TECHNICAL SUPPORT DOCUMENT

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

SUBMITTED BY

KERN RIVER GAS TRANSMISSION COMPANY

For

GOODSPRINGS COMPRESSOR STATION

Part 70 Operating Permit Number: 468
SIC Code 4922: Natural Gas Transmission
NAICS Code 486210: Natural Gas Transmission

Clark County
Department of Air Quality
Permitting Section

EXECUTIVE SUMMARY

Kern River Gas Transmission Company's Goodsprings Compressor Station is a major Part 70 source for NO_x and a minor PSD source for PM_{10}, CO, SO_X, VOC and HAP. The source is identified as a major source for GHG as well. The source is categorized under SIC code 4922: Natural Gas Transmission and NAICS code 486210: Natural Gas Transmission. The source is located 1½ Miles Southeast of Goodsprings, NV in North Ivanpah hydrographic area 164A (T25S, R59E, Section 6 and T24S, R59E, Section 31). Hydrographic basin 164A is PSD for all regulated air pollutants.

The source consists of three (3) Mars 100-T15000S 15,000 hp (11.5 MWe) natural gas-fired simple cycle turbines with Solar SoLoNOx burners for the compression of natural gas; one (1) Waukesha natural gas-fired 525 kW emergency generator; one (1) 3.85 MMBtu/hr natural gas-fired Peerless boiler; and associated ancillary equipment. The potential emissions for the facility are shown in the Table 1 below.

Table 1: Source PTE (tons per year)[1]

PM_{10}	$PM_{2.5}$	NO_X	CO	SO_X	VOC	HAP	GHG
10.72	**10.72**	**132.41**	**56.62**	**5.47**	**11.20**	**1.72**	**651,928**

[1] Not a source-wide emission limit; values are used for determining the major source status.

Clark County Department of Air Quality (Air Quality) has delegated authority to implement the requirement of the Part 70 Operating Permit (OP) program.

Based on information submitted by the applicant and a technical review performed by the Air Quality staff, the Air Quality proposes the issuance of a renewed Part 70 OP to Kern River Gas Transmission Company's Goodsprings Compressor Station.

I. SOURCE INFORMATION

A. General

Permittee	Kern River Gas Transmission Company's Goodsprings Compressor Station
Mailing Address	P.O. Box 71400 Salt Lake City, UT 84171-0400
Contacts	Dave Dahl
Phone Number	(702) 639-3600 ext 3601
Source Location	1.5 Miles Southeast of Goodsprings, NV
Hydrographic Area	164A
Township, Range, Section	T25S, R59E, Section 6 and T24S, R59E, Section 31
SIC Code	4922: Natural Gas Transmission
NAICS Code	486210: Natural Gas Transmission

B. Description of Process

The existing equipment at the Goodsprings Compressor Station consists of three (3) Mars 100 natural gas-fired simple cycle, variable load turbine compressors (ISO rated at 15,000 hp), one (1) natural gas fired Waukesha 525 kW emergency generator and one (1) Peerless 3.85 MMBtu per hour natural gas-fired boiler. The turbines are used to compress natural gas through the Kern River Pipeline, and the emergency generator is used to produce electric power. The turbines are subject to 40 CFR 60 Subpart GG.

The facility operates 8,760 hours per year. The Kern River pipeline receives a majority of natural gas from Wyoming, however, gas can be purchased and fed into the pipeline from as far away as Canada. A series of compressor stations along the pipeline compress the natural gas through the pipeline, which can then be distributed to various customers. The compressor stations utilize simple cycle, variable load natural gas-fired turbines to compress the pipeline quality natural gas. These turbines are generally ISO rated at 15,000 hp, and are considered to be small by comparison to electric generating units.

Air flows through an inlet air filter and associated inlet ductwork and is then compressed in the turbine compressor section. Natural gas fuel is injected into the combustor section and then ignited. The hot combustion gases expand through the turbine and then are exhausted through a 64.75-foot stack at 913°F. The energy produced by the combustion process is converted to rotating mechanical energy that drives a compressor.

The Solar Mars turbines are fueled entirely by natural gas supplied directly from the pipeline. The lower heating value (LHV) of the fuel is 950 Btu per cubic foot – dry, and the higher heating value (HHV) of the fuel is 1,050 Btu per cubic foot – dry. The Mars 100 turbines will nominally combust 97.81 MMBtu/hr (LHV) of natural gas at full load (at 3,441 feet altitude). The turbine's maximum annual heat input and predicted long-term emissions are based on operating at a 100 percent load at 59°F for 8,760 hours per year. The short-term hourly emission rates are based on operating at 100 percent load at 0°F. The proposed Solar Mars 100-T15000S turbine specifications are listed below.

The Mars 100 turbines utilize a SoLoNOx burner system, a dry low-NO_X combustion technology. The manufacturer guarantees NO_X emissions rate (based on a three hour rolling average) at 25 ppmvd (referenced at 15 percent oxygen). The manufacturer guarantees CO emissions at 50 ppmvd (referenced at 15 percent oxygen) but the Permittee is required to maintain CO emissions rate at 16 ppmvd, based on a three-month average of hourly values.

Kern River has proposed a Solar Mars Parametric Emissions Monitoring System (PEMS) in lieu of the CEMS. The Solar Mars PEMS (SCADA - supervisory control and data acquisition) was approved by Air Quality in 1997 for the use at the Goodsprings facility. The PEMS has been used successfully and will be permitted in lieu of CEMS for continuous monitoring of the performance of the turbines as well as quarterly and annual compliance reporting.

C. Permitting History

On May 16, 2006, Kern River was issued an amendment (Amendment One) to Modification Two to incorporate clarified emission limits, updated permitting language, and inclusion of categorically exempt units.

On January 28, 2008, Kern River was issued the initial Part 70 OP.

On September 20, 2011 Kern River submitted an application for the renewal of the Part 70 OP. The source proposed the following changes to the existing Part 70 OP:

1. The addition of the requirements from 40 CFR 63, Subpart ZZZZ that apply to the Waukesha emergency generator with an effective date of October 19, 2013.

   Air Quality Response: The applicable requirements of 40 CFR 63, Subpart ZZZZ subject to the Waukesha emergency generator will be added to the OP. This is a minor revision of the OP.

2. The removal of the hourly emission limits for all emission units that do not require emission testing. There are no testing requirements for any equipment other than the compressor packages.

   Air Quality Response: The hourly emission limits for all emission units that do not require emission testing will be removed from Table III-A-2 of the OP. However, the operational limitations will be used to demonstrate compliance with the annual limitations on a rolling 12-month basis. This is considered a significant revision of the OP.

3. The removal of the 52 hours per year operating limit for the Waukesha emergency generator. The PTE calculations for the Waukesha emergency generator were revised from 52 hours per year to 500 hours per year. The Waukesha emergency generator can be operated for maintenance and testing purposes up to 100 hours per year.

