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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-3269
Plant ID No.:	017-00158
Applicant:	EQT Gathering, LLC
Facility Name:	Janus Compressor Station
Location:	Near West Union, Doddridge County
SIC/NAICS Code:	1311/211111
Application Type:	Construction
Received Date:	August 28, 2015
Engineer Assigned:	Joe Kessler
Fee Amount:	$4,500
Date Received:	September 9, 2015
Complete Date:	September 24, 2015
Due Date:	December 23, 2015
Applicant's Ad Date:	September 8, 2015
Newspaper:	*The Herald Record*
UTM's:	516.767 km Easting • 4,345.400 km Northing • Zone 17
Latitude/Longitude:	39.25777/-80.80566
Description:	Construction of a natural gas compressor station.

Entire Document
NON-CONFIDENTIAL

DESCRIPTION OF PROCESS

EQT Gathering, LLC (EQT) is proposing to construct a natural gas compressor station to be located approximately 3.1 miles south-southwest of West Union, WV east of County Route (CR) 11 (Arnold's Creek Road). The proposed Janus Compressor Station will consist of four (4) Caterpillar G3616 4-Stroke Lean Burn (4SLB) 5,350 horsepower (hp) compressor engines, five (5) Capstone C200 NG 200kWe Microturbines, two (2) Exterran 125 mmscf/day triethylene glycol (TEG) dehydration units (GDUs), two (2) fuel gas heaters (1.15 and 0.77 mmBtu/hr), and two (2) 8,820 gallon produced liquid storage tanks.

Natural gas produced in area wells will enter into the facility and will be compressed by the engines (ENG-001 through ENG-004). The compressed gas is sent and through the GDUs (DEHY-

001 and DEHY-002) where it is dehydrated to the desired level. The compressor engines are each controlled (CO, VOCs, and formaldehyde) by an EMIT Technologies EBX-9000-3036F-8C4E-48C oxidation catalyst (C1 through C4).

Glycol dehydration is a liquid desiccant system used for the removal of water from natural gas. In each GDU, lean, water-free glycol is fed to the top of an absorber (known as a "contactor") where it is contacted with the wet natural gas stream. The glycol removes water from the natural gas by physical absorption and is carried out the bottom of the column. The dry natural gas leaves the top of the absorption column and is fed into a pipeline for transportation. The dehydrator still vent gases are each sent an associated enclosed flare (FLARE-001 and FLARE-002) for destruction. Additionally, each GDU contains several TEG storage tanks. However, the storage tanks are defined as *de minimis* sources under Table 45-13B of 45CSR13 as they are each less than 10,000 gallons and TEG has an extremely low vapor pressure (<0.01 mm Hg).

After leaving the absorber, each glycol stream - now referred to as "rich" glycol - is fed to a flash vessel where flashed hydrocarbon vapors are either sent to the reboiler as fuel or, if the reboiler is not in operation, sent to the associated enclosed flare. Any liquid hydrocarbons removed in the flash tank are sent to one of the 8,820 gallon produced liquid storage tanks (T-001 and T-002). Vapors from the produced liquids storage tanks (working/breathing/flashing) are sent to an associated enclosed flare (FLARE-003).

After leaving the flash vessel, in each unit, the rich glycol is fed to a Glycol Regenerator Column. Each Regenerator Column consists of a column, an overhead condenser, and the reboiler. The glycol is thermally regenerated to remove excess water and regain high purity. The heat for the regeneration is provided by two (2) 2.31 mmBtu/hr natural gas-fired reboilers (RB-001 and RB-002). The hot, lean glycol is cooled by a heat-exchanger and is then fed to a pump where it is sent to the glycol absorber for reuse. Liquids produced in the regeneration process are sent to one of the facility storage tanks.

A portion of the gas is withdrawn after dehydration but before the station outlet metering and sent to the fuel gas system. The fuel gas is directed through a fuel gas scrubber and metering before being directed to the compressor engines and other gas-powered equipment. Two (2) fuel gas heaters (HTR-1 and HTR-2) will be used in the fuel gas system to prevent the formation of hydrates and to minimize condensate dropout from the pressure reduction.

There are many other small storage tanks proposed for the facility (T-003 through T-024) used for bulk storage (lube oil storage, compressor oil storage, TEG storage, etc.). Any emissions from the miscellaneous tanks are, based on the vapor pressures of the materials stored, considered insignificant. Additionally, the proposed facility will utilize an uncontrolled truck loadout (L1) to remove condensate and produced water from the site (estimated to be a maximum of 210,000 gallons/year). Five (5) 200 kWe uncontrolled Microturbines (EG-001 through EG-005) will be used to produce primary power for the facility.

