PIO PICO ENERGY CENTER (SD 11-01)
PREVENTION OF SIGNIFICANT DETERIORATION PERMIT
PROPOSED PERMIT CONDITIONS

PROJECT DESCRIPTION

The proposed Pio Pico Energy Center (Project) consists of three General Electric (GE) LMS100 natural gas-fired combustion turbine-generators (CTGs) rated at 100 megawatt each. The Project will have an electrical output of 300 MW. The Project will be located in an unincorporated area of San Diego County known as Otay Mesa. The Project's footprint is a 9.99 acre parcel located at 7363 Calzada de la Fuente in the Otay Mesa Business Park. The site is located within the San Diego County Air Pollution Control District (SDAPCD, or District).

This proposed Prevention of Significant Deterioration (PSD) permit for the Project requires the use of Best Available Control Technology (BACT) to limit emissions of nitrogen oxides (NO_X), total particulate matter (PM), particulate matter 10 micrometers (μm) in diameter and smaller (PM_{10}), particulate matter 2.5 μm in diameter and smaller ($PM_{2.5}$), and greenhouse gases (GHG), to the greatest extent feasible. Air pollution emissions from the Project will not cause or contribute to violations of any National Ambient Air Quality Standards (NAAQS) or any applicable PSD increments for the pollutants regulated under the PSD permit.

EQUIPMENT LIST

The following devices and activities are subject to this PSD permit:

Unit ID	Description
Turbine 1	• 100 MW (gross) combustion turbine generator (CTG), with a maximum heat input rate of 903 MMBtu/hr (HHV) • Natural gas-fired GE Model LMS100 CTG • Emissions of NO_X controlled by water injection, Selective Catalytic Reduction (SCR)
Turbine 2	• 100 MW (gross) combustion turbine generator (CTG), with a maximum heat input rate of 903 MMBtu/hr (HHV) • Natural gas-fired GE Model LMS100 CTG • Emissions of NO_X controlled by water injection, Selective Catalytic Reduction (SCR)
Turbine 3	• 100 MW (gross) combustion turbine generator (CTG), with a maximum heat input rate of 903 MMBtu/hr (HHV) • Natural gas-fired GE Model LMS100 CTG • Emissions of NO_X controlled by water injection, Selective Catalytic Reduction (SCR)
Partial Dry Cooling System	• Dry cooling tower with a 16,520 gallons per minute (GPM) maximum circulation rate, supplemented by 7,000 GPM wet cooling tower. • Total dissolved solids (TDS) concentration in makeup water of 5,600 ppm (560 mg/L) • Drift eliminator with drift losses less than or equal to 0.001 percent based on circulation rate
Circuit Breakers	• 3 switchyard and 2 generator breakers containing SF6

PERMIT CONDITIONS

I. PERMIT EXPIRATION

As provided in 40 CFR § 52.21(r), this PSD Permit shall become invalid if construction:

A. is not commenced (as defined in 40 CFR § 52.21(b)(9)) within 18 months after the approval takes effect; or

B. is discontinued for a period of 18 months or more; or

C. is not completed within a reasonable time.

II. PERMIT NOTIFICATION REQUIREMENTS

The Permittee shall notify EPA Region IX by letter or by electronic mail of the:

A. date construction is commenced, postmarked within 30 days of such date;

B. actual date of initial startup, as defined in 40 CFR § 60.2, postmarked within 15 days of such date;

C. date upon which initial performance tests will commence, in accordance with the provisions of Condition IX.G, postmarked not less than 30 days prior to such date. Notification may be provided with the submittal of the performance test protocol required pursuant to Condition IX.G; and

D. date upon which initial performance evaluation of the continuous emissions monitoring system (CEMS) will commence in accordance with 40 CFR § 60.13(c), postmarked not less than 30 days prior to such date. Notification may be provided with the submittal of the CEMS performance test protocol required pursuant to Condition IX.G.

