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PART 70 OPERATING PERMIT TECHNICAL SUPPORT DOCUMENT (STATEMENT of BASIS)

**APPLICATION FOR:
Renewal**

Application Received: April 10, 2023

SUBMITTED BY:
Southshore Environmental, Inc.

FOR:
Apex Generating Station
Source: 01520

LOCATION:
15555 Apex Power Parkway
Las Vegas, Nevada 89165

SIC code 4911, "Electric Services"
NAICS code 221112, "Fossil Fuel Electric Power Generation"

January 22, 2024

EXECUTIVE SUMMARY

Apex Generating Station is an electricity generating facility located in the Garnet Valley (Hydrographic Area 216), which is currently designated as an attainment area for all regulated air pollutants. The source meets the AQR 12.2.2(j) definition of a categorical source for a fossil-fired steam generating plant due to the fact that the heat input ratings for the generators exceed 250 MMBtu/hr.

The source, which is owned by the Southern California Public Power Authority, is a major stationary source for PM₁₀, PM_{2.5}, NO_x, CO, and GHG, and a minor source for SO₂, VOCs, and HAPs.

The source consists of gas-fired turbines, heat recovery steam generators with natural gas-fired duct burners, a natural gas-fired fuel gas dew point heater, a diesel-powered emergency generator, a diesel-powered fire pump, and propane-fired boiler. The source also consists of the following insignificant activities: propane and kerosene-fired heaters; aboveground storage tanks; a media blaster; solvent cleaning; gasoline and diesel-powered generators and light towers; diesel-powered welder and pressure washer; and transformers to include: isolation, excitation, step-up, step-down, and construction.

The following table summarizes the source potential to emit for each regulated air pollutant from all emission units addressed by this Part 70 Operating Permit:

Table 1: Source Potential To Emit and Program Applicability

Pollutant	PM ₁₀	PM _{2.5}	NO _x	CO	SO ₂	VOC	HAP	Pb	H ₂ S	GHG
Tons/year	107.05	107.05	208.77	323.89	12.94	59.90	13.51	0	0	2,306,436.99
Major Source Thresholds (Title V/Categorical)	100	100	100	100	100	100	10/25 ¹			

¹10 tons for any individual HAP or 25 tons for combination of all HAPs.

DAQ will continue to require the sources to estimate their GHG potential to emit in terms of each individual pollutant (CO₂, CH₄, N₂O, SF₆). The TSD includes these PTEs for informational purposes.

This source is subject to 40 CFR Part 60, Subparts Da and GG; 40 CFR Part 63, Subpart ZZZZ; 40 CFR Part 72, 40 CFR Part 73, and 40 CFR Part 75.

DAQ has received delegated authority from the U.S. Environmental Protection Agency to implement the requirements of the Part 70 OP. Based on the information submitted by the applicant, supplemental information provided to the application, and a technical review performed by DAQ staff, the draft Part 70 OP is proposed.

TABLE OF CONTENTS

- I. ACRONYMS AND ABBREVIATIONS..... 5**
- II. SOURCE DESCRIPTION 6**
 - A. Description of Process6
 - B. Permitting History.....6
 - C. Current Permitting Action.....6
- III. EMISSIONS INFORMATION..... 8**
 - A. Emission Unit List8
 - B. Applicability Emissions9
 - C. Source-wide PTE10
 - D. Operational Limits10
 - E. Control Technology12
 - F. Monitoring13
 - G. Performance Testing.....14
- IV. REGULATORY REVIEW 14**
 - A. Local Regulatory Requirements14
 - B. Federally Applicable Regulations.....16
- V. COMPLIANCE..... 24**
 - A. Summary of Monitoring for Compliance24
- VI. EMISSION REDUCTION CREDITS (OFFSETS)..... 29**
- VII. MODELING 29**
- VIII. ENVIRONMENTAL JUSTICE 29**
- IX. PERMIT SHIELD 32**
- X. PUBLIC PARTICIPATION 34**
- XI. ATTACHMENTS 34**

LIST OF TABLES

Table 1: Source Potential To Emit and Program Applicability2
Table III-A-1: Summary of Emission Units8
Table III-A-2: Insignificant Activities8
Table III-B-1: Applicability Emissions Evaluation (tons per year).....10
Table III-C-1: Source-wide PTE (tons per year)10
Table III-C-2: Emissions Increase (tons per year)10
Table III-D-1: Fuel Limitations for Turbine Units11
Table IV-A-1. Air Quality Regulations and SIP status.....14
Table V-A-1: Compliance Summary (local rules).....24
Table V-A-2: Applicable Federal Air Quality Regulations27
Table VII-1: PSD Increment Consumption29
Table IX-1: Applicable Requirements Related to Permit Shield.....33
Table IX-2: Streamlined Requirements Related to Permit Shield33
XI-1. Emission Rates (pounds per hour).....34
XI-2. PTE/Applicability of HAPs from Turbine (tons per year)36
XI-3. PTE/Applicability for Diesel Engine36
XI-4. PTE/Applicability for Diesel Engine37
XI-5. PTE/Applicability for Fuel Gas Dew Point Heater37
XI-6. PTE for Propane-Fired Boiler (rental).....38
Table XI-7: GWP Factors (from 40 CFR 98 Subpart A, Table A-1)38
Table XI-8: Emission Factors (from 40 CFR 98 Subpart C, Tables C-1 and C-2).....38
Table XI-9: Heat Capacity of Diesel Fuel (per engine).....39
Table XI-10: PTE/Applicability for GHG39
Table XI-11: Applicability for Propane-Fired Boiler39
Table XI-12: Applicability for Diesel Engines (Insignificant Activities)40
Table XI-13: Applicability for Gasoline Engines (Insignificant Activities)40
Table XI-14: Applicability for Kerosene-Fired Equipment (Insignificant Activities)40
Table XI-15: Applicability for Propane-Fired Equipment (Insignificant Activities)41
Table XI-16: Applicability for Media Blasting (Insignificant Activity)41
Table XI-17: Applicability for Solvent Usage (Insignificant Activity).....41
Table XI-18: Applicability for Tanks (Insignificant Activity)41

I. ACRONYMS AND ABBREVIATIONS

AQR	Clark County Air Quality Regulation
CEMS	continuous emissions monitoring system
CFR	Code of Federal Regulations
CO	carbon monoxide
CTG	combustion Turbine Generator
DAQ	Division of Air Quality
DES	Clark County Department of Environment and Sustainability
DOM	date of manufacture
EPA	U.S. Environmental Protection Agency
EU	emission unit
FGDH	fuel gas dew point heater
GHG	greenhouse gas
H ₂ S	hydrogen sulfide
HAP	hazardous air pollutant
HHV	higher heating value
hp	horsepower
HRSG	heat recovery steam generator
ISO	International Organization for Standardization
kW	kilowatt
LHV	lower heating value
MMBtu	British thermal units (in millions)
MW	megawatt
NAICS	North American Industry Classification System
NO _x	nitrogen oxide(s)
O&M	operations and maintenance
PEMS	parametric emission monitoring system
Pb	lead
PM _{2.5}	particulate matter less than 2.5 microns in aerodynamic diameter
PM ₁₀	particulate matter less than 10 microns in aerodynamic diameter
ppm	parts per million
ppmvd	parts per million volumetric dry
PTE	potential to emit
QA/QC	quality assurance/quality control
QAP	quality assurance plan
RATA	relative accuracy test audit
SCC	source classification code
SCR	selective catalyst reduction
SIC	Standard Industrial Classification
SO ₂	sulfur dioxide
SU/SD	startup/shutdown
VE	visible emissions
VOC	volatile organic compound

II. SOURCE DESCRIPTION

A. DESCRIPTION OF PROCESS

The facility consists of two natural gas-fired combustion turbines rated at 185 MW with a heat input rating of 1,980 MMBtu/hour. The exhaust heat from each turbine is directed through the HRSG, which generates steam to drive a secondary turbine to supplement electricity production. The duct burner in each HRSG provides additional heat to aid in the production of additional steam.

Natural gas is drawn from the Kern River pipeline and piped directly into the facility where a fuel gas dewpoint heater prevents condensation droplets from entering the turbines. The fuel is then piped to the gas turbines and HRSG for combustion. A rental boiler is used temporarily during turbine outages to generate steam in order to process turbine wastewater.

Selective catalytic reduction, which utilizes anhydrous ammonia, controls NO_x emissions, while catalytic oxidation is used to control CO and VOC emissions from the turbines.

B. PERMITTING HISTORY

The following represents permitting activities since the issuance of the last renewal permit on October 16, 2018:

December 12, 2019: The permittee submitted notification of replacement of the SCR catalyst beds. This type of activity falls under routine maintenance, repair, and replacement, which negates requirements to revise the operating permit.

December 8, 2021: Reopen for Cause. DES was required to implement Section 182(a)(3)(B) of the Clean Air Act which requires all ozone nonattainment areas to have in place a program that requires emissions statements from stationary sources of NO_x and/or VOCs. Apex Generating Station was identified as a source that emits more than 25 tons for both NO_x and VOC pollutants on an annual basis. As a result, the permit was reopened to add a condition mandating the source to submit annual emission statements which include actual emissions for all NO_x and VOC emitting activities.

C. CURRENT PERMITTING ACTION

This permitting action is for the renewal of the Part 70 operating permit that will expire on October 15, 2023. The permittee submitted a renewal application on April 10, 2023. The application did not request revisions to the permitted emission units or to the annual throughputs.

There is a discrepancy in the application with regard to the source operating under “power augmentation” conditions. This process includes equipment that would allow for additional electricity production, on a temporary basis, during periods of peak demand. During the permit renewal process in 2018, the source requested to remove this mode of operation, stating that the power augmentation equipment would be removed from the site by June 1, 2018. However, the current renewal application included two separate PTE tables for the source, one of which included

PTE for power augmentation, further providing an explanation of the process and estimated time the source would operate under these conditions. The consultant for the permittee confirmed that the power augmentation equipment had been removed from the site, and subsequently submitted a supplemental application which excluded the power augmentation operation and associated PTE calculations.

The application provided revised HAP calculations for the combustion turbines. The explanation for this change is that the revised emission factors are consistent with HAP calculation methodologies used for combined cycle powerplants in other states. It should be noted that different formaldehyde emission factors are used for the turbines and duct burners. This is because these are two distinct combustion sources with very different characteristics, including combustion temperature. The duct burners are located in the HRSG, and is essentially are direct-fire external combustion sources. Although the source is not applicable to 40 CFR Part 63, Subpart YYYY the formaldehyde emission factor from this subpart was used as a worst-case scenario. Due to the fact that this emission factor is not applicable to duct burners, emission factor approved by the Ventura County Air Pollution Control District are used. This same emission factor has been used to calculate emissions since the initial permit issued for this source. The revised HAP calculations result in a source wide increase of 2.64 tons per year. Due to the fact that this increase are a result of revised calculation methodologies, rather than a deviation to permitted operational limits, it is not deemed to be an emission increase.

This application was submitted within the timeframe specified in AQR 12.5.2.1(a)(2). As a result of the timely submittal, the permittee is eligible for an application shield. In instances where an operating permit expires before the renewal permit is issued, an application shield allows a source to operate, without penalties, until the renewal permit is issued.

Source comments for the draft OP and TSD were received on October 18, 2023. The permittee requested the removal of all conditions pertaining to sulfur requirements for diesel fuel for the two emergency engines. The permittee cited 40 CFR 63.6640(f)(4)(ii) as justification for removal. This rule is applicable to nonemergency diesel engines greater than 300 hp and emergency diesel engines greater than 100 hp that meet one, or more, of the following conditions: (1) supplies power as part of a financial arrangement; (2) is dispatched by the local balancing authority or local transmission and distribution system operator; (3) is intended to mitigate local transmission and/or distribution limitations so as to avert potential voltage collapse or line overloads that could lead to the interruption of power supply in a local area or region; (4) follows reliability, emergency operation or similar protocols that follow specific NERC, regional, state, public utility commission or local standards or guidelines; (5) provides power to the facility itself or to support the local transmission and distribution system; or (6) dispatches the engine and the specific NERC, regional, state, public utility commission or local standards or guidelines that are being followed for dispatching the engine. The permittee stated that the emergency engines at the source “. . . are not configured to provide electricity in that manner.” As a result, all references to sulfur requirements for diesel fuel have been removed from the permit and TSD.

