

**STATEMENT OF BASIS**  
**Title V Permit**

**Facility Name:** Carlsbad Energy Center, LLC

**Title V App. Number:** APCD2019-APP-005818

**Title V Permit Number:** APCD2021-TVP-00046

**Facility ID:** APCD1982-SITE-00195

**Equipment Address:** 4950 Avenida Encina, Carlsbad, CA 92008

**Facility Contact:** Paul Mattesich

**Contact Phone:** (805) 616-5836

**Permit Engineer:** Arthur Carbonell

**Date:** 8/12/2022

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**Permit Engineer**

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**Senior Engineer**

**1.0 Introduction / Purpose**

This Statement of Basis describes an initial Title V application and permit covering five natural gas combustion turbine generators and one emergency diesel engine. The facility is subject to Title V permitting because it is subject to the Acid Rain program under Title IV of the federal Clean Air Act (CAA) which requires permitting pursuant to 40 CFR §70.3.

## 2.0 Permit History:

This facility was issued a Final Determination of Compliance on July 31, 2015, pursuant to District Rule 20.5, which comprised the preconstruction review. Permits to Operate (PTOs for each of the 6 emission units will be issued concurrently and will be renewed annually. A Title V permit application was submitted on May 2, 2019, which is the subject of this review. This initial permit will replace the previous Title V operating permit held by the owner of the Carlsbad Energy Center (NRG Energy Inc.) which previously operated a power plant (Encina Power Station) at a contiguous property. This plant has since entirely ceased operations, so the proposed Title V permit will entirely replace the previous operating permit.

Under applications APCD2014-APP-003482 through 003486, five natural gas fired turbines were issued a Final Determination of Compliance (FDOC) by the District and approved by the California Energy Commission (CEC) to replace five existing natural gas fired boilers used for power generation (the previous boilers were designated Units 1-5; the new turbines are designated Units 6-10). APCD2014-APP-003481 for a diesel emergency engine driving a fire pump was also part of this project. Authorities to Construct (ATCs) were issued for this equipment on July 31, 2015. Note that initially six turbines and two emergency diesel engines (one to provide backup power at the site) were proposed but only five turbines and the emergency fire pump engine were installed. The sixth turbine was kept as a spare unit to be used when one of the other five turbines needs to be taken off-line for repairs. Commissioning operations began on May 2, 2018, and commercial operations began on December 12, 2018.

Under application APCD2019-APP-006018, the turbine ATCs were amended to increase the allowable carbon monoxide (CO) emissions during startups and to modify the definition of shutdowns. These modifications were approved and a revised Startup Authorization (SA) was issued on November 24, 2020. This SA has been extended several times.

Under application APCD2021-APP-006792, the turbine SAs were amended to set separate emission limits during tuning operations instead of the emission limits required during startups, shutdowns, and normal operation. These modifications have been approved and a revised Startup Authorization issued on upon completion of a 30-day public notice (see Section 7.0, District Rule 20.3, below).

It was determined that the CO/VOC surrogate specified in the Final Determination of Compliance is not viable with this equipment. Due to the low emissions of VOCs, the ratio of CO to VOC emissions greatly varied during testing and, in many cases, VOCs were below detection level and a CO/VOC surrogate could not be established. As VOC emissions have consistently been shown to be very low and in compliance with all established emission limits, it was determined that annual compliance testing for VOC emissions will be sufficient to show continued compliance with the emission limits. To show compliance with VOC limits during startups and shutdowns, permit conditions will require a source test during these operating scenarios. The District intends to require that testing successfully demonstrate compliance once for each turbine during each Title V permit 5-year renewal cycle. The permit condition will specify the source test methods to be used and require a source test protocol to be approved in advance by the District.

Lastly, it was determined that source testing to show compliance with the BACT limits specified in the permit conditions will be done annually instead of following the same parameters of RATA testing. No changes will be made to the frequency of RATA testing.

The Title V Public Notice was completed on October 3, 2022. The only comments received were from Carlsbad Energy Center. Responses to the comments have been provided in a separate document and all relevant changes have been included in this Statement of Basis.

### 3.0 Facility Description

This site is a simple-cycle power plant with a total net output capacity of 526.5 MW consisting of five natural gas turbines along with one emergency diesel engine driving a fire pump. Each turbine is equipped with an oxidation catalyst and selective catalytic reduction (SCR) system and the diesel engine is certified to meet EPA Tier 4i standards.