III. FACILITY OPERATION

At all times, including periods of startup, shutdown, shakedown, and malfunction, the Permittee shall, to the extent practicable, maintain and operate the facility that is subject to this PSD permit (Facility), including associated air pollution control equipment, in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to EPA, which may include, but is not limited to, monitoring results, opacity observations, review of operating maintenance procedures and inspection of the Facility.

IV. MALFUNCTION REPORTING

A. The Permittee shall notify EPA at R9.AEO@epa.gov within two (2) working days following the discovery of any failure of air pollution control equipment or

process equipment, or failure of a process to operate in a normal manner, which results in an increase in emissions above any allowable emission limit stated in Section IX of this permit.

B. In addition, the Permittee shall provide an additional notification to EPA in writing or electronic mail within fifteen (15) days of any such failure described under Condition IV.A. This notification shall include a description of the malfunctioning equipment or abnormal operation, the date of the initial malfunction, the period of time over which emissions were increased due to the failure, the cause of the failure, the estimated resultant emissions in excess of those allowed in Section IX, and the methods utilized to mitigate emissions and restore normal operations.

C. Compliance with this malfunction notification provision shall not excuse or otherwise constitute a defense to any violation of this permit or any law or regulation such malfunction may cause.

V. RIGHT OF ENTRY

The EPA Regional Administrator, and/or an authorized representative, upon the presentation of credentials, shall be permitted:

A. to enter the premises where the Facility is located or where any records are required to be kept under the terms and conditions of this PSD Permit;

B. during normal business hours, to have access to and to copy any records required to be kept under the terms and conditions of this PSD Permit;

C. to inspect any equipment, operation, or method subject to requirements in this PSD Permit; and

D. to sample materials and emissions from the source(s).

VI. TRANSFER OF OWNERSHIP

In the event of any changes in control or ownership of the Facility, this PSD Permit shall be binding on all subsequent owners and operators. Within 14 days of any such change in control or ownership, the Permittee shall notify the succeeding owner and operator of the existence of this PSD Permit and its conditions by letter. The Permittee shall send a

copy of this letter to EPA Region IX within thirty (30) days of its issuance.

VII. SEVERABILITY

The provisions of this PSD Permit are severable, and, if any provision of the PSD Permit is held invalid, the remainder of this PSD Permit shall not be affected.

VIII. ADHERENCE TO APPLICATION AND COMPLIANCE WITH OTHER ENVIRONMENTAL LAWS

The Permittee shall construct the Project in compliance with this PSD permit, the application on which this permit is based, and all other applicable federal, state, and local air quality regulations. This PSD permit does not release the Permittee from any liability for compliance with other applicable federal, state and local environmental laws and regulations, including the Clean Air Act.

IX. SPECIAL CONDITIONS

A. Air Pollution Control Equipment and Operation

As soon as practicable following initial startup of the power plant (startup as defined in 40 CFR § 60.2) but prior to commencement of commercial operation (as defined in 40 CFR § 72.2), and thereafter, except as noted below in Condition IX.C, the Permittee shall install, continuously operate, and maintain the SCR system for control of NO_X on Turbine 1, Turbine 2, and Turbine 3. The Permittee shall also perform any necessary operations to minimize emissions so that emissions are at or below the emission limits specified in this permit.

B. Emission Limits

1. On and after the date of initial startup, the Permittee shall not discharge or cause the discharge of emissions from each CTG (Turbine 1, Turbine 2, and Turbine 3) into the atmosphere in excess of the following limits. The emission limits in this condition shall apply at all times, except that for NOx only, the alternate emission limits in Condition IX.C shall apply during startup and shutdown, after which the limits in this condition shall apply:

Pollutant	Emission Limit (per CTG)
NO_X	• 2.5 ppmvd @ 15% O_2 • 1-hr average • 8.18 lb/hr
PM, PM_{10}, and $PM_{2.5}$	• 0.0065 lb/MMBtu (HHV) • 9-hr average • PUC-quality natural gas (sulfur content of no greater than 0.25 grains per 100 dscf on a 12-month rolling average and not greater than 1.0 gr per 100 dscf at any time)
CO_2	• 1,181 lb/MWh net output • 8,760 rolling operating-hour average

2. CO_2e emissions from the circuit breakers shall not exceed 40.2 tons per calendar year.

3. The Permittee shall install, operate, and maintain enclosed-pressure SF6 circuit breakers with a maximum annual leakage rate of 0.5% by weight.