   Air Quality Response: The revised PTE calculations based on 500 hours per year will be incorporated in the source PTE calculation; testing and maintenance conditions will be changed to 100 hours per year in a manner consistent with the provisions of 40 CFR 63, Subpart ZZZZ. This change does not trigger any new applicable requirements and therefore, it is considered as an administrative revision of the OP.

4. The removal of the conditions to record hours of operation for all equipment that is permitted to operate 8,760 hours per year.

   Air Quality Response: All such conditions will be removed from the OP. This is considered a significant revision of the OP.

5. The removal of Condition IV.B.6, as the boiler has no applicable emission limitations.

   Air Quality Response: Condition IV.B.6 will be removed from the OP. This is considered a significant revision of the OP.

6. Minor corrections were made to the annual emission calculations PM_{10}, $PM_{2.5}$, NO_X, CO, SO_X, VOC and HAP's resulting in small increases in ton per year PTE values. Greenhouse gas emissions were also included in the emissions calculations.

   Air Quality Response: Updated PTE calculations will be included in the OP to reflect updated emission factor for NO_X as well as the corresponding increase in emissions due to emergency

generator emissions recalculation based on a 500 hours per year regulatory requirement. This is considered a minor revision of the OP.

7. Kern River requested confirmation from Air Quality that it is acceptable to use entire compressor package (turbine, compressor, ignition, vents, fire suppression system, etc.) for purposes of determining whether any given maintenance, repair or replacement activity qualifies as a Routine Maintenance, Repair or Replacement (RMRR) for permitting purposes.

   Air Quality Response: Air Quality confirms that the replacement of the term turbine with entire compressor package is acceptable. This is considered a minor revision of the OP.

8. Kern River requested that existing wash sump be listed as an insignificant emission unit and its capacity be changed from 1,000 gallons to 1,100 gallons.

   Air Quality Response: Air Quality acknowledges that the wash sump can be considered an insignificant emission unit due to the low emission potential of this unit. The wash sump will be moved to the insignificant emission unit list and its capacity will be changed to 1,100 gallons. This is considered an administrative revision of the OP.

The proposed changes listed above have been incorporated into the OP as part of the renewal.

D. Operating Scenario

Kern River is permitted to operate the natural gas-fired Solar Mars turbines for 8,760 hours per year. The compressor package utilizes a SoLoNO$_X$ burner system, a dry low- NO$_X$ combustion technology. The manufacturer guarantees NO$_X$ emissions (based on three hour rolling average) at 25 ppmvd (corrected to 15 percent oxygen). The manufacturer guarantees CO emissions at 50 ppmvd (corrected to 15 percent oxygen) but the Permittee is required to maintain CO emissions at 16 ppmvd, based on a three month quarterly of hourly values.

The existing Title V Operating Permit requirement (Condition V-1) to replace existing 25 ppm NO$_X$ turbines with turbines that can achieve 15 ppm NO$_X$ at 15 percent oxygen shall become effective at the next regularly scheduled engine exchange or overhaul at which such technology is available in the Solar exchange fleet. A letter from the manufacturer dated May 24, 2011 explaining the current lack of availability of 15 ppm NO$_X$ technology, as a retrofit, for the Mars 100 replacement fleet is included in Attachment C of the current Application for a Title V renewal.

Kern River proposed a Solar Mars Parametric Emissions Monitoring System (PEMS) in lieu of the CEMS requirement. The Solar Mars PEMS was approved by Air Quality staff in 1997 for use at the Goodsprings facility. The PEMS has been used successfully for continued monitoring of the performance of the turbines as well as quarterly and annual compliance reporting.

In addition to the Solar Mars compressor packages, Kern River also permitted to operate a natural gas fired Waukesha emergency generator with a rating of 818 hp, a natural gas fired 3.052 MMBtu/hr boiler, a 4,200 gallon pipeline liquids or natural gas condensate tank, a 1,500 gallon lubricating oil tank in the compressor system, a 20 gallon parts washer, and other insignificant or exempt equipment. The emergency generator can be operated for maintenance and testing purposes 100 hours per year. All other equipment may be operated 8,760 hours per year.

II. EMISSIONS INFORMATION

A. Source wide Potential to Emit

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

	PM_{10}	$PM_{2.5}$	NO_X	CO	SO_X	VOC	HAP
Source Total	**10.72**	**10.72**	**132.41**	**56.62**	**5.47**	**11.20**	**1.75**
Major Source Threshold	70	100	100	100	100	100	25/10[2]

[1] Not a source-wide emission limit; values are used for determining the major source status.
[2] 25 tons for combination of all HAPs (no single HAP exceeds 10 tons).

B. Emission Units and PTE

Table II-B-1: Emission Units List

EU	Description	Rating	Make	Model No.	Serial No.
A001	Natural Gas Fired Compressor #1 Package with SoLoNO$_X$ Burner	15,000 hp	Solar	Mars 100-T15000S	MC91362
A002	Natural Gas Fired Compressor #2 Package with SoLoNO$_X$ Burner	15,000 hp	Solar	Mars 100-T15000S	MC02634
A003	Natural Gas Fired Compressor #3 Package with SoLoNO$_X$ Burner	15,000 hp	Solar	Mars 100-T15000S	MC02638
B01	Natural Gas Fired Emergency Generator	818 hp	Waukesha	VHP 7100G	403187
B02	Natural Gas Fired Boiler	3.052 MMBtu/hr	Peerless	724FDA WU	7FDA-7582-0891
C01	Pipeline Liquids or Natural Gas Condensate Tank	4,200 gal	N/A	N/A	N/A
C02	Lube Oil Compressor System	1,500 gal	N/A	N/A	N/A
C04	Parts Washer	20 gal	N/A	N/A	N/A

The following insignificant units or activities are present at this source:

Table II-B-2: Insignificant Units or Activities

Description
0.175 MMBtu/hr Trane Space Heater, M/N: GPND017ADB10000B, S/N: N/A
0.175 MMBtu/hr Trane Space Heater, M/N: GPND017ADB10000B, S/N: N/A
0.12 MMBtu/hr Trane Space Heater, M/N: TUS120896CAC, S/N: N/A
0.032 MMBtu/hr A.O. Smith Water Heater, M/N: FSG 40, S/N: N/A
11 (eleven) Trane Radiant Space Heaters (no emissions) in Compressor Building, M/N: N/A, S/N: N/A
2 (two) Trane Air Conditioning Systems in Main Office, M/N: TTA060C400AO, S/N: N/A
1,100 gal Lube Oil /Wash Water Sump, M/N: N/A, S/N: N/A

The PTE calculation tables reflect an updated PTE due to increase in operating time for the Waukesha emergency generator as well as the slight adjustment to the compressor packages' emission factors. The annual PTE of each turbine unit is also the enforceable emission limitation which includes emissions from startup and shut down.

