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Application No.:	R13-3095B
Plant ID No.:	017-00058
Applicant:	EQM Gathering Opco, LLC
Facility Name:	Pandora Station
Location:	Doddridge County
NAICS Code:	211111
Application Type:	Modification
Received Date:	October 14, 2016
Engineer Assigned:	Jonathan Carney
Fee Amount:	$4,500.00
Date Received:	October 17, 2016
Complete Date:	November 10, 2016
Due Date:	February 8, 2017
Applicant Ad Date:	October 18, 2017
Newspaper:	*The Herald Record*
UTM's:	Easting: 525.316+ km Northing: 4,357.155 km Zone: 17
Description:	Application to increase the emissions limits on two (2) compressor engines, update the permit regarding horsepower for two (2) engines not yet constructed, revise the number of tanks at the site and include emissions from pigging operations.

DESCRIPTION OF PROCESS

The following description is from the R13-3095B application:

Natural gas will enter the station via a distribution pipeline system and is first compressed, using one of four natural gas fired compressors. Two of the natural gas compressors are rated at 4,735 hp. Two of the natural gas compressors are rated at 2,370 hp . The compressed natural gas stream will then be processed through one of two triethylene glycol (TEG) dehydration units (each rated at 120 mmscfd) with associated reboilers and controlled with enclosed vapor combustors (each rated at 3 mmbtu/hr). The dehydration unit introduces TEG to the gas stream in a contact tower to absorb water vapor from the gas to a level not exceeding 7 pounds per million cubic feet. The glycol is then sent to the natural gas-fired reboiler, rated at 2.31 mmbtu/hr of

heat input (1.5 MMBtu/hr output). The water is evaporated from the glycol in the reboiler and exhausted and then the glycol is sent back to the contact tower. The natural gas stream from the contact tower flows into the pipeline to be transported further along the distribution system via the sales pipeline. The station will also be equipped with seventeen (17) storage tanks for storage of liquids associated with the engines, dehydration unit, and pipeline fluids.

Compressor Engines

The permittee is seeking to increase emission limits on the two (2) 4,735 hp compressor engines, (S1 and S2) in the process description above. The permittee is also seeking to increase the horsepower rating of the 2,370 hp compressor engines (S3 and S4) to 2,500 hp and update the emission limits.

Microturbine

The permittee is seeking to add an existing microturbine that was exempt from permitting at the time it was installed to the equipment list of the permit as emission unit S19.

Storage Tanks

The permittee is seeking to add four (4) 300 gallon lube oil tanks and three (3) 500 gallon methanol tanks to the equipment list.

Pigging Operations

The permittee is seeking to include emissions from pigging operations. The permittee initially proposed one Station ESD Vent event equal to 550,000 scf of vented gas per year, seventy five (75) pig receiver events per year equal to 1,181 scf of vented gas per event from the 16 x 20 receiver, seventy five (75) pig receiver events per year equal to 673 scf of vented gas per event from the 12 x 16 receiver, and forty-eight (48) compressor blowdowns per year equal to 45,000 scf of vented gas per event. The permittee changed the following numbers during the application review:

Five (5) Station ESD Vent events equal to 350,000 scf per year.
125 pig receiver events per year from each receiver.
40,000 scf of gas vented per compressor blowdown event.

Fugitive Emissions

In calculating the fugitive emissions, the permittee changed the number of valves from 308 to 358.

EQM Gathering Opco, LLC - Pandor
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SITE INSPECTION

No site inspection of the facility was deemed necessary for this permitting action. However, a site inspection of the proposed site was performed for the original permit application. The following narrative comes directly from Engineering Evaluation R13-3095:

"A site inspection of the facility was performed by the writer on September 5, 2013. The facility will be located in a rural section of Doddridge County along Brush Run Road. There are several residences adjacent to the facility. To get to the facility from Charleston take I-77 north to exit 176. Turn east on US Route 50 and go approximately 43.2 miles. Then turn left on State Route 18 and go approximately 0.5 miles. Turn right and go over the bridge. At the end of the bridge turn right on Smithton Road (County Route 30/50) and go approximately 1.0 mile. Then turn left on Rock Run Road (County Route 5) and go approximately 5.3 miles. At the stop sign turn left on Big Flint Road (County Route 3) and go approximately 1.6 miles. Next, turn right on Brush Run Road (County Route 3/1). Go approximately 1.0 mile and the access road should be on the right. It should be noted that no access road currently exists at this entry point. Since EQT has numerous new and existing wells in the area, there may or may not be existing access roads to the site from other entry points. The following picture of the area was taken on the day of the inspection. The facility will be located at the top of the hill in the background (obscured by trees), not the field in the foreground."