III. EMISSIONS INFORMATION

A. EMISSION UNIT LIST

Table III-A-1 lists the emission units covered by this Part 70 OP.

Table III-A-1: Summary of Emission Units

EU	Description	Rating	Manufacturer	Model No.	Serial No.	SCC
A01	Stationary Gas Turbine; natural gas-fired; MEQ = 185	185 MW at ISO	General Electric	7FA	297836	20100201
A02	Duct Burner for HRSG associated with A01; MEQ = 74	460 MMBtu/hr	Coen		40D-13761-1-000	10100601
A03	Stationary Gas Turbine; natural gas-fired; MEQ = 185	185 MW at ISO	General Electric	7FA	297837	20100201
A04	Duct Burner for HRSG associated with A03; MEQ = 74	460 MMBtu/hr	Coen		40D-13761-1-000	10100601
A05	Fuel Gas Dew Point Heater	9.67 MMBtu/hr	Total Energy Resources Inc.		618614	10100602
A06	Emergency Generator	800 kW	Caterpillar	SR4B	9EP01846	20200102
	Diesel Engine; DOM: 02/04/2002	1,180 hp		3412CDITA	1EZ02448	
A07	Fire Pump		Sterling	6AEF12	565226	20200102
	Diesel Engine; DOM: 11/08/2000	270 hp	Caterpillar	3208	03Z17773	
A09	Propane-Fired Boiler (rental)	9.5 MMBtu/hr (Max)	Various	Various	Various	10300602

The following units or activities listed in in Table III-A-2 are present at this source, but are deemed insignificant.

Table III-A-2: Insignificant Activities

Rating	Description
0.035 MMBtu/hr	Propane-Fired Heater
0.042 MMBtu/hr	Propane-Fired Heater
0.055 MMBtu/hr	Propane-Fired Heater
0.045 MMBtu/hr	Kerosene-Fired Heater
0.055 MMBtu/hr	Kerosene-Fired Heater
0.125 MMBtu/hr	Kerosene-Fired Heater
15,228 Gallon	Aboveground Storage Tank; Ammonia
499 Gallon (each)	Aboveground Storage Tank; Propane (2)
250 Gallon	Aboveground Storage Tank; Diesel
500 Gallon	Aboveground Storage Tank; Diesel
2,413 Gallon	Aboveground Storage Tank; Diesel
550 Gallon	Aboveground Storage Tank; Used Lube Oil

Rating	Description
6,200 Gallons (each)	Aboveground Storage Tank; Combustion Turbine Generator Lube Oil (2)
10,200 Gallon	Aboveground Storage Tank; Steam Turbine Generator Lube Oil
235 Gallon	Aboveground Storage Tank; Steam Turbine Generator Hydraulic Oil
390 Gallon	Aboveground Storage Tank; Well Pump Mineral Oil
977 Gallon (each)	Isolation Transformer; Combustion Turbine Generator (2)
390 Gallon (each)	Excitation Transformer; Combustion Turbine Generator (2)
390 Gallon	Excitation Transformer; Steam Turbine Generator
450 Gallon	Construction Transformer
2,598 Gallon	Construction Transformer
322 Gallon	Step Down Transformer; Load Center
5,555 Gallon (each)	Step Down Transformer; Auxiliary Unit (2)
404 Gallon	Step Down Transformer; Well Pump
322 Gallon	Step Down transformer; Water Treatment
19,200 Gallon	Step Up Transformer; Steam Turbine Generator
23,775 Gallon (each)	Step Up Transformer; Combustion Turbine Generator (3)
322 – 652 Gallon (each)	Air Cooled Condenser Load Center Step Down Transformer (6)
25 cfm	Media Blasting Cabinet
	Solvent Cleaners (2)
12 hp (each)	Diesel-Powered Light Tower (2)
19 hp	Diesel-Powered Welder
19 hp	Diesel-Powered Mobile Pressure Washer
5.5 hp	Gasoline-Powered Portable Generator
8 hp	Gasoline-Powered Portable Generator
10 hp	Gasoline-Powered Portable Generator

B. APPLICABILITY EMISSIONS

Permitting applicability is determined by calculating the emissions for all proposed emission units using 8,760 hours of operation (except for emergency generators or fire pumps, which use 500 hours), any inherent controls, any inherent throughput limitations, and the emission factors provided by the manufacturer, by source test results, by EPA AP-42, or by other approved methods. As a fossil-fuel steam electric plant with a heat input rating greater than 250 MMBtu/hr, Apex Generating Station is defined as a categorical source. As a result, fugitive emissions are required to be included with applicability calculations.

Table III-B-1: Applicability Emissions Evaluation (tons per year)

Pollutant	PM ₁₀	PM _{2.5}	NO _x	CO	SO ₂	VOC	H ₂ S	Pb	HAP	GHG
Applicability Thresholds	5	5	5	25	25	5	1	0.3		
Major Source Thresholds (Categorical Source)	100	100	100	100	100	100	n/a	100	10/25 ¹	75,000
Applicability Emissions Total	108.11	108.11	223.69	328.90	13.06	63.68	0	0	15.76	2,306,436.99

¹10 tons for a single HAP or 25 tons for any combination of HAP compounds.

As Table III-B-1 shows, Applicability Emissions are above major source thresholds for PM₁₀, PM_{2.5}, NO_x, CO, and GHG. The PTE of these pollutants listed in Table II-C-1 are above the major source thresholds which qualifies this source as a major source for the aforementioned pollutants and a minor source for SO₂, VOC, and HAP. The calculations are included as an attachment.

C. SOURCE-WIDE PTE

Table III-C-1: Source-wide PTE (tons per year)

Pollutant	PM ₁₀	PM _{2.5}	NO _x	CO	SO ₂	VOC	HAP	Pb	H ₂ S	GHG ¹
tons/year	107.05	107.05	208.77	323.89	12.94	59.90	13.51	0	0	2,306,436.99

¹In units of CO_{2e}

Table III-C-2: Emissions Increase (tons per year)

Description	PM ₁₀	PM _{2.5}	NO _x	CO	SO ₂	VOC	HAP	GHG ¹
Current Permitting Action	107.05	107.05	208.77	323.89	12.94	59.90	13.51	2,306,436.99
Significant Revision Issued 10/16/2018	107.05	107.05	208.77	323.89	12.94	59.90	10.87	2,306,402.67
Excluded Emissions	0	0	0	0	0	0	2.64 ²	0
Emissions Increase	0	0	0	0	0	0	0	34.32 ³
AQR 12.5.1(d) Minor NSR Significant Levels	7.5	5	20	50	20	20		
AQR 12.2.2(uu) Significance Thresholds	15	10	40	100	40	40	10	n/a
BACT Analysis Required	No	No	No	No	No	No	No	No

¹In units of CO_{2e}

²Difference is a result of updated PTE calculations. Therefore, it is excluded from emission increase calculations.

³This value reflects rounding methodology between manual calculations in the 2018 permit versus Excel calculations for current action. Also, 2018 permit did not include contributions from CH₄ and N₂O pollutants from generators.

D. OPERATIONAL LIMITS

The operating permit will continue to include the following operational limitations. The operating condition for the emergency generator has been updated with this permitting action because of the revisions to 40 CFR Part 63.6640.

1. The operation of the turbines and duct burners shall be limited to the fuel limitations identified in Table III-D-1.

Table III-D-1: Fuel Limitations for Turbine Units

Description	Fuel Type	Max. Hourly MMBtu	Max. Yearly MMBtu
Each Turbine (A01 and A03)	Natural gas	1,980 (HHV)	17,344,800
Each Duct Burner (A02 and A04)	Natural gas	460 (HHV)	2,300,000

2. The operation of each duct burner shall be limited to 5,000 hours in any consecutive 12-month period (EUs: A02 and A04).
3. Startup and shutdown shall be limited to 876 hours, per turbine, in any consecutive 12-month period.
4. The permittee shall limit operation of the rental boiler to 1,000 hours in any consecutive 12-month period (EU: A09).
5. The operation of the emergency generator shall be limited to 100 hours per year for testing and maintenance purposes. The permittee may operate the emergency generator up to 50 hours/year for nonemergency situations, but those hours count towards the 100 hours provided for testing and maintenance. Except as provided below (a–e inclusive), the emergency generator cannot be used for peak shavings or nonemergency demand response, or to generate income for a facility by supplying power to an electric grid or to otherwise supply power as part of a financial arrangement with another entity (EU: A06):
 - a. The engine is dispatched by the local balancing authority and/or local transmission and distribution operator.
 - b. The dispatch is intended to mitigate local transmission and/or distribution limitations to avert potential voltage collapse or line overloads that could lead to interruption of power supply in a local area or region.
 - c. The dispatch follows reliability, emergency operation, or similar protocols that follow specific NERC, regional, state, public utility commission, or local standards or guidelines.
 - d. The power is provided only to the facility itself or to support the local transmission and distribution system.
 - e. The owner or operator identifies and records the entity that dispatches the engine and the specific NERC, regional, state, public utility commission, or local standards or guidelines that are being followed for the dispatching engine. The local balancing authority or local transmission and distribution system operator may keep these records on behalf of the engine owner or operator.

6. The permittee shall limit the operation of the fire pump for testing and maintenance purposes to 100 hours/year. The permittee may operate the fire pump up to 50 hours/year for nonemergency situations, but those hours count towards the 100 hours provided for testing and maintenance (EU: A07).

E. CONTROL TECHNOLOGY

There are no changes to the emissions of all pollutant except the GHG emissions. The emission increases associated with this permitting action are below the minor NSR significant thresholds for all pollutants. Therefore, a BACT analysis is not required. A summary of BACT requirements established with previous permitting actions is included below. These requirements remain enforceable.

Stationary Gas Turbines and Duct Burners

1. Only pipeline quality natural gas shall be combusted in each stationary gas turbine and duct burner (EUs: A01 – A04).
2. Each turbine unit shall be equipped with dry low NO_x burners.
3. Selective catalyst reduction (SCR) shall be employed to control NO_x pollutants. The SCR system shall operate at all times the associated turbine units are in operation, excluding startup and shutdown (EUs: A01 through A04).
4. A catalytic oxidizer shall be employed on each stationary gas turbine unit to control CO and VOC pollutants. The catalytic oxidizer shall operate at all times the associated turbine unit is operating, excluding periods of startup and shutdown (EUs: A01 through A04).
5. Particulate matter from exhaust emissions from each stationary gas turbine and duct burner shall be controlled through good operating practice, per manufacturer's recommendations, and by maintaining, and periodically replacing, the inlet air filters preceding each turbine.

Fuel Gas Dew Point Heater

6. Only combust natural gas in the fuel gas dew point heater (EU: A05).
7. The fuel gas dew point heater permittee shall be operated and maintained in accordance with the manufacturer's specifications (EU: A05).

Emergency Engines

8. Only combust diesel fuel with a maximum sulfur content of 15 ppm and either a minimum cetane index of 40 or a maximum aromatic content of 35% by volume shall be combusted in the emergency generator (EU: A06) and fire pump (EU: A07).
9. The permittee shall operate and maintain the emergency generator (EU: A06) and fire pump (EU: A07) in accordance with the manufacturer's operations and maintenance instructions. In addition, the following maintenance schedule shall be followed (unless the manufacturer's specifications are more stringent):
 - a. Change oil and filter every 500 hours of operation or annually, whichever comes first;

- b. Inspect air cleaners every 1,000 hours of operation or annually, whichever comes first; and
- c. Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary.

