TECHNICAL SUPPORT DOCUMENT

TECHNICAL INFORMATION PRESENTED IN REVIEW OF AN
APPLICATION FOR A MINOR REVISION TO A PART 70 OPERATING PERMIT
FOR A STATIONARY SOURCE

SUBMITTED BY

BROADBENT & ASSOCIATES, INC.

for

SAGUARO POWER COMPANY

Source: 393

SIC Code 4931: Electric and Other Services Combined
NAICS Code: 221112: Fossil Fuel Electric Power Generation

Clark County Department of Air Quality
Permitting Section

January 2016

EXECUTIVE SUMMARY

The Saguaro Power Company (SPC) is located at 435 Fourth Street, Henderson, Nevada, in the Las Vegas Valley airshed, hydrographic basin 212. Hydrographic basin 212 is attainment for all regulated air pollutants.

SPC operates two General Electric (GE), 35 MW, natural gas combustion turbine generators (CTGs) with heat recovery steam generators (HRSG), a 23.1 MW extraction/condensing steam turbine generator system and two waste heat recovery steam generators with four 25 MMBtu/hr, each, supplemental firing duct burners. Duct burners are permitted to fire on hydrogen and natural gas. There are also two auxiliary boilers that are used to provide continuous steam supply. In addition, SPC operates a cooling tower, two diesel fired turbine starter engines, and an ammonia storage and injection system. All generating and support processes at the site are grouped under the SIC 4911: Electric Services (NAICS 221112: Fossil Fuel Electric Power Generation). The SPC emits particulate matter (PM_{10}), carbon monoxide (CO), oxides of nitrogen (NO_x), oxides of sulfur (SO_x), volatile organic compounds (VOCs), and hazardous air pollutants (HAP). The SPC is a categorical stationary source as defined by AQR 12.2.2(j). The source has a combined total fossil-fuel boiler rating of more than 250 MMBtu/hr. The SPC is a major stationary source for NO_X, synthetic minor for CO and minor for all other pollutants. The source also emits greenhouse gases (GHG).

The facility potential to emit (PTE) has been calculated as follows:

PM_{10}	$PM_{2.5}$	NO_x	CO	SO_2	VOC	HAP	H_2S	Pb
38.77	**38.05**	**164.11**	**90.36**	**13.49**	**14.43**	**9.05**	**0**	**0**

Clark County Department of Air Quality (Air Quality) issued the current Part 70 Operating Permit on October 6, 2014.

On November 24, 2015, the source submitted an application to add an emergency diesel-powered air compressor (EU: A13).

This Technical Support Document (TSD) accompanies the proposed Part 70 Operating Permit for Saguaro Power Company.

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I. ACRONYMS

Table I-1: List of Acronyms and Abbreviations

Acronym	Term
Air Quality	Clark County Department of Air Quality
AQR	Clark County Air Quality Regulations
ATC	Authority to Construct
ATC/OP	Authority to Construct/Operating Permit
CE	Control Efficiency
CEM	Continuous Emissions Monitoring System
CF	Control Factor
CFR	United States Code of Federal Regulations
CO	Carbon Monoxide
CPI	Urban Consumer Price Index
DAQEM	Clark County Department of Air Quality & Environmental Management
EF	Emission Factor
EPA	United States Environmental Protection Agency
EU	Emission Unit
HAP	Hazardous Air Pollutant
HP	Horse Power
kW	kiloWatt
MMBtu	Millions of British Thermal Units
NAC	Nevada Administrative Code
NAICS	North American Industry Classification System
NEI	Net Emission Increase
NG	Natural Gas
NO_X	Nitrogen Oxides
NOV	Notice of Violation
NRS	Nevada Revised Statutes
NSPS	New Source Performance Standards
NSR	New Source Review
$PM_{2.5}$	Particulate Matter less than 2.5 microns
PM_{10}	Particulate Matter less than 10 microns
ppm	Parts per Million
PSD	Prevention of Significant Deterioration
PTE	Potential to Emit
scf	Standard Cubic Feet
SCC	Source Classification Codes
SCR	Selective Catalytic Reduction
SIC	Standard Industrial Classification
SIP	State Implementation Plan
SO_X	Sulfur Oxides
TCS	Toxic Chemical Substance
TSD	Technical Support Document
VOC	Volatile Organic Compound

II. SOURCE INFORMATION

A. General

Permittee	Saguaro Power Company
Mailing Address	P.O. Box 90849, Henderson, Nevada 89009-0849
Responsible Official	William Dusenbury
Phone Number	(702) 558-1134
Fax Number	(702) 564-2735
Source Location	435 Fourth Street, Henderson, Nevada 89015
Hydrographic Area	212
Township, Range, Section	T22S, R62E, Section 11, 12, 13, 14
SIC Code	4931: Electric and Other Services Combined
NAICS Code	221112: Fossil Fuel Electric Power Generation

B. Description of Process

Normal operating processes are not affected by this permitting action. During power outages or loss of existing electric air compressors, the new diesel-powered air compressor may operate within the limitations of 40 CFR 63, Subpart ZZZZ.

C. Permitting Action

SPC is proposing to add an emergency diesel-powered air compressor. This unit will operate when needed during power outages, or loss of an electric air compressor. The unit is subject to 40 CFR 63, Subpart ZZZZ, including the operating limitations found in the subpart.

D. Operating Scenario

Normal operations are not affected by this permitting action.

III. EMISSIONS INFORMATION

A. Source-wide Potential to Emit

1. Saguaro Power Company is a major source for NO_x and GHG; a synthetic minor source for CO, and a minor source for PM_{10}, $PM_{2.5}$, SO_x, VOC, and HAP, as summarized in Table III-A-1:

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

Pollutant	PM_{10}	$PM_{2.5}$	NO_x	CO	SO_x	VOC	HAP	GHG
PTE Totals	**38.77**	**38.05**	**164.11**	**90.36**	**13.49**	**14.43**	**9.05**	**564,304**
Major Source Thresholds	**70**	**250**	**100**	**100**	**100**	**100**	**25[1]**	**100,000**

[1]25 tons for combination of all HAPs (no single HAP exceeds 10 tons).

B. Emission Units and PTE

The new emission unit is listed in Table III-B-1.

Table III-B-1: New Emission Unit (EU)

EU	Description	Rating	Make	Model No.	Serial No.	SCC
A13	Diesel-powered Emergency Air Compressor	140 hp	Sullair	375HAFDP OJD	004-145169	20100102
			John Deere	4045HF275	4045H376301	

The PTE of the new emission unit is based on 500 hours per year of operation.

Table III-B-2: Source PTE, Including Startup and Shutdowns (tons per year)

EU	Rating	PM_{10}	$PM_{2.5}$	NO_x	CO	SO_2	VOC	HAP	NH_3
A13	140 hp	0.02	0.02	0.34	0.23	0.01	0.09	0.01	0
Existing PTE		38.75	38.03	163.77	90.13	13.48	14.34	9.04	45.03
Total		**38.77**	**38.05**	**164.11**	**90.36**	**13.49**	**14.43**	**9.05**	**45.03**

Table III-B-3: Emission Unit A13 PTE (pounds per hour)

EU	PM_{10}	$PM_{2.5}$	NO_x	CO	SO_2	VOC	HAP	NH_3
A013	0.07	0.07	1.36	0.94	0.01	0.35	0.01	0

Table III-B-4: Emission Unit A13 GHG PTE

Pollutant	tons/yr	CO_2e	Total GHG Emissions
CO_2	37.25	37.25	37.38
CH_4	0.002	0.04	
N_2O	0.0003	0.09	

The increase in PTE does not exceed any significance threshold from AQR 12.5.1(d), therefore no controls analysis is required. In addition, the increase in GHG emissions does not affect the source's GHG status.

C. Monitoring

The source is required to monitor and record the hours of operation for testing, maintenance, and use during emergencies for the new air compressor.

D. Testing

No new performance testing requirements are added in this permitting action. The air compressor is not subject to testing.

IV. REGULATORY REVIEW

The new emission unit is subject to 40 CFR 63, Subpart ZZZZ, based on the date of manufacture. The maintenance and operational requirements of the subpart have been added to the Part 70 Operating Permit. A condition requiring the monitoring of operation hours is also added to ensure compliance with the operational limit.

V. INCREMENT

Saguaro Power is a major source in Hydrographic Area 212 (Las Vegas Valley). Permitted emission units include two turbine generators, two starter engines, two boilers, one cooling tower and other equipment. Since minor source baseline dates for NO_X (October 21, 1988) and SO_2 (June 29, 1979) have been triggered, Prevention of Significant Deterioration (PSD) increment analysis is required.

Air Quality 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 (1999 to 2003) of meteorological data from the McCarran Station and Desert Rock Station were used in the model. United States Geological Survey (USGS) National Elevation Dataset (NED) terrain data was used to calculate elevations. Table V-1 presents the results of the modeling.

Table V-1: PSD Increment Consumption

Pollutant	Averaging Period	PSD Increment Consumption by the Source ($\mu g/m^3$)	Location of Maximum Impact	
			UTM X (m)	UTM Y (m)
SO_2	3-hour	52.34[1]	679114	3990413
SO_2	24-hour	36.32[1]	679114	3990413
SO_2	Annual	0.26	679136	3990509
NO_X	Annual	6.55	679136	3990509

[1] Second High Concentration

Table V-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.

VI. PUBLIC NOTICE

This permitting action is a minor revision and therefore is not subject to public notice per AQR 12.5.2.10(a)(2).

VIII. ATTACHMENTS

EU#	A13		Horsepower:	140		Emission Factor (lb/hp-hr)	Control Efficiency	Potential Emissions		
Make:	John Deere		Hours/Day:						lb/hr	ton/yr
Model:	4045HF275		Hours/Year	500	PM10	4.77E-04	0.00%	0.06675	0.07	0.02
S/N:	4045H376301				NOx	9.70E-03	0.00%	1.35793	1.36	0.34
					CO	6.68E-03	0.00%	0.93520	0.94	0.23
Manufacturer Guarantees					SOx	1.21E-05	0.00%	0.00170	0.01	0.01
PM10	0.29	g/kW-hr			VOC	2.51E-03	0.00%	0.35197	0.35	0.09
NOx	5.9	g/kW-hr			HAP	4.52E-05	0.00%	0.00632	0.01	0.01
CO		g/hp-hr								
SOx		g/hp-hr								
VOC		g/hp-hr								
Engine Type:	Diesel				Diesel Fuel Sulfur Content is 15 ppm (0.0015%)					

Existing Insignificant Emission PTE, Not Included in Source PTE (tons per year)

EU	PM_{10}	$PM_{2.5}$	NO_x	CO	SO_2	VOC	HAP	NH_3
Insig. EU	0.00	0.00	0.00	0.00	0.00	0.17	0.04	0.00

TECHNICAL SUPPORT DOCUMENT

TECHNICAL INFORMATION PRESENTED IN REVIEW OF AN APPLICATION FOR A RENEWAL OF PART 70 OPERATING PERMIT FOR A STATIONARY SOURCE

SUBMITTED BY

BROADBENT & ASSOCIATES, INC.

for

SAGUARO POWER COMPANY

Source: 393

SIC Code 4931: Electric and Other Services Combined
NAICS Code: 221112: Fossil Fuel Electric Power Generation

Clark County Department of Air Quality
Permitting Section

January 2014

EXECUTIVE SUMMARY

The Saguaro Power Company (SPC) is located at 435 Fourth Street, Henderson, Nevada 89015, in the Las Vegas Valley airshed, hydrographic basin 212. Hydrographic basin 212 is nonattainment for PM_{10}, and attainment for all other regulated air pollutants.