Permit Number	Permit Description
APCD2022-PTO-004219	Unit #6: One nominal 105.3 MW (net) natural-gas-fired simple-cycle General Electric LMS100-PA combustion turbine generator with demineralized water injection, S/N 878-176; maximum heat input of 984 MMBtu/hr (HHV) at average site-specific ambient conditions; an inlet-air evaporative cooler; and with the combustion turbine exhaust ducted to an oxidation catalyst and selective catalytic reduction (SCR) system with aqueous ammonia injection.
APCD2022-PTO-004220	Unit #7: One nominal 105.3 MW (net) natural-gas-fired simple-cycle General Electric LMS100-PA combustion turbine generator with demineralized water injection, S/N 878-186; maximum heat input of 984 MMBtu/hr (HHV) at average site-specific ambient conditions; an inlet-air evaporative cooler; and with the combustion turbine exhaust ducted to an oxidation catalyst and selective catalytic reduction (SCR) system with aqueous ammonia injection.
APCD2022-PTO-004221	Unit #8: One nominal 105.3 MW (net) natural-gas-fired simple-cycle General Electric LMS100-PA combustion turbine generator with demineralized water injection, S/N 878-188; maximum heat input of 984 MMBtu/hr (HHV) at average site-specific ambient conditions; an inlet-air evaporative cooler; and with the combustion turbine exhaust ducted to an oxidation catalyst and selective catalytic reduction (SCR) system with aqueous ammonia injection.
APCD2022-PTO-004222	Unit #9: One nominal 105.3 MW (net) natural-gas-fired simple-cycle General

	Electric LMS100-PA combustion turbine generator with demineralized water injection, S/N 878-187; maximum heat input of 984 MMBtu/hr (HHV) at average site-specific ambient conditions; an inlet-air evaporative cooler; and with the combustion turbine exhaust ducted to an oxidation catalyst and selective catalytic reduction (SCR) system with aqueous ammonia injection.
APCD2022-PTO-004223	Unit #10: One nominal 105.3 MW (net) natural-gas-fired simple-cycle General Electric LMS100-PA combustion turbine generator with demineralized water injection, S/N 878-191; maximum heat input of 984 MMBtu/hr (HHV) at average site-specific ambient conditions; an inlet-air evaporative cooler; and with the combustion turbine exhaust ducted to an oxidation catalyst and selective catalytic reduction (SCR) system with aqueous ammonia injection.
APCD2020-PTO-003631	Emergency fire pump diesel engine: John Deere/Clark model JW6H-UFADF0; S/N RG6090L130217; EPA certified Tier 3, family HJDXL09.0114; 327 bhp rated at 1760 rpm; turbocharged with charge air cooler for emission control; driving an emergency fire pump.

#### 4.0 Title IV (Acid Rain) and Title V Permitting

The Title V regulation applies to any stationary source that is a major stationary source as defined in Rule 1401(c)(26) or is subject to the acid rain provisions of Title IV of the federal Clean Air Act (CAA). Carlsbad Energy Center LLC is an affected source under the acid rain program thereby making the facility subject to Title V provisions.

Additionally, the District has proposed to lower the applicability threshold for Title V permitting for NO<sub>x</sub> and VOC to 25 tpy due to being reclassified as severe non-attainment for Ozone. The Once this rule is finalized, this facility will also be a major source of NO<sub>x</sub>.

#### 5.0 Potential to Emit

Facility Emissions Summary		
Criteria Pollutant	tons/year	Major Source?
NO <sub>x</sub>	70.8	Y
VOC	19.9	N
PM <sub>10</sub>	23.5	N
PM <sub>2.5</sub>	23.5	N
SO <sub>2</sub>	4.7	N

CO	64.8	N
HAPs	9.36	N

## 6.0 40 CFR Part 64 CAM (Compliance Assurance Monitoring)

Since this is the initial application Title V application, CAM is not required. However, the gas turbines are equipped with CEMS and are subject to an NSPS rule with prescribed monitoring, and therefore CAM will also not be required in the future pursuant to §64.2(b)(1)(vi). The turbines are required to operate and maintain the CEMS to measure NO<sub>x</sub>, CO, and NH<sub>3</sub> pursuant to District Rules 20.1, 20.3, 69.3.1 and 40 CFR60 subpart KKKK.