Boiler

10. Only propane gas shall be combusted in the rental boiler (EU: A09).
11. The permittee shall operate and maintain the rental boiler in accordance with the manufacturer's operations and maintenance instructions (EU: A09).

F. MONITORING

Visible Emissions

1. The permittee shall adhere to the *Visible Emissions Check Guidebook* and keep a copy of the signed guide on-site at all times.
2. Quarterly visual emissions checks shall be conducted on the entire plant while it is in operation.

Gas Turbines and Duct Burners

3. A CEMS shall be operated and maintained which monitors NO_x, CO, and O₂ emissions from the gas turbines and duct burners. The CEMS shall include an automated data acquisition and handling system.
4. A quality assurance plan (QAP) for the CEMS shall be maintained that contains auditing and reporting schedules, design specifications and other quality assurance requirements.
5. A relative accuracy test audit (RATA) of the NO_x, CO and O₂ CEMS shall be conducted at least every four calendar quarters, except in the case where the affected facility is off-line.
6. The fuel flow for each combined cycle turbine and duct burner shall be monitored and recorded with a Continuous Monitoring System that utilizes a non-resettable fuel meter.

Fuel Gas Dew Point Heater

7. A burner efficiency test shall be conducted once each calendar year in accordance with manufacturer specifications for good combustion practices (EU: A05).

Emergency Engines

8. The diesel-powered emergency generator (EU: A06) and fire pump (EU: A07) with a nonresettable hour meter and monitor each one during testing, maintenance, and nonemergency operation.

Boiler

9. Operation of the rental boiler shall be monitored with a non-resettable hour meter or other devices approved in advance by the Control Officer (EU: A09).

10. An initial burner efficiency test shall be conducted on any boiler that remains onsite for 180 consecutive days or greater. The boiler rental company’s records of burner efficiency tests performed within one year prior to the initial onsite startup of the boiler may be substituted. (EU: A09).
11. A log shall be maintained for each rental/temporary boiler operated on-site. Each log entry will include the heat input (in MMBtu/hr), manufacturer, model number, serial number, date brought on-site, hours of operation, date taken off-site, date of maintenance, and description of any repairs (EU: A09).

G. PERFORMANCE TESTING

All initial performance testing requirements have been completed. Due to the fact that the permittee operates a CEMS for NO_x and CO for the gas turbines and duct burners, routine performance testing is not required. If the Control Officer has reason to believe an emission in excess of permitted limitations is occurring, the permittee may be required to conduct performance testing.

IV. REGULATORY REVIEW

A. LOCAL REGULATORY REQUIREMENTS

DAQ has determined that the following public laws, statutes, and associated regulations are applicable:

1. Title 40 of the Code of Federal Regulations (CFR);
2. Nevada Revised Statutes (NRS), Chapter 445B;
3. Portions of the AQR included in the State Implementation Plan (SIP) for Clark County, Nevada. SIP requirements are federally enforceable. All requirements from Operating Permits issued by The Clark County Department of Air Quality are federally enforceable due to the fact that permits are issued pursuant to SIP-included sections of this AQR;
4. Portions of the AQR not included in the SIP. These locally applicable requirements are locally enforceable only.

Table IV-A-1. Air Quality Regulations and SIP status

Section/Title	Applicable Subsection	SIP	Affected Emission Unit
AQR 00: “Definitions”	All Subsections	Yes	Entire Source
AQR 04: “Control Officer”	All Subsections (SIP: 4.7.3 and 4.12.1 through 4.12.3)	partial	Entire Source
AQR 05: “Interference with Control Officer”	All Subsections	Yes	Entire Source
AQR 7: “Hearing Board and Hearing Officer”	All Subsections	No	Entire Source
AQR 08: “Persons Liable for Penalties”	All Subsections	Yes	Entire Source
AQR 09: “Civil Penalties”	All Subsections	No	Entire Source

Section/Title	Applicable Subsection	SIP	Affected Emission Unit
AQR 12.0: "Applicability and General Requirements"	All Subsections	Yes	Entire Source
AQR 12.2: "Permit Requirements for Major Sources in Attainment Areas (Prevention of Significant Deterioration)"	All Subsections	Yes	Entire Source
AQR 12.3: "Permit Requirements for Major Sources in Nonattainment Areas"	All Subsections	Yes	Entire Source
AQR 12.4: "Authority to Construct Application and Permit Requirements for Part 70 Sources"	All Subsections	Yes	Entire Source
AQR 12.5: "Part 70 Operating Permit Requirements"	All Subsections	No	Entire Source
AQR 12.6: "Confidentiality"	All Subsections	No	Entire Source
AQR 12.7: "Emission Reduction Credits"	All Subsections	Yes	Entire Source
AQR 12.9: "Annual Emissions Inventory Requirement"	All Subsections	No	Entire Source
AQR 12.10: "Continuous Monitoring Requirement for Stationary Sources"	All Subsections	No	Gas Turbines & Duct Burners
AQR 12.12: "Transfer of Permit"	All Subsections	No	Entire Source
AQR 12.13: "Posting of Permit"	All Subsections	No	Entire Source
AQR 13: "National Emission Standards for Hazardous Air Pollutants"	§13.2(b)(1): "Subpart A - General Provisions" §13.2(b)(82): "Subpart ZZZZ - National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines" §13.2(b)(83):	No	Entire Source
AQR 14: "New Source Performance Standards"	§14.1(b)(1): "Subpart A – General Provisions" §14.1(b)(3): "Subpart Da – Standards of Performance for Electric Utility Steam Generating Units." And §14.1(b)(40): "Subpart GG – Standards of Performance for Stationary Gas Turbines."	No	Entire Source
AQR 18: "Permit and Technical Service Fees"	All Subsections (SIP: 18.1 through 18.5.2 and 18.6 through 18.12)	Yes	Entire Source

Section/Title	Applicable Subsection	SIP	Affected Emission Unit
AQR 25: “Affirmative Defense for Excess Emissions due to Malfunctions, Startup, and Shutdown”	§25.1: Requirements for excess emissions cause by upset/breakdown and malfunctions & §25.2: Reporting and Consultation	Yes	Entire Source
AQR 26: “Emission of Visible Air Contaminants”	All Subsections	Yes	Entire Source
AQR 27: “Particulate Matter from Process Weight Rate”	All Subsections	No	Entire Source
AQR 28: “Fuel Burning Equipment”	All Subsections	Yes	Gas Turbines & Duct Burners
AQR 40: “Prohibitions of Nuisance Conditions”	§40.1 Prohibitions	No	Entire Source
AQR 41: “Fugitive Dust”, AQR 41.1.2 only	§41.1.2 Prohibitions	Yes	Entire Source
AQR 43: “Odors in the Ambient Air”	All Subsections	No	Entire Source
AQR 70: “Emergency Procedures”	All Subsections	Yes	Entire Source
AQR 80: “Circumvention”	All Subsections	Yes	Entire Source
AQR 81: “Provisions of Regulations Severable”	All Subsections	Yes	Entire Source

B. FEDERALLY APPLICABLE REGULATIONS

DAQ has determined that the following federal regulations are applicable:

1. **Clean Air Act, as amended (CAAA), Authority: 42 U.S.C. § 7401, et seq.;**
2. **40 CFR 52 – Approval and Promulgation of Implementation Plans**

40 CFR 52.21 – Prevention of significant deterioration of air quality

Discussion: The requirements of this section apply to the construction of any new major stationary source or any project at an existing major stationary source.

3. **40 CFR 60 – Standards of Performance for New Stationary Sources:**

Subpart A – General Provisions

40 CFR 60.7 – Notification and record keeping

Discussion: This regulation requires notification to Air Quality of modifications, opacity testing, records of malfunctions of process equipment and/or continuous monitoring device, CEMS data, and performance test data. These requirements are found in the Part 70 OP. Air Quality requires records to be maintained for five years, a more stringent requirement than the two years required by 40 CFR 60.7.

40 CFR 60.8 – Performance tests

Discussion: These requirements are found in the Part 70 OP. Notice of intent to test, the applicable test methods, acceptable test method operating conditions, and the requirement for three runs are outlined in this regulation. Air Quality requirements for initial performance testing are identical to AQR Section 60.8. Air Quality also requires periodic performance testing on emission units based upon throughput or usage.

40 CFR 60.11 – Compliance with standards and maintenance requirements

Discussion: Compliance with various applicable standards will be demonstrated by performance tests unless otherwise specified in the standard. The source is subject to and 40 CFR 60 Subparts Y, HH, and OOO. Compliance requirements for these standards are discussed in corresponding sections.

40 CFR 60.12 – Circumvention

Discussion: This prohibition is addressed in the Part 70 OP. This is also local rule AQR 80.1.

40 CFR 60.13 – Monitoring requirements

Discussion: This regulation describes requirements for continuous monitoring systems (COMS and CEMS). These requirements can be found in the Part 70 OP.

Subpart Da – Standards of Performance for Electric Utility Steam Generating Units for which Construction Commenced After September 18, 1978

40 CFR 60.40Da – Applicability

Discussion: Electric utility steam generating units constructed between September 18, 1978 and February 28, 2005 and rated at, or above, 250 MMBtu/hr heat input of fossil fuel are subject to the provisions of this subpart. The initial ATC for the APG facility was issued on March 29, 2001 and each duct burner (EUs: A02 and A04) has a rated capacity of 460 MMBtu/hr. Therefore, the source is applicable.

40 CFR 60.42Da – Standard for Particulate Matter

Discussion: Stack emissions shall not contain particulate matter in excess of 0.03 pounds per MMBtu of heat input or exceed 20 percent opacity for a period of more than 6 consecutive minutes. There is an allowance of 27 percent for one 6-minute period per hour.

40 CFR 60.43Da – Standard for Sulfur Dioxide

Discussion: The Permittee shall not discharge into the atmosphere any gasses that contain SO₂ in excess of 100 percent of the potential combustion concentration when emissions are less than 0.20 pounds per MMBtu of heat input.

40 CFR 60.44Da – Standard for Nitrogen Oxides

Discussion: The Permittee shall not discharge into the atmosphere any gases that contain NO_x in excess of 1.6 pounds per MWh gross energy output, based on 30-boiler operating day rolling average.

40 CFR 60.48Da – Compliance Provisions

Discussion: Emission standards for PM, NO_x and SO₂ are not applicable to startup and shutdown operations. The Part 70 operating permit defines the allowable emission standards for SU/SD. The source has completed all compliance demonstrations and has demonstrated compliance with all applicable emission standards. The source also employs a CEMS on each of the stationary gas turbine stacks to monitor NO_x emissions.

40 CFR 60.49Da – Emissions Monitoring

Discussion: This regulation requires the source to monitor opacity emissions via a COMS, but allows alternate monitoring methods for facilities that combust only gaseous or liquid fuels. Since the duct burners combust only natural gas, COMS and SO₂ CEMS are not required. AGS is subject to the requirements of 40 CFR 75. Therefore, the data acquired by the NO_x CEMS are allowed to be used to show compliance with 40 CFR 60, Subpart Da and 40 CFR 75. The duct burners and the combustion turbines exhaust through the same stack. As a result, the required monitoring of stationary gas turbine emissions will also monitor duct burner emissions. The reporting and monitoring requirements are outlined in the Part 70 OP.

40 CFR 60.50Da – Compliance Determination Procedures and Methods

Discussion: Identifies the reference methods and procedures required for compliance. These are specified in the Part 70 OP.

40 CFR 60.51Da – Reporting Requirements

Discussion: Stipulates the frequencies for reporting plant emissions. These are included in the Part 70 OP.

Subpart GG – Standards of Performance for Stationary Gas Turbines

40 CFR 60.330 – Applicability and designation of affected facility

Discussion: Defines Applicable facilities as those constructed after October 3, 1997 that operate stationary gas turbines with a heat input equal to, or greater than, 10 MMBtu per hour. The two stationary gas turbines (EUs: A01 and A03) are rated at 1,980 MMBtu per hour, making them subject to the provisions of this subpart.