SPC operates two General Electric (GE), 35 MW, natural gas combustion turbine generators (CTGs) with heat recovery steam generators (HRSG), a 23.1 MW extraction/condensing steam turbine generator system and two waste heat recovery steam generators with four 25 MMBtu/hr, each, supplemental firing duct burners. Duct burners are permitted to fire on hydrogen and natural gas. There are also two auxiliary boilers that are used to provide continuous steam supply. In addition, SPC operates a cooling tower, two diesel fired turbine starter engines, and an ammonia storage and injection system. All generating and support processes at the site are grouped under the SIC 4911: Electric Services (NAICS 221112: Fossil Fuel Electric Power Generation). The SPC emits particulate matter (PM_{10}), carbon monoxide (CO), oxides of nitrogen (NO_x), oxides of sulfur (SO_x), volatile organic compounds (VOCs), and hazardous air pollutants (HAP). The SPC is a categorical stationary source as defined by AQR 12.2.2(j). The source has a combined total fossil-fuel boiler rating of more than 250 MMBtu/hr. The SPC is a major stationary source for NO_X, synthetic minor for CO and minor for all other pollutants. The source also emits greenhouse gases (GHG).

Clark County Department of Air Quality (Air Quality) issued the current Part 70 Operating Permit on August 10, 2009. As required in AQR 12.5.2.1(a)(2) the SPC submitted a renewal application on September 20, 2013. Additionally, this permit addresses a minor permit revision application submitted on April, 2, 2012.

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This Technical Support Document (TSD) accompanies the proposed Part 70 Operating Permit for Saguaro Power Company.

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NSPS	New Source Performance Standards
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$PM_{2.5}$	Particulate Matter less than 2.5 microns
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A. General

Permittee	Saguaro Power Company
Mailing Address	P.O. Box 90849, Henderson, Nevada 89009-0849
Contacts	Larry Flashberg
Phone Number	(702) 558-1134
Fax Number	(702) 564-2735
Source Location	435 Fourth Street, Henderson, Nevada 89015
Hydrographic Area	212
Township, Range, Section	T22S, R62E, Section 11, 12, 13, 14
SIC Code	4931: Electric and Other Services Combined
NAICS Code	221112: Fossil Fuel Electric Power Generation

B. Description of Process

Saguaro Power Company (SPC) produces electrical power and thermal energy (steam). The electrical energy is transmitted to NV Energy electrical grid for distribution to consumers. The steam is sold to other manufacturing facilities. The SPC is defined as a cogeneration facility because it generates and sells two useful forms of energy.

SPC operates two combined cycle General Electric (GE), 35 MW each, natural gas combustion turbine generators (CTGs) (EUs: A01 and A02): with four, 25 MMBtu/hr each, supplemental firing duct burners (EUs: F05, F05a, F06 and F06a), two heat recovery steam generators (HRSG) and a 23.1 MW extraction/condensing steam turbine generator system. These units are permitted to fire on hydrogen gas and natural gas. Both turbines are permitted to operate 8,760 hours/year on natural gas and up to 480 hours/year on diesel fuel.

Two 520-horsepower (hp) Detroit diesel starter engines (EUs: A03 and A04) provide additional power for the turbines during the startup period. The starter engines are employed only during startups, and each engine is permitted for 125 hours/year of run time.

In addition, SPC operates two natural gas fired boilers to meet contractual obligations for steam delivery to local businesses. The boilers contribute to the overall heating capacity of the facility by assisting in the steam production process. These boilers provide steam to customers when the combustion turbines are not operating. The Volcano (EU: A05) and Nationwide (EU: A06) boilers are permitted to operate 8,760 hours/year and 6,000 hours/year, respectively.

The SPC facility has a 750,000-gal aboveground storage tank for fuel oil storage (EU: A08). This tank provides fuel oil storage for turbines and starter engines.

The source operates one Thermal-Dynamics cooling tower with three cells (EU: A09). The cooling tower cools the process equipment by circulating water through the facility. The cooling tower is permitted to operate 8,760 hours/year.

The ammonia storage and injection (EU: F11) serves a Selective Catalytic Reduction (SCR) system, which controls NO_X emissions in turbine exhaust.

The remaining emission units at the SPC facility are essential to the plant operations. These units are designated as insignificant: Fuel Oil Transfer Pump (EU: F01); Fuel Oil Unloading (EU: F02); Natural Gas Metering Station (EU: F03); Natural Gas Coalescing Filters (EU: F04); and Lube Oil Systems (EUs: F07, F08 and F09).

Fuel is supplied to the combustion chambers where it is mixed with the compressed air and the mixture is ignited. The thermal energy of the combustion gases exiting the combustors is transformed into rotating mechanical energy as the gases expand through the turbine sections of the CTGs. The mechanical energy is converted into electrical energy via an electrical generator. The high temperature, pressurized gas produced by the combustion expands through the turbine blades, driving the electric generator and the compressor. The exhaust gases will exit to the atmosphere after leaving the turbine, having already passed through an oxidation catalyst for CO control and selective catalytic reduction (SCR) system for NO_X control. Power cycle heat rejection is accomplished with a cooling tower.

The SPC NO_x and CO emissions are monitored with continuous emission monitoring system (CEMS). The ammonia (NH_3) parametric emissions monitoring system (PEMS) is used to demonstrate the performance of the SCR system. The monitoring system generates a log of data and provides alarm signals to the control room when the level of emissions exceeds preselected limits.

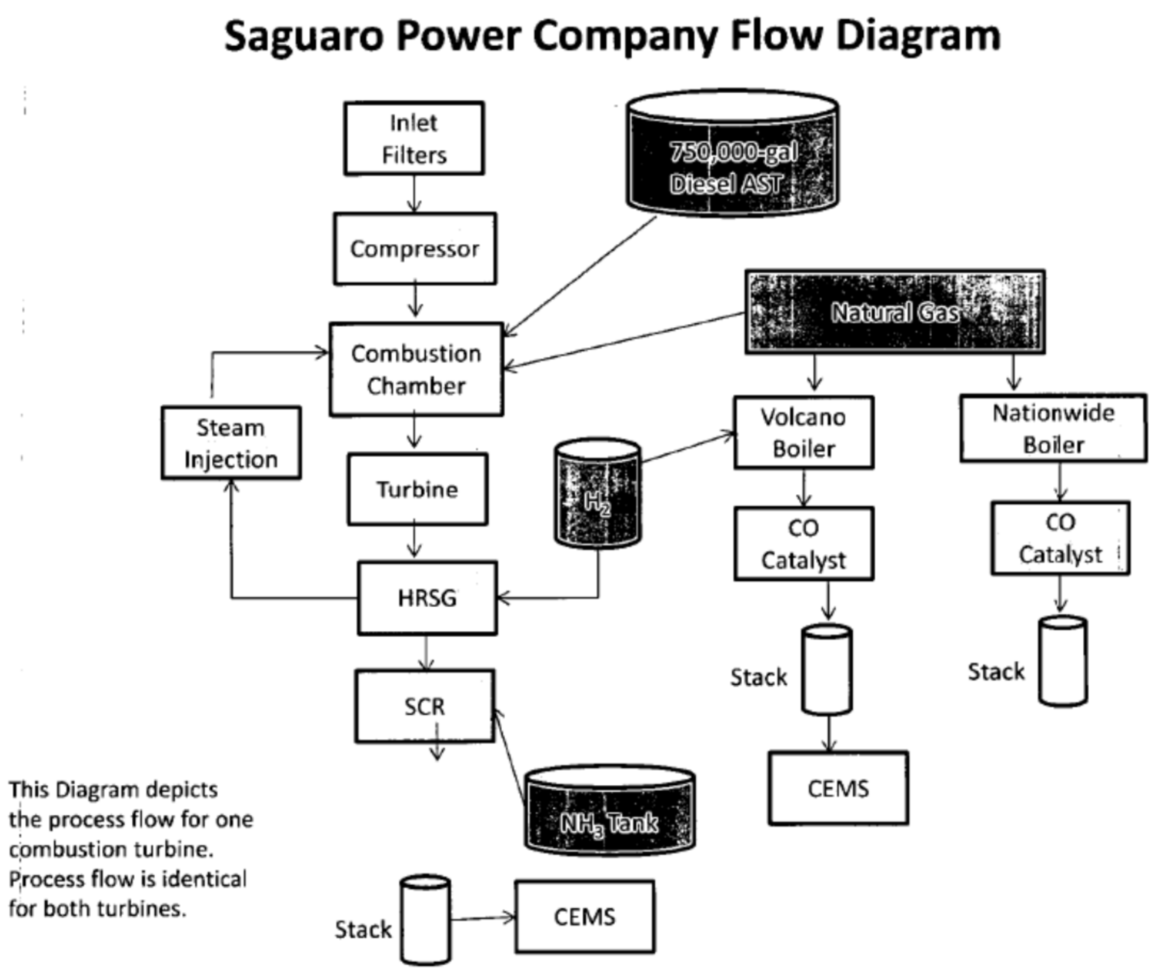

Figure 1. Saguaro Power Process Flow Diagram.

C. Permitting Action

The SPC currently operates under the Part 70 OP program, as it is a major source of NO_x and GHG as well as synthetic minor source of CO. Other priority pollutants, PM_{10}, $PM_{2.5}$, SO_x, VOC, and HAP do not exceed the applicable major source thresholds. Air Quality issued the current Part 70 OP to SPC on August 10, 2009. The OP expires on August 9, 2014. Pursuant to AQR

12.5.2.1(a)(2), the SPC submitted the Part 70 OP renewal application on September 20, 2013. The application package includes the following changes to the Part 70 OP:

1. Designation of SPC as a synthetic minor source for CO.

The Environmental Protection Agency (EPA) has approved the CO re-designation petition for the Las Vegas Valley (hydrographic basin 212). The basin has thus been granted attainment status for the CO standard. Consequently, the major source permitting threshold for CO increased from 70 tons/year to 100 tons/year. SPC is permitted as a major source for CO based on the non-attainment major source threshold of 70 tons/year. With the new threshold of 100 tons/year and the CO Potential to Emit (PTE) of 90.13 tons/year, SPC requests to be classified as a synthetic minor source for CO emissions.

DAQ response: Air Quality changed the status of the source to a synthetic minor source for CO.

2. Increase CO emission limit for the Indeck/Volcano auxiliary boiler (EU: A05).

The Indeck/Volcano boiler (EU: A05) is permitted with a CO emission concentration limit of 1.2 ppmvd based on a three-hour averaging period. The current CO limit does not leave any room for operational flexibility. SPC requests to increase the 1.2 ppmvd limit to 5 ppmvd. SPC will continue to operate the oxidation catalyst to control CO emissions as it has in the past. However, SPC has discovered that even minor changes in air flow or fuel can result in short term fluctuations that over the long term make the existing limit difficult to maintain.

The source researched the RACT/BACT/LAER Clearinghouse (RBLC) for Industrial-size Boilers/Furnaces permitted within the last ten (10) years. The CO emission concentration limits ranged from 20 ppmvd to 400 ppmvd and are significantly higher than the Indeck/Volcano boiler limit. The lowest limit of 20 ppmvd, was considered the Lowest Achievable Emission Rate (LAER) for this type of equipment in some cases.

In addition, SPC requests to increase the averaging period for the Volcano boiler to 4 hours, which is the same averaging period for the combustion turbines. Having the combustion turbines and the Volcano boiler on the same averaging period will considerably simplify operation and programming of the Continuous Emissions Monitoring System (CEMS).

DAQ response: Air Quality denied the request to increase the CO concentration limit to 5 ppmvd and to increase the averaging period for the Volcano boiler to 4 hours (EU: A05). The decision by Air Quality is based on the fact that there was no modification to the emission unit proposed to cause such a change in the previously permitted emission limit. Besides, the current emission limit was established by an NSR analysis and it cannot be relaxed unless a modification with a physical change or change in the method of operation is proposed.