## 7.0 Applicable Requirements

The following table summarizes the rules and requirements applicable to this facility and is followed by a discussion of the most notable of these requirements. These requirements and supporting analysis were previously included in an EPA comment period and public notice during review of the initial applications for this equipment. This document, “Revised Final Determination Of Compliance Carlsbad Energy Center” is attached and contains more detailed discussion of specific requirements of applicable rules.

### General Permit Program Applicable Requirements

Regulation	Rule Citation	Title
SDCAPCD Reg. II	10	Authority to Construct Required
SDCAPCD Reg. II	19	Provision of Sampling & Testing Facilities
SDCAPCD Reg. II	19.3	Emission Information
SDCAPCD Reg. II	20, 20.1, 20.2, 20.3, 20.5	New Source Review (NSR)
SDCAPCD Reg. II	21	Permit Conditions
SDCAPCD Reg. II	24	Temporary Permit to Operate
SDCAPCD Reg. II	25	Appeals
SDCAPCD Reg. IV	60	Circumvention
SDCAPCD Reg. IV	71	Abrasive Blasting
SDCAPCD Reg. V	98	Breakdown Conditions: Emergency Variance
SDCAPCD Reg. VI	101	Burning Control
SDCAPCD Reg. VIII	131	Stationary Source Curtailment Plan
40 CFR Part 82	Subpart B	Servicing of Motor Vehicle Air Conditioners
40 CFR Part 82	Subpart F	Recycling and Emission Reducing

40 CFR Part 89	Part 59	VOC Standards for Consumer Products
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### General Prohibitory Applicable Requirements

Regulation	Rule Citation	Title
SDAPCD Reg. IV	50	Visible Emissions
SDAPCD Reg. IV	51	Nuisance
SDAPCD Reg. IV	53	Specific Air Contaminants
SDAPCD Reg. IV	60	Circumvention
SDAPCD Reg. IV	62	Sulfur Content of Fuels
SDCAPCD Reg. IV	67.0	Architectural coating
SDCAPCD Reg. IV	67.17	Storage Material coating
SDAPCD Reg. IV	69.3.1	Stationary Gas Turbine Engines
SDAPCD Reg. IV	69.4.1	Stationary Internal Combustion Engines
SDCAPCD Reg. IV	71	Abrasive Blasting
SDAPCD Reg. VI	101	Burning Control
SDAPCD Reg. X	Subpart A	NSPS - General Provisions
SDAPCD Reg. XI	Subpart A	NESHAP - General Provisions
40 CFR Part 61	Subpart M	NESHAP - Asbestos
40 CFR Part 60	Subpart Db	NSPS – Standard of Performance for Industrial-Commercial-Institutional Steam Generating
40 CFR Part 60	Subpart GG	Standard of Performance for Stationary Gas Turbines
40 CFR Part 60	Subpart IIII	Standards of Performance for Compression Ignition Reciprocating Internal Combustion Engines
40 CFR Part 60	Subpart KKKK	Standards of Performance for Stationary Gas Turbines

40 CFR Part 63	Subpart YYYY	National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines
40 CFR Part 63	Subpart ZZZZ	National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines
40 CFR Part 72	Subpart A	Acid Rain Permit Application
40 CFR Part 72	Subpart C	Acid Rain Program
40 CFR Part 73		Sulfur Dioxide Allowance System
40 CFR Part 75		Continuous Emissions Monitoring
40 CFR Part 82	Subpart A	Production and Consumption Controls
40 CFR Part 82	Subpart F	Recycling and Emissions Reduction
SDAPCD Reg. XII	1200	Toxic Air Contaminants – New Source Review

