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September 19, 2011

VIA EMAIL AND MAIL

Mr. Eric Solorio, Siting Project Manager
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

Re: Pio Pico Energy Center Project (11-AFC-01)
Application for a Prevention of Significant Deterioration Permit

Dear Mr. Solorio:

On behalf of Applicant Pio Pico Energy Center, LLC, please find enclosed herein Applicant's repackaged Application for a Prevention of Significant Deterioration Permit submitted to the United States Environmental Protection Agency, Region IX, on or about September 15, 2011. Due to the voluminous nature of this document, a disc containing the application will be served to all parties on the Proof of Service list.

Should you have any questions regarding this correspondence or the above-referenced application, please contact Melissa Foster at (916) 319-4673.

Respectfully submitted,

Kimberly J. Hellwig
Paralegal

KJH:jmw
Enclosure
cc: Proof of Service List

September 15, 2011

sierra research

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Mr. Gerardo Rios
Chief, Permits Office
USEPA Region IX
75 Hawthorne Street
San Francisco, CA 94105

Subject: Pio Pico Energy Center
Repackaged Application for a Prevention of Significant Deterioration Permit

Dear Mr. Rios:

As requested by EPA in a telephone conversation on August 9, 2011, we are submitting on behalf of Pio Pico Energy Center, LLC a repackaged version of the application filed on April 1, 2011 for a PSD permit for the proposed Pio Pico Energy Center (PPEC). This repackaged application has been revised, as requested by EPA, to delete certain portions of the application which were not relevant to EPA's review of the PSD permit application for PPEC.

PSD modeling data files are provided as electronic files on media accompanying this submittal.

As requested by EPA, this repackaged application also contains information that demonstrates that that PPEC has no potential for a significant adverse impact to any threatened or endangered species as a result of nitrogen deposition.

The generating facility will include three General Electric (GE) LMS100 natural gas-fired combustion turbine generators (CTGs), each equipped with water injection to the combustors for reducing production of oxides of nitrogen (NOx), a selective catalytic reduction (SCR) system with 19 percent aqueous ammonia (NH_3) injection to further reduce NOx emissions, and an oxidation catalyst to reduce carbon monoxide (CO) emissions. The total net generating capacity would be approximately 300 MW. The new emitting units will be installed on a 9.9 acre parcel in the southeast quadrant of the intersection of Alta Road and Calzada De La Fuente Road, adjacent to the Otay Mesa Energy Center. The Project will be a new major source under the federal Prevention of Significant Deterioration (PSD) program because it will have the potential to emit more than 100,000 TPY of greenhouse gases (GHGs), a federally regulated pollutant.

The applicant's contact information is:

Gary Chandler
President, Pio Pico Energy Center, LLC
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If you have any questions regarding this application, please contact the applicant's representative David Jenkins at (317) 431-1004, or Gary Rubenstein or me at (916) 444-6666.

Sincerely,

Steve Hill

enclosures

cc: (w/o enclosure)
John McKinsey, Stoel Rives LLP
David Jenkins, Apex Power Group
Steve Moore, SDAPCD

sierra research

Application to the U.S. EPA for a Prevention of Significant Deterioration Permit
Pio Pico Energy Center
San Diego County, California

prepared for:

Pio Pico Energy Center, LLC

September 2011

prepared by:

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Application to the U.S. EPA for a Prevention of Significant Deterioration Permit
Pio Pico Energy Center
San Diego County, California

prepared for:

Pio Pico Energy Center, LLC

September 2011

Principal author:

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Application to the U.S. EPA for a Prevention of Significant Deterioration Permit Pio Pico Energy Center San Diego County, California

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1. INTRODUCTION

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1.0 INTRODUCTION

In this Application for a Prevention of Significant Deterioration (PSD) permit, Pio Pico Energy Center, LLC (PPEC LLC or "Applicant") is seeking approval from the U.S. Environmental Protection Agency (EPA) to construct and operate a power generation facility, the Pio Pico Energy Center (PPEC), within the County of San Diego. PPEC LLC seeks EPA approval in order to satisfy an obligation to supply electrical capacity and energy to San Diego Gas & Electric (SDG&E) under a 20-year Power Purchase Agreement (PPA).

PPEC is a proposed simple-cycle power generation project that consists of three General Electric (GE) LMS100 natural gas-fired combustion turbine generators (CTGs). The total net generating capacity would be 300 megawatts (MW), with each CTG capable of generating 100MW. The proposed plant will be owned and operated by PPEC LLC. The electricity generated by this project would be in support of a contract with SDG&E.

The generating facility will include three GE LMS100 natural gas-fired combustion turbine generators (CTGs), each equipped with water injection to the combustors for reducing production of oxides of nitrogen (NOx), a selective catalytic reduction (SCR) system with 19 percent aqueous ammonia (NH_3) injection to further reduce NOx emissions, and an oxidation catalyst to reduce carbon monoxide (CO) emissions. The total net generating capacity would be approximately 300 MW. The new emitting units will be installed on a 9.9 acre parcel in the southeast quadrant of the intersection of Alta Road and Calzada De La Fuente Road, adjacent to the Otay Mesa Energy Center. The Project will be a new major source under the federal Prevention of Significant Deterioration (PSD) program because it will have the potential to emit more than 100,000 TPY of greenhouse gases (GHGs), a federally regulated pollutant.

TABLE 1-1
PSD APPLICABILITY

Pollutant	Major Source Threshold[a] (TPY)	PSD Significant Emission Threshold[b] (TPY)	PPEC Emissions (TPY)	Major Source?	Significant Emissions?	Subject to PSD?
SO_2	250	40	4.1	No	No	No
PM_{10}	250	15	37.2	No	Yes	**Yes**
$PM_{2.5}$	250	10	37.2	No	Yes	**Yes**
NOx	250	40	70.4	No	Yes	**Yes**
VOC	250	40	20.7	No	No	No
CO	250	100	96.4	No	No	No
Lead	250	0.6	0.0	No	No	No
GHGs	100,000[c]	75,000[c]	685,000	Yes	Yes	**Yes**

[a] 40 CFR 52.21(b)(1)
[b] 40 CFR 52.21(b)(23)
[c] 40 CFR 52.21(b)(49)

USEPA's *New Source Review Workshop Manual, Prevention of Significant Deterioration and Nonattainment Area Permitting* states the following:

> *Although each applicant for a PSD permit must perform an additional impacts analysis, the depth of the analysis generally will depend on existing air quality, the quantity of emissions, and the sensitivity of local soils, vegetation, and visibility in the source's impact area.*[1]

The remaining sections of this permit application are as follows:

- Section 2 presents an overview of the project and its impacts.
- Section 3 provides detailed project description information.
- Section 4 presents the Air Quality supporting materials.
- Section 5 describes impacts on soils and vegetation.
- Section 6 describes the potential for growth-inducing impacts.
- Appendix 1 contains detailed emission calculations, modeling results, and the BACT analysis.
- Appendix 2 contains detailed information regarding biological resources.

[1] USEPA, *New Source Review Workshop Manual, Prevention of Significant Deterioration and Nonattainment Area Permitting (Draft, Oct 1990)*, page D.1.

2. EXECUTIVE SUMMARY

(Section 1.0 of the Application for Certification)

1.1 INTRODUCTION

In this Application for Certification (AFC), Pio Pico Energy Center, LLC (PPEC LLC or "Applicant") is seeking approval from the California Energy Commission (CEC) to construct and operate a power generation facility, the Pio Pico Energy Center (PPEC), within the County of San Diego. PPEC LLC seeks CEC approval in order to satisfy an obligation to supply electrical capacity and energy to San Diego Gas & Electric (SDG&E) under a 20-year Power Purchase Agreement (PPA).

PPEC is a proposed simple-cycle power generation project that consists of three General Electric (GE) LMS100 natural gas-fired combustion turbine generators (CTGs). The total net generating capacity would be 300 megawatts (MW), with each CTG capable of generating 100MW. The proposed plant will be owned and operated by Pio Pico Energy Center, LLC (PPEC LLC). The electricity generated by this project would be in support of a contract with SDG&E. Section 2.0, Project Objectives, describes the contract in more detail.

The GE LMS100 is the first intercooled gas turbine system developed especially for the peaking electrical needs of the power generation industry. The LMS100 is designed for cyclic applications with 10-minute starts that provide flexible power generation for peaking and intermediate solutions vital to support variable demand and variable renewable energy sources that SDF&E is increasingly contracting for.

The project site consists of previously disturbed and prepared land within an industrial park, the Otay Mesa Business Park, in the County of San Diego, adjacent to the existing Otay Mesa Generating Project. The site is served by prepared, paved streets, water and other utilities. Besides short connections in the streets for water and sewer, PPEC will require only a natural gas transmission pipeline and an electrical transmission connection line. Surrounding uses are highly compatible with PPEC. For these reasons, PPEC will have minimal adverse environmental impacts while providing a valuable peaking and load shaping needs for the San Diego area.

PPEC is designed to directly satisfy the San Diego area demand for peaking and load-shaping generation, near and long term. Power would come from three GE LMS100 natural gas-fired CTGs. Each CTG would be equipped with water injection for reducing oxides of nitrogen (NO_x) emissions, a selective catalytic reduction (SCR) system with 19 percent aqueous ammonia (NH_3) injection to further reduce NO_x emissions, and an oxidation catalyst to reduce carbon monoxide (CO) and volatile organic compound (VOC) emissions. Auxiliary equipment would include inlet air filters with evaporative coolers, a turbine compressor section intercooler, a partial dry-cooling system, circulating water pumps, water treatment equipment, natural gas compressors, generator step-up and auxiliary transformers, and water storage tanks.

This AFC has been prepared in accordance with the requirements of the Warren Alquist Act (Public Resources Code section 25000 et. seq) and regulations adopted pursuant to that law. The AFC provides:

- A detailed description of the proposed PPEC project.

- An assessment of the anticipated project impacts on the existing environment.
- A discussion of compliance with applicable laws, ordinances, regulations, and standards (LORS).

The remainder of this Executive Summary summarizes the more detailed information presented in the balance of the AFC.

1.2 FACILITY LOCATION AND DESCRIPTION

1.2.1 Facility Location

The project site is located in an unincorporated area of San Diego County known as Otay Mesa. It is comprised of a 9.99 acre parcel located in the southeast quadrant of the Alta Road and Calzada de la Fuente intersection in an industrial park entitled the Otay Mesa Business Park. The proposed project site comprises the entire parcel Assessor's Parcel Number (APN) 648-040-45, and the laydown area is 6.00 acres of APN 648-040-46 (Figure 3.3-2, Project Location). A natural gas supply pipeline will be constructed along one of two routes to connect the project to an existing natural gas supply pipeline. A 230 kV transmission line will be constructed on one of two routes to connect the project to an existing 230 kV switchyard. Existing site and surrounding land uses include two correctional facilities (State and County) and an existing natural gas-fired electrical generating station.

1.2.2 Facility Description

PPEC is designed to directly satisfy the San Diego area's current and long-term requirements or peaking and load-shaping generation. As previously stated, the generating facility would consist of three GE LMS100 natural gas-fired CTGs. Each CTG is equipped with water injection for reducing NO_x emissions, a SCR system with 19 percent NH_3 injection to further reduce NO_x, and an oxidation catalyst to reduce CO and VOC emissions. The total net generating capacity would be approximately 300MW.

Each CTG would generate approximately 100MW at summer design ambient conditions. The project would have a maximum annual capacity factor of approximately 46 percent (4,000 hours per year). Associated equipment would include emission control systems necessary to meet the proposed emission limits. Stack emission NO_x in normal operation would be controlled to 2.5 parts per million, volumetric dry (ppmvd) corrected to 15 percent oxygen through a combination of water injection in the combustors and operation of the SCR system. The oxidation catalyst would limit normal operation CO stack emissions to 4 ppmvd adjusted to 15 percent oxygen.

Refer to Appendix A through F for the engineering design criteria for the project.

1.2.3 Fuel Gas Supply

The CTGs would fire natural gas exclusively. At full load, each CTG would require up to 825 million British thermal units per hour (MMBtu/hr) low heating value (LHV) of natural gas, for a total plant demand of 2,475 MMBtu/hr LHV. SDG&E would build, own, and operate a

gas pipeline from SDG&E's existing gas pipeline to the south and west. The AFC proposes two alternate routes for the gas supply line.

1.2.4 Water Supply and Discharge

PPEC is designed and intended to use recycled water. Process water uses include plant service water, cooling system makeup, combustion turbine NO_x injection (after treatment), and combustion turbine inlet air evaporative cooler makeup. The CTG injection water would be treated using an ultra filtration (UF) system, a reverse osmosis (RO) system, and skid-mounted ion exchange vessels. Process water would also serve as a secondary source of fire protection water. A connection to the Otay Water District potable water would supply facility drinking water, showers, sinks, toilets, eye wash stations, and safety showers in hazardous chemical areas. It would also serve as the facility's primary source of fire protection water. In the event that recycled water is not available upon start up of the project, the project would temporarily use potable water for all plant needs until such time as recycled water is available.

1.2.5 Transmission Facilities

PPEC will be connected to the nearby existing 230kv Otay Mesa Switchyard via one of two proposed new transmission lines.

1.3 PROJECT SCHEDULE

Construction for PPEC is expected to begin in 2013 following the CEC approval of this AFC. Startup, testing and commercial operation would begin in 2014.

1.4 PROJECT OWNERSHIP

- Owner: Pio Pico Energy Center, LLC
- Operator: Pio Pico Energy Center, LLC

1.5 SUMMARY OF ENVIRONMENTAL IMPACTS

Like all major power plants, the proposed project has the potential to adversely impact the existing environment. The Applicant, however, has carefully chosen the project location and incorporated innovative design measures to ensure that any potential project impacts will be at or below a level of significance. Section 5 of this AFC assesses environmental impacts according to the standard CEC structure of topics. Transmission Safety Line and Nuisance, Power Plant Reliability and Power Plant Efficiency, however, are located in Section 3. The AFC demonstrates that the project will have no unmitigated significant adverse environmental impacts.

3. PROJECT DESCRIPTION

(Sections 2.0 and 3.0 of the Application for Certification)

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The Pio Pico Energy Center (PPEC) is a simple-cycle power generation project that has been designed and developed to conform to the requirements of San Diego Gas and Electric (SDG&E) and the California Public Utilities Commission (CPUC). This project's primary goal is to meet the objectives of SDG&E's 2009 Request for Offers (RFO) and the resulting contractual requirements contained in the Power Purchase Agreement between SDG&E and Pio Pico Energy Center, LLC (PPEC LLC).

2.1 SDG&E REQUEST FOR OFFERS

The CPUC approved the SDG&E long-term resource plan. In this proceeding, SDG&E submitted its long-term resource needs and the increments of generation required to meet these load projections. SDG&E indicated that most of the required generation would be acquired to satisfy peaking and shoulder loads, and would be dispatchable. According to CPUC's decision that approves SDG&E's long-term resource plan, SDG&E was authorized and encouraged to seek new peaking dispatchable generation through a bidding process to satisfy projected system loads.

In response to this decision, SDG&E issued its 2009 RFO. SDG&E also indicated that, in accordance with the CPUC decision, SDG&E would utilize an "Independent Evaluator" to oversee the RFO process. SDG&E notified prospective bidders that their bids would be evaluated utilizing a number of factors, including market valuation, portfolio fit, transmission impact, environmental characteristics, and conformance with SDG&E's nonprice terms and conditions.

These RFO objectives are derived from a need for new electric power generation as projected and authorized by the CPUC and California Independent System Operator (CAISO). SDG&E, as authorized by the CPUC, issued an RFO in June 2009 and awarded PPEC LLC a Power Purchase Agreement in January 2011 under the RFO Product 2 category. Following is an excerpt from that Product 2 offering:

> **Product 2 - New Local Generation Projects, online in 2010 – 2014.**
>
> SDG&E seeks a minimum of 100 MW of peaking or intermediate-class resources as new construction or expansion projects within SDG&E's territory. Any resulting contract will be a tolling agreement with a term of 20 years and online dates of May 1- or October 1 in either 2010, 2011, 2012, 2013, or 2014. The generation must be located physically within SDG&E's service territory (as more specifically described in the Addendum) or have its sole generator transmission system interconnection (gen-tie) directly interconnected to the electric network internal to SDG&E's local area as currently defined by the California Independent System Operator ("CAISO") such that the unit supports SDG&E's Local RA requirement. … Products offered in this category shall be capable of operating under all permits at annual capacity factors of a minimum of 30% with an availability of >98%. It is anticipated that heat rates will be no higher than 10,500 btu/kWh. For this product, SDG&E requires flexible resources that are capable of providing regulation during the morning and evening ramps and/or units that can be started and shut down as needed. In addition, SDG&E will include the

additional value provided from projects that can provide quick start operations in the ranking of Offers. SDG&E also requires that each Offer contain pricing for, and an option to provide, black start capability.

These SDG&E RFO objectives are listed below:

1. Be online by 2014.
2. Be a minimum of 100 megawatts (MW) of peaking and intermediate-class resources.
3. Locate in SDG&E service territory.
4. Operate under a fuel tolling agreement over a 20-year contract.
5. Be capable of operating under all permits at annual capacity factors of a minimum of 30% with an availability of >98%.
6. Heat rates will be no higher than 10,500 British thermal units per kilowatt hour (Btu/kWh).
7. Use flexible resources that can provide regulation during the morning and evening ramps and/or units that can be started and shut down as needed.
8. Provide quick start operations.

2.2 RESPONSE TO REQUEST FOR OFFERS

The Applicant, upon evaluation of all the RFO Product offerings, decided that Product 2 (peaking power) was the most compatible offering with the Applicant's power development experience. PPEC LLC was incorporated and a bid into the SDG&E RFO was submitted in August 2009. The PPEC team believes that a relatively large number of offers were submitted to SDG&E in response to its June 9, 2009, RFO.

In December 2009, PPEC LLC was informed by SDG&E that the PPEC bid had been short-listed and that power purchase agreement negotiations would begin in earnest. See Section 4.0, Alternatives, for more details on PPEC's RFO response. As noted above, a PPA was executed between SDG&E and PPEC, LLC in January 2011.

2.3 SDG&E CONTRACT

SDG&E evaluated the offers and created a short list of potential projects. Following the submittal of additional information to SDG&E, the list of projects was further shortened. In December 2009, SDG&E informed PPEC LLC that its project had been accepted on a final list, thereby commencing negotiations over contract terms and conditions. Rigorous negotiation ensued over contract terms that culminated in a contract signed in January 2011 for generation services.

Salient contract provisions include:

- A contract term of 20 years.
- PPEC would be constructed on a leased parcel of land located in San Diego County.
- PPEC would have three General Electric LMS100 combustion turbine machines.
- Each of these combustion turbines would provide approximately 100MW of capacity in summer peak conditions for a total of 300MW.
- A turbine efficiency level no higher than 10,500 Btu/kWh is to be produced at 100 percent rated capacity, summer peak conditions.
- SDG&E has the ability to dispatch each of the units as system conditions require.
- The entire three-turbine project is to be online and available for SDG&E to dispatch into the grid on or before May 27, 2014.

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3.1 INTRODUCTION

The Pio Pico Energy Center (PPEC), proposed by Pio Pico Energy Center, LLC (PPEC LLC), is a simple-cycle electrical generating facility that is contracted under a 20-year power purchase agreement (PPA) with San Diego Gas & Electric (SDG&E) in response to their 2009 Request for Offers (RFO). The RFO was a broad solicitation for power generation that included peaking facilities, like PPEC, as well as demand-side management and generation from renewable energy resources.

PPEC, which would be owned and maintained by PPEC LLC, is designed to directly satisfy the San Diego area peaking and load-shaping generation current and long-term requirements. Key among these requirements is supporting wind and solar generation, whose overall output varies. As wind, hydro, solar, and other renewable resource output drops, PPEC can be dispatched from 'cold iron' to 300 megawatts (MW) in fewer than 10 minutes to make up the lost grid capacity. Thus, PPEC would support and allow heightened penetration of renewable energy into SDG&E's service territory.

Electric power generated at PPEC would be sold to SDG&E under a 20-year PPA between PPEC LLC and SDG&E. Design of the plant and equipment selection is based on requirements in the PPA.

The project would be located on a disturbed and development-prepared parcel within an unincorporated industrial area within San Diego County (see Figure 3.1-1, Regional Location, and Figure 3.1-2, Site Vicinity). The project site and facilities would encompass 9.99 acres of permanent improvement and would temporarily utilize 6.0 acres of laydown area. The project also has linears comprised of a natural gas pipeline having a maximum length of approximately 10,300 feet, and an electrical transmission line having a maximum length of approximately 2,650 feet. The project will also connect to water supply and discharge pipelines in the paved streets adjacent to the site. The project site is adjacent to or nearby all necessary supporting infrastructure. Specifically:

- The 230-kilovolt (kV) SDG&E Otay Mesa switchyard is located within 1,800 feet.
- An SDG&E intrastate gas transmission line is located within two miles.
- Otay Water District will provide potable and, eventually, recycled water directly to the project site through Otay Water District water lines immediately adjacent to the site.
- Sewer discharge mains area located immediately adjacent to the project site along Alta Road and Calzada de la Fuente.
- The site is easily accessible by existing primary County roads.

Photograph: View of the project site near the intersection of Calzada de la Fuente and Alta Road (northwest corner of the project site) and facing generally east. The existing Otay Mesa Generating Project, which is located directly east of the PPEC project property, is shown on the photograph.

The generating facility would include three General Electric (GE) LMS100 natural gas-fired combustion turbine generators (CTGs), each equipped with water injection to the combustors for reducing production of oxides of nitrogen (NO_x); a selective catalytic reduction (SCR) system with 19 percent aqueous ammonia (NH_3) injection to further reduce NO_x emissions; and an oxidation catalyst to reduce carbon monoxide (CO). The total net generating capacity would be approximately 300MW.

The GE LMS100 is the first intercooled gas turbine system developed especially for the power generation industry. It uses heavy-duty gas turbine and aero-derivative gas turbine technology. The LMS100 produces approximately 100MW at an efficiency rate that is approximately ten percent higher than that of other commercial simple-cycle gas turbines. The LMS100 is specifically designed for cyclic applications; it provides flexible power and ten-minute starts. Equipment locations and dimensions are depicted on Figure 3.1-3A, Site Arrangement.

The LMS100 combines GE's existing and proven frame, the MS6001FA, and GE's aero-derivative CF6-80 gas turbine technologies to provide high thermal efficiency in power generation applications. The GE CF6-80 gas turbine has over 100 million hours of operating experience in both aircraft engines and industrial applications, and the MS6001FA medium

duty gas turbine F class technology family has over 28 million operating hours in power generation and other applications. Combining the high pressure compressor technology of the CF6, the low pressure compressor technology of the MS6001FA, and the optimum design of other components and systems based on proven designs and operating experience provides the advanced design and performance of the LMS100. The LMS100 technology is GE Power's growth platform in the peaking and loading power generation market.

Electricity generated by PPEC would be delivered to an existing 230kV SDG&E switchyard located approximately 1,800 feet from the project site, as shown in Figure 3.1-3B, Site Arrangement and Potential Offsite Transmission Line Structure Locations. The 230kV connecting transmission line will be built and owned by PPEC LLC, with ownership shifting to SDG&E at the switchyard entrance.

3.2 FACILITY NEED

The project would improve reliability within the SDG&E service territory, complement the increasing use of renewable energy sources through its ten-minute start and high-efficiency characteristics, and help allow the retirement of the South Bay Power Plant.

Upon approval by the California Public Utilities Commission (CPUC), SDG&E issued an all-source RFO in June 2009. The RFO sought demand responses and supply resources to: support reliability within the SDG&E service territory; to supply energy to bundled customers; and/or to meet other portfolio needs, including Resource Adequacy (RA) requirements. The RFO sought seven different products, and PPEC LLC responded to a request for new local generation projects coming online between 2010 and 2014.

3.3 PROJECT SITE, LINEARS, AND TEMPORARY LAYDOWN AREA

PPEC consists of the project site, linears, and a temporary laydown area (Figure 3.3-1, Facility Plot Plan and Figure 3.3-3, Potential Linears). The project site is located in an unincorporated area of San Diego County known as Otay Mesa. It is comprised of a 9.99 acre parcel located in the southeast corner of the Alta Road and Calzada de la Fuente intersection. The proposed project site comprises the entire parcel with Assessor's Parcel Number (APN) 648-040-45, and the laydown area is 6.00 acres of an adjacent parcel to the south (APN 648-040-46) (Figure 3.3-2, Project Location). The existing setting within one-mile of the project site and potential transmission line routes are presented on Figure 3.3-4, Existing Setting within 1-Mile Radius of Potential Transmission Lines. The project affects the following areas:

- Plant site – 9.99 acres.

- Temporary laydown and parking area – 6.00 acres, on an adjacent parcel that is contiguous to the project site.

- Natural Gas pipeline – There are two possible routes for the gas supply pipeline. Both routes would connect to an existing SDG&E natural gas pipeline, but at different locations. The Modified Gas Line Route A extends approximately 2,375 feet south along

This page has been revised from the original AFC to reflect subsequent refinements to the project design.

Alta Road. The Modified Gas Line Route A then turns west on Otay Mesa Road for approximately 2,700 feet, and then turns south on Enrico Fermi Drive for approximately 2,700 feet to Airway Road, at which point it would connect to the existing SDG&E natural gas pipeline (refer to Figure 3.3-3, Potential Linears). Route B would extend approximately 2,375 feet south along Alta Road, turn west on Otay Mesa Road, and continue approximately 7,920 feet to Harvest Road at which point it would connect to the existing SDG&E natural gas pipeline for a total of approximately 10,300 feet. The pipeline will be constructed, owned, and operated by SDG&E.

- Sewer pipeline – A short connection will be made to an existing 12-inch sewer main along Calzada de la Fuente along the north project site boundary, or to an existing 15-inch sewer main along Alta Road, along the west project site boundary.

- Stormwater pipeline – A short connection will be made from a detention pond located at the northwest corner of the project site to an existing 30-inch stormwater pipeline located along Calzada de la Fuente, adjacent to the project site.

- Power line – Two possible routes are provided for a 230kV transmission line that will connect the project into the existing 230kV Otay Mesa switchyard. Route A would begin as an overhead power line along Calzada de la Fuente, extend approximately 1,700 feet east where it would then be routed underground for approximately 400 feet into the Otay Mesa switchyard (total length of Route A would be approximately 2,100 feet). Route B would begin as an overhead power line from the eastern edge of the project site, run south approximately 550 feet, then turn east along the northern border of the parcels with APN 648-040-48 and APN 648-040-43 for 1,400 feet, and finally turn north for approximately 700 feet into the Otay Mesa switchyard (total length of Route B would be approximately 2,650 feet). The power line will be owned and maintained by the Applicant.

- Water supply pipelines – The project will make a short connection to the potable service system, either at an existing 12-inch main along Calzada de la Fuente, or at an existing 24-inch main along Alta Road. Upon the Otay Water District (OWD)'s completion of the planned Otay Mesa area recycled water system, the project will make a connection to an existing 8-inch recycled water main along Calzada de la Fuente or a new recycled water main to be constructed in Alta Road.

3.4 SITE DESCRIPTION

3.4.1 Topography

The site topography as of December 2010 is provided on Figure 3.4-1, 2010 Site Topography. The industrial park developer will grade the property in first quarter 2011 as described in the

This page has been revised from the original AFC to reflect subsequent refinements to the project design.

2009-2010 County of San Diego Grading Permit 2700-1555. This planned soil removal and grading of the property was already planned for prior to the inception of this project and will occur regardless of the submittal of this AFC or its eventual approval. Site elevation for purposes of this project will be approximately 635 feet above mean sea level (msl). This will establish the baseline conditions that this AFC is founded upon. The baseline site topography is shown on Figure 3.4-2, Baseline Site Topography.

The project preliminary grading and drainage is shown on Figure 3.4-3, Preliminary Grading and Drainage Plan.

3.4.2 Geologic Setting and Seismology

The geologic and seismologic setting of the proposed plant site is discussed below and presented in more detail in Section 5.3, Geologic Hazards and Resources.

3.4.2.1 Subsurface Conditions

The PPEC geologic study area, which generally consists of the area within two miles of the project site and associated transmission line and natural gas pipeline routes, comprises basement complex metamorphic rocks, poorly to weakly cemented nonmarine rocks, and alluvial sediments. A more detailed summary of subsurface conditions will be provided in a geotechnical investigation report based on geotechnical analysis conducted soon after the landowner completes his grading plan for the project site.

3.4.2.2 Seismology and Seismic Shaking

The PPEC site is not located within an Alquist-Priolo Earthquake Fault Zone, and no faults were identified within the PPEC geologic study area. The project site area (and all of the San Diego County area) is designated within a Seismic Zone 4, and like most of Southern California, is subject to ground shaking. The project would be designed in accordance with the 2007 California Building Code seismic design parameters, as detailed in Section 5.3.

3.4.2.3 Liquefaction Potential

Liquefaction is not known to have occurred in San Diego County. Historically, seismic shaking levels have not sufficed to trigger liquefaction, and ground failures or damage to structures has not occurred as a consequence of liquefaction. The risk of liquefaction at the project site and surrounding area is considered low. Please refer to Section 5.3, Geologic Hazards and Resources, for further details.

3.4.3 Hydrological Setting

The PPEC site is in the Otay River watershed, which is part of the San Diego Bay watershed. The site is approximately ten miles east of San Diego Bay.

The climate in the vicinity of PPEC can be characterized as semi-arid. Based on 31 years of historical records, the average annual temperature for El Cajon is 65.2 degrees Fahrenheit (°F). The El Cajon station is at elevation 400 feet msl and is approximately 15 miles north of the project site.

Precipitation in the area is characterized by long dry summers and intermittent wet periods. Based on the 31-year record of precipitation at El Cajon, the average annual precipitation is approximately 12 inches, of which approximately 90 percent occurs from November through April.

3.4.3.1 Surface Water

The project site is not located within a Federal Emergency Management Agency 100-year floodplain (Zone A). Further details on surface water are presented in Section 5.5, Water Resources.

3.4.3.2 Groundwater

Depth to groundwater underlying the PPEC site is unknown, however, results from a geotechnical investigation conducted in 1997 for the adjacent Otay Mesa Generating Project indicate that the groundwater table in the vicinity of the project site is below elevation 580 feet (See Section 5.3). The presence or lack of shallow or perched groundwater will be determined as part of the geotechnical investigation for the project site. Groundwater resources, if present, will not be accessed or used for the project.

3.5 FACILITY DESCRIPTION

3.5.1 Overview

The generating facility will consist of three GE LMS100 natural gas-fired CTGs, each equipped with water injection to the combustors for reducing production of NO_x, an SCR system with 19 percent NH_3 injection to further reduce NO_x emissions, and an oxidation catalyst to reduce CO and volatile organic compound (VOC) emissions. The total net generating capacity would be approximately 300MW. Table 3.5-1 provides a description of major equipment, and Figure 3.5-1, Site Arrangement Elevations illustrates project elevations.

TABLE 3.5-1
MAJOR EQUIPMENT INFORMATION

Description	Dimensions			
	Capacity	Length (ft)	Width (ft)	Height (ft)
Combustion Turbines (3)	103MW	130	30	40
Intercooler Heat Exchangers (3)	120 MMBtu/hr	44	15	13.5
CTG Stacks (3)	--	--	14.5 diameter	100
Variable Bleed Vents, with Silencers (3)	--	--	12	53
Hot SCR	--	70	25	35
Wet Cooling Components (12)	120 MMBtu/hr	26	14	22
Dry Cooling Components (9)		47	14	15
Raw Water Storage Tank	500,000 gal	--	54 diameter	30
Demineralized Water Storage Tank	240,000 gal	--	38 diameter	30

Description	Dimensions			
	Capacity	Length (ft)	Width (ft)	Height (ft)
Wastewater Collection Tank	95,000 gal	--	26 diameter	24
Gas Compressor Enclosure (3)	--	50	17	15

Notes:
CTG = combustion turbine generator
ft = foot (feet)
gal = gallon(s)
MMBtu/hr = million British thermal units per hour
MW = megawatt
SCR = selective catalytic reduction

Each CTG would generate approximately 100MW at summer design ambient conditions. The project would have a maximum annual capacity factor of approximately 46 percent (4,000 hours per year).

Associated equipment would include emission control systems necessary to meet the proposed emission limits. Emissions are described in Section 5.2, Air Quality.

Refer to Appendices A through F for the project's engineering design criteria.

3.5.2 Project Site Access

Access to the PPEC site would be via Calzada de la Fuente, west of the Otay Mesa Generating Project (OMGP).

3.5.3 Site Layout

The PPEC site layout, including the location and size of the plant facilities and the temporary construction parking and laydown areas, is depicted on Figure 3.1-3A, Site Arrangement, and Figure 3.3-1, Facility Plot Plan. A site elevation view of the new plant is illustrated on Figure 3.5-1, Site Arrangement Elevations. Off-site linear improvements, including the gas pipeline, and electric transmission line, are described in Section 3.3, Project Site, Linears, and Temporary Laydown Area, and shown on Figure 3.3-1, Facility Plot Plan and Figure 3.3-3, Potential Linears.

The plant facilities have been arranged for optimum use of the property and ease of operation and maintenance. Grading and drainage for the project site are shown on Figure 3.4-3, Preliminary Grading and Drainage Plan.

The maximum area of construction disturbance (i.e., in the event that the longest natural gas pipeline and transmission line routes [Route B in each case] are installed) would be approximately 32.68 acres, which is comprised of 9.99 acres for the plant site, 6.00 acres for the temporary construction laydown area, 11.82 acres for the Route B natural gas pipeline, and 4.87 acres for the Route B 230kV transmission line.

3.5.4 Power Plant Cycle

Each simple-cycle LMS100 CTG produces approximately 100MW of electricity. Output depends on inlet air ambient conditions and inlet evaporative cooling. The CTG design incorporates a compressor intercooler and increased firing temperatures to achieve high efficiency and optimum performance under high ambient temperatures. The CTGs are equipped with hot SCRs to reduce NO_x, CO, and VOC emissions.

3.5.4.1 Combustion Turbine Generator

Thermal energy is produced in the CTGs through the combustion of natural gas, which is converted into mechanical energy to drive the combustion turbine compressors and electric generators.

Three GE LMS100 CTGs were selected for the plant. The LMS100 integrates features of GE's frame and aero-derivative CTG design features. The low-pressure compressor is derived from the heavy-duty frame engine designs, and the high-pressure compressor, combustor, and power turbine components are derived from the aero-derivative designs. Each CTG consists of a stationary combustion turbine-generator and associated auxiliary equipment.

Turbine compressor inlet air is drawn through the air inlet ductwork above the combustion turbine. The inlet air filter removes dust and particulate from the intake air. During hot weather the filtered air is cooled by contact with water in the evaporative cooler section of the air inlet ductwork.

Filtered and cooled air drawn into the gas turbine low-pressure compressor section is compressed to an intermediate pressure. Compressing the air causes the air temperature to rise along with the increase in pressure. Cooling the intermediate pressure air before final compression improves the efficiency of the compression process. Hot intermediate pressure air is cooled in a water-cooled heat exchanger (intercooler), external to the compressor, before it enters the high-pressure compressor section.

Hot high-pressure compressed air from the high-pressure compressor discharge flows to the combustion turbine combustor, where high-pressure natural gas is injected into the compressed air and ignited. Water is injected into the combustor to temper the combustion temperature, which reduces the production of thermal NO_x.

Heated air and combustion gas pass from the combustor through the expansion section of the turbine, causing it to rotate. The expander draws energy from the hot compressed gases, causing them to cool as they progress through the expander.

The expander section of the turbine produces enough power to drive both the compressor and the electric generator. Integrating the intercooler between compressor stages in the LMS100, together with higher combustor firing temperatures, has resulted in gross turbine generator efficiency that is approximately ten percent more efficient than similar simple-cycle combustion turbines.

The metal acoustical enclosure, which contains the CTGs and accessory equipment, will be located outdoors. The CTGs will be equipped with the following required accessories to provide safe, reliable operation:

- Evaporative coolers (enhance hot weather performance)
- Inlet air filters (remove dust and particulate from the air)
- Metal acoustical enclosure (reduce sound emissions)
- Duplex shell and tube lube oil coolers for the turbine and generator (cool lubricating oil)
- Annular standard combustor combustion system
- Compressor wash system (cleans compressor blades and restores compressor performance)
- Fire detection and protection system
- Compressor intercooler (improves the efficiency of the compressor)
- Hydraulic starting system
- Combustor water injection system (for NO_x control and output enhancement)
- Compressor variable bleed valve vent (prevent compressor surge in off-design operation)
- The combustion gases exit the turbine at approximately 770ºF and then pass through the hot SCR system for NO_x emission control and an oxidizing catalyst for control of CO and VOC emissions. The SCR is used in conjunction with NH_3 injection for the control of NO_x emissions. A 19 percent aqueous NH_3 solution is injected into the CTG exhaust gas stream that passes over a catalyst bed, which reduces the NO_x to inert nitrogen.
- The SCR equipment includes a reactor chamber, catalyst modules, NH_3 storage, vaporization and injection system, and monitoring equipment and sensors. The NH_3 storage area will consist of a tank on a concrete pad with a boxed containment wall. After passing through the SCR, the exhaust gases exit through the attached stack.

3.5.4.2 Performance Data and Plant Efficiency

Each CTG will generate approximately 100MW under most ambient conditions. The PPEC plant will be limited to a maximum capacity factor of 46 percent, which is equivalent to 4,000 hours per year for each CTG.

The full-load performance of each CTG on a typical day (70 degrees ºF and 57 percent relative humidity) is as follows:

- Power Output 102.4.7MW at the generator terminals

- Fuel Flow 808 million British thermal units per hour (MMBtu/hr) low heating value (LHV), or 39,203 pounds per hour (lb/hr)
- Heat Rate 7,894 British thermal units per kilowatt hour (Btu/kWh) LHV

Auxiliary power loads for CTG auxiliaries and for the balance of plant equipment will reduce the net electrical power output transmitted from the generator terminals to the transmission grid. The project operating characteristics during season (i.e., Winter, Spring/Fall, and Summer) and peak periods are provided on the heat and mass balance diagrams presented on Figures 3.5-2A through 3.5-2D, and key characteristics are summarized in Table 3.5-2, Seasonal Heat and Mass Balances. Annual operating characteristics (per CTG and total plant) are presented in Table 3.5-3, Design Condition Annual Operating Characteristics.

TABLE 3.5-2
SEASONAL HEAT AND MASS BALANCES

	Winter	Spring/Fall	Summer	Peak
Conditions				
Ambient Dry Bulb, ºF	59	70	80	93
Relative Humidity, %	60	57	38	22
Performance				
CTG Output (each), MW	104.3	102.4	101.0	99.3
Heat Rate, Btu/kWh, LHV	7,856	7,894	7,926	7,964
Fuel Flow, MMBtu/hr, LHV	819	808	800	791
NO_x Water Injection, lb/hr	26,388	25,255	24,910	24,472
CT Exhaust Flow, klb/hr	1,708	1,685	1,669	1,650

ºF = degrees Fahrenheit
klb/hr = kilo pound per hour
lb/hr= pound per hour
LHV= lower heating value
MW = megawatts

TABLE 3.5-3
DESIGN CONDITION ANNUAL OPERATING CHARACTERISTICS

	Winter (per CTG)	Spring/Fall (per CTG)	Summer (per CTG)	Peak (per CTG)	Total Annual (Per CTG)	Total Annual Plant (3 CTGs)
Operating Hours	1,100	1,600	1,000	300	4,000	4,000
Fuel Consumption[1], MMBtu, LHV	900,900	1,292,800	800,000	237,300	3,231,000	9,693,000
Net Electrical Energy Produced[1], MWhr	114,730	163,840	101,000	29,790	409,360	1,228,080

MMBtu = One million Btu
MWhr = Megawatt-hour
LHV = lower heating value
[1] Assumes 500 startups and shutdowns per year.

3.5.4.3 Emissions Data

After commissioning of the CTG units, the emissions from the stack of each CTG at full-load conditions would be as follows:

- NO_x 2.5 parts per million volumetric dry (ppmvd) corrected to 15 percent oxygen (O_2)
- CO 4.0 ppmvd corrected to 15 percent O_2
- VOC 2.0 ppmvd corrected to 15 percent O_2
- NH_3 Slip 5.0 ppmvd corrected to 15 percent O_2
- Particulate matter less than 10 micrometers in diameter (PM_{10}) 5.5 lb/hr

3.5.5 Major Electrical Equipment and Systems

The net electric power generated by the PPEC facility would be transmitted to the power grid through a 230kV interconnection with the SDG&E Otay Mesa switchyard. A small percentage of electric power would be utilized on site to power auxiliaries, such as pumps, natural gas compressors, cooling fans, control systems, and general facility electric loads, including lighting, heating, and air conditioning. Some of the auxiliary power would also be converted from alternating current (AC) to direct current (DC) and would be used as back-up power for control systems and other uses.

The CTGs will generate power at 13.8kV, which will be stepped-up by fan-cooled generator step-up unit (GSU) transformers to 230kV for transmission to the utility switchyard and grid. When the units are off-line, the auxiliary power would be back-fed through each step-up and auxiliary transformer. Once the units are running, they will supply their own auxiliary power. Surge arresters will be provided at the high-voltage bushings to protect the transformers from surges on the 230kV system caused by lightning strikes or other system disturbances. The high-voltage side of the step-up transformers would be connected to gas-insulated (SF_6) circuit breakers located in the facility's 230kV switchyard.

Each subsection generally describes provisions that would be incorporated into the system's design. Specific equipment and system ratings will be established during detailed design.

3.5.5.1 Step-up Transformers

An overall one-line diagram of the PPEC facility's electrical generation and distribution system is shown on Figure 3.5-3, Electrical One-Line Diagram. The power will be generated at 13.8kV by the three power blocks, each consisting of one GE LMS100 gas turbine generator. The electricity generated at 13.8kV will be stepped up by GSU transformers to 230kV for transmission. The output of each generator will be connected by isolated phase bus to the two-winding, oil-filled GSU transformer. Surge arresters at the high-voltage bushings will protect the transformer from surges in the 230kV systems resulting from lightning strikes or other system disturbances. The transformers will be set on concrete pads with oil

containment provisions provided. A deluge type fire protection system will be provided for each step-up transformer. As recommended by the National Fire Protection Association (NFPA) 850, firewalls or separation will be installed between transformers to protect each transformer from a fire from any adjacent transformers. The firewalls will also offer a degree of protection to other equipment and structures in the immediate area.

3.5.5.2 Facility 230kV Switchyard

The facility's 230kV switchyard will consist of a 230kV radial feed type configuration, 230kV circuit breakers and disconnect switches, and structural bus supports. An outgoing 230kV generation tie line will be constructed using either Route A or Route B to connect the plant to the existing SDG&E Otay Mesa switchyard located approximately 1,800 feet east of the plant site. All equipment required to interface with the plant will be provided. As stated in Section 3.3, Route A would begin as an overhead power line along the north side of Calzada de la Fuente, extend approximately 1,700 feet east where it would then be routed underground for approximately 400 feet into the Otay Mesa switchyard (total length of Route A would be approximately 2,100 feet). Route B begins as an overhead power line from the eastern edge of the project site, would run south approximately 550 feet, then turn east along the northern border of the parcels with APN 648-040-48 and APN 648-040-43 for 1,400 feet, and finally turn north for approximately 700 feet into the Otay Mesa switchyard (total length of Route B would be approximately 2,650 feet).

3.5.5.3 Auxiliary AC Power Distribution

When the PPEC facility is shut down, SDG&E will provide electricity for the project site by back feeding from the SDG&E switchyard and tie line. When the facility generation is in operation, balance-of-plant (BOP) auxiliary power requirements will be supplied internally.

Auxiliary power to the facility loads will be distributed at 4.16kV AC by two unit auxiliary transformers. The auxiliary transformers will supply all electrical power to the BOP auxiliary equipment. The auxiliary transformers are oil-filled, two-winding, three-phase, 60 hertz (Hz) transformers with delta connected high side and wye-connected low-resistance grounded low-side windings. An off-load tap changer may be required on the GSU transformers and/or auxiliary supply transformers, as required by the connecting utility. Each auxiliary transformer's 4.16kV secondary winding will be connected by nonsegregated phase bus duct to the double ended 4.16kV switchgear through a normally closed main switchgear breaker.

The 4.16kV volt switchgear lineup will supply power to the various 4,000-volt (V) motors and to the secondary unit substation (SUS) transformers rated 4.16kV to 480V for 480V power distribution. The 4.16kV switchgear will have vacuum-operated metal-clad breakers for the main feeds. Fused contactors will be used for power distribution to the SUS transformer feeders and to 4,000 volt motors. The 4.16kV system will be low-resistance grounded to limit the maximum ground fault current.

Each auxiliary transformer will supply power to BOP and combustion turbine auxiliary loads in normal operation. Each auxiliary power transformer will be sized to accommodate the entire facility's complete auxiliary load in case there is any failure or shut down of an

auxiliary power transformer or one GSU transformer. The double ended 4.16kV switchgear will be equipped with a tie breaker for interconnecting both 4.16kV switchgear buses in case of a failure of one of the auxiliary transformers.

SUS transformers will be outdoor dry-type and will each supply 480V, three-phase power to the SUS buses through normally closed SUS main breakers. The 480V system will be high-resistance grounded to minimize the need for individual ground fault protection.

SUS transformers will each be sized to provide full 480V auxiliary load to the BOP facility loads. The 480V switchgear lineup will each be designed to be interconnected by a tie breaker in case of emergency, to supply power from only one 480V secondary substation transformer if required. Separate 480V transformers will be supplied to feed 480V loads on each CTG, the water treatment system, and the closed-cooling water system components.

SUS transformers will provide power through feeder breakers to the various large 480V motors and to motor control centers (MCCs). MCCs will distribute power to smaller 480V motors, 480V power panels, and other intermediate 480V loads. The normal supply for the two BOP MCCs will be from the SUS transformers, but automatic transfer switches will allow supply from an alternative source. MCCs will distribute power to 480-480/277V isolation transformers for 277V single-phase lighting loads. MCC fed 480V power panels will distribute power to small 480V loads.

The 480V MCCs and 480V power panels will provide power for the AC power supply (120/208V) system. The 480-120/208V solidly grounded dry-type transformers will provide transformation of 480V power to 120/208V power.

3.5.5.4 DC Power Supply

The DC power supply system for BOP loads will consist of one 125V DC battery bank, two 125V DC full-capacity battery chargers, ground detectors, and distribution panels. The 125V DC battery bank will feed all station DC loads and the uninterruptible power supply (UPS). Additional 125V DC systems may also be supplied as part of the CTG equipment.

Under normal operating conditions, the battery chargers will supply DC power to the DC loads. The battery chargers will receive 480V, three-phase AC power from the AC power supply (480V) system and continuously float charge the battery while supplying power to the DC loads. The ground detection scheme will detect grounds on the DC power supply system.

Under abnormal or emergency conditions when power from the AC power supply (480V) system is unavailable, the battery will supply DC power to the DC power supply system loads. Recharging of a discharged battery will occur whenever 480V power becomes available from the AC power supply (480V) system. The rate of charge will depend on the characteristics of the battery bank, battery charger, and the connected DC load during charging. However, the anticipated maximum recharge time will be 24 hours.

The BOP 125V DC system will be used to provide control power to the 4.16kV switchgear, the 480V SUSs, and critical control circuits.

3.5.5.5 Uninterruptible Power Supply System

The CTGs will also have an essential service 120V AC, single-phase, 60 Hz power source to supply AC power to essential instrumentation, controls, monitoring, critical equipment loads, and unit protection and safety systems that require uninterruptible AC power. The essential service AC system and the DC power supply system will be designed to ensure that all critical safety and unit protection control circuits always have power and can take the correct action on a unit trip or loss of plant AC power.

The essential service AC system will consist of one full-capacity inverter, a solid-state transfer switch, a manual bypass switch, an alternate source transformer and voltage regulator, and AC panel boards for each CTG.

One source of power to the system will be from the DC power supply system through the inverter to the panel boards. A solid-state static transfer switch will continuously monitor both the inverter output and the alternate AC source. The transfer switch will automatically transfer essential AC loads without interruption from the inverter output to the alternate source upon loss of the inverter output.

A manual bypass switch will also be included to enable isolation of the inverter-static transfer switch for testing and maintenance without interruption to the essential service AC loads.

3.5.5.6 Emergency Power System

In the event of a total loss of auxiliary power, or in situations when the utility transmission system is out of service, the emergency power required for emergency lighting and CTG critical loads, such as turbine lube oil pumps and jacking gear motors, will be provided from batteries.

3.5.6 Fuel Gas System

The combustion turbine generators will fire natural gas exclusively. At full load, each CTG will require up to 819 MMBtu/hr LHV of natural gas, for a total plant demand of 2,457 MMBtu/hr LHV. SDG&E will build, own, and operate a high pressure gas pipeline from SDG&E's nearby 36-inch 800-psig (per square inch gauge) gas pipeline. The gas pipeline will convey natural gas via a pipeline (up to 12 inches) that will utilize one of the following two possible routes. The Modified Gas Line Route A would extend south along Alta Road for approximately 2,375 feet, turn west on Otay Mesa Road for approximately 2,700 feet, and then turn south on Enrico Fermit Drive for approximately2,700 feet to Airway Road, at which point it would connect to the existing SDG&E natural gas pipeline. Route B would extend approximately 2,375 feet south along Alta Road, turn west on Otay Mesa Road, and continue approximately 7,920 feet to Harvest Road, at which point it would connect to the existing SDG&E natural gas pipeline (total length of Route B would be approximately 10,300 feet).

Gas pressure available from SDG&E varies seasonally. The gas supply pressure at the PPEC plant boundary metering station is expected to be approximately 500 pounds per square inch (psi). The CTGs require the fuel pressure at the turbine connection to be approximately 920 psi.

This page has been revised from the original AFC to reflect subsequent refinements to the project design.

To ensure adequate fuel flow and pressure for the entire project, three 50 percent of plant capacity electric-motor-driven fuel gas compressors (two operating and one installed spare) will be provided to boost the natural gas pressure as needed by the CTGs. The compressors will be reciprocating compressors that have lubricated, double-acting, single-stage, two-throw, horizontally-opposed cylinders.

To protect the compressors from liquid slugs and debris, the natural gas will be filtered and separated from entrained liquids before flowing into the compressors. Gas exiting the compressors will be cooled by a trim cooler and passed through filter coalescers and a liquid separator to prevent potential liquid ingestion into the turbine combustors.

3.5.7 Water Supply and Treatment

The Otay Water District plans to establish additional recycled water supply in the Otay Mesa area. Recycled water will be the primary source of process water for the PPEC. Process water uses include plant service water, cooling system make-up, combustion turbine injection, combustion turbine evaporative cooler make-up, and secondary fire protection water. Upon the District's commissioning of the proposed Otay Mesa area recycled water system, the project will make a connection to a recycled water main either along Calzada de la Fuente or along Alta Road.

In the event that this system is not available, the project plans to rely on potable water supplied by Otay Water District. The project would make short connections to the potable service system either at an existing 12-inch main along Calzada de la Fuente, or at an existing 24-inch main along Alta Road. Once the project's process water needs are supplied using recycled water, PPEC's permanent potable water needs would consist of drinking water, showers, sinks, toilets, eye wash stations, safety showers, and primary fire protection water. The water balance, as described in more detail in Section 5.5, Water Resources, is based on recycled water quality parameters, which presents a worst case scenario, based on volume.

Process water uses include plant service water, cooling system makeup, combustion turbine NO_x injection (after demineralization), and combustion turbine inlet air evaporative cooler makeup. The CTG injection water will be demineralized using an ultra filtration (UF) system, a reverse osmosis (RO) system, and skid-mounted ion exchange vessels. Process water will also serve as a secondary source of fire protection water.

The connection to Otay Water District potable water will supply facility drinking water, showers, sinks, toilets, eye wash stations, and safety showers in hazardous chemical areas. It will also serve as the facility's primary source of fire protection water.

3.5.7.1 Facility Water Balance

Up to 120 MMBtu/hr of heat rejection is required for the intercooler and lube oil coolers connected to each of the facility's LMS100 CTGs. The plant will use a partial dry-cooling system (PDCS) in a closed-loop configuration. By doing this, the heat will be rejected by first using ambient air, followed by an external water evaporation portion of the loop. This allows the plant water consumption to be dramatically decreased in two ways. First, the dry-cooling section will reduce the total amount of water evaporated during the cooling process. Second,

the closed-loop cooling allows the contaminants in the evaporative water to be concentrated to a much greater extent than in a traditional open-loop cooling system because that water does not pass through the combustion turbine equipment.

Compared to a typical open-loop system with no dry cooling, the PDCS described above will decrease the annual plant water consumption by approximately 53 percent and the wastewater production rate by 59 percent. Table 3.5-4, Daily and Annual Water Flows, shows the maximum daily, average daily, and average annual water supply and disposal flows.

Figure 3.5-4A, Water Balance Flow Diagram and Figure 3.5-4B, Water Balance Flow Values show all of the water flow streams for various operating conditions.

TABLE 3.5-4
DAILY AND ANNUAL WATER FLOWS

Flow Stream	Maximum Daily (1,000 gpd)	Average Daily (1,000 gpd)	Annual (acre-ft/yr)
Recycled Water Supply			
Cooling System Makeup	248	124	139
UF and RO Systems	315	147	165
Evaporative Cooler Makeup	255	64	71
Service Water	7	3	4
Total Process Water Requirements	825	338	379
Potable Water Supply	3	1	1
Process Wastewater			
Cooling System Blowdown	124	57	64
Oil-water Separator	26	12	13
Total Process Wastewater	150	69	77
Sanitary Wastewater	3	1	1
Total Wastewater to City Sewer	153	70	78

acre-ft/yr = acre feet per year
gpd = gallons per day
RO = reverse osmosis
UF = ultra filtration
See Figure 3.5-4A for the water balance diagram.

3.5.7.2 Water Quality

The typical expected water quality data for the recycled water and potable water are presented in Table 3.5-5 below, and discussed in Section 5.5, Water Resources.

TABLE 3.5-5
EXPECTED AVERAGE WATER QUALITY OF RECYCLED AND POTABLE WATER

Constituent	Units	Recycled Water[1]	Potable Water[2]
Conductivity	µS/cm	1,450	895
pH		6.9	8.1
Total Suspended Solids (TSS)	ppm	2	NA
Total Dissolved Solids (TDS)	ppm	887	545
Ion Chemistry, as $CaCO_3$			
Total Alkalinity	mg/L	85	122

Constituent	Units	Recycled Water[1]	Potable Water[2]
Hardness	mg/L	279	249
Calcium	mg/L	167	59
Cations			
Magnesium	mg/L	112	24
Sodium	mg/L	332	87
Potassium	mg/L	22	4.6
Bicarbonate	mg/L	85	NA
Sulfate	mg/L	245	180
Chloride	mg/L	326	89
Nitrate-Nitrite	mg/L	52	ND
Trace Metals			
Aluminum	mg/L	0.057	NA
Antimony	mg/L	<0.001	NA
Arsenic	mg/L	0.0015	ND
Barium	mg/L	0.086	NA
Beryllium	mg/L	<0.001	NA
Boron	mg/L	0.41	125
Cadmium	mg/L	<0.0005	NA
Chromium	mg/L	0.0024	NA
Cyanide	mg/L	<0.005	NA
Copper	mg/L	0.05	<1.3
Fluoride	mg/L	0.525	0.9
Iron	mg/L	0.03	NA
Lead	mg/L	0.00078	NA
Manganese	mg/L	<0.002	NA
Mercury	mg/L	<0.0002	NA
Nickel	mg/L	<0.005	NA
Selenium	mg/L	<0.005	NA
Silver	mg/L	0.0012	NA
Thallium	mg/L	<0.001	NA
Zinc	mg/L	0.09	NA
Silica, SiO_2	mg/L	12	NA

Notes:

[1] Water quality for recycled water is based on data for the Ralph W. Chapman Water Recycling Facility for 2007, 2008, and 2009 (OWD, 2008, 2009, and 2010b).

[2] Water quality for potable water is from Otay Water District, 2009 and 2010. No margin has been added to the two samples used to estimate potable water quality.

mg/L = milligrams per liter

NA = not available

ND = not detected, detection limit not available

ppm = parts per million

µS/cm = microsiemens per centimeter

3.5.7.3 Water Treatment

Cooling System Makeup Water

The planned-for makeup water will be from the Otay Water District recycled water supply with total dissolved solids (TDS) content of approximately 1,150 milligrams per liter (mg/L). Should recycled water not be available an alternative supply of potable water would be utilized until such time as recycled water is available, should there be an interruption with the primary supply. The raw water supplied by Otay Water District will be stored in a raw water storage tank. The PDCS makeup water will be pumped or gravity fed from the tank to the cooling module basins as required, replacing water lost from evaporation, blowdown, and

drift. The cooling water blowdown rate will be set to maintain approximately 5.0 cycles of concentration. The concentration limit is determined based on the water chemistry of the recycled water and is aided by the use of highly corrosion-resistant materials in the PDCS.

A chemical feed system will supply water-conditioning chemicals to the cooling water to minimize corrosion, bio-fouling, and the formation of mineral scale. Sulfuric acid is anticipated to be fed into the cooling water system in proportion to makeup water flow for alkalinity reduction to control the scaling tendency of the cooling water. The acid feed equipment will consist of a bulk sulfuric acid storage tank and two full-capacity sulfuric acid metering pumps.

To further inhibit scale formation, a scale-inhibiting solution will be fed into the cooling water system as a sequestering agent in an amount proportional to the cooling water blowdown flow. The scale inhibitor feed equipment will consist of a chemical solution bulk storage tank and two full-capacity scale inhibitor metering pumps.

To prevent bio-fouling in the cooling water system, a sodium hypochlorite solution will be fed into the system. The hypochlorite feed equipment will consist of a bulk storage tank and two full-capacity hypochlorite metering pumps. Two full-capacity metering pumps will be provided for feeding either stabilized bromine or sodium bromide as supplemental biocides.

In general, the cooling system water treatment system will be used to maintain the cooling water quality within the requirements of the cooling system manufacturer, as shown in Table 3.5-6, Cooling Water Quality Limits.

TABLE 3.5-6
COOLING WATER QUALITY LIMITS

Constituent	Concentration (ppm)
Alkalinity, as $CaCO_3$	100 to 500
Silica, as SiO_2	<150
Iron	<3.0
Manganese	<0.1
Sulfides	<1.0
NH_3	<50
TDS	<5000
Calcium as $CaCO_3$	<900
Chlorides, as Cl	<1,500
Sulfates as $CaCO_3$	<2,000
Nitrates, as NO_3	<300

Notes:
< = less than
NH_3 = ammonia
ppm = parts per million
TDS = total dissolved solids

Demineralized Water

Raw water will be filtered and sent through an RO system to remove all of the suspended solids and most of the dissolved solids from the water. The RO system rejects approximately 28 percent of the feed water, along with the impurities that were removed. The product water from the RO system is sent through skid-mounted mixed-bed ion exchange demineralizers

and then to a demineralized water storage tank. The mixed-bed resins will be regenerated by an off-site contractor. In addition to being used for CTG NO_x control, a portion of the demineralized water will also be used for CTG compressor washing.

3.5.7.4 Wastewater Treatment and Discharge

The two process wastewater streams are cooling system blowdown and RO reject. Both of these streams will be routed to an on-site wastewater storage tank and then discharged to an adjacent sewer that connects to the Johnson Canyon Trunk Line owned and managed by San Diego County.

The PDCS external water will be concentrated by evaporative losses and will include the residues of chemicals added to the water. These chemicals control scaling and biological growth in the cooling system and corrosion of the heat exchanger tubes. Cooling water treatment will require the addition of a pH control agent (acid), a mineral scale dispersant (polyacrylate polymer or equivalent), corrosion inhibitors (phosphate based), and biocide (sodium hypochlorite and sodium bromide or equivalent). The blowdown will then be removed from the cooling system to prevent mineral scale formation on heat transfer surfaces. Table 3.5-7, Process Waste Characterization, shows the major wastewater streams and the resultant wastewater for disposal. Refer to the water balances on Figure 3.5-4A and Figure 3.5-4B for wastewater flows.

TABLE 3.5-7
PROCESS WASTE CHARACTERIZATION

Constituent	Units	Process Wastewater[1]	Industrial Wastewater Limits[2]
Conductivity	µS/cm	8.080	NA
pH		7.8	5 to 12.5
Total Suspended Solids	ppm	30	100[3]
Total Dissolved Solids	ppm	5,252	NA
Ion Chemistry, as $CaCO_3$			
Total Alkalinity	mg/L	150	NA
Hardness	mg/L	1,851	NA
Calcium	mg/L	950	NA
Cations			
Magnesium	mg/L	900	NA
Sodium	mg/L	1,882	NA
Potassium	mg/L	123	NA
Bicarbonate	mg/L	151	NA
Sulfate	mg/L	1,715	NA
Chloride	mg/L	1,850	NA
Nitrate-Nitrite	mg/L	294	NA
Trace Metals, µg/L (ppb), as Such (i.e., as chemical species identified below)			
Aluminum	mg/L	-	NA
Antimony	mg/L	-	NA
Arsenic	mg/L	-	NA
Barium	mg/L	-	NA
Beryllium	mg/L	-	NA
Boron	mg/L	-	NA
Cadmium	mg/L	-	1.0
Chromium	mg/L	-	5.0
Cyanide	mg/L	-	1.9

Constituent	Units	Process Wastewater[1]	Industrial Wastewater Limits[2]
Copper	mg/L	0.28	11.0
Fluoride	mg/L	-	NA
Iron	mg/L	0.17	NA
Lead	mg/L	-	5.0
Manganese	mg/L	-	NA
Mercury	mg/L	-	NA
Nickel	mg/L	-	13
Selenium	mg/L	-	NA
Silver	mg/L	-	NA
Thallium	mg/L	-	NA
Zinc	mg/L	0.51	24
Silica, SiO2	mg/L	68	NA

Notes:

[1] Estimated by Kiewit and based on a worse-case use of recycled water, not potable water. Process wastewater quality assumes chemical addition and materials upgrades to equipment in contact with wastewater. Trace metals given at their minimum detection limit were not propagated throughout the system. Conductivity is a field measurement but is estimated in the table.

[2] Based on City of San Diego Metropolitan Wastewater Department's Industrial Wastewater Control Program's Current Local Limits (MWD, 2006)

[3] Federal pretreatment standards for power plant discharges to a sewer system limit total suspended solids for a maximum one day at 100 mg/L and average 30-day to 30 mg/L (40 CFR 423)

mg/L = milligrams per liter

NA = not available

ND = not detected, detection limit not available

ppm = parts per million

µS/cm = microsiemens per centimeter

- = not estimated

Plant Drains and Wash-down

Area drains will be located by mechanical equipment where it is determined that oil could mix with rainwater or other water sources. The water collected by these drains will go to the oil-water separator, which separates out any oil before the effluent goes to the sewer. The oil-contaminated fluid will be pumped out by a vacuum truck on an as-needed basis and disposed of at a facility specifically qualified to handle such waste. Hazardous containments will not have drains, but they will be pumped out by vacuum pump if hazardous materials are present.

Domestic/Sanitary Wastewater

The sanitary waste drains will be sent to the San Diego County sewer line via the dedicated connection pipe that would also carry the RO rejects and cooling tower blowdown.

Stormwater Drainage

Stormwater will be managed by employing Best Management Practices (BMPs) that prevent soil erosion and impacts on surrounding vegetation. Generally, gravel will be used in lieu of concrete and asphalt paving, where possible, to allow for on-site stormwater infiltration. Remaining stormwater will be routed through culverts and swales to an onsite stormwater pond and then discharged to the Otay Mesa stormwater drainage system located along Calzada de la Fuente. See Figure 3.4-3 for the Preliminary Grading and Drainage Plan. See Section 5.5, Water Resources, for further discussion on stormwater drainage.

3.5.8 Waste Management

Waste management is the process and procedures whereby all wastes produced at PPEC will be properly collected, treated (where applicable), and disposed. Project-related wastes include wastewater, solid nonhazardous waste, and both liquid and solid hazardous waste. See Table 3.5-8, Estimated Waste Generated during Construction and Operation, for details regarding the project waste characterization and management. Refer to Section 5.14 for additional information on waste management.

3.5.8.1 Solid Waste – Nonhazardous

PPEC will produce maintenance and plant wastes typical of natural gas-fired power generation operations. Generation plant wastes include oily rags, broken and rusted metal and machine parts, defective or broken electrical materials, empty containers, and other solid wastes, including the typical refuse generated by workers. Recyclable materials will be taken off site. Waste collection and disposal will be in accordance with applicable regulatory requirements to minimize health and safety effects.

Construction Waste

Construction of PPEC will generate wastes typical for the construction of simple-cycle, natural gas-fired combustion turbine power generation plants. Wastes will include packing materials and dunnage, surplus excavated materials, excess materials trimmed from standard dimension materials (whether wood, metal, wire, or other basic building materials), concrete spoil, temporary weather covers, consumable abrasive and cutting tools, broken tools, parts and electrical and electronic components, construction equipment maintenance materials, empty containers, oily rags, and other solid wastes, including the typical refuse generated by workers (see Table 3.5-8).

Solid waste will be segregated, where practical, for recycling. Nonrecyclable waste will be placed in covered dumpsters and removed on a regular basis by a certified waste-handling contractor for disposal at a Class III landfill.

PPEC expects to generate less than 100 kilograms per month of hazardous waste. Hazardous wastes generated during construction and operation, if any, will be handled and disposed of in accordance with applicable LORS. Some hazardous solid waste, such as welding materials and dried paint, may also be generated. The hazardous waste will be collected in satellite accumulation containers near the points of generation. This waste will be moved daily to the contractor's 90-day hazardous waste storage area. The waste will be delivered to an authorized hazardous waste management facility before the expiration of the 90-day storage limit.

Startup will generate wastes typical of normal operation plus initial cleaning wastes, such as rags, consumable materials, and failed components. See Table 3.5-8, Solid Waste Generated During Construction and Operation, for a list of solid waste expected to be generated during construction.

TABLE 3.5-8
ESTIMATED WASTE GENERATED DURING CONSTRUCTION AND OPERATION

Waste Stream	Waste Classification	Amount	Disposal Method
CONSTRUCTION			
Paper, wood, glass, and plastics from packing materials, waste lumber, insulation, and empty nonhazardous containers	Nonhazardous	25 tons	Weekly collection for recycling and/or disposal at a Class III Landfill
Concrete	Nonhazardous	17 tons	Weekly collection/disposal at a Class III Landfill
Metal, including steel from welding/ cutting operations, packing materials, empty nonhazardous containers, aluminum waste from packing materials, and electric wire	Nonhazardous	7 tons	Recycling dumpsters. If not recyclable, then disposal at a Class III Landfill
Empty hazardous material containers – drums	Hazardous recyclable	2 cubic yards/week	Recondition, recycle, or waste disposal at Class I Landfill
Used and waste lube oil during CTG and STG lube oil flushes	Hazardous[2] recyclable	<55 gal per flush period, approximately 3-week duration	Recycle
Oil-absorbent mats from CTG and STG lube oil flushes and normal construction	Nonhazardous	1,000 sq. ft. per month, as needed	Waste disposal facility or laundry (permitted to wash rags)
Spent batteries; lead acid	Hazardous	2 batteries/yr	Recycle
Spent batteries; alkaline type, sizes AAA, AA, C, and D	Hazardous Recyclable	60 batteries/month	Recycle
CTG cleaning waste	Hazardous	1,000 gal per cleaning	Hazardous waste disposal facility or recycle
Sanitary waste-portable chemical toilets and construction office holding tanks	Sanitary	1,500 gal per week	Weekly collection (minimum) and off-site treatment/disposal
Waste oil, including used motor oil, transmission fluid, hydraulic fluid, and antifreeze	Hazardous[2]	20 gal per week	Hazardous waste disposal facility or recycle
Waste paint, thinners, and solvents	Hazardous	2 gal per week	Hazardous waste disposal facility or recycle
Oily rags	Hazardous[2]	2-3 55-gal drums	Hazardous waste disposal facility or recycled
Oil absorbents	Hazardous[2]	Less than 1 cubic yard per week	Hazardous waste disposal facility
OPERATION			
Paper, wood, plastic, cardboard, insulation, yard debris, and deactivated equipment and parts	Nonhazardous	100 lbs per week	Weekly collection for recycling and/or disposal at a Class III Landfill
Empty hazardous material containers	Hazardous	50 lbs per week	Recondition or recycle
Used hydraulic fluids, oils, grease, oily filters	Hazardous[2]	<5 gal per day	Recycle
Spent batteries	Hazardous	5 batteries per year	Recycle
Spent selective catalytic reduction (SCR) catalyst	Hazardous	250 lbs every 3 to 5 years	Recycle
Spent carbon monoxide (CO) catalyst	Hazardous	250 lbs every 3 to 5 years	Recycle
Cooling tower basin sludge	Nonhazardous	2 tons per year	Recycle or dispose at nonhazardous waste facility

Waste Stream	Waste Classification	Amount	Disposal Method
CONSTRUCTION			
Used oil from oil-water separator	Recyclable Hazardous[2]	50 gal per year	Recycle
Oily rags	Hazardous[2]	100 lbs per year	Hazardous waste disposal facility or recycled
Oily absorbent	Recyclable Hazardous[2]	55 gal per month	Recycle or hazardous waste disposal facility
Used air filters	Nonhazardous	2,000 filters every 5 years	Recycle
Sanitary wastewater	Nonhazardous	1,000 gal per day	Liquids disposed to on-site leaching field; sludge disposed to a sanitary waste disposal facility
Combustion turbine generator (CTG) periodic operational chemical cleaning	Hazardous	100 gal per cleaning (2 cleanings every 5 years)	Hazardous waste disposal facility (by licensed subcontractors)

Source: Kiewit Power Engineers, 2010.
Notes:
[1] Under California regulations.
< = less than
CTG = combustion turbine generator
gal = gallon(s)
sq. ft. = square feet
STG = steam turbine generator

Operations Waste

Operation of the PPEC facility will generate wastes resulting from processes, routine facility maintenance, and office activities (see Table 3.5-8). Nonhazardous waste during facility operation will be recycled to the greatest extent practical; a certified waste-handling contractor will remove the remainder on a regular basis.

The plant will produce maintenance and plant waste typical of power generation operations. The following types of nonhazardous solid waste may be generated: paper, wood, plastic, cardboard, broken and rusted metal and machine parts, defective or broken electrical materials, empty nonhazardous containers, and other miscellaneous solid wastes, including the typical refuse generated by workers.

Office paper, newsprint, aluminum cans, wood, insulation, yard debris, concrete, gravel, scrap metal, cardboard, glass, plastic containers, and other nonhazardous waste material will be recycled to the extent practical, and a certified waste-handling contractor will remove the remainder on a regular basis for disposal at a Class III landfill.

Hazardous waste will be accumulated at the generating facility according to California Code of Regulations (CCR) Title 22 requirements for satellite accumulation. A licensed hazardous waste hauler will collect hazardous waste with the use of a hazardous waste manifest. Waste will only be shipped to authorized hazardous waste management facilities. Biannual hazardous waste generator reports will be prepared and submitted to the California Department of Toxic Substances Control (DTSC). Copies of manifests, reports, waste analyses, and other documents will be kept on site and remain accessible for inspection for at least three years.

Waste lubricating oil will be recovered and recycled by a waste oil-recycling contractor. Spent oil filters and oily rags will be recycled. Spent SCR and oxidation catalysts will be recycled by the supplier, if possible, or disposed of in a Class I landfill. Laboratory analysis wastes will be recycled if possible, or disposed of in a Class I landfill. Please refer to Section 5.14, Waste Management, for a list of solid waste expected to be generated during operation.

3.5.8.2 Liquid Wastes – Nonhazardous

Nonhazardous liquid wastes that are nonrecoverable, such as cooling system blowdown and RO reject water, will be disposed of into the County's sewer line. Sanitary waste will also flow into this sewer line.

3.5.9 Emissions Control and Monitoring Equipment

Air emissions from the combustion of natural gas in the CTGs will be controlled using state-of-the-art systems. Emissions that will be controlled include:

- NO_x
- CO
- Particulate matter (PM)
- VOCs
- Oxides of sulfur (SO_x)

3.5.9.1 NO_x Production and Control Mechanisms

The project would control NO_x emission production during the CTG combustion and post-combustion processes. The CTG combustors will be equipped with water injection capability to reduce thermal NO_x formed during the combustion process. Water is injected into the combustor to reduce the combustion temperature, which reduces the production of thermal NO_x. NO_x concentrations in the exhaust gas emitted to the atmosphere would be 2.5 ppmvd adjusted to 15 percent O_2 from the gas turbines/SCR systems.

Post-combustion NO_x emissions control would occur through the catalyst housings on the CTG discharge (one per CTG), which are equipped with SCR catalyst modules to further reduce NO_x in the CTG exhaust gas. The SCR process will use 19 percent aqueous NH_3 as the reducing agent in the presence of high-temperature to activate the catalyst. Diluted NH_3 vapor will be injected into the exhaust gas stream via a grid of nozzles located upstream of the catalyst module. The subsequent chemical reaction on the catalyst will reduce NO_x to nitrogen and water. The resulting exhaust gas would have a NO_x concentration no greater than 2.5 ppmvd, adjusted to 15 percent O_2, on a three-hour average basis. NH_3 slip, or the concentration of unreacted NH_3 in the exiting exhaust gas, would be limited to 5.0 ppmvd adjusted to 15 percent O_2 on a dry basis. The SCR equipment will include a reactor chamber, catalyst modules, NH_3 storage system, NH_3 vaporization and injection system, and monitoring equipment and sensors.

3.5.9.2 Dry Low NO_x Combustors

Dry low NO_x combustors are not commercially proven in the LMS100 CTGs; therefore, they are not considered for this project.

3.5.9.3 CO and VOC Emissions

An oxidation catalyst will be installed within the catalyst housing to reduce the concentration of CO in the exhaust gas emitted to atmosphere to no greater than 4.0 ppmvd when adjusted to 15 percent O_2 on a dry basis.

VOCs include all unburned hydrocarbons except methane. VOC emissions are low because of proper combustion controls in the CTG. No other controls are required for VOC reduction.

3.5.9.4 Particulates

Particulate emissions will be controlled by the use of natural gas, which is low in particulates, as the sole fuel for the CTGs. Particulates from cooling tower drift will also be minimized by using a partial-dry cooling system.

3.5.9.5 SOx Emissions

SO_x emissions will be controlled by the use of natural gas, which is low in sulfur, as the sole fuel for the CTGs. Utilization of SCR and oxidation catalyst promotes formation of sulfite (SO_3) from sulfur dioxide (SO_2).

3.5.9.6 Emission Monitoring

Continuous Emissions Monitoring Systems (CEMS) will sample, analyze, and record fuel gas flow rate, NO_x and CO concentration levels, and the percentage of O_2 in the stack gas. This system will generate reports of emissions data in accordance with permit requirements and will send alarm signals to the plant's control system when emissions approach or exceed preselected limits.

3.5.10 Fire Protection System

3.5.10.1 Firewater System

The fire protection system will mitigate personnel injury, loss of life, property loss, and plant downtime due to fire. The fire protection system will be connected to the Otay Water District's potable water system as its primary water source. A reduced-pressure principal backflow preventer will be used at the connection to prevent any possibility of potable water contamination with the raw (recycle) water. As a back-up to the primary fire water supply, the lower portion of the 500,000-gallon raw/service water storage tank will be reserved for fire protection. The dedicated volume in the 500,000-gallon storage tank will provide 2 hours of protection from an on-site worst-case single fire. An electric fire protection pump will activate automatically if the fire protection system pressure drops below acceptable levels.

A dedicated underground firewater distribution system with fire hydrants, sprinkler systems, and deluge systems, designed in conformance with the NFPA code, will be used to distribute the fire protection water. The 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 and fixed suppression systems will be supplied from the firewater loop. Fire hydrants will be spaced at approximately 300-foot intervals around the facility in accordance with NFPA 850 and local fire codes.

In addition, the combustion turbines and associated electrical modules will be protected by a carbon dioxide (CO_2) fire protection system.

3.5.10.2 Fixed Fire Protection Systems

The fire protection water supply is shown on Figure 3.5-5, Fire Protection System. Fixed-fire protection systems will be provided for the oil-filled GSU transformers and the turbine lubrication oil system. In addition, buildings will have sprinkler systems, as required by NFPA and local fire codes. Sprinkler and fixed-spray systems will be designed and installed in accordance with NFPA 13 and NFPA 15. Electronic and electrical equipment rooms will have smoke detectors and alarms, as well as local hand held fire extinguishers.

3.5.10.3 Fire Alarm and Detection

Fire alarms will be installed in buildings in accordance with NFPA 72 and as required by local fire codes. The alarm system will include alarm annunciation and supervisory and trouble signals. Alarms will require urgent action by the plant operators. Supervisory signals indicate abnormal conditions that require investigation. Trouble signals indicate adverse conditions, such as ground fault or power supply problems, which should be rectified by qualified personnel.

3.5.10.4 Portable Extinguishers

Hand-held CO_2 and dry chemical fire extinguishers will be located throughout the plant in accordance to NFPA 10.

3.5.10.5 Miscellaneous Fire Safety Items

All material used in construction of the PPEC plant and its auxiliary systems will be free of asbestos and will meet the fire and smoke rating requirements of NFPA 255.

3.5.11 Plant Auxiliaries

3.5.11.1 Lighting

See Section 5.13, Visual Resources, for details on lighting. Lighting will be provided in the following areas:

- Interior of office, control, maintenance, and other buildings

- Exterior entrances to buildings
- Platforms and walkways
- Transformer and switchyard areas
- Plant roads
- Parking areas
- Entry gate
- Cooling system equipment

Lighting will be designed to minimize visual impacts while providing adequate lighting for normal operations and maintenance and ensuring security and safety requirements are met. Switches or motion detectors will control lighting in areas not normally accessed as part of routine operation or to ensure safety of personnel and property.

Emergency lighting fixtures with integral battery packs will be located in areas of regular personnel traffic to allow exit from areas where normal lighting has failed. In areas with major control equipment and electrical distribution equipment, emergency lighting located in these areas will suffice to allow operations to reestablish auxiliary power during a normal lighting failure.

3.5.11.2 Grounding and Lightning Protection

Electrical systems are susceptible to ground faults, lightning, and switching surges, all of which can lead to a rise in unit ground potential. This rise is a hazard to both site personnel and electrical equipment. Hence, a grounding system will be instituted to provide an adequate path to allow the dissipation of ground fault currents and thereby minimize rises in the ground potential.

The station-grounding grid will be designed with sufficient capacity to dissipate heat from the ground current under the most severe fault conditions in places of high ground fault current concentration. The grid spacing will be set to maintain safe step voltage gradients.

Bare copper conductors will be installed below grade in a grid pattern. Each junction of the grid will be bonded together by either an exothermal welding process or mechanical connectors.

Ground resistivity readings, performed as part of the subsurface investigations, will be used to determine the necessary numbers of ground rods and grid spacing to ensure safe step and touch potentials under fault conditions.

Grounding cables will be brought from the ground grid to connect to building steel and non-energized metallic parts of electrical equipment. Insulated grounding conductors to the isolated ground will be provided for sensitive control systems.

Lightning protection will be furnished for buildings and structures in accordance with NFPA 780 or Underwriters Laboratories (UL) 96 and UL 96A.

3.5.11.3 Cathodic Protection

A cathodic protection system will be present for buried carbon steel pipes and structures (except rebar). Cathodic protection will be provided by an impressed current system, a sacrificial system, or a combination of both.

3.5.11.4 Programmable Logic Controller (or Digital Control System)

The programmable logic controller (PLC) provides modulating control, digital control, monitoring, and indicating functions for the plant power block systems. The following functions will be provided:

- Controlling the CTGs and other systems in a coordinated manner
- Controlling the BOP systems in response to plant demands
- Monitoring controlled plant equipment and process parameters and delivering this information to plant operators
- Monitoring the CTG CEMS units for critical alarms and collecting data for historical logging
- Providing control displays (printed logs, operator interface) for signals generated within the system or received from input/output (I/O) signals
- Providing consolidated plant process status information through displays presented in a timely and meaningful manner
- Providing alarms for out-of-limit parameters or parameter trends, displaying this information on operator interface units, and recording on an alarm log printer
- Providing storage and retrieval of historical data

The PLC will be a redundant microprocessor-based system consisting of the following major components:

- Liquid crystal display (LCD) flat-screen displays on operator workstations
- Engineer work station
- Distributed processing units
- I/O card cabinets
- Printers
- Data link to the combustion turbines

The PLC will have redundant processing units linked to a group of operator workstations and the engineer workstation by redundant data highways. Each processor will be programmed to perform specific dedicated tasks for control information, data acquisition, and annunciation. By being redundant, no single processor failure can cause or prevent a unit trip.

The PLC will interface with the control systems furnished by the CTG supplier to provide supervisory remote control capabilities, as well as data acquisition, annunciation, and historical storage of turbine and generator operating information.

3.5.11.5 Plant Instrument and Service Air System

The plant service and instrument air system will consist of packaged air compressor skid(s) and a distribution system with a main header and branches that distribute air to various locations in the power block. The main components of the air compressor skid will include three 50 percent air compressors, two 100 percent air dryers with pre-filters and after-filters, and an air receiver.

The air compressors will be oil-flooded, air-cooled, rotary screw air compressors with a discharge pressure rated at 125 pounds psig and sized for instrument and service air capacity requirements. The compressors will be provided with inlet filters, after-coolers, totally enclosed fan-cooled (TEFC) motors, controls, automatic condensate trap, piping, and valves.

The air dryers will be heatless, dual tower, regenerative desiccant type. Coalescing pre-filters, particulate after-filters, a moisture-indicating instrument, and a regulator will be supplied with the dryer.

The air receiver will be American Society of Mechanical Engineers (ASME) code rated. Typically a vertical vessel, the receiver will have a pressure safety valve to prevent over-pressure.

The main header will distribute air from the receiver and deliver it by a network of branches from the header throughout the plant, where needed. A pressure-regulating valve will be provided at each service and utility station to prevent the service air system from degrading the instrument air pressure.

Service air headers will be routed to hose connections located at various points throughout the facility. Instrument air will be routed to locations within the facility equipment areas and within the water treatment facility where pneumatic operators and devices will be located.

3.5.12 Heating, Ventilation, and Air Conditioning

The heating, ventilation, and air-conditioning (HVAC) system will provide an acceptable environment for personnel comfort and equipment operation within the plant buildings.

Only the administration and control building will be air conditioned. The HVAC system will be designed in accordance with the California Building Code (CBC) and the Uniform Mechanical Code (UMC), as prescribed by the CCR.

Air conditioning in the control room and administrative areas will maintain a suitable environment for plant personnel. If required for proper equipment operation, humidity control will be provided in the control room.

Outside air ventilation systems will be provided for buildings where air-conditioning is not required. Electric heaters will be used for winter heating.

Every building and respective portion of the building will be supplied with fresh air in accordance with the CBC; American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) Standard 62; and the CCR.

3.5.13 Plumbing

The plumbing system will supply potable water to all plumbing fixtures and will collect and convey waste fluids to the waste collection system. The system will be designed and constructed in accordance with the California Plumbing Code.

3.5.14 Noise Emission Abatement Equipment

The PPEC facility equipment would be individually specified with source controls, such that overall noise from the facility at noise-sensitive receptors meets regulatory requirements. During normal operations, the nature of noise from the proposed facility would be essentially continuous and broadband (no tones).

Anticipated equipment source controls would include the following:

- CTGs housed within high performance acoustic enclosures
- CTG enclosures equipped with ventilation system silencers
- CTG air inlet equipped with high performance acoustical silencer
- Combustion turbine air inlet compressor equipped with a variable bleed valve silencer
- SCR and CO emission control systems with integral stack/silencer system
- Gas compressors housed within acoustical enclosures
- Water treatment equipment located within a building

3.6 CIVIL/STRUCTURAL FEATURES

This section describes the buildings, structures, and other civil/structural features that will constitute the PPEC facility, as shown on Figure 3.1-3A, Site Arrangement.

3.6.1 Overview

The power block will consist of three separate simple-cycle combustion turbine power generation trains, each consisting of one GE LMS100 CTG, an air inlet system, an intercooler and variable bleed valve silencer, an SCR system, one stack, a power control module, an intercooler motor control center, a fuel gas filter/separator, and a generator step-up transformer.

In addition to the three combustion turbine power generation trains, there will be a cooling system (PDCS), an NH_3 storage tank, natural gas compressors, a water treatment facility, and two auxiliary transformers. BOP mechanical and electrical equipment will also be present.

The major equipment will be supported on reinforced concrete foundations at grade. Individual reinforced pads at grade will be used to support the BOP mechanical and electrical equipment. The gas compressors and water treatment equipment will be in an enclosed building(s).

3.6.2 Stacks

The SCR/CO system will include an integral stack/silencer system. The stack will be a 100-foot tall self-supporting steel stack and will include the associated appurtenances, such as sampling ports, exterior ladders, side step platforms, and electrical grounding.

3.6.3 Buildings

The plant buildings will include a main plant building consisting of an administration and control area and warehouse area, a water treatment building, a firewater pump modular enclosure, switchgear modules, and gas compressor modules. Building dimensions are shown on Figure 3.1-3A, Site Arrangement. All of the buildings or modules will be supported on mat foundations or individual spread footings.

3.6.4 Transformer Foundations and Firewalls

There will be three 13.8kV to 230kV generator step-up oil-filled transformers and two 13.8kV to 4.16kV auxiliary oil-filled transformers. Each will be supported on reinforced concrete foundations at grade. Construction of a concrete retention basin around each transformer will provide oil containment in the event of a transformer failure. Concrete firewalls will be provided as required by NFPA 850 for each step-up transformer and auxiliary transformer to limit a potential transformer fire to its concrete basin area.

3.6.5 Yard Tanks

The yard water storage tanks will include the raw water storage tank (500,000 gallons), the demineralized water storage tank (240,000 gallons), and the wastewater collection tank (95,000 gallons).

The yard storage tanks will be vertical, cylindrical, field-erected, or shop-fabricated steel tanks. Each tank will be supported on a suitable foundation consisting of either a reinforced concrete ring wall with an interior bearing layer of compacted sand for the tank bottom or a reinforced concrete mat.

3.6.6 Roads

Access to the project site will be through controlled access gates. The new facility will be served by the road network shown on Figure 3.3-1, Facility Plot Plan. New roads, miscellaneous access drives, and permanent parking areas within the project site boundaries will be asphalt or aggregate surfaced roads. Surrounding the equipment will be a network of roads for fire equipment and facility maintenance access. Primary access to the site will be from Calzada de la Fuente, and the construction and laydown area access will be from Alta Road or Paseo de la Fuente.

3.6.7 Site Security

A temporary chain-link security fence surrounding the project site perimeter will enclose the new facility during construction. Upon completion of the project, a permanent chain link security fence will encompass the facility. In addition, the facility switchyard will be enclosed within a chain-link fence for the safety of the workforce. A controlled-access gate will be located at the main entrance from Calzada de la Fuente. During construction, a temporary chain-link security fence will be erected around the outside perimeter of the laydown site. This fence will be removed at the conclusion of the construction phase.

3.6.8 Site Grading and Drainage

The PPEC plant site will consist of paved roads, paved parking areas, and graveled areas. Stormwater that does not infiltrate the project site will be routed through culverts and swales to an onsite detention pond and then discharged to the Otay Mesa stormwater system along Calzada de la Fuente. Stormwater entering the property from off site will be diverted away from the plant area using ditches. The grading and drainage facilities will be designed in accordance with the San Diego County Drainage Design Manual, San Diego County Hydrology Manual, and the County of San Diego Standard Urban Stormwater Mitigation, and BMPs will be implemented to reduce erosion and remove silt. The site grading and drainage plan for the project is shown on Figure 3.4-3, Preliminary Grading and Drainage Plan. See Appendix I, Water Resources, for the detention basin calculations.

A Stormwater Pollution Prevention Plan (SWPPP) will be prepared in accordance with the State Water Resources Control Board General Permit for Discharges of Storm Water Associated with Construction Activities, prior to construction of PPEC. This plan will identify BMPs to be used at PPEC to control stormwater during the facility's construction. BMPs may include such as stabilized construction entrances, silt fencing, berms, hay bales, and detention basins to control runoff from all construction areas.

This page has been revised from the original AFC to reflect subsequent refinements to the project design.

3.6.9 Site Flood Issues

According to the Federal Emergency Management Agency (FEMA), the site is outside of the 100-year floodplain.

3.6.10 Sanitary System

The sanitary system will consist of a sewer connection to the existing San Diego County sewer designed to handle the sanitary flow from the administration and control building and any restrooms, located on the site. The sewer connection will be on site near the administration and control building, connecting to the linear sewer line.

3.6.11 Earthwork

Excavation activities are expected to be minimal based on previous grading activities conducted by the landowner. Excavation work will consist of the removal, storage, and/or disposal of earth, sand, gravel, vegetation, organic matter, loose rock, boulders, and debris to the lines and grades necessary for construction. Materials suitable for backfill will be stockpiled at designated locations using proper erosion protection methods.

The site is currently vacant industrial land located immediately west of the OMGP. Graded areas will be smooth, compacted, free from irregular surface changes, and sloped to drain. Cut-and-fill slopes for permanent embankments will be designed to withstand horizontal ground accelerations for Seismic Zone 4. For slopes requiring soil reinforcement to resist seismic loading, geogrid reinforcement will be used for fills and soil nailing for cuts. Slopes for embankments will be no steeper than 4:1 (horizontal:vertical). Construction will be at existing grade, which is fairly level; therefore, major cuts and fills are not anticipated.

Areas to be backfilled will be prepared by removing unsuitable material and rocks. The bottom of an excavation will be examined for loose or soft areas. Such areas will be excavated fully and backfilled with compacted fill.

Backfilling will be done in layers of uniform, specified thickness. Soil in each layer will be properly moistened to facilitate compaction to achieve the specified density. To verify compaction, representative field density and moisture-content tests will be performed during compaction. Structural fill supporting foundations, roads, and parking areas will be compacted to at least 95 percent of the maximum dry density, as determined by American Society for Testing Materials (ASTM) D698. Embankments, dikes, bedding for buried piping, and backfill surrounding structures will be compacted to a minimum of 90 percent of the maximum dry density. Backfill placed in remote and/or unsurfaced areas will be compacted to at least 85 percent of the maximum dry density.

Where fills are to be placed on subgrades sloped at 6:1 (horizontal:vertical) or greater, keys into the existing subgrade may be provided to help withstand horizontal seismic ground accelerations.

3.7 ELECTRICAL INTERCONNECTION

The new generation will be interconnected to the SDG&E transmission grid through a newly constructed transmission line, which will connect to the existing SDG&E 230kV Otay Mesa switchyard east of the facility. The transmission line route will have a right-of-way (ROW) width of 80 feet. Representative switchyard, transmission pole structures, and underground transmission line structures are presented on Figure 3.7-1A (230kV Switchyard Tubular Steel H-Frame Structure), Figure 3.7-1B (230kV Transmission Line Tubular Steel Tangent Structure), Figure 3.7-1C (230kV Transmission Line Tubular Steel Dead-End Structure), and Figure 3.7-1D (230kV Underground Cable Riser/Dead-End Structure and Duct Bank) which the PPEC proposes to use to transition the 230kV circuits to the existing switchyard.

3.7.1 PPEC Switching Station and Interconnect Specifications

The on-site interconnection facilities will consist of a switchyard, which includes the following major equipment:

- 230kV SF_6 gas-filled high-voltage circuit breakers, each rated 2,000 amperes continuous capacity (ACC), 40 thousand amps interrupting capacity (KAIC).
- 230kV, 2,000-amperes (amp), three-phase breaker disconnect switches, manually operated, each mounted horizontally upright on a low-profile steel support structure.
- 230kV, 2,000-amp three-phase line disconnect switch mounted on a low-profile switch support structure underneath a 230kV dead end/pull off structure for the new 230kV transmission line connection. This 2,000-amp switch serves as a line disconnect on the SDG&E side.
- 230kV coupling capacitor voltage transformers (CCVTs) on one-phase or three-phase steel support structures.
- All necessary yard lighting standards and lighting fixtures along with yard receptacle fixtures providing 120/240V one-phase power. One outdoor lighting panel will be installed for this.
- Drivable cable trenches and/or duct bank, and pull boxes.
- 230kV dead-end/pull off structure/switch support structures for 230kV transmission line to the SDG&E Otay Mesa switchyard. Concrete foundations for all aboveground structures, supports, and equipment.
- One main ground grid system.
- Entrance gate or gates.
- One chain-link fence system with an isolated fence ground, including entrance gates and emergency personnel gates.

- SCADA remote terminal unit (RTU) for station automation, as required by SDG&E.
- Communication hardware, including fiber-optic terminal equipment for fiber links for current differential line protection, as required by SDG&E.
- All instrumentation and control required.

The switchyard design and transmission line interconnection will be coordinated with SDG&E as required.

3.7.1.1 Conductor

The 230kV generation-tie line connecting the project to the existing SDG&E switchyard will be constructed using overhead and potentially some underground conductors, to be approved by SDG&E. Overhead conductor will be one 1113 kilo-circular mil (kcmil) aluminum conductor steel reinforced (ACSR) per phase and underground conductor will nominally be one 2300kcmil Al XLPE cable per phase.

3.7.1.2 Ground Wire

The transmission line will have shield or ground wires in place. The location of the shield wires in relation to conductors will be in accordance with best industry practices and determined by the surrounding terrain. The shield wire will be extra high-strength galvanized-steel or copper-clad steel, as determined by the location and the detailed design.

3.7.2 Transmission Structures

The transmission structures associated with the PPEC 230kV interconnecting transmission line will include 230kV pole structures designed to accommodate overhead shield/ground wire. As described above, the transmission structures will be placed within an 80-foot wide right-of-way. Refer to Figures 3.7-1A through 3.7-1D, which provide representative project transmission structure detail. Refer to Figure 3.1-3A, Site Arrangement, and Figure 3.1-3B, Site Arrangement and Potential Offsite Transmission Line Structure Locations, for potential locations of the new structures for the transmission interconnection.

3.7.3 Transmission System Evaluation

3.7.3.1 Transmission System Reliability Criteria

SDG&E performed the evaluation of the transmission system based on criteria as established by the North American Electric Reliability Council (NERC), the Western Electricity Coordinating Council (WECC), the California Independent System Operator (CAISO), and the SDG&E reliability criteria.

3.7.3.2 CAISO Interconnection Study

PPEC LLC submitted an Interconnect Application to CAISO in January 2010 for the cluster study process. The resulting studies will include work previously known as the System Impact Study and Facilities Study. The studies are underway, and are expected to provide an acceptable plan and executable LGIA for project interconnection. See Appendix H for CAISO interconnection study agreement and proof of payment.

3.7.4 Transmission Line Safety and Nuisance

3.7.4.1 Transmission Line Description

One 230kV transmission line will be routed along one of the two alternate routes, as described in Section 3.3, from PPEC to the existing SDG&E Otay Mesa switchyard. The electric effects of the high-voltage lines fall into two categories: field effects and corona effects. Field effects comprise of electric and magnetic fields. Corona is the ionization of the air that occurs at the surface of the energized conductor and suspension hardware due to very high electric field strength at the surface of the metal during certain conditions. Corona may result in radio and television reception interference, audible noise, light, and production of ozone. A transmission line's field effects are the voltages and currents that may be induced in nearby conduction objects.

3.7.4.2 Generation of Electric and Magnetic Fields

Power lines, electrical wiring, electrical machinery, and appliances all produce electric and magnetic fields, commonly referred to as electromagnetic field (EMF). The EMF produced by the alternating current from PPEC would have a frequency of 60 Hz, which means that the intensity and orientation of the field changes 60 times per second. When a conductor is energized, both an electric and magnetic field will form around the conductor directly proportional to the energization voltage and current, respectively. The magnitude of the EMF depends on the current in the conductor, geometry of the structures, degree of cancellation from other conductors, and the distance of the receptor from the conductors. Maximum magnetic fields are produced at the maximum conductor currents. Both electric and magnetic field magnitudes are inversely proportional to the distance from the conductors, meaning that EMF will attenuate as a function of distance from the conductors.

Considerable research has been conducted over the last 30 years on the possible biological effects and human health effects from EMF. This research has produced many studies that offer no uniform conclusions about whether long-term exposure to EMF is harmful. In the absence of conclusive evidence, some states, including California, have chosen not to specify maximum acceptable levels of EMF. Instead, California mandates a program of prudent avoidance whereby EMF exposure to the public would be minimized by encouraging electric utilities to use cost-effective techniques to reduce the levels of EMF.

To reduce electric and magnetic fields, overhead transmission lines are designed to carry power over three conductors with currents and voltages that are 120 degrees out of phase with each other. Combined, the phase differences tend to cancel out the fields from the conductors. However, within a close range, such as when a person stands on the ROW under a

transmission line, one conductor will be significantly closer; hence, it will contribute a net uncancelled field at the person's location.

EMFs occur independently of one another as electric and magnetic fields at the 60-Hz frequency used in transmission lines, and both are created by electric charges. Electric fields exist when these charges are not moving. Magnetic fields are created when the electric charges are moving. The magnitude of both electric and magnetic fields falls off rapidly as the distance from the source increases (proportional to the inverse of the square of distance).

California does not have regulatory levels for electric and magnetic fields. The estimated PPEC electric field at the center of the proposed transmission line ROW is 1.8 kV/meter, and is 0.45 kV/meter at the edge of the ROW. The estimated PPEC magnetic field directly under the 230kV transmission line is 70 mG (0.07 G), and 40 mG (0.04G) at the edge of the ROW, which are well below those established by states that do have limits. Other states have established regulations for magnetic field strengths that have limits ranging from 150 mG to 250 mG at the edge of the ROW, depending on voltage.

3.7.4.3 Corona Effect

An electric field is generated in the air surrounding a transmission line conductor when the transmission line is in operation. A corona discharge occurs at the conductor surface when the intensity of the electric field at the conductor surface exceeds the breakdown strength of the surrounding air. The electrical energy released from the conductors during this process is known as corona loss and is manifested as audible noise and radio/television interference.

Corona may result in certain radio and television reception interference, audible noise, light, and production of ozone, which are described in further detail below. The effects of corona are greatest at locations on the conductor where the field is enhanced by protrusions, such as nicks, insects, or drops of water (for instance during wet weather).

3.7.4.4 Audible Noise, Radio and Television Interference, Visible Light, and Photochemical Reactions

Energized electric transmission lines can also generate audible noise by a process called corona discharge, most often perceived as a buzz or hum. This condition is usually worse when the conductors are wet. The EPRI has conducted several transmission line tests and studies that measured sound levels for several power line sizes with wet conductors (*Transmission Line Reference Book, 345 kV and Above,* EPRI 1975, 1982). *Transmission Line Reference Book, 345 kV and Above* also notes that the noise produced by a conductor attenuates (decreases) by 2 to 3 dB for each doubling of the distance from the source.

Many factors contribute to the pre-project ambient noise levels in the plant area. The project transmission line will be designed such that noise from the line will continue to be well below undesirable levels, as described below. Any noise or radio/TV interference complaints will be logged, investigated, and, to the degree possible, mitigated.

- **Audible Noise.** Corona-generated audible noise from transmission lines are generally characterized as a buzz or hum noise. The Electric Power Research Institute (EPRI) has conducted several transmission line studies that measure the sound levels for several line sizes with wet conductors (EPRI, 1975, 1982). The EPRI found that the noise produced by a conductor attenuates by 2.0 to 3.0 decibels (dB) for each doubling of the distance from the source. As previously noted, the project transmission line will be designed according to CPUC and California code, which will also serve to keep noise effects from reaching undesirable levels. Any complaints will be logged, investigated, and, to the degree possible, mitigated.

- **Radio and Television Interference.** Radio and television interference, known as gap-type noise, is caused by a film on the surface of two hardware pieces that are in contact. The film acts as an insulator between the surfaces. This results in small electric arcs that produce noise and interference. Corona-generated radio interference is most likely to affect the amplitude modulation (AM) broadcast band (535 to 1,605 kilohertz); frequency modulation (FM) radio is rarely affected. Only AM receivers located very near to transmission lines have the potential to be affected by interference. The potential for interference with radio or television use is expected to be minimal or nonexistent. This type of noise is not a problem in well-maintained transmission lines. Well-trained transmission line maintenance crews will maintain the project transmission line; therefore, problems that might occur can be readily pinpointed and corrected. As previously noted, the project transmission line will be designed according to CPUC and California code, which will also serve to keep interference effects from reaching undesirable levels. Any complaints will be logged, investigated, and, to the degree possible, mitigated.

- **Visible Light.** Corona may be visible at night as a bluish glow or as bluish plumes. On the transmission lines in the area, the corona levels are so low that the corona on the conductors usually is observable only under the darkest conditions with the aid of binoculars.

- **Photochemical Reactions.** When coronal discharge is present, the air surrounding the conductors is ionized and many chemical reactions take place producing small amounts of ozone and other oxidants. Approximately 90 percent of the oxidants are ozone, and the remaining ten percent are composed principally of nitrogen oxides.

3.7.4.5 Induced Currents and Hazardous/Nuisance Shocks

A conducting object such as a vehicle or person in an electric field will experience induced voltages and currents. The strength of the induced current will depend upon the object-to-ground resistance and the electric field strength and the size and shape of the conduction object. When a conducting object is isolated from the ground and a grounded person touches the object, a perceptible current or shock may occur as the current flows to the ground. The mitigation for hazardous and nuisance shocks is to ensure that metallic objects on or near the ROW are grounded and that sufficient clearances are provided at roadways and parking lots to keep electric fields at these locations low enough to prevent vehicle short-circuit currents from exceeding 5.0 milliamperes (mA).

Similarly, magnetic fields also induce voltages and currents in conducting objects. Typically, this requires a long, metallic object, such as a wire fence or aboveground pipeline that is grounded at only one location. Again, a person closing an electrical loop by grounding the object at a different location will experience a shock similar to one caused by the electric field described above. The mitigation for magnetic field effects is to ensure multiple grounds for fences or pipelines, especially those oriented parallel to the transmission line.

The on-site 230kV transmission interconnection and transmission line will be constructed in conformance with California Public Utility Commission (CPUC) General Order (GO) 95 requirements and Title 8 CCR 2700 requirements. In this way, hazardous shocks are highly unlikely to occur as a result of the project construction, operation, and maintenance.

3.7.4.6 Transmission Line Safety and Nuisance Laws, Ordinances, and Standards

This sections provides a list of applicable laws, ordinances, regulations, and standards (LORS) relating to transmission line safety and nuisance that apply to the proposed transmission line, substation, and engineering. Refer to Table 3.7-3 for agencies with jurisdiction to issue permits or approvals, conduct inspections, or enforce the above-referenced LORS.

TABLE 3.7-1
TRANSMISION LINE SAFETY AND NUISANCE LORS

LORS	Applicability	Conformance
Design and Construction LORS for the Proposed Transmission Line and Switchyard		
Title 8 CCR, Section 2700 et seq. "High Voltage Electrical Safety Orders"	Establishes essential requirements and minimum standards for installation, operation, and maintenance of electrical installation and equipment to provide practical safety and freedom from danger.	Section 3.7.4.5
GO-52, CPUC, "Construction and operation of power and communication lines for the prevention or mitigation of inductive interference"	Applies to the design of facilities to provide or mitigate inductive interference.	Section 3.7.4.5
IEEE 1119, "IEEE Guide for Fence Safety Clearances in Electric-Supply Stations"	Recommends clearance practices to protect persons outside the facility from electric shock.	Section 3.7.4.5
Electric and Magnetic Fields		
Decision 93-11-013, CPUC	CPUC position on EMF reduction.	Section 3.7.4.2
GO-131D, CPUC, "Rules for Planning and Construction of Electric Generation, Line, and Substation Facilities in California"	CPUC construction application requirements, including requirements related to EMF reduction.	Section 3.7.4.2
Hazardous Shock		
8 CCR 2700 et seq. "High Voltage Electrical Safety Orders"	Establishes essential requirements and minimum standards for installation, operation, and maintenance of electrical equipment to provide practical safety and freedom from danger.	Section 3.7.4.5
NESC, ANSI C2, Section 9, Article 92, Paragraph E; Article 93, Paragraph C	Covers 5 mA vehicle short circuit current limitation.	Section 3.7.4.5

LORS	Applicability	Conformance
Design and Construction LORS for the Proposed Transmission Line and Switchyard		
Communications Interference		
47 CFR 15.25, "Operating Requirements, Incidental Radiation"	Prohibits operations of any device emitting incidental radiation that causes interference to communications; the regulation also requires mitigation for any device that causes interference.	Section 3.7.4.4
GO-52, CPUC	Covers all aspects of the construction, operation, and maintenance of power and communication lines and specifically applies to the prevention or mitigation of inductive interference.	Section 3.7.4.5

3.7.5 Transmission System Design Laws, Ordinances, Regulations, and Standards

This section provides a list of applicable laws, ordinances, regulations, and standards (LORS) that apply to the design and construction of the proposed transmission line and connection to the proposed SDG&E switchyard of the PPEC. As shown in Figure 3.5-3, the output of each CGT generator will be stepped up to 230kV, and will be connected to the project switchyard via a 1200 ampere rated, SF_6-cooled, circuit breaker. The project switchyard bus will be connected to the SDG&E PPEC substation via the 230kV interconnection, as shown on Figures 3.3-1 and 3.5-3. All transmission and interconnection facilities will be built in conformity with applicable LORS.

Table 3.7-2 lists the applicable LORS for the design and construction of the proposed transmission line and proposed connection to the SDG&E switchyard.

TABLE 3.7-2
DESIGN AND CONSTRUCTION LORS FOR THE PROPOSED TRANSMISSION LINE AND SWITCHYARD

LORS	Applicability	Conformance
ANSI/IEEE 80, "IEEE Guide for Safety in AC Substation Grounding"	Presents guidelines for assuring safety through proper grounding of AC outdoor substations.	Section 3.7.1
ANSI/IEEE 693,"IEEE Recommended Practices for Seismic Design of Substations"	Provides recommended design and construction practices.	Sections 3.5.5, 3.7.1, 3.7.2, 3.7.3, 3.7.4; and Figures 3.5.3, 3.7-1A through and 3.7-1D.
IEEE 980 "Containment of Oil Spills for Substations"	Provides recommendations to prevent release of oil into the environment.	Sections 3.5.5, 3.5.8, and 3.6.4
IEEE 998 "Direct Lightning Stroke Shielding of Substations"	Provides recommendations to protect electrical system from direct lightning strokes.	Sections 3.5.5, 3.7.1, 3.7.2, 3.7.3, 3.7.4; and Figures 3.5.3, 3.7-1A through and 3.7-1D.
IEEE 1119 "IEEE Guide for Fence Safety Clearances in Electric-Supply Stations"	Provides recommended clearance practices to protect persons outside the facility from electric shock.	Sections 3.5.5, 3.7.1, 3.7.2, 3.7.3, 3.7.4; and Figures 3.5.3, 3.7-1A through and 3.7-1D.
NESC, ANSI C2, Section 9, Article 92, Paragraph E; Article 93, Paragraph C	Covers grounding methods for electrical supply and communications facilities.	Sections 3.5.11.2, 3.7.1, and 3.7.2

LORS	Applicability	Conformance
14 CCR Sections 1250-1258, "Fire Prevention Standards for Electric Utilities"	Provides specific exemptions from electric pole and tower firebreak and electric conductor clearance standards, and specifies when and where standards apply.	Section 3.5.5 and 3.5.10.2, and Figure 3.7.1A through 3.7-1D
47 CFR 15.25, "Operating Requirements, Incidental Radiation"	Prohibits operations of any device emitting incidental radiation that causes interference to communications; the regulation also requires mitigation for any device that causes interference.	Section 3.7.4.4
Title 8 California Code of Regulations (CCR), Section 2700 et seq. "High Voltage Electrical Safety Orders"	Establishes essential requirements and minimum standards for installation, operation, and maintenance of electrical installation and equipment to provide practical safety and freedom from danger.	Sections 3.5.5, 3.7.1, 3.7.2, 3.7.3, 3.7.4; and Figures 3.5.3, 3.7-1A through and 3.7-1D.
General Order 52 (GO-52), CPUC, "Construction and Operation of Power and Communication Lines":	Applies to the design of facilities to provide or mitigate inductive interference.	Section 3.7.4
General Order 95 (GO-95), CPUC, "Rules for Overhead Electric Line Construction"	CPUC rule covers required clearances, grounding techniques, maintenance, and inspection requirements. The rule covers all aspects of design, construction, operation, and maintenance of electric transmission line and fire safety (hazards).	Sections 3.5.5, 3.7.1, 3.7.2, 3.7.3, 3.7.4; and Figures 3.5.3, 3.7-1A through and 3.7-1D.
General Order 128 (GO-128), CPUC, "Rules for Construction of Underground Electric Supply and Communications Systems"	Applies to the design and construction of underground transmission lines. Specifically establishes requirements and minimum standards to be used for the underground installation of AC power and communications circuits.	Sections 3.5.5, 3.7.1, 3.7.2, 3.7.3, 3.7.4; and Figure 3.7-1D.
GO-131D, CPUC, "Rules for Planning and Construction of Electric Generation, Line, and Substation Facilities in California"	CPUC construction application requirements, including requirements related to EMF reduction.	Section 3.7.4.2
Suggestive Practices for Raptor Protection on Power lines, April 1996	Provides guidelines to avoid or reduce raptor collision and electrocution.	Sections 3.5.5; 3.7.2 and 3.7.4; and Figures 3.7-1A through and 3.7-1D.

3.7.6 Transmission System Involved Agencies and Agency Contacts

Table 3.7-3 identifies federal, state, and local agencies with jurisdiction to issue permits or approvals, conduct inspections, and/or enforce the above referenced LORS. Table 3.7.3 also identifies the associated responsibilities of these agencies as they relate to the construction and operation of PPEC.

TABLE 3.7-3
AGENCIES WITH JURISDICTION FOR TRANSMISSION SYSTEM ENGINEERING AND DESIGN CONSIDERATIONS

Agency	Jurisdiction	Contact Information
Caltrans Department of Aeronautics	Grants permits to private heliports in California. May advise local jurisdictions regarding obstructions to helicopter navigation.	Division of Aeronautics 1120 N Street, Room 3300 Sacramento, CA 95814 916-654-4959
CEC	New transmission lines associated with thermal power plants that are 50 MW or more. (PRC § 25500).	1516 Ninth Street Sacramento, CA 95814 800-555-7794
CEC	Lines out of a thermal power plant to the interconnection point to the utility grid. (PRC § 25107).	1516 Ninth Street Sacramento, CA 95814 800-555-7794
CEC	Modifications of existing facilities that increase peak operating voltage or peak kilowatt capacity 25 percent. (PRC § 25123).	1516 Ninth Street Sacramento, CA 95814 800-555-7794
CPUC	Regulates construction and operation of overhead transmission lines. (General Order No. 95 and 131-D) (those not regulated by the CEC).	San Francisco Office (Headquarters) 505 Van Ness Avenue San Francisco, CA 94102 415-703-2782
CPUC	Regulates construction and operation of power and communications lines for the prevention of inductive interference. (General Order No. 52).	San Francisco Office (Headquarters) 505 Van Ness Avenue San Francisco, CA 94102 415-703-2782
FAA	Establishes regulations for marking and lighting of obstructions in navigable airspace. (AC No. 70/7460-1G).	Western-Pacific Region 15000 Aviation Boulevard Hawthorne, CA 90250 310-725-3550
CAISO	Provides Final Interconnection Approval.	P.O. Box 639014 Folsom, CA 95763-9014 916-351-4400
County of San Diego	Issues applicable permits, leases, or approvals to enforce LORS.	Planning and Land Use 5201 Ruffin Road, Suite B San Diego, CA 92123 858-694-2960

3.8 PIPELINES

The project includes one underground natural gas supply pipeline to be constructed and routed, as indicated on Figure 3.3-1 Facility Plot Plan.

3.8.1 Natural Gas Supply Line

Natural gas will be delivered to the PPEC plant site from a connection to an SDG&E gas transmission line. A new metering and regulator station will be provided on the project site. The gas will be metered as it enters the plant. The gas will be compressed as required and directed to each CTG. Additional flow metering will be provided at each CTG.

3.8.1.1 Description

Piping will be installed underground from the connection at the SDG&E gas transmission line to the point where it enters the project site. At the project site boundary, the piping will be routed to the aboveground gas metering and regulation station and either routed aboveground or below ground to the gas compressors. From the gas compressors, the pipeline will be routed underground to each CTG. The gas piping system will be constructed of carbon steel materials suitable for the design pressures and temperatures. Isolation and control valves will be provided as required by design, operational, and safety requirements.

3.8.1.2 Natural Gas Pipeline Routes

The PPEC project will require the construction of an off-site pipeline to supply natural gas to the project site. Two possible routes are proposed. Modified Gas Line Route A would extend south along Alta Road for approximately 2375 feet, turn west on Otay Mesa Road for approximately 2,700 feet, then turn south on Enrico Fermi Drive for approximately 2,700 feet to Airway Road, at which point it would connect to the existing SDG&E natural gas pipeline. Route B would extend approximately 2,375 feet south along Alta Road, turn west on Otay Mesa Road, and continue approximately 7,920 feet to Harvest Road, at which point it would connect to the existing SDG&E natural gas pipeline, for a total of approximately 10,300 feet (Figure 3.3-3, Potential Linears).

3.8.1.3 Buried Pipe

SDG&E will construct all gas pipelines outside of the project site limits up to and including the new metering station. Construction will primarily use an open trench method and will comply with all requirements for the protection of biological resources.

The pipeline will be constructed of carbon steel in accordance with the American Petroleum Institute (API) specifications for gas pipelines or specifications of the ASTM. The pipe will have corrosion-protection coating that is either factory- or field-applied. Joints will be welded, inspected using x-ray, and wrapped with a corrosion-protection coating.

Trenching

The trench width depends on the soil type encountered. The pipeline will be buried with a minimum 36-inch cover. The excavated soil will be piled on one side of the trench and later used for backfilling after the pipe is installed in the trench.

Stringing

The pipe will be laid out (stringing) on wooden skids along the side of the open trench during installation.

Installation

Installation consists of:

- Welding, coating, and bending of pipe

This page has been revised from the original AFC to reflect subsequent refinements to the project design.

- Laying sand or fine spoil on the trench floor
- Lowering the pipe string into the trench

Welding will meet the applicable API and ASTM standards and will be performed by qualified welders. Welds will undergo radiographical inspection by an independent, qualified radiography contractor. All coatings will be checked for holidays and will be repaired before lowering the pipe into the trench.

Backfilling

Backfilling consists of returning excavated soil or slurry fill back into the trench around and on top of the pipe and up to the original grade of the surface. The backfill will be compacted to protect the stability of the pipe and minimize subsequent subsidence. Backfilling will return the trench to the original grade.

Plating

Plating consists of covering any open trenches, for safety purposes, with solid rectangular plates in areas of foot or vehicular traffic at the end of a workday. Plywood plates can be used in areas of foot traffic and steel plates on areas of vehicular traffic.

3.8.2 Pneumatic Testing

Pneumatic testing consists of plugging both open ends of a pipeline that is to be tested, filling the pipe with air up to a pressure specified by code requirements, and maintaining the pressure for a period of time.

Cleanup

Cleanup consists of restoring the ground surface by removing construction debris, grading the surface to its original state, and replanting vegetation.

Commissioning

Commissioning consists of cleaning and drying the interior of the pipeline, purging air from the pipeline, and filling the pipeline with natural gas.

Safety

Measures to ensure safety during construction and maintenance of the pipeline include complying with all applicable California Occupational Safety and Health Administration (Cal/OSHA), OSHA, and other regulations and standards as well as the contractor's specific safety plans for the project, which will address specific pipeline safety issues. This installation will also comply with all of the County of San Diego regulations, as required.

3.8.3 Sewer Line

Wastewater from the project site will be connected to either the existing 12-inch sewer main along Calzada de la Fuente along the northern project site boundary, or the existing 15-inch sewer main immediately adjacent and to the west of the project site along Alta Road.

3.9 PROJECT CONSTRUCTION

Construction of the generating facility, from site preparation and grading to commercial operation, is expected to require 16 months. The major construction schedule milestones are listed in Table 3.9-1, Project Construction Dates.