In response to the denial, the source requested an increase of the averaging period from 3 hours to 24 hours while maintain the existing CO emission limit of 1.2 ppm. This proposal was reviewed by Air Quality and concluded that the proposed change of the averaging period would not violate any local or federal applicable requirements. Also there is no impact in the NAAQS or increment consumption.

3. Addition of greenhouse gas (GHG) emissions.

Prevention of Significant Deterioration and the Title V Greenhouse Gas (GHG) Tailoring Rule require that sources properly address their GHG emissions during their 5-year renewal process, The renewal application estimates GHG emission for all fuel burning equipment that can combust two types of fuel (natural gas and diesel fuel). GHG emissions generated by fuel combustion are: Carbon Dioxide (CO_2), Methane (CH_4), and Nitrous Oxide (N_2O). GHG composition varies on types of fuel, process, raw materials used, etc. In order to simplify complex GHG composition, final GHG emissions are presented in CO_2(e), carbon dioxide equivalent.

The major source permitting threshold for GHG is 100,000 metric tons/year of CO_2(e). The GHG PTE for the SPC facility of 551,563 metric tons/year of CO_2(e) exceeds the major source permitting threshold; hence SPC requests to include the GHG PTE in the Part 70 OP.

DAQ response: Air Quality has included the GHG PTE in the Part 70 OP and detailed GHG calculations in this TSD.

4. Update cooling tower water flow and drift parameters (EU: A09).

After a review of manufacturer specifications, SPC requested to correct the cooling tower permitted recirculation water flow rate. The cooling tower is currently permitted with a flow of 19,185 gallons per cell per minute (gpm). The actual gpm rating for each of three cooling tower cells is 7,666 gpm. In addition, SPC requested to update the drift loss percentage from 0.0006% to 0.002%. This request is based on the review of the manufacturer's specification sheets for the cooling tower.

DAQ response: Air Quality corrected the cooling tower water flow rate and the drift loss percentage. Additionally, Air Quality combined the cooling tower cells (EUs: A09a, A09b and A09c) into a single emission unit EU: A09. This increase in flow rate and drift loss causes an increase in PM_{10} emissions less than 1 (one) ton per year. The actual drift loss rating would have been sufficient to meet BACT when the cooling tower was originally permitted.

5. Amendment of the quarterly reporting requirements for the Nebraska boiler (EU: A06).

The Part 70 OP outlined fuel usage recordkeeping requirements for the Nebraska boiler (EU: A06). The permit calls for fuel usage to be reported on a daily, monthly, quarterly, and rolling 12-months basis. SPC requests to remove the daily monitoring reporting requirement and replace it with fuel usage reporting that summarizes monthly fuel use on a rolling basis. Daily, monthly, and quarterly natural gas fuel usage records are kept on site, and are available for review, if requested by the Control Officer.

DAQ response: Pursuant 40 CFR 60.49b(d)(1) the Permittee shall record and maintain records of the amounts of each fuel combusted during each day and calculate the annual capacity factor individually for coal, distillate oil, residual oil, natural gas, wood, and municipal-type solid waste for the reporting period. The annual capacity factor is determined on a 12-month rolling average basis with a new annual capacity factor calculated at the end of each calendar month. Air Quality maintains daily fuel usage recordkeeping requirement, but will not require this data to be reported.

6. Revision of the startup and shutdown actual emissions calculation methodology.

Table IV-B-3 in the Part 70 OP presents startup and shutdown emission rates for the combustion turbines (EUs: A01 and A02) and the Volcano boiler (EU: A05). Although startup and shutdown emissions could be calculated by using CEMS data, when available, SPC proposes to use only emission factors for the calculation of the startup and shutdown emissions. The determination if the CEMS data is available could be problematic. CEMS averaging periods and varying startup and shutdown times can create questions as to whether the data should be considered available. This new methodology will significantly simplify calculating startup and shutdown emission.

DAQ response: Air Quality accepted the new methodology for calculating startup and shutdown emissions and deleted the footnote from the table (now Table III-B-4 in the OP) that stated “emission factors will be used when CEMS data is not available.

7. Addition of two insignificant units (a degreaser and a Sandblaster).

On April 2, 2012, the source submitted an application for a minor revision requesting the addition of two insignificant units; a degreaser and a sandblaster.

DAQ response: Air Quality added the two emission units to the insignificant activities list.

8. Correction of a typographical error in section IV.F.2(b).

Section IV.F.2 (b) of the Part 70 OP contains a typographical error. This permit condition currently reads: “include quarterly summaries of items listed in Conditions IV-E-3-(a) through (m)”. The corrected text should read: “include quarterly summaries of items listed in Conditions IV-E-2-(a) through (m)”.

DAQ response: Air Quality corrected the typographical error to correctly reference condition III-E-2(a) through (m) in the OP.

9. Update horsepower ratings for starter engines (EUs: A03 and A04);

The SPC requested to update the horsepower (hp) ratings for the starter engines (EUs: A03 and A04). The starter engines are currently permitted as 445 hp engines. Upon further review of manufacturer specifications, it has been determined the appropriate rating is 520 hp @ 1,800 revolutions per minute (rpm). Once the starter engines reach 1,800 rpm, the combustion turbines take over the operation and the starter engines are stopped. The starter engines will never exceed 1,800 rpm, consequently, the horsepower rating is capped at a maximum of 520 hp.

DAQ response: Air Quality revised the horsepower rating of the starter engines (EUs: A03 and A04). This increase does not affect the required controls on the units.

10. Additional clarification for steam injection requirements in section IV.B.3;

SPC proposed additional clarification of steam injection operation for the turbines (EUs: A01 and A02). Currently, the permit discusses steam injection being utilized to further control NO_X emissions from the combustion turbines. The steam injection is not available during the startup period, since the temperature and pressure required for steam injection are not reached until the end of the startup period. The startup period has a maximum duration of one hour. Steam injection commences once the startup period is over. SPC proposes additional explanation in the permit to clearly define when steam injection is available to control NO_X emissions.

DAQ response: Air Quality included explanation in the permit that clearly defines when steam injection is available to control NO_X emissions.

11. Proposed language for diesel fuel performance testing.

SPC proposes to modify permit requirements for performance testing of the combustion turbines while burning diesel fuel (EUs: A01 and A02). The facility has the ability to operate on diesel fuel when natural gas is not available. However, the facility has only operated in this manner for purposes of performance testing and compliance demonstration. SPC proposes that performance testing of the combustion turbines while consuming diesel fuel only be required after a unit actually operates in this mode for at least 72 continuous hours. Once this condition is met, SPC would initiate an official performance test to determine compliance with the emission standards.

DAQ response: Air Quality accepts to remove any reference to performance testing when firing on diesel fuel for turbines (EUs: A01 and A02). On February 21, 2014, DAQ received a letter from Saguaro Power Company requesting that their draft Part 70 Operating Permit that the Permitting Division is currently working on be revised to eliminate the performance testing requirement for the two gas turbines when fired on diesel fuel. The current Part 70 Operating Permit contains a provision that the source shall conduct performance testing when the gas turbines are being fired on diesel fuel. In the last 15 plus years, the only time the turbines have been fired on diesel fuel is when they have been tested. Saguaro Power Company attempted to test the turbines some months ago; however operational problems prevented the units from being tested.

Section 4 of the AQR provides authority to the Control Officer to require performance testing of emission units when the Control Officer deems it is necessary. Since Saguaro Power Company has not fired the turbines on diesel fuel nor has future plans to fire the turbines on diesel fuel, they have requested the requirements of performance testing the turbines when fired on diesel fuel be removed from the permit. Based on past operating history of the turbines and it appears the turbines will not be operated in the foreseeable future, the Compliance Division of Air Quality fully supported their request on removing performance testing when fired on diesel fuel from the Part 70 Operating Permit.

12. New burner rating of the Indeck/Volcano auxiliary boiler (EU: A05).

The Volcano Boiler (EU: A05) was originally rated with a burner capacity of 249 MMBtu/hr. However, burner upgrades meet lower emission limits and derate the burner to a maximum capacity of 218 MMBtu/hr. The new rating is reflected in the emission calculations.

DAQ response: Air Quality accepts derating of the Volcano Boiler (EU: A05).

The emission control equipment and BACT requirements are summarized in Table II-C-1:

Table II-C-1: BACT Determinations for Saguaro Power Company

EU	Description	BACT Technology	BACT Limit
A01, A02	35 MW natural gas-fired electric turbine generators, with HRSG, Supplemental duct-firing	Low-NO_X burners, SCR, steam injection, natural gas combustion	10 ppmvd NO_X on 4-hour average at 15% O_2 (natural gas); 17 ppmvd NO_X on 4-hour average at 15% O_2 (fuel oil); 10 ppmvd CO on 4-hour average at 15% O_2 (natural gas and fuel oil).
A03, A04	Detroit Diesel Starter Engines	Turbocharged, Aftercooled, Low sulfur diesel fuel (< 0.05%)	No limit imposed.
A05	Indeck/Volcano Auxiliary Boiler #1; 218 MMBtu/hr	Low-NOx burners with FGR; CO oxidation system	12 ppmvd NO_X on 4-hour average at 3% O_2; 1.2 ppmvd CO on 24-hour average at 3% O_2.
A06	Nebraska Auxiliary Boiler #2; 86 MMBtu/hr	Sole use of pipeline quality natural gas; good combustion practices	30 ppmvd NO_X on 4-hour average at 3% O_2; 400 ppmvd CO on 4-hour average at 3% O_2.
A09	Thermal-Dynamics Towers Inc., Cooling Tower; 22,998 gpm total	Limit of TDS; drift loss eliminators	3,800 mg/L TDS, 0.002% drift loss.

EU	Description	BACT Technology	BACT Limit
F05, F05a, F06, F06a	John Zink Model LDR-11-LE Supplemental Duct Burner, 25 MMBtu/hr	Low-NO_X burners, SCR, steam injection, natural gas combustion	10 ppmvd NO_X on 4-hour average at 15% O_2 (natural gas); 17 ppmvd NO_X on 4-hour average at 15% O_2 (fuel oil); 10 ppmvd CO on 4-hour average at 15% O_2 (natural gas and fuel oil).

D. Operating Scenario

Combustion Turbine Generators (CTG) (EUs: A01 and A02)

SPC operates two GE Frame 6 (PG6541B) combined-cycle CTGs rated at 34.93 megawatts (at one atmosphere pressure, ambient temperature of 105°F and 16 percent relative humidity). At standard conditions the CTGs maximum heat input is 447 MMBtu/hr (HHV). The CTGs primarily fire natural gas but are permitted to fire distillate fuel oil for up to 480 hours per year per CTG. The CTGs are operated as base-load units, and are permitted to operate 8,760 hours per year. The CTGs incorporate steam injection to control NO_x emissions.

The CTGs exhaust to a three pressure HRSG that incorporates two sets of duct burners. One duct burner set is capable of firing a maximum of 25 MMBtu/hr of hydrogen (supplied by the adjacent chemical manufacturer). The other set of duct burners is capable of firing a maximum of 25 MMBtu/hr of natural gas (HHV). The duct burners (for each CTG) are rated at 50 MMBtu/hr (HHV).

The HRSGs also include selective catalytic reduction systems (SCR) for the control of NO_x emissions. The SCR system uses anhydrous ammonia as a reactant in the presence of a catalyst to convert NO_x to elemental nitrogen. The SCR system includes one anhydrous ammonia storage tank with vaporizers, piping, mixing systems, and an injection grid for each CTG (EU: F11).

An exhaust gas blower extracts exhaust gas from the exhaust stacks (for each CTG) for use by the adjacent chemical manufacturer as a source of carbon dioxide. The CTG's design incorporates a diesel-fired starter engine used to start the CTGs. These starter engines are integral to the CTG design and are enclosed within the CTG enclosures (EUs: A03 and A04).