40 CFR 60.332 – Standard for Nitrogen Oxides

Discussion: The Permittee shall not discharge into the atmosphere from any gas turbine any gases which contain nitrogen oxides in excess of the standard as determined by:

$$STD = 0.0075 \frac{(14.4)}{Y} + F$$

where:

Y = manufacturer's rated heat rate at manufacturer's rated load in units of kilojoules per watt-hour, based on the lower heating value of fuel; and

F = fuel-bound nitrogen

The SI temperature for natural gas is 59°F. Table 14, of the Advanced Gas Path application for a minor revision (submitted on January 16, 2018), provided the lower heat rate, at 59°F, as 9,016 Btu/kW-hour. This is converted to kilojoules/watt-hour as follows:

$$Y = \frac{9,016 \text{ BTU}}{\text{kW-hr}} \times \frac{1 \text{ kW}}{1,000 \text{ Watts}} \times \frac{1.055 \text{ kilojoules}}{\text{Btu}} = 9.51 \text{ kilojoules/watt-hour}$$

The source combusts only pipeline natural gas supplied by the Public Utilities Commission of Nevada, which is void of fuel-bound nitrogen. Therefore, F = 0.

Using the ‘Y’ value determined, above: $\text{STD} = 0.0075 \times \frac{14.4}{9.51} = 0.01135 \text{ \% volume}$

$$0.01135 \text{ \% volume} \times \frac{10,000 \text{ ppm}}{\%} = 113.5 \text{ ppmvd} \sim 114 \text{ ppmvd}$$

40 CFR 60.333 – Standard for Sulfur Dioxide

Discussion: Specifies the maximum SO₂ emissions discharged from any stationary gas turbine as 0.015 percent, by volume, at 15 percent oxygen. Also places limits on the sulfur content for fuel combusted in any stationary gas turbine to 0.8 percent by weight.

40 CFR 60.334 – Monitoring of operations

Discussion: The Permittee shall monitor the sulfur content of the fuel combusted in the stationary gas turbines. The Part 70 OP requires the source to verify sulfur content based on data provided by the supplier.

40 CFR 60.335 – Test methods and procedures

Discussion: This regulation identifies the test methods the source is required to conduct. These requirements are included in the Part 70 OP.

Subpart KKKK – Standards of Performance for Stationary Combustion Turbines

40 CFR 60.4305 - Applicability

Discussion: This regulation is applicable to stationary turbines that commenced construction, modification, or reconstruction after February 18, 2005. The source is not subject to this regulation due to the fact that construction predates the applicability date.

40 CFR Appendix F – Quality Assurance Procedures

Discussion: This regulation specifies the minimum quality assurance requirements necessary for the control and assessment of the quality of the CEMS data. These requirements can be found in the Part 70 OP.

4. 40 CFR 63 – National Emission Standards for Hazardous Air Pollutants

Subpart ZZZZ – National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

40 CFR 63.6580 – Statement of Purpose

Discussion: Subpart ZZZZ establishes national emission limitations and operating limitations for hazardous air pollutants (HAP) emitted from stationary reciprocating internal combustion engines (RICE) located at major and area sources of HAP emissions. This subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limitations and operating limitation.

40 CFR 63.6585 – Definition of Applicability

Discussion: This subpart defines sources that are subject to the requirements of Subpart ZZZZ. As the owner/operator of stationary RICE, Apex Generating Station is subject to this subpart.

40 CFR 63.6590 – Parts of Plant that are Subject to the Rule

Discussion: All existing, new, or reconstructed stationary RICE are subject.

40 CFR 63.6595 – Dates for Compliance

Discussion: This subpart establishes May 3, 2013 as the date to comply with all applicable requirements.

40 CFR 63.6603 – Emission and Operational Limitations for an Area Source of HAP Emissions

Discussion: This subpart establishes the emissions limitations for emergency and nonemergency RICE greater than 300 hp. Compliance with the emission limitations, as specified in Table 4 of Subpart ZZZZ, are based on the results of the average of three 1-hour test runs for each affected emission unit.

40 CFR 63.6605 – General Requirements for Compliance

Discussion: The Permittee must be in compliance with the applicable emission limitations and operating limitations defined in this subpart at all times. All affected units must be operated and maintained in a manner consistent with safety and good air pollution control practices for minimizing emissions. This requirement includes associated air pollution control equipment and monitoring equipment.

40 CFR 63.6620 – Performance Tests and Procedures

Discussion: This subpart defines the performance tests that are required and the EPA-approved methods that are applicable for each test.

40 CFR 63.6625(h) – Operation Requirements

Discussion: This subpart requires the permittee to minimize the engine's time spent at idle during startup and minimize the engine's startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes.

40 CFR 63.6630 – Requirements for Initial Compliance Demonstration

Discussion: This subpart defines the methods for determining each operating limitation. It also requires the source to submit the results of the tests.

40 CFR 63.6645 – Notification Requirements

Discussion: This subpart specifies the notification requirements and dates for affected units.

40 CFR 63.6650 – Report Submission Requirements

Discussion: This subpart defines the requirements, and frequency, for submitting compliance reports.

40 CFR 63.6655 – Recordkeeping Requirements

Discussion: This subpart defines the type of records that must be kept to verify compliance.

40 CFR 63.6660 – Maintenance of Records

Discussion: All records must be maintained in a suitable form and must be readily accessible, in hard copy or electronic form, for a minimum of 5 years following the date of each occurrence, measurement, maintenance, corrective action, report, or record.

5. 40 CFR 64 – Compliance Assurance Monitoring

40 CFR 64.2(a) – General Applicability

Discussion: This regulation requires a source to draft, and adhere to, a compliance assurance monitoring plan for pollutant-specific emissions at a source that is a major source of one or more pollutants and is required to obtain a Part 70 or 71 Operating Permit.

40 CFR 64.2(b)(iii) – Exemptions to CAM

Discussion: CAM is not applicable to a source subject to acid rain requirements of the Clean Air Act. Apex Generating Station is subject to the acid rain requirement of 40 CFR Part 72.

40 CFR 64.2(b)(vi) – Exemptions to CAM

Discussion: CAM is not applicable when a Part 70 operating permit specifies a continuous compliance determination method. The DES Part 70 operating permit requires Apex Generating Station to operate a CEMS to monitor pollutants from the gas turbines and duct burners

6. 40 CFR PART 72 – Acid Rain Permit Regulations

Subpart A – Acid Rain Program General Provisions

40 CFR 72.6 – Applicability

Discussion: Apex Generating Station is defined as a utility unit in the definitions of 40 CFR 72. Therefore, the provisions of this regulation apply.

40 CFR 72.9 – Standard Requirements

Discussion: Apex Generating Station has applied for all of the proper permits under this regulation.

Subpart B – Designated Representative

40 CFR 72.20 – Authorization and Responsibilities of the Designated Representative

Discussion: Apex Generating Station has a Certificate of Representation for Designated Representative on file. The source fulfilled all requirements under this Subpart.

Subpart C – Acid Rain Permit Applications

40 CFR 72.30 – Requirement to Apply

Discussion: Apex Generating Station has applied for an acid rain permit.

Subpart D – Acid Rain Compliance Plan and Compliance Options

40 CFR 72.40 – 72.44

Discussion: This Subpart discusses the individual requirements necessary for a complete compliance plan. A compliance plan exists for each stationary combustion turbine.

Subpart E – Acid Rain Permit Contents

40 CFR 72.50 – General Requirements

Discussion: Apex Generating Station has applied for an acid rain permit and it will contain all information necessary to demonstrate compliance with this Subpart.

40 CFR 72.51 – Permit Shield

Discussion: Apex Generating Station has applied for and met all of the requirements for a permit shield.

7. 40 CFR PART 73 – Sulfur Dioxide Allowance System

40 CFR 73.2 – Applicability

Discussion: Apex Generating Station is an affected source pursuant to 40 CFR 72.6 because it fits the definition of a utility unit; therefore, this regulation shall apply.

Subpart B – Allowance Allocations

40 CFR 73.10 – Initial Allocations for Phase I and Phase II

Discussion: Apex Generating Station is not listed on either Phase I or Phase II tables because it is a newer power plant. Therefore, it will not have an initial allocation,

Subpart C – Allowance Tracking System

CFR 73.30 – Allowance Tracking System Accounts

Discussion: A complete certificate of representation has been received and an account has been established for this source. Apex Generating Station shall follow all guidelines and instructions presented in this Subpart while maintaining its allowance account.

Subpart D – Allowance Transfers

40 CFR 73.50 – Scope and Submission of Transfers

Discussion: When an allowance transfer is necessary, the Permittee shall follow all procedures in this Subpart.

Subpart E – Auctions, Direct Sales and Independent Power Producers Written Guarantee

CFR 73.70 – 73.73

Discussion: This Subpart outlines the auction, bidding, and sales processes for allowance credits.

Subpart F – Energy Conservation and Renewable Energy Reserve

40 CFR 73.80 – Operation of Allowance Reserve Program for Conservation and renewable Energy

Discussion: There are no qualified conservation measures or renewable energy generation processes at this source; therefore, this Subpart does not apply.

8. 40 CFR PART 75 – Continuous Emissions Monitoring

40 CFR 75.2 – Applicability

Discussion: Apex Generating Station is subject to the Acid Rain emission limitations of 40 CFR 72. Therefore, the facility is subject to the monitoring requirements of this regulation.

Each stationary gas turbine/duct burner has been equipped with a NO_x CEMS and a diluent oxygen monitor. Each stationary gas turbine is also equipped with a fuel flow monitor. The data from the CEMS is used to provide quarterly acid rain reports to both EPA and Air Quality.

All required monitoring plans, RATA testing protocols and certification testing reports have been provided to EPA and Air Quality. Initial CEMS certification testing was completed on November 23, 2003. The CEMS Quality Assurance Plan was approved on January 2, 2002. Initial CEMS testing certification was completed on April 10, 2003.

40 CFR 75, Appendix D – Optional SO₂ Emissions Data Protocol

Discussion: Apex Generating Station combusts pipeline quality natural gas. A fuel may initially qualify as pipeline natural gas, if information is provided in the monitoring plan required under § 75.53, demonstrating that the definition of pipeline natural gas in § 72.2 of this chapter has been met. The information must demonstrate that the fuel meets either the percent methane or GCV requirement and has a total sulfur content of 0.5 grains/100scf or less.