TABLE 3.9-1
PROJECT CONSTRUCTION DATES

Activity	Date
Begin Construction	February 2013
Startup and Test	March 2014
Commercial Operation	May 2014

As shown in Tables 3.9-2A and 3.9-2B, Project Workforce Projections, the average monthly and peak monthly workforce are projected to be 148 and 284, respectively, construction craft people, supervisory, support, and construction management personnel on site during construction.

Construction will typically take place between 7:00 a.m. and 5:30 p.m., Monday through Friday. Additional hours may be necessary to make up schedule deficiencies or to complete critical construction activities. During some construction periods and during the startup phase of the project, some activities may continue 24-hrs per day, seven-days per week.

The peak construction site workforce level is expected to last from Month 6 through Month 10 of the construction period following commencement of construction.

TABLE 3.9-2A
PROJECT WORKFORCE PROJECTIONS

Plant Construction																	
	Months After Construction Notice-to-Proceed													Commissioning			
Discipline	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**Total**
Insulation Workers	0	0	0	0	0	0	0	8	8	8	17	4	3	0	0	0	48
Boilermakers	0	0	0	0	0	14	14	14	14	14	14	11	11	11	0	0	117
Carpenters/Cement Finishers	4	12	19	19	19	15	13	8	5	4	4	4	2	2	1	0	131
Electricians	3	11	9	9	19	28	36	53	55	51	29	17	10	5	5	5	345
Ironworkers	0	3	5	31	29	31	31	29	25	22	19	17	8	3	0	0	253
Laborers	6	11	15	20	20	20	20	20	20	17	12	8	4	3	2	2	200
Millwrights	0	0	0	7	8	13	28	41	41	41	30	9	9	1	1	1	230
Operating Engineers	8	8	8	9	9	9	9	9	9	4	1	1	1	1	1	0	87
Painters	0	0	0	0	0	4	9	9	9	4	4	2	2	2	0	0	45
Pipefitters	4	16	26	26	33	33	35	45	48	24	16	10	4	4	4	4	332
Sheetmetal Workers	0	0	0	0	0	3	6	7	9	7	7	7	2	1	0	0	49
Surveyors	4	5	5	3	3	2	2	2	2	2	2	2	2	2	0	0	38
Teamsters	4	3	5	3	2	2	2	2	2	2	2	2	1	1	1	0	34
Commissioning Group	0	0	2	2	2	2	2	2	2	2	4	5	5	5	5	5	45
Management Staff	17	21	24	35	37	40	35	35	34	34	27	25	19	13	12	12	420
Total Workforce	**50**	**90**	**118**	**164**	**181**	**216**	**242**	**284**	**283**	**236**	**188**	**124**	**83**	**54**	**32**	**29**	2,374

TABLE 3.9-2B
PROJECT WORKFORCE PROJECTIONS

Linear Piping Construction																	
Months After Construction Notice-to-Proceed																	
Discipline	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**Total**
Laborers	4	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	12
Surveyors	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	6
Teamsters	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	6
Management Staff	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	6
Total Workforce	**10**	**10**	**10**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**30**

3.9.1.1 Execution Plans – Engineering and Construction Phases

This is an engineering, procurement, and construction (EPC) type project. As such, a single general contractor will be selected for the design, procurement, and construction of the facility. The general contractor will select subcontractors for specialty work portions as needed.

Materials and supplies will be delivered to the project site by truck. Truck deliveries of construction materials and equipment will generally occur on weekdays between 6:00 a.m. and 6:00 p.m.; however, some larger heavy-load deliveries may be delivered outside those hours. PPEC site access will be controlled for both personnel and delivery vehicles.

3.10 FACILITY OPERATIONS AND MAINTENANCE

This section discusses operation and maintenance procedures that PPEC staff will follow to ensure safe and reliable, operation of the power plant, transmission system, and pipelines, consistent with environmental laws and regulations.

3.10.1 Introduction

Plant operations staff will include a total of four operators, four maintenance technicians, one environmental technician, one administrative staff member, one operations supervisor, and a plant manager. The plant will operate and be staffed 24 hours per day, seven days per week. Plant operations will be directed from a control room. All system equipment will be controlled through a programmable logic controller (PLC) or digital control system (DCS) system, and the project equipment will be integrated into this proven control system.

3.10.2 Power Plant Facility

PPEC is designed as a simple-cycle, peaking, and intermediate load facility with three LMS100 CTGs. The project will be designed to emphasize efficiency and flexibility.

3.10.2.1 Plant Operation

As an intermediate load and peaking facility, each unit will be limited to operate no more than 4,000 hr/yr. The plant will be dispatched by SDG&E in accordance with its economic dispatch procedures. The time required for startup is approximately ten minutes. The SDG&E contract allows for 500 startups and shutdowns per unit per calendar year in addition to the 4,000 hours of normal operation.

3.10.2.2 Controls

The plant control system will consist of a state-of-the-art, integrated, microprocessor-based DCS. The control system 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 or remote PLC(s).

Process switches (i.e., pressure, temperature, level, flow) used for protective functions will be connected directly to the DCS or PLCs and the protective system.

3.10.2.3 Degree of Automation

The PPEC plant will be designed with automation where practical to reduce the required actions performed by operating personnel. Through subsystem automation and use of the DCS, the number of individual control switches and indicators that confront the operator will be greatly reduced.

3.10.2.4 Centralized Control

The majority of the equipment required to support plant operation will be located in the control room and electrical equipment rooms. The control room will contain the DCS-based operator workstations and any auxiliary control panels. In addition, the control room will contain the alarm, utility, and log printers.

Local control panels or stations will be furnished 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 indicators and control functions will be duplicated for those variables critical to plant availability.

3.10.3 Transmission System Operation and Maintenance

Transmission line facilities will be operated and maintained in accordance with industry general practice and SDG&E interconnection requirements.

3.10.4 Pipeline Operation and Maintenance

SDG&E will own, operate, and maintain the natural gas pipeline from the existing fuel gas supply lines in accordance with applicable Federal Energy Regulatory Commission (FERC) and U.S. Department of Transportation (DOT) regulations. This piping system will be inspected periodically as part of SDG&E's pipeline maintenance program.

Industrial wastewater and sanitary systems will be discharged to the San Diego County's sewer system.

3.11 FACILITY CLOSURE

Facility closure can be either temporary or permanent. Facility closure can result from two circumstances: (1) the facility is closed suddenly and/or unexpectedly because of unplanned circumstances, such as a natural disaster or other unexpected event (e.g., a temporary shortage of facility fuel) or (2) the facility is closed in a planned, 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.

3.11.1 Temporary Closure

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 facility damage does not result in a hazardous substance release, the facility would be kept "as

is," ready to resume operations when the unplanned closure event is rectified or ceases to restrict operations.

In the event that a hazardous substance is possibly released, the project owner will notify the CEC compliance unit and follow emergency plans in accordance with the emergency Risk Management Plan (RMP). Depending upon the expected duration of the shutdown, chemicals may be drained from the storage tanks and other equipment. All waste (hazardous and nonhazardous) will be disposed of according to LORS in effect at the time of the closure. Facility security will be retained so that the PPEC facility is secure from trespassers.

3.11.2 Permanent Closure

The generation facility's anticipated life 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 longer period of time.

3.11.3 Closure Mitigation

At the time of facility closure, decommissioning will be completed in a manner that: (1) protects the health and safety of the public and (2) is environmentally acceptable. One year prior to a planned closure, the project owner will submit a specific decommissioning plan that would include the following:

- Identification, discussion, and scheduling of the decommissioning activities to include the power plant, applicable transmission lines, and other pertinent facilities constructed as part of the project.

- Description of the measures to be taken that will ensure the safe shutdown and decommissioning of all equipment, including the draining and cleaning of all tanks and the removal of any hazardous waste.

- Identification of all applicable LORS in effect at the time, and how the specific decommissioning will be accomplished in accordance with the LORS.

- Notification of state and local agencies.

- 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 PPEC plant site is to return to its natural state, the specific decommissioning plan will include the removal of all aboveground and underground objects and material and an erosion control plan that is consistent with sound land management practices.

In the event of an unplanned closure due to earthquake damage or other circumstances, the project owner will meet with the CEC and local agencies and submit a detailed decommissioning closure plan in a timely manner.

No decommissioning plan will be submitted for a temporary shutdown.

3.12 SAFETY, AVAILABILITY, AND RELIABILITY

3.12.1 Safety Precautions and Emergency Systems

Safety precautions and emergency systems will be implemented as part of the PPEC plant's design and construction to ensure safe and reliable operation of the facilities. Administrative controls will include classroom and hands-on training in operating and maintenance procedures and general safety items and a well-planned maintenance program. These controls will work with the system design and monitoring features to enhance safety and reliability.

Safety, auxiliary, and emergency systems will consist of lighting, grounding, DC back-up for controls, fire and hazardous materials safety systems, security systems, and natural gas, steam, and chemical safety systems. The plant will include its own utilities and services, such as emergency power, plant and instrument air, fire suppression, and potable water systems.

3.12.1.1 Safety Precautions

Worker Safety

PPEC will implement programs to ensure that compliance with federal and state occupational safety and health program requirements is maintained. In addition, PPEC will identify and implement plant-specific programs that effectively assess potential hazards and mitigate them routinely.

A complete discussion of worker safety is provided in Section 5.17, Worker Safety.

Hazardous Materials Handling

Hazardous materials will be stored and used at PPEC during construction and operation. Design and construction of hazardous materials storage and dispensing systems will be in accordance with applicable laws, regulations, and standards. Hazardous materials storage areas will be curbed or diked to contain spills or leaks.

Potential hazards that are associated with hazardous materials will be further mitigated by implementing a hazards communication (HAZCOM) program. This program involves thorough training of employees on proper identification, handling, and emergency response to spills or accidental releases.

Emergency eyewashes and showers will be provided at appropriate locations, and appropriate Personal Protective Equipment (PPE) will be provided during facility construction and operation. A detailed discussion of hazardous materials handling is presented in Section 5.15, Hazardous Materials Handling.

Security

The PPEC plant site will be enclosed with a security fence, and limited access gates will be employed. In addition to the perimeter security fence, the switchyard and transformer area will be fenced and provided with access gates. Security will be maintained on a 24-hour basis with either surveillance devices or personnel.

Public Health and Safety

The programs implemented to protect worker health and safety will also benefit public health and safety. Facility design will include controls and monitoring systems to minimize the potential for upset conditions that could result in public exposure to acutely hazardous materials. Potential public health impacts associated with operation of the project will be mitigated by development and implementation of an Emergency Response Plan (ERP); a HAZCOM Program; a Spill Prevention, Control, and Countermeasures (SPCC) Plan; safety programs; and employee training.

PPEC will coordinate with local emergency responders, provide them with copies of the plant site ERP, conduct plant site tours to point out the location of hazardous materials and safety equipment, and encourage these providers to participate in annual emergency response drills.

3.12.1.2 Emergency Systems

Fire Protection Systems

PPEC will have on-site fire protection systems and will be supported by local fire protection services. Section 3.5.10, Fire Protection System, includes a detailed description of the fire protection systems.

Portable and fixed-fire suppression equipment and systems will be included in the project. Portable fire extinguishers will be at strategic locations throughout the project site. Smoke detectors, sprinkler systems, and fire hydrants with hoses are included in the facility design. Based on a detailed design, the fixed-fire protection system may also include a CO_2 or a deluge spray system.

Employees will be given fire safety training, including instruction in fire prevention, the use of portable fire extinguishers and hose stations, and reporting fires to the local fire department. Employees will only suppress fires in their incipient stage. Fire drills will be conducted at least twice each year for each work area.

The San Diego County Rural Fire Protection District (RFPD), Community Facilities District (CFD) No. 09-1 will provide primary fire protection, firefighting, and emergency response services to the PPEC site. Both fire and emergency service will be provided out of RFPD Interim Station 22, located at 446 Alta Road, which is approximately 0.25 mile north of the project site. The estimated response time to the site is four minutes. The RFPD Fire Marshall will perform a final fire safety inspection upon completion of construction and, thereafter, will conduct periodic fire safety inspections. Prior to plant startup, the RFPD Fire Marshall will be requested to visit the project site to review project emergency response procedures.

Medical Services and Emergency Response

PPEC will have an ERP, which will address potential emergencies, including chemical releases, fires, and injuries, and will describe emergency response equipment and its location, evacuation routes, procedures for reporting to local emergency response agencies, responsibilities for emergency response, and other actions to be taken in the event of an emergency.

Employee response to an emergency will be limited to an immediate response to minimize the risk of escalation of the accident or injury. Employees will be trained to respond to fires, spills, earthquakes, and injuries. A first-aid facility with adequate first-aid supplies and personnel qualified in first-aid treatment will be on site.

3.12.2 Aviation Safety – Power Generation Stacks

The Federal Aviation Administration (FAA) regulations establish standards for determining obstructions in navigation space and set forth requirements for notification of construction. These regulations require notification of any construction over 200 feet in height above ground level. The closest airfield with commercial flights is Brown Field, approximately two miles away.

Three 100-foot tall self-supporting steel stacks with integral stack/silencer systems and associated appurtenances will be the tallest structures at the PPEC facility. A lighting system on the top of the stacks will not be required in this instance, per FAA Advisory Circular for Obstruction Marking and Lighting.

3.12.3 Facility Availability

The PPEC facility would consist of three simple-cycle gas turbines and generators that are specifically designed for peaking services. To support dispatch service, each turbine generator is commonly operated between 50 and 100 percent of its full capacity; hence, the facility will be operated to support dispatch service and automatic generation control in response to customer demands for electricity.

The facility is designed for an operating life of 30 years. Reliability and availability projections are based on this operating life. Operations and maintenance procedures will be consistent with industry standard practices to ensure the plant components' useful life span.

The overall plant availability is best defined by the Equivalent Availability Factor (EAF) which is equal to the amount of energy the plant would actually produce if called upon divided by the maximum theoretical capacity for each time period. This method takes into account unit derates as well as complete outages. The EAF for this plant is projected to be in excess of 98 percent over its operating lifetime.

The Capacity Factor (CF) is equal to the actual energy produced over a period of time divided by the maximum theoretical capacity for that time period. Based on the maximum operating load (i.e., 4,000 hours per year for each CTG), the CF would be 45.66 percent. A reasonable projection is that the plant will operate at an annual CF between 25 and 45 percent, resulting in a lifetime estimated CF of approximately 35 percent.

3.12.4 Equipment Reliability and Redundancy

The following subsections identify equipment redundancy as it applies to plant availability, and Table 3.12-1 lists equipment redundancy.

TABLE 3.12-1
EQUIPMENT REDUNDANCY

Description	Number
CTGs	Three trains
Closed-Loop Cooling Water Pumps	Two, 100% capacity
PDCS Cooling Water Pumps	N+1 redundancy
Demineralized-RO System	Two, 60% trains
Natural Gas Compressor	Three, 50% capacity
Generator Step-up Transformers	Three (one per CTG)
Auxiliary Transformers	Two, 100% capacity

Notes:
CTG = combustion turbine generator
PCDS = partial dry-cooling system
RO = reverse osmosis

3.12.4.1 Combustion Turbine

The power block consists of three separate CTGs operating in simple-cycle mode. Each CTG power train will provide approximately 33 percent of the total facility output. The major components of each turbine generator power train consist of the following systems.

Combustion Turbine Generator Subsystems

The combustion turbine subsystems include the combustion turbine, inlet air filtration and evaporative inlet cooling system, intercooling system, generator and excitation systems, and turbine control and instrumentation. The combustion turbine consists of a compressor, intercooler system, a combustion section, and a turbine section. Compressed air from the compressor section is cooled by the intercooler and then heated by the combustion of natural gas in the combustion section. The heated compressed gasses expand in the turbine section, where the expansion turns the rotor to produce mechanical energy to drive the compressor section and the generator. Exhaust gas from the combustion turbine will be directed into an SCR system to control NO_x emissions and an oxidation catalyst to control CO emissions. The generator will be air-cooled. The generator excitation system will be a solid-state static system. A combustion turbine control and instrumentation system (interfaced with the plant control system) will cover the turbine governing system and the turbine protection system.

Control and Information System

The control system will be designed with a redundancy level such that critical controls and indications do not fail due to a single component failure. Critical functions and parameters will have redundant sensors and controls. Control systems in general, and especially the equipment protection systems, will be designed according to stringent reliability criteria.

Digital control system (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 online and in control. The control system will incorporate online, self-diagnostic features to verify proper operation of system hardware, software, and related support functions, such as control power, field contact interrogating power, and system modules in position.

The GE Mark VIe CTG control system includes controllers that are arranged in a single, dual, or triple modular redundant arrangement, depending on the criticality of the system being controlled. In addition to the Mark VIe controllers, there are independent generator monitors for vibration, fire, and gas.

Plant operation will be controlled from the operator workstations located in the control room. The operator workstations will consist of three individual LCD/keyboard workstations and one engineering workstation. Each workstation will be an independent electronic package so that failure of a single package does not disable more than one workstation. The engineering workstation will allow the control system operator interface or logic to be revised by authorized personnel.

Demineralized Water System

A demineralized water system will provide high-purity water to be used as injection water into the turbine combustor for NO_x control. The demineralized water system will consist of two 60 percent capacity RO mixed-bed demineralizer trains. Makeup water to the demineralized water system will be from a 500,000-gallon raw water/firewater storage tank. Demineralized water will be stored in a 240,000-gallon demineralized water storage tank.

Water Injection Makeup and Storage System

The water injection makeup and storage subsystem will provide demineralized water storage and pumping capabilities to supply high-purity water for water injection. Major components of the system are the demineralized water storage tank (240,000 gallons), providing approximately a 24-hr supply of demineralized water at peak load, and two full-capacity, horizontal, centrifugal, makeup water pumps.

Closed-Loop Cooling Water Systems

The closed-loop cooling water systems will provide cooling water to each combustion turbine's intercoolers and lube oil coolers. Two 100 percent capacity cooling water pumps will be the prime movers for these systems.

3.12.5 Fuel/Water Availability

3.12.5.1 Gas Supply

SDG&E will supply fuel through its gas distribution and transmission system. A new gas pipeline between the project site and existing SDG&E lines will be constructed as part of the project.

3.12.5.2 Water Availability

Process water will be readily available from Otay Water District, as described in Section 5.5, Water Resources. Refer to Appendix I for the project water supply agreement with the Otay Water District.

3.12.6 Project Quality and Control

The general contractor, the design-engineer contractor, and all significant vendors, suppliers, and subcontractors for the project will be required to develop a project-specific quality control program prior to beginning work. Each program will define quality goals, processes to measure events, and incentive programs. Quality standards will include safety and environmental compliance objectives.

3.12.6.1 Quality Assurance

The quality assurance manual will define the quality management system and processes, management responsibility and organization, project execution, and measurement methods. Other elements of the quality assurance program will include a procedure manual, standards, job quality analysis, quality tours, preventive action planning, internal and external assessment, training, and trending.

Key quality indicators will be tracked and include surveillance, deficiencies, non-conformances, weld reject rate, audit results, quality incidents, and rework. The quality indicators will be metrically measured and reported.

3.12.6.2 Quality Control Records

Quality records will be maintained during the project's detailed design phase, construction phase, and plant commissioning. Quality records include written documentation that procedures and standards are followed, including inspection and testing reports, audit checklists, audit reports, and quality incident investigation reports.

3.13 LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The applicable LORS for each engineering discipline are included as part of Appendices A through F.

3.14 REFERENCES

California Building Code (CBC). 2010. California Code of Regulations, Title 24, Part 2, Volume 2 of 2. California Building Standards Commission.

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URS Greiner Woodward Clyde, 1999. Application for Certification Otay Mesa Generating Project. August.

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United States of America. 14CFR1250-1258 – Fire Prevention Standards for Electric Utilities.

United States of America. 15CFR77 – Objects Affecting Navigable Airspace.

United States of America. 47CFR15.25 – Operating Requirements, Incidental Radiation.

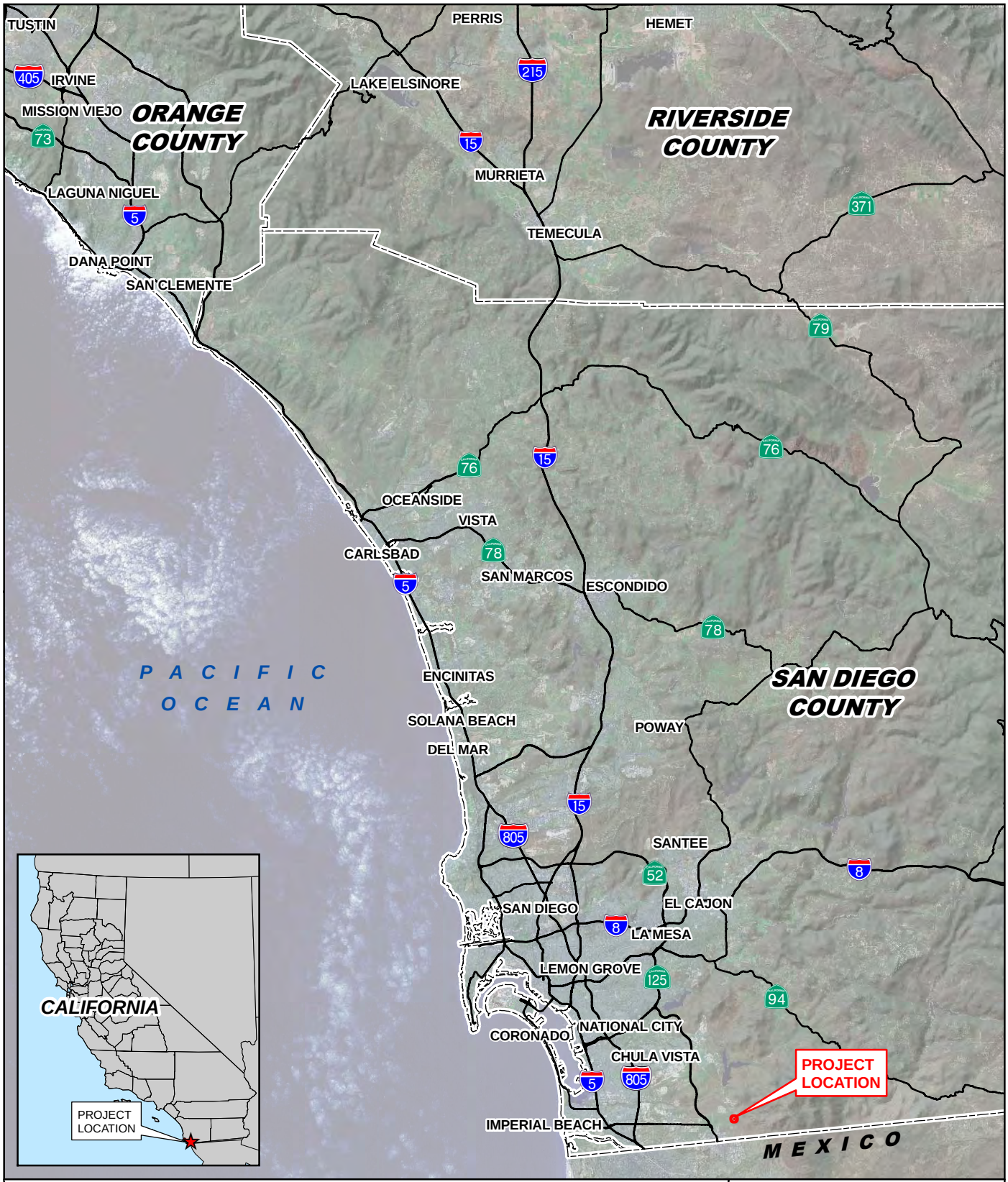

FIGURE 3.1-1
REGIONAL LOCATION

PIO PICO
ENERGY CENTER

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DATE: DECEMBER 2010

URS

Legend

Project Site

N

0 2,000 4,000 Feet

FIGURE 3.1-2
SITE VICINITY

PIO PICO ENERGY CENTER

PROJECT NO.: 29874827
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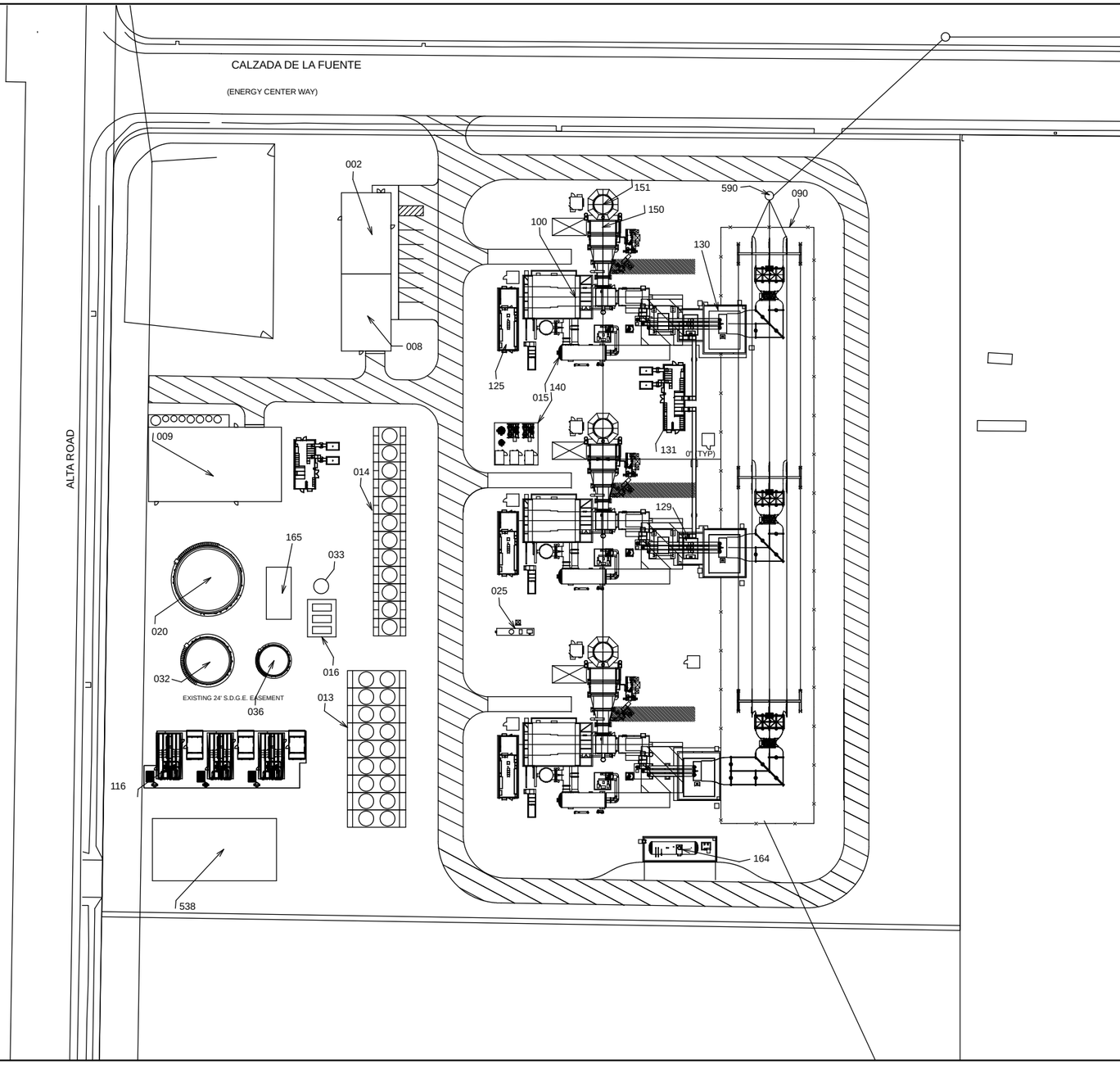


NO	EQUIPMENT TITLE
002	CONTROL ROOM
008	WAREHOUSE
009	WATER TREATMENT
013	DRY AIR COOLERS
014	WET AIR COOLERS
015	INTERCOOLER
016	CIRCULATING WATER PUMPS
020	SERVICE WATER TANK
025	OIL/WATER SEPERATOR
032	DEMINERALIZED WATER TANK
033	CIRCULATING WATER EXPANSION TANK
036	WASTE WATER TANK
090	PLANT SWITCHYARD
100	COMBUSTION TURBINE
116	GAS COMPRESSOR MODULE
125	CTG POWER/CONTROL MODULE
129	AUXILIARY TRANSFORMER
130	GENERATOR TRANSFORMER
131	5KV ELECTRICAL MODULE
140	AIR COMPRESSOR
150	SCR
151	STACK
164	AMMONIA STORAGE
165	FIRE WATER PUMP BUILDING
538	GAS METERING STATION
590	TRANSMISSION LINE

N

30 0 30 60
SCALE IN FEET
SCALE: 1" = 30'-0"

FIGURE 3.1-3A
SITE ARRANGEMENT

PIO PICO
ENERGY CENTER

PROJECT NO.: 29874827
DATE: DECEMBER 2010

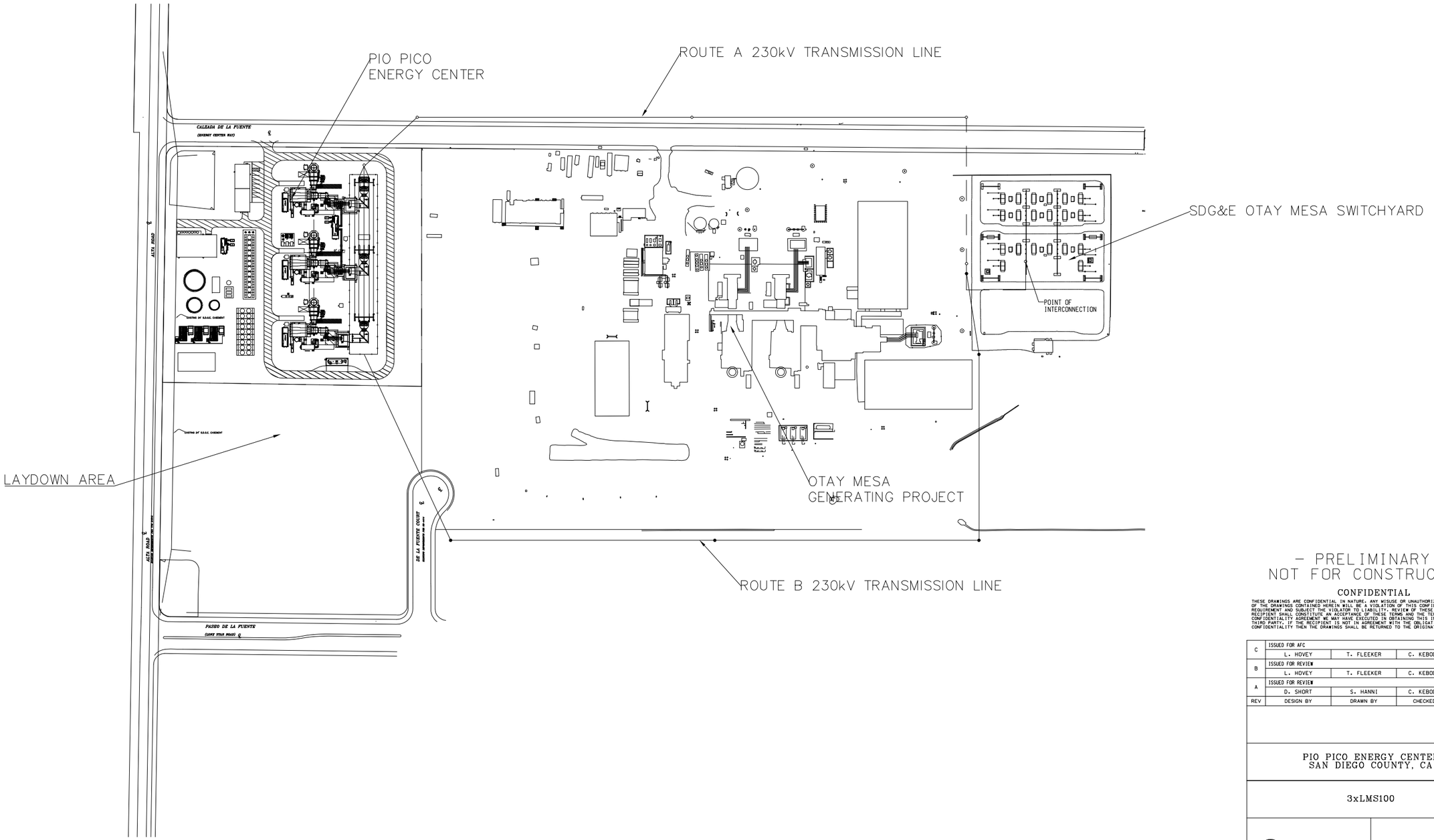
URS

LEGEND

OVERHEAD 230KV LINE

UNDERGROUND 230KV LINE

TRANSMISSION LINE POLE



PSD - 3.68

100 0 100 200

SCALE IN FEET

SCALE: 1" = 100'-0"

N

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C	ISSUED FOR AFC			
	L. HOVEY	T. FLEEKER	C. KEBODEAUX	02-03-11
B	ISSUED FOR REVIEW			
	L. HOVEY	T. FLEEKER	C. KEBODEAUX	01-06-11
A	ISSUED FOR REVIEW			
	D. SHORT	S. HANNI	C. KEBODEAUX	12-21-10

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FIGURE 3.1-3B

SITE ARRANGEMENT AND POTENTIAL
OFFSITE TRANSMISSION LINE
STRUCTURE LOCATIONS

ENGINEER/DESIGN ORIGINATOR	S. HANNI
LEAD ENG	C. KEBODEAUX
ENG MGR	1st Int. Last Name
PROJ MGR	A. HACKLER

DRAWING NUMBER

P009-041-SP-002

$$DATE$$ $$TIME$$ $$USERNAME$$ $$FILENAME$$

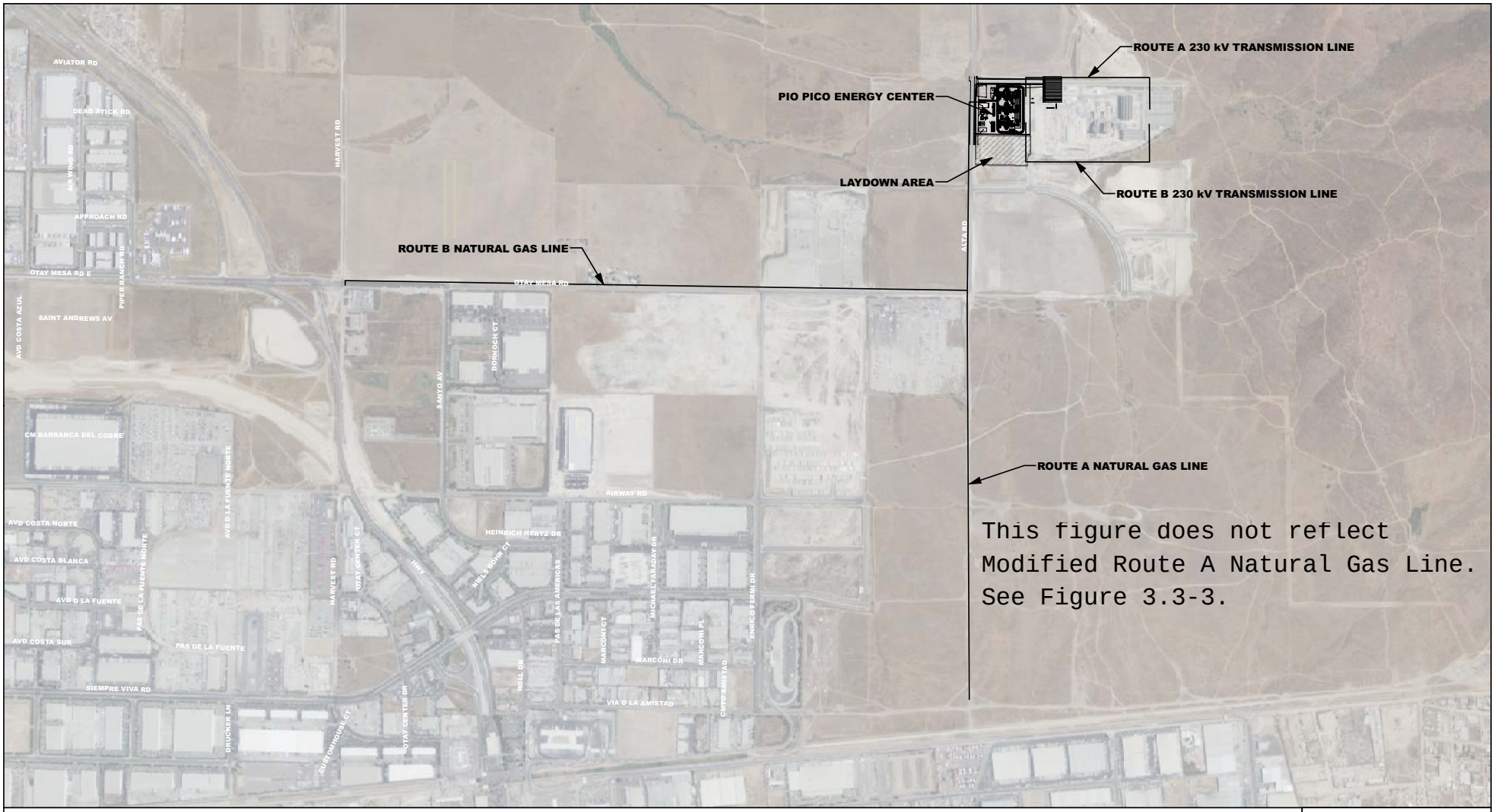

FIGURE 3.3-1
FACILITY PLOT PLAN

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PROJECT NO.: 29874827
DATE: DECEMBER 2010

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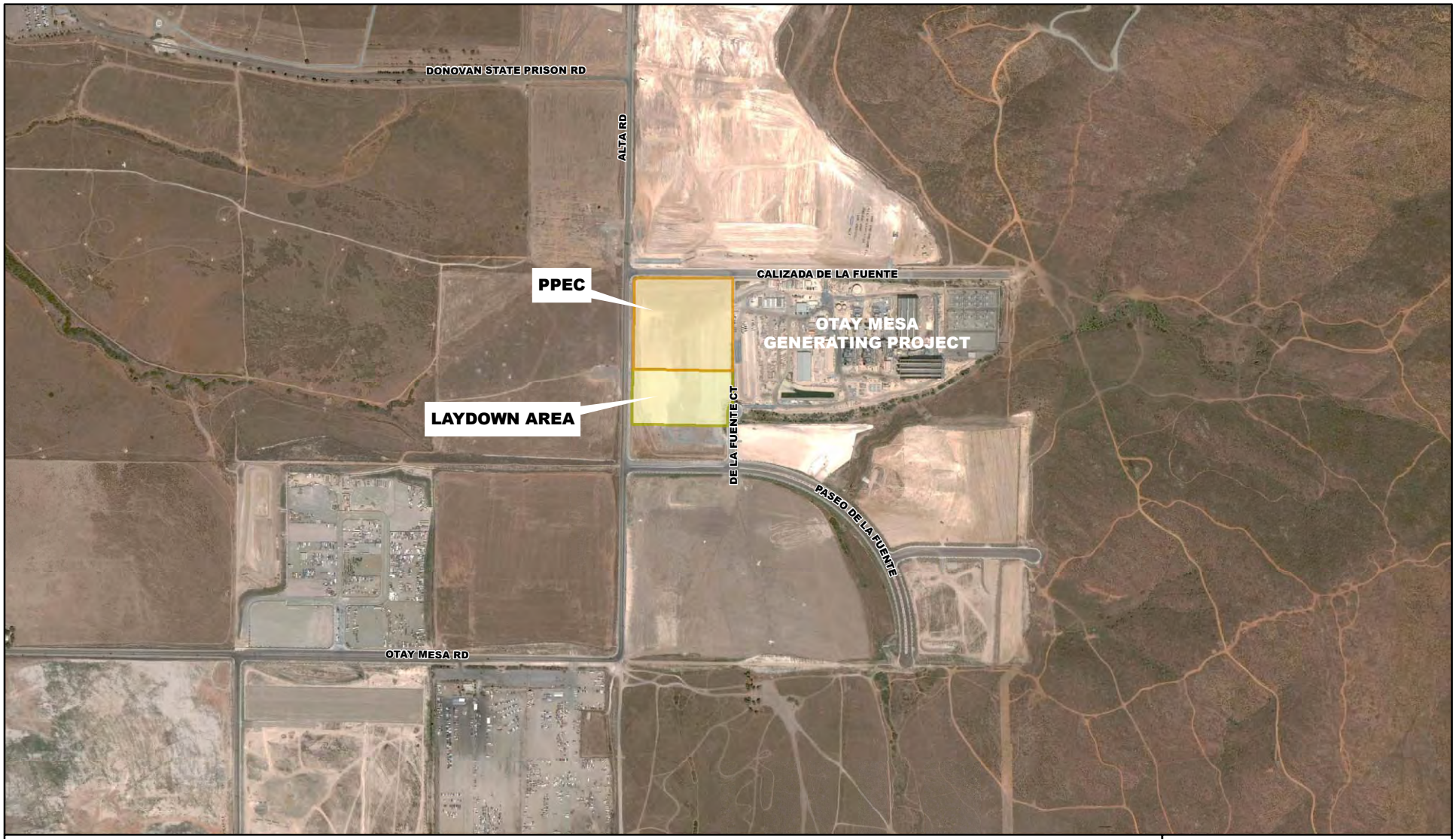

Legend

- Project Site
- Laydown Area

N

0 500 1,000 Feet

FIGURE 3.3-2
PROJECT LOCATION

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PROJECT NO.: 29874827
DATE: DECEMBER 2010

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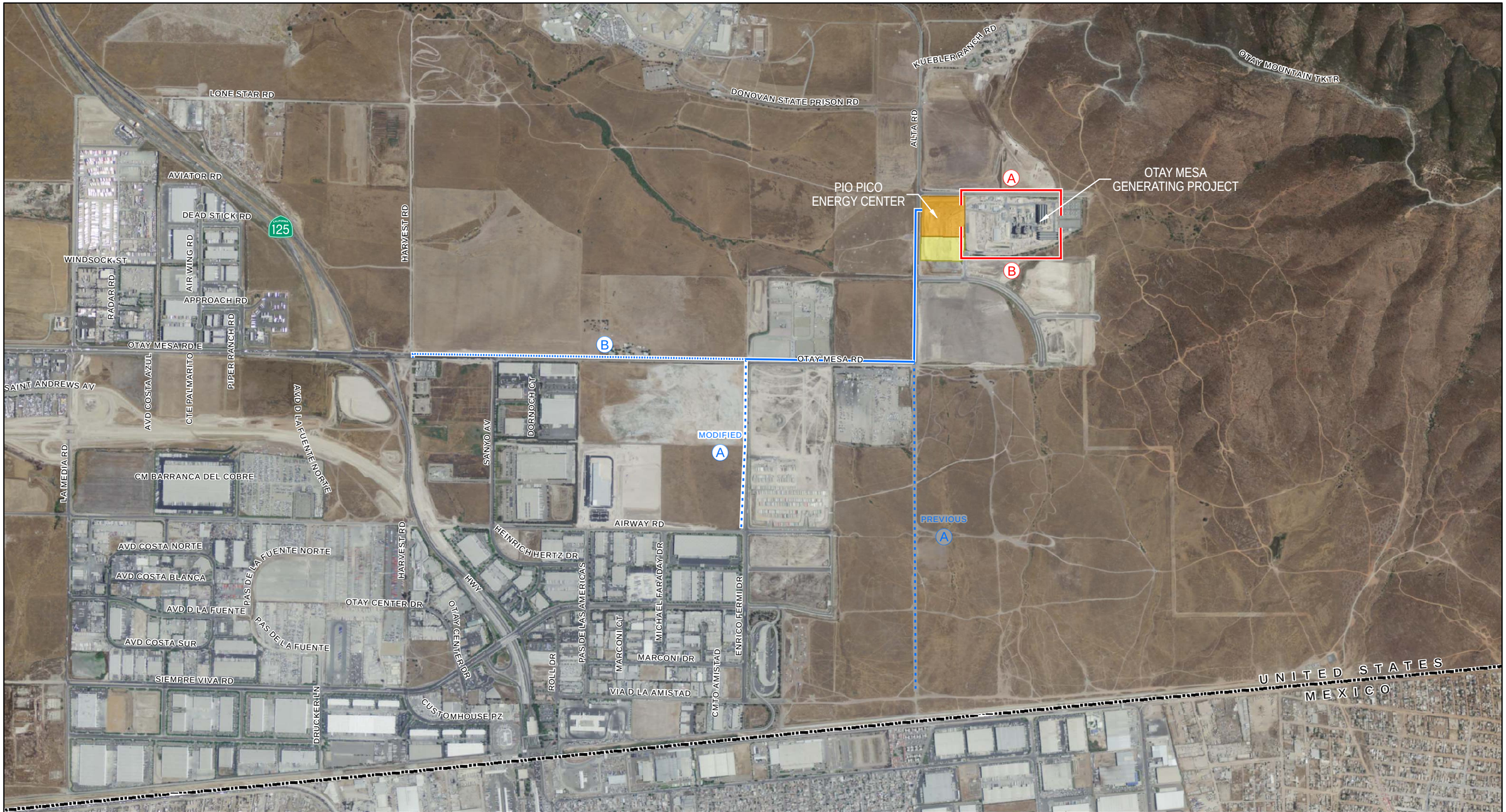

LEGEND

- Project Site
- Laydown Area
- United States/Mexico Border
- 230 kV Transmission Line (Route A and Route B)
- Shared Portion of Route B and Modified Route A Natural Gas Line
- Modified Route A Natural Gas Line
- Previous Route A Natural Gas Line
- Route B Natural Gas Line

N

0 750 1,500 Feet

FIGURE 3.3-3 (REVISED)
POTENTIAL LINEARS

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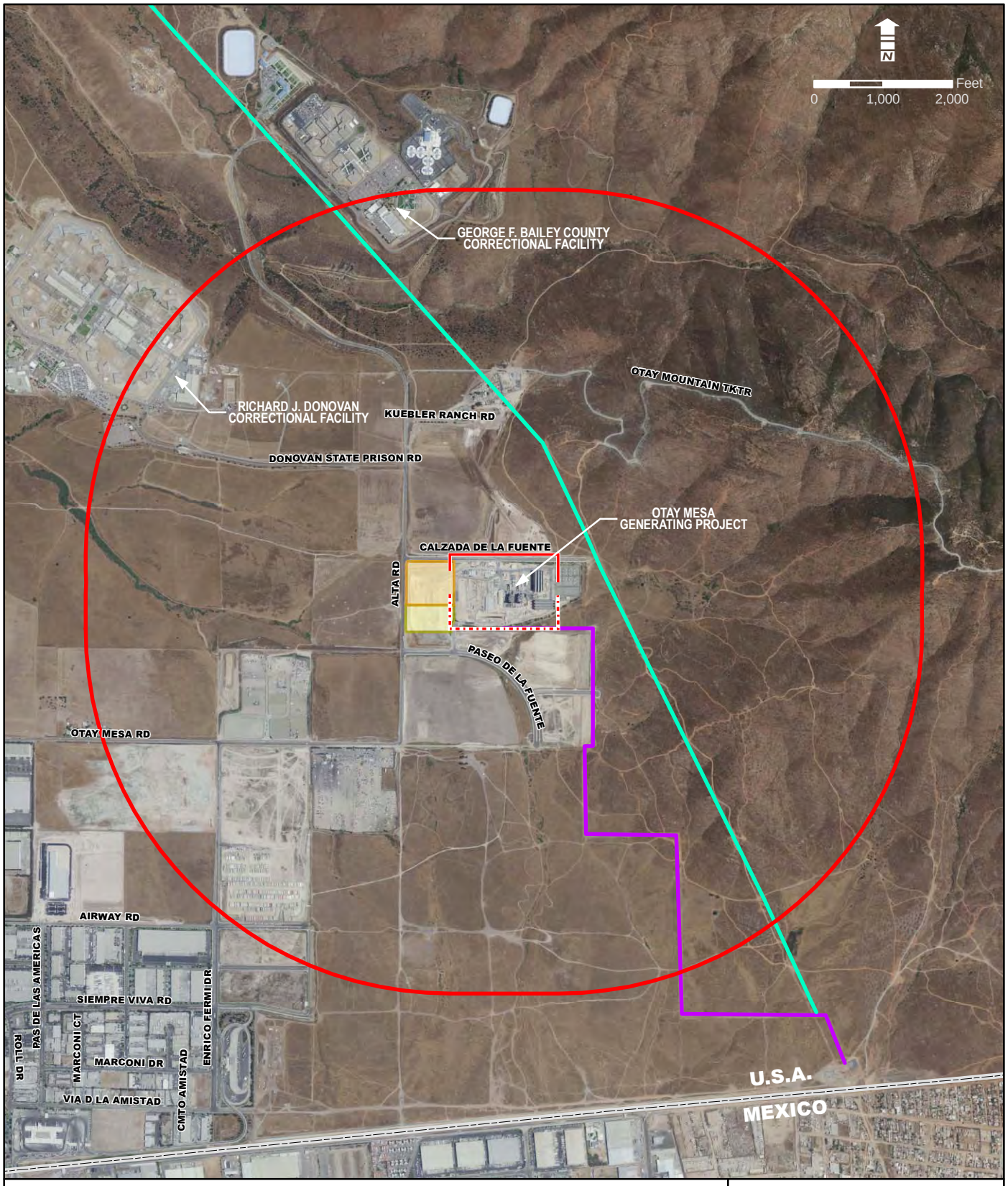

Legend

- 1-Mile Radius of Potential Transmission Lines
- Project Site
- Laydown Area
- Existing 230 kV Transmission Line
- Existing Natural Gas Line
- Route A 230 kV Transmission Line
- Route B 230 kV Transmission Line

FIGURE 3.3-4
EXISTING SETTING WITHIN 1-MILE RADIUS OF POTENTIAL TRANSMISSION LINES

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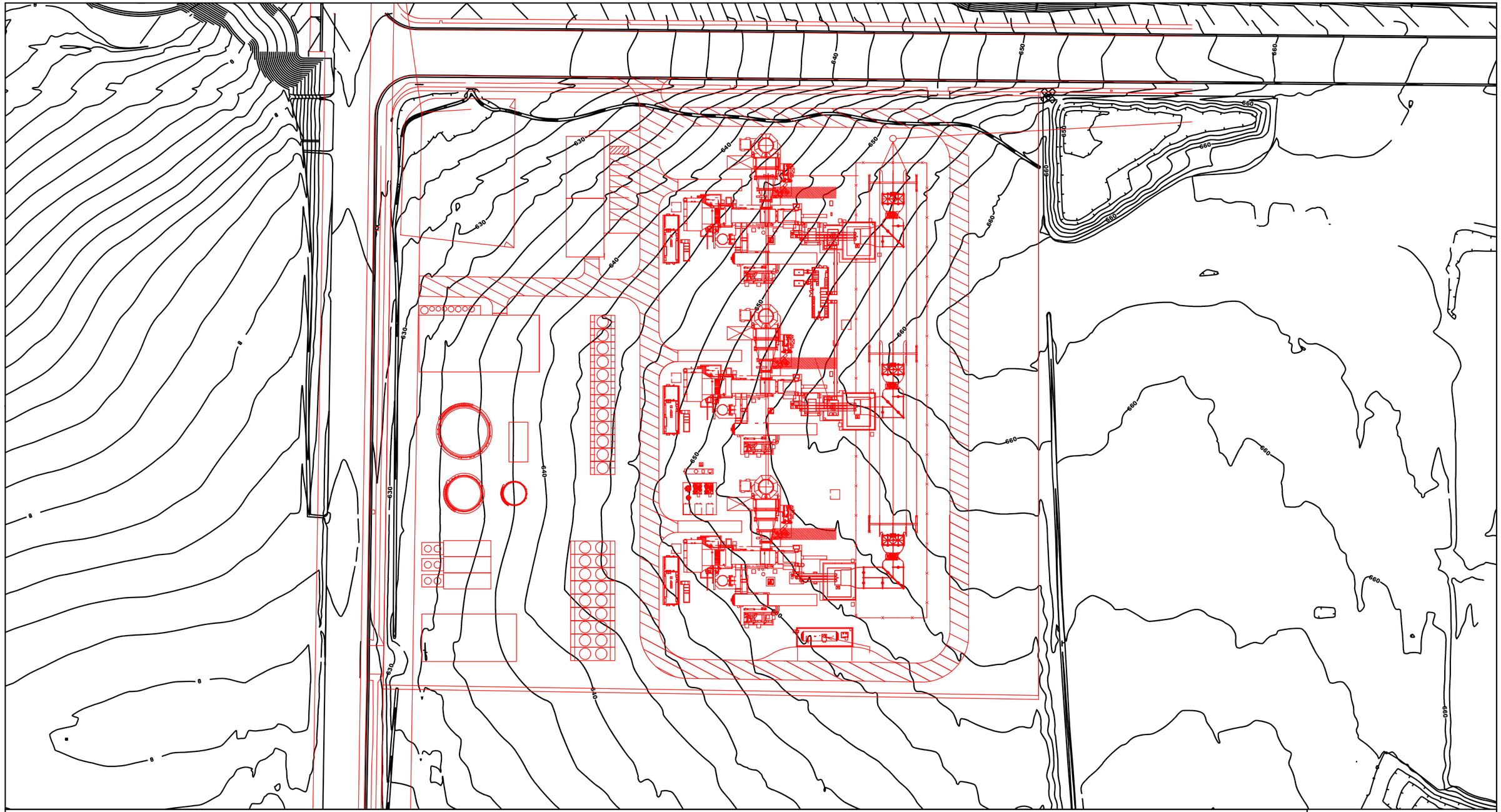

Legend

Potential Project Site

Existing Topography

FIGURE 3.4-1
2010 SITE TOPOGRAPHY

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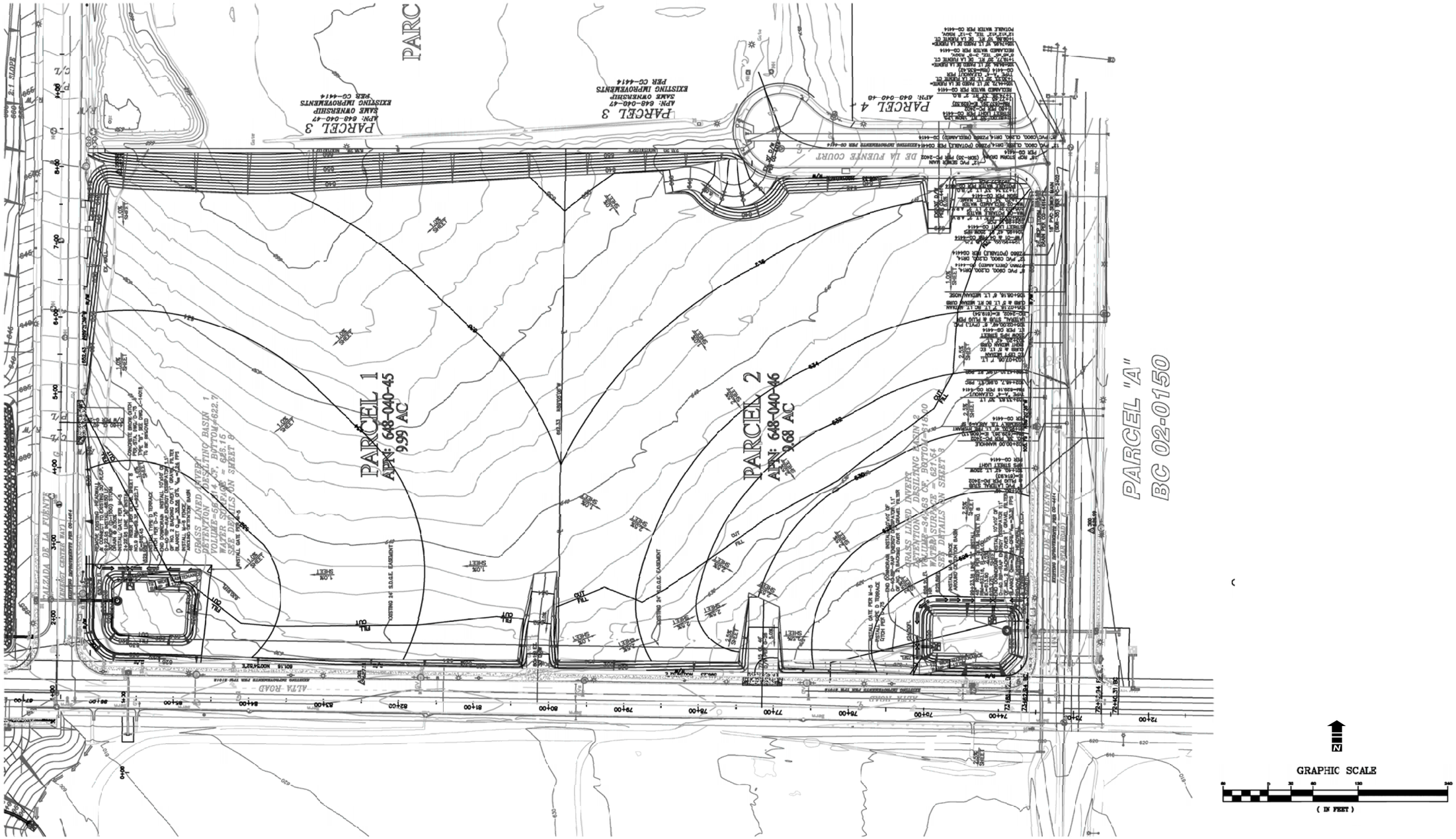

FIGURE 3.4-2
BASELINE SITE TOPOGRAPHY

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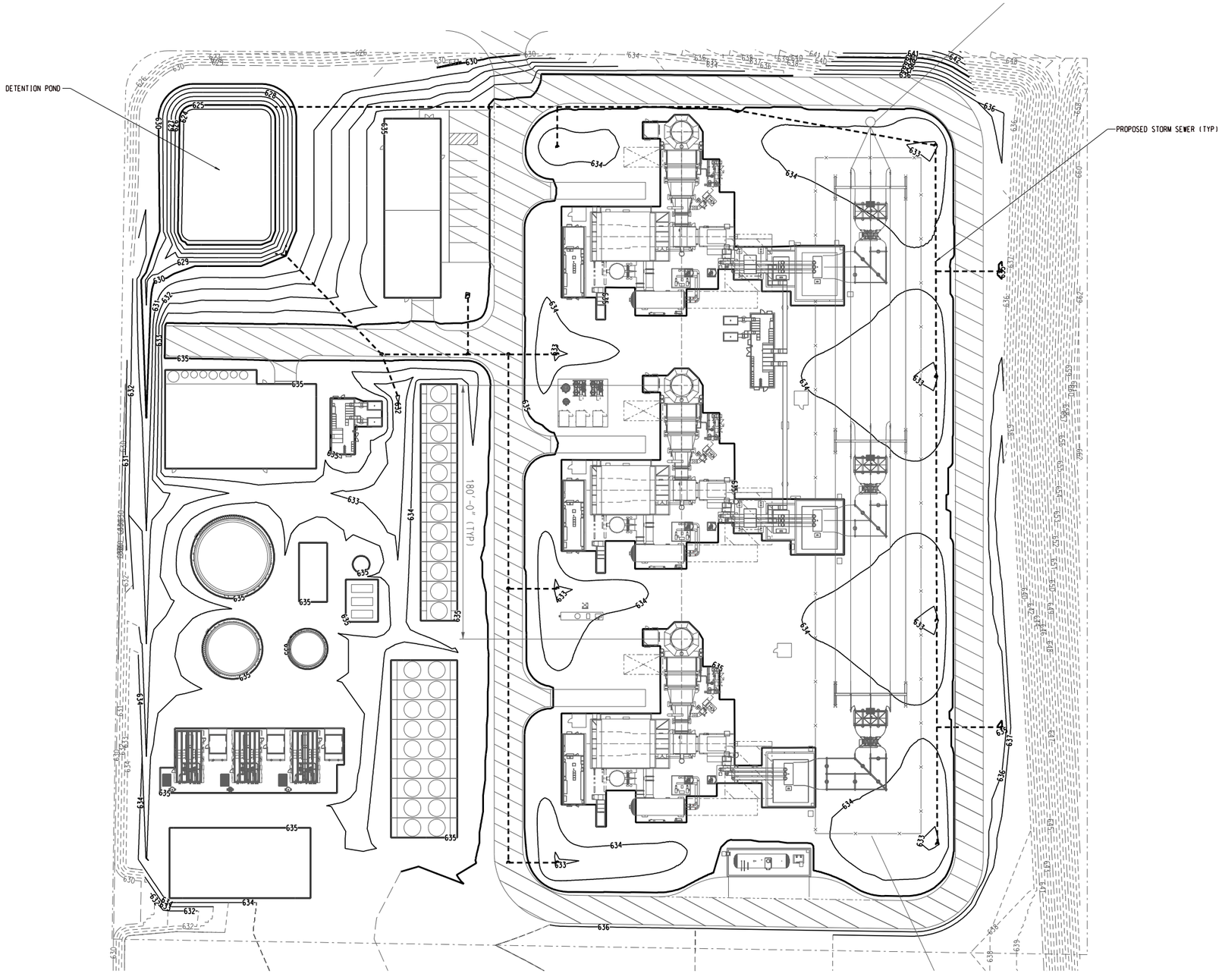
ENERGY CENTER

PROJECT NO.: 29874827
DATE: DECEMBER 2010

URS

NOTES:

1. ALL SLOPES GREATER THAN 3:1 SHALL HAVE EROSION PROTECTION.
2. PERMANENT PLANT AREA: 9.99 AC.
3. PERMANENT PLANT VOLUME: CUT 6,530 CY: FILL 11,900 CY



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	S. BADDELEY	S. BADDELEY	S. HANNI	12-21-10
B	ISSUED FOR REVIEW			
	S. BADDELEY	S. BADDELEY	S. HANNI	12-03-10
A	ISSUED FOR REVIEW			
	S. BADDELEY	S. BADDELEY	S. HANNI	11-05-10

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FIGURE 3.4-3

PRELIMINARY GRADING AND DRAINAGE PLAN

ENGINEER/DESIGN ORIGINATOR	S. BADDELEY
LEAD ENG	
ENG MGR	C. KEBODEAUX
PROJ MGR	E. ELAM

DRAWING NUMBER: P009-041-CG-002

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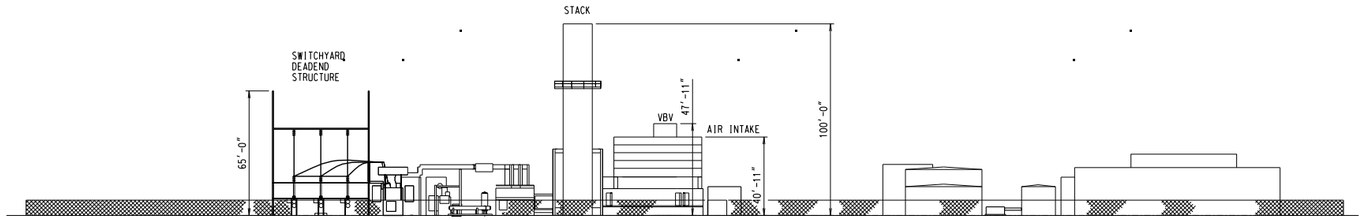
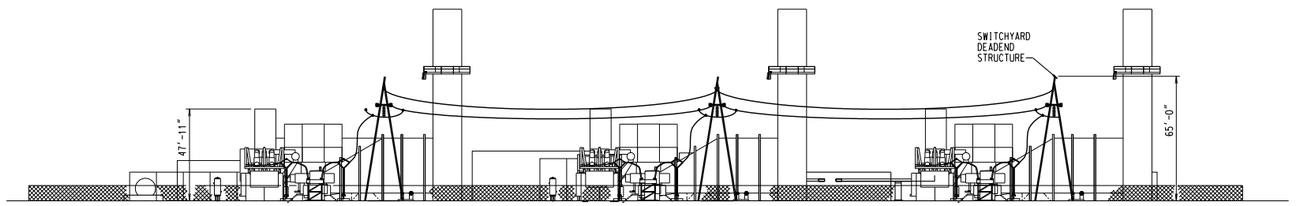
SCALE IN FEET
SCALE: 1" = 30'-0"

N

2009041-CG-002.dgn 12/21/2010 9:30:20 AM scott.baddeley



ELEVATION LOOKING SOUTH



ELEVATION LOOKING WEST

30 0 30 60
SCALE IN FEET
SCALE: 1" = 30'-0"

SEE SHEET 1A FOR NOTES AND LEGEND ONLY

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REV	DESIGN BY	DRAWN BY	CHECKED BY	DATE
G	ADDED FENCE C. KEBODEAUX	T. FLEEKER	C. KEBODEAUX	OPEN
F	REMOVED SOUNDWALL; REVISED SITE LOCATION D. SHORT	M. ROSAS	C. KEBODEAUX	12-22-10
E	REVISED FOR PERMIT; REVISED STACK HEIGHT B. BROWN	S. HANNI	E. ELAM	09-03-10
D	REVISED FOR PERMIT B. BROWN	S. HANNI	E. ELAM	08-13-10
C	ISSUED FOR PERMIT B. BROWN	S. HANNI	E. ELAM	08-12-10
B	ISSUED FOR REVIEW			05-28-10
A	ISSUED FOR REVIEW			05-13-10

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Lenexa, Kansas 66219

FIGURE 3.5-1

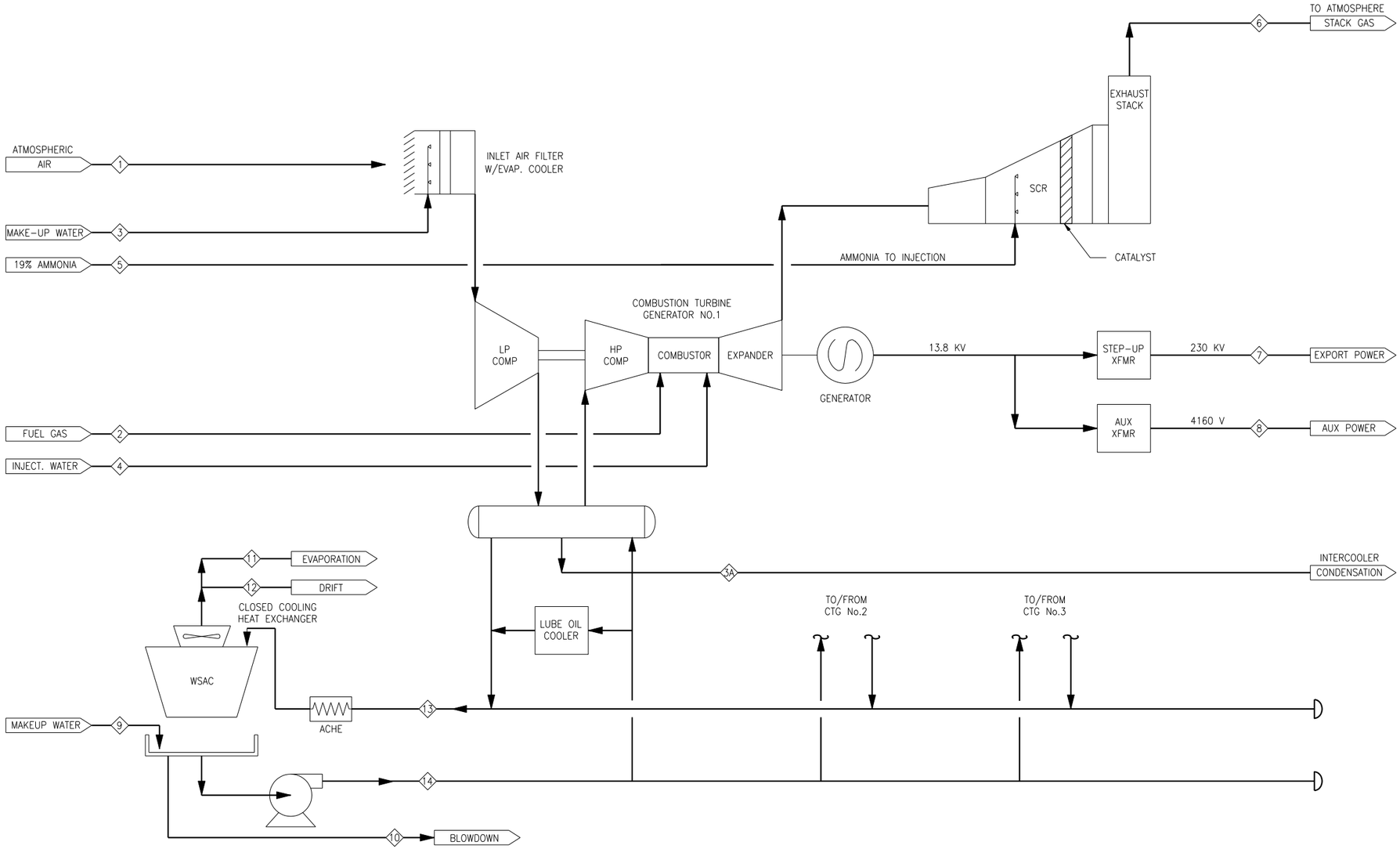
OPEN

SITE ARRANGEMENT
ELEVATIONS

DRAWING NUMBER

P009-041-EL-001

ENGINEER/DESIGN ORIGINATOR	P. WEST
LEAD ENG	B. BROWN
ENG MGR	E. ELAM
PROJ MGR	---



NOTES

1. STREAM DESIGNATION ◇6
2. COMBUSTION TURBINE GENERATOR GROSS OUTPUT AT 100% LOAD AND THE GIVEN AMBIENT CONDITION IS 102,350 KW EACH.
3. AMBIENT CONDITION 70^F DB/60^F WB.
4. VALUES ARE FOR CTG'S AT 100% LOAD WITH EVAPORATIVE COOLING ON.

HEAT AND MATERIAL BALANCE FOR NOTE 3 AMBIENT CONDITION

		ONE COMBUSTION TURBINE GENERATOR									THREE (3) COMBUSTION TURBINE GENERATORS														
	UNITS	1	2	3	3A	4	5	6	7	8	1	2	3	3A	4	5	6	7	8	9	10	11	12	13	14
FLOW	lb/hr	1,625,068	39,203	46,500	4,680	25,255	182	1,684,846			4,875,204	117,609	139,500	14,040	75,765	546	5,054,538			89,000	42,500	127,000	39	4,800,000	4,800,000
FLOW	gpm			93.0	9.4	50.5	0.4						279	28.1	151.5	1.1				178	85	254	0.08	9,600	9,600
TEMPERATURE	^F	70	212	80	80	100	80	787			70	212			100	80	787			65	85			114	85
LHV HEAT INPUT	mmBtu/hr		808									2,424													
GROSS POWER	KW								102,351	2,250								307,053	6,750						
Gr.LHV HEAT RATE	Btu/kwhr								7894									23,682							

PSD - 3.77

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REV	DESIGN BY	DRAWN BY	CHECKED BY	DATE
B	UPDATED FOR REVISED SITE			
	C. KEBODEAUX	T. FLEEKER	B. BROWN	OPEN
A	ISSUED FOR PERMIT			
	B. BROWN	S. HANNI	E. ELAM	08-12-10

PIO PICO ENERGY CENTER
SAN DIEGO COUNTY, CA

3xLMS100

Kiewit Power
9401 Renner Boulevard
Lenexa, Kansas 66219

FIGURE 3.5-2A

HEAT AND MASS BALANCE
SPRING/FALL

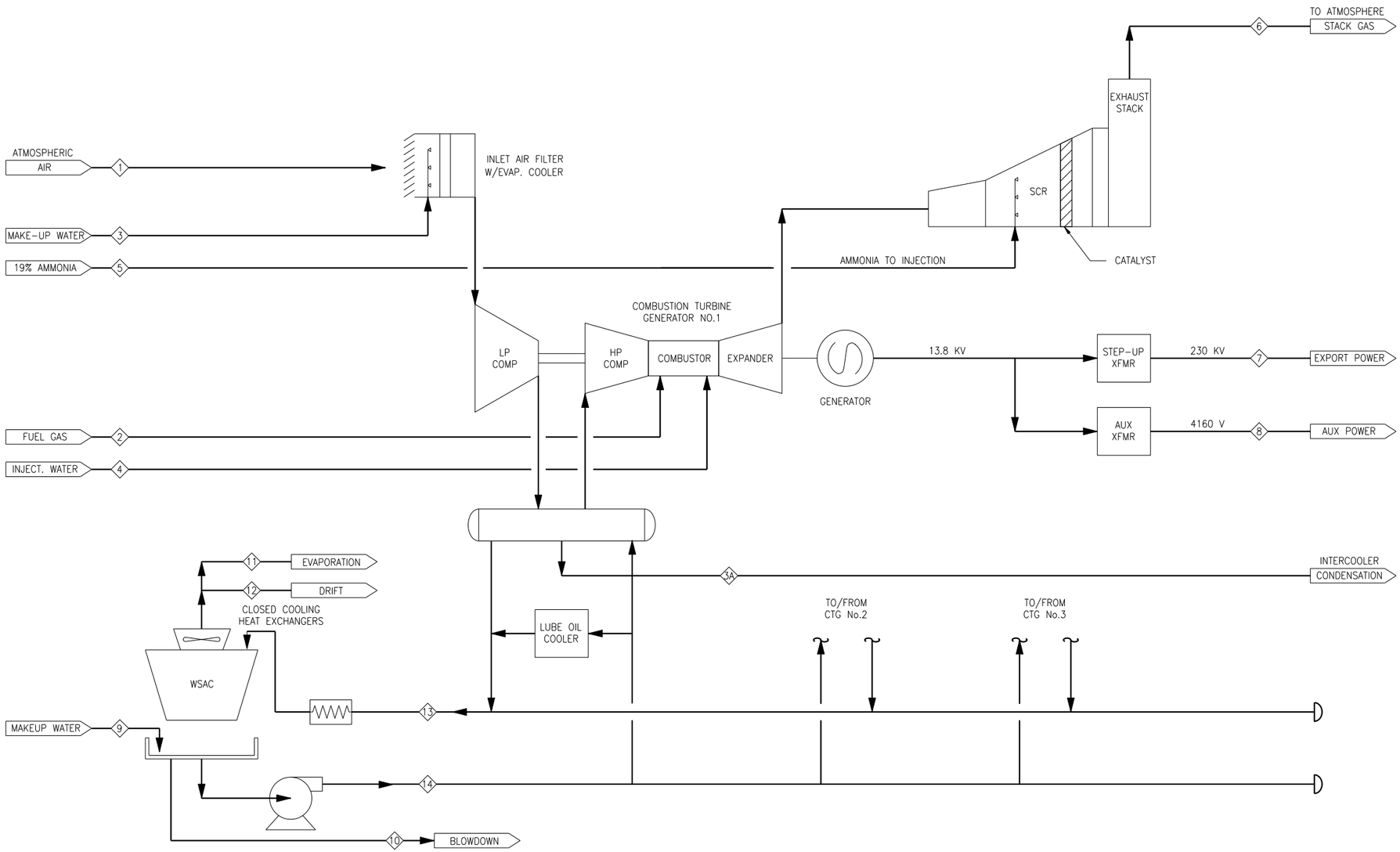
ENGINEER/DESIGN ORIGINATOR	S. HANNI
LEAD ENG	B. BROWN
ENG MGR	E. ELAM
PROJ MGR	---

DRAWING NUMBER

P009-041-HMBS/F-001

NOTES

1. STREAM DESIGNATION (6)
2. COMBUSTION TURBINE GENERATOR GROSS OUTPUT AT 100% LOAD AND THE GIVEN AMBIENT CONDITION IS 100,990 KW EACH.
3. AMBIENT CONDITION 80^F DB/63^F WB.
4. VALUES ARE FOR CTG'S AT 100% LOAD WITH EVAPROATIVE COOLING ON.



HEAT AND MATERIAL BALANCE FOR NOTE 3 AMBIENT CONDITION

		ONE COMBUSTION TURBINE GENERATOR									THREE (3) COMBUSTION TURBINE GENERATORS														
	UNITS	1	2	3	3A	4	5	6	7	8	1	2	3	3A	4	5	6	7	8	9	10	11	12	13	14
FLOW	lb/hr	1,611,310	38,835	81,000	5,760	24,910	182	1,669,295			4,833,930	116,505	243,000	17,280	74,730	546	5,007,885			88,500	44,500	155,500	39	4,800,000	4,800,000
FLOW	gpm			162	11.5	49.8	0.4						486	34.6	149.5	1.1				177	89	311	.08	9,600	9,600
TEMPERATURE	^F	80	212	80	80	100	80	790			80	212			80	80	790			75	85			119	85
LHV HEAT INPUT	mmBtu/hr		800									2,400													
GROSS POWER	KW								100,994	2,250								302,982	6,750						
Gr.LHV HEAT RATE	Btu/kwhr								7,926									23,778							

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REV	DESIGN BY	DRAWN BY	CHECKED BY	DATE
B	C. KEBODEAUX	T. FLEEKER	B. BROWN	OPEN
	UPDATED FOR NEW SITE			
A	B. BROWN	S. HANNI	E. ELAM	08-12-10
	ISSUED FOR PERMIT			

PIO PICO ENERGY CENTER
SAN DIEGO COUNTY, CA

3xLMS100

Kiewit Power
9401 Renner Boulevard
Lenexa, Kansas 66219

FIGURE 3.5-2B

HEAT AND MASS BALANCE
SUMMER

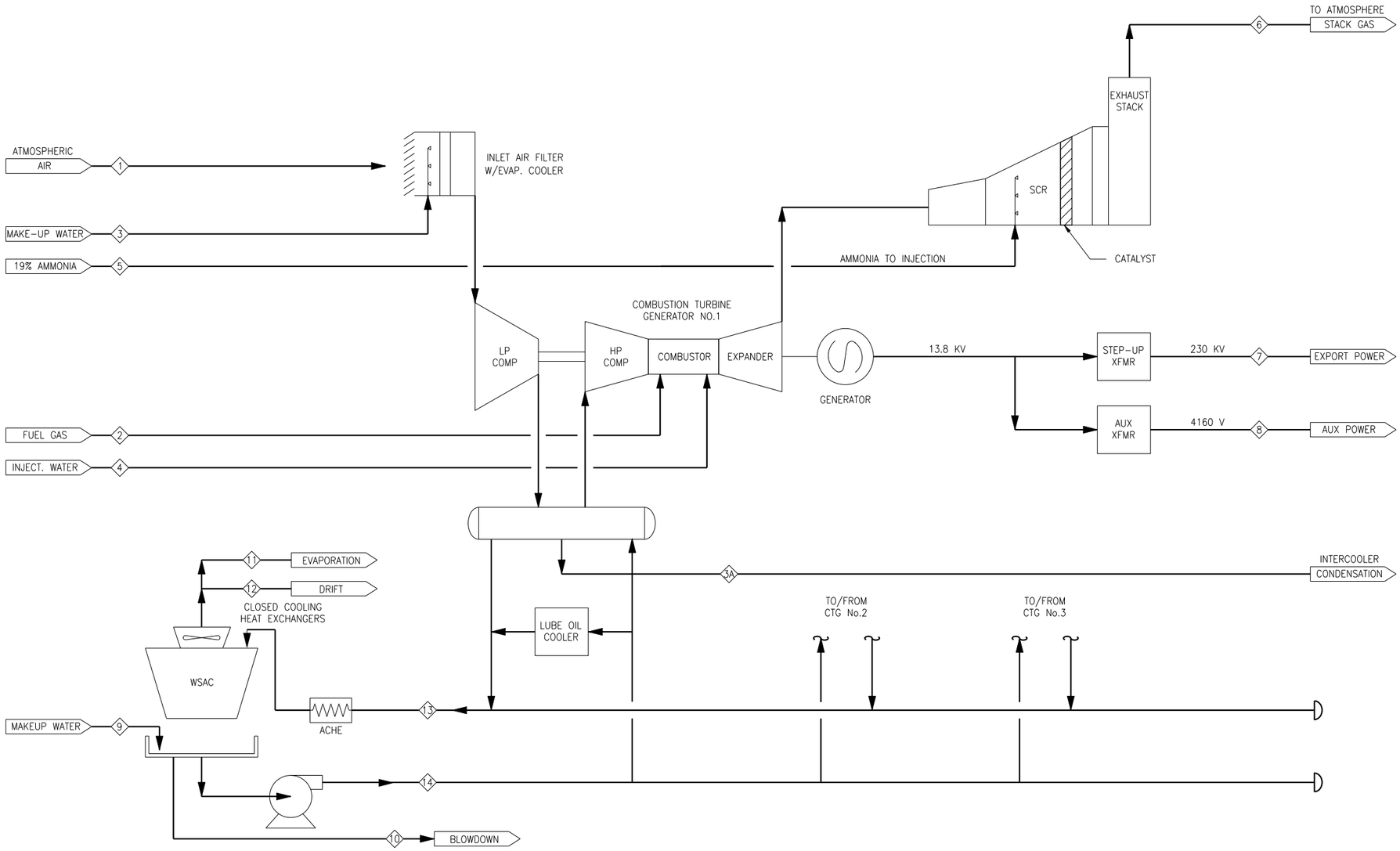
ENGINEER/DESIGN ORIGINATOR	S. HANNI
LEAD ENG	B. BROWN
ENG MGR	E. ELAM
PROJ MGR	1st Int.Last Name

DRAWING NUMBER

P009-041-HMBS-001

NOTES

1. STREAM DESIGNATION ◇6
2. COMBUSTION TURBINE GENERATOR GROSS OUTPUT AT 100% LOAD AND THE GIVEN AMBIENT CONDITION IS 99,300 KW EACH.
3. AMBIENT CONDITION 93^F DB/65^F WB
4. VALUES ARE FOR CTG'S AT 100% LOAD WITH EVAPORATIVE COOLING ON.



HEAT AND MATERIAL BALANCE FOR NOTE 3 AMBIENT CONDITION

		ONE COMBUSTION TURBINE GENERATOR								THREE (3) COMBUSTION TURBINE GENERATORS													
	UNITS	1	2	3	3A	4	5	6	7	8	1	2	3	3A	4	5	6	7	8	9	10	11	12	13	14
FLOW	lb/hr	1,593,927	38,370	127,000	7200	24,472	180	1,649,569			4,781,781	115,110	381,000	21,600	73,416	540	4,948,707			92,500	51,500	192,500	39	4,800,000	4,800,000
FLOW	gpm			254	14.4	48.9	0.4						762	43.2	146.7	1.2				185	103	385	.08	9,600	9,600
TEMPERATURE	^F	93	212	80	80	100	80	794			93	212			80	80	799			80	85			119	85
LHV HEAT INPUT	mmBtu/hr		791									2,373													
GROSS POWER	KW								99,305	2,250								297,915	6,750						
Gr.LHV HEAT RATE	Btu/kwhr								7964									23,892							

PSD - 3.79

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REV	DESIGN BY	DRAWN BY	CHECKED BY	DATE
B	C. KEBODEAUX	T. FLEEKER	B. BROWN	OPEN
	UPDATED FOR NEW SITE			
A	B. BROWN	S. HANNI	E. ELAM	08-12-10
	ISSUED FOR PERMIT			

PIO PICO ENERGY CENTER
SAN DIEGO COUNTY, CA

3xLMS100

Kiewit

Kiewit Power
9401 Renner Boulevard
Lenexa, Kansas 66219

FIGURE 3.5-2C

HEAT AND MASS BALANCE
PEAK

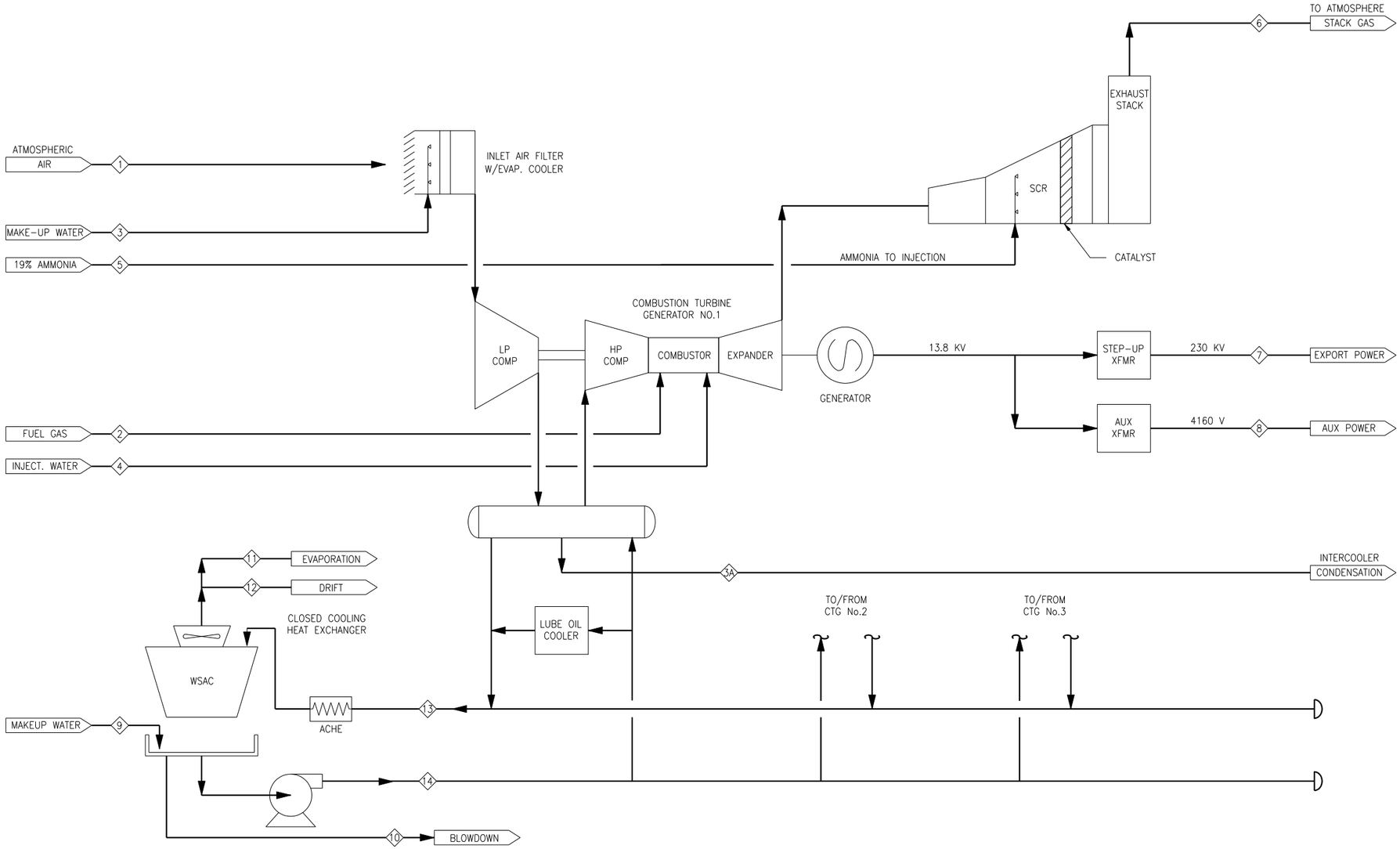
ENGINEER/DESIGN ORIGINATOR	S. HANNI
LEAD ENG	B. BROWN
ENG MGR	E. ELAM
PROJ MGR	---

DRAWING NUMBER

P009-041-HMBP-001

NOTES

1. STREAM DESIGNATION ◇6
2. COMBUSTION TURBINE GENERATOR GROSS OUTPUT AT 100% LOAD AND THE GIVEN AMBIENT CONDITION IS 104,300 KW EACH.
3. AMBIENT CONDITION 59^F DB/51^F WB.
4. VALUES ARE FOR CTG'S AT 100% LOAD WITH EVAPORATIVE COOLING OFF.



HEAT AND MATERIAL BALANCE FOR NOTE 3 AMBIENT CONDITION

		ONE COMBUSTION TURBINE GENERATOR								THREE (3) COMBUSTION TURBINE GENERATORS													
	UNITS	1	2	3	3A	4	5	6	7	8	1	2	3	3A	4	5	6	7	8	9	10	11	12	13	14
FLOW	lb/hr	1,642,160	39,755	0	0	26,388	184	1,708,303			4,926,480	119,265	0	0	79,164	552	5,124,909			107,500	42,500	95,900	39	4,800,000	4,800,000
FLOW	gpm	———	———	0.0	0.0	52.8	0.4						0.0	0.0	158.4	1.1				215	85	191	0.08	9,600	9,600
TEMPERATURE	^F	59	212			100	80	783			59	212			80	80	763			60	85			113	85
LHV HEAT INPUT	mmBtu/hr		819									2,457													
GROSS POWER	KW								104,302	2,250								312,906	6,750						
Gr.LHV HEAT RATE	Btu/kwhr								7,856									23,568							

PSD - 3.80

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REV	DESIGN BY	DRAWN BY	CHECKED BY	DATE
B	C. KEBODEAUX	T. FLEEKER	B. BROWN	OPEN
	UPDATED FOR NEW SITE			
A	B. BROWN	S. HANNI	E. ELAM	08-12-10
	ISSUED FOR PERMIT			

PIO PICO ENERGY CENTER
SAN DIEGO COUNTY, CA

3xLMS100

Kiewit

Kiewit Power
9401 Renner Boulevard
Lenexa, Kansas 66219

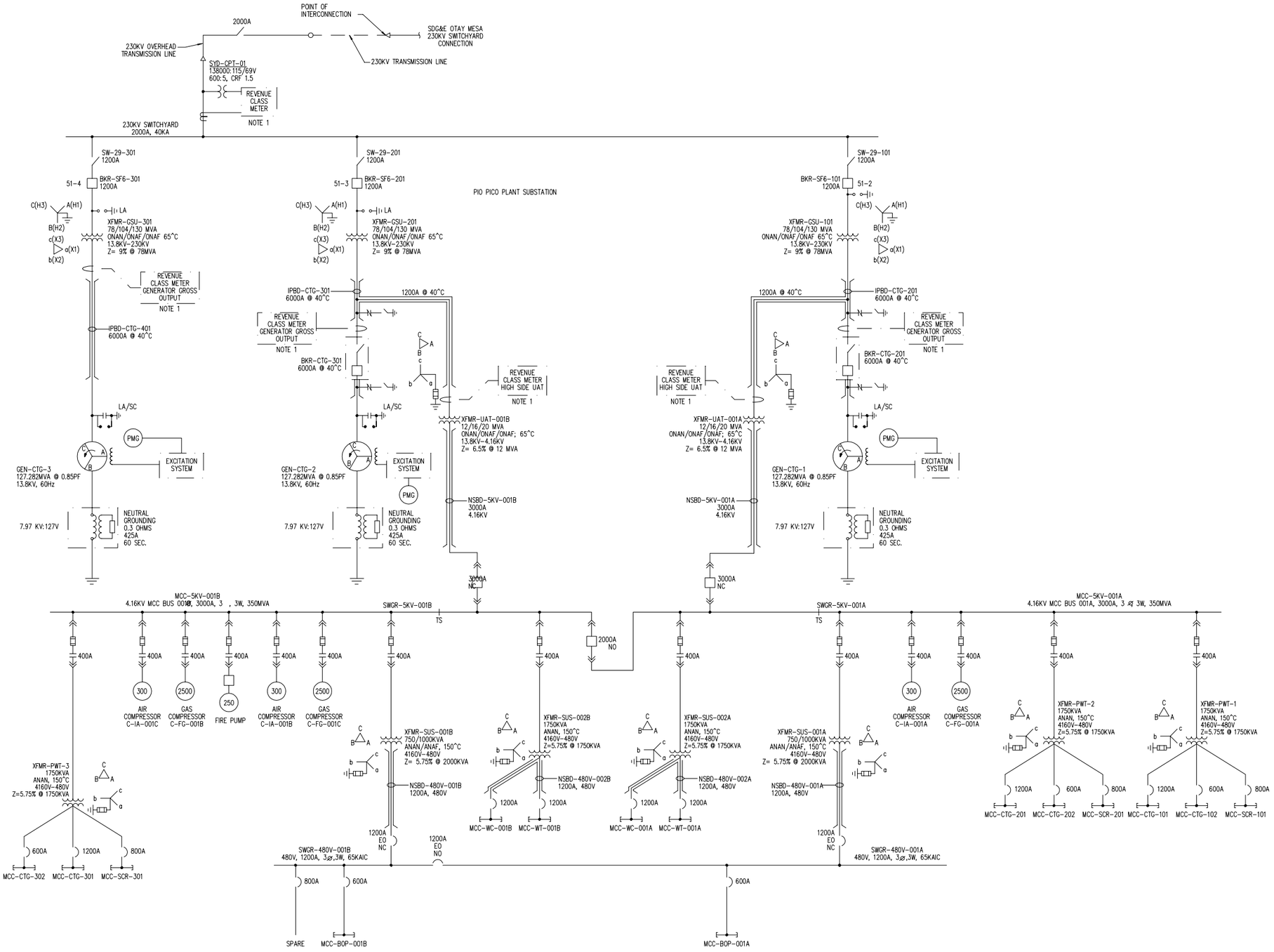
FIGURE 3.5-2D

HEAT AND MASS BALANCE
WINTER

ENGINEER/DESIGN ORIGINATOR	S. HANNI
LEAD ENG	B. BROWN
ENG MGR	E. ELAM
PROJ MGR	---

DRAWING NUMBER

P009-041-HMBW-001



NOTES

1. ALL METERS & CT'S CAL-ISO QUALITY.
2. ALL BREAKER RATINGS ARE FRAME SIZE ONLY.

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REV	DESCRIPTION	DWN	CHK	APP	DATE
F	ISSUED FOR REVIEW				01-04-11
E	ISSUED FOR REVIEW				12-21-10
D	ISSUED FOR REVIEW				12-17-10
C	ISSUED FOR REVIEW				08-19-10
B	ISSUED FOR AFC				05-13-10
A	PRELIMINARY				date

PIO PICO ENERGY CENTER
SAN DIEGO COUNTY, CA

3xLMS100

FIGURE 3.5-3

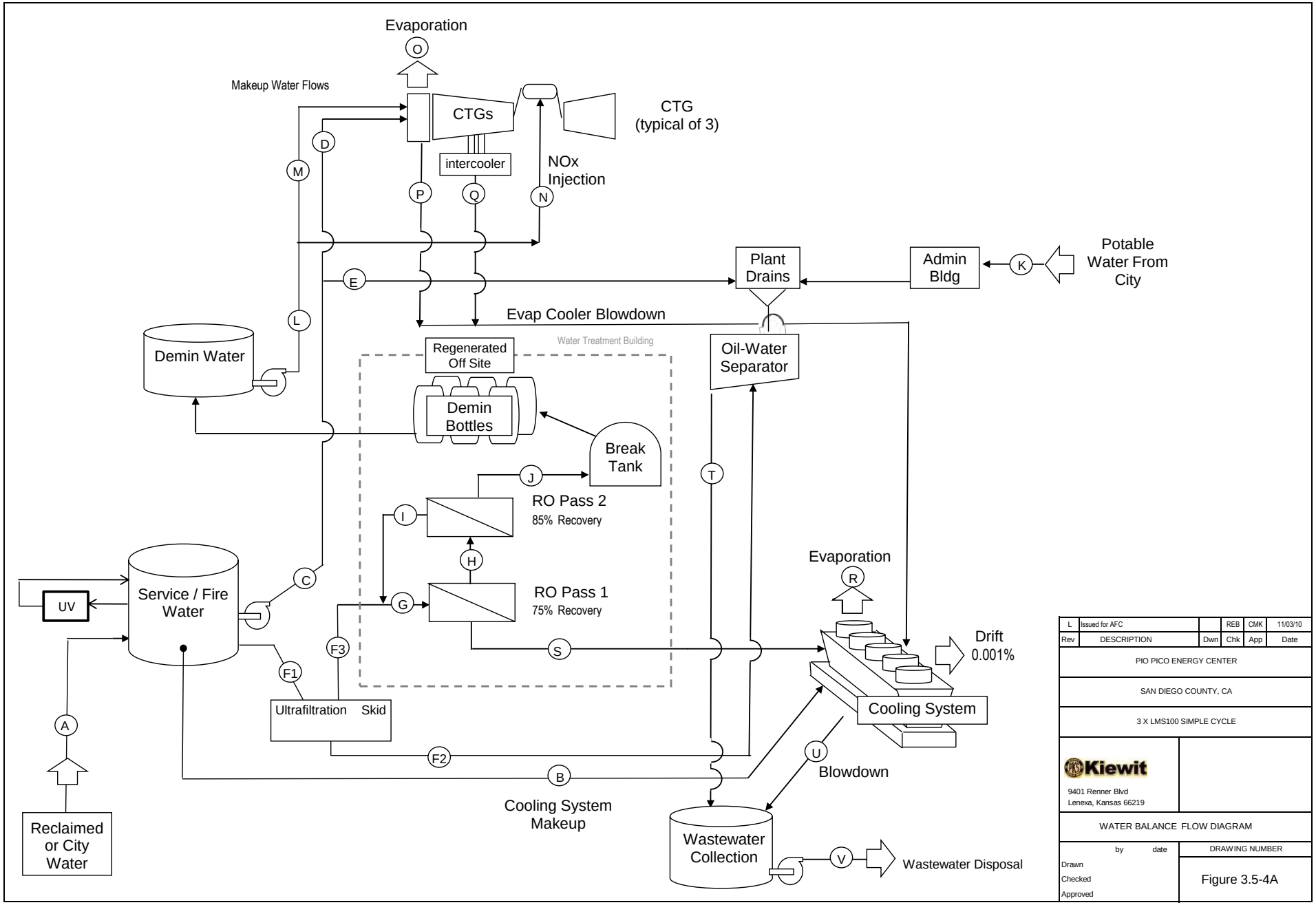
OVERALL ONE-LINE DIAGRAM

	by	date
DESIGNED		
DRAWN		
CHECKED		
APPROVED		

DRAWING NUMBER

P009-041-E0-001

$$DATE$$ $$TIME$$ $$USERNAME$$ $$FILENAME$$


Evaporation
O
Makeup Water Flows
CTGs
CTG
(typical of 3)
intercooler
NOx
Injection
D
M
P
Q
N
E
Plant
Drains
Admin
Bldg
K
Potable
Water From
City
L
Evap Cooler Blowdown
Water Treatment Building
Regenerated
Off Site
Demin Water
Oil-Water
Separator
Demin
Bottles
Break
Tank
T
J
RO Pass 2
85% Recovery
I
H
Evaporation
R
UV
Service / Fire
Water
C
G
RO Pass 1
75% Recovery
Drift
0.001%
F3
S
F1
Ultrafiltration Skid
Cooling System
A
F2
U
Blowdown
B
Cooling System
Makeup
Reclaimed
or City
Water
Wastewater
Collection
V
Wastewater Disposal
L Issued for AFC REB CMK 11/03/10
Rev DESCRIPTION Dwn Chk App Date
PIO PICO ENERGY CENTER
SAN DIEGO COUNTY, CA
3 X LMS100 SIMPLE CYCLE
Kiewit
9401 Renner Blvd
Lenexa, Kansas 66219
WATER BALANCE FLOW DIAGRAM
by date
DRAWING NUMBER
Drawn
Checked
Approved
Figure 3.5-4A

	CASE	ISO	Average High	Summer High	Peak Hour	Peak Day Average
	Ambient Temperature	59	70	80	93	82
	Wet Bulb Temperature	51	60	63	65	63
	Relative Humidity, %	60	57	38	22	38
	Ambient Pressure	14.36	14.36	14.36	14.36	14
	Gross Turbine Output, MW	104.3	102.4	101.0	99.3	100.7
	Inlet Air Cooler Status	Off	On	On	On	On
	Description CTs in service	3	3	3	3	3
A	Water Required by Plant	452	497	564	658	573
B	Required Makeup to Cooling System	215	178	177	185	172
C	Service Water Flow	5	98	167	259	182
D	Service water to evap coolers	0	93	162	254	177
E	Washdown hose use	5	5	5	5	5
F1	UF System Feed	232	222	219	215	218
F2	UF System Backwash	12	11	11	11	11
T	Oil/Water Sep Effluent	19	18	18	18	18
F3	RO System Feed	220	211	208	204	208
G	RO Pass 1 Inlet Flow	248	238	234	230	234
H	RO Pass 2 Inlet Flow	186	178	176	173	175
I	RO Pass 2 Reject to Pass 1	28	27	26	26	26
J	RO Product Water	158	152	149	147	149
S	RO rejects	62	59	59	58	58
K	Potable water to admin bldg	2	2	2	2	2
L	Demineralized Water Flow	158	152	149	147	149
M	Demin water to evap coolers	0	0	0	0	0
N	NOx injection	158	152	149	147	149
O	Evap cooler evaporation	0	19	32	51	35
	Evap cooler Cycles of Concentration	1.25	1.25	1.25	1.25	1.25
P	Evaporative cooler blowdown	0	74	130	203	142
	Evap cooler Total Makeup	0	93	162	254	177
	Evap cooler makeup demin fraction	0%	0%	0%	0%	0%
Q	Intercooler condensation	0	28	35	43	36
	Heat Rejection (MMBtu/hr)	118	123	124	126	124
	Percent Dry Cooling	71%	63%	56%	46%	54%
R	Cooling System Evaporation	191	254	311	385	322
	Cooling System Cycles of Concentration	3.25	4.00	4.50	4.75	4.75
U	Cooling System Blowdown	85	85	89	103	86
	Cooling System Total Makeup	277	339	400	488	408
V	Wastewater Flow	104	103	107	121	104

						Annual
Annual Operation	hours	1,100	1,600	1,000	300	4,000
Water Used	Acre-ft	92	147	104	36	378
Water Saved, compared to	Acre-ft	139	173	92	23	427
100% evaporative cooling	%	60%	54%	47%	39%	53%
Wastewater Disposal	Acre-ft	21	30	20	7	78

Notes:

1) All Flows are displayed in GPM
2) Based on GE APPS performance
3) Ultrafilter recovery rate 95%
4) RO 1st Pass Recovery Rate 75%
5) RO 2nd Pass Recovery Rate 85%
6) Overall RO Recovery Rate 72%
7) Cooling System Drift 0.0010%
8) Service Water Use, gpm 5
9) Annual Capacity Factor 46%
10) Annual Water Savings 53%
compared to 100% evaporative cooling
11) Operating hours are estimated
to maximize operation at higher temperatures

L	Issued for AFC		REB	CMK	11/03/10

PIO PICO ENERGY CENTER

SAN DIEGO COUNTY, CA

3 X LMS100 SIMPLE CYCLE

Kiewit

9401 Renner Blvd
Lenexa, Kansas 66219

WATER BALANCE FLOW VALUES

by	date	DRAWING NUMBER
Drawn		Figure 3.5-4B
Checked		
Approved		

CALZADA DE LA FUENTE

(ENERGY CENTER WAY)

℄

℄

ALTA ROAD

FIRE WATER PUMP BUILDING

EXISTING 24' S.D.G.E. EASEMENT

EXISTING 24' S.D.G.E. EASEMENT

FH-1

FH-2

FH-3

FH-4

FH-5

FH-6

FH-7

FH-8

FH-9

0' (TYP)

LEGEND

① GSU DELUGE SYSTEM (TYP)

② LUBE OIL SKID (TYP)

FH-X FIRE HYDRANT (TYP)

30 0 30 60

SCALE IN FEET

SCALE: 1" = 30'-0"

N

PSD - 3.84

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REV	DESIGN BY	DRAWN BY	CHECKED BY	DATE
A	PRELIMINARY			12-21-10

PIO PICO ENERGY CENTER
SAN DIEGO COUNTY, CA

3xLMS100

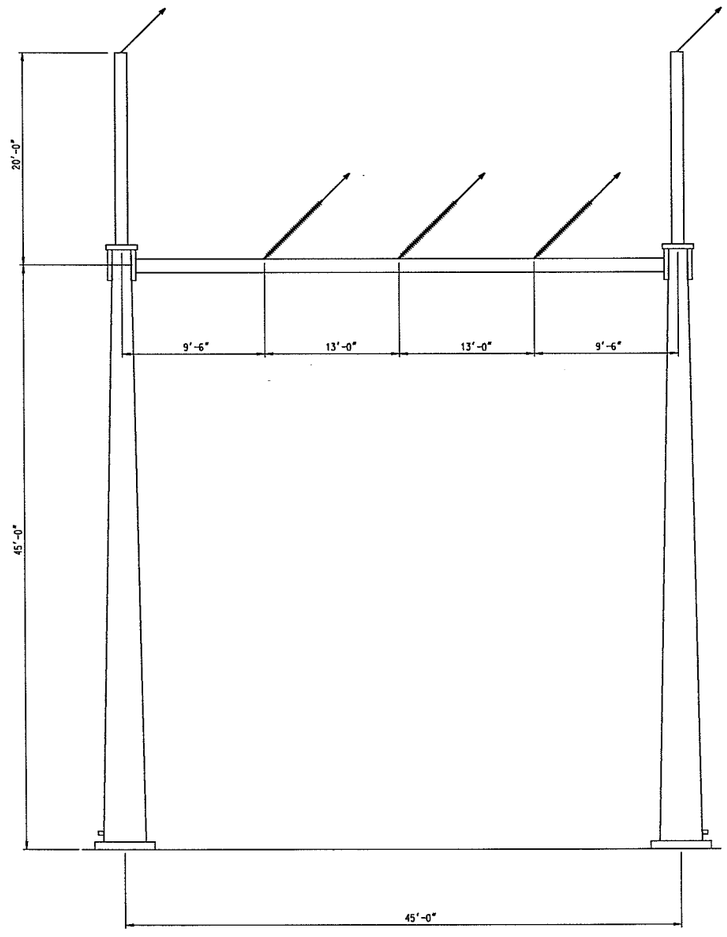
FIGURE 3.5-5

FIRE PROTECTION SYSTEM

ENGINEER/DESIGN ORIGINATOR	DRAWING NUMBER
LEAD ENG	P009-041-FP-001
ENG MGR	
PROJ MGR	

NOTES

1.



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REV	DESCRIPTION	DWN	CHK	APP	DATE
A	PRELIMINARY	TEF	DPM	SM	01-18-11

PIO PICO ENERGY CENTER
SAN DIEGO COUNTY, CA

3xLMS100

Kiewit

Kiewit Power
9401 Renner Boulevard
Lenexa, Kansas 66219

FIGURE 3.7-1A

230KV SWITCHYARD TUBULAR
STEEL H-FRAME STRUCTURE

	by	date
DESIGNED	TEF	01-17-11
DRAWN	TEF	01-17-11
CHECKED	DPM	01-18-11
APPROVED	SM	01-18-11

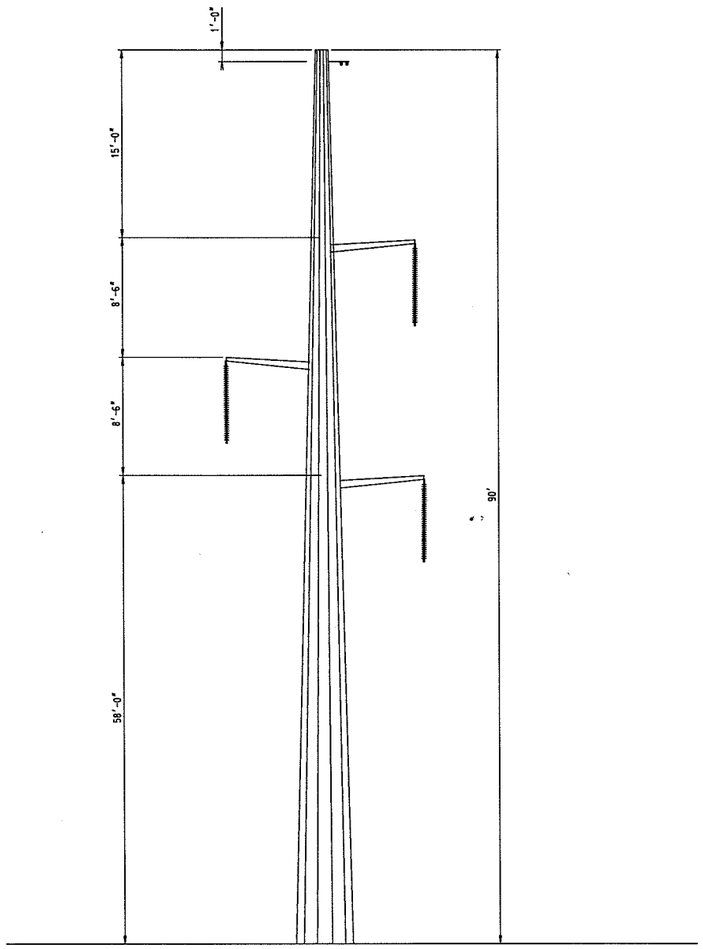
DRAWING NUMBER

P009-041-PDS-700

...\!BD\ELE\P009-041-PDS-700.dgn 1/18/2011 1:47:11 PM Tom.Fleeker

NOTES

1.



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REV	DESCRIPTION	OWN	CHK	APP	DATE
A	PRELIMINARY	TEF	DPM	SM	01-18-11

PIO PICO ENERGY CENTER
SAN DIEGO COUNTY, CA

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FIGURE 3.7-1B

230KV T-LINE TUBULAR
STEEL TANGENT STRUCTURE

	by	date
DESIGNED	TEF	01-18-11
DRAWN	TEF	01-18-11
CHECKED	DPM	01-18-11
APPROVED	SM	01-18-11

DRAWING NUMBER

P009-041-PDT-900

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NOTES

1.

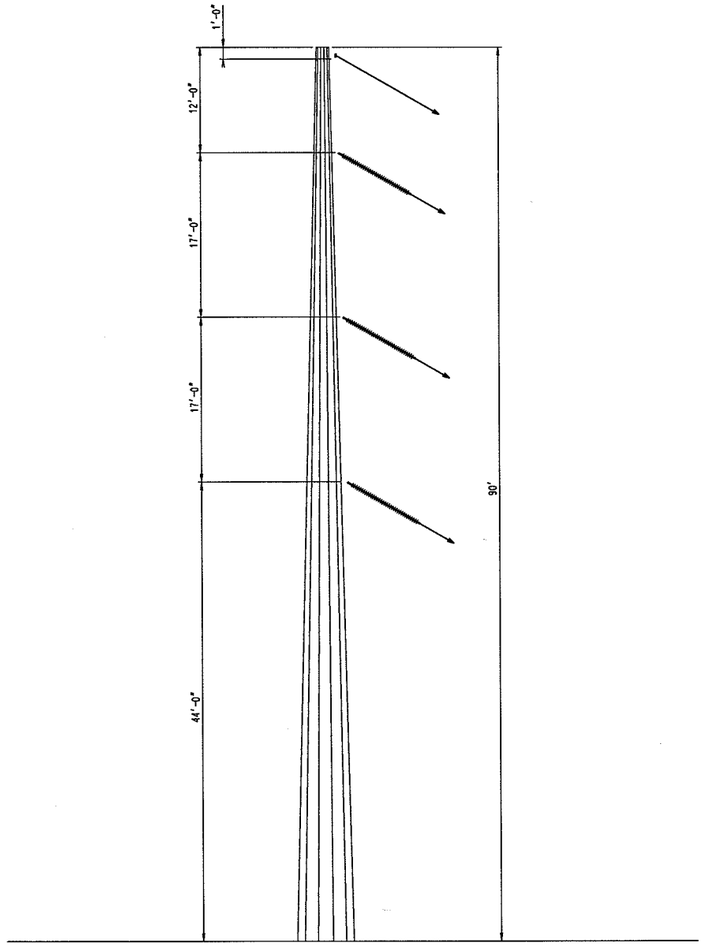

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FIGURE 3.7-1C

230KV T-LINE TUBULAR
STEEL DEAD-END STRUCTURE

	by	date
DESIGNED	TEF	01-18-11
DRAWN	TEF	01-18-11
CHECKED	DPM	01-18-11
APPROVED	SM	01-18-11

DRAWING NUMBER

P009-041-PDT-902

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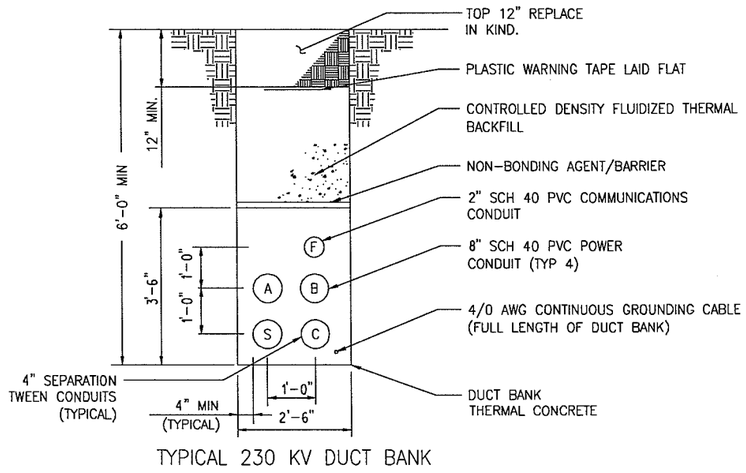
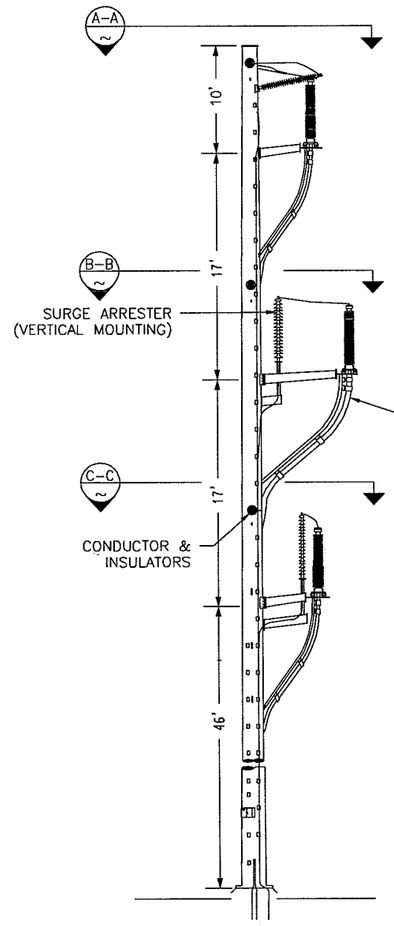


TYPICAL 230 KV DUCT BANK

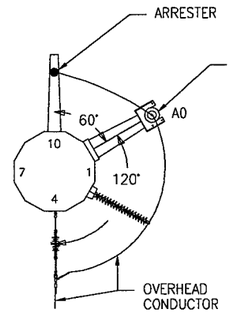
SCALE: NTS



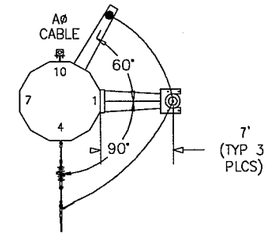
230 KV UG CABLE RISER STRUCTURE

SCALE: NTS

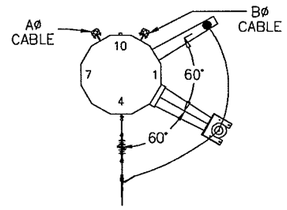
WITH ARM SUPPORTS FOR TERMINATORS AND ARRESTORS IN VERTCIAL POSITIONS



SECTION A-A



(+L) SECTION B-B



SECTION C-C

NOTES

1.

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FIGURE 3.7-1D

230KV UG CABLE RISER / DEADEND STRUCTURE AND DUCT BANK

	by	date
DESIGNED	TEF	01-17-11
DRAWN	TEF	01-17-11
CHECKED	DPM	01-18-11
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4. AIR QUALITY IMPACT ANALYSIS

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4.0 AIR QUALITY IMPACT ANALYSIS

The generating facility would include three General Electric (GE) LMS100 natural gas-fired combustion turbine generators (CTGs), each equipped with water injection to the combustors for reducing production of oxides of nitrogen (NOx), a selective catalytic reduction (SCR) system with 19 percent aqueous ammonia (NH_3) injection to further reduce NOx emissions, and an oxidation catalyst to reduce carbon monoxide (CO) emissions. The total net generating capacity would be approximately 300 MW. The new emitting units will be installed on a 9.9 acre parcel in the southeast quadrant of the intersection of Alta Road and Calzada De La Fuente Road, adjacent to the Otay Mesa Energy Center. The Project will be a new major stationary source under the federal Prevention of Significant Deterioration (PSD) program because it will have the potential to emit more than 100,000 TPY of greenhouse gases (GHGs), a federally regulated pollutant.