The CTGs incorporate a system to wash the compressor section of the units with demineralized water or with an aqueous-based cleaning solution. Washes can be performed while the units are operating and during outages. Manufacturers' information doesn't list any HAPs present in the wash solution.

Starter Engines (EUs: A03 and A04)

Each CTG design incorporates a diesel starter engine (EUs: A03 and A04) which provides the necessary power to initiate the startup sequence for the CTGs. These engines are permitted to operate 125 hours per year per engine. The criteria pollutant emissions limits and HAP emission estimates are based on EPA AP-42 emission factors.

Auxiliary Boilers (EUs: A05 and A06)

SPC currently has two auxiliary boilers that supply steam to their customers during periods when the CTGs are not in operation. The larger of the two is a natural gas-fired boiler rated at 218 MMBtu/hr (LHV) heat input (EU: A05). This boiler is permitted to operate up to 8,760 hours per year firing only natural gas and hydrogen gas. The boiler's design incorporates Low-NO_x burners and flue gas recirculation to control NO_X emissions and CO oxidation system for CO control.

The second auxiliary boiler (EU: A06) is rated to produce 70,000 pounds per hour of steam at a heat input of 86 MMBtu/hr (LHV). This boiler is permitted to operate 510,000 MMBtu/year firing only natural gas. The boiler's design incorporates Low-NO_x burners and flue gas recirculation to control NO_X emissions.

Water Treatment Chemical Storage

The SPC facility operates two water treatment systems: one for the boiler make-up water and a boiler pH and steam drum chemistry system.

The boiler make-up water treatment system has a primary system which is a leased trailer-mounted ion exchange system used to treat make-up water for steam production. This trailer-mounted system is taken off site for regeneration (by the vendor) and does not emit any pollutants to the atmosphere. A back-up ion exchange-based boiler make-up water system is located on site. This system is permitted, but only used as a back-up system to the primary system. The back-up system is capable of being regenerated using hydrochloric acid and sodium hydroxide. The sodium hydroxide (NaOH) and hydrochloric acid (HCl) are stored as aqueous solutions in closed-top containers. The HCl storage tank vents to a scrubbing system where the gases vented during filling of the tank are bubbled through a container of water. Any HCl mist in the vent gas will be absorbed by the water with negligible HCl emitted to the atmosphere.

The second water treatment system is the boiler pH and steam drum chemistry system. This system uses tri-sodium phosphates; an oxygen scavenging product; and an amine-based product to control the boiler water chemistry. The sodium phosphate products are stored as both dilute aqueous solutions and dry powders in closed-top containers. The oxygen scavenging and amine-based products are stored as dilute liquids in closed-top containers. Product manufacturers report that no regulated pollutants are contained in these products.

Distillate Fuel Oil Firing

In the event of a curtailment of natural gas, the SPC facility is capable of firing fuel oil in the CTGs for up to 480 hours per year per CTG or a total of 960 hours of fuel oil firing per year. These emissions include emission controls for NO_X in the form of steam injection/SCR and Fuel Oil System.

The SPC receives, stores, and transports distillate fuel oil. The fuel oil is stored in a 750,000 gallon fixed roof storage tank (EU: A08). The storage tank's only emission point is an atmospheric vent with a pressure relief valve installed to control vapor emissions. The storage tank's annual average temperature is 77°F. The emissions are based on EPA AP-42 emission factors (Section 4.3-5) and the annual average temperature. All emissions for the fuel oil tank are assumed to be VOC emissions.

The fuel oil is received at an unloading station located outside the main SPC facility to the North. The receiving station consists of a manifold system with capabilities of accepting deliveries from either tanker trucks or rail cars. The manifold is connected to an unloading pump located inside the SPC fence line that pumps the fuel oil from the unloading vessel to the onsite storage tank.

Fuel oil is transferred from the storage tank to the CTGs and starter engines by a pumping system. The pumping system consists of two electric-driven pumps with underground piping. The fuel oil transfer and receiving fugitive emission estimates are based on the maximum allowable fuel oil usage and EPA emission factors for valves, flanges, and pumps.

Cooling Tower (EU: A09)

Waste heat is rejected to the atmosphere by a mechanical-draft, three-cell cooling tower. The cooling tower uses the principal of evaporation to reject this heat. In the cooling process, a fraction of the cooling water escapes the cooling tower as cooling tower drift. The SPC cooling tower circulates 22,998 gpm of water with a drift rate of 0.002 percent of the cooling capacity. The cooling tower total dissolved solids (TDS) content is controlled to approximately 3,800 ppm. It is assumed that TDS will become particulate matter when the water mist or drift is emitted from the cooling tower. Emission estimates for the cooling tower are based on the above data, and assume that the cooling tower is operated 8,760 hours per year. The cooling tower uses gaseous chlorine (Cl_2) for biological growth control. The Cl_2 is injected into a slip stream of water which is mixed with the cooling tower water. The Cl_2 content of the cooling tower water is controlled to approximately 0.2 ppm (with a maximum chlorine concentration of 0.5 ppm). The SPC facility uses approximately 2.6 tons of Cl_2 per year or 0.60 pounds per hour. Chlorine reacts with water to form hypochlorus acid (HOCl) which is classified as HAP. A review of available emission factor literature did not reveal emission factors for chlorine or hypochlorus acid from cooling towers. Additionally, given the quantity of Cl_2 used, and the low drift rate for the cooling tower, the emissions of hypochlorus acid are insignificant.

Natural Gas Conveyance System

The natural gas conveyance system at SPC is comprised of a metering station which is located to the north of the SPC facility, a filtering station, the CTG gas control and metering enclosures, and the HRSG duct burner control and metering skids. These systems contain many valves, flanges, and seals which all leak to a minor extent. The first phase of developing an emission estimate for the natural gas system was to perform a valve, flange, and seal inventory. This inventory was broken down by location and included the metering station, filtration system, the CTG gas control and metering enclosures, and the duct burner skids. The CTG natural gas conveyance systems were primarily underground and were not capable of being inventoried. The valve and flange inventories and EPA emission factors were used to calculate the natural gas emissions. The natural gas emissions were converted into volatile organic compound emissions by assuming that 10 percent of the natural gas is non-methane hydrocarbons (or VOC).

Lubricating Oil System

The CTGs and steam turbine have lubricating (lube) oil systems to provide a constant supply of oil to bearings, gears, and other components requiring lubrication. The oil supply systems are pressurized. The oil in the lubricated components is typically at atmospheric pressure and requires an atmospheric vent. The CTG vents are equipped with a blower and a coalescing mist eliminator. The steam turbine lube oil vent is equipped with a blower and precipitator-type mist eliminator.

As with the natural gas conveyance system, these systems leak to a minor extent. An inventory of the valves and flanges was performed as the basis for the fugitive emission estimates from these lube oil systems. The valve and flange inventory and EPA emission factors were used to estimate the emissions of lube oil. A review of the material data safety sheet for the lube oil determined that the oil contained less than 5 percent (by weight) volatile organic compounds (VOC). The VOC emission estimate was assumed to be 5 percent of the system oil leaks (calculated using the EPA emission factor).

Ammonia Storage and Injection System (EU: F11)

The SCR system uses anhydrous ammonia (NH_3) to control NO_X emissions from the CTGs. This ammonia is stored in a pressure vessel (common to both CTGs) and is transported to the

SCR control and injection skids via welded piping. A valve and flange inventory and EPA emissions factors were used to estimate the ammonia emission from the ammonia storage and injection system.

Miscellaneous Emissions

SPC plans on painting the entire source within the next five years. Architectural coatings can result in emissions of VOCs. SPC has solicited quotes from painting contractors to provide proposals to paint the facility, and to provide an estimate of the VOC emissions. Based on these estimates, it would require approximately 600 gallons each of primer and top-coat paint with a VOC content of 109 and 207 grams per liter, respectively. The hourly emissions were estimated assuming that the paint would cure over a three-day period and emissions would be constant over the curing period.

The SPC facility conducts maintenance operations requiring the use of a variety of materials and products. These materials include paints, lubricants, cements/adhesives, greases, hydraulic fluids, cutting oils, spray foam, welding rods, fuel oil, contact cleaners, and antifreeze. These materials are purchased from local vendors and typically range in size from several ounces to gallon size containers. Lubricating oils used in the CTG's and other equipment are stored in larger sized containers (55-gallon drums). Emissions estimates associated with these materials were not performed.

Other activities at the SPC have the potential to generate air emissions. Some of these activities are metal cutting and welding (arc, gas, and plasma), use of pressure washing systems, the water chemistry laboratory, gasoline-powered (less than 5 hp) water pumps, parts cleaning, and glove booth abrasive cleaning. Most of these activities are intermittent in nature and occur infrequently with the exception of the water chemistry lab. The lab uses standard test kits developed by chemical supply companies containing buffer solutions and standardized reagents in small quantities (typically less than one gallon and generally less than one quart). These chemical solutions are all aqueous solutions.

Other activities which potentially could generate air emissions are computer (laser) printer and photocopier usage, general cleaning (using household consumer cleaning products), and repaving of the parking areas. SPC also maintains an uninterruptible power system based on gel cell and lead-acid batteries. Again, emission estimates for these operations were not performed due to the insignificant contribution of these sources on the emission estimate.

In addition to these activities, SPC operates numerous refrigeration-type air conditioning systems containing chlorofluorocarbons (CFC) which are regulated by the Title 40 Code of Federal Regulations, Part 82. These CFC-containing systems provide space cooling (for personnel and equipment) and are closed systems except when being maintained or repaired. SPC contracts with a certified contractor for the maintenance and repair of these CFC containing units. The CFC emissions and applicability of Title 40 Code of Federal Regulations, Part 82 are not considered in this application due to the nature of these potential emissions (if any) and the fact that SPC contracts out the maintenance of these units to a maintenance organization with certified technicians.

Table II-D-1: Fuel Usage and Operating Schedules

EU	Description	Rating	Fuel Usage	Operating Schedule (hours/year)
A01	Combustion Turbine Generator #1 with a fired HRSG	35 MW	447 MMBtu/hr –NG	8,760
			3,035 gal/hr – fuel oil	480
A02	Combustion Turbine Generator #2 with a fired HRSG	35 MW	447 MMBtu/hr –NGl	8,760
			3,035 gal/hr – fuel oi	480
A03	Detroit Diesel Starter Engine,	520 hp	N/A	125

EU	Description	Rating	Fuel Usage	Operating Schedule (hours/year)
	Generator #1			
A04	Detroit Diesel Starter Engine, Generator #2	520 hp	N/A	125
A05	Auxiliary Boiler #1	218 MMBtu/hr	218 MMBtu/hr –NG and H2	8,760
A06	Auxiliary Boiler #2	86 MMBtu/hr	86 MMBtu/hr –NG	6,000
A08	Fuel Oil Storage Tank	750,000 gallon	N/A	8,760
A09	Cooling Tower	22,998 gpm	N/A	8,760
F05	Supplemental Duct Burner, Skid # 1	25 MMBtu/hr	Included in EU: A01	8,760
F05a	Supplemental Duct Burner, Skid # 1	25 MMBtu/hr	Included in EU: A01	8,760
F06	Supplemental Duct Burner, Skid # 2	25 MMBtu/hr	Included in EU: A02	8,760
F06a	Supplemental Duct Burner, Skid # 2	25 MMBtu/hr	Included in EU: A02	8,760
F11	Ammonia Storage and Injection	12,000 gallons	N/A	8,760

III. EMISSIONS INFORMATION

A. Source-wide Potential to Emit

1. Saguaro Power Company is a major source for NO_x and GHG; a synthetic minor source for CO, and a minor source for PM_{10}, $PM_{2.5}$, SO_x, VOC, and HAP, as summarized in Table III-A-1:

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

Pollutant	PM_{10}	$PM_{2.5}$	NO_x	CO	SO_x	VOC	HAP	GHG
PTE Totals	**38.75**	**38.03**	**163.77**	**90.13**	**13.48**	**14.34**	**9.04**	**564,304**
Major Source Thresholds	**70**	**250**	**100**	**100**	**100**	**100**	**25[1]**	**100,000**

[1]25 tons for combination of all HAPs (no single HAP exceeds 10 tons).