SITE INSPECTION

On November 18, 2015, the writer conducted an inspection of the proposed location of the Janus Compressor Station. The proposed Janus site is located in a rural area of Doddridge County

approximately 3.1 miles south-southwest of West Union, WV east of County Route (CR) 11 (Arnold's Creek Road). The writer was accompanied on the inspection by Mr. Alex Bosiljevac, Environmental Coordinator with EQT. Observations from the inspection include:

- The proposed facility will lie atop a hill approximately 3.1 miles south-southwest of West Union, WV east of County Route (CR) 11 (Arnold's Creek Road). The area is rural in nature with scattered homes and farms within several miles of the proposed location. Much natural gas construction activity (pipelines, well-heads, etc.) is located in the County;

- At the time of the inspection, EQT was in the process of improving an access road to the top of the hill where the compressor station will sit and doing extensive landscaping work at the proposed site. No emission units were seen on the property; and

- The occupied dwelling located nearest to the proposed site is approximately 0.50 miles northwest of the proposed site on a hillside near CR 11/4 (Left Fork Run Road). A previously occupied home near the beginning of the access road to the site was in the process of being demolished.

The following is a picture of the proposed site of the Janus Compressor Station taken on the day of the inspection:

Directions: [Latitude: 39.25777, Longitude: -80.80566] From the intersection of United States (US) Route 50 and CR 11 (Arnold's Creek Road), travel south on CR 11 for approximately 0.7 miles and then turn left onto CR 11/4 (Left Fork Run Road) - this road was unmarked at the time of inspection. Follow the CR 11/4 for approximately 1.1 miles to the facility access road on the right. The compressor station is located at the end of the access road atop the hill.

AIR EMISSIONS AND CALCULATION METHODOLOGIES

EQT included in Attachment N of the permit application air emissions calculations for the equipment and processes at the Janus Compressor Station. The following will summarize the calculation methodologies used by EQT to calculate the potential-to-emit (PTE) of the proposed facility.

Compressor Engines

Potential emissions from each of the four (4) Caterpillar G3616 4SLB 5,350 hp compressor engines (ENG-001 through ENG-004) were based on post-control emission factors provided by the oxidation catalyst vendor, the engine vendor, and as given in AP-42, Section 3.2 (AP-42 is a database of emission factors maintained by USEPA). Hourly emissions were based on the (as calculated using a fuel heat rating of 7,338 Btu/hp-hr) maximum design heat input (MDHI) of the engines of 39.43 mmBtu/hr and the maximum hp rating. Annual emissions were based on 8,760 hours of operation per year. The following table details the PTE of each compressor engine:

Table 1: Per-Compressor Engine PTE

Pollutant	Emission Factor	Source	Hourly (lb/hr)	Annual (ton/yr)
CO[(1)]	0.1729 g/hp-hr (controlled)	Catalyst Vendor	2.04	8.93
NO_X	0.50 g/hp-hr	Engine Vendor	5.90	25.83
$PM_{2.5}/PM_{10}/PM$[(2)]	9.91×10^{-3} lb/mmBtu	AP-42, Table 3.2-2	0.39	1.71
SO_2	5.88×10^{-4} lb/mmBtu	AP-42, Table 3.2-2	0.02	0.10
VOCs[(1)]	0.3335 g/hp-hr (controlled)	Catalyst Vendor	3.93	17.23
Total HAPs	Various	AP-42, Table 3.2-2	1.00	4.38
Formaldehyde[(1)]	0.02 g/hp-hr (controlled)	Catalyst Vendor	0.24	1.03

(1) Based on post-control emission factor provided by the catalytic converter vendor.
(2) Includes condensables.

Microturbines

Emissions from the five (5) 2.28 mmBtu/hr Capstone C200 NG 200kWe Microturbines (EG-001 and EG-005) were based on the emission factors provided by the vendor and taken from AP-42, Section 3.1. Hourly emissions were based on the maximum electrical output and the MDHI of the units. Annual emissions were based on an annual operation of 8,760 hours. All emissions were increased by 20% to account for the possibility of "richer gas." The PTE generated by each microturbine and the emission factor/emission factor source are given in the following table:

Table 2: Per-Microturbine PTE[1]

Pollutant	Emission Factor	Source	Hourly (lb/hr)	Annual (ton/yr)
NO_X	0.40 lb/MWe-hr	Vendor Information	0.08	0.35
CO	1.10 lb/MWe-hr	Vendor Information	0.22	0.96
$PM_{2.5}/PM_{10}/PM^{(2)}$	6.6×10^{-3} lb/mmBtu	AP-42, Table 3.1-2a	0.02	0.07
SO_2	3.4×10^{-4} lb/mmBtu	AP-42, Table 3.1-2a	0.01	0.03
VOC	0.10 lb/MWe-hr	Vendor Information	0.02	0.11
Total HAPs	Various	AP-42, Table 3.1-3	~0.00	~0.00

(1) Final emissions increase by 20% to account for potentially richer gas burned.