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Existing facility wide emissions are as follows (based on Engineering Evaluation R13-3095A):

CO		NO_x		$PM_{10}/PM_{2.5}$		SO_2		VOCs		HAPs
lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	tpy
13.21	57.90	20.61	90.22	1.54	6.41	0.21	0.52	20.53	59.01	23.10

Emissions from the parts of the facility effected by this modification are as follows.

Existing S1 and S2 (4,735 HP each) Compressor engine emissions of each engine:

Existing Pollutant	**Source**	**Hourly (lb/hr)**	**Annual (ton/yr)**
NO_x	Mfg. Data	5.22	22.86
CO	Mfg. Data	2.87	12.57
$PM_{10}/PM_{2.5}$[1]	AP-42	0.36	1.56
VOCs	AP-42	2.24	9.83

Existing Pollutant	Source	Hourly (lb/hr)	Annual (ton/yr)
SO_x	AP-42	0.02	0.09
Formaldehyde	Mfg. Data	0.27	1.19

(1) Filterable + Condensable.

New S1 and S2 (4,735 HP each) Compressor engine emissions of each engine:

Existing Pollutant	Source	Hourly (lb/hr)	Annual (ton/yr)
NO_x	Mfg. Data	5.22	22.86
CO	Mfg. Data	2.87	12.57
$PM_{10}/PM_{2.5}$[1]	AP-42	0.36	1.56
VOCs(2)	Mfg. Data	4.86	21.31
SO_x	AP-42	0.02	0.09
Formaldehyde	Mfg. Data	0.27	1.19

(1) Filterable + Condensable.
(2) Includes Formaldehyde

S1 and S2 (4,735 HP each) Compressor engine emission increases each engine:

Pollutant	Source	Hourly (lb/hr)	Annual (ton/yr)
NO_x	Mfg. Data	0.00	0.00
CO	Mfg. Data	0.00	0.00
$PM_{10}/PM_{2.5}$[1]	AP-42	0.00	0.00
VOC	Mfg. Data	2.62	11.48
SOx	AP-42	0.00	0.00
Formaldehyde	Mfg. Data	0.00	0.00

(1) Filterable + Condensable.

Existing S3 and S4 (2,370HP each) Compressor engine emissions of each engine:

Existing Pollutant	Source	Hourly (lb/hr)	Annual (ton/yr)
NO_x	Mfg. Data	2.61	11.44
CO	Mfg. Data	1.44	6.29
$PM_{10}/PM_{2.5}$[1]	AP-42	0.18	0.78
VOCs(2)	Mfg. Data	1.12	4.92
SO_x	AP-42	0.01	0.04

Existing Pollutant	Source	Hourly (lb/hr)	Annual (ton/yr)
Formaldehyde	Mfg. Data	0.14	0.60
HAPs(2)	Mfg. Data/AP-42	0.40	1.74

(1) Filterable + Condensable.
(2) Includes Formaldehyde

New S3 and S4 (2,500 HP each) Compressor engine emissions of each engine:

Existing Pollutant	Source	Hourly (lb/hr)	Annual (ton/yr)
NO_x	Mfg. Data	1.65	7.24
CO	Mfg. Data	1.10	4.82
$PM_{10}/PM_{2.}$(1)	AP-42	0.19	0.83
VOCs(2)	AP-42	1.82	7.97
SO_x	AP-42	0.01	0.04
Formaldehyde	Mfg. Data	0.17	0.73
HAPs(2)	Mfg. Data/AP-42	0.42	1.84

(1) Filterable + Condensable.
(2) Includes Formaldehyde.