B. Emission Units and PTE

1. The stationary source consists of the emission units and associated appurtenances summarized in Table III-B-1.

Table III-B-1: List of Emission Units (EU)

EU	Description	Rating	Make	Model No.	Serial No.	SCC
A01	Combustion Turbine Generator #1 with a fired HRSG	35 MW	GE	PG6541B	295525	20100101
A02	Combustion Turbine Generator #2 with a fired HRSG	35 MW	GE	PG6541B	295524	20100101
A03	Detroit Diesel Starter Engine, Generator #1	520 hp	Detroit	71237300	12VA083956	20100202
A04	Detroit Diesel Starter Engine, Generator #2	520 hp	Detroit	71237300	12VA083901	20100202
A05	Auxiliary Boiler #1	218	Indeck/	0-7-2000		31000414

EU	Description	Rating	Make	Model No.	Serial No.	SCC
		MMBtu/h	Volcano			
A06	Auxiliary Boiler #2	86 MMBtu/hr	Nebraska	NOS 2A/S-55	032-88	31000414
A08	Fuel Oil Storage Tank	750,000 gallon				40301019
A09	Cooling Tower	22,998 gpm	Thermal-Dynamics Towers Inc.	TD-3030-3-2424CF		38500101
F05	Supplemental Duct Burner, Skid # 1	25 MMBtu/hr	John Zink	LDR-11-LE	S82733	20100101
F05a	Supplemental Duct Burner, Skid # 1	25 MMBtu/hr	John Zink	LDR-11-LE	S82733	20100101
F06	Supplemental Duct Burner, Skid # 2	25 MMBtu/hr	John Zink	LDR-11-LE	S82733	20100101
F06a	Supplemental Duct Burner, Skid # 2	25 MMBtu/hr	John Zink	LDR-11-LE	S82733	20100101
F11	Ammonia Storage and Injection	12,000 gallons				40781699

2. The units or activities are present at this source, but are insignificant. The emissions from these units or activities, when added to the PTE of the source, do not contribute to making the source major for any pollutant other than NO_X.

Table III-B-2: Insignificant EU or Activities

Description
Natural Gas Metering Station
Natural Gas Coalescing Filters
Lube Oil System – CTG-01
Lube Oil System – CTG-02
Lube Oil System – CTG-03
Facility Maintenance (Painting)
Degreaser
Sandblaster, Make: Trinko

Table III-B-3: Turbine PTE, Including Startup and Shutdowns (tons per year)

EU	PM_{10}	$PM_{2.5}$	NO_x	CO	SO_2	VOC	HAP	NH_3
A01[1]	10.35	10.35	62.93	37.26	1.12	3.81	1.90	20.62
A01[2]	4.08	4.08	6.31	2.16	5.19	0.48	0.13	1.20
A02[1]	10.35	10.35	62.93	37.26	1.12	3.81	1.90	20.62
A02[2]	4.08	4.08	6.31	2.16	5.19	0.48	0.13	1.20
Total	**28.86**	**28.86**	**138.48**	**78.84**	**12.62**	**8.58**	**4.06**	**43.64**

[1]Annual emissions are based on 8,240 hours/year of natural gas combustion. The average fuel flow rate is 447 MMBtu/hr (LHV).
[2]Annual emissions are based on 480 hours/year of diesel fuel combustion.

Table III-B-4: Source PTE, Including Startup and Shutdowns (tons per year)

EU	Rating	PM_{10}	$PM_{2.5}$	NO_x	CO	SO_2	VOC	HAP	NH_3
A01[1]	447 MMBtu/hr	14.43	14.43	69.24	39.42	6.31	4.29	2.03	21.82
A02[1]	447 MMBtu/hr	14.43	14.43	69.24	39.42	6.31	4.29	2.03	21.82
A03	520 hp	0.07	0.07	1.01	0.22	0.07	0.08	0.01	0.00
A04	520 hp	0.07	0.07	1.01	0.22	0.07	0.08	0.01	0.00
A05	218 MMBtu/hr	6.66	6.66	13.94	0.86	0.57	4.47	4.47	0.00

EU	Rating	PM_{10}	$PM_{2.5}$	NO_x	CO	SO_2	VOC	HAP	NH_3
A06	86 MMBtu/hr	1.29	1.29	9.33	9.99	0.15	1.08	0.48	0.00
A08	750,000 gal	0.00	0.00	0.00	0.00	0.00	0.05	0.01	0.00
A09	22,998 gpm	1.80	1.08	0.00	0.00	0.00	0.00	0.00	0.00
F05, F05a	25 MMBtu/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F06, F06a	25 MMBtu/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F11	12,000 gal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.39
Ins EUs	---	0.00	0.00	0.00	0.00	0.00	0.17	0.04	0.00
Total		**38.75**	**38.03**	**163.77**	**90.13**	**13.48**	**14.51**	**9.08**	**45.03**

Table III-B-5: Source PTE, Excluding Startup and Shutdown (pounds per hour)

EU	PM_{10}	$PM_{2.5}$	NO_x	CO	SO_2	VOC	HAP	NH_3
A01[1,2]	2.50	2.50	15.20	9.00	0.27	0.92	0.46	4.98
A01[1,3]	17.00	17.00	26.30	9.00	21.64	2.00	0.54	4.98
A02[1,2]	2.50	2.50	15.20	9.00	0.27	0.92	0.46	4.98
A02[1,3]	17.00	17.00	26.30	9.00	21.64	2.00	0.54	4.98
A03	1.14	1.14	16.12	3.47	1.07	1.31	0.02	0.00
A04	1.14	1.14	16.12	3.47	1.07	1.31	0.02	0.00
A05	1.52	1.52	3.18	0.20	0.13	1.02	1.02	0.00
A06	0.43	0.43	3.11	3.33	0.05	0.46	0.16	0.00
A09	1.23	0.75	0.00	0.00	0.00	0.00	0.00	0.00
F11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32

[1]Emissions based on worse-case scenario between natural gas and diesel fuel combustion in the turbines (EUs: A01 and A02).
[2]Emissions from the combustion of natural gas in the turbines include the emissions from the duct burners.
[3]Emissions from the combustion of diesel fuel only.

Table III-B-6: Emissions Limitations in ppmvd[1]

EU	O_2 Standard	NO_X	CO	NH_3
A01	15%	10	10	10
A02	15%	10	10	10
A05	3%	12	1.2	---
A06	3%	30	400	---

[1] Emissions from the combustion of natural gas are calculated using a three-hour rolling average not to include startup or shutdown.

Table III-B-6: Startup and Shutdown Emissions (pounds per hour)[1]

EU	PM_{10}	$PM_{2.5}$	NO_X	CO	SO_2	VOC	HAP	NH_3
A01, A02[2]	2.50	2.50	65.00	9.00	0.27	0.94	0.46	2.04
A01, A02[3]	17.00	17.00	104.00	9.00	21.64	0.17	0.54	2.04
A05	1.87	1.87	9.11	9.24	0.15	1.34	0.49	---

[1]Start-up and shut-down emission rates are to be used to calculate compliance with annual emissions limits. Startup has duration of one hour.
[2]Emission from the combustion of the natural gas in the turbines.
[3]Emission from the combustion of the diesel oil in the turbines.

C. GHG Emissions Calculations

The most common greenhouse gases (GHG) covered by the regulations are: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFC), perfluorocarbons (PFC), sulfur hexafluoride (SF_6), and other fluorinated gases including nitrogen trifluoride (NF_3), and hydrofluorinated ethers (HFE). Chapter 1 of the AP-42 Compilation of Air Pollutant Emission Factors, *External Combustion Sources*, discusses emissions associated with natural gas and fuel oil combustion, and it specifically lists three GHG associated with these fuels: carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O).

The GHG emission calculations are based on 40 CFR 98.33, Subpart C. There are four calculation methods presented in 40 CFR 98.33. For natural gas and fuel oil combustion sources, Tier 2 methodology is utilized to quantify GHG emissions. The Tier 2 method requires the annual volume of fuel combusted as well as its high heating value (HHV).

To determine GHG emissions associated with the SPC, the following emission units are evaluated: the two GE Combustion Turbines (EUs: A01 and A02), two startup engines (EUs: A03 and A04), the Volcano boiler (EU: A05), and the Nationwide boiler (EU: A06). The Tier 2 method is detailed below.

CO_2 Emissions

Annual carbon dioxide emissions are calculated using the following equation: *[40 CFR 98.33(a)(s)(2)(i)]*

$CO_2 = 1\times10^{-3} \times \text{Fuel} \times \text{HHV} \times \text{EF}$

Where:

CO_2	=	Annual CO_2 mass emissions, metric tons
Fuel	=	Volume of fuel combusted during the year scf for gaseous fuel or gal for liquid fuel
HHV	=	High heat value obtained from Table C-1, MMBtu/scf or MMBtu/gal
EF	=	Fuel specific default CO_2 emission factor from Table C-1, kg CO_2/MMBtu
1×10^{-3}	=	Conversion factor from kilograms to metric tons.

The CO_2 natural gas emission factor of 53.02 kg CO_2/MMBtu was obtained from Table C-1 of Subpart C: *Default CO_2 Emission Factors and High Heat Values for Various Types of Fuel*. The CO_2 fuel oil emission factor of 73.96 kg CO_2/MMBtu was obtained from Table C-1 of Subpart C: *Default CO_2 Emission Factors and High Heat Values for Various Types of Fuel*.

CH_4 and N_2O Emissions

The annual methane and nitrous oxide emissions are calculated by using the equation C-9a from 40 CFR 98.33 (c)(2).

$CH_4 \text{ or } N_2O = 1*10^{-3} \times \text{HHV} \times \text{EF} \times \text{Fuel}$

Where:

CH_4 or N_2O	=	Annual CH_4 or N_2O mass emissions, metric tons
HHV	=	High heat value obtained from Table C-1, MMBtu/scf
EF	=	Fuel specific default emission factors from Table C-2, kg CH_4 or N_2O/MMBtu
1×10^{-3}	=	Conversion factor from kilograms to metric tons.

The CH_4 natural gas emission factor of 1.0×10^{-3} kg CH_4/MMBtu and the N_2O natural gas emission factor of 1.0×10^{-4} kg N_2O/MMBtu were obtained from Table C-2 of Subpart C: *Default CH_4 and N_2O Emission Factors and High Heat Values for Various Types of Fuel*. The CH_4 fuel oil emission factor of 3.0×10^{-3} kg CH_4/MMBtu and the N_2O natural gas emission factor of 6.0×10^{-4} kg N_2O/MMBtu were obtained from Table C-2 of Subpart C: *Default CH_4 and N_2O Emission Factors and High Heat Values for Various Types of Fuel*.