V. COMPLIANCE

A. SUMMARY OF MONITORING FOR COMPLIANCE

Table V-A-1: Compliance Summary (local rules)

Citation	Title	Applicability	Applicable Test Method	Compliance Status
AQR Section 0	Definitions	Applicable – AGS will comply with all applicable definitions as they apply.	AGS will meet all applicable test methods should new definitions apply.	AGS complies with applicable requirements
AQR Section 4	Control Officer	Applicable – The Control Officer or his representative may enter into Apex Generating Station property, with or without prior notice, at any reasonable time for purpose of establishing compliance with permit regulations	Apex Generating Station will allow Control Officer to enter property as required.	AGS complies with applicable requirements
AQR Section 10	Compliance Schedule	Applicable - Any existing source not in compliance with emission limitations will submit a compliance schedule as stipulated in the regulation.	AGS shall adhere to emissions limitations and submit a required compliance schedule if those limits are exceeded.	AGS complies with applicable requirements
AQR Section 12.0	Applicability, General Requirements, and Transition Procedures	Applicable - Facility as a whole is subject to these requirements. Rule outlines source applicability, requirement for a source to obtain a permit, and transition for sources that received permit prior to rulemaking.	AGS applied for and received ATC permits from DAQ prior to commercial operations. AGS shall comply with the requirements for ATCs.	AGS complies with applicable requirements
AQR Section 12.5	Part 70 Operating Permits	Applicable – AGS is a major stationary source and under Part 70. Renewal applications are due between 6 and 18 months prior to expiration. Revision applications will be submitted within 12 months of commencing operation of the new emission unit.	Apex Generating Station submitted the initial Part 70 permit application within 12 months of startup. The renewal application was submitted within the appropriate timeframe.	AGS complies with applicable requirements
AQR Section 12.9	Annual Emissions Inventory	Applicable - Every major source shall complete and submit an annual emission inventory.	SCPPA submits an emission inventory prior to March 31 every year.	AGS complies with applicable requirements
AQR Section 12.10	Continuous Monitoring Requirements	Applicable - The Control Officer may require any source of regulated air pollutants, to monitor, sample or perform other studies to quantify emissions or the levels of air pollution that may be reasonably attributable to such source.	AGS is subject to continuous monitoring requirements in 40 CFR 60 and 40 CFR 75. NOx and CO CEMS have been installed on the turbine stacks. All required protocols and test plans have been submitted.	AGS complies with applicable requirements

Citation	Title	Applicability	Applicable Test Method	Compliance Status
AQR Section 13.2.82 Subpart ZZZZ	NESHAP – Stationary Reciprocating Internal Combustion Engines	Applicable – The Apex Generating Station fire pump is an affected unit.	Applicable monitoring requirements.	AGS complies with applicable requirements
AQR Section 14.1(b)(1) Subpart A	NSPS – General Provisions	Applicable – AGS is an affected facility under the regulations. Sec. 14 is locally enforceable; however, the NSPS standards they reference are federally enforceable.	Applicable monitoring, recordkeeping and reporting requirements.	AGS complies with applicable requirements
AQR Section 14.1(b)(3) Subpart Da	NSPS – Standards of Performance for Electric Utility Steam Generating Units for Which Construction is Commenced after September 18, 1978	Applicable – The Apex Generating Station duct burners are natural gas fired units with heat input greater than 250 MMBtu/hr.	All duct burners meet the applicable PM, SO ₂ and NO _x emission standards. The duct burners also meet the opacity requirements.	AGS complies with applicable requirements
AQR Section 14.1(b)(40) Subpart GG	NSPS – Standards of Performance for Stationary Gas Turbines	Applicable – The Apex Generating Station stationary gas turbines are natural gas fired units with heat input greater than 10 MMBtu/hr.	All stationary gas turbines meet the applicable NO _x emission standard. When firing on natural gas, NO _x emissions shall not exceed 3.0 ppmv (dry, corrected to 15 percent oxygen). NO _x emissions determined by EPA Method 7E.	AGS complies with applicable requirements
AQR Section 18	Permit and Technical Service Fees	Applicable – AGS will be required to pay all required applicable permit and technical service fees.	AGS is required to pay all required/applicable permit and technical service fees.	AGS complies with applicable requirements
AQR Section 21	Acid Rain Permits	Applicable – AGS is an affected facility. The stationary combustion turbines are applicable under the Acid Rain Program.	AGS submitted required acid rain permit forms/applications.	AGS complies with applicable requirements
AQR Section 22	Acid Rain Continuous Emission Monitoring	Applicable – AGS an affected facility and is required to meet the requirements for the monitoring, recordkeeping and reporting of flow rate.	Apex Generating Station submitted all required protocols/test plans per ATC prior to CEMS certification.	AGS complies with applicable requirements
AQR Section 25	Upset/Breakdown, Malfunctions	Applicable – Any upset, breakdown, emergency condition, or malfunction which causes emissions of regulated air pollutants in excess of any permit limits shall be reported to Control Officer. Section 25.1 is locally and federally enforceable.	Any upset, breakdown, emergency condition, or malfunction in which emissions exceed any permit limit shall be reported to the Control Officer within 1-hour of onset of such event.	AGS complies with applicable requirements
AQR Section 26	Emissions of Visible Air Contaminants	Applicable – Opacity for the any emission unit may not exceed 20 percent for more than 6 consecutive minutes.	Compliance determined by EPA Method 9.	AGS complies with applicable requirements

Citation	Title	Applicability	Applicable Test Method	Compliance Status
AQR Section 28	Fuel Burning Equipment	Applicable – The PM emission rates for all stationary gas turbines are well below those established based on Section 28 requirements.	Maximum allowable PM emission rate determined from equation in Section 28.	AGS complies with applicable requirements
AQR Section 40	Prohibition of Nuisance Conditions	Applicable – No person shall cause, suffer or allow the discharge from any source whatsoever such quantities of air contaminants or other material which cause a nuisance. Section 40 is locally enforceable only.	AGS air contaminant emissions controlled by pollution control devices or good combustion and thus will not cause a nuisance.	AGS complies with applicable requirements
AQR Section 41	Fugitive Dust	Applicable – AGS shall take necessary actions to abate fugitive dust from becoming airborne.	AGS utilizes appropriate best practices to not allow airborne fugitive dust.	AGS complies with applicable requirements
AQR Section 42	Open Burning	Applicable – In event AGS burns combustible material in any open areas, such burning activity will have been approved by Control Officer in advance. Section 42 is a locally enforceable rule only.	Apex Generating Station will contact the Air Quality and obtain approval in advance for applicable burning activities as identified in the rule.	AGS complies with applicable requirements
AQR Section 43	Odors in the Ambient Air	Applicable – An odor occurrence is a violation if the Control Officer is able to detect the odor twice within a period of an hour, if the odor causes a nuisance, and if the detection of odors is separated by at least 15 minutes. Section 43 is a local enforceable rule only.	AGS is a predominantly natural gas-fired facility and is not expected to cause odors.	AGS complies with applicable requirements
40 CFR 60	Appendix A, Method 20 or equivalent	Applicable – The CTG emissions at the Station are subject to requirements for determination of NO _x , SO ₂ , and diluent emissions from CTGs.	Emissions determined from EPA Method 20 or Equivalent.	AGS complies with applicable requirements.

Citation	Title	Applicability	Applicable Test Method	Compliance Status
AQR Section 70.4	Emergency Procedures	Applicable – AGS submitted an emergency standby plan for reducing or eliminating air pollutant emissions in the Section 16 Operating Permit Application.	AGS submitted an emergency standby plan and received the Section 16 Operating Permit.	AGS complies with applicable requirements.
AQR Section 80	Circumvention	Applicable – AGS shall not build, erect, install or uses any article, machine, equipment or other contrivance, the use of which, without resulting in a reduction in the total release of air contaminants to the atmosphere, reduces or conceals an emission which would otherwise constitute a violation of these regulations.	AGS shall submit an application with the appropriate information as required by this regulation.	AGS complies with applicable requirements.

Table V-A-2: Applicable Federal Air Quality Regulations

Citation	Title	Applicability	Applicable Test Method	Compliance Status
40 CFR 52.21	Prevention of Significant Deterioration (including Preconstruction permits)	Applicable – PTE > 100 TPY and is listed as one of the 28 source categories.	BACT analysis and visibility and additional impact analysis performed for original ATC permits.	AGS complies with applicable sections as required by PSD regulations.
40 CFR 52.1470	Approval and Promulgation of Implementation Plans: Subpart DD – Nevada [SIP Rules]	Applicable – AGS is classified as a Title V source, and SIP rules apply.	Applicable monitoring and record keeping of emissions data.	AGS is in compliance with applicable state SIP requirements including monitoring and record keeping of emissions data.
40 CFR 60 Subpart A	Standards of Performance for New Stationary Sources (NSPS) – General Provisions	Applicable – The Station is an affected facility under the regulations.	Applicable monitoring, recordkeeping and reporting requirements.	AGS complies with applicable requirements.
40 CFR 60 Subpart Da	Standards of Performance for New Stationary Sources (NSPS) – Electric utility steam generating units with heat input greater than 250 MMBtu/hr.	Applicable – The duct burners are natural gas-fired units with heat input rating of 460 MMBtu/hr.	Duct burners meet applicable NO _x and PM emission standards. NO _x emission determined by EPA Method 7E and PM ₁₀ by EPA Method 201/201a and 202.	AGS complies with applicable requirements.
40 CFR 60 Subpart GG	Standards of Performance for New Stationary Sources (NSPS) – Stationary Gas Turbines	Applicable – The four (4) CTGs at the Station are natural gas- fired units with heat input greater than 10 MMBtu/hr.	The four CTGs meet the applicable NO _x emission standard. NO _x emission determined by EPA Method 7E.	AGS complies with applicable requirements.
40 CFR 60	Appendix A, Method 9 or equivalent, (Opacity)	Applicable – Emissions from stacks are subject to opacity standards.	Opacity determined by EPA Method 9.	AGS complies with applicable requirements.

Citation	Title	Applicability	Applicable Test Method	Compliance Status
40 CFR 60	Appendix A, Method 20 or equivalent	Applicable – The CTG emissions at the Station are subject to requirements for determination of NO _x , SO ₂ , and diluent emissions from CTGs.	Emissions determined from EPA Method 20 or Equivalent.	AGS complies with applicable requirements.
40 CFR 63 Subpart ZZZZ	National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines	Applicable – The diesel emergency engines are existing emergency engines as defined.	Not applicable	AGS complies with applicable requirements.
40 CFR 70	Federally Mandated Operating Permits	Applicable – AGS is a major stationary source and under Part 70. The initial Title V permit application was submitted as required. Renewal applications are due between 6 and 18 months prior to expiration. Revision applications will be submitted within 12 months or commencing operation of any new emission units.	The previous Part 70 OP renewed October 16, 2018. Current renewal application was submitted on April 10, 2023. Applications for new units will be submitted within 12 months of startup.	AGS complies with applicable requirements.
AQR Section 70.4	Emergency Procedures	Applicable – AGS submitted an emergency standby plan for reducing or eliminating air pollutant emissions in the Section 16 Operating Permit Application.	AGS submitted an emergency standby plan and received the Section 16 Operating Permit.	AGS complies with applicable requirements.
40 CFR 72	Acid Rain Permits Regulation	Applicable – AGS is an affected facility. The CTGs and duct burners are applicable units under the Acid Rain Program.	AGS submitted required acid rain permit forms/applications.	AGS complies with applicable requirements.
40 CFR 73	Acid Rain Sulfur Dioxide Allowance System	Applicable – AGS is an affected facility. The permittee will obtain SO ₂ allowances based on the calculated actual emissions.	AGS shall be required to obtain required SO ₂ allowances.	AGS complies with applicable requirements.
40 CFR 75	Acid Rain CEMS	Applicable – AGS is an affected facility and is required to meet the requirements for the monitoring, recordkeeping and reporting of flow rate, SO ₂ , NO _x , and CO ₂ emissions.	AGS submitted all required protocols/test plans per ATC permit prior to CEMS certification. The Station submitted Initial Certification applications within 45 days of last certification test. Air Quality and EPA approve CEMS certifications.	AGS complies with applicable requirements.

VI. EMISSION REDUCTION CREDITS (OFFSETS)

Apex Generating Station is located in a hydrographic area that is designated attainment with NAAQS standards. As a result, it is not subject to offset requirements.

VII. MODELING

Facility Location: 682885, 4032110 (Universal Transverse Mercator (UTM) NAD83)

Apex Generating Station is a major source in Hydrographic Area 216 (Garnet Valley). Permitted emission units include two turbines, one heater, one generator, one boiler and one fire pump. Since minor source baseline dates for PM₁₀ (December 31, 1980), NO₂ (January 24, 1991) and SO₂ (December 31, 1980) have been triggered, Prevention of Significant Deterioration (PSD) increment analysis is required.

DAQ modeled the source using AERMOD to track the increment consumption. Stack data submitted by the applicant were supplemented with information available for similar emission units. Five years (2011 to 2015) of meteorological data from the McCarran Station were used in the model. U.S. Geological Survey National Elevation Dataset terrain data were used to calculate elevations. Table VII-1 shows the location of the maximum impact and the potential PSD increment consumed by the source at that location. The impacts are below the PSD increment limits.

