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MAJOR PART 70 SOURCE

TECHNICAL SUPPORT DOCUMENT

(STATEMENT of BASIS)

APPLICATION FOR:

Operating Permit

SUBMITTED BY:

Broadbent & Associates Inc.
8 West Pacific Avenue
Henderson, Nevada 89015

FOR:

Source ID: 00360

Nevada Cogeneration Associates 1

ADDRESS:

420 North Nellis Boulevard, Suite #A3-400
Las Vegas, Nevada 89110

SIC code 4931, "Electric Services"

NAICS code 221112, "Fossil Fuel Electric Power Generation"

Date: May 6, 2024

EXECUTIVE SUMMARY

Nevada Cogeneration Associates #1 (NCA 1) owns and operates a fossil fuel electric power generation plant, located at 11401 U.S. Hwy. 91, Apex, Nevada. The station is located in Hydrographic Area 216, the Garnet Valley. NCA 1 is a major stationary source for NO_x and CO, and a minor source for PM₁₀, PM_{2.5}, SO₂, VOCs, and HAPs. NCA1 is also a source of greenhouse gases. Garnet Valley was designated “in attainment” for all regulated pollutants at the time of issuance of the Title V Part 70 Operating Permit (OP).

NCA 1 is a major, categorical stationary source, as defined by AQR 12.2.2(j)(1). The source operates natural gas-fired turbines, heat recovery steam generating (HRSG) units each equipped with supplemental duct burners, diesel engines, a cooling tower, and an aboveground storage tank (AST). The source is subject to the requirements of 40 CFR Part 60, Subpart A, Subpart GG, Subpart IIII; 40 CFR Part 63, Subpart CCCCCC and Subpart ZZZZ; 40 CFR Parts 72-78.

The following table summarizes the source potential to emit for each regulated air pollutant.

Source-Wide PTE (tons per year)

Pollutants	PM ₁₀	PM _{2.5}	NO _x	CO	SO ₂	VOC	HAP ¹	GHG ²
PTE Totals	67.38	61.00	169.27	141.97	9.17	26.51	6.39	505,512

¹10 tons for any single HAP or 25 tons for any combination of HAPs.

²GHG is expressed as CO₂e for information only.

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ACRONYMS AND ABBREVIATIONS

(These terms may be seen in the Technical Support Document)

AQR	Clark County Air Quality Regulation
ATC	Authority to Construct
BACT	Best Available Control Technology
BAE	baseline actual emissions
CAM	Compliance Assurance Monitoring
CARB	California Air Resources Board
CCCT	combined cycle combustion turbine
CD	consent decree
CE	control efficiency
CF	control factor
cfm	cubic feet per minute
CFR	Code of Federal Regulations
CI	Compression Ignition
CO	carbon monoxide
DAQ	Department of Air Quality
EE	excludable emissions
EF	emission factor
EPA	U.S. Environmental Protection Agency
EU	emission unit
gpm	gallons per minute
GE	General Electric
HAP	hazardous air pollutant
HRSG	heat recovery steam generators
inHg	inches of mercury
kW	kilowatt
lb	pound
LHV	lower heat value
MMBtu	British thermal units (in millions)
MWh	megawatts per hour
NAICS	North American Industry Classification System
ng/J	nanogram per joule
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO _x	nitrogen oxide
NSPS	New Source Performance Standards
NSR	New Source Review
NVE	NV Energy
PAE	projected actual emissions
PM _{2.5}	particulate matter less than 2.5 microns in aerodynamic diameter
PM ₁₀	particulate matter less than 10 microns in aerodynamic diameter
ppm	parts per million
PSD	Prevention of Significant Deterioration
PTE	potential to emit
RACT	Reasonably Available Control Technology

RATA	Relative Accuracy Test Audit
RICE	reciprocating internal combustion engine
rpm	rotations per minute
SCC	Source Classification Codes
SCR	selective catalytic reduction
scfm	standard cubic feet per minute
SIC	Standard Industrial Classification
SO ₂	sulfur dioxide
STD	standard
TSD	Technical Support Document
UTM	Universal Transverse Mercator
VMT	vehicle miles traveled
VOC	volatile organic compound

I. SOURCE INFORMATION

A. General

Preparer: Dawn Leaper

Action Received: November 21, 2023

Permittee: Nevada Cogeneration Associates 1

Submitted by: Broadbent & Associates, Inc.