C. Requirements during Gas Turbine (Turbine 1, Turbine 2, and Turbine 3) Startup and Shutdown Periods

The CTG NO_X emission limits in Condition IX.B.1 shall not apply during CTG startup and shutdown periods. During these periods, the following requirements shall apply:

1. The CEMS shall be in operation during each startup and shutdown period.

2. Duration of startups and shutdowns of each CTG (Turbine 1, Turbine 2, and Turbine 3) shall not exceed 30 and 10.5 minutes, respectively, per occurrence.

3. Total number of startups shall not exceed 500 per turbine, per calendar year.

4. For CTGs, "initial startup" is defined as the first fire of each unit.

5. Startup is defined as the period beginning with combustion turbine ignition and lasting until the equipment has reached a continuous operating level and the emissions from the turbines are at or below the emission limits specified in Condition IX.B.1.

6. Shutdown is defined as the period beginning with the initiation of combustion turbine shutdown sequence and lasting until fuel flow is completely off and combustion has ceased.

7. NO_X emissions during startup or shutdown from each CTG shall not exceed 26.6 lb/hr based on a 1-hr average.

8. NOx emissions from each CTG shall not exceed 22.5 pounds per startup event, or 6.0 pounds per shutdown event.

D. Operational Limits

1. The hours of operation for each turbine (Turbine 1, Turbine 2, and Turbine 3) shall not exceed 4,000 hours in any calendar year.

2. During any turbine startup, ammonia injection shall be initiated as soon as the SCR catalyst temperature exceeds 575 degrees F.

3. The cooling tower drift rate shall not exceed 0.001%; and the maximum total dissolved solids (TDS) shall not exceed 5,600 ppm.

4. Within 60 days after achieving normal operation, but not later than 180 days after the initial startup of equipment, each CTG (Turbine 1, Turbine 2, and Turbine 3) shall achieve an initial heat rate at full load that does not exceed 9,196 Btu_{hhv}/kWh_{gross}.

5. The circuit breakers shall be equipped with a 10% by weight leak detection system. The leak detection system shall be calibrated in accordance with manufacturer's specifications. The manufacturer's specifications and records of all calibrations shall be maintained on site.

E. Fuel Use

1. To fire Turbines 1, 2 and 3, the Permittee shall use only Public Utilities Commission (PUC)-pipeline quality natural gas with a sulfur content that (1) is less than or equal to 0.25 grains per 100 dscf on a 12-month rolling average, and (2) shall not at any time exceed 1.0 grains per 100 dscf.
2. The Permittee shall keep a monthly record of the quantity of natural gas used in Turbine 1, Turbine 2, and Turbine 3.
3. The Permittee shall sample and record the sulfur content of the natural gas fuel on a monthly basis.
4. The fuel sulfur content of the natural gas shall be determined using any of the following test methods: ASTM D1072, D3246, D4468, D5504 or D6667.

F. Continuous Emissions Monitoring System (CEMS) for Turbines

1. Before Turbines 1, 2, and 3 commence commercial operation (as defined in 40 CFR § 72.2), the Permittee shall install and calibrate CEMS to measure stack gas NO_X, CO_2, and O_2 concentrations and a continuous monitoring system (CMS) to measure exhaust gas flow and moisture content to demonstrate compliance with the emission limits in Conditions IX.B.1, IX.C.7, and IX.C.8.

