

United States Environmental Protection Agency  
Region 8, Air Program  
1595 Wynkoop Street  
Denver, CO 80202



**Air Pollution Control  
Synthetic Minor Source Permit to Construct**

**40 CFR 49.151**

**# SMNSR-SU-000031-2011.001**

*Permit to Construct to establish legally and practically enforceable limitations  
and requirements on sources at an existing facility*

**Permittee:**

Samson Resources Company

**Permitted Facility:**

South Ignacio Central Delivery Point (CDP)  
Southern Ute Indian Reservation  
La Plata County, Colorado

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## **I. Conditional Permit to Construct**

### **A. General Information**

<u>Facility:</u>	Samson Resources Company, South Ignacio CDP
<u>Permit Number:</u>	SMNSR-SU-000031-2011.001
<u>SIC Code and SIC Description:</u>	1311- Crude Petroleum and Natural Gas

<u>Site Location:</u>	<u>Corporate Office Location</u>
South Ignacio CDP	Samson Resources Company
SE ¼, Sec 32 T33N R7W	Samson Plaza
Southern Ute Indian Reservation	Two West Second Street
La Plata County, CO	Tulsa, Oklahoma 74103-3103

The equipment listed in this permit may only be operated by the Samson Resources Company (Samson) at the following location:

Latitude 37.053917N, Longitude -107.625222W

### **B. Background**

On July 1, 2011, the EPA promulgated the Tribal Minor New Source Review (MNSR) Permit Program at 40 CFR Part 49. The rule became effective on August 30, 2011. The purpose of the rule is to establish a preconstruction permitting program for new and modified minor sources and minor modifications at existing major sources. In addition, the rule provides a mechanism to create legally and practically enforceable restrictions upon request to recognize emission controls, limits in hours of operation, limits on throughputs, etc. creating synthetic minor sources. In other words, an otherwise major stationary source may receive restrictions on its total potential to emit to become a synthetic minor source for purposes of the Prevention of Significant Deterioration permit Program at 40 CFR Part 52 (PSD) and/or the Title V Operating Permit Program at 40 CFR Part 71 (Part 71). This mechanism is voluntary and may also be used to establish an otherwise major source of hazardous air pollutants (HAP) as a synthetically minor source of HAP.

Section 49.153(a)(3)(iv) of the MNSR rule provides the EPA with the authority to require at its discretion existing sources whose limits were established through mechanisms such as a consent decree to apply for a permit under the MNSR Permit Program to transfer the limits to a MNSR permit.

### **C. Proposal**

Through this permit action, the EPA is incorporating legally and practically enforceable emission limits that were originally established in a July 1, 2002 Consent Agreement (#CAA-08-2002-09), and incorporated into the initial Part 71 operating permit the EPA issued to the facility on April 2, 2004. The Part 71 operating permit was significantly modified on November 30, 2005, approving construction of the 6<sup>th</sup>, 7<sup>th</sup>, and 8<sup>th</sup> compressor engines and the 2<sup>nd</sup> tri-ethylene glycol (TEG) dehydration system, and containing enforceable restrictions on emissions from the 6<sup>th</sup>, 7<sup>th</sup>, and 8<sup>th</sup> engines. The Part 71 permit was significantly modified again on July 14, 2008, establishing enforceable restrictions on the two (2) dehydrators and an enforceable facility-wide restriction. The Part 71 operating permit was renewed on August 10, 2009. Specifically, through these Part 71 operating permit actions, the EPA had established legally and practically enforceable requirements to control carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), benzene, formaldehyde (CH<sub>2</sub>O), and total HAP emissions from existing emission units at the

facility. The EPA also established facility-wide CH<sub>2</sub>O and total HAP emission limits, as well as emission unit-specific benzene emission limits, to create a synthetic minor source of HAP emissions. Two (2) TEG dehydration units at the facility are equipped with enclosed combustion devices that combust HAP emissions from the TEG dehydration process to meet the emission unit-specific benzene emission limits and contribute to meeting the facility-wide total HAP emission limits. In addition to the controls on the TEG dehydration units, seven (7) natural gas-fired 4-stroke lean-burn (4SLB) reciprocating internal combustion engines used for natural gas compression, ranging from 1,267 horsepower (hp) to 1,400 hp, and one (1) natural gas-fired 1,680 hp 4-stroke rich-burn (4SRB) reciprocating internal combustion engine used for electric power generation, are equipped with catalytic emission control systems that contribute to meeting the facility-wide CH<sub>2</sub>O and total HAP emission limits, as well as engine-specific CO, NO<sub>x</sub>, and CH<sub>2</sub>O emission limits.

**D. Applicability**

1. This permit is being issued under authority of the MNSR permit program.
2. The requirements in this permit have been created, at the Permittee's request, to establish legally and practically enforceable restrictions for limiting benzene TEG dehydration unit emissions, CO and NO<sub>x</sub> engine emissions, and facility-wide CH<sub>2</sub>O and total HAP emissions.
3. Any conditions established for this facility or any specific units at this facility pursuant to any permit issued under the authority of the PSD permit program or the MNSR permit program shall continue to apply.
4. By issuing this permit, the EPA does not assume any risk of loss which may occur as a result of the operation of the permitted facility by the Permittee, Owner, and/or Operator, if the conditions of this permit are not met by the Permittee, Owner, and/or Operator.

**E. Facility-Wide Requirements**

1. Emission Limits

- (a) Facility-wide emissions of CH<sub>2</sub>O shall not exceed 9.5 tons during any consecutive 12 months.
- (b) Facility-wide emissions of total HAPs shall not exceed 23.0 tons during any consecutive 12 months.
- (c) Emission limits shall apply at all times, unless otherwise specified in this permit.

2. CH<sub>2</sub>O Monitoring Requirements

- (a) Facility-wide actual CH<sub>2</sub>O emissions shall be calculated by the Permittee, in tons, and recorded at the end of each month, beginning with the first calendar month that this permit is effective.
- (b) Prior to 12 full months of facility-wide emissions calculations, the Permittee shall, at the end of each calendar month, add the emissions for that month to the calculated emissions for all previous calendar months and record the total. Thereafter, the Permittee shall, at the end of each calendar month, add the facility-wide emissions for that month to the

calculated facility-wide emissions for the preceding 11 months and record a new 12-month total.

