

TECHNICAL SUPPORT DOCUMENT

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

SUBMITTED BY

Las Vegas Cogeneration, LC

for

LAS VEGAS COGENERATION, LP

Part 70 Operating Permit Number: 329

Revision: 1

SIC Code 4931: Electric Cogeneration



Clark County
Department of Air Quality and Environmental Management
Permitting Section

October 2010

EXECUTIVE SUMMARY

Las Vegas Cogeneration Limited Partnership (LVC) is a major source for NO_x, a synthetic minor source for PM₁₀, and a minor source for CO, SO_x, VOC, and HAP. The source is under SIC 4931: Electric Cogeneration (NAICS 221112: Fossil Fuel Electric Power Generation) and is located on 1701 East Alexander Road in North Las Vegas, Nevada, in the Las Vegas Valley airshed, hydrographic basin 212 (T20S, R61E, Section 11). Hydrographic basin 212 is nonattainment for CO, PM₁₀, and ozone, and attainment for all other regulated air pollutants.

The LVC operates five Turbine Generator Packages with GE LM-6000 stationary combustion turbines, one with a heat recovery steam generator (HRSG) and four with once-through steam generators (OTSG). There is no supplemental firing (no duct burners). There are also two auxiliary boilers that are used to heat thermal storage tanks at the adjacent greenhouse. There are no emissions associated with the HRSG and OTSG units or the steam turbine itself. In addition, the LVC operates two cooling towers, a fire pump, and an emergency generator. The potential emissions for the source are shown in Table 1:

Table 1: Maximum Source PTE (tons per year)

PM ₁₀	NO _x	CO	SO _x	VOC	HAP	NH ₃
68.89	101.39	55.60	6.10	40.14	9.19	110.33

The Clark County Department of Air Quality and Environmental Management (DAQEM) has delegated authority to implement the requirements of the Part 70 Operating Permit (OP) program. The LVC emits particulate matter (PM₁₀), carbon monoxide (CO), oxides of nitrogen (NO_x), oxides of sulfur (SO_x), volatile organic compounds (VOCs), and hazardous air pollutants (HAP).

The initial Part 70 OP was issued on November 11, 2006, and ATC/OP Modification 3, Revision 5, was issued on May 20, 2009. DAQEM received the application for the Part 70 OP revision on June 7, 2010. Based on the information submitted by the applicant and a technical review performed by the DAQEM staff, the DAQEM proposes a minor revision of the Part 70 OP issued to LVC.

This Technical Support Document (TSD) accompanies the proposed Part 70 Operating Permit for Las Vegas Cogeneration, LP.

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I. SOURCE INFORMATION

A. General

Permittee	Las Vegas Cogeneration Limited Partnership
Mailing Address	1701 East Alexander Road, North Las Vegas, Nevada 89030
Contacts	Jeffrey Pangle, Plant Manager
Phone Number	(702) 642-0331
Fax Number	(702) 642-8738
Source Location	1701 East Alexander Road, North Las Vegas, NV 89030
Hydrographic Area	212
Township, Range, Section	T20S, R61E, Section 11
SIC Code	4931: Electric Services (fossil fuel power generation)
NAICS Code	221112: Fossil Fuel Electric Power Generation

B. Description of Process

Las Vegas Cogeneration (LVC) is located at 1701 East Alexander Road in North Las Vegas, Nevada, in the Las Vegas Valley airshed, hydrographic basin 212. Hydrographic basin 212 is nonattainment for CO, PM₁₀, and ozone, and attainment for all other regulated air pollutants.

LVC operates five General Electric (GE) Turbine Generator Packages one with a heat recovery steam generators (HRSG) and four with once-through steam generators (OTSG) and no supplemental firing (no duct burners). There are also two auxiliary boilers that are used to boost thermal storage tanks for a greenhouse. There are no emissions associated with the HRSG and OTSG units or the steam turbine itself. In addition, the LVC operates two cooling towers, a fire pump, and a diesel fired emergency generator. LVC is a major source for NO_x, synthetic minor for PM₁₀ and minor for CO, SO_x, VOC and HAP. The Permittee has taken voluntary operation limitations on various emission units and therefore the source is synthetic minor for PM₁₀ emissions.

In the combustion turbine generators (CTG) 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 stationary gas turbine sections of the CTG. The rotating mechanical energy is converted into electrical energy via a shaft on each CTG connected to an electrical generator. The high temperature, pressurized gas produced by the combustion expands through the turbine blades, driving the electric generator and the compressor.

Exhaust gas (thermal energy) from the turbine is directed through internally insulated ductwork to the HRSG and OTSG. The HRSG and OTSG transfer heat from exhaust gasses of the turbine to feed water to produce steam for the steam turbine. The rotating mechanical energy generated by the steam turbine will be converted into electrical energy via a shaft connected to an electrical generator. The exhaust gases will exit to the atmosphere after leaving the HRSG and OTSG, having already passed through an oxidation catalyst for CO and VOC control and selective catalytic reduction (SCR) system for NO_x control. Power cycle heat rejection is accomplished with a cooling tower.

The GEA Thermo cooling tower (EUs: A02a and A02b) is a two-cell counter-flow, mechanical draft unit. Two pumps, each rated at 7,100 gallons per minute, pump approximately 14,200 gallons per minute through the cells enabling the unit to handle a heat load of 135 MMBtu/hr. The tower is 60 feet long, 34 feet wide and 25 feet tall. The high efficiency mist eliminators limit drift losses to 0.005 percent.

The GEA Thermo cooling tower (EUs: A07a through A07j) is a ten-cell mechanical draft tower with a circulation rate of 5,861 gallons per minute per cell or 58,610 gallons per minute total. Total dissolved solids will be limited to 3,000 ppm with operation allowed 8,760 hours annually. The tower is fitted with high efficiency mist eliminators rated at 0.001 percent.

There is also a 10,000-gallon aqueous ammonia tank on-site limited to 20,000 pounds of NH₃ (63,648 pounds of 31% NH₃ solution) at any one time. A 30-gallon and a 130-gallon diesel tank store fuel for the fire pump and the emergency diesel generator.

Existing control technology on-site includes SCR, oxidation catalyst and water injection on the turbines, low-NO_x burners on the boilers and high efficiency drift eliminators on the cooling towers.

C. Permitting Action

On June 7, 2010, the LVC submitted application to revise the existing Part 70 OP. This revision corrects the language that identifies several emission units that could be interpreted to identify only the turbine engine, a component of the whole unit, instead of identifying the Turbine Generation Package.

The five turbine/generator units operated at LVC are comprised of a GE LM-6000 natural gas-fired turbine packages and are identified as follows:

- Unit 1 (EU: A01) GE Turbine Generator Package, S/N: 191-170;
- Unit 2 (EU: A03) GE Turbine Generator Package, S/N: 191-334;
- Unit 3 (EU: A04) GE Turbine Generator Package, S/N: 191-336;
- Unit 4 (EU: A05) GE Turbine Generator Package, S/N: 185-163;
- Unit 5 (EU: A06) GE Turbine Generator Package, S/N: 185-160.

Each of the five identical GE Turbine Generator Packages (EUs: A01 and A03 through A06) are comprised of the following components and systems:

- a. 1-Generator assembly
- b. 1-Gas turbine assembly
- c. 1-Ignition exciter system
- d. 1-Air inlet silencer/Filter house
- e. 1-Gas fuel flow metering system
- f. 1-Water injection metering system
- g. 2-Turbine ventilation fans
- h. 2-Generator ventilation fans
- i. 1-Hydraulic starter
- j. 1-Generator lubricating oil system
- k. 1-Gas turbine lubricating oil system
- l. 1-Fire protection system

Turbines are inspected externally daily and internally every few months. The turbine high pressure (HP) and low pressure (LP) shafts spin at 10,000 and 3,600 rpm respectively. The LP shaft is coupled with an electric generator that produces about 44 MW. During normal life of the turbine, large amounts of water and fuel that run through a turbine cause erosion and stress to hot path parts. This normal wear is monitored with periodic internal inspections that could reveal potential problems. Due to the size, design, and complexity of turbines the equipment manufacturer requires worn and damaged parts to be sent to depots for repairs or replacement. A similar maintenance practice is followed at other electricity generating facilities that utilize the same gas turbine technology.