Glycol Regenerator Column/GDU Flash Tank Emissions

Uncontrolled VOC and Hazardous Air Pollutant (HAP) emissions from the glycol regenerator and GDU flash tank are based on the emissions calculation program GRI-GLYCalc Version 4.0. GRI-GLYCalc is a well-known program for estimating air emissions from glycol units using TEG. Included in the application is a copy of the appropriate GLY-Calc analysis sheets. A representative gas analysis taken on October 10, 2012 was used to provide inputs to GLY-Calc and was included in the permit application. Controlled emissions were based on a 98% destruction and removal efficiency (DRE) of hydrocarbons of the associated enclosed flares.

Flare Combustion Exhaust Emissions

Emissions created from the combustion of the hydrocarbons (coming from the GDU Still Vents/Flash Tanks and the storage tanks) at the enclosed flares (FLARE-001 through FLARE-003) were based on emission factors provided for natural gas combustion as given in AP-42 Section 1.4. While Section 1.4 of AP-42 is primarily intended for estimating emissions from boilers combusting natural gas, in the absence of other factors, it can be used to conservatively estimate the nominal amounts of expected combustion emissions from various pollutants from enclosed flares. Hourly emissions were based on the capacity of the units (in mmBtu/hr) and annual emissions were based on an annual operation of 8,760 hours. A waste gas heat content value of 1,226 Btu/ft^3 was used in the calculations.

Reboiler/Fuel Heaters Combustion Exhaust Emissions

Combustion emissions from the reboilers (RB-001 and RB-002) and Fuel Gas Heaters (HTR-1 and HTR-2) were based on the emission factors provided for natural gas combustion as given in AP-42 Section 1.4. Hourly emissions were based on the MDHI of the units and annual emissions were based on an annual operation of 8,760 hours. A fuel/waste gas heat content value of 1,226 Btu/ft^3 was used in the calculations.

Storage Tanks

EQT provided an estimate of the uncontrolled emissions produced from the two (2) produced liquids storage tanks (T-001 and T-002) using the TANKS 4.09d program (working/breathing losses) as provided under AP-42, Section 7 and using E&P TANKS (flashing losses). E&P TANKS is a computer-based software designed to use site-specific information to predict emissions from petroleum production storage tanks. As stated above, the uncontrolled emissions are captured and sent, via a closed vent system, to an enclosed flare (FLARE-003) for destruction. The controlled emissions from the noted storage tanks are, therefore, based on a minimum DRE of 95% (EQT conservatively used a lower DRE for FLARE-003 to account for the lower volume of hydrocarbons emitted at the storage tanks).

Truck Loadouts

Air emissions from produced liquid loading operations (L1) occur as fugitive emissions generated by displacement of vapors when loading trucks. The emission factor used to generate the VOC emissions is based on Equation (1) of AP-42 Section 5.2-4. In this equation, EQT used variables specific to the liquids loaded and to the method of loading - in this case "splash loading." Additionally, worst-case annual emissions were based on a maximum loading rate of 210,000 gal/year of liquids. As no maximum hourly pumping rate was provided, hourly emissions were based on a maximum loading rate of 1,000 gal/hour.

Fugitives

Equipment Leaks

EQT based their VOC fugitive equipment leak calculations on emission factors taken from the document EPA-453/R-95-017 - "Protocol for Equipment Leak Emission Estimates" Table 2-4 (VOCs) with a 20% safety factor added on. No control efficiencies, as based on a Leak Detection and Repair (LDAR) protocol, were applied. Component counts were given and shall be limited in the draft permit. VOC by-weight percentages (15%) of the natural gas was also used in the calculations and is based on a site-specific gas analysis taken on October 10, 2012.

Maintenance and Emergency Events

EQT also included in their fugitive emission estimate a certain number of scenarios where natural gas is released for emergency or maintenance purposes. Those included were filter maintenance (2 events/year), compressor blowdown/startup events (24 events/year), station emergency shutdowns (1 event/year), and "pigging" events (3 events/year). Emissions were calculated in accordance with Equations W-35 and W-36 in Subpart W of 40 CFR 98. VOC by-weight percentages (15%) of the natural gas was also used in the calculations and is based on a site-specific gas analysis taken on October 10, 2012.

Emissions Summary

Based on the above estimation methodology as submitted in Attachment N of the permit application, the post-modification facility-wide PTE of the proposed Janus Compressor Station is given in Attachment A.

REGULATORY APPLICABILITY

The proposed Janus Compressor Station is subject to the following substantive state and federal air quality rules and regulations: 45CSR2, 45CSR6, 45CSR13, 40 CFR 60 Subpart JJJJ, and 40 CFR 63, Subparts HH and ZZZZ. Each applicable rule (and those that have questionable non-applicability) and EQT's compliance therewith will be discussed in detail below.

45CSR2: To Prevent and Control Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers

Pursuant to the definition of "fuel burning unit" under 45CSR2 ("producing heat or power by indirect heat transfer"), 45CSR2 does not apply to the compressor engines or microturbines.