This section describes existing air quality conditions, maximum potential impacts from the project, compliance with applicable laws, ordinances, regulations and standards, 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. As required by EPA, the analysis in support of the PSD application is based on a five-year period of data—in this case, the five-year period from 2004 through 2008.

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;
- Selective catalytic reduction (SCR) and combustion turbine water injection to reduce NOx emissions;
- Oxidation catalysts to reduce emissions of carbon monoxide 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 4.1, Affected Environment, describes the local environment surrounding PPEC, 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 4.2, Laws, Ordinances, Regulations, and Standards, describes applicable laws, ordinances, regulations, and standards (LORS) pertaining to air quality aspects of the project.

- Section 4.3, Environmental Consequences, evaluates the maximum potential air quality impacts due to the project's emissions of nitrogen oxides (NOx), 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), PM_{10}, and $PM_{2.5}$ is presented; the results show that the project would not cause or significantly contribute to exceedances of the National Ambient Air Quality Standards (NAAQS). Emissions of greenhouse gases (GHGs) from the project are also described.

- Section 4.4, PSD Cumulative Analysis, addresses the cumulative impacts of the project emissions with other potential new sources of air pollution in the area around PPEC.

- Section 4.5, Consistency with Laws, Ordinances, Regulations, and Standards, describes how the project will comply with applicable laws, ordinances, regulations, and standards (LORS) pertaining to air quality aspects of the project. This section also provides an analysis of best available control technology (BACT) for the proposed project and explains how the use of water injection with selective catalytic reduction (SCR) and ammonia injection satisfies the NOx requirements for BACT for the PPEC turbines.

- Section 4.6, Class I Area Impact Analysis, demonstrates that the project will not adversely impact visibility in the Agua Tibia Wilderness, which is located 91 km from the project.

- Section 4.7, Class II Visibility Impairment Analysis, demonstrates that the project will not adversely impact visibility in Cleveland National Forest or Cabrillo National Monument, two FLM Class II areas within 50 km of the project.

4.1 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.

PPEC consists of the project site, linears, and a temporary laydown area (Figure 3.3-1, Facility Plot Plan). The project site is located in an unincorporated area of San Diego County known as Otay Mesa. It is comprised of a 9.99 acre parcel located in the southeast quadrant of the intersection of Alta Road and Calzada De La Fuente, adjacent to the Otay Mesa Energy Center. The proposed project site comprises all of Assessor's Parcel Number (APN) 648-040-45, and the laydown area is 6.00 acres of APN 648-040-46 (Figure 3.3-2, Project Location).

4.1.1 Geography and Topography

The project site is near the western base of the San Ysidro Mountains at an elevation of approximately 650 feet above mean sea level. Terrain elevations are generally flat to the west and south of the project site

4.1.2 Meteorology and Climate

Consistent with the typical weather of coastal Southern California, western San Diego County in general enjoys a mild Mediterranean and semi-arid climate characterized by low precipitation, warm summers, mild winters, and temperature inversions. The area's climatic conditions are strongly influenced by the large-scale sinking and warming of air in the semi-permanent subtropical high-pressure center over the eastern Pacific. This high-pressure system effectively blocks out most mid-latitude storms, except in winter when the ridge is weaker and farther south. The coastal mountains on the eastern edge of the county also have a major influence on climate, serving as a meteorological boundary that effectively removes moisture from the marine air flowing from the Pacific.

The nearest full-time meteorological monitoring station to the proposed project site is maintained by the SDAPCD and is located at Otay Mesa on California State Route 905 at the U.S./Mexico border, approximately 1.9 miles south of the project site. Based on five years of data collection in 2004-2008, the annual average temperature measured there is 63 degrees Fahrenheit (°F). Temperatures of 32°F or below rarely occur at this station, but temperatures of 90°F or above are more frequent, occurring from April through August. During the fall, Santa Ana winds can last for several days. These are strong, dry, easterly winds from the inland desert areas and result in high temperatures (greater than 90°F) and low relative humidity (often below 20%) in the project area.

San Diego County receives most of its annual rainfall from November to March, when the semi-permanent high-pressure system over the eastern Pacific Ocean moves south, allowing storms to move through the area. The average annual precipitation at the project site is about 11 inches. Local wind circulations are driven by temperature differentials between the land and adjacent Pacific Ocean, creating a system of sea- and land-breezes. Winds are typically of light to moderate strength from the sector between northwest and southwest. Annual and quarterly wind roses and quarterly wind frequency distributions for the project area are provided in Appendix 1A.

During springtime, a local marine layer forms at night and can remain through the morning, causing considerable fogginess along the coastline and extending inland several miles. This fog typically dissipates during the late morning, and the afternoons are generally clear. Fog can also occur during the fall and winter months, lasting well into the day.

The nearest long-term meteorological station with available temperature and precipitation means and extremes is a National Weather Service Cooperative Network (COOP) station in Bonita. This weather station is located approximately 8.7 miles to the northwest of the PPEC at latitude 32°39.6'N, longitude 117°02.0'W. Data collected at this station over a 55-year period (1915-1970) are presented in TABLE 4-1. The hottest month, August, has an average maximum temperature of 80.8°F and an average minimum temperature of 60.7°F. The coldest month, January, has an average maximum temperature of 66.4°F and an average minimum temperature of 40.0°F.

TABLE 4-1
AVERAGE TEMPERATURES AND PRECIPITATION IN BONITA, SAN DIEGO COUNTY (1915-1970)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Average Max Temperature °F)	66.4	67.3	68.6	70.9	72.6	75.0	79.4	80.8	80.6	77.0	73.5	68.4	73.4
Average Min Temperature(°F)	40.0	42.2	44.2	48.2	52.6	55.9	59.6	60.7	57.5	51.6	44.3	40.9	49.8
Precipitation (in)	2.14	2.09	1.75	0.97	0.36	0.06	0.01	0.06	0.18	0.55	1.09	2.25	11.51

Source: Western Regional Climate Center (http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca0968)
Notes:
°F = degrees Fahrenheit
in = inches
Max = maximum
Min = minimum

During winter, the semi-permanent, subtropical high-pressure system over the Pacific Ocean moves south, allowing the passage of frontal systems that bring most of the area's annual precipitation, which totals about 11 inches on average. Monthly mean precipitation amounts at Bonita range from 2.25 inches in December to 0.01 inches in July. Relative humidity levels are generally moderate. In the summer, relative humidity averages 60 to 70 percent in the early morning and about 30 to 50 percent in the afternoon. In winter, relative humidity averages 70 to 80 percent in the early morning and 40 to 60 percent in the afternoon. At the Otay Mesa station, the prevailing wind direction for most of the year is from the northwest. Wind direction is much more variable during winter months, which can often be associated with the passing of winter storm systems. Wind speeds are normally light or calm.

4.1.3 Overview of Air Quality Standards

The U.S. Environmental Protection Agency (EPA) has established national ambient air quality standards (NAAQS) for ozone, nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter with aerodynamic diameter less than or equal to 10 microns (PM_{10}), particulate matter with aerodynamic diameter less than or equal to 2.5 microns ($PM_{2.5}$), and airborne lead. Areas with ambient levels above these standards are designated by EPA as ~~"n~~onattainment areas" subject to planning and pollution control requirements that are more stringent than standard requirements.

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 4-2 presents the NAAQS for selected pollutants.

TABLE 4-2
NATIONAL AMBIENT AIR QUALITY STANDARDS

Averaging Time	Averaging Time	Primary	Secondary	Method
Ozone	8 Hour	0.075 ppm (147 µg/m^3)	Same as Primary Standard	Ultraviolet Photometry
Respirable Particulate Matter (PM_{10})	24 Hour	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
Fine Particulate Matter ($PM_{2.5}$)	24 Hour	35 µg/m^3 [1]	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	15.0 µg/m^3		
Carbon Monoxide (CO)	8 Hour	9 ppm (10 mg/m^3)	None	Non-Dispersive Infrared Photometry (NDIR)
	1 Hour	35 ppm (40 mg/m^3)		
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	53 ppb (100 µg/m^3)	Same as Primary Standard	Gas Phase Chemiluminescence
	1 Hour	100 ppb [2] (188 µg/m^3)	None	
Sulfur Dioxide (SO_2)	3 Hour	--	0.5 ppm (1300 µg/m^3)	Ultraviolet Fluorescence Spectrophotometry (Parasaniline Method)
	1 Hour	75 ppb [3] (196 µg/m^3)	--	
Lead	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		

Notes:
[1] To attain this standard, the 3-year average of the 98th percentile of the daily concentrations must not exceed 35 µg/m^3.
[2] To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average must not exceed 100 ppb.
[3] 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 (09/08/10)

4.1.4 Existing Air Quality

All ambient air quality data presented in this section were published by the California Air Resources Board (CARB) on the ADAM website and/or by U.S. Environmental Protection Agency (EPA) on the AIRS data website. Ambient air concentrations of ozone (O_3), NO_2, PM_{10}, and $PM_{2.5}$ are recorded at monitoring stations throughout San Diego County. The immediate area surrounding the project site (within 1.5 to 2 miles) is an area with sparse population. Further out, areas to the north, northeast, east, and southeast are all vacant, hilly terrain with very sparse population. However, areas more than 2 miles to the south (Tijuana), 5 miles west (Otay Mesa West) and northwest (Sunbowl) are urban or suburban areas with moderate to high-density residential areas. Most air quality monitoring stations in the region only record measurements for one or two criteria pollutants, except for those stations located in urban areas. The monitoring stations were generally positioned to represent area-wide ambient conditions rather than the localized impacts of any particular emission source or group of sources. In rural areas of the county, pollutant concentrations are not expected to vary dramatically from one location to the next, because the emission sources are few and widely distributed. Concentrations of

pollutants emitted by industrial and vehicular sources are generally higher in the more populated areas of greater San Diego than in the rest of the county.

The closest air quality monitoring station to the Project is located in Otay Mesa at the Otay Mesa-Paseo International Border crossing 1.2 miles south of the Project. However, the pollutant concentrations recorded at this station are heavily influenced by the emissions from the hundreds of Mexican vehicles waiting each hour at the border entry point of Otay Mesa-Paseo International, burning fuels that do not meet strict United States and California standards. The San Diego - Overland Street and San Diego - 1110 Beardsley Street monitoring stations are both more than 15 miles away from the PPEC facility, and both are located in the coastal area. The air quality data at these monitoring stations are not representative of the greater Lower Otay Lake area. Therefore, after consultation with the District, data from the Chula Vista monitoring station 11 miles northwest of the project site were used to represent background air pollutant concentrations for the vicinity of the Project. Background data for the 2004 to 2008 time period were selected for the air modeling analysis of the Project.

Ambient concentrations of O_3, NO_2, SO_2, CO, $PM_{2.5}$, and PM_{10} are recorded at the Chula Vista monitoring station located at 80 East J Street, approximately 11 miles northwest of the project site. The closest station that monitors ambient lead is in Imperial County (Calexico-Ethel Street).

Ozone (O_3). Ozone 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 federal air quality planning, the entire San Diego air basin is classified as a nonattainment area with respect to national ambient standards for ozone. TABLE 4-3 shows the measured ozone levels at the Chula Vista station during the period from 2004 to 2008.

TABLE 4-3
OZONE LEVELS AT CHULA VISTA (PPM)

Chula Vista Station, San Diego County	2004	2005	2006	2007	2008
Maximum 1-hour Average	0.10	0.09	0.08	0.11	0.11
Number of Days Exceeding Old National 1-hour Standard (0.12 ppm)[1]	0	0	0	0	0
Maximum 8-hour Average	0.09	0.08	0.07	0.09	0.08
Number of Days Exceeding National 8-hour Standard (0.075 ppm)[2]	1	1	0	1	3

Sources: CARB ADAM Website (www.arb.ca.gov/adam/welcome.html).
[1] EPA revoked the 1-hour ozone standard in all areas on June 15, 2005.
[2] 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).
ppm = parts per million

The federal 8-hour ozone 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 4-3 does not equate to the number of violations.

O_3 data completeness at the Chula Vista station averaged 97 percent over the five-year analysis period.

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 ozone.

TABLE 4-4 shows NO_2 levels recorded at the Chula Vista station for the years 2004 through 2008.

TABLE 4-4
NITROGEN DIOXIDE LEVELS AT CHULA VISTA (PPM)

Chula Vista Station, San Diego County	2004	2005	2006	2007	2008
Maximum 1-hour Average	0.072	0.071	0.074	0.082	0.072
Annual Average	0.016	0.016	0.017	0.015	0.015
Days Over Federal Standard (0.100 ppm, 1-hour)[1]	NA	NA	NA	NA	NA

Sources: CARB ADAM Website (www.arb.ca.gov/adam/welcome.html).
[1]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.
NA = not applicable
ppm = parts per million

For purposes of federal air quality planning, the San Diego air basin is in attainment with regard to NO_2. The highest 1-hour concentration recorded at the Chula Vista station during the years 2004 to 2008 was 0.082 ppm in 2007. 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 San Diego air basin must not exceed 0.100 ppm. TABLE 4-4 also shows that there were no violations of the annual NAAQS (0.053 ppm) at the Chula Vista station during this period. Data completeness for NO_2 concentrations at the Chula Vista station averaged 97 percent for the 2004 through 2008 period.

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 4-5 shows the available data on maximum 1-hour and 8-hour average CO levels recorded at the Chula Vista station during the period from 2004 to 2008. As indicated by this table, the maximum measured 1-hour average CO levels comply with the NAAQS (35.0 ppm) and the maximum 8-hour values comply with the NAAQS of 9.0 ppm. The highest individual 1-hour and 8-hour CO concentrations at this station during the period from 2006 to 2008 were 3.9 ppm and 2.5 ppm, respectively, both recorded in 2004. Because ambient CO concentrations are generally highest in the immediate vicinity of large fuel-burning sources, the concentrations at the Chula Vista monitoring station provide a conservative overestimate of actual concentrations in the project site area. For purposes of federal air quality planning, the San Diego air basin is in attainment with regard to CO.

TABLE 4-5
CARBON MONOXIDE LEVELS AT CHULA VISTA (PPM)

Chula Vista Station, San Diego County	2004	2005	2006	2007	2008
Maximum 1-hour Average	3.9	2.8	2.7	3.1	2.0
Maximum 8-hour Average	2.5	2.1	2.2	2.2	1.9
Days Over the 8-hour Federal Standard (9 ppm)	0	0	0	0	0

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

Data completeness for CO concentrations at the Chula Vista station averaged 95 percent over the five-year analysis period.

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 San Diego air basin is considered to be in attainment for SO_2 for purposes of federal air quality planning.

TABLE 4-6 shows the available data on maximum 1-hour, 3-hour, 24-hour, and annual average SO_2 levels recorded at the Chula Vista station during the period from 2004 to 2008. As indicated by this table, the maximum measured 1-hour average SO_2 levels comply with the new NAAQS (75 ppb), the maximum 3-hour average SO_2 levels comply with the NAAQS (0.5 ppm), and the maximum 24-hour values comply with the NAAQS of 0.14 ppm. 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 Chula Vista station averaged 97 percent over the five-year analysis period.

TABLE 4-6
SULFUR DIOXIDE LEVELS AT CHULA VISTA (PPM)

Chula Vista Station, San Diego County	2004	2005	2006	2007	2008
Highest 1-hour average	0.042	0.016	0.017	0.012	0.010
Highest 3-hour average	0.021	0.009	0.013	0.007	0.005
Highest 24-hour average	0.016	0.005	0.006	0.004	0.004
Annual Average	0.003	0.003	0.003	0.002	0.002
Days Over 1-hour Federal Standard (75 ppb)[1]	0	0	0	0	0
Days Over 3-hour Federal Standard (0.5 ppm)	0	0	0	0	0

Sources: CARB ADAM Website (www.arb.ca.gov/adam/welcome.html); EPA AIRS Website (www.epa.gov/air/data/index.html)
[1] 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.
ppm = parts per million

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 4-7 shows the maximum PM_{10} levels recorded at the Chula Vista monitoring station during the period from 2004 through 2008 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} concentration data completeness at the Chula Vista station averaged 99 percent for the five years analyzed.

TABLE 4-7
PARTICULATE MATTER (PM10) LEVELS AT CHULA VISTA (µG/M3)

Chula Vista Station, San Diego County	2004	2005	2006	2007	2008
Maximum 24-hour Average (federal testing samplers)	44	52	51	57	53
Annual Arithmetic Mean[1]	26.4	27.0	26.3	26.1	26.7
Estimated Number of Days Exceeding Federal Standard (150 µg/m^3)	0	0	0	0	0

Sources: CARB ADAM Website (www.arb.ca.gov/adam/welcome.html).
[1] On December 17, 2006, the annual PM_{10} federal standard (50 µg/m^3) was revoked.
µg/m^3 = micrograms per cubic meter
PM_{10} = particulate matter less than 10 microns in diameter

The federal annual PM_{10} standard was revoked by the EPA in 2006 due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution. San Diego County's attainment status for the federal PM_{10} standard is ~~"u~~nclassified."

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/m3) became effective on December 17, 2006.

The $PM_{2.5}$ data in TABLE 4-8 show that the national 24-hour average NAAQS of 35 $\mu g/m^3$ was exceeded several times during the five-year analysis period, all during the 2007 calendar year. The maximum recorded 24-hour average value was 45.7 $\mu g/m^3$ in 2007. The highest value recorded in 2007 (77.8 $\mu g/m^3$) was excluded by the District as an exceptional event related to wild fires in the area. The annual $PM_{2.5}$ data are also presented in this table. The maximum annual arithmetic mean was 12.5 $\mu g/m^3$, recorded in 2007, which is below the national standard of 15 $\mu g/m^3$. San Diego County's attainment status for the federal $PM_{2.5}$ standards is ~~"u~~nclassifiable/attainment."

TABLE 4-8
PARTICULATE MATTER ($PM_{2.5}$) LEVELS AT CHULA VISTA ($\mu G/M^3$)

Chula Vista Station, San Diego County	2004	2005	2006	2007	2008
Maximum 24-hour Average (federal only)1	32.7	34.3	30.2	45.7	32.9
Annual Arithmetic Mean	12.2	11.8	11.2	12.5	12.3
Estimated Number of Days Exceeding Federal Standard (35 µg/m3)	0	0	0	9.9	0

Source: CARB ADAM Website (www.arb.ca.gov/adam/welcome.html).
[1] 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.
µg/m3 = micrograms per cubic meter
$PM_{2.5}$ = particulate matter less than 2.5 microns in diameter

4.2 LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

4.2.1 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);
- New Source Review (NSR);

- 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.

4.2.1.1 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 greenhouse gases (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 SDAPCD, the PSD pollutants are SO_2, PM_{10}, $PM_{2.5}$, NOx, CO, lead, and GHGs).

A significant increase for a PSD pollutant is an increase above the significant emission rate for that pollutant (TABLE 4-9). It is important to note that, once PSD is triggered by any pollutant,

TABLE 4-9
PSD SIGNIFICANT EMISSION THRESHOLDS

Pollutant	PSD Significant Emission Threshold (TPY)[1]
SO_2	40
PM_{10}	15
$PM_{2.5}$	10
NOx	40
CO	100
Lead	0.6

[1] 40 CFR 52.21 (b)(1)(23).

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 PPEC, the facility is major because of GHG emissions. PSD applies to the project's significant increases of NOx, PM_{10}, and $PM_{2,5}$, even though the facility will not be major for any of those pollutants. The principal requirements for the PSD program include the following:

- Emissions of the PSD 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 PPEC is located in a Class II area.)

4.2.1.2 Air Quality Monitoring

At its discretion, EPA Region 9 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 EPA Region 9 to characterize the impacts of proposed project emissions on ambient air quality.

4.2.1.3 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.

4.2.1.4 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 4-10. Once PSD is triggered for the project, all pollutants with emission increases above the PSD significance thresholds are subject to this requirement.

TABLE 4-10
PSD INCREMENTS AND SIGNIFICANT IMPACT LEVELS

Pollutant	Averaging Time	SILs (µg/m³)[1]	Maximum Allowable Class II Increments[2]
SO_2	Annual	1.0	20
	24-hr	5	91
	3-hr	25	512
	1-hr	7.8[3]	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[3]	No 1-hr increment
CO	8-hr	500	No CO increments
	1-hr	2,000	

[1] 40 CFR 51.165 (b)(2).
[2] 40 CFR 52.21 (c)
[3] However, EPA has suggested that, until SILs have been promulgated, values of 4 ppb (7.5 µg/m³) for NO_2 and 3 ppb (7.8 µg/m³) 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.

4.2.1.5 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.

4.2.1.6 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: EPA Region 9.

4.2.1.7 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 SDAPCD for all pollutants and is discussed further under local LORS section below.

Administering Agency: SDAPCD, with EPA Region 9 oversight.

4.2.1.8 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 simple-cycle 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: SDAPCD, with EPA Region 9 and CARB oversight.

4.2.1.9 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: SDAPCD, with EPA Region 9 oversight.

4.2.1.10 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. SDAPCD has received delegation authority to implement Title IV.

Administering Agency: SDAPCD, with EPA Region 9 oversight.

4.2.1.11 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. SDAPCD has received delegation authority for this program.

Administering Agency: SDAPCD, with EPA Region IX oversight.

4.2.2 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.

4.2.2.1 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 SDAPCD Rules and Regulations that have also been incorporated into the SIP are discussed with the local LORS.

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

4.2.2.2 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 ~~"e~~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 SJVAPCD Air Quality Plan is discussed with the local LORS.

Administering Agency: SJVAPCD, with CARB oversight.

4.2.2.3 Nuisance Regulation

Authority: CA Health & Safety Code §41700

Requirements: Provides that ~~"n~~o 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: SDAPCD and CARB

4.2.2.4 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: SDAPCD and CARB

4.2.2.5 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: SDAPCD and CARB

4.2.2.6 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 AFC is required to include information concerning air quality protection.

Administering Agency: California Energy Commission

4.2.2.7 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. The California Climate Action Registry had already published protocols for voluntary reporting of GHG emissions from a number of sectors of the economy, and CARB has adopted regulations to limit GHG emissions from electric power plants and other specific source categories. In addition, CARB has issued guidance with recommended emission factors for calculating GHG emissions.

AB 32 also sets the following milestone dates for CARB to take specific actions:

- June 30, 2007: Identify a list of discrete early action GHG emission reduction measures (first report published April 20, 2007, with additional measures adopted on October 25, 2007).
- January 1, 2008: Establish a statewide GHG emission cap for 2020 that is equivalent to 1990 emissions.
- January 1, 2008: Adopt mandatory reporting rules for significant sources of GHGs.
- January 1, 2009: Adopt a scoping plan that will indicate how GHG emission reductions will be achieved from significant GHG sources through regulations, market-based compliance mechanisms, and other actions, including recommendation of a *de minimis* threshold for GHG emissions, below which sources would be exempt from reduction requirements.
- January 1, 2011: Adopt regulations to achieve maximum technologically feasible and cost-effective GHG emission reductions, including provisions for both market-based and alternative compliance mechanisms.
- January 1, 2012: Regulations adopted prior to January 1, 2010, become effective.

Senate Bill (SB) 97, adopted August 21, 2007, requires the California Office of Planning and Research (OPR) to develop CEQA guidelines ~~f~~or the mitigation of GHG emissions or the effects of GHG emissions" by July 1, 2009. SB 97 further requires the Resources Agency Secretary to adopt these CEQA guidelines by January 1, 2010. Finally, SB 97 removes GHG emissions as a cause of action under CEQA for specified state-financed infrastructure projects until January 1, 2010.

The AFC 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.

4.2.3 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:

- 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 was filed with SDAPCD at the same time as the Application for Certification (AFC) was filed with the Commission.

4.2.3.1 San Diego Air Pollution Control 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: SDAPCD, with CARB oversight.

4.2.3.2 Permits Required

Under Regulation II, Rule 10, Permits Required, and Rule 20.5, Power Plants, SDAPCD administers the air quality regulatory program for the construction, alteration, replacement, and operation of new power plants. As part of the AFC process, the project will be required to obtain a preconstruction Determination of Compliance (DOC) from the SDAPCD. Regulation II, Rule 10 incorporates other SDAPCD rules that govern how sources may emit air contaminants through the issuance of air permits (i.e., Authority to Construct [ATC] and Permit to Operate [PTO]). This permitting process allows the SDAPCD 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 AFC process must obtain a final DOC (equivalent under SDAPCD rules to an ATC upon issuance of a CEC Final Decision that includes all the conditions proposed in the DOC) from the local air district (in this case, SDAPCD) prior to construction of the new power plant. The ATC remains in effect until the PTO application is granted, denied, or canceled. Once the project commences operations and demonstrates compliance with the ATC, SDAPCD will issue a PTO. The PTO specifies

conditions that the facility must meet to comply with all applicable air quality rules, regulations, and standards.

4.2.3.3 New Source Review Requirements

The SDAPCD's New Source Review (NSR) rule (Regulation II, Rule 20.3 NSR – Major Stationary Sources & PSD Stationary Sources) establishes the criteria for siting new and modified emission sources; this rule is applicable to the proposed project. SDAPCD has been delegated authority for NSR rule development and enforcement according to the terms of Rule 20.3. 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.

4.2.3.4 New Source Review Requirements for Air Toxics

The SDAPCD's New Source Review (NSR) rule for air toxics (Regulation XII, Rule 1200 (Toxic Air Contaminants - New Source Review) 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.

4.2.3.5 New Source Performance Standards

The SDAPCD'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 the New Source Performance Standards are discussed above under the federal regulations section.

4.2.3.6 Federal Programs and Permits

The federal Title IV acid rain program requirement and Title V operational permit requirements are in SDAPCD's Rule 1412 (Federal Acid Rain Program Requirements) and Regulation XIV Rule 1401/1410. The applicability and requirements of these programs and permits are discussed above under the federal regulations section.

4.2.3.7 Public Notification

Because the proposed PPEC project emissions will exceed the AQIA trigger levels, public notice under Rule 20.3 is required and the Applicant expects that the SDAPCD Air Pollution Control Officer will provide this notice in a timely manner.

4.2.3.8 Permit Fees

The SDAPCD 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.

4.2.3.9 Prohibitions

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

- Rule 50 – Visible Emissions: This rule prohibits any source from discharging any emissions of any air contaminant that is darker in shade than that designated as Number 1 on the Ringelmann Chart for a period or periods aggregating more than 3 minutes in any period of 60 consecutive minutes.

- Rule 51 – 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 52 – Particulate Matter Emission Standards: This rule does not apply to stationary internal combustion engines. Rule 53 addresses particulate emissions from such sources.

- Rule 53 – Specific Air Contaminants: This rule sets the following limits for combustion sources:

    - Sulfur compounds, calculated as SO_2: 0.05% by volume on a dry basis

    - Particulates: 0.10 grains/dscf @ 12% CO_2.

- Rule 55 – Fugitive Dust Control: This rule requires control of dust emissions during construction activities. It prohibits visible dust emissions beyond the property line for periods aggregating more than 3 minutes in any 60-minute period, and minimization and daily removal of roadway dust;

- Rule 62 – Sulfur Content of Fuels: This rule prohibits any stationary source to use any gaseous fuel containing more than 10 grains of sulfur compounds per 100 cubic feet of dry gaseous fuel.

- Rule 69.3 – Stationary Gas Turbines Engines – Reasonable Available Control Technology: This rule limits NOx emissions from a gas turbine to 42 ppmv @15% O_2. The limit does not apply during a startup or shutdown period that does not exceed 120 minutes.

- Rule 69.3.1 – Stationary Gas Turbines Engines – Reasonable Available Retrofit Control Technology: This rule limits NOx emissions from a gas turbine larger than 10 MW to 9 x E/25 ppm @15% O_2, where E is the unit's thermal efficiency.

- Rule 1200 – Toxic Air Contaminants: This rule requires preparation of a health risk assessment, and demonstration that the project will not result in unacceptable health risks (cancer risk > 10 in a million, chronic health index > 1, acute health index > 1).

- Regulation XIV – Title V Operating Permits: this regulation implements the Title V federal operating permit program discussed above under Federal LORS.

All applicable LORS are summarized in TABLE 4-11.

TABLE 4-11
LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

LORS	Purpose	Regulating Agency
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.	EPA
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.	SDAPCD with EPA oversight
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.	SDAPCD with EPA oversight
CAA §501 (Title V), 42 USC §7661 (Federal Operating Permits Program)	Establishes comprehensive permit program for major stationary sources.	SDAPCD with EPA oversight
CAA §111, 42 USC §7411, 40 CFR Part 60 (New Source Performance Standards [NSPS])	Establishes national standards of performance for new stationary sources.	SDAPCD with EPA oversight
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.	SDAPCD with EPA oversight
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	SDAPCD with CARB oversight
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.	SDAPCD with CARB oversight
California Public Resources Code §25523(a); 20 CCR §1752, 2300-2309 (CEC & CARB Memorandum of Understanding)	Requires that CEC's decision on AFC include requirements to assure protection of environmental quality; AFC required to address air quality protection.	CEC
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

TABLE 4-11
LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

LORS	Purpose	Regulating Agency
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.	SDAPCD with CARB oversight
SDAPCD Regulation II, Rule 10 (Permits required) and Rule 20.5 (Power Plants)	Administers air quality regulation program for power plants	SDAPCD with CARB oversight
SDAPCD Regulation II, Rule 20.3 (New Source Review)	Establishes criteria for siting new and modified emission sources.	SDAPCD with CARB oversight
SDAPCD Regulation XII, Rule 1200 (Toxic Air Contaminants New Source Review)	Establishes procedures for review and control of toxic air contaminants from new sources	SDAPCD with CARB oversight
SDAPCD Regulation X, Standards of Performance for New Stationary Sources	Incorporates federal NSPS standards.	SDAPCD with CARB oversight
SDAPCD Rules 1401, 1410, and 1412 (Federal permits)	Implements Acid Rain and Title V permit programs	SDAPCD with EPA oversight
SDAPCD Rule 20.3 (d)(4)	Public Notification Requirement	SDAPCD with CARB oversight
SDAPCD Regulation III (Permit Fees)	Permit fees	SDAPCD
SDAPCD Rule 50 (Visible Emissions)	Prohibits visible emissions above certain levels.	SDAPCD with CARB oversight
SDAPCD Rule 51 (Nuisance)	Prohibit emissions and other discharges (such as smoke and odors) from specific sources of air pollution in excess of specified levels.	SDAPCD with CARB oversight
SDAPCD Rule 53 (Specific Air Contaminants)	Limits emissions of sulfur compounds and particulates from combustion sources.	SDAPCD with CARB oversight
SDAPCD Rule 55 (Fugitive Dust Control)	Applies to construction activities. Limits visible emissions beyond property line. Requires minimization of roadway dust.	SDAPCD with CARB oversight
SDAPCD Rule 62 (Fuel Sulfur)	Limits fuel sulfur content	SDAPCD with CARB oversight
SDAPCD Rule 69.3 (Stationary Gas Turbine Engines-RACT)	Limits NOx emissions from new gas turbines.	SDAPCD with CARB oversight
SDAPCD Rule 69.3.1 (Stationary Gas Turbine Engines-RARCT)	Limits NOx emissions from gas turbines.	SDAPCD with CARB oversight
SDAPCD Rule 1200 (Toxic Air Contaminants)	Requires preparation of a health risk assessment. Limits offsite impacts of toxic air contaminants	SDAPCD with CARB oversight
SDAPCD Regulation XIV (Title V Operating Permits)	Requires application for Title V permit and compliance with permit once issued	SDAPCD with EPA oversight

TABLE 4-11
LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

LORS	Purpose	Regulating Agency
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.	EPA
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CAA §501 (Title V), 42 USC §7661 (Federal Operating Permits Program)	Establishes comprehensive permit program for major stationary sources.	SDAPCD with EPA oversight
CAA §111, 42 USC §7411, 40 CFR Part 60 (New Source Performance Standards [NSPS])	Establishes national standards of performance for new stationary sources.	SDAPCD with EPA oversight
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.	SDAPCD with EPA oversight
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	SDAPCD with CARB oversight
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.	SDAPCD with CARB oversight
California Public Resources Code §25523(a); 20 CCR §1752, 2300-2309 (CEC & CARB Memorandum of Understanding)	Requires that CEC's decision on AFC include requirements to assure protection of environmental quality; AFC required to address air quality protection.	CEC
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
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.	SDAPCD with CARB oversight
SDAPCD Regulation II, Rule 10 (Permits required) and Rule 20.5 (Power Plants)	Administers air quality regulation program for power plants	SDAPCD with CARB oversight
SDAPCD Regulation II, Rule 20.3 (New Source Review)	Establishes criteria for siting new and modified emission sources.	SDAPCD with CARB oversight
SDAPCD Regulation XII, Rule 1200 (Toxic Air Contaminants New Source Review)	Establishes procedures for review and control of toxic air contaminants from new sources	SDAPCD with CARB oversight

TABLE 4-11
LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

LORS	Purpose	Regulating Agency
SDAPCD Regulation X, Standards of Performance for New Stationary Sources	Incorporates federal NSPS standards.	SDAPCD with CARB oversight
SDAPCD Rules 1401, 1410, and 1412 (Federal permits)	Implements Acid Rain and Title V permit programs	SDAPCD with EPA oversight
SDAPCD Rule 20.3 (d)(4)	Public Notification Requirement	SDAPCD with CARB oversight
SDAPCD Regulation III (Permit Fees)	Permit fees	SDAPCD
SDAPCD Rule 50 (Visible Emissions)	Prohibits visible emissions above certain levels.	SDAPCD with CARB oversight
SDAPCD Rule 51 (Nuisance)	Prohibit emissions and other discharges (such as smoke and odors) from specific sources of air pollution in excess of specified levels.	SDAPCD with CARB oversight
SDAPCD Rule 52 (Particulate Matter)	Limits emissions of particulate matter	SDAPCD with CARB oversight
SDAPCD Rule 62 (Fuel Sulfur)	Limits fuel sulfur content	SDAPCD with CARB oversight

4.3 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 significant impact at a time and location where a violation of an ambient air quality standard occurs.

4.3.1 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 detailed analysis of the construction emissions is included in Appendix 1B. 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 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 16 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 3.0, Facility 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 3.0, Facility Description, and Appendix 1B. The California Air Resources Board (CARB) OFFROAD2007 and EMFAC2007 models were used to generate equipment-specific emission factors for all criteria pollutants for diesel-fueled construction equipment and for on-road vehicles, respectively. Assumptions used in calculating project construction emissions included a 16-month construction period; 5 construction days per week; and a single-shift, 8-hour workday. The list of fueled equipment needed during each month of the construction effort (see TABLE 4-12) 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 EPA AP-42 emission factors for activities including bulldozing and dirt-pushing, travel on paved and unpaved roads, material handling, and wind erosion to storage of aggregate materials. A combined dust control efficiency of 92 percent was assumed to be achieved for traveling on unpaved surfaces at the project site and temporary construction area activities 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 trip generation information (presented in Table 3.9-2A) and emission factors provided by CARB's EMFAC2007 model. Construction workers were assumed to commute to the proposed project site from locations within the greater San Diego area.

The short-term maximum emissions were calculated using Month 5 for combustion emissions from construction equipment and month 2 for fugitive dust. Activities in month 5 include grading and building, and facility construction. Activities in month 2 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 1-12 of the 16-month schedule for combustion emissions, and Months 2-13 for fugitive dust.

Maximum daily construction emissions are shown in TABLE 4-13. Maximum annual construction emissions are shown in TABLE 4-14.

TABLE 4-12
ESTIMATED CONSTRUCTION EQUIPMENT/VEHICLE USAGE

Equipment/Vehicles	Horsepower (approx.)	Month of Construction (Unit: # per day)															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Off-Road Equipment																	
Hydro Crane 35-50 Ton RT	200					1	1	1	1	1	1	1	1				
RT 760 - 60 ton Crane	250		1	1	1	2	2	2	2	2	2	2	1				
Hydro Crane 75-80 Ton RT	250									1	1	1	1	1	1	1	1
2250 Manitowoc 300 Ton (track mounted crane)	420					1	1	1	1	1	1						
40' - 60' Manlift	85					3	5	8	9	8	6	4	2				
90' Manlift	85					2	3	4	6	4	4	2	2				
Forklift	100	1	1	1	1	2	2	2	2	2	2	1	1	1	1	1	1
Diesel Welder 400 Amp	22		2	2	2	2	2	2	3	3	3	3	2	2	2	1	1
185 CFM Compressor	49	2	2	2	2	2	2	2	2	2	2	2	1	1			
Light Tower 5 KW	22	2	3	3	3	3	3	3	3	3	3	3	2	1	1	1	1
Water Truck 4000 Gal	225	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Track 330 Excavator	268	1	1	1	1	1											
RT Hoe 710 (Backhoe)	150		2	2	2	2	1	1	1	1	1	1	1				
Roller	100		1	1	1	1	1	1	1	1	1	1	1	1	1		1
950/960 Loader	280		2	2	2	2	1	1	1	1	1	1	1	1	1		
Cat D6 Dozer	250	1	1	1													
Dump Truck	250	1	1	1													
Grader	200	1	1	1									1	1	1		
Fusion Machine	22	3	3	3	3	3	3										
Asphalt Paver	120																1
Paving Equipment	120																1
On-Road Vehicles																	
Pickup trucks		27	28	28	39	39	42	37	37	36	36	31	30	24	18	17	
Concrete Deliveries			6	6	6	6	6	3	1	1	1						
Light/Medium Deliveries		3	3	6	12	15	21	21	21	21	21	21	21	21	15	15	
HD Truck Delivery						1	1	1	1	1							
Construction workers		50	90	118	164	181	216	242	284	283	236	188	124	83	54	32	29

Notes:
1. Construction schedule is provided by the Applicant.
- Total month construction 16 months
- Days per week 5 days
- Days per month 22 days
- Hours per day 8 hours

2. Construction phases are provided by the Applicant and listed as follows:
- Clearing and grubbing month 1
- Underground water line relocation month 2
- Access road widening work month 1-2
- Site grading month 2-3
- Underground gas and waste water linear month 2-3
- Relocation of the reclaimed/recycled water line month 2-3
- Facilities building month 4-15
- Lateral construction month 10-11
- Asphalt paving month 16

3. Delivery trips per day, distance, and origins are based on the information provided by the Applicant and assumptions.
4. Worker passenger vehicles will park in the laydown area so there will be no one traveling on site.
5. It is assumed the numbers of worker passenger vehicles are the numbers of workers divided by 1.5.

TABLE 4-13
MAXIMUM DAILY CONSTRUCTION EMISSIONS, POUNDS PER DAY, MONTH 5 (COMBUSTION), MONTH 2 (FUGITIVE DUST)

	NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$
Onsite						
Construction Equipment	40.7	24.3	4.1	0.0	1.6	1.6
Fugitive Dust	--	--	--	--	19.7	2.9
Offsite						
Worker Travel, Truck Deliveries	11.2	63.8	6.3	0.1	0.1	0.1
Total	51.9	88.1	10.4	0.1	21.4	4.6

Notes:
PM_{10} = particulate matter less than 10 micrometers in diameter
$PM_{2.5}$ = particulate matter less than 2.5 micrometers in diameter
VOC = volatile organic compound
CO = carbon monoxide
NOx = nitrogen oxide(s)
SOx = sulfur oxide(s)

TABLE 4-14
MAXIMUM ANNUAL CONSTRUCTION EMISSIONS, TONS PER YEAR

	NOx	CO	VOC	SOx	$PM_{2.5}$	PM_{10}
Onsite						
Construction Equipment	4.7	2.3	0.4	0.0	0.2	0.2
Fugitive Dust	--	--	--	--	0.3	1.6
Offsite						
Worker Travel, Truck Deliveries	0.8	2.6	0.3	0.0	0.0	0.0
Total	5.5	4.9	0.7	0.0	0.5	1.9

Notes:
PM_{10} = particulate matter less than 10 micrometers in diameter
$PM_{2.5}$ = particulate matter less than 2.5 micrometers in diameter
VOC = volatile organic compound
CO = carbon monoxide
NOx = nitrogen oxides
SOx = sulfur oxides

4.3.2 Emitting Units

Key operating parameters are summarized below. Additional information relating to the fuel characteristics, heat rate, and startup and operating limits of PPEC may be found in Section 3.0, Facility Description, and Appendix 1C.

4.3.2.1 Gas Turbines (each, of three)

- LMS100 simple cycle combustion gas turbines
- 4,000 hours per year normal operation plus 500 startup/shutdown cycles (per turbine)
- Fueled exclusively with natural gas (see TABLE 4-15 for nominal natural gas fuel properties)

4.3.2.2 Partial Dry Cooling Tower

- 23,520 GPM water circulation rate
- Maximum TDS: 5,600 ppmw (4.67 cycles of concentration)
- 12 cells
- 0.001% drift rate
- 4,337 hours per year of full operation (more hours per year at proportionately reduced water circulation rate if all three turbines not fired simultaneously)

TABLE 4-15
NOMINAL FUEL PROPERTIES—NATURAL GAS

Component Analysis		Chemical Analysis	
Component	Average Concentration, Volume	Constituent	Percent by Weight
CH_4	95.88%	C	72.93 %
C_2H_6	1.85%	H	23.85 %
C_3H_8	0.32%	N	1.16 %
C_4H_{10}	0.11%	O	2.05 %
C_5H_{12}	0.03%	S	0.75 gr/100 scf
N_2	0.70%	Higher Heating Value	1,019 Btu/scf 22,840 Btu/lb
CO_2	1.08%		
S	<0.0001%		

4.3.3 Turbine Commissioning

The commissioning period begins when the GE model LMS100 natural gas-fired turbines are prepared for first fire and ends upon successful completion of initial performance testing. The commissioning process entails several relatively short periods of operation prior to and during installation and testing of the SCR and CO catalyst systems. During these periods, NOx emissions will be higher than normal operating levels because the NOx emissions control system would not be fully operational and because the gas turbine would not be tuned for optimum performance. CO emissions would also be higher than normal because turbine performance would not be optimized and the CO emissions control system would not be fully operational.

Turbine commissioning activities can be broken down into five separate test periods, as described below. The first four periods occur prior to SCR system and oxidation catalyst installation, when the combustor is being tuned. In the first four phases, NOx emissions will be higher than normal because the NOx and CO emissions control system would not be functioning and because the combustors would not be tuned for optimum performance. The fifth phase occurs when the combustors have been tuned but the SCR and oxidation catalyst installation is not complete, and other parts of the turbine operating system are being checked out. Because the control system installation would not be complete, NOx emissions would be higher than for normal operations.

Commissioning activities are discussed in more detail below. Emission estimates are based on vendor-supplied emission rates for the various stages of commissioning. The estimated duration of each stage is based on the recent commissioning of the four GE LMS100 turbines at the Panoche Energy Center. To be conservative, the average duration of each stage during commissioning at Panoche was doubled for the expected commissioning of turbines at PPEC. Total commissioning at Panoche lasted 56 turbine operating hours for each turbine, whereas the total commissioning for PPEC is estimated to be up to 112 operating hours for each turbine. At the conclusion of the commissioning period, operational emissions rates will be at the controlled rates discussed previously in this section. The required continuous emissions monitoring system (CEMS) for NOx and CO will be calibrated and operating, but will not be certified until after the commissioning period.

Emissions associated with commissioning activities at PPEC are projected from actual commissioning experience at the Panoche Energy Center and from estimated emission data provided by General Electric. The five commissioning phases likely to be required for each LMS100 turbine are as follows:

- First Fire (operate unit at synchronous idle and perform a system check – 16 hours);
- Sync/AVR Testing (synchronize unit to the electrical grid and operate the unit at various loads to test the voltage regulator – 12 hours);
- SCR Burn-out/AVR Testing (operate the unit at various loads to test the voltage regulator – 20 hours);
- Water Injection Mapping (commissioning of the NOx water injection system – 32 hours); and
- SCR Commissioning (unit operation to adjust SCR control – 32 hours).

During the commissioning activities, worst-case hourly NOx and CO emission rates for each turbine are expected to be 50.0 lb/hour and 75.0 lb/hour, respectively. Actual activity durations will vary, but total commissioning emissions for each turbine are not expected to exceed totals based on these worst-case hourly rates over 112 hours of testing for each turbine (i.e., 3,700 lbs of NOx and 6,320 lbs of CO). The turbine commissioning emissions for all pollutants in each phase are presented in TABLE 4-16. In all likelihood, the commissioning of individual turbines will take place sequentially.

During the first year of operation after turbines are commissioned, PPEC will operate in such a way as to ensure that the annual emissions limit for normal operations, shown in TABLE 4-19, will not be exceeded, even with the emissions from commissioning activities included.

TABLE 4-16
COMMISSIONING EMISSIONS (PER TURBINE)

			Pollutant Emission Rates				
Activity	Duration (Hours)	Heat Input (MMBTU/hr)	NOx (lb/hr)	CO (lb/hr)	VOC (lb/hr)	SO_2 (lb/hr)	PM_{10} (lb/hr)
First Fire	16	75	11.3	45	1.1	0.17	5.5
Sync/AVR Testing	12	500	50	75	5	0.6	5.5
SCR Burnout/AVR Testing	20	500	50	75	5	0.6	5.5
Water Injection Mapping	32	500	50	75	5	0.6	5.5
Ammonia Injection Tuning	32	500	10	25	1.5	0.6	5.5

Notes:
PM_{10} = particulate matter less than 10 micrometers in diameter
$PM_{2.5}$ = particulate matter less than 2.5 micrometers in diameter
VOC = volatile organic compounds
CO = carbon monoxide
NOx = nitrogen oxides
SOx = sulfur oxides

4.3.4 Operational Emissions

The principal emission sources of the project will be the three simple-cycle combustion turbine generators (CTGs), which will burn exclusively natural gas fuel. Annual operational emissions from each of the three project CTGs were estimated by summing the emissions from 4,000 hours per year of normal operations plus emissions associated with 500 startup and shutdown events for each CTG.

The only other source of emissions from project operations is the partial dry cooling tower. Emissions from this source are very low, especially when compared with emissions from combined cycle plants, because this cooling is used only for lubricating oil. Most of the cooling requirements for a combined cycle plant are associated with condensing the water used in the steam turbines. The cooling tower will emit drift droplets containing dissolved solids; when the water in the suspended droplets evaporates, the solids remain in the air as particulate matter.

NOx and particulate emissions from the gas turbines are summarized in TABLE 4-17. 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 limit of 2.5 ppmv reflects the application of SCR. The proposed VOC emission limit of 2.0 ppmv reflects the use of good combustion practices. The proposed CO emission limit of 4.0 ppmv reflects 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 and the cooling tower 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). SO_2 emissions were calculated based on the proposed maximum allowable fuel sulfur content of 0.75 grain per 100 standard cubic feet (scf).

TABLE 4-17
MAXIMUM EMISSION RATES—COMBUSTION TURBINES

Pollutant	ppmv @ 15% O_2	lb/MMBtu	lb/hr
Combustion Turbines (each)			
NOx	2.5	0.0091	8.18
SO_2[1]	0.4	0.0021	1.90
CO	4.0	0.0088	7.97
VOC	2.0	0.0025	2.28
$PM_{10}/PM_{2.5}$[2]	—	—	5.5

Notes:
NOx, CO, VOC, and PM_{10} emission rates exclude startups and shutdowns (see Table 4-18).
[1] Based on maximum natural gas sulfur content of 0.75 gr/100 scf. See text.
[2] 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 30°F to a high of 110°F. The maximum hourly emissions for all criteria pollutants from the turbine during normal operations are expected to occur under the conditions with the highest firing rate: 100% load, use of evaporative cooling, and 72°F ambient temperature.

The expected emissions and durations associated with individual turbine startup and shutdown events are summarized in TABLE 4-18. Based on vendor information, each turbine startup is expected to take 30 minutes; each turbine shutdown is expected to be completed within 10.5 minutes. The 30-minute startup NOx emission rate was calculated using GE vendor data during the first nine minutes of the startup, and Panoche Energy Center Continuous Emissions Monitoring System (CEMS) data for minutes 10-30. The Panoche Energy Center is comprised of four GE LMS100 turbines operating in service similar to the proposed PPEC. To be conservative, a 20 percent buffer of additional emissions for each minute was added to the Panoche Energy Center actual startup emission data. Because hours that include startup and shutdown events may have higher NOx, CO, and VOC emissions than the normal operating condition with functioning SCR and CO catalyst, they were incorporated into the worst-case short- and long-term turbine emissions estimates in the model simulations pertaining to these pollutants.

TABLE 4-18
STARTUP AND SHUTDOWN EMISSIONS (PER TURBINE)

		Pollutant Emission Rates				
Activity	Duration (minutes)	NOx (lb/event)	CO (lb/event)	VOC (lb/event)	SO_2 (lb/event)	PM_{10} (lb/event)
Startup	30	22.5	17.9	4.7	0.66	2.75
Shutdown	10.5	6.0	47.0	3.0	0.08	0.96

Notes:
PM_{10} = particulate matter less than 10 micrometers in diameter
$PM_{2.5}$ = particulate matter less than 2.5 micrometers in diameter
VOC = volatile organic compound
CO = carbon monoxide
NOx = nitrogen oxide(s)
SOx = sulfur oxide(s)

The maximum expected emissions for each averaging period were used in the compliance demonstration modeling, and are summarized in TABLE 4-19 and TABLE 4-20.

TABLE 4-19
EMISSION SUMMARY

Equipment	NOx Max lb/hr	NOx Max lb/day	NOx Total TPY	S0x Max lb/hr	S0x Max lb/day	S0x Total TPY	CO Max lb/hr	CO Max lb/day	CO Total TPY	VOC Max lb/hr	VOC Max lb/day	VOC Total TPY	PM_{10} Max lb/hr	PM_{10} Max lb/day	PM_{10} Total TPY
Turbine 1	26.6	288.1	23.5	1.9	45.6	1.4	53.5	428.9	32.1	6.5	85.9	6.9	5.5	132.0	11.9
Turbine 2	26.6	288.1	23.5	1.9	45.6	1.4	53.5	428.9	32.1	6.5	85.9	6.9	5.5	132.0	11.9
Turbine 3	26.6	288.1	23.5	1.9	45.6	1.4	53.5	428.9	32.1	6.5	85.9	6.9	5.5	132.0	11.9
Cooling Tower	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	15.8	1.4
Total	79.9	864.3	70.4	5.7	136.8	4.1	160.5	1,287	96.4	19.6	257.7	20.7	17.2	411.8	37.2

Notes:
1. Maximum hourly turbine emissions based on startup emissions for NOx, , and worst case normal operations for PM_{10} and $PM_{2.5}$. See Appendix 1C, Table 1C.4 and 1C.5 for calculation of hourly emissions during startup/shutdown..
2. Annual emissions based on 4000 hours of normal operations at 100% load and average ambient temperature plus 500 startup and shutdown events.

TABLE 4-20
CRITERIA POLLUTANT SOURCES AND EMISSION TOTALS FOR MODELING

			Emission (lbs) Entire Period	
Averaging Time	**Operating Equipment**	**Pollutant**	**Each CTG**	**Cooling System**
1-hour	**NOx**: One startup (all turbines) with remainder of the hour at worst case normal operation.	NOx	26.6	
	CO: One shutdown (all turbines) with remainder of the hour at worst case normal operation.	CO	53.5	
	SO_2: Full load at worst case normal operation	SO_2	1.9	
3-hour	**SO_2**: Full load at worst case normal operation.	SO_2	5.7	
8-hour	**CO**: 8 hours at worst case 1-hour emissions (screening assessment)	CO	428	
24-hour	**SO_2**: Full load at worst case normal operation.	SO_2	136.8	
	PM_{10}: Full load at worst case normal operation plus cooling system	$PM_{10}/PM_{2.5}$	132.0	23.7
Annual	**All**: Each turbine operates for 4,000 hours at full load and annual average ambient temperature plus 500 startups, 500 shutdowns (4,337 total hours). Cooling system operates 4,337 hours.	NOx	46,930	
		SO_2	2,745	
		$PM_{10}/PM_{2.5}$	23,840	2,855

Notes: Emissions of SOx for annual average based on fuel sulfur content of 0.25 gr/100 dscf. Emissions of SOx for all other averaging times based on 0.75 gr/100 dscf.

PM_{10} = particulate matter less than 10 micrometers in diameter
$PM_{2.5}$ = particulate matter less than 2.5 micrometers in diameter
VOC = volatile organic compounds

CO = carbon monoxide
NOx = nitrogen oxides
SOx = sulfur oxides

4.3.4.1 Non-Criteria Pollutant Emissions

Non-Criteria Pollutant emissions are summarized in TABLE 4-21.

TABLE 4-21
NON-CRITERIA POLLUTANT EMISSIONS

	Emissions (Per turbine)		Emissions (Total, 3 units)	
Pollutant	Lb/hr	TPY	Lb/hr	TPY
Turbines				
Propylene	3.37E-01	7.30E-01	1.01E+00	2.19E+00
Acetaldehyde	1.78E-02	3.86E-02	5.35E-02	1.16E-01
Acrolein	2.86E-03	6.19E-03	8.57E-03	1.86E-02
Benzene	5.33E-03	1.16E-02	1.60E-02	3.47E-02
1,3-Butadiene	1.92E-04	4.16E-04	5.75E-04	1.25E-03
Ethylbenzene	1.42E-02	3.09E-02	4.27E-02	9.26E-02
Formaldehyde	4.01E-01	8.69E-01	1.20E+00	2.61E+00
Hexane, n-	1.13E-01	2.45E-01	3.39E-01	7.36E-01
Naphthalene	5.81E-04	1.26E-03	1.74E-03	3.78E-03
PAHs (listed individually below)	2.86E-04	6.21E-04	8.59E-04	1.86E-03
Acenaphthene	8.30E-06	1.80E-05	2.49E-05	5.40E-05
Acenapthyene	6.42E-06	1.39E-05	1.93E-05	4.18E-05
Anthracene	1.48E-05	3.20E-05	4.43E-05	9.61E-05
Benzo(a)anthracene	9.87E-06	2.14E-05	2.96E-05	6.42E-05
Benzo(a)pyrene	6.07E-06	1.32E-05	1.82E-05	3.95E-05
Benzo(e)pyrene	2.38E-07	5.15E-07	7.13E-07	1.55E-06
Benzo(b)fluoranthrene	4.94E-06	1.07E-05	1.48E-05	3.21E-05
Benzo(k)fluoranthrene	4.81E-06	1.04E-05	1.44E-05	3.13E-05
Benzo(g,h,i)perylene	5.98E-06	1.30E-05	1.80E-05	3.89E-05
Chrysene	1.10E-05	2.39E-05	3.30E-05	7.16E-05
Dibenz(a,h)anthracene	1.03E-05	2.23E-05	3.08E-05	6.68E-05
Fluoranthene	1.89E-05	4.09E-05	5.66E-05	1.23E-04
Fluorene	2.53E-05	5.49E-05	7.60E-05	1.65E-04
Indeno(1,2,3-cd)pyrene	1.03E-05	2.23E-05	3.08E-05	6.68E-05
Phenanthrene	1.37E-04	2.97E-04	4.11E-04	8.92E-04
Pyrene	1.21E-05	2.63E-05	3.64E-05	7.90E-05
Toluene	5.81E-02	1.26E-01	1.74E-01	3.78E-01
Xylene	2.85E-02	6.19E-02	8.56E-02	1.86E-01
Cooling Tower				
Arsenic	9.90E-08	2.15E-07	9.90E-08	2.15E-07
Carbon Tetrachloride	1.16E-07	2.50E-07	1.16E-07	2.50E-07
Chlorine	1.27E-02	2.74E-02	1.27E-02	2.74E-02
Chromium	1.54E-07	3.34E-07	1.54E-07	3.34E-07
Lead	4.73E-08	1.03E-07	4.73E-08	1.03E-07
Total HAPs[1]				4.26

4.3.4.2 Greenhouse Gas Emissions

Potential maximum annual GHG emissions for the operational PPEC were calculated using the calculation methods and emission factors from the California Air Resources Board GHG Reporting Regulation.[1] TABLE 4-22 presents the estimated GHG emissions due to project operations in 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.

One-time GHG emissions from construction activities are presented in TABLE 4-23.

Appendix 1C presents supporting technical information and calculation spreadsheets used to develop emissions data for the various scenarios of the operational project.

TABLE 4-22
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[1]	CO_2, metric tons/MWh
CTGs	628,000	222	364	<1	621,500	0.477

[1] Includes CH_4, N_2O, and SF_6.

TABLE 4-23
CONSTRUCTION GREENHOUSE GAS EMISSIONS

Unit	CO_2, metric tons/year	CH_4, metric tons/year	N_2O, metric tons/year	CO_2eq, metric tons/yr[1]
Offroad Fuel Use	78	3.19E-03	6.38E-04	
Worker Travel	307	1.30E-02	2.60E-03	
Truck Deliveries	81	3.34E-03	6.68E-04	
TOTAL	466	1.95E-02	3.91E-03	467

4.3.5 Air Dispersion Modeling

An assessment of impacts from the PPEC on ambient air quality has been conducted using EPA-approved air quality dispersion models, following the modeling protocol submitted to the agencies in November 2010 (see Appendix 1H). 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 analysis uses meteorological and ambient data for the five-year time period 2004 through 2008.

[1] CARB, *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions, Appendix A*, December 2007

The impact analysis was used to determine the worst-case ground-level impacts of the Project. The results were compared with established 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 over predict 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.

4.3.5.1 Model Selection

The screening and refined air quality impact analyses were performed using the American Meteorological Society/Environmental Protection Agency Regulatory Model Improvement Committee (AERMIC) model, also known as AERMOD (current version 09292). 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).[2] 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.

[2] 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).

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 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 Otay Mesa/Paseo International monitoring station and upper air data from the Marine Corps Air Station Miramar (MCAS Miramar).

4.3.5.2 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 ("~~G~~uideline 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.

4.3.5.3 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 were 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, receptor locations at which the NO_2, $PM_{2.5}$, and PM_{10} significant impact levels were not exceeded were not included in PSD analyses for these pollutants.

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

South West corner: Lat: 32.38, Lon: -117.82;

North East corner: Lat: 33.1, Lon: -116.26.

The analysis was limited to impacts in the United States.

4.3.5.4 Meteorological Data Selection

The District provided a meteorological dataset already processed by AERMET to generate AERMOD-compatible meteorological data for air dispersion modeling. The surface meteorological data were recorded at the District's Otay Mesa-Paseo International monitoring station, and the upper air data were recorded at the MCAS Miramar (No. 03190). EPA defines the term ~~"o~~n-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 ~~"o~~f 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*.[3] 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 applicant concurs, that the District's Otay Mesa 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 Otay Mesa-Paseo International meteorological monitoring station. The Otay Mesa-Paseo International meteorological monitoring station is in close proximity to the proposed project site (distance between the two locations is approximately 1.2 miles 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, located approximately 24 miles northwest of the Project. No other upper air meteorological monitoring stations are located in the San Diego Air Basin. The next closest upper air station in California is located at Oakland International Airport.

4.3.5.5 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 Chula Vista monitoring station provides the most representative ambient air quality background data for PM_{10}, $PM_{2.5}$, NO_2, SO_2, O_3, and CO. Although the monitoring site at Otay Mesa-Paseo International is closer to the project site than the Chula Vista station, the Otay Mesa station is strongly impacted by traffic coming across the border from Mexico, and is therefore not representative of regional background concentrations.

> *Several thousand border-crossing trucks passing near the monitor each day heavily impact PM measurements at this location. To better gauge ambient PM_{10} concentrations throughout the Otay Mesa area as a whole, a second monitor was recently established in Otay Mesa, two miles north of the existing monitor. The additional monitor is not unduly influenced by specific local PM sources*[4]

PM_{10} concentrations at the border station are about twice as high as maximum concentrations at the alternate site. The border trucks impact all combustion pollutant measurements at the Otay Mesa monitor, not just PM_{10}. In contrast, the Chula Vista station is not impacted by nearby sources, and is only 8 miles from the project site. The five-year period 2004-2008 is the most recent five-year period for which all required data are available. This is the period for which PSD modeling has been performed.

[3] EPA, *Supplement A to the Guideline on Air Quality Models (Revised)*, 1987.
[4] SDAPCD, *Measures to Reduce Particulate Matter in San Diego County*, December 2005, p. 3-6

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 are no gaps in the data. This prevents exclusion of modeled high impact hours because of missing monitoring data.

4.3.5.6 Normal Operations Impact Analysis

4.3.5.6.1 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 turbine. 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 1C. These operating conditions represent CTG operation at maximum, average, and minimum ambient temperatures (110°F, 63°F and 30°F), and at full load and minimum load (50 percent).

Ambient impacts for each of the six 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 1C. The analysis showed that for short-term averaging periods, modeled impacts were highest under cold temperature, peak load operating conditions. For 24-hour and annual averages, impacts were highest under cold temperature, peak load operating conditions, except for PM_{10} impacts which were highest under cold temperature, low load conditions.

4.3.5.6.2 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. The results of the AERMOD assessment for normal plant operations are summarized in TABLE 4-24. Listed below are the operating assumptions used in developing the emission rates for each emissions unit and averaging period.

4.3.5.6.2.1 1-hour and 3-hour averages

- CTG at peak load, cold temperature (maximum impact case from screening analysis)

4.3.5.6.2.2 8-hour average

- CTG at peak load, cold temperature (maximum impact case from screening analysis)

4.3.5.6.2.3 24-hour averages

- For $PM_{10}/PM_{2.5}$ impacts: CTG at low load, cold temperature (maximum impact case from screening analysis)

- For all other pollutants, CTG at peak load, cold temperature (maximum impact case from screening analysis)

4.3.5.6.2.4 Annual Averages

- For $PM_{10}/PM_{2.5}$ impacts: CTG at low load, cold temperature (maximum impact case from screening analysis)
- For all pollutants, CTG at peak load, annual average temperature (maximum impact case from screening analysis)
- For all pollutants, maximum annual emissions used to calculate average hourly emission rate

TABLE 4-24
SUMMARY OF MODELING RESULTS

Pollutant	Averaging Period	Modeled Concentration (µg/m³) Normal Operation	Startup	Inversion Breakup Fumigation[1]	PSD Significant Impact Level (µg/m³)
NO_2	1-hr	27	111	2.9	7.5[2]
	Annual	0.3	--	--	1.0
PM_{10}	24-hr	2.6	--	0.2	5
	Annual	0.26	--	--	1
$PM_{2.5}$	24-hr	2.6	--	0.2	1.2
	Annual	0.26	--	--	0.3

Notes:
[1] Inversion breakup fumigation is a short-term phenomenon and does not affect annual impacts.
[2] This is an interim SIL and has not been formally adopted by EPA.

4.3.5.6.3 Startup and Shutdown Impacts Analysis

Short-term ambient NOx[5] impacts from the facility during turbine startup may be higher than impacts during normal operation because emission control systems are not fully operational during some part of the initial startup period when the turbine operates at low loads and the exhaust temperatures are low. (See 4.3.4 for a discussion of emissions.)

For modeling the impacts during an hour including a startup or shutdown, NOx emission rates from TABLE 4-18 were used to calculate emissions during the transition period, while emissions during the remainder of the clock hour were assumed to be the maximum normal emission level. The NOx emission rates used for modeling startup impacts are shown in TABLE 4-19.

Turbine exhaust parameters for minimum load operation and under cold temperature conditions were used to characterize CTG exhaust during startup, because that operating case produced the highest modeled impacts in the screening analysis. Startup impacts were evaluated for the 1-hour averaging period for NOx. The emission rates and stack parameters used are shown in Appendix 1D. The results of the analysis are summarized in TABLE 4-24.

[5] $PM_{10}/PM_{2.5}$ emissions during startup are assumed to be the same as during normal operation.

4.3.5.6.4 Inversion Breakup Fumigation Modeling

Inversion breakup 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 1 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). Guidance from EPA[6] was followed in evaluating fumigation impacts. The maximum fumigation impact from this analysis, which is shown in more detail in Appendix 1D, showed that impacts under fumigation conditions are expected to be lower than the maximum concentrations calculated by AERMOD under downwash conditions. Inversion breakup impacts are also shown in TABLE 4-24.

For all pollutants, fumigation impacts are lower than the maximum predicted impacts from normal operations and meteorological conditions.

4.3.6 Demonstration of Compliance

The maximum facility impacts calculated from the modeling analyses described above are summarized in TABLE 4-25. The highest modeled short-term NO_2 impacts are expected to occur under startup conditions; the highest impacts for other pollutants and averaging periods occur under normal operating conditions. To determine the project's air quality impacts, the modeled concentrations are added to the highest reported background ambient air concentrations and then compared to the applicable ambient air quality standards. The highest reported background ambient concentrations were discussed in Section 4.1.4 and the monitored concentrations during the past three years are shown in the TABLE 4-25. More detailed discussions of why the data collected at these stations are representative of ambient concentrations in the vicinity of the project are provided in Section 4.1.4.

TABLE 4-24 shows that project impacts exceed the significance level only for the federal NO_2 one-hour and $PM_{2.5}$ 24-hour standards. All other project impacts are too low to have the potential to cause or contribute significantly to a violation of an ambient air quality standard. No further analysis is necessary for those pollutants and averaging periods.

The federal 1-hour NO_2 and 24-hour $PM_{2.5}$ standards are statistically based. Unlike most of the other standards, which are generally not to be exceeded, compliance with these two standards is determined by averaging, for three consecutive years, the 98^{th} percentile value of the annual values. For a full set of data, the 98^{th} percentile equals the 8^{th} highest (out of 365) $PM_{2.5}$ 24-hour average, and the 8^{th} highest (out of 365) NO_2 daily 1-hour maximum.

[6] EPA-454/R-92-019, "Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised."

TABLE 4-25
SUMMARY OF RESULTS (MODELED MAXIMUM IMPACTS PLUS BACKGROUND)

Pollutant	Averaging Time	Maximum Predicted Impact (operating mode) (µg/m³)	Background Concentration (µg/m³)	Total Concentration (Maximum Impact plus Background) (µg/m³)	3 year Average of 98th Percentile of Total Concentration (µg/m³)	NAAQS (µg/m³)
NO_2	1-hr	111 (startup)	154	265	159	188
	Annual	0.3 (normal)	32	32	--	100
PM_{10}	24-hr	3 (normal)	57	60	--	150
	Annual	0.3 (normal)	26.7	30	--	--
$PM_{2.5}$	24-hr	2.6 (normal)	45.7	--	25.9	35
	Annual	0.26 (normal)	12.5	12.8	--	15.0

[1] 40 CFR 51.165 (b)(2).

Details of the compliance demonstration for the federal 1-hour NO_2 and 24-hour $PM_{2.5}$ standards are presented in Appendix 1G, and are summarized in TABLE 4-26. TABLE 4-26 shows that the project will comply with these statistically-based federal standards.

TABLE 4-26
SUMMARY OF RESULTS OF DEMONSTRATION OF COMPLIANCE WITH FEDERAL 1-HOUR NO2 AND 24-HOUR PM2.5 STANDARDS

Standard	Maximum Predicted Impact (µg/m³)	Maximum Background Concentration (µg/m³)	3 year Average of 98th Percentile of Total Concentration (µg/m³)	NAAQS (µg/m³)
Federal 1-hour NO_2	111 (startup)	154	159	188
Federal 24-hour PM_{10}	2.6 (normal)	45.7	25.9	35

4.4 PSD CUMULATIVE ANALYSIS

The cumulative impact analysis was performed by modeling the sources shown in TABLE 4-27 and TABLE 4-28. Short-term cumulative impacts (averaging times less than one year) were calculated assuming that each of the non-project sources was operating at maximum allowable hourly emission rates, while PPEC sources were all in startup mode (for NOx) or operating at maximum 24-hour emission levels (for PM). Annual cumulative impacts were assessed using annual average emissions for all sources. The stack parameters used for this analysis are also shown in TABLE 4-27 and TABLE 4-28. Impacts were not assessed at receptors where PPEC impacts were previously demonstrated to be less than the federal PSD Significant Impact Levels, because any projected violations of an AAQS at those locations would not be caused, or contributed significantly to, by PPEC.

The federal 1-hour NO_2 standard is met if the 3-year average of the 98th percentile highest daily 1-hour average NO_2 concentration, including background, does not exceed 100 ppb. At standard

temperature and pressure, this limit is equivalent to 188 $\mu g/m^3$. The standard is converted to $\mu g/m^3$ for the analysis because the modeling results are in those units.

The procedure for demonstrating compliance with the NAAQS is to determine the highest 1-hour NO_2 concentration, including background, for each calendar day in the year at every receptor. These concentrations are rank-ordered, highest to lowest, and the 98th percentile value (8th highest concentration for a reasonably complete data set) is selected to represent that year. These values are then averaged over the five years included in the analysis. The resulting average must be less than or equal to the standard. Results of the cumulative impact modeling are shown in TABLE 4-29.

The 5-year average cumulative impact of 179 $\mu g/m^3$ is below the 1-hour NO_2 NAAQS of 188 $\mu g/m^3$. Compliance with the annual NO_2 NAAQS is demonstrated by comparing the highest annual cumulative impact with the standard, which is not to be exceeded. The cumulative impact of 38 $\mu g/m^3$ is below the annual NO_2 state NAAQS of 53 ppb (100 $\mu g/m^3$). The federal 24-hour $PM_{2.5}$ standard is met if the 3-year average of the 98th percentile daily 24-hour average $PM_{2.5}$ concentration, including background, does not exceed 35 µg/m3.

The procedure for demonstrating compliance with the NAAQS is to determine the 24-hour $PM_{2.5}$ concentration, including background, for each calendar day in the year at every receptor. These concentrations are rank-ordered, highest to lowest, and the 98th percentile value (8th highest concentration for a reasonably complete data set) is selected to represent that year. These values are then averaged over the five years included in the analysis. The resulting average must be less than or equal to 35 µg/m3. The cumulative impact of 29.9 $\mu g/m^3$ is below the 24-hour average $PM_{2.5}$ NAAQS of 35 $\mu g/m^3$.

Compliance with the annual $PM_{2.5}$ NAAQS is demonstrated by comparing the highest annual cumulative impact with the standard, which is not to be exceeded. The cumulative impact of 14.4 $\mu g/m^3$ is below the annual $PM_{2.5}$ NAAQS of 15 $\mu g/m^3$.

Compliance with the 24-hour PM_{10} NAAQS is demonstrated by comparing the second highest annual cumulative impact with the standard, which is not to be exceeded. The cumulative impact of 64 $\mu g/m^3$ is below the 24-hour PM_{10} NAAQS of 150 $\mu g/m^3$.

Modeling files in electronic format are being submitted as part of this application.

TABLE 4-27
STACK PARAMETERS FOR CUMULATIVE IMPACT MODELING (SHORT AVERAGING TIME)

Emission Rates and Stack Parameters for Cumulative Impact Modeling (Maximum Normal Operating Emissions)
Pio Pico Energy Center

Facility/Source	Stack Height feet	Stack Diam feet	Stack Flow wacfm	Stack Vel ft/sec	Stack Temp deg F	Stack Height meters	Stack Diam meters	Stack Flow m3/sec	Stack Vel m/sec	Stack Temp deg K	Emission Rates, lb/hr NO_X	Emission Rates, lb/hr $PM_{2.5}$	Emission Rates, g/s NO_X	Emission Rates, g/s $PM_{2.5}$
PPEC														
Turbine 1	100	14.5	645,580	65.16	820	30.48	4.42	304.72	19.86	711.2	26.63	5.5	2.26	0.69
Turbine 2	100	14.5	645,580	65.16	820	30.48	4.42	304.72	19.86	711.2	26.63	5.5	2.26	0.69
Turbine 3	100	14.5	645,580	65.16	802	30.48	4.42	304.72	19.86	711.2	26.63	5.5	2.26	0.69
Cooling System	22	13	268,650 (per cell)	33.7	86	6.71	3.96	126.79 (per cell)	10.28	303.0	0	0,055 (per cell)	0	0.0069 (per cell)
Pacific Recovery														
Landfill Engine 1	16	1.5	6,410	60.50	894	4.88	0.46	3.03	18.44	752.04	4.1	1.1	0.52	0.14
Landfill Engine 2	16	1.5	6,410	60.50	894	4.88	0.46	3.03	18.44	752.04	3.3	1.1	0.42	0.14
Landfill Engine 3	18	1.5	17,588	166.00	900	5.49	0.46	8.30	50.60	755.37	2.1	1.1	0.26	0.14
Landfill Engine 4	18	1.5	17,588	166.00	900	5.49	0.46	8.30	50.60	755.37	3.3	1.1	0.42	0.14
Calpeak Border														
Unit 1	50	12	786,547	115.91	700	15.24	3.66	371.21	35.33	644.26	7.20	3.3	0.91	0.42
Larkspur 1 and 2														
Larkspur 1	60	12	599,868	88.40	850	18.29	3.66	283.11	26.94	727.59	8.40	4.07	1.06	0.51
Larkspur 2	60	12	599,868	88.40	850	18.29	3.66	283.11	26.94	727.59	8.40	4.07	1.06	0.51
Otay Mesa														
Turbine 1	160	18.5	1,019,118	63.19	178	48.77	5.64	480.97	19.26	354.10	15.95	11.5	2.01	1.45
Turbine 2	160	18.5	1,019,118	63.19	178	48.77	5.64	480.97	19.26	354.10	15.95	11.5	2.01	1.45
Donovan Detention Center														
Solar Turbine	30.5	3.33	56,400	107.93	400	9.30	1.01	26.62	32.90	477.59	4.07		2.071	0.51

TABLE 4-28
STACK PARAMETERS FOR CUMULATIVE IMPACT MODELING (ANNUAL AVERAGING TIME)

Emission Rates and Stack Parameters for Cumulative Impact Modeling (Annual Average Operating Emissions)
Pio Pico Energy Center

Facility/Source	Stack height feet	Stack Diam feet	Stack flow wacfm	Stack Vel ft/sec	Stack Temp deg F	Stack Height meters	Stack Diam meters	Stack flow m3/sec	Stack Vel m/sec	Stack Temp deg K	Emission Rates, lb/hr NOx	Emission Rates, lb/hr $PM_{2.5}$	Emission Rates, g/s NOx	Emission Rates, g/s $PM_{2.5}$
PPEC														
Turbine 1	100	14.5	645,580	65.16	802	30.48	4.42	304.72	19.86	711.2	5.36	2.72	0.675	0.343
Turbine 2	100	14.5	645,580	65.16	802	30.48	4.42	304.72	19.86	711.2	5.36	2.72	0.675	0.343
Turbine 3	100	14.5	645,580	65.16	802	30.48	4.42	304.72	19.86	711.2	5.36	2.72	0.675	0.343
Cooling System	22	13	268,650 (per cell)	33.7	86	6.71	3.96	126.79 (per cell)	10.28	303.0	0	0,027 (per cell)	0	0.0034 (per cell)
0Pacific Recovery														
Landfill Engine 1	16	1.5	6,410	60.50	894	4.88	0.46	3.03	18.44	752.04	3.0	0.8	0.38	0.10
Landfill Engine 2	16	1.5	6,410	60.50	894	4.88	0.46	3.03	18.44	752.04	2.5	0.8	0.31	0.10
Landfill Engine 3	18	1.5	17,588	166.00	900	5.49	0.46	8.30	50.60	755.37	1.8	0.9	0.23	0.12
Landfill Engine 4	18	1.5	17,588	166.00	900	5.49	0.46	8.30	50.60	755.37	2.9	1.0	0.36	0.12
Calpeak Border														
Unit 1	50	12	786,547	115.91	700	15.24	3.66	371.21	35.33	644.26	7.21	3.3	0.91	0.42
Larspur 1 and 2														
Larkspur 1	60	12	599,868	88.40	850	18.29	3.66	283.11	26.94	727.59	5.71	2.766	0.72	0.35
Larkspur 2	60	12	599,868	88.40	850	18.29	3.66	283.11	26.94	727.59	5.71	2.766	0.72	0.35
Otay Mesa														
Turbine 1	160	18.5	1,019,118	63.19	178	48.77	5.64	480.97	19.26	354.10	11.42	8.23	1.44	1.04
Turbine 2	160	18.5	1,019,118	63.19	178	48.77	5.64	480.97	19.26	354.10	11.42	8.23	1.44	1.04
Donovan Detention Center														
Solar Turbine	30.5	3.33	56,400	107.93	400	9.30	1.01	26.62	32.90	477.59	4.07		2.071	0.51

TABLE 4-29
RESULTS OF COMPLIANCE DEMONSTRATION (CUMULATIVE IMPACT)[1]

Pollutant	Standard	Maximum Cumulative Impact (µg/m³)	5 year Average of 98th Percentile of Total Concentration (µg/m³)	NAAQS (µg/m³)
NO_2	1-hr		179	188
NO_2	annual	38		100
$PM_{2.5}$	24-hr		27.7	35
$PM_{2.5}$	annual	14.4		15
PM_{10}	24-hr	64		150

Note 1: Cumulative impact for annual standards is based on maximum permitted annual emissions from all sources. Cumulative impact for other standards includes PPEC sources in startup mode and the following sources operating at maximum allowable hourly emissions: Larkspur Energy Facility, Pacific Recovery, Otay Mesa Generating Company, CalPeak Border, Donovan Detention Facility.

4.5 CONSISTENCY WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

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

4.5.1 Consistency with Federal Requirements

4.5.1.1 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. Effective July 1, 2011, PSD will also apply to a new stationary source that emits more than 100,000 TPY of greenhouse gases (GHGs). Because the GHG emissions for the proposed project are above the PSD major source threshold of 100,000 TPY, the proposed project is subject to PSD review. TABLE 4-30 shows the pollutants that trigger PSD review.

TABLE 4-30
PSD SIGNIFICANT EMISSION THRESHOLDS

Pollutant	PSD Significant Emission Threshold (TPY)[1]	Project Emissions (TPY)	Significant? (Y/N)
SO_2	40	4.1	N
PM_{10}	15	37.2	Y
$PM_{2.5}$	10	37.2	Y
NO_2	40	70.4	Y
CO	100	96.4	N
GHGs	75,000	685,000	Y
Lead	0.6	0.0	N

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

4.5.1.2 Nonattainment New Source Review

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

4.5.1.3 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 2.5 ppmc NOx (equivalent to approximately 0.077 lbs NOx/MW-hr) and 1.9 lbs/hr SO_2 (equivalent to approximately 0.019 lbs SOx/MW-hr) proposed for this project are well below the Subpart KKKK limits, as shown in TABLE 4-31.

TABLE 4-31
COMPLIANCE WITH 40 CFR 60 SUBPART KKKK

Pollutant	Proposed Permit Limits			Subpart KKKK Limit, lb/MW-hr
	ppmc	lb/hr	lb/MW-hr (max)	
SO_2	0.42	1.9	0.019	0.58
NO_2	2.5	8.2	0.077	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.

4.5.1.4 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 the NESHAP for combustion turbines, which limits formaldehyde emissions from turbines, is potentially applicable to the proposed project. However, as shown in TABLE 4-21, the HAPs emissions for the proposed project are below the NESHAP major source thresholds of 10 TPY of any single HAP or 25 TPY of all HAPS. Therefore, this NESHAP is not applicable to the proposed project and NESHAP requirements will not be addressed further.

4.5.1.5 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. SDAPCD has received delegation authority to implement Title IV. PPEC will comply with the acid rain program requirements and will file an acid rain permit application in accordance with the deadlines in SDAPCD Regulation 14.

4.5.1.6 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. SDAPCD has received delegation authority for this program. PPEC will comply with the requirements of Title V by filing a Title V permit application in accordance with the deadlines in SDAPCD Regulation 14.

4.5.2 Consistency with State Requirements

As discussed in Section 4.3.2, state law set up 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 SDAPCD; therefore, compliance with SDAPCD regulations will assure compliance with state air quality requirements.

The PPEC CO_2 emission rate of 0.477 MT/MWh would meet the Emission Performance Standard of 0.51 MT/MWh. However, as a simple-cycle power plant, PPEC is not designed or intended for base load generation. The EPS only applies to procurements which entail an annualized capacity factor in excess of 60%. With an expected operating limit on PPEC that is the equivalent of 4000 full-load hours per year, PPEC's annualized capacity factor will be less than 50%. Therefore, the SB 1368 limitation does not apply to this facility.

4.5.3 Consistency with Local Requirements

The SDAPCD has been delegated responsibility for implementing local, state, and federal air quality regulations in the San Diego 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. The following sections include the evaluation of facility compliance with applicable District requirements.

4.5.3.1 New Source Review Requirements

The SDAPCD's New Source Review (NSR) rule (Regulation II, Rule 20.3 NSR – Major Stationary Sources & PSD Stationary Sources) 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.

BACT

A comparison of potential emissions with the BACT thresholds in SDAPCD Rule 20.3 is presented in TABLE 4-32. 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 cooling tower are below the BACT threshold in the District's NSR rule; however, under federal PSD rules BACT must be evaluated for emissions from the cooling tower.

TABLE 4-32
APPLICABILITY OF BACT REQUIREMENTS UNDER NSR

Pollutant	BACT Threshold, lb/day	Unit Emissions, lb/day	BACT Required?
Gas Turbines, *each*			
NOx	10	288.1	yes
VOC	10	85.9	yes
SO_2	10	45.6	yes
PM_{10}	10	132.0	yes
Cooling Tower			
PM_{10}	10	9.4	no

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 1E. A summary of the proposed BACT is provided in TABLE 4-33.

TABLE 4-33
SUMMARY OF PROPOSED BACT

Pollutant	Control Technology	Concentration
NOx	Water injection and SCR and non-use of carbon control and capture system (CCS)	2.5 ppmvd @ 15% O_2 (1-hr avg)
CO	Catalytic Oxidation	4.0 ppmvd @ 15% O_2 (1-hr avg)
VOC	Good combustion practices	2.0 ppmvd @ 15% O_2 (1-hr avg)
SO_2	Pipeline Natural Gas	NA
$PM_{10}/PM_{2.5}$, gas turbines	Pipeline Natural Gas	NA
$PM_{10}/PM_{2.5}$, cooling tower	High-efficiency drift eliminator	NA
GHGs	Efficient simple-cycle gas turbine	NA

Offsets

SDAPCD Rule 20.3(d)(5) requires that projects with emissions of any federal nonattainment criteria pollutant or its precursors, which exceed major source thresholds (50 tons per year (TPY) of NOx or VOC), be offset with actual emission reductions. The District is a federal nonattainment area only for ozone. Based on emissions data presented in Section 4.3.4, Operational Emissions, annual emissions of NOx from PPEC would exceed the District's offset trigger of 50 TPY. According to Rule 20.3, NOx offsets need to be provided at a ratio of 1.2:1.

The actual mix of emission reduction credits (ERCs) and/or emission reduction projects that will be used to offset proposed project emissions will be determined based on availability and market conditions. The primary option is to purchase ERCs. SDAPCD regulations allow the use of interpollutant offsets in situations where one pollutant is a precursor to another or when two pollutants are both precursors to another nonattainment pollutant. For example, because NOx and VOC both contribute to the formation of ozone, VOC ERCs could be used to offset some of the proposed project's NOx emissions. PPEC will purchase ERCs sufficient to comply with SDAPCD requirements.

4.5.3.2 Air Quality Impact Analysis

Under the SDACPD 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 4.3.5 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.

4.5.3.3 New Source Review Requirements for Air Toxics

The SDAPCD's New Source Review (NSR) rule for air toxics (Regulation XII, Rule 1200 (Toxic Air Contaminants - New Source Review) 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. PPEC will comply with the requirements of this rule. An air toxics health risk assessment consistent with SDAPCD requirements under Rule 1200 was prepared.

4.5.3.4 New Source Performance Standards

The SDAPCD'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.

4.5.3.5 Federal Programs and Permits

The federal Title IV acid rain program requirement and Title V operational permit requirements are in SDAPCD's Rule 1412 (Federal Acid Rain Program Requirements) and Regulation XIV Rule 1401/1410. The applicability and requirements of and compliance with these programs and permits are discussed above under the federal regulations section.

4.5.3.6 Public Notification

Because the proposed PPEC project emissions will exceed the AQIA trigger levels, public notice under Rule 20.3 is required and the project expects the SDAPCD Air Pollution Control Officer will provide this notice in a timely manner.

4.5.3.7 Permit Fees

The SDAPCD 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. PPEC will pay the applicable fees in accordance with these requirements.

4.5.3.8 Prohibitions

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

- Rule 50 – Visible Emissions: This rule prohibits any source from discharging any emissions of any air contaminant that is darker in shade than that designated as Number 1 on the Ringelmann Chart for a period or periods aggregating more than 3 minutes in any period of 60 consecutive minutes. The PPEC project use of natural gas would eliminate the possibility of a dark visible emissions. Therefore, the PPEC project is expected to comply with this requirement.

- Rule 51 – 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. The PPEC project would not emit odorous pollutants, and the screening level health risk assessment demonstrates that the potential health risk from the emissions are less than significant.

- Rule 52 – Particulate Matter Emission Standards: This rule does not apply to stationary internal combustion engines. Rule 53 addresses particulate emissions from such sources.

- Rule 53 – Specific Air Contaminants: This rule sets the following limits for combustion sources:

    - Sulfur compounds, calculated as SO_2: 0.05% by volume on a dry basis
    - Particulates: 0.10 grains/dscf @ 12% CO_2.

The SOx concentration in the turbine exhaust will be less than 0.42 ppm (see TABLE 4-31), or 0.000042 %, which complies with the limit in the rule.

Particulate emissions from each turbine will be less than 5.5 lb/hr. At low loads, the turbine flow rate will be 236,320 dscfm @ 3.92% CO_2 (see Table 1C.1). The particulate concentration will be 0.0027 grains/dscf[7] @ 3.92% CO_2, or 0.0083 grains/dscf[8] @ 12% CO_2, which complies with the limit in the rule.

- Rule 55 – Fugitive Dust Control: This rule requires control of dust emissions during construction activities. It prohibits visible dust emissions beyond the property line for periods aggregating more than 3 minutes in any 60-minute period, and minimization and daily removal of roadway dust. Project measures to minimize fugitive dust emissions from construction activities are described in Appendix 1B. These measures include sweeping paved roadways twice daily, as well as other dust minimization measures that will assure compliance.

- Rule 62 – Sulfur Content of Fuels: This rule prohibits any stationary source from using any gaseous fuel containing more than 10 grains of sulfur compounds per 100 cubic feet of dry gaseous fuel. The proposed PPEC project will have a range of 0.25 (long term) to 0.75 (short term) grains per 100 cubic feet of dry gaseous fuel, both of which are much less than the limit under this rule.

- Rule 69.3 – Stationary Gas Turbines Engines: Reasonable Available Control Technology: This rule limits NOx emissions from a gas turbine to 42 ppmv @15% O_2. The limit does not apply during a startup or shutdown period that does not exceed 120 minutes. The project's proposed NOx limit of 2.5 ppm will comply with the rule.

- Rule 69.3.1 – Stationary Gas Turbines Engines: Reasonable Available Retrofit Control Technology: This rule limits NOx emissions from a gas turbine larger than 10 MW to 9 x E/25 ppm @ 15% O_2, where E is the unit's thermal efficiency. The project's heat rate is 8,694 Btu (HHV) per kw-hr, which is a thermal efficiency of 39.3%. The allowable NOx limit under this rule is therefore 14.1 ppm @ 15% O_2. The project's proposed NOx limit of 2.5 ppm will comply with the rule.

- Rule 1200 – Toxic Air Contaminants: This rule requires preparation of a health risk assessment, and demonstration that the project will not result in unacceptable health risks (cancer risk > 10 in a million, chronic health index > 1, acute health index > 1). The project will comply with these limits. Regulation XIV – Title V Operating Permits: This regulation implements the Title V federal operating permit program discussed above under Federal LORS. An application for a Title V permit will be submitted within 12 months of start of facility operation.

[7] (5.5 lb/hr) / (236,320 dscfm) *(7,000 grains / lb) * (1 hr/60 min) = 0.0027 grains/dscf

[8] The stack oxygen content for the low load case is 14.1%. Adjusting for a CO_2 content of 12% is equivalent to adjusting for stoichiometric combustion, or a stack O_2 concentration of 0%. The equation for calculating that adjustment is as follows: 0.0027 gr/dscf * (20.9 – 0)/(20.9 – 14.1) = 0.0083 grains/dscf @12% CO2.

4.6 CLASS I AREA IMPACT ANALYSIS

Class I areas are areas of special national or regional natural, scenic, recreational, or historic value for which the PSD regulations provide special protection. If a proposed major source or major modification may affect a Class I area, the federal PSD regulations require the reviewing authority to provide written notification of any such proposed source to the Federal Land Managers (FLM) (and the USDI and USDA officials delegated permit review responsibility). The meaning of the term "may affect" is interpreted by EPA policy to include all major sources or major modifications which propose to locate within 100 kilometers (km) of a Class I area.

The two nearest Class I areas are listed below, with only one being within 100 km of the project site.

- Agua Tibia Wilderness (91 km)
- San Jacinto Wilderness (122 km)

The impact analysis presented below is different than the analysis proposed in the modeling protocol submitted for this project (see Appendix 1H). The guidance that forms the basis for the analysis below is more recent than the guidance upon which the protocol was based, and therefore better reflects current standards of review.

The Federal Land Managers' Air Quality Related Values (AQRV) Work Group (FLAG) has published guidance for a screening approach to determine whether a more refined Class I Air Quality Impact Analysis is required.[9] This screening approach, which applies to projects located more than 50 km from a Class I area, requires adding all of the visibility-related emissions (SO_2, NOx, PM_{10}, and sulfuric acid mist) from a project (in units of tons per year)[10] and dividing the sum by the distance between the project and the Class I area. If the result is less than 10, the project is presumed to have no adverse impact.

TABLE 4-34 shows that the project's emissions are well below the FLAG screening criteria. As indicated previously, all Class I areas are more than 50 km from the project site. No further Class I impact analysis is required.

[9] U.S Forest Service et. al., "Federal Land Managers' Air Quality Related Values Work Group (FLAG), Phase I Report—Revised (2010)," October 2010, p. 18

[10] Emissions (in tons per year) are equal to the maximum daily emissions (lb/day) * 365 days/2000 lb/ton.

TABLE 4-34
CLASS I AIR QUALITY IMPACT SCREENING ANALYSIS

Pollutant	PPEC Emissions (max 24-hours, lb/day)	PPEC Emissions[a] (max 24-hours, TPY)	Q/D Screening Threshold[b]	Class I Analysis Required?
SO_2	136.8	25.0	--	--
PM_{10}	411.8	75.2	--	--
NOx	864.3	157.7	--	--
Sulfuric Acid Mist	0	0	--	--
Total	--	257.9	--	--
Distance, km	--	91	--	--
Q/D	--	2.8	10	**NO**

[a] TPY = max daily emissions (lb/day) *365/2000

[b] U.S Forest Service et. al., "Federal Land Managers' Air Quality Related Values Work Group (FLAG), Phase I Report—Revised (2010)," October 2010, p. 18-19

4.7 CLASS II VISIBILITY IMPAIRMENT ANALYSIS

The Class II Visibility Impairment Analysis is distinct from the Class I visibility analysis. The goal of the analysis is to determine the degree to which the PSD project will impair visibility in sensitive areas such as state parks, wilderness areas, scenic sites, and overlooks.

As proposed in the Modeling Protocol for this project (see Appendix 1H), a Class II Visibility Impairment Analysis was performed for this project; however, the methodology proposed in the modeling protocol was updated to reflect the procedure recently recommended by the Federal Land Managers' Air Quality Related Values Work Group (FLAG).[11] The methodology and the results are presented below.

4.7.1 Methodology

In general, the Class II Visibility Analysis methodology follows the methodology for a Class I Visibility Analysis. The procedure is divided into two parts, reflecting very different procedures for near-field analysis (where plumes or layers are compared against a viewing background) and far-field analysis (where distant plumes affect the general appearance of a scene.

4.7.1.1 Distant/multi-source visibility impacts

The first step in evaluating distant visibility impacts is an initial screening step. This step is identical to the Class I screening analysis presented in Section 3. If the ratio Q/D of emissions to distance is less than 10 when D = 50 km, then no further analysis is required for receptors beyond this distance.

[11] U.S Forest Service et. al., —Federal Land Managers' Air Quality Related Values Work Group (FLAG), Phase I Report—Revised (2010)," October 2010, p. 18-53.

4.7.1.2 Near-field visibility impairment (plume impact)

In this part of the analysis, the potential for the project's plume to affect visibility in Class II areas managed by federal land managers (FLM Class II areas) within 50 km of the project is evaluated. If there are no FLM Class II areas within the study area, then the screening procedure is complete; otherwise, a Visibility Screening Analysis must be conducted.

4.7.2 Visibility Screening Analysis

Screening Level 1

The Level 1 visibility screening analysis is a series of conservative calculations designed to identify those emission sources that have little potential of adversely affecting visibility. The VISCREEN model is used in the Level 1 analysis to model visibility impacts for observers located at each sensitive Class II site for which the FLM screening value is exceeded. Calculated values relating source emissions to visibility impacts are compared to a standardized screening value. Those sources with calculated values greater than the screening criteria are judged to have potential visibility impairments. If potential visibility impairments are identified, then the Level 2 analysis is undertaken.

There are two different types of visibility impacts that may be considered, based on visibility impairment inside or outside the park. The first type is the potential impairment of vistas inside the park. For this, the screening analysis assesses the project's potential to impact the view of one part of the park as seen by an observer elsewhere in the park.

The second type of visibility impact is the potential impairment of vistas outside the park. This screening analysis also assesses the project's potential to impact views of the surrounding area as seen by an observer within the park. Protection of vistas outside of Class I areas is not automatic, and protection of vistas outside of Class II areas is uncommon.

The relevant visibility parameters are ~~"a~~pparent contrast" and ~~"d~~elta E," which can be computed by the screening visibility model VISCREEN. The significance thresholds for these two visibility parameters, used as significance criteria in the Class II screening analysis, are the Class I area thresholds (i.e., 0.05 and 2.00 for apparent contrast and delta E, respectively) increased by the ratio of the PSD Class II PM_{10} increment to the PSD Class I PM_{10} increment (i.e., 30 $\mu g/m^3$ divided by 8 $\mu g/m^3$). As shown in TABLE 4-35, the Class II significance thresholds are an apparent contrast of 0.19 and a delta E of 7.50.[12]

[12] The Class I threshold is the level at which the FLM is likely not to object to the issuance of the PSD permit based on near field visibility impacts to a Class I area. The Class II threshold has been extrapolated from the Class I thresholds using the ratio of Class II PM_{10} increment to Class I PM_{10} increment. A less-stringent threshold for triggering the much more complex Level 2 analysis is justified because (a) there is a distinction between the degrees of protection applicable to Class I and Class II areas; (b) Class I areas can be protected through AQRV analysis, whereas protection of Class II areas can be achieved using BACT requirements; (c) the results of the visibility analysis are for informational, not regulatory, purposes.

TABLE 4-35
VISIBILITY PARAMETER SIGNIFICANCE THRESHOLDS

Visibility Parameter or Criteria Pollutant	Averaging Period/Units	Federal Class I Area PSD Ambient Air Increment	Federal Class II Area PSD Ambient Air Increment	Federal Class I Area Significance Threshold	Federal Class II Area Significance Threshold
Apparent Contrast	1 hour [a]/(-)	NA	NA	0.05[b]	0.19[c]
Delta E	1 hour [a]/(-)	NA	NA	2.00[b]	7.50[c]
PM_{10}	24 hours/ ($\mu g/m^3$)	8[d]	30[d]	Not used	Not used

NA = not applicable

[a] Shortest-period emission rates of visibility-related criteria pollutants used in VISCREEN model. U.S. EPA, *Workbook for Plume Visual Impact Screening and Analysis (Revised),* EPA-454/R-92-023, October 1992.

[b] U.S Forest Service et. al., "Federal Land Managers' Air Quality Related Values Work Group (FLAG), Phase I Report—Revised (2010)," October 2010, p. 21.

[c] Estimated by multiplying the federal Class I area significance threshold for the visibility parameter by the ratio of the 24-hr average federal Class II and Class I area PM_{10} PSD increments.

[d] These maximum allowable increases are found in the Code of Federal Regulations, Title 40, Part 52, Section 52.21(c), *Ambient air increments*.

Screening Level 2

The Level 2 screening procedure is similar to the Level 1 analysis in that its purpose is to estimate impacts during worst-case meteorological conditions; however, more specific information regarding the source, topography, regional visual range, and meteorological conditions is assumed to be available. The analysis may be performed with the aid of hand calculations, reference tables and figures, VISCREEN, or a computer-based visibility model called ~~"~~PLUVUE II."

If the Levels 1 and 2 screening analyses indicate the possibility of visibility impairment, a still more detailed analysis is undertaken in Level 3.

Level 3 Analysis

The Level 3 analysis, no longer a screening analysis, uses the plume visibility model and meteorological and other regional data to provide an accurate description of the magnitude and frequency of occurrence of impact. The procedures for utilizing the plume visibility model are described in the document *User's Manual for the Plume Visibility Model,* which is available from EPA.

4.7.3 Results

4.7.3.1 Distant/multi-source visibility impacts

As shown in TABLE 4-34, Q = 257.9 TPY. At 50 km, Q/D = 5.2. Because Q/D is less than 10 for all receptors 50 km away or further, there are no receptors for which distant/multi-source visibility impacts must be evaluated. No further analysis of distant receptors is required.

4.7.3.2 Near-field visibility impairment (plume impact)

The FLM Class II areas listed in TABLE 4-36 were identified as being wholly or partially located within a 50 km radius of the project, with the minimum distance to the project as indicated. A Level 1 visibility screening analysis was conducted for each of these areas.

TABLE 4-36
FLM CLASS II AREAS WITHIN 50 KM OF PPEC

Site	Distance from Project (km)	FLM Screening Value (tons/km)
Cleveland National Forest	23	11.2
Cabrillo National Monument	33	7.8

Screening Level 1

The methodology used for these analyses was described above. Results of these analyses, using absolute worst-case project emissions, are summarized in TABLE 4-37 and TABLE 4-38. These tables show that, under absolute worst-case project emissions and dispersion conditions, the project's potential visibility impacts inside Class II areas are below the Class I thresholds for significance. Impacts on views outside the Class II areas are below the Class II thresholds for significance, but above the Class I thresholds. Because all project visibility impacts are below the Class II thresholds, and because the vistas outside the parks are unlikely to be subject to the stringent visibility protection standards applicable to Class I areas, no further analysis is required.

TABLE 4-37
PPEC IMPACTS ON VISIBILITY IN CLEVELAND NATIONAL FOREST (WORST CASE)

		Emission	Density	Diameter
Background Ozone:0.04 ppm	Particulate:	2.08 g/s	2.5	1
Background Visual Range: 95 km[b]	NOx:	4.54 g/s		
Source-Observer Distance: 23 km	Primary NO2	0.00 g/s		
Min. Source-Class II Distance: 23 km	Soot	0.00 g/s	2.0	1
Max. Source-Class II Distance: 50 km	Sulfate	0.00 g/s	1.5	4
Stability: 6				
Wind Speed: 1.00 m/s				

Maximum Visual Impacts INSIDE Class II Area [a]

					Delta E		Contrast	
Background	Theta	Azi	Dist	Alpha	Criterion	Plume	Criterion	Plume
Sky	10	145	32.8	24	7.5	1.26	0.19	-0.011
Sky	140	145	32.8	24	7.5	0.902	0.19	-0.006
Terrain	10	159	50	9	7.5	1.184	0.19	0.014
Terrain	140	159	50	9	7.5	0.528	0.19	0.015

Maximum Visual Impacts OUTSIDE Class II Area [a]

					Delta E		Contrast	
Background	Theta	Azi	Dist	Alpha	Criterion	Plume	Criterion	Plume
Sky	10	1	1	168	7.5	2.376	0.19	-0.04
Sky	140	1	1	168	7.5	1.896	0.19	-0.014
Terrain	10	1	1	168	7.5	5.445	0.19	0.069
Terrain	140	1	1	168	7.5	2.438	0.19	0.077

[a] Impacts based on 4 startups and 4 shutdowns of each turbine in a single day, remainder of day at peak operation.
[b] National Park Service, Visibility Monitoring Data, http://www.nature.nps.gov/air/monitoring/vismon.cfm#data (accessed 3/17/2011)

TABLE 4-38
PPEC IMPACTS ON VISIBILITY IN CABRILLO NATIONAL MONUMENT (WORST CASE)

		Emission	Density	Diameter
Background Ozone:0.04 ppm	Particulate:	2.08 g/s	2.5	1
Background Visual Range: 95 km[b]	NOx:	4.54 g/s		
Source-Observer Distance: 23 km	Primary NO2	0.00 g/s		
Min. Source-Class II Distance: 23 km	Soot	0.00 g/s	2.0	1
Max. Source-Class II Distance: 50 km	Sulfate	0.00 g/s	1.5	4
Stability: 6				
Wind Speed: 1.00 m/s				

Maximum Visual Impacts INSIDE Class II Area [a]

					Delta E		Contrast	
Background	Theta	Azi	Dist	Alpha	Criterion	Plume	Criterion	Plume
Sky	10	93	33	75	7.5	0.752	0.19	-0.005
Sky	140	93	33	75	7.5	0.524	0.19	-0.003
Terrain	10	84	32	84	7.5	0.603	0.19	0.004
Terrain	140	84	32	84	7.5	0.234	0.19	0.005

Maximum Visual Impacts OUTSIDE Class II Area [a]

					Delta E		Contrast	
Background	Theta	Azi	Dist	Alpha	Criterion	Plume	Criterion	Plume
Sky	10	0	1	168	7.5	1.75	0.19	-0.028
Sky	140	0	1	168	7.5	1.034	0.19	-0.01
Terrain	10	0	1	168	7.5	3.621	0.19	0.051
Terrain	140	0	1	168	7.5	1.548	0.19	0.055

[a] Impacts based on 4 startups and 4 shutdowns of each turbine in a single day, remainder of day at peak operation.
[b] National Park Service, Visibility Monitoring Data, http://www.nature.nps.gov/air/monitoring/vismon.cfm#data (accessed 3/17/2011)

5. IMPACTS ON SOILS AND VEGETATION

(Section 5.6 of the Application for Certification and Responses to CEC Data Requests)

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5.0 IMPACTS ON SOILS AND VEGETATION

This section demonstrates that and explains how the project's nitrogen emissions are miniscule and will not have any significant adverse environmental effects to federally endangered or threatened species, jeopardize the continued existence or result in the destruction or adverse modification of designated critical habitat for such a species and that, for those reasons, there is no reason or legal basis to require or include a Section 7 consultation under the Endangered Species Act. This is primarily because the maximum possible levels of nitrogen contribution from the project are negligible and are not sufficient to cause an identifiable or statistically significant change in plant growth patterns. In addition, any possible effects of even greater levels of nitrogen deposition in the areas of possible concern have already been eliminated by virtue of agreed-to environmental enhancements provided by an immediately adjacent power plant.

5.0.1 Applicable Legal Authority

The ESA requires federal agencies (i.e., EPA Region 9), to consult with the U.S. Fish and Wildlife Service (FWS), to ensure that agency actions are not likely to jeopardize federally-designated endangered or threatened species, or result in the destruction or adverse modification of critical habitat for such a species. Section 7(a)(2) of the ESA states that each Federal Agency shall, in consultation with FWS, ensure that any action it authorizes, funds, or carries out, is not likely to jeopardize the continued existence of a listed species or result in the destruction of adverse modification of designated critical habitat. In fulfilling these requirements, the use of the best scientific and commercial data shall be provided (USFWS 1998). "Jeopardize the continued existence of" is defined as "to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species" (USFWS 1998). "Destruction or adverse modification of critical habitat" is defined as "a direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species. Such alterations include, but are not limited to, alterations adversely modifying any of those physical or biological features that were the basis for determining the habitat to be critical" (USFWS 1998).

5.0.2 Background

The project's facility placement and design were intended to avoid populations of special-status species within the region. The majority of the study area has been previously disturbed and includes developed areas containing commercial and public infrastructure. Additionally, the industrial park developer graded the project property in first quarter 2011 as described in the 2009-2010 County of San Diego Grading Permit 2700-1555. This soil removal and grading of the property was already planned prior to the inception of this project and occurred regardless of the project. Accordingly, the environmental baseline includes facility placement and design that targets the majority of project impacts towards lands that are adjacent to cleared or disturbed areas and roads. The lands abutting the project's ground disturbance footprint include the Otay Mesa Generating Project (OMGP) and its appurtenances. Any individual species present in the area or in adjacent/surrounding areas are assumed to have acclimated and developed tolerance to substantial noise, light, and other effects resulting from the presence of an active power plant and

its access roads. Botanical and wildlife field studies conducted within the project site did not identify any threatened or endangered plant or wildlife species within the project study area (URS 2010). Construction of the project will be on 9.99 acres of previously developed/disturbed non-native habitat. The hills approximately 1,500 feet east of the project include FWS designated critical habitat for Otay Tarplant, Quino Checkerspot Butterfly, and California Gnatcatcher.

The existing OMGP, which is a baseload power plant of greater power generation (approximately 500 MW) and significantly greater capacity factor (greater than 90 percent equivalent to 8,000 hours per year) is located immediately adjacent to and east of the proposed project. OMGP agreed to provide assurances against any possible nitrogen deposition effects by funding regular inspection for and eradication of non-native weeds in essentially the same nitrogen deposition zone as the proposed project. In contrast, the proposed project will generate 300 MW and operate a maximum of 4,000 hours per year (which is equivalent to a 46 percent capacity factor). As such, the proposed project's contribution to nitrogen deposition will be substantially smaller than OMGP's contribution to the habitat areas located east of the project. This is highly relevant when considering any possible and, by definition, necessarily much smaller incremental effects of the proposed project, since the primary possible impact area has already been provided assurances against any adverse impact by virtue of OMPP's agreed to nitrogen deposition impact elimination activities.

5.0.3 Nitrogen Deposition

Generally speaking, increasing nitrogen deposition onto vegetated areas may increase non-native invasive plant species and alter native vegetation communities, which could negatively affect threatened and endangered species. Atmospheric nitrogen deposition also has the potential to decrease biodiversity and contribute to the loss of critical habitat for endangered species by altering the structure and function of terrestrial ecosystems (Weiss 2006). Nitrogen is often a primary limiting nutrient on overall plant productivity; as a result, an increase of nitrogen in natural communities can result in an abundance of nitrophilous species, which then out-compete native species adapted to the natural environmental conditions. Based on a California-wide study of nitrogen deposition, 5 kg/ha/yr has been used as a benchmark to assess potential effects of nitrogen deposition on plant communities). However, this benchmark does not imply that 5 kg/ha/yr is the critical load for negative impacts for all ecosystems, since some may be more sensitive and some may be less sensitive (Weiss, 2006). This CEC-derived threshold serves as a benchmark for coarse screening of nitrogen deposition on plant communities and it is not a federal regulation related to the ESA.

The regional background deposition without the project is estimated to be 11.56 kg/ha/yr (Tonneson et. al. 2007), which is more than double the threshold for significance in sensitive areas. The peak impact from OMGP, which is located directly east of the project, is roughly 13 kg/ha/yr, compared to the project's contribution of 1.6 kg/ha/yr. The contribution of nitrogen deposition from the project is 2% of the total cumulative regional nitrogen background, averaged over the critical habitat for Otay Tarplant, Quino Checkerspot Butterfly, and California Gnatcatcher, with portions experiencing a 6% increase.

Accordingly, the project will result in a miniscule increase in nitrogen concentrations in the areas surrounding the project, particularly to the east. The potential increase of non-native invasive plant species and the alteration of native vegetation communities are negligible on a regional level compared to the current regional background. The incremental increase in nitrogen emissions from the proposed project will not have significant adverse environmental effects to federally endangered or threatened species, jeopardize the continued existence or result in the destruction or adverse modification of designated critical habitat for such a species.

The project's NOx emissions will also be offset at the District mandated ratio of 1 to 1.2. These NOx offsets were generated from the decommissioning of a power plant located 10 miles west of the project site. Based on the incremental contribution to the local background and the NOx offsets, the project team concluded that NOx emissions will not have a significant adverse impact on endangered species and/or critical habitat. The project Applicant has, nevertheless, agreed to voluntarily contribute funds in support of weeding efforts at an approved research and habitat management area that would include periodic weeding of non-native plants. The proposed funding would be sufficient to pay for weeding of 50 acres once every four years for the life of the 20-year project. The project as thus constituted will, therefore, have no significant adverse effects on biological resources. Moreover, the project would not (either individually or cumulatively) cause an impermissible "take" of a protected species under section 9 of the ESA. This is because the definition of "harm" under the regulations implementing the ESA is not met here.

In summary, the information presented in this application, including air quality modeling and nitrogen deposition analysis, is sufficient to support a determination that the project will not have significant adverse environmental effects to federally endangered or threatened species, jeopardize the continued existence or result in the destruction or adverse modification of critical habitat for such a species. Furthermore, with the NOx emission offsets and voluntary habitat weeding, the project will compensate for all inconsequential direct, indirect, and cumulative adverse impacts from the project on biological resources to levels that are not significant.

5.0.4 Other Impacts

For most types of soils and vegetation, ambient concentrations of criteria pollutants below the secondary NAAQS will not result in harmful effects because the secondary NAAQS are set to protect public welfare, including animals, plants, soils, and materials. Section 5.6, Biological Resources of the AFC, provides a discussion of the Facility's potential impacts on soils and vegetation.

EPA provided guidance[1] in 1980 to determine if maximum modeled ground-level concentrations of project-emitted criteria pollutants NO_2, SO_2, and CO could have an impact on plants, soils, and animals. As shown in Table 5-1, the maximum modeled concentrations from the Project are well below the thresholds.

[1] USEPA. *A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals," EPA 450/2-81-078, December 1980.*

TABLE 5-1
PROJECT MAXIMUM CONCENTRATIONS AND EPA GUIDANCE LEVELS

Criteria Pollutant and Guidance [a] Averaging Time	EPA Screening Concentration (µg/m^3)	Modeled Maximum Concentrations [b] (µg/m^3)	Averaging time
SO_2 1-Hour	917	6	1 hour
SO_2 3-Hour	786	3	3 hour
SO_2 Annual	18	<0.1	Annual
NO_2 4-Hours	3,760	111	1 hour
NO_2 1-Month	564	111	1 hour
NO_2 Annual	94	0.3	Annual
CO Weekly	1,800,000	52	8 hour

[a] "A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals," EPA 450/2-81-078, December 1980.
[b] Table 4-22.

(The rest of this section is taken from Section 5.6 of the Application for Certification and responses to CEC Data Requests)

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5.6 BIOLOGICAL RESOURCES

The Pio Pico Energy Center Project (PPEC) is a proposed facility to be located within an unincorporated area south of the City of San Diego, California (see Figure 3.1-1, Regional Location). For the purposes of this section, the proposed PPEC project will be hereafter referred to as the "project." The project occurs within the San Bernardino Merdian, Section 30, Township 18 South, and Range 1 East of the Otay Mesa United States Geological Survey (USGS) 7.5-Minute Topographic Quadrangle Map (USGS, 1975). For the purposes of this evaluation, the project's "study area" is defined as the physical ground disturbance footprint (i.e., generating facility site, construction laydown area, transmission line pole locales, gas line, etc.) plus a 1,000-foot buffer (Figure 5.6-1). Facility placement and design were intended to avoid populations of special-status species within the region. The final design will also minimize impacts to wildlife connectivity and movement to avoid resource conflicts and permitting delays to the maximum extent practicable. Additionally, the industrial park developer grade the property in first quarter 2011 as described in the 2009-2010 County of San Diego Grading Permit 2700-1555. This planned soil removal and grading of the property was already planned for prior to the inception of this project and will occur regardless of the submittal of this Application for Certification (AFC) or its eventual approval. Site elevation for the purposes of this project will be approximately 635 feet above mean sea level (msl). This will establish the baseline conditions that this AFC is founded upon. The baseline site topography is shown on Figure 3.4-2, Baseline Site Topography.

This section of the AFC is intended to assess the impacts of the project on biological resources[1] and special-status species[2] and their habitats, as well as special aquatic resource areas[3]. The information contained in this section will only include summarized technical data, maps, and similar relevant information sufficient to allow assessment of any significant environmental consequences of the proposed project by reviewing agencies and members of the public. Furthermore, where the potential for significant impacts are identified, measures are presented to avoid, minimize, and mitigate impacts.

The botanical field studies have identified that no special-status plant species are found within the project study area.

The wildlife field studies identified the following special-status wildlife species have potential to occur within the project study area:

- San Diego Fairy Shrimp (*Branchinecta sandiegonensis*); and
- Burrowing Owl (*Athene cincularia*).

[1] For the purposes of this analysis, "biological resources" refers to the plants, wildlife, and habitats that occur, or have the potential to occur, within the Project's study area.

[2] For the purposes of this analysis, "special-status species" refers to any species that has been afforded special protection by federal, state, or local resource agencies (e.g., U.S. Fish and Wildlife Service, California Department of Fish and Game) or resource conservation organizations (e.g., California Native Plant Society). The term "special-status species" excludes those avian species solely identified under Section 10 of the Migratory Bird Treaty Act (MBTA) for federal protection. Nonetheless, MBTA Section 10 protected species are afforded avoidance and minimization measures per state and federal requirements.

[3] For the purposes of this analysis, special aquatic resource areas including vernal pools that are defined as potential: United States Army Corps of Engineers (USACE) jurisdiction pursuant to Section 404 of the Clean Water Act (CWA); Regional Water Quality Control Board (RWQCB) legal authority in accordance with Section 401 of the CWA and as defined within Section 13050(e) et seq. of the California Water Code (CWC) via the Porter-Cologne Water Quality Control Act (Porter-Cologne); and California Department of Fish and Game (CDFG) jurisdiction pursuant to Section 1600 et seq. of the California Fish and Game Code (CFG Code).

5.6.1 Methods

Prior to beginning field surveys, URS Corporation (URS) consulted resource specialists and reviewed available information from resource management plans and relevant documents to determine the locations and types of biological resources that have the potential to exist within and adjacent to the project study area; resources were evaluated within one mile and ten miles of the project pursuant to California Energy Commission's (CEC) evaluation guidelines. The materials reviewed included, but were not limited to, the following:

- County of San Diego, Biological Mitigation Ordinance (1996)
- County of San Diego in Conjunction with the United States Fish and Wildlife Service (USFWS) and California Department of Fish & Game (CDFG). Multiple Species Conservation Program
- USFWS Critical Habitat Mapper and File Data (USFWS, 2010a and 2010b)
- USFWS Carlsbad Field Office Species List for San Diego County
- The California Natural Diversity Database (CDFG, 2010) (See Appendix J-3)
- California Native Plant Society Electronic Inventory (CNPS, 2010)
- Aerial Photographs (Digital Globe 2009)
- Biological Database for California Department of Transportation (Caltrans) State Route (SR)-11 Project (URS, 2005)

Wildlife corridors were also evaluated within the study area. This evaluation included a literature review to identify any previously recognized regional[4] and/or local[5] wildlife corridors or linkages (Ogden Environmental, 1993). To evaluate the arrangement of open space for its usefulness as a wildlife corridor, a group of focal target species was selected as well. The focal species included the larger mammal species: mule deer (*Odocoileus hemionus*), mountain lion (*Felis concolor*), bobcat (*Felis rufus*), and coyote (*Canus latrans*). Detection of sign and/or visual observation of these species were documented during the various field efforts. These data will be analyzed to determine areas of high wildlife use.

Pedestrian-based field surveys were performed as well to assess general and dominant vegetation community types, community sizes, habitat types, and species present within communities. Detailed methods, field survey dates and results for the pedestrian-based field survey are provided in Appendix J-1, Biological Technical Report. In summary, community type descriptions were based on observed dominant vegetation composition based on the criteria and definitions of widely accepted vegetation classification systems (Holland 1986, Sawyer, Keeler-Wolf and Evens 2009). Plants were identified to the lowest taxonomic level sufficient to determine whether the plant species observed were non-native, native, or special-

4Regional corridors link two or more large areas of natural open space and serve to maintain demographic and genetic exchange between wildlife populations residing within these geographically distinct areas (Beier and Loe 1992).

5Local corridors give resident animals access to essential resources (e.g., water, food, cover, or den sites) within a large habitat patch and may also function as secondary connections to the regional corridor system (Beier and Loe 1992).

status. Plants of uncertain identity were subsequently identified from taxonomic keys (Hickman, 1993). Scientific and common species names were recorded according to Hickman (1993). The presence of a wildlife species was based on direct observation, and wildlife signs (e.g., tracks, burrows, nests, scat, or vocalization). Field data compiled for wildlife species included scientific name, common name, and evidence of sign when no direct observations were made. Wildlife of uncertain identity were documented and subsequently identified from specialized field guides and related literature (Burt and Grossenheider, 1980; Halfpenny, 2000; Sibley, 2000; Elbroch, 2003; and Stebbins, 2003).