The turbines require periodic maintenance in response to specific operational needs. For instance, the pipeline quality natural gas used to power turbines, while cleaned prior to combustion, contains impurities that can cause premature damage to the internal parts. Water used for control of NO_x can cause metal fatigue and corrosion. These operational conditions require the turbines to be periodically sent to the approved repair depot for maintenance. GE LM-6000 turbines are designed to have 30-year lifetime expectancy. In order to achieve this life expectancy LVC must follow a RMRR protocol.

LVC intends to utilize the routine maintenance, repair, and replacement (RMRR) language for each of the turbine package component replacement of parts at the LVC facility. The source states that package component exchange is not a physical or operational modification that would trigger requirements of the New Source Review (NSR). The source determination is based on the five factor-analysis for determining RMRR as articulated in WEPCO decision [Wis. Elec. Power Co. vs. Reilly, 893 F.2d 901, 910 (7th Cir, 1990)]. The five factors are addressed both from the perspective of LVC and the entire electric generation industry.

The five RMRR factors are nature, extent, purpose, frequency, and cost of the activity. Generally, RMRR refers to activities which are undertaken on a prescribed or regular schedule, limited in scope and expense. RMRR does not include activities that are infrequent, large in scope, extend the life of the facility, or result in the regaining of lost capacity or availability. To qualify for the RMRR exclusion, the "package component replacement" must be "functionally equivalent" to the replaced unit. The U.S. EPA defines "functionally equivalent" as any item that identical to the existing component or serves the same purpose or function as the replaced component.

Application of the five RMRR factors is analyzed for LVC:

1. **Nature:** The package component replacement involves the routine repair of a few components and will not be significantly different from other incremental maintenance and repairs of the unit. The purpose of the maintenance and repair activity is to ensure the design operating parameters of the technology are maintained throughout the life expectancy of the package. The package components will be replaced with identical or functionally equivalent components that serve the same purpose as the replaced component.
2. **Extent:** The RMRR activities will not enhance the present efficiency of the plant and will not provide any additional generation capacity at the LVC. The RMRR activity will not alter the basic design parameters of the gas turbine, but will maintain the design parameters over the life expectancy. The RMRR or package component replacement

- will not cause the gas turbine to exceed any legally enforceable permitted emission or operational limits. The capacity of the gas turbine remains the same after the RMRR.
3. **Purpose:** The RMRR activity will not extend the plant’s useful economic life. The RMRR is required to maintain the plant’s useful economic life. The maintenance is routine and necessary in order maintain turbine design parameters and does not constitute “life extension” for the units. These activities will ensure that the plant maintains design parameters to meet the original design life expectancy. In the WEPCO ruling, the court recognized the need for some repairs in order to maintain the life expectancy of the plant.
 4. **Frequency:** The activity is performed when the repairs are required as determined by routine inspection. The routine inspection can occur as often as daily to every few months.
 5. **Cost:** The fixed capital cost of the replacement component, plus the cost of any repair and maintenance is well below 50 percent of the replacement value of the emission unit.

The RMRR activity is considered part of normal operations of the facility and will not result in extension of the plant’s life, net increase of emissions, or increase of electrical generation capacity. Since the operational capacity and package components are the same before and after RMRR, the turbine components are considered a single part of the emission unit which also includes the air pollution equipment (SCR and CO catalyst), electrical generator, ammonia injection system as well as other support equipment. When a package component is repaired at the depot, not all the parts are replaced. Rather, only certain package parts are replaced with identical or functionally equivalent components.

Since the plant activities are not “modifications” or “reconstructions”, and are classified under the clear meaning and intent of RMRR as determined with application of the five factors analysis. DAQEM concludes that the use of identical package replacement components satisfies the RMRR exclusion under the NSR program.

On September 8, 2010, the LVC submitted request to correct the discrepancies in the Part 70 OP regarding equipment identification noted during DAQEM compliance inspection. The source requested that DAQEM revise the Part 70 OP List of EUs to reflect the equipment information detailed in Table II-C-1.

Table II-C-1: List of EUs and Specifications

EU	Description	Manufacturer	Model #	Serial #	Specifications
A02	2-Cell mechanical draft Cooling Tower	GEA	TD-3630-2-2422CF	A02	14,200 gpm, 0.005% drift loss
A07	10-Cell mechanical draft Cooling Tower	GEA	363028-10I-22-WCF	A07	58,610 gpm, 0.001% drift loss
B01	Hot Water Boiler	Volcano	BF-400L	656-E	13.39 MMBtu/hr
B02	Hot Water Boiler	Volcano	BF-400L	657-E	13.39 MMBtu/hr
C01	Diesel Fire Pump	Caterpillar	3208	90N74714	121 HP
C02	Diesel Emergency Generator	Generac	95A00971S	2019062	6.4 Liter Engine 125 kW
D01	Aqueous Ammonia Storage Tank	Trusco Tank	N/A	F93726	10,085 gal

Additionally, LVC requested adding the following equipment to the Part 70 OP:

Description	Manufacturer	Model	Serial Number	Specifications
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Parts Washer	R&D	E200	8021963	30 gal
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The two boilers (EU: B01 and B02) were originally permitted for 700 hours/year and the PTE was estimated based on the limited hours of operation. However, the 700 hrs/yr limit was never identified in the production limit. ATC/OP Modification 3, Revision 2, issued on September 21, 2007, identified and corrected this deficiency. This Title V renewal incorporates this limit of hours of operation as a condition under production limitation.

The two boilers (EU: B01 and B02) are required to perform the burner efficiency test only once a year because of the operational restriction below the 2,000 hrs/year which would otherwise require burner efficiency test twice a year. This is in consistence with the AQR Section 49 requirement existed at the time of ATC/OP Modification 3, Revision 2.

During this Title V renewal action, it was noted that the two boilers (EU: B01 and B02) emissions limits (lbs/hr and tons/year) were not consistent with the CO ppm limit specified in the permit. After discussion with the source, it was concluded that the CO emission limit in ppm shall be corrected in order to be consistent. Therefore, the CO ppm emission limit has been changed from 400 ppm to 250 ppm.

D. Operating Scenario

The LVC is permitted to operate the GE turbine generators up to 8,760 hours per year (EUs: A01 and A03 through A06). The operation of each of the boilers is limited to 700 hours per year (EUs: B01 and B02). The diesel fire pump (EU: C01) may operate up to 100 hours per year for testing and maintenance purposes only and emergency use is limited to 500 hours per year. The emergency standby diesel generator (EU: D01) is limited to 100 hours per year for testing and maintenance and emergency use is limited to 500 hours per year. The maximum water flow of the cooling tower (EUs: A02) is limited to 14,200 gallons per minute. The maximum water flow of the GEA cooling tower (EUs: A07) is limited to 58,610 gallons per minute.

The replacement of GE LM-6000 natural gas-fired turbines in five turbine/generator units at LVC will be performed from a specific exchange pool of LM-6000 turbines. A location of each turbine in the pool with corresponding serial number is listed in Table I-D-1.

