

TECHNICAL SUPPORT DOCUMENT

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

SUBMITTED BY

KERN RIVER GAS TRANSMISSION COMPANY

for

GOODSPRINGS COMPRESSOR STATION

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



Clark County
Department of Air Quality and Environmental Management
Permitting Section

January 2008

This Technical Support Document (TSD) accompanies the proposed Part 70 Operating Permit for Kern River Gas Transmission Company's Goodsprings Compressor Station.

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I. EXECUTIVE SUMMARY

Kern River Gas Transmission Company's Goodsprings Compressor Station is located 1 ½ Miles Southeast of Goodsprings, NV in North Ivanpah, hydrographic area 164A. Hydrographic basin 164A is nonattainment for ozone and PSD for all other regulated air pollutants.

The facility 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 below.

Table 1-1: Maximum Facility PTE (tons per year)

PM ₁₀	NO _x	CO	SO ₂	VOC	HAP
9.50	130.47	51.43	4.85	9.92	9.50

Clark County Department of Air Quality and Environmental Management (DAQEM) has delegated authority to implement the requirement of the Part 70 operating permit program.

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

II. FACILITY 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 ½ 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 facility is subject to 40 CFR 60 Subpart GG.

The facility operates 8,760 hours per year. The Standard Industrial Code (SIC) for the subject property is 4922: Natural Gas Transmission. The NAICS code is 486210.

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 $\leq 15,000$ 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). 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 SoLoNO_x burner system, a dry low-NO_x combustion technology. The manufacturer guarantees NO_x emissions at 25 ppmvd (referenced at 15 percent oxygen). The manufacturer guarantees CO emissions at 50 ppmvd (referenced at 15 percent oxygen). The permittee will be required to maintain CO emissions at 16 ppmvd, based on a three-month quarterly average of hourly values.

Kern River has proposed a Solar Mars Parametric Emissions Monitoring System (PEMS) in lieu of the CEMS requirement. The Solar Mars PEMS was approved by DAQEM staff 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

Kern River Gas Transmission Company was granted an Authority to Construct (ATC) for the Goodsprings Compressor Station on 10/23/91. The compressor station became operational on 1/2/92 and was issued "Yellow Ticket" Operating Permits. Kern River was subsequently issued an Operating Permit with conditions on 1/22/92.

Condition 10 of the 1/22/92 Operating Permit required Kern River to install a new low-NO_x combustor that was under development by Solar Turbines, Inc. preceding the first scheduled major turbine overhaul after the low-NO_x combustor became available. Pursuant to Condition 10 of the Operating Permit conditions, the retrofit would reduce the initial permitted NO_x emission concentration limit from 170 ppmvd to 42 ppmvd (referenced at 15 percent oxygen) and mass emissions of 237.3 tons per year and 72.3 tons per year, respectively.

Kern River was issued a revised Operating Permit on 4/7/95. The Operating Permits of 1/22/92 and 4/7/95 iterate the same conditions, however, APCD approved the use of an alternate monitoring system in lieu of CEMS in the latter permit. A Solar Parametric Emissions Monitoring System (PEMS) would replace CEMS to verify compliance with permit limitations. Compliance monitoring and quarterly and annual reporting to APCD would be required based on the PEMS.

Kern River was issued another revised Operating Permit on 11/18/96. The revised permit reflected the installation of the Solar SoLoNO_x Combustor which was required, pursuant to Condition 10 of the 1/22/92 Operating Permit. Consequently, the NO_x mass emission rate reduced the Goodsprings Compressor Station from major source status of 237.3 tons per year to minor source levels of 72.3 tons per year, which was confirmed by the performance test results. A second performance test was conducted on 5/2/96. The results of that test verified the initial performance test and compliance with the 42 ppm NO_x concentration and subsequent mass emission limits.

Kern River requested the withdrawal of the Goodsprings Compressor Station Part 70 Operating Permit application (reference: Letter to Dr. David Lee, CCHD-APCD; From Kirk W. Rhodes, Sr. Environmental Specialist, Kern River; Dated: November 13, 1996). The letter stated that the Goodsprings Compressor Station was no longer subject to CCHD AQR Section 19 (Part 70 Operating Permits). This was due to a reclassification to minor source status for all regulated pollutants as a result of the installation of the SoLoNO_x combustors.