Table III-C-1: Summary of GHG PTE for Fuel Oil Combustion (tons per year)

EU	Rating (MMBtu/hr)	CO_2	CH_4	N_2O	CO_2e
A01	447	15,267	1.02	0.01	15,319
A02	447	15,267	1.02	0.01	15,319
A03	1.32	12.28	0.00	0.00	12.28
A04	1.32	12.28	0.00	0,00	12.28
Total		**30,558.56**	**2.04**	**0.02**	**30,662.56**

Table III-C-2: Summary of GHG PTE for Natural Gas Combustion (tons per year)

EU	Rating (MMBtu/hr)	CO_2	CH_4	N_2O	CO_2e
A01	447	200,769	3.78	0.39	200,967
A02	447	200,769	3.78	0.39	200,967
A05	218	103.590	1.95	0.20	103,691
A06	86	27,990	0.53	0.05	28,018
Total		**429,632**	**10.04**	**1.03**	**533,643**

Table III-C-3: Source-wide GHG PTE (tons per year)

CO_2	CH_4	N_2O	CO_2e
563,675	**11.29**	**1.26**	**564,304**

D. Testing

Performance testing is subject to 40 CFR 60, Subpart A; 40 CFR 60, Subpart GG; 40 CFR 60, Subpart Db; 40 CFR 60, Subpart Dc; 40 CFR 60, Subpart KKKK; and Air Quality Guideline on Performance Testing. The required testing will be performed using the following methods:

Table III-D-1: Performance Testing Requirements (40 CFR 60, Appendix A)

Test Point	Pollutant	Method
Turbine Exhaust Stack	NO_X	Chemiluminescence Analyzer (EPA Method 7E)
Turbine Exhaust Stack	CO	EPA Method 10 analyzer
Turbine Exhaust Stack	VOC	EPA Methods 18 or 25a
Turbine Exhaust Stack	NH_3 Slip	Method Pre-approved by Air Quality/EPA
Turbine Exhaust Stack	PM_{10}	EPA Method 5, 201a and 202
Turbine Exhaust Stack	Opacity	EPA Method 9
Boiler Exhaust Stack	NO_X	Chemiluminescence Analyzer (EPA Method 7E)
Boiler Exhaust Stack	CO	EPA Method 10 analyzer
Stack Gas Parameters	---	EPA Methods 1, 2, 3, 4, or Method 19

Annual Relative Accuracy Test Audits (RATA) testing must be performed on each NO_X, CO, and O_2 Continuous Emissions Monitoring Systems (CEMS).

Performance testing for turbine operation using natural gas shall be conducted annually and within 60 days of the anniversary date of the previous performance test. The performance testing is subject to Air Quality "Guideline on Performance Testing".

E. Continuous Emissions Monitoring

To demonstrate continuous direct compliance with all emission limitations for NO_X and CO specified in this permit, the source operates continuous emission monitoring system (CEMS) for NO_X, CO and O_2 on each turbine (EUs: A01 and A02) and in accordance with 40 CFR 60. Each CEMS includes an automated data acquisition and handling system. Each system shall monitor and record at least the following data:

a. exhaust gas concentration of NO_X, CO and diluent O_2;

b. exhaust gas flow rate (by direct or indirect methods);

c. fuel flow rate,

d. hours of operation;

e. four-hour rolling averages for each of NO_X and CO concentration (EUs: A01, A02 and A05),

f. hourly , daily and quarterly accumulated mass emissions of NO_X and CO; and

g. hours of downtime of the CEMS.

Each CEMS shall be installed, calibrated, operational, and certified prior to issuance of an operating permit. A quality assurance plan for all CEMS includes auditing schedules, reporting schedules, design specifications, and other quality assurance requirements for each CEMS. Required periodic audit procedures and QA/QC procedures for CEMS shall conform to the provisions of 40 CFR 60 Subpart B, Appendix F. Relative accuracy test audits (RATA) of the CO, NO_X and O_2 CEMS shall be conducted at least annually. The facility shall install a fuel flow meter for each combined cycle turbine, each duct burner, and the auxiliary Indeck/Volcano boiler (EU: A05), and shall monitor the natural gas fuel flow rate of each emission unit with CEMS. The primary method for demonstrating compliance with this requirement is demonstrated by a Data Acquisition System (DAS).

SPC may operate an ammonia predictive emissions monitoring system (PEMS) on each combined cycle emission unit stack. The ammonia PEMS is based on the principle that NO_X reduction occurs at a 1.26:1 molar ratio with ammonia. Typically though, more ammonia is injected than is "theoretically" needed because the physical process doesn't allow for ideal conditions like complete mixing, uniform ammonia flow, gas flow, temperature distributions, etc. The un-reacted ammonia slips through the catalyst bed and out of the stack as ammonia emissions.

The PEMS uses two (2) NO_X readings, an ammonia flow reading and several constants to calculate an estimate of ammonia emissions. One (1) NO_X reading is from an analyzer at the SCR inlet, and the other is from the stack CEMS analyzer. These measure the change in NO_X across the SCR (always a reduction), which is converted to an ideal ammonia usage based on the stoichiometric principle noted above. This is then subtracted, on a molar basis, from actual ammonia usage and converted to an ammonia concentration going out of the stack. The calculation is carried out in the CEMS and stored in the computer that stores the CEMS parameters.

IV. REGULATORY REVIEW

A. Local Regulatory Requirements

Air Quality has determined that the following public law, statutes and associated regulations are applicable:

1. Clean Air Act, as amended (CAAA), Authority: 42 U.S.C. § 7401, et seq.;
2. Title 40 of the Code of Federal Regulations (CFR); including Part 70 and others;
3. Nevada Revised Statutes (NRS), Chapter 445; Sections 401 through 601;
4. Portions of the AQR included in the State Implementation Plan (SIP) for Clark County, Nevada. SIP requirements are federally enforceable. All requirements from Authority to

Construct permits and Section 12.5 Operating Permits issued by Air Quality are federally enforceable because these permits were issued pursuant to SIP-included sections of the AQR; and

5. Portions of the AQR not included in the SIP. These locally applicable requirements are locally enforceable only.

The Nevada Revised Statutes (NRS) and the Clean Air Act Amendments (CAAA) are public laws that establish the general authority for the Regulations mentioned. The Air Quality Part 70 (Title V) Program received Final Approval on November 30, 2001 with publication of that approval appearing in the Federal Register December 5, 2001 Vol. 66, No. 234. AQR Section 12.5 - Part 70 Operating Permits [Amended 07/01/2010] details the Clark County Part 70 Operating Permit Program. These regulations may be accessed on the Internet at: http://www.clarkcountynv.gov/depts/AirQuality/Pages/Rules_CurrentRulesandRegulations.aspx

Local regulations contain sections that are federally enforceable and sections that are locally enforceable only. Locally enforceable only rules have not been approved by EPA for inclusion into the State Implementation Plan (SIP). Requirements and conditions that appear in the Part 70 OP which are related only to non-SIP rules are notated as locally enforceable only.

Table IV-A-1: AQR Section 12 Summary Table

	PM_{10}	$PM_{2.5}$	NO_X	CO	SO_2	VOC	HAP
Source PTE (tpy)	**38.76**	**38.04**	**163.77**	**92.80**	**13.61**	**14.51**	**9.08**
Minor Source	< 70 tpy	< 250 tpy	< 100 tpy	< 100 tpy	≤ 100 tpy	<100 tpy	≤ 25 tpy
Control Technology	BACT	BACT	BACT	BACT	BACT	BACT	BACT
Notice of Proposed Action	If NEI ≥ 15 tpy	If NEI ≥ 20 tpy	If NEI ≥ 20 tpy	If NEI ≥ 10 tpy	If NEI ≥ 40 tpy	If NEI ≥ 20 tpy	If PTE or NEI ≥ 10 tpy

Table IV-A-2: Clark County Department of Air Quality – Air Quality and State Implementation Plan with Facility Compliance or Requirement

Applicable Section – Title	Applicable Subsection - Title	SIP	Affected Emission Unit
0. Definitions	applicable definitions	yes	entire source
2. Air Pollution Control Board	all subsections	yes	entire source
4. Control Officer	all subsections	yes	entire source
5. Interference with Control Officer	all subsections	yes	entire source
6. Injunctive Relief	all subsections	yes	entire source
8. Persons Liable for Penalties - Punishment: Defense	all subsections	yes	entire source
9. Civil Penalties	all subsections	yes	entire source
10. Compliance Schedule	when applicable; applicable subsections	yes	entire source
12.4. Authority to Construct Application and Permits Requirements for Part 70 Sources	applicable subsections	yes	entire source
12.5. Part 70 Operating Permit Requirements	applicable subsections	yes	entire source
12.6. Confidentiality	all subsections	yes	entire source
12.7. Emission Reduction Credits	all subsections	yes	entire source
12.9. Annual Emission Inventory Requirement	all subsections	yes	entire source

Applicable Section – Title	Applicable Subsection - Title	SIP	Affected Emission Unit
12.10. Continuous Monitoring Requirements for Stationary Sources	applicable subsections	yes	entire source
12.12. Transfer of Permit	all subsections	yes	entire source
12.13. Posting of Permit	all subsections	yes	entire source
13.1.8 Emission Standards for Hazardous Air Pollutants	Subpart M: National Emission Standards for Asbestos	no	entire source
14.1.10 New Source Performance Standards	Subpart Db: Standards of Performance for Industrial – Commercial – Institutional Steam Generating Units	no	boilers
14.1.11 New Source Performance Standards	Subpart Dc: Standards of Performance for Small Industrial – Commercial – Institutional Steam Generating Units	no	boilers
14.1.56 New Source Performance Standards	Subpart GG - Standards of Performance for Gas Turbines	no	turbines
18. Permit and Technical Service Fees	18.1 Operating Permit Fees 18.2 Annual Emission Unit Fees 18.4 New Source Review Application Review Fee 18.5 Part 70 Application Review Fee 18.6 Annual Part 70 Emission Fee 18.14 Billing Procedures	yes	entire source
24. Sampling and Testing - Records and Reports	24.1 Requirements for installation and maintenance of sampling and testing facilities 24.2 Requirements for emissions record keeping 24.3 Requirements for the record format 24.4 Requirements for the retention of records by the emission sources	yes	entire source
25.1 Upset/Breakdown, Malfunctions	25.1 Requirements for the excess emissions caused by upset/breakdown and malfunctions	no	entire source
25.2 Upset/Breakdown, Malfunctions	25.2 Reporting and Consultation	yes	entire source
26. Emission of Visible Air Contaminants	26.1 Limit on opacity (≤ 20 percent for 3 minutes in a 60-minute period)	yes	entire source
28. Fuel Burning Equipment	Emission Limitations for PM	yes	entire source
40. Prohibitions of Nuisance Conditions	40.1 Prohibitions	no	entire source
41. Fugitive Dust	41.1 Prohibitions	yes	entire source
43. Odors In the Ambient Air	43.1 Prohibitions coded as Section 29	no	entire source
60. Evaporation and Leakage	all subsections	yes	entire source
70. Emergency Procedures	all subsections	yes	entire source
80. Circumvention	all subsections	yes	entire source
81. Provisions of Regulations Severable	all subsections	yes	entire source

B. Federally Applicable Regulations

40 CFR 60 - STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES:

40 CFR 60, 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, 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 (2) 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 40 CFR 60.8. Air Quality also requires periodic performance testing on emission units based upon throughput or usage. More discussion is in this document under the compliance section.

40 CFR 60.11 - Compliance with standards and maintenance requirements
Discussion: Subpart GG also requires fuel monitoring and sampling to meet a standard. Subpart GG requirements are addressed in the Part 70 OP. AQR 26 is more stringent than the federal opacity standards, setting a maximum of 20 percent obscurity except for three (3) minutes in any 60-minute period. SPC shall operate in a manner consistent with AQR 26.

40 CFR 60.12 – Circumvention
Discussion: This prohibition is addressed in the Part 70 OP. This is also local rule 80.1.

40 CFR 60.13 - Monitoring requirements
Discussion: This section requires that CEMS meet Appendix B and Appendix F standards of operation, testing and performance criteria. Part 70 OP contains the CEMS conditions and citations to Appendix B and F. In addition, the QA plan approved for the CEMS follows the requirements outlined including span time and recording time.

40 CFR 60, Subpart GG - Standards of Performance for Stationary Gas Turbines

40 CFR 60.330 - Applicability and designation of affected facility
Discussion: 40 CFR 60, Subpart GG applies to two (2) turbines at this source (EUs: A01 and A02).