Table I-D-1: Location of GE LM-6000 exchange pool turbines

EU	Current Location	Serial No.
A01	GE Turbine Generator Package Unit 1	191-170
A03	GE Turbine Generator Package Unit 2	191-334
A04	GE Turbine Generator Package Unit 3	191-336
A05	GE Turbine Generator Package Unit 4	185-163
A06	GE Turbine Generator Package Unit 5	185-160
---	Spare turbine	191-350
---	Spare turbine	191-256
---	Spare turbine	191-213
---	Spare turbine	191-157
---	Spare turbine	191-225
---	Spare turbine	191-229
---	Spare turbine	191-145
---	Spare turbine	191-232
---	Spare turbine	191-230
---	Spare turbine	191-192

EU	Current Location	Serial No.
---	Spare turbine	191-324

BACT/LAER analyses for all emission units have already been completed and are unaffected by this permitting action. The summary of control technologies is presented in Table I-D-2.

Table I-D-2: Source BACT Determination

EU	Description	Control Technology
A01	GE Turbine Generator Package Unit 1 - GE LM-6000 turbine; 397 (LHV) MMBtu/hr; natural gas only; no supplemental firing; 44 MW	SCR, dry low-NO _x burners, oxidation catalyst, water injection, natural gas combustion, inlet air filters
A02	GEA Thermo 2-cell mechanical draft cooling tower; 14,200 gpm	3,000 ppm TDS, 0.005% drift loss
A03 - A06	GE Turbine Generator Package Units 2 through 5 -GE LM-6000 turbine; 451 MMBtu/hr (HHV); natural gas only; no supplemental firing; 44 MW each	SCR, dry low-NO _x burners, oxidation catalyst, water injection, natural gas combustion, inlet air filters
A07	GEA 10-cell mechanical draft cooling tower, 58,610 gpm	3,000 ppm TDS, 0.001% drift loss
B01 and B02	IBW 13.39 MMBtu/hr boiler	Low-NO _x burners, natural gas combustion
C01	Diesel fire pump; 121 hp	Timing retard, turbocharging, aftercooling, low sulfur diesel
D01	Emergency diesel generator; 125 kW	Timing retard, turbocharging, aftercooling, low sulfur diesel

E. Proposed Exemptions

There are no exemptions.

II. EMISSIONS INFORMATION

A. Source-wide Potential to Emit

1. Las Vegas Cogeneration, LP is a major source for NO_x, a synthetic minor source for PM₁₀ and a minor source for CO, SO_x, VOC, and HAP.

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

Pollutant	PM ₁₀	NO _x	CO	SO _x	VOC	HAP	NH ₃
Source Total	68.89	101.39	55.60	6.10	40.14	9.10	110.33
Major Source Threshold	70	50	100	100	50	25/10 ¹	1.0

¹25 tons for combination of all HAPs (no single HAP exceeds 10 tons)

B. Emission Units and PTE

Table II-B-1: List of Emission Units

EU	Description	Rating	Make	Model #	Serial #
A01	Turbine Generator Package Unit 1, Natural Gas-fired; SCR and Oxidation Catalyst	397 MMBtu/hr; 44 MW	General Electric	LM-6000	191-170

EU	Description	Rating	Make	Model #	Serial #
A02	Two-cell mechanical draft cooling tower, 3,000 ppm TDS, 0.005% drift loss, Cell 1	14,200 gpm total	GEA Thermo	N/A	N/A
A03	Turbine Generator Package Unit 2, Natural Gas-fired; SCR and Oxidation Catalyst	451 MMBtu/hr; 44 MW	General Electric	LM-6000	191-334
A04	Turbine Generator Package Unit 3, Natural Gas-fired; SCR and Oxidation Catalyst	451 MMBtu/hr; 44 MW	General Electric	LM-6000	191-336
A05	Turbine Generator Package Unit 4, Natural Gas-fired; SCR and Oxidation Catalyst	451 MMBtu/hr; 44 MW	General Electric	LM-6000	185-163
A06	Turbine Generator Package Unit 5, Natural Gas-fired; SCR and Oxidation Catalyst	451 MMBtu/hr; 44 MW	General Electric	LM-6000	185-160
A07	10-cell mechanical draft cooling tower, 3,000 ppm TDS, 0.001% drift loss; Cell 1	58,610 gpm total	GEA	N/A	N/A
B01	Hot Water Boiler	13.39 MMBtu/hr	IBW	BF-400L	656-E
B02	Hot Water Boiler	13.39 MMBtu/hr	IBW	BF-400L	657-E
C01	Diesel Fire Pump	121 hp	Caterpillar	3208NA-175	90N74714
D01	Diesel Emergency Standby Generator	163 hp	Caterpillar	95A00971-a	2019062
D02	Aqueous Ammonia Storage and Injection	10,000-gal storage tank	N/A	N/A	N/A

The following units or activities are present at this source. The emissions from these units or activities, when added to the PTE of the source presented in Table II-B-1, will not make any pollutant major for this source.

Table II-B-2: Insignificant Units or Activities

Emission Unit Description
Parts Washer, R&D Model E200, S/N: 8021963, 30 gallons

The emission rates at different ambient temperatures for Turbine Units 2 through 5 (EUs: A03 through A06) are shown in Table 3.

Table II-B-3: Turbine Stack Gas Parameters and Emission Rates

Ambient Temperature (°F)	115	66	36
Stack O ₂ (%)	15.07	14.84	14.72
Exhaust Flow (dscfm)	194,276	203,862	210,182
NO _x (ppm)	1.98	2.05	2.09
CO (ppm)	1.98	2.05	2.09
NH ₃ (ppm)	9.88	10.27	10.47
NO _x (lbs/hour)	2.75	3.00	3.15
CO (lbs/hour)	1.67	1.83	1.92
NH ₃ (lbs/hour)	5.08	5.54	5.83
NO _x (tons/year)	12.05	13.14	13.81
CO (tons/year)	7.33	8.00	8.41

Ambient Temperature (°F)	115	66	36
NH ₃ (tons/year)	22.26	24.28	25.53

For purposes of calculating potential short-term emissions, the 36°F ambient scenario was used to approximate worst case conditions as well as maximum exhaust flow rates and stack oxygen contents. The 66°F ambient scenario was used to approximate the annual emissions, while the 115°F ambient scenario was used to illustrate potential emission during summertime conditions. The hourly emission rates were calculated according to the proposed emission limitations using the equation below:

$$PTE \frac{\text{lbs}}{\text{hr}} = \frac{(C_{\text{ppm}})(Q)(MW) \left(60 \frac{\text{min}}{\text{hr}} \right)}{\left(1 \times 10^6 \right) \left(385.3 \frac{\text{ft}^3}{\text{lb - mole}} \right)}$$

Where:

C_{ppm} = Pollutant concentration, ppm

Q = Exhaust gas flow rate, dscfm

MW = Pollutant Molecular Weight, lb/lb-mole

Table II-B-4: Source PTE, Including Startup and Shutdowns (tons per rolling 12-months)¹

EU	PM ₁₀	NO _x	CO	SO _x	VOC	HAP	NH ₃
A01	7.70	48.00	22.00	0.80	5.00	1.83	13.20
A02	4.66	0.00	0.00	0.00	0.00	0.00	0.00
A03	10.95	13.14	8.00	1.31	8.76	1.83	24.28
A04	10.95	13.14	8.00	1.31	8.76	1.83	24.28
A05	10.95	13.14	8.00	1.31	8.76	1.83	24.28
A06	10.95	13.14	8.00	1.31	8.76	1.83	24.28
A07	12.61	0.00	0.00	0.00	0.00	0.00	0.00
B01	0.04	0.18	0.75	0.01	0.03	0.01	0.00
B02	0.04	0.18	0.75	0.01	0.03	0.01	0.00
C01	0.01	0.11	0.02	0.01	0.01	0.01	0.00
D01	0.03	0.36	0.08	0.03	0.03	0.01	0.00
D02 ²	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Total	68.89	101.39	55.60	6.10	40.14	9.19	110.33

¹ Annual limits are based upon 66 °F. Annual start-up and shut-down emissions are included.

