



**DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION**

**Permit Application Analysis
A0000325**

July 30, 2015

NAME OF FIRM:	EOG Resources, Inc.
NAME OF FACILITY:	I-80 Compressor Station
FACILITY LOCATION:	SE ¹ / ₄ SE ¹ / ₄ of Section 19, T14N, R64W <u>Lat:</u> 41.161986° <u>Long:</u> -104.581983° Laramie County, Wyoming
TYPE OF OPERATION:	Gas Compression
RESPONSIBLE OFFICIAL:	David Long, Environmental Manager
MAILING ADDRESS:	600 17 th Street, Suite 1000N Denver, CO 80202
TELEPHONE NUMBER:	(303) 262-9448
REVIEWING ENGINEER:	Nathan Henschel, Air Quality Scientist

1. PURPOSE OF APPLICATION

On December 9, 2014, the Division of Air Quality received an application from EOG Resources, Incorporated (EOG) to construct the I-80 Compressor Station, to consist of two (2) 20.0 MMscfd tri-ethylene glycol (TEG) dehydration units equipped with 0.6 MMBtu/hr reboiler heaters, one (1) flare, two (2) 400 barrel (bbl) condensate storage tanks, one (1) 400 bbl produced water storage tank, and three (3) electric compressor motors. The I-80 Compressor Station is located in the SE¹/₄SE¹/₄ of Section 19, T14N, R64W, approximately thirteen (13) miles east of Cheyenne, in Laramie County, Wyoming.

A map of the compressor station location is attached as Appendix A.

2. PROCESS DESCRIPTION

Gas and hydrocarbon liquids from EOG's I-80 area wellheads will be directed to the I-80 Compressor Station where gas, condensate, and produced water will be separated. The gas and condensate will be dehydrated in the TEG dehydration units and then recombined with the condensate in the pipeline, compressed and directed to a third party gas treatment facility. Produced water will be directed via pipeline to a disposal facility.

The three (3) compressors at the facility will be electrically driven, thus having no emissions. The two (2) 400 bbl condensate storage tanks will be used as needed, but all gas and liquids produced during normal operation will be directed into the pipeline system. When needed, the storage tanks will be emptied via truck, with vapors being routed back to the tanks. The onsite flare will be used to control emissions from the dehydration unit flash tanks, the dehydration unit still vents, the storage tanks, and the truck load-out.

3. ESTIMATED EMISSIONS

3.1 TEG Dehydration unit

The major pollutants from the two (2) 20.0 MMscfd TEG dehydration units are volatile organic compounds (VOCs) and hazardous air pollutants (HAPs) associated with vapors from the dehydration unit reboiler still vents and flash tanks. Uncontrolled emissions from the dehydration units were estimated using GRI-GLYCalc Version 4.0 software at a gas pressure of 1,000 psig and a wet gas temperature of 100°F. The applicant proposes to route non-condensables in the flash tank to a flare with 98% destruction efficiency. The applicant proposes three (3) potential control alternatives for the dehydration unit still vents:

- 1) Emissions will be routed through a condenser, with non-condensables being routed directly to the facility flare for 98% control efficiency.
- 2) Emissions will be routed to a condenser, with non-condensables being routed to the reboiler fuel line for combustion. At times when the reboiler is not firing, the vent stream would be redirected to the facility flare for 98% control efficiency.
- 3) Emissions will be routed to a condenser, with non-condensables being routed back to the compressors' inlet stream for a potential 100% control efficiency. At times when this is not possible, emissions would be routed to the facility flare for 98% control efficiency.

Uncontrolled and controlled emissions from the dehydration unit are listed in the following table:

Table 1: Dehydration Unit Emissions (tpy)				
Source	Uncontrolled		Controlled ¹	
	VOC	HAP	VOC	HAP
20.0 MMScfd TEG Dehydration Unit	1,797.4	126.76	35.9	2.53
20.0 MMScfd TEG Dehydration Unit	1,797.4	126.76	35.9	2.53
Total	3,594.8	253.52	71.8	5.06

¹ Controlled emission based on worst case use of a flare to control the still vent emissions (ninety-eight percent (98%) control efficiency) 8,760 hours annually.