2. The CEMS and CMS required by this permit shall be installed, calibrated, operated, audited, tested, and maintained in accordance with the manufacturers' recommendations and the appropriate performance standards and quality assurance requirements in the appendices of either 40 CFR part 60 or 40 CFR part 75.

3. The Permittee shall reduce CEMS and CMS data to one-hour averages in a manner meeting the specifications in 40 CFR § 60.13(h) for all operating hours, including startup and shutdown.

4. No later than 90 days after commencement of commercial operation, the Permittee shall submit to EPA a CEMS and CMS quality assurance plan. The plan shall specify how the Permittee will demonstrate compliance with emission limits in Conditions IX.B.1, IX.C.7, and IX.C.8, including emission limits that apply during startup and shutdown.

5. The Permittee shall perform for each CEMS:

a. Daily calibration checks,

b. Quarterly linearity checks, and

c. Annual relative accuracy test audits (RATA).

6. The Permittee shall perform initial RATAs no later than the initial performance test for the associated emission unit.

7. The Permittee shall submit RATA test plans and reports of RATA test results to EPA as described in Condition IX.G.1.h.

8. The Permittee shall maintain the following records for at least five years from the date of origin:

a. One-hour averages calculated pursuant to Condition IX.G.3,

b. The results of all calibration and linearity checks, and

c. RATA test plans and reports of test results.

G. Performance Tests

1. Stack Tests

a. Within 60 days after achieving normal operation, but not later than 180 days after the initial startup of equipment, and, unless otherwise specified, annually thereafter (within 30 days of the initial performance test anniversary), the Permittee shall conduct performance tests (as described in 40 CFR § 60.8) as follows:

i. NO_X, CO_2, PM, PM_{10}, and $PM_{2.5}$ emissions from each gas turbine (Turbine 1, Turbine 2, and Turbine 3);

ii. PM, PM_{10}, and $PM_{2.5}$ emissions from the cooling tower (annual testing not required).

iii. Heat rate performance according to the requirements of the American Society of Mechanical Engineers Performance Test Code on Overall Plant Performance (ASME PTC 22).

b. The Permittee shall submit a performance test protocol to EPA no later than 30 days prior to the test to allow review of the test plan and to arrange for an observer to be present at the test. The performance test shall be

conducted in accordance with the submitted protocol, and any changes required by EPA.

c. Performance tests shall be conducted in accordance with the test methods set forth in 40 CFR § 60.8 and 40 CFR Part 60 Appendix A, as modified below. In lieu of the specified test methods, equivalent methods may be used with prior written approval from EPA:

   i. EPA Methods 1-4 and 7E for NO_X emissions measured in ppmvd

   ii. EPA Methods 1-4, 7E, and 19 for NO_X emissions measured on a heat input basis

   iii. EPA Methods 1-4 and 3B for CO_2 emissions

   iv. EPA Method 5 for PM, Method 201A for filterable PM_{10} and $PM_{2.5,}$ and Method 202 for PM_{10} and $PM_{2.5}$. In lieu of Method 202, the Permittee may use EPA Conditional Test Method CTM-039.

   v. Modified Method 306 for PM emissions from the wet cooling tower, and

   vi. the provisions of 40 CFR § 60.8 (f).

d. The initial performance test conducted after initial startup shall use the test procedures for a "high NO_2 emission site," as specified in San Diego Test Method 100, to measure NO_X emissions. The source shall be classified as either a "low" or "high" NO_2 emission site based on these test results. If the emission source is classified as a:

   i. "high NO_2 emission site," then each subsequent performance test shall use the test procedures for a "high NO_2 emission site," as specified in San Diego Test Method 100.

   ii. "low NO_2 emission site," then the test procedures for a "high NO_2 emission site," as specified in San Diego Test Method 100, shall be performed once every five years to verify the source's classification as a "low NO_2 emission site."

e. The performance test methods for NO_X emissions specified in Condition IX.G.1.c.i and ii., may be modified as follows:

   i. Perform a minimum of 9 reference method runs, with a minimum time per run of 21 minutes, at a single load level, between 90 and 100 percent of peak (or the highest physically achievable) load, and

   ii. Use the test data both to demonstrate compliance with the applicable NO_X emission limit and to provide the required reference method data for the RATA of the CEMS.