The GDU Reboilers and Fuel Gas Heaters have been determined to each meet the definition of a "fuel burning unit" under 45CSR2 and are, therefore, subject to the applicable requirements therein. However, pursuant to the exemption given under §45-2-11, as the MDHI of the GDU Reboilers and Fuel Gas Heaters are less than 10 mmBtu/hr, the units are not subject to sections 4, 5, 6, 8 and 9 of 45CSR2. The only remaining substantive requirement is under Section 3.1 - Visible Emissions Standards.

Pursuant to 45CSR2, Section 3.1, the reboilers and heaters are subject to an opacity limit of 10%. Proper maintenance and operation of the units (and the use of flash gas or natural gas as fuel) should keep the opacity of the units well below 10% during normal operations.

45CSR6: To Prevent and Control Particulate Air Pollution from Combustion of Refuse

EQT has proposed enclosed flaring for control of the waste gas produced from GDU and produced liquid storage tanks. Each enclosed flare meets the definition of an "incinerator" under 45CSR6 and is, therefore, subject to the requirements therein. The substantive requirements applicable to the enclosed flare are discussed below.

45CSR6 Emission Standards for Incinerators - Section 4.1

Section 4.1 limits PM emissions from incinerators to a value determined by the following formula:

Emissions (lb/hr) = F x Incinerator Capacity (tons/hr)

Where, the factor, F, is as indicated in Table I below:

Table I: Factor, F, for Determining Maximum Allowable Particulate Emissions

Incinerator Capacity	Factor F
A. Less than 15,000 lbs/hr	5.43
B. 15,000 lbs/hr or greater	2.72

For the enclosed flares (FLARE-001 and FLARE-002) servicing the GDUs, based on information included in the application, the maximum vapor mass sent to each flare will be 270 lb/hr (0.14 tons/hour). Based on the above equation, the particulate matter limit of each flare is 0.76 lbs/hr. Conservatively using AP-42 Section 1.4 natural gas emission factors (see above), total PM from each enclosed flare was estimated to be 0.04 lbs/hr, which is in compliance with the 45CSR6 limit.

Based on the maximum capacity of the storage tank enclosed flare of 20,280 scf/hr, and using the density of methane (0.0422 lb/scf) as a reasonable surrogate, the capacity of FLARE-003 in lbs/hr would be approximately 855 lbs/hour (0.43 tons/hr). Using this value in the above equation produces a PM emission limit of 2.33 lb/hr. Conservatively using AP-42 Section 1.4 natural gas emission factors (see above), total PM from the enclosed flare was estimated to be 0.25 lbs/hr, which is in compliance with the 45CSR6 limit.

45CSR6 Opacity Limits for - Section 4.3, 4.4

Pursuant to Section 4.3, and subject to the exemptions under 4.4, each enclosed flare has a 20% limit on opacity during operation. Proper design and operation of the enclosed flares should prevent any substantive opacity from the units.

45CSR10: To Prevent and Control Air Pollution from the Emission of Sulfur Oxides (NON APPLICABILITY)

Pursuant to the definition of "fuel burning unit" under 45CSR10 ("producing heat or power by indirect heat transfer"), the limitations on fuel burning units under 45CSR10 do not apply to the compressor engines or microturbines.

45CSR10 has requirements limiting SO_2 emissions from "fuel burning units," limiting in-stack SO_2 concentrations of "manufacturing processes," and limiting H_2S concentrations in process gas streams. The only potential applicability of 45CSR10 to the Janus Compressor Station is the limitations on fuel burning units. The GDU Reboilers and Fuel Gas Heaters have each been determined to meet the definition of a "fuel burning unit" under 45CSR10. However, pursuant to the exemption given under §45-10-10.1, as the MDHI of the GDU Reboilers and Fuel Gas Heaters are less than 10 mmBtu/hr, the units are not subject to the limitations on fuel burning units under 45CSR10.

45CSR13: Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation

The proposed construction of the Janus Compressor Station has a potential to emit in excess of six (6) lbs/hour and ten (10) TPY of a regulated pollutant (see Attachment A) and, therefore, pursuant to §45-13-2.24, the construction is defined as a "stationary source" under 45CSR13. Pursuant to §45-13-5.1, "[n]o person shall cause, suffer, allow or permit the construction . . . and

operation of any stationary source to be commenced without . . . obtaining a permit to construct." Therefore, EQT is required to obtain a permit under 45CSR13 for the construction and operation of the facility.

As required under §45-13-8.3 ("Notice Level A"), EQT placed a Class I legal advertisement in a "newspaper of *general circulation* in the area where the source is . . . located." The ad ran on September 8, 2015 in *The Herald Record* and the affidavit of publication for this legal advertisement was submitted on September 21, 2015.