Source ID #: 00360

Source name: Nevada Cogeneration Associates 1

Source address: 11401 North U.S. Highway 91, Las Vegas, Nevada 89165

II. PROCESS DESCRIPTION

The source operates three natural gas-fired, turbine generator packages that exhaust into heat recovery steam generators (HRSG), each equipped with a 77 MMBtu/hr supplemental duct burner. Additionally, a nominal 29.74 MW steam turbine generator is operated to produce electrical power. Other operating emission units include a rental back-up generator, a diesel fire pump, a diesel-fired water pump, and a cooling tower.

III. PERMITTING ACTION

Beginning January 1, 2024 NCA1 will no longer be eligible for the exemption under 40 CFR Part 72.6(b). According to AQR 12.5.2.14 “any permit revision for purposes of the “acid rain” portion of the permit shall be governed by regulations promulgated by the Administrator under Title IV of the Clean Air Act and shall require a significant permit revision”.

An application for a significant revision to incorporate the relative acid rain provision into the existing Title V Operating Permit (OP) was submitted by the permittee on November 21, 2023.

IV. FACILITY EMISSION UNITS

Table 1 lists the affected EUs at the facility. The SCC codes for the supplemental duct burners have been updated for accuracy. The source did not request changes to the existing emission units at the facility.

Table 1. EUs List of Affected Units by the Acid Rain Permit

EU	Rating	Description	Make	Model #	Serial #	SCC
A001	22.2 MW285 MMBtu/hr	Turbine Generator Package #1	General Electric	LM-2500PE- MEE-06	260157-1	20200201
A001a	77 MMBtu/hr	Supplemental Duct Burner	Coen		GV ALPHA	10100602
A002	22.2 MW285 MMBtu/hr	Turbine Generator Package #2	General Electric	LM-2500PE- MEE-06	260157-2	20200201
A002a	77 MMBtu/hr	Supplemental Duct Burner	Coen		GV BRAVO	10100602
A003	22.2 MW285 MMBtu/hr	Turbine Generator Package #3	General Electric	LM-2500PE- MEE-06	260157-3	20200201
A003a	77 MMBtu/hr	Supplemental Duct Burner	Coen		GV CHARLIE	10100602

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

Table 2. Insignificant Activities

3 Generator Lube Oil Tanks, 215 gallons (units A-C)
Steam Turbine Lube Oil Tank
Steam Turbine Lube Oil Conditioner Tank, 270 gallons
Oil/Water Sump
3 Gas Turbine Lube Oil Tanks, 150 gallons (units 1-3)
Diesel AST, 350 gallons (Fire Water Pump)
Steam and Water Treatment
Evaporation Pond
Maintenance Operations
Storage Tank, Diesel, 250,000 gallons
Storage Tank, Ammonia, 1,000 gallons

V. CONTROL TECHNOLOGY

Turbines and Duct Burners

NCA 1 operates turbines (EUs A001–A003) and HRSGs (EUs A001a–A003a) with SCRs capable of achieving NO_x concentrations of not more than 12 ppmvd, corrected to 15% O₂ as measured on a 3-hour rolling average. When the SCR is not operating during startup/shutdown cycles or low temperature excursion, the NO_x concentration shall not exceed 25 ppmvd, corrected to 15% O₂ as measured on a 3-hour rolling average.

The source also uses an oxidation catalyst for controlling CO emissions below 23 ppmvd, corrected to 15% O₂. The catalysts shall be maintained and operated according to the manufacturer’s specifications because the unit is plug and play, so does not entail “operation.” Manufacturer’s specifications are more precise than an operations and maintenance manual in this case.