- (c) The Permittee shall include emissions from all controlled and uncontrolled emission sources at the facility in the calculations, including but not limited to insignificant emission units, as defined in 40 CFR 71.5(c)(11)(ii).
- (d) The facility-wide emissions of CH<sub>2</sub>O shall be calculated as follows:
  - (i) Emission units with control devices:
    - (A) For engines equipped with catalytic control systems, CH<sub>2</sub>O emissions for the month shall be calculated by multiplying the most recent performance test results for CH<sub>2</sub>O for each engine in pounds per hour (lb/hr), by the number of operating hours for the engine for that month. If data on operating hours are not available for that unit for that month, full-time operation of the unit for that month (24 hours per day, 7 days per week) shall be assumed.
    - (B) Monthly emissions for any engine break-in period, as specified in this permit, where the engine was operated without the catalytic control system installed, shall be calculated by multiplying the manufacturer-specified CH<sub>2</sub>O emission factors for an uncontrolled engine by the hours the engine operated without the emission control system installed for that month.
    - (C) The calculated CH<sub>2</sub>O emissions for each engine with catalytic control systems shall be added together to calculate the total CH<sub>2</sub>O emissions for controlled engines for that month.
  - (ii) Emission units without control devices. For remaining emission units at the facility, emissions for the month for each unit shall be calculated by multiplying the CH<sub>2</sub>O emission factor for that unit, in lb/hr, by the number of operating hours for that unit for that month. If data on operating hours are not available for a unit for that month, full-time operation of the unit for that month (24 hours per day, 7 days per week) shall be assumed.

### 3. Total HAP Monitoring Requirements

- (a) Facility-wide actual HAP emissions shall be calculated by the Permittee, in tons, and recorded at the end of each month, beginning with the first calendar month that this permit is effective.
- (b) Prior to 12 full months of facility-wide emissions calculations, the Permittee shall, at the end of each calendar month, add the emissions for that month to the calculated emissions for all previous calendar months and record the total. Thereafter, the Permittee shall, at the end of each calendar month, add the facility-wide emissions for that month to the calculated facility-wide emissions for the preceding 11 months and record a new 12-month total.
- (c) The Permittee shall include emissions from all controlled and uncontrolled emission sources at the facility in the calculations, including but not limited to insignificant emission units, as defined in 40 CFR 71.5(c)(11)(ii).

- (d) The facility-wide emissions of total HAPs shall be calculated as follows:
- (i) TEG Dehydration systems. Total HAP emissions from each TEG dehydration system shall be obtained from the requirements for determining total HAPs from each dehydration system still vent in this permit;
  - (ii) CH<sub>2</sub>O Emissions. CH<sub>2</sub>O emissions shall be obtained from the requirements for determining facility-wide CH<sub>2</sub>O emissions in this permit;
  - (iii) All other HAP emissions. For remaining emission units at the facility, emissions for the month for each unit shall be calculated by multiplying the HAP emission factors for that unit, in lb/hr, by the number of operating hours for that unit for that month. If data on operating hours are not available for a unit for that month, full-time operation of that unit for that month (24 hours per day, 7 days per week) shall be assumed. The Permittee shall provide the basis for the HAP emission calculations with the next annual emissions report required by this permit.

4. Recordkeeping Requirements

The Permittee shall maintain the following records:

- (a) The actual monthly and rolling 12-month facility-wide CH<sub>2</sub>O and HAP emissions, in tons per year (tpy);
- (b) All input parameters and calculations used to determine the monthly emissions from all controlled and uncontrolled emission sources at the facility; and
- (c) All deviations from the requirements of this permit.

**F. Requirements for Engines**

1. Construction and Operational Limits:

- (a) The Permittee shall install and operate emission controls as specified in this permit on one (1) 4SRB reciprocating internal combustion engine for electric power generation meeting the following specifications:
  - (i) Operated as a 4SRB engine;
  - (ii) Fired with natural gas; and
  - (iii) Limited to a maximum site rating of 1,680 hp.
- (b) The Permittee shall install and operate emission controls as specified in this permit on two (2) 4SLB reciprocating internal combustion engines for natural gas compression, each meeting the following specifications:
  - (i) Operated as a 4SLB engine;
  - (ii) Fired with natural gas; and
  - (iii) Limited to a maximum site rating of 1,267 hp.
- (c) The Permittee shall install and operate emission controls as specified in this permit on one (1) 4SLB reciprocating internal combustion engine for natural gas compression, meeting the following specifications:

- (i) Operated as a 4SLB engine;
  - (ii) Fired with natural gas; and
  - (iii) Limited to a maximum site rating of 1,336 hp.
- (d) The Permittee shall install and operate emission controls as specified in this permit on four (4) 4SLB reciprocating internal combustion engines for natural gas compression, each meeting the following specifications:
  - (i) Operated as a 4SLB engine;
  - (ii) Fired with natural gas; and
  - (iii) Limited to a maximum site rating of 1,400 hp.
- (e) Only the engines that are operated and controlled as specified in this permit are approved for installation under this permit.

## 2. Emission Limits

- (a) Emissions from the one (1) 4SRB 1,680 hp engine shall not exceed the following:
  - (i) CO: 12.9 lb/hr;
  - (ii) NO<sub>x</sub>: 9.2 lb/hr; and
  - (iii) CH<sub>2</sub>O: 0.07 lb/hr.
- (b) Emissions from each of the two (2) 4SLB 1,267 hp engines shall not exceed the following:
  - (i) CO: 2.79 lb/hr; and
  - (ii) CH<sub>2</sub>O: 0.29 lb/hr.
- (c) Emissions from the one (1) 4SLB 1,336 hp engine shall not exceed the following:
  - (i) CO: 2.94 lb/hr; and
  - (ii) CH<sub>2</sub>O: 0.25 lb/hr.
- (d) Emissions from each of the four (4) 4SLB 1,400 hp engines shall not exceed the following:
  - (iii) CO: 3.08 lb/hr; and
  - (iv) CH<sub>2</sub>O: 0.31 lb/hr.
- (e) Emission limits shall apply at all times, unless otherwise specified in this permit.