3.2 Flare and Reboiler

The flare shall potentially control emissions from the two (2) TEG dehydration unit still vents and flash tanks, and will also control emissions from the three (3) 400 bbl storage tanks. Emissions were calculated using the Wyoming Oil and Gas Permitting Guidance (2013) flare emission factors. Emission totals can be found in Table 2.

Emissions from the reboiler were calculated using EPA AP-42 factors. Emission totals can be found in Table 2.

3.3 Storage Tanks and Load-out

During normal operation, liquids will be routed via pipeline off site. For some small liquid streams and during malfunction or emergency events, the liquids will be routed to the two (2) 400 bbl condensate storage tanks and the one (1) 400 bbl produced water tank. These tanks will be controlled by a flare and will be periodically emptied via a truck load-out, as needed.

The truck load-out emissions were estimated using a conservative estimate loadout volume of 100 bbl/day for 365 days. Emissions from the truck load-out will be routed back to the tanks and controlled by the facility flare. Emissions are reported in Table 2.

3.4 Rod Packing Vents

Rod packing vent emissions are a continuous emissions source from compressors. Based upon manufacturer information the emissions from this source will be insignificant as long as the scheduled replacement intervals required 40 CFR part 60, subpart OOOO are met. The I-80 Compressor Station will be subject to subpart OOOO.

Estimated emissions from each source at the compressor station are shown in the following table:

Table 2: Proposed I-80 Compressor Station Emissions									
ID	Source	NO _x		CO		VOC		HAPs	
		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
DHY001	20.0 MMscfd TEG Dehydration Unit	--	--	--	--	Controlled by Flare			
DHY002	20.0 MMscfd TEG Dehydration Unit	--	--	--	--				
TNK001-TNK002	two (2) 400 bbl Condensate Storage Tanks	--	--	--	--				
TNK003	400 bbl Produced Water Tank	--	--	--	--				
LUD001	Truck Load-Out	--	--	--	--				
	Blowdowns	--	--	--	--				
	Pigging Activities	--	--	--	--				
FLR001	Flare	--	18.3	--	4.6	--	85.3	--	6.44
HET001	0.6 MMBtu/hr Reboiler Heater	0.1	0.3	0.1	0.2	<0.1	<0.1	<0.01	0.01
HET002	0.6 MMBtu/hr Reboiler Heater	0.1	0.3	0.1	0.2	<0.1	<0.1	<0.01	0.01
	Rod Packing Vents	--	--	--	--	--	--	--	--
Fug	Fugitive Emissions	--	--	--	--	1.5	6.5	0.15	0.64
Facility Total		0.2	18.9	0.2	5.0	1.5	91.8	0.15	7.1

4. BEST AVAILABLE CONTROL TECHNOLOGY (BACT)

Per the requirements of Chapter 6 Section 2 of the Wyoming Air Quality Standards and Regulations (WAQSR), all facilities must demonstrate the use of BACT.

Emissions of VOC and HAPs from the two (2) 20.0 MMscfd dehydration unit still vents and flash tanks will be controlled. EOG proposes three (3) potential control scenarios with the greatest control efficiency attributed to routing the flash tank emissions to the facility flare (98% control efficiency), and recycling the still vent vapors to the compressors' inlet stream for recompression (100% control efficiency), and the least being having the still vent and flash tank emissions be routed directly to the flare (98% control efficiency). The Division considers these control scenarios to represent BACT for these units.

The emissions for working/breathing of the three (3) storage tanks will be routed to the flare for ninety-eight percent (98%) destruction efficiency. Emissions associated with the truck load-out will be recycled back to the tanks. The Division considers this to represent BACT for these types of units.

EOG proposes to follow the rod packing maintenance procedures from 40 CFR part 60, subpart OOOO. The Division has determined this to meet the BACT requirements for this emission source.

5. CHAPTER 6, SECTION 3 APPLICABILITY

The I-80 Compressor Station is not a “major source” as defined by Chapter 6, Section 3 of the Wyoming Air Quality Standards and Regulations (WAQSR). Therefore, EOG shall obtain an operating permit in accordance with Chapter 6, Section 2 of the WAQSR.

6. NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (MACT)

40 CFR part 63, subpart HH - *National Emission Standards for Hazardous Air Pollutants From Oil and Natural Gas Production Facilities*: Emissions from this facility are less than major source levels of 10 tpy of any individual HAP and 25 tpy of any combination of HAPs, therefore this facility is an area source relative to 40 CFR part 63, subpart HH. Subpart HH control requirements apply to glycol units for which the actual annual average flowrate of natural gas is equal to or greater than 85 thousand standard cubic meters (3.0 MMscfd) or the actual average emissions of benzene from the glycol dehydration unit process vent to the atmosphere are equal to or greater than 0.90 megagrams per year (1.0 tons per year).

EOG shall maintain records of the actual annual average flowrate of natural gas to the glycol dehydration unit or actual average emissions of benzene from the glycol dehydration unit process vent for each year of operation in accordance with 63.774(d)(1). The procedures in 63.772(b) shall be used to determine the glycol dehydration unit flowrate or benzene emissions. EOG shall comply with all applicable requirements of 40 CFR part 63, subpart HH.

7. PREVENTION OF SIGNIFICANT DETERIORATION (PSD)

The I-80 Compressor Station is not a “major stationary source” as defined by Chapter 6, Section 4 of the WAQSR. Therefore, the I-80 Compressor Station is not subject to PSD review under Chapter 6, Section 4.

8. NEW SOURCE PERFORMANCE STANDARDS (NSPS)

40 CFR part 60, subpart OOOO - *Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution* applies to any new, modified or reconstructed emission source installed after August 23, 2011 at compressor stations. The affected emission sources include centrifugal and reciprocating compressors, continuous bleed pneumatic controllers, and storage vessels. The affected emission sources at the I-80 Compressor Station are subject to all applicable requirements of 40 CFR part 60, subpart OOOO.

The three (3) 400 bbl tanks are not subject to the requirements of 40 CFR part 60, subpart Kb– *Standards of Performance for Volatile Organic Liquid Storage Vessels (including Petroleum Liquid Storage Vessels) for which Construction, Reconstruction, or Modification Commenced after July 23, 1984*, due to the fact that the tanks do not exceed the 471 bbl minimum capacity.

There are no NSPS standards for dehydration units.

9. AMBIENT AIR IMPACT

Based on the Division’s knowledge of the nature of the onsite NO_x sources and the level of emissions, the Division feels the NAAQS and WAAQS will be protected with the operation of the I-80 Compressor Station.

10. COUNTY ZONING

On June 23, 2015, the Division received a completed Certificate of Review, issued May 5, 2015, by the Laramie County Planning & Development Department approving the site plan for the I-80 Compressor Station. The documentation provided to the Division meets the WAQSR requirement for proper land use planning [Chapter 6, Section 2(c)(iv)].

11. SAGE GROUSE

The Division has determined that the proposed I-80 Compressor Station does not reside within any Sage Grouse Core Areas or within two (2) miles of an occupied lek. Therefore, the Division has determined that the requirements of the Greater Sage Grouse Executive Order 2011-5 have been met.