The study area was also assessed for its potential to support special-status species based on habitat suitability comparisons with reported occupied habitats. The following definitions were utilized to determine the need for subsequent surveys and to assess project-related effects to special-status species:

Absent [A] - Species distribution is restricted by substantive habitat requirements, which do not occur within the project footprint, and no further survey or study is necessary to determine likely presence or absence of this species.

Low [L] - Species distribution is restricted by substantive habitat requirements, which are negligible within the project footprint, and no further survey or study is obligatory to determine likely presence or absence of this species.

Moderate [M] – Species distribution is restricted by substantive habitat requirements, which marginally occur within the Project's foot print, and further survey or study may be necessary to determine likely presence or absence of species.

Habitat Present [HP] - Species distribution is restricted by substantive habitat requirements, which occur within the project footprint, and further survey or study may be necessary to determine likely presence or absence of species.

Present [P] - Species or species sign were observed to be present in the project footprint.

Additionally, suspected special aquatic resource areas were examined and evaluated within the study area using the general methodology set forth in:

- The U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual (Environmental Laboratory, 1987);

- The USACE's Interim Regional Supplement to the USACE Wetland Delineation Manual: Arid West Region Direction on Delineating Arid Streams (Wakeley et al., 2006);

- The USACE's and Environmental Protection Agency's June 2007 issued Clean Water Act (CWA) Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States & Carabell v. United States Guidance Document (USACE, 2007); and

- Those analysis tools detailed in A Field Guide to Lake and Streambed Alteration Agreements Sections 1600-1607 (ESD, 1994).

Detailed field survey methods are provided in the Preliminary Jurisdictional Delineation Report which presents our best effort at estimating jurisdictional boundaries using the most up-to-date regulations, written policies, and guidance from the USACE, Regional Water Quality Control Board (RWQCB), and CDFG. Nonetheless, only the USACE, RWQCB, and CDFG can make a final determination of jurisdictional boundaries for this Project.

As a result of the above-referenced literature reviews, the following focused surveys were determined to be necessary:

- Fairy Shrimp
- Burrowing Owl

5.6.2 Affected Environment

The majority of the study area has been previously disturbed and the region includes developed areas containing commercial and public infrastructure. The project's proposed ground disturbance footprint is relatively flat and insulated from the adjacent drainage and open space by roughly 200 feet. Additionally, the industrial park developer will grade the property in first quarter 2011 as described in the 2009-2010 County of San Diego Grading Permit 2700-1555. This planned soil removal and grading of the property was already planned for prior to the inception of this project and will occur regardless of the submittal of this AFC or its eventual approval. Site elevation for the purposes of this project will be approximately 635 feet above msl. This will establish the baseline conditions that this AFC is founded upon. The baseline site topography is shown on Figure 3.4-2, Baseline Site Topography. Facility placement and design were also intended to avoid special-status species within the region. The final design also will also minimize impacts to wildlife connectivity and movement to avoid resource conflicts and permitting delays. Figures 5.6-2 and 5.6-3 identify biological resources within a one-mile and ten-mile radius of the project, respectively (CNDDB, 2010; CNPS, 2010; and USFWS, 2010).

Vegetation Communities

The project study area includes four vegetation communities/land cover types, which are discussed further below and listed in Table 5.6-1. Figure 5.6-4 depicts the vegetation communities/land cover types observed within the project study area.

TABLE 5.6-1
VEGETATION COMMUNITIES/LAND COVER TYPES OBSERVED WITHIN THE STUDY AREA

Vegetation Community Type	Acres
Non-Native Grassland	425.0
Riparian	5.6
Developed/Disturbed	388.6

Non-Native Grassland

Non-native grassland generally occurs on fine-textured loam or clay soils that are moist or even waterlogged during the winter rainy season and very dry during the summer and fall.

This habitat is a disturbance-related community most often found in old fields or openings in native scrub habitats and is characterized by a dominant cover (greater than 50% cover) of annual grasses and occasionally native and nonnative annual forbs (Holland, 1986). Non-native grasses have replaced native grassland and coastal sage scrub at many localities throughout Southern California.

Riparian

Dominant riparian species within the study area include southern cattail (*Typha domingensis*), tall umbrella sedge (*Cyperus eragrostis*), and arroyo willow (*Salix lasiolepis*). This vegetation is present for most, or all, of the growing season in most years and is dominated by perennial species.

Developed/Disturbed

Developed lands within the study area include roadways, parking lots, vacant lots, residences and other private/public infrastructure with ornamental plantings. Species composition in developed communities within the study area varied and dominated by non-native cultivar species.

Disturbed or ruderal vegetation typically develops on sites with heavily compacted soils following intense levels of disturbance, such as grading, agriculture, off-road activities, or previous development. Disturbed areas are dominated by broad-leaf herbaceous species such as mustards (*Brassica* spp., *Hirshfeldia incana*), horseweed (*Conyza canadensis*), and thistles (*Centaurea* spp., *Silybum* spp., *Carduus* spp., etc.) and often have a subdominant cover (less than 50% cover) of annual non-native grasses.

Plant species observed within the project study area are identified in Table 5.6-2. Plant species observed within the study area are common to urban habitats and undeveloped natural areas.

TABLE 5.6-2
OBSERVED PLANT SPECIES

SCIENTIFIC NAME	COMMON NAME
FLOWERING PLANTS	
MONOCOTS	
Arecaceae	Palm Family
Washingtonia sp.	Fan palm
Cyperaceae	Sedge Family
Cyperus eragrostis	Tall umbrella-sedge
Poaceae	Grass Family
Avena barbata *	Slender wild oat
Avena fatua *	Wild oat
Bromus diandrus * †	Ripgut brome
Bromus hordeaceus *	Soft chess
*Bromus japonicus**	Japanese broom
Bromus madritensis *	Foxtail chess
Bromus sp.* †	Brome grass
Cynodon dactylon *	Bermuda grass
Elymus condensatus	Giant wildrye
Lolium multiflorum *	Italian wild rye
Piptatherum miliaceum	Smilo grass
Polypogon monspeliensis *	Annual beard grass
Typhaceae	Cattail Family
Typha domingensis	Southern cattail
DICOTS	
Aizoaceae	Fig-Marigold Family
Carpobrotus edulis	Iceplant
Anacardiaceae	Sumac Family
Rhus ovata	Sugar bush
Schinus molle *	Pepper tree
Apiaceae	Carrot Family
Foeniculum vulgare *	Sweet fennel
Apocynaceae	Dogbane Family
Nerium oleander	Oleander
Asteraceae	Aster Family
Ambrosia psilostachya	Ragweed
Artemisia californica	California sagebrush
Artemisia douglasiana	Mugwort
Baccharis pilularis	Coyote brush
Baccharis salicifolia	Mule fat
Conyza canadensis	Common horseweed
Encilia californica	California encilia
Heterotheca grandiflora	Telegraph weed
Isocoma menziesii var. *menziesii*	Goldenbush
Iva hayesiana **	San Diego marsh elder
Lactuca serriola *	Prickly lettuce
Picris echioides *	Bristly ox-tongue
Sonchus asper *	Prickly sow thistle
Sonchus oleraceus *	Sow thistle
Stephanomeria exigua	Wreath-plant
Brassicaceae	Mustard Family
Brassica nigra *	Black mustard
Hirschfeldia incana *	Shortpod mustard

SCIENTIFIC NAME	COMMON NAME
Cactaceae	Cactus Family
Cylindropuntia sp.	Cholla
Opuntia littoralis	Coastal prickly pear
Chenopodiaceae	Goosefoot Family
Atriplex semibaccata *	Australian saltbush
Salsola tragus *	Russian thistle
Convolvulaceae	Morning Glory Family
*Convolvulus arvensis**	Bindweed
Euphorbiaceae	Spurge Family
Chamaesyce polycarpa	Small seeded spurge
Eremocarpus setigerus	Doveweed
Ricinus communis *	Castor bean
Fabaceae	Pea Family
Melilotus alba *	White sweetclover
Trifolium repens *	White clover
Geraniaceae	Geranium Family
Erodium botrys *	Longbeak stork's bill
Erodium cicutarium *	Redstem stork's bill
Lamiaceae	Mint Family
Marrubium vulgare *	Common horehound
Malvaceae	Mallow Family
Malva parviflora *	Cheeseweed
Myrtaceae	Myrtle Family
Eucalyptus sp. *	Eucalyptus tree
Onagraceae	Evening Primrose Family
Oenothera elata	Hooker's evening primrose
Polygonaceae	Buckwheat Family
Rumex crispus *	Curly dock
Primulaceae	Primrose Family
Anagallis arvensis *	Scarlet pimpernel
Rosaceae	Rose Family
Heteromeles arbutifolia	Toyon
Salicaceae	Willow Family
Salix exigua	Sandbar willow
Salix lasiolepis	Arroyo willow
Solanaceae	Nightshade Family
Nicotiana glauca *	Tree tobacco
Tamaricaceae	Tamarisk Family
Tamarix ramosissima	Mediterranean tamarisk
Urticaceae	Nettle Family
Urtica dioica	Stinging nettle
Verbenaceae	Verbena Family
Lantana sp.*	Lantana

* Non-native (California Invasive Plant Council, 2006),

Wildlife

The study area provides habitat for a diversity of wildlife species; species observed within the project study area are listed in Table 5.6-3.

TABLE 5.6-3
OBSERVED WILDLIFE SPECIES

Scientific Name	Common Name
REPTILES	
PHRYNOSOMATIDAE	SPINY LIZARDS
Sceloperous occidentalis	Western fence lizard
BIRDS	
ACCIPITRIDAE	HAWKS, KITES, AND EAGLES
Buteo jamaicensis	Red-tailed Hawk
ARDEIDAE	HERONS AND EGRETS
Ardea alba	Great Egret
COLUMBIDAE	PIGEONS AND DOVES
Zenaida mcroura	Mourning Dove
FALCONIDAE	FALCONS
Falco sparverius	American Kestrel
ICTERIDAE	NEW WORLD BLACKBIRDS AND ORIOLES
Sturnella neglecta	Western Meadowlark
POLIOPTILIDAE	GNATCATCHERS
Polioptila caerulea	Blue gray Gnatcatcher
TROCHILIDAE	HUMMINGBIRDS
Calypte anna	Anna's Hummingbird
TYRANNIDAE	TYRANT FLYCATCHERS
Sayornis nigricans	Black Phoebe
Tyrannus vociferans	Cassin's Kingbird
TYTONIDAE	BARN OWLS
Tyto alba	Barn Owl
MIMIDAE	MOCKINGBIRDS AND THRASHERS
Mimus polyglottos	Northern Mockingbird
CORVIDAE	JAYS AND CROWS
Corvus brachyrhynchos	American Crow
Corvus corax	Common Raven
EMBERIZIDAE	AMERICAN SPARROWS
Zonotrichia leucophrys	White-crowned Sparrow
FRINGILLIDAE	FINCHES
Carpodacus mexicanus	House Finch
MAMMALS	
CANIDAE	FOXES, DOGS, WOLVES, AND COYOTES
Canis familiaris	Domestic Dog (sign)
Canis latrans	Coyote (sign)
LEPORIDAE	RABBITS AND HARES
Sylvilagus sp.	cottontail (sign)
SCIURIDAE	SQUIRRELS
Otospermophilus beecheyi	California ground squirrel (sign)

Special-Status Plants

Thirty-nine (39) special status plant species are reported to occur within the USGS Otay Mesa 7.5-minute Quadrangle Map that includes the project footprint (Table 5.6-4). Eight of the listed plants are considered endangered or threatened plant species. All 39 listed species were determined to have an "Absent" or "Low" potential for occurrence within the project disturbance footprint, and no further survey or study is necessary to determine presence or absence of these species.

TABLE 5.6-4
SPECIAL-STATUS PLANTS AND THEIR POTENTIAL FOR OCCURRENCE WITHIN THE PROJECT FOOTPRINT

SCIENTIFIC AND COMMON NAME	HABITAT AND DISTRIBUTION	BLOOMING PERIOD	STATUS DESIGNATION	POTENTIAL FOR OCCURRENCE
Acanthomintha ilicifolia San Diego thorn-mint	Annual herb. Found in chaparral, coastal scrub, valley and foothill grassland, and vernal pools/clay soils. Occurs from 33 to 3,150 ft. in elevation.	Apr-Jun	Fed: THR CA: END CNPS: List 1B.1 Local: NE	Low
Adolphia californica California adolphia	Deciduous shrub. Found in chaparral, coastal shrub, and valley and foothill grassland/clay soils. Occurs from 150 to 2,400 ft. in elevation.	Dec-May	Fed: NONE CA: NONE CNPS: List 2.1	Low
Ambrosia chenopodiifolia San Diego bur-sage	Shrub. Found in coastal scrub. Occurs from 180 to 540 ft. in elevation.	Apr-Jun	Fed: NONE CA: NONE CNPS: List 2.1	Absent
Ambrosia monogyra Singlewhorl burrobush	Shrub. Found in chaparral and Sonoran desert scrub/sandy soils. Occurs from 33 to 1,640 ft. in elevation.	Aug-Nov	Fed: NONE CA: NONE CNPS: List 2.2	Absent
Atriplex coulteri Coulter's saltbush	Perennial herb. Found in coastal bluff scrub, coastal dunes, coastal scrub, and valley and foothill grassland/alkaline or clay soils. Occurs from 10 to 1,500 ft. in elevation.	Mar-Oct	Fed: NONE CA: NONE CNPS: List 1B.2	Low
Atriplex pacifica South Coast saltscale	Annual herb. Found in coastal bluff scrub, coastal dunes, coastal scrub, and playas. Occurs from 0 to 460 ft. in elevation.	Mar-Oct	Fed: NONE CA: NONE CNPS: List 1B.2	Absent
Bergerocactus emoryi Golden-spined cereus	Stem succulent. Found in closed-cone coniferous forest, chaparral, and coastal scrub/sandy soils. Occurs from 10 to 1,300 ft. in elevation.	May-Jun	Fed: NONE CA: NONE CNPS: List 2.2	Absent
Brodiaea orcuttii Orcutt's brodiaea	Bulbiferous herb. Found in closed-cone coniferous forest, chaparral, cismontane woodland, meadows and seeps, valley and foothill grassland, and vernal pools/mesic and clay soils, sometimes serpentine. Occurs from 100 to 5,500 ft. in elevation.	May-Jul	Fed: NONE CA: NONE CNPS: List 1B.1 Local: NE	Low

SCIENTIFIC AND COMMON NAME	HABITAT AND DISTRIBUTION	BLOOMING PERIOD	STATUS DESIGNATION	POTENTIAL FOR OCCURRENCE
California macrophylla Round-leaved filaree	Annual herb. Found in cismontane woodland and valley and foothill grasslands/clay soils. Occurs from 50 to 4,000 ft. in elevation.	Mar-May	Fed: NONE CA: NONE CNPS: List 1B.1	Low
Calochortus dunnii Dunn's mariposa-lily	Bulbiferous herb. Found in closed-cone coniferous forest, chaparral, and valley and foothill grassland/ gabbroic or metavolcanic, rocky soils. Occurs from 1,250 to 6,000 ft. in elevation.	Apr-Jun	Fed: NONE CA: RARE CNPS: List 1B.2 Local: NE	Absent
Camissonia lewisii Lewis' evening primrose	Annual herb. Found in coastal bluff scrub, cismontane woodland, coastal dunes, coastal scrub, and valley and foothill grassland/sandy or clay soils. Occurs from 0 to 980 ft. in elevation.	Mar-May	Fed: NONE CA: NONE CNPS: List 3	Low
Ceanothus cyaneus Lakeside ceanothus	Evergreen shrub. Found in closed-cone coniferous forest and chaparral. Occurs from 770 to 2,480 ft. in elevation.	Apr-Jun	Fed: NONE CA: NONE CNPS: List 1B.2 Local: NE	Absent
Ceanothus otayensis Otay Mountain ceanothus	Evergreen shrub. Found in chaparral/metavolcanic or gabbroic rock. Occurs from 1,968 to 3,600 ft. in elevation.	Jan-Apr	Fed: NONE CA: NONE CNPS: List 1B.2	Absent
Comarostaphylis diversifolia ssp. *diversifolia* Summer holly	Evergreen shrub. Found in chaparral and cismontane woodland. Occurs from 100 to 1,800 ft. in elevation.	Apr-Jun	Fed: NONE CA: NONE CNPS: List 1B.2	Absent
Cordylanthus orcuttianus Orcutt's bird's-beak	Annual herb; hemiparasitic. Found in coastal scrub. Occurs from 33 to 1,150 ft. in elevation.	Apr-Jul	Fed: NONE CA: NONE CNPS: List 2.1	Absent
Cylindropuntia californica var. *californica* Snake cholla	Perennial succulent. Found in chaparral and coastal scrub. Occurs from 100 to 165 ft. in elevation.	April - May	Fed: NONE CA: NONE CNPS: List 1B.1	Low
Deinandra conjugens Otay tarplant	Annual herb. Found in coastal scrub, and valley and foothill grassland/clay soils. Occurs from 246 to 985 ft. in elevation.	May-Jun	Fed: THR CA: END CNPS: List 1B.1 Local: NE	Low
Dudleya variegata Variegated dudleya	Perennial herb. Found in chaparral, cismontane woodland, coastal scrub, valley and foothill grassland, and vernal pools/clay soils. Occurs from 10 to 1,900 ft. in elevation.	Apr-Jun	Fed: NONE CA: NONE CNPS: List 1B.2 Local: NE	Low
Eryngium aristulatm var. *parishii* San Diego button-celery	Annual/perennial herb. Found in coastal scrub, valley and foothill grassland, and vernal pools/mesic soil. Occurs from 66 to 2,035 ft. in elevation.	Apr-Jun	Fed: END CA: END CNPS: List 1B.1	Low
Ferocactus viridescens San Diego barrel cactus	Stem succulent. Found in chaparral, coastal scrub, valley and foothill grassland, and vernal pools. Occurs from 10 to 1,500 ft. in elevation.	May-Jun	Fed: NONE CA: NONE CNPS: List 2.1	Low

SCIENTIFIC AND COMMON NAME	HABITAT AND DISTRIBUTION	BLOOMING PERIOD	STATUS DESIGNATION	POTENTIAL FOR OCCURRENCE
Fremontodendron mexicanum Mexican flannelbush	Evergreen shrub. Found in closed-cone coniferous forest, chaparral, and cismontane woodland/ gabbroic, metavolcanic, or serpentinite. Occurs from 32 to 2,350 ft. in elevation.	Mar-Jun	Fed: END CA: RARE CNPS: List 1B.1	Absent
Harpagonella palmeri Palmer's grapplinghook	Annual herb. Found in chaparral, coastal scrub, and valley and foothill grassland/clay. Occurs from 66 to 3,130 ft. in elevation.	Mar-May	Fed: NONE CA: NONE CNPS: List 4.2	Low
Hesperocyparis forbesii Tecate cypress	Evergreen tree. Found in closed-cone coniferous forest and chaparral/clay soils, gabbroic or metavolcanic rock. Occurs from 836 to 4,900 ft. in elevation.	N/A	Fed: NONE CA: NONE CNPS: List 1B.1	Absent
Iva hayesiana San Diego marsh-elder	Perennial herb. Found in marshes and swamps and playas. Occurs from 33 to 1640 ft. in elevation.	Apr-Oct	Fed: NONE CA: NONE CNPS: List 2.2	Low
Lepechinia ganderi Gander's pitcher sage	Shrub. Found in closed-cone coniferous forest, chaparral, coastal scrub, and valley and foothill grassland/gabbroic or metavolcanic rock. Occurs from 1,000 to 3,300 ft. in elevation.	Jun-Jul	Fed: NONE CA: NONE CNPS: List 1B.3 Local: NE	Absent
Lepidium virginicum var. *robinsonii* Robinson's pepper-grass	Annual herb. Found in chaparral and coastal scrub. Occurs from 3 to 2,900 ft. in elevation.	Jan-Jul	Fed: NONE CA: NONE CNPS: List 1B.2	Absent
Monardella stoneana Jennifer's monardella	Perennial herb. Found in closed-cone coniferous forest, chaparral, coastal scrub, and riparian scrub/usually rocky intermittent streambeds. Occurs from 33 to 2,600 ft. in elevation.	Jun-Sept	Fed: NONE CA: NONE CNPS: List 1B.2	Low
Monardella viminea Willowy monardella	Perennial herb. Found in chaparral, coastal scrub, riparian forest, riparian scrub, and riparian woodland/alluvial ephemeral washes. Occurs from 165 to 740 ft. in elevation.	Jun-Aug	Fed: END CA: END CNPS: List 1B.1 Local: NE	Absent
Muilla clevelandii San Diego goldenstar	Perennial bulbiferous herb. Chaparral, coastal scrub, valley and foothill grassland, and vernal pools/clay. Occurs from 64 to 1,525 ft. in elevation.	Apr-May	Fed: NONE CA: NONE CNPS: List 1B.1	Low
Myosurus minimus ssp. *apus* Little mousetail	Annual herb. Found in valley and foothill grassland and vernal pools/alkaline soils. Occurs from 66 to 2,100 ft. in elevation.	Mar-Jun	Fed: NONE CA: NONE CNPS: List 3.1	Low
Nama stenocarpum Mud nama	Annual/perennial herb. Found in marshes and swamps (lake margins, riverbanks). Occurs from 16 to 1,650 ft. in elevation.	Jan-Jul	Fed: NONE CA: NONE CNPS: List 2.2	Absent

SCIENTIFIC AND COMMON NAME	HABITAT AND DISTRIBUTION	BLOOMING PERIOD	STATUS DESIGNATION	POTENTIAL FOR OCCURRENCE
Navarretia fossalis Spreading navarretia	Annual herb. Found in chenopod scrub, marshes and swamps (assorted shallow freshwater), playas, and vernal pools. Occurs from 100 to 4265 ft. in elevation.	Apr-Jun	Fed: THR CA: NONE CNPS: List 1B.1	Low
Orcuttia californica California Orcutt grass	Annual herb. Found in vernal pools. Occurs from 50 to 2,165 ft. in elevation.	Apr-Aug	Fed: END CA: END CNPS: List 1B.1	Low
Pogogyne nudiuscula Otay Mesa mint	Annual herb. Found in vernal pools. Occurs from 295 to 820 ft. in elevation.	May-Jul	Fed: END CA: END CNPS: List 1B.1	Low
Quercus dumosa Nutall's scrub oak	Evergreen shrub. Found in closed-cone coniferous forest, chaparral, and coastal scrub/sandy, clay loam soils. Occurs from 50 to 1,312 ft. in elevation.	Feb-Apr	Fed: NONE CA: NONE CNPS: List 1B.1	Absent
Salvia munzii Munz's sage	Evergreen shrub. Found in chaparral and coastal scrub. Occurs from 390 to 3,500 ft. in elevation.	Feb-Apr	Fed: NONE CA: NONE CNPS: List 2.2	Absent
Stemodia durantifolia Purple stemodia	Perennial herb. Found in Sonoran desert scrub (often mesic, sandy soils). Occurs from 590 to 984 ft in elevation.	Jan-Dec	Fed: NONE CA: NONE CNPS: List 2.1	Absent
Streptanthus bernardinus Laguna Mountains jewel-flower	Perennial herb. Found in chaparral and lower montane coniferous forest. Occurs from 2,200 to 8,200 ft. in elevation.	May-Aug	Fed: NONE CA: NONE CNPS: List 4.3	Absent
Tetracoccus dioicus Parry's tetracoccus	Deciduous herb. Found in chaparral and coastal scrub. Occurs from 540 to 3,280 ft. in elevation.	Apr-May	Fed: NONE CA: NONE CNPS: List 1B.2	Absent

Status Codes

Federal designations: (Federal Endangered Species Act, USFWS):
END: Federal-listed, endangered.
THR: Federal-listed, threatened.
NONE: Not listed.

State designations: (California Endangered Species Act, CDFG)
END: State-listed, endangered.
THR: State-listed, threatened.
RARE: State-listed as rare
NONE: Not listed.

California Native Plant Society (CNPS) designations:
List 1A: Plants presumed extinct in California.
List 1B: Plants rare and endangered in California and throughout their range.
List 2: Plants rare, threatened, or endangered in California but more common elsewhere in their range.
List 3: Plants about which we need more information; a review list.
List 4: Plants of limited distribution; a watch list.

Threat Codes:
.1 Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)
.2 Fairly endangered in California (20-80% occurrences threatened)
.3 Not very endangered in California (<20% of occurrences threatened or no current threats known)

Local Designation: City of Chula Vista MSCP Subarea Plan
NE: Narrowly Endemic

Special-Status Wildlife

Twenty-five (25) special status wildlife species are reported to occur within the USGS Otay Mesa Quadrangle Map that includes the project footprint (Table 5.6-5). Twenty-three (23) of these special-status wildlife species had an "Absent" or "Low" potential of occurrence within the project study area and therefore no further survey or study is necessary to determine presence or absence of these species. The remaining two special-status wildlife species were determined to have a moderate potential for occurrence, and further evaluation would be necessary to assess project-related effects to these species.

The two species with a moderate potential for occurrence within the study area include:

- San Diego fairy shrimp (*Branchinecta sandiegonensis*),
- Burrowing Owl (*Athene cunicularia*),

Of the aforementioned special-status wildlife species, the San Diego fairy shrimp is federally listed as endangered. As of December 2010, none of the aforementioned special-status wildlife species have been identified within the proposed ground disturbance footprint. Furthermore, no fish or wildlife species that have commercial value were observed or are expected to be detected within the proposed ground disturbance footprint.

TABLE 5.6-5 SPECIAL-STATUS WILDLIFE AND THEIR POTENTIAL FOR OCCURRENCE WITHIN THE PROJECT FOOTPRINT

SCIENTIFIC AND COMMON NAME	HABITAT AND DISTRIBUTION	STATUS DESIGNATION	POTENTIAL FOR OCCURRENCE
INVERTEBRATES			
Branchinecta sandiegonensis San Diego fairy shrimp	Occurs in tectonic swales/earth slump basins in grassland and coastal sage scrub habitats. Inhabits seasonally astatic pools filled by winter/spring rains and hatches in warm water later in the season. Endemic to Orange and San Diego counties.	Fed: FE CA: NONE	Moderate
Callophrys thornei Thorne's hairstreak	Generally associated with chaparral or closed-coned coniferous habitats.	Fed: NONE CA: NONE *	Absent
Euphydryas editha quino Quino checkerspot butterfly	Occurs in open coastal sage scrub, chaparral and grassland habitats. Populations are limited to Riverside and San Diego counties.	Fed: FE CA: NONE	Absent
Streptocephalus woottoni Riverside fairy shrimp	Occurs in tectonic swales/earth slump basins in grassland and coastal sage scrub habitats. Inhabits seasonally astatic pools filled by winter/spring rains and hatches in warm water later in the season. Endemic to west Riverside, Orange, and San Diego counties.	Fed: FE CA: NONE	Absent
REPTILES AND AMPHIBIANS			
Aspidoscelis hyperythra Orange-throated whiptail	Frequents coastal chaparral, thornscrub, and streamside growth. Occurs in washes, streams, terraces, and other sandy areas, often where there are rocks and patches of brush and rocky hillsides.	Fed: NONE CA: SSC	Low

SCIENTIFIC AND COMMON NAME	HABITAT AND DISTRIBUTION	STATUS DESIGNATION	POTENTIAL FOR OCCURRENCE
Aspidoscelis tigris stejnegeri Coastal whiptail	Inhabits grasslands, coastal sage scrub, chaparral, and woodlands that support adequate prey species.	Fed: NONE CA: NONE *	Low
Phrynosoma coronatum blainvillii San Diego coast horned lizard	Found in a wide variety of habitats, including coastal sage, annual grassland, chaparral, oak woodland, riparian woodland, and coniferous forest. Key habitat elements are loose, fine soils with a high sand fraction; an abundance of native ants or other insects; and open areas with limited overstory for basking and low, but relatively dense shrubs for refuge.	Fed: NONE CA: SSC	Low
Salvadora hexalepis virgultea Coast patch-nosed snake	Found in semi-arid brushy areas and chaparral in canyons, rocky hillsides, and plains.	Fed: NONE CA: SSC	Absent
Spea hammondii Western spadefoot	Occurs primarily in grasslands; occasional populations occur in valley-foothill hardwood woodlands. Ranges throughout the Central Valley and adjacent foothills; usually common where it occurs. In the Coast Ranges, it is found from Point Conception, Santa Barbara county, south to the Mexican border. Found from near sea level to 4470 ft in elevation.	Fed: NONE CA: SSC	Low
Thamnophis hammondii Two-striped garter snake	Generally found around pools, creeks, cattle tanks, and other water sources; often in rocky areas, oak woodland, chaparral, brushland, and coniferous forest.	Fed: NONE CA: SSC	Absent
BIRDS			
Athene cunicularia Burrowing Owl	Found in open, dry, annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. A subterranean nester that is dependent upon burrowing mammals, most notably the California ground squirrel.	Fed: NONE CA: SSC	Moderate
Campylorhynchus brunneicapillus sandiegensis Coastal Cactus Wren	Found in coastal sage scrub habitat. Nests almost exclusively in prickly pear (*Opuntia littoralis*) and coastal cholla (*O. prolifera*).	Fed: NONE CA: SSC	Absent
Eremophila alpestris actia California Horned Lark	Occurs in open terrain, which is often sparsely vegetated.	Fed: NONE CA: NONE *	Low
Icteria virens Yellow-breasted Chat	Inhabits dense thickets, brush, and secondary growth. Nests in dense shrubs.	Fed: NONE CA: SSC	Absent
Polioptila californica californica Coastal California Gnatcatcher	Local, uncommon, obligate resident of arid coastal sage scrub vegetation on mesas, hillsides and in washes. Nests almost exclusively in California sagebrush.	Fed: FT CA: SSC	Absent

SCIENTIFIC AND COMMON NAME	HABITAT AND DISTRIBUTION	STATUS DESIGNATION	POTENTIAL FOR OCCURRENCE
Vireo belli pusillus Least Bell's Vireo	Resides in low riparian areas close to the water or dry riverbeds. Nests are usually constructed in bushes or within the branches of mesquite (*Prosopis* spp.), willows, and mule fat. Found below 2000 ft in elevation.	Fed: FE CA: SE	Absent
	MAMMALS		
Chaetodipus fallax fallax Northwestern San Diego pocket mouse	Found in sparse, low desert shrub lands up to dense, high coastal sage-scrub vegetation.	Fed: NONE CA: SSC	Low
Eumops perotis californicus Western mastiff bat	Forages in dry desert washes, floodplains, chaparral, oak woodland, open ponderosa pine forest, grassland, and agricultural areas. Roosts in colonies under exfoliating rock slabs (e.g., granite, sandstone, or columnar basalt) and in similar crevices in large boulders and buildings; generally high above ground.	Fed: NONE CA: SSC	Absent
Lasiurus blossevillii Western red bat	Occurs in riparian areas. Roosts alone, generally in the foliage of trees and shrubs.	Fed: NONE CA: SSC	Absent
Lepus californicus bennettii San Diego black-tailed jackrabbit	Occurs in coastal sage scrub and grassland habitats.	Fed: NONE CA: SSC	Low
Myotis ciliolabrum Western small-footed myotis	Occurs in rocky areas in coniferous forest, desert, chaparral, and riparian zones. Roosts alone or in small groups in cliff and rock crevices, buildings, concrete overpasses, caves, and mines.	Fed: NONE CA: NONE *	Absent
Myotis yumanensis Yuma myotis	Low-flying bat. Occurs in a wide variety of upland and lowland habitats, including riparian, arid scrublands and deserts, and forests. Often associated with permanent water sources, typically rivers and streams. Roosts in bridges, buildings, cliff crevices, caves, mines, and trees.	Fed: NONE CA: NONE *	Absent
Neotoma lepida intermedia San Diego desert woodrat	Typically found in the coastal scrub of southern California from San Diego County to San Luis Obispo County. Prefer moderate to dense vegetation canopies. They are particularly abundant in rock outcrops and rocky cliffs and slopes.	Fed: NONE CA: SSC	Absent
Nyctinomops femorosaccus Pocketed free-tailed bat	Found near large, open water sources in a variety of habitats, including desert shrub and pine-oak forest. Roosts in colonies in crevices of rugged cliffs, high rocky outcrops, slopes, and buildings.	Fed: NONE CA: SSC	Absent
Taxidea taxus American badger	Uncommon, permanent resident found throughout most of the state. Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Extirpated from many areas in Southern California.	Fed: NONE CA: SSC	Low

SCIENTIFIC AND COMMON NAME	HABITAT AND DISTRIBUTION	STATUS DESIGNATION	POTENTIAL FOR OCCURRENCE

Status Codes
FEDERAL
Federal Endangered Species Act
FE Federal Endangered
FT Federal Threatened
CH Critical Habitat
STATE
California Endangered Species Act
SE State Endangered
ST State Threatened
FP Fully Protected
CDFG Code
SSC California Species of Special Concern
* Other

Special Aquatic Resource Areas

Summary of USACE Jurisdiction Pursuant to Section 404 of the CWA

The USACE regulates discharge of fills to Waters of the United States (WoUS[6]) through Section 404 of the CWA. The study area contains seven unnamed, potential WoUS drainage features. Each drainage feature is a non-Relatively Permanent Water (RPW) tributary to, and having a significant nexus with, a Traditional Navigable Water (TNW) and may be within the jurisdiction of Section 404 of the CWA. A total of 4.25 acres of potential CWA Section 404 jurisdiction occurs within the study area, consisting of 4.15 acres of non-wetland WoUS and 0.1 acres of WoUS with USACE-defined wetlands. No temporary impacts or permanent losses to potential CWA Section 404 jurisdiction are expected with the project.

Summary of RWQCB Jurisdiction Pursuant to Section 401 of the CWA and the Porter-Cologne Water Quality Control Act

The RWQCB regulates fills to Waters of the State (WoS) through the CWA Section 401 Water Quality Certification (WQC) Program and Porter-Cologne. Pursuant to CWA Section 401, the RWQCB's legal authority within the project's study area is equal to CWA Section 404 jurisdiction. Because the seven drainage features within the study area are potentially subject to CWA Section 404 jurisdiction (and subsequently CWA Section 401 jurisdiction), there is no additional RWQCB jurisdiction subject to Porter-Cologne. A total of 4.25 acres of CWA Section 401 jurisdiction occur within the study area, consisting of 4.15 acres of non-wetland WoS and 0.1 acres of WoS with included wetlands. No temporary impacts or permanent losses to CWA Section 401 jurisdiction are expected with the project.

[6] The term WoUS is defined as follows (33 CFR 328.3): (1) All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (2) All interstate waters including interstate wetlands; (3) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters: (i) Which are or could be used by interstate or foreign travelers for recreational or other purposes; or (ii) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (iii) Which are used or could be used for industrial purpose by industries in interstate commerce; (4) All impoundments of waters otherwise defined as WoUS; (5) Tributaries of WoUS identified above; (6) The territorial seas; and (7) Wetlands adjacent to waters (other than waters that are themselves wetlands).

Summary of CDFG Jurisdiction Pursuant to Section 1600 (et seq.) of the CFG Code

Pursuant to Section 1600 (et seq.) of the CFG Code, the CDFG regulates diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake that supports fish or wildlife. Seven features within the study area contain a bed, bank, and channel and function as drainages that provide functions and values for wildlife and are therefore subject to CFG Code Section 1600 (et seq.) jurisdiction. These features are all unnamed drainages consisting of 6.25 acres of non-riparian bed, bank, and channel, and 0.3 acres of associated riparian vegetation. No temporary impact or permanent losses to CFG Code Section 1600 (et seq.) jurisdiction are expected as a result of the project.

Detailed methods, field survey dates and results for the pedestrian-based field survey are provided in Appendix J-2, Preliminary Jurisdictional Determination Report.

Special Environmental Areas in the Project Vicinity

The study area has been identified as a minor amendment area within the San Diego County Multiple Species Conservation Program (MSCP) (Figure 5.6-1). The MSCP is one of three subregional habitat planning efforts in San Diego County that contribute to preservation of regional biodiversity though coordination with other habitat conservation planning efforts throughout southern California. The MSCP addresses multiple species habitat needs and the preservation of native vegetation communities. The plan is designed to streamline and coordinate existing procedures for review and permitting of project impacts on biological resources. The MSCP has been implemented in the County of San Diego under Ordinance No. 8845 as the Biological Mitigation Ordinance (BMO). The study area is also located within the San Diego National Wildlife Refuge (Otay-Sweetwater Unit). The Otay-Sweetwater Unit of the San Diego NWR is part of the National Wildlife Refuge System's contribution to the MSCP, a program designed to conserve enough open space and habitat for species survival while enabling orderly development to occur where necessary.

Wildlife Corridors

A wildlife corridor is defined as a linear landscape feature that allows animal movement between two patches of habitat or between habitat and geographically discrete resources (e.g., water, Ogden Environmental, 1993). Connections between extensive areas of open space are integral to maintaining regional biological diversity and population viability. Areas that serve as wildlife movement corridors are considered biologically unique because they facilitate the persistence of special-status species. In the absence of corridors, habitats become fragmented, isolated islands surrounded by development. Fragmented habitats support significantly lower numbers of species and increase the likelihood of extinction for select species. The pedestrian surveys and literature reviews suggest that the project study area does not support any regionally important wildlife movement areas. The proposed ground disturbance footprint is isolated from any obvious connections to the Otay Valley. Accordingly, the closest known wildlife corridor is Johnson Canyon, which is roughly four miles north of the proposed ground disturbance footprint. Furthermore, the surveys and literature reviews also suggest that the project study area does not support denning or nesting sites for common and/or special status species and that no active nesting raptor or passerine birds were observed within the study area.

5.6.3 Environmental Consequences

Potential and expected direct and indirect impacts to biological resources are discussed below. Significant impacts are those that would involve jeopardizing the continued existence of a sensitive plant or wildlife species or degradation of their habitat to non-sustainable levels. The project would have significant impacts to vegetation and wildlife if it would:

- Cause a fish or wildlife population to drop below self-sustaining levels (California Environmental Quality Act [CEQA] Guidelines, Section 15065 (a)).

- Threaten to eliminate a plant or animal community (CEQA Guidelines, Section 15065 (a)).

- Substantially affect, reduce the number, or restrict the range of unique, rare, or endangered species of animal or plant, or the habitat of the species (CEQA Guidelines, Section 15065 (a), Appendix G (c), Appendix I (II.4.b) and (II.5.b)).

- Substantially diminish or reduce habitat for fish, wildlife, or plants (CEQA Guidelines, Section 15065 (a), Appendix G (t)).

- Interfere substantially with the movement of resident or migratory fish or wildlife species (CEQA Guidelines, Appendix G (d)).

- Change the diversity of species, or number of any species of plants (including trees, shrubs, grass crops, and aquatic plants) or animals (birds, land animals including reptiles, fish and shellfish, benthic organisms, or insects) (CEQA Guidelines, Appendix I (II.4.1) and (II.5.a)).

- Introduce new species of plants or animals into an area, or act as a barrier to the normal replenishment of existing species (CEQA Guidelines, Appendix I (II.4.c) and (II.5.c)).

- Deteriorate existing fish or wildlife habitat (CEQA Guidelines, Appendix I (II.5.d)).

- Conflict with any regional Habitat Conservation Plans (HCPs).

The above criteria were used to evaluate the project's impacts to plant communities and wildlife. The potential impacts associated with the construction, operation, and maintenance of the project are discussed below.

Construction Impacts

Construction of the project is not likely to have an adverse impact on common plant and wildlife species, including special-status species, as the result of the permanent removal of 9.99 acres of non-native habitat. Table 5.6-6 shows the acres of permanent impacts to vegetation communities/land cover types.

As discussed in Section 5.6.2, Affected Environment, the environmental baseline for this assessment includes facility placement and design that targets the majority of project impacts towards lands that are adjacent to cleared or disturbed areas and roads. The lands abutting the

project's ground disturbance footprint include the Otay Mesa Generating Project (OMGP) and its appurtenance, which would further isolate the project's construction and operational activities. Any individual species present in the area or in adjacent/surrounding areas are assumed to have acclimated and developed tolerance to substantial noise, light, and other effects resulting from the presence of an active power plant and its access roads. Nonetheless, the measures listed in Section 5.6.5 are expected to reduce construction and operational impacts to a less than significant level.

TABLE 5.6-6
IMPACTS TO VEGETATION COMMUNITIES / LAND COVER TYPES

Vegetation Community / land cover type	Acres
Non-Native Grassland	0
Riparian	0
Developed/Disturbed	9.99

The project study area includes documentation of historic and current occurrences of special-status species. Specifically, the study area may support the following special-status wildlife species: burrowing owl (*Athene cunicularia*) and San Diego fairy shrimp (*Branchinecta sandiegonensis*). As of December 2010, none of these species have been observed within the project's proposed ground disturbance footprint.

Construction of the project may result in minimal temporary and permanent impacts to the aforementioned special-status species because of the permanent removal of 9.99 acres of non-developed/disturbed native habitat. Compliance with the state and federal Endangered Species Acts will ensure that impacts to listed species would be less than significant with mitigation. Construction activities may result in a short-term loss of habitat, but may only temporarily and incrementally increase habitat fragmentation on a regional level. Some breeding potential could be lost during construction activities for species that may breed in close proximity to the project and other areas proposed for disturbance. This loss of productivity would be limited to one season, and breeding individuals would be expected to reoccupy adjacent habitats following completion of construction activities.

Construction of the project will not likely impact any special aquatic resource areas. The project will not adversely effect on federal- or state-protected waters.

No significant impacts to wildlife movement are expected from project implementation. The project avoids the adjacent open space and undeveloped locales essential for the regional long-term viability of plants and wildlife. In this context, facility placement and design deliberately avoid open space and other biological resources to further consolidate high-quality habitats within the region and minimize impacts to wildlife connectivity and movement to avoid resource conflicts. The project design complements the long-term preservation of the ecological processes within the area and is important to the cohesiveness and quality of the surrounding land for ecological purposes.

Operation and Maintenance Impacts

Project operational impacts include intermittent air emissions, noise, light, vibration, and potential collision hazards associated with the three approximately 100-foot-tall stacks. Migratory birds generally fly at an altitude that would avoid ground structures, except when crossing over topographic features (e.g., ridge tops) or when inclement weather forces them closer to the ground. Topographic or ecological features are not present that would likely attract birds to the project area. Raptor and other migratory bird species that are protected by the Migratory Bird Treaty Act (MBTA) are expected to occur in the general area (i.e., barn owl [*Tyto alba*], red-tailed hawk [*Buteo jamaicensis*] and Cooper's hawk [*Accipiter cooperii*]) and could potentially collide with the stacks during inclement weather (e.g., fog and rain). Smaller birds are assumed to be more agile and are less likely to collide with project facilities. Because of the relatively low structure heights, the potential for wildlife collisions is considered less than significant. In addition, placement of downward-facing lighting on the stacks to reduce wildlife attraction would minimize the potential for collisions.

Post-construction operation and maintenance could temporarily displace special-status species from some habitat areas and impair their ability to establish territories. Noise, light, vibration, and human activities may cause some species (e.g., burrowing owl) to avoid an area until the disturbance conditions are eliminated or the individuals become accustomed to the chronic disturbance activities.

As human populations expand geographically, artificial lighting also expands, and it is now almost impossible to find areas free from human influence. Verheijen (1981b) was the first to apply the term "photopollution" to situations in which artificial light has adverse effects on wildlife. Additionally, some evidence indicates that the increasing use of artificial light at night is having an adverse effect on wildlife populations, particularly those that typically migrate at night (Verheijen, 1985).

No special status species (e.g., burrowing owl) known from the vicinity are expected to be affected by lighting impacts if lighting BMPs are implemented. Intermittent air emissions, noise, light, vibration, and human activities may cause wildlife to avoid an area until the disturbance conditions are eliminated or the wildlife become accustomed to the disturbance. The measures listed in Section 5.6.5 are expected to reduce operation impacts to a less than significant level.

5.6.4 Cumulative Impacts

The purpose of this section is to identify past, present, and reasonably foreseeable actions in the PPEC project area that could affect the same resources as those of the project and provide the following analysis:

- Determine if the impacts of PPEC and the other actions would overlap in time or geographic extent.

- Determine if the impacts of the proposed project would interact with, or intensify, the impacts of the other actions.

- Identify any potentially significant cumulative impacts.

Section 5.18 presents a list of potential projects that could result in cumulative impacts with the proposed project.

The project occurs within an area that includes non-native habitats. Accordingly, the proposed ground disturbance foot print includes low habitat value (existing non-native grasses and human disturbances) and provides only low-quality foraging opportunities for local wildlife species. Furthermore the following potential projects within the region were evaluated and include similar low habitat value non-native habitats:

- International Industrial Park
- Corrections Corporation of America Correctional Facility
- Vulcan Batch Plant
- Otay Hills Construction Aggregate Extraction Operation
- Otay Crossings Commerce Park

The aforementioned surrounding projects include roughly the same low quality habitat as this project. Accordingly, the addition of this project would not significantly contribute to cumulative impacts to biological resources within the region. Therefore, there is no potential for cumulative impacts related to these biological resources.

5.6.5 Avoidance, Minimization, and Mitigation Measures

The following measures will be implemented to avoid and minimize impacts to biological resources:

BIO-1 The project owner will assign a Designated Biologist to the project. The project owner will submit the resume of the proposed Designated Biologist, with at least three references and contact information, to the California Energy Commission (CEC) Compliance Project Manager (CPM) for approval.

The Designated Biologist must meet the following minimum qualifications:

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

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

Verification: The project owner shall submit the specified information at least 90 days prior to the start of any site (or related facilities) mobilization. No site or related facility activities shall commence until an approved Designated Biologist is available to be on site.

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

BIO-2 The project owner shall ensure that the Designated Biologist performs the following during any site (or related facilities) mobilization, ground disturbance, grading, construction, operation, and closure activities.

The Designated Biologist may be assisted by the approved Biological Monitor(s), but the Designated Biologist will be the contact for the project owner and CPM. The Designated Biologist shall:

1. Advise the project owner's Construction and Operation Managers on the implementation of the biological resources Conditions of Certification;

2. Consult on the preparation of the Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) to be submitted by the project owner;

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

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

5. Inspect active construction areas where animals may have become trapped prior to construction commencing each day. At the end of the day, inspect for the installation of structures that prevent entrapment or allow escape during periods of construction inactivity. Periodically inspect areas with high vehicle activity (i.e., parking lots) for animals in harm's way;

6. Notify the project owner and the CPM of any noncompliance with any biological resources Condition of Certification;

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

8. Maintain written records of the tasks specified above and those included in the BRMIMP. Summaries of these records shall be submitted in the Monthly Compliance Report and the Annual Report; and

9. Train the Biological Monitors as appropriate and verify their familiarity with the BRMIMP, Worker Environmental Awareness Program (WEAP) training, and all permits.

Verification: The Designated Biologist shall submit in the Monthly Compliance Report to the CPM copies of all written reports and summaries that document biological resources activities. If actions may affect biological resources during operation, a Designated Biologist will be available for monitoring and reporting.

During project operation, the Designated Biologist will submit record summaries in the Annual Compliance Report, unless their duties are ceased as approved by the CPM.

BIO-3 The project owner's Designated Biologist will submit the resume, at least three references, and contact information of the proposed Biological Monitors to the CPM for approval. The resume will demonstrate to the satisfaction of the CPM, the appropriate education and experience to accomplish the assigned biological resource tasks.

Biological Monitor(s) training by the Designated Biologist will include familiarity with the Conditions of Certification and the BRMIMP, WEAP, and all permits.

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

BIO-4 Designated Biologist and Biological Monitor Authority. The project owner's Construction/Operation Manager will act on the advice of the Designated Biologist and Biological Monitor(s) to ensure conformance with the biological resources Conditions of Certification.

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

The Designated Biologist will:

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

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

3. Notify the CPM if there is a halt of any activities and advise the CPM of any corrective actions that have been taken, or will be instituted, as a result of the work stoppage.

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

Verification: The project owner will ensure that the Designated Biologist or Biological Monitor notifies the CPM immediately (and no later than the following morning of the incident, or Monday morning in the case of a weekend) of any noncompliance or a halt of any

site mobilization, ground disturbance, grading, construction, and operation activities. The project owner will 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 5 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-5 Worker Environmental Awareness Program. The project owner will develop and implement a CPM-approved WEAP by which each of its employees, as well as employees of contractors and subcontractors who work on the project site or any related facilities during site mobilization, ground disturbance, grading, construction, operation and closure, is informed about sensitive biological resources associated with the project.

The WEAP must:

1. Be developed by or in consultation with the Designated Biologist and consist of an on-site or training center presentation through which supporting written material and electronic media (video or DVD) is made available to all participants.

2. Discuss the locations and types of sensitive biological resources on the project site and adjacent areas.

3. Present the reasons for protecting these resources.

4. Present the meaning of various temporary and permanent habitat protection measures.

5. Identify whom to contact if there are further comments and questions about the material discussed in the program.

6. Include a training acknowledgment form to be signed by each worker indicating that they received training and will abide by the guidelines.

7. The specific program can be administered by a competent individual(s) acceptable to the Designated Biologist.

Verification: At least 60 days prior to the start of any site (or related facilities) mobilization, the project owner will provide to the CPM for review and comment, two copies each of the proposed WEAP and all supporting written materials and electronic media prepared or reviewed by the Designated Biologist and a resume of the person(s) administering the program.

The project owner will provide in the Monthly Compliance Report the number of persons who have completed the training in the prior month and a running total of all persons who have completed the training to date. The project owner will submit two copies of the CPM-approved materials at least ten days prior to site and related facilities mobilization.

The signed training acknowledgement forms will be kept on file by the project owner for a period of at least six months after the start of commercial operation.

During project operation, signed statements for active project operational personnel will be kept on file for six months following the termination of an individual's employment.

BIO-6 The project owner will submit two copies of the proposed BRMIMP to the CPM (for review and approval) and implement the measures identified in the approved BRMIMP.

The BRMIMP will be prepared in consultation with the Designated Biologist and will identify:

1. All biological resources mitigation, monitoring, and compliance measures proposed and agreed to by the project owner.

2. All biological resources Conditions of Certification identified as necessary to avoid or mitigate impacts.

3. All biological resources mitigation, monitoring, and compliance measures required in local agency permits, such as site grading and landscaping requirements.

4. All sensitive biological resources to be impacted, avoided, or mitigated by project construction, operation and closure.

5. All required mitigation measures for each sensitive biological resource.

6. Required habitat compensation strategy, including provisions for acquisition, enhancement, and management for any temporary and permanent loss of sensitive biological resources.

7. A detailed description of measures that will be taken to avoid or mitigate temporary disturbances from construction activities.

8. All locations on a map, at an approved scale, of sensitive biological resource areas subject to disturbance and areas requiring temporary protection and avoidance during construction. This includes the installation of prominently colored fencing or similar materials wherever the limits of grading are adjacent to native/non-native vegetation communities or other biological resources. Fencing will remain in place during all construction activities. Temporary fencing will also be shown on all grading plans and project specifications. Barriers and signage will be installed to direct public access to appropriate locations.

9. Aerial photographs, at an approved scale, of all areas to be disturbed during project construction activities – one set prior to any site or related facilities mobilization disturbance and one set subsequent to completion of project construction. Include planned timing of aerial photography and a description of why times were chosen.

10. Duration for each type of monitoring and a description of monitoring methodologies and frequency.

11. Performance standards to be used to help decide if/when proposed mitigation is or is not successful.

12. All performance standards and remedial measures to be implemented if performance standards are not met.

13. A preliminary discussion of biological resources-related facility closure measures.

14. A process for proposing plan modifications to the CPM and appropriate agencies for review and approval.

15. A copy of all biological resources related permits obtained.

Verification: The project owner will provide the specified document at least 60 days prior to start of any site (or related facilities) mobilization.

The CPM will determine the BRMIMP's acceptability within 45 days of receipt. If any permits have not yet been received when the BRMIMP is submitted, these permits will be submitted to the CPM within five days of their receipt, and the BRMIMP will be revised or supplemented to reflect the permit condition within ten days of their receipt by the project owner. Ten days prior to site and related facilities mobilization, the revised BRMIMP will be resubmitted to the CPM.

The project owner will notify the CPM no fewer than five working days before implementing any modifications to the approved BRMIMP to obtain CPM approval. Any changes to the approved BRMIMP must also be approved by the CPM to ensure no conflicts exist.

Implementation of BRMIMP measures will be reported in the Monthly Compliance Reports by the Designated Biologist (i.e., survey results, construction activities that were monitored, species observed). Within 30 days after completion of project construction, the project owner will provide to the CPM, for review and approval, a written construction closure report identifying which items of the BRMIMP have been completed; a summary of all modifications to mitigation measures made during the project's site mobilization, ground disturbance, grading, and construction phases; and which mitigation and monitoring items are still outstanding.

BIO-7 The project owner shall implement the following measures to manage their construction site and related facilities in a manner to avoid or minimize impacts on the local biological resources.

1. Install temporary fencing and provide wildlife escape ramps for construction areas that contain steep walled holes or trenches if outside of an approved, permanent exclusionary fence. The temporary fence shall be hardware cloth or similar materials that are approved by USFWS and CDFG. Before such holes or trenches are filled, they should be thoroughly inspected for trapped animals by the Designated Biologist or Biological Monitor.

2. Make certain all food-related trash is disposed of in closed containers and removed at least once a week from the project site.

3. Prohibit feeding of wildlife by staff and subcontractors.

4. Prohibit nonsecurity-related firearms or weapons from being brought to the project site.

5. Prohibit pets from being brought to the project site.

6. Report all inadvertent deaths of special-status species to the appropriate project representative.

7. Injured animals shall be reported to CDFG, and the project owner shall follow instructions that are provided by CDFG. The USFWS Office shall be notified in writing within three working days of the accidental death or injury to special-status species during project-related activities.

8. Contact USFWS and CDFG for specific notification procedures.

9. Minimize use of rodenticides and herbicides in the project area and prohibit the use of chemicals and pesticides known to cause harm to amphibians. If rodent control must be conducted, zinc phosphide or an equivalent product shall be used.

Verification: All mitigation measures and their implementation methods shall be included in the BRMIMP. Implementation of the measures will be reported in the Monthly Compliance Reports by the Designated Biologist. Within 30 days after completion of project construction, the project owner shall provide to the CPM, for review and approval, a written construction termination report identifying how all biological resource-related mitigation measures have been completed.

BIO-8 Any time the project owner modifies or finalizes the project design they shall incorporate all feasible measures to avoid or minimize impacts to the local biological resources, including:

1. Design, install, and maintain transmission line poles, access roads, pulling sites, and storage and parking areas to avoid identified sensitive resources.;

2. Design, install, and maintain transmission lines and all electrical components in accordance with the Avian Power Line Interaction Committee's (APLIC) Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006 (APLIC, 2006) to reduce the likelihood of electrocutions of large birds.

3. Eliminate any California Exotic Pest Plants of Concern (Cal-IPC, 2007) List A species from landscaping plans.

4. Prescribe a road sealant that is nontoxic to wildlife and plants.

5. Design, install, and maintain facility lighting to prevent side casting of light towards wildlife habitat.

6. Use straw wattles or silt fences to prevent sediment from reaching irrigation and drainage canals.

7. Fence buffer zones during construction to minimize habitat disturbance.

8. Restore temporarily impacted areas to approximate original site conditions.

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

BIO-9 The project shall conduct a vernal pool and fairly survey derived from the *1996 USFWS Interim Survey Guidelines to Permittees for Recovery of Permits under Section 10(a)(1)(A) of the Endangered Species Act for the Listed Vernal Pool Branchiopods* in the Fall of 2010 and early winter of 2011.

Verification: The project owner shall provide the specified documents at least 60 days prior to the start of any site (or related facilities) mobilization.

BIO-10 The project shall conduct a burrowing owl survey in the spring of 2011 following the *1993 California Department of Fish and Game Survey Guidelines to* Burrowing Owl Survey Protocol and Mitigation.

Verification: The project owner shall provide the specified documents at least 60 days prior to the start of any site (or related facilities) mobilization and appropriate avoidance and minimization measures shall be implemented.

BIO-11 If federally protected species (e.g., San Diego fairy shrimp) are identified within the proposed ground disturbance footprint, the applicants will comply with the state and federal Endangered Species Acts will ensure that impacts to special-status species would be less than significant with mitigation.

Verification: The project owner shall provide the specified documents at least 60 days prior to the start of any site (or related facilities) mobilization.

BIO-12 In order to comply with the Migratory Bird Treaty Act and relevant sections of the CDFG Code (e.g., 3503, 3503.4, 3504, 3505, et seq.), any vegetation clearing would take place outside of the typical avian nesting season (i.e., February 1st – August 31st), to the maximum extent practical. If this is not possible, prior to ground-disturbing activities, construction, and so forth within the Action Area, a qualified biologist will conduct and submit a migratory nesting bird and raptor survey report. A qualified biologist is an individual with sufficient education and field experience in local California ecology and biology to adequately identify local plant and wildlife species. The survey shall occur not more than 72 hours prior to initiation of project activities and any occupied passerines and/or raptor nests occurring within or adjacent to the Action Area will be delineated. To the maximum extent practicable, a minimum buffer zone from occupied nests will be maintained during physical ground-disturbing activities. Once nesting has been determined to cease, the buffer may be removed.

BIO-12 Closure/ decommissioning of the proposed project.

Facility closure activities are not expected to impact biological resources. In addition, the decommissioning and closure of the project should not negatively affect biological resources since the majority of the ground disturbed during decommissioning and closure would have been already disturbed, and mitigated as required, during construction and operation of the project. Upon completion of operation, all areas subject to ground disturbances, including the facility storage areas, roads installed by the project, transmission line tower pads, etc. shall be addressed within a project specific closure plan. The closure plan shall include mitigation measures similar to the construction mitigation measures that will reduce impacts to common and special status plant and wildlife species.

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

5.6.6 Laws, Ordinances, Regulations, and Standards

The following are laws, ordinances, regulations and standards (LORS) that are applicable or potentially applicable to the project. Construction and operation associated with the proposed project will adhere to the LORS pertinent to biological resources.

TABLE 5.6-7 SUMMARY OF BIOLOGICAL RESOURCES LORS AND COMPLIANCE

JURIS-DICTION	AUTHORITY	AGENCY	DETAILS	COMPLIANCE	AFC SECTIONS
Federal	ESA of 1973: 16 United States Code (USC) Section 1531 et seq.; 50 Code of Federal Regulations (CFR) Parts 17 and 222	USFWS	The Federal Endangered Species Act (FESA)[7] protects plants and wildlife that are listed by the USFWS and the National Marine Fisheries Service as endangered or threatened (USA, 1973). Section 9 of the FESA prohibits the taking of endangered wildlife, where "taking" is defined as any effort to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct" (50 CFR 17.3). For plants, this statute governs removing, possessing, maliciously damaging, or destroying any endangered plant on federal land, and removing, cutting, digging up, damaging, or destroying any endangered plant on non-federal land in knowing violation of state law (16 United States Code [USC] 1538). Under Section 7 of FESA, federal agencies are required to consult with the USFWS if their actions, including permit approvals or funding, could adversely affect an endangered species (including plants) or its critical habitat. The County of San Diego has been issued a Federal Section 10(a)(1)(B) permit by the USFWS and an NCCP authorization from the CDFG that allows the Incidental Take within the Subarea of those Covered Species determined by USFWS and CDFG to be adequately conserved by the MSCP Subregional Plan and the County Southwestern and Metro Subarea Plan in accordance with the County's IA. Through the IA, the County may issue Incidental Take of Covered Species by Third Party Beneficiaries under direct control of the County, specifically project implementation activities in conformance with an approval granted by the County in compliance with the County's IA. FESA specifies that the USFWS designated habitat for a species at the time of its listing in which the physical or biological features "essential to the conservation of the species" are found or that may require "special management consideration or protection...." (16 USC 1533[a][3].2, 1532[a]).	The project may result in adverse temporary and permanent impacts to federally protected species; however, avoidance and minimization measures are incorporated into the project and are expected to reduce impacts to a less than significant level. As of December 2011, no federal listed species have been identified.	5.6.1, 5.6.2, 5.6.3 and 5.6.6

7 Endangered Species Act of 1973 (16 USC 1531 et seq.), as amended.

JURIS-DICTION	AUTHORITY	AGENCY	DETAILS	COMPLIANCE	AFC SECTIONS
Federal	Migratory Bird Treaty Act: 16 USC Sections 703 – 711; 50 CFR Subchapter B	USFWS	The Migratory Bird Treaty Act (MBTA)[8] implements international agreements between the United States and other nations; the Treaty was created to protect migratory birds, any of their parts, eggs, and nests from activities such as hunting, pursuing, capturing, killing, selling, and shipping, unless expressly authorized in the regulations or by permit (USA, 1918). As authorized by the MBTA, the USFWS issues permits to qualified applicants for the following types of activities: falconry, raptor propagation, scientific collecting, special purposes (rehabilitation, education, migratory game bird propagation, and salvage), take of depredating birds, taxidermy, and waterfowl sale and disposal. The regulations governing migratory bird permits can be found in 50 CFR part 13 (General Permit Procedures) and 50 CFR part 21 (Migratory Bird Permits). The State of California has incorporated the protection of birds of prey in Sections 3800, 3513, and 3503.5 of the California Fish and Game Code (CFGC).	The project may result in adverse temporary and permanent impacts to migratory bird species; however, avoidance and minimization measures are incorporated into the project and are expected to reduce impacts to a less than significant level.	5.6.3
Federal	Bald and Golden Eagle Protection Act: 16 USC Section 668-668d, 54 Stat.250	USFWS	The Bald and Golden Eagle Protection Act (The Eagle Act) (1940) amended in 1962, was originally implemented for the protection of bald eagles (*Haliaeetus leucocephalus*). In 1962, Congress amended the Eagle Act to cover golden eagles (*Aquila chrysaetos*), a move that was, partially, an attempt to strengthen protection of bald eagles, because the latter were often killed by people mistaking them for golden eagles. This act makes it illegal to import, export, take (molest or disturb), sell, purchase, or barter any bald eagle or golden eagle or part thereof. The golden eagle, however, is accorded somewhat lighter protection under the Eagle Act than the bald eagle.	The project is not expected to result in a take of bald or golden eagle.	5.6.3

[8] Migratory Bird Treaty Act (16 USC 703 et seq.), as amended.

JURIS-DICTION	AUTHORITY	AGENCY	DETAILS	COMPLIANCE	AFC SECTIONS
	Clean Water Act of 1977: 33 USC Section 1251 - 1376; 30 CFR Section 330.5(a)(26)	USACE	The purpose of the Clean Water Act (CWA) (USA, 1977) is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." Section 404 of the CWA prohibits the discharge of dredged or fill material into "waters of the United States" without a permit from the U.S. Army Corps of Engineers (USACE). The definition of waters of the United States includes rivers, streams, estuaries, territorial seas, ponds, lakes, and wetlands. Wetlands are defined as those areas "that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3 7b). The U.S. Environmental Protection Agency also has authority over wetlands and may override a USACE permit. Substantial impacts to wetlands may require an individual permit. Projects that only minimally affect wetlands may meet the conditions of one of the existing nationwide permits. A water quality certification or waiver pursuant to Section 401 of the CWA is required for Section 404 permit actions; this certification or waiver is issued by the Regional Water Quality Control Board (RWQCB) in California.	The project will include measures requiring compliance with the Clean Water Act to minimize impacts to jurisdictional features.	5.6.1, 5.6.2, 5.6.3 and 5.6.6; Appendix J

JURIS-DICTION	AUTHORITY	AGENCY	DETAILS	COMPLIANCE	AFC SECTIONS
State	California Endangered Species Act of 1984: California Fish and Game Code Sections 2050 – 2098	CDFG	The California Endangered Species Act (CESA) generally parallels the main provisions of the FESA, but unlike its federal counterpart, CESA also applies take prohibitions to species proposed for listing (called "candidates" by the State) and has a much narrower definition of "take" (State of California, 1984). Section 2080 of the CFGC prohibits the taking, possession, purchase, sale, and import or export of endangered, threatened, or candidate species, unless otherwise authorized by permit or in the regulations. "Take" is defined in Section 86 of the CFGC as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." CESA allows for take incidental to otherwise lawful development projects. State lead agencies are required to consult with CDFG to ensure that any action they undertake is not likely to jeopardize the continued existence of any endangered or threatened species.	The project may result in adverse temporary and permanent impacts to state listed species; however, avoidance and minimization measures are incorporated into the project and are expected to reduce impacts to a less than significant level. As of December 2011, no state listed species have been identified or are expected to be identified..	5.6.1, 5.6.2, 5.6.3 and 5.6.6
	California Fish and Game Code Section 3503	CDFG	This code section prohibits the taking and possessing of bird eggs and nests.	The project may result in adverse temporary and permanent impacts to California Fish and Game Code Section 3503 protected species; however, avoidance and minimization measures are incorporated into the project and are expected to reduce impacts to a less than significant level.	5.6.1, 5.6.2, 5.6.3 and 5.6.6
	California Fish and Game Code Section 3511, Section 4700, Section 5050, Section 5515	CDFG	This code section prohibits the taking of birds, mammals, reptiles, and fish listed as fully protected.	The project is not expected to result in a take of species listed as fully protected.	5.6.1, 5.6.2, 5.6.3 and 5.6.6

JURIS-DICTION	AUTHORITY	AGENCY	DETAILS	COMPLIANCE	AFC SECTIONS
State	CEQA, Public Resources Code Section 21000 et seq	CEC	The CEQA provides for protection of the environment in the State of California.	Provide information to the CEC through the AFC process showing protection of the environment and impact from the project.	5.6.1, 5.6.2, 5.6.3 and 5.6.6
	Multiple Species Conservation Program	County of San Diego	The study area is located within the San Diego Multiple Species Conservation Program (MSCP), which is a comprehensive, long-term habitat conservation plan that addresses the needs of multiple species and the preservation of natural vegetation communities in San Diego County. The MSCP addresses the potential impacts of urban growth and loss of natural habitat and species endangerment and creates a plan to mitigate for the potential loss of Covered Species and their habitat due to the direct, indirect, and cumulative impacts of future development of both public and private lands within the MSCP area. The MSCP is a subregional plan under the California Natural Community Conservation Planning (NCCP) Act of 1991. The MSCP Plan (August 1998) (MSCP Subregional Plan) was prepared for the Subregion, an area encompassing 12 jurisdictions and 582,243 acres. The MSCP Subregional Plan is implemented through local Subarea Plans.	Implement avoidance and minimization measures to reduce potentially significant temporary and permanent impacts in areas of the project that are located within the County MSCP boundaries.	5.6.3 and 5.6.6

5.6.7 Involved Agencies and Agency Contacts

Agencies with jurisdiction to issue applicable permits or enforce LORS related to biological resources are shown in Table 5.6-8.

TABLE 5.6-8
AGENCY CONTACT LIST

Agency	Contact	Address	Telephone
United States Fish And Wildlife Service (USFWS)	TBD	6010 Hidden Valley Road, Suite 101 Carlsbad, California 92011	(760) 431-9440
California Department of Fish and Game (CDFG)	TBD	4949 Viewridge Avenue San Diego, CA 92123	(858) 467-4201
United States Army Corps of Engineers (USACE)	TBD	911 Wilshire Blvd # 1525 Los Angeles, CA 90017	(213) 452-3908
Regional Water Quality Control Board (RWQCB)	TBD	9174 Sky Park Court, Suite 100 San Diego, CA. 92123-4340	(858) 467-2952

5.6.8 Permits Required and Permitting Schedule

A summary of applicable permits and permitting schedule is presented in Table 5.6-9.

TABLE 5.6-9
APPLICABLE PERMITS

Responsible Agency	Permit/Approval	Schedule
USACE	404 Nationwide Permit	TBD
CDFG	CDGC 1600 Stream Bed Alteration Agreement	TBD
RWQCB	401 Water Quality Certification	TBD

5.6.9 References

Burt, W.H. and R. P. Grossenheider. 1980. A Field Guide to Mammals: North America; North of Mexico. New York, NY: Houghton Mifflin Company.

CDFG (California Department of Fish and Game). 2010. RareFind California Department of Fish and Game Natural Diversity Database (CNDDB) La Habra USGS 7.5-Minute Quadrangle. Sacramento, CA: California Department of Fish and Game, Biogeographic Data Branch.

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County of San Diego in conjunction with the United States Fish and Wildlife Service, California Department of Fish and Game. October 22, 1997. County of San Diego Multiple Species Conservation Program

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Elbroch, M. 2003. Mammal Tracks & Sign, A Guide to North American Species. Mechanicsburg, PA: Stackpole Books.

Halfpenny, J.C. 2000. Scats and Tracks of the Desert Southwest, A Field Guide to the Signs of 70 Wildlife Species. Helena, MT: Falcon Publishing, Inc.

Hickman, J.C. (ed) 1993. The Jepson Manual: Higher Plants of California. Berkeley: University of California Press.

Holland, R.F. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California (California Department of Fish and Game The Resources Agency, ed), p. 156. Sacramento, CA.

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Ogden Environmental and Energy Services. 1993. Baldwin Otay Ranch Wildlife Corridor Studies. Prepared for: Otay Ranch Project Team. December.

Rich, C., and T. Longcore (Eds.). 2006. *Ecological Consequences of Artificial Night Lighting*. Island Press.

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USFWS (United States Fish and Wildlife Service). 2010a. Critical Habitat Portal. USFWS

USFWS (United States Fish and Wildlife Service). 2010b. San Diego Fish and Wildlife Office Endangered and Threatened Species List. In: U.S. Department of the Interior, editor. Carlsbad, CA: USFWS.

USA. 1918. Migratory Bird Treaty Act (16 USC 703 et seq.), as amended. USA.

USA. 1973. Endangered Species Act of 1973 (16 USC 1531 et seq.), as amended. USA.

USA. 1977. Clean Water Act of 1977 (33 USC 1251 et seq.). USA.

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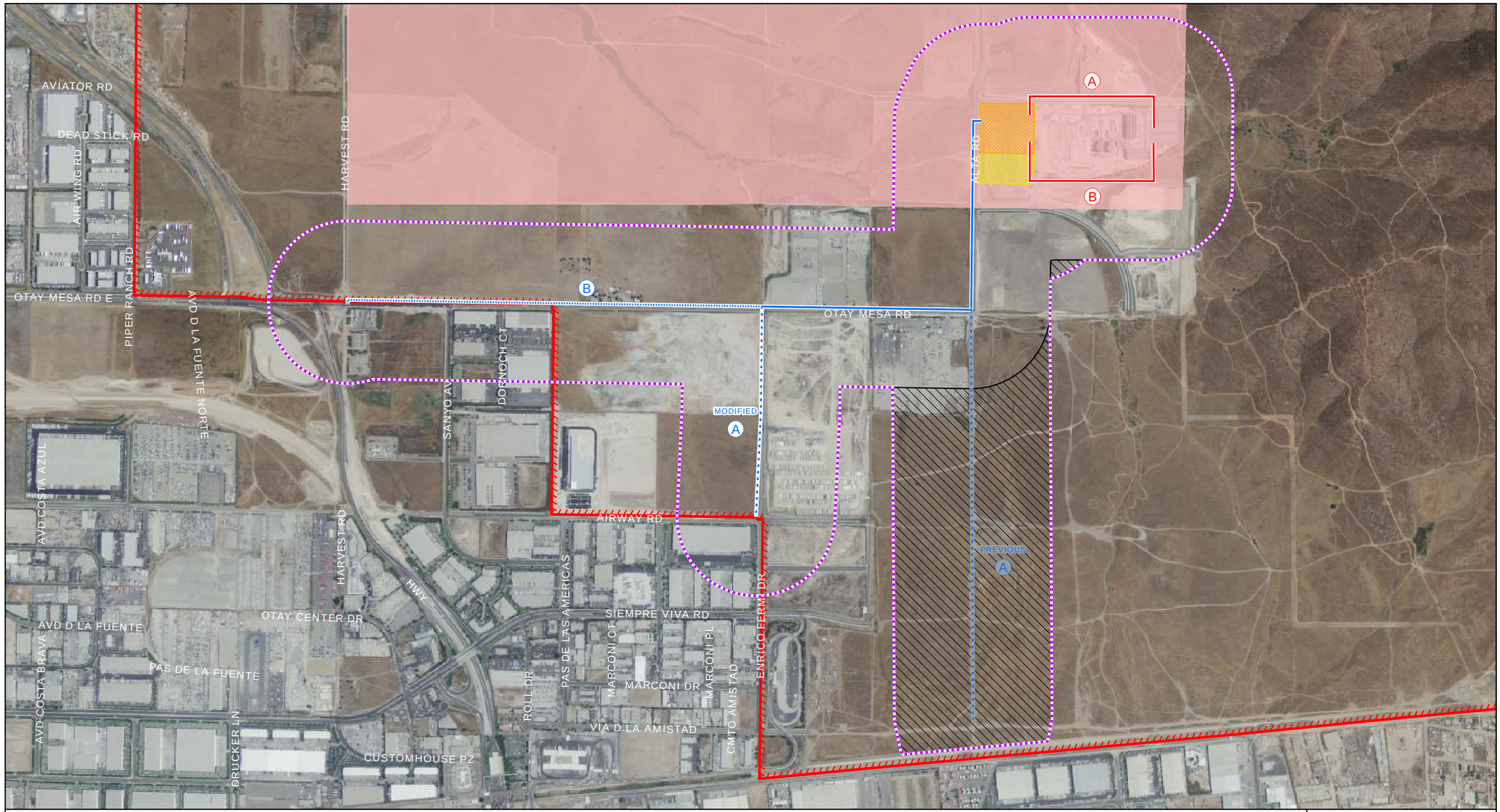
Verheijen, F.J. 1985. Photopollution: Artificial light optic spatial control systems fail to cope with. Incidents, causations, remedies. Experimental Biology 44:1-18. In: Ecological Consequences of Artificial Night Lighting. Rich, Catherine, and T. Longcore (Eds.). Island Press. 2006.



Legend

- Biological Study Area
- Not Included in Final Design
- Project Site
- Laydown Area
- 230 kV Transmission Line (Route A and Route B)
- Natural Gas Line
- Modified Route A Natural Gas Line
- Previous Route A Natural Gas Line
- Route B Natural Gas Line
- USFWS National Wildlife Refuge Otay-Sweetwater Unit
- MSCP Boundary

N

0 600 1,200 Feet

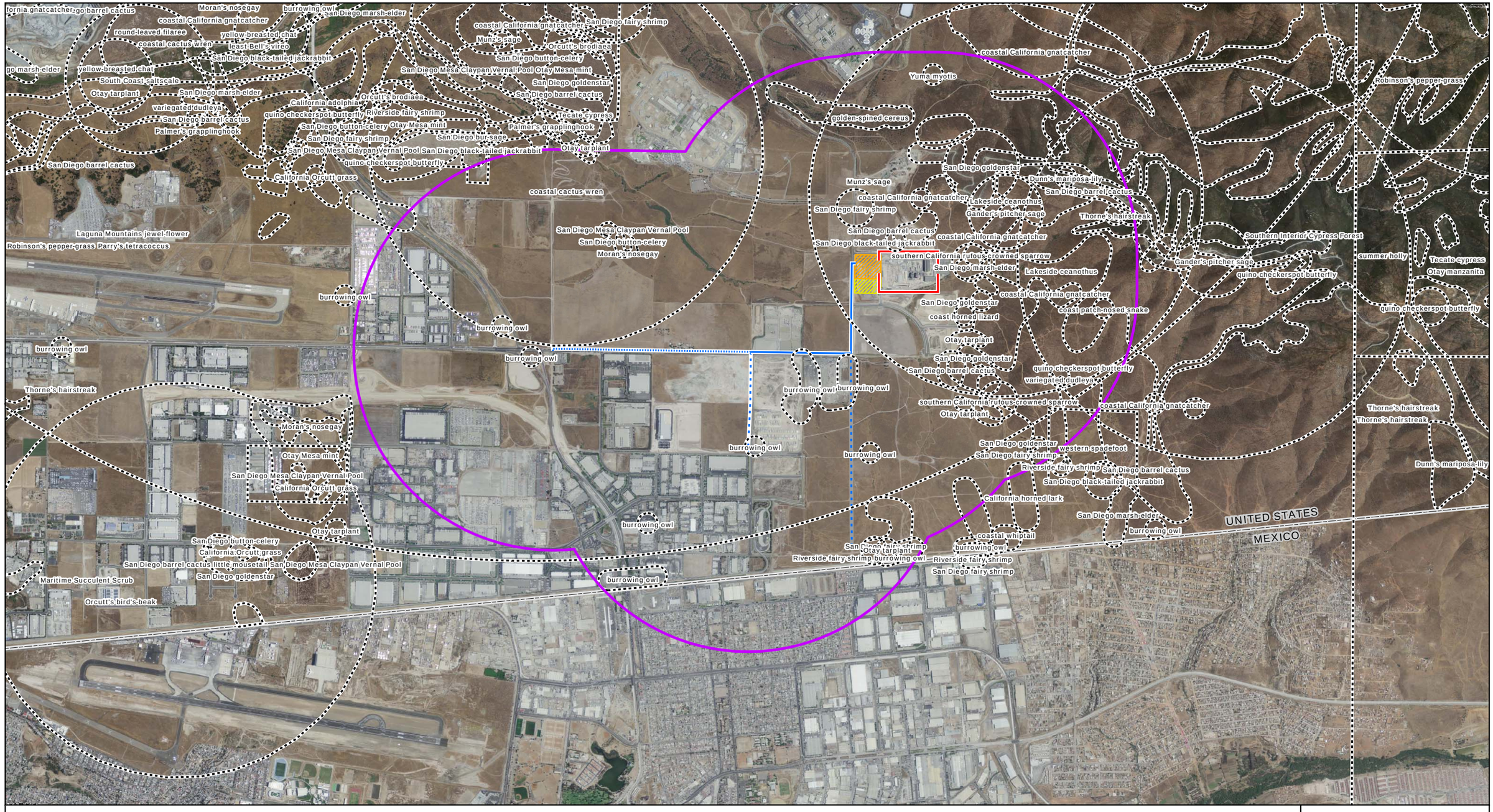
Note: This figures has been revised from the original AFC to reflect subsequent refinements to the project design.

FIGURE 5.6-1 (REVISED)
BIOLOGICAL STUDY AREA

PIO PICO
ENERGY CENTER

PROJECT NO.: 29874827
DATE: DECEMBER 2010

URS



Legend

- 1-Mile Radius of Proposed Site
- Project Site
- Laydown Area
- 230 kV Transmission Line (Route A and Route B)
- Natural Gas Line
- Modified Route A Natural Gas Line
- Previous Route A Natural Gas Line
- Route B Natural Gas Line
- California Natural Diversity Database (May 2010)

N

0 2,500 Feet

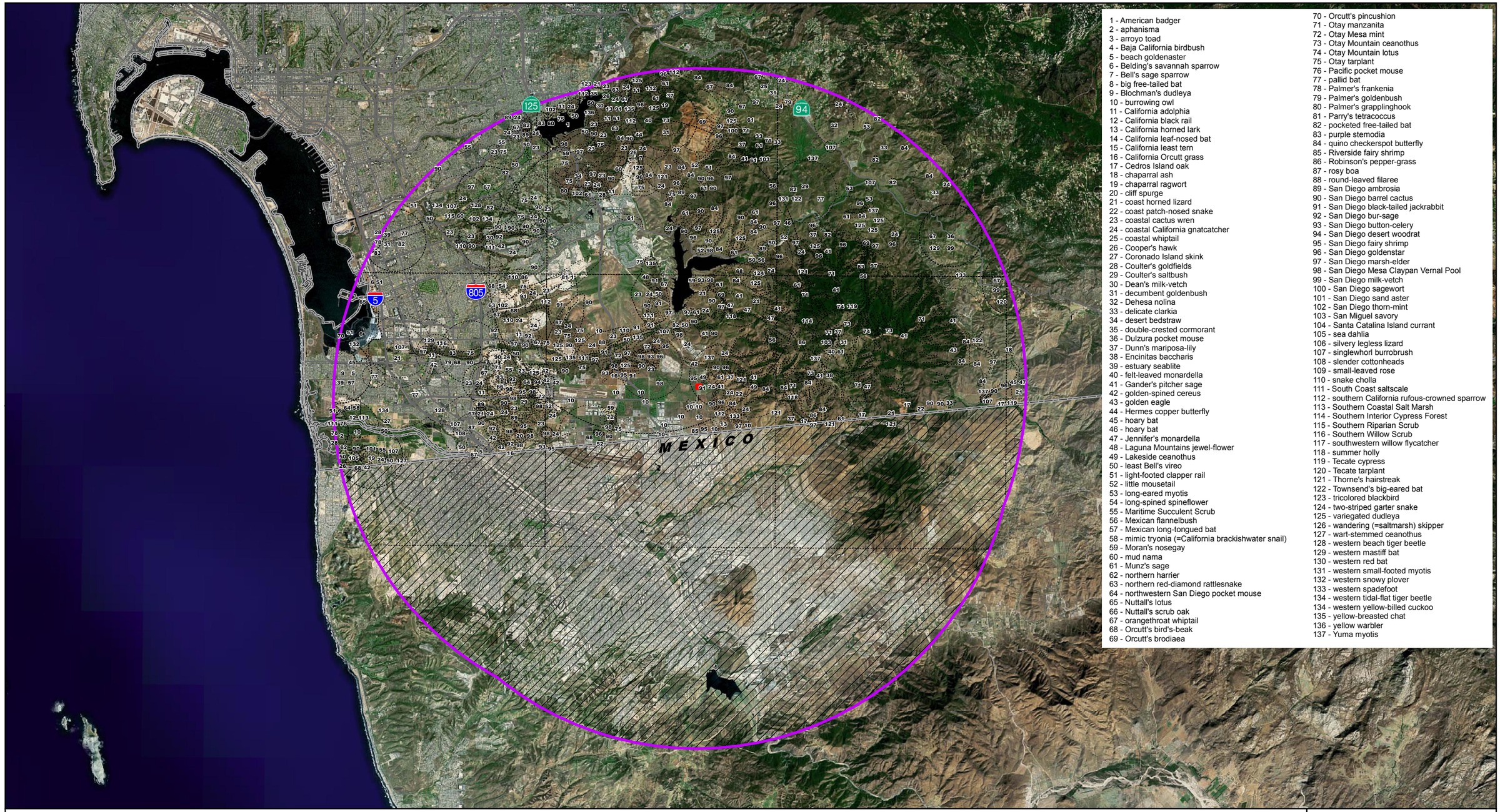
Note: This figures has been revised from the original AFC to reflect subsequent refinements to the project design.

FIGURE 5.6-2 (REVISED)
BIOLOGICAL RESOURCES WITHIN A 1-MILE RADIUS OF THE SITE

PIO PICO ENERGY CENTER

PROJECT NO.: 29874827
DATE: DECEMBER 2010

URS



1 - American badger
2 - aphanisma
3 - arroyo toad
4 - Baja California birdbush
5 - beach goldenaster
6 - Belding's savannah sparrow
7 - Bell's sage sparrow
8 - big free-tailed bat
9 - Blochman's dudleya
10 - burrowing owl
11 - California adolphia
12 - California black rail
13 - California horned lark
14 - California leaf-nosed bat
15 - California least tern
16 - California Orcutt grass
17 - Cedros Island oak
18 - chaparral ash
19 - chaparral ragwort
20 - cliff spurge
21 - coast horned lizard
22 - coast patch-nosed snake
23 - coastal cactus wren
24 - coastal California gnatcatcher
25 - coastal whiptail
26 - Cooper's hawk
27 - Coronado Island skink
28 - Coulter's goldfields
29 - Coulter's saltbush
30 - Dean's milk-vetch
31 - decumbent goldenbush
32 - Dehesa nolina
33 - delicate clarkia
34 - desert bedstraw
35 - double-crested cormorant
36 - Dulzura pocket mouse
37 - Dunn's mariposa-lily
38 - Encinitas baccharis
39 - estuary seablite
40 - felt-leaved monardella
41 - Gander's pitcher sage
42 - golden-spined cereus
43 - golden eagle
44 - Hermes copper butterfly
45 - hoary bat
46 - hoary bat
47 - Jennifer's monardella
48 - Laguna Mountains jewel-flower
49 - Lakeside ceanothus
50 - least Bell's vireo
51 - light-footed clapper rail
52 - little mousetail
53 - long-eared myotis
54 - long-spined spineflower
55 - Maritime Succulent Scrub
56 - Mexican flannelbush
57 - Mexican long-tongued bat
58 - mimic tryonia (=California brackishwater snail)
59 - Moran's nosegay
60 - mud nama
61 - Munz's sage
62 - northern harrier
63 - northern red-diamond rattlesnake
64 - northwestern San Diego pocket mouse
65 - Nuttall's lotus
66 - Nuttall's scrub oak
67 - orangethroat whiptail
68 - Orcutt's bird's-beak
69 - Orcutt's brodiaea
70 - Orcutt's pincushion
71 - Otay manzanita
72 - Otay Mesa mint
73 - Otay Mountain ceanothus
74 - Otay Mountain lotus
75 - Otay tarplant
76 - Pacific pocket mouse
77 - pallid bat
78 - Palmer's frankenia
79 - Palmer's goldenbush
80 - Palmer's grapplinghook
81 - Parry's tetracoccus
82 - pocketed free-tailed bat
83 - purple stemodia
84 - quino checkerspot butterfly
85 - Riverside fairy shrimp
86 - Robinson's pepper-grass
87 - rosy boa
88 - round-leaved filaree
89 - San Diego ambrosia
90 - San Diego barrel cactus
91 - San Diego black-tailed jackrabbit
92 - San Diego bur-sage
93 - San Diego button-celery
94 - San Diego desert woodrat
95 - San Diego fairy shrimp
96 - San Diego goldenstar
97 - San Diego marsh-elder
98 - San Diego Mesa Claypan Vernal Pool
99 - San Diego milk-vetch
100 - San Diego sagewort
101 - San Diego sand aster
102 - San Diego thorn-mint
103 - San Miguel savory
104 - Santa Catalina Island currant
105 - sea dahlia
106 - silvery legless lizard
107 - singlewhorl burrobrush
108 - slender cottonheads
109 - small-leaved rose
110 - snake cholla
111 - South Coast saltscale
112 - southern California rufous-crowned sparrow
113 - Southern Coastal Salt Marsh
114 - Southern Interior Cypress Forest
115 - Southern Riparian Scrub
116 - Southern Willow Scrub
117 - southwestern willow flycatcher
118 - summer holly
119 - Tecate cypress
120 - Tecate tarplant
121 - Thorne's hairstreak
122 - Townsend's big-eared bat
123 - tricolored blackbird
124 - two-striped garter snake
125 - variegated dudleya
126 - wandering (=saltmarsh) skipper
127 - wart-stemmed ceanothus
128 - western beach tiger beetle
129 - western mastiff bat
130 - western red bat
131 - western small-footed myotis
132 - western snowy plover
133 - western spadefoot
134 - western tidal-flat tiger beetle
134 - western yellow-billed cuckoo
135 - yellow-breasted chat
136 - yellow warbler
137 - Yuma myotis

Legend

- Proposed Site Location
- 10-Mile Radius of Proposed Site
- California Natural Diversity Database (CNDDB - May 2010)
- Outside U.S. Jurisdiction

N

0 Miles 2.5

FIGURE 5.6-3
BIOLOGICAL RESOURCES WITHIN A 10-MILE RADIUS OF THE SITE

PIO PICO ENERGY CENTER

PROJECT NO.: 29874827
DATE: DECEMBER 2010

URS

AVIATOR RD
DEAD STICK RD
AIR WING RD
HARVEST RD
PIPER RANCH RD
OTAY MESA RD E
AVD D LA FUENTE NORTE
AVD COSTA AZUL
OTAY MESA RD
DORNOCH CT
SANYO AV
MODIFIED
A
B
AIRWAY RD
ALTA RD
PREVIOUS
HARVEST RD
HWY
OTAY CENTER DR
AVD D LA FUENTE
AVD COSTA BRAVA
PAS DE LA FUENTE
DRUCKER LN
CUSTOMHOUSE PZ
ROLL DR
PAS DE LAS AMERICAS
SIEMPRE VIVA RD
MARCONI CT
MARCONI DR
MARCONI PL
VIA D LA AMISTAD
CMTO AMISTAD
ENRICO FERMI DR

Legend

- Biological Study Area
- Not Included in Final Design
- Project Site
- Laydown Area
- 230 kV Transmission Line (Route A and Route B)
- Natural Gas Line
- Modified Route A Natural Gas Line
- Previous Route A Natural Gas Line
- Route B Natural Gas Line
- Developed/Disturbed
- Riparian
- Non-Native Grassland

N

0 600 1,200 Feet

Note: This figures has been revised from the original AFC to reflect subsequent refinements to the project design.

FIGURE 5.6-4 (REVISED)
VEGETATION COMMUNITIES/
LAND COVER TYPES

PIO PICO
ENERGY CENTER

PROJECT NO.: 29874827
DATE: DECEMBER 2010

URS

BACKGROUND

The AFC (page 5.6-16) states that 3.7 acres of waters of the US and 0.1 acre of waters of the US with US Army Corp-defined wetlands occur within the study area. Temporary impacts to 0.1 acre of non-wetland waters of the US will occur. However on page 5.6-19 it is stated that the project will not adversely impact any federal or state protected waters. Staff requires further information to be able to evaluate the impacts of the project, and determine if any mitigation is required.

Technical Area: Biological Resources

Data Request BIO-15: Please provide additional information on temporary impacts to waters of the US. Describe the type of impact, equipment to be used, construction methods and processes, and expected duration of temporary impacts.

Response: The current PPEC, as refined by the June 8, 2011 AFC Refinement, will not impact Waters of the US[1]. The current disturbance footprint, including all linear features (i.e., the Modified Gas Line Route A option, Gas Line Route B option, Transmission Line Route A, and Transmission Route B), will avoid all Waters of the US. Accordingly, no impacts, temporary or otherwise, to Waters of the US are expected from any project activities. Detailed methods, field survey dates and results are provided in Appendix J-2, Preliminary Jurisdictional Determination Report of the AFC (February 2011).

[1] The original Gas Line Route A analyzed in the February 2011 AFC would have resulted in temporary impacts to Waters of the US. The gas line route was refined and analyzed in the AFC Refinement (June 2011), and the modified route, Modified Gas Line Route A, will avoid impacts to Waters of the US.

Technical Area: Biological Resources

Data Request BIO-16: Please provide maps of scale roughly at 1:100 feet (or finer) that depict areas to be impacted, including the 0.1 acre of non-wetland waters impacted, and the location of the 3.7 acre of waters of the US. Please use aerial maps with topographic overlay. Please clarify the location of non-wetland waters totaling 0.1 acre, and the US Army Corp-defined 0.1 acre wetland.

Response: The current PPEC, as refined by the June 8, 2011 AFC Refinement, will not impact Waters of the US[2]. The current disturbance footprint, including all linear features (i.e., Modified Gas Line Route A option and Gas Line Route B option, Transmission Line Route A option, and Transmission Route B option), will avoid all Waters of the US. Accordingly, no impacts, temporary or otherwise, to Waters of the US are expected from any project activities. Detailed methods, field survey dates are provided in Appendix J-2, Preliminary Jurisdictional Determination Report of the AFC (February 2011).

[2] The original Gas Line Route A analyzed in the February 2011 AFC would have resulted in temporary impacts to Waters of the US. The gas line route was refined and analyzed in the AFC Refinement (June 2011), and the modified route, Modified Gas Line Route A, will avoid impacts to Waters of the US.

Technical Area: Biological Resources

Data Request BIO-17: Please describe proposed best management practices to be used, and restoration activities to be performed, or other applicable mitigation, to minimize and restore temporary impacts to waters.

Response: The current PPEC, as refined by the June 8, 2010 AFC Refinement, will not impact waters of the US[3]. The current disturbance footprint, including all linear features (i.e., the Modified Gas Line Route A option and Gas Line Route B option and all other linears), will avoid all waters of the US. Accordingly, no impacts, temporary or otherwise, to waters of the US are expected from any project activities. Detailed methods, field survey dates are provided in Appendix J-2, Preliminary Jurisdictional Determination Report of the AFC (February 2011).

[3] The original Gas Line Route A analyzed in the February 2011 AFC would have resulted in temporary impacts to Waters of the US. The gas line route was refined and analyzed in the AFC Refinement (June 2011), and the modified route, Modified Gas Line Route A, will avoid impacts to Waters of the US.

Technical Area: Biological Resources

Data Request BIO-18: Please provide an update of consultation progress with the US Army Corp of Engineers, the Regional Water Quality Control Board for Section 401 permit.

Response: The current PPEC, as refined by the June 8, 2011 AFC Refinement, will not impact waters of the US[4]. The current disturbance footprint (including the Modified Gas Line Route A option and Gas Line Route B option and all other linears), will avoid all waters of the US, including Clean Water Act (CWA) Section 404 waters. Accordingly, no impacts, temporary or otherwise, to waters of the US are expected from any project activities.

Facility placement and design, including all linear facilities avoid all special aquatic resource areas (including waters of the U.S. and State). The final design spans all potential jurisdictional features and avoids impacts regulatory permitting (e.g., 404, 401, and 1600). Detailed methods, field survey dates and results are provided in Appendix J-2, Preliminary Jurisdictional Determination Report of the AFC (February 2011). Accordingly, no CWA Section 401 certification from the Regional Water Quality Control Board or CWA Section 404 permit are will be required for project activities. The Preliminary Jurisdictional Determination Report will be provided to the Army Corps of Engineers for concurrence that the project avoids all special aquatic resources areas and no impacts, temporary or otherwise, to Waters of the US are expected from any project activities

[4] The original Gas Line Route A analyzed in the February 2011 AFC would have resulted in temporary impacts to Waters of the US. The gas line route was refined and analyzed in the AFC Refinement (June 2011), and the modified route, Modified Gas Line Route A, will avoid impacts to Waters of the US.

BACKGROUND

Page 5.6-4, Table 5.6-1, describes acreages of vegetative communities mapped within the study area, which includes a 1,000-foot buffer surrounding the project. Staff is unable to distinguish between onsite and offsite resources; and therefore cannot complete its analysis of project impacts.

Technical Area: Biological Resources

Data Request BIO-19: Please differentiate between vegetation type location onsite and vegetation type mapped within the study area buffer zone. Clarifications should be made to tables throughout the AFC that depict vegetation acreage, and an additional map should be created. This map can be based off Figure 5.6-4, Vegetation Communities/Land Cover Type, but should be plotted onto a topographic map, and clearly showing project vegetation types, and vegetation types within the study area buffer zone.

Response: The vegetation types for the onsite and study area buffer zone are included in the below tables. An additional vegetation map has been plotted onto a topographic map, clearly showing project vegetation types, and vegetation types within the study area buffer zone (Figure 5.6.5)

TABLE 5.6-10
VEGETATION TYPE LOCATION ONSITE
INCLUDING LINEARS AND LAYDOWN AREA

Vegetation Community Type	Acres
Non-Native Grassland	2.7
Riparian	0.00
Developed/Disturbed	23.0

TABLE 5.6-11
VEGETATION WITHIN THE STUDY AREA BUFFER ZONE

Vegetation Community Type	Acres
Non-Native Grassland	433.2
Riparian	5.6
Developed/Disturbed	365.6

BACKGROUND

Tables 5.6-2 and 5.6-3 lists plant and wildlife species observed within the study area, respectively. The blue gray gnatcatcher was observed within the study area; however, in Table 5.6-5, a similar species with similar habitat requirements, the coastal California gnatcatcher, is listed as "absent" the potential of occurrence on the project. Staff requires clarification of the information used to eliminate species from further review within the AFC.

Technical Area: Biological Resources

Data Request BIO-20: For both tables 5.6-2 and 5.6-3 please differentiate observations of species within the study area from species observed within the project site. Please provide a textual description of species eliminated from further review and considerations used in eliminating species from further analysis within the AFC. Please provide literature references, personal communications, or any other information source used in making determinations of presence or absence.

Response: The new tables below include the species observations within the study area and within the project site.

TABLE 5.6-12
PLANT SPECIES OBSERVED ONSITE INCLUDING LINEARS AND LAYDOWN AREA

Scientific Name	Common Name
FLOWERING PLANTS	
MONOCOTS	
Poaceae	Grass Family
Avena barbata *	Slender wild oat
Avena fatua *	Wild oat
Bromus diandrus * †	Ripgut brome
Bromus hordeaceus *	Soft chess
*Bromus japonicus**	Japanese broom
Bromus madritensis *	Foxtail chess
Bromus sp.* †	Brome grass
Cynodon dactylon *	Bermuda grass
Elymus condensatus	Giant wild rye
Lolium multiflorum *	Italian wild rye
DICOTS	
Aizoaceae	Fig-Marigold Family
Carpobrotus edulis	Iceplant
Apocynaceae	Dogbane Family
Nerium oleander	Oleander
Asteraceae	Aster Family
Ambrosia psilostachya	Ragweed
Heterotheca grandiflora	Telegraph weed
Lactuca serriola *	Prickly lettuce
Sonchus oleraceus *	Sow thistle
Brassicaceae	Mustard Family
Brassica nigra *	Black mustard
Hirschfeldia incana *	Shortpod mustard
Chenopodiaceae	Goosefoot Family
Salsola tragus *	Russian thistle
Convolvulaceae	Morning Glory Family
*Convolvulus arvensis**	Bindweed

TABLE 5.6-12 (CONTINUED)
PLANT SPECIES OBSERVED ONSITE INCLUDING LINEARS AND LAYDOWN AREA

Scientific Name	Common Name
Euphorbiaceae	Spurge Family
Ricinus communis *	Castor bean
Fabaceae	Pea Family
Melilotus alba *	White sweetclover
Trifolium repens *	White clover
Malvaceae	Mallow Family
Malva parviflora *	Cheeseweed
Myrtaceae	Myrtle Family
Eucalyptus sp. *	Eucalyptus tree
Solanaceae	Nightshade Family
Nicotiana glauca *	Tree tobacco
Verbenaceae	Verbena Family
Lantana sp.*	Lantana

* Non-native (California Invasive Plant Council, 2006),

TABLE 5.6-13
OBSERVED WILDLIFE SPECIES OBSERVED ONSITE INCLUDING LINEARS AND LAYDOWN AREA[5]

Scientific Name	Common Name
REPTILES	
Phrynosomatidae	Spiny Lizards
Sceloperous occidentalis	Western fence lizard
BIRDS	
Columbidae	Pigeons and Doves
Zenaida mcroura	Mourning Dove
Falconidae	Falcons
Falco sparverius	American Kestrel
Icteridae	New World Blackbirds and Orioles
Sturnella neglecta	Western Meadowlark
Trochilidae	Hummingbirds
Calypte anna	Anna's Hummingbird
Tyrannidae	Tyrant Flycatchers
Tyrannus vociferans	Cassin's Kingbird
Mimidae	Mockingbirds and Thrashers
Mimus polyglottos	Northern Mockingbird
Corvidae	Jays and Crows
Corvus brachyrhynchos	American Crow
Corvus corax	Common Raven
Emberizidae	American Sparrows
Zonotrichia leucophrys	White-crowned Sparrow
Fringillidae	Finches
Carpodacus mexicanus	House Finch
Sciuridae	Squirrels
Otospermophilus beecheyi	California ground squirrel (sign)

[5] Wildlife species observed may utilize the project site and the buffer zone.

TABLE 5.6-14
OBSERVED PLANT SPECIES OBSERVED WITHIN THE STUDY AREA BUFFER ZONE[6]

Scientific Name	Common Name
FLOWERING PLANTS	
MONOCOTS	
Arecaceae	Palm Family
Washingtonia sp.	Fan palm
Cyperaceae	Sedge Family
Cyperus eragrostis	Tall umbrella-sedge
Poaceae	Grass Family
Avena barbata *	Slender wild oat
Avena fatua *	Wild oat
Bromus diandrus * †	Ripgut brome
Bromus hordeaceus *	Soft chess
*Bromus japonicus**	Japanese broom
Bromus madritensis *	Foxtail chess
Bromus sp.* †	Brome grass
Cynodon dactylon *	Bermuda grass
Elymus condensatus	Giant wild rye
Lolium multiflorum *	Italian wild rye
Piptatherum miliaceum	Smilo grass
Polypogon monspeliensis *	Annual beard grass
Typhaceae	Cattail Family
Typha domingensis	Southern cattail
DICOTS	
Aizoaceae	Fig-Marigold Family
Carpobrotus edulis	Iceplant
Anacardiaceae	Sumac Family
Rhus ovata	Sugar bush
Schinus molle *	Pepper tree

[6] Wildlife species observed may utilize the project site and the buffer zone.

TABLE 5.6-14 (CONTINUED)
OBSERVED PLANT SPECIES OBSERVED WITHIN THE STUDY AREA BUFFER ZONE

Scientific Name	Common Name
Apiaceae	Carrot Family
Foeniculum vulgare *	Sweet fennel
Apocynaceae	Dogbane Family
Nerium oleander	Oleander
Asteraceae	Aster Family
Ambrosia psilostachya	Ragweed
Artemisia californica	California sagebrush
Artemisia douglasiana	Mugwort
Baccharis pilularis	Coyote brush
Baccharis salicifolia	Mule fat
Conyza canadensis	Common horseweed
Encilia californica	California encilia
Heterotheca grandiflora	Telegraph weed
Isocoma menziesii var. *menziesii*	Goldenbush
Iva hayesiana **	San Diego marsh elder
Lactuca serriola *	Prickly lettuce
Picris echioides *	Bristly ox-tongue
Sonchus asper *	Prickly sow thistle
Sonchus oleraceus *	Sow thistle
Stephanomeria exigua	Wreath-plant
Brassicaceae	Mustard Family
Brassica nigra *	Black mustard
Hirschfeldia incana *	Shortpod mustard
Cactaceae	Cactus Family
Cylindropuntia sp.	Cholla
Opuntia littoralis	Coastal prickly pear
Chenopodiaceae	Goosefoot Family
Atriplex semibaccata *	Australian saltbush
Salsola tragus *	Russian thistle

TABLE 5.6-14 (CONTINUED)
OBSERVED PLANT SPECIES OBSERVED WITHIN THE STUDY AREA BUFFER ZONE

Scientific Name	Common Name
Convolvulaceae	Morning Glory Family
*Convolvulus arvensis**	Bindweed
Euphorbiaceae	Spurge Family
Chamaesyce polycarpa	Small seeded spurge
Eremocarpus setigerus	Doveweed
Ricinus communis *	Castor bean
Fabaceae	Pea Family
Melilotus alba *	White sweetclover
Trifolium repens *	White clover
Geraniaceae	Geranium Family
Erodium botrys *	Longbeak stork's bill
Erodium cicutarium *	Redstem stork's bill
Lamiaceae	Mint Family
Marrubium vulgare *	Common horehound
Malvaceae	Mallow Family
Malva parviflora *	Cheeseweed
Myrtaceae	Myrtle Family
Eucalyptus sp. *	Eucalyptus tree
Onagraceae	Evening Primrose Family
Oenothera elata	Hooker's evening primrose
Polygonaceae	Buckwheat Family
Rumex crispus *	Curly dock
Primulaceae	Primrose Family
Anagallis arvensis *	Scarlet pimpernel
Rosaceae	Rose Family
Heteromeles arbutifolia	Toyon
Salicaceae	Willow Family
Salix exigua	Sandbar willow
Salix lasiolepis	Arroyo willow

TABLE 5.6-14 (CONTINUED)
OBSERVED PLANT SPECIES OBSERVED WITHIN THE STUDY AREA BUFFER ZONE

Scientific Name	Common Name
Solanaceae	Nightshade Family
Nicotiana glauca *	Tree tobacco
Tamaricaceae	Tamarisk Family
Tamarix ramosissima	Mediterranean tamarisk
Urticaceae	Nettle Family
Urtica dioica	Stinging nettle
Verbenaceae	Verbena Family
Lantana sp.*	Lantana

* Non-native (California Invasive Plant Council, 2006).

TABLE 5.6-15
OBSERVED WILDLIFE SPECIES WITHIN THE STUDY AREA BUFFER ZONE

Scientific Name	Common Name
REPTILES	
Phrynosomatidae	Spiny Lizards
Sceloperous occidentalis	Western fence lizard
BIRDS	
Accipitridae	Hawks, Kites, and Eagles
Buteo jamaicensis	Red-tailed hawk
Ardeidae	Herons and Egrets
Ardea alba	Great egret
Columbidae	Pigeons and Doves
Zenaida mcroura	Mourning dove
Falconidae	Falcons
Falco sparverius	American kestrel
Icteridae	New World Blackbirds and Orioles
Sturnella neglecta	Western meadowlark
Polioptilidae	Gnatcatchers
Polioptila caerulea	Blue gray gnatcatcher
Trochilidae	Hummingbirds
Calypte anna	Anna's hummingbird
Tyrannidae	Tyrant Flycatchers
Sayornis nigricans	Black phoebe
Tyrannus vociferans	Cassin's kingbird
Tytonidae	Barn owls
Tyto alba	Barn owl
Mimidae	Mockingbirds and Thrashers
Mimus polyglottos	Northern mockingbird
Corvidae	Jays and Crows
Corvus brachyrhynchos	American crow
Corvus corax	Common raven

TABLE 5.6-15 (CONTINUED)
OBSERVED WILDLIFE SPECIES WITHIN THE STUDY AREA BUFFER ZONE

Scientific Name	Common Name
Emberizidae	American Sparrows
Zonotrichia leucophrys	White-crowned sparrow
Fringillidae	Finches
Carpodacus mexicanus	House finch
MAMMALS	
Canidae	Foxes, Dogs, Wolves, and Coyotes
Canis familiaris	Domestic dog (sign)
Canis latrans	Coyote (sign)
Leporidae	Rabbits and Hares
Sylvilagus sp.	Cottontail (sign)
Sciuridae	Squirrels
Otospermophilus beecheyi	California ground squirrel (sign)

The project was also assessed for its potential to support special-status species based on habitat suitability comparisons with reported occupied habitats. Data and information from resource management plans and relevant documents to determine the locations and types of biological resources that have the potential to exist within and adjacent to the project study area; resources were evaluated within one mile and ten miles of the project pursuant to California Energy Commission's (CEC) evaluation guidelines. The materials reviewed included the following:

- County of San Diego, Biological Mitigation Ordinance (1996)
- County of San Diego in Conjunction with the United States Fish and Wildlife Service (USFWS). Multiple Species Conservation Program
- USFWS Critical Habitat Mapper and File Data (USFWS, 2010a and 2010b)

- USFWS Carlsbad Field Office Species List for San Diego County
- The California Natural Diversity Database (CDFG, 2010)
- California Native Plant Society Electronic Inventory (CNPS, 2010)

The following definitions were also utilized to characterize the potential for occurrence for special-status species:

- **Absent [A] –** Species distribution is restricted by substantive habitat requirements, which do not occur within the project footprint, and no further survey or study is necessary to determine likely presence or absence of this species.
- **Low [L] –** Species distribution is restricted by substantive habitat requirements, which are negligible within the project footprint, and no further survey or study is obligatory to determine likely presence or absence of this species.
- **Habitat Present [HP] –** Species distribution is restricted by substantive habitat requirements, which occur within the project footprint, and further survey or study may be necessary to determine likely presence or absence of species.
- **Present [P] –** Species or species sign were observed to be present in the project footprint.

As an example, the California gnatcatcher ([CAGN] *Polioptila californica californica*), which is closely associated with coastal sage scrub habitat; particularly in those areas dominated by California sagebrush (*Artemisia californica*) and California buckwheat (*Eriogonum* fasciculatum) (Braden et al. 1997), was not observed in the study area. The project site includes non-native developed/disturbed habitats which will not support CAGN. Furthermore, construction of the project will not result temporary and permanent impacts special-status species because of the permanent removal of non-native developed/

disturbed habitats. As a result, the CAGN is characterized with Absent [A]. The blue gray gnatcatcher ([BGGN] *Polioptila caerulea*) which is not a special status species, was observed in the study area; however it was not observe within project site. The BGGN is closely associated to variety of native habitats including coastal sage scrub and mature forest. The project site includes non-native developed/disturbed habitats which will not support BGGN. Each species potential for occurrence is detailed further in Table 5.6-5 in the AFC (February 2011).

BACKGROUND

Page 5.6-17 references surveys and literature review that supports the assertion that the project study area does not contain denning or nesting sites for common and or special status species, and that no active nesting raptor or passerine birds were observed in the study area. Staff needs further information to complete analysis of the projects' conformance with the Migratory Bird Treaty Act, and with Fish and Game codes relative to protection of furbearing mammals.

Technical Area: Biological Resources

Data Request BIO-21: Please provide citations for literature, and describe survey results that support assertion that no denning or nesting sites for special status species occur within the study area. Discuss the potential of the surrounding adjacent landscape to support populations of special status species.

Response: Prior to beginning field surveys, URS Corporation (URS) consulted resource specialists (CDFG and USFWS) and reviewed available information from resource management plans and relevant documents (see below) to determine the locations and types of biological resources that have the potential to exist within and adjacent to the project study area. Resources were evaluated within one mile and ten miles of the project pursuant to California Energy Commission's (CEC) evaluation guidelines. The materials reviewed included the following:

- County of San Diego, Biological Mitigation Ordinance (1996)
- County of San Diego in Conjunction with the United States Fish and Wildlife Service (USFWS) and California Department of Fish & Game (CDFG). Multiple Species Conservation Program
- USFWS Critical Habitat Mapper and File Data (USFWS, 2010a and 2010b)
- USFWS Carlsbad Field Office Species List for San Diego County

- The California Natural Diversity Database (CDFG, 2010) (See Appendix J-3)
- California Native Plant Society Electronic Inventory (CNPS, 2010)
- Aerial Photographs (Digital Globe 2009)
- Biological Database for California Department of Transportation (Caltrans) State Route (SR)-11 Project (URS, 2005)

The majority of the study area has been previously disturbed and the region includes developed areas containing commercial and public infrastructure. The project's proposed ground disturbance footprint is relatively flat and insulated from the adjacent drainage and open space by an existing road (Paseo De La Fuente) and existing ornamental landscaping. However, the Route B Transmission Line option will span the drainage, but no impacts are expected. Facility placement and design, including all linear facilities avoid all special aquatic resource areas (including waters of the U.S. and State). The final design spans all potential jurisdictional features and avoids impacts regulatory permitting (e.g., 404, 401 and 1600). Additionally, the industrial park developer graded the property in first quarter 2011 as described in the 2009-2010 County of San Diego Grading Permit 2700-1555.

The literature review and field survey data suggests that there are no denning or nesting sites that may support special status species within the Project footprint. The Project footprint lacks suitable habitat that would typically support special status species or receive state or federal Endangered Species Act (ESA) protections. Therefore, there is no reasonable presumption of adverse impact to any special status species or their habitats as a result of Project implementation. The surrounding adjacent landscape includes developed areas (e.g., Roads, Otay Mesa Generating Project), disturbed areas, non-native grasses and ornamental landscaping. Native habitats do exist east of the project site behind the existing Otay Mesa

Generating Project. These native habitats may support populations of special status species; however, the PPEC is separated from all native habitats by the existing Otay Mesa Generating Project, and open space. Please see Figure 5.6-2 in the AFC presenting the CNDDB query results for all of the special status species observations in the region. Additionally, no impacts are expected to species protected by the Migratory Bird Treaty Act and relevant sections of the CDFG Code (e.g., 3503, 3503.4, 3504, 3505, et seq.) including fur bearing mammals because of the permanent removal of non-developed/disturbed native habitat.

BACKGROUND

Page 5.6-20 of the AFC states that potential collision hazards may exist with the 100-foot tall stacks, and that several raptors, such as red-tailed hawk, Cooper's hawk, and barn owls may potentially collide with the stacks. With the information currently provided, staff is currently unable to ascertain if collisions will be an impact of the project. Analysis of any necessary minimization techniques, as well as the project's conformance with applicable federal guidelines (Migratory Bird Protection Act) and voluntary guidelines which are jointly issued by the USFWS and the Avian Power Line Interaction Committee, will not be possible until required information is supplied, including information on the T-line poles and towers.

Technical Area: Biological Resources

Data Request BIO-22: Please provide information that was used to determine the potential for collisions. Document existing known raptor nest sites and distance to the project site, and how the location of the stacks within the surrounding ecosystem, and design details of the stacks may or may not contribute to the potential of collisions.

Response: The literature used to determine the potential for collisions included the following:

- Avian Powerline Interaction Committee (APLIC). 2006. Suggested Practices for Raptor Protection on Powerlines: The State of the Art in 2006. Edison Electric Institute, APLIC, and the California Energy Commission. Washington, D.C and Sacramento, California.
- Brown, W. M. 1993. Avian collisions with utility structures: Biological perspectives. In: Proceedings: avian interactions with utility structures. Intern. Workshop, Miami, FL. Sponsored by APLIC and EPRI.
- Rich, C., and T. Longcore (Eds.). 2006. *Ecological Consequences of Artificial Night Lighting*. Island Press.

No known raptor nest sites were observed within the project footprint and 1,000 foot buffer during the November 2010 field surveys. Project operational impacts include potential collision hazards associated with the three approximately 100-foot-tall

stacks. Migratory birds generally fly at an altitude that would avoid ground structures, except when crossing over topographic features (e.g., ridge tops) or when inclement weather forces them closer to the ground. Topographic or ecological features are not present that would likely attract birds to the project area. Raptor and other migratory bird species that are protected by the Migratory Bird Treaty Act (MBTA) are expected to occur in the general area and could potentially collide with the stacks during inclement weather (e.g., fog and rain). Smaller birds are assumed to be more agile and are less likely to collide with project facilities. Collisions are also more probable near wetlands, within valleys that are bisected by power lines or stacks, and within narrow passes where power lines run perpendicular to flight paths (APLIC 1996). These features are not present near or on the proposed Project site. Therefore, it is unlikely that the Project's structures would pose a significant collision threat to resident or migratory bird populations.

Because of the relatively low structure heights (three approximately 100-foot-tall stacks), the potential for wildlife collisions is considered less than significant. In addition, placement of downward-facing lighting on the stacks to reduce attracting wildlife would minimize the potential for collisions. Accordingly, mitigation measure BIO-8 was proposed in the AFC to ensure the design is in accordance with the Avian Power Line Interaction Committee's (APLIC) Suggested Practices for Raptor Protection on Power Lines. With implementation of this mitigation, significant avian mortality due to electrocution by PPEC transmission structures is not expected to occur.

Technical Area: Biological Resources

Data Request BIO-23: Please also identify potential mitigation measures, including best management practices available to lessen the effects. Please also discuss how power lines and poles or towers may be adapted to prevent raptors from attempting to perch or nest upon them, which can result in electrocutions, provide specifications of the power lines, and describe if the project will be in conformance with the voluntary Avian Power Line Interaction Committee guidelines.

Response: Potential impacts to wildlife resulting from electrocution by transmission lines will be mitigated by incorporating the construction design recommendations provided in Suggested Practices for Raptor Protection on Power Lines, as described in Mitigation Measure BIO-8 on page 5.6-27 of the AFC. Specifically, the phase conductors shall be separated by a minimum of 150 cm (60 in). In addition to the aforementioned separation requirements, Condition of Certification BIO-8 (included below) states that bird perch diverters and/or specifically designed avian protection materials should be used to cover electrical equipment where adequate separation is not feasible (APLIC 2006). With implementation of this design feature and adherence to BIO-8, significant avian mortality due to electrocution by PPEC transmission structures is not expected to occur.

As set forth on pages 5.6-27 and 5.6-28 of the AFC, BIO-8 provides, in part:

BIO-8 Any time the project owner modifies or finalizes the project design they shall incorporate all feasible measures to avoid or minimize impacts to the local biological resources, including:

1. Design, install, and maintain transmission line poles, access roads, pulling sites, and storage and parking areas to avoid identified sensitive resources.

2. Design, install, and maintain transmission lines and all electrical components in accordance with the Avian Power Line Interaction Committee's (APLIC) Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006 (APLIC, 2006) to reduce the likelihood of electrocutions of large birds.
3. Design, install, and maintain facility lighting to prevent side casting of light towards wildlife habitat.