David Lee, Supervisor of APCD Title V, issued a letter to Kern River (reference: Letter to Kirk W. Rhodes, Sr. Environmental Specialist, Kern River; From David C. Lee; Dated: December 31, 1996) confirming that Kern River's Goodsprings Compressor Station would no longer be subject to the applicable requirements of Part 70. APCD accepted Kern River's request to withdraw the Part 70 application.

Kern River formally requested that APCD remove the CEMS and PEMS requirements from their Operating Permit (reference: Letter to Michael Naylor; From Kirk W. Rhodes, Sr. Environmental Specialist, Kern River; Dated: January 22, 1997). Kern River stated that these conditions were no longer warranted since the Goodsprings Compressor Station was now classified as a minor source of all regulated air pollutants.

APCD issued a letter to Kern River removing the CEMS and PEMS requirement for direct compliance as a result of the minor source reclassification (reference: Letter to Kirk W. Rhodes, Sr. Environmental Specialist, Kern River; From Elizabeth A. Gilmartin, NSR Supervisor, APCD; Dated: March 19, 1997). A revised Operating Permit was issued on 3/27/97. The revised Operating Permit removed all CEMS, PEMS and quarterly reporting requirements. Annual compliance reporting was still required. Turbine performance was continuously monitored using the PEMS system although Kern River was not required to submit quarterly reports.

Kern River requested an ATC for Modification One to upgrade the existing stationary gas fired turbine from a Mars 90 rated at (approximately) 11,000 hp to a Mars 100 rated at 15,000 hp. The increase in turbine horsepower would result in higher natural gas compression and increased natural gas flow through the pipeline. Kern River was granted the ATC for Modification One for the turbine substitution on 3/29/01. The Operating Permit was issued on 9/5/01. Kern River was still classified as a minor source.

On 10/8/02, Kern River was issued an ATC (Modification Two) for two (2) additional 15,000 hp turbines. An annual CO limit of 16 ppmvd will be required for the proposed two (2) new turbines. The CO emission rate shall be based on a three-month quarterly average of hourly values. The existing turbine shall be required to meet the same annual 16 ppmvd CO limitation and the corresponding mass emissions will be amended in the ATC for Modification Two. This change is based on historical information contained in file A468 and by the BACT analysis contained in Section 4 of this Technical Support Document. Operational authority for the two (2) new turbines was granted on 5/11/04 after performance testing was complete.

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.

III. EMISSIONS INFORMATION

A. Total Facility Potential to Emit

The facility potential to emit (PTE) for pollutants (Table III-A-1), as presented in the Part 70 Operating Permit, reflects the permitted emission limits established in the May 16, 2006 NSR ATC/OP (Permit 468, Modification 2, Amendment 1).

Table III-A-1: Maximum Facility PTE (tons per year)

PM ₁₀	NO _x	CO	SO ₂	VOC	HAP
9.50	130.47	51.43	4.85	9.92	9.50

B. Emission Units and PTE

The following tables summarize the allowable limits for each emission unit.

Table III-B-1: Facility Emission Units

EU #	Description	SCC #	Type ¹
A001	Mars 100-T15000S Turbine #1, Solar SoLoNOx Burners, Simple Cycle, Natural Gas-fired, 15,000 hp, 11.5 MWe	20300202	TR1, MEQ
A002	Mars 100-T15000S Turbine #2, Solar SoLoNOx Burners, Simple Cycle, Natural Gas-fired, 15,000 hp, 11.5 MWe	20300202	TR1, MEQ
A003	Mars 100-T15000S Turbine #3, Solar SoLoNOx Burners, Simple Cycle, Natural Gas-fired, 15,000 hp, 11.5 MWe	20300202	TR1, MEQ
B01	Waukesha Natural Gas-fired Emergency Generator, M/N: VHP 7100G, S/N: 403187, 525 kW	20300201	EE1
B02	Peerless Boiler, Natural Gas-fired, M/N: 724 FDA WU, S/N: N/A, 3.85 MMBtu/hour	10300603	DM
C01	4,200-gallon Pipeline Liquids or Natural Gas Condensate Tanks	40400311	DM
C02	1,500 Gallons Lube Oil in Compressor System	20180001	DM

EU #	Description	SCC #	Type ¹
C03	1,000-gallon Lube Oil/Wash Water Sump ²	20180001	DM
C04	20-gallon Parts Washer	40100216	DM

¹ Billing code is a designation for emission unit billing purposes: TR1 = turbine; MEQ = megawatt equivalent; EE1 = emergency engine under 1,500 hp; DM = De Minimis. Fees are listed in AQR Section 18.