## 3. Control and Operational Requirements

- (a) The Permittee shall ensure that the one (1) 4SRB engine is equipped with a non-selective catalytic reduction (NSCR) control system and air-to-fuel ratio (AFR) control system capable of reducing uncontrolled NO<sub>x</sub>, CO and CH<sub>2</sub>O emissions to meet the engine specific emission limits in this permit.
- (b) The Permittee shall replace the oxygen (O<sub>2</sub>) sensor on the AFR controller on the one (1) 4SRB engine within every 2,190 hours of engine run time.

- (c) The Permittee shall ensure that the seven (7) 4SLB engines are all equipped with oxidation catalytic control systems capable of reducing uncontrolled CO and CH<sub>2</sub>O emissions to meet the engine specific emission limits in this permit.
- (d) The Permittee shall install, operate, and maintain temperature sensing devices (e.g., thermocouple or resistance temperature detectors) before the inlet to the catalyst bed on each engine in order to continuously monitor the engine exhaust temperature at the inlet to the catalyst bed. Each temperature sensing device shall be calibrated and operated according to manufacturer specifications or equivalent specifications developed by the Permittee or vendor.
- (e) Except during startups, which shall not exceed 30 minutes, the engine exhaust temperature of each engine at the inlet to the catalyst bed shall be maintained at all times the engines operate within the following limits:
  - (i) For the one (1) 4SRB engine, an inlet temperature of at least 750 °F and no more than 1,250 °F.
  - (ii) For the seven (7) 4SLB engines, an inlet temperature of at least 500 °F and no more than 1,250 °F.
- (f) During operation, the pressure drop across the catalyst bed on each engine shall be maintained to within  $\pm 2$  inches of water from the baseline pressure drop measured during the most recent performance test. The baseline pressure drop for the catalyst bed shall be determined at 100%  $\pm$  10% of the engine load measured during the most recent performance test.
- (g) The Permittee shall only fire the engines with natural gas. The natural gas shall be pipeline-quality in all respects except that the carbon dioxide (CO<sub>2</sub>) concentration in the gas shall not be required to be within pipeline-quality.
- (h) The Permittee shall follow, for each engine and any respective catalytic control system, the manufacturer recommended maintenance schedule and procedures, or equivalent maintenance schedule and procedures developed by the Permittee or vendor, to ensure optimum performance of each engine and its respective catalytic control system.
- (i) The Permittee may rebuild or replace an existing permitted engine with an engine of the same hp rating, and configured to operate in the same manner as the engine being rebuilt or replaced. Any emission limits, requirements, control technologies, testing or other provisions that apply to the permitted engines that are replaced shall also apply to the rebuilt or replaced engines.
- (j) The Permittee may resume operation without the catalytic control system during an engine break-in period, not to exceed 200 operating hours, for rebuilt and replaced engines.

#### 4. Performance Testing Requirements

- (a) Performance tests shall be conducted on the one (1) 4SRB engine equipped with a NSCR control system and AFR controller for measuring NO<sub>x</sub>, CO, and CH<sub>2</sub>O emissions and on each of the seven (7) 4SLB engines equipped with catalytic control systems for measuring CO and CH<sub>2</sub>O emissions, to demonstrate compliance with each respective emission



limitation in this permit. The performance tests shall be conducted in accordance with appropriate reference methods specified in 40 CFR Part 60, Appendix A, 40 CFR Part 63, Appendix A, or an appropriate EPA-approved American Society for Testing and Materials (ASTM) method. The Permittee may submit to the EPA a written request for approval of an alternate test method, but shall only use that alternate test method after obtaining written approval from the EPA.

- (i) The initial performance test shall be conducted within 90 calendar days of startup of a new engine.
- (ii) Performance tests shall be conducted within 90 calendar days of startup of all rebuilt and replaced engines.
- (iii) Performance tests shall be conducted within 90 calendar days of each catalyst replacement.
- (iv) Subsequent performance tests for CH<sub>2</sub>O emissions shall be performed once every calendar quarter.
  - (A) The first subsequent performance test shall be conducted within 90 days of the initial performance test for each engine.
  - (B) For any one (1) engine, if the results of two (2) consecutive subsequent quarterly performance tests demonstrate compliance with CH<sub>2</sub>O emission limits, required testing frequency for CH<sub>2</sub>O may change from quarterly to semi-annually.
  - (C) For any one (1) engine, if the results of any subsequent semi-annual performance test demonstrates non-compliance with the CH<sub>2</sub>O emission limits, required monitoring frequency for CH<sub>2</sub>O shall change back to quarterly.
- (b) The Permittee shall not perform engine tuning or make any adjustments to engine settings, catalytic control system settings, processes or operational parameters immediately prior to the engine testing or during the engine testing. Any such tuning or adjustments may result in a determination by the EPA that the test is invalid. Artificially increasing an engine load to meet test requirements is not considered engine tuning or adjustments.
- (c) The Permittee shall not abort any engine tests that demonstrate non-compliance with any NO<sub>x</sub>, CO, or CH<sub>2</sub>O emission limits in this permit.
- (d) Performance tests conducted on the one (1) 4SRB engine for measuring NO<sub>x</sub>, CO, and CH<sub>2</sub>O emissions and on each of the seven (7) 4SLB engines for measuring CO and CH<sub>2</sub>O emissions shall meet the following requirements:
  - (i) The pressure drop across each catalyst bed and the inlet temperature to each catalyst bed shall be measured and recorded during all performance tests.
  - (ii) All performance tests for NO<sub>x</sub> and CO emissions on the one (1) 4SRB engine equipped with a NSCR control system and AFR controller shall be performed simultaneously.
  - (iii) The Permittee shall measure NO<sub>x</sub> emissions from each of the seven (7) 4SLB engines simultaneously with all performance tests for CO emissions. NO<sub>x</sub> emissions shall be measured using a portable analyzer and protocol approved in

writing by the EPA. *[Note to Permittee: Although the permit does not contain NO<sub>x</sub> emission limits for these engines, NO<sub>x</sub> measurement requirements have been included as an indicator to ensure compliance with Condition C.4(b) above.]*