40 CFR 60.332 - Standard for nitrogen oxides
Discussion: See Table III-B-3 in the Part 70 OP.

40 CFR 60.333 - Standard for sulfur dioxide
Discussion: The sole use of pipeline-quality natural gas with total sulfur content less than 0.8 percent (8,000 ppmw) satisfies this requirement.

40 CFR 60.334 - Monitoring of operations
Discussion: The source installed, calibrated, maintains and operates a continuous emission monitoring system.

40 CFR 60.335 - Test methods and procedures
Discussion: These requirements are found in the conditions for performance testing found in the Part 70 OP.

40 CFR 60, Subpart Db - Standards of Performance for Electric Utility Steam Generating Units for Which Construction is Commenced After September 18, 1978

40 CFR 60.40b – Applicability and delegation of authority

Discussion: The auxiliary Volcano boiler (EU: A05) is subject to the provisions of this subpart. It has a rated capacity of 218 MMBtu per hour.

40 CFR 60.42b – Standard for sulfur dioxide (SO_2)
Discussion: This section does not pertain to boilers that exclusively fire natural gas.

40 CFR 60.43b – Standard for particulate matter (PM)
Discussion: This section does not pertain to boilers that exclusively fire natural gas.

40 CFR 60.44b – Standard for nitrogen oxides (NO_X)
Discussion: See Table III-B-1.

40 CFR 60, Subpart Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

40 CFR 60.40c – Applicability and delegation of authority
Discussion: The auxiliary Nebraska boiler (EU: A06) is rated 86 MMBtu per hour; therefore, Subpart Dc is applicable to this emission unit.

40 CFR 60.42c – Standard for sulfur dioxide (SO_2)
Discussion: This section does not pertain to boilers that exclusively fire natural gas.

40 CFR 60.43c – Standard for particulate matter (PM)
Discussion: This section does not pertain to boilers that exclusively fire natural gas.

40 CFR 60.48c – Reporting and recordkeeping requirements
Discussion: These are addressed in the Part 70 OP.

40 CFR 60, Subpart Kb - Standards of Performance for Organic Volatile Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984

40 CFR 60.110b – Applicability and designation of affected facility
Discussion: The fuel storage tank (EU: A08) is not a subject to the provisions of this subpart because a storage vessel capacity is greater than 151 cubic meters (m3) and the maximum true vapor pressure of the stored liquid is less than 3.5 kilopascals (kPa).

40 CFR 60, Subpart KKKK - Standards of Performance for Stationary Combustion Turbines

40 CFR 60.4305 – Applicability
Discussion: The two (2) turbines (EUs: A01 and A02) are not subject to the provisions of this subpart because these turbines commenced construction, modification, or reconstruction before February 18, 2005.

40 CFR 64 - COMPLIANCE ASSURANCE MONITORING

40 CFR 64.2 – Applicability
Discussion: The CAM Rule is not applicable to the auxiliary boilers (EUs: A05 and A06), the starter engines (EUs: A03 and A04), or the fuel oil storage (EU: A08) based on the applicability statement outlined in 40 CFR 64.2(a) (2), i.e., no control devices are used on these units to achieve compliance with any emission limitation or standard for a regulated air pollutant. The gas turbines are exempt from the CAM Rule for NO_X and CO based on the exemption outlined in 40 CFR 64.2(b)(1)(vi). The permit specifies a continuous compliance determination method for the NO_X and CO limitations in the form of a CEMS, required for Part 60 compliance. The CAM Rule is not applicable to these units for SO_X based on the applicability statement outlined in 40 CFR 64.2(a) (2). The CAM Rule is not applicable to these units for PM_{10}, HAPs or NH_3 based on the applicability statement outlined 40 CFR 64.2(a) (2). Combustion turbines/duct

heaters (EUs: A01 and A02) are also not CAM-applicable for VOC emissions based on the exemption outlined in 40 CFR 64.2(a) (3), i.e., the potential pre-control emissions are less than the major threshold.

40 CFR 72 - ACID RAIN PERMITS REGULATION

40 CFR 72, Subpart A – Acid Rain Program General Provisions

40 CFR 72.6 – Applicability

Discussion: SPC is a cogeneration facility exempted based on the applicability criteria defined in 40 CFR 72.6 (b)(5); therefore, the provisions of this regulation do not apply.

40 CFR 73 – ACID RAIN SULFUR DIOXIDE ALLOWANCE SYSTEM

Discussion: SPC is not subject to 40 CFR 72; therefore, the provisions of this regulation do not apply.

40 CFR 75 - CONTINUOUS EMISSION MONITORING

Discussion: SPC is not subject to the Acid Rain emission limitations of 40 CFR 72; therefore, the facility is not subject to the monitoring requirements of this regulation.

C. Compliance Demonstration

Excluding start-up periods which are not to exceed 1 (one) hour, or shut-down periods, any exceedance of the hourly, three–hour rolling, daily, or annual CO and/or NO_X emissions limitations as determined by the CEMS shall be considered a violation of the emission limit imposed and may result in enforcement action.

SPC may operate an ammonia predictive emissions monitoring system (PEMS) on each combined cycle emission unit stack. The ammonia PEMS is based on the principle that NO_x reduction occurs at a 1.26:1 molar ratio with ammonia. The un-reacted ammonia slips through the catalyst bed and out of the stack as ammonia emissions. The PEMS calculates the mass emissions by multiplying an ammonia emission factor (AEF) by each turbine's annual actual operating hours. The AEF, in pounds per hour, is determined for each turbine during its required periodic performance test. This factor shall be used until the next performance test.

The Permittee shall install a fuel flow meter for each combined cycle turbine, each duct burner, and the Indeck/Volcano boiler, and shall monitor the natural gas fuel flow rate of each emission unit with Data Acquisition System (DAS) and Continuous Emission Monitoring System (CEMS). The primary method for demonstrating compliance with this requirement is demonstrated by DAS.

The fuel flow meters for combined cycle turbines, duct burners, and the Indeck/Volcano boiler continuously transmit signals to the plant main Digital Control System (DCS) where data is converted into the flow rates. In turn, these fuel flow rates are transmitted to the plant Data Acquisition System (DAS), which also captures the emission concentrations from the CEMS. DAS averages the fuel flows and emission concentrations and calculates one minute, 15 minutes, three hours, and eight hours averages for both concentrations and emission rates in pounds per hours for each measured emission unit. The DAS retains these values on the hard drive for five years. In addition, the DSC has a computerized system that continuously records the input fuel data and prints out a fuel report every six hours.

The Nebraska boiler (EU: A06) is not connected to DAS. The Permittee maintains records of monthly, quarterly and annual (12-month rolling total) of natural gas fuel used for Nebraska boiler.

D. Mitigation

The source has no CO offset requirements.

V. INCREMENT

Saguaro Power is a major source in Hydrographic Area 212 (Las Vegas Valley). Permitted emission units include two turbine generators, two starter engines, two boilers, one cooling tower and other equipment. Since minor source baseline dates for NO_X (October 21, 1988) and SO_2 (June 29, 1979) have been triggered, Prevention of Significant Deterioration (PSD) increment analysis is required. Air Quality 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 (1999 to 2003) of meteorological data from the McCarran Station and Desert Rock Station were used in the model. United States Geological Survey (USGS) National Elevation Dataset (NED) terrain data was used to calculate elevations. Table V-1 presents the results of the modeling.

Table V-1: PSD Increment Consumption

Pollutant	Averaging Period	PSD Increment Consumption by the Source (μg/m^3)	Location of Maximum Impact	
			UTM X (m)	UTM Y (m)
SO_2	3-hour	52.28[1]	679114	3990413
SO_2	24-hour	36.27[1]	679114	3990413
SO_2	Annual	0.24	679136	3990509
NO_X	Annual	5.82	679136	3990509

[1] Second High Concentration

Table V-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.

VI. COMPLIANCE

A. Compliance Certification

Requirements for compliance certification:

a. Regardless of the date of issuance of this Part 70 OP, the schedule for the submittal of reports to the Control Officer shall be as follows:

Table VI-A-1: Reporting Schedule

Required Report	Applicable Period	Due Date1
Semi-annual Report for 1st Six-Month Period	January, February, March, April, May, June	July 30 each year
Semi-annual Report for 2nd Six-Month Period, Any additional annual records required.	July, August, September, October, November, December	January 30 each year

Required Report	Applicable Period	Due Date1
Annual Compliance Certification Report	Calendar Year	January 30 each year
Annual Emission Inventory Report	Calendar Year	March 31 each year
Notification of Deviations with Excess Emissions	As Required	Within 24 hours of the Permittee learns of the event
Report of Deviations with Excess Emissions	As Required	Within 72 hours of the notification
Deviation Report	As Required	Along with semi-annual reports
Performance Testing	As Required	Within 60 days from the end of the test.

[1]If the due date falls on a Saturday, Sunday or a Federal or Nevada holiday, then the submittal is due on the next regularly scheduled business day.

b. A statement of methods used for determining compliance, including a description of monitoring, recordkeeping, and reporting requirements and test methods.

c. A statement indicating the source's compliance status with any applicable enhanced monitoring and compliance certification requirements of the Act.

B. Compliance Summary

Table VI-B-1: Compliance Summary Table - AQR

Citation	Title	Applicability	Applicable Test Method	Compliance Status
AQR Section 0	Definitions.	Applicable – SPC will comply with all applicable definitions as they apply.	SPC will meet all applicable test methods should new definitions apply.	SPC complies with applicable requirements.
AQR Section 4	Control Officer.	Applicable – The Control Officer or his representative may enter into SPC property, with or without prior notice, at any reasonable time for purpose of establishing compliance.	SPC will allow Control Officer to enter Station property as required.	SPC complies with applicable requirements.
AQR Section 12.5	40 CFR Part 70 Operating Permits	Applicable – SPC 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 unit. Section 19 is both federally and locally enforceable	SPC reviewed the Part 70 permit dated August 10, 2009. This renewal application was submitted before February 10, 2014. Applications for new units will be submitted within 12 months of startup.	SPC complies with applicable requirements.

Citation	Title	Applicability	Applicable Test Method	Compliance Status
AQR Section 13.2.14 Subpart Q	National Emission Standards for Hazardous Air Pollutants for Industrial Process Cooling Towers	Applicable – The SPC cooling towers are the affected units.	Applicable monitoring requirements.	SPC complies with applicable requirements.
AQR Section 14.1.1 Subpart A	NSPS – General Provisions	Applicable – SPC 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.	SPC complies with applicable requirements.
AQR Section 14.1.10 Subpart Db	Standards of Performance for Industrial – Commercial – Institutional Steam Generating Units	Applicable – SPC boiler is affected unit under the regulations. Sec. 14 is locally enforceable; however, the NSPS standards they reference are federally enforceable.	Applicable monitoring, recordkeeping and reporting requirements.	SPC complies with applicable requirements.
AQR Section 14.1.11 Subpart Dc	Standards of Performance for Small Industrial – Commercial – Institutional Steam Generating Units	Applicable – SPC boiler is affected unit under the regulations. Sec. 14 is locally enforceable; however, the NSPS standards they reference are federally enforceable.	Applicable monitoring, recordkeeping and reporting requirements.	SPC complies with applicable requirements.
AQR Section 14.1.56 Subpart GG	Standards of Performance for New Stationary Sources (NSPS) – Stationary Gas Turbines	Applicable – The two (2) SPC turbines are natural gas-fired units with heat input greater than 10 MMBtu/hr.	The two (2) turbines meet the applicable NO_X emission standard. NO_X emissions determined by EPA Method 7E.	SPC complies with applicable requirements.
AQR Section 18	Permit and Technical Service Fees	Applicable – SPC will be required to pay all required/applicable permit and technical service fees.	SPC is required to pay all required/applicable permit and technical service fees.	SPC 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 one (1) hour of onset of such event.	SPC complies with applicable requirements.