VI. EMISSION LIMITS

The source did not ask to modify any emission limits at this time. The permittee is expected to demonstrate compliance with annual emission limits by including startup emissions using either continuous emission monitoring data or the emission rates in Table 3, as applicable. [ATC/OP, Condition II-B-1 (January 2002)]

Table 3: Startup Emission Rates per EU (lb/hr)¹

EU	PM ₁₀	NO _x (SCR)	NO _x (no SCR)	CO	SO ₂	VOC
A001, A001a	3.88	13.31	21.50	32.69	0.69	2.75
A002, A002a	3.88	13.31	21.50	32.69	0.69	2.75
A003, A003a	3.88	13.31	21.50	32.69	0.69	2.75

¹Pounds per hour emissions for turbine units 1-3 are based on 40 minutes of startup and 20 minutes of normal operation (with duct burner firing).

The shutdown emission rates were removed from the permit for the same reason as the startup emission rates (Table 4). The permittee shall continue to demonstrate compliance with annual emission limits by including shutdown emissions and using the emission rates in Table 4 when CEMS data is not available.

Table 4: Shutdown Emissions per EU (lb/hr)^{1,2}

EU	PM ₁₀	NO _x (SCR)	NO _x (no SCR)	CO	SO ₂	VOC
A001, A001a	3.88	11.01	21.50	17.33	0.69	2.32
A002, A002a	3.88	11.01	21.50	17.33	0.69	2.32
A003, A003a	3.88	11.01	21.50	17.33	0.69	2.32

¹Pounds per hour emissions for turbine units 1-3 are based on 8 minutes of shutdown and 52 minutes of normal operation (with duct burner firing).

²NO_x, CO, and VOC emission factors were provided by the manufacturer.

40 CFR 60, Subpart GG has standards for SO₂ as well as NO_x. The SO₂ standards were added to the permit, although they have been excluded in the past. Per the regulation, the source is prohibited from emitting into the atmosphere from any stationary gas turbine SO₂ over 0.015% by volume at 15% O₂ on a dry basis, or from burning in any stationary gas turbine any fuel that contains total sulfur over 0.8% by weight (8,000 ppmw).

VII. OPERATIONAL LIMITS

The source did not request changes to the operational limits for any of the emission units during this permit action.

VIII. REVIEW OF APPLICABLE REGULATIONS

A. Local Regulations

The requirements for the following local regulations identified as applicable to this source are tabulated in Attachment 1:

- Chapter 445B of the Nevada Revised Statutes (NRS).

- Clark County AQRs.

B. Federal Regulations

The requirements for the following federal regulations identified as applicable to this source are tabulated in Attachment 2:

- Clean Air Act Amendments (authority: 42 U.S.C. § 7401, et seq.)
- Title 40 of the Code of Federal Regulations.

The applicable Acid Rain Program regulations are contained in 40 CFR Parts 72 through 78:

40 CFR Part 72: Permits Regulation

40 CFR Part 73: SO₂ Allowance System

40 CFR Part 74: Opt-In

40 CFR Part 75: Continuous Emissions Monitoring

40 CFR Part 76: Acid Rain Nitrogen Oxides Emission Reduction Program

40 CFR Part 77: Excess Emissions

40 CFR Part 78: Appeal Procedures

IX. MONITORING

A continuous emission monitoring system (CEMS) is required by 40 CFR Part 75 to sample, analyze, measure, and provide, by recording readings at least once every 15 minutes using an automated data acquisition, handling system, and a permanent record of NO_x emissions or stack gas volumetric flow rate.

X. PERFORMANCE TESTING

The permittee shall conduct RATA testing in accordance with 40 CFR Parts 75 for NO_x and O₂ annually unless otherwise required under 40 CFR Part 75, Appendix B.

XI. ACID RAIN PERMIT

This source is no longer exempted based on the applicability criteria defined in 40 CFR Part 72.6(b). Therefore, an EPA Acid Rain Permit application is required.

XII. RECORDKEEPING AND REPORTING

Provisions for all CEMS information required by 40 CFR Part 75, including a CEMS monitoring plan, downtime justifications and corrective actions taken have been incorporated into the permit.