² Sealed system, only fugitive ammonia emissions are included.

Table II-B-5: Source PTE, Excluding Startup and Shutdowns (lbs/hr)¹

EU	PM ₁₀	NO _x	CO	SO _x	VOC	HAP	NH ₃
A01	3.00	14.00	9.00	0.30	2.00	0.48	5.00
A02	1.06	0.00	0.00	0.00	0.00	0.00	0.00
A03	2.50	3.15	1.92	0.30	2.00	0.48	5.83
A04	2.50	3.15	1.92	0.30	2.00	0.48	5.83
A05	2.50	3.15	1.92	0.30	2.00	0.48	5.83
A06	2.50	3.15	1.92	0.30	2.00	0.48	5.83
A07	2.88	0.00	0.00	0.00	0.00	0.00	0.00
B01	0.10	0.50	2.52	0.01	0.07	0.03	0.00
B02	0.10	0.50	2.52	0.01	0.07	0.03	0.00
C01	0.20	2.81	0.61	0.19	0.23	0.01	0.00
D01	0.34	4.78	1.04	0.32	0.38	0.01	0.00

EU	PM ₁₀	NO _x	CO	SO _x	VOC	HAP	NH ₃
D02 ²	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Total	17.68	35.19	23.37	2.03	10.75	2.48	28.33

¹ Hourly limits are based on 36 F. Annual limits are based upon 66 F. Annual start-up and shut-down emissions are included.

Facility HAP emissions shall be calculated based upon fuel consumption of the emission unit. HAP emissions for each diesel engine are established at less than 0.01 tons per year. Cumulative turbine emissions have been calculated at 9.08 tons per year. No single HAP exceeds ten tons per year nor do HAPs aggregate to more than 25 tons per year. MACT, therefore, does not apply to this facility.

Table II-B-6: Turbine HAP PTE¹

Substance	Lbs/hr per Turbine	Lbs/hr Cumulative	Tons/yr per Turbine	Tons/yr Cumulative
Acetaldehyde	0.02	0.09	0.07	0.36
Acrolein	0.01	0.01	0.01	0.05
Benzene	0.01	0.03	0.02	0.11
Ethylbenzene	0.01	0.07	0.06	0.29
Formaldehyde	0.32	1.60	1.29	6.47
Naphthalene	0.01	0.01	0.01	0.01
PAH	0.01	0.01	0.01	0.02
Toluene	0.06	0.29	0.24	1.19
Xylene	0.03	0.14	0.12	0.58
Turbines total	0.48	2.25	1.83	9.08

¹ Emission Factors from AP-42, Section 3.1, Table 3.1-3 Rev. 4/2000. PTE are based on maximum combustion of 451 MMBtu/hr and average of 8,760 hr/year of operation for turbine 1 (EU: A01) and 7,920 hr/year of operation for each of turbines 2 through 5 (EUs: A03 through A06).

Table II-B-7: Enforceable Emissions Limitations (ppmvd)

EU	Description	NO _x	CO	NH ₃
A01 ¹	Turbine Unit 1 w/ SCR	10	10	10
A03 ¹	Turbine Unit 2 w/ SCR	2.0	2.0	10
A04 ¹	Turbine Unit 3 w/ SCR	2.0	2.0	10
A05 ¹	Turbine Unit 4 w/ SCR	2.0	2.0	10
A06 ¹	Turbine Unit 5 w/ SCR	2.0	2.0	10
B01 ²	IBW Boiler w/ DLN	30	250	N/A
B02 ²	IBW Boiler w/ DLN	30	250	N/A

¹ Limitations in ppmvd @ 15 percent O₂.

² Limitations in ppmvd @ 3 percent O₂ (Section 49).

Table II-B-7: Startup/Shutdown PTE (lbs/hr) per Turbine Units 2 through 5

Pollutant	Startup (Per Turbine)	Shutdown (Per Turbine)
NO _x	9.6	3.2
CO	5.7	1.9
VOC	6.0	2.0

Note: These emissions are included in the emission unit and source PTEs in Table 4.

Start-up and shut-down emissions, as recorded by the CEMS for NO_x pounds per hour and CO pounds per hour, must be included in the annual emission totals. If CEMS is not available during any start-up or shut-down, the actual emissions shall be calculated in accordance with the values in Table II-B-7. This table has been removed from the permit and placed in the TSD

because the values do not represent limits, but, are used only to calculate emissions for start-up and shut-downs in the absence of the CEMS.

Under no circumstances shall the facility PTE be exceeded for any hourly or annual limitations shown in Table II-B-3 of this document. The annual limits in Table II-B-3 of this document were calculated based on 7,920 hours per year of operation for the Turbine Units 2 through 5 and 8,760 hours per year of operation for the Turbine Unit 1.

C. Testing

Initial performance testing for the turbines was completed on May 14, 2002. Any additional required testing will be performed using the following methods:

Table II-C-1: Performance Testing Requirements (40 CFR 60, Appendix A)

Test Point	Pollutant	Method
Turbine/HRSG/OTSG Exhaust Stack; Auxiliary Boiler Exhaust Stack	NO _x	Chemiluminescence Analyzer (EPA Method 7E, Method 20)
Turbine/HRSG/OTSG Exhaust Stack; Auxiliary Boiler Exhaust Stack	CO	EPA Method 10
Turbine/HRSG/OTSG Exhaust Stack	VOC	EPA Method 25A
Turbine/HRSG/OTSG Exhaust Stack	NH ₃ slip	Method pre-approved by DAQEM/EPA
Turbine/HRSG/OTSG Exhaust Stack	PM ₁₀	EPA Method 201/202 or 201A/202
Turbine/HRSG/OTSG Exhaust Stack; Auxiliary Boiler Exhaust Stack	Opacity	EPA Method 9
Stack Gas Parameters	---	EPA Method 1, 2, 3, 4, or 9

Annual Relative Accuracy Test Audits (RATA) testing must be performed on each NO_x, CO, and O₂ CEMS.

All performance tests on the turbine units must conform to 40 CFR 60 Subparts A and GG for all turbine sources and 40 CFR 75 for Turbine Unit 1 through Turbine Unit 5 (EUs: A01 and A03 through A06). All performance tests on the two boilers (EUs: B01 and B02) must conform to AQR Section 49.

D. Continuous Emissions Monitoring

To demonstrate continuous, direct compliance with the emission limitations for NO_x, CO, and NH₃ the LVC shall install, calibrate, maintain, operate, and certify Continuous Emissions Monitoring Systems (CEMS) on Turbine Units 1 through 5 (EUs: A01 and A03 through A06). The system shall include an automated data acquisition and handling system. Regulatory requirements of the CEMS are presented in the Tables II-D-1 through II-D-3:

Table II-D-1: 40 CFR 60 Subpart GG Combustion Turbines

Pollutant	Regulation	CEMS Description
NO _x ^{1,2}	60.332	NO _x ppm corrected to 15% Oxygen
SO ₂ ²	60.333	None – only routine fuel sampling (variable frequency)

¹ Units 1 through 5 (EUs: A01 and A03 through A06) currently operate a CEMS for NO_x (ppm corrected to 15% Oxygen) as an option to monitoring Water/Fuel Ratio.

² As allowed under 40CFR60 Subpart GG, units 1 through 5 (EUs: A01 and A03 through A06) currently maintain CEMS QA requirements under 40CFR75.