45CSR14: Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution for the Prevention of Significant Deterioration - (NON APPLICABILITY)

The Janus Compressor Station is proposed to be located in Doddridge County, WV. Doddridge County is classified as "in attainment" with all National Ambient Air Quality Standards. Therefore, as the facility is not a "listed source" under §45-14-2.43, the individual major source applicability threshold for all pollutants is 250 TPY. As given in Attachment A, the facility-wide PTE of the proposed Janus Compressor Station is less than 250 TPY for all criteria pollutants. Therefore, the facility is not defined as a "major stationary source" under either 45CSR14 and the rule does not apply.

45CSR27: To Prevent and Control the Emissions of Toxic Air Pollutants - (NON APPLICABILITY)

Pursuant to §45-27-3.1, the "owner or operator of a plant that discharges or may discharge a toxic air pollutant into the open air in excess of the amount shown in the Table A [of 45CSR27] shall employ [Best Available Technology] at all chemical processing units emitting the toxic air pollutant." As calculated from Table 1 above, the aggregate PTE of formaldehyde generated by the compressor engines is greater than 0.5 TPY - greater than the 1,000 pound per year threshold given in Table A of 45CSR27. However, internal combustion engines do no meet the definition of "chemical processing units" under §45-27-2.4 and, therefore, they are not subject to BAT under 45CSR27.

45CSR30: Requirements for Operating Permits

45CSR30 provides for the establishment of a comprehensive air quality permitting system consistent with the requirements of Title V of the Clean Air Act. The proposed Janus Compressor Station will meet the definition of a "major source under §112 of the Clean Air Act" as outlined under §45-30-2.26 and clarified (fugitive policy) under 45CSR30b. The proposed facility-wide PTE (see Attachment A) of a regulated pollutant does exceed 100 TPY. Therefore, as a result of this permit, the source is a major source subject to 45CSR30. The Title V (45CSR30) application will be due within twelve (12) months after the commencement date of any operation authorized by this permit.

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 - (NON APPLICABILITY)

Pursuant to §60.110b, 40 CFR 60, Subpart Kb applies to "each storage vessel with a capacity greater than or equal to 75 cubic meters (m^3) that is used to store volatile organic liquids (VOL) for which construction, reconstruction, or modification is commenced after July 23, 1984." The largest storage tanks proposed for the Janus Compressor Station are each 8,820 gallons, or 33 m^3. Therefore, Subpart Kb does not apply to any storage tanks at the proposed facility.

40 CFR 60 Subpart KKKK: Standards of Performance for Stationary Combustion Turbines - (NON APPLICABILITY)

Pursuant to §60.4305(a), 40 CFR 60, Subpart KKKK applies if "you are the owner or operator of a stationary combustion turbine with a heat input at peak load equal to or greater than 10.7 gigajoules (10 MMBtu) per hour, based on the higher heating value of the fuel, which commenced construction, modification, or reconstruction after February 18, 2005." The microturbines proposed for the Janus Compressor Station are each rated at 2.28 mmBtu/hr and are not, therefore, subject to Subpart KKKK. Further it is important to note that, pursuant to §60.4305(b), stationary combustion turbines regulated under Subpart KKKK are exempt from the requirements of 40 CFR 60, Subpart GG.

40 CFR 60 Subpart JJJJ: Standards of Performance for Stationary Spark Ignition Internal Combustion Engines.

EQT's four (4) Caterpillar G3616 4SLB 5,350 hp compressor engines proposed for the Sherwood Compressor Station are defined under 40 CFR 60, Subpart JJJJ as stationary spark-ignition internal combustion engines (SI ICE) and are each, pursuant to §60.4230(a)(4)(i), subject to the applicable provisions of the rule. Pursuant to §60.4233(e): "Owners and operators of stationary SI ICE with a maximum engine power greater than or equal to 75 KW (100 HP) (except gasoline and rich burn engines that use LPG) must comply with the emission standards in Table 1 to this subpart for their stationary SI ICE." Therefore, as the proposed EQT's compressor engines are greater than 100 hp, each engine must comply with the emission standards under Table 1 for "Non-Emergency SI ICE ≥ 500 hp manufactured after July 1, 2010:" NO_x - 1.0 g/HP-hr, CO - 2.0 g/HP-hr, and VOC - 0.7 g/HP-hr. The emission standards and the proposed compliance therewith of the engines are given in the following table:

Table 3: Caterpillar G3616 Subpart JJJJ Compliance

Pollutant	Standard (g/HP-hr)	Uncontrolled Emissions (g/bhp)(1)	Control Percentage	Controlled Emissions (g/bhp)(1)	JJJJ Compliant?
NO_x	1.0	0.50	0.00%	0.50	Yes
CO	2.0	2.47	93.00%	0.17	Yes
VOC	0.7	0.75	55.53%	0.33	Yes

(1) Based on the EMIT Technologies, Inc. Model EBX-9000-3036F-8C4E-48C oxidation catalyst specification sheet included in the permit application. VOC emissions based on NMNEHC + CH_2O emission factors.