XIII. INCREMENT ANALYSIS

Nevada Cogeneration Associates #1 is a major source in Hydrographic Area 216 (Garnet Valley). Permitted emission units include three turbines, one fire pump, one generator, one cooling tower and one water pump. Since minor source baseline dates for PM₁₀ (December 31, 1980), NO₂ (January 24, 1991) and SO₂ (December 31, 1980) have been triggered, Prevention of Significant Deterioration (PSD) increment analysis is required.

DAQ modeled the source using AERMOD to track the increment consumption. Stack data submitted by the applicant were supplemented with information available for similar emission units. Average actual annual emissions (2021 and 2022) were used in the model. Five years (2011 to 2015) of meteorological data from the McCarran Station were used in the model. U.S. Geological Survey National Elevation Dataset terrain data were used to calculate elevations. Table 5 shows the location of the maximum impact and the potential PSD increment consumed by the source at that location. The impacts are below the PSD increment limits.

Table 5: PSD Increment Consumption

Pollutant	Averaging Period	Source's PSD Increment Consumption ($\mu\text{g}/\text{m}^3$)	Location of Maximum Impact	
			UTM X (m)	UTM Y (m)
SO ₂	3-hour	2.23 ¹	686600	4024200
SO ₂	24-hour	1.08 ¹	686700	4024300
SO ₂	Annual	0.17	686700	4024400
NO _x	Annual	2.06	686700	4024400
PM ₁₀	24-hour	21.36 ¹	686597	4024097
PM ₁₀	Annual	3.48	686600	4024100

¹ Highest Second High Concentration.

XIV. PUBLIC PARTICIPATION

Under AQR 12.5.2.17, public participation is required for a significant revision to the Title V (i.e., 40 CFR Part 70) operating permits.

XV. ATTACHMENTS

See the following.

Attachment 1

As shown in the following table, the lb/hr values were multiplied by 8,760 hours of operation for each emission unit except the GDO and emergency fire pump. The pump value was calculated using the recommended 500 hours per year; GDO was based on the throughput proposed by the source.

Applicability Emissions

EU	Condition	PM ₁₀	PM _{2.5}	NO _x	CO	SO ₂	VOC	HAP	NH ₃ ¹
A001, A001a	8,760 hr/yr	16.99	16.99	94.17	46.87	3.02	8.76	2.01	27.81
A002, A002a	8,760 hr/yr	16.99	16.99	94.17	46.87	3.02	8.76	2.01	27.81
A003, A003a	8,760 hr/yr	16.99	16.99	94.17	46.87	3.02	8.76	2.01	27.81
A004	500 hr/yr	0.33	0.33	3.33	1.16	0.00	0.07	0.00	0.00
A005	8,760 hr/yr	15.94	9.59	0.00	0	0	0	0	0
A006	8,760 hr/yr	0.79	0.79	5.17	2.41	0.74	0.92	1.36	0.00
A010	9,000 gal/yr	0	0	0.00	0	0	0.01	0.01	0.00
B01	8,760 hr/yr	2.01	2.01	64.52	34.95	0.09	4.29	0.18	0.00
Total		70.06	63.71	355.53	179.11	9.90	31.57	7.59	83.44

¹For informational purposes only.

²Emissions values are without the SCR.

Attachment 2

Applicable AQRs

Citation	Title	SIP Approved	Applicable
Section 0	Definitions	Yes	Yes
Section 4	Control Officer	Yes, partial	Yes
Section 5	Interference with Control Officer	Yes	Yes
Section 6	Injunctive Relief	Yes	Yes
Section 8	Persons Liable for Penalties – Punishment: Defense	Yes	Yes