Table II-B-3: Source PTE (tons per year)

EU	Rating	Conditions	PM_{10}	$PM_{2.5}$	NO_X	CO	SO_X	VOC	HAP
A001	15,000 hp	8,760 hrs/yr	3.54	3.54	42.61	16.64	1.82	3.70	0.55
A002	15,000 hp	8,760 hrs/yr	3.54	3.54	42.61	16.64	1.82	3.70	0.55

EU	Rating	Conditions	PM_{10}	$PM_{2.5}$	NO_X	CO	SO_X	VOC	HAP
A003	15,000 hp	8,760 hrs/yr	3.54	3.54	42.61	16.64	1.82	3.70	0.55
B01	818 hp	500 hrs/yr	0.01	0.01	3.27	5.50	0.01	0.04	0.05
B02	3.052 MMBtu/hr	8,760 hrs/yr	0.10	0.10	1.31	1.10	0.01	0.07	0.02
C01	4,200 gal	8,760 hrs/yr	0.00	0.00	0.00	0.00	0.00	0.01	0.01
C02	1,500 gal	8,760 hrs/yr	0.00	0.00	0.00	0.00	0.00	0.01	0.01
C04	20 gal	8,760 hrs/yr	0.00	0.00	0.00	0.00	0.00	0.01	0.01
Potential to Emit (tons per year)			**10.73**	**10.73**	**132.41**	**56.52**	**5.48**	**11.24**	**1.75**

Table II-B-4: Source PTE (Excluding Startup/Shutdown) (pounds per hour)

EU	Rating	Conditions	PM_{10}	$PM_{2.5}$	NO_X	CO	SO_X	VOC	HAP
A001	15,000 hp	1 hour	0.81	0.81	11.09	3.80	0.42	0.84	0.13
A002	15,000 hp	1 hour	0.81	0.81	11.09	3.80	0.42	0.84	0.13
A003	15,000 hp	1 hour	0.81	0.81	11.09	3.80	0.42	0.84	0.13
B01	818 hp	1 hour	0.06	0.06	13.06	21.99	0.01	0.17	0.19
B02	3.052 MMBtu/hr	1 hour	0.02	0.02	0.30	0.25	0.002	0.02	0.01
C01	4,200 gal	1 hour	0.00	0.00	0.00	0.00	0.00	0.01	0.01
C02	1,500 gal	1 hour	0.00	0.00	0.00	0.00	0.00	0.01	0.01
C04	20 gal	1 hour	0.00	0.00	0.00	0.00	0.00	0.01	0.01
Potential to Emit (pounds per hour)			**2.51**	**2.51**	**46.63**	**33.64**	**1.27**	**2.74**	**0.62**

Table II-B-5: Exempt Emission Units PTE (tons per year)

Exempt Emission Unit	PM_{10}	$PM_{2.5}$	NO_X	CO	SO_X	VOC	HAP
0.175 MMBtu/hr Trane Space Heater	0.01	0.01	0.15	0.13	0.01	0.01	0.01
0.175 MMBtu/hr Trane Space Heater	0.01	0.01	0.15	0.13	0.01	0.01	0.01
0.12 MMBtu/hr Trane Furnace	0.01	0.01	0.05	0.04	0.01	0.01	0.01
0.032 MMBtu/hr A.O. Smith Water Heater	0.01	0.01	0.01	0.01	0.01	0.01	0.01

Table II-B-6: Enforceable Emission Limitations–ppmvd @ 15% O_2, Excluding Startup/shutdown

EU	PM_{10}	NO_X[1]	CO[2]	SO_2	VOC	HAP
A001	---	25	16	---	---	---
A002	---	25	16	---	---	---
A003	---	25	16	---	---	---

[1] NO_X emission rate based on a three-hour rolling average. The three-hour emission limitation for each turbine is 25 ppm.
[2] CO emission rate based on a quarterly average of hourly values. .

Table II-B-7: Maximum Allowable Emissions for Each Turbine Based on HHV

Pollutant	Emission Factors (15% O_2)	Potential Emissions		
		lb/hr[1]	lb/day[1]	ton/yr[2]
PM_{10}	6.60E-03 lb/MMBtu[5]	0.81	19.44	3.54
NO_X (25 ppmvd)	9.95E-02 lb/MMBtu[3]	11.09	266.16	42.61
CO (16 ppmvd)	3.88E-02 lb/MMBtu[4]	3.80	91.20	16.64
SO_X	3.40E-03 lb/MMBtu[5]	0.42	10.08	1.82
VOC	6.90E-03 lb/MMBtu[6]	0.84	20.16	3.70
HAPs	1.03E-03 lb/MMBtu[7]	0.13	3.12	0.55

[1] Short-term hourly emission rates are based on operating at 100 percent load at 0°F This does not include startup/shutdown. Reference:"Technical Support Document" (April 2004).
[2] Annual emission rates are based on operating at 100 percent load at 59°F for 8,760 hours per year. This limit includes emissions from startup/shutdown. Reference: "Technical Support Document" (April 2004).
[3] From "New Equipment Predicted Emissions Performance Data." Temperature: 59°F. Date run: December 17, 2001. Run by: Tom Cleeland, Solar Turbines, Inc. Customer: Williams Kern River, Model: Mars 100-T15000S. Goodsprings, Nevada.
[4] 16 ppmvd CO limit based on quarterly average of hourly values.
[5] From AP-42 Table 3.1-2a (April 2000), using higher heating value (HHV) MMBtu/hr fuel flow.
[6] The VOC emission factor is estimated conservatively high at 20% of the unburned hydrocarbon (UHC) value reported by the turbine vendor. The UHC value is from "New Equipment Predicted Emission Performance Data" as listed in Appendix B of the May 2002 Goodsprings permit application. Temperature: 59 °F. Date run: December 17, 2001. Run by Tom Cleeland, Solar Turbines, Inc. Customer: Williams Kern River, Model: Mars 100-T15000s. Goodsprings, Nevada.
[7] From AP-42 Table 3.1-3 (April 2000), using higher heating value (HHV) MMBtu/hr fuel flow.

Table II-B-8 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 startup and shutdown events. Estimated tonnages of startup emissions are included in the operational PTE in Table III-B-1 of the Operating Permit.. VOC emissions from startup/shutdown are based on 20% of the UHC.

Table II-B-8: Startup and Shutdown PTE per Compressor Package Unit (pounds)

Description	NO_x (lbs)	CO (lbs)	VOC (lbs)
Startup - 10 minutes	1.3	33.5	2.7
Shutdown - 13 minutes	1.7	26.8	2.2
Total per startup/shutdown - 23 minutes	3.0	60.3	4.9

[1] The approximate start-up and shut-down durations are 13 minutes and 10 minutes, respectively, according to a Solar Turbines document entitled "Emission Estimates at Startup, Shutdown, and Commissioning for SoLoNOx Products" dated January 27, 2003.
[2] Data taken from a Solar Turbines document entitled "Emission Estimates at Startup, Shutdown, and Commissioning for SoLoNOx Products" dated January 27, 2003.