S3 and S4 Compressor engine emission changes of each engine:

Pollutant	Source	Hourly (lb/hr)	Annual (ton/yr)
NO_x	Mfg. Data	-0.96	-4.2
CO	Mfg. Data	-0.34	-1.47
$PM_{10}/PM_{2.5}$	AP-42	0.01	0.05
VOC	AP-42	0.7	3.05
SOx	AP-42	0.00	0.00
Formaldehyde	Mfg. Data	0.03	0.13
HAPs(2)	Mfg. Data/ AP-42	0.02	0.10

Microturbine Generator engine emissions:

Pollutant	Source	Hourly (lb/hr)	Annual (ton/yr)
NO_x	Mfg. Data	0.03	0.13
CO	Mfg. Data	0.08	0.36
$PM_{10}/PM_{2.5}$	AP-42	0.01	0.04
VOC	Mfg. Data	<0.01	0.03
SOx	AP-42	<0.01	0.01
Formaldehyde	AP-42	<0.01	<0.01
HAPs(2)	AP-42	<0.01	<0.01

Lube Oil Tanks emissions:

Pollutant	Source	Hourly (lb/hr)	Annual (ton/yr)
VOC	E&P Tanks/Tanks 4.0.9d	<0.01	<0.01
HAPs(2)	E&P Tanks/Tanks 4.0.9d	<0.01	<0.01

Methanol Tanks emissions:

Pollutant	Source	Hourly (lb/hr)	Annual (ton/yr)
VOC	E&P Tanks/Tanks 4.0.9d	<0.01	<0.01
HAPs(2)	E&P Tanks/Tanks 4.0.9d	<0.01	0.01

Pigging and Blowdown emissions*:

Pollutant	Source	Hourly (lb/hr)	Annual (ton/yr)
VOC	Material Balance	-	10.22
HAPs(2)	Material Balance	-	0.46

*Pigging and Blowdown emissions based on the the following:

- 5 Station ESD Vent events of 350,000 scf vented gas per event
- 125 16x20 Pig receiver events of 1,181 scf vented gas per event
- 125 12x16 Pig receiver events of 673 scf vented gas per event
- 48 Compressor blowdowns of 40,000 scf vented gas per event

Compressor Blowdowns and Pigging

Type of Event	# of Events (event/yr)	Amount Vented per event (scf/event)	Total Emissions (scf/yr)	VOC emissions (ton/yr)
Station ESD Vent	5	350,000	1,750,000	4.58
Pig Receiver	125	1,181	147,625	0.39
Pig Receiver	125	673	84,125	0.22
Compressor	12	40,000	1,920,000	5.03
TOTAL			3,902,000	10.22

The estimated change in facility wide emissions are as follows:

Source	CO		NOx		$PM_{10}/PM_{2.5}$		SO2		VOCs		HAPs	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
S1	--	--	--	--	--	--	--	--	2.62	11.48	--	--
S2	--	--	--	--	--	--	--	--	2.62	11.48	--	--
S3	-0.34	-1.47	-0.96	-4.2	0.01	0.05	0.00	0.00	0.7	3.05	0.02	0.10
S4	-0.34	-1.47	-0.96	-4.2	0.01	0.05	0.00	0.00	0.7	3.05	0.02	0.10
Microturbine	0.08	0.36	0.03	0.13	0.01	0.04	<0.01	0.01	<0.01	0.03	<0.01	<0.01
Lube Oil Tanks	--	--	--	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01
Methanol Tanks	--	--	--	--	--	--	--	--	<0.01	0.01	<0.01	0.01
Pigging/Blow downs	--	--	--	--	--	--	--	--	--	10.22	--	0.46
TOTAL	-0.6	-2.58	-1.89	-8.27	0.03	0.14	0.00	0.01	6.64	39.32	0.04	0.67

The new facility wide emission estimates are as follows:

CO		NOx		$PM_{10}/PM_{2.5}$		SO2		VOCs		HAPs	
lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
12.61	55.32	18.72	81.85	1.57	6.55	0..21	0.53	27.17	98.33	-	23.77

REGULATORY APPLICABILITY

The modifications to the proposed Pandora Station are subject to the following substantive state and federal air quality rules:

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 modification of the Pandora Station has a potential to emit in excess of six (6) lbs/hour and ten (10) TPY of a regulated pollutant and, therefore, pursuant to §45-13-2.24, the modification 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, EQM is required to obtain a permit under 45CSR13 for the modification and operation of the facility.