Table II-D-2: 40 CFR 75 Combustion Turbine Generators

Pollutant	Regulation	CEMS Description
Opacity	75.14	None (Gas Fired Exemption)
Hg	75.80	None (Gas Fired Exemption)
NO _x	75.12	NO _x lb/mmBtu ¹ (Peaking Units & LME – No CEMS)
CO ₂	75.13	And Flow (scfh)(Use Optional App D Flow Meter) And CO ₂ (tons/hr) (Use Optional Oxygen Analyzer)
SO ₂	75.11	None – only routine fuel sampling (App D)(Gas Fired)

¹ Units 1 through 5 (EUs: A01 and A03 through A06) currently operate a NO_x lb/MMBtu CEMS as an option to LME for NO_x..

Table II-D-3: Clark County AQR Combustion Turbines

Pollutant	Regulation	CEMS Description
NO _x	AQR	NO _x ppm corrected to 15% Oxygen ¹
		NO _x lb/hr ²
CO	AQR	CO ppm corrected to 15% Oxygen ³
		CO lb/hr ⁴
NH ₃	AQR	PEMS per DAQEM Approved Methods

¹ Units 1 through 5 (EUs: A01 and A03 through A06) must maintain NO_x ppm corrected to 15% Oxygen CEMS QA requirements as required under 40CFR75.

² Units 1 through 5 (EUs: A01 and A03 through A06) must maintain NO_x lb/hr CEMS using QA requirements as required under 40CFR75 for NO_x lb/MMBtu and Fuel Flow meter (App D).

³ Units 1 through 5 (EUs: A01 and A03 through A06) must maintain CO ppm corrected to 15% Oxygen CEMS using QA requirements as required under 40CFR60 App F except that this CEMS may conduct linearity instead of CGAs and may follow QA timing and range requirements as per 40CFR75 App B in order to coordinate QA with other CEMS.

⁴ Units 1 through 5 (EUs: A01 and A03 through A06) must maintain CO lb/hr CEMS using QA requirements as required under 40CFR60 App F except that this CEMS may conduct linearity instead of CGAs and may follow QA timing and range requirements as per 40CFR75 App B in order to coordinate QA with other CEMS and must maintain Fuel Flow meter per 40CFR75 App D.

LVC has installed NO_x and CO CEMS on each turbine unit. CEMS installed on Units 1 through 5 (EUs: A01 and A03 through A06) shall demonstrate continued, direct compliance with operational limitations and the three-hour rolling average and annual emissions limitations for CO and NO_x specified in this document. The CEMS shall monitor and record the following parameters for each individual CTG:

1. exhaust gas concentration of NO_x, CO, and diluent O₂, including periods of startup and shutdown;
2. exhaust gas flow rate (by direct or indirect methods);
3. fuel flow rate;
4. hours of operation;
5. three-hour rolling averages for NO_x concentration;
6. one-hour average CO concentration;
7. hourly, daily, and quarterly accumulated mass emissions of NO_x and CO; and
8. hours of downtime for each CEMS.

Excluding start-up or shut-down periods not to exceed 180 minutes per unit for both events, 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.

LVC must also 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 uses two NO_x readings. One NO_x reading is from an analyzer at the selective catalytic reduction (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. The site developed a PEMS formula, based upon the manufacturer's recommendations and verified that formula's accuracy through repeated testing to develop the current ammonia PEMS. The calculation is carried out in the CEMS and stored in the computer that stores the CEMS parameters.

III. REGULATORY REVIEW

A. Local Regulatory Requirements

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

1. Nevada Revised Statutes (NRS), Chapter 445; Sections 401 through 601;
2. 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 16 Operating Permits issued by DAQEM are federally enforceable because these permits were issued pursuant to SIP-included sections of the AQR; and
3. 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 DAQEM 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 19 - Part 70 Operating Permits [Amended 07/01/04] details the Clark County Part 70 Operating Permit Program. These regulations may be accessed on the Internet at: <http://www.accessclarkcounty.com/depts/daqem/aq/rules/pages/regs.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 III-A-1: Source PTE

Pollutant	PM ₁₀	NO _x	CO	SO _x	VOC	HAP	NH ₃
PTE Totals	68.89	101.39	55.60	6.10	40.14	9.19	110.33
Major Source Thresholds	100	100	100	100	100	25¹	1.0

¹25 tons for combination of all HAPs (no single HAP exceeds 10 tons).

Discussion: LVC is a major source of NO_x. As part of the original New Source Review Analysis all of these emissions triggered public Notice. The proposed Title V permit is a minor revision of the existing Title V operating permit and therefore, EPA review is required before issuance.

Table III-A-2: Clark County DAQEM – 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
1. 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
11. Ambient Air Quality Standards	applicable subsections	yes	entire source
12. Preconstruction Review for New or Modified Stationary Sources	All subsections <u>except</u> the following: 12.2.18 HAP Sources in Clark County. 12.2.20 Additional Requirements for STATIONARY SOURCES with Beryllium, Mercury, Vinyl Chloride, or Asbestos EMISSIONS in Clark County	yes	
13. Emission Standards for Hazardous Pollutants	Condition A-37 is the EPA-required standard condition concerning asbestos.	no	entire source
14. New Source Performance Standards	AQR 14.1.15: Subpart Dc - Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units AQR 14.1.56: Subpart GG - Standards of Performance for Gas Turbines	no	Turbines and boilers
16. Operating Permits	all subsections	yes	entire source
17. Dust Control Permit and Construction Activities	all subsections	yes	entire source
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
19. Part 70 OP	19.2 Applicability 19.3 Part 70 Permit Applications 19.4 Part 70 Permit Content 19.5 Permit Issuance, Renewal, Re-openings, and Revisions 19.6 Permit Renewal by the EPA and Affected States 19.7 Fee Determination and Certification	N/A	entire source
20. Emission Standards for Hazardous Air Pollutants for Source Categories	all subsections	yes	Gasoline Dispensing

Applicable Section – Title	Applicable Subsection - Title	SIP	Affected Emission Unit
21. Acid Rain Permits	all subsections	yes	An acid rain permit is required.
22. Acid Rain Continuous Emissions Monitoring	all subsections	yes	An acid rain permit is required.
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 (\leq 20 percent for 3 minutes in a 60-minute period)	yes	entire source
28. Fuel Burning Equipment	Emission Limitations for PM	yes	entire source
29. Sulfur Contents of Fuel Oil	Sulfur content shall be equal to or less than 0.05 percent sulfur by weight	no	Diesel Engines
35. Diesel Engine Powered Electrical Generating Equipment	all subsections	yes	The Part 70 OP limits use of the emergency generator to testing, maintenance, and emergencies, and prohibits its use for dispatchable peak shaving.
40. Prohibitions of Nuisance Conditions	40.1 Prohibitions	no	entire source
41. Fugitive Dust	41.1 Prohibitions	yes	entire source
42. Open Burning	42.2	no	entire source
43. Odors In the Ambient Air	43.1 Prohibitions coded as Section 29	no	entire source
55. Preconstruction Review for New or Modified Stationary Sources in the 8-hour Ozone Nonattainment Area	all subsections	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

AQR SECTION 11 - AMBIENT AIR QUALITY STANDARDS [Amended 07/01/04] (*in part*)

Discussion: Las Vegas Cogeneration is a major source in the Las Vegas Valley hydrographic area. According to Sections 12.2.15.6 and 12.2.16.6, the Control Officer is required to maintain a record of increment-consuming sources for all PSD areas in Clark County. Since minor source baseline dates for NO_x (October 21, 1988) and SO₂ (October 1, 1979) have been

triggered. Since the facility applied for an ATC after the baseline dates were established, PSD increment analysis is required. DAQEM modeled the source using ISCST3 to track the increment consumption.