C. Testing

A performance test shall be conducted on each Mars 100 turbines (EUs: A001, A002 and A003). Initial performance tests were conducted on June 27 and 28, 2003. In addition, performance testing shall be conducted after each spare engine replacement.

Table II-C-1: Performance Testing Protocol Requirements for Turbines[1]

Test Point	Pollutant	Method (40 CFR 60, Appendix A)
Turbine Exhaust Outlet Stack	NO_x	Chemiluminescence Analyzer (EPA Method 7E)
Turbine Exhaust Outlet Stack	CO	EPA Method 10 analyzer
Stack Gas Parameters	---	EPA Methods 1, 2, 3, 4 or Method 19

Since NOx and CO emissions are monitored through PEMS, performance testing on the three (3) Mars 100 turbines shall be conducted once each year, within 90 days of the anniversary date of the of the most recent. Performance testing is subject to 40 CFR 60 Subpart A, 40 CFR 60 Subpart GG, and Air Quality Performance Test Guideline.

D. Emissions Monitoring

Compliance monitoring for the stationary gas turbines has been in operation since 1999. Kern River implemented software controls in order to identify most types of mechanical instability on all SoLoNOx operating turbines.

In order to better understand the existing compliance-monitoring program, the following information regarding turbine operation is provided to outline the basic mechanics of the turbine and how

monitoring specific parameters can ensure emissions compliance.

The Solar Mars turbines used at Goodsprings are of the “two-shaft” design. The section of the turbine containing the first shaft is known as the Gas Producer, and consists of an air inlet system, axial-flow combustion air compressor, the combustion chamber and a two stage turbine dedicated to driving the combustion air compressor. The Gas Producer is so-called because it provides a stream of hot gas to drive the power turbine.

The section of the turbine containing the second shaft is called the power turbine (sometimes called a “free turbine”), and it consists of the two-stage power turbine, exhaust collector and power output shaft. The output shaft is directly connected to the pipeline gas compressor. There is no mechanical connection between the two turbines, and they are free to run at different rotational speeds.

The gas turbine engine is a heat engine in which energy is generated and then converted into mechanical energy through the application of thermodynamic processes arranged in a cycle of events. The events of the cycle comprise the following four processes:

1. Compression - Atmospheric air is compressed
2. Combustion - Fuel is added to the compressed air and ignited
3. Expansion - Hot combustion gases expand through turbine blades
4. Exhaust - Combustion gases are discharged into the atmosphere

The thermodynamic processes that take place in a turbine are continuous. There is a continuous flow of compressed air from the compressor section, continuous combustion within the combustion chamber, and continuous power output from the turbine section. Air is drawn into the compressor section through the air inlet by the compressor rotor, first by power delivered to the compressor rotor by the starter motor, and later by power produced by the turbine section as combustion begins. The compressed air passes through the diffuser, where part of its kinetic energy is converted to pressure energy, and into the combustion chamber where fuel is injected into the pressurized air.

During the engine start cycle, a torch, protruding into the combustion chamber and fed by a separate fuel line, is ignited by a spark plug. The torch in turn ignites the fuel-air-mixture entering the combustion chamber and continuous burning is maintained as long as there is an adequate flow of pressurized air and fuel. The torch is later extinguished. The rapid rise of the temperature within the combustion chamber produces a considerable increase in volume and flow velocity of the combustion gases. There is, however, no change in pressure. As a result, the hot gases expand through the turbine section where rotary motion or kinetic energy of the turbine rotor is produced by the gases acting upon the rotor blades. The expanding gases drive both the gas producer and the power turbine rotors.

Kern River maintains a SCADA (supervisory control and data acquisition) computer system that connects to each major emission unit along Kern River's natural gas pipeline transportation system. The SCADA system allows Kern River to continuously monitor all emission units on a real time basis. Although numerous parameters are monitored via the SCADA system, the following parameters are continuously evaluated and recorded as part of the emissions monitoring system:

1. Gas Producer Speed - NGP (Hourly average)
2. Power Turbine Speed - NPT (Hourly average)
3. All individual T5 thermocouples (Hourly average)
4. T5 temperature, average of the 17 thermocouples (Hourly average)
5. Ambient temperature (Hourly average)

6. Fuel Use (Hourly average)
7. Hourly Operation
8. Average plant operation (hours per day, days per week, weeks per year)
9. Suction and discharge Pressure
10. Compressor Discharge Pressure - PCD (Hourly average)

In order to better understand the importance of these parameters, a brief description of factors influencing emissions is given below:

NGP and NPT

These are the rotational speeds (typically stated as a percentage of the maximum speed) of the gas producer and power turbine rotors that are mechanically independent of each other. The two-stage gas producer turbine is used to drive the combustion air compressor and the accessories only. The power turbine rotor absorbs the remaining energy of the escaping gases, providing power to the pipeline gas boost compressor through the drive shaft. During acceleration, some excess compressed air may build up in the final compression stages and could cause turbine stall. This is prevented by ducting some of the excess air through the bleed air valve to the exhaust.

Gas Producer Speed (NGP)

The gas producer speed indicates the percentage of the engine's maximum speed, which has a non-linear relationship to power output. This percent of speed is achieved as a function of the required power level, ambient temperature and other additional factors. Given that other factors remain fairly constant, the higher the gas producer speed, the greater the NO_x and VOC emissions and the lower the CO emissions. NO_x and VOC emissions decrease and CO emissions increase slightly as the gas producer speed decreases. Solar's guaranteed emission rates and concentration are based upon this maximum gas producer speed. Operating at or below this maximum speed will ensure compliance within permit limitations as indicated through regular emission tests. If the maximum NGP speed was exceeded it would lead to mechanical stress failure of the combustion air compressor or gas producer turbine. The PLC automatically controls the speed by limiting fuel flow to maintain operations at or below this maximum speed.

Below 94% NGP (which corresponds to approximately 50% maximum power), the combustion system is unable to sustain the low emissions mode (lean pre-mix), and the turbine reverts to high emissions diffusion combustion mode. The control system is programmed to always run above 94% NGP except during start-up, shut-down and certain fault conditions.

The speed of the gas producer is measured by a magnetic speed pickup that provides a signal to the unit PLC that counts the pulses and compares the speed to the maximum rated speed. This speed pickup, calibrated by the manufacturer prior to installation, is verified during routine maintenance inspections. If the speed pickup fails completely, no signal will be generated to the PLC, which records the event and shuts the turbine down. If the maximum NGP is exceeded, the PLC unit will shut the turbine down. In the event of a magnetic speed pickup failure or exceeding the maximum NGP speed, corrective actions will be taken before the turbine is restarted and returned to service. There is a completely independent backup over-speed shutdown system to protect the turbine in the event of failure of the speed pickup, fuel control system or PLC. At each emissions test, a correlation is developed between NGP, NO_x and CO emissions, and NGP is the main parameter used by the Parametric Emissions Monitoring System (PEMS) to determine emissions during normal operation.