<b>Combustion Turbines</b>	
Pollutant	Primary Limiting Regulation(s)
NOx	Rule 20.3 (NSR); 40 CFR 60 Subpart KKKK
VOC	Rule 20.3
PM10	Rule 20.3; Rule 53 (PM)
SO2	Rule 20.3; Rule 62; Rule 53; 40CFR60 Subpart KKKK
CO	Rule 20.3 (AQIA only)
Toxic Pollutants	Rule 1200
<b>Emergency Engine</b>	
Pollutant	Primary Limiting Regulation(s)
NOx	Rule 69.4.1, 40 CFR 60 Subpart IIII
VOC	Rule 69.4.1, 40 CFR 60 Subpart IIII
PM10	40 CFR 60 Subpart IIII; 17 CCR §93115
SO2	Rule 62; Rule 69.4.1; 17 CCR §93115
Toxic Pollutants	Rule 1200
Federal HAPs	40 CFR 63 Subpart ZZZZ

#### District Rule 20.3 (NSR)

This rule provides for new source review at any new or modified stationary source. Section 20.3(d)(1) requires any new or modified emission unit that increases its potential to emit and results in a post-project potential to emit (PTE) of 10 lbs/day or greater to apply Best Available Control Technology (BACT) for NOx, VOC, SOx, and PM10. Additionally, this section requires Lowest Achievable Emission Rate (LAER) for new major sources or for contemporaneous emission increases equal to or greater than major modification thresholds at

existing major sources. For this project, LAER was triggered for NO<sub>x</sub> emissions. The emission limits specified in the permit conditions give BACT and LAER limits for each applicable pollutant. Generally, these are the most stringent quantitative limits cited in the permits.

Additionally, permit conditions specify emission limits for CO emissions from each turbine exhaust which are based on Section 20.3(d)(2) of this rule. This subsection requires an air quality impact analysis (AQIA) for each applicable air contaminant. An AQIA was performed at the time of the FDOC and the permit limit for CO ensures emissions do not exceed those considered in the AQIA. The emissions from the emergency engine were also included in the AQIA. No exceedances of the National Ambient Air Quality Standards (NAAQS) were indicated in the results of the AQIA.

After the issuance of the FDOC, the applicant amended the application under APCD2019-APP-006018 to allow higher CO emissions during startups. The application was amended again under APCD2021-APP-006792 to allow higher NO<sub>x</sub> and CO emissions during tuning operations. The existing BACT and LAER determinations continue to apply to these amendments. Additionally, the increase in emissions remain below the levels evaluated in the AQIA, however a revised AQIA 30-day public notice was performed concurrently with the 45-day Title V public notice.

### District Rule 53

This rule limits emissions of PM resulting from the burning of carbon containing material. This rule also limits emissions of gaseous sulfur compounds not produced from fuel combustion. The turbines and emergency engine are subject to the PM limits. Preconstruction review determined that all the applicable equipment meets the requirements of this rule. The standards are written into conditions within District permits and are referenced accordingly.

### District Rule 62

This rule sets limits on fuel sulfur content. Natural gas combusted in the turbines is required to be California Public Utility Commission (PUC) grade, i.e.,  $\leq 5$  grains sulfur per 100 ft<sup>3</sup> of gas, which is more stringent than this rule. Diesel fuel combusted in the emergency engine is limited to 0.5% sulfur. This fuel is also subject to District Rule 69.4.1 which requires the use of CARB diesel fuel. CARB diesel fuel is limited to a sulfur content of no more than 15 ppm in accordance with 17CCR §93115 and 13CCR §2281. This is more stringent than this rule. The standards are written into conditions within District permits and are referenced accordingly.

### District Rule 69.3.1

This rule limits NO<sub>x</sub> emissions from stationary turbines. The standards of this rule are superseded by the NO<sub>x</sub> limits established for compliance with BACT and LAER requirements in accordance District Rule 20.3 as discussed above.

### District Rule 69.4.1

This rule places limits on NO<sub>x</sub> emissions from stationary internal combustion engines. This rule also requires the use of California diesel fuel which limits sulfur content. The emergency diesel fire pump engine meets the standards of this rule based on preconstruction analysis of manufacturer specifications and/or EPA certification. Additionally, this rule requires installation of a non-resettable totalizing hour meter with which the engine is equipped. Periodic



maintenance and record keeping are also required. All of these requirements are included in the permit conditions.

#### Federal Acid Rain Program (40 CFR Parts 72, 73, and 75)

This facility is subject to Title V permitting because it is subject to the federal Acid Rain program. Therefore, both District permits and the body of the Title V permit include conditions pursuant to the Acid Rain program, specifically 40CFR §72, 73, and 75.