Citation	Title	Applicability	Applicable Test Method	Compliance Status
AQR Section 26	Emissions of Visible Air Contaminants	Applicable – Opacity for the SPC combustion turbine must not exceed 20 percent for more than six (6) minutes in any 60-minute period.	Compliance determined by EPA Method 9.	SPC 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.	SPC air contaminant emissions controlled by pollution control devices or good combustion in order not to cause a nuisance.	SPC complies with applicable requirements.
AQR Section 41	Fugitive Dust	Applicable – SPC shall take necessary actions to abate fugitive dust from becoming airborne.	SPC utilizes appropriate best practices to not allow airborne fugitive dust.	SPC complies with applicable requirements.
AQR Section 42	Open Burning	Applicable – In event SPC 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.	SPC will contact the Air Quality and obtain approval in advance for applicable burning activities as identified in the rule.	SPC 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 fifteen minutes. Section 43 is a locally enforceable rule only.	SPC will not operate its facility in a manner which will cause odors. SPC is a natural gas fired facility and is not expected to cause odors.	SPC complies with applicable requirements.
AQR Section 70.4	Emergency Procedures	Applicable – SPC submitted an emergency standby plan for reducing or eliminating air pollutant emissions in the Section 16 Operating Permit Application.	SPC submitted an emergency standby plan and received the Section 16 Operating Permit.	SPC complies with applicable requirements.

Table VI-B-2: Compliance Summary Table – Federal Regulations

Citation	Title	Applicability	Applicable Test Method	Compliance Status
40 CFR Part 52.21	Prevention of Significant Deterioration (PSD)	Applicable – SPC PTE > 100 TPY and is listed as one of the 28 source categories.	BACT analysis, air quality analysis using modeling, and visibility and additional impact analysis performed for original ATC permits.	SPC complies with applicable sections as required by PSD regulations.

Citation	Title	Applicability	Applicable Test Method	Compliance Status
40 CFR Part 52.1470	SIP Rules	Applicable – SPC is classified as a Title V source, and SIP rules apply.	Applicable monitoring and record keeping of emissions data.	SPC is in compliance with applicable state SIP requirements including monitoring and record keeping of emissions data.
40 CFR Part 60, Subpart A	Standards of Performance for New Stationary Sources (NSPS) – General Provisions	Applicable – SPC is an affected facility under the regulations.	Applicable monitoring, recordkeeping and reporting requirements.	SPC complies with applicable requirements.
40 CFR Part 60, Subpart Db	Standards of Performance for New Stationary Sources (NSPS) – Industrial-Commercial-Institutional Steam Generating Units	Applicable – The SPC boiler is natural gas- fired units with heat input greater than 100 MMBtu/hr.	Applicable monitoring, recordkeeping and reporting requirements.	SPC complies with applicable requirements.
40 CFR Part 60, Subpart Dc	Standards of Performance for New Stationary Sources (NSPS) – Industrial-Commercial-Institutional Steam Generating Units	Applicable – The SPC boiler is natural gas- fired units with heat input greater than 10 MMBtu/hr.	Applicable monitoring, recordkeeping and reporting requirements.	SPC complies with applicable requirements.
40 CFR Part 60, Subpart GG	Standards of Performance for New Stationary Sources (NSPS) – Stationary Gas Turbines	Applicable – The SPC two turbines are natural gas-fired units with heat input greater than 10 MMBtu/hr.	Applicable monitoring, recordkeeping and reporting requirements.	SPC complies with applicable requirements.
40 CFR Part 60	Appendix A, Method 9 or equivalent, (Opacity)	Applicable – Emissions from stacks are subject to opacity standards.	Opacity determined by EPA Method 9.	SPC complies with applicable requirements.
40 CFR Part 64	Compliance Assurance Monitoring	Not Applicable – SPC has CEMS to monitor NO_x and CO emissions, the NH_3 emissions are continuously monitored with PEMS. SPC is exempt from CAM regulations based on 40 CFR 64.2 (b) (1) (Vi).	SPC continuously monitors NO_x and CO missions with CEMS. NH_3 emissions are monitored with PEMS.	SPC complies with applicable requirements.
40 CFR Part 70	Federally Mandated Operating Permits	Applicable – SPC 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 unit.	SPC reviewed the initial Part 70 permit. The renewal application was submitted on October 10, 2013. Applications for new units will be submitted within 12 months of startup.	SPC complies with applicable requirements.

Citation	Title	Applicability	Applicable Test Method	Compliance Status
40 CFR Part 72	Acid Rain Permits Regulation	Not Applicable – SPC is exempt from acid rain regulations based on 40 CFR 72.6 (b)(4).	SPC maintains an Acid Rain Permit.	SPC complies with applicable requirements.
40 CFR Part 73	Acid Rain Sulfur Dioxide Allowance System	Not Applicable – SPC is not exempt from acid rain regulations based on 40 CFR 73.2 (a).	SPC verifies SO_2 allowance with US EPA.	SPC complies with applicable requirements.
40 CFR Part 75	Acid Rain CEMS	Not Applicable – SPC is exempt from acid rain regulations based on 40 CFR 75.2 (b)(2).	SPC continuously monitors NO_x and CO missions with CEMS.	SPC complies with applicable requirements.
40 CFR Part 82	Protection of Stratospheric Ozone	Applicable – SPC is subject to stratospheric ozone regulations based on 40 CFR 82.4.	SPC does not use stratospheric ozone depleting compounds.	SPC complies with applicable requirements.

C. Summary of Monitoring for Compliance

Table VI-C-1: Compliance Monitoring

EU	Process Description	Monitored Pollutants	Applicable Subsection Title	Requirements	Compliance Monitoring
A01, A02	Combustion turbines	CO, NO_X, SO_2, PM_{10}, VOC, HAPs, NH_3	AQR Section 12.5 40 CFR Subpart GG	Annual and short-term emission limits.	CEMS for NO_X and CO; PEMS for NH_3. Stack testing for NO_X and CO by EPA Methods as outlined in Part 70 Permit. Compliance for PM_{10}, SO_2, VOC and HAPs shall be based on sole use of pipeline quality natural gas as fuel and emission factors. Compliance for PM_{10}, SO_2, VOC and HAPs shall be based on the sole use of low sulfur diesel fuel and emission factors. Recording is required for compliance demonstration.
A01, A02	Combustion turbines	Opacity	AQR Section 26	Less than 20% opacity except for six (6) minutes in any 60-minute period.	Use of natural gas as fuel and good combustion practices as well as EPA Method 9 performance testing upon the request of the Control Officer.
A09	Cooling tower	PM_{10},	AQR Section 12.5 AQR Section 26	Opacity shall not exceed 20%, except for 6 minutes out of every 60 minutes period.	Additional monitoring per the request of the Control Officer
B05	Boiler	CO, NO_X	40 CFR 60 Subpart Db	12 ppm NO_x and 1.2 ppm CO emission limitations	CEMS for NO_X and CO CEMS for NO_X and CO Stack testing by EPA Methods once every five years Semi-annual burner efficiency tests. Fuel consumption recording is required for compliance demonstration.
B06	Boiler	CO, NO_X	40 CFR 60 Subpart Dc	30 ppm NO_x and 400 ppm CO emission limitations	Stack testing by EPA Methods once every five years Semi-annual burner efficiency tests. Fuel consumption recording is required for compliance demonstration.
B05, B06	Boilers	Opacity	AQR Section 26	Opacity shall not exceed 20%, except for 3 min. out of every 60 min. period	Additional monitoring per the request of the Control Officer

D. 40 CFR Subparts Dc, Db and GG Streamlining Demonstration

Table VI-D-1: Streamlining Demonstration

Regulation (40 CFR)	Regulatory Standard	Permit Limit	Value Comparison				Averaging Period Comparison		
			Relevant Heat Input or Load Level[1]	Standard Value, in Units of Permit Limit	Permit Limit Value	Is Permit Limit Equal or More Stringent?	Standard Averaging Period	Permit Limit Averaging Period	Is Permit Limit Equal or More Stringent?
60.332 (GG)	75 ppmvd NO_x @15% O_2 (natural gas)	10 ppmvd NO_x @15% O_2 (natural gas)	N/A	75[(1)]	10.0	Yes	4 hours	4 hours	Yes
60.333 (GG)	150 ppmvd (326 lbs/hr) SO_x @15% O_2 (natural gas)	27 lbs/hr SO_x @15% O_2 (natural gas)	N/A	326	0.27	Yes	4 hours	4 hours	Yes
60.333 (GG)	0.8% of S by weight	0.05% of S by weight	N/A	0.8	0.05	Yes	N/A	N/A	N/A
60.43b (Db)	20% Opacity	20% Opacity	N/A	20	20	Yes	60-minute period, excepting 6 minutes	60-minute period, excepting 6 minutes	Yes
60.44b (Db)	0.20 lb NOx per MMBtu (192 ppm NOx @ 15% O_2)	12 ppm NOx @ 15% O_2	N/A	192	12	Yes	4 hours	4 hours	Yes
60.42c (Dc)	SO_2 Standards Not Applicable for Natural Gas	0.05 lb/hr, Natural Gas	N/A	N/A	0.05 lbs/hr	Yes	N/A	N/A	N/A
60.43c (Dc)	PM Standards Not Applicable for Natural Gas	0.43 lb/hr, Natural Gas	N/A	N/A	0.43 lbs/hr	Yes	N/A	N/A	N/A

[1]The 60.332.NOx standard is a formula; the value (75 ppmvd) is the minimum possible value of the standard for any emission unit.

Note: The formula used: EF =Cd * Cf * Fd * 20.9/(20.9 - %O2) and E = EF*HI.

where:
EF = emission rate (lb/MMBtu);
Cd = emission concentration (ppmvd);
Cf for NO_x = 1.194 E-07 (lb NOx/dscf ppm);
Fd = 8,710 dscf/MMBtu, dry basis F factor for O2 dilution for natural gas;
%O_2 = 15% (the oxygen volume at the stated limit;
E = mass emission rate (lb/hr); and
HI = heat input (MMBtu/hr).

E. Permit Shield

A permit shield was requested by the source. Compliance with the terms contained in this permit shall be deemed compliance with the following applicable requirements in effect on the date of permit issuance:

Table VI-E-1: Applicable Requirements Related to Permit Shield

Citation	Title
40 CFR Subpart GG	Standards of Performance for New Stationary Sources (NSPS) – Stationary Gas Turbines

VII. EMISSION REDUCTION CREDITS (OFFSETS)

The source is not subject to offset requirements in accordance with AQR 12.7.

VIII. ADMINISTRATIVE REQUIREMENTS

Section 12.5 requires that Air Quality identify the original authority for each term or condition in the Part 70 Operating Permit. Such reference of origin or citation is denoted by *[italic text in brackets]* after each Part 70 OP condition.

Air Quality proposes to issue the Part 70 OP conditions on the following basis:

Legal:
On December 5, 2001 in Federal Register Volume 66, Number 234 FR30097 the EPA fully approved the Title V Operating Permit Program submitted for the purpose of complying with the Title V requirements of the 1990 Clean Air Act Amendments and implementing Part 70 of Title 40 Code of Federal Regulations.

Factual:
SPC has supplied all the necessary information for Air Quality to draft Part 70 OP conditions encompassing all applicable requirements and corresponding compliance.

Conclusion:
Air Quality has determined that SPC will continue to determine compliance through the use of CEMS, PEMS, performance testing, semi-annual reporting, and daily recordkeeping, coupled with annual certifications of compliance. Air Quality proceeds with the decision that a Part 70 Operating Permit should be issued as drafted to SPC for a period not to exceed five (5) years.