Power Turbine Speed (NPT).

The Power Turbine Speed is to a certain extent independent of the Gas Producer Speed, and is determined by operating conditions of the pipeline gas compressor. Variations in NPT do not affect

emissions. Emission levels are entirely dependent upon combustion conditions in the Gas Producer section.

T5 Temperature (Power Turbine Inlet Temperature).

The manufacturer sets an upper limit on the power turbine inlet temperature, commonly known as T5, to prevent damage to the internal components of the turbine. Because the combustion temperature cannot be measured directly, the temperature of combustion products as they reach the power turbine is utilized as an indicator of the temperature within the combustion chamber. The T5 temperatures are detected by thermocouples providing a signal to the PLC, which continuously monitors the temperature to ensure that the engine operations do not exceed the design setting. Limiting the operation of the turbine at or below this temperature prevents exceeding the established emission limitations. The PLC unit will shutdown the turbine automatically if the design temperature is exceeded. The unit PLC continuously monitors each individual T5 thermocouple and compares the temperature of every thermocouple in the average. If any thermocouple is more than 200 degrees Fahrenheit greater than the average, the PLC will generate an alarm for the turbine. This does not mean that any emission limit has been exceeded, rather than a fuel injector actually may need inspecting or a thermocouple is failing. The heat produced from any injector actually influences the temperature reading of 2 or 3 thermocouples; therefore, if one thermocouple is out of range by the average of 200 degrees it does not conclusively mean that there is an injector problem. However, if two adjacent thermocouples are outside the average range of 200 degrees or more, Kern River personnel will investigate the situation. This may include downloading the information and plotting the current data with the historical data to determine operating trends, then to take appropriate corrective action, which may in turn indicate a need to inspect the influencing injector. Several thermocouples are visually inspected during the semi-annual inspections and during periods of suspect operations as indicated by the above-mentioned alarm. If three or more of the thermocouples fail, the unit PLC shuts the turbine down automatically.

SoLoNOx Operations

“SoLoNOx” is Solar’s trade name for their design of dry low emissions (lean pre-mix) combustion system. This system has evolved significantly since its introduction in the early 1990s, and Kern River’s turbines are now equipped with the latest variant available on a retrofit basis. In particular, the current generation of high force, electronically controlled fuel regulating valves provides more accurate fuel control than the earlier electro-hydraulic valves, and makes a significant improvement in emissions stability over time.

The unit is in SoLoNOx emissions mode when it is operating above 94% NGP. To achieve this mode of operation, the fuel injectors have two separate fuel circuits. The pilot fuel provides gas through a center of the injector, and this fuel burns as a diffusion flame, with high emissions. The main fuel circuit supplies gas through spokes around the outside of the injector, which are also supplied with primary air to achieve a low emission, lean pre-mix flame. The lean pre-mix flame becomes unstable at lower operating speeds, and to maintain flame stability, more pilot fuel is required. During startup and shutdown, most of the fuel is supplied to the injectors through the pilot circuit and this is identified as non-SoLoNOx mode (less than 94% NGP (50% load) or when the T5 set point cannot be maintained). In this situation, a non-SoLoNOx mode alarm is generated on the operator’s display and the accumulated time is recorded. This accumulated time is retained and archived for monitoring and reporting the time that the unit has run in the non-SoLoNO$_x$ mode.

Bleed Valve Operation

There is a limited range of fuel-air ratios over which the combustor can operate within the low emissions mode. To maintain emissions over a wider range of operating speed, the controls operate the bleed valve to bypass some combustion air from the combustor directly to the exhaust. This means that flame temperature (as indicated by T5) is maintained relatively constant, which

keeps NO_x emissions nearly constant (in PPM), while minimizing the increase in CO, which would occur if flame temperature were allowed to decrease. With Solar's current design of air bleed system, extensive testing has proven that a leaking bleed valve will not lead to increased NO_x emissions at full speed, as T5 temperature will be held constant. A leaking bleed valve will result in reduced power output by the turbine, but will not lead to increased emissions.

Fuel injectors

Natural Gas fuel is supplied to the turbine through 14 fuel injectors mounted around the combustion chamber. As noted above, each injector contains both a pilot and main fuel circuit. Fouling or deterioration of the fuel injectors can lead to uneven distribution of combustion around the combustion chamber and this can cause an increase in emissions. To identify problems with the fuel injectors, the variation in T5 temperature (known as T5 spread) between the individual thermocouples is monitored. The fuel injectors are removed and visually inspected at each semiannual inspection, and when indicated by a change in the established T5 temperature spread.

Combustion Air Compressor

The combustion air compressor is a 15 stage axial compressor with variable geometry stators for the first six stages. Mechanical deterioration or fouling of the combustion air compressor can lead to increased emissions. The primary measure of the health of the air compressor is the relationship between its discharge pressure (known as PCD) and its speed, which is NGP. A decrease in PCD for a given NGP indicates a potential problem with the combustion air compressor that is investigated. Fouling results from contaminants in the inlet air, and good air filtration is the first means of minimizing this problem. Regular cleaning of the air compressor by washing with water and detergent removes any deposits that can lead to excessive fouling. The air compressor is visually inspected with a bore scope at each semiannual inspection.

Combustion Chamber.

Thermal erosion or cracking of the combustion chamber can also lead to increased emissions. The primary indication of a problem with the combustion chamber is the distribution of T5 temperatures, which is monitored as described above. The combustion chamber is inspected at each semiannual inspection and as indicated by the T5 spread using a borescope inserted through the fuel injector ports. A major problem with the combustion chamber will typically result in the turbine being removed from service and returned to the manufacturer for overhaul.

Emissions Set-up on Site.

Because emissions are influenced by site conditions (particularly elevation), and each turbine has individual mechanical characteristics, when a new turbine is installed on site, the emissions controls, particularly pilot fuel and bleed valve operation, are programmed for the operating conditions. From the initial emissions test, a correlation between NO_x, CO and NGP is developed for the individual turbine. Using this correlation, annual emissions are calculated from turbine run time and actual NGP. At each annual emissions test, the emissions/NGP correlation is recalibrated as required to ensure annual calculated emissions continue to be accurate.

Monitoring of Parameters that Effect Emissions.

In order to ensure maintenance of approved emissions levels, the following relationships are continually monitored by the turbine control system, and alarms are generated when the parameters are out of the acceptable range:

1. Predicted NGP vs. actual NGP;
2. T5 average vs. NGP;
3. PCD vs. NGP;
4. T5 spread.

Summary

The Solar Mars PEMS was approved by Air Quality staff in 1997 for the use at the Goodsprings facility. The PEMS has been used successfully and was permitted in lieu of CEMS for continuous monitoring of the performance of the proposed turbines as well as semi-annual and annual compliance reporting. Through implementation of the procedures outlined above, Kern River will be able to report emissions levels and monitor operation of the turbines to identify any deviation from normal performance that may result in increased emissions.