- (iv) All performance tests shall be conducted at a maximum operating rate (90% to 110% of the maximum achievable load available at the time of the test). The Permittee may submit to the EPA a written request for approval of an alternate load level for testing, but shall only test at that alternate load level after obtaining written approval from the EPA.
- (v) During each test run, data shall be collected on all parameters necessary to document how emissions were measured and calculated (such as test run length, minimum sample volume, volumetric flow rate, moisture and oxygen corrections, etc.).
- (vi) Each test shall consist of at least three 1-hour or longer valid test runs. Emission results shall be reported as the arithmetic average of all valid test runs and shall be in terms of the emission limits in this permit.
- (vii) Performance test plans shall be submitted to the EPA for approval 60 calendar days prior to the date the test is planned.
- (viii) Performance test plans that have already been approved by the EPA for the emission units approved in this permit may be used in lieu of new test plans unless the EPA requires the submittal and approval of new test plans. The Permittee may submit new plans for EPA approval at any time.
- (ix) The test plans shall include and address the following elements:
  - (A) Purpose of the test;
  - (B) Engines and catalytic control systems to be tested;
  - (C) Expected engine operating rate(s) during the test;
  - (D) Sampling and analysis procedures (sampling locations, test methods, laboratory identification);
  - (E) Quality assurance plan (calibration procedures and frequency, sample recovery and field documentation, chain of custody procedures); and
  - (F) Data processing and reporting (description of data handling and quality control procedures, report content).
- (e) The Permittee shall notify the EPA at least 30 calendar days prior to scheduled performance testing. The Permittee shall notify the EPA at least 1 week prior to scheduled performance testing if the testing cannot be performed.
- (f) If the results of a complete and valid performance test of the emissions from any permitted engine demonstrate noncompliance with the emission limits in this permit, the engine shall be shut down as soon as safely possible, and appropriate corrective action shall be taken (e.g., repairs, catalyst cleaning, catalyst replacement). The Permittee shall notify the EPA in writing within 24 hours of each such shut down. The engine must be retested within 7 days of being restarted and the emissions must meet the applicable limits in this permit. If the retest shows that the emissions continue to exceed the limits in this permit, the engine

shall again be shut down as soon as safely possible, and the engine may not operate, except for purposes of startup and testing, until the Permittee demonstrates through testing that the emissions do not exceed the emission limits in this permit.

- (g) If a permitted engine is not operating, the Permittee does not need to start up the engine solely to conduct a performance test. The Permittee may conduct the performance test when the engine is started up again.

5. Monitoring Requirements

- (a) The Permittee shall continuously measure the engine exhaust temperature at the inlet to the catalyst bed on the one (1) 4SRB engine equipped with a NSCR control system and AFR controller and each of the seven (7) 4SLB engines.
- (b) Except during startups not to exceed 30 minutes, if the engine exhaust temperature at the inlet to the catalyst bed deviates from the acceptable ranges specified in this permit then the following actions shall be taken. The Permittee's completion of any or all of these actions shall not constitute, nor qualify as, an exemption from any other emission limits in this permit.
  - (i) Within 24 hours upon determining a deviation of the engine exhaust temperature at the inlet to the catalyst bed, the Permittee shall investigate. The investigation shall include testing the temperature sensing device, inspecting the engine for performance problems and assessing the catalytic control system for possible damage that could affect catalytic system effectiveness (including, but not limited to, catalyst housing damage, and fouled, destroyed or poisoned catalyst).
  - (ii) If the engine exhaust temperature at the inlet to the catalyst bed can be corrected by following the engine manufacturer's recommended procedures or equivalent procedures developed by the Permittee or vendor and the catalytic control system has not been damaged, then the Permittee shall correct the engine exhaust temperature at the inlet to the catalyst bed within 24 hours of inspecting the engine and catalytic control system.
  - (iii) If the engine exhaust temperature at the inlet to the catalyst bed cannot be corrected using the engine manufacturer recommended procedures or equivalent procedures developed by the Permittee or vendor, or the catalytic control system has been damaged, then the affected engine shall cease operating immediately and shall not be returned to routine service until the following has been met:
    - (A) The engine exhaust temperature at the inlet to the catalyst bed is measured and found to be within the acceptable temperature range for that engine; and
    - (B) The catalytic control system has been repaired or replaced, if necessary.
- (c) The Permittee shall monitor the pressure drop across the catalyst bed of the one (1) 4SRB engine equipped with a NSCR control system and AFR controller and each of the seven (7) 4SLB engines once every calendar week using pressure sensing devices before and after the catalyst bed to obtain a direct reading of the pressure drop (also referred to as the differential pressure). *[Note to Permittee: Differential pressure measurements, in general, are used to show the pressure across the filter elements. This information will determine*

*when the elements in the catalyst bed are fouling, blocked or blown out and thus require cleaning or replacement.]*