² This tank collects wash water from turbine wash downs. When full, this tank is made up of approximately 95% water and 5% oil.

Table III-B-2: Exempt Emission Units

Exempt Unit	Emission Rate	PM ₁₀	NO _x	CO	SO _x	NM VOC	HAP
Two (2) Trane 0.175 MMBtu/hr Space Heaters	lb/hour	1.30E-03	0.02	0.01	1.03E-04	9.44E-04	3.23 E-04
	lb/day	0.03	0.39	0.16	2.47E-03	0.02	0.01
	tons/year	0.01	0.07	0.03	4.51 E-04	4.13 E-03	1.41 E-03
One (1) Trane 0.12 MMBtu/hr Furnace	lb/hour	8.94E-04	0.01	4.71E-03	7.06E-05	6.47E-04	2.21E-04
	lb/day	0.02	0.27	0.11	1.69E-03	0.02	0.01
	tons/year	3.92E-03	0.05	0.02	3.09E-04	2.83E-03	9.70E-04
One (1) A.O. Smith 0.032 MMBtu/hr Water Heater	lb/hour	2.38 E-04	2.95 E-03	1.25 E-03	1.88 E-05	1.73 E-04	5.90 E-05
	lb/day	0.01	0.07	0.03	4.52 E-04	4.14 E-03	1.42 E-03
	tons/year	1.04 E-03	0.01	0.01	8.24 E-05	7.56 E-04	2.59 E-04

¹ Emissions from AP-42 Section 1.4 (July 1998).

Table III-B-3: Insignificant Activities for Informational Purposes Only

Description	Location
11 Trane Radiant Space Heaters (no emissions)	Compressor Building
Two (2) Trane Air Conditioning Systems	Main Office

Table III-B-4: Facility Potential to Emit by Emission Unit (tons per year)

EU #	Rating	Conditions	PM ₁₀	NO _x	CO	SO ₂	VOC	HAP
A001	15,000 hp	8,760 hr/yr	3.12	42.61	16.64	1.61	3.26	0.49
A002	15,000 hp	8,760 hr/yr	3.12	42.61	16.64	1.61	3.26	0.49
A003	15,000 hp	8,760 hr/yr	3.12	42.61	16.64	1.61	3.26	0.49
B01	525 kW	52 hr/yr	<0.01	0.95	0.09	<0.01	<0.01	<0.01
B02	3.85 MMBtu	8,760 hr/yr	0.13	1.69	1.42	0.01	0.09	<0.01
C01	4,200 gal	8,760 hr/yr	0.00	0.00	0.00	0.00	<0.01	<0.01
C02	1,500 gal	8,760 hr/yr	0.00	0.00	0.00	0.00	<0.01	<0.01
C03	1,000 gal	8,760 hr/yr	0.00	0.00	0.00	0.00	<0.01	<0.01
C04	20 gal	8,760 hr/yr	0.00	0.00	0.00	0.00	<0.01	<0.01
Potential to Emit (tons/year)			9.50	130.47	51.43	4.85	9.92	1.53

Table III-B-5: Facility Potential to Emit by Emission Unit (pounds per hour)

EU #	Rating	Conditions	PM ₁₀	NO _x	CO	SO ₂	VOC	HAP
A001	15,000 hp	24 hr/day	0.81	9.73	3.80	0.42	0.84	0.13
A002	15,000 hp	24 hr/day	0.81	9.73	3.80	0.42	0.84	0.13
A003	15,000 hp	24 hr/day	0.81	9.73	3.80	0.42	0.84	0.13
B01	525 kW	2 hr/day	0.07	36.50	3.40	<0.01	0.39	<0.01

EU #	Rating	Conditions	PM ₁₀	NO _x	CO	SO ₂	VOC	HAP
B02	3.85 MMBtu	24 hr/day	0.03	0.39	0.32	<0.01	0.02	<0.01
C01	4,200 gal	8,760 hr/yr	0.00	0.00	0.00	0.00	<0.01	<0.01
C02	1,500 gal	8,760 hr/yr	0.00	0.00	0.00	0.00	<0.01	<0.01
C03	1,000 gal	8,760 hr/yr	0.00	0.00	0.00	0.00	<0.01	<0.01
C04	20 gal	8,760 hr/yr	0.00	0.00	0.00	0.00	<0.01	<0.01
Potential to Emit (pounds/hour)			2.53	66.08	15.12	1.28	2.97	0.45

Table III-B-6: Emission Limitations-ppmvd @ 15% O₂

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. The annual emission limitation for each turbine is 16 ppm.