Table VII-1: PSD Increment Consumption

Pollutant	Averaging Period	Source's PSD Increment Consumption (µg/m ³)	Location of Maximum Impact	
			UTM X (m)	UTM Y (m)
SO ₂	3-hour	1.03 ¹	682600	4031800
SO ₂	24-hour	0.40 ¹	682658	4031943
SO ₂	Annual	0.10	682658	4031943
NO _x	Annual	4.43	682658	4031943
PM ₁₀	24-hour	7.82 ¹	682658	4031943
PM ₁₀	Annual	1.62	682912	4032405

¹ Highest Second High Concentration.

VIII. ENVIRONMENTAL JUSTICE

The primary principle of environmental justice is that all people have a right to live in a healthful environment that is protected from industrial pollution. Environmental justice focuses on the fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. One technique in which this is accomplished is through the methodical distribution of new large pollution-emitting sources based on a balance of socioeconomic factors.

The EPA EJ Screen website allows users to obtain demographic indicators (e.g., low-income communities, communities of color, and tribal/indigenous communities) with environmental indicators in order to conduct a screening of a community potentially disproportionately and adversely affected by environmental and human health harms or risks.

Apex Generating Station is located outside of the Las Vegas metropolitan area. The nearest residential areas are in Las Vegas, approximately 12 miles southwest of the source, and the Moapa Indian reservation, approximately 13 miles northeast of the source.

The map and statistical tables included in this section were obtained from the EJ Screen website. As a means to obtain reasonable demographic data, a 20 miles radius from the center of the source was selected. The area within this circle equates to 1,256 square miles and represents a residential population of 774,561. The statistics indicate that there is a high percentile of the socioeconomic indicators in this area. There are no emission increases associated with this permitting action. Therefore, additional outreach is not warranted.

Sites reporting to EPA within defined area:

Superfund	0
Hazardous Waste, Treatment, Storage, and Disposal Facilities	24
Water Dischargers	722
..	
Air Pollution	27
Brownfields	143
..	
Toxic Release Inventory	48

Other community features within defined area:

Schools	135
Hospitals	10
Places of Worship	79

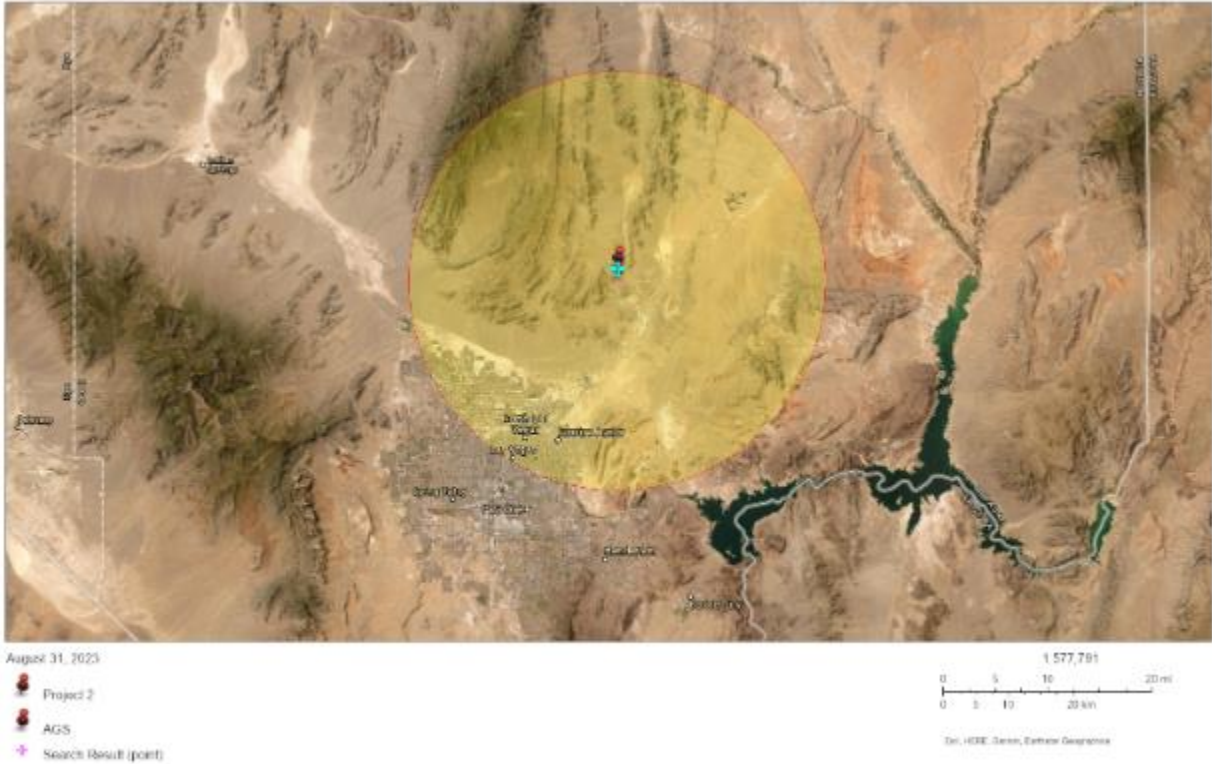
Other environmental data:

Air Non-attainment	Yes
Impaired Waters	Yes

Selected location contains American Indian Reservation Lands*	Yes
Selected location contains a "Justice40 (CEJST)" disadvantaged community	Yes
Selected location contains an EPA IRA disadvantaged community	Yes

Report for 20 miles Ring Centered at 36.432601,-114.959068

Map of Selected Area



LANGUAGES SPOKEN AT HOME

LANGUAGE	PERCENT
English	57%
Spanish	36%
Other Indo-European	1%
Tagalog (including Filipino)	3%
Other Asian and Pacific Island	1%
Total Non-English	43%

HEALTH INDICATORS					
INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Low Life Expectancy	20%	20%	38	20%	52
Heart Disease	6	6.4	44	6.1	50
Asthma	11	10.3	76	10	77
Cancer	4.6	5.7	30	6.1	19
Persons with Disabilities	12.9%	13.2%	55	13.4%	52

CRITICAL SERVICE GAPS					
INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Broadband Internet	16%	13%	67	14%	66
Lack of Health Insurance	15%	12%	71	9%	84
Housing Burden	Yes	N/A	N/A	N/A	N/A
Transportation Access	Yes	N/A	N/A	N/A	N/A
Food Desert	Yes	N/A	N/A	N/A	N/A

CLIMATE INDICATORS					
INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Flood Risk	2%	6%	45	12%	21
Wildfire Risk	6%	33%	60	14%	80

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
POLLUTION AND SOURCES					
Particulate Matter ($\mu\text{g}/\text{m}^3$)	6.4	5.65	76	8.08	11
Ozone (ppb)	66.1	64.1	60	61.6	81
Diesel Particulate Matter ($\mu\text{g}/\text{m}^3$)	0.615	0.446	72	0.261	95
Air Toxics Cancer Risk* (lifetime risk per million)	28	25	5	28	3
Air Toxics Respiratory HI*	0.37	0.34	23	0.31	31
Toxic Releases to Air	180	1,400	67	4,600	31
Traffic Proximity (daily traffic count/distance to road)	210	200	71	210	75
Lead Paint (% Pre-1960 Housing)	0.057	0.063	76	0.3	27
Superfund Proximity (site count/km distance)	0.0045	0.014	16	0.13	0
RMP Facility Proximity (facility count/km distance)	0.44	0.29	83	0.43	74
Hazardous Waste Proximity (facility count/km distance)	2.1	1.8	62	1.9	74
Underground Storage Tanks (count/km ²)	3.9	3.3	72	3.9	72
Wastewater Discharge (toxicity-weighted concentration/m distance)	4.4	7	93	22	95
SOCIOECONOMIC INDICATORS					
Demographic Index	57%	41%	76	35%	81
Supplemental Demographic Index	21%	16%	74	14%	81
People of Color	73%	50%	77	39%	79
Low Income	42%	33%	68	31%	71
Unemployment Rate	9%	7%	69	6%	77
Limited English Speaking Households	9%	6%	77	5%	84
Less Than High School Education	22%	14%	77	12%	84
Under Age 5	7%	5%	69	6%	68
Over Age 64	12%	17%	42	17%	35
Low Life Expectancy	20%	20%	38	20%	52

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: <https://www.epa.gov/haps/air-toxics-data-update>.

IX. PERMIT SHIELD

1. The source has requested a permit shield for applicable regulations in the regulations identified in Table IX-1.

Table IX-1: Applicable Requirements Related to Permit Shield

Citation	Title
40 CFR 60, Subpart Da	Standards of Performance for Electric Utility Steam Generating Units
40 CFR 60, Subpart GG	Standards of Performance for Stationary Gas Turbines

2. Compliance with the terms contained in this permit shall be deemed compliance with the applicable requirements of Table IX-2 in effect on the date of permit issuance.

Table IX-2: Streamlined Requirements Related to Permit Shield

EU	Regulation (40 CFR)	Regulatory Standard	Permit Limit	Is Permit Limit Equal or More Stringent?	Averaging Period Comparison			Streamlining Statement for Shielding Purposes
					Standard Averaging Period	Permit Limit Averaging Period	Is Permit Limit Equal or More Stringent?	
A01/A02 A03/A04	60.332 (GG)	114 ppmvd NO _x @ 15% O ₂	3.0 ppmvd NO _x @ 15% O ₂	Yes	4 hour	3 hour	Yes	The permit limits are more stringent than the standard based upon both concentration and averaging time. Compliance with the permit demonstrates compliance with the standard.
A01/A02 A03/A04	60.333 (GG)	150 ppmvd (1,878.8 lbs/hr) ¹ SO ₂ @ 15% O ₂	1.47 lbs/hr SO ₂ @ 15% O ₂ (natural gas)	Yes	4 hour	3 hour	Yes	
A01/A02 A03/A04	60.333 (GG)	0.8% Sulfur by weight (280 gr/100 scf) ²	0.5 gr/100 scf	Yes	4 hour	rolling 12-month	Yes	
A01/A02 A03/A04	60.42Da	0.03 lb PM/MMBtu (73.20 lbs/hr) ³	13.00 lbs PM ₁₀ /hr	Yes	30-day rolling	3 hour	Yes	The permit limits are more stringent than the standard based upon both concentration and averaging time.
A01/A02 A03/A04	60.42Da	20% Opacity	20% Opacity	Yes	60-minute period, excepting 6 minutes	60-minute period, excepting 6 minutes	Yes	
A01/A02 A03/A04	60.43Da	0.20 lb SO ₂ /MMBtu (488 SO ₂ /hr) ⁴	1.47 lb SO ₂ /hr	Yes	30-day rolling	3 hour	Yes	Compliance with the permit demonstrates compliance with the standard.
A01/A02 A03/A04	60.44Da	0.15 lb NO _x /MMBtu (366 lbs NO _x @ 15% O ₂) ⁵	3.0 ppm NO _x @ 15% O ₂	Yes	30-day rolling	3 hour	Yes	
A01/A02 A03/A04	60.44Da	1.6 lb NO _x /MW-hr (296 lbs NO _x /hr) ⁶	19.86 lb NO _x /hr	Yes	30-day rolling	3 hour	Yes	

¹ Converting 150 ppmvd SO₂ to lbs/hr:

$$EF \text{ for } SO_2 = \left(\frac{150 \text{ ppm}}{10^6}\right) \left(\frac{64.06 \text{ lb } SO_2}{\text{lb} - \text{mol}}\right) \left(\frac{\text{lb} - \text{mol}}{385 \text{ scf}}\right) \left(\frac{8740 \text{ dscf of Natural Gas}}{\text{MMBtu}}\right) \left(\frac{20.9}{20.9 - 15}\right) = \frac{0.77 \text{ lb } SO_2}{\text{MMBtu}}$$

$$EF \text{ for } SO_2 = \left(\frac{0.77 \text{ lb } SO_2}{MMBtu} \right) \left(\frac{2,440 \text{ MMBtu}}{hr} \right) = \frac{1,524.6 \text{ lb}}{hr}$$

where:

(lb-mol/ 385 scf) is a constant for gas

8,740 dscf/MMBtu is a constant at standard conditions of natural gas

(20.9/20.9-15) is the percent oxygen in affluent gas stream measured on a dry basis

2,440 MMBtu/hr are the turbine and HRSG combined rating.