As required under §45-13-8.3 ("Notice Level A"), EQM placed a Class I legal advertisement in a "newspaper of *general circulation* in the area where the source is . . . located." The ad ran on October 18, 2016 in the *Herald Record* and the affidavit of publication for this legal advertisement was submitted on October 27, 2016.

45CSR30: Requirements for Operating Permits - (NON APPLICABILITY)

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 modified Pandora Station does not 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 of any regulated pollutant does not exceed 100 TPY. Additionally, the facility-wide PTE does not exceed 10 TPY of any individual HAP or 25 TPY of aggregate HAPs.

However, as the emission units affected by this modification are subject to two New Source Performance Standard (NSPS) - 40 CFR 60, Subpart JJJJ and Subpart OOOO - and one Maximum Achievable Control Technology (MACT) rules - 40 CFR 63, Subpart ZZZZ, the facility would, in most cases, be subject to Title V as a "deferred source." However, pursuant to §60.4230(c), §60.5370(c), and §63.6585(d) as a non-major "area source," EQM is not required to obtain a Title V permit for the proposed facility. Therefore, the Pandora Station is not subject to 45CSR30.

40 CFR 60 Subparts OOOO – (Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution for which Construction, Modification or Reconstruction Commenced after August 23, 2011, and on or before September 18, 2015)

On April 27, 2012, the USEPA issued a final rule (Federal Register Date: 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. EPA published amendments to the Subpart on September 23, 2013 and June 3, 2016.

Each potentially applicable section of Subpart OOOO is discussed below.

Compressor Engines

EQM is proposing to install two new compressor engines under this modification. The standards addressed in the previous permit will be carried over into the modification permit.

Pneumatic Controllers

EQM is not proposing to install any pneumatic controllers under this modification.

Storage Tanks

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."

EQM is proposing to add seven storage tanks to the equipment list of the permit with this modification. These are existing storage tanks. The emissions from each tank will still not exceed 6 tpy.

40 CFR 60 Subpart OOOOa – (Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution for which Construction, Modification or Reconstruction Commenced after September 18, 2015)

Fugitive Emissions Components

EQM is proposing to install two new compressor engines. The proposed project is a modification under 40 CFR 60.5365a(j). In addition to the standards addressed in the previous permit that will be carried over into the modification permit, all fugitive emission components, defined in §60.5430a, shall be monitored for fugitive emissions. Fugitive emissions are any visible emission from a fugitive emissions component observed using optical gas imaging or an instrument reading of 500 ppm or greater using Method 21.

40 CFR 60 Subpart JJJJ - (Standards of Performance for Stationary Spark Ignition Internal Combustion Engines)

The two (2) Caterpillar G3616 compressor engines and two (2) Caterpillar G3608 engines are new SI ICE that commenced construction after June 12, 2006. Subpart JJJJ is applicable to the compressor engines. The compressor engines are required by the permit to comply with all applicable requirements in Subpart JJJJ including those not specified in the permit. The permit specifically requires that the compressor engines comply with Table 1 as well as monitoring, compliance demonstration, and recordkeeping requirements of this subpart.

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

Subpart ZZZZ establishes national emission limitations and operating limitations for hazardous air pollutants (HAP) emitted from stationary reciprocating internal combustion engines (RICE) located at major and area sources of HAP emissions. This Subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limitations and operating limitations. This section reflects EPA's final amendments to 40 CFR part 63, Subpart ZZZZ that were issued on January 15, 2013 and published in the Federal Register on January 30, 2013.

According to 40 CFR 63.6590(c),

> *Stationary RICE subject to Regulations under 40 CFR Part 60.* 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.
>
> (c)(1) A new or reconstructed stationary RICE located at an area source.