The Caterpillar G3616 is not a "certified" engine under Subpart JJJJ so EQT will have to show compliance with the emission standards pursuant to §60.4243(b)(2)(ii): conducting an initial performance test and thereafter conducting subsequent performance testing every 8,760 hours or 3 years, whichever comes first, to demonstrate compliance. Performance testing requirements are given under §60.4244 of Subpart JJJJ. EQT will additionally have to meet all applicable monitoring, recording, and record-keeping requirements under Subpart JJJJ.

40 CFR 60, Subpart OOOO: Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution

On April 27, 2012, the USEPA issued a final rule (with amendments finalized on August 16, 2012) that consists of federal air standards for natural gas wells that are hydraulically fractured, along with requirements for several other sources of pollution in the oil and gas industry that currently are not regulated at the federal level. Each potentially applicable section of Subpart OOOO is discussed below.

Compressor Engines

Pursuant to §60.5365(c), "[e]ach reciprocating compressor affected facility, which is a single reciprocating compressor located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment" that is constructed after August 23, 2011 is subject to the applicable provisions of Subpart OOOO. As the Janus Compressor Station is located before the point of custody transfer, the compressor engines are applicable to Subpart OOOO. The substantive requirements for the engines are given under §60.5385(a): the engines' "rod packing" must replaced according to the given schedule and the engine must meet applicable MRR given under §60.5410(c), §60.5415(c), and §60.5420(b)(1).

Pneumatic Controllers - (NON APPLICABILITY)

Pursuant to §60.5365(d)(2), "[f]or the natural gas production segment (between the wellhead and the point of custody transfer to the natural gas transmission and storage segment and not including natural gas processing plants), each pneumatic controller affected facility, which is a single continuous bleed natural gas-driven pneumatic controller operating at a natural gas bleed rate greater than 6 scfh" that is constructed after August 23, 2011 is subject to the applicable provisions of Subpart OOOO. As the Janus Compressor Station is located before the point of custody transfer, any pneumatic controllers that meet the above definition will be required to meet the substantive requirement for pneumatic controllers as given under §60.5390. However, in the permit application, EQT stated that "no pneumatic controllers installed will meet the definition of a pneumatic controller affected facility [under Subpart OOOO]."

Storage Tanks - (NON APPLICABILITY)

Pursuant to §60.5365(e), for "[e]ach storage vessel affected facility, which is a single storage vessel, located in the oil and natural gas production segment, natural gas processing segment or natural gas transmission and storage segment" that is constructed after August 23, 2011 and,

pursuant to §60.5395 has "VOC emissions equal to or greater than 6 tpy" must meet the control requirements under §60.5395 as of October 15, 2013. The substantive requirement is to "reduce VOC emissions by 95.0 percent or greater." The controlled PTE of each storage tank proposed for the Janus Compressor Station is less than 6 TPY. Therefore, the storage tanks are not subject to the requirements of Subpart OOOO.

40 CFR 63 Subpart HH: National Emission Standards for Hazardous Air Pollutants From Oil and Natural Gas Production Facilities

On June 1, 2013 the DAQ took delegation of the area source provisions of 40 CFR 63, Subpart HH. Pursuant to §63.760(a)(3), as the Janus Compressor Station - an area source of HAPs (see Attachment A) - "process[es], upgrade[s], or store[s] natural gas prior to the point at which natural gas enters the natural gas transmission and storage source category or is delivered to a final end user," it is defined as an area source subject to the applicable provisions under Subpart HH.

Pursuant to §63.760(b)(2), each TEG GDU located at an area source that meets the requirements under §63.760(a)(3) is defined as an affected facility under Subpart HH. The requirements for affected sources at area sources are given under §63.764(d). However, for a GDU, exemptions to these requirements are given under §63.764(e): if (1) "actual annual average flowrate of natural gas to the glycol dehydration unit is less than 85 thousand standard cubic meters [3 mmscf/day] per day" or (2) "actual average emissions of benzene from the glycol dehydration unit process vent to the atmosphere are less than 0.90 megagram [1 TPY] per year."

Information in the permit application indicates the the maximum aggregate PTE of benzene emissions from each GDU is less than 1 TPY. Therefore, the GDUs are exempt from the Subpart HH requirements given under §63.764(d).

40 CFR 63 Subpart ZZZZ: Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

On June 1, 2013 the DAQ took delegation of the area source provisions of 40 CFR 63, Subpart ZZZZ. As the Janus Compressor Station is defined as an area source of HAPs (see Attachment A), the facility is subject to applicable requirements of Subpart ZZZZ. Pursuant to §63.6590(c):

> An affected source that meets any of the criteria in paragraphs (c)(1) through (7) of this section must meet the requirements of this part by meeting the requirements of 40 CFR part 60 subpart IIII, for compression ignition engines or 40 CFR part 60 subpart JJJJ, for spark ignition engines. No further requirements apply for such engines under this part.