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

Pollutant	Emissions Factors (Referenced at 15% O ₂)	Potential Emissions Rate		
		lb/hour ¹	lb/day ¹	ton/year ²
PM ₁₀	6.60E-03 lb/MMBtu ⁵	0.81	19.36	3.12
NO _x (25 ppmvd)	9.95E-02 lb/MMBtu ³	9.73	223.48	42.61
CO (16 ppmvd)	3.88E-02 lb/MMBtu ⁴	3.80	91.18	16.64
SO ₂	3.40E-03 lb/MMBtu ⁵	0.42	9.97	1.61
VOC	6.90E-03 lb/MMBtu ⁶	0.84	20.24	3.26
HAPs	1.03E-03 lb/MMBtu ⁷	0.13	3.01	0.49

¹ Short-term hourly emission rates are based on operating at 100 percent load at 0 °F. Reference: "Technical Support Document" prepared by Shelly Walker, Clark County Department of Air Quality Management (April 2004).

² Annual emission rates are based on operating at 100 percent load at 59 °F for 8,760 hours per year. Reference: "Technical Support Document" prepared by Shelly Walker, Clark County Department of Air Quality (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 annual emission rate 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: III-B-8: Potential Emissions from Turbine Startup and Shutdowns

Mode	NO _x ² (pounds)	CO ² (pounds)	VOC ² (pounds)
Startup	1.3	33.5	2.7

Mode	NO _x ² (pounds)	CO ² (pounds)	VOC ² (pounds)
Shutdown	1.7	26.8	2.2

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. Performance Testing and Continuous Emission Monitoring

The owner/operator shall conduct a performance test on the three (3) 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. NO_x and CO performance test requirements are summarized in Table III-C-1.

Table III-C-1: Performance Testing Protocol Requirements for Turbines/Duct Burners

Test Point	Pollutant	Method
Turbine Exhaust Outlet Stack	NO _x	EPA Method 20 or 7E
Turbine Exhaust Outlet Stack	CO	EPA Method 10
Stack Gas Parameters	--	EPA Methods 1, 2, 3 and 4 or 19

Performance testing on the three (3) Mars 100 turbines shall be conducted once each year on or before the anniversary date of the initial performance test. Performance testing is subject to 40 CFR 60 Subpart A, 40 CFR 60 Subpart GG, and DAQEM's Performance Test Frequency Guideline.

Emissions Monitoring

Compliance monitoring for the stationary gas turbines has been in operation since 1999. Due to an extensive engine review, Kern River now has the ability to implement software controls in order to identify most types of mechanical instability on all SoLoNOx operating turbines.

In order to better understand the 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 to occur in a cycle of events.

The events of the cycle comprise the following four processes:

- Compression - Atmospheric air is compressed

- Combustion - Fuel is added to the compressed air and ignited
- Expansion - Hot combustion gases expand through turbine blades
- 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 in 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:

- NGP (Hourly average)
- NPT (Hourly average)
- All individual T5 thermocouples (Hourly average)
- T5 temperature, average of the 17 thermocouples (Hourly average)
- Ambient temperature (Hourly average)
- Fuel Use (Hourly average)
- Hourly Operation
- Average plant operation (hours per day, days per week, weeks per year)
- Suction and discharge Pressure
- PCD Compressor Discharge Pressure (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 were 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 overspeed 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 effect 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 unit PLC 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 one 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 that a fuel injector actually may need inspecting or a thermocouple is failing. The heat produced from any one injector actually influences the temperature reading of 2 or 3 thermocouples; therefore, if one thermocouple is out of range of the average by 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 setpoint 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-SoLoNOx 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 borescope 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:

- Predicted NGP vs. actual NGP;
- T5 average vs. NGP;
- PCD vs. NGP;
- T5 spread.

Summary.

The Solar Mars PEMS was approved by DAQM staff 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 proposed turbines as well as quarterly 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.

IV. REGULATORY REVIEW

A. Local Regulatory Requirements

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

1. Clean Air Act, as amended (CAAA), Authority: 42 U.S.C. § 7401, et seq.;
2. Title 40 of the Code of Federal Regulations (CFR);
3. Nevada Revised Statutes (NRS), Chapter 445B;
4. Portions of the AQR that are 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
5. Portions of the AQR that are 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.co.clark.nv.us/air_quality/Regs.htm

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 that are related only to non-SIP rules are notated as locally enforceable only.