12. PROPOSED PERMIT CONDITIONS

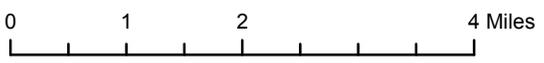
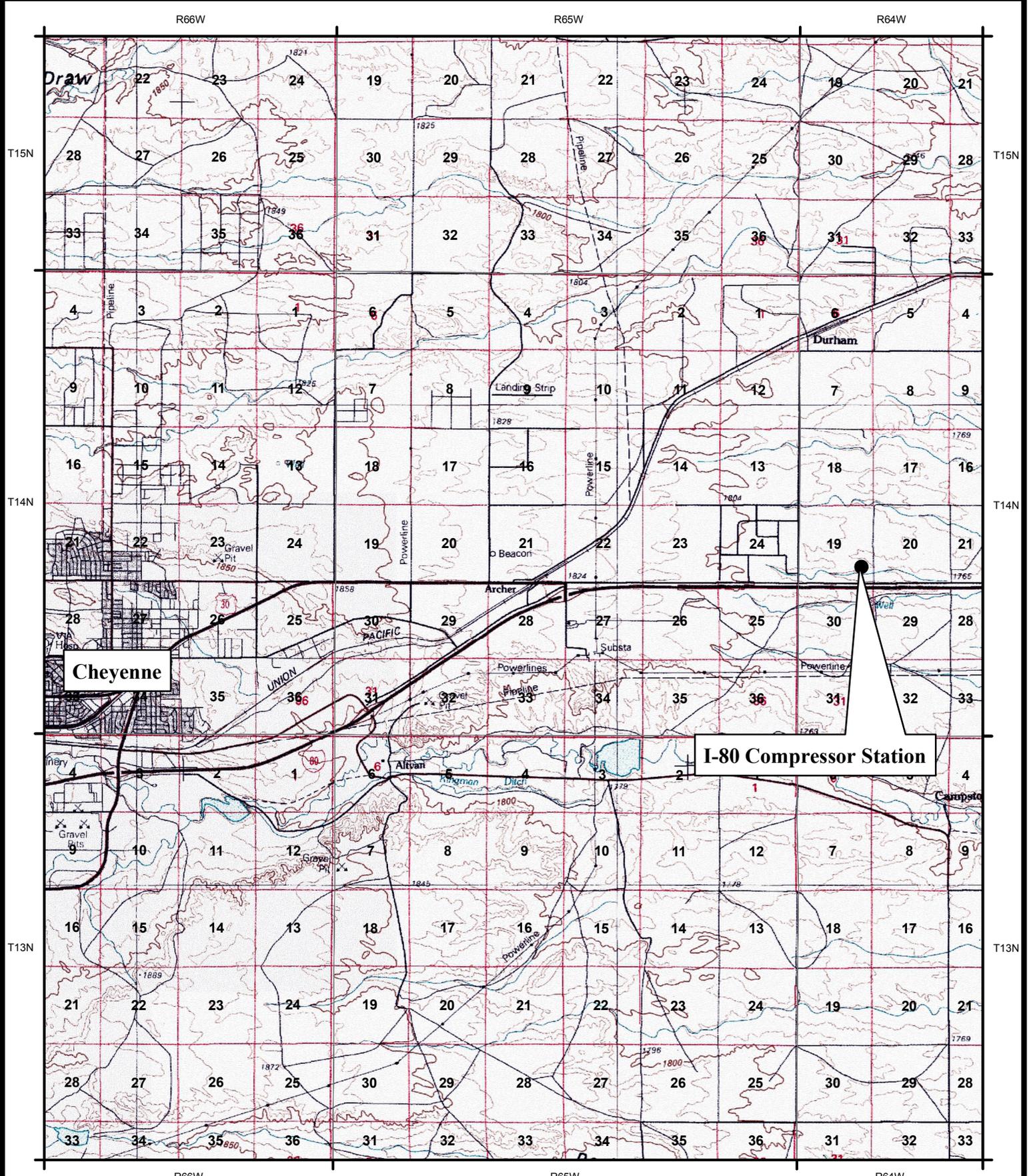
The Division proposes to issue an Air Quality Permit to EOG Resources, Inc. to construct the I-80 Compressor Station with the following conditions:

1. That authorized representatives of the Division of Air Quality be given permission to enter and inspect any property, premise or place on or at which an air pollution source is located or is being constructed or installed for the purpose of investigating actual or potential sources of air pollution and for determining compliance or non-compliance with any rules, standards, permits or orders.
2. That all substantive commitments and descriptions set forth in the application for this permit, unless superseded by a specific condition of this permit, are incorporated herein by this reference and are enforceable as conditions of this permit.