Permitted units include five turbines, two cooling towers, two boilers, one fire pump and one generator. All emission units except the cooling towers were modeled for NO_x and SO₂ increment consumption.

Stack data submitted by the applicant was supplemented by information available for similar emission units. Five years (1985 to 1989) of meteorological data from the McCarran Station and Desert Rock Station were used in the model. USGS 7.5-minute DEM terrain data was obtained from the internet (webgis.com) and used in the model to calculate elevations. The following table presents the results of the modeling.

Table III-A-3: 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	31.282 ¹	668933,	4011047
SO ₂	24-hour	9.736 ¹	668933,	4011047
SO ₂	Annual	0.117	668933,	4011047
NO _x	Annual	0.624	668933,	4011047

¹Modeled 2nd High Concentration

The above table shows the location of the maximum impact and the PSD increment consumed by the source at that location.

B. Federally Applicable Regulations

1. Clean Air Act, as amended (CAAA), Authority: 42 U.S.C. 40 CFR 7401, et seq.;
2. Title 40 of the Code of Federal Regulations (CFR); including Part 70 and others;

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

Subpart A - General Provisions

40 CFR 60.7 - Notification and record keeping.

Discussion: This regulation requires notification to DAQEM 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. DAQEM 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. DAQEM requirements for initial performance testing are identical to 40 CFR 60.8. DAQEM also requires periodic performance testing on emission units based upon throughput or usage.

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 obscuration except for six (6) minutes in any 60-minute period. LVC shall operate in a manner consistent with this section of the regulation.

40 CFR 60.12 – Circumvention.

Discussion: This prohibition is addressed in the Part 70 OP. This is also AQR Section 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. The 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.

Subpart GG - Standards of Performance for Stationary Gas Turbines

40 CFR 60.330 - Applicability and designation of affected facility.

Discussion: Turbine Unit 1 (EU: A01) began construction in the late 1980s. The four newer combined-cycle turbines (EUs: A03 through A06) began construction in 2000. The maximum heat input rating of each of the five the turbine units, based on the lower heating value of the natural gas fuel, is above the 10-MMBtu per hour threshold. Subpart GG applies to the five (5) turbines at this source.

40 CFR 60.332 - Standard for nitrogen oxides.

Discussion: The NSPS NO_x emission standard is calculated with a heat rate of 1.0548 kJ/Btu. Assuming that there are 8.29 Btu/Wh, the value of Y in this equation is 8.74 kJ/Wh. Because the facility uses natural gas, the F factor is zero.

Therefore:

$$\text{NO}_x \text{ emission standard} = 0.0075 (14.4 / Y) + F$$

$$0.0075 \times 14.4 / 8.74 + 0 = 0.0124 \text{ percent by volume at 15 percent oxygen}$$

$$0.0124 \text{ volume\%} \times (10,000 \text{ ppm/volume\%}) = 124 \text{ ppmv NO}_x \text{ at 15 percent oxygen}$$

LVC shall comply with this standard.

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 (8000 ppmw) satisfies this requirement. The sulfur is limited to 0.75 grains per 100 dry standard cubic feet.

40 CFR 60.334 - Monitoring of operations.

Discussion: Sulfur content shall be verified annually and based on data from the gas supplier. 40 CFR 60.334 (h)(3)(i) also allows the site to maintain a current Tariff document from the gas supplier to satisfy the requirements of sulfur sampling.

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.

Subpart Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

40 CFR 60.40c – Applicability and delegation of authority.

Discussion: Subpart Dc applies to the two (2) IBW 13.39 MMBtu/hr boilers (EUs: B01 and B02) as the facility was built after 1989. Records of fuel usage are required.

40 CFR 60, Subpart III – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

40 CFR 60.4200 – Applicability Determination

Discussion: The provisions of this subpart are applicable to manufacturers, owners, and operators of stationary compression ignition (CI) internal combustion engines (ICE) with a displacement less than 30 liters per cylinder where the model year is 2007 or later, for engines that are not fire pumps, and July 1, 2006, for ICE certified by the National Fire Protection Association as fire pump engines. This subpart does not apply.

Subpart KKKK - Standards of Performance for Stationary Combustion Turbines

40 CFR 60.4305 – Applicability.

Discussion: The five (5) turbines (EUs: A01 and A03 through A06) are not subject to the provisions of this subpart because these turbines commenced construction, modification, or reconstruction before February 18, 2005.

40 CFR 63 – NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR SOURCE CATEGORIES:

Subpart A - General Provisions

40 CFR 63.4 – Prohibited activities and circumvention

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

40 CFR PART 64 - COMPLIANCE ASSURANCE MONITORING

40 CFR 64.2 – Applicability.

Discussion: LVC is major for NO_x. Control devices are used on the combustion turbines (EUs: A01, A03 through A06) for NO_x and CO; therefore, PM₁₀ and NH₃ emissions are not subject to Compliance Assurance Monitoring (CAM). The boilers (EUs: B01 and B02), fire pump (EU: C01) and emergency generator (EU: D01) do not have uncontrolled emission above major source thresholds, so none of these four emission units are subject to CAM. The turbines at LVC are subject to the NO_x emission limits of 40 CFR 60 Subpart GG, which was promulgated in 1979; therefore, the exemption listed in 40 CFR 64.2(b)(1)(i) does not apply. The only acid rain provision that applies to NO_x is Section 407 of the CAA, however the section only applies to coal-fired utility units. Because the turbines at LVC are natural gas-fired, this section of the CAA does not apply and the exemption listed in 40 CFR 64.2(b)(1)(iii) does not apply. However, because the source is required to operate a CEMS to demonstrate compliance with all emissions limitations for NO_x from facility's turbines, the turbines at LVC qualify for the CAM exemption listed in 40 CFR 64.2(b)(vi) for NO_x. The turbines at LVC are subject to the CO emission limits presented in the facility's ATC. There are no promulgated NSPS or DAQEM emission limits; therefore, the exemption listed in 40 CFR 64.2(b)(1)(i) does not apply. Because the source is required to operate a CEMS to demonstrate compliance with all emissions

limitations for CO from facility's turbines, the turbines at LVC qualify for the CAM exemption listed in 40 CFR 64.2(b)(vi) for CO.

40 CFR PART 72 - ACID RAIN PERMITS REGULATION

Subpart A – Acid Rain Program General Provisions

40 CFR 72.6 – Applicability.

Discussion: LVC is defined as a utility unit pursuant to the definitions in Part 72; therefore, the provisions of this regulation apply to Turbine Unit 1 through Turbine Unit 5 (EUs: A01 and A03 through A06).

40 CFR 72.9 – Standard Requirements

Discussion: LVC has applied for all of the proper permits under this regulation. An ORIS Code (#10761) for emission units GE LM-6000 Turbine Unit 1 through 5 (EUs: A01 and A03 through A06) has been obtained. A Certificate of Representation for Designated Representative has been registered.

Subpart B – Designated Representative

LVC has a Certificate of Representation for Designated Representative on file. The source has fulfilled all requirements under this subpart.

Subpart C – Acid Rain Permit Applications

LVC has applied for an acid rain permit.

Subpart D – Acid Rain Compliance Plan and Compliance Options

This subpart discusses the individual requirements necessary for a complete compliance plan. A compliance plan exists for each combustion turbine.

Subpart E – Acid Rain Permit Contents

LVC has applied for an acid rain permit, and it will contain all information to demonstrate compliance with this subpart.

40 CFR PART 73 – ACID RAIN SULFUR DIOXIDE ALLOWANCE SYSTEM

40 CFR 73.2 – Applicability.

Discussion: LVC is a subject of 40 CFR Part 72; therefore, the provisions of this regulation do apply per 40 CFR 73.10.

Subpart B – Allowance Allocations

LVC is not listed on either the Phase I or Phase II tables because it is a newer power plant; therefore, it will not have an initial allocation per 40 CFR 73.10.