E. Increment

Goodsprings Compressor Station is a major source in Hydrographic Area 164A (Ivanpah Valley North). Permitted emission units include three turbines, one boiler and one generator. Since minor source baseline dates for PM_{10} (November 10, 1981), NO_2 (August 15, 2001) and SO_2 (November 10, 1981) 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 II-E-1 presents the results of the modeling.

Table II-E-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	5.26[1]	643477	3964052
SO_2	24-hour	2.86[1]	643477	3964052
SO_2	Annual	0.50	643477	3964052
PM_{10}	24-hour	5.88[1]	643477	3964052
PM_{10}	Annual	1.13	643477	3964052
NO_x	Annual	14.10	643477	3964052

[1] Modeled 2nd High Concentration

Table II-E-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.

F. Greenhouse Gas (GHG) Emissions

Beginning January 2, 2011, only newly constructed or existing Title V major sources will have Title V requirements for GHGs. Facilities, such as this, that emit 100,000 tons of CO_2e or more per year will be subject to the Title V permitting requirements beginning July 1, 2011 in accordance with federal and/or state/local requirements for submittal of a timely Title V application, which is typically within one year of meeting the applicability criteria.

The Permittee must address GHG requirements because the facility is renewing the OP after the January 2, 2011 applicability date. These requirements will include any GHG applicable requirements, associated monitoring, record-keeping, and reporting. The Permittee has calculated the source's GHG emissions in Table II-F-1. According to the calculated GHG PTE, the source is a major source of GHG.

Table II-F-1: GHG PTE (tons/year)[1]

EU	CO_2	CH_4[2]	N_2O[3]	CO_2e
A001	58,924	106	498	Total CO_2 (178,507.21) + Total CH_4 (326.51 x 23) + Total N_2O (1,502.94 x 310)
A002	58,924	106	498	
A003	58,924	106	498	
B01	162.53	7.82	0.00	
B02	1572.68	0.69	8.94	
Totals	**178,507.21**	**326.51**	**1,502.94**	**651,928.34**

[1] All emission factors used in determining GHG emissions are from AP-42 (Emission factors for criteria pollutants and Greenhouse Gases from Stationary Gas Turbines) except CO and NO_X.
[2] EPA indicates a CO_2e for methane (CH_4) of 23.
[3] EPA indicates a CO_2e for Nitrous Oxide (N_2O) of 310.

III. REGULATORY OVERVIEW

A. Local Regulatory Requirements

Air Quality 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 by Air Quality 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.

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. These regulations may be accessed on the Internet at:

http://www.clarkcountynv.gov/Depts/daqem/Pages/CurrentRulesandRegulations.aspx

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

	PM_{10}	$PM_{2.5}$	NO_X	CO	SO_X	VOC	HAP
Source Total	10.72	10.72	132.41	56.62	5.47	11.20	1.72
Major Source Threshold	70	100	100	100	100	100	25/10[2]

[1] Not a source-wide emission limit; values are used for determining the major source status.
[2] 25 tons for combination of all HAPs (no single HAP exceeds 10 tons).

Discussion: Kern River Gas Transmission Company's Goodsprings Compressor Station is a major source of NO_X. The proposed permit renewal of the existing Part 70 OP requires EPA review before issuance.

Table III-A-2: Applicable Local Regulations

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
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; all 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
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
13.2.85 National Emission Standards for Hazardous Air Pollutants for Source Categories	Subpart ZZZZ: National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines	No	Emergency natural gas engine
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

Applicable Section – Title	Applicable Subsection - Title	SIP	Affected Emission Unit
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 PART 60 - STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES

Subpart A - General Provisions

40 CFR 60.7 - Notification and Record Keeping

These regulation requirements are found in the Part 70 OP in Sections IV-E and IV-F. Air Quality requires records to be maintained for five years, a more stringent requirement than the two (2) years required by § 60.7.

40 CFR 60.8 - Performance Tests

These requirements are found in the Part 70 OP in Section IV-D.

40 CFR 60.11-Compliance with Standards and Maintenance Requirements

These requirements are found in the Part 70 OP in Section IV-C.

40 CFR 60.12- Circumvention

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

40 CFR 60.13-Monitoring requirements.

This section requires that CEMS, or approved PEMS, meet Appendix B and Appendix F standards of operation, testing and performance criteria. Sections IV-B and IV-C of the Part 70 OP contains the PEMS conditions.

Subpart GG-Standards of Performance for Stationary Gas Turbines

40 CFR 60.330-Applicability and Designation of Affected Facility.

(a) The provisions of this subpart are applicable to all stationary gas turbines with a heat input at peak load equal to or greater than 10.70 gigajoules per hour (ten MMBtu per hour), based on the lower heating value of the fuel fired.

(b) Any facility under paragraph (a) of this section which commences construction, modification, or reconstruction after October 3, 1977, is subject to the requirements of this part except as provided in paragraphs (e) and (j) of § 60.332. *[44 FR 52798, Sept. 10, 1979, as amended at 52 FR 42434, Nov. 5, 1987]*

Discussion: Subpart GG applies to the three (3) turbines at this source. The emission limits for the compressor turbines, as specified by Subpart GG, are summarized below.

Table III-B-1: Emission Limits Summary

Pollutant	Emission Limit (ppmvd @ 15% O_2)
NO_X	160
SO_2	150

40 CFR 60.333-Standard for Sulfur Dioxide

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

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

These requirements are found in the conditions for performance testing found in Section IV-A of the Part 70 OP.

40 CFR 63, Subpart ZZZZ – National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

According to 40 CFR 63.6590(b)(3)(vii), the existing commercial stationary reciprocating Internal Combustion Engines (RICE) located at an area source of HAP; pursuant to 40 CFR 63.6595 the compliance date is October 19, 2013.