f. Upon written request and adequate justification from the Permittee, EPA may waive a specific annual test and/or allow for testing to be done at less than maximum operating capacity.

g. For performance test purposes, sampling ports, platforms, and access shall be provided on the emission unit exhaust system in accordance with the requirements of 40 CFR § 60.8(e).

h. The Permittee shall furnish EPA with a written report of the results of performance tests within 60 days of completion.

2. Cooling Tower Total Dissolved Solids Testing

a. The Permittee shall perform weekly tests of the blow-down water quality using an EPA-approved method. This weekly test shall not be required for any 7-day period in which the wet cooling tower is not in operation, provided that the Permittee maintains a log of wet cooling tower operation.

b. The Permittee shall maintain a log that contains the date and result of each blow-down water quality test, and the resulting mass emission rate. This log shall be maintained onsite for a minimum of five years and shall be provided to EPA and District personnel upon request.

c. The Permittee shall calculate the PM, PM_{10}, and $PM_{2.5}$ emission rates using an EPA-approved calculation based on the TDS and water circulation rate.

d. The Permittee shall conduct all required cooling tower water quality tests in accordance with an EPA-approved test and emissions calculation protocol. Thirty (30) days prior to the first such test, the Permittee shall provide a written test and emissions calculation protocol for EPA review and approval, and send a copy to the District.

e. A maintenance procedure shall be established that states how often and what procedures will be used to ensure the integrity of the drift eliminators, to ensure that the TDS limits are not exceeded, and to ensure compliance with recirculation rates. This procedure is to be kept onsite and made available to EPA and District personnel upon request. The Permittee shall promptly report any deviations from this procedure.

H. Recordkeeping and Reporting

1. The Permittee shall maintain a file of all records, data, measurements, reports, and documents related to operation of the Facility. All records shall be in a permanent form suitable for inspection.

2. The Permittee shall maintain CEMS records that include the following: the occurrence and duration of any startup, shutdown, or malfunction, performance testing, evaluations, calibrations, checks, adjustments, maintenance, duration of any periods during which a CEMS is inoperative, and corresponding emission measurements.
3. The Permittee shall maintain records of the hours of operation for each turbine (Turbine 1, Turbine 2, and Turbine 3), on a monthly basis.
4. The Permittee shall maintain records and submit a written report of all excess emissions and any other noncompliance with permit conditions to EPA for each six-month reporting period from January 1 to June 30 and from July 1 to December 31, except when more frequent reporting is specifically required by an applicable subpart, or EPA, on a case-by-case basis, determines that more frequent reporting is necessary to accurately assess the compliance status of the source. The report shall be postmarked by the 30th day following the end of each semi-annual period and shall include the following:
    a. Time intervals, data and magnitude of the excess emissions, the nature and cause (if known), corrective actions taken and preventive measures adopted;
    b. Applicable time and date of each period during which the CEMS was inoperative (monitor down-time), except for zero and span checks, and the nature of CEMS repairs or adjustments;
    c. A statement in the report of a negative declaration; that is, a statement when no excess emissions occurred or when the CEMS has not been inoperative, repaired, or adjusted;
    d. Any failure to conduct any required source testing, monitoring, or other compliance activities; and
    e. Any violation of limitations on operation, including but not limited to restrictions on hours of operation.
5. Excess emissions shall be defined as any period in which any turbine exceeds any emission limits set forth in this permit.
6. A period of monitor down-time shall be defined as any unit operating clock hour in which sufficient data are not obtained by the CEMS to validate the hour for NO_X, CO_2, or O_2, while the CEMS is also meeting the requirements of Condition IX.F.3.
7. Excess emissions indicated by the CEM system, source testing, or compliance monitoring shall be considered violations of the applicable emission limit for the purpose of this permit.