Subpart C – Allowance Tracking System

LVC is considered a new unit. A complete certificate of representation has been received and an account has been established for this facility. LVC shall follow all guidelines and instructions presented in this subpart while maintaining its allowance account.

Subpart D – Allowance Transfers

When an allowance transfer is necessary, LVC shall follow all procedures in this subpart.

Subpart E – Auctions, Direct Sales, and Independent Power Producers Written Guarantee
This subpart outlines the auction process for allowance credits.

Subpart F – Energy Conservation and Renewable Energy Reserve

There are no qualified conservation measures or renewable energy generation processes at this facility; therefore, this subpart does not apply.

40 CFR PART 75 - CONTINUOUS EMISSION MONITORING

Discussion: LVC is subject to the Acid Rain emission limitations of 40 CFR Part 72; therefore, the facility is subject to the monitoring requirements of this regulation. Each combined cycle turbine unit has been equipped with both a NO_x CEMS and a diluent oxygen monitor. Each turbine unit is also equipped with a fuel flow monitor. Each turbine unit also has a CO CEMS and a CEMS-equivalent monitoring device to measure ammonia emissions. The data from the CEMS are used to provide quarterly acid rain reports to both EPA and DAQEM. All required monitoring plans, RATA testing protocols, and certification-testing reports have been provided to EPA and DAQEM. Initial CEMS certification testing was completed on April 10, 2003. The CEMS Quality Assurance Plan was approved on January 2, 2002.

IV. COMPLIANCE

A. Compliance Certification

19.3.3.9 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 IV-A-1: Reporting Schedule

Required Report	Applicable Period	Due Date ¹
Semi-annual Report for 1st half of the year.	January, February, March, April, May, June	July 30 each year
Semi-annual Report for 2nd half of the year. Any additional annual records required.	July, August, September, October, November, December	January 30 each year
Annual Compliance Certification Report	12 Months	30 days after the Operating Permit issuance anniversary date
Annual Emission Inventory Report	Calendar Year	March 31 each year
Excess Emission Notification	As Required	Within 24 hours of the onset of the event
Excess Emission Report	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 IV-B-1: Compliance Summary Table - AQR

Citation	Title	Applicability	Applicable Test Method	Compliance Status
AQR Section 0	Definitions.	Applicable – LVC will comply with all applicable definitions as they apply.	LVC will meet all applicable test methods should new definitions apply.	LVC complies with applicable requirements.
AQR Section 4	Control Officer.	Applicable – The Control Officer or his representative may enter into LVC property, with or without prior notice, at any reasonable time for purpose of establishing compliance.	LVC will allow Control Officer to enter Station property as required.	LVC complies with applicable requirements.
AQR Section 11	Ambient Air Quality Standards.	Applicable – LVC is a source of air pollutants.	LVC demonstrated compliance in the ATC permit application with air dispersion modeling.	LVC complies with applicable requirements.
AQR Section 12.1	General application requirements for construction of new and modified sources of air pollution.	Applicable – LVC applied for and the ATC permit was issued before commencing construction.	LVC received the ATC permit to construct.	LVC complies with applicable requirements.
AQR Section 12.2.2	Requirements for specific air pollutants: PM ₁₀ emission source located in the Serious Non-Attainment Area.	Applicable – LVC has PM ₁₀ PTE < 70 TPY.	All new or modified emission units at the LVC will meet LAER requirement.	LVC complies with applicable requirements.
AQR Section 12.2.7	Requirements for specific air pollutants: CO sources located in the Serious Non-Attainment Area.	Applicable – LVC has CO PTE > 70 TPY.	All new or modified emission units at the LVC will meet LAER requirement.	LVC complies with applicable requirements.
AQR Section 12.2.12	Requirements for specific air pollutants: VOC sources located in the VOC Management Area.	Not Applicable – LVC is located in Hydrographic Area 216.	Not Applicable.	Not Applicable.
AQR Section 12.2.14	Requirements for specific air pollutants: NO _x sources located in the NO _x Management Area.	Applicable – LVC has NO _x PTE > 50 TPY.	All new or modified emission units at the LVC will meet BACT requirement.	LVC complies with applicable requirements.

Citation	Title	Applicability	Applicable Test Method	Compliance Status
AQR Section 12.2.16	Requirements for specific air pollutants: SO ₂ sources located in the PSD area.	Applicable – LVC has SO ₂ PTE > 40 TPY.	All new or modified emission units at the LVC will meet BACT requirement.	LVC complies with applicable requirements. Sulfur content of natural gas will not exceed 0.75 grains per 100 dscf (based on 12-month rolling average).
AQR Section 12.2.19	Requirements for specific air pollutants: TCS sources in Clark County	Applicable – LVC does have ammonia (NH ₃) emissions over 100 TPY and NH ₃ was considered a locally regulated TCS. The BACT requirement for NH ₃ is 10 ppm or less for ammonia slip, and acceptable monitoring.	The BACT requirement for NH ₃ is 10 ppm or less NH ₃ slip, and acceptable monitoring. The CTGs/HRSGs meet BACT requirements based on meeting the 10-ppm NH ₃ slip limit with PEMS monitoring.	LVC complies with applicable requirements.
AQR Section 12.5	Air Quality Models	Applicable – Dispersion modeling will be performed as required for any future major modifications.	As applicable, future dispersion modeling will be performed in ATC permit modifications will be in accordance with provisions of 40 CFR Part 51, Appendix W.	LVC complies with applicable requirements.
AQR Section 12.7	Continuous Emission Monitoring (CEM) Systems	Applicable – LVC has NO _x and CO PTE > 100 tpy. NO _x and CO CEMS installed on all stacks and meets provisions of 40 CFR Parts 60 and 75.	LVC submitted all required protocols/test plans per ATC permit prior to CEMS certification. CEMS certification was approved by DAQEM.	LVC complies with applicable requirements.
AQR Section 14.1.1 Subpart A	New Source Performance Standards (NSPS) General Provisions	Applicable – LVC is an affected facility under the regulations. Section 14 is locally enforceable; however, the NSPS standards referenced are federally enforceable.	Applicable monitoring, recordkeeping and reporting requirements.	LVC complies with applicable requirements.
AQR Section 14.1.56 Subpart GG	Standards of Performance for New Stationary Sources (NSPS) – Stationary Gas Turbines	Applicable – The five (5) LVC turbines are natural gas-fired units with heat input greater than 10 MMBtu/hr.	The five (5) turbines meet the applicable NO _x emission standard. NO _x emissions determined by EPA Method 7E.	LVC complies with applicable requirements.
AQR Section 16	DAQEM Operating Permits	Applicable – Any emission unit of stationary source must apply for and obtain a DAQEM operating permit. Station applied for the operating permit from DAQEM.	LVC applied for and received operating permit from DAQEM prior to commercial operation.	LVC complies with applicable requirements.
AQR Section 17	Dust Control Permit for Construction Activities Including Surface Grading and Trenching	Applicable – LVC will need to apply for dust control permit in event construction activity greater than ¼ acre (aggregate) or trench at least 100 ft in length (and aggregate acreage greater than ¼ acre).	LVC applied for permits as needed during initial construction and conformed to required best management practices in dust control permit. LVC will continue to do so in future as needed.	LVC complies with applicable requirements.