40 CFR PART 64-COMPLIANCE ASSURANCE MONITORING

40 CFR 64.2 – Applicability

a. General applicability. Except for backup utility units that are exempt under paragraph (b)(2) of this section, the requirements of this part shall apply to a pollutant-specific emissions unit at a major source that is required to obtain a Part 70 or 71 permit if the unit satisfies all of the following criteria:

   1. The unit is subject to an emission limitation or standard for the applicable regulated air pollutant (or a surrogate thereof), other than an emission limitation or standard that is exempt under paragraph (b)(1) of this section;

   2. The unit uses a control device to achieve compliance with any such emission limitation or standard; and

   3. The unit has potential pre-control device emissions of the applicable regulated air pollutant that are equal to or greater than 100 percent of the amount, in tons per year, required for a source to be classified as a major source. For purposes of this paragraph, ‘‘potential pre-control device emissions’’ shall have the same meaning as ‘‘potential to emit,’’ as defined in § 64.1, except that emission reductions achieved by the applicable control device shall not be taken into account.

b. Exemptions:

   1. Exempt emission limitations or standards. The requirements of this part shall not apply to any of the following emission limitations or standards:

      i. Emission limitations or standards proposed by the Administrator after November 15,1990 pursuant to section 111 or 112 of the Act.

ii. Stratospheric ozone protection requirements under title VI of the Act.

iii. Acid Rain Program requirements pursuant to sections 404, 405, 406, 407(a), 407(b), or 410 of the Act.

iv. Emission limitations or standards or other applicable requirements that apply solely under an emissions trading program approved or promulgated by the Administrator under the Act that allows for trading emissions within a source or between sources.

v. An emissions cap that meets the requirements specified in § 70.4(b)(12) or § 71.6(a)(13)(iii) of this chapter.

vi. Emission limitations or standards for which a Part 70 or 71 permit specifies a continuous compliance determination method, as defined in § 64.1. The exemption provided in this paragraph (b)(1)(vi) shall not apply if the applicable compliance method includes an assumed control device emission reduction factor that could be affected by the actual operation and maintenance of the control device (such as a surface coating line controlled by an incinerator for which continuous compliance is determined by calculating emissions on the basis of coating records and an assumed control device efficiency factor based on an initial performance test; in this example, this part would apply to the control device and capture system, but not to the remaining elements of the coating line, such as raw material usage).

Discussion: There is no control device installed on the turbines at the Goodsprings compressor station. A control device is defined by Section 64.1(2) as equipment "used to destroy or remove air pollutant(s) prior to discharge to the atmosphere."The Mars 100 turbines use SoLoNOx low-NO_X combustion technology, which prevents the formation of NO_X but does not destroy or remove any air pollutants. No other emission unit at the facility has either control devices, as defined, or a potential to emit greater than 100 tons per year; therefore, the source is not subject to CAM requirements.

40 CFR PART 72-ACID RAIN PERMITS REGULATION

Subpart A – Acid Rain Program General Provisions

40 CFR 72.6 – Applicability

a. Each of the following units shall be an affected unit, and any source that includes such a unit shall be an affected source, subject to the requirements of the Acid Rain Program:

1. Unit listed in table 1 of § 73.10(a) of this chapter.

2. A unit that is listed in table 2 or 3 of § 73.10 of this chapter and any other existing utility unit, except a unit under paragraph (b) of this section.

3. A utility unit, except a unit under paragraph (b) of this section, that:

i. Is a new unit; or

ii. Did not serve a generator with a nameplate capacity greater than 25 MWe on November 15, 1990 but serves such a generator after November 15, 1990.

iii. Was a simple combustion turbine on November 15, 1990 but adds or uses auxiliary firing after November 15, 1990;

iv. Was an exempt cogeneration facility under paragraph (b)(4) of this section but during any three calendar year period after November 15, 1990 sold, to a utility

power distribution system, an annual average of more than one-third of its potential electrical output capacity and more than 219,000 MWe-hrs electric output, on a gross basis;

v. Was an exempt qualifying facility under paragraph (b)(5) of this section but, at any time after the later of November 15, 1990 or the date the facility commences commercial operation, fails to meet the definition of qualifying facility;

vi. Was an exempt IPP under paragraph (b)(6) of this section but, at any time after the later of November 15, 1990 or the date the facility commences commercial operation, fails to meet the definition of independent power production facility; or

vii. Was an exempt solid waste incinerator under paragraph (b)(7) of this section but during any three calendar year period after November 15, 1990 consumes 20 percent or more (on a Btu basis) fossil fuel.

Discussion: Kern River is not a utility facility and therefore, not an applicable source with regard to Part 72 and is not subject to acid rain provisions.

IV. 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 Air Quality Compliance Reporting Supervisor shall be as follows:

Required Report	Applicable Period	Due Date[1]
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
Annual Compliance Certification Report	Calendar Year	January 30 each year
Annual Emission Inventory Report	Calendar Year	March 31 each year
Notification of Malfunctions, Startup, Shutdowns or Deviations with Excess Emission	As Required	Within 24 hours of the Permittee learns of the event
Report of Malfunctions, Startup, Shutdowns or Deviations with Excess Emission	As Required	Within 72 hours of the notification
Deviation Report without Excess Emissions	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 schedule for submission of compliance certifications during the permit term.

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

B. Compliance Summary – AQR and Federal Regulations

Citation	Title	Applicability	Applicable Requirement	Compliance Status
AQR Section 0	Definitions	Applicable: Source will comply with all applicable definitions as they apply.	Source will meet all applicable test methods should new definitions apply.	Source complies with applicable requirements.
AQR Section 4	Control Officer	Applicable – The Control Officer or his representative may enter into Source property, with or without prior notice, at any reasonable time for purpose of establishing compliance.	Kern River will allow Control Officer to enter Source property as required.	Source complies with applicable requirements.
AQR Section 12.5	40 CFR Part 70 Operating Permits	Applicable – the source 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.	A complete application for renewal of the Part 70 permit was submitted in a timely manner.	Source currently complies with its obligation to submit its Part 70 application.
AQR Section 14.1.1 Subpart A	New Source Performance Standards (NSPS) General Provisions	Applicable – Source 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.	Source complies with applicable requirements.
AQR Section 14.1.56 Subpart GG	Standards of Performance for New Stationary Sources (NSPS) – Stationary Gas Turbines	Applicable: The four (4) Source turbines are natural gas-fired units with heat input greater than 10 MMBtu/hr.	The four (4) turbines meet the applicable NO_X emission standard. NO_X emissions determined by EPA Method 20 or 7E.	Source complies with applicable requirements.
AQR Section 18	Permit and Technical Service Fees	Applicable: Source will be required to pay all required/applicable permit and technical service fees.	Source is required to pay all required/applicable permit and technical service fees.	Source complies with applicable requirements.
AQR Section 21	Acid Rain Permits	Not applicable – Source is not an affected facility.	Not applicable.	Source complies with applicable requirements.
AQR Section 22	Acid Rain Continuous Emission Monitoring	Not applicable – Source is not an affected facility.	Not applicable.	Source 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	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	Source complies with applicable requirements.