BACKGROUND

Pages 5.6-18-5 and 6-19 provides details of construction impacts, and references a short-term loss of habitat, and states that the project may only temporarily and incrementally increase habitat fragmentation on a regional level. Information provided is insufficient to allow staff to conduct analysis of indirect effects of construction activities, such as noise, lighting, and vibrations, or to support the claim of temporary/incremental habitat fragmentation.

Technical Area: Biological Resources

Data Request BIO-24: Please provide information on extent and/or duration of any proposed construction and operational nighttime lighting, noise impacts and attenuation across the site and into the study area, and vibratory effects. Current background noise levels and anticipated project-related noise levels (both construction-related and operational) must be described within the biological section of the AFC, as well as available species-specific thresholds. Please conduct a literature review and consult with CDFG and the USFWS to identify noise threshold standards for wildlife, particularly special-status wildlife species.

Response: Construction of the generating facility, from site preparation and grading to commercial operation, is expected to take place from February 2013 to May 2014. Although operation would create additional noise, light and vibration, significant impacts to biological resources are not expected. The existing Otay Mesa Generating Project, located adjacent to the project site, provides an elevated ambient level of noise and lighting to which local wildlife, including nocturnal species, have acclimated.

The closest receptor **(**approximately 4,700 southwest of the project site**)** included existing noise levels ranging from 62 dBA to 74 dBA. The average hourly L_{eq} during the entire measurement period was 72dBA. The average daytime, evening, and nighttime hourly L_{eq} values were 73 dBA, 69 dBA, and 69 dBA, respectively (Section 5.12 of the AFC). The higher noise levels are due to high volumes of traffic near the

along Otay Mesa Road and the existing Otay Mesa Generating Project.

The impact of noise involves a number of parameters, but one of the most apparent is the potential for masking of wildlife communication. Wildlife depends on calls and song for species identification, mate attraction, and territorial defense. Hearing in all forms of wildlife is not analogous to hearing in mammals. For example, birds show a high degree of frequency selectivity and vocalize in a much higher frequency level than most traffic noise produces. Studies evaluating the potential for masking of bird song by traffic noise have concluded that continuous noise levels above 60 decibels A-weighted (dBA) equivalent sound level (Leq) within habitat areas may affect the suitability of habitat use (SANDAG, 1988). Many regulatory agencies (e.g., CDFG, USFWS) suggest that the application of 60 dBA Leq hourly levels to be considered a significant impact for special status species at the edge of suitable habitat. The existing noise exposure at the closest sensitive receptor is already above 60 dBA and the existing noise plus the project does not change the noise exposure as a result of the proposed project. As such, any individual species present in the area or in adjacent/ surrounding areas are assumed to have acclimated and developed tolerance to substantial noise, light, and other effects resulting from the presence of an active power plant and its access roads. Temporary noise levels associated with site clearing are estimated to be 89 dBA at a distance of 50 feet during the daytime. Nonetheless, because of the recent industrial park developer grading, special status species are not expected to occur within the site.

Vibration from an operating power plant could be transmitted by two mechanisms: through the ground (groundborne vibration) and through the air (airborne vibration). The operating components of a simple-cycle power plant consist of high-speed gas turbines, compressors, and various pumps. All of these pieces of equipment must be carefully balanced to operate smoothly. Permanent vibration sensors are attached to the turbines and generators. Similar facilities (e.g., Panoche

Energy Center) have not resulted in ground or airborne vibration impacts, and it is not anticipated that the Project will produce groundborne or airborne vibration. The only potential power plant construction operation likely to produce vibration that could be perceived off site would be pile driving. Pile driving will not be required for construction of PPEC. Therefore, no vibration impacts are anticipated.

The mitigation measures included in the AFC (Section 5.6.5) are expected to reduce operation and construction impacts from noise, light, and vibration to a less-than-significant level.

Technical Area: Biological Resources

Data Request BIO-25: Please identify specific mitigation/minimization measures to be implemented to limit impacts of construction effects, including but not limited to lighting, noise, vibratory effects, or any other indirect effect caused by construction. These would include any use of directional lighting, limits to extent of lighting or particularly noisy equipment during special status species breeding time periods.

Response: All proposed short term construction lighting, noise, vibratory impacts on wildlife species near the proposed Project are assumed to insignificant as a result of the existing developed areas containing commercial and public infrastructure, including existing electric generation uses (e.g., Otay Mesa Generating Project). Existing energy facilities adjacent to the proposed site provide an elevated ambient level of lighting to which local wildlife, including nocturnal species, have acclimated. Furthermore, the following Mitigation Measures will be implemented during construction:

Visual Resources-1: The project owner shall prepare a Lighting Plan for Compliance Project Manager (CPM) and CEC visual resources staff review and approval. The Lighting Plan shall include the following components:

- External lighting shall incorporate commercially available fixture hoods and shielding that direct light downward or toward the area to be illuminated.
- Light fixtures shall not cause obtrusive spill light beyond the project boundary.
- All lighting shall be of minimum necessary brightness consistent with operational safety and security.
- Direct lighting shall not illuminate the nighttime sky.

NOISE-3: The project owner shall submit to the CPM for review and approval a noise control program and a statement, signed by the project owner's project manager, verifying that

the noise control program will be implemented throughout construction of the project. 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.

NOISE-5: Heavy equipment operation and noisy construction work relating to any project features shall be restricted to an eight hour period between the times delineated below:

- Any Day: 7:00 a.m. to 7:00 p.m.

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.

BIO-1: The project owner will assign a Designated Biologist to the project. The project owner will submit the resume of the proposed Designated Biologist, with at least three references and contact information, to the California Energy Commission (CEC) Compliance Project Manager (CPM) for approval.

The Designated Biologist must meet the following minimum qualifications:

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

In lieu of the above requirements, the resume shall demonstrate to the satisfaction of the CPM, that the proposed Designated Biologist or alternate has the appropriate training and

background to effectively implement the Conditions of Certification.

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

BIO-2: The project owner shall ensure that the Designated Biologist performs the following during any site (or related facilities) mobilization, ground disturbance, grading, construction, operation, and closure activities.

The Designated Biologist may be assisted by the approved Biological Monitor(s), but the Designated Biologist will be the contact for the project owner and CPM. The Designated Biologist shall:

1. Advise the project owner's Construction and Operation Managers on the implementation of the biological resources Conditions of Certification;
2. Consult on the preparation of the Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) to be submitted by the project owner;
3. Be available to supervise, conduct, and coordinate mitigation, monitoring, and other biological resources compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as special-status species or their habitat;
4. Clearly mark sensitive biological resource areas and inspect these areas at appropriate intervals for compliance with regulatory terms and conditions;
5. Inspect active construction areas where animals may have become trapped prior to construction commencing each

day. At the end of the day, inspect for the installation of structures that prevent entrapment or allow escape during periods of construction inactivity. Periodically inspect areas with high vehicle activity (i.e., parking lots) for animals in harm's way;

6. Notify the project owner and the CPM of any noncompliance with any biological resources Condition of Certification;
7. Respond directly to inquiries of the CPM regarding biological resource issues;
8. Maintain written records of the tasks specified above and those included in the BRMIMP. Summaries of these records shall be submitted in the Monthly Compliance Report and the Annual Report; and
9. Train the Biological Monitors as appropriate and verify their familiarity with the BRMIMP, Worker Environmental Awareness Program (WEAP) training, and all permits.

During project operation, the Designated Biologist will submit record summaries in the Annual Compliance Report, unless their duties are ceased as approved by the CPM.

BIO-3: The project owner's Designated Biologist will submit the resume, at least three references, and contact information of the proposed Biological Monitors to the CPM for approval. The resume will demonstrate to the satisfaction of the CPM, the appropriate education and experience to accomplish the assigned biological resource tasks.

Biological Monitor(s) training by the Designated Biologist will include familiarity with the Conditions of Certification and the BRMIMP, WEAP, and all permits.

BIO-4: Designated Biologist and Biological Monitor Authority. The project owner's Construction/Operation Manager will act on the advice of the Designated Biologist and Biological Monitor(s) to ensure conformance with the biological resources Conditions of Certification.

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

The Designated Biologist will:

1. Require a halt to all activities in any area when determined that there would be an unauthorized adverse impact to biological resources if the activities continued;
2. Inform the project owner and the Construction/Operation Manager when to resume activities;
3. Notify the CPM if there is a halt of any activities and advise the CPM of any corrective actions that have been taken, or will be instituted, as a result of the work stoppage; and
4. If the Designated Biologist is unavailable for direct consultation, the Biological Monitor will act on behalf of the Designated Biologist

Whenever corrective action is taken by the project owner, a determination of success or failure will be made by the CPM within 5 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-5: Worker Environmental Awareness Program. The project owner will develop and implement a CPM-approved WEAP by which each of its employees, as well as employees of contractors and subcontractors who work on the project site or any related facilities during site mobilization, ground disturbance, grading, construction, operation and closure, is informed about sensitive biological resources associated with the project.

The WEAP must:

1. Be developed by or in consultation with the Designated Biologist and consist of an on-site or training center presentation through which supporting written material and electronic media (video or DVD) is made available to all participants;
2. Discuss the locations and types of sensitive biological resources on the project site and adjacent areas;
3. Present the reasons for protecting these resources;
4. Present the meaning of various temporary and permanent habitat protection measures;
5. Identify whom to contact if there are further comments and questions about the material discussed in the program;
6. Include a training acknowledgment form to be signed by each worker indicating that they received training and will abide by the guidelines; and
7. The specific program can be administered by a competent individual(s) acceptable to the Designated Biologist.

The project owner will provide in the Monthly Compliance Report the number of persons who have completed the training in the prior month and a running total of all persons who have completed the training to date. The project owner will submit two copies of the CPM-approved materials at least ten days prior to site and related facilities mobilization.

The signed training acknowledgement forms will be kept on file by the project owner for a period of at least six months after the start of commercial operation.

During project operation, signed statements for active project operational personnel will be kept on file for six months following the termination of an individual's employment.

BIO-6: The project owner will submit two copies of the proposed BRMIMP to the CPM (for review and approval) and implement the measures identified in the approved BRMIMP.

The BRMIMP will be prepared in consultation with the Designated Biologist and will identify:

1. All biological resources mitigation, monitoring, and compliance measures proposed and agreed to by the project owner.
2. All biological resources Conditions of Certification identified as necessary to avoid or mitigate impacts.
3. All biological resources mitigation, monitoring, and compliance measures required in local agency permits, such as site grading and landscaping requirements.
4. All sensitive biological resources to be impacted, avoided, or mitigated by project construction, operation and closure.
5. All required mitigation measures for each sensitive biological resource.
6. Required habitat compensation strategy, including provisions for acquisition, enhancement, and management for any temporary and permanent loss of sensitive biological resources.
7. A detailed description of measures that will be taken to avoid or mitigate temporary disturbances from construction activities.
8. All locations on a map, at an approved scale, of sensitive biological resource areas subject to disturbance and areas requiring temporary protection and avoidance during construction. This includes the installation of prominently colored fencing or similar materials wherever the limits of grading are adjacent to native/non-native vegetation communities or other biological resources. Fencing will remain in place during all construction activities. Temporary fencing will also be shown on all grading plans

and project specifications. Barriers and signage will be installed to direct public access to appropriate locations.

9. Aerial photographs, at an approved scale, of all areas to be disturbed during project construction activities – one set prior to any site or related facilities mobilization disturbance and one set subsequent to completion of project construction. Include planned timing of aerial photography and a description of why times were chosen.
10. Duration for each type of monitoring and a description of monitoring methodologies and frequency.
11. Performance standards to be used to help decide if/when proposed mitigation is or is not successful.
12. All performance standards and remedial measures to be implemented if performance standards are not met.
13. A preliminary discussion of biological resources-related facility closure measures.
14. A process for proposing plan modifications to the CPM and appropriate agencies for review and approval.
15. A copy of all biological resources related permits obtained.

The CPM will determine the BRMIMP's acceptability within 45 days of receipt. If any permits have not yet been received when the BRMIMP is submitted, these permits will be submitted to the CPM within five days of their receipt, and the BRMIMP will be revised or supplemented to reflect the permit condition within ten days of their receipt by the project owner. Ten days prior to site and related facilities mobilization, the revised BRMIMP will be resubmitted to the CPM.

The project owner will notify the CPM no fewer than five working days before implementing any modifications to the approved BRMIMP to obtain CPM approval. Any changes to the approved BRMIMP must also be approved by the CPM to ensure no conflicts exist.

Implementation of BRMIMP measures will be reported in the Monthly Compliance Reports by the Designated Biologist (i.e., survey results, construction activities that were monitored, species observed). Within 30 days after completion of project construction, the project owner will provide to the CPM, for review and approval, a written construction closure report identifying which items of the BRMIMP have been completed; a summary of all modifications to mitigation measures made during the project's site mobilization, ground disturbance, grading, and construction phases; and which mitigation and monitoring items are still outstanding.

BIO-7: The project owner shall implement the following measures to manage their construction site and related facilities in a manner to avoid or minimize impacts on the local biological resources.

1. Install temporary fencing and provide wildlife escape ramps for construction areas that contain steep walled holes or trenches if outside of an approved, permanent exclusionary fence. The temporary fence shall be hardware cloth or similar materials that are approved by USFWS and CDFG. Before such holes or trenches are filled, they should be thoroughly inspected for trapped animals by the Designated Biologist or Biological Monitor.
2. Make certain all food-related trash is disposed of in closed containers and removed at least once a week from the project site.
3. Prohibit feeding of wildlife by staff and subcontractors.
4. Prohibit nonsecurity-related firearms or weapons from being brought to the project site.
5. Prohibit pets from being brought to the project site.
6. Report all inadvertent deaths of special-status species to the appropriate project representative.
7. Injured animals shall be reported to CDFG, and the project owner shall follow instructions that are provided by CDFG.

The USFWS Office shall be notified in writing within three working days of the accidental death or injury to special-status species during project-related activities.

8. Contact USFWS and CDFG for specific notification procedures.
9. Minimize use of rodenticides and herbicides in the project area and prohibit the use of chemicals and pesticides known to cause harm to amphibians. If rodent control must be conducted, zinc phosphide or an equivalent product shall be used.

BIO-8: Any time the project owner modifies or finalizes the project design they shall incorporate all feasible measures to avoid or minimize impacts to the local biological resources, including:

1. Design, install, and maintain transmission line poles, access roads, pulling sites, and storage and parking areas to avoid identified sensitive resources.
2. Design, install, and maintain transmission lines and all electrical components in accordance with the Avian Power Line Interaction Committee's (APLIC) Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006 (APLIC, 2006) to reduce the likelihood of electrocutions of large birds.
3. Eliminate any California Exotic Pest Plants of Concern (Cal-IPC, 2007) List A species from landscaping plans.
4. Prescribe a road sealant that is nontoxic to wildlife and plants.
5. Design, install, and maintain facility lighting to prevent side casting of light towards wildlife habitat.
6. Use straw wattles or silt fences to prevent sediment from reaching irrigation and drainage canals.
7. Fence buffer zones during construction to minimize habitat disturbance.

8. Restore temporarily impacted areas to approximate original site conditions.

BIO-11: If federally protected species (e.g., San Diego fairy shrimp) are identified within the proposed ground disturbance footprint, the applicants will comply with the state and federal Endangered Species Acts will ensure that impacts to special-status species would be less than significant with mitigation.

BIO-12: In order to comply with the Migratory Bird Treaty Act and relevant sections of the CDFG Code (e.g., 3503, 3503.4, 3504, 3505, et seq.), any vegetation clearing would take place outside of the typical avian nesting season (i.e., February 1st – August 31st), to the maximum extent practical. If this is not possible, prior to ground-disturbing activities, construction, and so forth within the Action Area, a qualified biologist will conduct and submit a migratory nesting bird and raptor survey report. A qualified biologist is an individual with sufficient education and field experience in local California ecology and biology to adequately identify local plant and wildlife species. The survey shall occur not more than 72 hours prior to initiation of project activities and any occupied passerines and/or raptor nests occurring within or adjacent to the Action Area will be delineated. To the maximum extent practicable, a minimum buffer zone from occupied nests will be maintained during physical ground-disturbing activities. Once nesting has been determined to cease, the buffer may be removed.

BACKGROUND

Page 5.6-20 of the AFC describes air emissions as an operational impact associated with the project. The project's anticipated NO_X emissions may contribute to the ongoing (cumulative) degradation of endangered species habitat located near the project site. NO_X emissions are a concern of USFWS and CDFG, and staff will be pursuing the issue with those agencies, and share information with the applicant as it becomes available.

Technical Area: Biological Resources

Data Request BIO-26: Please quantify the existing baseline total nitrogen deposition rate in the vicinity of the project in kg/ha/yr. The geographical extent of the nitrogen deposition mapping should be directed by the results, i.e. extend geographically to where the deposition is considered below any stated threshold of significance for vegetation communities. Conduct a literature review and consult with CDFG and USFWS to identify appropriate thresholds. Thresholds for nitrogen deposition by vegetation type are available within the March 2007 California Energy Commission PIER report, titled "Assessment of Nitrogen Deposition: Modeling and Habitat Assessment," available at: http://www.energy.ca.gov/2006publications/CEC-500-2006-032/CEC-500-2006-032.PDF, and the May 2006 2007 California Energy Commission PIER report, titled "Impacts of Nitrogen Deposition on California Ecosystems and Biodiversity, available at: http://www.energy.ca.gov/2005 publications/CEC-500-2005-165/CEC-500-2005-165.PDF.

Response: The National Atmospheric Deposition Program (NADP) monitoring network[7] provides long-term monitoring records of nitrogen wet deposition across the United States. In California, the NADP monitoring sites are mostly located within National Forest and National Park lands. An isopleth data map from the NADP National Trends Network at the University of Illinois Urbana-Champaign (Figure DR 26.1) shows average wet nitrogen deposition rates in the western and southeastern United States of generally less than 3.0 kilograms per hectare

[7] National Atmospheric Deposition Program (NADP). 2010. National Trends Network. University of Illinois, Urbana-Champaign. http://nadp.sws.uiuc.edu/. Accessed June 2011.

per year (kg/ha/yr). Interpolating these data to the vicinity of the PPEC, the baseline value would be between one and two kg/ha/yr in 2009.

The closest nitrogen deposition monitoring location to the PPEC project site is Converse Flats, California, which is approximately 110 miles north of the PPEC site. Direct data measurements from the Converse wet deposition monitoring station show a four-year average from January 2007 through December 2010 of 1.44 kg/ha/yr with a maximum annual average of 1.61 (2008) and a minimum annual average of 1.11 (2009). The value for 2010 was 1.51 kg/ha/yr. The four-year average of 1.44 kg/ha/yr is the best available estimate of background nitrogen wet deposition for the PPEC that is based on verifiable measurements.

The Clean Air Status and Trends Network (CASTNET) reports total, dry, and wet deposition rates for many sites in the United States, including the same Converse Flats site. Over the period 2005 through 2009, reported total nitrogen deposition averaged 4.2 kg/ha/yr with a maximum annual average of 4.97 (2006) and a minimum annual average of 3.06 (2009).[8] No value was reported for 2010. The five-year average of 4.2 kg/ha/yr is the best available estimate of background total nitrogen deposition for the PPEC that is based on verifiable measurements.

CEC staff used a nitrogen deposition rate of 5 kg/ha/yr as a threshold of significance for sensitive habitats in the FSA for the Oakley Generating System project.[9]

[8] http://epa.gov/castnet/javaweb/charts/CON186_totn.png, accessed June 2011.
[9] CEC, Final Staff Assessment, Oakley Generating Station, March 2011, p. 4.2-44.

Technical Area: Biological Resources

Data Request BIO-27: The analysis should specify the amount of total nitrogen deposition in kg/ha/yr in special status habitats, vegetation types, and critical habitat, for wet and dry deposition. Please provide the complete citation for references used in determining this number.

Response: As discussed above, a threshold for significance for sensitive areas of 5 kg/ha/yr is proposed for this analysis.

Project-only nitrogen deposition modeling results are shown in Figure DR-BIO-27.1. This figure shows the area where project total nitrogen deposition rates are predicted to exceed 0.1 kg/ha/yr, which is 2% of the proposed threshold of significance for sensitive areas.

Technical Area: Biological Resources

Data Request BIO-28: Please provide an isopleths graphic over USGS 7.5 minute maps (or equally detailed maps) of the direct nitrogen deposition rates caused by the project. This will be a graphical depiction of the projects' nitrogen deposition.

Response: Wet, dry, and combined deposition rates were calculated using AERMOD. Emission and stack parameters are shown in Table DR-BIO-27.1 The requested isopleth graphic is shown in Figure DR-BIO-27.1. This figure shows the area where project total nitrogen deposition rates are predicted to exceed 0.1 kg/ha/yr, which is 2% of the proposed threshold of significance for cumulative impacts in sensitive areas.

TABLE DR-BIO-28.1
EMISSION RATES AND STACK PARAMETERS FOR NITROGEN DEPOSITION MODELING
(ANNUAL AVERAGE OPERATING EMISSIONS)

Facility/Source	Stack Height (feet)	Stack Diameter (feet)	Stack Flow (wacfm)	Stack Velocity (ft/sec)	Stack Temp (deg F)	Stack Height (meters)	Stack Diameter (meters)	Stack Flow (m^3/sec)	Stack Velocity (m/sec)	Stack Temp (deg K)	Emission Rates, lb/hr		Emission Rates, g/s	
											NO_X	NH_3	NO_X	NH_3
PPEC														
Turbine 1	100	14.5	645,580	65.16	802	30.48	4.42	304.72	19.86	711.2	5.36	5 ppm	0.675	0.381
Turbine 2	100	14.5	645,580	65.16	802	30.48	4.42	304.72	19.86	711.2	5.36	5 ppm	0.675	0.381
Turbine 3	100	14.5	645,580	65.16	802	30.48	4.42	304.72	19.86	711.2	5.36	5 ppm	0.675	0.381
Pacific Recovery														
Landfill Engine 1	16	1.5	6,410	60.50	894	4.88	0.46	3.03	18.44	752.04	3.0		0.38	0.00
Landfill Engine 2	16	1.5	6,410	60.50	894	4.88	0.46	3.03	18.44	752.04	2.5		0.31	0.00
Landfill Engine 3	18	1.5	17,588	166.00	900	5.49	0.46	8.30	50.60	755.37	1.8		0.23	0.00
Landfill Engine 4	18	1.5	17,588	166.00	900	5.49	0.46	8.30	50.60	755.37	2.9		0.36	0.00
Calpeak Border														
Unit 1	50	12	786,547	115.91	700	15.24	3.66	371.21	35.33	644.26	7.21	10 ppm	0.91	1.90
Larkspur 1 and 2														
Larkspur 1	60	12	599,868	88.40	850	18.29	3.66	283.11	26.94	727.59	5.71	10 ppm	0.72	1.46
Larkspur 2	60	12	599,868	88.40	850	18.29	3.66	283.11	26.94	727.59	5.71	10 ppm	0.72	1.46
Otay Mesa														
Turbine 1	160	18.5	1,019,118	63.19	178	48.77	5.64	480.97	19.26	354.10	11.42	10 ppm	1.44	2.61
Turbine 2	160	18.5	1,019,118	63.19	178	48.77	5.64	480.97	19.26	354.10	11.42	10 ppm	1.44	2.61

Technical Area: Biological Resources

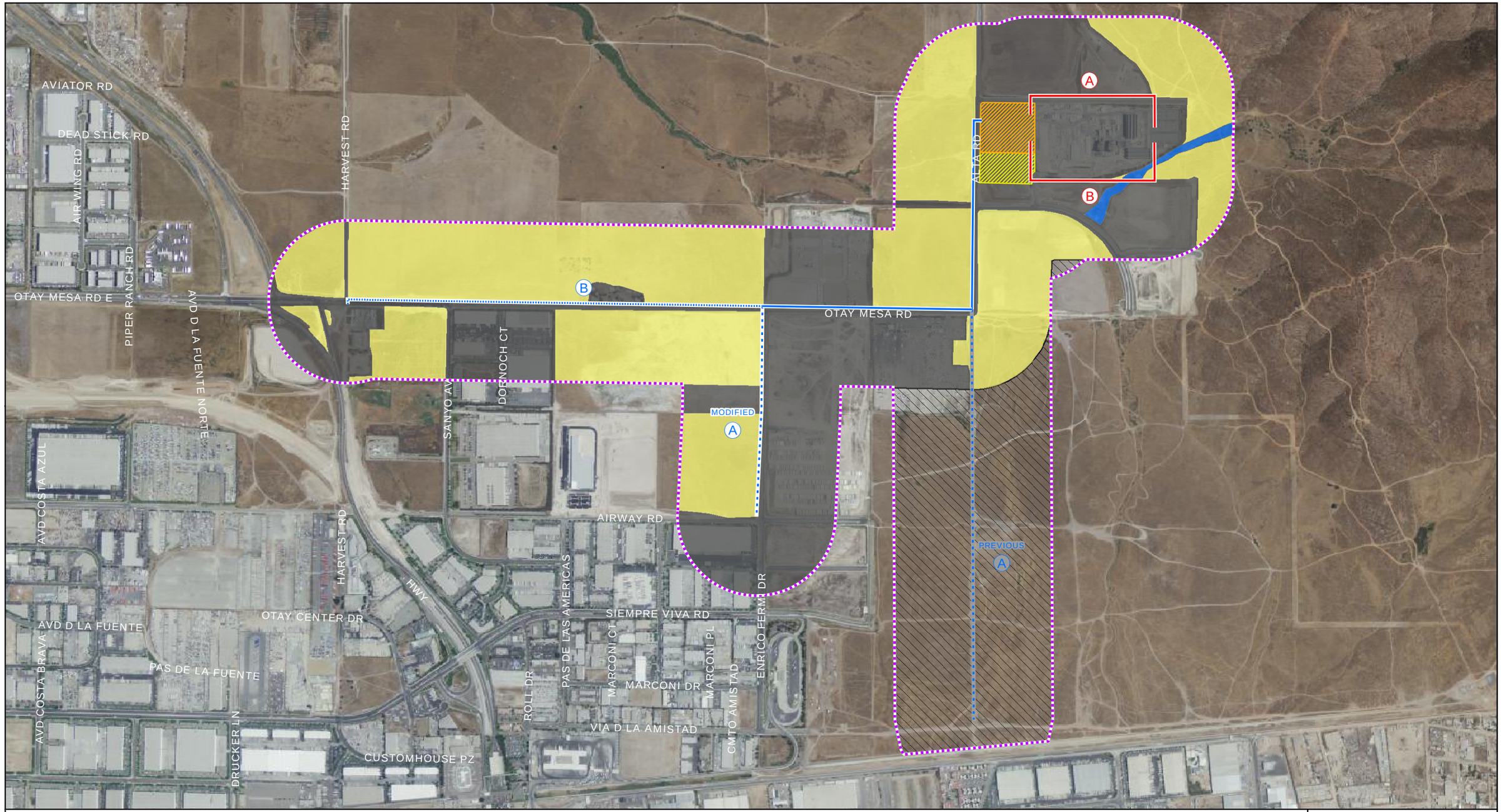
Data Request BIO-29: Please also provide a cumulative impact analysis of the nitrogen deposition values in kg/ha/yr. Provide an isopleths graphic over USGS 7.5-minute maps of the direct nitrogen deposition values in the cumulative analysis and specify the cumulative nitrogen deposition rate in kg/ha/yr at any affected special status habitat, vegetation type, or critical habitat. The geographical extent of the cumulative nitrogen deposition mapping should be directed by the results, i.e. extend geographically to where the deposition is considered below any stated threshold of significance.

Response: Applicant is currently working on the cumulative impact analysis of the nitrogen deposition values in kg/ha/yr and the requested corresponding isopleths graphic. Applicant anticipates providing staff with a supplemental response to BIO-29 within the next few weeks.

Technical Area: Biological Resources

Data Request BIO-30: Please describe potential mitigation to decrease cumulative nitrogen deposition impacts to less than significant levels for any affected resources, particularly Quino checkerspot critical habitat, special status vegetation types, or other special status habitat. Levels of significance should be determined using the references cited in data request 12, or as otherwise specified and agreed-upon by the California Energy Commission, CDFG, and USFWS.

Response: As noted in Response BIO-29, Applicant is currently working on the cumulative impact analysis of the nitrogen deposition values in kg/ha/yr and the requested corresponding isopleths graphic. Depending on the results from that analysis, Applicant will determine if any potential mitigation measures are necessary, and, if so, will provide staff with a supplemental response to BIO-30 within the next few weeks.



Legend

- Biological Study Area
- Not Included in Final Design
- Project Site
- Laydown Area
- 230 kV Transmission Line (Route A and Route B)
- Natural Gas Line
- Modified Route A Natural Gas Line
- Previous Route A Natural Gas Line
- Route B Natural Gas Line
- Developed/Disturbed
- Riparian
- Non-Native Grassland

N

0 600 1,200 Feet

FIGURE 5.6-5
VEGETATION COMMUNITIES/
LAND COVER TYPES

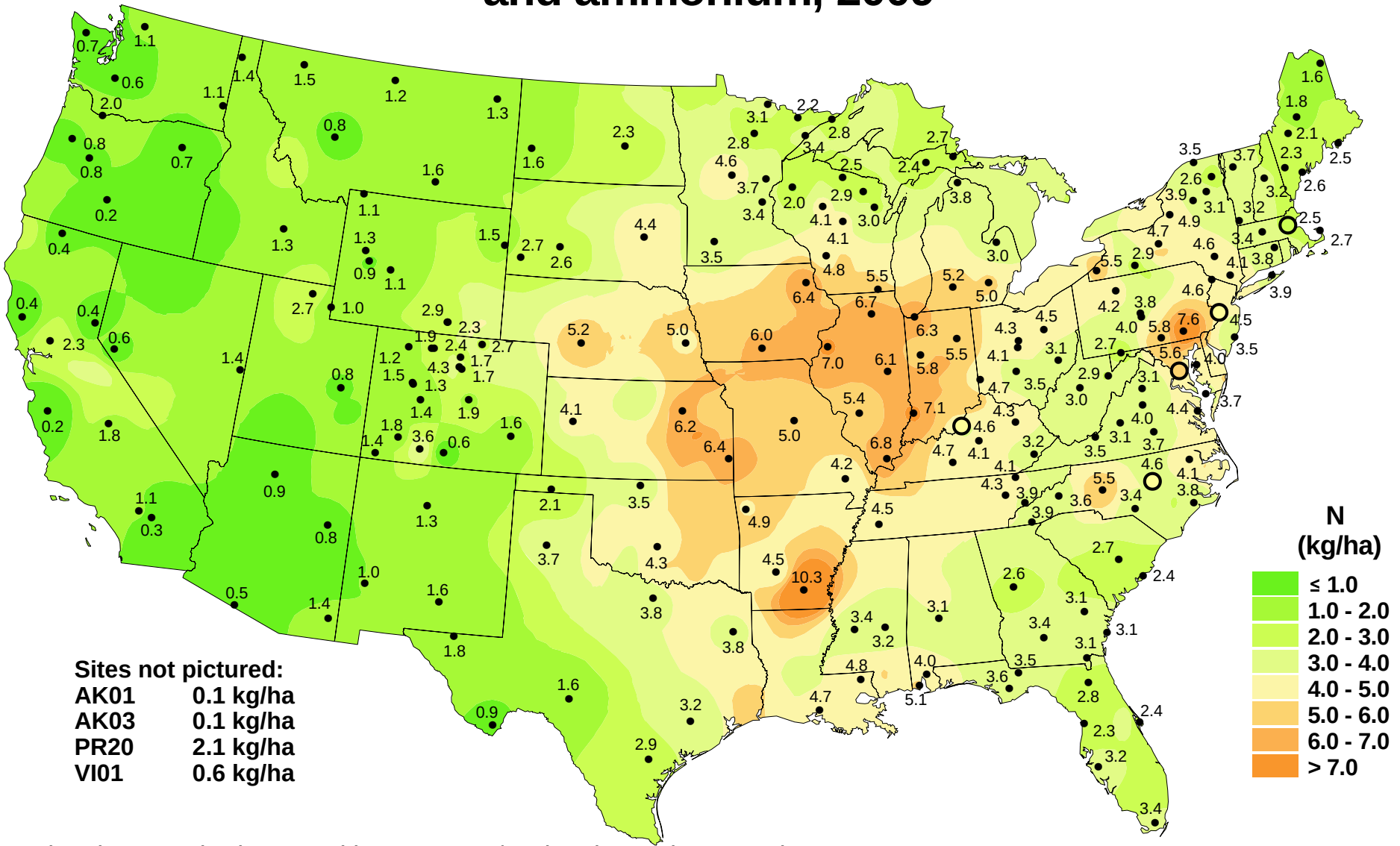
PIO PICO
ENERGY CENTER

PROJECT NO.: 29874827
DATE: DECEMBER 2010

URS

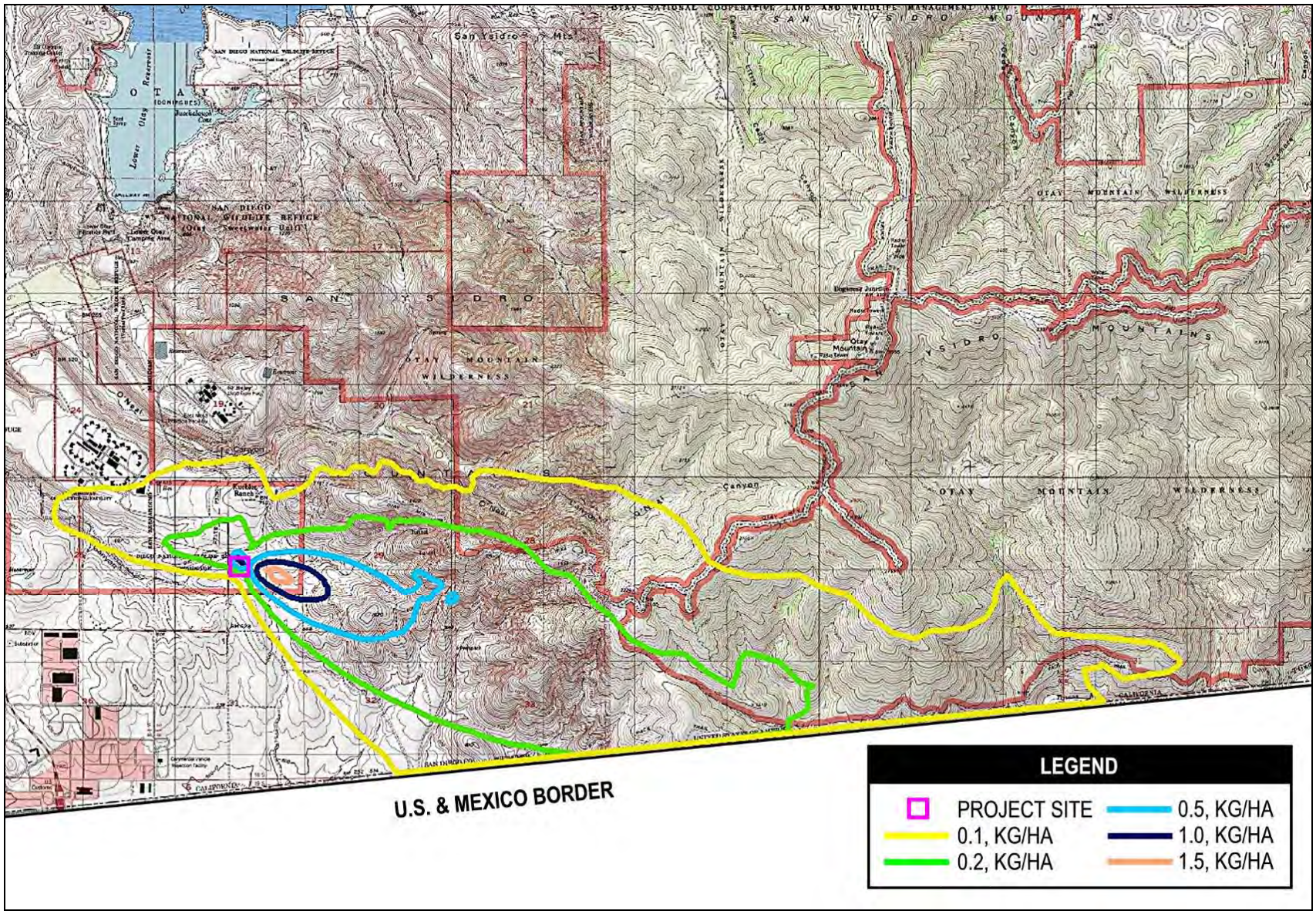
Figure DR 26.1

Inorganic nitrogen wet deposition from nitrate and ammonium, 2009



National Atmospheric Deposition Program/National Trends Network
http://nadp.sws.uiuc.edu

FIGURE DR-BIO 27.1
PPEC TOTAL NITROGEN DEPOSITION, KG/HA/YR



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August 11, 2011

VIA EMAIL

Mr. Eric Solorio, Siting Project Manager
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

Re: Pio Pico Energy Center Project (11-AFC-01)
Supplemental Responses to Data Requests BIO-29 and BIO-30

Dear Mr. Solorio:

On behalf of Applicant Pio Pico Energy Center, LLC, please find enclosed herein supplemental responses to Staff's Data Requests BIO-29 and BIO-30. Specifically, the submitted information is provided in response to Energy Commission Staff Ann Crisp's August 2, 2011 email correspondence to Applicant's consultant, Lincoln Hulse.

Please contact me directly if you have any questions regarding the enclosed information.

Very truly yours,

Melissa A. Foster

MAF:kjh
Enclosures
cc: Proof of Service List

70840282.1 0042399-00001

PIO PICO ENERGY CENTER PROJECT
11-AFC-01

Supplemental Responses to BIO-29 and BIO-30
Responses to Ann Crisp's August 2, 2011 Email Correspondence

1. What are the cumulative sources used for the nitrogen deposition isopleths on the maps?
   As requested by CEC staff, we used the same non-project sources for nitrogen deposition as were used for the cumulative air quality impact analysis
   - **Pacific Recovery**
   - **Calpeak Border**
   - **Larkspur 1 and 2**
   - **Otay Mesa Generating Station**

2. What does the 13.0, 15.0 and 17.0 kg/ha represent? Is this baseline plus additional regional sources? Also what does the 19 kg/ha represent?
   As requested by the CEC staff, we calculated cumulative impact by adding the modeled impact from the project and non-project sources to the staff-specified regional background rate of 11.56 kg/ha/yr. The isopleths are lines connecting points where the cumulative impact has the specified value. The 19 kg/ha point is the modeled maximum cumulative impact in the area that the figure represents.

3. The map states kg/ha - is this actually kg/ha/yr?
   Yes

4. Please identify the sources of the data layers, including the sources for critical habitat for species. I believe the map does not show the revised Quino checkerspot butterfly critical habitat from 2009 but the original 2002 Quino critical habitat designation.
   The habitat and species source data is provided below:
   - **Quino Checkerspot Butterfly: U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Final Critical Habitat for the Quino Checkerspot Butterfly, June 17, 2009.**
   - **Otay Tarplant: U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Final Critical Habitat for the Otay tarplant, December 10, 2002.**
   - **CA Gnatcatcher: U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Final Critical Habitat for the Coastal California gnatcatcher, December 19, 2007.**

   Furthermore, Figures 29.1 and 29.2 have been revised based on the 2009 Quino Checkerspot Butterfly data and are submitted herewith.

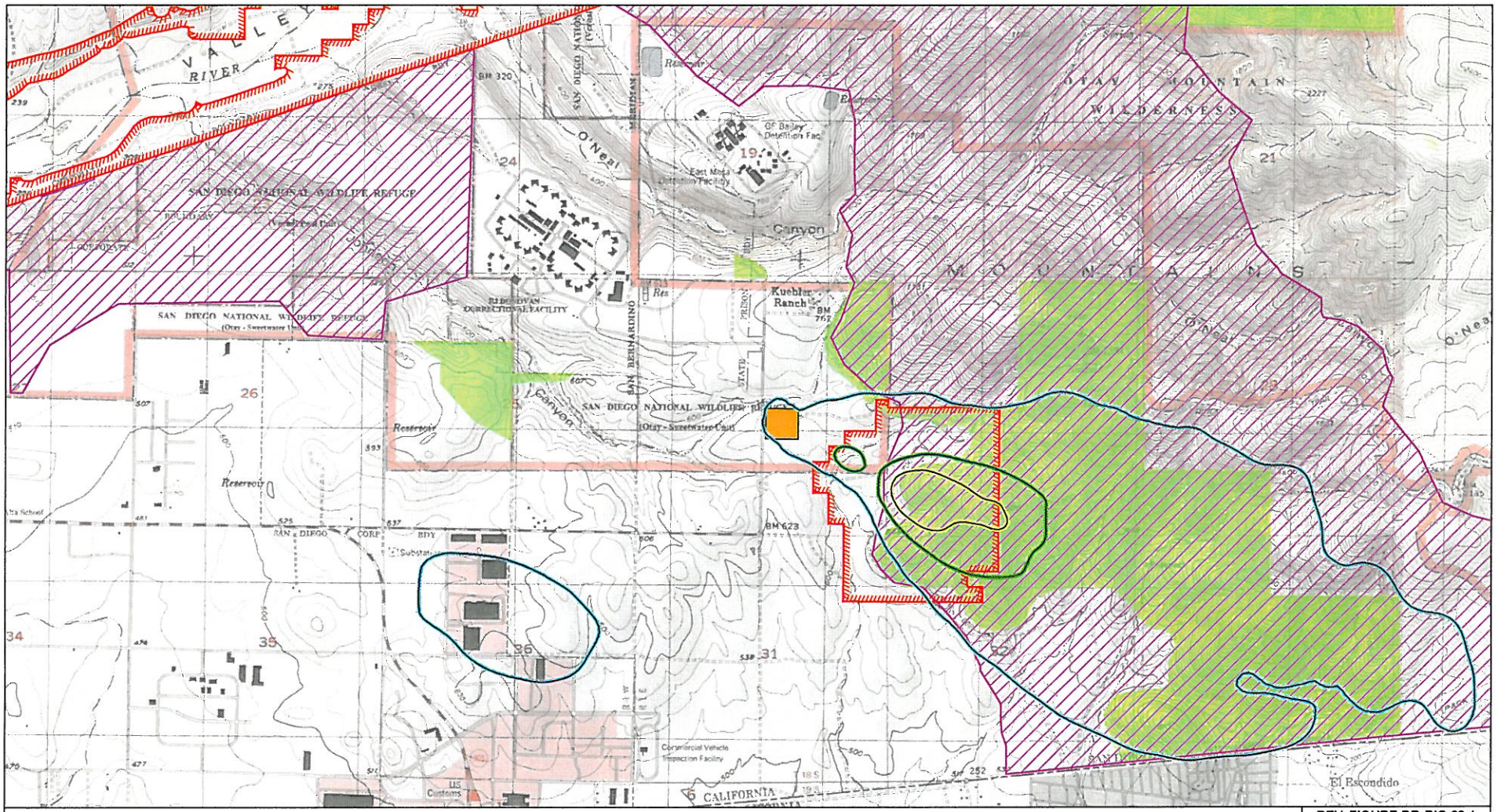
5. The response to BIO-30 refers to weed management on a 50-acre parcel. What 50-acre parcel is referred to?
   The 50 acre number that is referenced for mitigation was derived from the 17.0 kg/HA/YR isopleth line which is approximately 50 acres. The 50-acre parcel for weed management is included as mitigation to compensate for the Project's relatively small nitrogen contribution to the regional background. The exact location of the 50-acre parcel has not

been identified; however Applicant is exploring options with local land owners, mitigation banks and adjacent federal lands.

6. How was the 6% contribution calculated?

The 6% represents the approximate average of the Project's contribution to the cumulative impact as a percentage on USFWS critical habitat for the Quino Checkerspot Butterfly. This value was taken from Figure 29.3 which has not been previously provided and represents the values (as a percentages) of the Project's contribution in relation to the location of USFWS critical habitat for Quino Checkerspot Butterfly.

Figure 29.3 shows the Project's contribution (expressed as a percentage) to the total cumulative impact. The values shown in Figure 29.3 were calculated using a spreadsheet containing output from the nitrogen deposition model (AERMOD, using appropriate options). The project's impact at each receptor in the modeling domain was divided by the total cumulative impact at that receptor, and the result converted to a percentage. The contribution in the area represented by Figure 29.3 ranged from close to zero (throughout most of the region) to a maximum of 10.9% (at the project's point of maximum impact).

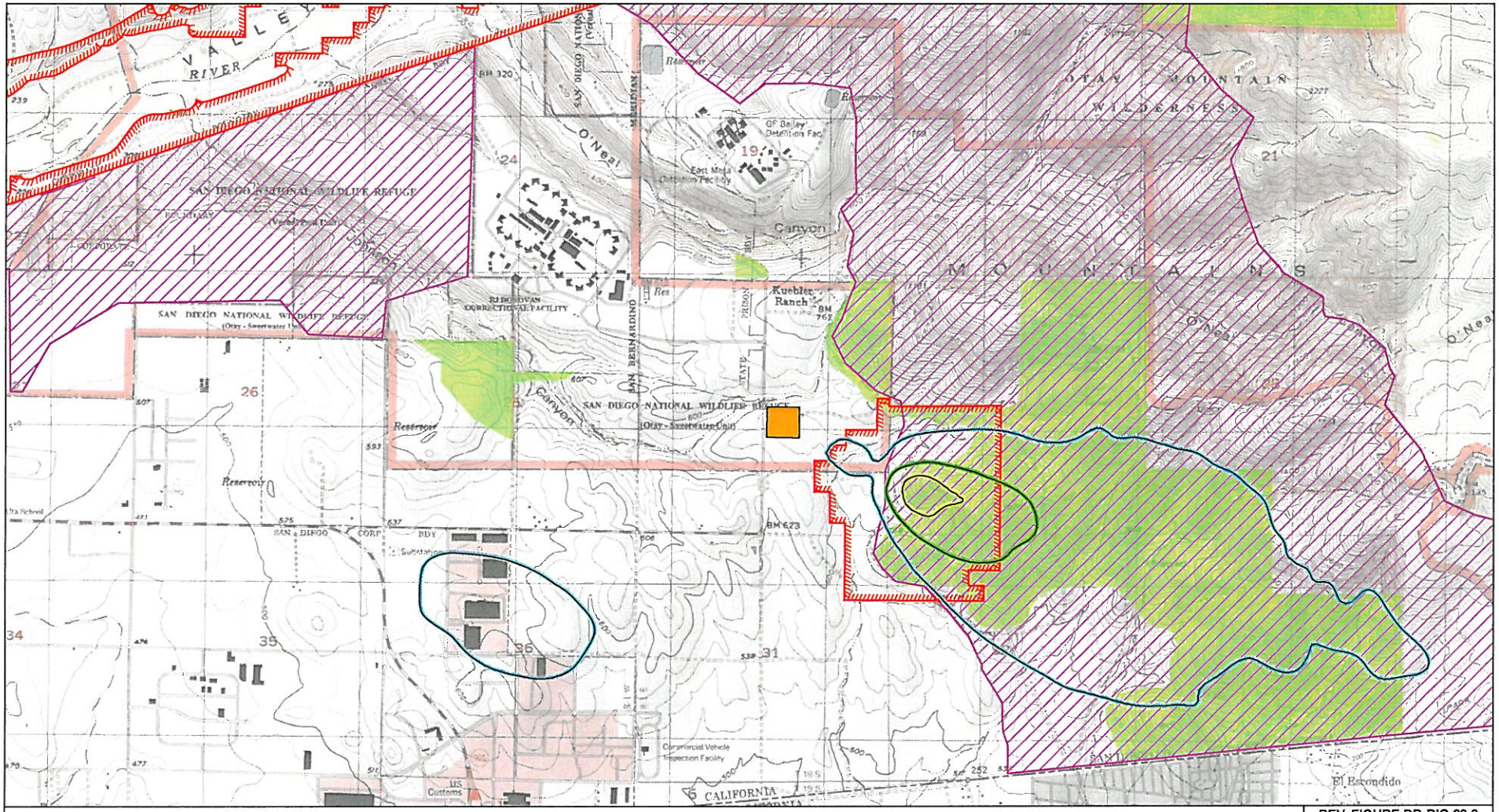


REV. FIGURE DR-BIO 29.1
CUMULATIVE NITROGEN DEPOSITION, INCLUDING PROJECT CONTRIBUTION (UNITS OF KG/HA/YR)

PIO PICO ENERGY CENTER

PROJECT NO 29874827
DATE JULY 2011
URS

Source: U.S. Fish and Wildlife Service. Carlsbad Fish and Wildlife Final Critical Habitat for the Quino Checkerspot Butterfly (Euphydryas editha quino) June 17, 2009
U.S. Fish and Wildlife Service. Carlsbad Fish and Wildlife Final Critical Habitat for the Deinandra conjugens (Otay tarplant) December 10, 2002
U.S. Fish and Wildlife Service. Carlsbad Fish and Wildlife Final Critical Habitat for the Coastal California gnatcatcher (Polioptila californica californica) December 19, 2007



Source: U.S. Fish and Wildlife Service. Carlsbad Fish and Wildlife Final Critical Habitat for the Quino Checkerspot Butterfly (Euphydryas editha quino) June 17, 2009
U.S. Fish and Wildlife Service. Carlsbad Fish and Wildlife Final Critical Habitat for the Deinandra conjugens (Otay tarplant) December 10, 2002
U.S. Fish and Wildlife Service. Carlsbad Fish and Wildlife Final Critical Habitat for the Coastal California gnatcatcher (Polioptila californica californica) December 19, 2007

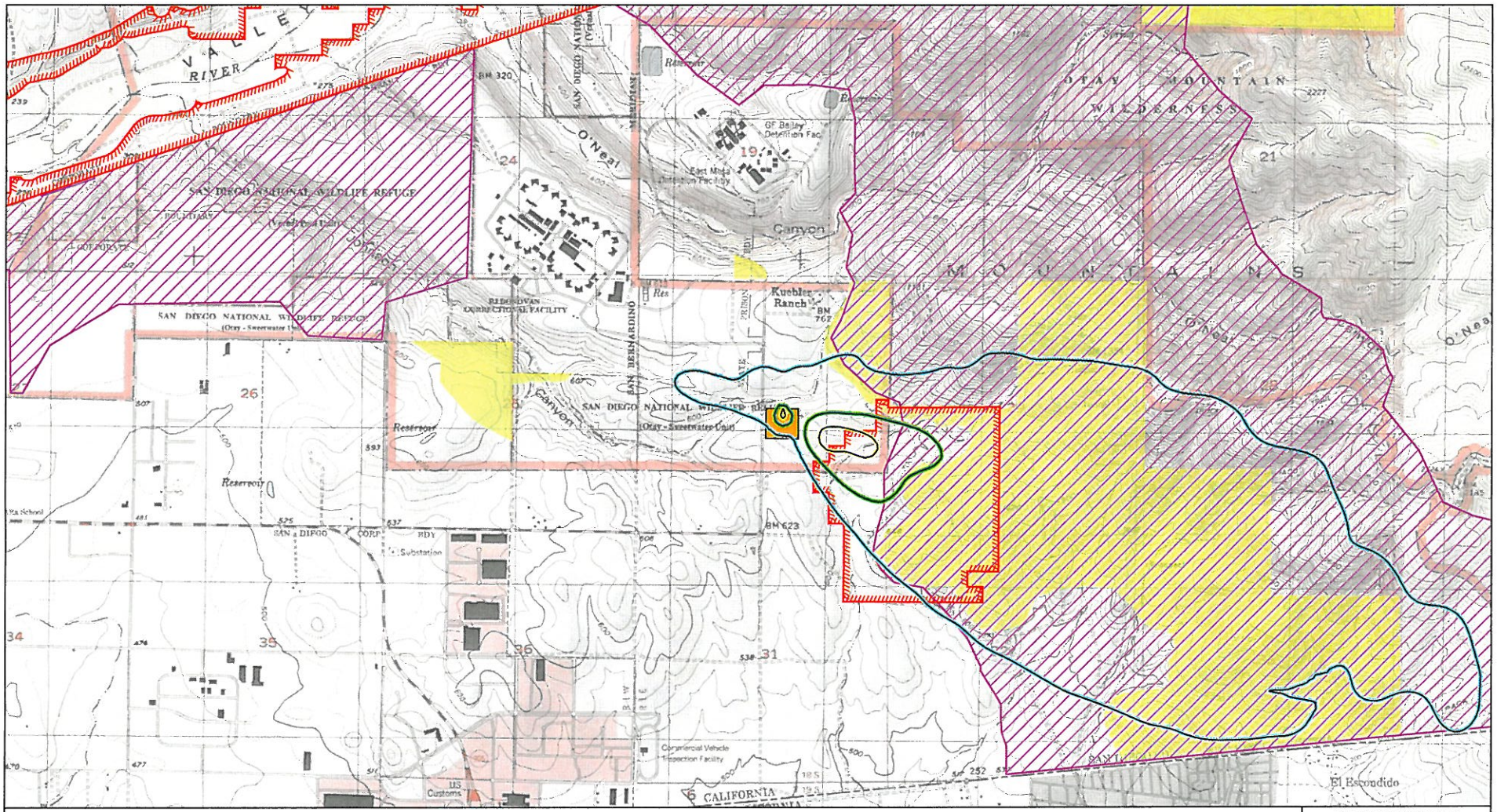


FIGURE DR-BIO 29.3
PROJECT COTRIBUTION AS A PERCENTAGE OF TOTAL CUMULATIVE NITROGEN DEPOSITION (UNITS OF PERCENT)

PIO PICO ENERGY CENTER

PROJECT NO 29674827
DATE JULY 2011
URS

Source: U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Final Critical Habitat for the Quino Checkerspot Butterfly (Euphydryas editha quino) June 17, 2009
U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Final Critical Habitat for the Deinandra conjugens (Otay tarplant) December 10, 2002
U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Final Critical Habitat for the Coastal California gnatcatcher (Polioptila californica californica) December 19, 2007

6. GROWTH-INDUCING IMPACTS

(Section 5.10 of the Application for Certification)

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5.10 SOCIOECONOMICS

The socioeconomics section describes the potential impact on the social and economic structure within the project vicinity and region resulting from the construction and operation of the proposed Pio Pico Energy Center (PPEC). This discussion considers issues in project-related impacts on population, housing, public services (fire protection, emergency response services, law enforcement, schools, libraries, and medical services) and utilities, sales and property tax revenue, and indirect and induced economic effects from the project. This section also includes an analysis of cumulative impacts on the availability of labor within the area. Additionally this section provides agency contacts relevant to socioeconomics, and addresses the applicability of the following: permits required for the project; proposed mitigation measures and conditions of certification; and laws, ordinances, regulations, and standards (LORS). With the recommended conditions of certification, the project will not have any significant environmental impacts, and will be in compliance with all LORS.

5.10.1 Affected Environment

5.10.1.1 Study Area

The proposed project includes the construction and operation of an electrical generating facility in the southwestern portion of unincorporated San Diego County. San Diego County is the southernmost major metropolitan area in California and comprises 4,261 square miles, and the unincorporated County area comprises 3,572 square miles. The project site is located in the East Otay Mesa Specific Plan area, in the near vicinity of the City of San Diego, the City of Chula Vista, National City, and the City of Imperial Beach (refer to Figure 5.10-1).

The PPEC project site is located on an approximately 9.99-acre parcel (Assessor's Parcel Number [APN] 648-040-45) and includes a 6.00-acre laydown area (portion of APN 648-040-46). The property is disturbed land near the western County boundary, and is adjacent to the existing Otay Mesa Generating Project (OMGP) site. Other areas surrounding the project site are undeveloped. The U.S.–Mexico border is approximately 1.5 miles south of the project site.

This section describes existing and future (i.e., during operation of the proposed project) economic and demographic conditions in the following identified geographic regions. The socioeconomic study area pertinent to potential project impacts on population and housing includes unincorporated San Diego County; the nearby cities of Chula Vista, San Diego, National City, and Imperial Beach; and San Diego County as a whole (incorporated and unincorporated). The project area pertinent to regional workforce and indirect and induced economic impacts for the proposed project was identified to be the County of San Diego. The environmental justice analysis evaluates the demographics and poverty levels for the population located within a six-mile radius of the project site.

5.10.1.2 Population, Housing, Economic Base, and Employment

Population. San Diego County is the second-largest county by population in California (DOF 2010a) and the fifth-largest county by population in the United States, as estimated by the U.S. Census Bureau (U.S. Census Bureau 2009). Historical and projected population data for San

Diego County and the cities composing the project area are summarized in Table 5.10-1, which compiles available data from the San Diego Association of Governments (SANDAG), California Department of Finance (CDOF), and the U.S. Census Bureau. While the project area and region is forecast for population growth, SANDAG has determined that the growth rate in the project region and in California is slowing because of a continuing decline in birth rates (i.e., the average number of children born to each woman) (SANDAG 2008). Recent data has indicated that this is occurring across most ethnic groups, and that the sharpest drop is seen among the Hispanic population (SANDAG 2008).

The City of Chula Vista is forecasted to undergo the highest percentage growth (average of 2.2 percent per year) in the project area, and the City of San Diego is projected to experience the highest numeric increase in population.

TABLE 5.10-1
HISTORICAL AND PROJECTED POPULATIONS IN THE PROJECT AREA, COUNTY, REGION, AND STATE

Area	Population, 2000[1]	Population, 2004[2]	Projected Population, 2010[3]	Projected Population, 2020[2]	Projected Population, 2030[2]	Forecast Growth (2000 to 2030)	Percentage Growth per Year
San Diego County, Unincorporated	442,919[2]	476,089	503,320	545,290	616,401	173,482 (39%)	1.3%
City of Chula Vista	173,556	208,997	237,595	267,427	289,044	115,488 (67%)	2.2%
City of Imperial Beach	26,992	27,758	28,680	32,590	36,125	9,133 (34%)	1.1%
City of San Diego	1,223,400	1,287,175	1,376,173	1,542,528	1,689,254	465,854 (38%)	1.3%
National City	54,260	56,018	57,799	62,300	69,306	15,046 (28%)	0.9%
San Diego County	2,836,303	3,013,023	3,224,432	3,535,000	3,870,000	1,033,697 (36%)	1.2%
California	33,871,650	35,394,062	38,826,898	44,135,923	49,240,891	15,369,241 (45%)	1.5%

Sources:
[1] U.S. Census Bureau, 2007.
[2] California Department of Finance, 2010a.
[3] San Diego Association of Governments, 2010.

Housing. As of January 1, 2010, the CDOF reports that total housing stock, which includes single-family, multi-family, and mobile home residences, in the project area (unincorporated San Diego County, and cities of Chula Vista, Imperial Beach, National City, and San Diego) was 811,853 units, which comprises more than half of the total housing in San Diego County (1,149,426) (refer to Table 5.10-2). Vacancy rates in the project area range from a low of 4.5 percent (National City) to a high of 6.7 percent (unincorporated San Diego County). Compared with the County as a whole (incorporated and unincorporated areas), which averages 7.0 percent vacancy, the project area has higher rates of occupied housing. However, the California Department of Housing and Community Development estimates that a three to five percent vacancy rate generally indicates a balance between the supply and demand of housing. By this standard, vacancy rates in the project area generally indicate that a higher supply of housing is available (i.e., vacant) compared with the amount of demand for housing.

Median values of housing units in the project area, county, and state are also presented in Table 5.10-2. The reported values provide a relative comparison of housing prices, where housing in the City of San Diego tends to be higher priced than the housing prices in the project vicinity and San Diego County tends to have a higher housing median value than that of California. In contrast, the cities of Imperial Beach and National City have a greater proportion of lower-valued housing compared with that of the project area.

Temporary housing consists of vacant housing units offered for rent, and those offered both for rent and sale (U.S. Census Bureau 2011a). In 2010, the San Diego County area had an approximately 8.5 percent rental housing vacancy rate (U.S. Census Bureau 2011b). Compared with the state, which had a lower rental housing vacancy rate at approximately 7.6 percent in 2010 (U.S. Census Bureau 2011b), the San Diego County area offers more housing choices available for renting households. Additionally, San Diego County has one of the stronger hotel and lodging markets in the United States because of the County's popularity for tourism and as a convention destination. As a result, the County has numerous hotel and motel lodgings. However, the County's hotel and lodging market has experienced decreasing demand because of the current national economic downturn and, therefore, has been subject to higher vacancy rates. The project area is reported to have a total supply of 412,450 lodging rooms and was projected to have an average occupancy of 65.4 percent in 2009 (PKF Consulting 2008).

TABLE 5.10-2
HOUSING CHARACTERISTICS IN THE PROJECT AREA, COUNTY, REGION, AND STATE

Jurisdiction	Total Units (2010)[1]	Single-Family (2010)[1]	Multi-Family (2010)[1]	Mobile Homes (2010)[1]	Percentage Vacancy (2010)[1]	Median Value of Owner-Occupied Housing Units (2000)[2]
Unincorporated San Diego County	196,142	130,888	26,078	12,176	6.7	N/A
City of Chula Vista	78,244	47,923	26,566	3,755	5.3	$197,000
City of Imperial Beach	9,860	5,542	4,009	309	5.1	$171,700
City of San Diego	511,820	278,694	227,565	5,561	6.0	$233,100
National City	15,787	8,847	6,580	360	4.5	$141,500
San Diego County	1,149,426	696,379	410,174	42,873	7.0	$227,200
California	13,591,866	8,747,293	4,247,635	596,938	5.9	$211,500

Sources:
[1] California Department of Finance, 2010b.
[2] U.S. Census Bureau, 2010.

Economic Base and Employment. The project region contains developed metropolitan areas, which is reflected in San Diego County's relative employment by industry, as shown in Table 5.10-3. In 2010, the top industrial sectors by percentage employment were government (17.7 percent); professional and business services (16.3 percent); trade, transportation, and utilities (16.0 percent); and leisure and hospitality (12.8 percent). As identified in the industry positions in 2008 and 2010, San Diego County has experienced declines in employment in most industries (exceptions being Education and Health Services and Government industries, which experienced growth), which is also reflected in the Industry total (i.e., a total of 1,440,800 in 2008, which declined to 1,218,800 in 2010). The decline in positions from 2008 to 2010 in San Diego County is attributed to the effects of the current economic downturn on industry sectors (Briceno 2010).

However, as economic recovery is forecasted, employment growth is planned with the projected positions shown in Table 5.10-3 for 2018 (Briceno 2010).

Based on current (2010) estimates and projected 2018 industry employment, the fastest-growing industry sectors by numeric growth are Professions and Business Services (increase by 41,000 positions); Trade, Transportation, and Utilities (increase by 37,200 positions); and Construction (increase by 33,000 positions. The slowest growing industries by numeric growth based on 2010 estimates and forecasted 2018 conditions are Mining and Logging (no increase); Farm (increase by 1,300 positions); Other Services (increase by 4,100 positions); and Information (increase by 5,800 positions).

Several cities within the project area (Chula Vista, Imperial Beach, and National City), exhibit lower median house incomes compared to those of the state and the County as a whole (incorporated and unincorporated areas). Historical and current unemployment levels for San Diego County, the City of San Diego, and the City of Chula Vista are consistently lower than the state (Table 5.10-4). The City of Imperial Beach and National City, which are farther from the project area, have substantially lower median household income levels than those of the state. These cities also have higher unemployment rates compared with those of the state and the areas closest to the project area. Unemployment rates have not been forecasted, but are expected to follow the historical unemployment trend shown in Table 5.10-4.

TABLE 5.10-3
SAN DIEGO COUNTY EMPLOYMENT BY INDUSTRY:
HISTORICAL AND PROJECTED

Industry[1]	2000[2)]	2008[3)]	2010[2)]	2018 (Projected)[3)]
Total Farm	10,500 (0.8%)	10,500 (0.7%)	9,400 (0.8%)	10,700 (0.7%)
Construction	72,900 (5.9%)	76,100 (5.3%)	57,500 (4.7%)	90,500 (5.7%)
Education and Health Services	116,800 (9.5%)	137,300 (9.5%)	145,200 (11.9%)	165,700 (10.5%)
Financial Activities	72,100 (5.8%)	75,200 (5.2%)	68,000 (5.6%)	79,600 (5.0%)
Government	211,900 (17.2%)	225,100 (15.6%)	215,600 (17.7%)	246,200 (15.6%)
Information	39,000 (3.2%)	38,500 (2.7%)	35,400 (2.9%)	41,200 (2.6%)
Leisure and Hospitality	129,400 (10.5%)	164,000 (11.4%)	155,400 (12.8%)	176,800 (11.4%)
Manufacturing	123,300 (10%)	102,800 (7.1%)	91,100 (7.5%)	105,000 (6.6%)
Mining and Logging	300 (0.0%)	400 (0.0%)	300 (0.0%)	300 (0.0%)
Professional and Business Services	201,800 (16.3%)	215,100 (14.9%)	198,100 (16.3%)	239,100 (15.2%)
Trade, Transportation, and Utilities	214,800 (17.4%)	215,900 (15%)	195,100 (16.0%)	232,300 (14.7%)
Other Services	42,600 (3.4%)	48,400 (3.4%)	47,500 (3.9%)	51,600 (3.3%)
Total, All Industries	1,235,400	1,440,800	1,218,800	1,578,000

[1] Excludes: 1) Unincorporated self-employed (the estimated and projected employment numbers include all workers who are primarily self-employed and wage and salary workers who hold a secondary job as a self-employed worker); and 2) Unpaid family workers who are those persons who work without pay for 15 or more hours per week on a farm or in a business operated by a member of the household to whom they are related by birth or marriage.

Sources:

[2]California Employment Development Department, Labor Market Information Division, 2010b.

[3]California Employment Development Department, Labor Market Information Division, 2010c.

TABLE 5.10-4
EMPLOYMENT CHARACTERISTICS IN THE STATE AND STUDY AREA

Area	Median Household Income (2000 Census)	Unemployment (%)			
		2000	2004	2009	2010
City of Chula Vista	$44,861	4.6	5.6	11.3	12.4
City of Imperial Beach	$35,882	6.5	7.8	15.5	16.8
City of San Diego	$45,733	3.9	4.7	9.7	10.6
National City	$29,826	7.9	9.5	18.5	20.0
San Diego County	$47,067	3.9	4.7	9.7	10.6
California	$47,493	4.9	6.2	11.4	12.8

Sources:
State of California Employment Development Department, Labor Market Information Division, 2010c.
U.S. Census Bureau, 2010.

5.10.1.3 Public Services and Utilities

Fire Protection and Emergency Response. The project site is located in the East Otay Mesa Planning Area, which is located within the San Diego Rural Fire Protection District (RFPD) service territory. The RFPD operates 14 fire stations and serves over 26,500 people living in a 720 square mile area. The East Otay Mesa Planning Area contains two RFPD fire stations: Station 22 (Otay Mesa), which is temporarily located at the East Otay Mesa Detention Facility (i.e., interim fire station); and Station 26 (Donovan), which is located at the Donovan Correction Facilities. Both stations are located within 0.25 mile of the project site. Based on communication with RFPD, Station 22 (Otay Mesa) would be the first responder to project site (San Diego County RFPD 2010). Station 22 currently operates Type I and Type II fire engines, and will be adding an aerial ladder truck in January 2011. Station 26 (Donovan) is operated with Type I and Type III fire engines, and is staffed with full time firefighters. RFPD has identified the need to establish a full-time fire and emergency medical service in East Otay Mesa, and is currently in the process of developing a facility in conjunction with CAL FIRE and the San Diego Sheriff. The new facility is planned to be located at the intersection of Enrico Fermi Drive and Lone Star Road, which is less than one mile from the project site (County of San Diego 2010).

The RFPD has secured Automatic Aid agreements with both the City of Chula Vista and City of San Diego. Additionally, RFPD, the City of San Diego, City of Chula Vista, and County of San Diego are signatories to a County Mutual Aid Agreement. Furthermore, because the East Otay Mesa Planning Area is located within the State Responsibility area, the California Department of Forestry has the responsibility for wildland fires in East Otay Mesa (County of San Diego 2010a).

The RFPD coordinates emergency medical response and transportation with American Medical Responses (AMR). AMR staff includes emergency medical technicians, nurses, physicians, and support staff. AMR serves multiple areas in San Diego County, where AMR employs approximately 300 paramedics and emergency medical technicians (EMTs) and responds to approximately 60,000 calls annually (AMR 2010).

Medical Facilities. The project site is in the vicinity of several large medical care facilities. Kaiser Permanente operates the Otay Mesa Outpatient Medical Center (4650 Palm Avenue, San Diego), which provides urgent care, including surgery, internal medicine, occupation health, and

immediate care services, and is located 6.7 miles west of the project site. Sharp HealthCare has three medical facilities in the City of Chula Vista: the Sharp Rees-Stealy Otay Ranch Medical Center (1400 East Palomar Street, Chula Vista) is approximately 5.5 miles northwest of the project site and offers internal medicine, surgery, and other care services; the Sharp Chula Vista Medical Center (751 Medical Center Court, Chula Vista; approximately seven miles northwest of the project site) is a comprehensive care facility that includes a 343-bed hospital, 24-hour emergency services, surgery, and other care services; and Sharp Rees-Stealy Chula Vista (525 Third Avenue, Chula Vista; ten miles northwest of the project site) is an urgent care center that provides occupational treatment, internal medicine, otolaryngology, cardiology, surgery, and other services.

Law Enforcement. Law enforcement in the project area is served by the San Diego County Sheriff's Department. Currently, no sheriff facilities are located within East Otay Mesa, and the nearest sheriff station is the Imperial Beach Station, which is approximately 11.5 miles west of the project site. Patrol functions in the East Otay Mesa, including the project area are performed by several patrol units assigned to the East Otay Mesa area (County of San Diego 2010a). As discussed above, a permanent facility for both RFPD and sheriff stations are currently being planned at the intersection of Enrico Fermi Drive and Lone Star Road, which is less than one mile from the project site.

Schools and Libraries. The project area is served by two school districts: the San Ysidro Elementary School District and the Sweetwater Union High School District (SUHSD).

The San Ysidro Elementary School District is comprised of one (1) pre-school, five (5) elementary schools, one (1) K-8 elementary school, and one (1) middle school. During school year 2008-2009, the San Ysidro Elementary School District had a total enrollment of 4,851 students. The average class size schoolwide for 2008-2009 was 25.8 students with an average pupil-teacher ratio of 21.2, in comparison to the County average class size of 25.2 students per classroom and average pupil-teacher ratio of 20.8 (California Department of Education 2010a). The District issued a Long-Range Facilities Master Plan (May 2007) which identifies the metric for standard classrooms (excluding K-3 and special needs) at 30 students per classroom. The Master Plan also identified the need to construct additional school facilities, but also noted trends in declining enrollment (San Ysidro School District 2007). Based on the California Department of Education, subsequent academic years indicate that enrollment has continued to decline. Based on the threshold used for standard classroom sizes and declining enrollment, it is expected that the 2008-2009 school year enrollment of 4,851 students indicates that the San Ysidro Elementary School District has available remaining capacity. While limited data is currently available for the 2009-2010 school year, present records indicate that a total of 4,725 students were enrolled during the 2009-2010 school year (California Department of Education 2011a), which reflects a decline from the 2008-2009 school year. This trend is consistent with the Master Plan assessment identifying the continuing declining enrollment. However, the San Ysidro School District bases expected future enrollment upon the forecasted population levels, which as shown in Table 5.10-1, project an overall population growth.

SUHSD comprises 23 middle and high schools (grades 7 through 12). During the 2008-2009 school year, SUHSD had an enrollment of 42,804 students and an average class size of 27 students and pupil-teacher ratio of 23, which was greater than the County average class size of

25.2 students per class and pupil-teacher ratio of 20.8 (California Department of Education 2010b). These data indicate that SUHSD is operating at or exceeding enrollment capacity. While limited data is currently available for the 2009-2010 school year, present records indicate that a total of 42,209 students were enrolled during the 2009-2010 school year (California Department of Education 2011b), which indicates a decline in enrollment from the 2008-2009 school year. However, future enrollment is expected to increase, based upon the forecasted population levels provided in Table 5.10-1.

The project site is located within the San Diego County Public Library service area; however, currently no County branch libraries are located within the vicinity of the project site. Several libraries under the City of Chula Vista Public Library (Civic Center Branch, Eastlake Branch, and South Chula Vista Branch) and City of San Diego Public Library (San Ysidro Branch Library and Otay Mesa Branch Library) provide library services to the project region.

Water Supply and Sewer Services. The Otay Water District provides water service to the East Otay Mesa Specific Plan Area. Currently the County has plans for providing recycled water to the Specific Plan Area, and the Otay Water District will become the recycled water purveyor and distributor for recycled water. The East Otay Mesa Sewer Maintenance District provides sewer service to accommodate planned development within the East Otay Mesa Specific Plan Area.

Electrical Power and Natural Gas. San Diego Gas & Electric (SDG&E) is the regulated public utility that provides electrical power and natural gas service to San Diego County and the project area.

5.10.1.4 Fiscal Resources

Since the project site is located in unincorporated San Diego County, the County is the local agency with taxing authority on the project. As a result, in addition to federal and state funding, the County would experience direct fiscal impacts in the form of property and sales tax, permit fees, and other charges for services. Key factors impacting these revenues include real estate activity and consumer spending, which in turn, are greatly influenced by interest rates and employment levels (County of San Diego 2010b).

Based on actual totals for fiscal year 2009-2010, San Diego County operated a general fund of $3.1 billion, which reflected a 2.3 percent decrease from the actual general fund from fiscal year 2008-2009 (County of San Diego 2009). The majority of the 2009-2010 general fund source was received from taxes ($904.5 million, or 29 percent), followed by federal aid ($824.8 million, or 27 percent), and state aid ($815 million, or 26 percent) (San Diego County 2010b). In comparison, previous fiscal years have reflected an average General Fund annual growth rate of approximately five percent. For fiscal years 2010-2011 and 2011-2012, San Diego County proposes General Fund revised budgets of $3.7 billion and $3.5 billion, respectively (San Diego County 2010c).

5.10.2 Environmental Consequences

The criteria used in determining whether project-related socioeconomic impacts would be significant are presented in the California Environmental Quality Act (CEQA) Guidelines, Appendix G. Impacts attributable to the project are considered significant if they would:

- Induce substantial growth or reduction of population in an area
- Displace substantial numbers of people or existing housing, necessitating the construction of replacement housing elsewhere
- Induce a substantial increase in demand for public services and utilities
- Disrupt or divide the physical arrangement of an established community
- Result in substantial long-term disruptions to businesses

This analysis assesses the potential occurrence and significance of socioeconomic impacts for the construction and operation of PPEC. The methodology used to analyze the environmental justice aspects of the project is detailed in legislation and guidelines, as summarized in Section 5.10.3.

5.10.2.1 Population and Housing during Construction Phase

Estimated labor personnel requirements during the construction and commissioning phases of the project are shown in Table 5.10-5. As shown in Tables 5.10-3 and 5.10-6 and discussed further in Section 5.10.2.2, a large regional workforce is available within commuting distance to the project site and is anticipated to supply the labor required for the construction. It has been assumed for this analysis that manual labor staff would consist of local workers and contractor staff would be nonlocal workers temporarily working in the area. This analysis also assumes that during an average work week, nonlocal workers would lodge in local hotels and motels and then return home for the weekend. Local workers for PPEC are expected to commute to the project, rather than relocate.

The project estimates that the maximum percentage of nonlocal workers (excluding management) supporting the project during construction would be five percent. Based on this assumption, the maximum estimate of nonlocal workers, including the assumption that construction management staff are nonlocal, occurs during the sixth month, with potentially 49 nonlocal workers (Table 5.10-5). During construction, these workers are expected to temporarily lodge in hotels and motels within the project vicinity; following construction, the nonlocal workers are expected to return to their existing residences.

In consideration of the available local workforce and the number of nonlocal workers, PPEC does not anticipate significant impacts on housing in the project vicinity during project construction. Nonlocal workers are expected to temporarily lodge in hotels and motels within the project vicinity. Thus, based on the number of hotels and motels, and their vacancy rates in the project vicinity, PPEC anticipates a sufficient supply of lodging would be available to accommodate the workers. Additionally, because the project expects to be able to hire its additional staff from the existing labor force in the region, the project concludes that the impact on local housing will also be less than significant.

The proposed project site is located adjacent on the west side of the existing OMGP, and other areas surrounding the project site are undeveloped. PPEC does not involve changing, disrupting, or dividing the physical arrangement of an established community. Additionally, the project site is generally remote, such that construction activities would not result in disruption to businesses.

5.10.2.2 Employment during Construction

Project construction and commissioning is expected to occur over a total of 16 months and would require an average of 148 workers, with a peak workforce of 284 workers in the eighth month of construction. According to the Electric Power Research Institute's (EPRI's) report entitled, *Socioeconomic Impacts of Power Plants*, construction workers will commute as much as two hours to construction sites from their homes, rather than relocate. Representative construction trades and the associated available and projected number of trade workers in San Diego County are provided in Table 5.10-6. In general terms, the availability of approximately 78,770 (Standard Occupational Code [SOC] 47-200) construction workers in San Diego County in 2008 would more than suffice to meet the project workforce needs (approximately 0.4 percent of the regional workforce); although, a small number of workers in certain specialized trades may potentially come from outside the region (estimated maximum of 49 nonlocal workers during the sixth month of construction, as discussed in Section 5.10.2.1). Additionally, given the region's forecast growth in construction workforce (Table 5.10-6) and the current unemployment rates (Table 5.10-4), it is expected that the project would not encounter difficulties finding an available labor force within the daily commuting distance to supply the workforce required for construction.

PPEC would provide approximately $26 million (in 2010 dollars) in direct construction payroll. Indirect and induced employment as a result of project construction is discussed in Section 5.10.2.7.

5.10.2.3 Population and Housing during Operation

Permanent employees will commute as much as one hour to their workplace (EPRI, 1982). As shown in Table 5.10-7, the project is expected to require 12 full-time employees during operations. The data presented in Table 5.10-6 indicates that the regional workforce in San Diego County will be available to supply the workforce needed for project operation. As a result, it is expected that the 12 new employees are available and would be hired from the project region, rather than relocate. Operation of PPEC is not expected to cause an influx of operation workers to relocate to the local area and, therefore, will have no significant impact on the population and housing in the region.

Operation of PPEC does not involve changing, disrupting, or dividing the physical arrangement of an established community. Additionally, operation of the facility would not result in substantial long-term disruption to businesses.

5.10.2.4 Employment during Operation

PPEC will require a staff of 12 permanent employees for operation. These are long-term positions, and include six operating technicians, four maintenance technicians, and two management staff, as shown in Table 5.10-7. Permanent employees will commute as much as

one hour to their workplace (EPRI, 1982). As presented in Table 5.10-10, the regional workforce in San Diego County provides sizable resources of potential hires for the 12 positions. It is reasonably anticipated that the 12 positions required for the operation phase may be hired from a commuting distance from the proposed project. As a result, the proposed project does not expect to encounter substantial employee relocation effects for its operation. The average salary per employee is expected to be approximately $85,000 per year, including benefits. Combined, the annual operation payroll would be approximately $1,020,000 for PPEC.

5.10.2.5 Public Services

Fire Protection and Emergency Response. RFPD Station 22 (Otay Mesa), which is within 0.25 mile of the project facility, would be the first responder to incidents on the PPEC site (RFPD 2010). Based on communication with RFPD Station 22, fire department response time to the site in the event of an incident would be approximately four minutes (San Diego County RFPD Station 22 2010). County standards for response time are established in the Public Facility Element of the San Diego County General Plan. For the unincorporated East Otay Mesa area, the minimum acceptable response time for fire and emergency calls is five minutes; therefore, the RFPD Station 22 maintains the County standards. In the event that additional assistance is needed, resources at Station 26 (Donovan) as well as fire protection services from the City of Chula Vista and City of San Diego would be available to respond in accordance with the County Automatic Aid Agreement.

The project will take steps during construction and operation to minimize potential need for fire and emergency enforcement. Emergency services during construction would be coordinated with the RFPD and local medical facilities. As discussed previously in Section 5.10.1.3, an integrated paramedic service and multiple medical facilities are available in the project region. The project would be constructed and operated in accordance with all applicable safety standards required by the California Occupational Safety and Health Administration (Cal-OSHA) and San Diego County, as well as other applicable regulations and standards. During project construction, the general contractor would retain a safety manager, who would prepare and implement a site-specific safety plan. This plan would include contact information for a local urgent care facility for non-emergency physician referrals; availability of first-aid kits, including in construction offices; and first-aid training requirements for all foremen and supervisors and at least one person per construction crew.

As described in Section 3.5.10 (Fire Protection System), the PPEC facility will be designed with several fire protection systems. The facility design includes a firewater system that would be connected to the Otay Water District's potable water system for the primary water source, and a secondary (i.e., back-up) water supply from an onsite water storage tank. The firewater distribution system would be equipped with fire hydrants, sprinklers, and deluge systems, in accordance with National Fire Protection Association (NFPA) code. In addition, combustion turbines and associated electrical modules will be protected by a carbon dioxide (CO_2) fire protection system. Electronic and electrical equipment rooms will be equipped with smoke detection, alarm systems including alarm annunciation, supervisory, and trouble signals, and fire extinguishers. Hand-held CO_2 and dry chemical fire extinguishers will be located throughout the facility in accordance with NFPA standards.

TABLE 5.10-5
CONSTRUCTION LABOR PERSONNEL REQUIREMENTS PER MONTH

	Months After Commencement of Project Site Work																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
Discipline	Construction Phase													Commissioning Phase			Total
Boilermakers	--	--	--	--	--	14	14	14	14	14	14	11	11	11	--	--	117
Carpenters/Cement Finishers	4	12	19	19	19	15	13	8	5	4	4	4	2	2	1	--	131
Electricians	3	11	9	9	19	28	36	53	55	51	29	17	10	5	5	5	345
Insulation Workers	--	--	--	--	--	--	--	8	8	8	17	4	3	--	--	--	48
Ironworkers	--	3	5	31	29	31	31	29	25	22	19	17	8	3	--	--	253
Laborers	6	11	15	20	20	20	20	20	20	17	12	8	4	3	2	2	200
Millwrights	--	--	--	7	8	13	28	41	41	41	30	9	9	1	1	1	230
Operating Engineers	8	8	8	9	9	9	9	9	9	4	1	1	1	1	1	--	87
Painters	--	--	--	--	--	4	9	9	9	4	4	2	2	2	--	--	45
Pipefitters	4	16	26	26	33	33	35	45	48	24	16	10	4	4	4	4	332
Sheet Metal Workers	--	--	--	--	--	3	6	7	9	7	7	7	2	1	--	--	49
Surveyors	4	5	5	3	3	2	2	2	2	2	2	2	2	2	--	--	38
Teamsters	4	3	5	3	2	2	2	2	2	2	2	2	1	1	1	--	34
Commissioning Group	--	--	2	2	2	2	2	2	2	2	4	5	5	5	5	5	45
Management Staff	17	21	24	35	37	40	35	35	34	34	27	25	19	13	12	12	420
Total Workforce	50	90	118	164	181	216	242	284	283	236	188	124	83	54	32	29	2,374

TABLE 5.10-6
CONSTRUCTION AND OPERATION OCCUPATIONAL PROJECTIONS OF EMPLOYMENT IN PROJECT REGION

Occupational Title	SOC[1] Code	Total Workforce, 2008	Total Projected Workforce, 2018	Projected Growth from 2008
Construction and Extraction Operations	470000	78,770	91,070	12,300 (15.6%)
Carpenters	472031	12,170	14,090	1,920 (15.8%)
Cement Masons and Concrete Finishers	472051	1,640	1,880	240 (14.6%)
Construction Laborers	472061	12,830	15,720	2,890 (22.5%)
Construction Trade Workers	47200	65,840	75,680	9,840 (14.9%)
Electrical Engineers	172071	1,660	1,720	60 (3.6%)
Electricians	472111	7,270	8,030	760 (10.5%)
Environmental Science and Protection Technicians, Including Health	194061	490	530	40 (8.2%)
Environmental Scientists and Specialists, Including Health	192041	1,560	1,710	150 (9.6%)
Industrial Truck and Tractor Operations	537051	4,090	4,380	290 (7.1%)
Insulation Workers	472131	230	250	20 (8.7%)
Mechanical Engineers	172141	2,880	3,050	170 (5.9%)
Operating Engineers and Other Construction Equipment Operators	472073	2,520	2,960	430 (17.0%)
Painters, Construction, and Maintenance	472141	7,660	8,310	650 (8.5%)
Plant and System Operators	518000	1,470	1,710	240 (16.3%)
Power Plant Operators	518013	310	350	40 (12.9%)
Plumbers, Pipe Fitters, and Steamfitters	472152	5,130	5,770	640 (12.5%)
Secretaries and Administrative Assistants	436000	40,370	44,280	3,910 (9.7%)
Supervisors, Construction	471000	7,510	9,060	1,550 (20.6%)
Surveyors	171022	570	590	20 (3.5%)
Welders, Cutters, Solderers, and Brazers	514121	2,510	2,660	150 (6.0%)

Source: State of California Employment Development Department, 2010e.
[1] SOC = Standard Occupational Code

TABLE 5.10-7
ESTIMATED PROJECT STAFF DURING OPERATIONS

Department	Position	Number of Employees	Shift	Workdays
Operations	Operators	4	Two 2-person shifts per day; overtime as required	7 days per week
Operations	Operations Supervisor	1	Standard 8-hour day	5 days per week
Maintenance	Maintenance Technician	4	Standard 8-hour day	5 days per week
Environmental	Environmental Technician	1	Standard 8-hour day	5 days per week
Management	Administrative Staff	1	Standard 8-hour day	5 days per week
Management	Plant Manager	1	Standard 8-hour day	5 days per week

Additionally, as mentioned previously, a permanent facility for both RFPD and sheriff stations are currently being planned at the intersection of Enrico Fermi Drive and Lone Star Road, which is less than one mile from the project site. Properties located within the East Otay Mesa area, which would be within the service area for the new facility, would be assessed a forthcoming CFD 09-1 Special Tax. Furthermore, the RFPD requires new developments to be assessed a Fire Mitigation Fee, which would generate additional funding required for the RFPD fire protection needs, including the development of the planned new facility (County of San Diego 2010a). The PPEC project's contribution to these funding mechanisms (i.e., the CFD 09-1 Special Tax and Fire Mitigation Fee, as described in further detail in Section 5.10.2.7) would help provide for expanded fire protection services in the project area.

In summary, based on the project fire protection design considerations and practices during facility construction and operation, the RFPD Station 22 current performance standards, and the project funding of the Fire Mitigation Fee and forthcoming CFD 09-1 Special Tax, the project is not expected to result in significant impacts on fire protection and emergency response services.

Medical Facilities. The project area is served by several hospitals equipped to provide 24-hour emergency room, acute care, and cardiology capabilities. Based on the project's health and safety practices, as described in Section 5.17, Worker Safety, and the available medical facilities identified in the vicinity of the project site (Section 5.10.1.3), significant impacts on medical services are not expected during construction and operation of PPEC.

Law Enforcement. The San Diego County Sheriff Department Imperial Beach Station would provide law enforcement services to the project site. In the event that an emergency call is placed from the project site, the Imperial Beach Station estimates that law enforcement response times would require between five to ten minutes for priority calls (San Diego County Sheriff Department, Imperial Beach Station 2010), and between 17 to 59 minutes for non-priority calls (County of San Diego 2010a). County standards for response time are established in the Public Facility Element of the San Diego County General Plan. For the unincorporated East Otay Mesa area, the minimum acceptable response time for priority calls is eight minutes, and 16 minutes for non-priority calls. As a result, the Imperial Beach Station response time to the project site area currently does not fully conform to the County General Plan response times. However, the County identified the need for additional law enforcement resources, and therefore has implemented plans to develop additional sheriff resources. These resources include provisions for a permanent new Sheriff facility that would be funded through the CFD 09-1 Special Tax applied as part of the assessed property tax in the Otay Mesa planning area (County of San Diego 2010a) (see Section 5.10.2.7).

The permanent facility serving for both RFPD and sheriff stations is currently being planned to be located at the intersection of Enrico Fermi Drive and Lone Star Road, which is less than one mile from the project site. Operation of this facility would increase law enforcement services, and is intended to provide the Sheriff Department with adequate resources to achieve the County standards.

The project will take steps during construction and operation to minimize potential need for law enforcement. During construction, the project includes installation of secured fencing around the entire project site (including laydown area) with controlled access. Upon completion of the

project, a permanent chain-link security fence will be installed, encompassing the facility. A controlled-access gate will be located at the entrance from Alta Road. Additionally, the facility switchyard will be enclosed within a separate chain-link fence with access gates, for worker safety. The project site would have 24-hour security measures using either surveillance devices or personnel (i.e., security guards). Furthermore, operation of the facility would result in negligible increases in population, if any, that would otherwise increase demand in law enforcement services.

In summary, based on the project's proposed safety and security practices, the project's operational workforce needs, and contribution of fair share funding for the planned permanent sheriff station, construction and operation of the PPEC would not be expected to substantially affect the Sheriff Department response services.

Schools and Libraries. Because a sufficient labor pool exists within commuting distance of the proposed project, it is anticipated that construction workers would commute to the project site, and nonlocal construction workers would stay in hotels and motels throughout the extent of construction, rather than relocate. Based on the regional workforce and existing high unemployment rates, the 12 additional employees required during project operation are expected to be hired within a commuting distance to the facility. As a result, the proposed project is expected to result in no or negligible impacts on schools and libraries during the project construction and operation.

5.10.2.6 Utilities

The following paragraphs summarize the project's approach to evaluate impacts on public utilities. PPEC will result in no significant impact on applicable utility services in the project vicinity.

Electricity. When the facility is shut down, electricity for the project site would be provided by SDG&E's existing power grid by backfeeding from the SDG&E tie line. When the facility generation is in operation, the balance of plant auxiliary power requirements would be supplied internally.

Natural Gas. Natural gas supply for the project is proposed to be delivered to PPEC through either Route A, which would run approximately 8,000 feet south along Alta Road to near the U.S.-Mexico border, at which point it would connect to the existing SDG&E pipeline. Route B would extend approximately 2,375 feet south along Alta Road, turn west on Otay Mesa Road, and continue approximately 7,920 feet to Harvest Road at which point it would connect to the existing SDG&E natural gas pipeline (Figure 3.3-3, Potential Linears) for a total of approximately 10,300 feet. Both possible routes would connect into an existing SDG&E trunkline, which would be capable of providing an adequate supply for the facility operation.

Water Supply. The project will make a short connection to the potable service system either at an existing 12-inch main along Calzada de la Fuente, or at an existing 24-inch main along Alta Road. As described in Section 3.0, the Otay Water District has plans to construct a new recycled water distribution system in the Otay Mesa area. Upon the District's commissioning of the proposed Otay Mesa area recycled water system, the project will make a connection to a new

recycled water main either along Calzada de la Fuente or along Alta Road. Process water uses include plant service water, cooling system make-up, combustion turbine injection, combustion turbine evaporative cooler make-up, and secondary fire protection water. PPEC's potable water needs for drinking water, showers, sinks, toilets, eye wash stations, safety showers, and primary fire protection water would be supplied through a connection to the Otay Water District. Refer to Section 5.5, Water Resources, for further information.

Sewage System. During construction, the project would provide portable restrooms for personnel. During operation, wastewater would be disposed through either a connection to an existing 12-inch sewer main along Calzada de la Fuente along the north project site boundary, or to an existing 15-inch sewer main located along Alta Road, along the west project site boundary.

5.10.2.7 Fiscal Resources

Property Tax. Based on the San Diego County Assessor's Office, the San Diego assessor has placed no value on the project site property. However, following construction of the project, the facility will be reassessed for property value and tax rate. California property tax assessments on electric generation facilities larger than 50MW are performed at the state level through the California Board of Equalization (BOE). The BOE will determine the Unitary Market Value (UMV) of the facility, based upon the project's cost, revenue, expenses, and land value, and then communicate the UMV to San Diego County (BOE, 2008). San Diego County is then responsible for assessing and collecting the property tax based on the BOE's assessed UMV.

The project capital cost is estimated to be in excess of $250 million. While the UMV determination is an extensive assessment process, the BOE estimates that a facility's UMV may be roughly estimated to be the initial capital cost, and that the applied tax rate would be approximately 1.2 percent. Since the initial capital cost of the facility is estimated to be in excess of $250 million, the estimated property tax for the project's first year of operation is expected to be approximately $3 million.

Community Facilities District (Number 09-1). As mentioned previously, the RFPD and Sheriff Department have plans to develop a permanent fire protection and sheriff facilities near the project site (at the intersection of Enrico Fermi Drive and Lone Star Road). To fund these facilities, the RFPD, with cooperation with the Sheriff's Department, implemented a special tax district, CFD 09-1 that would be assessed and applied in property tax collected in the East Otay Mesa areas served by the RFPD and Sheriff Department. The County Assessor would apply the special tax to property owners, including those of the PPEC site. The CFD 09-1 Special Tax is expected to be collected each fiscal year commencing in fiscal year 2010-2011. As of December 2010, the District rate and method of apportionment has not yet been finalized (Nissen 2010). Upon approval and commencing in the property taxes for fiscal year 2010-2011, the CFD 09-1 district special tax would be added to the PPEC site property tax rate.

Sales Tax. During construction, local commodities expenditures are expected to be approximately $7 million and would occur within San Diego County. San Diego County sales tax and allocations resulting from local expenditures are presented in Table 5.10-8. As shown,

the estimated total sales tax paid during construction is $612,500 for the County. Estimated local expenditures and sales tax are reported in 2010 dollars.

During project operation, local commodities expenditures are expected to be approximately $970,000 (based on 2010 dollars) annually and would occur within San Diego County. The estimated yearly operations sales tax and allocations are presented in Table 5.10-8. As shown, total sales tax paid in San Diego County annually during operation is estimated at $84,875, based on 2010 dollars.

TABLE 5.10-8
PPEC ESTIMATED CONSTRUCTION AND OPERATION
LOCAL SALES TAX IN SAN DIEGO COUNTY

Recipient	Percentage Sales Tax Allocation[1]	PPEC Construction Estimated Sales Tax[2] (2010 U.S. dollars)	PPEC Operation Estimated Sales Tax (2010 U.S. dollars)
Statewide Base Sales/Use Tax (8.25%)			
State General Fund	6.0	$420,000	$58,200
State Fiscal Recovery Fund (to pay off Economic Recovery Bonds [2004])	0.25	$17,500	$2,425
State Local Public Safety Fund (supports local criminal justice activities)(1993)	0.50	$35,000	$4,850
State Local Revenue Fund (supports local health and social services programs)(1991 Realignment)	0.50	$35,000	$4,850
Local County Transportation Funds	0.25	$17,500	$2,425
Local Allocation to City and County Operations	0.75	$52,500	$7,275
County District Tax3			
San Diego County Regional Transportation Commission (SDTC)	0.50	$35,000	$4,850
Total Sales/Use Tax, San Diego County	**8.75**	**$612,500**	**$84,875**

[1] California State Board of Equalization (CBOE), 2010.
[2] Sales tax is based on the estimated value of materials and supplies purchased during construction ($7,000,000) and operation ($970,000) in San Diego County.
[3] Tax rate for jurisdictions within San Diego County, with the exception of: the City of El Cajon, which has an additional 0.50% Service Preservation Transactions and Use Tax and 0.50% Public Safety Facilities Transactions and Use Tax; City of La Mesa, with an additional 0.75% Transactions and Use Tax; National City, which has an additional 1.0% Transactions and Use Tax; and City of Chula Vista, which has an additional 0.50% Transactions and Use Tax.

Fire Mitigation Fee Program. As mentioned in Section 5.10.2.5, the RFPD requires new developments to be assessed a Fire Mitigation Fee, which would generate additional funding required for the RFPD fire protection needs, including the development of the planned new facility (County of San Diego 2010a). The Fire Mitigation Fee is considered a self-mitigating measure for developers to offset the additional fire service costs of the proposed new development, and is applied at $0.46 per square foot of covered and enclosed, non-residential space. The calculated fees would be based on the final design for construction, and would be assessed prior to issuance of the project building permit.

School Impact Fees. The PPEC site is located within the San Ysidro Elementary School District and Sweetwater Union High School District boundaries. In accordance with California Government Code 65995, the current Statutory School Fees in effect at the end of fiscal year 2009-2010 applicable to new commercial or industrial development is $0.19 and $0.26 per square foot of covered and enclosed, non-residential space constructed for the San Ysidro Elementary School District and Sweetwater Union High School District, respectively. The school district fees on new commercial and industrial construction provide a self-mitigating measure for development projects to fund the needs for expanded or new school facilities. The project would be assessed a school district fee based on the "chargeable covered and enclosed space," which is defined as the covered and enclosed space determined to be within the perimeter of the industrial structure during plan review prior to issuance of building permits.

Indirect and Induced Economic Effects. The following sections assess expected secondary economic effects during construction and operation of PPEC. *Indirect effects* represent the impacts (e.g., change in employment) caused by the iteration of industries purchasing from industries resulting from direct final demand changes. *Induced effects* represent the impacts (e.g., change in employment) on all industries caused by the expenditures of new household income generated by the direct and indirect effects of direct final demand changes. The indirect and induced economic effects of the project are considered beneficial impacts on the project region. IMPLAN Professional Version 2.0.1025 was used to create an input/output model assessing these economic impacts.

Indirect and Induced Economic Effects during Project Construction. Construction activity would result in secondary economic and employment impacts (indirect and induced impacts) that would occur within San Diego County. The affected project region was determined based on San Diego County's available labor force within reasonable commuting distance to serve the project's construction needs and locations where supplies and materials are expected to be purchased.

Indirect and induced income and spending effects would occur because of purchases of goods and services by firms involved with construction. Indirect employment effects and induced employment result from construction workers spending their income in their local area and typically lag behind direct effects by six to 12 months.

The modeling input was based on the project's estimated initial capital cost of $300 million for project construction, expenditures of $7 million for locally-purchased materials and services, and an average direct construction employment of 148, having a combined payroll of $26 million. IMPLAN Pro Sector 41 (Other New Construction, Power Plants) was used for this analysis, and economic estimates were based on 2010 dollars. The estimated indirect and induced employment in San Diego County resulting from PPEC construction comprises 35 and 177 jobs, respectively. These additional jobs result from the estimated $7 million expenditures in local construction supplies and equipment and approximately $26 million in payroll over the PPEC construction timeframe. These additional jobs would result from local construction expenditures as well as from spending by local construction workers. These secondary jobs are expected to be filled locally and regionally. Assuming an average direct construction employment of 148, the employment multiplier associated with the construction

of PPEC is approximately 2.43 ([148 + 35 + 177]/148). This project construction employment multiplier is based on a Social Accounting Matrix (SAM) type model.

Indirect and induced income impacts were estimated at $2,070,145 and $78,083,101, respectively. Assuming a total annual local construction expenditure (payroll and materials and supplies) of $33 million ($26 million in payroll and $7 million in supplies), the project income multiplier based on a Type SAM model is approximately 1.31 ([$33,000,000 + $2,070,145 + $8,083,101]/$33,000,000).

The proposed project's output describes the value of production by the industry. Output includes spending for materials and supplies (nonlabor costs), plus value added, which comprises employee compensation, proprietary income, other property income, and indirect business taxes. PPEC's indirect and induced outputs for dollars generated by other industries supplying construction of power facilities are estimated at $4,890,823 and $24,378,854, respectively. The project output multiplier based on a Type SAM model is approximately 1.75 ([$39,179,996 + $4,890,823 + $24,378,854]/$39,179,996).

Indirect and Induced Effects from Project Operation. Similar to project construction, operation of PPEC would result in indirect and induced economic impacts in San Diego County. As with the construction phase, the affected project region during operation was similarly determined based on the available labor force within reasonable commuting distance and reasonable locations where operations and maintenance supplies and materials are expected to be purchased. Unlike construction indirect and induced impacts, operational indirect and induced impacts represent *permanent* increases in area jobs, income, and spending. These impacts would lag behind direct effects by 6 to 12 months.

The modeling input was based on an estimated annual operations and maintenance (O&M) budget of approximately $15 million, local operation expenditures of $970,000 for materials required to maintain and operate the facility, and an average direct employment of 12 people, having a combined payroll of $1,020,000. Fuel costs were not included in the IMPLAN modeling because natural gas prices are variable and unknown and the effects of the purchase would not likely occur within the project region. IMPLAN Pro Sector 30 (Power Generation and Supply) was used for this analysis, and economic estimates were based on 2010 dollars.

The resulting indirect and induced effects of the PPEC operation would be two and seven jobs, respectively, within San Diego County. These additional jobs result from the $15 million in O&M costs and $1,020,000 in payroll. Assuming a direct operation employment of 12, the employment multiplier associated with PPEC's operation is approximately 1.76 ([12 + 2 + 7]/12). The project operation employment multiplier is based on a SAM type model.

Indirect and induced income impacts are estimated at $110,468 and $289,506, respectively. The income multiplier associated with PPEC's operational phase is approximately 1.2 ([$1,990,000 + $110,468 + $289,506]/$1,990,000), which is based on a SAM type multiplier using 2010 dollars.

The project's indirect and induced outputs for dollars generated by other industries supplying power generation were estimated at $274,812 and $875,329, respectively. The project output multiplier is based on a Type SAM model using 2010 dollars and is approximately 1.35 ([$3,280,000 + $274,812 + $875,329]/$3,280,000).

5.10.3 Environmental Justice

In response to Executive Orders (EO) 12250 and 12898, the California Energy Commission (CEC) requires environmental justice analysis in the siting process. President Carter signed EO 12250 in 1980, which directed federal agencies to adopt *disparate impact* regulations. Disparate impacts may be claimed if a minority community can demonstrate unique, different, and negative effects on their population as a result of the actions of a state's permitting agency (Scoll 2003).

EO 12898 directs each federal agency and state agencies such as CEC that receive federal assistance to "make environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high or adverse human health effects of its programs, policies, and activities on minority populations and low-income populations…" In this respect, the CEC considers a "high and adverse" environmental or health effect disproportionately falling upon a minority or low-income population in its analysis of environmental justice.

5.10.3.1 Environmental Justice Screening Analysis

In accordance with U.S. Environmental Protection Agency (USEPA) published guidelines for addressing environmental justice concerns, *Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA [National Environmental Policy Act] Compliance Analyses* (1998), the following criteria may be used during environmental justice screening and impact assessment:

- The minority or low-income population may be identified for the affected area if the minority or low-income population of the affected area is greater than 50 percent of the affected area's general population.
- The minority or low-income population percentage of the area is "meaningfully greater" than the minority population percentage in the general population or other appropriate unit of geographic analysis.
- Whether potential environmental impacts attributable to the project would fall disproportionately on the minority or low-income residents of the community.

In the following analysis, the percentages of minority and low-income populations were assessed for each census tract that falls entirely or partly within the project environmental justice area (EJ area), which is defined as a 6-mile radius around the proposed project site. Affected populations were characterized in terms of ethnic composition and poverty status using 2000 U.S. Census data, as presented in Table 5.10-9 and depicted on Figure 5.10-1 (Minority Population Distribution by Census Tracts Within 6 Miles of Project), and Figure 5.10-2 (Poverty Population Distribution by Census Tracts Within 6 Miles of Project).

To determine whether the project EJ area contains a minority or poverty population meaningfully greater than the regional geographic context, the project EJ area data were compared with similar data collected for San Diego County. For the purposes of this assessment, the portion of the project's EJ area within Mexico (approximately 1.5 miles south of the project site) was not included in this EJ analysis. Impacts were then assessed by determining whether disproportionate impacts associated with the proposed project would occur in an area occupied by low-income or minority populations as defined above.

Minority Population Analysis. The project EJ area overlays 11 census tracts, which consist of 45,461 inhabitants (Table 5.10-9 and Figure 5.10-1). Of the census tracts, four tracts have minority populations greater than 50 percent. Within the applicable EJ area, 40.1 percent of the inhabitants are minority residents. As a result, inhabitants in the project EJ area do not consist of minority populations exceeding the 50 percent threshold.

According to USEPA guidance, in addition to the 50 percent threshold, minority populations may also be identified where the proportion of minority residents within the project EJ area are "meaningfully greater" than the region as a whole. As indicated in Table 5.10-9, San Diego County has an overall minority percentage of 33.5 percent, which is lower than the project EJ area minority population by 6.6 percentage points. The project EJ area contains a higher percentage of minority inhabitants than that of San Diego County; however, because the difference (i.e., 6.6 percentage points) is not substantial, this analysis determines that the percentage of minority population within the project EJ area does not constitute a "meaningfully greater" percentage than the project geographic context.

As a result, this analysis concludes that no minority populations are present that: 1) exceed the 50 percent threshold within the project EJ area; and 2) are considered meaningfully greater than that of the project region.

Low-income Population Analysis. For the purposes of the low-income analysis, *low income* is defined as individuals living below the federally-adopted poverty levels (U.S. Department of Health and Human Services 2010), as presented in Table 5.10-10. As shown in Table 5.10-9 and Figure 5.10-2, no census tracts within the project EJ area contain low-income populations exceeding the 50 percent threshold. The project EJ area also contains a lower percentage of low-income population (3.1 percent) in comparison to San Diego County (12.4 percent). As a result, this analysis concludes that no poverty populations are present that: 1) exceed the 50 percent threshold within the project EJ area; and 2) are considered meaningfully greater than that of the project region.

Evaluation of Disproportionate Impacts. Typical project impacts associated with environmental justice concerns for power generation projects such as the proposed project pertain to air quality, residential or business displacements, noise, public health, public service, traffic, and water quality impacts. The proposed project, as designed, would not emit significant emissions of criteria pollutants that could lead to health effects in the project vicinity (Section 5.2, Air Quality); would not involve displacement of residences or businesses or be expected to result in negligible effects to local housing (Section 5.10.2.3); would not result in significant noise or health impacts at the residences (Section 5.12, Noise); would not result in significant emission of toxic air contaminants that could increase the ambient cancer risk or result in

noncancer health effects above established thresholds (Section 5.16, Public Health and Safety); and would not involve wastewater discharges that could affect drinking water supplies and quality (Section 5.5, Water Resources). The proposed project may result in temporary impacts to public transportation needs; however, these impacts would not be significant (see Section 5.11, Traffic and Transportation).

As previously determined, no minority or low-income populations are present within the project EJ area that: 1) exceed the 50 percent threshold within the project EJ area; and 2) are considered meaningfully greater than that of the project region. Furthermore, the proposed project would not result in potential environmental impacts having the likelihood of affecting populations more susceptible to pollution, environmental degradation, and public transportation. In summary, this analysis concludes that the proposed project would not result in environmental justice impacts.

5.10.4 Cumulative Impacts

Section 5.18, Cumulative Impacts, identifies other proposed projects considered in cumulative socioeconomic impacts. The potential for cumulative socioeconomic impacts exists where other projects are proposed in the region, construction schedules overlap, and employment opportunities are created. Projects with overlapping construction schedules and/or operations could cumulatively result in a demand for labor that cannot be met by the project area labor pool, which could lead to an influx of nonlocal workers and their dependents. Consequently, this potential population increase could impact socioeconomic resources.

It is important to note however, that the current economic downturn has generally slowed economic growth, and has resulted in delayed development. As a result, while the identified pending projects have active permitting status, the actual project permitting and/or construction timeframes occur further in the future than previously planned, and it is possible that fewer projects than identified will be developed during the PPEC construction timeframe. As indicated in the workforce data provided in Section 5.10.2.2 and 5.10.2.4, the project construction (peak workforce of 284 workers) and operation (12 permanent workers) represents a small portion of the existing and projected regional workforce in San Diego County. In conjunction with the current high unemployment rates in the project study area, as assessed in Section 5.10.1.2, construction and operation of the PPEC is not expected to result in a cumulatively significant demand on the regional workforce. Based on the large available workforce and employment base in the project region, the PPEC construction and operation workers are expected to commute and not relocate to the project site; thus, the project is expected to result in minimal, if any, impacts to increasing the project area population and housing demand. Therefore, the project's incremental contribution to population and housing is not expected to result in cumulative significant impacts.

Additionally, the PPEC's minimal (if any) impacts to increasing population would similarly result in minimal increases to the demand for fire protection, law enforcement, and education that would otherwise result from an increased population base. As described in Section 5.10.2.5, PPEC incorporates fire protection and security measures into the project design and practices to reduce the potential incidents that would increase demand for fire department and law enforcement services. Furthermore, as identified in Section 5.10.2.7, the project would be required to provide taxes and fees designated to fund the RFPD and Sheriff Department

resources. The County applies these taxes and fees as a self-mitigating measure for developers, which mitigates for increase cumulative demands for fire protection and law enforcement services associated with new and existing developments. In summary, with implementation of the project fire protection and security design measures and practices, and required payment of County taxes and fees, the project's incremental contribution to cumulative public service impacts is expected to be insignificant.

The project would generate revenue for the County in the form of taxes and fees, as described in Section 5.10.2.7. Additionally, the project would result in direct purchases and indirect and induced economic effects in the County area (Section 5.10.2.7). Considered with other proposed projects, the project would contribute cumulative, beneficial fiscal impacts.

TABLE 5.10-9
ETHNIC AND ECONOMIC CHARACTERISTICS OF
PROJECT REGION AND WITHIN SIX MILES OF THE PROPOSED PROJECT

Census Tract Number	Total Population 2000	White Population (%)	Minority Population (%)	Individuals Above Federal Poverty Level (%)	Individuals Below Federal Poverty Level (%)
100.14	8,312	34.1%	65.9%	100%	0.0%
100.15	1,064	52.4%	47.6%	71%	29.4%
133.10	2,290	47.3%	52.7%	100%	0.2%
133.11	7,897	49.4%	50.6%	99%	0.6%
133.13	1,277	46.1%	53.9%	96%	3.7%
134.16	4,155	64.6%	35.4%	95%	4.7%
134.18	6,004	57.7%	42.3%	97%	3.1%
134.19	2,293	57.9%	42.1%	99%	1.1%
213.02	4,412	86.0%	14.0%	94%	6.4%
213.03	5,342	85.1%	14.9%	96%	3.7%
213.04	2,415	86.8%	13.2%	96%	3.7%
Census Tract Total Within 6-Mile Radius	45,461	59.1% (26,878)	40.1% (18,583)	96.9%[1] (44,073)	3.1%[1] (1,388)
San Diego County, Total	2,813,833	66.5% (1,871,839)	33.5% (941,994)	88.0% (2,475,434)	12.4% (338,399)

Source: U.S. Census 2000.
[1]Note: Minor arithmetic discrepancies occur because of data rounding.

TABLE 5.10-10
FEDERAL POVERTY THRESHOLDS

Size of Family	Poverty Threshold
1	$10,830
2	$14,570
3	$18,310
4	$22,050
5	$25,790
6	$29,530
7	$33,270
8	$37,010

Source: U.S. Department of Health and Human Services. 2010 Poverty Guidelines.

5.10.5 Mitigation Measures and Conditions of Certification

No significant adverse impacts pertaining to socioeconomics have been identified for PPEC. No mitigation measures or conditions of certification are proposed.

5.10.6 Applicable Laws, Ordinances, Regulations, and Standards (LORS)

Table 5.10-11 summarizes the LORS applicable to the socioeconomic impacts of PPEC.

TABLE 5.10-11
LORS APPLICABLE TO SOCIOECONOMICS

LORS	Description	AFC Conformance (Section)
Federal		
Executive Order 12250	Federal agencies to adopt disparate impact regulations, where a minority community may claim a "disparate impact" when it can demonstrate unique, different, and negative effects resulting from the state's permitting agency.	5.10.3
Executive Order 12898	Agencies are required to identify and address disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations.	5.10.3
State		
California Constitution, Article 13, Section 3(b)	Property owned by a local government (except those that are outside of its boundaries) is exempt from property taxes.	5.10.2.7
Government Code Sections 65302 et seq.	Each city and county is required to develop a General Plan to guide planning and development within a jurisdiction.	5.10.6.5
Government Code Sections 65995-65997 (Education Code Section 17620)	Includes provisions for levies against development projects in school districts.	5.10.2.7
Local		
San Diego County General Plan, Part XII Public Facility Element	**Policy 2.1:** New development shall be required to finance its full and fair share of the facility and equipment needs that it generates. *Implementation:* Utilize the Fire Mitigation Fee Ordinance to enable fire protection agencies to meet the facility and equipment needs generated by new development.	5.10.2.7
San Diego County General Plan, Part XII Public Facility Element	**Policy 3.2:** New development shall be required to contribute toward financing sheriff facilities toward achieving the short term objective. *Implementation:* When the Sheriff's Department determines that additional or expanded sheriff facilities are needed, new development shall be required to contribute towards the cost of new or expanded facilities to achieve the short-term objective for the unincorporated area. The costs may include an impact fee paid by new development, direct payments by the developer for services, construction of facilities, or other means acceptable to the County.	5.10.2.7
County of San Diego East Otay Mesa Specific Plan, Public Facilities Element	**Policy F-7:** Property Owners in East Otay Mesa shall contribute their fair share toward financing a sheriff station. *Implementation:* A Community Facilities District was formed in 2009 for the purpose of constructing interim and permanent law enforcement facilities in East Otay Mesa. The interim sheriff station became operational in 2010.	5.10.2.7

5.10.6.1 Federal

Executive Order 12250. As discussed in Section 5.10.3, EO 12250 requires federal agencies to adopt disparate impact regulations, where a minority community may claim a *disparate impact* when it can demonstrate unique, different, and negative effects resulting from the state's permitting agency. Refer to Section 5.10.3 for environmental justice screening related to PPEC.

Executive Order 12898. Also discussed in Section 5.10.3, EO 12898 *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations* (1994) requires federal government agencies to identify and address disproportionately high and adverse effects of federal action on the health and environment of minority and low-income populations. The USEPA has adopted the Order, and the California Environmental Protection Agency has established a working group for environmental justice concerns. The CEC receives federal funding and therefore must address environmental justice concerns associated with projects under its permitting jurisdiction. Refer to Section 5.10.3 for environmental justice analysis related to PPEC.

5.10.6.2 State

Government Code Sections 65995-65997 and Education Code Sections 17620-17626. In the event that new development impacts schools to the extent of requiring new construction or reconstruction, Government Code Sections 65995-65997 and Education Code Sections 17620-17626 give governing boards the authority to collect developer fees for residential, commercial, and industrial development within a school district. To assess a fee, the district must conduct a Fee Justification Study that reasonably demonstrates a relationship between the fee and the type of development to be assessed. The study includes consideration for the number of employees increased as a result of that development and the housing provided for those employees.

Government Code Sections 65300-65303.4. California State Planning Law (Government Code Sections 65300-65303.4) requires that each city and county adopt a General Plan consisting of seven mandatory elements to guide planning and development within the jurisdiction. The San Diego County General Plan and San Diego County East Otay Mesa Specific Plan are described below in Section 5.10.6.3.

5.10.6.3 Local

Policies and associated implementation measures from the San Diego County General Plan and San Diego County East Otay Mesa Specific Plan applicable to the PPEC project are discussed below.

San Diego County General Plan, Part XII Public Facility Element, Policy 2.1. New development shall be required to finance its full and fair share of the facility and equipment needs that it generates.

Implementation: Utilize the Fire Mitigation Fee Ordinance to enable fire protection agencies to meet the facility and equipment needs generated by new development.

San Diego County General Plan, Part XII Public Facility Element, Policy 3.2. New development shall be required to contribute toward financing sheriff facilities toward achieving the short term objective.

Implementation: When the Sheriff's Department determines that additional or expanded sheriff facilities are needed, new development shall be required to contribute towards the cost of new or expanded facilities to achieve the short-term objective for the unincorporated area. The costs may include an impact fee paid by new development, direct payments by the developer for services, construction of facilities, or other means acceptable to the County.

East Otay Mesa Specific Plan, Public Facilities Element, Policy F-7. Property Owners in East Otay Mesa shall contribute their fair share toward financing a sheriff station.

Implementation: A Community Facilities District was formed in 2009 for the purpose of constructing interim and permanent law enforcement facilities in East Otay Mesa. The interim sheriff station became operational in 2010.

5.10.6.4 Involved Agencies and Agency Contacts

Various public service agencies were contacted in the course of the socioeconomics investigation to check on levels of activity and expected impacts of the project. Table 5.10-12, Involved Agencies and Contacts, lists those agencies.