Citation	Title	SIP Approved	Applicable
Section 9	Civil Penalties	Yes	Yes
Section 10	Compliance Schedule	No, repealed 12/18/18	No
Section 12.0	Applicability and General Requirements	Yes	No
Section 12.1	Applicability Requirements for Minor Sources	Yes	No
Section 12.2	Permit Requirements for Major Sources in Attainment Areas	Yes	Yes
Section 12.3	Permit Requirements for Major Sources in Nonattainment Areas	Yes	No
Section 12.4	Authority to Construct Application and Permit Requirements for Part 70 Sources	Yes	Yes
Section 12.5	Part 70 Operating Permit Requirements	Yes	Yes
Section 12.9	Annual Emissions Inventory Requirement	No	Yes
Section 12.10	Continuous Monitoring Requirements for Stationary Sources	No	Yes
Section 12.13	Posting of Permit	No	Yes
Section 13.2(b)(1), Subpart A	National Emission Standards for Hazardous Air Pollutants (NESHAP) General Provisions	No	Yes
Section 13.2(b)(82), Subpart ZZZZ	NESHAP for Stationary Reciprocating Internal Combustion Engines	No	Yes
Section 14.1(b)(1), Subpart A	New Source Performance Standards (NSPS) General Provisions	No	Yes
Section 14.1(b)(40), Subpart GG	NSPS – Stationary Gas Turbines	No	Yes
Section 14.1(b)(81), Subpart IIII	NSPS – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines	No	Yes
Section 18	Permit and Technical Service Fees	Yes, partial	Yes
Section 21	Acid Rain Continuous Emissions Monitoring	No	Yes
Section 22	Acid Rain Permits	No	Yes
Section 25	Upset/Breakdown, Malfunctions	Yes, partial	Yes
Section 26	Emissions of Visible Air Contaminants	Yes	Yes
Section 28	Fuel Burning Equipment	Yes	Yes
Section 40	Prohibition of Nuisance conditions	No	Yes
Section 41	Fugitive Dust	Yes	Yes
Section 42	Open Burning	Yes	Yes
Section 43	Odors in the Ambient Air	No	Yes
Section 52	Gasoline Dispensing Facilities	No, repealed 4/19/11	No
Section 70	Emergency Procedures	Yes	Yes
Section 80	Circumvention	Yes	Yes
Section 81	Provisions of Regulations Severable	Yes	Yes
Section 90	Fugitive Dust from Open Areas and Vacant Lots	Yes	Yes

Citation	Title	SIP Approved	Applicable
Section 91	Fugitive Dust from Unpaved Road, Unpaved Alleys, and Unpaved Easement Roads	Yes	Yes
Section 92	Fugitive Dust from Unpaved Parking Lots and Storage Areas	Yes	Yes
Section 93	Fugitive Dust from Paved Roads and Street Sweeping Equipment	Yes	Yes
Section 94	Permitting and Dust Control for Construction Activities	Yes	Yes

Attachment 3

Applicable Federal Requirements

Citation	Title	Applicable
40 CFR Part 52.21	Prevention of Significant Deterioration (PSD)	Yes
40 CFR Part 52.1470	Identification of Plan (SIP Rules)	Yes
40 CFR Part 60, Subpart A	NSPS - General Provisions	Yes
40 CFR Part 60, Subpart Dc	NSPS – Standards of Performance for Small Steam Generating Units	Yes
40 CFR Part 60, Subpart GG	NSPS – Standards of Performance for Stationary Gas Turbines	Yes
40 CFR Part 60, Subpart IIII	NSPS – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines	Yes
40 CFR Part 60, Appendix A	Method 9 or equivalent (opacity)	Yes
40 CFR Part 60, Appendix B	Performance Specifications for NOx, CO, and O ₂ CEMS	Yes
40 CFR Part 60, Appendix F	Quality Assurance Procedures	Yes
40 CFR Part 63, Subpart ZZZZ	NESHAP - Stationary Reciprocating Internal Combustion Engines	Yes
40 CFR Part 63, Subpart CCCCC	NESHAP - Gasoline Dispensing Facilities	Yes
40 CFR Part 70	Federally Mandated Operating Permits	Yes
40 CFR Part 72	Acid Rain Permits Regulation	Yes
40 CFR Part 73	Acid Rain Sulfur Dioxide Allowance System	Yes
40 CFR Part 75	Acid Rain Continuous Emission Monitoring	Yes
40 CFR Part 76	Acid Rain Nitrogen Oxides Emission Reduction Program	Yes
40 CFR Part 77	Excess Emissions	Yes
40 CFR Part 78	Appeal Procedure	Yes
40 CFR Part 82	Protection of Stratospheric Ozone	Yes
40 CFR Part 98	Greenhouse Gas Reporting	Yes