§63.6590(c)(1) specifies that "[a] new or reconstructed stationary RICE located at an area source" is defined as a RICE that shows compliance with the requirements of Subpart ZZZZ by "meeting the requirements of . . . 40 CFR part 60 subpart JJJJ, for spark ignition engines." Pursuant to §63.6590(a)(2)(iii), a "stationary RICE located at an area source of HAP emissions is new if [the applicant] commenced construction of the stationary RICE on or after June 12, 2006." The engines proposed for the Janus Compressor Station are each defined as a new stationary RICE (application states manufacture date of engines is July 2013) and, therefore, will show compliance with Subpart

ZZZZ by meeting the requirements of 40 CFR 60, Subpart JJJJ. Compliance with Subpart JJJJ is discussed above.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

This section provides an analysis for those regulated pollutants that may be emitted from the proposed Janus Compressor Station and that are not classified as "criteria pollutants." Criteria pollutants are defined as Carbon Monoxide (CO), Lead (Pb), Oxides of Nitrogen (NO_x), Ozone, Particulate Matter (PM_{10} and $PM_{2.5}$), and Sulfur Dioxide (SO_2). These pollutants have National Ambient Air Quality Standards (NAAQS) set for each that are designed to protect the public health and welfare. Other pollutants of concern, although designated as non-criteria and without national concentration standards, are regulated through various federal and programs designed to limit their emissions and public exposure. These programs include federal source-specific Hazardous Air Pollutants (HAPs) limits promulgated under 40 CFR 61 (NESHAPS) and 40 CFR 63 (MACT). Any potential applicability to these programs were discussed above under REGULATORY APPLICABILITY.

The majority of non-criteria regulated pollutants fall under the definition of HAPs which, with some revision since, were 188 compounds identified under Section 112(b) of the Clean Air Act (CAA) as pollutants or groups of pollutants that EPA knows or suspects may cause cancer or other serious human health effects. The following table lists each HAP with a facility-wide PTE above 0.05 TPY and the associated carcinogenic risk (as based on analysis provided in the Integrated Risk Information System (IRIS)):

Table 4: Potential HAPs - Carcinogenic Risk

HAPs	Type	Known/Suspected Carcinogen	Classification
Acetaldehyde	VOC	Yes	B2 - Probable Human Carcinogen
Acrolein	VOC	No	Inadequate Data
Formaldehyde	VOC	Yes	B1 - Probable Human Carcinogen
Methanol	VOC	No	No Assessment Available
Biphenyl	VOC	Yes	Suggestive Evidence of Carcinogenic Potential
1,3-Butadiene	VOC	Yes	B2 - Probable Human Carcinogen
Naphthalene	VOC	Yes	C - Possible Human Carcinogen
n-Hexane	VOC	No	Inadequate Data
Benzene	VOC	Yes	Category A - Known Human Carcinogen
Toluene	VOC	No	Inadequate Data
Ethylbenzene	VOC	No	Category D - Not Classifiable
Xylenes	VOC	No	Inadequate Data
2,2,4-Trimethylpentane	VOC	No	Inadequate Data

All HAPs have other non-carcinogenic chronic and acute effects. These adverse health affects may be associated with a wide range of ambient concentrations and exposure times and are influenced by source-specific characteristics such as emission rates and local meteorological conditions. Health impacts are also dependent on multiple factors that affect variability in humans such as genetics, age, health status (e.g., the presence of pre-existing disease) and lifestyle. As stated previously, *there are no federal or state ambient air quality standards for these specific chemicals.* For a complete discussion of the known health effects of each compound refer to the IRIS database located at *www.epa.gov/iris*.

AIR QUALITY IMPACT ANALYSIS

The estimated maximum emissions of the proposed facility are less than applicability thresholds that would define the proposed facility as "major" under 45CSR14 and, therefore, no air quality impacts modeling analysis was required. Additionally, based on the nature and location of the proposed source, an air quality impacts modeling analysis was not required under §45-13-7.

MONITORING, COMPLIANCE DEMONSTRATIONS, REPORTING, AND RECORDING OF OPERATIONS

The draft permit contains extensive and detailed monitoring, compliance demonstration, and record-keeping requirements (MRR) on all emission units primarily based on the applicable requirements contained in the recently issued G35-C General Permit. The requirements are given under Section 4.2 (and some additional record-keeping and reporting requirements under Section 4.3 and 4.4, respectively) of the draft permit and may be reviewed at that location.