Table IV-A-1: AQR Section 12 and 55 Summary Table for This Facility

	PM ₁₀	NO _x	CO	SO ₂	VOC	HAP
Air Quality Area	PSD	nonattainment (ozone)	PSD	PSD	nonattainment (ozone)	N/A
Facility PTE (tpy)	9.50	130.47	51.43	4.85	9.92	1.53
Major Source	≥ 100 tpy	≥ 50 tpy	≥ 100 tpy	≥ 100 tpy	≥ 50 tpy	≥ 10 tpy for each HAP, or ≥ 25 tpy for combined HAPs

Discussion: Kern River Gas Transmission Company's Goodsprings Compressor Station is a major source of NO_x.

Table IV-A-2: Clark County Department of Air Quality and Environmental Management – 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 facility
1. Definitions	applicable definitions – “Affected Facility”, “Air Contaminant”, “Air Pollution Control Committee”, “Area Source”, “Atmosphere”, “Board”, “Commercial Off-Road Vehicle Racing”, “Dust”, “Existing Facility”, “Existing Gasoline Station”, “Fixed Capital Cost”, “Fumes”, “Health District”, “Hearing Board”, “Integrated Sampling”, “Minor Source”, “Mist”, “New Gasoline Station”, “New Source”, “NIC”, “Point Source”, “Shutdown”, “Significant”, “Single Source”, “Smoke”, “Source of Air Contaminant”, “Special Mobile Equipment”, “Standard Commercial Equipment”, “Standard Conditions”, “Start Up”, “Stop Order”, “Uncombined Water”, and “Vapor Disposal System”	yes	entire facility
4. Control Officer	all subsections	yes	entire facility
5. Interference with Control Officer	all subsections	yes	entire facility
8. Persons Liable for Penalties - Punishment: Defense	all subsections	yes	entire facility
9. Civil Penalties	all subsections	yes	entire facility

Applicable Section – Title	Applicable Subsection - Title	SIP	Affected Emission Unit
10. Compliance Schedule	when applicable; applicable subsections	yes	entire facility
11. Ambient Air Quality Standards	applicable subsections	yes	entire facility
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	entire facility
14. New Source Performance Standards	CCAQR Section 14.1.56: Subpart GG Standards of Performance for Gas Turbines	no	Applicable – turbine units
16. Operating Permits	all subsections	yes	entire facility
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 facility
19. Part 70 Operating Permit Federal Approval (11/25/01)	§ 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 facility
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 facility
25.1 Upset/Breakdown, Malfunctions	§ 25.1 Requirements for the excess emissions caused by upset/breakdown and malfunctions	no	entire facility
25.2 Upset/Breakdown, Malfunctions	§ 25.2 Reporting and Consultation	yes	entire facility

Applicable Section – Title	Applicable Subsection - Title	SIP	Affected Emission Unit
26. Emission of Visible Air Contaminants	§ 26.1 Limit on opacity (\leq 20 percent for 3 minutes in a 60-minute period)	yes	entire facility
28. Fuel Burning Equipment	Emission Limitations for PM	yes	entire facility
29. Sulfur Contents of Fuel Oil	Sulfur content shall be equal to or less than 0.05 percent sulfur by weight	no	entire facility
40. Prohibitions of Nuisance Conditions	§ 40.1 Prohibitions	no	entire facility
41. Fugitive Dust	§ 41.1 Prohibitions	yes	entire facility
42. Open Burning	§ 42.2	no	entire facility
43. Odors In the Ambient Air	§ 43.1 Prohibitions coded as Section 29	no	entire facility
49. Emission Standards for Boilers and Steam Generators Burning Fossil Fuels	Local enforcement only all subsections	no	entire facility
55. Preconstruction Review for New or Modified Stationary Sources in the 8-hour Ozone Nonattainment Area	all subsections	no	entire facility
60. Evaporation and Leakage	all subsections	yes	entire facility
70. Emergency Procedures	all subsections	yes	entire facility
80. Circumvention	all subsections	yes	entire facility

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 requirements are found in the Part 70 OP in Sections IV-C and IV-D. DAQEM 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 requirements are found in the Part 70 OP in Section IV-A.

40 CFR § 60.11-Compliance with standards and maintenance requirements are found in the Part 70 OP in Section IV-A, IV-B and IV-C.

40 CFR § 60.12- Circumvention prohibition is Condition I-A-27 in the Part 70 OP. This is also local rule § 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 III-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.