² Sulfur content was converted from percent by weight to grains per 100 scf as follows:

0.08% sulfur x 7,000 gr/lb = 56 gr sulfur per lb of natural gas

AP-42 defines natural gas generally more than 85 percent methane and varying amounts of ethane, propane, butane, and inerts (typically nitrogen, carbon dioxide, and helium). Assuming an average molecular weight of 18 lb/lb-mol, 1 lb of natural gas = 20 scf. Lastly, 56 grains sulfur per 20 scf of natural gas = 280 gr/100 scf.

³ EUs: A01/A02 and A03/A04 have a combined rating of 2,440 MMBtu/hr:

Standard lb/hr = (0.03 lb/MMBtu)(2,440 MMBtu/hr) = 73.20 lbs/hr. AP-42 Table 1.4-2 footnotes that all PM is assumed to be less than 1.0 micron in diameter. Therefore, the correlation between the PM standard from 60.42Da and the PM10 standard in the permit is appropriate for streamlining purposes.

⁴ EUs: A01/A02 and A03/A04 are rated at 2,440 MMBtu/hr: Standard lb/hr = (0.20 lb/MMBtu)(2,440 MMBtu/hr) = 488 lbs/hr

⁵ EUs: A01/A02 and A03/A04 are rated at 2,440 MMBtu/hr: Standard lb/hr = (0.15 lb/MMBtu)(2,440 MMBtu/hr) = 366 lbs/hr

⁶ EUs: A01/A02 and A03/A04 are rated at 185 MW: Standard lb/hr = (1.6 lb/MW-hr)(185 MW) = 296 lbs/hr

X. PUBLIC PARTICIPATION

This permitting action is for the renewal of an AQR 12.5 operating permit. As a result, public participation is required in accordance with AQR 12.5.2.17.

XI. ATTACHMENTS

PTE/Applicability from Combustion Turbines and HRSG

XI-1. Emission Rates (pounds per hour)

Pollutant	Turbine/HRSG	Turbine/HRSG + Duct Burner	Startup/Shutdown
PM ₁₀	11.0	13.0	18
PM _{2.5}	11.0	13.0	18
NO _x	18.1	21.4	180
CO	27.0	43.4	200
SO ₂	1.47	1.47	1.47
VOC	2.6	9.9	1.7

¹Emission rates provided by manufacturer.

The application proposed two operating scenarios were proposed. The source PTE is calculated using the scenario that calculates to be the highest PTE value for each pollutant using the emission factors from Table XI-1. Each scenario is described, below. The worst case values for each pollutant are bolded and underlined.

Operational Scenario #1:

Turbine/HRSG = 3,760 hours/year

Turbine/HRSG + Duct Burner = 5,000 hours/year

Startup/Shutdown = 0 hours/year

$$PM_{10}/PM_{2.5} = [(3,760 \times 11) + (5,000 \times 13)] \div 2,000 = \mathbf{53.18 \text{ tons/year}}$$

$$NO_x = [(3,760 \times 18.1) + (5,000 \times 21.4)] \div 2,000 = 87.53 \text{ tons/year}$$

$$CO = [(3,760 \times 27) + (5,000 \times 43.4)] \div 2,000 = \mathbf{159.26 \text{ tons/year}}$$

$$SO_2 = (8,760 \times 1.47) \div 2,000 = \mathbf{6.44 \text{ tons/year}}$$

$$VOC = [(3,760 \times 2.6) + (4,000 \times 9.9)] \div 2,000 = \mathbf{29.64 \text{ tons/year}}$$

Operational Scenario #2:

Turbine/HRSG = 1,000 hours/year

Turbine/HRSG + Duct Burner = 1,000 hours/year

Startup/Shutdown = 876 hours/year

$$PM_{10}/PM_{2.5} = [(1,000 \times 11) + (1,000 \times 13) + (876 \times 18)] \div 2,000 = 19.88 \text{ tons/year}$$

$$NO_x = [(1,000 \times 18.1) + (1,000 \times 21.4) + (876 \times 180)] \div 2,000 = \mathbf{98.59 \text{ tons/year}}$$

$$CO = [(1,000 \times 27) + (1,000 \times 43.4) + (876 \times 200)] \div 2,000 = 122.80 \text{ tons/year}$$

$$SO_2 = (2,876 \times 1.47) \div 2,000 = 2.11 \text{ tons/year}$$

$$VOC = [(1,000 \times 2.6) + (1,000 \times 9.9) + (876 \times 1.7)] \div 2,000 = 6.99 \text{ tons/year}$$

XI-2. PTE/Applicability of HAPs from Turbine (tons per year)

Pollutant	Single Unit PTE							
	EF (CT)	EF (DB)	PTE (lb/hr)			PTE (ton/yr)		
	lb/mmBtu	lb/mmscf	CT	DB	Total	CT	DB	Total
1,3-Butadiene	4.30E-07		8.51E-04	0.00E+00	8.51E-04	3.73E-03	0.00E+00	3.73E-03
Acetaldehyde	4.00E-05		7.92E-02	0.00E+00	7.92E-02	3.47E-01	0.00E+00	3.47E-01
Acrolein	6.40E-06		1.27E-02	0.00E+00	1.27E-02	5.55E-02	0.00E+00	5.55E-02
Arsenic		2.00E-04	0.00E+00	9.02E-05	9.02E-05	0.00E+00	2.25E-04	2.25E-04
Benzene	1.20E-05	2.10E-03	2.38E-02	9.47E-04	2.47E-02	1.04E-01	2.37E-03	1.06E-01
Beryllium		1.20E-05	0.00E+00	5.41E-06	5.41E-06	0.00E+00	1.35E-05	1.35E-05
Cadmium		1.10E-03	0.00E+00	4.96E-04	4.96E-04	0.00E+00	1.24E-03	1.24E-03
Chromium		1.40E-03	0.00E+00	6.31E-04	6.31E-04	0.00E+00	1.58E-03	1.58E-03
Cobalt		8.40E-05	0.00E+00	3.79E-05	3.79E-05	0.00E+00	9.47E-05	9.47E-05
Dichlorobenzene		1.20E-03	0.00E+00	5.41E-04	5.41E-04	0.00E+00	1.35E-03	1.35E-03
Ethylbenzene	3.20E-05		6.34E-02	0.00E+00	6.34E-02	2.78E-01	0.00E+00	2.78E-01
Formaldehyde	2.19E-04	3.60E-03	4.34E-01	1.62E-03	4.35E-01	1.90E+00	4.06E-03	1.90E+00
Hexane		1.80E+00	0.00E+00	8.12E-01	8.12E-01	0.00E+00	2.03E+00	2.03E+00
Lead		5.00E-04	0.00E+00	2.25E-04	2.25E-04	0.00E+00	5.64E-04	5.64E-04
Manganese		3.80E-04	0.00E+00	1.71E-04	1.71E-04	0.00E+00	4.28E-04	4.28E-04
Mercury		2.60E-04	0.00E+00	1.17E-04	1.17E-04	0.00E+00	2.93E-04	2.93E-04
Naphthalene	1.30E-06	6.10E-04	2.57E-03	2.75E-04	2.85E-03	1.13E-02	6.88E-04	1.20E-02
Nickel		2.10E-03	0.00E+00	9.47E-04	9.47E-04	0.00E+00	2.37E-03	2.37E-03
PAH	2.20E-06		4.36E-03	0.00E+00	4.36E-03	1.91E-02	0.00E+00	1.91E-02
POM		8.82E-05	0.00E+00	3.98E-05	3.98E-05	0.00E+00	9.94E-05	9.94E-05
Propylene Oxide	2.90E-05		5.74E-02	0.00E+00	5.74E-02	2.51E-01	0.00E+00	2.51E-01
Selenium		2.40E-05	0.00E+00	1.08E-05	1.08E-05	0.00E+00	2.71E-05	2.71E-05
Toluene	1.30E-04	3.40E-03	2.57E-01	1.53E-03	2.59E-01	1.13E+00	3.83E-03	1.13E+00
Xylenes	6.40E-05		1.27E-01	0.00E+00	1.27E-01	5.55E-01	0.00E+00	5.55E-01
Total HAP:			1.06	0.82	1.88	4.65	2.05	6.70

XI-3. PTE/Applicability for Diesel Engine

EU#	A06		Horsepower:	1,180		Emission Factor	Potential Emissions			
Make:	Caterpillar		Hours/Day:	24.0		(lb/hp-hr)	lb/hr	lb/day	ton/yr	
Model:	3412CTA		Hours/Year	500		PM10	5.93E-04	0.70	16.80	0.18
S/N:	1EZ02448					NOx	1.59E-02	18.73	449.52	4.68
						CO	3.52E-03	4.15	99.60	1.04
Manufacturer Guarantees						SO₂	1.21E-05	0.01	0.34	0.01
PM10	0.7	lb/hr				VOC	5.76E-04	0.68	16.32	0.17
NOx	18.73	lb/hr				HAP	1.10E-05	0.01	0.31	0.01
CO	4.15	lb/hr				CO2	1.15E+00	1357.00	32568.00	339.25
SO₂		lb/hp-hr								
VOC	0.68	lb/hr								
Engine Type:	Diesel					Diesel Fuel Sulfur Content is 15 ppm (0.0015%)				

XI-4. PTE/Applicability for Diesel Engine

EU#	A07		Horsepower:	270			Emission Factor	Potential Emissions			
Make:	Caterpillar		Hours/Day:	24.0			(lb/hp-hr)	lb/hr	lb/day	ton/yr	
Model:	3208		Hours/Year	500			PM10	2.20E-03	0.59	14.26	0.15
S/N:	03Z17773						NOx	3.10E-02	8.37	200.88	2.09
							CO	6.68E-03	1.80	43.29	0.45
Manufacturer Guarantees							SO₂	1.21E-05	0.01	0.08	0.01
PM10		g/hp-hr ▼					VOC	2.51E-03	0.68	16.29	0.17
NOx		g/hp-hr ▼					HAP	2.71E-05	0.01	0.18	0.01
CO		g/hp-hr ▼					CO2	1.15E+00	310.50	7452.00	77.63
SO₂		g/hp-hr ▼									
VOC		g/hp-hr ▼									
Engine Type:	Diesel ▼						Diesel Fuel Sulfur Content is 15 ppm (0.0015%)				

XI-5. PTE/Applicability for Fuel Gas Dew Point Heater

EU#:	A05			Emission Factor	Potential Emissions		
Make:	Total Energy Resources			(lb/mmBtu)	lb/hr	lb/day	ton/yr
Model:	N/A			PM10	0.0075	0.07	0.32
S/N:	618614			PM2.5	0.0075	0.07	0.32
				NOx	0.0980	0.95	4.15
	9.7 mmBtu/hr			CO	0.0824	0.80	3.49
	24.0 hr/day			SO₂	6.00E-04	0.01	0.03
	8760 hr/yr			VOC	0.0054	0.05	0.23
				HAP	1.90E-03	0.02	0.08
Concetrations:		%O ₂		Lead	4.90E-07	4.74E-06	2.08E-05
	ppm NOx	3.0					
	ppm CO	3.0					
Fuel:	Natural Gas ▼						

XI-6. PTE for Propane-Fired Boiler (rental)

EU#:	A09			Emission Factor (lb/mmBtu)	Potential Emissions		
Make:	Various (rental)				lb/hr	lb/day	ton/yr
Model:	Various (rental)		PM10	0.0077	0.07	1.76	0.04
S/N:	Various (rental)		PM2.5	0.0077	0.07	1.76	0.04
			NOx	0.1421	1.35	32.40	0.67
	9.50 mmBtu/hr		CO	0.082	0.78	18.70	0.39
	24.0 hr/day		SO₂	2.00E-04	0.01	0.05	0.01
	1000 hr/yr		VOC	0.0109	0.10	2.49	0.05
			HAP	3.016E-05	0.01	0.01	0.01
Concentrations:		%O₂	Lead	7.31E-10	6.94E-09	1.67E-07	3.47E-09
	ppm NOx	3.0					
	ppm CO	3.0					
Fuel:	Propane						

Greenhouse Gas Calculations

Greenhouse gases (GHG) are a group of compounds that act to trap heat in the atmosphere making the Earth’s surface warmer than it would be, otherwise. The EPA has identified carbon dioxide, methane, nitrous oxide, and fluorinated gases as the primary GHG compounds. Total source GHG emissions, represented as CO₂e, are calculated by applying a global warming potential (GWP) factor to each GHG compound. The GWP is an equalization factor which compares the heat-trapping capacity of each GHG compound to an equal mass of CO₂. Table XI-7 shows the GWP for each GHG compound emitted by the Apex Generating Plant.