PERFORMANCE TESTING OF OPERATIONS

The draft permit contains performance testing requirements primarily based on the applicable requirements contained in the recently issued G35-C General Permit. The requirements are given under Section 4.3 of the draft permit and may be reviewed at that location.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates that compliance with all applicable state and federal air quality regulations will be achieved. Therefore, I recommend to the Director the issuance of a Permit Number R13-3269 to EQT Gathering, LLC for the proposed construction and operation of the Janus Compressor Station located near West Union, Doddridge County, WV.

Joe Kessler, PE
Engineer

1/04/15
Date

Attachment A: Facility-Wide PTE

EQT Gathering, LLC: Janus Compressor Station

Permit Number R13-3269: Facility ID 017-00158

Emission Unit	EP ID	CO		NO_x		PM[1]		SO_x		VOC		Acetaldehyde		HAPs	
		lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
Compressor Engine	ENG-001	2.04	8.93	5.90	25.83	0.39	1.71	0.02	0.10	3.93	17.23	0.33	1.44	1.00	4.38
Compressor Engine	ENG-002	2.04	8.93	5.90	25.83	0.39	1.71	0.02	0.10	3.93	17.23	0.33	1.44	1.00	4.38
Compressor Engine	ENG-003	2.04	8.93	5.90	25.83	0.39	1.71	0.02	0.10	3.93	17.23	0.33	1.44	1.00	4.38
Compressor Engine	ENG-004	2.04	8.93	5.90	25.83	0.39	1.71	0.02	0.10	3.93	17.23	0.33	1.44	1.00	4.38
Microturbines	EG-001	0.22	0.96	0.08	0.35	0.02	0.07	0.01	0.03	0.02	0.11	~0.00	~0.00	~0.00	~0.00
Microturbines	EG-002	0.22	0.96	0.08	0.35	0.02	0.07	0.01	0.03	0.02	0.11	~0.00	~0.00	~0.00	~0.00
Microturbines	EG-003	0.22	0.96	0.08	0.35	0.02	0.07	0.01	0.03	0.02	0.11	~0.00	~0.00	~0.00	~0.00
Microturbines	EG-004	0.22	0.96	0.08	0.35	0.02	0.07	0.01	0.03	0.02	0.11	~0.00	~0.00	~0.00	~0.00
Microturbines	EG-005	0.22	0.96	0.08	0.35	0.02	0.07	0.01	0.03	0.02	0.11	~0.00	~0.00	~0.00	~0.00
Dehy #1 Vent/Flash Tank[2]	DEHY-001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.55	6.80	0.00	0.00	0.68	2.96
Dehy #1 Reboiler[3]	RB-001	0.16	0.69	0.19	0.83	0.01	0.06	~0.00	~0.00	0.01	0.05	~0.00	~0.00	~0.00	~0.00
Dehy #2 Vent/Flash Tank[2]	DEHY-002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.55	6.80	0.00	0.00	0.68	2.96
Dehy #2 Reboiler[3]	RB-002	0.16	0.69	0.19	0.83	0.01	0.06	~0.00	~0.00	0.01	0.05	~0.00	~0.00	~0.00	~0.00
Fuel Gas Heater #1	HTR-1	0.08	0.35	0.09	0.41	0.01	0.03	~0.00	~0.00	0.01	0.02	~0.00	~0.00	~0.00	~0.00
Fuel Gas Heater #2	HTR-2	0.05	0.23	0.06	0.28	~0.00	~0.00	~0.00	~0.00	0.01	0.02	~0.00	~0.00	~0.00	~0.00
Dehy Enclosed Flares Combustion[3]	FLARE-001, FLARE-002	0.96	4.20	1.14	5.00	0.08	0.48	0.01	0.04	0.00	0.00	0.00	0.00	0.00	0.00
Tank Enclosed Flare Combustion[3]	FLARE-003	2.82	12.34	3.35	14.69	0.25	1.11	0.02	0.09	0.00	0.00	0.00	0.00	0.00	0.00
Storage Tanks	T-01, T-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.42	0.00	0.00	<0.01	<0.01
Truck Loadout	L1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.80	0.09	0.00	0.00	0.00	0.00
Fugitive Emissions	n/a	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.74	12.01	~0.00	~0.00	1.16	0.51
Facility-Wide Total[4] →		***13.49***	***59.03***	***29.02***	***127.10***	***2.03***	***8.94***	***0.16***	***0.68***	***22.61***	***95.71***	***1.32***	***5.76***	***6.52***	***23.96***

(1) All particular matter emissions are assumed to be 2.5 microns or less.
(2) As emitted at the associated enclosed flare after 2% pass-through (5% for storage tank enclosed flare).
(3) Combustion exhaust only. Aggregate of both flares.
(4) No individual HAP has a PTE over 10 TPY. As the PTE of all individual HAPs are less than 10 TPY (acetaldehyde is the highest emitted individual HAP) and the PTE of total HAPs is less than 25 TPY, the Janus Compressor Station is defined as a minor (area) source of HAPs for purposes of 40 CFR 61, 40CFR63, and Title V.