Pollutant	Emission Limit (ppmvd @ 15% O2)
NO _x	160
SO ₂	150

40 CFR § 60.333-Standard for sulfur dioxide shall be demonstrated by the use of pipeline quality PUC natural gas.

40 CFR § 60.334-Monitoring of operations shall be demonstrated by the use of pipeline quality PUC natural gas.

40 CFR § 60.335-Test methods and procedures are found in the conditions for performance testing found in Section IV-A of the Part 70 OP.

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 SoLoNO_x 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 an applicable source with regard to Part 72 and is not subject to acid rain provisions.

V. 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 DAQEM Compliance Reporting Supervisor shall be as follows:

Quarter	Applicable Period	Due Date	Required Contents
1	January, February, March	April 30 each year	Quarterly Report for 1 st Calendar Quarter
2	April, May, June	July 30 each year	Quarterly Report for 2 nd Calendar Quarter
3	July, August, September	October 30 each year	Quarterly Report for 3 rd Calendar Quarter
4	October, November, December	January 30 each year	Quarterly Report for 4 th Calendar Quarter, any additional annual records required, and Annual Certification of Compliance

- (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

Citation	Title	Applicability	Applicable Test Method	Compliance Status
CCAQR Section 0 [amended 10/7/04]	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.
CCAQR Section 4 [amended 7/1/04]	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.
CCAQR Section 11 [amended 7/1/04]	Ambient Air Quality Standards	Applicable – Source is a source of air pollutants.	Source demonstrated compliance in the ATC permit application with air dispersion modeling using ISCST3.	Source complies with applicable requirements using ISCST3.
CCAQR Section 12.1 [amended 10/7/04]	General application requirements for construction of new and modified sources of air pollution	Applicable – Source applied for and the ATC certificate was issued before commencing construction.	Source received the ATC permit to construct.	Source complies with applicable requirements.
CCAQR Section 12.2.5 [amended 10/7/04]	Requirements for specific air pollutants: PM ₁₀ emission source located in the PSD area	Not Applicable – Source has PM ₁₀ PTE < 100 TPY.	Not Applicable	Source complies with applicable requirements.
CCAQR Section 12.2.6 [amended 10/7/04]	Requirements for specific air pollutants: CO sources located in the PSD area	Not Applicable – Source has CO PTE < 100 TPY.	Not Applicable	Source complies with applicable requirements.
CCAQR Section 12.2.13 [amended 10/7/04]	Requirements for specific air pollutants: VOC sources located in the PSD area	Not Applicable – Source has VOC PTE < 100 TPY	Not Applicable	Source complies with applicable requirements.

Citation	Title	Applicability	Applicable Test Method	Compliance Status
CCAQR Section 12.2.15 [amended 10/7/04]	Requirements for specific air pollutants: NO _x sources located in the PSD area	Applicable – Source has NO _x PTE > 100 TPY	The Mars 100 turbines meet BACT requirements based on installation of burners equipped with Solar SoLoNO _x limit. Emissions were assessed with dispersion modeling and results complied with PSD Class I and II increments and NAAQS using ISCSST3.	Source complies with applicable requirements.
CCAQR Section 12.2.16 [amended 10/7/04]	Requirements for specific air pollutants: SO ₂ sources located in the PSD area	Not Applicable – SO ₂ PTE < 100 TPY	Not Applicable	Source complies with applicable requirements.
CCAQR Section 12.2.19 [amended 10/7/04]	Requirements for specific air pollutants: TCS sources in Clark County	Not Applicable	Not Applicable	Source complies with applicable requirements.
CCAQR Section 12.5 [amended 10/7/04]	Air Quality Models	Applicable – Dispersion modeling performed in ATC permit application using ISCSST3 in accordance with provisions of 40 CFR Part 51, Appendix W.	As applicable, future dispersion modeling performed in ATC permit modifications will be in accordance with provisions of 40 CFR Part 51, Appendix W.	Source complies with applicable requirements.
CCAQR Section 12.7 [amended 10/7/04]	Continuous Emission Monitoring (CEM) Systems	Applicable – The Source has NO _x emissions > 100 TPY.	The DAQEM-approved Parametric Emissions Monitoring System (PEMS) for NO _x emissions shall be utilized during turbine operation.	Source complies with applicable requirements.
CCAQR Section 14.1.1 Subpart A [amended 7/1/04]	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.