TABLE 5.10-12
INVOLVED AGENCIES AND CONTACTS

Subject	Agency	Contact/Title	Telephone
Fiscal Resources	San Diego County Assessor/Recorder/County Clerk 1600 Pacific Highway San Diego, CA 92101-2400	Staff	(858) 505-6262
Fiscal Resources	San Diego County Treasurer-Tax Collector 1600 Pacific Highway - Room 162 San Diego, CA 92101	Staff	(877)829-4732
Education	San Ysidro Elementary School District 4350 Otay Mesa Road San Ysidro, CA 92173	Manuel H. Paul, Superintendent	(619) 428-4476
Education	Sweetwater Union High School District 1130 Fifth Avenue Chula Vista, CA 91911-2896	Dianne Russo, CFO	(619) 691-5550
Fire Protection Services	San Diego Rural Fire Protection District (Headquarters) 14024 Peaceful Valley Ranch Road Jamul, CA 91935	Chief Dave Nissen	(619) 669-1188
Fire Protection Services	Station #22 (Otay Mesa) 446 Alta Road San Diego, CA 92154	Staff	(619) 661-2820
Law Enforcement	San Diego County Sheriff's Imperial Beach Station 845 Imperial Beach Boulevard Imperial Beach, CA 91932-2796	Staff	(619) 498-2400 (Business)

5.10.6.5 Applicable Permits, Permit Schedule, and Fees

Table 5.10-13 summarizes the socioeconomic permits and fees applicable to PPEC. Please refer to Section 5.10.2.7 for a discussion of the identified fees. As shown, no applicable permits are required related to socioeconomic resources.

TABLE 5.10-13
APPLICABLE SOCIOECONOMIC PERMITS AND FEES

Jurisdiction	Potential Permit and Fee Requirements
Federal	No permits or fees have been identified
State	No permits or fees have been identified
Local	
San Ysidro Elementary School District and Sweetwater Union High School District	Statutory School Fee, collected during the project's application for the project building permit (for an applicable structure).
San Diego Rural Fire Protection Department (RFPD)	Fire mitigation fee, collected during the project's application for the project building permit (for an applicable structure).

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Census 2000. *Table DB-4. Profile of Selected Housing Characteristics: 2000; Geographic Area: San Diego County, California.*

Census 2000. *Table DB-1. Profile of General Demographic Characteristics: 2000; Geographic Areas: Chula Vista City, Imperial Beach City, National City, and San Diego City, California.*

Census 2000. *Table DB-2. Profile of Selected Social Characteristics: 2000; Geographic Areas: Chula Vista City, Imperial Beach City, National City, and San Diego City, California.*

Census 2000. *Table DB-3. Profile of Selected Economic Characteristics: 2000; Geographic Areas: Chula Vista City, Imperial Beach City, National City, and San Diego City, California.*

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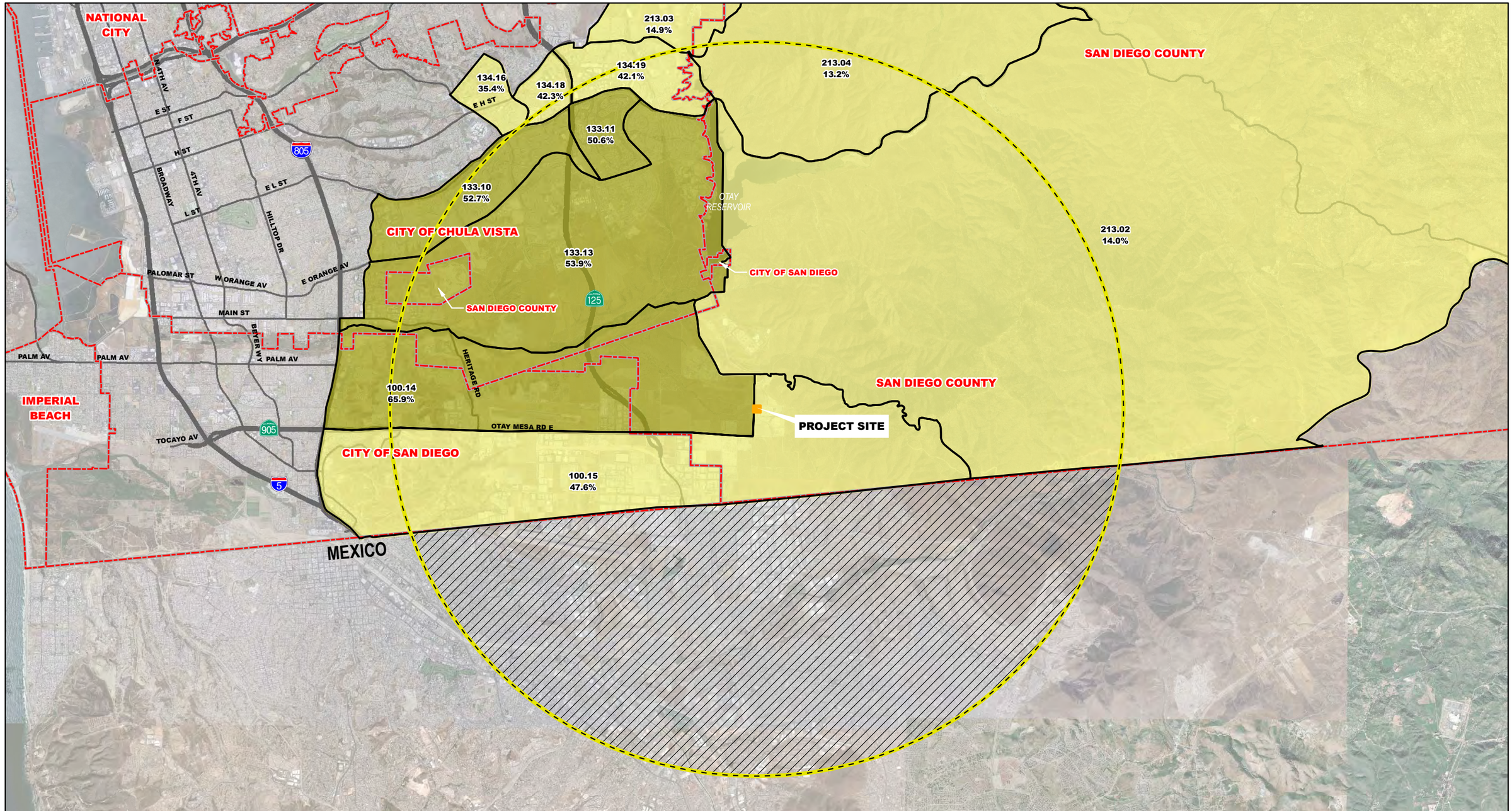


Legend

- Project Site
- Jurisdictional Boundary
- 6-Mile Project Site Radius
- Area Not Included in Environmental Justice Analysis
- Census Tract Boundary
- Minority Population < 50%
- Minority Population > 50%

133.13 ← Census Tract ID
53.10% ← Minority Percentage

The minority percentage represents the number of residents that in 2000, were included in the following race or ethnicity categories (as defined by the U.S. Census): White Hispanic/Latino, Black or African American, American Indian and Alaskan Native, Native Hawaiian or Other Pacific Islander, Some Other Race, and Two or More Races.

N

0 1 2 Miles

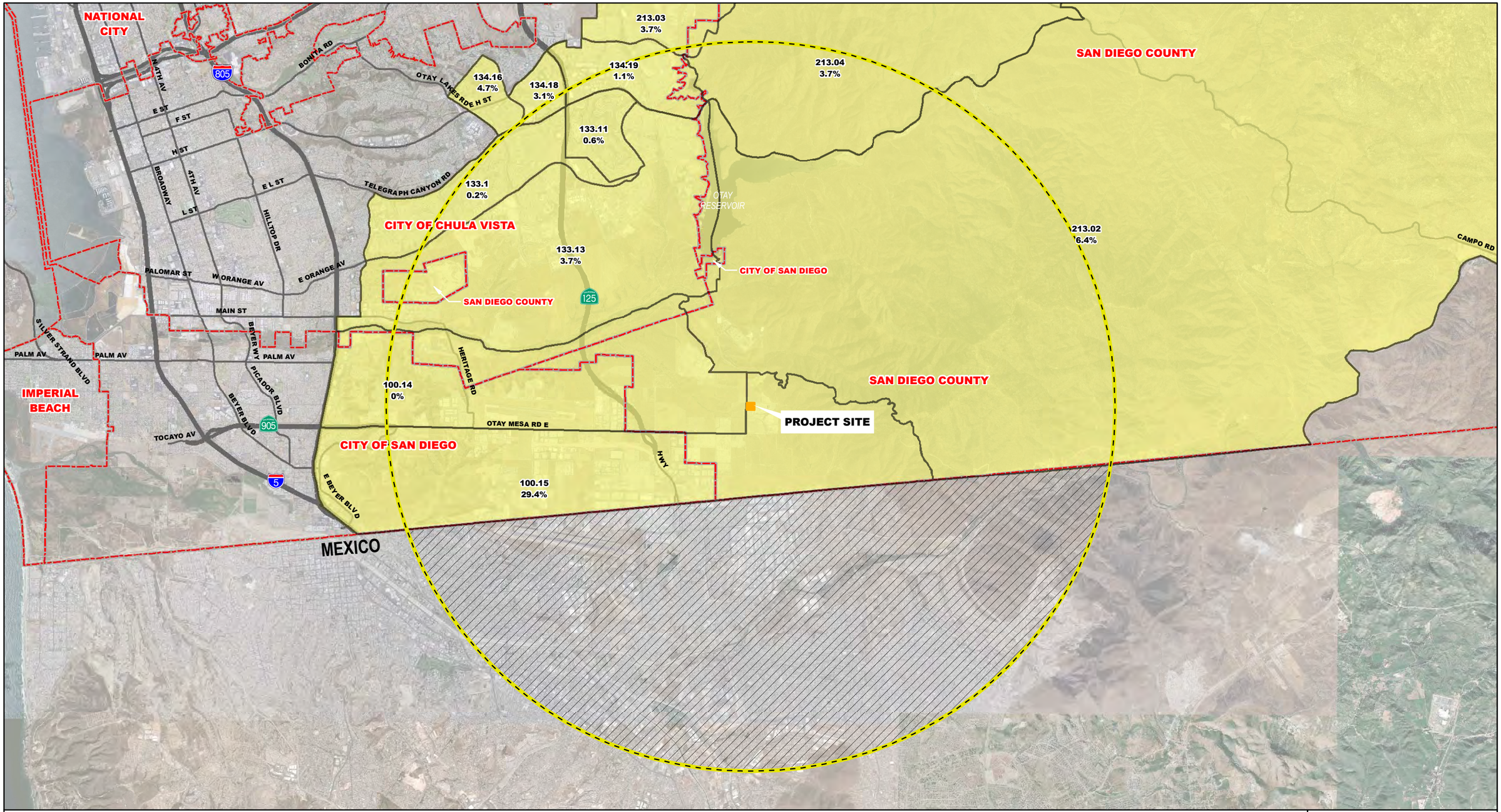
FIGURE 5.10-1
MINORITY POPULATION DISTRIBUTION BY CENSUS TRACTS WITHIN 6 MILES OF PROJECT

PIO PICO ENERGY CENTER

PROJECT NO.: 29874836
DATE: DECEMBER 2010

URS

Source: U.S. Census Bureau (www.census.gov), 2000



Legend

- Project Site
- Jurisdictional Boundary
- 6-Mile Project Site Radius
- Area Not Included in Environmental Justice Analysis
- Census Tract Boundary
- Poverty Population < 50%

133.13 — Census Tract ID
3.7% — Poverty Percentage

Low-income percentage represents the population of residents living below the U.S. Department of Health and Human Services 2000 Federal Poverty Thresholds.

N

0 1 2 Miles

FIGURE 5.10-2
POVERTY POPULATION DISTRIBUTION BY CENSUS TRACTS WITHIN 6 MILES OF PROJECT

PIO PICO ENERGY CENTER

PROJECT NO.: 29874836
DATE: DECEMBER 2010

URS

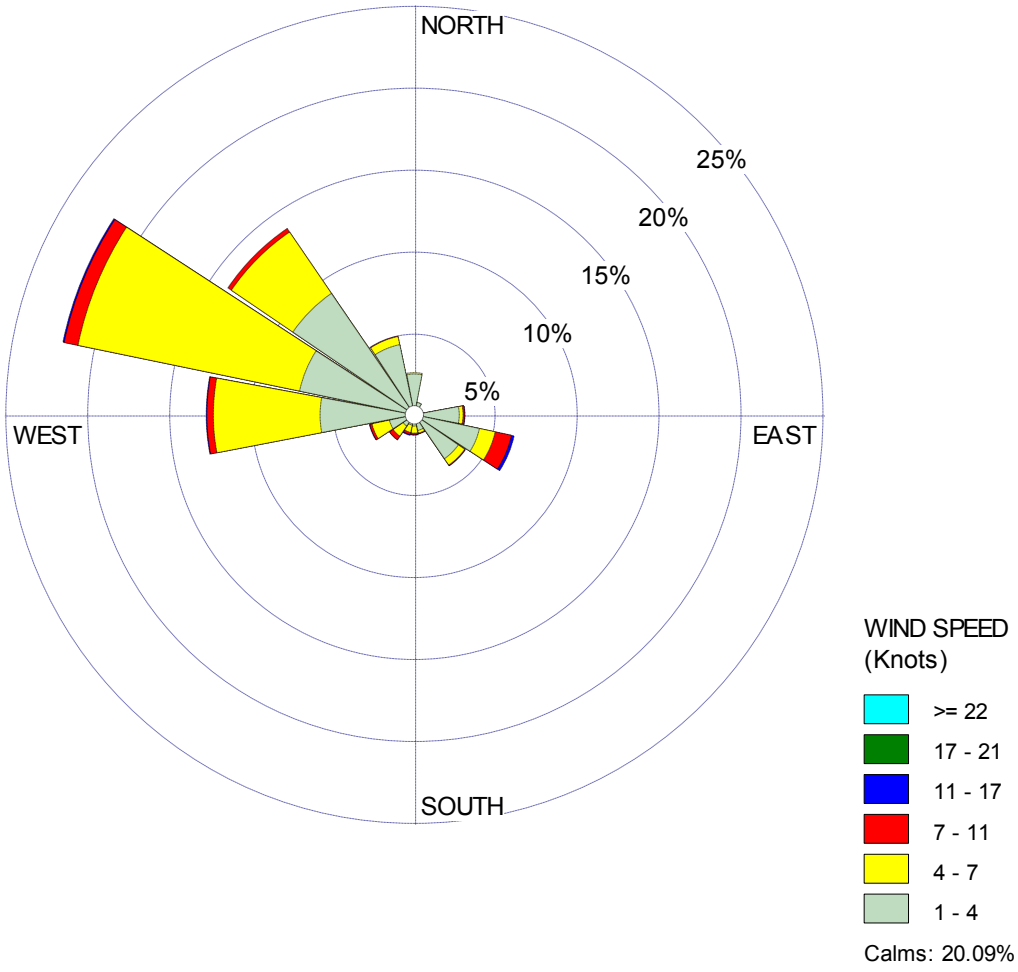
Source: SanGIS 2000 Census Income and Education, 2006.

APPENDIX 1

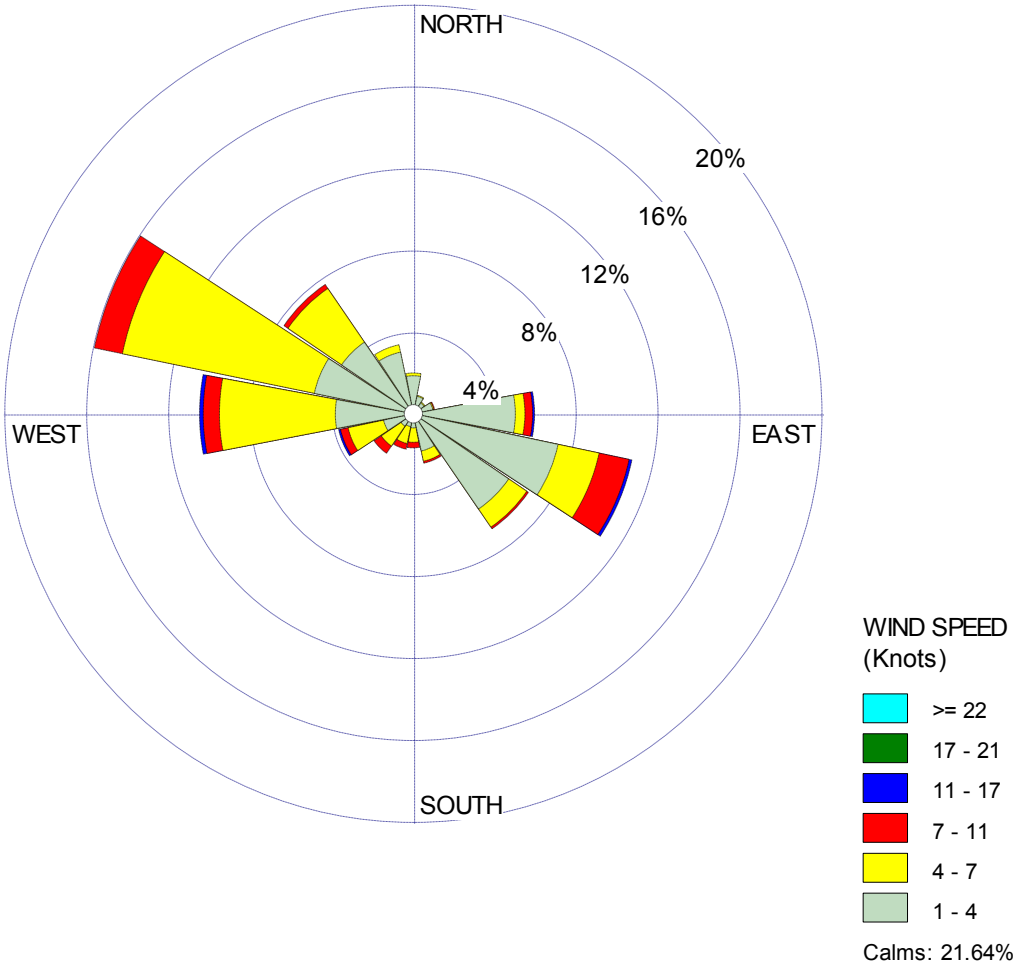
(Air Quality Support Documents)

APPENDIX 1A

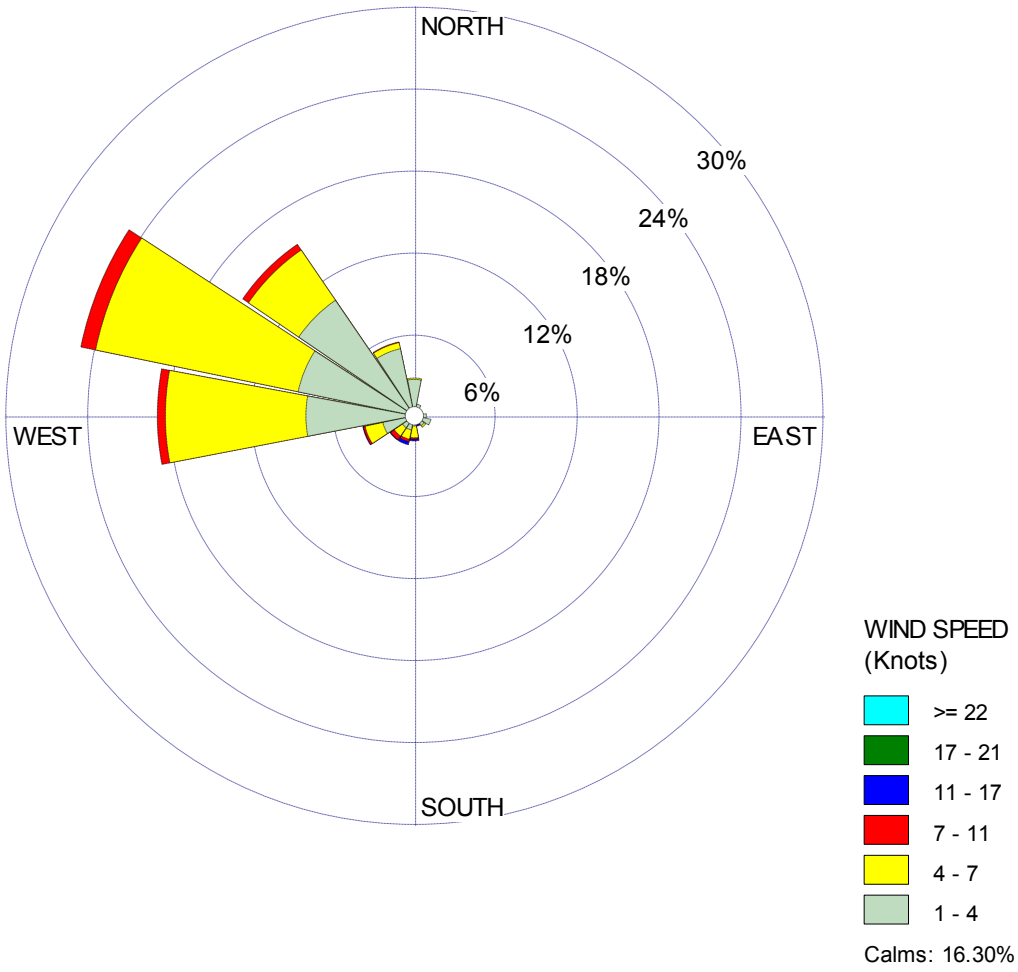
Wind Roses and Wind Frequency Distributions



Otay Mesa - 2006



Otay Mesa – First Quarter 2006



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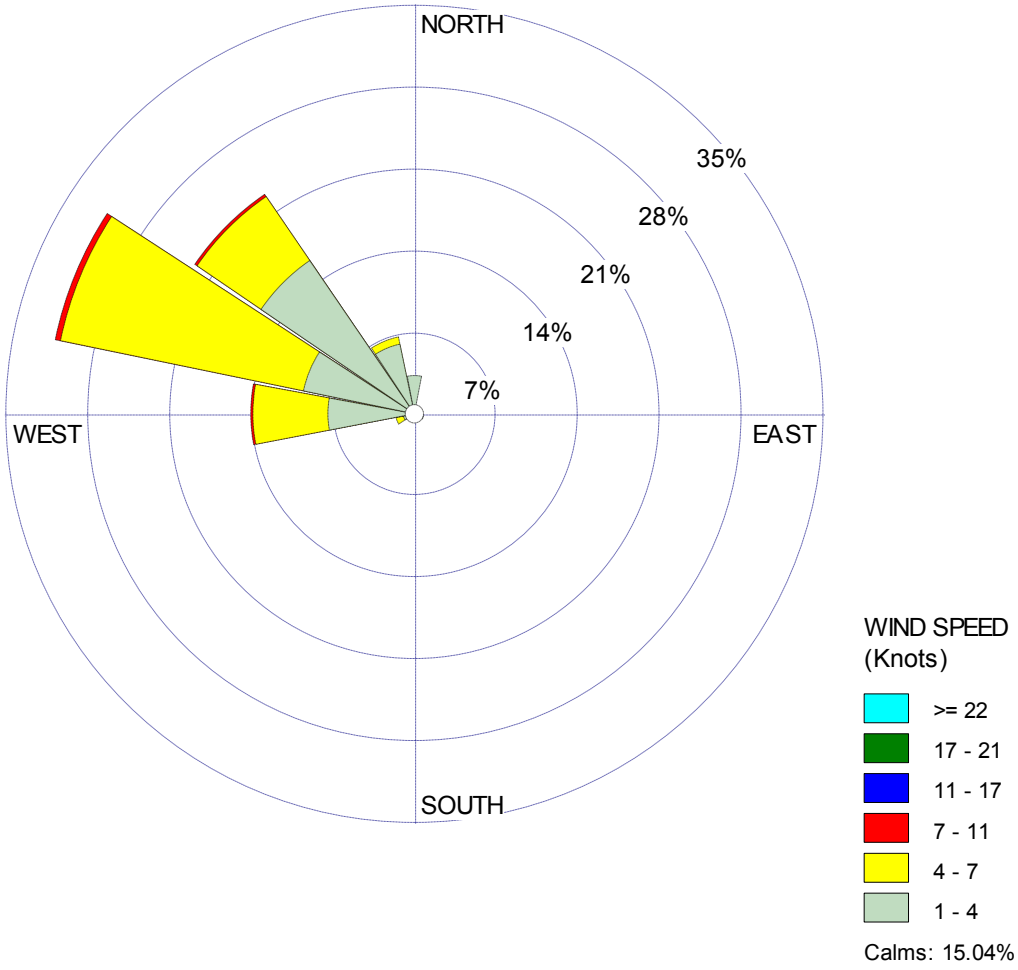

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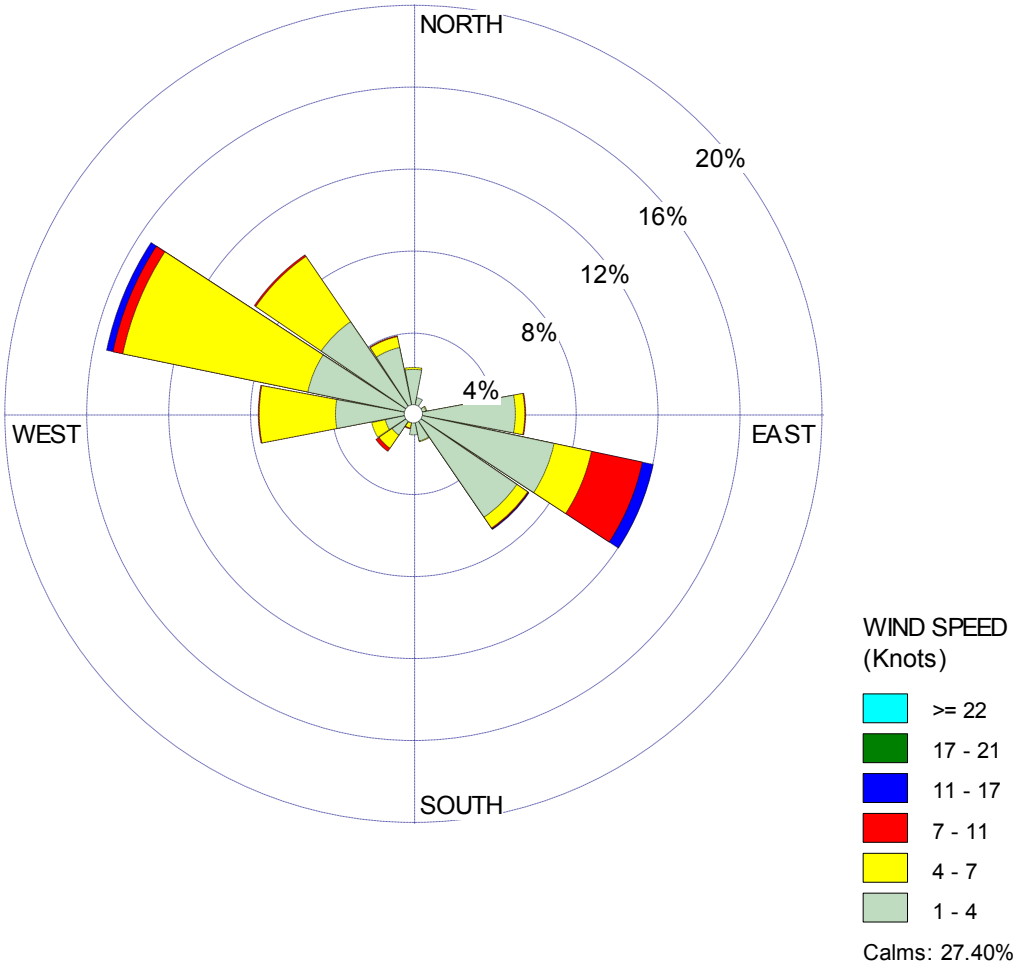
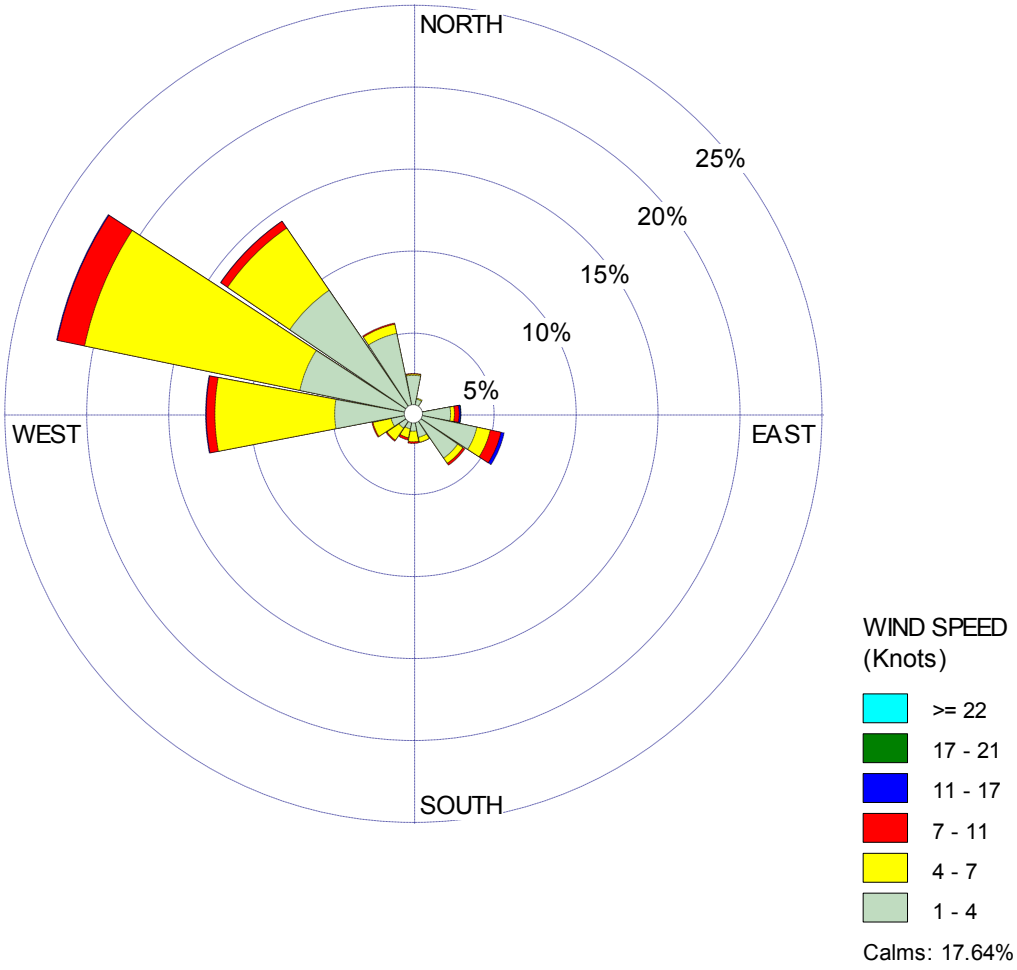
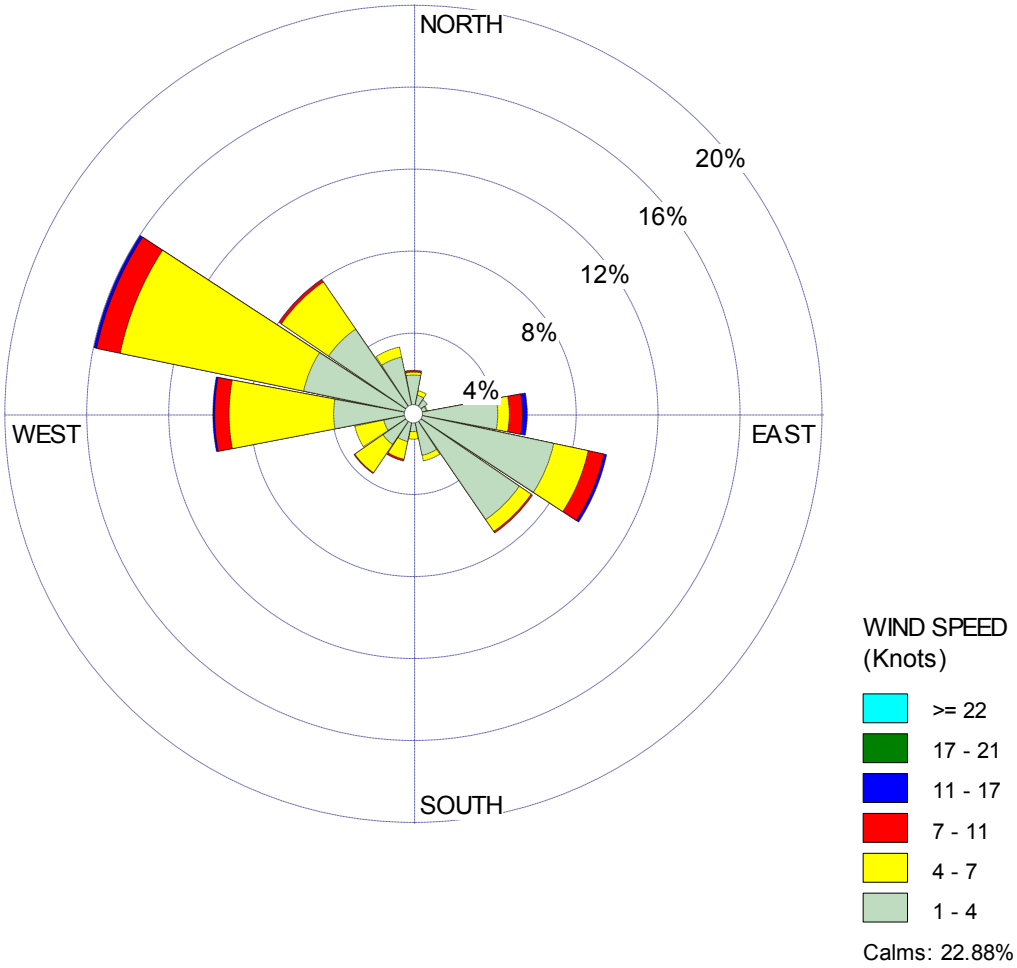


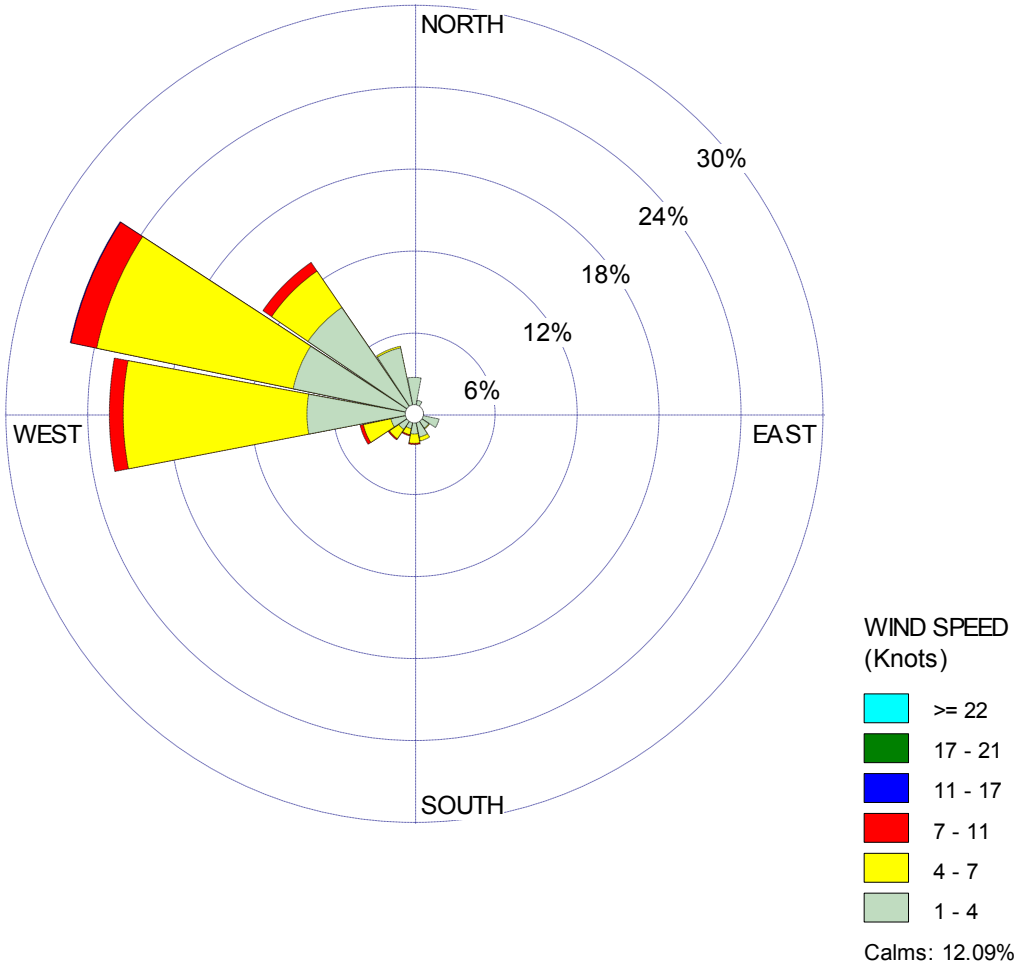
Otay Mesa – Fourth Quarter 2006



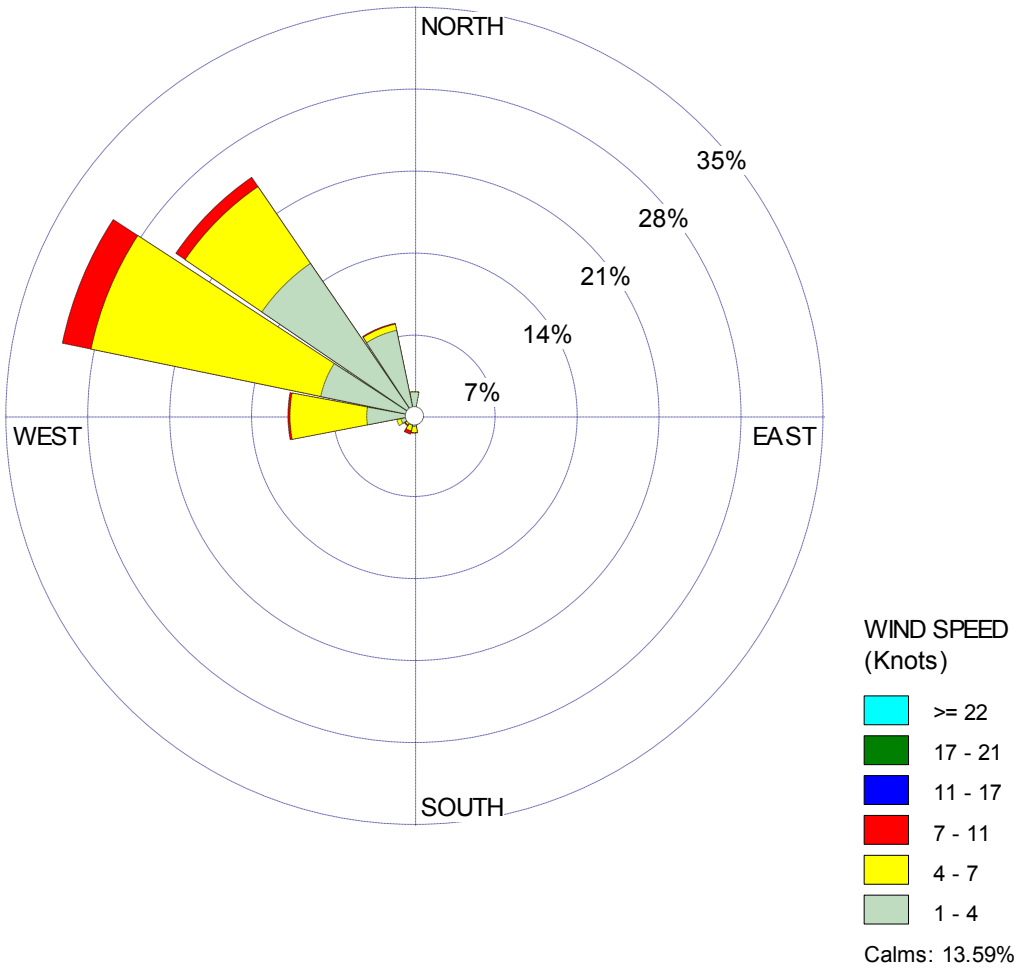
Otay Mesa – 2007



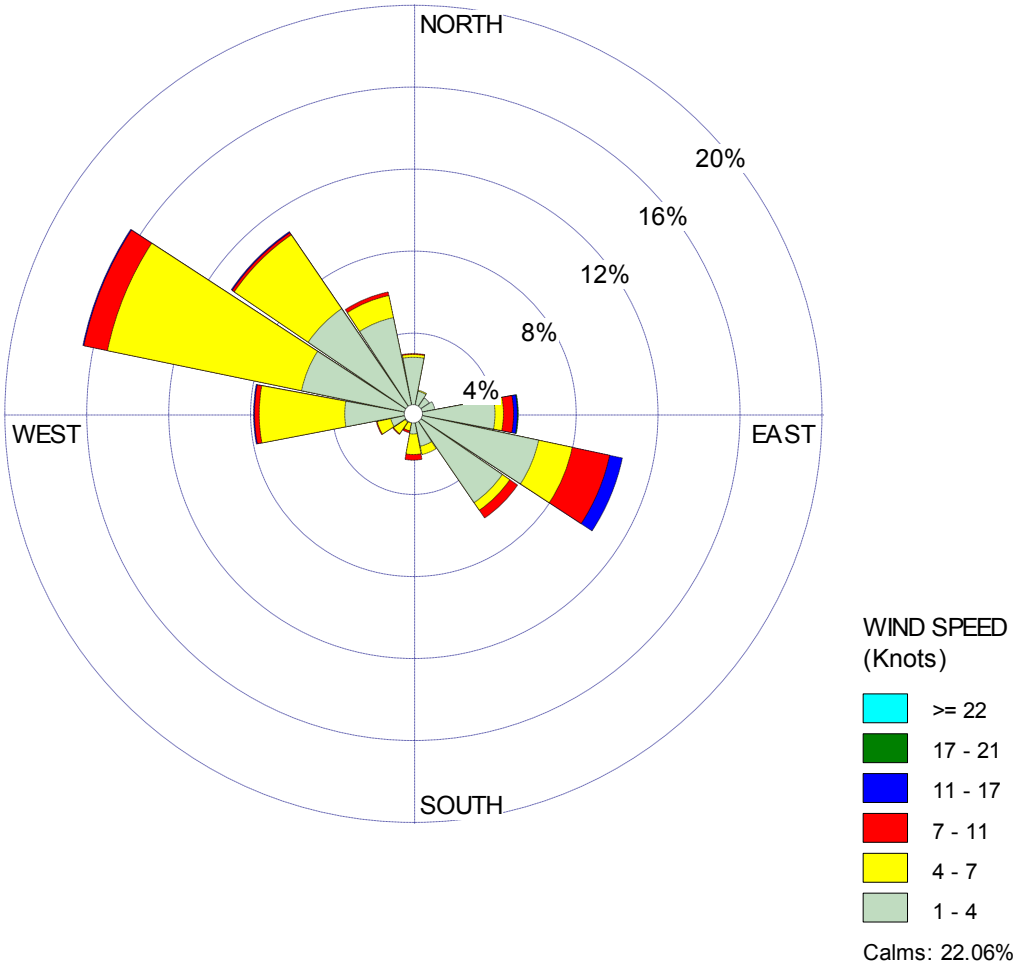
Otay Mesa – First Quarter 2007



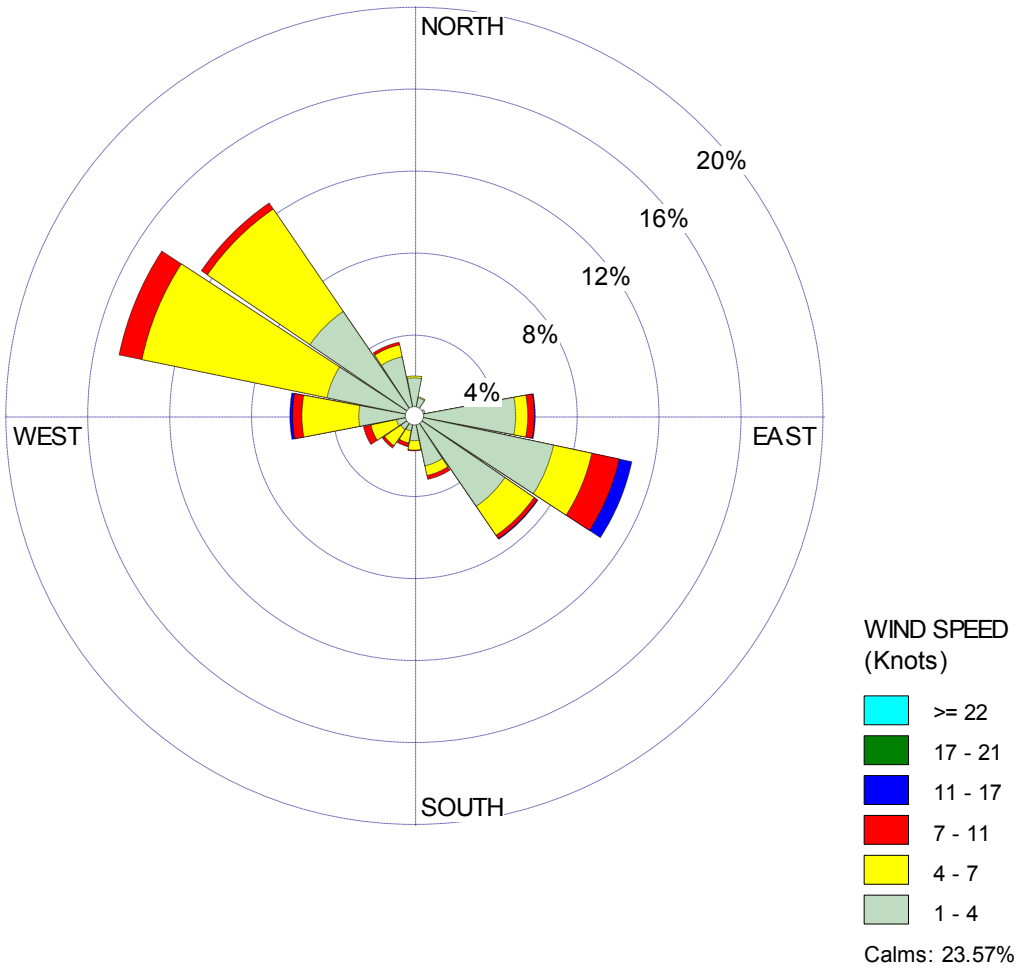
Otay Mesa – Second Quarter 2007



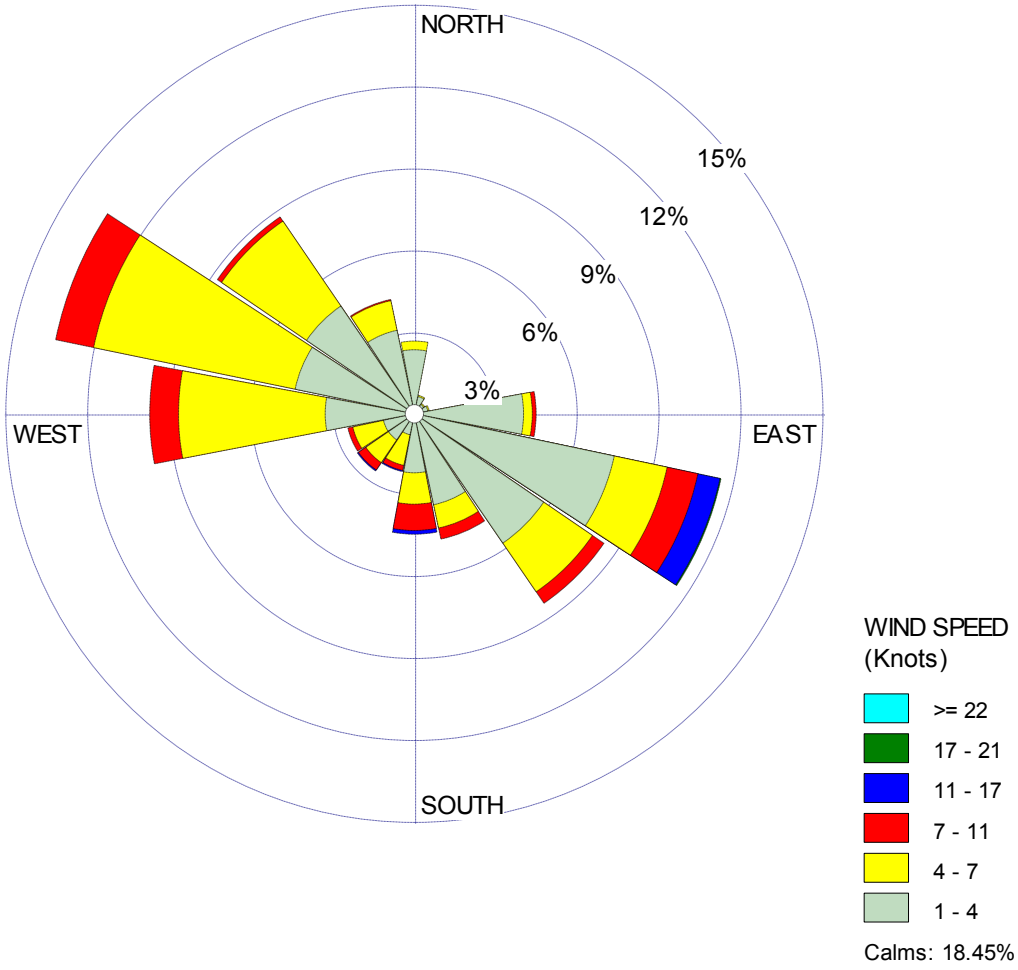
Otay Mesa – Third Quarter 2007



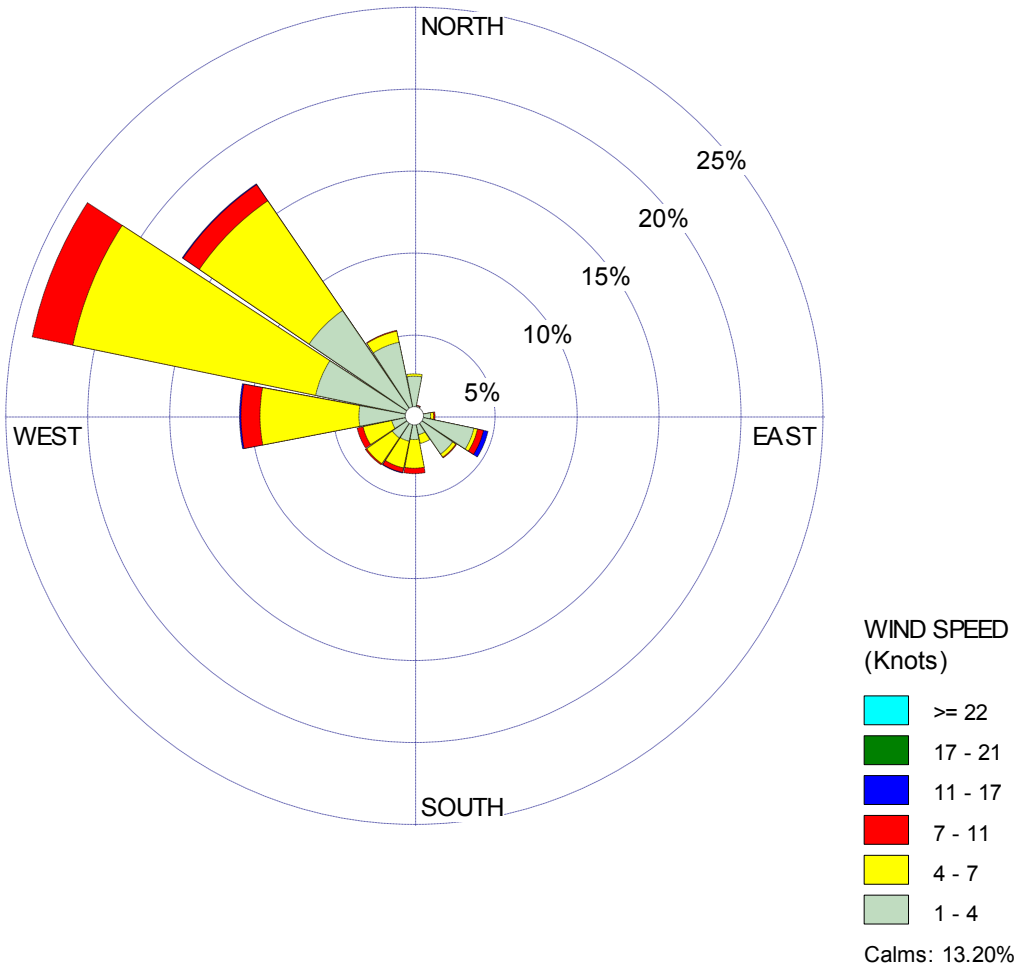
Otay Mesa – Fourth Quarter 2007



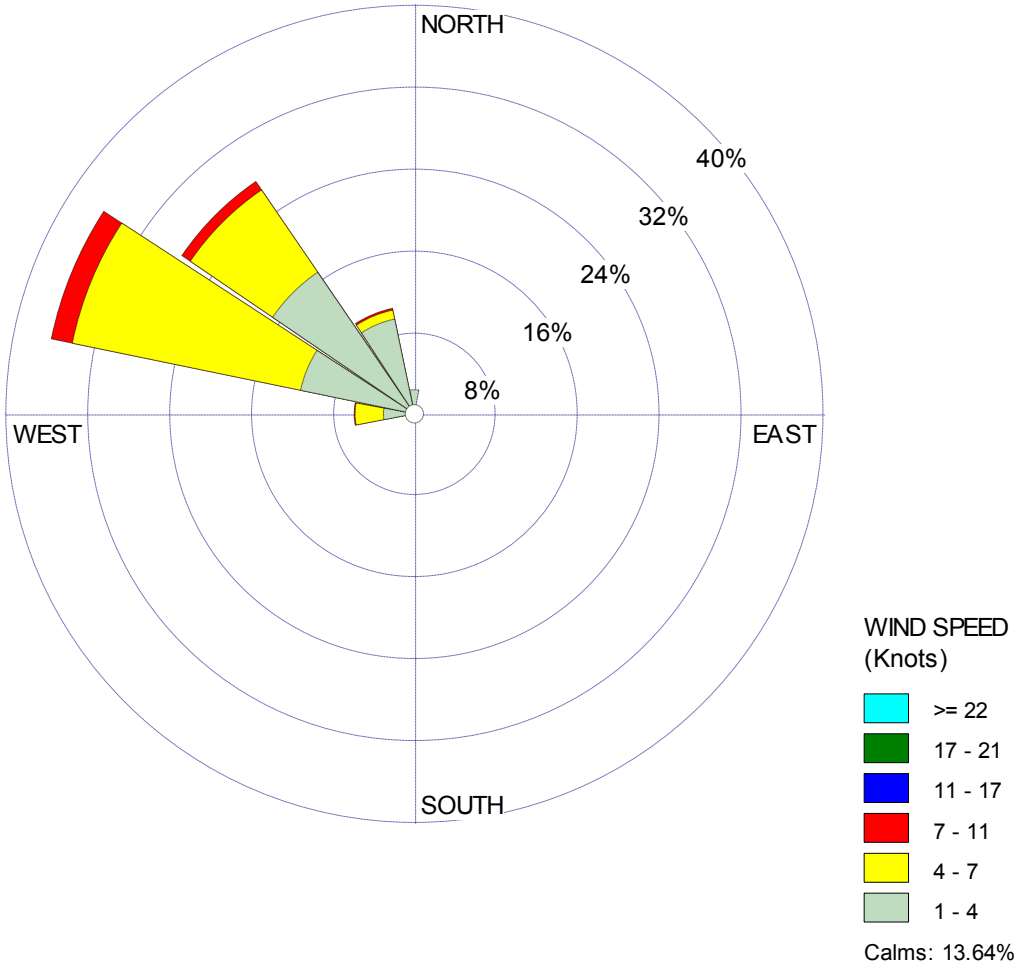
Otay Mesa – 2008



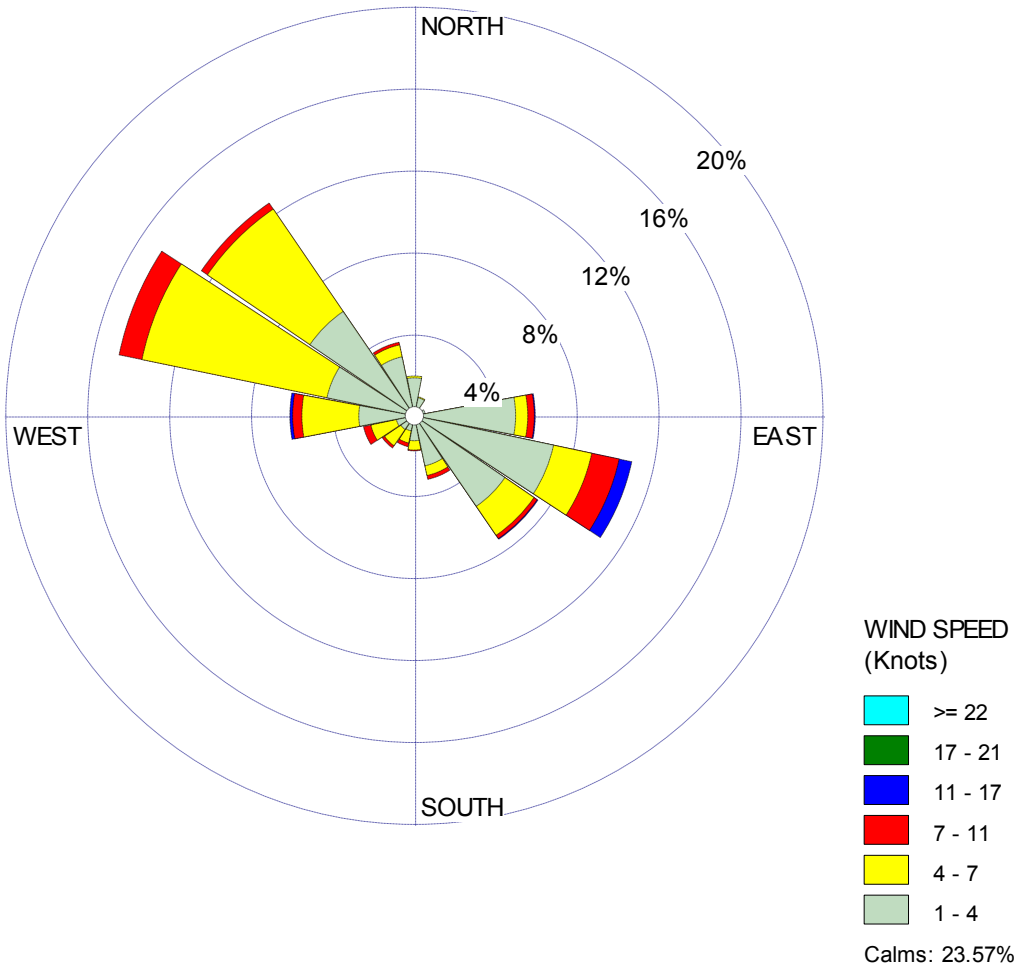
Otay Mesa – First Quarter 2008



Otay Mesa – Second Quarter 2008



Otay Mesa – Third Quarter 2008



Otay Mesa – Fourth Quarter 2008

PIO PICO ENERGY CENTER
METEOROLOGICAL DATA:
2006, 2007, AND 2008
WIND FREQUENCY DISTRIBUTIONS

2006

WIND SPEEDS AT 10 METERS HEIGHT (m/s)

SECTOR	0.5-1	1-2	2-3	3-4	4-5	5-6	6-7	>=7	Total
N	146	78	7	0	0	0	0	0	231
NNE	54	20	1	0	0	0	0	0	75
NE	29	11	1	0	0	0	0	0	41
ENE	35	10	2	1	0	0	0	0	48
E	199	46	8	12	8	3	0	0	276
ESE	208	153	40	48	71	22	7	0	549
SE	124	166	29	13	2	0	1	0	335
SSE	42	50	11	3	3	0	1	1	111
S	25	41	31	7	7	2	1	1	115
SSW	28	34	32	8	10	2	2	2	118
SW	34	45	38	30	18	1	1	0	167
WSW	61	80	63	33	8	5	1	0	251
W	124	384	372	196	33	5	1	0	1115
WNW	200	430	658	547	75	0	5	2	1917
NW	260	529	251	145	22	1	0	0	1208
NNW	200	188	35	9	2	0	0	0	434
Sub-Total:	1769	2265	1579	1052	259	41	20	6	6991
Calms									1758
Missing/Incomplete									11
Total									8760

Average Wind Speed: 1.59m/s

2006 First Quarter

WIND SPEEDS AT 10METERS HEIGHT (m/s)

SECTOR	0.5-1	1-2	2-3	3-4	4-5	5-6	6-7	>=7	Total
N	19	22	3	0	0	0	0	0	44
NNE	13	7	1	0	0	0	0	0	21
NE	12	3	1	0	0	0	0	0	16
ENE	17	5	1	1	0	0	0	0	24
E	85	23	5	5	7	3	0	0	128
ESE	79	77	24	23	23	8	1	0	235
SE	50	72	17	7	1	0	0	0	147
SSE	19	22	8	3	2	0	0	0	54
S	7	9	11	4	6	0	0	0	37
SSW	6	9	14	4	6	0	0	0	39
SW	6	11	11	15	7	1	0	0	51
WSW	17	16	22	16	5	5	0	0	81
W	19	64	79	42	17	3	1	0	225
WNW	31	76	106	99	30	0	0	0	342
NW	24	68	45	23	4	1	0	0	165
NNW	35	32	8	0	0	0	0	0	75
Sub-Total:	439	516	356	242	108	21	2	0	1684
Calms									465
Missing/Incomplete									11
Total									2160

Average Wind Speed: 1.61m/s

2006 Second Quarter

WIND SPEEDS AT 10METERS HEIGHT (m/s)

SECTOR	0.5-1	1-2	2-3	3-4	4-5	5-6	6-7	>=7	Total
N	41	19	2	0	0	0	0	0	62
NNE	15	6	0	0	0	0	0	0	21
NE	6	2	0	0	0	0	0	0	8
ENE	4	2	0	0	0	0	0	0	6
E	20	1	0	0	0	0	0	0	21
ESE	21	8	0	0	0	0	0	0	29
SE	7	14	3	0	0	0	0	0	24
SSE	6	8	2	0	1	0	1	1	19
S	7	11	16	3	1	2	1	1	42
SSW	12	13	13	2	3	2	2	2	49
SW	11	14	11	7	5	0	1	0	49
WSW	21	32	20	9	3	0	1	0	86
W	47	128	144	80	11	2	0	0	412
WNW	59	132	190	140	24	0	0	0	545
NW	70	155	56	41	11	0	0	0	333
NNW	53	58	7	3	1	0	0	0	122
Sub-Total:	400	603	464	285	60	6	6	4	1828
Calms									356
Missing/Incomplete									0
Total									2184

Average Wind Speed: 1.70m/s

2006 Third Quarter

WIND SPEEDS AT 10METERS HEIGHT (m/s)

SECTOR	0.5-1	1-2	2-3	3-4	4-5	5-6	6-7	>=7	Total
N	49	25	0	0	0	0	0	0	74
NNE	9	5	0	0	0	0	0	0	14
NE	8	3	0	0	0	0	0	0	11
ENE	2	0	0	0	0	0	0	0	2
E	5	0	0	0	0	0	0	0	5
ESE	13	7	0	0	0	0	0	0	20
SE	6	5	1	0	0	0	0	0	12
SSE	3	3	0	0	0	0	0	0	6
S	6	2	4	0	0	0	0	0	12
SSW	7	4	1	0	0	0	0	0	12
SW	6	2	5	2	2	0	0	0	17
WSW	14	9	8	6	0	0	0	0	37
W	40	125	86	55	4	0	0	0	310
WNW	71	144	224	243	10	0	0	0	692
NW	129	222	89	57	5	0	0	0	502
NNW	71	65	11	3	0	0	0	0	150
Sub-Total:	439	621	429	366	21	0	0	0	1876
Calms									332
Missing/Incomplete									0
Total									2208

Average Wind Speed: 1.67m/s

2006 Fourth Quarter

WIND SPEEDS AT 10METERS HEIGHT (m/s)

SECTOR	0.5-1	1-2	2-3	3-4	4-5	5-6	6-7	>=7	Total
N	37	12	2	0	0	0	0	0	51
NNE	17	2	0	0	0	0	0	0	19
NE	3	3	0	0	0	0	0	0	6
ENE	12	3	1	0	0	0	0	0	16
E	89	22	3	7	1	0	0	0	122
ESE	95	61	16	25	48	14	6	0	265
SE	61	75	8	6	1	0	1	0	152
SSE	14	17	1	0	0	0	0	0	32
S	5	19	0	0	0	0	0	0	24
SSW	3	8	4	2	1	0	0	0	18
SW	11	18	11	6	4	0	0	0	50
WSW	9	23	13	2	0	0	0	0	47
W	18	67	63	19	1	0	0	0	168
WNW	39	78	138	65	11	0	5	2	338
NW	37	84	61	24	2	0	0	0	208
NNW	41	33	9	3	1	0	0	0	87
Sub-Total:	491	525	330	159	70	14	12	2	1603
Calms									605
Missing/Incomplete									0
Total									2208

Average Wind Speed: 1.37m/s

2007

WIND SPEEDS AT 10METERS HEIGHT (m/s)

SECTOR	0.5-1	1-2	2-3	3-4	4-5	5-6	6-7	>=7	Total
N	121	90	5	2	3	0	0	0	221
NNE	58	28	4	2	0	0	0	0	92
NE	35	16	0	0	0	0	0	0	51
ENE	36	11	1	0	0	0	0	0	48
E	141	63	10	11	21	8	4	2	260
ESE	199	153	44	30	44	19	6	6	501
SE	125	168	28	5	10	2	0	0	338
SSE	64	70	19	9	1	0	0	0	163
S	44	55	39	18	8	1	0	0	165
SSW	40	48	31	18	11	1	0	0	149
SW	38	61	56	21	6	0	0	0	182
WSW	53	74	71	28	6	0	0	0	232
W	117	308	365	274	42	5	1	1	1113
WNW	203	421	554	617	139	12	2	0	1948
NW	292	511	245	156	44	1	0	0	1249
NNW	217	227	43	7	5	1	0	0	500
Sub-Total:	1783	2304	1515	1198	340	50	13	9	7212
Calms									1545
Missing/Incomplete									3
Total									8760

Average Wind Speed: 1.67m/s

2007 First Quarter

WIND SPEEDS AT 10METERS HEIGHT (m/s)

SECTOR	0.5-1	1-2	2-3	3-4	4-5	5-6	6-7	>=7	Total
N	25	17	1	2	2	0	0	0	47
NNE	14	7	3	2	0	0	0	0	26
NE	14	5	0	0	0	0	0	0	19
ENE	9	6	1	0	0	0	0	0	16
E	67	23	5	7	11	5	3	0	121
ESE	96	56	20	17	15	2	3	0	209
SE	53	83	12	3	2	0	0	0	153
SSE	23	23	2	4	0	0	0	0	52
S	8	12	6	2	0	0	0	0	28
SSW	13	18	10	9	2	0	0	0	52
SW	15	25	28	8	1	0	0	0	77
WSW	16	17	22	9	0	0	0	0	64
W	22	63	72	38	13	2	1	1	212
WNW	42	77	114	83	25	1	2	0	344
NW	50	59	43	17	3	0	0	0	172
NNW	29	33	9	2	0	0	0	0	73
Sub-Total:	496	524	348	203	74	10	9	1	1665
Calms									494
Missing/Incomplete									1
Total									2160

Average Wind Speed: 1.48m/s

2007 Second Quarter

WIND SPEEDS AT 10METERS HEIGHT (m/s)

SECTOR	0.5-1	1-2	2-3	3-4	4-5	5-6	6-7	>=7	Total
N	39	21	0	0	0	0	0	0	60
NNE	20	4	0	0	0	0	0	0	24
NE	6	1	0	0	0	0	0	0	7
ENE	6	0	0	0	0	0	0	0	6
E	13	3	0	0	0	0	0	0	16
ESE	29	13	0	0	0	0	0	0	42
SE	11	19	0	1	0	0	0	0	31
SSE	16	24	6	0	0	0	0	0	46
S	11	23	12	3	2	0	0	0	51
SSW	6	20	5	5	2	0	0	0	38
SW	10	22	13	5	2	0	0	0	52
WSW	8	32	31	14	5	0	0	0	90
W	42	131	154	139	21	1	0	0	488
WNW	65	134	132	188	35	8	0	0	562
NW	84	123	40	30	17	0	0	0	294
NNW	65	44	2	1	0	0	0	0	112
Sub-Total:	431	614	395	386	84	9	0	0	1919
Calms									264
Missing/Incomplete									1
Total									2184

Average Wind Speed: 1.82m/s

2007 Third Quarter

WIND SPEEDS AT 10METERS HEIGHT (m/s)

SECTOR	0.5-1	1-2	2-3	3-4	4-5	5-6	6-7	>=7	Total
N	29	18	1	0	0	0	0	0	48
NNE	11	4	0	0	0	0	0	0	15
NE	2	1	0	0	0	0	0	0	3
ENE	1	0	0	0	0	0	0	0	1
E	9	0	0	0	0	0	0	0	9
ESE	16	3	0	0	0	0	0	0	19
SE	6	4	7	0	0	0	0	0	17
SSE	2	9	6	1	1	0	0	0	19
S	9	13	11	1	1	0	0	0	35
SSW	13	7	10	1	5	1	0	0	37
SW	7	8	2	6	2	0	0	0	25
WSW	12	16	6	2	0	0	0	0	36
W	30	62	78	66	4	0	0	0	240
WNW	57	125	186	255	54	1	0	0	678
NW	113	236	98	77	21	0	0	0	545
NNW	83	83	10	2	2	0	0	0	180
Sub-Total:	400	589	415	411	90	2	0	0	1907
Calms									300
Missing/Incomplete									1
Total									2208

Average Wind Speed: 1.82m/s

2007 Fourth Quarter

WIND SPEEDS AT 10METERS HEIGHT (m/s)

SECTOR	0.5-1	1-2	2-3	3-4	4-5	5-6	6-7	>=7	Total
N	28	34	3	0	1	0	0	0	66
NNE	13	13	1	0	0	0	0	0	27
NE	13	9	0	0	0	0	0	0	22
ENE	20	5	0	0	0	0	0	0	25
E	52	37	5	4	10	3	1	2	114
ESE	58	81	24	13	29	17	3	6	231
SE	55	62	9	1	8	2	0	0	137
SSE	23	14	5	4	0	0	0	0	46
S	16	7	10	12	5	1	0	0	51
SSW	8	3	6	3	2	0	0	0	22
SW	6	6	13	2	1	0	0	0	28
WSW	17	9	12	3	1	0	0	0	42
W	23	52	61	31	4	2	0	0	173
WNW	39	85	122	91	25	2	0	0	364
NW	45	93	64	32	3	1	0	0	238
NNW	40	67	22	2	3	1	0	0	135
Sub-Total:	456	577	357	198	92	29	4	8	1721
Calms									487
Missing/Incomplete									0
Total									2208

Average Wind Speed: 1.57m/s

2008

WIND SPEEDS AT 10METERS HEIGHT (m/s)

SECTOR	0.5-1	1-2	2-3	3-4	4-5	5-6	6-7	>=7	Total
N	114	88	9	3	0	0	0	0	214
NNE	48	23	2	0	1	0	0	0	74
NE	29	8	0	1	1	1	0	0	40
ENE	29	5	1	0	0	0	0	0	35
E	159	68	16	8	10	2	1	0	264
ESE	216	190	52	38	52	27	13	10	598
SE	152	161	63	27	16	0	1	0	420
SSE	50	109	32	10	12	1	0	0	214
S	39	77	51	22	26	4	2	0	221
SSW	25	51	48	26	12	4	0	0	166
SW	28	63	49	35	11	1	1	0	188
WSW	46	46	50	44	16	2	0	0	204
W	93	184	216	159	52	7	1	0	712
WNW	180	402	570	626	154	3	0	0	1935
NW	262	521	316	289	59	2	0	0	1449
NNW	212	234	54	18	8	1	0	0	527
Sub-Total:	1682	2230	1529	1306	430	55	19	10	7261
Calms									1511
Missing/Incomplete									12
Total									8784

Average Wind Speed: 1.75m/s

2008 First Quarter

WIND SPEEDS AT 10METERS HEIGHT (m/s)

SECTOR	0.5-1	1-2	2-3	3-4	4-5	5-6	6-7	>=7	Total
N	23	29	5	2	0	0	0	0	59
NNE	9	6	1	0	0	0	0	0	16
NE	9	1	0	1	0	0	0	0	11
ENE	11	1	1	0	0	0	0	0	13
E	59	29	6	1	3	0	0	0	98
ESE	74	90	23	20	22	7	5	10	251
SE	57	69	30	17	11	0	0	0	184
SSE	20	55	11	8	8	1	0	0	103
S	20	28	12	13	18	4	2	0	97
SSW	5	13	13	12	3	2	0	0	48
SW	9	17	15	7	6	1	1	0	56
WSW	12	14	14	11	4	0	0	0	55
W	21	51	66	51	21	2	0	0	212
WNW	31	67	88	76	31	0	0	0	293
NW	27	78	46	36	4	0	0	0	191
NNW	34	35	19	5	1	0	0	0	94
Sub-Total:	421	583	350	260	132	17	8	10	1781
Calms									403
Missing/Incomplete									0
Total									2184

Average Wind Speed: 1.73m/s

2008 Second Quarter

WIND SPEEDS AT 10METERS HEIGHT (m/s)

SECTOR	0.5-1	1-2	2-3	3-4	4-5	5-6	6-7	>=7	Total
N	35	19	3	0	0	0	0	0	57
NNE	9	6	0	0	1	0	0	0	16
NE	8	2	0	0	1	1	0	0	12
ENE	6	2	0	0	0	0	0	0	8
E	17	6	4	0	2	0	0	0	29
ESE	56	26	3	2	5	5	4	0	101
SE	29	34	5	0	1	0	0	0	69
SSE	9	18	11	1	0	0	0	0	39
S	8	25	31	7	7	0	0	0	78
SSW	12	24	27	9	6	1	0	0	79
SW	8	29	21	20	2	0	0	0	80
WSW	15	17	25	16	4	2	0	0	79
W	23	52	72	64	20	2	0	0	233
WNW	48	87	143	185	53	2	0	0	518
NW	53	117	81	95	25	2	0	0	373
NNW	41	60	10	5	1	0	0	0	117
Sub-Total:	377	524	436	404	128	15	4	0	1888
Calms									287
Missing/Incomplete									9
Total									2184

Average Wind Speed: 1.93m/s

2008 Third Quarter

WIND SPEEDS AT 10METERS HEIGHT (m/s)

SECTOR	0.5-1	1-2	2-3	3-4	4-5	5-6	6-7	>=7	Total
N	39	15	0	0	0	0	0	0	54
NNE	19	1	0	0	0	0	0	0	20
NE	7	1	0	0	0	0	0	0	8
ENE	1	0	0	0	0	0	0	0	1
E	6	0	0	0	0	0	0	0	6
ESE	2	4	0	0	0	0	0	0	6
SE	4	1	0	0	0	0	0	0	5
SSE	0	1	0	0	0	0	0	0	1
S	4	3	0	0	0	0	0	0	7
SSW	3	1	0	0	0	0	0	0	4
SW	9	0	0	0	0	0	0	0	9
WSW	9	4	0	0	0	0	0	0	13
W	29	40	40	21	2	0	0	0	132
WNW	74	178	224	277	46	0	0	0	799
NW	144	227	104	110	22	0	0	0	607
NNW	110	100	16	4	4	0	0	0	234
Sub-Total:	460	576	384	412	74	0	0	0	1906
Calms									301
Missing/Incomplete									1
Total									2208

Average Wind Speed: 1.77m/s

2008 Fourth Quarter

WIND SPEEDS AT 10METERS HEIGHT (m/s)

SECTOR	0.5-1	1-2	2-3	3-4	4-5	5-6	6-7	>=7	Total
N	17	25	1	1	0	0	0	0	44
NNE	11	10	1	0	0	0	0	0	22
NE	5	4	0	0	0	0	0	0	9
ENE	11	2	0	0	0	0	0	0	13
E	77	33	6	7	5	2	1	0	131
ESE	84	70	26	16	25	15	4	0	240
SE	62	57	28	10	4	0	1	0	162
SSE	21	35	10	1	4	0	0	0	71
S	7	21	8	2	1	0	0	0	39
SSW	5	13	8	5	3	1	0	0	35
SW	2	17	13	8	3	0	0	0	43
WSW	10	11	11	17	8	0	0	0	57
W	20	41	38	23	9	3	1	0	135
WNW	27	70	115	88	24	1	0	0	325
NW	38	99	85	48	8	0	0	0	278
NNW	27	39	9	4	2	1	0	0	82
Sub-Total:	424	547	359	230	96	23	7	0	1686
Calms									520
Missing/Incomplete									2
Total									2208

Average Wind Speed: 1.56m/s

APPENDIX 1B

Construction Emissions Analysis

APPENDIX 1B

Construction Emissions Analysis

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. 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 16 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 PSD Application Section 3.0 (AFC Section 3.0, Facility Description).

Construction equipment and vehicle exhaust emissions were estimated using equipment lists and construction scheduling information provided by the project design engineering firm. The California Air Resource Board (CARB) OFFROAD2007 model and EMFAC2007 model were used to generate equipment-specific emission factors for all criteria pollutants for diesel-fueled construction equipment, and for on-road vehicles, respectively. Assumptions used in calculating project construction emissions included a 16-month construction period; 5 construction days per week; and a single-shift, 8-hour workday. The list of fueled equipment needed during each month of the construction effort (see Table 1B.16) served as the basis for estimating pollutant emissions throughout the term of construction, and helped to identify the periods of expected maximum short-term emissions.

Combustion emissions during construction will result from:

- 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 resulting from on-site soil disturbances were estimated using USEPA AP-42 emission factors activities including bulldozing and dirt-pushing, travel on paved and unpaved roads, material handling, and wind erosion to storage of aggregate

materials. A combined dust control efficiency of 92 percent was assumed to be achieved for traveling on unpaved surfaces at the project site and temporary construction area activities by the mitigation measures of frequent watering and limiting speeds to 15 miles per hour.

Fugitive dust emissions from the construction of the project will result from:

- 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.

Estimates of Emissions with Mitigation Measures - Onsite Construction

Tables 1B.1 and 1B.2 show the estimated maximum daily and annual heavy equipment exhaust and fugitive dust emissions with recommended mitigation measures for onsite construction activities. Detailed emission calculations are included as Tables 1B.7 through 1B.16.

Table 1B.1
Maximum Daily Emissions During Construction, Pounds Per Day
Month 5 (combustion)
Month 2 (dust)

	NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$
Onsite						
Construction Equipment	44.8	19.9	4.0	0.1	1.5	1.5
Fugitive Dust	--	--	--	--	19.7	2.9
Offsite						
Worker Travel, Truck Deliveries	11.2	63.8	6.3	0.1	0.1	0.1
Total Emissions						
Total	56.0	83.6	10.3	0.1	21.3	4.5

Table 1B.2
Peak Annual Emissions During Project Construction, Tons Per Year

	NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$
Onsite						
Construction Equipment	4.7	2.3	0.4	0.0	0.2	0.2
Fugitive Dust	--	--	--	--	1.6	0.3
Offsite						
Worker Travel, Truck Deliveries	0.8	2.6	0.3	0.0	0.0	0.0
Total Emissions						
Total	5.5	4.9	0.7	0.0	1.9	0.5

Table 1B.4

Daily Construction Emissions (peak month) (lbs/day)

Month 5 (combustion)
Month 2 (fugitive dust)

	NOx	CO	VOC	SOx	PM2.5	PM10
Onsite						
Construction Equipment	44.8	19.9	4.0	0.1	1.5	1.5
Fugitive Dust					2.9	19.7
Subtotal =	44.8	19.9	4.0	0.0	4.4	21.2
Offsite						
Worker Travel (combustion)	6.1	61.2	5.8	0.1	0.1	0.1
Truck Deliveries (combustion)	5.1	2.5	0.4	0.0	0.0	0.0
Dust from travel on dirt roads					0.0	0.0
Subtotal =	11.2	63.8	6.3	0.1	0.1	0.1
Total =	56.0	83.6	10.3	0.1	4.5	21.3

Table 1B.5

Annual Construction Emissions (peak 12-month period)
(tons/yr)

Months 1-12 (combustion)
Months 2-13 (fugitive dust)

	NOx	CO	VOC	SOx	PM2.5	PM10
Onsite						
Construction Equipment (combustion)	4.7	2.3	0.4	0.0	0.2	0.2
Fugitive Dust					0.3	1.6
Subtotal =	4.7	2.3	0.4	0.0	0.5	1.8
Offsite						
Worker Travel	0.2	2.4	0.2	0.0	0.0	0.0
Truck Deliveries	0.5	0.3	0.0	0.0	0.0	0.0
Dust from travel on dirt roads					0.0	0.0
Subtotal =	0.8	2.6	0.3	0.0	0.0	0.0
Total =	5.5	4.9	0.7	0.0	0.5	1.9

Table 1B.6

Greenhouse Gas Emissions Calculations: Project Construction

Unit	Fuel	Fuel Use, gal	Total Construction Emissions, metric tons			
			CO_2	CH_4	N_2O	SF_6
Offroad Fuel Use	Diesel	62,606	636	2.61E-02	5.22E-03	0.00
Worker Travel	Gasoline	34,864	307	1.30E-02	2.60E-03	0.00
Truck Deliveries	Diesel	8,020	81	3.34E-03	6.68E-04	0.00
Total	--	105,490	1,023	4.24E-02	8.49E-03	0
CO2eq			1,023	1	3	0

TOTAL 1,026

Natural Gas GHG Emission Rates (Note 1)

	Emission Factors, kg/gal			
	CO_2 (2)	CH_4	N_2O	SF_6
Diesel	10.140	4.17E-04	8.33E-05	n/a
Gasoline	8.800	3.73E-04	7.45E-05	
Global Warming Potential (4)	1	21	310	23,900

g/MMBTU		MMBtu/gal
CH_4 (3)	N_2O (3)	
3.00E+00	6.00E-01	1.39E-01
3.00E+00	6.00E-01	1.24E-01

Notes:

1. Calculation methods and emission factors from ARB, "Regulation for the Mandatory Reporting of Greenhouse Gas Emissions," December 2007
2. Ibid, Appendix A, Table 3.
3. Ibid, Appendix A, Table 6.
4. Ibid, Appendix A, Table 2.

Table 1B.7
Delivery Truck Daily Emissions (Peak Month)

Number of Deliveries Per Day(1)	Average Round Trip Haul Distance (miles)	Vehicle Miles Traveled Per Day	Emission Factors (lbs/vmt)(1)					Daily Emissions (lbs/day)				
			NOx	CO	POC	SOx	PM10	NOx	CO	POC	SOx	PM10
3.18	50	159.09	0.0320	0.0160	0.0028	0.0000	0.0014	5.10	2.54	0.45	0.01	0.22
Idle exhaust (2)												0.01336

Notes:
(1) See notes for combustion emissions.
(2) 20 trucks per day times 1 hr idle time per visit times 0.0042 lb/hr.

Table 1B.8
Delivery Truck Annual Emissions

Number of Deliveries Per Year	Average Round Trip Haul Distance (miles)	Vehicle Miles Traveled Per Year	Emission Factors (lbs/vmt)(1)					Annual Emissions (tons/yr)				
			NOx	CO	POC	SOx	PM10	NOx	CO	POC	SOx	PM10
652	50	32600.00	0.0320	0.0160	0.0028	0.0000	0.0014	0.52	0.26	0.05	0.00	0.02
Idle exhaust (2,3)												0.00137

Notes:
(1) See notes for combustion emissions.
(2) Annual average number of trucks per year times 1 hr idle time per visit times 0.0042 lb/hr
(3) Based on 1.91 g/hr idle emission rate for the composite HDD truck fleet in 2001 from EPA's PART5 model.

Table 1B.9
Worker Travel Daily Emissions (Peak Month)

Number of Workers Per Day(1)	Average Vehicle Occupancy (person/veh.)	Number of Round Trips Per Day	Average Round Trip Haul Distance (Miles)	Vehicle Miles Traveled Per Day (Miles)	Emission Factors (lbs/vmt)(1)					Daily Emissions (lbs/day)				
					NOx	CO	POC	SOx	PM10	NOx	CO	POC	SOx	PM10
284	1.5	189	40	7,573	0.0008	0.0081	0.0008	0.0000	0.0001	6.12	61.24	5.85	0.07	0.68

Notes:
(1) See notes for combustion emissions.

Table 1B.10
Worker Travel Annual Emissions

Average Number of Workers Per Day	Average Vehicle Occupancy (person/veh.)	Number of Round Trips Per Day	Average Round Trip Haul Distance (Miles)	Days per Year	Vehicle Miles Traveled Per Year	Emission Factors (lbs/vmt)(1)					Annual Emissions (tons/yr)				
						NOx	CO	POC	SOx	PM10	NOx	CO	POC	SOx	PM10
184	2	123	40	120	589,067	0.0008	0.0081	0.0008	0.0000	0.0001	0.24	2.38	0.23	0.00	0.03

Table 1B.11

Onsite Combustion Emissions

		Adjusted factors lbs/1000 gallon (4)					Total Daily Fuel Use(5) (Gals/day)	Daily Emissi Lbs/day					Total Al Fuel Us (Gals/yr)	Annual Emissio Lbs/yr				
Equipment	Tier	NOx	CO	VOC	SOx	PM10		NOx	CO	VOC	SOx	PM10		NOx	CO	VOC	SOx	PM10
Hydro Crane 35-50 Ton RT	2	170.60	31.88	13.16	0.21	1.95	12.30	2.10	0.39	0.16	0.00	0.02	2,165	369.38	69.03	28.49	0.45	4.22
RT 760 - 60 ton Crane	2	184.89	35.93	7.12	0.21	1.95	30.76	5.69	1.11	0.22	0.01	0.06	6,090	1125.92	218.82	43.35	1.27	11.88
Hydro Crane 75-80 Ton RT	2	184.89	35.93	7.12	0.21	1.95	0.00	0.00	0.00	0.00	0.00	0.00	1,353	250.20	48.63	9.63	0.28	2.64
2250 Manitow oc 300 Ton (track mounted crane)	2	184.89	35.93	7.12	0.21	1.95	25.83	4.78	0.93	0.18	0.01	0.05	3,410	630.52	122.54	24.27	0.71	6.65
40' - 60' Manlift	2	168.09	197.65	27.34	0.21	11.71	41.50	6.98	8.20	1.13	0.01	0.49	4,565	767.29	902.25	124.80	0.95	53.45
90' Manlift	2	168.09	197.65	27.34	0.21	11.71	27.67	4.65	5.47	0.76	0.01	0.32	2,739	460.38	541.35	74.88	0.57	32.07
Forklift	2	169.60	137.47	14.65	0.21	7.55	9.75	1.65	1.34	0.14	0.00	0.07	1,931	327.43	265.41	28.27	0.40	14.58
Diesel Welder 400 Amp	2	160.21	125.59	17.47	0.21	8.79	6.90	1.10	0.87	0.12	0.00	0.06	1,315	210.63	165.11	22.97	0.27	11.55
185 CFM Compressor	2	170.61	89.05	11.12	0.21	12.17	10.81	1.84	0.96	0.12	0.00	0.13	2,734	466.47	243.48	30.41	0.57	33.28
Light Tow er 5 KW	2	160.21	125.59	17.47	0.21	8.79	9.58	1.53	1.20	0.17	0.00	0.08	2,388	382.55	299.87	41.71	0.50	20.99
Water Truck 4000 Gal	Onroad	173.70	86.54	15.22	0.21	7.61	7.83	1.36	0.68	0.12	0.00	0.06	2,066	358.83	178.77	31.44	0.43	15.72
Track 330 Excavator	2	164.48	56.00	15.00	0.21	5.69	0.00	0.00	0.00	0.00	0.00	0.00	2,478	407.56	138.75	37.18	0.51	14.09
RT Hoe 710 (Backhoe)	2	163.01	80.51	28.01	0.21	9.15	11.85	1.93	0.95	0.33	0.00	0.11	3,910	637.35	314.78	109.51	0.81	35.79
Roller	2	164.48	56.00	15.00	0.21	5.69	12.61	2.07	0.71	0.19	0.00	0.07	3,051	501.84	170.85	45.78	0.63	17.35
950/960 Loader	2	160.47	48.29	13.68	0.21	3.17	31.43	5.04	1.52	0.43	0.01	0.10	10,371	1664.26	500.89	141.87	2.16	32.91
Cat D6 Dozer	2	164.48	56.00	15.00	0.21	5.69	0.00	0.00	0.00	0.00	0.00	0.00	2,240	368.38	125.41	33.61	0.47	12.74
Dump Truck	Onroad	173.70	86.54	15.22	0.21	7.61	0.00	0.00	0.00	0.00	0.00	0.00	475	82.53	41.12	7.23	0.10	3.62
Grader	2	160.47	48.29	13.68	0.21	3.17	0.00	0.00	0.00	0.00	0.00	0.00	1,479	237.38	71.44	20.24	0.31	4.69
Fusion Machine	2	160.21	125.59	17.47	0.21	8.79	0.00	0.00	0.00	0.00	0.00	0.00	1,264	202.53	158.76	22.08	0.26	11.11
Asphalt Paver	2	160.47	48.29	13.68	0.21	3.17	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00
Paving Equipment	2	160.47	48.29	13.68	0.21	3.17	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00

(1) - Steady State Emission Factors from Table A4 of EPA July 2010 NR-009d Publication.

(2) - In use adjustment factors per Table A5 EPA July 2010 NR-009d Publication.

(3) - PM10 and SO2 adjustments due to Equation 3 and Equation 5 on pages 6 and 23, Respectively of EPA Report No. NR-009d

(4) - Calculation uses adjusted BSFC and assumed 7.1 lbs/gallon. The onroad emission factors are not adjusted.

(5) - Daily fuel use based on peak combustion month equipment schedule.

(6) - Annual fuel use based on average level during peak 12-month period.

Table 1B.12

Daily Fugitive Dust Emissions (peak month)	Month 2								
Equipment	Number of Units	Daily Process Rate Per Unit	Total Process Rate	Units	PM2.5 Emission Factor(1) (lbs/unit)	PM10 Emission Factor(1) (lbs/unit)	Control Factor(1) (%)	PM2.5 Emissions (lbs/day)	PM10 Emissions (lbs/day)
Hydro Crane 35-50 Ton RT	0	0.0	0.0	none	0.00E+00	0.00E+00	0%	0.00	0.00
RT 760 - 60 ton Crane	1	0.0	0.0	none	0.00E+00	0.00E+00	0%	0.00	0.00
Hydro Crane 75-80 Ton RT	0	0.0	0.0	none	0.00E+00	0.00E+00	0%	0.00	0.00
2250 Manitowoc 300 Ton (track mounted crane)	0	0.0	0.0	none	0.00E+00	0.00E+00	0%	0.00	0.00
40' - 60' Manlift	0	0.0	0.0	none	0.00E+00	0.00E+00	0%	0.00	0.00
90' Manlift	0	0.0	0.0	none	0.00E+00	0.00E+00	0%	0.00	0.00
Forklift	1	7.2	7.2	vmt	1.71E-01	1.71E+00	92%	0.10	1.05
Diesel Welder 400 Amp	2	0.0	0.0	none	0.00E+00	0.00E+00	0%	0.00	0.00
185 CFM Compressor	2	0.0	0.0	none	0.00E+00	0.00E+00	0%	0.00	0.00
Light Tower 5 KW	3	0.0	0.0	none	0.00E+00	0.00E+00	0%	0.00	0.00
Water Truck 4000 Gal	1	15.0	15.0	vmt	2.84E-01	2.84E+00	92%	0.36	3.62
Track 330 Excavator	1	434.7	434.7	tons	1.14E-05	3.63E-05	0%	0.00	0.02
RT Hoe 710 (Backhoe)	2	466.2	932.4	tons	5.30E-05	1.51E-03	0%	0.05	1.41
Roller	1	13.8	13.8	vmt	1.93E-02	2.75E-01	0%	0.27	3.80
950/960 Loader	2	4.3	8.6	vmt	1.93E-02	2.75E-01	0%	0.17	2.37
Cat D6 Dozer	1	5.2	5.2	hrs	2.31E-01	4.19E-01	0%	1.20	2.18
Dump Truck	1	13.8	13.8	vmt	1.43E-01	1.43E+00	92%	0.17	1.68
Grader	1	4.6	4.6	vmt	1.93E-02	2.75E-01	0%	0.09	1.27
Fusion Machine	3	0.0	0.0	none	0.00E+00	0.00E+00	0%	0.00	0.00
Asphalt Paver	0	14.1	0.0	vmt	1.93E-02	2.75E-01	0%	0.00	0.00
Paving Equipment	0	14.1	0.0	vmt	1.93E-02	2.75E-01	0%	0.00	0.00
0	0	0.0	0.0	0.0	0.00E+00	0.00E+00	0%	0.00	0.00
Windblown Dust (active construction area)	N/A	435600	435600	sq.ft.	6.73E-06	1.68E-05	92%	0.25	0.62
Windblown Dust (laydown area)	N/A	261360	261360	sq.ft.	6.73E-06	1.68E-05	92%	0.15	0.37
Worker Gravel Road Travel (onsite)	189.333	0.1	18.9333	vmt	7.71E-02	7.71E-01	92%	0.12	1.24
Delivery Truck Gravel Road Travel (onsite)	3.18182	0.1	0.31818	vmt	2.31E-01	2.31E+00	92%	0.01	0.06
Total onsite=								2.94	19.67

(1) Dust control efficiency for unpaved road travel and active excavation area is based on "Control of Open Fugitive Dust Sources", U.S. EPA, 9/88.

Table 1B.13
Annual Fugitive Dust Emissions

Activity	Average Daily PM2.5 Emissions(1) (lbs/day)	Average Daily PM10 Emissions(1) (lbs/day)	Days per Year	Annual PM2.5 Emissions (tons/yr)	Annual PM10 Emissions (tons/yr)
Construction Activities	1.94	13.72	240	0.23	1.65E+00
Windblown Dust	0.40	1.00	365	0.07	1.82E-01
Total =				0.31	1.83E+00

Notes:
(1) Based on average of daily emissions during peak 12-month construction period.

Table 1B.14

Construction Equipment Daily Fuel Use (peak period)

Month 5

Equipment	Number of Units	Hrs/Day Per Unit	Gals/Hr Per Unit	Total Fuel Use (Gals/day)
Hydro Crane 35-50 Ton RT	1	3.4	3.6	12.3
RT 760 - 60 ton Crane	2	3.4	4.5	30.8
Hydro Crane 75-80 Ton RT	0	3.4	4.5	0.0
2250 Manitowoc 300 Ton (track mounted crane)	1	3.4	7.6	25.8
40' - 60' Manlift	3	4	1.2	13.8
90' Manlift	2	4	1.2	9.2
Forklift	2	2.4	2.0	9.8
Diesel Welder 400 Amp	2	3.6	0.6	4.6
185 CFM Compressor	2	3.8	1.4	10.8
Light Tower 5 KW	3	5	0.6	9.6
Water Truck 4000 Gal	1	5	1.6	7.8
Track 330 Excavator	1	4.6	4.9	22.5
RT Hoe 710 (Backhoe)	2	3.7	3.2	23.7
Roller	1	4.6	2.7	12.6
950/960 Loader	2	4.3	7.3	62.9
Cat D6 Dozer	0	5.2	6.5	0.0
Dump Truck	0	4.6	1.6	0.0
Grader	0	4.6	3.7	0.0
Fusion Machine	3	5	0.6	9.6
Asphalt Paver	0	4.7	2.2	0.0
Paving Equipment	0	4.7	2.2	0.0

Total = 265.8

Table 1B.15

Construction Equipment Annual Fuel Use (Peak 12-month construction period)

Equipment	Average number of units per day: Total Construction Period	Average number of units per day: Peak Construction Year	Average Operating Hrs/Day Per Unit	Gals/Hr Per Unit	Average Operating Days per Year	12-Month Average Total Fuel Use (Gals/yr)	Peak 12-Month Average Total Fuel Use (Gals/yr)
Hydro Crane 35-50 Ton RT	0.50	0.67	3.40	3.6	264	1,624	2,165
RT 760 - 60 ton Crane	1.13	1.50	3.40	4.5	264	4,567	6,090
Hydro Crane 75-80 Ton RT	0.50	0.33	3.40	4.5	264	2,030	1,353
2250 Manitowoc 300 Ton (track mounted crane)	0.38	0.50	3.40	7.6	264	2,558	3,410
40' - 60' Manlift	2.81	3.75	4.00	1.2	264	3,424	4,565
90' Manlift	1.69	2.25	4.00	1.2	264	2,054	2,739
Forklift	1.38	1.50	2.40	2.0	264	1,770	1,931
Diesel Welder 400 Amp	2.00	2.17	3.60	0.6	264	1,214	1,315
185 CFM Compressor	1.50	1.92	3.80	1.4	264	2,140	2,734
Light Tower 5 KW	2.38	2.83	5.00	0.6	264	2,001	2,388
Water Truck 4000 Gal	1.00	1.00	5.00	1.6	264	2,066	2,066
Track 330 Excavator	0.31	0.42	4.60	4.9	264	1,858	2,478
RT Hoe 710 (Backhoe)	0.94	1.25	3.70	3.2	264	2,932	3,910
Roller	0.88	0.92	4.60	2.7	264	2,912	3,051
950/960 Loader	1.06	1.25	4.30	7.3	264	8,816	10,371
Cat D6 Dozer	0.19	0.25	5.20	6.5	264	1,680	2,240
Dump Truck	0.19	0.25	4.60	1.6	264	356	475
Grader	0.38	0.33	4.60	3.7	264	1,664	1,479
Fusion Machine	1.13	1.50	5.00	0.6	264	948	1,264
Asphalt Paver	0.06	0.00	4.70	2.2	264	170	0
Paving Equipment	0.06	0.00	4.70	2.2	264	170	0
Total =						46,954	54,760

Table 1B.16
Equipment Schedule

Duration of Construction Period:	16	Months	Avg const. day/year			264											
Month		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Construction Workers		50	90	118	164	181	216	242	284	283	236	188	124	83	54	32	29
Major Construction Equipment	HP																
Hydro Crane 35-50 Ton RT	200					1	1	1	1	1	1	1	1				
RT 760 - 60 ton Crane	250		1	1	1	2	2	2	2	2	2	2	1				
Hydro Crane 75-80 Ton RT	250									1	1	1	1	1	1	1	1
2250 Manitowoc 300 Ton (track mounted crane)	420					1	1	1	1	1	1						
40' - 60' Manlift	85					3	5	8	9	8	6	4	2				
90' Manlift	85					2	3	4	6	4	4	2	2				
Forklift	100	1	1	1	1	2	2	2	2	2	2	1	1	1	1	1	1
Diesel Welder 400 Amp	22		2	2	2	2	2	2	3	3	3	3	2	2	2	1	1
185 CFM Compressor	49	2	2	2	2	2	2	2	2	2	2	2	1	1			
Light Tower 5 KW	22	2	3	3	3	3	3	3	3	3	3	3	2	1	1	1	1
Water Truck 4000 Gal	225	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Track 330 Excavator	268	1	1	1	1	1											
RT Hoe 710 (Backhoe)	150		2	2	2	2	1	1	1	1	1	1	1				
Roller	100		1	1	1	1	1	1	1	1	1	1	1	1	1		1
950/960 Loader	280		2	2	2	2	1	1	1	1	1	1	1	1	1		
Cat D6 Dozer	250	1	1	1													
Dump Truck	250	1	1	1													
Grader	200	1	1	1									1	1	1		
Fusion Machine	22	3	3	3	3	3	3										
Asphalt Paver	120																1
Paving Equipment	120																1
Pickup trucks		27	28	28	39	39	42	37	37	36	36	31	30	24	18	17	
Concrete Deliveries			6	6	6	6	6	3	1	1	1						
Light/Medium Deliveries		3	3	6	12	15	21	21	21	21	21	21	21	21	15	15	
HD Truck Delivery						1	1	1	1	1							

Note:

1. Construction schedule is provided by the applicant.
- Total month construction 16 months
- Days per week 5 days
- Days per month 22 days

- Hours per day 8 hours

2. Construction phases are provided by the applicant and listed as follows:

- Clearing and grubbing month 1
- Underground water line relocation month 2
- Access road widening work month 1-2
- Site grading month 2-3
- Underground gas and waste water linear month 2-3
- Relocation of the reclaimed/recycled water line month 2-3
- Facilities building month 4-15
- Lateral construction month 10-11
- Solar field month 15-16
- Asphalt paving month 16

3. Deliveries trip per day, distance, and origins are based on the information provided by the applicant and assumptions.

4. Worker passenger vehicles will park in the laydown area so there's no on-site travelling.

5. It is assumed the numbers of worker passenger vehicles are the numbers of workers divided by 1.5

Table 1B.17
Onsite Equipment Combustion Emission Factors

	Offroad Combustion Factors																			
					Base Factors g/bhp, if Tier 1 >50 hp (1)					Adjustment (2)						Adjustment (3)	Adjusted Factors (g/bhp)			
Dust Process Units per Hour per unit	Road dust suppression Abatement Factor	HP Cat.	Tier	BSFC lb/hp	NOx	CO	VOC	SOx	PM10	Adj. Type	NOx	CO	VOC	SOx	PM10	PM10 Fuel S	BSFC	NOx	CO	VO
0	0.000	175-300	2	0.367	4	0.7475	0.3085	0.00499	0.1316	None	1	1	1	1	1	-0.08585669	0.367	4	0.7475	0.3
0	0.000	300-600	2	0.367	4.3351	0.8425	0.1669	0.00499	0.1316	None	1	1	1	1	1	-0.08585669	0.367	4.3351	0.8425	0.1
0	0.000	300-600	2	0.367	4.3351	0.8425	0.1669	0.00499	0.1316	None	1	1	1	1	1	-0.08585669	0.367	4.3351	0.8425	0.1
0	0.000	300-600	2	0.367	4.3351	0.8425	0.1669	0.00499	0.1316	None	1	1	1	1	1	-0.08585669	0.367	4.3351	0.8425	0.1
0	0.000	50-100	2	0.408	4.7	2.3655	0.3672	0.00555	0.24	LoLF	1.1	2.57	2.29	1.18	1.97	-0.112629	0.48144	5.17	6.07934	0.84
0	0.000	50-100	2	0.408	4.7	2.3655	0.3672	0.00555	0.24	LoLF	1.1	2.57	2.29	1.18	1.97	-0.112629	0.48144	5.17	6.07934	0.84
3	0.915	50-100	2	0.408	4.7	2.3655	0.3672	0.00555	0.24	Hi LF	0.95	1.53	1.05	1.01	1.23	-0.09640279	0.41208	4.465	3.61922	0.38
0	0.000	16-25	2	0.408	4.4399	2.161	0.438	0.00555	0.2665	Hi LF	0.95	1.53	1.05	1.01	1.23	-0.09640279	0.41208	4.21791	3.30633	0.4
0	0.000	26-50	2	0.408	4.728	1.5323	0.2789	0.00555	0.3389	Hi LF	0.95	1.53	1.05	1.01	1.23	-0.09640279	0.41208	4.4916	2.34442	0.29
0	0.000	16-25	2	0.408	4.4399	2.161	0.438	0.00555	0.2665	Hi LF	0.95	1.53	1.05	1.01	1.23	-0.09640279	0.41208	4.21791	3.30633	0.4
3	0.915	Onroad	Onroad	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
94.5	0.000	100-175	2	0.367	4.1	0.8667	0.3384	0.00499	0.18	Hi LF	0.95	1.53	1.05	1.01	1.23	-0.08671526	0.37067	3.895	1.32605	0.35
126	0.000	100-175	2	0.367	4.1	0.8667	0.3384	0.00499	0.18	LoLF	1.1	2.57	2.29	1.18	1.97	-0.10131089	0.43306	4.51	2.22742	0.77
3	0.000	100-175	2	0.367	4.1	0.8667	0.3384	0.00499	0.18	Hi LF	0.95	1.53	1.05	1.01	1.23	-0.08671526	0.37067	3.895	1.32605	0.35
1	0.000	175-300	2	0.367	4	0.7475	0.3085	0.00499	0.1316	Hi LF	0.95	1.53	1.05	1.01	1.23	-0.08671526	0.37067	3.8	1.14368	0.32
1	0.000	100-175	2	0.367	4.1	0.8667	0.3384	0.00499	0.18	Hi LF	0.95	1.53	1.05	1.01	1.23	-0.08671526	0.37067	3.895	1.32605	0.35
3	0.915	Onroad	Onroad	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1	0.000	175-300	2	0.367	4	0.7475	0.3085	0.00499	0.1316	Hi LF	0.95	1.53	1.05	1.01	1.23	-0.08671526	0.37067	3.8	1.14368	0.32
0	0.000	16-25	2	0.408	4.4399	2.161	0.438	0.00555	0.2665	Hi LF	0.95	1.53	1.05	1.01	1.23	-0.09640279	0.41208	4.21791	3.30633	0.4
3	0.000	175-300	2	0.367	4	0.7475	0.3085	0.00499	0.1316	Hi LF	0.95	1.53	1.05	1.01	1.23	-0.08671526	0.37067	3.8	1.14368	0.32
3	0.000	175-300	2	0.367	4	0.7475	0.3085	0.00499	0.1316	Hi LF	0.95	1.53	1.05	1.01	1.23	-0.08671526	0.37067	3.8	1.14368	0.32

(1) - Steady State Emission Factors from Table A4 of EPA July 2010 NR-009d Publication.

(2) - In use adjustment factors per Table A5 EPA July 2010 NR-009d Publication.

(3) - PM10 and SO2 adjustments due to Equation 3 and Equation 5 on pages 6 and 23, Respectively of EPA Report No. NR-009d

(4) - PM2.5 = PM10 * 0.97 per page 25 of EPA Report No. NR-009d

Table 1B.19
Combustion Emission Ranking

Combustion Emission Ranking																		
Equipment	Hrs/Day Per Unit (1)	Gals/Hr Per Unit	Month															
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hydro Crane 35-50 Ton RT	3.4	3.6	0	0	0	0	12	12	12	12	12	12	12	12	0	0	0	0
RT 760 - 60 ton Crane	3.4	4.5	0	15	15	15	31	31	31	31	31	31	31	15	0	0	0	0
Hydro Crane 75-80 Ton RT	3.4	4.5	0	0	0	0	0	0	0	0	15	15	15	15	15	15	15	15
2250 Manitowoc 300 Ton (track mounted crane)	3.4	7.6	0	0	0	0	26	26	26	26	26	26	0	0	0	0	0	0
40' - 60' Manlift	4	1.2	0	0	0	0	14	23	37	41	37	28	18	9	0	0	0	0
90' Manlift	4	1.2	0	0	0	0	9	14	18	28	18	18	9	9	0	0	0	0
Forklift	2.4	2.0	5	5	5	5	10	10	10	10	10	10	5	5	5	5	5	5
Diesel Welder 400 Amp	3.6	0.6	0	5	5	5	5	5	5	7	7	7	7	5	5	5	2	2
185 CFM Compressor	3.8	1.4	11	11	11	11	11	11	11	11	11	11	11	5	5	0	0	0
Light Tower 5 KW	5	0.6	6	10	10	10	10	10	10	10	10	10	10	6	3	3	3	3
Water Truck 4000 Gal	5	1.6	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Track 330 Excavator	4.6	4.9	23	23	23	23	23	0	0	0	0	0	0	0	0	0	0	0
RT Hoe 710 (Backhoe)	3.7	3.2	0	24	24	24	24	12	12	12	12	12	12	12	0	0	0	0
Roller	4.6	2.7	0	13	13	13	13	13	13	13	13	13	13	13	13	13	0	13
950/960 Loader	4.3	7.3	0	63	63	63	63	31	31	31	31	31	31	31	31	31	0	0
Cat D6 Dozer	5.2	6.5	34	34	34	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Truck	4.6	1.6	7	7	7	0	0	0	0	0	0	0	0	0	0	0	0	0
Grader	4.6	3.7	17	17	17	0	0	0	0	0	0	0	0	17	17	17	0	0
Fusion Machine	5	0.6	10	10	10	10	10	10	0	0	0	0	0	0	0	0	0	0
Asphalt Paver	4.7	2.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
Paving Equipment	4.7	2.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
		Total =	120	242	242	184	266	214	223	239	240	231	182	163	102	97	34	67
		12-month Total =												2547	2529	2383	2174	2057

Table 1B.20
Vehicle Emission Factors

	Emission Factors (1)					
	NOx	CO	VOC	SOx	PM10	
Truck Hauling (lbs/vmt)	0.03205	0.01597	0.00281	0.00004	0.00140	
Truck Hauling (lbs/1000 gals)	173.70	86.54	15.22	0.21	7.61	
Notes:						
(1) From EMFAC 2007 V.2.3, heavy-heavy duty Diesel trucks, fleet average for calendar year 2011, Fresno County.						
	Emission Factors					
	NOx	CO	POC	SOx	PM10	
Light Duty Trucks/Cars (lbs/vmt)(1)	0.00081	0.00809	0.00077	0.00001	0.00009	
Light Duty Trucks (lbs/1000 gals)(2)	18.19	157.61	14.43	0.18	1.92	
Medium Duty Trucks (lbs/1000 gals)(3)	17.57	136.64	11.07	0.18	1.51	

Notes:
(1) From EMFAC 2007 V.2.3, average of light duty automobiles and light duty trucks, fleet average for calendar year 2011.
(2) From EMFAC 2007 V.2.3, light duty trucks (gasoline and Diesel), fleet average for calendar year 2011.
(3) From EMFAC EMFAC 2007 V.2.3, medium duty trucks (gasoline and Diesel), fleet average for calendar year 2011.

Gasoline Equipment Factors - Small Engines					
			(gm/bhp-hr)		
	NOx	CO	POC	SO2	PM10
Small Equipment(1) (g/bhp-hr)	0.0066	0.082	0.0010	0.00059	0.00072
Small Equipment(1) (lb/1000 gal)	116.78	1459.70	17.75	10.49	12.80

Notes:

(1) NOx, CO and VOC factors reflect Tier 1 Emissions Standards for Large SI Engines, effective starting in 2004.
SO2 and PM10 factors from AP-42 Table 3.3-1.

Table 1B.21: EMFAC Emissions Inventory (tons per day)

Title : 2011 Annual San Diego County
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/11/24 16:25:30
Scen Year: 2011 -- All model years in the range 1967 to 2011 selected
Season : Annual
Area : San Diego County
I/M Stat : Enhanced Interim (2005)
Emissions: Tons Per Day

	LDA-NCAT	LDA-CAT	LDA-DSL	LDA-TOT	LDT1-NCA	LDT1-CAT	LDT1-DSL	LDT1-TOT	LDT2-NCA	LDT2-CAT	LDT2-DSL	LDT2-TOT	MDV-NCAT	MDV-CAT	MDV-DSL	MDV-TOT	HDT1-NCA	HDT1-CAT	HDT1-DSL	HDT1-TOT	HDT2-NCA	HDT2-CAT	HDT2-DSL	HDT2-TOT	MHDT-NCA	MHDT-CAT
Vehicles	10799	1177670	3662	1192130	3846	190927	9152	203925	2601	548192	1010	551803	1629	212372	851	214852	154	30957	9336	40447	58	5695	5846	11599	365	3421
VMT/1000	177	42986	88	43251	75	7416	299	7790	51	21118	30	21199	38	8725	31	8794	4	1397	444	1844	1	243	243	487	3	171
Trips	42501	7404550	19802	7466860	15257	1200740	55985	1271980	10405	3448290	5887	3464580	6912	1341740	5280	1353930	5089	1023640	117438	1146170	1922	188320	73536	263779	16650	156243
Reactive Organic Gas Emissions																										
Run Exh	1.23	3.2	0.01	4.44	0.54	0.43	0.02	1	0.36	1.63	0	2	0.36	0.89	0	1.25	0.03	0.62	0.1	0.74	0.01	0.09	0.08	0.17	0.02	0.1
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.04	0	0.04	0	0.01	0	0.01	0	0.01
Start Ex	0.24	3.89	0	4.14	0.09	0.52	0	0.6	0.06	1.98	0	2.04	0.05	0.99	0	1.04	0.03	0.61	0	0.65	0.01	0.11	0	0.13	0.16	0.22
Total Ex	1.47	7.09	0.01	8.58	0.63	0.95	0.02	1.6	0.42	3.62	0	4.04	0.41	1.89	0	2.3	0.06	1.27	0.1	1.43	0.02	0.21	0.08	0.3	0.19	0.33
Diurnal	0.07	0.83	0	0.9	0.02	0.12	0	0.14	0.02	0.38	0	0.4	0	0.13	0	0.13	0	0	0	0	0	0	0	0	0	0
Hot Soak	0.15	1.36	0	1.51	0.05	0.21	0	0.26	0.04	0.63	0	0.67	0.01	0.21	0	0.22	0	0.05	0	0.06	0	0.01	0	0.01	0.01	0.01
Running	0.84	3.58	0	4.42	0.19	0.9	0	1.09	0.12	3.04	0	3.15	0.02	0.97	0	0.99	0.02	0.71	0	0.73	0.01	0.14	0	0.15	0.08	0.1
Resting	0.06	0.63	0	0.69	0.02	0.1	0	0.12	0.01	0.3	0	0.31	0	0.11	0	0.11	0	0	0	0	0	0	0	0	0	0
Total	2.58	13.5	0.01	16.09	0.91	2.28	0.02	3.21	0.6	7.97	0	8.58	0.44	3.3	0	3.75	0.09	2.04	0.1	2.23	0.03	0.36	0.08	0.47	0.27	0.43
Carbon Monoxide Emissions																										
Run Exh	15.61	100.66	0.07	116.35	6.64	19.44	0.19	26.27	4.44	64.39	0.02	68.85	5.92	28.7	0.02	34.63	0.55	6.92	0.55	8.01	0.18	1	0.35	1.53	0.5	1.67
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.26	0.01	0.27	0	0.05	0.01	0.05	0	0.04
Start Ex	1.42	45.58	0	47	0.52	7.37	0	7.89	0.35	25.37	0	25.72	0.44	11.2	0	11.64	0.23	7.58	0	7.81	0.09	1.28	0	1.36	1.1	3.78
Total Ex	17.03	146.24	0.07	163.35	7.16	26.81	0.19	34.16	4.78	89.76	0.02	94.57	6.36	39.9	0.02	46.27	0.77	14.76	0.56	16.09	0.27	2.33	0.35	2.95	1.61	5.5
Oxides of Nitrogen Emissions																										
Run Exh	0.86	10.22	0.15	11.23	0.36	1.76	0.51	2.64	0.24	8.89	0.05	9.19	0.3	4.45	0.05	4.8	0.01	0.92	1.93	2.86	0	0.16	1.31	1.47	0.01	0.45
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.03	0.03	0	0	0.02	0.02	0	0
Start Ex	0.07	3.01	0	3.07	0.02	0.48	0	0.5	0.02	2.51	0	2.53	0.02	1.13	0	1.15	0	1.99	0	1.99	0	0.37	0	0.37	0.02	0.49
Total Ex	0.93	13.23	0.15	14.31	0.39	2.24	0.51	3.14	0.26	11.41	0.05	11.72	0.31	5.58	0.05	5.95	0.01	2.9	1.96	4.87	0	0.52	1.32	1.85	0.03	0.94
Carbon Dioxide Emissions (000)																										
Run Exh	0.1	18.19	0.03	18.33	0.04	3.91	0.11	4.07	0.03	11.17	0.01	11.21	0.03	6.31	0.01	6.35	0	1.49	0.25	1.75	0	0.26	0.14	0.4	0	0.13
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0	0.01	0	0	0	0	0	0
Start Ex	0.01	0.59	0	0.6	0	0.12	0	0.12	0	0.34	0	0.34	0	0.18	0	0.18	0	0.05	0	0.05	0	0.01	0	0.01	0	0.01
Total Ex	0.11	18.78	0.03	18.93	0.05	4.03	0.11	4.19	0.03	11.51	0.01	11.56	0.03	6.5	0.01	6.54	0.01	1.55	0.26	1.81	0	0.27	0.14	0.41	0.01	0.14
PM10 Emissions																										
Run Exh	0.01	0.59	0.01	0.61	0	0.11	0.01	0.13	0	0.7	0	0.71	0	0.28	0	0.29	0	0.02	0.02	0.05	0	0	0.02	0.02	0	0
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0	0.06	0	0.06	0	0.01	0	0.01	0	0.06	0	0.06	0	0.02	0	0.02	0	0	0	0	0	0	0	0	0	0
Total Ex	0.01	0.65	0.01	0.67	0	0.12	0.01	0.14	0	0.77	0	0.77	0	0.31	0	0.31	0	0.03	0.02	0.05	0	0	0.02	0.02	0	0
TireWear	0	0.38	0	0.38	0	0.07	0	0.07	0	0.19	0	0.19	0	0.08	0	0.08	0	0.02	0.01	0.02	0	0	0	0.01	0	0
BrakeWr	0	0.59	0	0.6	0	0.1	0	0.11	0	0.29	0	0.29	0	0.12	0	0.12	0	0.02	0.01	0.03	0	0	0	0.01	0	0
Total	0.01	1.62	0.01	1.65	0	0.29	0.02	0.32	0	1.24	0	1.25	0	0.51	0	0.51	0	0.06	0.04	0.1	0	0.01	0.02	0.04	0	0.01
Lead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOx	0	0.18	0	0.18	0	0.04	0	0.04	0	0.11	0	0.11	0	0.06	0	0.06	0	0.02	0	0.02	0	0	0	0	0	0
Fuel Consumption (000 gallons)																										
Gasoline	14.63	1948.96	0	1963.59	6.11	417.64	0	423.75	4.15	1194.35	0	1198.5	4.16	672.06	0	676.22	0.67	161.1	0	161.77	0.23	27.98	0	28.21	0.96	15.05
Diesel	0	0	3.12	3.12	0	0	10.27	10.27	0	0	1.04	1.04	0	0	1.05	1.05	0	0	23.03	23.03	0	0	12.87	12.87	0	0

Table 1B.21 Cont.