- (d) The Permittee shall perform the first measurement of the pressure drop across each catalyst bed no more than 7 days from the date of the initial performance test. Thereafter, the Permittee shall measure the pressure drop across the catalyst bed, at a minimum every 7 days. Subsequent performance tests, as required in this permit, can be used to meet the periodic pressure drop monitoring requirement provided it occurs within the 7-day window. The pressure drop reading can be a one-time measurement on that day, the average of performance test runs, or a 12-hour average of all the measurements on that day if continuous readings are taken.
- (e) If the pressure drop reading exceeds  $\pm 2$  inches of water from the baseline pressure drop reading taken during the most recent performance test, then the following actions shall be taken. The Permittee's completion of any or all of these actions shall not constitute, nor qualify as, an exemption from any other emission limits in this permit:
  - (i) Within 24 hours of determining a deviation of the pressure drop across the catalyst bed, the Permittee shall investigate. The investigation shall include testing the pressure transducers and assessing the catalytic control system for possible damage that could affect catalytic system effectiveness (including, but not limited to, catalyst housing damage, and plugged, fouled, destroyed or poisoned catalyst).
  - (ii) If the pressure drop across the catalyst bed can be corrected by following the catalytic control system manufacturer's recommended procedures or equivalent procedures developed by the Permittee or vendor, and the catalytic control system has not been damaged, then the Permittee shall correct the problem within 24 hours of inspecting the catalytic control system.
  - (iii) If the pressure drop across the catalyst bed cannot be corrected using the catalytic control system manufacturer's recommended procedures or equivalent procedures developed by the Permittee or vendor, or the catalytic control system is damaged, then the Permittee shall do one of the following:
    - (A) Conduct a performance test as specified in this permit to ensure that the  $\text{CH}_2\text{O}$  emission limits are being met and to re-establish the pressure drop across the catalyst bed; or
    - (B) Cease operating the affected engine immediately. The engine shall not be returned to routine service until the pressure drop is measured and found to be within the acceptable pressure range for that engine as determined from the most recent performance test. Corrective action may include removal and cleaning of the catalyst or replacement of the catalyst.
- (f) The Permittee shall monitor CO and  $\text{NO}_x$  emissions from the exhaust of the catalytic control system on each engine at least quarterly, to demonstrate compliance with the engine emission limits in this permit. To meet this requirement, the Permittee shall:
  - (i) Measure CO and  $\text{NO}_x$  emissions at the normal operating load using a portable analyzer and a monitoring protocol approved by the EPA or conduct a performance test as specified in this permit;

- (ii) Measure the CO and NO<sub>x</sub> emissions simultaneously; and
  - (iii) Commence monitoring for CO and NO<sub>x</sub> emissions within 90 calendar days of the Permittee's submittal of the initial performance test results for NO<sub>x</sub> and/or CO emissions, as appropriate, to the EPA.
- (g) The Permittee shall not perform engine tuning or make any adjustments to engine settings, catalytic control system settings, processes or operational parameters the day of or during measurements. Any such tuning or adjustments may result in a determination by the EPA that the result is invalid. Artificially increasing an engine load to meet testing requirements is not considered engine tuning or adjustments.
- (h) For each of the seven (7) 4SLB engines, if the results of consecutive quarterly portable analyzer measurements demonstrate compliance with the CO emission limits, the required monitoring frequency may change from quarterly to semi-annually.
- (i) For the one (1) 4SRB engine, if the results of consecutive quarterly portable analyzer measurements demonstrate compliance with the NO<sub>x</sub> and CO emission limits, the required monitoring frequency may change from quarterly to semi-annually.
- (j) For any one (1) engine, if the results of consecutive semi-annual portable analyzer measurements demonstrate non-compliance with the NO<sub>x</sub> and/or CO emission limits, the required test frequency shall revert back to quarterly.
- (k) The Permittee shall submit portable analyzer specifications and monitoring protocols to the EPA at the following address for approval at least 45 calendar days prior to the date of initial portable analyzer monitoring:
- U.S. Environmental Protection Agency, Region 8  
Office of Enforcement, Compliance & Environmental Justice  
Air Toxics and Technical Enforcement Program, 8ENF-AT  
1595 Wynkoop Street  
Denver, Colorado 80202
- (l) Portable analyzer specifications and monitoring protocols that have already been approved by the EPA for the emission units approved in this permit may be used in lieu of new protocols unless the EPA determines it is necessary to require the submittal and approval of a new protocol. The Permittee may submit a new protocol for EPA approval at any time.
- (m) The Permittee is not required to conduct parametric monitoring of exhaust temperature and catalyst differential pressure on engines that have not operated during the monitoring period. The Permittee shall certify that the engine(s) did not operate during the monitoring period in the annual report specified in this permit.

## 6. Recordkeeping Requirements

- (a) Records shall be kept of manufacturer and/or vendor specifications and maintenance requirements developed by the manufacturer, vendor, or Permittee for each engine, and each catalytic control system, temperature-sensing device, and pressure-measuring device required in this permit.

- (b) Records shall be kept of all calibration and maintenance conducted for each engine, and each catalytic control system, temperature-sensing device, and pressure-measuring device required in this permit.
- (c) Records shall be kept that are sufficient to demonstrate that the fuel for the engines is pipeline quality natural gas in all respects, with the exception of CO<sub>2</sub> concentrations.
- (d) Records shall be kept of all temperature measurements required in this permit, as well as a description of any corrective actions taken pursuant to this permit.
- (e) Records shall be kept of all pressure drop measurements required in this permit, as well as a description of any corrective actions taken pursuant to this permit.
- (f) Records shall be kept of all required testing and monitoring in this permit. The records shall include the following:
  - (i) The date, place, and time of sampling or measurements;
  - (ii) The date(s) analyses were performed;
  - (iii) The company or entity that performed the analyses;
  - (iv) The analytical techniques or methods used;
  - (v) The results of such analyses or measurements; and
  - (vi) The operating conditions as existing at the time of sampling or measurement.
- (g) Records shall be kept of all catalyst replacements or repairs, AFR controller replacements, engine rebuilds and replacements.
- (h) Records shall be kept of each rebuilt or replaced engine break-in period, pursuant to the requirements of this permit, where an existing engine that has been rebuilt or replaced resumes operation without the catalyst control system, for a period not to exceed 200 hours.
- (i) Records shall be kept of each time any of the eight (8) engines are shut-down due to a deviation in the inlet temperature to the catalyst bed or pressure drop across a catalyst bed. The Permittee shall include in the record the cause of the problem, the corrective action taken, and the timeframe for bringing the pressure drop and inlet temperature range into compliance.

## **G. Requirements for TEG Dehydration Systems**

### **1. Construction and Operational Limits**

- (a) The Permittee may install and operate no more than one (1) TEG dehydration unit meeting the following specifications:
  - (i) Limited to a maximum natural gas processing capacity of 30 million standard cubic feet per day (MMscfd);
  - (ii) Equipped with a natural gas-fired TEG reboiler limited to a maximum heat input capacity of 0.6 million British thermal units per hour (MMBtu/hr).