Citation	Title	Applicability	Applicable Test Method	Compliance Status
<p>CCAQR Section 14.1.56 Subpart GG [amended 7/1/04]</p>	<p>Standards of Performance for New Stationary Sources (NSPS) – Stationary Gas Turbines</p>	<p>Applicable – The four (4) Source turbines are natural gas-fired units with heat input greater than 10 MMBtu/hr.</p>	<p>The four (4) turbines meet the applicable NO_x emission standard. NO_x emissions determined by EPA Method 20 or 7E.</p>	<p>Source complies with applicable requirements.</p>
<p>CCAQR Section 15.13 (revised 9/3/1981)</p>	<p>Prevention of Significant Deterioration</p>	<p>Applicable – Source PTE > 100 TPY and is listed as a PSD source. Section 15 is the former SIP and has been superseded by Section 12 rule and is federally enforceable.</p>	<p>The requirements of PSD have been met under Section 12 review.</p>	<p>Source complies with applicable requirements.</p>
<p>CCAQR Section 15.13.9 (revised 9/3/1981)</p>	<p>Control Review Requirements</p>	<p>Applicable – Source PTE > 100 TPY and is listed as a PSD source. Section 15 is the former SIP and has been superseded by Section 12 rule and is federally enforceable.</p>	<p>The requirements of emission control review have been met under Section 12 review.</p>	<p>Source complies with applicable requirements.</p>
<p>CCAQR Section 15.13.11 (revised 9/3/1981)</p>	<p>Air Quality Models</p>	<p>Applicable – Source PTE > 100 TPY and is listed as a PSD source. Section 15 is the former SIP and has been superseded by Section 12 rule and is federally enforceable.</p>	<p>The requirement of using the appropriate air quality model at the time of Source's application for Authority to Construct has been met under Section 12 rule.</p>	<p>Source complies with applicable air quality models using ISCST3.</p>
<p>CCAQR Section 15.13.12 (revised 9/3/1981)</p>	<p>Air Quality Analysis</p>	<p>Applicable – Source PTE > 100 TPY and is listed as a PSD source. Section 15 is the former SIP and has been superseded by Section 12 rule and is federally enforceable.</p>	<p>The requirements of the air quality analysis using the appropriate air quality model at the time of Source's application for Authority to Construct has been met under Section 12 rule.</p>	<p>Source complies with applicable air quality models using ISCST3.</p>
<p>CCAQR Section 15.13.14 (revised 9/3/1981)</p>	<p>Additional Impact Analysis</p>	<p>Applicable – Source PTE > 100 TPY and is listed as a PSD source. Section 15 is the former SIP and has been superseded by Section 12 rule and is federally enforceable.</p>	<p>The requirements of the additional impact analysis using the appropriate air quality model at the time of Source's application for Authority to Construct has been met under Section 12 rule.</p>	<p>Source complies with applicable air quality models using ISCST3.</p>
<p>CCAQR Section 16 [amended 7/1/04]</p>	<p>DAQEM Operating Permits</p>	<p>Applicable – Any emission unit of stationary source must apply for and obtain a DAQEM operating permit. Source applied for the operating permit from DAQEM.</p>	<p>Source applied for and received operating permit from DAQEM prior to commercial operation.</p>	<p>Source complies with applicable requirements.</p>

Citation	Title	Applicability	Applicable Test Method	Compliance Status
CCAQR Section 17 [amended 7/1/04]	Dust Control Permit for Construction Activities Including Surface Grading and Trenching	Applicable – Source 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). Applicable – Source will be required to pay all required/applicable permit and technical service fees.	Source applied for permits as needed during initial construction and conformed to required best management practices in dust control permit. Source will continue to do so in future as needed. Source is required to pay all required/applicable permit and technical service fees.	Source complies with applicable requirements.
CCAQR Section 18 [amended 1/20/05]	Permit and Technical Service Fees	Applicable – Source is a major stationary source and under Part 70 the initial Title V permit application will be submitted within 12 months of startup. Section 19 is both federally and locally enforceable	Source did not submit its Part 70 application in a timely manner. DAQEM took enforcement, which has been resolved. The Part 70 application was submitted on October 1, 2004 and received by DAQEM on October 4, 2007.	Source complies with applicable requirements.
CCAQR Section 19 [amended 7/1/04]	40 CFR Part 70 Operating Permits	Not applicable – Source is not an affected facility.	Not applicable.	Source complies with applicable requirements.
CCAQR Section 21 [amended 7/1/04]	Acid Rain Permits	Not applicable – Source is not an affected facility.	Not applicable.	Source complies with applicable requirements.
CCAQR Section 22 [amended 7/1/04]	Acid Rain Continuous Emission Monitoring	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.	Source complies with applicable requirements.
CCAQR Section 25 [amended 7/1/04]	Upset/Breakdown, Malfunctions	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.
CCAQR Section 26 [amended 7/1/04]	Emissions of Visible Air Contaminants			