Table XI-7: GWP Factors (from 40 CFR 98 Subpart A, Table A-1)

CO₂	CH₄	N₂O
1	25	298

Table XI-8: Emission Factors (from 40 CFR 98 Subpart C, Tables C-1 and C-2)

Fuel	CO₂	CH₄	N₂O
Natural Gas	53.06 kg/MMBtu	0.001 kg/MMBtu	0.0001 kg/MMBtu
Propane	62.87 kg/MMBtu	0.003 kg/MMBtu	0.0006 kg/MMBtu

Equation 1 (Turbines): $E = I \times H \times 2.2046 \times EF \div 2,000$, lb/ton, where:

- E = GHG PTE (tons/year per pollutant)
- I = Heat Input Rating (MMBtu/hr)
- H = Hours per Year
- EF = Pollutant Specific Emission Factor (from Table XII-7)
- 2.2046 = Conversion Factor (2.2046 lb/kg)

Equation 2: Heat Capacity for Diesel Engine (MMBtu/yr):

$MMBtu/hr = \text{Fuel Consumption (gal/hr)} * \text{run time (hr/year)} * \text{Heat Capacity of Diesel (MMBtu/gal)}$

Table XI-9: Heat Capacity of Diesel Fuel (per engine)

EU	Fuel Consumption	Operation	Heat Capacity (diesel) ¹	MMBtu/yr
A06	58.59 gal/yr	500 hr/yr	0.138 MMBtu/gal	4,042.71
A07	18.6 gal/yr	500 hr/yr	0.138 MMBtu/gal	1,283.40

¹Bureau of Transportation Statistics

Table XI-10: PTE/Applicability for GHG

EU	Description	Emission Factor (kg/mmBtu)			MMBtu/yr	PTE (tons/year)			
		CO2	CH4	N2O		CO2	CH4	N2O	CO2e
A01	Turbine 1	53.06	0.001	0.0001	17,344,800.00	1,014,479.03	19.12	1.91	1,015,526.78
A02	Duct Bumer Turbine 1	53.06	0.001	0.0001	2,300,000.00	134,524.57	2.54	0.25	134,663.51
A03	Turbine 2	53.06	0.001	0.0001	17,344,800.00	1,014,479.03	19.12	1.91	1,015,526.78
A04	Duct Bumer Turbine 2	53.06	0.001	0.0001	2,300,000.00	134,524.57	2.54	0.25	134,663.51
A05	Dewpoint Heater	53.06	0.001	0.0001	84,709.20	4,954.55	0.09	0.01	4,959.67
A06	CAT 3412 Emergency Generator	73.96	3.00E-03	6.00E-04	4,042.71	329.59	0.01	0.00	330.72
A07	Cat 3208 Fire Pump Engine	73.96	3.00E-03	6.00E-04	1,283.40	104.63	0.00	0.00	104.99
A09	Propane Rental Boiler	62.87	3.00E-03	6.00E-04	9,500.00	658.38	0.03	0.01	661.03
		Total Permitted:				2,304,054.36	43.45	4.35	2,306,436.99

Table XI-11: Applicability for Propane-Fired Boiler

EU#:	A09		Emission Factor (lb/mmBtu)	Potential Emissions			
Make:	Various (rental)			lb/hr	lb/day	ton/yr	
Model:	Various (rental)		PM10	0.0077	0.07	1.76	0.32
S/N:	Various (rental)		PM2.5	0.0077	0.07	1.76	0.32
			NOx	0.1421	1.35	32.40	5.91
	9.5 mmBtu/hr		CO	0.082	0.78	18.70	3.41
	24.0 hr/day		SO ₂	2.00E-04	0.01	0.05	0.01
	8760 hr/yr		VOC	0.0109	0.10	2.49	0.45
			HAP	3.016E-05	0.01	0.01	0.01
Concentrations:		%O2	Lead	7.31E-10	6.94E-09	1.67E-07	3.04E-08
	ppm NOx	3.0					
	ppm CO	3.0					
Fuel:	Propane						
		3					

Table XI-12: Applicability for Diesel Engines (Insignificant Activities)

EU#	Insignificant	Horsepower:	62 *	Emission Factor (lb/hp-hr)	Potential Emissions			
					lb/hr	lb/day	ton/yr	
Make:	Various	Hours/Day:	24.0					
Model:	Various	Hours/Year	8760	PM10	2.20E-03	0.14	3.27	0.60
S/N:	Various			NOx	3.10E-02	1.92	46.13	8.42
				CO	6.68E-03	0.41	9.94	1.81
Manufacturer Guarantees				SO ₂	1.21E-05	0.01	0.02	0.01
PM10	<input type="text" value="g/hp-hr"/>			VOC	2.51E-03	0.16	3.74	0.68
NOx	<input type="text" value="g/hp-hr"/>			HAP	2.71E-05	0.01	0.04	0.01
CO	<input type="text" value="g/hp-hr"/>							
SO ₂	<input type="text" value="g/hp-hr"/>			*Cumulative total for all units				
VOC	<input type="text" value="g/hp-hr"/>							
Engine Type:	<input type="text" value="Diesel"/>			Diesel Fuel Sulfur Content is 15 ppm (0.0015%)				

Table XI-13: Applicability for Gasoline Engines (Insignificant Activities)

EU#	Insignificant	Horsepower:	23.5 *	Emission Factor (lb/hp-hr)	Potential Emissions			
					lb/hr	lb/day	ton/yr	
Make:	Various	Hours/Day:	24.0					
Model:	Various	Hours/Year	8760	PM10	7.21E-04	0.02	0.41	0.07
S/N:	Various			NOx	1.10E-02	0.26	6.20	1.13
				CO	6.96E-03	0.16	3.93	0.72
Manufacturer Guarantees				SO ₂	5.91E-04	0.01	0.33	0.06
PM10	<input type="text" value="g/hp-hr"/>			VOC	2.16E-02	0.51	12.18	2.22
NOx	<input type="text" value="g/hp-hr"/>			HAP	2.16E-02	0.51	12.18	2.22
CO	<input type="text" value="g/hp-hr"/>							
SO ₂	<input type="text" value="g/hp-hr"/>			*Cumulative total for all units				
VOC	<input type="text" value="g/hp-hr"/>							
Engine Type:	<input type="text" value="Gasoline"/>			Diesel Fuel Sulfur Content is 15 ppm (0.0015%)				

Table XI-14: Applicability for Kerosene-Fired Equipment (Insignificant Activities)

EU#:	Insignificant	Emission Factor (lb/mmBtu)	Potential Emissions			
			lb/hr	lb/day	ton/yr	
Make:	Various					
Model:	Various	PM10	0.0148	0.01	0.08	0.01
S/N:	Various	PM2.5	0.0148	0.01	0.08	0.01
		NOx	0.148	0.03	0.80	0.15
	0.225 mmBtu/hr*	CO	0.037	0.01	0.20	0.04
	24.0 hr/day	SO ₂	0.0421	0.01	0.23	0.04
	8760 hr/yr	VOC	0.0025	0.01	0.01	0.01
		HAP	3.380E-04	0.01	0.01	0.01
Concentrations:	%O ₂	Lead	7.31E-10	1.64E-10	3.94E-09	7.20E-10
	ppm NOx					
	ppm CO					
	<input type="text" value="Propane"/>	*Cumulative total for all units				
Fuel:	3	KEROSENE				

Table XI-15: Applicability for Propane-Fired Equipment (Insignificant Activities)

EU#:	Insignificant			Emission Factor (lb/mmBtu)	Potential Emissions		
Make:	Various				lb/hr	lb/day	ton/yr
Model:	Various			PM10	0.0077	0.01	0.01
S/N:	Various			PM2.5	0.0077	0.01	0.01
				NOx	0.1421	0.02	0.08
0.132	mmBtu/hr*			CO	0.0820	0.01	0.05
24.0	hr/day			SO ₂	2.00E-04	0.01	0.01
8760	hr/yr			VOC	0.0109	0.01	0.01
				HAP	3.02E-05	0.01	0.01
Concentrations:		%O ₂		Lead	7.31E-10	9.64E-11	4.22E-10
	ppm NOx	3.0					
	ppm CO	3.0					
				*Cumulative total for all units			
Fuel:	Propane						

Table XI-16: Applicability for Media Blasting (Insignificant Activity)

EU	Description	Air Flow Rate (scfm)	Outlet Grain Loading (gr/scf)	PM ₁₀ (lb/hr)	PM ₁₀ (tpy)	PM ₁₀ (lb/hr)	PM _{2.5} (tpy)
N/A	Model 101698R-A Econoline Blast Cabinet	100	0.1085	0.09	0.09	0.09	0.09

1. Model 101698R-A is a 40 X 40 FT, 25 CFM foot blast with 100 CFM Exhaust
2. Hourly max data based on worst case grain loading data from Econoline (mfg)
3. Daily and annual emissions based on data from the mfg.
4. Sample calc: 100 scf/min * 60 mins/hour * 0.1085 grains/scf / 7000 grains/lb = 0.09 lbs/hr

Table XI-17: Applicability for Solvent Usage (Insignificant Activity)

EU	Description	Solvent	VOC Content	HAP %	Usage		VOC PTE		HAP PTE	
					Gal/Month	Gal/Year	lb/mo	ton/yr	lb/mo	ton/yr
IA	Graymills PL-36	Safety Kleen Premium Gold	6.70	0.00%	23	115	154.10	0.39	0.00	0.00
IA	Safety Kleen Model 9800	Armakleen Aqueous	0.21	0.00%	125	625	26.08	0.07	0.00	0.00
							180.18	0.45	0.00	0.00

Table XI-18: Applicability for Tanks (Insignificant Activity)

Tank	Throughput		Standing Storage Loss (lb/yr)					Working Loss (lb/yr)					VOC Emissions		
	gal/yr	bbl/yr	Vv	Wv	KE	KS	LS	Vapor MW	Pva	Q	KN	KP	LW	lb/yr	ton/yr
500 gal - FP Day Tank	9300	221.4286	14.25352	1.24167E-05	0.118344	0.999684	0.007642	130	0.0065	221.4286	0.917478	1	0.171667	0.179309066	8.97E-05
250 gal - EG Day Tank	29295	697.5	5.301438	1.24144E-05	0.12586	0.999797	0.003023	130	0.0065	697.5	0.256304	1	0.151063	0.154085372	7.70E-05
2413 gal Feeder Tank	38595	918.9286	36.81554	1.2425E-05	0.0911	0.999662	0.015205	130	0.0065	918.9286	0.646423	1	0.501944	0.517149532	2.59E-04