- (b) The Permittee may install and operate no more than one (1) TEG dehydration unit meeting the following specifications:
    - (i) Limited to a maximum natural gas processing capacity of 40 MMscfd;
    - (ii) Equipped with a natural gas-fired TEG reboiler limited to a maximum heat input capacity of 0.6 MMBtu/hr.
  - (c) Only the TEG dehydration units that are operated and controlled as specified in this permit may be installed and operated.
2. Emission Limits: Emissions of benzene from each of the TEG dehydration systems approved in this permit for installation and operation at the facility shall not exceed 0.9 tons in any consecutive 12 months. The emission limits shall apply at all times.
3. Control and Operational Requirements
- (a) *TEG Dehydration Units.* The Permittee shall meet the following requirements for the TEG dehydration unit:
    - (i) Each TEG dehydration unit must be equipped with flash gas separators that route the flash gas back into the sales line, condensers, or an enclosed combustor capable of 98.0% benzene emission destruction efficiency.
    - (ii) All emissions from each TEG dehydration unit shall be routed through a closed-vent system to an emissions control system as specified in this permit.
    - (iii) The Permittee shall follow, for each TEG dehydration unit and respective emission control system, the manufacturer's recommended maintenance schedule and procedures to ensure optimum performance.
  - (b) *Closed-Vent Systems.* The Permittee shall meet the following requirements for the closed-vent systems:
    - (i) Each closed-vent system shall route all hydrocarbon emissions from the dehydration units to the control system required by this permit.
    - (ii) All vent lines, connections, fittings, valves, relief valves, or any other appurtenance employed to contain and collect gases, vapors, and fumes and transport them to control equipment shall be maintained and operated during any time the control equipment is operating.
    - (iii) Each closed-vent system shall be designed to operate with no detectable emissions.
    - (iv) If any closed-vent system contains one or more bypass devices that could be used to divert all or a portion of the gases, vapors, or fumes from entering the control devices, the Permittee shall meet the one of following requirements for each bypass device:
      - (A) At the inlet to the bypass device that could divert the stream away from the control device and into the atmosphere, properly install, calibrate, maintain, and operate a flow indicator that is capable of taking periodic readings and sounding an alarm when the bypass device is open such that the stream is

- being, or could be, diverted away from the control device and into the atmosphere;
- (B) Secure the bypass device valve installed at the inlet to the bypass device in the non-diverting position using a car-seal or a lock-and-key type configuration;
  - (C) Low leg drains, high point bleeds, analyzer vents, open-ended valves or lines, and safety devices are not subject to the requirements applicable to bypass devices.
- (v) The Permittee shall minimize leaks of hydrocarbon emissions from all vent lines, connections, fittings, valves, relief valves, or any other appurtenance employed to contain, collect, and transport gases, vapors, and fumes to the control device.
- (c) *Enclosed Combustion Devices.* The Permittee shall meet the following requirements for each enclosed combustion device:
- (i) For each enclosed combustion device, the Permittee shall follow the manufacturer's written operating instructions, procedures and maintenance schedule to ensure good air pollution control practices for minimizing emissions.
  - (ii) The Permittee shall ensure that each enclosed combustion device has sufficient capacity to achieve at least a 98.0% benzene emission destruction efficiency for the minimum and maximum hydrocarbon volumetric flow rate and BTU content routed to the device.
  - (iii) The Permittee must ensure that each enclosed combustion device is:
    - (A) A model demonstrated by a manufacturer to meet the benzene destruction efficiency requirements of this permit using the procedures specified in 40 CFR 60.5413(d) for VOC emissions by the due date of the first annual report as specified in 40 CFR 49.147(b); or
    - (B) Demonstrated by the Permittee to meet the benzene destruction efficiency requirements of this permit by using the EPA approved performance test methods specified in 40 CFR 63.772 (e)(i) – (iii) for hazardous air pollutants, by the due date of the first annual report.
  - (iv) The Permittee must ensure that each enclosed combustion device is:
    - (A) Operated properly at all times that natural gas is routed to it;
    - (B) Operated with a liquid knock-out system to collect any condensable vapors (to prevent liquids from going through the control device);
    - (C) Equipped with a flash-back flame arrestor;
    - (D) Equipped with one of the following:
      - I. A continuous burning pilot flame, a thermocouple, and a malfunction alarm and notification system if the pilot flame fails; or



II. An electronically controlled auto-ignition system with a malfunction alarm and notification system if the pilot flame fails while produced natural gas or natural gas emissions are flowing to the enclosed combustor;

(E) Maintained in a leak-free condition; and

(F) Operated with no visible smoke emissions.

(d) The Permittee shall follow, for each TEG dehydration unit and respective emission control system, the manufacturer's recommended maintenance schedule and procedures to ensure optimum performance.

#### 4. Testing Requirements

The Permittee shall obtain extended wet gas analyses of the inlet wet gas stream to each TEG dehydration system at least once per calendar month. The analysis shall include the inlet gas temperature and pressure at which the sample was taken.

#### 5. Monitoring Requirements

- (a) The Permittee shall monitor each closed vent system for leaks of hydrocarbon emissions from all vent lines, connections, fittings, valves, relief valves, or any other appurtenance employed to contain, collect, and transport gases, vapors, and fumes to the enclosed combustion devices as follows:
- (i) Visit the facility on a quarterly basis to inspect all closed vent systems for defects that could result in air emissions and document each inspection. Defects include, but are not limited to, visible cracks, holes, or gaps in piping; loose connections; or broken or missing caps or other closure devices. If a quarterly visit is not feasible due to sudden, infrequent, and unavoidable events (i.e., weather, road conditions), every effort shall be made to visit the facility as close to quarterly as possible;
  - (ii) The inspections shall be based on audio, visual, and olfactory procedures; and
  - (iii) Any leaks detected in any closed vent system shall be addressed immediately unless the repair requires resources not currently available. If the resources are not available, the leak shall be repaired no later than 15 days after initial detection of the leak.
- (b) The Permittee shall monitor each enclosed combustion device to confirm proper operation as follows:
- (i) Continuously monitor the proper functioning of each enclosed combustion device's combustion source using a thermocouple or other or other heat sensing monitoring device and a recording device that indicates the continuous ignition of the flame while gas is flowing to it;
  - (ii) Visually inspect the combustion source (continuous burning pilot flame or automatic igniter) to ensure proper operation whenever an operator is on site, at a minimum, quarterly; and