Citation	Title	Applicability	Applicable Test Method	Compliance Status
CCAQR Section 27 [amended 7/1/04]	Particulate Matter from Process Weight Rate	Applicable – Source emission units are required to meet the maximum weight based on maximum design rate of equipment.	Compliance determined by meeting maximum particulate matter discharge rate based on process rate from AQR Table 27-1.	Source complies with applicable requirements.
CCAQR Section 28 [amended 7/1/04]	Fuel Burning Equipment	Applicable – The PM emission rate for the compressor turbines are below those established based on Section 28 requirements.	Maximum allowable PM emission rate determined from equation in Section 28.	Source complies with applicable requirements.
CCAQR Section 40 [amended 7/1/04]	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.
CCAQR Section 41 [amended 7/1/04]	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.
CCAQR Section 42 [amended 7/1/04]	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.
CCAQR Section 43 [amended 7/1/04]	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.	Source will not operate its facility in a manner that will cause odors.	Source complies with applicable requirements.
CCAQR Section 49 [amended 7/1/04]	Emission Standards for Boilers and Steam Generators Burning Fossil Fuels	Not applicable – the Source does not have a boiler rated over 4 MMBtu/hour.	Not applicable.	Source complies with applicable requirements.

Citation	Title	Applicability	Applicable Test Method	Compliance Status
CCAQR Section 55 [adopted 12/21/04]	Preconstruction review for New or Modified Stationary Sources in the 8-Hour Ozone Nonattainment Area	Applicable – Source is located in North Ivanpah Valley airshed (hydrographic area 164A) and will need to meet the applicable emission control requirements at times of future modifications.	In the event Source undertakes a modification, Source will have to apply proper control technologies and meet offset requirements, as applicable.	Source complies with applicable requirements.
CCAQR Section 70.4 [amended 7/1/04]	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.
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 NO _x emission standard. NO _x 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.

Citation	Title	Applicability	Applicable Test Method	Compliance Status
40 CFR Part 60	Appendix A, Method 20 or equivalent	Applicable – The compressor turbine emissions are subject to requirements for determination of NO _x , SO ₂ , and diluent 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 68	Chemical Accident Prevention Provisions	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

Emission Unit #	Process Description	Monitored Pollutants	Applicable Subsection Title	Requirements	Compliance Monitoring
A001, A002, A003	Mars 100 turbines	CO, NO _x , SO ₂ , PM ₁₀ , VOC, HAPs	Section 12, Section 19, Section 55 40 CFR Subpart GG	Annual and short-term emission limits.	PEMS for NO _x and CO. Stack testing for NO _x and CO EPA Methods as outlined in Part 70 Permit. Compliance for PM ₁₀ , SO ₂ , VOCs and HAPs shall be based on sole use of natural gas as fuel and emission factors. Recording is required for compliance demonstration.
A001, A002, A003	Mars 100 turbines	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.
B01	Waukesha Natural Gas-fired Emergency Generator	CO, NO _x , SO ₂ , PM ₁₀ , VOC, HAPs	Section 12, Section 19, Section 55	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, HAPs	Section 12, Section 19, Section 55	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.

Emission Unit #	Process Description	Monitored Pollutants	Applicable Subsection Title	Requirements	Compliance Monitoring
C01	4,200-gallon Pipeline Liquids or Natural Gas Condensate Tanks	VOC, HAPs	Section 12, Section 19, Section 55	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, Section 19, Section 55	Annual and short-term emission limits.	Recording is required for compliance demonstration.
C03	1,000-gallon Lube Oil/Wash Water Sump ²	VOC, HAPs	Section 12, Section 19, Section 55	Annual and short-term emission limits.	Recording is required for compliance demonstration.
C04	20-gallon Parts Washer	VOC, HAPs	Section 12, Section 19, Section 55	Annual and short-term emission limits.	Recording is required for compliance demonstration.

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:

Kern River Gas Transmission Company's Goodsprings Compressor Station 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 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. DAQEM proceeds with the preliminary 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.