MHDT-DSL	MHDT-TOT	HHDT-NCA	HHDT-CAT	HHDT-DSL	HHDT-TOT	OBUS-NCA	OBUS-CAT	OBUS-DSL	OBUS-TOT	SBUS-NCA	SBUS-CAT	SBUS-DSL	SBUS-TOT	UB-NCAT	UB-CAT	UB-DSL	UB-TOT	MH-NCAT	MH-CAT	MH-DSL	MH-TOT	MCY-NCAT	MCY-CAT	MCY-DSL	MCY-TOT	ALL-TOT
15142	18928	39	525	8344	8908	27	814	864	1704	64	240	1798	2102	8	157	714	880	891	24873	3044	28808	54097	30036	0	84132	2360220
1003	1177	1	51	1516	1567	0	42	55	97	3	11	85	100	1	22	101	124	9	330	41	380	467	330	0	797	87607
424576	597468	1787	23990	42223	68000	1232	37162	24219	62614	256	960	7193	8408	33	628	2857	3518	89	2488	304	2882	108182	60065	0	168247	1.6E+07
0.25	0.37	0.01	0.18	1.65	1.84	0	0.03	0.01	0.04	0.02	0.02	0.03	0.08	0.01	0.02	0.09	0.12	0.06	0.13	0	0.19	2.19	0.79	0	2.98	15.22
0.01	0.01	0	0	0.19	0.19	0	0	0	0	0	0	0	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0.26
0	0.39	0.03	0.11	0	0.15	0.01	0.05	0	0.07	0	0	0	0.01	0	0	0	0	0	0	0	0	0.28	0.14	0	0.42	9.62
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0.25	0.77	0.04	0.29	1.84	2.17	0.01	0.08	0.01	0.11	0.03	0.03	0.04	0.09	0.01	0.03	0.09	0.12	0.06	0.13	0	0.2	2.47	0.93	0	3.4	25.11
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0.02	0.13	0	0.16	1.74
0	0.02	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.02	0.05	0	0.07	2.82
0	0.17	0.01	0.02	0	0.03	0.01	0.01	0	0.02	0	0	0	0.01	0	0	0	0	0	0.01	0	0.01	0.14	0.19	0	0.33	11.1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.02	0.08	0	0.1	1.34
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0.25	0.96	0.05	0.31	1.84	2.2	0.02	0.1	0.01	0.13	0.03	0.03	0.04	0.1	0.01	0.03	0.09	0.13	0.06	0.15	0	0.21	2.68	1.38	0	4.06	42.11
2.37	4.54	0.32	2.48	6.8	9.61	0.04	0.48	0.12	0.64	0.53	0.28	0.29	1.1	0.22	0.21	0.4	0.83	1.4	3.64	0.05	5.08	30.16	5.42	0	35.58	313.04
0.04	0.09	0	0	0.74	0.74	0	0.01	0	0.01	0.01	0.02	0.03	0.05	0	0	0	0	0	0	0	0	0	0	0	0	1.22
0	4.89	0.55	1.61	0	2.17	0.08	0.92	0	1.01	0.02	0.06	0	0.08	0	0.03	0	0.03	0.01	0.04	0	0.05	0.93	0.85	0	1.78	111.42
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2.41	9.52	0.87	4.1	7.54	12.51	0.12	1.42	0.13	1.66	0.56	0.35	0.32	1.23	0.23	0.23	0.4	0.86	1.41	3.68	0.05	5.13	31.09	6.27	0	37.36	425.68
8.48	8.94	0.01	0.66	22.48	23.15	0	0.15	0.42	0.57	0.01	0.04	1.05	1.11	0	0.06	2	2.06	0.03	0.49	0.36	0.88	0.68	0.39	0	1.06	69.95
0.12	0.12	0	0	1.73	1.73	0	0	0.01	0.01	0	0	0.08	0.08	0	0	0	0	0	0	0	0	0	0	0	0	1.99
0	0.51	0.01	0.21	0	0.22	0	0.13	0	0.13	0	0	0	0	0	0	0	0	0	0	0	0	0.04	0.02	0	0.06	10.55
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8.61	9.57	0.02	0.88	24.21	25.11	0	0.28	0.43	0.71	0.01	0.05	1.13	1.19	0	0.07	2	2.07	0.03	0.49	0.36	0.88	0.72	0.4	0	1.12	82.49
1.66	1.8	0	0.03	3.06	3.09	0	0.03	0.09	0.12	0	0.01	0.14	0.15	0	0.02	0.3	0.32	0.01	0.25	0.07	0.32	0.06	0.07	0	0.13	48.05
0.01	0.01	0	0	0.1	0.1	0	0	0	0	0	0	0	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0.13
0	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0	0	0.01	1.33
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1.67	1.81	0	0.03	3.16	3.2	0	0.03	0.09	0.13	0	0.01	0.15	0.16	0	0.02	0.3	0.32	0.01	0.25	0.07	0.32	0.07	0.07	0	0.14	49.51
0.29	0.29	0	0	0.96	0.96	0	0	0.02	0.02	0	0	0.04	0.04	0	0	0.03	0.04	0	0	0.01	0.01	0.03	0	0	0.03	3.19
0	0	0	0	0.03	0.03	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.03
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.17
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0.29	0.29	0	0	0.99	0.99	0	0	0.02	0.02	0	0	0.04	0.04	0	0	0.03	0.04	0	0	0.01	0.01	0.03	0	0	0.03	3.39
0.01	0.02	0	0	0.06	0.06	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0	0	0	0	0.83
0.01	0.02	0	0	0.05	0.05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0	0	0	0.01	1.23
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0.32	0.33	0	0	1.09	1.1	0	0	0.02	0.02	0	0	0.05	0.05	0	0	0.04	0.04	0	0.01	0.01	0.02	0.04	0	0	0.04	5.46
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.02	0.02	0	0	0.03	0.03	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.48
0	16.01	0.23	4.18	0	4.41	0.07	3.69	0	3.76	0.38	1.1	0	1.48	0.14	1.92	0	2.05	0.95	26.14	0	27.09	12.65	8.65	0	21.3	4528.15
150.31	150.31	0	0	284.71	284.71	0	0	8.24	8.24	0	0	13.14	13.14	0	0	26.8	26.8	0	0	6.11	6.11	0	0	0	0	540.69

Table 1B.22
Dust Emission Ranking

Dust Emission Ranking Equipment	Hrs/Day Per Unit (1)	PM10 lbs/hr Per Unit	Month															
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hydro Crane 35-50 Ton RT	3.4	0.0	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
RT 760 - 60 ton Crane	3.4	0.0	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
Hydro Crane 75-80 Ton RT	3.4	0.0	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
2250 Manitowoc 300 Ton (track mounted crane)	3.4	0.0	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
40' - 60' Manlift	4	0.0	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
90' Manlift	4	0.0	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
Forklift	2.4	0.4	1.05	1.05	1.05	1.05	2.09	2.09	2.09	2.09	2.09	2.09	1.05	1.05	1.05	1.05	1.05	1.05
Diesel Welder 400 Amp	3.6	0.0	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
185 CFM Compressor	3.8	0.0	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
Light Tower 5 KW	5	0.0	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
Water Truck 4000 Gal	5	0.7	3.62	3.62	3.62	3.62	3.62	3.62	3.62	3.62	3.62	3.62	3.62	3.62	3.62	3.62	3.62	3.62
Track 330 Excavator	4.6	0.0	0.02	0.02	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
RT Hoe 710 (Backhoe)	3.7	0.2	0.00	1.41	1.41	1.41	1.41	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.00	0.00	0.00	0.00
Roller	4.6	0.8	0.00	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	0.00	3.80
950/960 Loader	4.3	0.3	0.00	2.37	2.37	2.37	2.37	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	0.00	0.00
Cat D6 Dozer	5.2	0.4	2.18	2.18	2.18	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
Dump Truck	4.6	0.4	1.68	1.68	1.68	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
Grader	4.6	0.3	1.27	1.27	1.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.27	1.27	1.27	0.00	0.00
Fusion Machine	5	0.0	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
Asphalt Paver	4.7	0.8	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	3.88
Paving Equipment	4.7	0.8	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	3.88
Total			9.8	17.4	17.4	12.3	13.3	11.4	11.4	11.4	11.4	11.4	10.3	11.6	10.9	10.9	4.7	16.2
			56%	100%	100%	71%	77%	66%	66%	66%	66%	66%	60%	12 67%	13 63%	12 63%	11 27%	11 93%

APPENDIX 1C

Emissions and Operating Parameters

Table 1C.1

Pio Pico Energy Center

Emissions and Operating Parameters for Gas Turbine

Case	1) Hot Peak	2) Avg Peak	3) Cold Peak	4) Hot Low	5) Avg Low	6) Cold Low
CTG Gross Power, MW	100	100	100	100	100	100
Ambient Temp, F	110	63	30	122	63	30
Turbine Load, %	100%	100%	100%	50%	50%	50%
CTG Heat Input, MMBTU/Hr (HHV)	852	903	890	653	546	542
Stack Flow, lb/hr	1,598,692	1,691,263	1,730,193	1,312,293	1,158,831	1,168,649
Stack Flow, acfm	877,825	913,717	909,632	733,309	646,428	645,580
Stack Flw, dscfm	320,354	340,311	349,912	263,898	236,320	238,986
Stack Temp, F	802	785	754	825	831	820
Stack Exhaust, vol %						
O2 (dry)	13.07%	13.08%	13.40%	13.60%	14.10%	14.22%
CO2 (dry)	4.50%	4.49%	4.31%	4.20%	3.92%	3.85%
H2O	11.43%	10.86%	10.23%	11.06%	9.22%	8.85%
Emissions						
NOx, ppmvd @ 15% O2	2.5	2.5	2.5	2.5	2.5	2.5
NOx, lb/hr	7.72	8.18	8.07	5.92	4.94	4.92
NOx, lb/MMBtu	0.0091	0.0091	0.0091	0.0091	0.0091	0.0091
SO2, ppmvd @ 15% O2	0.4	0.4	0.4	0.4	0.4	0.4
SO2, lb/hr short-term)	1.79	1.90	1.87	1.38	1.15	1.14
SO2, lb/MMBtu (short-term)	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021
SO2, lb/hr (long-term)	0.60	0.63	0.62	0.46	0.38	0.38
SO2, lb/MMBtu (long-term)	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007
CO, ppmvd @ 15% O2	4.0	4.0	4.0	4.0	4.0	4.0
CO, lb/hr	7.52	7.97	7.86	5.77	4.82	4.79
CO, lb/MMBtu	0.0088	0.0088	0.0088	0.0088	0.0088	0.0088
VOC, ppmvd @ 15% O2	2.0	2.0	2.0	2.0	2.0	2.0
VOC, lb/hr	2.15	2.28	2.25	1.65	1.38	1.37
VOC, lb/MMBtu	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025
PM10, gr/dscf	0.0020	0.0019	0.0018	0.0024	0.0027	0.0027
PM10, lb/hr	5.50	5.50	5.50	5.50	5.50	5.50
PM10, lb/MMBtu	0.0065	0.0061	0.0062	0.0084	0.0101	0.0101
NH3, ppmvd @ 15% O2	5.0	5.0	5.0	5.0	5.0	5.0
NH3, lb/hr	5.71	6.05	5.96	4.38	3.66	3.63

Table 1C.2
Calculation of Wet SAC Emissions
Pio Pico Energy Center

Typical Worst-Case Design Parameters		
	Per Cell	Total
Water Flow Rate, 10E6 lbm/hr	0.980	11.755
Water Flow Rate, gal/min	1960.000	23520.000
Drift Rate, %	0.001	0.001
Drift, lbm water/hr	9.796	117.553
PM10 Emissions based on TDS Level		
TDS level, ppm	5600.000	5600.000
PM, lb/hr	0.055	0.658
PM, lb/day	1.317	15.799
PM, tpy	0.119	1.428
PM10, lb/hr	0.055	0.658
PM10, lb/day	1.317	15.799
PM10, tpy	0.119	1.428
PM2.5, lb/hr	0.055	0.658
PM2.5, lb/day	1.317	15.799
PM2.5, tpy	0.119	1.428
PM2.5, g/s	6.912E-03	8.295E-02
Based on 4337	hrs/yr	

Table 1C.3
Pio Pico Energy Center
Detailed Calculations for Maximum Hourly, Daily, and Annual Criteria Pollutant Emissions

Daily Emission Scenario		NOx	SOx	CO	VOC	PM10
Equipment	hrs/day	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
Gas Turbine, baseload (each)	16	8.18	1.90	7.97	2.28	5.5
Gas Turbine, shutdowns	4	12.68	1.90	53.51	5.81	5.5
Gas Turbine, startups	4	26.63	1.90	21.84	6.53	5.5

Annual Emission Scenario		NOx	SOx	CO	VOC	PM10
Equipment	hrs/yr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
Gas Turbine, baseload (each)	3335	8.18	0.63	7.97	2.28	5.5
Gas Turbine, shutdowns	500	12.68	0.63	53.51	5.81	5.5
Gas Turbine, startups	500	26.63	0.63	21.84	6.53	5.5

NOTE: Annual SO2 emissions based on 0.25 gr/100 scf

	NOx			SOx			CO			VOC			PM10		
	Max	Max	Total	Max	Max	Total	Max	Max	Total	Max	Max	Total	Max	Max	Total
Equipment	lb/hr	lb/day	tpy	lb/hr	lb/day	tpy	lb/hr	lb/day	tpy	lb/hr	lb/day	tpy	lb/hr	lb/day	tpy
Gas Turbine 1	26.6	288.1	23.5	1.9	45.6	1.4	53.5	428.9	32.1	6.5	85.9	6.9	5.5	132.0	11.92
Gas Turbine 2	26.6	288.1	23.5	1.9	45.6	1.4	53.5	428.9	32.1	6.5	85.9	6.9	5.5	132.0	11.92
Gas Turbine 3	26.6	288.1	23.5	1.9	45.6	1.4	53.5	428.9	32.1	6.5	85.9	6.9	5.5	132.0	11.92
Cooling Tower	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	15.8	1.4
Total	79.9 lb/hr	864.3 lb/day	70.4 tpy	5.7 lb/hr	136.8 lb/day	4.1 tpy	160.5 lb/hr	1286.6 lb/day	96.4 tpy	19.6 lb/hr	257.7 lb/day	20.7 tpy	17.2 lb/hr	411.8 lb/day	36.2 tpy

Table 1C.4
Startup Emissions
Pio Pico Energy Center
Maximum Hour Emissions

	0-30 minutes	31-60 minutes	lb/hr
NOx, lbs	22.54	4.09	26.63
CO, lbs	17.86	3.98	21.84
VOC, lbs	4.67	1.14	5.81

Table 1C.5
Shutdown Emissions
Pio Pico Energy Center
Maximum Hour Emissions

	10-49 minutes	50-60 minutes	lb/hr
NOx, lbs	6.68	6.00	12.68
CO, lbs	6.51	47.00	53.51
VOC, lbs	1.86	4.67	6.53

Table 1C.6
Commissioning Emissions--Maximum Hour Emissions
Pio Pico Energy Center

	NOx	**CO**	**SO2**	**PM10**
lb/hr	50	75	0.63	5.5
g/s	6.30	9.45	0.08	0.69

Table 1C.7
Greenhouse Gas Emission Calculations: Project Operations

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
Turbine 1	100.0	4337	3,914,556	433,700	206,963	3.52	0.39	0.00	0.477	8.12E-06	9.03E-07
Turbine 2	100.0	4337	3,914,556	433,700	206,963	3.52	0.39	0.00	0.477	8.12E-06	9.03E-07
Turbine 3	100.0	4337	3,914,556	433,700	206,963	3.52	0.39	0.00	0.477	8.12E-06	9.03E-07
Total	--	--	11,743,669	1,301,100	620,888	11	1	0	0.477	8.12E-06	9.03E-07
CO2eq					620,888	222	364	0			
							TOTAL	621,474			

Natural Gas GHG Emission Rates (Note 1)

	Emission Factors, kg/MMBtu			
	CO2 (2)	CH4 (3)	N2O (3)	SF6
Natural Gas	52.870	9.00E-04	1.00E-04	n/a
Global Warming Potential (4)	1	21	310	23,900

Notes:
1. Calculation methods and emission factors from ARB, "Regulation for the Mandatory Reporting of Greenhouse Gas Emissions," December 2007
2. Ibid, Appendix A, Table 4; heat content 1000 to 1025 Btu/scf.
3. Ibid, Appendix A, Table 6.
4. Ibid, Appendix A, Table 2.

APPENDIX 1D

Modeling Analysis

APPENDIX 1D

Modeling Analysis

Dispersion modeling was conducted following the modeling protocol presented in Appendix 1H. The analysis followed the protocol with the following exceptions:

- Under guidance from the District, in-stack NO/NOx ratios of 0.13 (normal operations) and 0.24 (Commissioning, startup, and other situations where SCR is not fully operational) were used instead of 0.10, as proposed in the protocol. The District's recommendation for normal operations is based on source tests of four natural-gas-fired LM6000PC SPRINT turbines equipped with water injection, SCR, and oxidation catalysts. These appear to be the closest analogue to the LMS100 proposed for Pio Pico (i.e., aeroderivative, simple cycle, diffusion flame combustors, same NOx controls, oxidation catalysts, and interstage cooling—albeit with water injection for the SPRINTs). The value is an average over the four turbines (rounded up) of the average NO_2/NOx ratio for each turbine. The average NO_2/NOx ratios for the four turbines were 0.0393 (2 tests), 0.0603 (2 tests), 0.185 (1 test), and 0.205 (1 test), respectively.

  For situations when the SCR is not operating, the ratio is based on source tests of 11 natural-gas-fired GE Frame 5 turbines. These turbines all have water injection but no other NOx controls and no oxidation catalyst. The NO_2/NOx ratio for these turbines ranges from about 0.18 to 0.285 (averaged over 7-10 source tests of each turbine).

Electronic modeling and meteorological data files are provided on a separate CD.

Table 1D.1

Screening Modeling Inputs

Pio Pico Energy Center

Operating Mode	Ambient Temp deg F	Stack height feet	Stack Diam feet	Stack flow wacfm	Stack Vel ft/sec	Stack Temp deg F	Stack Height meters	Stack Diam Meters	Stack flow m3/sec	Stack Vel m/sec	Stack Temp deg K
Startup/shutdown	30	100	14.5	645,580	65.16	820	30.48	4.4196	304.72	19.86	711.2
Hot Peak	110	100	14.5	877,825	88.60	802	30.48	4.4196	414.34	27.01	700.9
Avg Peak	63	100	14.5	913,717	92.22	785	30.48	4.4196	431.28	28.11	691.2
Cold Peak	30	100	14.5	909,632	91.81	754	30.48	4.4196	429.36	27.98	674.0
Hot Low	122	100	14.5	733,309	74.01	825	30.48	4.4196	346.13	22.56	713.8
Avg Low	63	100	14.5	646,428	65.24	831	30.48	4.4196	305.12	19.89	717.2
Cold Low	30	100	14.5	645,580	65.16	820	30.48	4.4196	304.72	19.86	711.2

Operating Mode	NOx lb/hr	PM10/ PM2.5 lb/hr	NOx g/sec	PM10/ PM2.5 g/sec
Startup/Shutdown	26.63		3.36	
Hot Peak	7.72	5.50	0.97	0.69
Avg Peak	8.18	5.50	1.03	0.69
Cold Peak	8.07	5.50	1.02	0.69
Hot Low	5.92	5.50	0.75	0.69
Avg Low	4.94	5.50	0.62	0.69
Cold Low	4.92	5.50	0.62	0.69

Table 1D.2

Startup Modeling Inputs

Pio Pico Energy Center

Case	Amb Temp	Stack height	Stack Diam	Stack flow	Stack Vel	Stack Temp	Stack Height	Stack Diam	Stack flow	Stack Vel	Stack Temp
	deg F	feet	feet	wacfm	ft/sec	deg F	meters	meters	m3/sec	m/sec	deg K
Cold Low	30	100	14.5	645,580	65.16	820	30.48	4.42	304.72	19.86	711.2

Table 1D.4

Pio Pico Energy Center

Operating Mode/Year	Conc. (ug/m3) NO2 1-hr	Conc. (ug/m3) PM10/PM2.5 24-hr	Conc. (ug/m3) NO2 Annual	Conc. (ug/m3) PM10/PM2.5 Annual
2008 Met Data				
Startup/shutdown	110.5	0.0	N/A	N/A
Hot Peak	25.7	1.3	0.25	0.18
Avg Peak	26.5	1.3	0.26	0.18
Cold Peak	**26.6**	1.3	0.26	0.18
Hot Low	22.3	1.5	0.23	0.22
Avg Low	20.4	1.7	0.22	0.25
Cold Low	20.4	1.7	0.22	0.25
2007 Met Data				
Startup/shutdown	98.1	0.0	N/A	N/A
Hot Peak	22.7	1.3	0.26	0.18
Avg Peak	23.4	1.3	0.27	0.18
Cold Peak	23.5	1.3	0.27	0.18
Hot Low	19.8	1.5	0.22	0.20
Avg Low	18.1	1.6	0.20	0.23
Cold Low	18.1	1.6	0.20	0.23
2006 Met Data				
Startup/shutdown	110.2	0.0	N/A	N/A
Hot Peak	24.8	1.9	0.29	0.21
Avg Peak	25.8	1.9	0.30	0.20
Cold Peak	25.8	1.9	**0.30**	0.21
Hot Low	21.2	2.3	0.25	0.23
Avg Low	20.3	2.6	0.23	0.26
Cold Low	20.3	**2.6**	0.23	**0.26**

Table 1D.5
Fumigation Modeling
Pio Pico Energy Center

Emission Rates Operating Mode	NOx lb/hr	PM10/PM2.5 lb/hr		NOx g/sec	PM10/PM2.5 g/sec
Startup/Shutdown	26.63			3.36	
Hot Peak	7.72	5.50		0.97	0.69
Avg Peak	8.18	5.50		1.03	0.69
Cold Peak	8.07	5.50		1.02	0.69
Hot Low	5.92	5.50		0.75	0.69
Avg Low	4.94	5.50		0.62	0.69
Cold Low	4.92	5.50		0.62	0.69

SCREEN3 Results SimpleTerrain		Unit Impacts	Distance to Max (m)
Startup/shutdown		0.5907	1197
Hot Peak		0.5867	1198
Avg Peak		0.5703	1206
Cold Peak		0.5582	1214
Hot Low		0.6321	1234
Avg Low		0.6572	1220
Cold Low		0.6359	1232

Inversion Breakup Results		Unit Impacts	Distance to Max (m)
Startup/shutdown		0.8536	21294
Hot Peak		0.7362	23738
Avg Peak		0.7313	23856
Cold Peak		0.7532	23343
Hot Low		0.8247	21840
Avg Low		0.9149	20236
Cold Low		0.9341	19931

Appropriate 1-hr unit impacts to use for longer averaging periods - Inversion Breakup Fumigation

		1-hr unit	24-hr unit
Startup/shutdown		0.8536	0.2429
Hot Peak		0.7362	0.2384
Avg Peak		0.7313	0.2321
Cold Peak		0.7532	0.2282
Hot Low		0.8247	0.2577
Avg Low		0.9149	0.2693
Cold Low		0.9341	0.2618

Inversion Fumigation impacts		NOx 1 hour	PM10/PM2.5 24 hour
Startup/shutdown		2.86	0.00
Hot Peak		0.72	0.17
Avg Peak		0.75	0.16
Cold Peak		0.77	0.16
Hot Low		0.62	0.18
Avg Low		0.57	0.19
Cold Low		0.58	0.18

Table 1D.6

WSAC Modeling Parameters (per cell)

Averaging Time	Amb Temp	Stack height	Stack Diam	Stack flow	Stack Vel	Stack Temp	Stack Height	Stack Diam	Stack flow	Stack Vel	Stack Temp	Emission, $PM_{2.5}$ (per cell)
	deg F	feet	feet	wacfm	ft/sec	deg F	meters	meters	m3/sec	m/sec	deg K	g/sec
Short term	86	22	13	268,650	33.73	86	6.7056	3.9624	126.81	10.28	303.2	6.912E-03
Annual	86	22	13	268,650	33.73	86	6.7056	3.9624	126.81	10.28	303.2	3.486E-03

Figure 1D.1
Layout of the Modeling Receptor Grids

Figure 1D.2
Layout of the Modeling Receptor Grids – Detail

APPENDIX 1E

Evaluation of Best Available Control Technology (BACT)

APPENDIX 1E

Evaluation of Best Available Control Technology

PPEC is required to use best available control technology (BACT) on the combustion turbine generators (CTGs) and the cooling system for regulated pollutants, in accordance with the requirements of District rules and the federal Prevention of Significant Deterioration (PSD) regulations. For sources subject to PSD, BACT is defined in 40 CFR 52.21(j) as:

> "~~a~~n emissions limitation…based on the maximum degree of reduction for each pollutant subject to regulation under the Clean Air Act which would be emitted from any proposed major stationary source or major modification which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant…"

The regulated pollutants for which the federal PSD BACT requirement is applicable are nitrogen oxides (NOx), fine particulate matter ($PM_{2.5}$), particulate matter with nominal aerodynamic diameter less than or equal to 10 microns (PM_{10}), and greenhouse gases (GHG). 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

EPA has outlined the process it generally uses to do this case-by-case analysis (referred to as a "~~t~~op-down" BACT analysis) in a June 13, 1989 memorandum. The top-down BACT analysis is a well-established procedure that EPA's Environmental Appeals Board (EAB) has consistently followed in adjudicating PSD permit appeals[1].

In brief, under the top-down process, all available control technologies are ranked in descending order of control effectiveness. The PSD applicant first examines the most stringent technology. That technology is established as BACT unless it is demonstrated that technical considerations, or energy, environmental, or economic impacts justify a conclusion that the most stringent technology is not achievable for the case at hand. If the most stringent technology is eliminated, then the next most stringent option is evaluated until BACT is determined. The top-down BACT analysis is a case-by-case exercise for the particular source under evaluation. The five steps involved in a top-down BACT evaluation are:

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

[1] See, e.g., In re: Knauf, 8 E.A.D. 121, 129-31 (EAB 1999); In re: Maui Electric, 8 E.A.D. 1, 5-6 (EAB 1998).

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, USEPA 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 CTGs: Normal Operations

NOx Emissions

Step 1 – Identify All Possible Control Technologies

The emissions unit for which BACT is being considered is a nominal 100 MW gas turbine operating in simple cycle.

Potential control technologies were identified by searching the following sources for determinations pertaining to combustion gas turbines:

- South Coast Air Quality Management District (SCAQMD) BACT Guidelines;
- San Joaquin Valley Air Pollution Control District (SJVAPCD) BACT Clearinghouse;
- Bay Area Air Quality Management District (BAAQMD) BACT Guidelines;
- USEPA Reasonably Available Control Technology (RACT)/BACT/ Lowest Achievable Emission Rate (LAER) Clearinghouse;
- Other districts' and states' BACT Guidelines; and
- BACT/LAER requirements in New Source Review permits issued by District[2] or other air pollution control agency.

Relevant BACT determinations contained in various clearinghouses are presented in Tables 1E.1 through 1E.3. California Air Resources Board's BACT guidelines for power plants are presented in Table 1E.4

[2] Any Air Quality Management District or Air Pollution Control District in California.

TABLE 1E.1

Simple Cycle Gas Turbine BACT Determinations (EPA RBLC Clearinghouse}

Facility/Location	Date Permit Issued	Equipment/Rating	NOx 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
Rawhide Energy Station Larimer Co., CA	June 2009	GE Frame 7FA 1 turbine, 150 MW total	9.0 ppm Dry low-Nox burners
TEC/Polk Power Energy Station Polk Co., FL	October 2007	Unspecified 2 turbines, 330 MW total	9.0 ppm Dry low-Nox burners

TABLE 1E.2

Simple Cycle Gas Turbine BACT BACT Determinations (CARB BACT Clearinghouse)

Facility/District	Permit No./Date	Equipment/Rating	NOx 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
Indigo Energy Facility Los Angeles Co., CA	July 2001	LM6000 (Enhanced Sprint) 1 turbine, 45 MW total	5.0 ppm SCR
El Colton, LLC San Bernardino Co., CA	January 2003	LM6000 (Enhanced Sprint) 1 turbine, 48.7 MW total	3.5 ppm SCR
Lambie Energy Center Solano Co., CA	December 2002	GE LM6000 Sprint PC 1 turbine, 49.9 MW total	2.5 ppm SCR
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

TABLE 1E.3

Simple Cycle Gas Turbine BACT BACT Determinations (District BACT Decisions Described in CEC Certificates)

Facility/District	Decision Date	Equipment/Rating	NOx 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
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
Orange Grove Energy, LLP	December 2008	GE LM6000 Sprint PC 2 turbines, 96 MW total	2.5 ppm Ultra-low NOx burners, water injection and SCR
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
Panoche Energy Project Fresno Co., CA	December 2007	GE LMS100 4 turbines, 400 MW total	2.5 ppm Water injection and SCR
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
Niland Power Plant Imperial County, CA	October 2006	GM LM6000 Sprint PC 2 turbines, 93 MW total	2.5 ppm Dry low-NOx burners and SCR

TABLE 1E.4 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)
PM_{10}	Fuel sulfur limit of 1.0 grains/100 scf

The following technologies for control of NOx have been identified:

- Low NOx burner design (e.g., dry low NOx (DLN) combustors)
- Water or steam injection
- Inlet air coolers
- 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).
- Selective Non-Catalytic Reduction (SNCR) capable of continuously complying with a limit of 4.5 ppmvd @15% O_2 (1-hour average)Alternative Basic Equipment:
    - Renewable Energy Source (e.g. Solar, Wind, etc.)

It should be noted that the use of renewable energy in lieu of a simple-cycle gas turbine would ~~"re~~define 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. Finally, one of the fundamental objectives of the proposed PPEC project is to provide firming capacity for renewable energy facilities, making the use of renewable energy for the project fundamentally incompatible with the project objective. Nevertheless, these technologies are feasible, and the technical feasibility of renewable energy sources for this specific application will be considered in Step 2.

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 1E.5. The most stringent NOx limit in these recent BACT determinations is a 2.5 ppm[3] limit averaged over a 1-hour averaging period, excluding startups and shutdowns. This level is achieved using water injection combustors and SCR.

[3] All turbine/HRSG exhaust emissions concentrations shown are by volume, dry corrected to 15% O_2.

EMx (formerly SCONOx) is a NOx reduction system distributed by EmeraChem. 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 not use ammonia as a reagent. EMx has yet to be demonstrated in practice on a combustion turbine larger than 50 MW. The EMx process has been demonstrated in practice on much 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 LMS100 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, in combination with water injection, 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 water-injected simple cycle turbines in peaking service.

TABLE 1E.5

Recent NOx BACT Determinations for Simple-Cycle Combustion Turbines[1]

Facility	District	NOx Limit[2]	Averaging Prd	Control Method Used	Date Permit Issued	Source
TID Almond 2 Power Plant	SJVAPCD	2.5 ppmvd	1 hr	water injection and SCR	2/16/10	FDOC
El Cajon Energy, LLC	SCDAPCD	2.5 ppmvd	1 hr	water injection and SCR	12/11/09	ATC
Miramar Energy Facility II	SDCAPCD	2.5 ppmvd	3 hrs	water injection and SCR	11/4/08	ATC
Walnut Creek Energy Park	SCAQMD	2.5 ppmvd	1 hr	water injection and SCR	5/5/11	CEC Siting Dif. website
Orange Grove Energy, LLP	SCDAPCD	2.5 ppmvd	1 hr	water injection and SCR	12/4/08 (FDOC)	CEC Siting Div website
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
El 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:

1. 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.

2. All concentrations expressed as parts per million by volume dry, corrected to 15% O_2.

Alternative Basic Technology

Solar Thermal

Solar thermal facilities collect solar radiation, then heat a working fluid (water or a hydrocarbon liquid) to create steam to power a steam turbine generator. All solar thermal facilities require considerable land for the collection field and are best located in areas of high solar incident energy per unit area. In addition, power is only generated while the sun shines, so the units do not supply power at night or on cloudy days. The PPEC parcel is not sufficiently large to be feasible for a commercial solar power plant. Furthermore, a solar power plant would not meet the project's objective of providing firming capability for intermittent renewable resources such as solar and wind energy projects. For these reasons, a solar thermal power plant is rejected as BACT for this application.

Wind

Wind power facilities use a wind-driven rotor to turn a generator to generate electricity. Only limited sites in California have an adequate wind resource to allow for the economic construction and operation of large-scale wind generators. Most of these sites have already been developed or are remote from electric load centers and have little or no transmission access. Even in prime locations the wind does not blow continuously, so power is not always available. Due to the lack of availability of good sites, limited dependability, and relatively high cost, this technology is not feasible for this project. Furthermore, a wind power plant would not meet the project's objective of providing firming capability for intermittent renewable resources such as solar and wind energy projects. For these reasons, a wind power plant is rejected as BACT for this application.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

Both SCR and EMx technologies, each in combination with water injection, 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. SNCR, with a NOx emission level of 4.5 ppmvd, is ranked below these technologies. Dry low NOx burners, and water or steam injection alone, are expected to achieve control levels of 9 ppmvd, and are all ranked even lower.

Step 4 – Evaluate the Most Effective Control Technology Considering Environmental, Energy, and Cost Impacts

The applicant has proposed SCR, one of the two top-ranking technologies, as BACT for this project. 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 showed the acute health hazard index and a 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.

Further, in its evaluation of BACT for the Palmdale Hybrid Power Plant, EPA determined that:

> –EMx™ technology (formerly SCONOx) is a relatively newer technology that has yet to be demonstrated in practice on CTs larger than 50 MW. The manufacturer has stated that it is a scalable technology and that NOx guarantees of <1.5 ppm are available. As a result, EMx™ is considered technically feasible for this facility. However, it is unclear what NOx emission levels can actually be achieved by the technology.
>
> –We found only one BACT analysis that determined that EMx™/SCONOx was BACT for a large CT. However, the accompanying permit for the facility, Elk Hills Power in California, allowed the use of SCR or SCONOx (the former name of EMx™) to meet a permit limit of 2.5 ppm, and the actual technology that was installed in that case was SCR."[4]

The same concern applies to PPEC; as discussed below, the largest turbine to which EMx has been applied is a 45 MW unit, less than one-half the size of the PPEC turbines.

A second potential environmental impact that may result from the use of SCR involves the storage and transport of aqueous or anhydrous ammonia.[5] 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 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 and there is no steam source in the project design. This would require the installation of an auxiliary boiler, and would result in a new source of emissions as well as additional consumption of natural gas.

"Achieved in Practice" Criteria

While there are no formal "achieved in practice" criteria applicable to this project, the SCAQMD has established formal criteria for determining when emission control

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[4] EPA, "Fact Sheet and Ambient Air Quality Impact Report, Palmdale Hybrid Power Project" (August 2011)

[5] The Project proposes to use the less concentrated, safer aqueous form of ammonia.

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.

SCR Technology – 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 the table above. 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 water-injected, 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. Further, 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 water-injected, aeroderivative gas turbines. As shown in the table above, this criterion is satisfied for water-injected 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 water-injected, 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 water-injected 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 water-injected, simple-cycle aeroderivative gas turbines at NOx limits lower than 2.5 ppm.

EMx Technology – 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 the new 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[6] 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 in between plant shutdowns and scheduled catalyst cleanings. Redding Unit 6 started up on October 2011; there is 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.

- 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

[6] Available at http://camddataandmaps.epa.gov/gdm/index.cfm?fuseaction=prepackaged.results

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,[7] 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.

- 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 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 peaking service. Consequently, due to the lack of actual performance data, there is some question regarding the effectiveness of the EMx systems on simple-cycle, peaking 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, peaking 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, peaking 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.

Determine BACT/Present Conclusions

[7] 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.

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 SDAPCD 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 NO_x emission limit of 2.5 ppmvd @ 15% O_2 averaged over one hour. However, the use of EMx would require a source of supplemental steam, and this is considered a potentially significant energy, economic, and environmental impact. In addition, 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 peaking 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.

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 2 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, identify the use of natural gas (with a sulfur limit) as the primary fuel as ~~"a~~chieved in practice" for the control of PM_{10} for combustion gas turbines (see Table 1E.4).

The CARB's BACT guidance document for stationary gas turbines used for power plant configurations[8] 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.

[8] 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, 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.

In addition to use of clean fuels and good combustion practices, a number of available add-on PM_{10} and $PM_{2.5}$ technologies are available:

- Cyclones
- Wet scrubber
- Electrostatic precipitator (ESP)
- Baghouse/fabric filter

Step 2 – Eliminate Technologically Infeasible Options

As discussed above, solar, wind and other renewable energy alternatives are not considered technologically feasible for this application.

All of the control technologies identified are technically feasible except for cyclones (including multiclones). Although cyclones have been identified as being capable of marginal $PM_{2.5}$ control, the low grain loading makes them technically infeasible for this application. Cyclones are generally used in high dust applications where a majority of the particulate emissions are filterable emissions. In contrast, the majority of emissions from the CTs will be condensable particulate matter.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

Add-on PM controls have not been applied to combustion turbine. This is because the inherently low PM emissions that result from combustion of clean natural gas make add-on controls prohibitively expensive. EPA recently evaluated PM control technologies for application of add-on control technologies for combustion turbines at the Palmdale Hybrid Power Plant.[9] EPA determined that add-on control technologies, while technically feasible and capable of higher control effectiveness than the baseline case, had never been applied to combustion turbines, and were not cost effective for that project.

A $PM_{10}/PM_{2.5}$ control effectiveness of 90% is assumed for a wet scrubber. A conservative control $PM_{10}/PM_{2.5}$ efficiency of 99% has been assumed for baghouses and ESPs.

The available add-on control technologies are ranked according to control effectiveness in 1E.6.

[9] EPA, *Fact Sheet and Ambient Air Quality Impact Report, Palmdale Hybrid Power Project* (August 2011).

TABLE 1E.6

PM Control Technologies Ranked by Control Effectiveness

PM Control Technology	Control Efficiency
ESP/Baghouse	99%
Wet Scrubber	90%
Baseline (clean fuel)	--

Step 4 – Evaluate the Most Effective Control Technology Considering Environmental, Energy, and Cost Impacts

Costs of add-on controls have been estimated using information provided in *Controlling Fine PM*.[10] This reference provides cost ranges for capital costs and operating costs for each control technology. A simple screening estimate of the cost effectiveness of each control technology can be made using the low end of each range. This approach is conservative (i.e., it estimates a conservatively low cost) because the lowest end of the range is used, and the 2006 costs have not been adjusted for inflation. A summary of this analysis is provided in 1E.7. The amount of $PM_{2.5}$ removed is based on the annual emissions from each turbine and the assumed control efficiency in 1E.6.

With cost-effectiveness values ranging between $310,000 and $440,000 per ton of $PM_{2.5}$ removed, add-on controls are considered cost-prohibitive for PPEC.

[10] STAPPA/ALAPCO, *Controlling Fine Particulate Matter Undre the Clean Air Act: A Menu of Options,* (March 2006)

TABLE 1E.7
PM Control Technologies Costs
(Per Turbine)

	Dry ESP	Baghouse (pulse-jet)	Wet Scrubber (venturi)
Flowrate (ft^3/min)	915,000	915,000	915,000
Capital Costs ($/scfm)	$10	$6	$2.50
Capital Costs ($)	$9,150,000	$5,490,000	$2,287,500
Cost Recovery Factor	0.11	0.11	0.11
Annualized Capital Costs ($/yr)	$1,006,500	$603,900	$251,625
O&M Costs ($/scfm)	$3	$5	$4.40
O&M costs ($/yr)	$2,745,000	$4,575,000	$4,026,000
Total Annualized Cost ($/yr)	$3,751,500	$5,178,900	$4,277,625
Removal Efficiency	99%	99%	90%
Tons of $PM_{2.5}$ Removed (TPY)	11.80	11.80	10.73
Cost Effectiveness ($/ton removed)	$317,902	$438,860	$398,735

Note:
Cost information from STAPPA/ALAPCO, *Controlling Fine Particulate Matter Undre the Clean Air Act: A Menu of Options*, (March 2006)

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 5.5 lbs/hr.

Greenhouse Gases (GHG)

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 suggests that lower-emitting process/practices/designs that do not achieve

[11] EPA, *PSD and Title V Permitting Guidance for Greenhouse Gases*, November 2010, p. 33.

[12] EPA, *PSD and Title V Permitting Guidance for Greenhouse Gases*, November 2010, p. 27.

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 ~~"a~~vailable" for PPEC.

- Renewable energy technology (solar or wind)
- Alternative generating technologies
- Alternative fuels
- Energy efficiency improvements
- Carbon capture and storage.

Step 2 -- Eliminate Technologically Infeasible Options

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 ~~"a~~vailable" 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.

Renewable Energy Technology

Alternative Basic Equipment, including renewable energy sources such as solar and wind, has also been identified as a technology for the control of GHG emissions. Such alternative basic equipment was already discussed above (Step 2 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.

Nuclear Generating Technology

Although nuclear generation has essentially no greenhouse gas emissions, this technology is not considered technologically feasible for this application. To be responsive to the requirements of the RFO, the project must (1) be online by 2014, and (2) be a peaking technology, able to start up and shut down quickly and often. Because of the extensive licensing requirements for nuclear generating technology, it would not be possible to license and construct a nuclear power plant in time to meet the 2014 online date. In addition, nuclear generating units are not fast-start units. For both of these reasons, nuclear generating technology would not meet the fundamental objectives of the proposed project.

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 peaking applications such as that proposed project, so can be considered technologically feasible for this application. However, boilers have very high thermal inertia, so are not quick-starting or fast ramping. Boiler technology is generally used for

baseload power and not for peaking 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 now 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. Therefore, combined cycle gas turbine technology is potentially technologically feasible for the proposed project.

Alternative Fuels

Potential alternative fuels include coal, oil, hydrogen, and a variety of biofuels. Coal and oil have higher carbon contents than natural gas, and hence would not result in lower carbon emissions. Hydrogen fuel, and liquid and gasous biofuels, are not available in quantities sufficient to serve the project. Solid 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. Although gaseous biofuel could potentially be used as an alternative to natural gas for this project from a technological perspective, SDG&E has specified natural gas as the fuel source in its RFO. Requiring the use of a different fuel would not be compatible with the purpose of the project, which is to respond to the RFO. Therefore, there are no alternative fuels that are considered technologically feasible without redefining the project.

Energy Efficiency Improvements

There are two potential applications of energy efficiency as potential BACT for the proposed project: (1) demand-side management (DSM) and similar electric load reduction programs to minimize or eliminate the need for the proposed project altogether; and (2) utilizing the most efficient generating technology that meets the objectives of the project. As discussed above, the project is being proposed to meet a request from the utility for peaking facilities; DSM programs are a separate component of the utility's system management effort and therefore DSM is not an alternative to this project. Utilization of the most efficient generating technology that meets the objects of the project is technologically feasible.

Carbon Capture and Storage (CCS)

CCS technology may be considered to be ~~"a~~vailable," in the sense that commercial facilities have been built on a scale comparable to PPEC (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 PPEC.)

However, the technology cannot yet be considered ~~"a~~pplicable." The Interagency Task Force on Carbon Capture and Storage (ITF) found that

> ~~"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

[13] Interagency Task Force on Carbon Capture and Storage, *Report of the Interagency Task Force on Carbon Capture and Storage*¸ August 2010. p. 28.

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 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. The Department of Energy expects commercial deployment in 2025.[15] Because the proposed project must go online by 2014, CCS does not appear to be commercially available for this application.

Step 3. Rank remaining control technologies.

Absent elimination of CCS as a potential control technology, CO_2 and other GHG emissions are a direct function of the amount of natural gas fuel burned. GHG emissions will be 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 1E.8.

TABLE 1E.8
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
Nuclear generation	n/a	No
Biomass and other biofuels	n/a	No
Demand-side management	n/a	No
CCS	n/a	No
Combined-cycle gas turbines	~7000 to 8000 Btu/kWh[1,2,3]	Yes
Reciprocating IC engines	~7500 Btu/kWh[4]	Yes
Simple-cycle gas turbines	~8700 to 10,000 Btu/kWh[1,2,3]	Yes
Boilers	>10,000 Btu/kWh[1,2,3]	No

Sources:
1. CEC FSA, Avenal Project. http://www.energy.ca.gov/sitingcases/avenal/index.html
2. CEC FSA, TIC Almond 2 Power Plant Project. http://www.energy.ca.gov/sitingcases/almond/index.html
3. CEC FSA, Carlsbad Energy Center Project. http://www.energy.ca.gov/sitingcases/carlsbad/index.html
4. 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

[14] Id.

[15] 73 FR 44370

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.

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. However, combined cycle gas turbines require heat recovery steam generators and steam turbines, which greatly increase the cost of a generating facility on a dollar per megawatt basis. When a facility is built to operate as a base load plant with a high capacity factor, the additional capital cost incurred can be offset by the reduced operating costs that result from more efficient fuel use. However, the proposed project will operate as a peaking plant with an expected capacity factor of not more than approximately 50%. Therefore, the additional cost imposed for a combined cycle plant could not be recovered and would make the project cost uncompetitive with respect to the RFO to which it responded. In addition, conventional combined cycle power plants have greater thermal inertia because of the additional equipment downstream of the gas turbine, so generally take longer to start up than simple cycle gas turbines. Although gas turbine vendors have developed fast-start gas turbine technology that allows some new combined cycle units to come online in less than 30 minutes, only simple-cycle turbines are proven to provide the multiple fast startups required as an objective of the project.

Further, the fast-start combined-cycle technology is available only on industrial turbines that are much larger than the 100 MW increment identified for the PPEC: the 300 MW Siemens SCC6-5000F and GE 7FA Rapid Response combined cycle units. A larger-capacity unit would be operated at less than optimum (full) output more frequently than a smaller-capacity turbine, and since gas turbine efficiency drops rapidly at less than full load, this mode of operation would likely reduce the overall efficiency of the combined-cycle units to below that of the proposed simple-cycle gas turbines. For the same reason, a single 300 MW unit does not have the same turndown ability as three 100 MW turbines (i.e., a practical operating range of 150-300 MW for the combined cycle unit vs. a practical operating range of 50-300 MW for the simple cycle facility). The use of a single 300 MW unit would therefore not provide the load-following capabilities required as an objective of the project.

Once-through steam generators (OTSG) can be used in place of conventional heat recovery steam generators in a combined-cycle plant to reduce startup time and increase overall plant efficiency. However, in a recent evaluation of this technology as an alternative to simple-cycle turbine technology, the CEC staff determined that under some operating scenarios, emissions of some pollutants would be higher with an OTSG-

equipped project than without. Further, even with the faster startups possible with OTSG technology, it still takes some time for the steam side to warm up and be available to produce power. This means that during the period when the steam side is warming up, there is no difference between a simple cycle plant and a once-through combined cycle plant.[16] Therefore, for peaking/firming plants that will undergo multiple startups, most of the time the steam side would not be used so would have no actual beneficial impact on project efficiency. For these reasons, and because inclusion of OTSGs in the project design would greatly increase project cost for essentially no benefit, the use of combined cycle technology with OTSG is not considered BACT for the project.

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.[17] The 300 MW size of the proposed project would require over 30 of these engines, which would result in a far more complex and expensive plant and control system. Further, BACT for NOx from engines of this type was recently determined to be 5 ppm,[18] 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[19] found:

> ~~"~~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 [SO_x], nitrogen oxides [NO_x], 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

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[16] CEC, "Final Staff Assessment for the Canyon Power Plant: Alternatives," September 2009.

[17] http://powerservices.lakho.com/2009/05/19/largest-natural-gas-reciprocating-engine-plant

[18] Bay Area Air Qualtiy Management District, "Final Determination of Compliance, Eastshore Energy Center," (October 2007)

[19] EPA, "Report of the Interagency Task Force on Carbon Capture and Storage," 2010. http://www.epa.gov/climatechange/downloads/CCS-Task-Force-Report-2010.pdf

energy required to regenerate the amine solvent and compress the CO_2 to pipeline conditions would result in about a 30 percent energy penalty." (pp.29-30)

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."[20] 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 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 is 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 view the energy and emissions penalties, the cost and the lack of commercial availability, CCS is not considered BACT for the proposed project.

Energy Efficiency of Simple Cycle Turbines

Alternative machines that can meet the project's objectives are the LM6000 SPRINT, the SGT-800 and the FT8 TwinPac, which are aeroderivative machines adapted from General Electric, Siemens Power Generation and Pratt & Whitney aircraft engines, respectively. The General Electric LM6000 SPRINT gas turbine generator in a simple cycle configuration is nominally rated at 50 MW and 40 percent efficiency LHV at ISO conditions. The Pratt & Whitney FT8 TwinPac gas turbine generator in a simple cycle configuration is nominally rated at 51 MW and 37 percent efficiency LHV at ISO conditions. The Siemens SGT-800 gas turbine generator in a simple cycle configuration is nominally rated at 45 MW and 38 percent efficiency LHV at ISO conditions. These machines are compared with the LMS100 in Table 1E.9.

TABLE 1E.9
Ranking of Simple-Cycle Peaking Units by Heat Rate (ISO Conditions)

Machine	Generating Capacity (MW)	Heat Rate (BTU/kw-hr, LHV)
GE LMS100	103	7,815[1]
GE LM6000PC SPRINT	49.6	8,531[2]
Siemens SGT-800	47	9,096[3]
P & W FT8 TwinPac	51	9,269[4]

Sources:
1. GE, LMS100 Aeroderivative Gas Turbine, http://www.ge-energy.com/products_and_services/products/gas_turbines_aeroderivative/lms100.jsp
2. GE, LMS6000 SPRINT Aeroderivative Gas Turbine, http://www.ge-energy.com/products_and_services/products/gas_turbines_aeroderivative/lm6000_sprint_aeroderivative_gas_turbines.jsp
3. Siemens Gas Turbine SGT-800 http://www.energy.siemens.com/co/en/power-generation/gas-turbines/sgt-800.htm#content=Technical%20Data
4. Gas Turbines International, P&W FT8 Gas Turbine Power Plant Technical Specifications http://www.gti-power.com/pdf/FT8_Specs_Mar_2010.pdf

[20] IEA Energy Technology Essentials, December 2006. http://www.iea.org/techno/essentials.htm

As shown in Table 1E.9, the LMS100, which incorporates intercooling to promote enhanced energy efficiency, is the most efficient of the alternatives identified. The heat rate of the LMS100 is well below the range of heat rates shown in Table 1E.9 for other 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.

It should be noted that the heat rate is a nominal value, calculated at representative conditions. It is not a guaranteed performance level that can be achieved under all anticipated operating conditions. BACT for GHG, therefore, is selection of the appropriate technology, and not a specific heat rate.

BACT for the CTGs: Startup/Shutdown

Startup and shutdown periods are a normal part of the operation of simple-cycle power plants such as PPEC. 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)
- An EMx 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)
- General Electric OpFlex Startup NOx
- Operating practices to minimize the duration of startup and shutdown

Step 2 – Eliminate Technologically Infeasible Options

It is not technically feasible to use SCR or EMx to control NOx emissions when the equipment is outside the manufacturer's recommended operating temperature ranges. For SCR and oxidation catalyst this occurs during turbine startup or shutdown. Therefore, BACT is achieved by minimizing the time for startup and shutdown.

GE's OpFlex Startup NOx is not available for or applicable to simple-cycle gas turbines.

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 as follows:

- 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; and
- 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.

$PM_{10}/PM_{2.5}$ Emissions

Because PM and PM_{10} emissions result from the characteristics of the fuel burned and do not rely on any emissions control system, the BACT analysis and determination for PM_{10} and $PM_{2.5}$ emissions during normal operations are applicable during startup and shutdown as well.

Summary—BACT for Simple Cycle Combustion Turbines

Table 1E.10 summarizes the BACT determinations for the project turbines, based on the preceding analysis.

TABLE 1E.10

Proposed BACT Determinations for PPEC Simple-Cycle Gas Turbines

Pollutant	Proposed BACT Determination
Nitrogen Oxides	Water injection and SCR system, 2.5 ppmc[a], 1-hour average; no CCS
PM_{10}	Natural gas fuel, 5.5 PM_{10} lbs/hr
$PM_{2.5}$	Natural gas fuel, 5.5 $PM_{2.5}$ lbs/hr
Startup/Shutdown (all pollutants)	Best operating practices to minimize startup/shutdown times and emissions
GHGs	LMS100 simple-cycle gas turbine technology, good combustion practices

Note:

a. ppmc: parts per million by volume, corrected to 15% O_2

BACT for the Cooling System

Step 1 – Identify All Possible Control Technologies

The emissions source for which BACT is being considered is the partial dry-cooling system (PDCS), which is a closed-loop two-stage cooling system. In this system, the heat will be rejected using ambient air in a dry cooling system, followed by a closed-loop evaporative fluid cooler for additional cooling. This will reduce plant water consumption in two ways. First, the dry-cooling section will reduce the amount of heat that must be rejected in the closed-loop evaporative fluid cooler, which results in a corresponding reduction in the total amount of water evaporated during the cooling process. Second, the closed-loop evaporative fluid cooler will allow the contaminants in the evaporative

cooling water to be concentrated to a much greater extent than in a traditional open-loop cooling system because that water does not pass through the combustion turbine equipment.

The dry cooling portion of the cooling system has no air emissions. The evaporative fluid cooler portion of the cooling system will be a 7000 gallon per minute (gpm) fluid cooler. The fluid cooler uses mechanical, induced-draft technology in a closed circuit. In the fluid cooler, the process fluid to be cooled is pumped through coils and cooling water passes over the coils, cooling the process fluid by evaporation. Particulate emissions result from the wet cooling portion of the system.

Potential control technologies applicable to particulate emissions from the evaporative (wet) cooling portion of the cooling system were identified by searching the following sources for entries pertaining to cooling towers:

- SCAQMD BACT Guidelines;
- SJVAPCD BACT Clearinghouse;
- BAAQMD BACT Guidelines;
- USEPA RACT/BACT/LAER Clearinghouse;
- Other districts' and states' BACT Guidelines; and
- BACT/LAER requirements in New Source Review permits issued by AQMD or other agencies.

BACT determinations from the SCAQMD, SJVAPCD, BAAQMD, and USEPA are summarized in Table 1E.11.

TABLE 1E.11
Summary of PM_{10} BACT Clearinghouse Guidelines

Permitting Agency	Guideline	Operation	PM_{10} BACT for Cooling Towers
SCAQMD	None	N/A	N/A
SJVAPCD	8.3.10	Induced Draft Evaporative Cooling Tower	Cellular Type Drift Eliminator
BAAQMD	None	N/A	N/A
USEPA	RBLC Listings	≤10,000 gpm Cooling Towers	Drift Eliminators 0.001% Drift Rate

Cooling devices of the size range used in simple-cycle power plants are generally not subject to local district BACT requirements because their emission rates are usually below district BACT thresholds. Table 1E.12 summarizes information on evaporative coolers of the type proposed for use at PPEC that have recently been approved by the California Energy Commission (CEC) through the Application for Certification (AFC)

process; these controlled emission rates were approved by the indicated permitting authority. Recent BACT determinations for similarly sized cooling towers from the EPA RBLC listings are summarized in Table 1E.13.

TABLE 1E.12
PM_{10} Emission Rates for Small Cooling Towers in CEC Proceedings

Permitting Agency	Project	Permit Required?	Permit Date	Circulating Water Flow Rate	Drift Rate Limit
SCAQMD	Canyon Power Plant	yes	2010	7,740 gpm	0.001%
BAAQMD	SF Electric Reliability Project	no (exempt)	2006	3,912 gpm	0.001%
SJVAPCD	MID Ripon	no (exempt)	2004	3,218 gpm	0.001%

TABLE 1E.13
PM_{10} BACT Determinations for Small Cooling Towers From RBLC Database

Project	Permit # (Date)	Circulating Water Flow Rate	Drift Rate Limit
MGM Mirage	NV-0050 (Nov. 2009)	10,890 gpm	0.001%
Harrah's Operating Company	NV-0049 (Aug. 2009)	7,200 gpm	0.005%
Crescent City Power	LA-0192 (June 2005)	35,000 gpm	0.005%

BACT must be at least as stringent as what has been achieved in practice (AIP) for a category or class of source. Additionally, USEPA guidelines require that 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. In order to be considered, the candidate control technology must be technologically feasible for the application being reviewed. In order to be required as BACT, the candidate technology must be cost effective, considering energy, environmental, economic, and other costs.

Three possible alternate basic technologies were identified from background technical materials prepared during the rulemaking of USEPA's National Pollutant Discharge Elimination System (NPDES): "Regulations Addressing Cooling Water Intake Structures for New Facilities" (Federal Register 66:24, December 18, 2001). The NPDES regulation establishes national technology-based performance requirements applicable to the

location, design, construction, and capacity of cooling water intake structures at new facilities using once-through cooling. During the rulemaking process, USEPA also evaluated alternatives to once-through cooling, including recirculating wet cooling systems, dry cooling systems, and hybrid cooling systems.

Recirculating Wet Cooling Tower with High Efficiency Drift Eliminator

In conventional open-cycle recirculating wet cooling towers, cooling water that has been used to cool the condensers is pumped to the top of a recirculating cooling tower; as the heated water falls, it cools through an evaporative process and warm, moist air rises out of the tower, often creating a vapor plume. Approximately 80% of the heat transfer (cooling) occurs due to evaporation, and 20% of the heat transfer occurs due to convection. Therefore, wet cooling towers are more effective in areas of low relative humidity.

Evaporative Coolers

Evaporative fluid coolers isolate process fluid from cooling water and operate as a closed-loop system.

Dry Cooling Tower

Dry cooling systems (towers) use either a natural or a mechanical air draft to transfer heat from the condenser tubes to air. Their effectiveness is independent of relative humidity and purely a function of the ambient (dry-bulb) temperature. Therefore, dry cooling towers are more effective in areas of low ambient temperature.

Hybrid Cooling Tower (Plume-Abated Wet Cooling)

There are two types of hybrid wet-dry cooling towers. One type is essentially a wet cooling tower with an additional dry section installed on top that reduces visible plumes by heating the wet air from the wet section. This is done to reduce or eliminate the visible condensation plume.

Hybrid Cooling Tower (Spray-Enhanced Dry Cooling)

The second type of hybrid system is essentially a dry cooling tower that enhances heat transfer in the condenser tubes by spraying water on the outside of the tubes.

Once-Through Cooling

Once-through cooling systems eliminate the cooling tower entirely by drawing cooling water from a water source (such as a river or the ocean), using the water to cool the condensers, and then discharging the heated water, usually back to the original water source.

Step 2 – Eliminate Technologically Infeasible Options

The next step in the top-down BACT procedure is to eliminate technologically infeasible options.

Recirculating Wet Cooling Tower

Recirculating wet cooling towers are generally used for large, combined cycle projects because of the much larger volume of cooling water that must be cooled and condensed. However, this technology is available for smaller applications and is technologically feasible for the proposed project.

Evaporative Cooling

An evaporative fluid cooler with drift eliminator has been proposed as part of the cooling system for this project. However, the capacity of this evaporative fluid cooler is reduced by including a dry cooling section in the cooling system design for the project.

Dry Cooling

USEPA has adopted standards for new facilities that draw cooling water from waters of the U.S. The regulation established the best technology available for minimizing adverse environmental impacts associated with the use of cooling water intake structures.

As part of the rulemaking process, USEPA considered the technical issues, cost, and environmental impacts associated with replacing once-through cooling with recirculating cooling towers and dry cooling. USEPA rejected dry cooling as the best replacement technology due to all three of these factors. For the purposes of this BACT analysis, the technical issues are evaluated in this step.

The main technical issue associated with dry cooling towers for this application is the limited availability to provide adequate cooling under high-temperature conditions. The plant will use a PDCS in a closed-loop configuration that utilizes dry cooling but also requires additional cooling capacity. For the purposes of this analysis, dry cooling was eliminated as a potential BACT option for the second stage of the cooling system because enhanced cooling is required for the plant beyond what is already being provided by the dry cooling system.

Hybrid Cooling (Plume-Abated Wet Cooling Tower)

Hybrid wet-dry (plume abated) cooling towers employ both a wet section and dry section and reduce or eliminate the visible plumes associated with wet cooling towers. In general, a hybrid cooling tower is used only where a visible plume presents a threat to public safety by its interference with major infrastructure, such as airports, or in some cases if the plume will block prominent landscape features or scenic coastal areas.

Hybrid cooling towers offer only insignificant changes in PM, PM10, and PM2.5 emissions compared to wet cooling towers. After the warm, moist air passes through the drift eliminators of the wet section, it is mixed with warm dry air that passed through the dry section. This step speeds the evaporation that would normally occur after the plume was released. While most remaining liquid drift may be eliminated within the dry section of the cooling tower via evaporation, the particulate nuclei are not reduced or eliminated by any physical process and are exhausted through the top of the cooling tower.

Even though this option does not decrease PM emissions from the cooling tower, it also has not been deemed technologically infeasible as appropriate BACT for the PPEC cooling tower. Thus, the environmental and economic impacts of this option are discussed in the following steps.

Hybrid Cooling Tower (Spray-Enhanced Dry Cooling)

A spray-enhanced hybrid cooling tower works essentially as a dry cooling tower that enhances heat transfer in the condenser tubes by spraying water on the outside of the tubes. The addition of the evaporating water spray can help alleviate the technical issues associated with dry cooling. Increased cooling may allow for fewer, more efficient dry cooling cells to be installed, thus shrinking the plant footprint required for the cooling tower. However, it is not clear that this technology would provide adequate additional cooling that would eliminate the need for the evaporative fluid cooler. Therefore, this technology is not considered technologically feasible for the proposed project.

Once-Through Cooling

Once-through cooling involves the water withdrawn from rivers, streams, lakes, reservoirs, estuaries, oceans, or other waters. In general, once-through cooling is only technologically feasible when a large surface water body exists in immediate proximity to the power plant. Since this situation does not exist for the PPEC project, once through cooling has been deemed a technologically infeasible BACT option and will not be further evaluated.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

Partial Dry Cooling System

This technology results in the lowest PM emissions of the remaining three technologies, and is proposed by the applicant for use in this project.

The remaining issue is the drift rate limit that should be applied to the evaporative fluid cooling portion of the PDCS. Drift rates for similar projects, shown in Tables 1E.12 and 1E.13, range from 0.001% to 0.005%; no installations have been identified with drift rates below the proposed 0.001% level.

Drift rates of 0.0005% have been achieved for once-through and recirculating water towers. However, those facilities are much larger than the PPEC cooling towers, with much higher water recirculation rates. Because most of the cooling is accomplished in the dry cooling portion of the system, the proposed drift rate of 0.001% is equivalent to the lower drift rate for a system that relies entirely on wet cooling.

Recirculating Wet Cooling Tower

A recirculating wet cooling tower would have higher water requirements and would require additional water treatment than the proposed partial dry system that utilizes an evaporative fluid cooler. The increase in water use would, by itself, be a negative environmental impact. While the evaporative fluid cooler portion of the cooling system could be replaced by a recirculating wet cooling tower, additional water treatment would still be required. For this reason, wet cooling tower technology is not considered to be BACT for the proposed project.

Hybrid Cooling (Plume-Abated Wet Cooling)

A plume-abated wet cooling tower is no more effective in eliminating drift and particulate matter compared to a wet cooling tower, but carries some of the energy penalties

associated with dry cooling. For this reason, a plume-abated cooling tower is ranked lower than an evaporative fluid cooler for PM10 BACT purposes. Since this technology is less effective than the proposed technology, it is eliminated from consideration and no further analysis is necessary.

The remaining technologies were ranked according to PM_{10} reductions, as shown in Table 1E.14.

TABLE 1E.14
Environmental, Energy and Cost Impacts of Cooling System Alternatives

Equipment	Environmental	Energy	Cost	Ranking
Partial Dry Cooling System (PDCS) with Evaporative Fluid Cooling	Minimizes water use; minimizes water treatment requirements	Higher energy consumption than wet cooling alone	Higher cost than wet cooling alone	1
Recirculating Wet Cooling Tower with drift eliminators	Higher water use than dry cooling	Lowest energy consumption	Lowest cost	2
Hybrid Cooling (Plume-Abated Wet Cooling)	Higher water use than dry cooling	Higher energy consumption than wet cooling alone	Higher cost than wet cooling alone	3

Step 4 – Evaluation of Environmental, Energy, and Cost Impacts

Environmental, energy, and cost impacts are summarized in Table 1E.14.

Step 5 – Select BACT

Based upon the above information, BACT is use of a PDCS with evaporative fluid cooler and high-efficiency drift eliminator with a drift rate of 0.001% or less. The proposed cooling tower complies with this BACT level.

APPENDIX 1F

Recently Permitted Projects

The PSD cumulative impact analysis is designed to ensure that industrial facilities which 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.

In order to identify recent projects whose impacts may not be reflected in the ambient monitoring data, the District provided a list of recently permitted sources located in the zip codes around the project site (see Table 1F.1). The District has indicated that all of these projects will have emissions of less than 5 TPY of any pollutant. As a result, all of these facilities were deemed unlikely to have a potential to contribute to cumulative impacts, and were excluded from the cumulative impact analysis presented in Appendix 1I.

The District also provided a list of existing facilities with NOx or PM emissions greater than 5 TPY. This list is presented and discussed in Appendix 1I.

TABLE 1F.1
Permit Applications in San Diego Since January 1, 2004

App No.	Equip Descr	Issue Date		Address		City
976949	VAPOR DEGREASER	28-Apr-04	TOP BRASS CO	2731	VIA ORANGE WY #112	SPRING VALLEY
978687	EMERGENCY GENERATOR MODEL #50075 S/N 263377	06-Jan-04	SUNRISE DEVELOPEMENT INC	3302	BONITA RD	BONITA
978744	MARINE COATING ON SHIPS & SUBMARINES GRACO MODEL 243283 BG, BRUSH & ROLLER	19-May-04	Q E D SYSTEMS INC	1330	30TH ST #D	SAN DIEGO
978829	INSTALLATION OF NEW ODOR CONTROL SYSTEM TO AN EXISTING SEWER PUMP STATION	30-Mar-04	SD CITY DEPT OF METRO WASTEWATER	1800	BOUNDRY AV	SAN DIEGO
978838	INTERNAL COMBUSTION ENGINE MODEL 200I W/CATALYST SYSTEM	25-Feb-04	VERALLIANCE PROPERTIES INC	2300	BOSWELL RD	CHULA VISTA
978839	INTERNAL COMBUSTION ENGINE W/CATALYST SYSTEM MODEL 2001	25-Feb-04	VERALLIANCE PROPERTIES INC	2300	BOSWELL RD	CHULA VISTA
978902	EMERGENCY GENERATOR FORD MODEL ESG-642	09-Mar-04	TARGET STORE T1815	910	EASTLAKE PY	CHULA VISTA
979038	CONCRETE BLOCK MANUFACTURING PLANT	28-Feb-05	RCP BLOCK & BRICK INC	2480	BRITANNIA BL	SAN DIEGO
979101	3 GASOLINE & 2 DIESEL TANKS, 6 NEW SINGLE-HOSE MPD DISPENSERS W/ BLENDERS	23-Jun-04	LA CIMA OIL INC	8289	OTAY MESA RD	SAN DIEGO
979299	SOIL REMEDIATION	17-Feb-04	ATC ASSOCIATES INC	605	3RD AV	CHULA VISTA
979471	WOOD PARTS/PRODUCTS APPLICATION STATION	28-Sep-04	SD FURNITURE	3137	BEYER BL #C	SAN DIEGO
979477	TWO (2) BLEEKER BROS. MODEL F-12-7-10,10'L X 12'W X 6'10"H, PAINT SPRAY BOOTH	30-Jan-07	WOOD CRAFT CO	1520	CORPORATE CENTER DR	SAN DIEGO
980002	CONCRETE BATCH PLANT, DRY, TRANSIT MIXED	30-Sep-05	ROBERTSONS	7961	AIRWAY RD	SAN DIEGO
980013	MOBILE FUEL BARGE; CAPACITY OF 9,800 GAL OF DIESEL & 800 GAL OF GAS	06-May-04	MARINE GROUP LLC THE	997	G ST	CHULA VISTA
980026	GASOLINE SITE	15-Jun-05	EASTLAKE PETROLEUM LP	950	EASTLAKE PY	CHULA VISTA
980106	REPLACE EXISTING USTS RE-PIPE NEW PHASE 2 EVR PHASE 1 NEW DISPENSERS AND UNDER DISPENSER CONTAINMENT	12-Apr-04	GASCO SELF SERVE	899	3RD ST	CHULA VISTA
980156	INTERNAL COMBUSTION ENGINE - DETROIT DIESEL, MODEL #12V2000-R1237K36, S/N#0760606, 1120 HP	04-Mar-05	CHULA VISTA CITY OF POLICE STATION	315	4TH AV	CHULA VISTA
980216	IC ENGINE MODEL BF4M1013EC	28-Apr-04	PROFIL RESEARCH	855	THIRD AV	CHULA VISTA
980246	HEALEY ORVR PHASE 11 VAPOR RECOVERY SYSTEM 8 NOZZLES 3 GRADES	17-Jan-05	USA GASOLINE PROFIT CENTER #68121	1382	PALOMAR ST E	CHULA VISTA
980851	AUTOMOTIVE APPLICATION STATION	03-Mar-05	SUPERIOR AUTO BODY	363	E ST	CHULA VISTA
981018	BALANCE PHASE I & II VAPOR RECOVERY	29-Aug-05	CHEVRON #301124	2115	OLYMPIC PY	CHULA VISTA
981076	WOOD PARTS/PRODUCTS APPLICATION STATION	11-Mar-05	JEER MANUFACTURING	2311	BOSWELL RD #1	CHULA VISTA
981189	GASOLINE SERVICE SITE	16-Dec-05	JUST 4 FUN LLC	2535	OTAY CENTER DR	SAN DIEGO
981204	SOLVENT CLEANING PROCESS LINE: SOLVENT CLEANING <5 SQ FT FOLLOWED BY DRYING OPERATION	14-Jul-04	PARKER HANNIFIN INC	7664	PANASONIC WY	SAN DIEGO
981205	SOLVENT CLEANING PROCESS LINE: SOLVENT CLEANING >5 SQ FT FOLLOWED BY DRYING OPERATION	14-Jul-04	PARKER HANNIFIN INC	7664	PANASONIC WY	SAN DIEGO
981206	SOLVENT APPLICATION OPER: DETACHMENT OF RUBBER SEALERS FROM METAL PARTS	04-Apr-05	PARKER HANNIFIN INC	7664	PANASONIC WY	SAN DIEGO
981207	SOLVENT APPLICATION OPER: DETACHMENT OF RUBBER SEALERS FROM METAL PARTS	04-Apr-05	PARKER HANNIFIN INC	7664	PANASONIC WY	SAN DIEGO
981208	SOLVENT APPLICATION OPER: DETACHMENT OF RUBBER SEALERS FROM METAL PARTS	04-Apr-05	PARKER HANNIFIN INC	7664	PANASONIC WY	SAN DIEGO
981324	APPLICATION STATION HVLP SPRAY GUN ACCUSPRAY SERIES 10	12-Oct-04	OTAY MESA SALES	1596	RADAR RD	SAN DIEGO
981326	DEGREASER MODEL PL36-A SN ICR90-B4	15-Jul-04	CROWER CAMS & EQUIPMENT	6180	BUSINESS CENTER CT	SAN DIEGO
981327	DEGREASER MODEL PL36-A SN ICGF7	15-Jul-04	CROWER CAMS & EQUIPMENT	6180	BUSINESS CENTER CT	SAN DIEGO
981328	DEGREASER MODEL PL36-A SN ICGF7	15-Jul-04	CROWER CAMS & EQUIPMENT	6180	BUSINESS CENTER CT	SAN DIEGO
981329	DEGREASER MODEL PL36-A SN IATT7	15-Jul-04	CROWER CAMS & EQUIPMENT	6180	BUSINESS CENTER CT	SAN DIEGO
981330	DEGREASER MODEL PL36A SN ICR90-B4	15-Jul-04	CROWER CAMS & EQUIPMENT	6180	BUSINESS CENTER CT	SAN DIEGO

TABLE 1F.1 (cont'd)
Permit Applications in San Diego Since January 1, 2004

App No.	Equip Descr	Issue Date		Address		City
981475	GASOLINE SERVICE SITE	28-Sep-06	ATTISHA ARCO	765	E ST	CHULA VISTA
981531	RECYCLE CRUSHING PLANT MODEL 62040 SN 1181	19-Aug-05	RCP BLOCK & BRICK INC	2480	BRITANNIA BL	SAN DIEGO
981540	IC ENGINE MODEL 6081AF001 SN RC6081A154970	27-Dec-05	REYNOLDS COMMUNITIES	4655	DEL SOL BL	SAN DIEGO
981556	AUTOMOTIVE APPLICATION STATION	01-Nov-04	US BORDER PATROL	7682	POGO ROW	SAN DIEGO
981629	CONCRETE BATCH PLANT PO 980222 FROM PORTABLE TO STATIONARY	19-Aug-05	SUPERIOR READY MIX CONCRETE LP	6935	CACTUS CT	SAN DIEGO
981661	MARINE COATING OPERATION	19-Oct-06	PACIFIC YACHT REFITTERS INC	997	G ST	CHULA VISTA
981766	IC ENGINE MODEL 6068TF250	27-Mar-06	THE HOME DEPOT	725	PLAZA CT	CHULA VISTA
981873	GASOLINE SERVICE SITE	17-Nov-05	CHULA VISTA CITY OF FIRE STATION #7	1640	SANTA VENETIA ST	CHULA VISTA
981912	CENTRAL MIXED CONCRETE BATCH PLANT AND SILOS; REX MODEL 120DRP528	23-Nov-05	ASSOCIATED READY MIXED CONRETE INC	1696	CACTUS RD	SAN DIEGO
982042	SAND AND AGGREGATE BAGGING UNIT	10-May-05	RCP BLOCK & BRICK INC	2480	BRITANNIA BL	SAN DIEGO
982263	CUMMINS DIESEL ENGINE MODEL DGDA 170 HP RATING CARB CERT# U-R-002-0223	10-Mar-06	CITY OF CHULA VISTA PUBLIC WORKS	800	AGUA VISTA DR	CHULA VISTA
982471	500 GAL AST	01-Sep-05	BONITA GOLF CLUB	5540	SWEETWATER RD	BONITA
983125	SMALL COLD SOLVENT DIP TANKS/REMOTE RESERVOIR CLEANERS	21-Jun-05	US BORDER PATROL IMMIGRATION & NATURALIZATION SVCS	7685	POGO ROW	SAN DIEGO
983376	IC ENGINE, CATERPILLAR, S/N GZS00307, MODEL 3516B, DIESEL, 2847 HP	10-Mar-06	OTAY WATER DISTRICT	1230	EASTLAKE PY	CHULA VISTA
983720	TARPAULIN FUMIGATION USING METHYL BROMIDE	14-Apr-06	HARBOR PEST CONTROL	8515	AVENIDA DE LA FUENTE	SAN DIEGO
983937	PORTABLE ASBESTOS MASTIC REMOVAL APPLICATION STATION	29-Dec-05	CLANCY CONTRACTING SERVICES	825	HOLLISTER ST #M	SAN DIEGO
984040	I/C ENGINE - CATERPILLAR MODEL C-18 DITA; S/N WJH00262, 630 HP, DIESEL.	15-Jun-07	OTAY WATER DISTRICT	1502	WUESTE RD	CHULA VISTA
984092	MARINE COATING APPLICATION	03-May-07	Q E D SYSTEMS INC	1330	30TH ST #D	SAN DIEGO
984176	GASOLINE DISPENSING FACILITY	09-Sep-08	PILOT TRAVEL CENTERS LLC	1497	PIPER RANCH RD	SAN DIEGO
984293	SELF SERVE. GASOLINE DISPENSING FACILITY. 10,000 GALLON AST. AVIATION FUEL ONLY	02-Apr-07	FIRST FLIGHT CORP	6810	CURRAN ST	SAN DIEGO
984435	IC ENGINE GENERAL MODEL 0046267; S/N 4356149, 80HP, NATURAL GAS.	25-Aug-06	CUSTOMS AND BORDER PROTECTION (CBP)		ARNIE'S POINT	CHULA VISTA
985041	SPRAY BOOTH M&W MODEL MWTR431616.	10-Jul-07	WORK TRUCKS UNLIMITED	2500	SWEETWATER SPRINGS BL	SPRING VALLEY
985175	OLYMPIAN DIESEL ENGINE MODEL D60P2 S/N GABL001576 HP RATING 98.4	27-Jun-07	MISSION IMPRINTABLES	6060	BUSINESS CENTER CT #200	SAN DIEGO
985439	LINDUS MODEL PM60 DRY CLEANING MACHINE	09-Jul-07	SATURN CLEANERS	655	SATURN BL #E	SAN DIEGO
985469	ABRASIVE BLASTING POT/MACHINE MODEL 1-9 DEZ S/N 27040070 HP 9.39	16-Jun-08	CLANCY CONTRACTING SERVICES	825	HOLLISTER ST #M	SAN DIEGO
985516	IC ENGINE CLARKE/JOHN DEERE MODEL JU4H-UF40, S/N PE4045T652489, 94HP DIESEL	18-Feb-08	PRUDENTIAL INSURANCE CO OF AMERICA THE	1440	INNOVATIVE DR	SAN DIEGO
985975	SOIL VAPOR EXTRACTION EQUIP. SOIL-THERM MODEL 2002-LR-EN	09-Apr-08	AMI ADINI & ASSOCIATES INC	77	BROADWAY (PORTABLE)	CHULA VISTA
986927	JOHN DEERE DIESEL ENGINE MODEL 6068HF285K S/N PE66068L039363 HP RATING 197	02-Jun-09	INNOVATIVE COLD STORAGE II	7350	BRITANNIA CT	SAN DIEGO
987439	MARINE COATING OPERATION	17-Mar-09	VT MILCOM	2232	VERUS ST	SAN DIEGO
987548	REPLACEMENT EMERGENCY STANDBY DIESEL 30K W ENGINE FOR PO #983068	19-Mar-09	FEDERAL AVIATION ADMINISTRATION		PGY BLDG	CHULA VISTA

APPENDIX 1G

Compliance Demonstration

Federal NO_2 and $PM_{2.5}$ Standards

APPENDIX 1G

Compliance Demonstration

The worst-case modeling analysis, in which maximum project impacts were added to maximum measured background concentrations, demonstrated compliance with all ambient air quality standards except for the federal 1-hour NO_2 standard and the federal 24-hour $PM_{2.5}$ standard (see Appendix 1B). A more refined analysis that more closely matches the actual ambient concentrations with the modeled project impact under the same meteorological conditions has been performed as a more realistic assessment of expected impacts of the proposed project.

The methodology for performing this analysis is described in detail in the modeling protocol (Appendix 1H), and will be summarized here. It should be noted that this analysis, although more refined than the screening analysis, is still conservative, for reasons that will be discussed below.

The turbine stack parameters used for this analysis are shown in Table 1G.1. WSAC stack parameters used for this analysis are the same as for the screening analysis, and are shown in Table 1D.6.

Compliance with the Federal 1-hour NO_2 Standard

Form of the Standard

The federal 1-hour NO_2 standard is met if the 3-year average of the 98th percentile highest daily 1-hour average NO_2 concentration, including background, does not exceed 100 ppb. At standard temperature and pressure, this limit is equivalent to 188 $\mu g/m^3$. The standard is converted to $\mu g/m^3$ for the analysis because the modeling results are in those units.

The procedure for determining compliance is to determine the highest 1-hour NO_2 concentration, including background, for each calendar day in the year at every receptor. These concentrations are rank-ordered, highest to lowest, and the 98th percentile value (8th highest concentration for a reasonably complete data set) is selected to represent that year. These values are then averaged over the three years included in the analysis. The resulting average must be less than or equal to 188 $\mu g/m^3$.

Compliance Demonstration Procedure

The output from the dispersion model provides the worst case project impact at all of the receptors in the impact area (the area where the maximum project impact exceeds the Significant Impact Level [SIL])[21] for each hour of the year (see Figures 1G.1 and 1G.2). Receptors outside the impact area are excluded from the analysis because the project impact cannot, by definition, cause or contribute significantly to a violation of the standard if the project impact, by itself, does not exceed the SIL.

Use of the worst-case modeled impact is the first conservative assumption in this analysis. It is conservative because it assumes that the project will be operating under its worst case conditions (i.e., all three turbines in simultaneous startup, for NO_2) every single hour of the year. Although this is clearly unrealistic, it is not possible to further refine the assumptions; it is **possible**, although

[21] It should be noted that USEPA has not adopted a SIL for the 1-hour NO_2 standard. Following EPA guidance, the interim SIL value of 4 ppb (7.5 $\mu g/m^3$) has been used for this analysis.

extremely **unlikely**, that such operation will line up with each of the 8 highest impact hours during the year.

The ambient background NO_2 concentration for each hour is then added to the modeled impact at each receptor. EPA has requested that the actual concentrations corresponding to the meteorological conditions not be used for this analysis. Instead, another conservative adjustment has been made to the results: for each calendar month, a composite daily background profile has been used. The composite daily background profile for a given calendar month is comprised of the highest ambient monitor NO_2 reading from the month for each clock GMT hour.

Once the modeled impact for each hour has been added to the corresponding ambient background concentration, the highest combined impact for each calendar day is determined. Daily maxima are rank ordered; because the data set is complete, the 8th highest result is averaged with those from the other years in the analysis to determine compliance.

Compliance Demonstration Results

The results of the compliance demonstration are shown in Table 1G.2. The project's impact of 156 $\mu g/m^3$ is below the standard of 188 $\mu g/m^3$.

Compliance with the Federal 24-hour $PM_{2.5}$ Standard

Form of the Standard

The federal 24-hour $PM_{2.5}$ standard is met if the 3-year average of the 98th percentile daily 24-hour average $PM_{2.5}$ concentration, including background, does not exceed 35 $\mu g/m^3$.

The procedure for determining compliance is to determine the 24-hour $PM_{2.5}$ concentration, including background, for each calendar day in the year at every receptor. These concentrations are rank-ordered, highest to lowest, and the 98th percentile value (8th highest concentration for a reasonably complete data set) is selected to represent that year. These values are then averaged over the three years included in the analysis. The resulting average must be less than or equal to 35 $\mu g/m^3$.

Compliance Demonstration Procedure

The output from the dispersion model provides the worst case project impact at all of the receptors in the impact area (the area where the maximum project impact exceeds the Significant Impact Level [SIL]) for each hour of the year. Receptors outside the impact area are excluded from the analysis because the project impact cannot, by definition, cause or contribute significantly to a violation of the standard if the project impact alone does not exceed the SIL. The ambient background concentration for each day is then added to the modeled impact at each receptor.

Once the modeled impact for each day has been added to the corresponding ambient background concentration, daily impacts are rank ordered; because the data set is complete, the 8th highest result is averaged with those from the other years in the analysis to determine compliance.

Compliance Demonstration Results

The results of the compliance demonstration are shown in Table 1G.2. The project's impact of 29.9 $\mu g/m^3$ is below the standard of 35 $\mu g/m^3$.

Table 1G.1

Turbine Emission Rates and Stack Parameters for Refined Modeling (per turbine)

Case/Year	Stack Height meters	Stack Diam meters	Stack flow m^3/sec	Stack Vel m/sec	Stack Temp deg K	Emission rates, lb/hr		Emission rates, g/s	
						NOx	PM_{10}	NOx	PM_{10}
Averaging Period: One hour Startup NOx									
Cold Low	30.48	4.42	414.34	27.01	700.9	26.63	n/a	3.36	n/a
Averaging Period: 24-hour PM2.5									
Cold Low	30.48	4.42	414.34	27.01	700.9	n/a	5.50	n/a	0.69

Table 1G.2

Results of Compliance Demonstration

Pollutant	Averaging Time	Maximum Predicted Impact (operating mode) ($\mu g/m^3$)	Maximum Background Concentration ($\mu g/m^3$)	3 year Average of 98th Percentile of Total Concentration ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	CAAQS ($\mu g/m^3$)
NO_2	1-hr	111 (startup)	154	159	188	339
$PM_{2.5}$	24-hr	2.6 (normal)	45.7	25.9	35	

Figure 1G.1

Areas Where Maximum 1-Hour Average NO_2 Impacts During Startup Exceed the Significant Impact Level

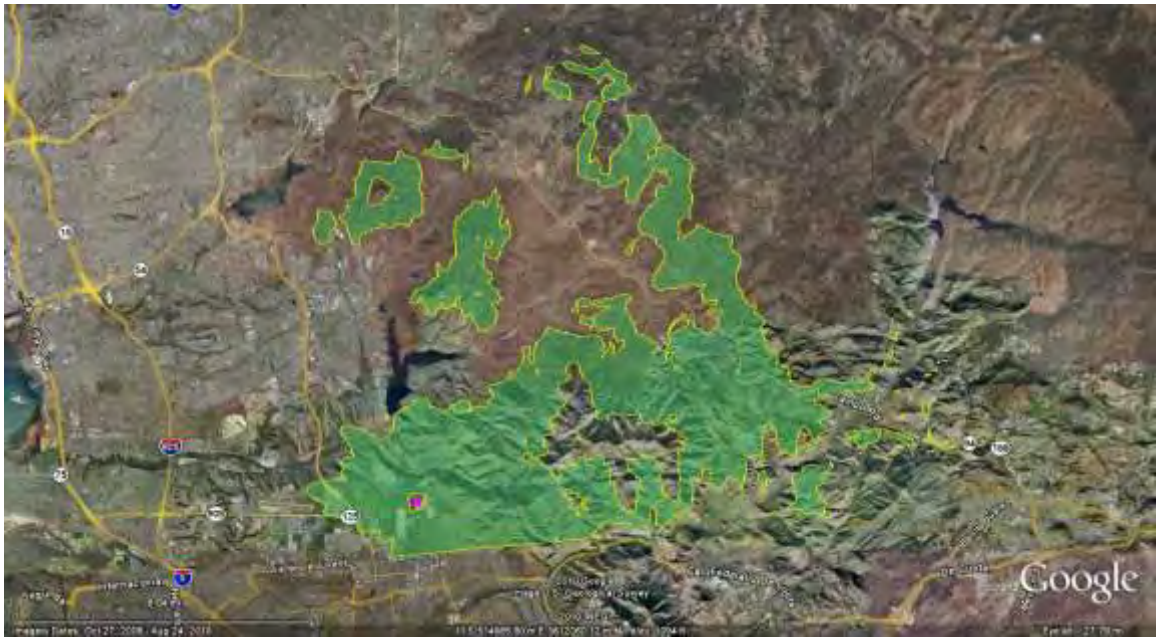

Figure 1G.2

Areas Where Maximum 24-Hour Average $PM_{2.5}$ Impacts Exceed the Significant Impact Level

APPENDIX 1H

Modeling Protocol

Pio Pico Energy Center
Modeling Protocol
November 2010

1. BACKGROUND

On behalf of Apex Power Group (Apex), Sierra Research is submitting this modeling protocol to the San Diego County Air Pollution Control District (SDAPCD or District), California Energy Commission (CEC), and the United States Environmental Protection Agency (EPA) for approval of the air dispersion and health risk assessment modeling proposed to be conducted in support of the Pio Pico Energy Center (PPEC) Project (Project) Application for a Determination of Compliance (DOC) from the District, the Application for Certification (AFC) from the CEC, and the Application for a Prevention of Significant Deterioration (PSD) Permit from EPA. The District will be providing a meteorological data set appropriate for use with AERMOD[22] (current version 09292), the primary air dispersion model to be used on this project. The data set combines surface meteorological data (e.g., wind speed and direction, temperature) from the District's Otay Mesa/Paseo International monitoring station and upper air data from the Marine Corps Air Station Miramar (MCAS Miramar). This protocol follows modeling guidance provided by the EPA in its "*Guideline on Air Quality Models*"[23] (including supplements).

The proposed project will consist of the construction and operation of three LMS100 combustion gas turbines in simple-cycle mode. The new emitting units will be installed on a 9.9 acre parcel in the southeast quadrant of the intersection of Alta Road and Calzada De La Fuente Road, adjacent to the existing Otay Mesa Generating Project. The new turbines will use partial air cooling and will have a total nominal net generating capacity of 300 MW. PPEC will be a new major source under District New Source Review regulations[24] because it will have a potential to emit more than 50 TPY of NOx; it will also be a new major stationary source under the federal Prevention of Significant Deterioration (PSD) program[25] because it will have a potential to emit more than 100,000 TPY of Greenhouse Gases (GHGs) and construction will commence after July 1, 2011. PPEC is not a PSD stationary source under District regulations.[26]

The proposed data sources, models, and modeling assumptions are identical for all three analyses (APCD, CEC, and EPA) except where specifically noted.

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[22] AERMOD stands for American Meteorological Society/Environmental Protection Agency Regulatory Model, and was developed by the American Meteorological Society/Environmental Protection Agency Regulatory Model Improvement Committee (AERMIC).

[23] USEPA, *Guideline on Air Quality Models (Revised).* U.S. EPA-45/2-78-027R,1986.

[24] SDAPCD Rule 20.1(c)(35).

[25] 40 CFR 52.21(b)(49)(v)(b).

[26] SDAPCD Rule 20.1(c)(58).

Net increases in emissions of NOx and PM_{10} are expected to exceed the District's thresholds for preparation of an Air Quality Impact Analysis (AQIA).[27] Under District rules, an AQIA must be prepared that demonstrates that emissions from the project will not cause or contribute to a violation of an ambient air quality standard.

Net increases in emissions of NOx, PM_{10}, $PM_{2.5}$, and GHGs are expected to exceed the significant increase thresholds for federal PSD requirements.[28] Under federal rules, an Air Quality Impact Analysis (AQIA) must be performed to demonstrate that emissions from the project will not cause or contribute to a violation of an ambient air quality standard.

Dispersion modeling will be performed to demonstrate compliance with ambient air quality standards. Because there are no ambient air quality standards for GHGs, no modeling will be performed for that pollutant. This document describes the procedures that will be used to conduct that modeling.

Impacts from operation of the facility will be compared to the following thresholds:

Air Quality Criteria	NO_2	PM_{10}	$PM_{2.5}$	CO	SO_2
PSD Significant Impact Levels[a]	√	√	√		
SDAPCD Significant Impact Levels	√	√	√		
PSD Monitoring Exemption Levels[a,b]	√	√	√		
Ambient Air Quality Standards (AAQS)[b]	√	√	√	√	√
Class I and Class II Visibility[b]	√	√			√
Impacts to Soils and Vegetation[b]	√	√			√
Class I Area Acid Deposition[b]	√	√			√

Notes:
a. PSD significant impact and monitoring exemption levels apply only to pollutants subject to an AQIA analysis under PSD
b. Pursuant to EPA's "PSD and Title V Permitting Guidance for Greenhouse Gases" (Nov. 2010; p. 48), these analyses will not be conducted for GHGs.

Comparison of project impacts with the standards will be conducted using a tiered approach, on a pollutant-by-pollutant basis (see Section 12). If compliance for a particular pollutant can be demonstrated using a simple conservative screening approach, no further analysis will be performed for that pollutant.

[27] SDAPCD Rule 20.3(d)(2)(ii).

[28] 40 CFR 52.21.

2. PROJECT LOCATION

The proposed gas turbine units will be constructed on a 9.9-acre parcel in the southeast quadrant of the intersection of Alta Road and Calzada De La Fuente Road, adjacent to the existing Otay Mesa Generating Project. The location of the site is approximately the following:

- Latitude: 32° 34' 22" N
- Longitude: 116° 55' 02" W

or, in Universal Transverse Mercator (UTM) coordinates,

- Northing: 3,603.9 kilometers (km) and
- Easting: 507.7 kilometers (North American Datum [NAD] 27, Zone 11).

The nominal site elevation is 196 meters (645 feet) above mean sea level.

3. PROJECT EMISSION SOURCES

The Project includes three combustion gas turbines in simple-cycle mode. The turbines will be fired with natural gas only, and will utilize advanced combustion design and emission controls to limit emissions of nitrogen oxides (NOx), carbon monoxide (CO), and volatile organic compounds (VOC). Emissions of particulate matter with nominal aerodynamic diameter less than or equal to 10 and 2.5 microns (PM_{10} and $PM_{2.5}$), and sulfur oxides (SOx) will be kept to a minimum through the exclusive use of natural gas as the fuel.

The project also includes a small partial dry cooling tower, which is a source of particulate emissions from evaporation of aerosol drift. For the purposes of the AQIA, all particulate from the cooling tower will be assumed to be $PM_{2.5}$.

There will not be a combustion engine-driven emergency generator or fire pump.

4. EXISTING EMISSION SOURCES

This is a new facility. There are no existing emission sources at this site.

5. NEARBY EMISSION SOURCES

For purposes of the District and CEC applications, the air quality impact analysis and/or cumulative impact analysis requires consideration of the project emissions, nearby sources that

might affect concentrations in the area impacted by the project (the ~~"i~~impact area"), and regional background concentrations.

For such analyses, to determine whether any new sources have been approved but are not reflected in the ambient monitoring data, the District will be requested to list all projects within 6 miles of the project site which have received construction permits but are not yet operating, or are in the permitting process. Sources with permitted emissions of less than 5 tons per year will be excluded. Sources on this list will be included in the District and CEC cumulative impacts analysis. This analysis will also include other sources, specifically identified by the District and CEC, for inclusion in this analysis. At the present time, the District has identified the Otay Mesa Generating Plant, located immediately adjacent to the proposed Project site, for inclusion in this analysis. The applicant will consult with the District and CEC staffs regarding the inclusion of other potential sources in the analysis.

For purposes of the PSD permit application, an alternative screening procedure will be used to determine whether any existing sources should be explicitly modeled because they could potentially have significant impacts at the time and place that the project has significant impacts, but are not adequately represented by the ambient monitoring data.

As described in Section 12 below, the PSD AQIA will be conducted in accordance with a two-step process. Step 1 of that process involves an analysis of the impacts of the project alone. Step 2 includes background concentrations and impacts from other sources, in addition to the project. The following steps will be followed for each pollutant subject to a Step 2 analysis in the PSD application:

1. *A list of all stationary sources within the District and within 50 km of the significant impact area (but no greater than 100 km from the project site), with actual emissions above 5 tpy for any pollutant subject to PSD review, during the most recent year for which emission inventory data are available, will be obtained from the District.*
2. *Projects with recently issued permits (i.e., after January 1, 2005) or recently submitted applications and a potential to emit above 5 TPY for any pollutant subject to PSD review, within the search area described above, will be added to the list (because their emissions are not reflected in ambient monitoring data).*
3. *If the pollutant is subject to a Step 2 analysis only for a 1-hour average standard, sources that are downwind[29] of the Project"s impact area will be screened out because they cannot affect the concentration at the same time and place as the Project.*
4. *In consultation with EPA, additional sources may be eliminated from the AQIA because size and location make it unlikely that they will affect the concentration*

[29] Preliminary modeling indicates that all of the impact areas are in the same compass quarter. Any offsite source that is on the other side of the impact areas from the project cannot possibly be modeled to affect the impact area at the same time as the project; the impact area will be affected by one or the other, but not both, at times that the project's impact is significant.

gradient in the impact area at the same time that the Project"s impacts occur. NOTE: this process may result in different lists for District/CEC and PSD modeling.

EPA has considered and accepted several methods for screening sources for inclusion in an AQIA inventory. These are summarized in the meeting notes for an EPA/State/Local PSD Workshop held in New Orleans in May 2005. As discussed in the workshop notes:

> *"The concept of „significant concentration gradient" is used to catch all instances not represented by "regional" monitored concentrations, added to the combined sources" impacts to determine total impacts, which could interact with the proposed source"s impacts. However, without some practical limitations, such gradients can occur anywhere in the "vicinity" of the sources defined by the SIA and could lead to a large and, at times, unnecessary resource expenditures. Thus, in order to balance the need for identifying all sources which meet the criteria in the Guideline and also to achieve a workable inventory of sources, various permitting agencies have developed and used objective tools to assist in the determination of an emission inventory. A 1992 EPA/States modelers" workgroup considered some of these approaches and concluded that all such tools should be used by the reviewing authority on a case by case basis to compliment [sic] their professional judgment in developing an inventory of nearby sources."*[30]

Impacts from facilities identified by this screening process will be included in any compliance demonstration beyond Step 1. Emissions of relevant pollutants from each included facility will be modeled at the facility"s potential to emit.

6. SITE REPRESENTATION – METEOROLOGICAL DATA

The District is expected to provide a meteorological dataset already processed by AERMET to generate AERMOD-compatible meteorological data for air dispersion modeling. The surface meteorological data were recorded at the District's Otay Mesa-Paseo International monitoring station (see Figure 1), and the upper air data were recorded at the MCAS Miramar (No. 03190).

EPA defines the term —onsite 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. 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.*[31] The representativeness of the data depends on (a) the proximity of the meteorological monitoring site

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[30] PSD Modeling Workgroup. EPA/State/Local Workshop. New Orleans, May 17, 2005.

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

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 applicant concurs, that the District's Otay Mesa meteorological data are representative of conditions at the project site.

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 Otay Mesa-Paseo International meteorological monitoring station. Representativeness has additionally been defined in the PSD Monitoring Guideline[32] as data that characterize the air quality for the general area in which the proposed project would be constructed and operated. As can be seen in Figure 1, the Otay Mesa-Paseo International meteorological monitoring station is in close proximity to the proposed project site (distance between the two locations is approximately 1.2 miles 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, located approximately 24 miles northwest of the Project. No other upper air meteorological monitoring stations are located in the San Diego Air Basin. The next closest upper air station in California is located at Oakland International Airport.

7. Site Representation – Surface Data

The surface characteristics input to AERMET should be based on the topographic conditions in the vicinity of the meteorological tower used to provide meteorological data.[33,34] The District has selected values for the surface characteristics of albedo, Bowen Ratio and surface roughness appropriate to the area around the Otay Mesa-Paseo International meteorological monitoring station following EPA guidance.

8. Existing Ambient Air Quality Data

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 will be used to represent regional background concentrations. The District has determined that the Chula Vista monitoring station provides the most representative ambient air quality background data for PM_{10}, $PM_{2.5}$, NO_2, SO_2, O_3, and CO. Although the monitoring site at Otay Mesa-Paseo International is closer to the project site than the Chula Vista station, the Otay Mesa station is

[32] USEPA, *Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD)*, 1987.

[33] Appendix W to Part 51—Guideline on air Quality Models, §8.3.c

[34] USEPA. *AERMOD Implementation Guide,* March 19, 2009.

strongly impacted by traffic coming across the border from Mexico, and is therefore not representative of regional background concentrations.

> ~~–~~Several thousand border-crossing trucks passing near the monitor each day heavily impact PM measurements at this location. To better gauge ambient PM10 concentrations throughout the Otay Mesa area as a whole, a second monitor was recently established in Otay Mesa, two miles north of the existing monitor. The additional monitor is not unduly influenced by specific local PM sources."[35]

Comparison of highest 24-hour PM_{10} data collected at the two monitors[36] show that maximum PM_{10} concentrations at the border station are about twice as high as maximum concentrations at the alternate site. The border trucks impact all combustion pollutant measurements at the Otay Mesa monitor, not just PM_{10}.

In contrast, the Chula Vista station is not impacted by nearby sources, and is only 8 miles from the project site. The 5-year period 2004-2008 is the most recent 5-year period for which all required data is available. Modeled concentrations for the Project and any qualifying nearby sources will be added to these representative background concentrations to determine compliance with the CAAQS and NAAQS.

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

9. AIR QUALITY DISPERSION MODELS

Overview

The following EPA air dispersion models are proposed for use to quantify pollutant impacts on the surrounding environment:

- American Meteorological Society/Environmental Protection Agency Regulatory Model Improvement Committee (AERMIC) model, also known as AERMOD (Version 09292);
- Building Profile Input Program – Plume Rise Model Enhancements (BPIP-PRIME, current version 04274); and
- SCREEN3 (Version 96043).

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[35] SDAPCD, *Measures to Reduce Particulate Matter in San Diego County,* December 2005, p. 3-6.

[36] CARB ADAM database, accessed November 28, 2010. Because the Otay Mesa-Richard Correctional Facility monitor only collects PM_{10} data, and does not include data from 2004, data from this monitor will not be used for this AQIA.

The three primary models listed above, and how they will be used, are discussed in detail below. The three additional models listed below are not expected to be used, but they are shown in the event that specialized, more refined modeling is necessary for the project. Further information on the use of CTDMPLUS is provided in Appendix A.

- Complex Terrain SCREEN (CTSCREEN, Version 94111)
- Complex Terrain Dispersion Model (CTDMPLUS, Version 93228)
- Visibility Screening Model (VISCREEN (Version 88341)

Simple, Complex, and Intermediate Terrain Impacts

For modeling project emissions in simple, complex, and intermediate terrain, the EPA-recommended guideline model AERMOD will be used with the AERMET-processed hourly meteorological data furnished by the District. The AERMOD model requires hourly meteorological data consisting of wind vector 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. The model assumes that there is no variability in meteorological parameters over a one-hour time period, hence the term ~~–st~~eady-state." The AERMOD model allows input of multiple sources and source groupings, eliminating the need for multiple model runs. Complex phenomena such as building-induced plume downwash are treated in this model.

Standard AERMOD control parameters will be used (stack tip downwash, non-screening mode, non-flat terrain, sequential meteorological data check employed). Stack-tip downwash, which adjusts the effective stack height downward following the methods of Briggs[37] for cases where the stack exit velocity is less than 1.5 times the wind speed at stack top, will be selected per EPA guidance. The rural default option will be used by not invoking the URBANOPT option.[38] The use of the rural default in modeling for this project is consistent with District policy and guidance[39] for past modeling using ISCST3.

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[37] Briggs, G.A., *Discussion on Chimney Plumes in Neutral and Stable Surroundings*. Atmos. Environ. 6:507-510, 1972.

[38] 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. This situation does not exist for the proposed project site.

[39] SDAPCD. *Use of Rural vs Urban Modeling Coefficients,* Memorandum from Richard J. Smith, Deputy Director, to Judith M. Lake, Chief, Monitoring and Technical Services, October 29, 1996.

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.[40] 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 Plume Volume Molar Ratio Method (PVMRM) adaptation of the Ozone Limiting Method[41] will be used. AERMOD PVMRM will be used to calculate the NO_2 concentration based on the PVMRM method and hourly ozone data. Contemporaneous hourly ozone data collected at the Chula Vista monitoring station, in a data file provided by the District, will be used in conjunction with PVMRM to calculate hourly NO_2 concentrations from hourly NOx concentrations. Ozone background data from the Otay Mesa-Paseo International monitoring station is not appropriate for use, even though the station is closer, for several reasons. First, the data set does not meet EPA completeness criteria. Second, the site is heavily impacted by local traffic emissions, and is therefore not representative of regional concentrations. Third, because the Otay Mesa station is heavily impacted by traffic emissions, the measured ozone levels may be depressed because of scavenging by automobile NO emissions. If depressed ozone levels are used in the PVMRM model, the predicted NOx levels will be lower.

The Chula Vista station, located only 8 miles from the project site, suffers from none of these deficiencies. The collected data meet EPA completeness criteria, the project is not heavily impacted by local sources, and is therefore reasonably representative of regional background concentrations. There are no intervening topographic features, so pollution transport conditions should be similar for both stations.

PVMRM involves an initial comparison of the estimated maximum NOx concentration and the ambient O_3 concentration left in the plume after reaction of NO with O_3 to determine which is the limiting factor in NO_2 formation. If the remaining O_3 concentration is greater than the maximum NOx concentration, total conversion is assumed. If the NOx concentration is greater than the remaining O_3 concentration, the formation of NO_2 is limited by the remaining ambient O_3 concentration. In this case, the NO_2 concentration is set equal to the O_3 concentration plus a correction factor that accounts for in-stack and near-stack thermal conversion.

Fumigation

The SCREEN3 model will be used to evaluate inversion breakup fumigation impacts for short-term averaging periods (24 hours or less), as appropriate. The methodology in EPA, 1992 (Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised) will

[40] USEPA, *Supplement C to the Guideline on Air Quality Models (revised)*, 1995.

[41] Cole, H.S. and J.E. Summerhays, *A review of techniques available for estimating short term NO2 concentrations*. Journal of the Air Pollution Control Association 29(8) 790-888, 1979.

be followed for these analyses. Combined impacts for all sources under fumigation conditions will be evaluated, based on EPA and any applicable SDAPCD modeling guidelines.

10. Good Engineering Practice (GEP) Stack Height and Downwash

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 that are used by AERMOD to evaluate wake effects. The BPIP-PRIME output is formatted for use in AERMOD input files.

11. Receptor Selection

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; hills will not be imported into AERMOD for CTDM-like processing.

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 as necessary to calculate the significant impact area).

For the full impact analyses, a nested grid will be developed to fully represent the maximum impact area(s). This grid will have 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 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. To simplify post-processing requirements, receptor locations at which the NO_2, $PM_{2.5}$, and PM_{10} significant impact levels are not exceeded will not be included in PSD analyses for these pollutants.

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

South West corner: Lat: 32.38, Lon: -117.82;
North East corner: Lat: 33.1, Lon: -116.26.

The analysis will be limited to impacts in the United States.

12. MODELING SCENARIOS

Pollutant emissions to the atmosphere from the proposed project will be dominated by the products of combustion of natural gas in the combustion turbines. Emission rates will be included in the Applications for the project and will be based on vendor data and additional conservative assumptions of equipment performance. Turbine emissions and stack parameters, such as flow rate and exit temperature, depend on ambient temperature and operating load. To calculate the maximum air quality impacts, a screening analysis will be performed to determine which combination of operating load and atmospheric temperature produces the maximum ground-level concentration (i.e., impact) for each combination of pollutant and averaging time used in an ambient air quality standard. Emissions from the partial dry-cooling tower will be modeled using the assumption that 100% of the particulate is $PM_{2.5}$.

In the modeling analysis, maximum impacts will be predicted for startup, base load (100%), and reduced load (50%) conditions. In addition, extreme hot, annual average, and extreme cold ambient temperatures will be evaluated for each load condition. Each of these conditions has unique performance characteristics that affect plume dispersion and thus predicted impacts. This analysis is most relevant to analyses for short-term impacts (24 hours or less). Annual average impacts will be modeled using annual average turbine performance. The results of this screening analysis will be used to select the maximum-impact operational scenarios for each pollutant and averaging period for the complete modeling analyses.

Details of Operating Scenarios

Maximum emissions during normal operation would occur during periods of maximum fuel consumption, which would occur at peak load. Besides normal operation, two other modes of operation would occur: commissioning (one initial period), and startup/shutdown. In addition to the impacts associated with normal operation, the modeling analysis for the project will examine the short-term impacts associated with commissioning and gas turbine startup/shutdown activities. The following table gives more detail on all three operating modes.

Operating Modes of the Combustion Gas Turbines	
Mode	Description
Commissioning	The process of tuning each of the turbines. The facility will follow a systematic approach to optimize performance of the turbines and the associated control equipment. Emissions are expected to be greater during commissioning than during normal operation for NOx, CO, and VOC. This one-time mode affects only the initial year of operation. The analysis of impacts during commissioning periods will not be part of the PSD analysis.
Start-up/Shutdown	Startup NOx emissions are higher because the SCR has not reached optimal temperature to begin the chemical reactions needed to convert NOx to elemental nitrogen and water. Shutdown occurs at the initiation of the turbine shutdown sequence and ends with the cessation of turbine firing. Typically, the shutdown process will emit less than the start-up process but may emit slightly greater than during normal operation because ammonia injection into the SCR reactor ceases during part of this operation.
Normal Operation	Normal operation begins after the turbines and the control equipment are working optimally, at their designated levels. Emissions may vary between the extreme hot, annual average, and extreme cold ambient conditions.

The modeling with AERMOD-PVMRM will include the assumption of an initial 10% nitrogen dioxide (NO_2) to NOx ratio in the exhaust exiting the stack during normal operating conditions, and a 6% initial NO_2 to NOx ratio for startup and commissioning operations, based on guidance developed by the San Joaquin Valley APCD.[42]

Ambient Air Quality Impact Analyses (AQIA)

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.

If, for a given pollutant and averaging time, the project's impact is below significance thresholds, the project's impact is deemed to be *de minimis*, and no further analysis is required. If the project's impact is above the significance threshold, 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

[42] SJVAPCD, *Assessment of Non-Regulatory Options in AERMOD Specifically OLM and PVMRM, Appendix C* (2010), Table 1.

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.

The Project requires approval from many agencies. An air quality impact analysis is required for Certification by the CEC, issuance of a Determination of Compliance by the District, and issuance of a PSD permit by USEPA. Each agency has its own criteria for preparation of the air quality impact analysis. The criteria used by the CEC and the District are similar enough that the same analysis will satisfy both. The same analysis will also meet EPA criteria for evaluating all standards except for the new federal 1-hour NO_2 standard.

EPA has not yet described, with any specificity, its criteria for evaluating compliance with the new federal 1-hour NO_2 standard; as a result, this protocol contains special procedures that will be utilized only for the PSD demonstration of compliance with the federal 1-hour NO_2 standard. These special procedures affect the Tier 4 analysis for NO_2 impacts and identification of nearby sources, and are identified below.

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,[43] "[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 significance levels for air quality impacts are shown in the following table. If the maximum modeled impact for any pollutant and averaging period is below the appropriate significance level, no further analysis is necessary.

Significance Levels for Air Quality Impacts in Class II Areas (µg/m^3)					
	Averaging Period				
Pollutant	Annual	24-hour	8-hour	3-hour	1-hour
SO_2	1	5	--	25	--
PM_{10}	1	5	--	--	--
$PM_{2.5}$	0.3	1.2	--	--	--
NOx	1	--	--	--	No SIL[44]
CO	--	--	500	--	2000

[43] USEPA, *New Source Review Workshop Manual (draft)*, October 1990. p. C.51.

[44] EPA has not yet defined significance levels for one-hour NO_2 impacts. However, EPA has suggested that, until one has been promulgated, a value of 4 ppb (7.5 µg/m^3) may be used. That value will be used in this analysis wherever a SIL would be used for NO_2.

No further analysis is necessary for any location where the modeled impacts from the project alone are below the PSD significance thresholds shown in the table above.

> *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 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.*[45]

Step 2: Project Plus Background

Pollutants/averaging periods that are not screened out in Step 1 will be subject to full air quality impact analysis. In this step, 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 in Section 8 of this protocol, the impacts of most existing sources are represented by the existing ambient air quality data collected at Chula Vista. 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.*

[45] 75 FR 64891.

The impact of natural sources and unidentified sources will be represented by ambient air quality monitoring data collected at the Chula Vista monitoring station. In this protocol, these impacts are characterized as part of the ~~r~~egional background."

Nearby sources are those non-project sources that have the potential to create a significant concentration gradient in the project's impact area. Nearby sources will be identified by the processes described in Section 5 (separately for the District/CEC analysis and for the PSD analysis). The impact of nearby sources will be modeled using each source's potential to emit, as determined by the District.

The impact of the proposed new equipment will be modeled using the maximum allowable emission limits as proposed in the application and the design capacities of the turbines, assuming continuous operation, in accordance with the guidance in Table 8-2 of Appendix W.

If a Step 2 analysis is required, the maximum predicted concentration from all sources in the five-year modeling period is added to the representative background concentration for a comparison with the NAAQS. In accordance with EPA guidelines,[46] the highest second-highest modeled concentrations will be used to demonstrate compliance with the short-term federal standards (except for the statistically-based federal 1-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.

For the 1-hour average federal NO_2 standard for the District and CEC analyses, the comparison of impacts with the new federal 1-hour standard will be done in accordance with the four-tier process developed by the San Joaquin Valley Air Pollution Control District (SJVAPCD).[47] The tiered screening approach was 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.

<u>Tier 1 Analysis</u> – In Tier 1, the maximum predicted 1-hour concentration from all sources in the five-year modeling period is added to the representative background concentration for a comparison with the 1-hour NAAQS. If compliance is demonstrated using Tier 1 values, no further analysis is required.

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[46] 40 CFR part 51, Appendix W, Sections 11.2.3.2 and 11.2.3.3.

[47] "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 Level1 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)."

Tier 2 Analysis – Tier 2 is the same as Tier 1, except that the 8th highest maximum predicted 1-hour concentration (in the five-year modeling period) is used.

Tier 3 Analysis – Tier 3 is the same as Tier 1, except that the 98th percentile predicted 1-hour concentration is used.

Tier 4 Analysis – The predicted concentrations from the model will be paired in time with the monitored hourly NO_2 concentrations. The 3-year average of the annual 98th percentile daily 1-hour maximum is used for comparison with the NAAQS. This approach follows the form of the standard, and is equivalent to siting an ambient monitoring site at each receptor, and demonstrating compliance at all of them.

> *For purposes of the PSD application, two synthetic background NO_2 data sets will be created using the following procedure. For the first data set, for each month in each year of the five year data period, the maximum hourly concentration will be determined for each clock hour period (i.e., 1 am, 2 am, 3 am, etc.). In this manner, 24 hourly NO_2 values will be determined for each month. These values will be used for each day of the month. For the second data set, for each year in the five year data period, the 98th percentile hourly concentration will be determined for each clock hour period. In this manner, 24 hourly NO_2 values will be determined for each year. These values will be used for each day of the year. For each of these two data sets, the predicted concentrations from the model will be paired in time with the concentrations from the synthetic data sets. The 3-year average of the annual 98th percentile daily 1-hour maximum is used for comparison with the NAAQS.*

For SO_2, the same four-tier process described above for the District/CEC analysis will be used, except that the 99th percentile value will be used in Tiers 2, 3 and 4. For $PM_{2.5}$, the comparison of impacts with the new federal 24-hour standard will be done in accordance with the same four-tier process described above for the District/CEC analysis, except that 24-hour averaging times will be used instead of 1-hour averaging times.

13. Class I Area Impact Methodology (PSD Application Only)

Class I areas are areas of special national or regional natural, scenic, recreational, or historic value for which the PSD regulations provide special protection. If a proposed major source or major modification may affect a Class I area, the federal PSD regulations require the reviewing authority to provide written notification of any such proposed source to the Federal Land Managers (FLM) (and the USDI and USDA officials delegated permit review responsibility). The meaning of the term "may affect" is interpreted by EPA policy to include all major sources or major modifications which propose to locate within 100 kilometers (km) of a Class I area.