#### 40 CFR 60 Subpart KKKK

This subpart applies to stationary combustion turbines with a heat input at peak load of 10 MMBtu/hr (HHV) or greater which commenced construction, modification, or reconstruction after February 18, 2005. The turbines at this site meet these criteria and are subject to this rule.

Subpart KKKK limits NO<sub>x</sub> emissions to 25 ppm at 15% oxygen. The BACT limit for NO<sub>x</sub>, pursuant to District Rule 20.3, is more stringent than that of this Subpart. However, the BACT limit does not apply during periods of startup, shutdown, or tuning operations. Therefore, Subpart KKKK limits are included in permit conditions to ensure compliance during these scenarios.

Subpart KKKK limits SO<sub>2</sub> emissions to 0.90 lbs/MW-hr gross output or 0.060 lbs/MMBtu/hr heat input. Permit conditions require the use of PUC quality natural gas which limits the sulfur content to 5 grains per 100 standard cubic feet in accordance with California PUC General Order 58-A. By complying with this limit, the source will comply the SO<sub>2</sub> standards of this rule.

#### 40 CFR 63 Subpart ZZZZ

This subpart applies to stationary reciprocating internal combustion engines and is applicable to the emergency diesel fire pump engine. §63.6640(f) specifies limits on the non-emergency hours of operation for this equipment. Additionally, maintenance practices and record keeping apply for this type of engine as specified in Table 2d of the rule and in §63.6655(e). Records showing compliance with the maintenance requirements shall be retained for a minimum of 5 years in accordance with §§63.6660(c) and 63.10(b). Permit conditions that ensure compliance with these federal requirements are included in the permit.

## **8.0 Monitoring, Record-Keeping, and Reporting**

Permit enforceability is dependent to a large extent on sufficient monitoring, record-keeping, and reporting (MRR), all of which must be effectively tied to the emissions limits and other requirements under applicable regulations. The District permits that are incorporated into the Title V permit at Appendix A contain substantial monitoring, record-keeping, and reporting. The body of the Title V permit contains additional MRR pursuant to District Regulation XIV (Title V) to further strengthen the permit. Below is a discussion of the more notable MRR.

All of the turbines are required to be source tested on an annual basis to ensure emissions of NO<sub>x</sub>, CO, VOC, PM<sub>10</sub>, and ammonia comply with the emission requirements of the permits.

Monitoring and testing are required for each turbine in the District Permits to Operate. Continuous emissions monitoring systems (CEMS) are required for monitoring emissions of NO<sub>x</sub>, CO, SO<sub>2</sub> and NH<sub>3</sub>. Requirements addressing the CEMS are specified in 40 CFR 60 Subpart KKKK, District Rule and 69.3.1, and the federal Acid Rain program under 40CFR §§ 72 and 75. The accuracy of the CEMS system is also tested using a relative accuracy test audit (RATA) conducted according to the frequencies defined in 40 CFR part 75.

The emergency engine is required to be equipped with a non-resettable totalizing hour meter to ensure the effective monitoring of hours of operation. Permit conditions also require record-keeping for engine maintenance, fuel type, and hours of operation.

## **9.0 Permit Shield**

Pursuant to District Rule 1410(p) and 40CFR §70.6(f), a Title V permit may include a provision stating that compliance with the conditions of the permit shall be deemed compliance with any applicable requirements as of the permit issuance date. The applicant did not require a permit shield and none is included in the permit.

## **10.0 Permit Process-Public Notification and Notice to EPA and Affected States**

Before issuing the final permit, The District will provide the opportunity for review by EPA and affected states and a public notice period. Notice will be provided to the EPA electronically through the EPS and will be sent electronically to affected states and tribes. The public notice and associated documents will be provided on the District's website and the public notice will be published in a newspaper. The District will incorporate any suggested changes made by EPA or the public if necessary and will re-notice if significant changes are made.

## **11.0 Conclusions / Recommendations**

The facility is expected to comply with all applicable requirements including those cited in the current District permit as well as those under District Rule 1401 and 40 CFR Part 70. Therefore, the recommendation of this report is for the subject renewal Title V permit to be issued following public notice, EPA review, and response to any comments.

## **12.0 Attachments**

The following are attached:

- Application Package
- Draft Permit
- Public Notice