Citation	Title	Applicability	Applicable Requirement	Compliance Status
		and federally enforceable.	event.	
AQR Section 26	Emissions of Visible Air Contaminants	Applicable – Opacity for the compressor turbines must not exceed 20 percent for more than three (3) minutes in any 60-minute period.	Compliance determined by EPA Method 9	Source 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.	Source air contaminant emissions controlled by pollution control devices or good combustion in order not to cause a nuisance.	Source complies with applicable requirements.
AQR Section 41	Fugitive Dust	Applicable – Source shall take necessary actions to abate fugitive dust from becoming airborne.	Source utilizes appropriate best practices to not allow airborne fugitive dust.	Source complies with applicable requirements.
AQR Section 42	Open Burning	Applicable – In event Source 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.	Source will contact the DAQEM and obtain approval in advance for applicable burning activities as identified in the rule.	Source 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 rue only.	Source will not operate its facility in a manner that will cause odors.	Source complies with applicable requirements.
AQR Section 70.4	Emergency Procedures	Applicable – Source submitted an emergency standby plan for reducing or eliminating air pollutant emissions in the Section 16 Operating Permit Application.	Source submitted an emergency standby plan and received the Section 16 Operating Permit.	Source complies with applicable requirements.
40 CFR Part 52.21	Prevention of Significant Deterioration (including Preconstruction permits)	Applicable: Source PTE > 100 TPY.	BACT analysis, air quality analysis using ISCST3, and visibility and additional impact analysis performed for original ATC permits.	Source complies with applicable sections as required by PSD regulations.
40 CFR Part 52.1470	SIP Rules	Applicable – Source is classified as a Title V source, and SIP rules apply.	Applicable monitoring and record keeping of emissions data.	Source is in compliance with applicable state SIP requirements including monitoring and record keeping of emissions data.

Citation	Title	Applicability	Applicable Requirement	Compliance Status
40 CFR Part 60, Subpart A	Standards of Performance for New Stationary Sources (NSPS) – General Provisions	Applicable – Source is an affected facility under the regulations.	Applicable monitoring, recordkeeping and reporting requirements.	Source complies with applicable requirements.
40 CFR Part 60, Subpart GG	Standards of Performance for New Stationary Sources (NSPS) – Stationary Gas Turbines	Applicable – The three (3) compressor turbines are natural gas-fired units with heat input greater than 10 MMBtu/hr.	The three (3) compressor turbines meet the applicable NOX emission standard. NOX emission determined by EPA Method 7E or 20.	Source 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.	Source complies with applicable requirements.
40 CFR Part 60	Appendix A, Method 20 or equivalent	Applicable – The compressor turbine emissions are subject to requirements for determination of NOX, SO2, and diluents emissions.	Emissions determined from EPA Method 20 or Equivalent.	Source complies with applicable requirements.
40 CFR Part 64	Compliance Assurance Monitoring	Not applicable – Source is not an affected facility.	Not applicable.	Source complies with applicable requirements.
40 CFR Part 72	Acid Rain Permits Regulation	Not applicable – Source is not an affected facility.	Not applicable.	Source complies with applicable requirements.
40 CFR Part 73	Acid Rain Sulfur Dioxide Allowance System	Not applicable – Source is not an affected facility.	Not applicable.	Source complies with applicable requirements.
40 CFR Part 75	Acid Rain CEMS	Not applicable – Source is not an affected facility.	Not applicable.	Source complies with applicable requirements.

C. Summary of Monitoring for Compliance

EU	Process Description	Monitored Pollutants	Applicable Subsection	Requirements	Compliance Monitoring
A001 A002 A003	Mars 100 Turbines	CO, NO_X, SO_2, PM_{10}, VOC, HAP	AQR Section 12.5 40 CFR Subpart GG	Annual and short term emission limits.	1. PEMS for NO_X and CO. 2. Stack testing for NO_X and CO EPA Methods as outlined in Part 70 Permit. 3. Compliance for PM_{10}, SO_2, VOCs and HAPs shall be based on sole use of natural gas as fuel and emission factors. 4. Recording is required for compliance demonstration.
A001 A002 A003	Mars 100 Turbines	Opacity	AQR Section 26	Less than twenty percent opacity except for three	Sole use of natural gas as fuel and EPA Method 9 performance testing upon the

EU	Process Description	Monitored Pollutants	Applicable Subsection	Requirements	Compliance Monitoring
				(3) minutes in any 60-minute period.	request of the Control Officer.
B01	Waukesha Natural Gas fired Emergency Generator	CO, NO_X, SO_2, PM_{10}, VOC, HAP	Section 12.5	Annual and short-term emission limits.	Sole use of natural gas as fuel and performance testing upon the request of the Control Officer. Recording is required for compliance demonstration.
B01	Waukesha Natural Gas fired Emergency Generator	Opacity	AQR Section 26	Less than twenty percent opacity except for three (3) minutes in any 60-minute period.	Sole use of natural gas as fuel and EPA Method 9 performance testing upon the request of the Control Officer.
B02	Peerless Natural Gas fired Boiler	CO, NO_X, SO_2, PM_{10}, VOC, HAP	Section 12.5	Annual and short-term emission limits.	Sole use of natural gas as fuel and performance testing upon the request of the Control Officer. Recording is required for compliance demonstration.
B02	Peerless Natural Gas fired Boiler	Opacity	AQR Section 26	Less than twenty percent opacity except for three (3) minutes in any 60-minute period.	Sole use of natural gas as fuel and EPA Method 9 performance testing upon the request of the Control Officer.
C01	4,200 gallon Pipeline Liquids or Natural Gas Condensate Tanks	VOC, HAPs	Section 12.5	Annual and short-term emission limits.	Recording is required for compliance demonstration.
C02	1,500 Gallons Lube Oil in Compressor System	VOC, HAPs	Section 12.5	Annual and short-term emission limits.	Recording is required for compliance demonstration.
C04	20-gallon Parts Washer	VOC, HAPs	Section 12.5	Annual and short-term emission limits.	Recording is required for compliance demonstration.

D. Streamlining Analysis (demonstrating compliance with 40 CFR Subpart GG)

40 CFR	Regulatory Standard	Permit Limit	Relevant Heat Input or Load Level	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 (nat. gas)	25 ppmvd NO_X @15% O_2 (nat.gas)	N/A	75[1]	25	Yes	4 hours	3 hours	Yes
60.333 (GG)	0.8% of S by weight	0.5 grains per 100 SCF	N/A	500.8[2] grains per 100 SCF	0.5 grains per 100 SCF	Yes	N/A	N/A	N/A

[1]60.332(a)(1) has a NO_X limit of nominally 75 ppm.
[2]Section 60.333(a) requires an owner/operator of stationary turbines to demonstrate compliance with either one of the following two conditions:

- Discharge SO_2 at less than or equal to 0.015% by volume at 15% oxygen on a dry basis; or
- Combust fuel with sulfur content less than or equal to 0.8% by weight (8000 ppmw).

E. Permit Shield

The source did not request a permit shield.

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 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 Permit condition.

Air Quality 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:

Kern River Gas Transmission Company's Goodsprings Compressor Station has supplied all the necessary information to Air Quality to draft Part 70 Operating Permit conditions encompassing all applicable requirements and corresponding compliance.

Conclusion:

Air Quality has determined that Kern River Gas Transmission Company's Goodsprings Compressor Station will continue to determine compliance through the use of PEMS, performance testing, quarterly reporting, outlined recordkeeping, along with annual certifications of compliance. Air Quality proceeds with the decision that a Part 70 Operating Permit should be issued as drafted to Kern River Gas Transmission Company's Goodsprings Compressor Station for a period not to exceed five (5) years.