8. All records required by this PSD Permit shall be retained for not less than five years following the date of such measurements, maintenance, reports, and/or records.

9. The Permittee shall measure and record the following for each CTG (Turbine 1, Turbine 2, and Turbine 3) on an hourly basis:

    a. Net energy output (MWh_{net});

    b. Pounds of CO_2 per net energy output (lb CO_2/MWh_{net});

    c. The 8,760-operating hour rolling average emission rate of lb CO_2/MWh_{net} based on the average hourly recordings.

10. The Permittee shall maintain a log describing maintenance and repair activities, including the following information:

    a. Date of activity

    b. Description of activity

    c. For scheduled maintenance, the elapsed time, hours of turbine operation, or other applicable measure since the activity was last performed.

    d. For scheduled maintenance, the elapsed time, hours of turbine operation, or other applicable measure until the activity should next be performed.

11. The Permittee shall calculate the SF6 emissions due to leakage from the circuit breakers by using the mass balance in equation DD-1 at 40 CFR Part 98, Subpart DD on an annual basis. Records of such calculations shall be maintained on site.

I. Shakedown Periods

The combustion turbine emission limits and requirements in Conditions IX.B, IX.C and IX.D shall not apply during combustion shakedown periods. Shakedown is defined as the period beginning with initial startup as defined in Condition IX.C.4 and ending no later than initial performance testing, during which the Permittee conducts operational and contractual testing and tuning to ensure the safe, efficient and reliable operation of the plant. The shakedown period shall not exceed 90 days. The requirements of Section III of this permit shall apply at all times.

X. AGENCY NOTIFICATIONS

All correspondence as required by this Approval to Construct must be sent to:

A. Director, Air Division (Attn: AIR-5)
EPA Region IX
75 Hawthorne Street
San Francisco, CA 94105-3901

Email: R9.AEO@epa.gov
Fax: (415) 947-3579

With a copy to:

B. Air Pollution Control Officer
San Diego County Air Pollution Control District
10124 Old Grove Road
San Diego, CA 92131-1649
Fax: (858) 586-2701

XI. ACROYNMS AND ABBREVIATIONS

Act	Clean Air Act [42 U.S.C. Section 7401 et seq.]
Agency	U.S. Environmental Protection Agency
BACT	Best Available Control Technology
BTU	British thermal units
CAA	Clean Air Act [42 U.S.C. Section 7401 et seq.]
CEMS	Continuous Emissions Monitoring System
CMS	Continuous Monitoring System
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CO2e	Carbon Dioxide Equivalent
CTG	Combustion Turbine Generator
GE	General Electric
GHG	Greenhouse Gas (Greenhouse Gases)
g/hp-hr	grams per horsepower-hour
gr/scf	Grains per Standard Cubic Feet
EAB	Environmental Appeals Board
EPA	U.S. Environmental Protection Agency
GHG	Greenhouse Gases
HHV	Higher Heating Value
HP	Horsepower
kW	Kilowatts of electrical power

kWhr	Kilowatt-hour
mg/L	Milligrams per liter
µg/m3	Microgram per Cubic Meter
MMBTU	Million British thermal units
MW	Megawatts of electrical power
NAAQS	National Ambient Air Quality Standards
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NMHC	Non-methane Hydrocarbons
NO	Nitrogen oxide or nitric oxide
NO2	Nitrogen dioxide
NOx	Oxides of Nitrogen (NO + NO2)
NP	National Park
NSPS	New Source Performance Standards, 40 CFR Part 60
NSR	New Source Review
O2	Oxygen
PM	Total Particulate Matter
PM2.5	Particulate Matter less than 2.5 micrometers (µm) in diameter
PM10	Particulate Matter less than 10 micrometers (µm) in diameter
PPEC	Pio Pico Energy Center
PPM	Parts per Million
PPMVD	Parts per Million by Volume, on a Dry basis
PSD	Prevention of Significant Deterioration