3. That a permit to operate, in accordance with Chapter 6, Section 2(a)(iii) of the WAQSR, is required after a 120 day start-up period in order to operate this facility.
4. That all notifications, reports and correspondences associated with this permit shall be submitted to the Stationary Source Compliance Program Manager, Air Quality Division, 122 West 25th Street, Cheyenne, WY 82002 and a copy shall be submitted to the District Engineer, Air Quality Division, 122 West 25th Street, Cheyenne, WY 82002. Submissions may also be done electronically through <https://airimpact.wyo.gov> to satisfy requirements of this permit.
5. That written notification of the anticipated date of initial start-up for each source, in accordance with Chapter 6, Section 2(i) of the WAQSR, is required not more than sixty (60) days or less than thirty (30) days prior to such date. Notification of the actual date of startup for each source is required within fifteen (15) days after startup.
6. That the date of commencement of construction shall be reported to the Administrator within thirty (30) days of commencement. In accordance with Chapter 6, Section 2(h) of the WAQSR, approval to construct or modify shall become invalid if construction is not commenced within twenty-four (24) months after receipt of such approval or if construction is discontinued for a period of twenty-four (24) months or more. The Administrator may extend the period based on satisfactory justification of the requested extension.
7. For the two (2) TEG dehydration units, reboiler still vent vapors shall be routed to condensers. Condensed reboiler still vent liquids shall be routed from the facility via pipeline or to the on-site condensate storage tanks. The non-condensable reboiler still vent vapors shall be routed to a flare, the reboiler, or recycled back to the facility inlet. The condenser and flare; condenser, reboiler and flare; or condenser and recycling of emissions to inlet or flare shall reduce the mass content of total HAP and VOC emissions in the reboiler still vent by at least ninety-eight percent (98%) by weight. Dehydration unit flash tank vapors shall be routed to the flare where the mass content of total HAP and VOC emissions from the flash tank shall be reduced by at least ninety-eight percent (98%) by weight.
8. That emissions from the three (3) liquids storage tanks, the truck load-out, blowdown events, and pigging activities shall be collected and routed to the flare. The flare shall reduce the mass content of VOC and HAP emissions from these sources by at least ninety-eight percent (98%) by weight.
9. The flare shall be operated and maintained to be smokeless, per Chapter 3, Section 6(b)(i) of the WAQSR, with no visible emissions except for periods not to exceed a total of five (5) minutes during any two (2) consecutive hours as determined by 40 CFR part 60, appendix A, Method 22.
10. The presence of the pilot flame for the flare and the reboiler, if used as a control device, shall be monitored using a thermocouple, continuous recording device, or any other equivalent device approved by the Division to detect and record the presence of the flame. Records shall be maintained noting periods during active operation when the pilot flame is not present. The records shall contain a description of the reason(s) for absence of the pilot flame and steps taken to return the pilot flame to proper operation.

11. That EOG Resources, Inc. shall maintain and operate the flare and the reboiler, if used as a control device, during all periods of active operation such that the devices remain effective as viable emissions control devices. Records shall be kept for a period of at least five (5) years and shall be made available to the Division upon request.
12. EOG Resources, Inc. shall comply with all applicable requirements of 40 CFR part 63, subpart HH.
13. EOG Resources, Inc. shall comply with all applicable requirements of 40 CFR part 60, subpart OOOO.
14. Periodic training on the proper operation of equipment, systems and devices used to contain, control, eliminate or reduce pollution shall be provided to company personnel whose primary job is to regularly ensure that facility production equipment is functional. The training shall provide these personnel with the ability to recognize, correct and report all instances of malfunctioning equipment, systems and devices associated with air pollution control. These equipment, systems and devices include, but are not limited to combustion units, reboiler overheads condensers, hydrocarbons liquids storage tanks, drip tanks, vent lines, connectors, fittings, valves, relief valves, hatches and any other appurtenance employed to, or involved with, eliminating, reducing, containing or collecting vapors and transporting them to a pollution control system or device.
15. Trained personnel shall perform, at a minimum, a quarterly site evaluation of the operation of the air pollution control equipment, systems and devices under Condition 14. The first quarterly site evaluation shall be conducted within the second quarter after issuance of this permit. At least one of the quarterly evaluations per calendar year shall include an evaluation of the facility for leaks from the equipment, systems and devices under Condition 14 using an optical gas imaging instrument.
16. Notification shall be provided to the Division at least fifteen (15) days prior to each quarterly evaluation under Condition 15.
17. An annual preventative maintenance program shall be instituted to inspect and replace equipment, systems and devices under Condition 14 as necessary to ensure their proper operation.
18. Results of all inspections, evaluations and periodic monitoring shall be documented and maintained for review by the Division upon request. Digital files of any optical gas imaging instrument evaluations need not be maintained.

Appendix A
Compressor Station Location



EOG Resources Inc.
I-80 Compressor Station
 SE¼SE¼ of Section 19, T14N, R64W
 Laramie County, Wyoming