The compressor engines subject to change by this modification were constructed after June 12, 2006 are new reciprocating internal combustion engines (RICE(s)), as defined in 40 CFR 63.6590(a)(2)(iii), and are located at an area source. These engines must meet the requirements of 40 CFR part 60 subpart JJJJ. No further requirements apply for such engines under this 40 CFR 63 Subpart ZZZZ.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

There will be small amounts of various non-criteria regulated pollutants emitted from the combustion of natural gas. However, due to the concentrations emitted, detailed toxicological information is not included in this evaluation.

AIR QUALITY IMPACT ANALYSIS

Since this is a modification to an existing non-major source (as defined in 45CSR14) no modeling was performed.

MONITORING OF OPERATIONS

No monitoring above that which is already required in R13-3095A is deemed necessary except that the same monitoring requirements applicable to the originally proposed engines will also be applied to the new engines.

CHANGES TO PERMIT R13-3095B

The entire format of the permit was changed/updated to a format similar to the GP-35D draft permit.

The VOC emission limits for each compressor engine, engines #1 and #2 (Emissions Units S1 and S2), were increased because manufacturer emissions data changed. Specifically, the control device VOC capture efficiency decreased from 70 % to 44%.

Design capacity of each compressor engine, engines #3 and #4 (Emission Units S3 and S4), were changed from 2,370 HP each to 2,500 HP each. New manufacturer supplied emission factors were used to calculate new emission limits.

An existing thermal electric generator (S19) that was exempt from permitting when it was installed has been added to Table 1.0. A fuel throughput limit for all microturbines was included along with monitoring and recordkeeping requirements.

Four existing lube oil tanks (T011-T014) and three existing methanol tanks (T015-T017) have been added to Table 1.0. In addition to adding these tanks to the permit, limits on the throughput of these tanks was also added along with monitoring and recordkeeping requirements.

Emissions resulting from the above changes and emissions from blowdown and pigging operations have been included in the facility wide emission estimates. A condition has been added to the permit that limits compressor blowdowns to 48 events, station shutdowns to 5 events, and pigging to 250 (125 events per receiver). In lieu of these limits, if the permittee can accurately determine the quantity of gas released during each event, the permittee may comply by limiting the quantity of gas released to 3,902 MSCF per year. Recordkeeping

CHANGES TO R13-3095B AFTER PUBLIC NOTICE

Removed a heading that was misplaced at the end of Condition 3.5.5.

Clarified the initial performance test in a note following 5.2.1.a.(1)

Removed 6.1.1.d because it contradicted 6.1.1.c.

Removed conditions 6.2.1 and 6.3.1 because they supported condition 6.1.1.d which has been removed from the permit.

Condition 7.5.2 was removed because it referenced condition 7.1.2.b which does not exist and it requires a determination be made when the site wide emissions are at or above 95% of HAPs major source levels. The application shows the site is already at 96% of the major source threshold so this condition is not applicable.

Conditions 8.2.1 and 9.2.1 were revised. The last sentence of each condition was changed to "The initial observation must be completed within 60 days of initial startup". The "permit issuance" and "whichever is later" criteria for the initial observation.

T003 – T0017 were removed from the table in condition 10.1.1 because these are de Minimis sources defined in 45 CSR13 Table 45-13B.

Permit condition 11 was removed because the emissions from loading are negligible and the throughput limits for produced fluids is are accounted for in section 10.

References within the NSPS conditions were revised so that they match.

Units S7/E7 – Dehy Unit, S8/E8 – Dehy Unit Reboiler, and C6/E7 enclosed flare installation year changed to year permit was issued since they have not been installed.

Installation date on C5 was changed from 2015 from 2013.

RECOMMENDATION TO DIRECTOR

Information supplied in the application indicates that compliance with all applicable regulations will be achieved. Therefore it is the recommendation of the writer that permit R13-3095B for the modification of the Pandora Station near, West Union, Doddridge County, be granted to EQM Gathering Opco, LLC.

Jonathan Carney
Permit Writer

3/3/2017
DATE