- (iii) Visually confirm that no smoke is present during operation of each smokeless enclosed combustion device whenever an operator is on site; at a minimum, quarterly.
- (c) Benzene and total HAP emissions from each of the TEG dehydration systems shall be determined monthly using the most recent version of the GRI GlyCalc model and the following input parameters:
  - (i) Current month's inlet wet gas stream properties;
  - (ii) Temperature and pressure of the gas provided in the inlet wet gas analysis;
  - (iii) The emission control device efficiency, unless the closed-vent system or control device was bypassed or down or a malfunction alarm was triggered. In such cases, the emission control device efficiency used in the calculation shall be 0.0%; and
  - (iv) The maximum gas throughput and glycol pump recirculation rate for each TEG dehydration system as follows:

<b>TEG Dehydration Unit Description</b>	<b>Maximum Glycol Pump Recirculation Rate</b>
30 MMscfd maximum gas throughput	15 gallons per minute
40 MMscfd maximum gas throughput	17 gallons per minute

- (d) Benzene and total HAP emissions from each TEG dehydration system shall be calculated and recorded at the end of each month, beginning with the first full calendar month after operations commenced. Prior to 12 full months of operation, the Permittee shall, at the end of each month, add the emissions for that month to the calculated emissions for all previous months since operations commenced, where applicable, and record the total. Thereafter, the Permittee shall, at the end of each month, add the emissions for that month to the calculated emissions for the preceding 11 months and record a new 12 month total.

## 6. Recordkeeping Requirements

The Permittee shall keep records of the following:

- (a) The monthly benzene, total HAP emissions, GRI GlyCalc model input parameters and GRI GlyCalc model reports for each TEG dehydration system.
- (b) Written, site-specific designs, operating instructions, operating procedures, and maintenance schedules.
- (c) All required monitoring of the control device operations;
- (d) The exceedances of the operating parameters specified in manufacturers' or vendors' guarantees or engineering specifications with regard to the TEG dehydration units, closed vent systems and control devices. The records shall include each TEG dehydration unit, closed-vent system, enclosed combustion device total operating times during the calendar

month in which the exceedance occurred, the date, time and length of time that the parameters were exceeded, and the corrective actions taken and any preventative measures adopted to operate the facility within that operating parameter;

- (e) Any instances in which any closed-vent system or control device was bypassed or down in each calendar month, the reason for each incident, its duration, and the corrective actions taken and any preventative measures adopted to avoid such bypasses or downtimes;
- (f) Any instances in which the pilot flame is not present in the combustor or the auto ignition system was not operating, the date and times of the observation and the corrective actions taken and any preventative measures adopted to limit the malfunctions;
- (g) Any instances in which the thermocouple (or other heat sensing monitoring device) installed to detect the presence of a flame in the combustor is not operational, the time period during which it was not operational, and the corrective measures taken;
- (h) Any instances in which the recording device installed to record data from the thermocouple is not operational;
- (i) Any time periods in which visible emissions are observed emanating from a control system; and
- (j) The emissions calculations included in the consecutive 12-month facility-wide total.
- (k) Each leak detection inspection. All leak detection inspection records must include, at a minimum, the following information:
  - (i) A description of the methods used for the inspection;
  - (ii) The date of the inspection;
  - (iii) The findings of the inspection;
  - (iv) Any corrective action taken and the date of the corrective action;
  - (v) Reason for any delays to corrective actions; and
  - (vi) The inspector's name and signature.
  - (vii) All input parameters and calculations used to determine the monthly emissions.

## **H. Requirements for Records Retention**

1. The Permittee shall retain all records required by this permit for a period of at least 5 years from the date the record was created.
2. Records shall be kept in the vicinity of the facility, such as at the facility, the location that has day-to-day operational control over the facility, or the location that has day-to-day responsibility for compliance of the facility.

## **I. Requirements for Reporting**

### **1. Annual Emission Reports**

- (a) The Permittee shall submit a written annual report of the actual annual emissions from all emission units at the facility each year no later than April 1<sup>st</sup>. The annual report shall cover

the period for the previous calendar year. All reports must be certified to truth and accuracy by the by the person primarily responsible for Clean Air Act compliance of the Permittee.

- (b) The report shall include NO<sub>x</sub>, CO, total HAP, CH<sub>2</sub>O, and benzene emissions.
- (c) The report shall be submitted to:

U.S. Environmental Protection Agency, Region 8  
Office of Partnerships and Regulatory Assistance  
Tribal Air Permitting Program, 8P-AR  
1595 Wynkoop Street  
Denver, Colorado 80202

The report may be submitted via electronic mail to [r8AirPermitting@epa.gov](mailto:r8AirPermitting@epa.gov).

- 2. All other documents required to be submitted under this permit, with the exception of the **Annual Emission Reports**, shall be submitted to:

U.S. Environmental Protection Agency, Region 8  
Office of Enforcement, Compliance & Environmental Justice  
Air Toxics and Technical Enforcement Program, 8ENF-AT  
1595 Wynkoop Street  
Denver, Colorado 80202

Documents may be submitted electronically to [r8airreportenforcement@epa.gov](mailto:r8airreportenforcement@epa.gov).

- 3. The Permittee shall promptly submit to the EPA a written report of any deviations of permit requirements, a description of the probable cause of such deviations, and any corrective actions or preventative measures taken. A “prompt” deviation report is one that is post marked or submitted via electronic mail to [r8airreportenforcement@epa.gov](mailto:r8airreportenforcement@epa.gov) as follows:
  - (a) Within 30 days from the discovery of any deviation of permit requirements that is left uncorrected for more than 5 days after discovering the deviation; and
  - (b) By April 1<sup>st</sup> for the discovery of a deviation of recordkeeping or other permit conditions during the preceding calendar year that do not affect the Permittee’s ability to meet the emission limits.
- 4. The Permittee shall submit a written report for any required performance tests to the EPA within 60 days after completing the tests.
- 5. The Permittee shall submit any record or report required by this permit upon EPA request.