There is one Class I area within 100 km of the project site. The nearest Class I areas are:

- Agua Tibia Wilderness 91 km
- San Jacinto Wilderness 122 km

EPA's policy requires, at a minimum, an Air Quality Related Values (AQRV) impact analysis of any PSD source the emissions from which increase pollutant concentration by more than 1 $\mu g/m^3$ (24-hour average) in a Class I area. This value is the annual-average significant impact level for SO_2, PM_{10}, and NO_2. Applying this rationale, the annual average SIL for $PM_{2.5}$ of 0.3 μg/m3 will be used for that pollutant to determine whether an AQRV impact analysis will be required. This analysis is based on the impacts of the proposed project.

If impacts from the proposed project are determined to be in excess of these levels, and if, after consultation with the FLMs, a determination is made that additional analysis is needed, impacts will be quantified using the CALPUFF Modeling System operated in a screening mode. The modeling will follow guidance provided by the FLMs' AQRV Workgroup (FLAG) Phase I report[48] and the Interagency Workgroup on Air Quality Modeling (IWAQM) Phase 2 Summary Report.[49] A separate protocol will be submitted if this analysis is performed.

PSD Increments in the Class I Area

If an analysis of Class I area impacts is required, maximum 3-hour, 24-hour and annual SO_2 emission rates, maximum 24-hour and annual PM_{10} emission rates, maximum 24-hour $PM_{2.5}$ emission rates, and maximum hourly and annual NOx emission rates will be used for modeling potential increment consumption in the Class I area.

14. RULE 1200 ANALYSIS

District Rule 1200 analysis requires a health risk assessment (HRA) performed according to the California Air Toxics Hot Spots guidelines[50] and SDAPCD supplemental guidelines[51] for Health Risk Assessments (HRAs). The HRA modeling will be prepared using the ARB's Hotspots Analysis and Reporting Program (HARP) computer program (Version 1.4b, August 2010). The HARP model will be used to assess cancer risk as well as non-cancer chronic and acute health hazards. The HRA will include the four following pathways: inhalation, dermal absorption, soil ingestion, and mother's milk ingestion.

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[48] USDA Forest Service Air Quality Program, National Park Service Air Resource Division, US Fish and Wildlife Service - Air Quality Branch, *Federal Land Managers' Air Quality Related Values Workgroup (FLAG) Phase I Report*. December 2000.

[49] IWAQM, *Phase 2 Summary Report and Recommendations for Modeling Long Range Transport Impacts*, EPA-454/R-98-019, December 1998.

[50] Office of Environmental Health Hazard Analysis, *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*, August 2003.

[51] SDAPCD, *Supplemental Guidelines for Submission of Air Toxics "Hot Spots" Program Health Risk Assessments (HRAs)*, Version 1.0, March 1, 2005.

Because the HARP model incorporates the ISCST3 model no longer approved by EPA, a special methodology will be employed to be consistent with using AERMOD for the air dispersion modeling and retain the health values and risk computations provided by HARP Version 1.4b. The OEHHA/ARB-approved methodology used to prepare the HRA has been described by the ARB[52] and is summarized below. Its use has also been approved by both the CEC and the District on previous power plant projects.[53]

Modeling Inputs

The risk assessment module of the HARP model will be run using unit ground-level impacts to obtain derived cancer risks for each toxic air contaminant (TAC). As requested by the District, only the cancer risks obtained for the derived (adjusted) method and derived (OEHHA) method for worker exposure will be used in the analysis. The HARP model output is cancer risk by TAC and pathway for each type of analysis, based on an exposure of 1.0 $\mu g/m^3$. Individual cancer risks are expressed in units of risk per $\mu g/m^3$ of exposure. To calculate the weighted risk for each source, the annual average emission rate in grams per second for each TAC will be multiplied by the individual cancer risk for that TAC in units of $(\mu g/m^3)^{-1}$. The resulting weighted cancer risks for each TAC will then be summed for the source. The same approach will be used to determine the non-cancer acute and chronic health hazards associated with the Project.

Health risk from exposure to a carcinogenic TAC is the product of the exposure concentration multiplied by a factor representing the risk per unit concentration (i.e., unit risk) for the TAC. In the case of cancer risk, the risk per unit concentration depends on breathing rate, the cancer potency factor of the TAC, dimensional factors, and other terms involving non-inhalation pathways, when relevant. In the case of chronic and acute non-cancer impacts, the unit impact or health hazard per unit concentration is normally calculated as 1 divided by the Reference Exposure Level (REL, expressed as a concentration in $\mu g/m^3$) for the TAC.

Exposure concentration is calculated as the product of the actual emission rate (in grams per second) of the TAC times the concentration per unit of emission (i.e., an emission rate of 1 g/s), which is the output from the AERMOD air dispersion modeling calculation. This exposure concentration is the ~~"U~~Unit Concentration."

The way that HARP usually works is for the program to automatically pass the ~~"U~~Unit Concentration" for a given source and receptor into its risk module, where it is multiplied by the actual emission rate (in g/s) for each TAC and the ~~"U~~Unit Risk" for the TAC to produce the calculated risk for the TAC. This is done for all the TACs emitted by a source and the summed cancer risk, or non-cancer health impact for common toxic endpoints in the case of chronic and acute risk, is the total risk or non-cancer health impact at that receptor from that source. The total cancer risk or non-cancer health impact at a receptor is the sum of the risks or health impacts from all of the sources.

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[52] ARB. *Part B of Topic 8 of the HARP How-To Guides: How to Perform Health Analyses Using a Ground Level Concentration*.

[53] This approach is also used because the HARP On-ramp does not address new 8-hour average RELs.

Because HARP is not designed to pass AERMOD "Unit Concentration" outputs to its Risk Module, an alternative procedure can be used. The calculation of cancer risk or non-cancer health impact does not require the variables to be multiplied in any particular order. Therefore, the final result will be the same if, for a given source, the "Unit Risk" for a TAC is multiplied by the actual emissions (g/s) for the TAC, and these products are added together to give a "Source Strength" for the source. The "Source Strength" is then used as the source emission rate in AERMOD.

This special methodology thus uses HARP to calculate the "Unit Risks" for all carcinogenic TACs and unit chronic and acute health impacts for all non-carcinogenic TACs, including all required exposure pathways and toxic end points as well as receptor types, including residents and workers. The unit risk or unit health impact for each TAC from a source is multiplied by the emission rate of that TAC from the source. These products are summed for all the TACs emitted by the source. This is done for each source. Finally, the resulting "Source Strengths" for each source are used as emission rates in an AERMOD calculation. The resulting risks are reported in the AERMOD output.

The HRA analysis is not a part of the PSD application.

Construction Impact Analysis

Emissions due to the construction of the project will be estimated, including an assessment of emissions from vehicle and equipment exhaust and the fugitive dust generated from material handling. Construction emissions from the project will then be modeled for potential air quality impacts, using the AERMOD Gaussian air dispersion model. Combustion Diesel PM_{10} emission impacts from delivery trucks and other construction equipment will be evaluated to demonstrate that the cancer risk from construction activities will be below ten in one million at all receptors. This analysis is not a part of the PSD application.

15. FINAL MODELING SUBMITTAL

The final modeling analyses will include the following materials:

- Turbine load, heat input, and stack exhaust O_2 content, pollution emission rates, temperature and velocity, and SCR temperature;

- Summaries of maximum modeled impacts for each air quality scenario showing meteorological conditions and receptor location and elevation;

- All modeling inputs and outputs (including BPIP-PRIME and meteorological files) in electronic format, together with a description of all filenames;

- Plot plan showing emission points, nearby buildings (including dimensions), cross-section lines, property lines, fencelines, roads, and UTM coordinates;

- A table showing building heights used in the modeling analysis; and

- Concentration isopleths maps for each criteria pollutant and averaging time combination.

The HRA results will include AERMOD output plot files, spreadsheets that relate the computed risks with UTM coordinates, and textual discussion that explains the methodology to the lay public.

Figure 1
Locations of Project and Surface Meteorological Monitoring Station
Pio Pico Energy Center Project

Appendix A

Information on CTDMPLUS 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 EPA's Appendix W[54] 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[55],

> *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-Transfer Workgroup developed a*

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[54] 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."

[55] USEPA, EPA-600/8-90-087, "User's Guide to CTDMPLUS: Volume 2. The Screening Mode (CTSCREEN)," October 1990.

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 EPA guidance.

Meteorological Data for CTDMPLUS

The discussion in Section 6 of the text focused on meteorological data needed to run AERMOD. As discussed in a later section, an additional model, Complex Terrain Dispersion Model PLUS (CTDMPLUS), may be used in lieu of the model Complex Terrain Screening Model (CTSCREEN) for receptors in the terrain above stack-top height. CTDMPLUS is an EPA-approved air dispersion model, and is fully supported with user guidance documentation.[56]

CTDMPLUS requires an extensive suite of meteorological data composed of not only wind speed, direction, and temperature, but also horizontal and vertical wind direction standard deviations (sigma theta and sigma phi, respectively), and vertical wind speed standard deviation (sigma w). The AERMOD-compatible meteorological data set provided by the District, derived from measurements taken at the Chula Vista monitoring station, does not include these non-standard measurements.

It is possible to develop conservative values for the standard deviation parameters sigma theta, sigma phi, and sigma w that are consistent with the available meteorological data, and use them to prepare a meteorological data set that is usable in CTDMPLUS and yields conservative (i.e., high) ground-level concentrations.

If modeling with CTDMPLUS is required, the District will be requested to develop ISCST3-compatible meteorological data sets for the baseline period. The ISCST3 meteorological data set would be used to create the CTDMPLUS-compatible meteorological data set. Because all three of these Gaussian dispersion models—ISCST3, AERMOD, and CTDMPLUS—require upper air data as well as surface data, the upper air data from the MCAS Miramar would be used as discussed earlier.

The following meteorological parameters are needed for CTDMPLUS and would be taken directly from the AERMET files:

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[56] USEPA. Technology Transfer Network, Support Center for Regulatory Atmospheric Modeling, *http://www.epa.gov/scram001/dispersion_prefrec.htm#ctdmplus*.

- Observed mixing height, provided as the height of the convective or planetary boundary layer (PBL);
- Calculated mixing height, provided as the height of the mechanical, or surface, boundary layer (SBL);
- Friction velocity (USTAR);
- Monin-Obukhov length (L); and
- Roughness length (Z_O).

The remaining standard deviations (sigma values) are not available from AERMOD and must be obtained from ISCST3-compatible files that would be developed from the meteorological data.

Stability classes determined by MPRM[57] or PCRAMMET[58] from the measured meteorological data would be used to select the most conservative values from the following ranges recommended in EPA's Meteorological Monitoring Guidance document:[59]

Stability Category	Sigma Phi (σ_Φ)/ Regulatory Range (degrees)	Sigma Theta (σ_θ)/ Regulatory Range (degrees)
A	11.5	22.5
B	10.0 – 11.5	17.5 – 22.5
C	7.8 – 10.0	12.5 – 17.5
D	5.0 – 7.8	7.5 – 12.5
E	2.4 – 5.0	3.8 – 7.5
F	< 2.4	< 3.8

The most conservative values (that is, the values that produce the highest modeled impacts) for sigma theta and sigma phi within each range would be determined by conducting a sensitivity analysis for all combinations of stack conditions to be modeled using CTDMPLUS and receptor locations for which CTDMPLUS would be used (that is, receptors above stack height). The sensitivity analysis would use the upper and lower values of each range for each stability

[57] The Meteorological Processor for Regulatory Models

[58] EPA meteorological preprocessor

[59] Tables 6-8a and 6-9a in Meteorological Monitoring Guidance for Regulatory Modeling Applications, EPA-454/R-99-005, US EPA Office of Air and Radiation, Office of Air Quality Planning and Standards, February 2000.

category. For example, for stability category D, four combinations would be evaluated as follows:

σ_Φ	σ_θ
5.0	7.5
5.0	12.5
7.8	7.5
7.8	12.5

For stability category A, maximum values for σ_Φ and σ_θ of 15.0 and 27.0, respectively, would be evaluated. For stability category F, minimum values for σ_Φ and σ_θ of 1.0 and 2.0, respectively, would be evaluated.

Sigma-w would be estimated by multiplying sigma-phi (after conversion from degrees to radians) by the horizontal wind speed.

APPENDIX 1I

Demonstration of Compliance with NAAQS

APPENDIX 1I

Demonstration of Compliance with NAAQS

The worst-case modeling analysis, in which maximum project impacts were added to maximum measured background concentrations, demonstrated compliance with all ambient air quality standards except for the federal 1-hour NO_2 standard and the federal 24-hour $PM_{2.5}$ standard (see Appendix 1D). A more refined analysis that more closely matches the actual ambient concentrations with the modeled project impact under the same meteorological conditions is presented below to provide a more realistic assessment of the expected impacts of the proposed project.

The methodology for performing this more refined analysis is described in detail in the modeling protocol submitted to EPA on December 1, 2010 (Appendix 1H). The methodology described in that protocol has been, for the most part, be followed; some changes have been made, however, to incorporate newly available modeling guidance. The methodology that was followed and the changes from the protocol are described below. It should be noted that this analysis, although more refined than the screening analysis, is still conservative, for reasons that are discussed below.

Before the analysis can be completed, EPA must review and approve the list of stationary sources to be included in the cumulative impact portion of the analysis. The proposed list of sources, and the basis for their selection, are presented below.

The stack parameters used for this analysis are shown in Table 1G.1 in Appendix 1G.

Compliance with the Federal 1-Hour NO_2 Standard

Form of the Standard

The federal 1-hour NO_2 standard is met if the 3-year average of the 98th percentile highest daily 1-hour average NO_2 concentration, including background, does not exceed 100 ppb. At standard temperature and pressure, this is equivalent to 188 $\mu g/m^3$. The standard is converted to $\mu g/m^3$ for the analysis because the modeling results are in those units.

The procedure for determining compliance is to determine the highest 1-hour NO_2 concentration, including background, for each calendar day in the year at every receptor. These concentrations are rank-ordered at each receptor, highest to lowest, and the 98th percentile value (8th highest concentration for a reasonably complete data set) is selected to represent that year for that receptor. These values are then averaged, for each receptor, over the five years included in the analysis. The resulting average must be less than or equal to 188 $\mu g/m^3$ for all receptors.

Compliance Demonstration Procedure

The output from the dispersion model provides the worst-case project impact at all of the receptors in the impact area (the area where the maximum project impact exceeds the Significant Impact Level [SIL])[60] for each hour of the year (see Figures 1G.1 and 1G.2). Receptors outside the impact area are excluded from the analysis because the project impact cannot, by definition, cause or contribute significantly to a violation of the standard if the project impact, by itself, does not exceed the SIL.[61]

Use of the worst-case modeled impact is the first conservative assumption in this analysis. It is conservative because it assumes that the project will be operating under its worst case conditions (i.e., all three turbines in simultaneous startup, for NO_2) every single hour of the year. Although this is clearly unrealistic, it is not possible to further refine the assumptions for a peaking turbine facility; given the expected frequency of turbine startups, it is possible, although extremely unlikely, that such operation will line up with each of the 8 highest background hours during the year.

The ambient background NO_2 concentration for each hour is then added to the modeled impact at each receptor. The ambient background concentration is comprised of two components: regional background and nearby sources. The regional background concentration is developed from ambient measurements at a nearby monitoring station or stations. Nearby sources are those that have the potential to create significant concentration gradients in the significant impact area, creating locally elevated concentrations that are not adequately reflected in the ambient monitoring data.

Once the modeled impact for each hour has been added to the corresponding ambient background concentration, the highest combined impact for each calendar day is determined. Daily maxima are rank ordered; because the data set is complete, the 8th highest result at each receptor is averaged with those from the other years in the analysis to determine compliance with the ambient air quality standard.

The final step of the significant contribution analysis is based on the source's contribution to a modeled violation paired in time and space. The significant contribution analysis is not limited to analyzing the source's contribution associated only with the modeled design value based on

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[60] It should be noted that the U.S. EPA has not adopted a SIL for the 1-hour NO_2 standard. Following EPA guidance, the interim SIL value of 4 ppb (7.5 $\mu g/m^3$) was used for this analysis.

[61] "[W]e deem it appropriate and acceptable in most cases to limit the cumulative impact analysis to only those receptors that have been shown to have significant impacts from a proposed new source based on the initial SIL analysis, assuming that the design of the original receptor grid was adequate to determine all areas of ambient air where the source could contribute significantly to modeled violations." Memo, T. Fox (EPA) to Regional Air Division Directors, "Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 Ambient Air Quality Standard," March 1, 2011, p. 3.

the 98th percentile cumulative air quality impact at the receptor, but rather must examine all cases where the air quality impact exceeds the NAAQS at or below the 98th percentile. The analysis will examine the source's contribution, paired in time and space, to every multiyear average of daily maximum 1-hour, beginning with the 8th highest (98th percentile), continuing down the ranked distribution until the cumulative impact is below the NAAQS. If the project impact at any of these receptors at any of these times exceeds the SIL, the project may not be approved as proposed.

Regional Background Concentrations

EPA has requested that the actual background concentrations corresponding in time to the meteorological conditions not be used for this analysis. Instead, another conservative adjustment has been made to the results: for each calendar month, a composite daily background profile has been used. The composite daily background profile for a given calendar month is comprised of the highest ambient monitor NO_2 reading from the month for each clock GMT hour. The same 24 hourly values are repeated as the background concentrations for each day of the month.[62]

All ambient air quality data used in this analysis were published by the California Air Resources Board (CARB) on the ADAM website and/or by U.S. Environmental Protection Agency (EPA) on the AIRS data website. Ambient air concentrations of ozone (O_3), NO_2, SO_2, CO, PM_{10}, and $PM_{2.5}$ are recorded at monitoring stations throughout San Diego County. The immediate area surrounding the project site (within 1.5 to 2 miles) is an area with sparse population. Further out, areas to the north, northeast, east, and southeast are all vacant, hilly terrain with very sparse population. However, areas more than 2 miles to the south (Tijuana), 5 miles west (Otay Mesa West), and northwest (Sunbowl) are urban or suburban areas with moderate to high-density residential areas. Most air quality monitoring stations in the region record measurements for only one or two criteria pollutants, except for those stations located in urban areas. The monitoring stations were generally positioned to represent area-wide ambient conditions rather than the localized impacts of any particular emission source or group of sources. In rural areas of the county, pollutant concentrations are not expected to vary dramatically from one location to the next, because the emission sources are few and widely distributed. Concentrations of pollutants emitted by industrial and vehicular sources are generally higher in the more populated areas of greater San Diego than in the rest of the county.

The closest air quality monitoring station to the Project is located in Otay Mesa at the Otay Mesa-Paseo International Border crossing 1.2 miles south of the Project. However, the pollutant concentrations recorded at this station are heavily influenced by the emissions from the hundreds of Mexican vehicles waiting each hour at the border entry point of Otay Mesa-Paseo International, burning fuels that do not meet strict United States and California standards. In

[62] Memo, T. Fox (EPA) to Regional Air Division Directors, "Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 Ambient Air Quality Standard," March 1, 2011, p. 18-19.

contrast, the Chula Vista station is not impacted by nearby sources, and is only 9 miles from the project site. Comparison of the highest 24-hour PM_{10} data collected at the two monitors[63] shows that maximum PM_{10} concentrations at the border station are about twice as high as maximum concentrations at the alternate site. The border trucks impact all combustion pollutant measurements at the Otay Mesa monitor, not just PM_{10}.

The San Diego - Overland Street and San Diego - 1110 Beardsley Street monitoring stations are each more than 15 miles away from the PPEC facility, and each is located in the coastal area. The air quality data at these monitoring stations are not representative of the greater Lower Otay Lake area. Therefore, after consultation with the District, data from the Chula Vista monitoring station located at 80 East J Street, approximately 9 miles northwest of the project site, were used to represent background air pollutant concentrations for the vicinity of the Project.

Processed background air quality 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 prevents exclusion of modeled high impact hours because of missing monitoring data.

Nearby Sources

Identification of non-project sources to be included in characterization of background concentrations for the compliance demonstration begins by developing a list of facilities with emissions above a threshold. The threshold that is selected for this purpose is low enough to ensure that potentially significant sources are not overlooked. The geographical area included in the search is large enough to ensure that sources that may have a significant impact anywhere in the project's impact area are identified. The most distant receptor with a significant project impact was 24 km east of the project site.

The District was asked to provide a list of all stationary sources within the District and within 80 km of the project (approximate distance to the farthest significant impact plus 50 km), with actual emissions above 5 TPY of either NOx or PM_{10}.[64] The District was also asked to provide a list of all new projects with recently issued permits (i.e., after January 1, 2005) or recently submitted applications and a potential to emit above 5 TPY NOx or PM_{10}. Because the District's database could not determine whether a source was within 80 km of the project, the District

[63] CARB ADAM database, accessed November 28, 2010. Because the Otay Mesa-Richard Correctional Facility monitor collects only PM_{10} data, and does not include data from 2004, data from this monitor will not be used for this air quality impact analysis.

[64] District emission inventories for PM_{10} are more complete than for $PM_{2.5}$. Because $PM_{2.5}$ is a subset of PM_{10}, the list of facilities generated by a PM_{10} threshold will be more extensive, and completely overlap, the list of facilities that would have been generated using a $PM_{2.5}$ threshold.

provided a list of all facilities within the District with emissions above 5 TPY of either pollutant. This list is presented in Table 1I-3 (at the end of this section).

Figures 1I-1 and 1I-2 show the location and relative strength of NO_2 sources near the project. Also shown are the site of the meteorological monitor, the site of the ambient air quality monitor, the impact area for 1-hour NO_2 standard, and a wind rose for the area.

Figure 1I-1
NOx Stationary Sources in Near Vicinity (within 10 km) of PPEC

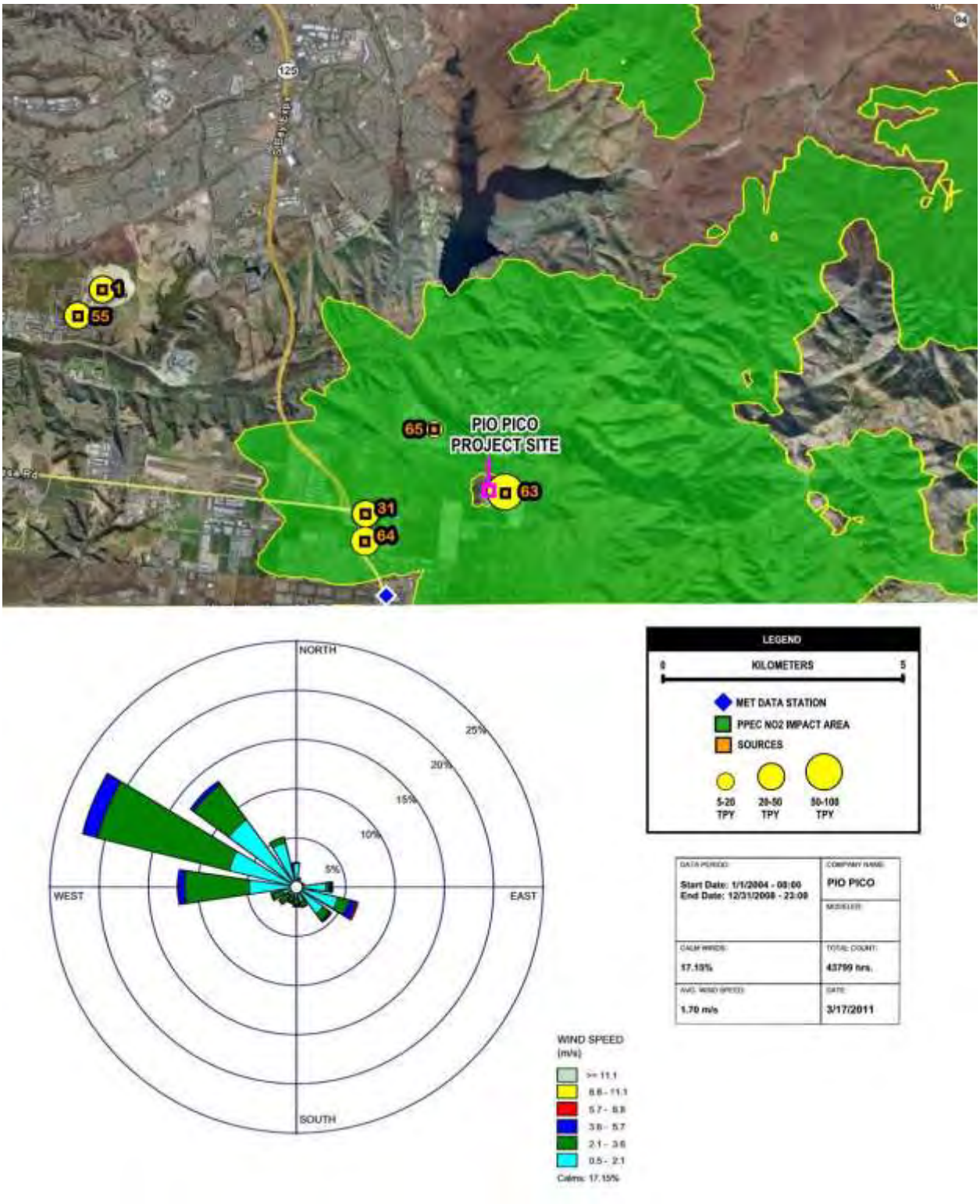
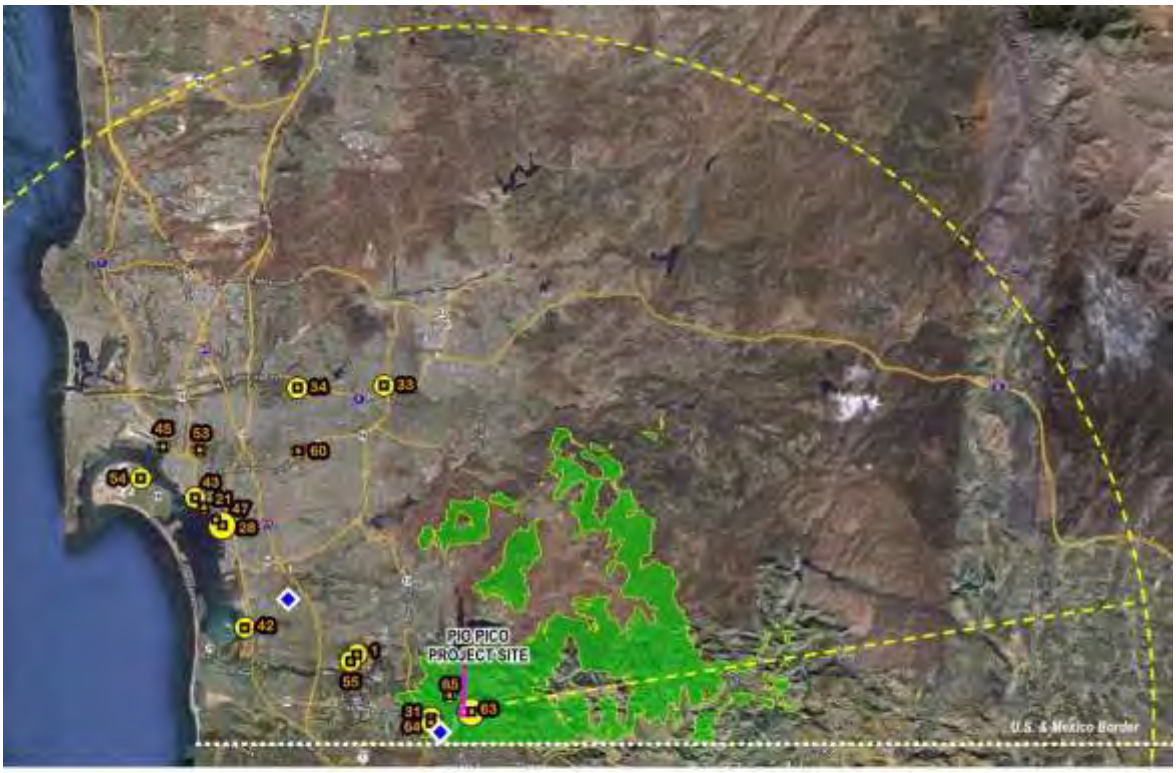


Figure 1I-2
NOx Stationary Sources in Vicinity (within 50 km) of PPEC



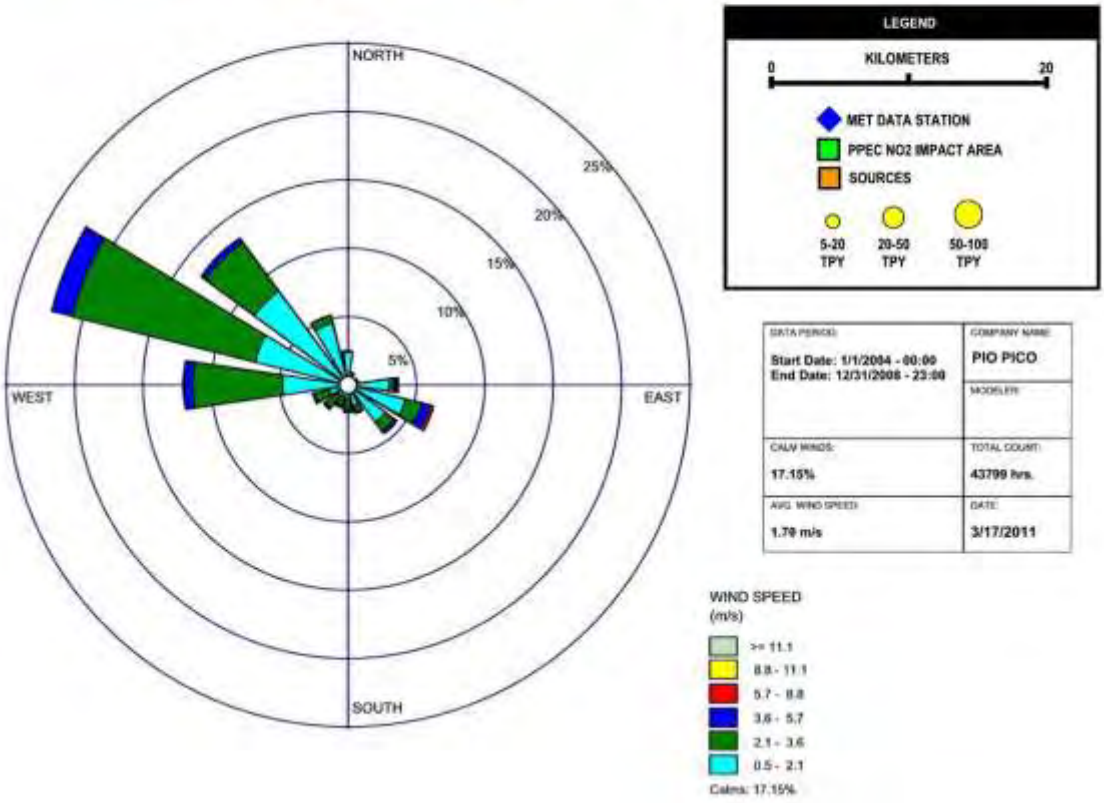


Table 1I-3 also indicates which non-project facilities and emissions are included in the compliance demonstration: NOx and $PM_{2.5}$ emissions from Larkspur Energy Facility (a small peaking plant located 2.5 km west of the project site); NOx and combustion $PM_{2.5}$ emissions from Pacific Recovery Corp (landfill gas waste-to-energy facility 9.2 km west of the project site); NOx and $PM_{2.5}$ emissions from Calpeak Border (a 50 MW peaking plant located 2.6 km SW of the project site); NOx and $PM_{2.5}$ from Donovan Correctional Facility (a small turbine 1.5 km NW of the project site) and NOx and $PM_{2.5}$ emissions from Otay Mesa Generating Company (a power plant located adjacent to the project site). These facilities are all large enough and close enough to the project site to have the potential to directly impact the project's significant impact area. Additionally, the energy facilities are likely to operate at peak capacity at the same time as PPEC.

The decision to include or exclude a specific facility is based on a number of considerations. The purpose of the analysis is to identify non-project sources that might contribute to a modeled violation at a time and place where the project has a significant impact; the size of the non-project source is important. A preliminary analysis that evaluated the combined impact of project and regional background, but no non-project sources, indicated that the project would raise the design value only 3 $\mu g/m^3$, from 153 $\mu g/m^3$ to 156 $\mu g/m^3$.[65] In order to result in a violation, a non-project source (or combination of non-project sources) would therefore have to have an impact of more than 32 $\mu g/m^3$ *at the same time and place* as the project's significant impact—about 10 times as great as the project's impact.

Because the averaging time is a short one (hourly for NO_2, daily for $PM_{2.5}$), a non-project source would need to be on the same (windward) side of the project impact area as the project in order to impact the project impact area at the same time.

Described below are the factors taken into account while reviewing the list of candidate sources.

- *Proximity*: Current EPA guidance[66] suggests that ~~"~~emphasis on determining which nearby sources to include in the modeling analysis should focus on the area within about 10 kilometers of the project location in most cases."

- *Size*: In order to affect the analysis, the candidate project or projects must have an impact 10 times as great as the project's impact at the same time and place as the project.

- *Location relative to impact areas*: For short-term impacts, a non-project facility must be on the same side of the impact area as the project in order to have an impact at the same time and place as the project.

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[65] Table 1G.2.

[66] Memo, T. Fox (EPA) to Regional Air Division Directors, "Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 Ambient Air Quality Standard," March 1, 2011, p. 12-16

- *Location relative to the ambient monitor*: Sources upwind of the ambient monitor are more likely to be adequately reflected in ambient monitoring data.

- **Operating schedule:** The variability of source operation, and the frequency of relatively high emission operations, can affect the source's contribution to significant concentration gradients. In this case, high emissions from peaking power plants are likely to align with startup emissions from the project.

Most of the facilities in Table 1I-3 are proposed for exclusion from the analysis because they are too far away from the project to be likely to create a significant impact gradient in the project's impact area. All of the excluded facilities except for Hanson Aggregates are more than 10 km away from the project, and more than 10 km away from the relevant significant impact area.

Based upon project modeling, the extent of the project's significant NO_2 impact was 24 km for an annual emission rate of 70 TPY. The ratio of emissions to distance to the limits of significant impact for the project is 70/24 TPY/km, or 2.9.[67] This ratio was used as a rough screening tool for estimating the impact of other facilities relative to the project. A facility with about the same emissions and about the same stack height can be expected to have similar impacts at a given distance. Because a non-project facility would need to have a much higher impact than the project in order to result in noncompliance, this screening level was a useful starting point for considering non-project facilities. This level was not used as a ~~b~~right line" to eliminate non-project sources from consideration. Rather, we used this ratio to separate non-project sources into three groups: those that clearly could be excluded, those that clearly should be included, and those where additional judgment was required.

It should be noted that distance over which a facility might have a significant impact for short-term standards (e.g., hourly NO_2) is determined by short-term maximum emission rates rather than annual emission rates. In fact, the PPEC impact area is determined by the peak emission rates that occur during startup and shutdown. District emission inventories report annual emission rates. If a candidate facility is operated in a way that the ratio of peak emissions to average emissions is much higher than for PPEC, use of the ratio of annual emissions distance to screen for impact is less valid. For this reason, facilities that were screened out because the annual emission-to-distance ratio of 2.9 TPY/km or lower were examined to determine if there was a likelihood that short-term emission rates would be much higher than annualized emission rates.

Other sources were screened out for the reasons outlined below.

[67] The ratio for $PM_{2.5}$ impacts is much higher (35.8TPY/3.8 km = 9.4).

- *Otay Landfill; Sycamore Landfill; Hanson Aggregates* – These facilities are on the list because they have large PM_{10} emissions. However, the $PM_{2.5}$ fraction of fugitive dust emissions is low (on the order of 20% of PM_{10}).[68] This fraction was based on the CEC's treatment of PM_{10} offsets from road paving projects (e.g., the CEC estimated that the $PM_{2.5}$ fraction of fugitive dust reductions at the Altamont Landfill would be 15% of the PM_{10} reductions).[69]

  If the $PM_{2.5}$ emissions are estimated by adjusting total $PM_{10,}$ the emission-to-distance ratio falls below the screening level. Furthermore, $PM_{2.5}$ from fugitive dust would be expected to settle out close to the source, when compared with combustion $PM_{2.5}$ emitted from a hot stack. Finally, the ratio of peak emissions to annual average emissions will be much lower for the fugitive dust sources. All of these factors combine to support excluding these sources from the analysis.

  For comparison, Table 1I-1 shows AP-42 factors for various dust-generating activities similar to those found at landfills and aggregate plants; they range from 5:1 to 15:1.

  The 20% fraction that was used to estimate PM2.5 emissions from reported fugitive PM10 emissions is therefore at the conservative end of the range of published emission factors.

Table 1I-1
AP-42 Factors
Material Handling and Vehicle Traffic (Dirt Roads)

AP-42 Section	Category	PM_{10} factor	$PM_{2.5}$ factor	Ratio
11.19.2	Tertiary Crushing (controlled)	0.00027 kg/Mg	0.00005 kg/Mg	0.19
11.19.2	Screening (controlled)	0.00037 kg/Mg	0.000025 kg/Mg	0.07
11.19.2	Truck Loading (controlled)	5.0E-05 kg/Mg	ND	--
13.2.2	Vehicle Traffic (Unpaved Roads)	1.5 lb/VMT	0.15 lb/VMT	0.10

[68] Note that the ratio shown in the seventh column of Table 1I-3 reflects the PM10 emission to distance ratio, and not the PM2.5 to distance ratio as indicated in the column header.

[69] CEC Staff, Final Staff Assessment, Tesla Power Project, April 2003. Air Quality Table 19, p. 4.1-40

- *Manson Construction and Engineering* – This is the storage location for portable equipment.[70] Emissions occur throughout the District.

- *Solar Turbines, Inc.* – Peak emissions from this turbine testing facility are lower than peak emissions from the 300 MW PPEC, and the distance from the facility to the PPEC significant impact area is much more than 24 km. Based on the PPEC modeling, it is not likely that this facility will have a significant impact on concentrations in the PPEC significant impact area.

- *Dynegy South Bay* – This facility is in the process of being decommissioned, and ceased operation on December 31, 2010.

Compliance with the Federal 24-hour $PM_{2.5}$ Standard

Form of the Standard

The federal 24-hour $PM_{2.5}$ standard is met if the three-year average of the 98th percentile daily 24-hour average $PM_{2.5}$ concentration, including background, does not exceed 35 $\mu g/m^3$.

The procedure for determining compliance is to determine the 24-hour $PM_{2.5}$ concentration, including background, for each calendar day in the year at every receptor. These concentrations are rank-ordered, highest to lowest, and the 98th percentile value (8th highest concentration for a reasonably complete data set) is selected to represent that year. These values are then averaged over the three years included in the analysis. The resulting average must be less than or equal to 35 $\mu g/m^3$.

Compliance Demonstration Procedure

The output from the dispersion model provides the worst-case project impact at all of the receptors in the impact area (the area where the maximum project impact exceeds the Significant Impact Level [SIL]) for each hour of the year. Receptors outside the impact area are excluded from the analysis because the project impact cannot, by definition, cause or contribute significantly to a violation of the standard if the project impact alone does not exceed the SIL. The ambient background concentration for each day is then added to the modeled impact at each receptor.

Once the modeled impact for each day has been added to the corresponding ambient background concentration, daily impacts are rank ordered; because the data set is complete, the 8th highest result is averaged with those from the other years in the analysis to determine compliance.

Regional Background Concentrations

Regional background concentrations have been obtained from the District. See the discussion above for NO_2, as well as the discussions in Section 4 of the PSD Application and in the modeling protocol, for more information about ambient monitoring, including representativeness.

Nearby Sources

The decision to include or exclude a specific facility is based on a number of considerations. The purpose of the analysis is to identify non-project sources that might contribute to a modeled violation at a time and place where the project has a significant impact; the size of the non-project source is important. A preliminary analysis that evaluated the combined impact of project and regional background, but no non-project sources, indicated that the project would raise the design value only 0.1 $\mu g/m^3$, from 25.8 $\mu g/m^3$ to 25.9 $\mu g/m^3$.[71] In order to result in a violation, a non-project source (or combination of non-project sources) would therefore have to have an impact of more than 9 $\mu g/m^3$ *at the same time and place* as the project's significant impact—more than 10 times as great as the project's impact.

Because the averaging time is short (daily for $PM_{2.5}$), a non-project source would need to be on the same (windward) side of the project impact area as the project in order to impact the project impact area at the same time.

Figures 1I-3 and 1I-4 show the location and relative strength of $PM_{2.5}$ sources near the project. Also shown are the site of the meteorological monitor, the site of the ambient air quality monitor, the impact area for 24-hour $PM_{2.5}$ standard, and a wind rose for the area.

[71] AFC Addendum, Table 1G.2.

Figure 1I-3
$PM_{2.5}$ Stationary Sources in Near Vicinity (within 10 km) of PPEC

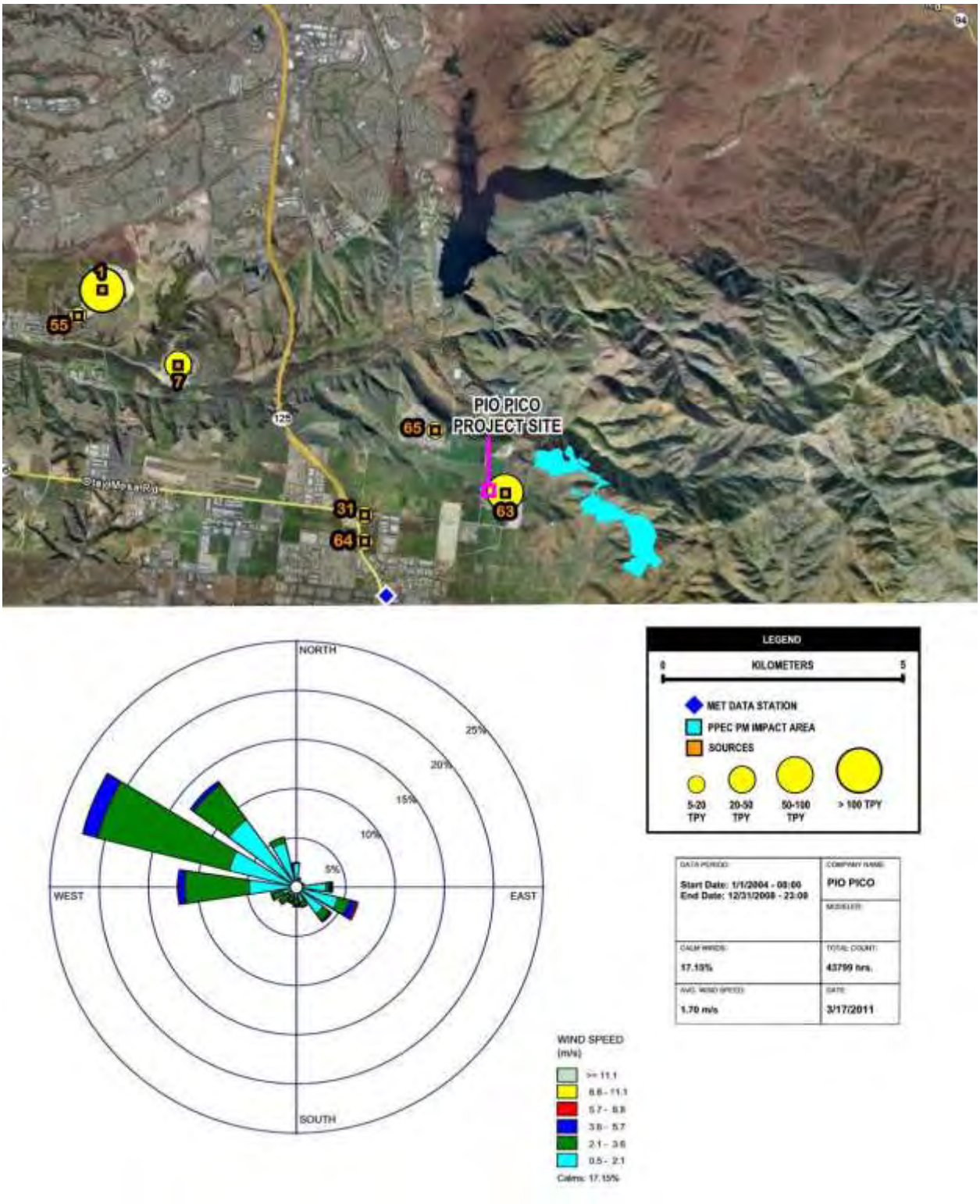
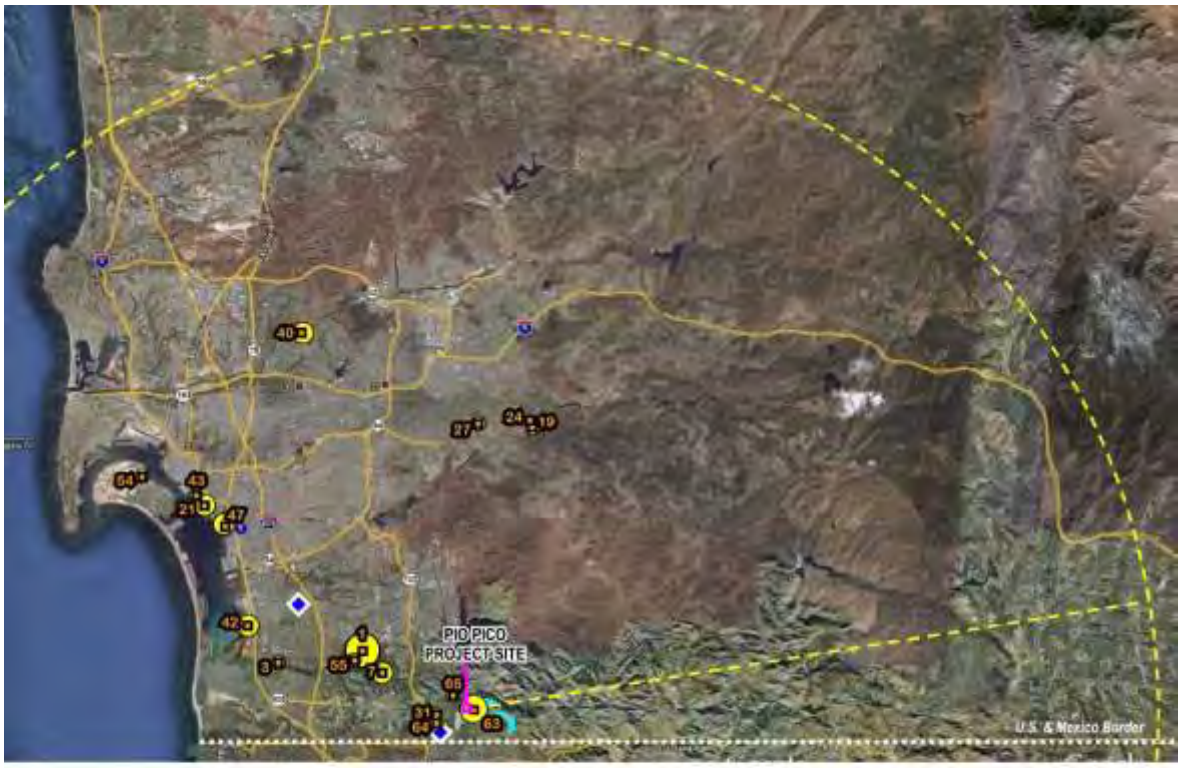
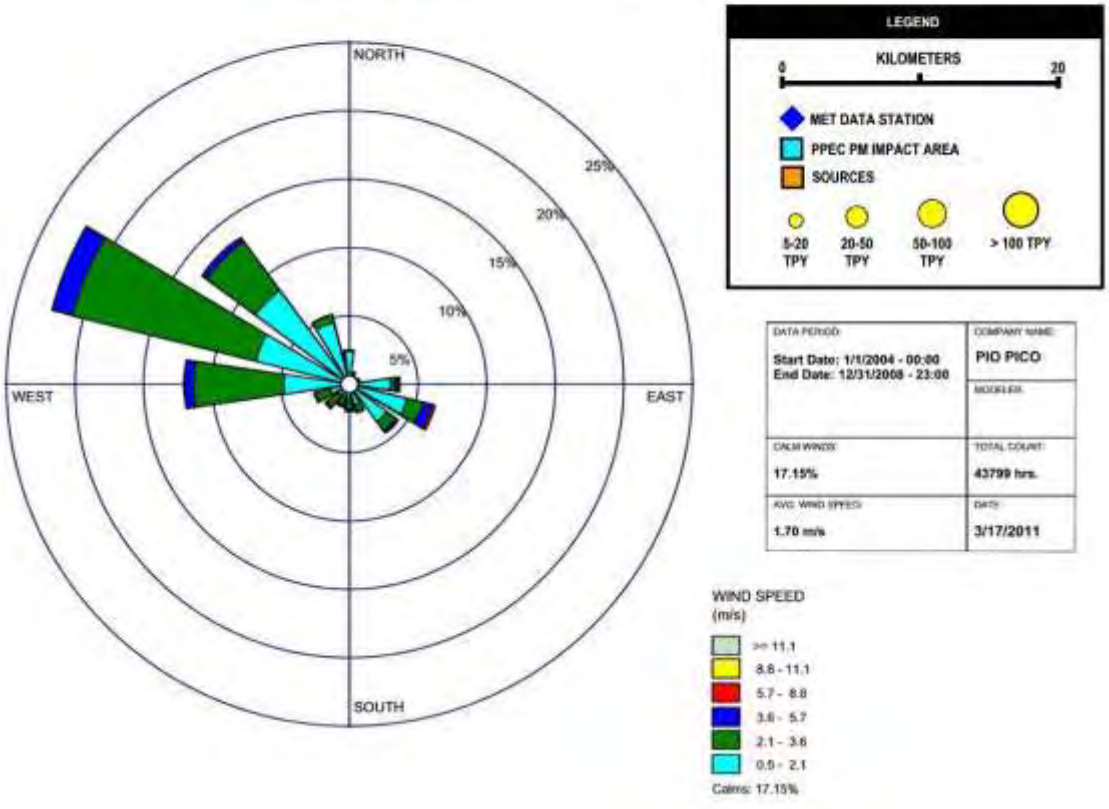


Figure 1I-4
$PM_{2.5}$ Stationary Sources in Vicinity (within 50 km) of PPEC





The same emission/distance ratio of 2.9, derived from NO_2 impacts, was used for initial screening of $PM_{2.5}$ sources. This conservative approach was taken because it simplifies the screening process. It avoids the need to account for the contribution that non-combustion sources make to project impacts, and it makes little difference in the number of sources that will be included in the cumulative impact analysis. Special factors taken into consideration for inclusion or exclusion of $PM_{2.5}$ sources are described above.

Compliance Demonstration Results

Results from the compliance demonstration are summarized in Table 1I-2.

Table 1I-2
Results of Compliance Demonstration
(Cumulative Impact)

Pollutant	Standard	Maximum Cumulative Impact ($\mu g/m^3$)	5 year Average of 98th Percentile of Total Concentration ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
NO_2	1-hr		179	188
NO_2	annual	38		100
$PM_{2.5}$	24-hr		29.9	35
$PM_{2.5}$	annual	14.4		15
PM_{10}	24-hr	64		150

Note: Cumulative impact for annual standards is based on maximum permitted annual emissions from all sources. Cumulative impact for other standards includes PPEC sources in startup mode and the following sources operating at maximum allowable hourly emissions: Larkspur Energy Facility, Pacific Recovery, Otay Mesa Generating Company, CalPeak Border, Donovan Detention Facility.

Table 1I-3 Identification of Nearby Sources								
Facility Name	Source Type	Distance from Pio Pico Project Site (kilometers)	NOx Emissions (TPY)	PM_{10} Emissions (TPY)	Emission/ Distance Ratio (NOx)	Emission/Distance Ratio ($PM_{2.5}$)	Include in Cumulative Impact	Basis for Exclusion
31. Larkspur Energy Facility	Electricity Generation	2.5	50	7.0	20.0	2.8	NOx, $PM_{2.5}$	
55. Pacific Recovery Corp	Electricity Generation	9.2	44.6	15.5	4.8	1.7	NOx	
63. Otay Mesa Generating Company[a]	Power	0.1	100	99.5	1000.0	995.0	NOx, $PM_{2.5}$	
64. Calpeak Border	Electricity Generation	2.6	31.6	14.5	12.2	5.6	NOx, $PM_{2.5}$	
65. Donovan Correctional Facility	Turbine	1.5	17.8	9.1	11.9	6.1	NOx, $PM_{2.5}$	
1. Otay Landfill Inc.	Landfill	9.0	20.7	187.5	2.3	20.8		Fugitive Dust Source[b]
2. Sycamore Landfill Inc.	Landfill	33.6	9.5	418.5	0.3	12.5		Fugitive Dust Source[b]
3. Hanson Aggregates – 7th & Main	Aggregate Production	14.4		16.8		1.2		Emission-to-distance ratio
4. Hanson Aggregates – Escondido	Aggregate Production	62.9		9.1		0.1		Emission-to-distance ratio
5. Superior Ready Mix Concrete	Concrete Mix Production	64.0		10.0		0.2		Emission-to-distance ratio
6. Hamilton Sundstrand Power Systems	Aerospace components (including auxiliary power systems)	33.7	12.6		0.4			Emission-to-distance ratio
7. Hanson Aggregates - Otay Valley Rd.	Aggregate Production	6.9		47.1		6.8		Emission-to-distance ratio
8. Manson Construction & Engineering	Marine Construction and Dredging	Portable source	13.8					Portable Source

Table 1I-3 Identification of Nearby Sources								
Facility Name	Source Type	Distance from Pio Pico Project Site (kilometers)	NOx Emissions (TPY)	PM_{10} Emissions (TPY)	Emission/ Distance Ratio (NOx)	Emission/Distance Ratio ($PM_{2.5}$)	Include in Cumulative Impact	Basis for Exclusion
9. Hanson Aggregates - Harris Plant	Aggregate Production	37.4		10.4		0.3		Emission-to-distance ratio
10. USN Air Station Noris	Unknown	30.7	9.1		0.3			Emission-to-distance ratio
11. Duplicate facility (#28)								Duplicate
12. Hanson Aggregates - Carroll Canyon	Aggregate Production	42.0		15.5		0.4		Emission-to-distance ratio
13. USMC Camp Pendleton - Military Schools	Unknown	89.0	6.2		0.1			Emission-to-distance ratio
14. USMC Camp Pendleton - Unpermitted Sources	Unknown	89.6	11.6		0.1			Emission-to-distance ratio
15. Hanson Aggregates - Twin Oaks	Aggregate Production	65.0		21.7		0.3		Emission-to-distance ratio
16. Hanson Aggregates - Sycamore Landfill	Aggregate Production	34.6		29.4		0.8		Emission-to-distance ratio
17. California Commercial Asphalt	Asphalt Production	37.4		12.4		0.3		Emission-to-distance ratio
18. Agri Service	Composting Facility	79.4		5.5		0.1		Emission-to-distance ratio
19. J Cloud Inc	Construction Materials Recycling	21.1		6.4		0.3		Emission-to-distance ratio
20. Encina Wastewater Authority	Wastewater Treatment	70.7	6.9		0.1			Emission-to-distance ratio
21. National Steel & Shipbuilding	Steel and Ship Production	24.3	12.9	23.2	0.5	1.0		Emission-to-distance ratio

Table 1I-3 Identification of Nearby Sources								
Facility Name	Source Type	Distance from Pio Pico Project Site (kilometers)	NOx Emissions (TPY)	PM_{10} Emissions (TPY)	Emission/ Distance Ratio (NOx)	Emission/Distance Ratio ($PM_{2.5}$)	Include in Cumulative Impact	Basis for Exclusion
22. Hanson Aggregates - Hwy 67 Lakeside	Aggregate Production	37.3		18.6		0.5		Emission-to-distance ratio
23. Pacific Gas Turbine Center	Electricity Production	40.7	12.9		0.3			Emission-to-distance ratio
24. Hanson Aggregates - El Cajon	Aggregate Production	21.3		5.0		0.2		Emission-to-distance ratio
25. So. Cal. Edison - San Onofre	Electricity Generation	106.3	27.2		0.3			Emission-to-distance ratio
26. Kyocera	Electronic Goods Production	34.5	16.9		0.5			Emission-to-distance ratio
27. CW Mcgrath	Quarry	20.6		5.9		0.3		Emission-to-distance ratio
28. USN Supships - 32nd St	Unknown	23.0	6.4		0.3			Emission-to-distance ratio
29. Gas Recovery System - San Marcos	Electricity Generation	63.2	16.1		0.3			Emission-to-distance ratio
30. Gas Recovery Systems - Santee	Electricity Generation	33.1	20.4		0.6			Emission-to-distance ratio
32. Encina Power Plant	Electricity Generation	73.6	54.6	47.6	0.7	0.6		Emission-to-distance ratio
33. Grossmont District Hospital	Medical Services	24.4	39.1		1.6			Emission-to-distance ratio
34. San Diego State University	University	26.6	25.4		1.0			Emission-to-distance ratio

Table 1I-3 Identification of Nearby Sources								
Facility Name	Source Type	Distance from Pio Pico Project Site (kilometers)	NOx Emissions (TPY)	PM_{10} Emissions (TPY)	Emission/ Distance Ratio (NOx)	Emission/Distance Ratio ($PM_{2.5}$)	Include in Cumulative Impact	Basis for Exclusion
35. Solar Turbines Inc.	Small Combustion Turbine Production	33.4	94.4	7.5	2.8	0.2		Emission-to-distance ratio
36. Pt. Loma Wastewater Treatment Plant	Wastewater Treatment	32.9	45.2	11.2	1.4	0.3		Emission-to-distance ratio
37. Qualcomm - Morehouse Dr.	Electronic Goods Production	44.0	26.5		0.6			Emission-to-distance ratio
38. Minnesota Methane - North City Facility	Cogeneration	42.7	25.3	8.5	0.6	0.2		Emission-to-distance ratio
39. Minnesota Methane - Miramar Facility	Cogeneration	37.4	42.2	14.9	1.1	0.4		Emission-to-distance ratio
40. Canyon Rock - Mission Gorge	Aggregate Production	29.9		35.9		1.2		Emission-to-distance ratio
41. Vulcan Materials	Aggregate Production	31.2		44.3		1.4		Emission-to-distance ratio
42. Dynegy South Bay	Electricity Generation	17.3	35.7	36.8	2.1	2.1		Ceased Operation
43. CP Kelco US Inc	Food Ingredients Production	25.3	38.8	6.4	1.5	0.3		Emission-to-distance ratio
44. Applied Energy LLC MCRD	Electricity Generation	32.6	40.4	12.8	1.2	0.4		Emission-to-distance ratio
45. Solar Turbines - Pacific Hwy	Small Combustion Turbine Production	29.5	16.6		0.6			Emission-to-distance ratio
46. RCP Block & Brick	Concrete Block and Brick Production	30.8		5.8		0.2		Emission-to-distance ratio

Table 1I-3 Identification of Nearby Sources								
Facility Name	Source Type	Distance from Pio Pico Project Site (kilometers)	NOx Emissions (TPY)	PM_{10} Emissions (TPY)	Emission/ Distance Ratio (NOx)	Emission/Distance Ratio ($PM_{2.5}$)	Include in Cumulative Impact	Basis for Exclusion
47. Applied Energy - Naval Station	Electricity Generation	22.5	56.2	22.3	2.5	1.0		Emission-to-distance ratio
48. BAE Systems Ship Repair	Ship Repair	45.0	7.3		0.2			Emission-to-distance ratio
49. UC San Diego	University	44.9	9.4	9.8	0.2	0.2		Emission-to-distance ratio
50. San Diego Union Tribune	Newspaper Production	31.3	8.0		0.3			Emission-to-distance ratio
51. US Marine Corps Miramar	Unknown	39.2	87.7	5.3	2.2	0.1		Emission-to-distance ratio
52. US Marine Corps Miramar – 3rd MAW	Motor Transportation Maintenance	39.6	21.2		0.5			Emission-to-distance ratio
53. Navy Hospital	Medical Services	27.3	10.7		0.4			Emission-to-distance ratio
54. Applied Energy - North Island	Electricity Generation	29.3	22.0	15.5	0.8	0.5		Emission-to-distance ratio
56. Vulcan Materials - Black Mtn. Rd.	Aggregate Production	41.2		27.1		0.7		Emission-to-distance ratio
57. SDG&E Palomar Energy Center	Electricity Production	63.3	95.4	37.6	1.5	0.6		Emission-to-distance ratio
58. Goal Line LP - Escondido	Electricity Generation	62.7	18.9	26.0	0.3	0.4		Emission-to-distance ratio
59. San Diego County - San Marcos Landfill	Closed Landfill	62.7	9.6		0.2			Emission-to-distance ratio

Table 1I-3 Identification of Nearby Sources								
Facility Name	Source Type	Distance from Pio Pico Project Site (kilometers)	NOx Emissions (TPY)	PM_{10} Emissions (TPY)	Emission/ Distance Ratio (NOx)	Emission/Distance Ratio ($PM_{2.5}$)	Include in Cumulative Impact	Basis for Exclusion
60. San Diego City - South Chollas Landfill	Closed Landfill	22.6	6.3		0.3			Emission-to-distance ratio
61. San Diego City - Miramar Landfill	Landfill	38.8		82.2		2.1		Emission-to-distance ratio
62. San Diego Metro Pumping Station #2	Water Pumping Facility	32.2	13.6		0.4			Emission-to-distance ratio

[a] Emissions from Otay Mesa Generating Company are maximum permitted annual emissions.

[b] Fugitive dust emission source. See text for discussion of factors resulting in exclusion.

APPENDIX 2

(Biological Resources – from AFC)

APPENDIX J-1
BIOLOGICAL TECHNICAL REPORT

BIOLOGICAL TECHNICAL REPORT
PIO PICO ENERGY CENTER
SAN DIEGO COUNTY, CALIFORNIA

December 2010
Modified May2011

Prepared for:
Pio Pico Energy Center, LLC

Prepared by:
URS

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Attachment B. Plant Species Observed within the Study Area
Attachment C. Wildlife Species Observed within the Study Area

1.0 Introduction

This report documents the findings of an evaluation of biological resources[1] conducted by URS Corporation (URS) for the proposed Pio Pico Energy Center project (hereafter referred to as the project). For the purposes of this report, the "study area" includes the project's proposed ground disturbance footprint (project footprint) and a 500-ft buffer, to the maximum extent practical[2] (Figures 1 and 2).

The project is located within a predominately anthropogenically-disturbed area (e.g., adjacent power plant) in an unincorporated area of San Diego County, California. The project occurs at an approximate elevation of 635 feet above mean sea level (msl). The project also occurs within the California, San Bernardino Merdian, Section 30, Township 18 South, and Range 1 East of the Otay Mesa United States Geological Survey (USGS) 7.5-Minute Topographic Quadrangle Map (USGS, 1975). The majority of the study area is currently disturbed and/or bifurcated with existing dirt roads and bare ground of open graded fields and is absent of native habitat. Land use in the surrounding vicinity of the study area includes ruderal, non-native grasslands, developed areas, commercial, and public infrastructure. The intended use of this document is to disclose and evaluate habitat conditions and determine the potential for occurrence of common and special-status species[3], their habitats[4], and special aquatic resource areas[5] within study area limits.

1 For the purposes of this analysis, "biological resources" refers to the plants, wildlife, and habitats that occur, or have the potential to occur, within the Project's study area.

2 Where 100% pedestrian coverage of the study area was not possible due to limited access (e.g., fenced areas where access to private property or other physical barriers [vegetative cover, health and safety concerns, etc.]), field observations were made from the nearest appropriate vantage points via public right-of-ways with binoculars and/or via aerial photographic interpretation.

3 For the purposes of this analysis, "special-status species" refers to any species that has been afforded special protection by federal, state, or local resource agencies (e.g., U.S. Fish and Wildlife Service, California Department of Fish and Game) or resource conservation organizations (e.g., California Native Plant Society). The term "special-status species" excludes those avian species solely identified under Section 10 of the Migratory Bird Treaty Act (MBTA) for federal protection. Nonetheless, MBTA Section 10 protected species are afforded avoidance and minimization measures per state and federal requirements.

4 A "habitat" is defined as the place, or type of locale where a plant or animal naturally or normally lives and grows.

5 For the purposes of this analysis, "special aquatic resource areas" are defined as potential: United States Army Corps of Engineers (USACE) jurisdiction pursuant to Section 404 of the Clean Water Act (CWA); Regional Water Quality Control Board (RWQCB) legal authority in accordance with Section 401 of the CWA and as defined within Section 13050(e) (et seq.) of the California Water Code (CWC) via the Porter-Cologne Water Quality Control Act (Porter-Cologne); and California Department of Fish and Game (CDFG) jurisdiction pursuant to Section 1600 (et seq.) of the California Fish and Game Code (CFG Code).

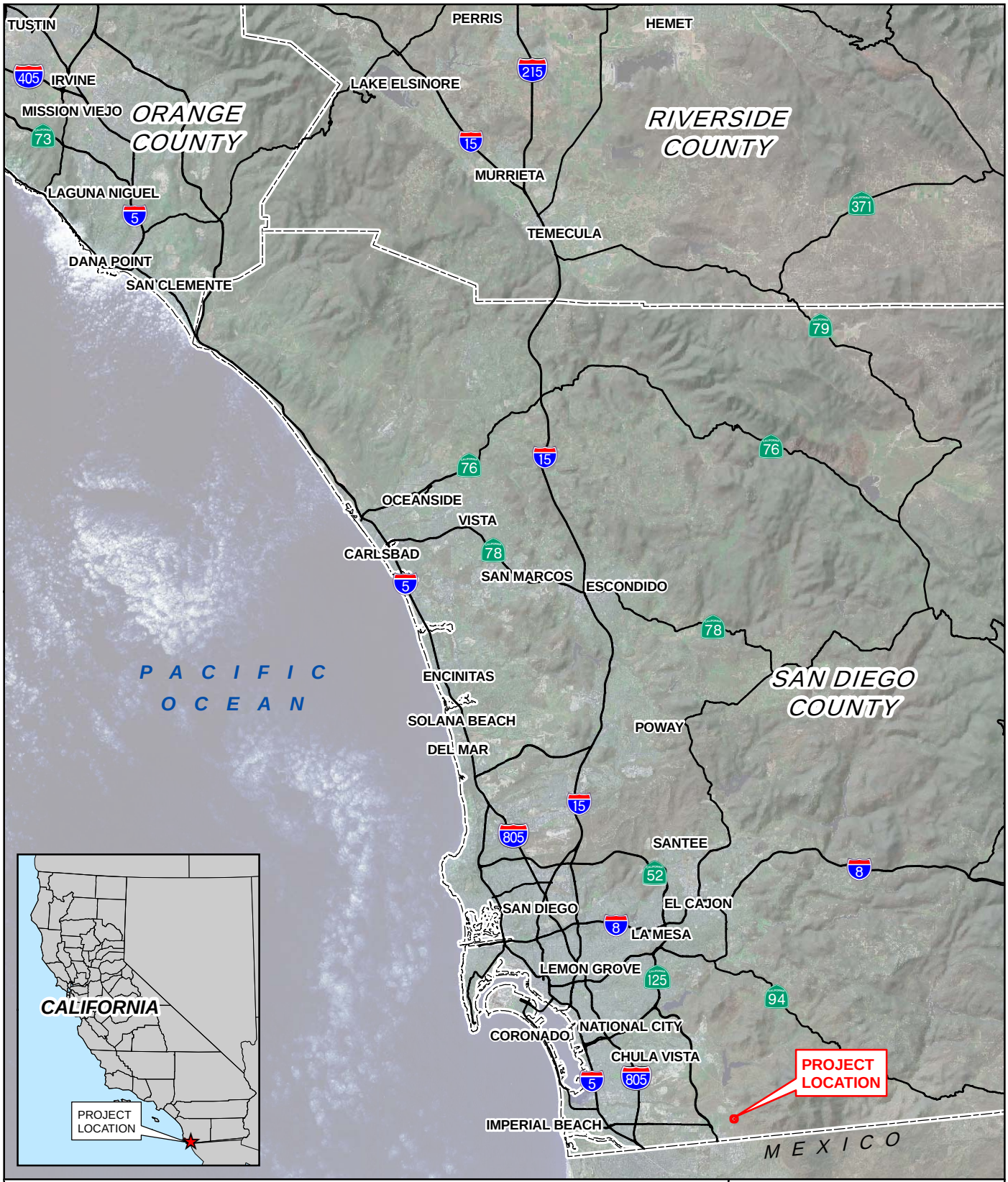
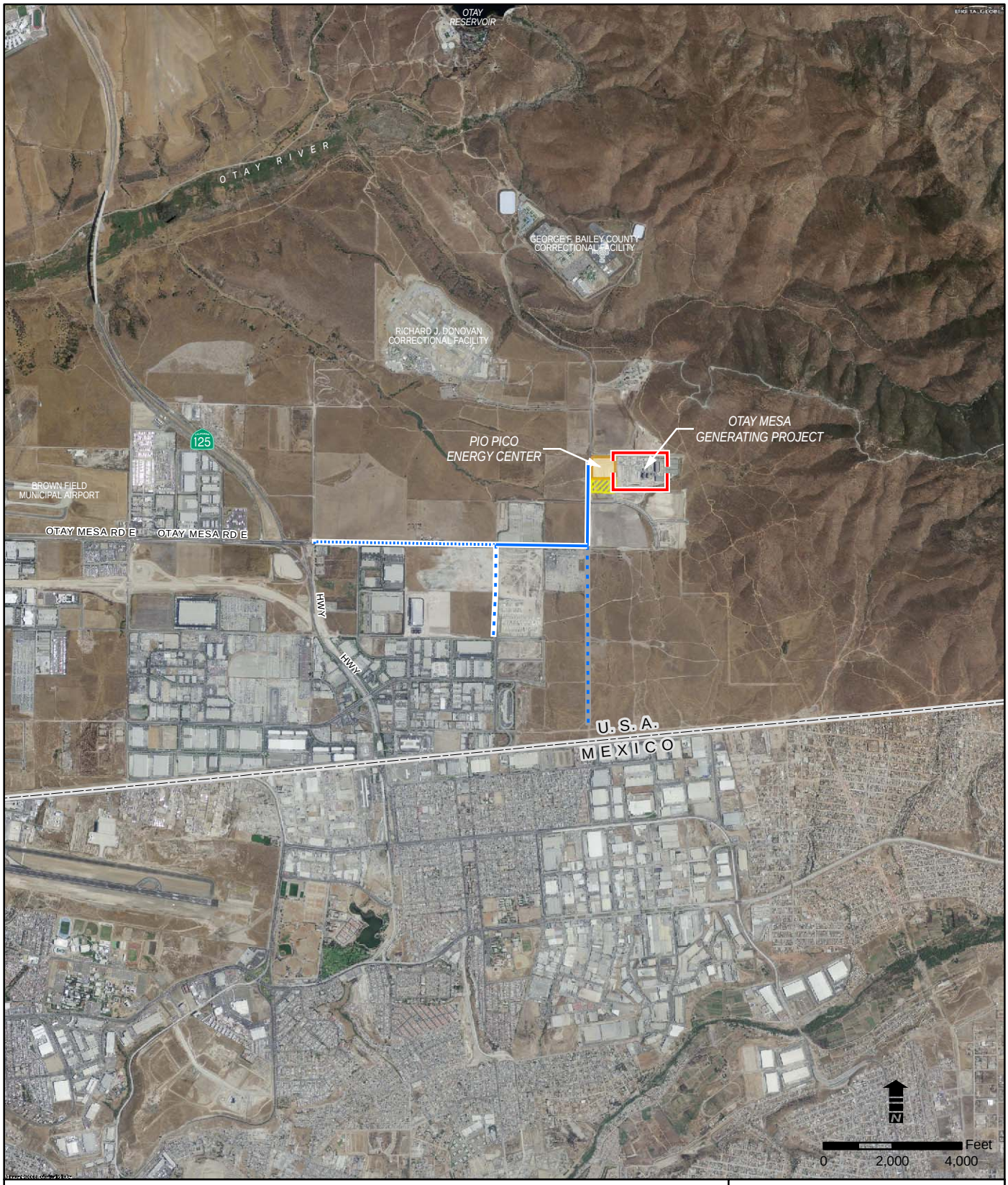


FIGURE 1
REGIONAL LOCATION

PIO PICO
ENERGY CENTER

PROJECT NO.: 29874827
DATE: DECEMBER 2010

URS



Legend

- Project Site
- Laydown Area
- 230 kV Transmission Line (Route A and Route B)
- Natural Gas Line
- Modified Route A Natural Gas Line
- Previous Route A Natural Gas Line
- Route B Natural Gas Line

FIGURE 2
SITE VICINITY

PIO PICO
ENERGY CENTER

PROJECT NO.: 29874827
DATE: DECEMBER 2010

URS

2.0 Methods

Prior to beginning field surveys, URS consulted resource specialists and reviewed available information from resource management plans and relevant documents to determine the locations and types of biological resources that have the potential to exist within and adjacent to the project study area; resources were evaluated within one mile and ten miles of the project pursuant to California Energy Commission's (CEC) evaluation guidelines. The materials reviewed included, but were not limited to, the following:

- County of San Diego, Biological Mitigation Ordinance (1996)
- County of San Diego in Conjunction with the United States Fish and Wildlife Service (USFWS). Multiple Species Conservation Program
- USFWS Critical Habitat Mapper and File Data (USFWS, 2010a and 2010b)
- USFWS Carlsbad Field Office Species List for San Diego County
- The California Natural Diversity Database (CDFG, 2010)
- California Native Plant Society Electronic Inventory (CNPS, 2010)
- Aerial Photographs (Digital Globe, 2009)

Wildlife corridors were also evaluated within the study area. This evaluation included a literature review to identify any previously recognized regional[6] and/or local[7] wildlife corridors or linkages (Ogden Environmental, 1993). To evaluate the arrangement of open space for its usefulness as a wildlife corridor, a group of focal target species was selected as well. The focal species included the larger mammal species: mule deer (*Odocoileus hemionus*), mountain lion (*Felis concolor*), bobcat (*Felis rufus*), coyote (*Canus latrans*), and kit fox (*Vulpes macrotis*). Detection of sign and/or visual observation of these species were documented during the various field efforts. These data will be analyzed to determine areas of high wildlife use.

Pedestrian-based field surveys were performed as well to assess general and dominant vegetation community types, community sizes, habitat types, and species present within communities. Community type descriptions were based on observed dominant vegetation composition based on the criteria and definitions of widely accepted vegetation classification systems (Holland, 1986; Sawyer, Keeler-Wolf and Evens, 2009). Plants were identified to the lowest taxonomic level sufficient to determine whether the plant species observed were non-native, native, or special-status. Plants of uncertain identity were subsequently identified from taxonomic keys (Hickman, 1993). Scientific and common species names were recorded according to Hickman (1993). The presence of a wildlife species was based on direct observation, and wildlife sign (e.g., tracks, burrows, nests, scat, or vocalization). Field data compiled for wildlife species included scientific

[6]Regional corridors link two or more large areas of natural open space and serve to maintain demographic and genetic exchange between wildlife populations residing within these geographically distinct areas (Beier and Loe, 1992).

[7]Local corridors give resident animals access to essential resources (e.g., water, food, cover, or den sites) within a large habitat patch and may also function as secondary connections to the regional corridor system (Beier and Loe, 1992).

name, common name, and evidence of sign when no direct observations were made. Wildlife of uncertain identity were documented and subsequently identified from specialized field guides and related literature (Burt and Grossenheider, 1980; Halfpenny, 2000; Sibley, 2000; Elbroch, 2003; and Stebbins, 2003).

The study area was also assessed for its potential to support special-status species based on habitat suitability comparisons with reported occupied habitats. The following definitions were utilized to determine the need for subsequent surveys and to assess project-related effects to special-status species:

Absent [A] - Species distribution is restricted by substantive habitat requirements, which do not occur within the project footprint, and no further survey or study is necessary to determine likely presence or absence of this species.

Low [L] - Species distribution is restricted by substantive habitat requirements, which are negligible within the project footprint, and no further survey or study is obligatory to determine likely presence or absence of this species.

Habitat Present [HP] - Species distribution is restricted by substantive habitat requirements, which occur within the project footprint, and further survey or study may be necessary to determine likely presence or absence of species.

Present [P] - Species or species sign were observed to be present in the project footprint.

Additionally, suspected special aquatic resource areas were examined and evaluated within the study area using the general methodology set forth in:

- The U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual (Environmental Laboratory 1987);
- The USACE's Interim Regional Supplement to the USACE Wetland Delineation Manual: Arid West Region Direction on Delineating Arid Streams (Wakeley et al., 2006);
- The USACE's and Environmental Protection Agency's June 2007 issued Clean Water Act (CWA) Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States & Carabell v. United States Guidance Document (USACE, 2007); and
- Those analysis tools detailed in A Field Guide to Lake and Streambed Alteration Agreements Sections 1600-1607 (ESD, 1994).

Detailed field survey methods are provided in the Preliminary Jurisdictional Delineation Report which presents our best effort at estimating jurisdictional boundaries using the most up-to-date regulations, written policies, and guidance from the USACE, Regional Water Quality Control Board (RWQCB), and California Department of Fish and Game (CDFG). Nonetheless, only the USACE, RWQCB, and CDFG can make a final determination of jurisdictional boundaries for this project.

3.0 Results

URS biologists Carol Thompson and Dennis Miller conducted surveys of the study area in November 2010. Ms. Thompson's professional experience includes nearly a decade performing habitat assessments, biological resource surveys, and special-status species monitoring across California. Ms. Thompson has a broad range of plant and wildlife taxonomy and data collection skills. She is also recognized as an authority in the identification and natural history of the Stephen's kangaroo rat, vernal pool branchiopods, California gnatcatcher, and least Bell's Vireo. Accordingly, Ms. Thompson holds USFWS 10(a)(1)(A) permits to survey and monitor for those species and routinely supports URS infrastructure, power, and transportation projects throughout Central and Southern California.

Mr. Miller has an extensive background in field research and ecological studies. As a biologist Mr. Miller has participated in projects which include vegetation mapping, biological monitoring, small mammal trapping, vernal pool branchiopod surveys, and protocol USFWS special status species surveys for avian and botanical surveys. He has prepared numerous biological reports, assessments, to demonstrate compliance with the Federal Energy Regulatory Commission (FERC), Federal Railroad Administration (FRA), Federal Highway Administration (FHWA), California Energy Commission (CEC), California Department of Transportation (Caltrans), California Coastal Commission (CCC), state and federal Endangered Species Acts. Mr. Miller has participated in consultation with regulating agencies including California Department of Fish and Game (CDFG), U.S. Fish and Wildlife Service (USFWS), and National Marine Fisheries Service (NMFS).

Weather conditions during the surveys included clear skies, temperatures ranging from 65–75 degrees Fahrenheit (^{o}F), and winds from 0 to 2 miles per hour (mph).

Vegetation communities / land cover types

Five vegetation communities/land cover types were observed within the study area which includes: Non-Native Grassland, Mule Fat/Tamarisk Scrub, Riparian, Disturbed/Developed (Table 1 and Figure 3). Vegetation community types are described below. Representative photos of the study area are provided in Attachment A, Photograph Log.

Table 1. Vegetation Communities Observed Within the Study Area

VEGETATION COMMUNITY TYPE	ACRES
Non-Native Grassland	425.0
Riparian	5.64
Disturbed/Developed	388.8

Non-Native Grassland

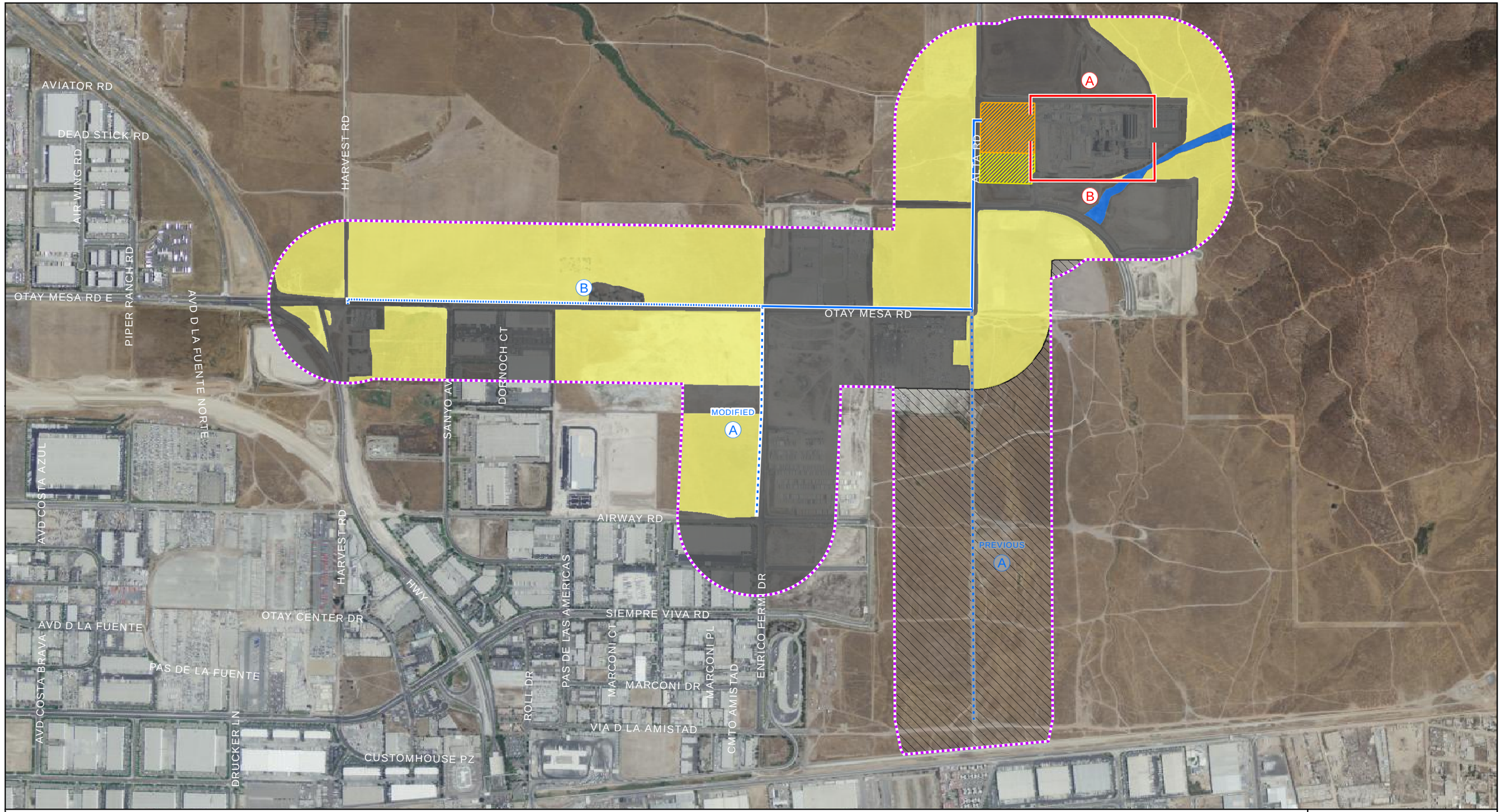
Non-Native Grassland generally occurs on fine-textured loam or clay soils that are moist or even waterlogged during the winter rainy season and very dry during the summer and fall. This habitat is a disturbance-related community most often found in old fields or openings in native scrub habitats and is characterized by a dominant cover (greater than 50% cover) of annual grasses and occasionally native and nonnative annual forbs (Holland, 1986). Non-native grasses have replaced native grassland and coastal sage scrub at many localities throughout Southern California.

Riparian

Dominant riparian species within the study area include southern cattail (*Typha domingensis*), tall umbrella sedge (*Cyperus eragrostis*), and arroyo willow (*Salix lasiolepis*). This vegetation is present for most, or all, of the growing season in most years and is dominated by perennial species.

Disturbed / Developed

Disturbed vegetation has developed within portions of the study area having varying levels of anthropogenic disturbance. Disturbed areas are dominated by broad-leaf herbaceous species such as mustards (*Brassica* spp.; *Hirshfeldia incana*), horseweed (*Conyza canadensis*), and thistles (*Centaurea* spp., *Silybum* spp., *Carduus* spp.) and often have a subdominant cover (less than 50% cover) of annual non-native grasses. Developed lands within the study area include a power plant, roadways, parking lots, vacant lots, and other private/public infrastructure with ornamental plantings. Species composition in developed communities within the study area varied and dominated by non-native cultivar species. Disturbed and developed vegetation communities are found throughout the study area.



Legend

- Biological Study Area
- Not Included in Final Design
- Project Site
- Laydown Area
- 230 kV Transmission Line (Route A and Route B)
- Natural Gas Line
- Modified Route A Natural Gas Line
- Previous Route A Natural Gas Line
- Route B Natural Gas Line
- Developed/Disturbed
- Riparian
- Non-Native Grassland

N

0 600 1,200 Feet

FIGURE 3
VEGETATION COMMUNITIES

PIO PICO
ENERGY CENTER

PROJECT NO.: 29874827
DATE: DECEMBER 2010

URS

Special-Status Plants

Thirty nine (39) special status plant species are reported to occur within the USGS Otay Mesa 7.5-minute Quadrangle Map that includes the project footprint (Table 2). Eight of the listed plants are considered endangered or threatened plant species. All 39 listed species were determined to have an "Absent" or "Low" potential for occurrence within the project disturbance footprint, and no further survey or study is necessary to determine presence or absence of these species. All plant species observed during the surveys are listed in Attachment B.

Table 2. Special-Status Plant Species Potential for Occurrence within the Project Footprint

SCIENTIFIC AND COMMON NAME	HABITAT AND DISTRIBUTION	BLOOMING PERIOD	STATUS DESIGNATION	POTENTIAL FOR OCCURRENCE
Acanthomintha ilicifolia San Diego thorn-mint	Annual herb. Found in chaparral, coastal scrub, valley and foothill grassland, and vernal pools/clay soils. Occurs from 33 to 3,150 ft. in elevation.	Apr-Jun	Fed: THR CA: END CNPS: List 1B.1 Local: NE	Low
Adolphia californica California adolphia	Deciduous shrub. Found in chaparral, coastal shrub, and valley and foothill grassland/clay soils. Occurs from 150 to 2,400 ft. in elevation.	Dec-May	Fed: NONE CA: NONE CNPS: List 2.1	Low
Ambrosia chenopodiifolia San Diego bur-sage	Shrub. Found in coastal scrub. Occurs from 180 to 540 ft. in elevation.	Apr-Jun	Fed: NONE CA: NONE CNPS: List 2.1	Absent
Ambrosia monogyra Singlewhorl burrobush	Shrub. Found in chaparral and Sonoran desert scrub/sandy soils. Occurs from 33 to 1,640 ft. in elevation.	Aug-Nov	Fed: NONE CA: NONE CNPS: List 2.2	Absent
Atriplex coulteri Coulter's saltbush	Perennial herb. Found in coastal bluff scrub, coastal dunes, coastal scrub, and valley and foothill grassland/alkaline or clay soils. Occurs from 10 to 1,500 ft. in elevation.	Mar-Oct	Fed: NONE CA: NONE CNPS: List 1B.2	Low
Atriplex pacifica South Coast saltscale	Annual herb. Found in coastal bluff scrub, coastal dunes, coastal scrub, and playas. Occurs from 0 to 460 ft. in elevation.	Mar-Oct	Fed: NONE CA: NONE CNPS: List 1B.2	Absent
Bergerocactus emoryi Golden-spined cereus	Stem succulent. Found in closed-cone coniferous forest, chaparral, and coastal scrub/sandy soils. Occurs from 10 to 1,300 ft. in elevation.	May-Jun	Fed: NONE CA: NONE CNPS: List 2.2	Absent

SCIENTIFIC AND COMMON NAME	HABITAT AND DISTRIBUTION	BLOOMING PERIOD	STATUS DESIGNATION	POTENTIAL FOR OCCURRENCE
Brodiaea orcuttii Orcutt's brodiaea	Bulbiferous herb. Found in closed-cone coniferous forest, chaparral, cismontane woodland, meadows and seeps, valley and foothill grassland, and vernal pools/mesic and clay soils, sometimes serpentine. Occurs from 100 to 5,500 ft. in elevation.	May-Jul	Fed: NONE CA: NONE CNPS: List 1B.1 Local: NE	Low
California macrophylla Round-leaved filaree	Annual herb. Found in cismontane woodland and valley and foothill grasslands/clay soils. Occurs from 50 to 4,000 ft. in elevation.	Mar-May	Fed: NONE CA: NONE CNPS: List 1B.1	Low
Calochortus dunnii Dunn's mariposa-lily	Bulbiferous herb. Found in closed-cone coniferous forest, chaparral, and valley and foothill grassland/ gabbroic or metavolcanic, rocky soils. Occurs from 1,250 to 6,000 ft. in elevation.	Apr-Jun	Fed: NONE CA: RARE CNPS: List 1B.2 Local: NE	Absent
Camissonia lewisii Lewis' evening primrose	Annual herb. Found in coastal bluff scrub, cismontane woodland, coastal dunes, coastal scrub, and valley and foothill grassland/sandy or clay soils. Occurs from 0 to 980 ft. in elevation.	Mar-May	Fed: NONE CA: NONE CNPS: List 3	Low
Ceanothus cyaneus Lakeside ceanothus	Evergreen shrub. Found in closed-cone coniferous forest and chaparral. Occurs from 770 to 2,480 ft. in elevation.	Apr-Jun	Fed: NONE CA: NONE CNPS: List 1B.2 Local: NE	Absent
Ceanothus otayensis Otay Mountain ceanothus	Evergreen shrub. Found in chaparral/metavolcanic or gabbroic rock. Occurs from 1,968 to 3,600 ft. in elevation.	Jan-Apr	Fed: NONE CA: NONE CNPS: List 1B.2	Absent
Comarostaphylis diversifolia ssp. *diversifolia* Summer holly	Evergreen shrub. Found in chaparral and cismontane woodland. Occurs from 100 to 1,800 ft. in elevation.	Apr-Jun	Fed: NONE CA: NONE CNPS: List 1B.2	Absent
Cordylanthus orcuttianus Orcutt's bird's-beak	Annual herb; hemiparasitic. Found in coastal scrub. Occurs from 33 to 1,150 ft. in elevation.	Apr-Jul	Fed: NONE CA: NONE CNPS: List 2.1	Absent
Cylindropuntia californica var. *californica* Snake cholla	Perennial succulent. Found in chaparral and coastal scrub. Occurs from 100 to 165 ft. in elevation.	April - May	Fed: NONE CA: NONE CNPS: List 1B.1	Low
Deinandra conjugens Otay tarplant	Annual herb. Found in coastal scrub, and valley and foothill grassland/clay soils. Occurs from 246 to 985 ft. in elevation.	May-Jun	Fed: THR CA: END CNPS: List 1B.1 Local: NE	Low

SCIENTIFIC AND COMMON NAME	HABITAT AND DISTRIBUTION	BLOOMING PERIOD	STATUS DESIGNATION	POTENTIAL FOR OCCURRENCE
Dudleya variegata Variegated dudleya	Perennial herb. Found in chaparral, cismontane woodland, coastal scrub, valley and foothill grassland, and vernal pools/clay soils. Occurs from 10 to 1,900 ft. in elevation.	Apr-Jun	Fed: NONE CA: NONE CNPS: List 1B.2 Local: NE	Low
Eryngium aristulatm var. *parishii* San Diego button-celery	Annual/perennial herb. Found in coastal scrub, valley and foothill grassland, and vernal pools/mesic soil. Occurs from 66 to 2,035 ft. in elevation.	Apr-Jun	Fed: END CA: END CNPS: List 1B.1	Low
Ferocactus viridescens San Diego barrel cactus	Stem succulent. Found in chaparral, coastal scrub, valley and foothill grassland, and vernal pools. Occurs from 10 to 1,500 ft. in elevation.	May-Jun	Fed: NONE CA: NONE CNPS: List 2.1	Low
Fremontodendron mexicanum Mexican flannelbush	Evergreen shrub. Found in closed-cone coniferous forest, chaparral, and cismontane woodland/ gabbroic, metavolcanic, or serpentinite. Occurs from 32 to 2,350 ft. in elevation.	Mar-Jun	Fed: END CA: RARE CNPS: List 1B.1	Absent
Harpagonella palmeri Palmer's grapplinghook	Annual herb. Found in chaparral, coastal scrub, and valley and foothill grassland/clay. Occurs from 66 to 3,130 ft. in elevation.	Mar-May	Fed: NONE CA: NONE CNPS: List 4.2	Low
Hesperocyparis forbesii Tecate cypress	Evergreen tree. Found in closed-cone coniferous forest and chaparral/clay soils, gabbroic or metavolcanic rock. Occurs from 836 to 4,900 ft. in elevation.	N/A	Fed: NONE CA: NONE CNPS: List 1B.1	Absent
Iva hayesiana San Diego marsh-elder	Perennial herb. Found in marshes and swamps and playas. Occurs from 33 to 1640 ft. in elevation.	Apr-Oct	Fed: NONE CA: NONE CNPS: List 2.2	Low
Lepechinia ganderi Gander's pitcher sage	Shrub. Found in closed-cone coniferous forest, chaparral, coastal scrub, and valley and foothill grassland/gabbroic or metavolcanic rock. Occurs from 1,000 to 3,300 ft. in elevation.	Jun-Jul	Fed: NONE CA: NONE CNPS: List 1B.3 Local: NE	Absent
Lepidium virginicum var. *robinsonii* Robinson's pepper-grass	Annual herb. Found in chaparral and coastal scrub. Occurs from 3 to 2,900 ft. in elevation.	Jan-Jul	Fed: NONE CA: NONE CNPS: List 1B.2	Absent
Monardella stoneana Jennifer's monardella	Perennial herb. Found in closed-cone coniferous forest, chaparral, coastal scrub, and riparian scrub/usually rocky intermittent streambeds. Occurs from 33 to 2,600 ft. in elevation.	Jun-Sept	Fed: NONE CA: NONE CNPS: List 1B.2	Low

SCIENTIFIC AND COMMON NAME	HABITAT AND DISTRIBUTION	BLOOMING PERIOD	STATUS DESIGNATION	POTENTIAL FOR OCCURRENCE
Monardella viminea Willowy monardella	Perennial herb. Found in chaparral, coastal scrub, riparian forest, riparian scrub, and riparian woodland/alluvial ephemeral washes. Occurs from 165 to 740 ft. in elevation.	Jun-Aug	Fed: END CA: END CNPS: List 1B.1 Local: NE	Absent
Muilla clevelandii San Diego goldenstar	Perennial bulbiferous herb. Chaparral, coastal scrub, valley and foothill grassland, and vernal pools/clay. Occurs from 64 to 1,525 ft. in elevation.	Apr-May	Fed: NONE CA: NONE CNPS: List 1B.1	Low
Myosurus minimus ssp. *apus* Little mousetail	Annual herb. Found in valley and foothill grassland and vernal pools/alkaline soils. Occurs from 66 to 2,100 ft. in elevation.	Mar-Jun	Fed: NONE CA: NONE CNPS: List 3.1	Low
Nama stenocarpum Mud nama	Annual/perennial herb. Found in marshes and swamps (lake margins, riverbanks). Occurs from 16 to 1,650 ft. in elevation.	Jan-Jul	Fed: NONE CA: NONE CNPS: List 2.2	Absent
Navarretia fossalis Spreading navarretia	Annual herb. Found in chenopod scrub, marshes and swamps (assorted shallow freshwater), playas, and vernal pools. Occurs from 100 to 4265 ft. in elevation.	Apr-Jun	Fed: THR CA: NONE CNPS: List 1B.1	Low
Orcuttia californica California Orcutt grass	Annual herb. Found in vernal pools. Occurs from 50 to 2,165 ft. in elevation.	Apr-Aug	Fed: END CA: END CNPS: List 1B.1	Low
Pogogyne nudiuscula Otay Mesa mint	Annual herb. Found in vernal pools. Occurs from 295 to 820 ft. in elevation.	May-Jul	Fed: END CA: END CNPS: List 1B.1	Low
Quercus dumosa Nutall's scrub oak	Evergreen shrub. Found in closed-cone coniferous forest, chaparral, and coastal scrub/sandy, clay loam soils. Occurs from 50 to 1,312 ft. in elevation.	Feb-Apr	Fed: NONE CA: NONE CNPS: List 1B.1	Absent
Salvia munzii Munz's sage	Evergreen shrub. Found in chaparral and coastal scrub. Occurs from 390 to 3,500 ft. in elevation.	Feb-Apr	Fed: NONE CA: NONE CNPS: List 2.2	Absent
Stemodia durantifolia Purple stemodia	Perennial herb. Found in Sonoran desert scrub (often mesic, sandy soils). Occurs from 590 to 984 ft in elevation.	Jan-Dec	Fed: NONE CA: NONE CNPS: List 2.1	Absent
Streptanthus bernardinus Laguna Mountains jewel-flower	Perennial herb. Found in chaparral and lower montane coniferous forest. Occurs from 2,200 to 8,200 ft. in elevation.	May-Aug	Fed: NONE CA: NONE CNPS: List 4.3	Absent
Tetracoccus dioicus Parry's tetracoccus	Deciduous herb. Found in chaparral and coastal scrub. Occurs from 540 to 3,280 ft. in elevation.	Apr-May	Fed: NONE CA: NONE CNPS: List 1B.2	Absent

Status Codes:
Federal designations: (Federal Endangered Species Act, USFWS):
END: Federal-listed, endangered.
THR: Federal-listed, threatened.
NONE: Not listed.

State designations: (California Endangered Species Act, CDFG)
END: State-listed, endangered.
THR: State-listed, threatened.
RARE: State-listed as rare
NONE: Not listed.

California Native Plant Society (CNPS) designations:
List 1A: Plants presumed extinct in California.
List 1B: Plants rare and endangered in California and throughout their range.
List 2: Plants rare, threatened, or endangered in California but more common elsewhere in their range.
List 3: Plants about which we need more information; a review list.
List 4: Plants of limited distribution; a watch list.

Threat Codes:
.1 Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)
.2 Fairly endangered in California (20-80% occurrences threatened)
.3 Not very endangered in California (<20% of occurrences threatened or no current threats known)

Local Designation: City of Chula Vista MSCP Subarea Plan
NE: Narrowly Endemic

Special-Status Wildlife

Twenty-five (25) special status wildlife species are reported to occur within the USGS Otay Mesa Quadrangle Map that includes the project footprint (Table 3). Twenty-three of these special-status wildlife species had an "Absent" or "Low" potential of occurrence within the project study area and therefore no further survey or study is necessary to determine presence or absence of these species. The remaining two special-status wildlife were determined to have a moderate potential for occurrence, and further evaluation would be necessary to assess project-related effects to these species. All wildlife species observed during the surveys are listed in Attachment C.

The two species with a moderate potential for occurrence within the study area include:

- San Diego fairy shrimp (*Branchinecta sandiegonensis)*
- Burrowing owl (*Athene cunicularia*)

Table 3. Special-Status Wildlife Species Potential for Occurrence within the Project Footprint

SCIENTIFIC AND COMMON NAME	HABITAT AND DISTRIBUTION	STATUS DESIGNATION	POTENTIAL FOR OCCURRENCE
INVERTEBRATES			
Branchinecta sandiegonensis San Diego fairy shrimp	Occurs in tectonic swales/earth slump basins in grassland and coastal sage scrub habitats. Inhabits seasonally astatic pools filled by winter/spring rains and hatches in warm water later in the season. Endemic to Orange and San Diego counties.	Fed: FE CA: NONE	Moderate
Callophrys thornei Thorne's hairstreak	Generally associated with chaparral or closed-coned coniferous habitats.	Fed: NONE CA: NONE*	Absent
Euphydryas editha quino Quino checkerspot butterfly	Occurs in open coastal sage scrub, chaparral and grassland habitats. Populations are limited to Riverside and San Diego counties.	Fed: FE CA: NONE	Absent
Streptocephalus woottoni Riverside fairy shrimp	Occurs in tectonic swales/earth slump basins in grassland and coastal sage scrub habitats. Inhabits seasonally astatic pools filled by winter/spring rains and hatches in warm water later in the season. Endemic to west Riverside, Orange, and San Diego counties.	Fed: FE CA: NONE	Absent
REPTILES AND AMPHIBIANS			
Aspidoscelis hyperythra Orange-throated whiptail	Frequents coastal chaparral, thornscrub, and streamside growth. Occurs in washes, streams, terraces, and other sandy areas, often where there are rocks and patches of brush and rocky hillsides.	Fed: NONE CA: SSC	Low
Aspidoscelis tigris stejnegeri Coastal whiptail	Inhabits grasslands, coastal sage scrub, chaparral, and woodlands that support adequate prey species.	Fed: NONE CA: NONE *	Low
Phrynosoma coronatum blainvillii San Diego coast horned lizard	Found in a wide variety of habitats, including coastal sage, annual grassland, chaparral, oak woodland, riparian woodland, and coniferous forest. Key habitat elements are loose, fine soils with a high sand fraction; an abundance of native ants or other insects; and open areas with limited overstory for basking and low, but relatively dense shrubs for refuge.	Fed: NONE CA: SSC	Low
Salvadora hexalepis virgultea Coast patch-nosed snake	Found in semi-arid brushy areas and chaparral in canyons, rocky hillsides, and plains.	Fed: NONE CA: SSC	Absent

SCIENTIFIC AND COMMON NAME	HABITAT AND DISTRIBUTION	STATUS DESIGNATION	POTENTIAL FOR OCCURRENCE
Spea hammondii Western spadefoot	Occurs primarily in grasslands; occasional populations occur in valley-foothill hardwood woodlands. Ranges throughout the Central Valley and adjacent foothills; usually common where it occurs. In the Coast Ranges, it is found from Point Conception, Santa Barbara county, south to the Mexican border. Found from near sea level to 4470 ft in elevation.	Fed: NONE CA: SSC	Low
Thamnophis hammondii Two-striped garter snake	Generally found around pools, creeks, cattle tanks, and other water sources; often in rocky areas, oak woodland, chaparral, brushland, and coniferous forest.	Fed: NONE CA: SSC	Absent
BIRDS			
Athene cunicularia Burrowing Owl	Found in open, dry, annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. A subterranean nester that is dependent upon burrowing mammals, most notably the California ground squirrel.	Fed: NONE CA: SSC	Moderate
Campylorhynchus brunneicapillus sandiegensis Coastal Cactus Wren	Found in coastal sage scrub habitat. Nests almost exclusively in prickly pear (*Opuntia littoralis*) and coastal cholla (*O. prolifera*).	Fed: NONE CA: SSC	Absent
Eremophila alpestris actia California Horned Lark	Occurs in open terrain, which is often sparsely vegetated.	Fed: NONE CA: NONE *	Low
Icteria virens Yellow-breasted Chat	Inhabits dense thickets, brush, and secondary growth. Nests in dense shrubs.	Fed: NONE CA: SSC	Absent
Polioptila californica californica Coastal California Gnatcatcher	Local, uncommon, obligate resident of arid coastal sage scrub vegetation on mesas, hillsides and in washes. Nests almost exclusively in California sagebrush.	Fed: FT CA: SSC	Absent
Vireo belli pusillus Least Bell's Vireo	Resides in low riparian areas close to the water or dry riverbeds. Nests are usually constructed in bushes or within the branches of mesquite (*Prosopis* spp.), willows, and mule fat. Found below 2000 ft in elevation.	Fed: FE CA: SE	Absent
MAMMALS			
Chaetodipus fallax fallax Northwestern San Diego pocket mouse	Found in sparse, low desert shrub lands up to dense, high coastal sage-scrub vegetation.	Fed: NONE CA: SSC	Low

SCIENTIFIC AND COMMON NAME	HABITAT AND DISTRIBUTION	STATUS DESIGNATION	POTENTIAL FOR OCCURRENCE
Eumops perotis californicus Western mastiff bat	Forages in dry desert washes, floodplains, chaparral, oak woodland, open ponderosa pine forest, grassland, and agricultural areas. Roosts in colonies under exfoliating rock slabs (e.g., granite, sandstone, or columnar basalt) and in similar crevices in large boulders and buildings; generally high above ground.	Fed: NONE CA: SSC	Absent
Lasiurus blossevillii Western red bat	Occurs in riparian areas. Roosts alone, generally in the foliage of trees and shrubs.	Fed: NONE CA: SSC	Absent
Lepus californicus bennettii San Diego black-tailed jackrabbit	Occurs in coastal sage scrub and grassland habitats.	Fed: NONE CA: SSC	Low
Myotis ciliolabrum Western small-footed myotis	Occurs in rocky areas in coniferous forest, desert, chaparral, and riparian zones. Roosts alone or in small groups in cliff and rock crevices, buildings, concrete overpasses, caves, and mines.	Fed: NONE CA: NONE *	Absent
Myotis yumanensis Yuma myotis	Low-flying bat. Occurs in a wide variety of upland and lowland habitats, including riparian, arid scrublands and deserts, and forests. Often associated with permanent water sources, typically rivers and streams. Roosts in bridges, buildings, cliff crevices, caves, mines, and trees.	Fed: NONE CA: NONE *	Absent
Neotoma lepida intermedia San Diego desert woodrat	Typically found in the coastal scrub of southern California from San Diego County to San Luis Obispo County. Prefer moderate to dense vegetation canopies. They are particularly abundant in rock outcrops and rocky cliffs and slopes.	Fed: NONE CA: SSC	Absent
Nyctinomops femorosaccus Pocketed free-tailed bat	Found near large, open water sources in a variety of habitats, including desert shrub and pine-oak forest. Roosts in colonies in crevices of rugged cliffs, high rocky outcrops, slopes, and buildings.	Fed: NONE CA: SSC	Absent
Taxidea taxus American badger	Uncommon, permanent resident found throughout most of the state. Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Extirpated from many areas in Southern California.	Fed: NONE CA: SSC	Low

SCIENTIFIC AND COMMON NAME	HABITAT AND DISTRIBUTION	STATUS DESIGNATION	POTENTIAL FOR OCCURRENCE
Status Codes FEDERAL Federal Endangered Species Act FE Federal Endangered FT Federal Threatened CH Critical Habitat STATE California Endangered Species Act SE State Endangered ST State Threatened FP Fully Protected CDFG Code SSC California Species of Special Concern * Other			

Special Aquatic Resource Areas

This document presents our best effort at estimating the extent of special aquatic resource areas within the study area[8]; nonetheless, only the USACE, CDFG, and RWQCB can make a final determination of the boundaries of their jurisdictions. Several small ephemeral washes and drainages were identified during the surveys. Consequently, completion of a jurisdictional wetlands and waters determination on those lands likely subject to USACE, RWQCB, and CDFG jurisdiction is warranted to determine project implementation level affects to these and other features observed within the study area.

[8] Formal wetlands and waters delineation was not performed by URS.

4.0 Conclusions

The majority of the study area has been previously disturbed and the region includes developed areas containing commercial and public infrastructure. The project footprint lacks suitable habitat that would typically support the majority of special-status species. However, the literature review and field survey data suggests that there is potential for two special-status species to utilize the project footprint. These two species include the burrowing owl and San Diego fairy shrimp. Consequently, further survey or study may be necessary to determine likely presence or absence of these species. The following measures are also recommended as a means of avoiding and minimizing adverse impacts to biological resources that have the potential to occur within the project footprint:

- In order to comply with the MBTA and relevant sections of the California Fish and Game Code, any vegetation clearing should take place outside of the typical avian nesting season (15 February to 31 August) to the maximum extent practical. If this is not possible, prior to ground-disturbing activities, a qualified biologist should conduct a pre-construction nesting-bird survey prior to project initiation. If active nests are observed, a minimum buffer zone from occupied nests is recommended to the maximum extent practicable. Once nesting has ended, the buffer may be removed.
- Limits of grading and construction activities within the project footprint should be clearly delineated with temporary staking, flagging, or similar materials.
- The project footprint should be minimized to the maximum extent feasible and access to it should be via pre-existing/maintained access routes to the greatest extent possible.
- To avoid attracting predators and nuisance species, the project footprint shall be clear of debris, where possible. All food-related trash items should be enclosed in sealed containers and regularly removed from the project footprint.

Several potential special aquatic resource areas were identified within the study area. Consequently, completion of a jurisdictional determination on those lands likely subject to CWA, RWQCB, and CDFG jurisdiction is warranted to determine project implementation level affects to these features as well. With the execution of the avoidance and minimizations measures recommended above, the project is not expected to adversely impact common or special-status species.

The services performed by URS and documented in this report have been conducted in a manner consistent with the level of care and skill ordinarily exercised by other professional consultants under similar circumstances. No other representations to Pio Pico Energy Center, LLC (PPEC LLC), either expressed or implied, and no warranty or guarantee is included or intended in this report. Opinions relating to presence, absence, or potential for occurrence of biological resources are based on limited data and actual conditions may vary from those encountered at the times and locations where the data were obtained despite due professional care. The services provided have been performed in accordance with a scope of work negotiated between PPEC LLC and URS. Any reliance on this report by any other party shall be at such party's sole risk unless that party has written authorization from URS to use this work product. The purpose of this restriction is to attempt to protect the interests of parties for whom the work product may be appropriately directed.

5.0 References

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ATTACHMENT A. PHOTOGRAPH LOG

	Photograph: 1 Direction: West
	Photograph: 2 Direction: East

	Photograph: 3 Direction: North
	Photograph: 4 Direction: South

ATTACHMENT B. PLANT SPECIES OBSERVED WITHIN THE PROJECT STUDY AREA

SCIENTIFIC NAME	COMMON NAME
FLOWERING PLANTS	
MONOCOTS	
Arecaceae	Palm Family
Washingtonia sp.	Fan palm
Cyperaceae	Sedge Family
Cyperus eragrostis	Tall umbrella-sedge
Poaceae	Grass Family
Avena barbata *	Slender wild oat
Avena fatua *	Wild oat
Bromus diandrus * †	Ripgut brome
Bromus hordeaceus *	Soft chess
*Bromus japonicus**	Japanese broom
Bromus madritensis *	Foxtail chess
Bromus sp.* †	Brome grass
Cynodon dactylon *	Bermuda grass
Elymus condensatus	Giant wildrye
Lolium multiflorum *	Italian wild rye
Piptatherum miliaceum	Smilo grass
Polypogon monspeliensis *	Annual beard grass
Typhaceae	Cattail Family
Typha domingensis	Southern cattail
DICOTS	
Aizoaceae	Fig-Marigold Family
Carpobrotus edulis	Iceplant
Anacardiaceae	Sumac Family
Rhus ovata	Sugar bush
Schinus molle *	Pepper tree
Apiaceae	Carrot Family
Foeniculum vulgare * †	Sweet fennel
Apocynaceae	Dogbane Family
Nerium oleander	Oleander
Asteraceae	Aster Family
Ambrosia psilostachya	Ragweed
Artemisia californica	California sagebrush
Artemisia douglasiana	Mugwort
Baccharis pilularis	Coyote brush
Baccharis salicifolia	Mule fat
Conyza canadensis †	Common horseweed
Encilia californica	California encilia
Heterotheca grandiflora †	Telegraph weed
Isocoma menziesii var. *menziesii* †	Goldenbush
Iva hayesiana **	San Diego marsh elder

SCIENTIFIC NAME	COMMON NAME
Lactuca serriola * †	Prickly lettuce
Picris echioides * †	Bristly ox-tongue
Sonchus asper *	Prickly sow thistle
Sonchus oleraceus *	Sow thistle
Stephanomeria exigua	Wreath-plant
Brassicaceae	Mustard Family
Brassica nigra * †	Black mustard
Hirschfeldia incana * †	Shortpod mustard
Cactaceae	Cactus Family
Cylindropuntia sp.	Cholla
Opuntia littoralis	Coastal prickly pear
Chenopodiaceae	Goosefoot Family
Atriplex semibaccata * †	Australian saltbush
Salsola tragus * †	Russian thistle
Convolvulaceae	Morning Glory Family
*Convolvulus arvensis** †	Bindweed
Euphorbiaceae	Spurge Family
Chamaesyce polycarpa	Small seeded spurge
Eremocarpus setigerus	Doveweed
Ricinus communis *	Castor bean
Fabaceae	Pea Family
Melilotus alba * †	White sweetclover
Trifolium repens * †	White clover
Geraniaceae	Geranium Family
Erodium botrys * †	Longbeak stork's bill
Erodium cicutarium * †	Redstem stork's bill
Lamiaceae	Mint Family
Marrubium vulgare *	Common horehound
Malvaceae	Mallow Family
Malva parviflora * †	Cheeseweed
Myrtaceae	Myrtle Family
Eucalyptus sp. * †	Eucalyptus tree
Onagraceae	Evening Primrose Family
Oenothera elata	Hooker's evening primrose
Polygonaceae	Buckwheat Family
Rumex crispus *	Curly dock
Primulaceae	Primrose Family
Anagallis arvensis *	Scarlet pimpernel
Rosaceae	Rose Family
Heteromeles arbutifolia †	Toyon
Salicaceae	Willow Family
Salix exigua	Sandbar willow
Salix lasiolepis	Arroyo willow

SCIENTIFIC NAME	COMMON NAME
Solanaceae	Nightshade Family
Nicotiana glauca * †	Tree tobacco
Tamaricaceae	Tamarisk Family
Tamarix ramosissima	Mediterranean tamarisk
Urticaceae	Nettle Family
Urtica dioica	Stinging nettle
Verbenaceae	Verbena Family
Lantana sp.*	Lantana

*indicates non-native species, ** listed species, † on project foot print as well as study area.

ATTACHMENT C. WILDLIFE SPECIES OBSERVED WITHIN THE STUDY AREA

SCIENTIFIC NAME	COMMON NAME
REPTILES	
PHRYNOSOMATIDAE	SPINY LIZARDS
Sceloperous occidentalis	Western fence lizard
BIRDS	
ACCIPITRIDAE	HAWKS, KITES, AND EAGLES
Buteo jamaicensis	Red-tailed Hawk
ARDEIDAE	HERONS AND EGRETS
Ardea alba	Great Egret
COLUMBIDAE	PIGEONS AND DOVES
Zenaida mcroura	Mourning Dove
FALCONIDAE	FALCONS
Falco sparverius	American Kestrel
ICTERIDAE	NEW WORLD BLACKBIRDS AND ORIOLES
Sturnella neglecta	Western Meadowlark
POLIOPTILIDAE	GNATCATCHERS
Polioptila caerulea	Blue gray Gnatcatcher
STRIGIDAE	TYPICAL OWLS
Athene cunicularia	Burrowing Owl
TROCHILIDAE	HUMMINGBIRDS
Calypte anna	Anna's Hummingbird
TYRANNIDAE	TYRANT FLYCATCHERS
Sayornis nigricans	Black Phoebe
Tyrannus vociferans	Cassin's Kingbird
TYTONIDAE	BARN OWLS
Tyto alba	Barn Owl
MIMIDAE	MOCKINGBIRDS AND THRASHERS
Mimus polyglottos	Northern Mockingbird
CORVIDAE	JAYS AND CROWS
Corvus brachyrhynchos	American Crow
Corvus corax	Common Raven
EMBERIZIDAE	AMERICAN SPARROWS
Zonotrichia leucophrys	White-crowned Sparrow
FRINGILLIDAE	FINCHES
Carpodacus mexicanus	House Finch
MAMMALS	
CANIDAE	FOXES, DOGS, WOLVES, AND COYOTES
Canis familiaris	Domestic Dog (sign)
Canis latrans	Coyote (sign)
LEPORIDAE	RABBITS AND HARES
Sylvilagus sp.	cottontail (sign)
SCIURIDAE	SQUIRRELS
Otospermophilus beecheyi	California ground squirrel (sign)

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT
COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION
FOR THE *PIO PICO ENERGY CENTER, LLC*

Docket No. 11-AFC-1
PROOF OF SERVICE
(Revised 5/15/11)

Pio Pico Energy Center, LLC
Letter to Eric Solorio, Siting Project Manager, California Energy Commission, dated September 19, 2011 Regarding Applicant's Application for Prevention of Significant Deterioration Permit dated September 15, 2011

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DECLARATION OF SERVICE

I, Judith M. Warmuth, declare that on September 19, 2011, I deposited copies of the aforementioned document and, if applicable, a disc containing the aforementioned document in the United States mail at 500 Capitol Mall, Suite 1600, Sacramento, California 95814, with first-class postage thereon fully prepaid and addressed to those identified on the Proof of Service list above.

AND/OR

Transmission via electronic mail, personal delivery and first class U.S. mail were consistent with the requirements of California Code of Regulations, Title 20, sections 1209, 1209.5, and 1210. All electronic copies were sent to all those identified on the Proof of Service list above.

I declare under penalty of perjury that the foregoing is true and correct.

Judith M. Warmuth