Citation	Title	Applicability	Applicable Test Method	Compliance Status
AQR Section 18	Permit and Technical Service Fees	Applicable – LVC will be required to pay all required/applicable permit and technical service fees.	LVC is required to pay all required/applicable permit and technical service fees.	LVC complies with applicable requirements.
AQR Section 12.5	40 CFR Part 70 Operating Permits	Applicable – LVC 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	LVC reviewed the initial Part 70 permit dated January 15, 2003. This renewal application was submitted before June 15, 2007. Applications for new units will be submitted within 12 months of startup.	LVC complies with applicable requirements.
AQR Section 21	Acid Rain Permits	Applicable - LVC is defined as a utility unit pursuant to the definitions in Part 72; therefore, the provisions of this regulation apply to all turbines.	LVC has applied for an acid rain permit, and it will contain all information to demonstrate facility compliance.	LVC complies with applicable requirements.
AQR Section 22	Acid Rain Continuous Emission Monitoring	Applicable - LVC is subject to the acid rain monitoring requirements. Each combined cycle turbine unit has been equipped with both a NO _x CEMS and a diluent oxygen monitor.	All required monitoring plans, RATA testing protocols, and certification-testing reports have been provided to EPA and DAQEM.	LVC 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.	LVC complies with applicable requirements.
AQR Section 26	Emissions of Visible Air Contaminants	Applicable – Opacity for the LVC combustion turbine must not exceed 20 percent for more than six (6) minutes in any 60-minute period.	Compliance determined by EPA Method 9.	LVC complies with applicable requirements.
AQR Section 27	Particulate Matter from Process Weight Rate	Not Applicable.	Not Applicable.	Not Applicable.

Citation	Title	Applicability	Applicable Test Method	Compliance Status
AQR Section 28	Fuel Burning Equipment	Applicable – The PM emission rate for the combustion the turbines and boilers is well below those established based on Section 28 requirements.	Maximum allowable PM emission rate determined from equation in Section 28.	LVC complies with applicable requirements.
AQR Section 29	Sulfur Content of Fuel Oil	Applicable – The diesel fuel that will be burned in the emergency generator engines at the LVC will require low sulfur fuel with sulfur content less than 0.05 percent by weight. Section 29 is locally enforceable only.	Fuel sulfur content verification obtained from fuel oil supplier.	LVC 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.	LVC air contaminant emissions controlled by pollution control devices or good combustion in order not to cause a nuisance.	LVC complies with applicable requirements.
AQR Section 41	Fugitive Dust	Applicable – LVC shall take necessary actions to abate fugitive dust from becoming airborne.	Station utilizes appropriate best practices to not allow airborne fugitive dust.	LVC complies with applicable requirements.
AQR Section 42	Open Burning	Applicable – In event LVC 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.	LVC will contact the DAQEM and obtain approval in advance for applicable burning activities as identified in the rule.	LVC 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.	LVC will not operate its facility in a manner which will cause odors. LVC is a natural gas fired facility and is not expected to cause odors.	LVC complies with applicable requirements.
AQR Section 49	Emission Standards for Boilers and Steam Generators Burning Fossil Fuels	Not Applicable – The LVC the heat recovery steam generators (HRSG) are exempt under Section 49.3.2.	Not Applicable.	Not Applicable.

Citation	Title	Applicability	Applicable Test Method	Compliance Status
AQR Section 70.4	Emergency Procedures	Applicable – LVC submitted an emergency standby plan for reducing or eliminating air pollutant emissions in the Section 16 Operating Permit Application.	LVC submitted an emergency standby plan and received the Section 16 Operating Permit.	LVC complies with applicable requirements.

Table IV-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 – LVC 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.	LVC complies with applicable sections as required by PSD regulations.
40 CFR Part 52.1470	SIP Rules	Applicable – LVC is classified as a Title V source, and SIP rules apply.	Applicable monitoring and record keeping of emissions data.	LVC 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 – LVC is an affected facility under the regulations.	Applicable monitoring, recordkeeping and reporting requirements.	LVC 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 LVC two boilers are natural gas-fired units with heat input greater than 10 MMBtu/hr.	Applicable monitoring, recordkeeping and reporting requirements.	LVC complies with applicable requirements.
40 CFR Part 60, Subpart GG	Standards of Performance for New Stationary Sources (NSPS) – Stationary Gas Turbines	Applicable – The LVC five turbines are natural gas-fired units with heat input greater than 10 MMBtu/hr.	Applicable monitoring, recordkeeping and reporting requirements.	LVC 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.	LVC complies with applicable requirements.
40 CFR Part 64	Compliance Assurance Monitoring	Not Applicable – LVC has CEMS to monitor NO _x and CO emissions, the NH ₃ emissions are continuously monitored with PEMS. LVC is exempt from CAM regulations based on 40 CFR 64.2 (b) (1) (Vi).	LVC continuously monitors NO _x and CO emissions with CEMS. NH ₃ emissions are monitored with PEMS.	LVC complies with applicable requirements.

Citation	Title	Applicability	Applicable Test Method	Compliance Status
40 CFR Part 70	Federally Mandated Operating Permits	Applicable – LVC 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.	LVC reviewed the initial Part 70 permit dated February 29, 2000. The renewal application was submitted on June 18, 2003. Applications for new units will be submitted within 12 months of startup.	LVC complies with applicable requirements.
40 CFR Part 72	Acid Rain Permits Regulation	Applicable – LVC is not exempt from acid rain regulations based on 40 CFR 72.6 (b)(4).	LVC maintains Acid Rain Permit.	LVC complies with applicable requirements.
40 CFR Part 73	Acid Rain Sulfur Dioxide Allowance System	Applicable – LVC is not exempt from acid rain regulations based on 40 CFR 73.2 (a).	LVC verifies SO ₂ allowance with US EPA.	LVC complies with applicable requirements.
40 CFR Part 75	Acid Rain CEMS	Applicable – LVC is exempt from acid rain regulations based on 40 CFR 75.2 (b)(2).	LVC continuously monitors NO _x and CO missions with CEMS.	LVC complies with applicable requirements.
40 CFR Part 82	Protection of Stratospheric Ozone	Applicable – LVC is subject to stratospheric ozone regulations based on 40 CFR 82.4.	LVC does not use stratospheric ozone depleting compounds.	LVC complies with applicable requirements.

C. Summary of Monitoring for Compliance

Table IV-C-1: Compliance Monitoring

EU	Process Description	Monitored Pollutants	Applicable Subsection Title	Requirements	Compliance Monitoring
A01, A03, A04, A05, A06	Combustion turbines	CO, NO _x , SO ₂ , PM ₁₀ , VOC, HAPs, NH ₃	AQR Section 12, Section 19, Section 55 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, A03, A04, A05, A06	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.
A02, A07	Cooling towers	PM ₁₀ ,	AQR Section 12 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
B01, B02	Boilers	CO, NO _x	AQR Section 49 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.
B01, B02	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
C01	Diesel Emergency Generator	SO ₂ , Opacity	AQR Section 26	Opacity shall not exceed 20%, except for 3 min. out of every 60 min. period	Hours of operation, sulfur content of fuel. Additional monitoring per the request of the Control Officer
D01	Diesel Fire Pump	SO ₂ , Opacity	AQR Section 26	Opacity shall not exceed 20%, except for 3 min. out of every 60 min. period	Hours of operation, sulfur content of fuel. Additional monitoring per the request of the Control Officer

V. EMISSION REDUCTION CREDITS (OFFSETS)

The source is not subject to offset requirements in accordance with Section 59 of the Clark County Air Quality Regulations.

VI. ADMINISTRATIVE REQUIREMENTS

Section 19 requires that DAQEM 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 Permit condition.

DAQEM proposes to issue the Part 70 Operating Permit 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:

LVC has supplied all the necessary information for DAQEM to draft Part 70 Operating Permit conditions encompassing all applicable requirements and corresponding compliance.

Conclusion:

DAQEM has determined that LVC 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. DAQEM proceeds with the decision that a Part 70 Operating Permit should be issued as drafted to LVC for a period not to exceed five (5) years.