## **II. General Provisions**

### **A. Conditional Approval:**

Pursuant to the authority of 40 CFR 49.151, the EPA hereby conditionally grants this permit. This authorization is expressly conditioned as follows:

1. *Document Retention and Availability:* This permit and any required attachments shall be retained and made available for inspection upon request at the location set forth herein.
2. *Permit Application:* The Permittee shall abide by all representations, statements of intent and agreements contained in the application submitted by the Permittee. The EPA shall be notified 10 days in advance of any significant deviation from this permit application as well as any plans, specifications or supporting data furnished.
3. *Permit Deviations:* The issuance of this permit may be suspended or revoked if the EPA determines that a significant deviation from the permit application, specifications, and supporting data furnished has been or is to be made. If the proposed source is constructed, operated, or modified not in accordance with the terms of this permit, the Permittee will be subject to appropriate enforcement action.
4. *Compliance with Permit:* The Permittee shall comply with all conditions of this permit, including emission limitations that apply to the affected emissions units at the permitted facility/source. Noncompliance with any permit term or condition is a violation of this permit and may constitute a violation of the Clean Air Act and is grounds for enforcement action and for a permit termination or revocation.
5. *Fugitive Emissions:* The Permittee shall take all reasonable precautions to prevent and/or minimize fugitive emissions during the construction period.
6. *National Ambient Air Quality Standard and PSD Increment:* The permitted source shall not cause or contribute to a National Ambient Air Quality Standard violation or a PSD increment violation.
7. *Compliance with Federal and Tribal Rules, Regulations, and Orders:* Issuance of this permit does not relieve the Permittee of the responsibility to comply fully with all other applicable federal and tribal rules, regulations, and orders now or hereafter in effect.
8. *Enforcement:* It is not a defense, for the Permittee, in an enforcement action, to claim that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.
9. *Facility/Source Modifications:* For proposed modifications, as defined at 40 CFR 49.152(d), that would increase an emissions unit allowable emissions of a pollutant above its existing permitted annual allowable emissions limit, the Permittee shall first obtain a permit modification pursuant to the MNSR regulations approving the increase. For a proposed modification that is not otherwise subject to review under the PSD or MNSR regulations, such proposed increase in the annual allowable emissions limit shall be approved through an administrative permit revision as provided at 40 CFR 49.159(f).

10. *Relaxation of Legally and Practically Enforceable Limits:* At such time that a new or modified source within this permitted facility/source or modification of this permitted facility/source becomes a major stationary source or major modification solely by virtue of a relaxation in any legally and practically enforceable limitation which was established after August 7, 1980, on the capacity of this permitted facility/source to otherwise emit a pollutant, such as a restriction on hours of operation, then the requirements of the PSD regulations shall apply to the source or modification as though construction had not yet commenced on the source or modification.
11. *Revise, Reopen, Revoke and Reissue, or Terminate for Cause:* This permit may be revised, reopened, revoked and reissued, or terminated for cause. The filing of a request by the Permittee, for a permit revision, revocation and reissuance, or termination, or of a notification of planned changes or anticipated noncompliance does not stay any permit condition. The EPA may reopen this permit for a cause on its own initiative, e.g., if this permit contains a material mistake or the Permittee fails to assure compliance with the applicable requirements.
12. *Severability Clause:* The provisions of this permit are severable, and in the event of any challenge to any portion of this permit, or if any portion is held invalid, the remaining permit conditions shall remain valid and in force.
13. *Property Rights:* This permit does not convey any property rights of any sort or any exclusive privilege.
14. *Information Requests:* The Permittee shall furnish to the EPA, within a reasonable time, any information that the EPA may request in writing to determine whether cause exists for revising, revoking and reissuing, or terminating this permit or to determine compliance with this permit. For any such information claimed to be confidential, you shall also submit a claim of confidentiality in accordance with 40 CFR Part 2, Subpart B.
15. *Inspection and Entry:* The EPA or its authorized representatives may inspect this permitted facility/source during normal business hours for the purpose of ascertaining compliance with all conditions of this permit. Upon presentation of proper credentials, the Permittee shall allow the EPA or its authorized representative to:
  - (a) Enter upon the premises where this permitted facility/source is located or emissions-related activity is conducted, or where records are required to be kept under the conditions of this permit;
  - (b) Have access to and copy, at reasonable times, any records that are required to be kept under the conditions of this permit;
  - (c) Inspect, during normal business hours or while this permitted facility/source is in operation, any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under this permit;
  - (d) Sample or monitor, at reasonable times, substances or parameters for the purpose of assuring compliance with this permit or other applicable requirements; and
  - (e) Record any inspection by use of written, electronic, magnetic and photographic media.

16. *Permit Effective Date:* This permit is effective immediately upon issuance unless comments resulted in a change in the proposed permit, in which case this permit is effective 30 days after issuance. The Permittee may notify the EPA, in writing, that this permit or a term or condition of it is rejected. Such notice should be made within 30 days of receipt of this permit and should include the reason or reasons for rejection.
17. *Permit Transfers:* Permit transfers shall be made in accordance with 40 CFR 49.159(f). The Air Program Director shall be notified in writing at the address shown below if the company is sold or changes its name.
- U.S. Environmental Protection Agency, Region 8  
Office of Partnerships and Regulatory Assistance  
Tribal Air Permitting Program, 8P-AR  
1595 Wynkoop Street  
Denver, Colorado 80202
18. *Invalidation of Permit:* This permit becomes invalid if construction is not commenced within 18 months after the effective date of this permit, construction is discontinued for 18 months or more, or construction is not completed within a reasonable time. The EPA may extend the 18-month period upon a satisfactory showing that an extension is justified. This provision does not apply to the time period between the construction of the approved phases of a phased construction project. The Permittee shall commence construction of each such phase within 18 months of the projected and approved commencement date.
19. *Notification of Start-Up:* The Permittee shall submit a notification of the anticipated date of initial start-up of this permitted source to the EPA within 60 days of such date, unless this permitted source is an existing source.

**B. Authorization:**

Authorized by the United States Environmental Protection Agency, Region 8

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Callie A. Videtich  
Acting Assistant Regional Administrator  
Office of Partnerships and Regulatory Assistance

Date