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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-3117
Plant ID No.:	039-00219
Applicant:	Cranberry Pipeline Corporation
Facility Name:	Rocky Fork Compressor Station
Location:	Kanawha County
NAICS Code:	211111
Application Type:	Modification
Received Date:	August 28, 2013
Engineer Assigned:	Steven R. Pursley, PE
Fee Amount:	$3,500.00
Date Received:	August 29, 2013
Complete Date:	September 26, 2013
Due Date:	December 24, 2013
Applicant Ad Date:	September 3, 2013
Newspaper:	*Charleston Gazette*
UTM's:	Easting: 438.65 km Northing: 4,258.16 km Zone: 17
Description:	Modification to address the after the fact installation of lean burn technology on a compressor engine. Application also addresses installation of a catalytic convertor on that same engine and the after the fact installation of two tanks.

DESCRIPTION OF PROCESS

Natural gas enters the facility via pipeline where it is compressed to a higher pressure by a natural gas fired, 1100 horsepower White Superior compressor engine. After compression, the gas exits the facility via pipeline. The entire facility consists of one compressor engine, one oil tank, and one condensate tank.

This permit application addresses the installation of a catalytic convertor on the compressor engine. Previously, (November 2004) "lean burn technology" had been incorporated into the engine. Additionally, a 1,000 gallon drip tank and 500 gallon oil tank

were previously installed at the facility. This application covers those changes as well.

SITE INSPECTION

A site inspection of the facility was not performed by the writer since this is an existing, well known, facility to DAQ. Additionally, the writer is familiar with the area around the facility. It is a rural/residential area with several homes within a few hundred feet of the facility. A full on-site inspection of the facility was performed by Mike Rowe of DAQ's enforcement section on September 27, 2011. The facility was found to be in compliance.

To get to the facility take I-77 north to exit 111. Turn left on County Route 29 and go 1.3 miles. Turn right on County Route 21 and go 1.2 miles. Then turn left on State Route 622 and go 3 miles. Turn left on an unmarked gravel road (directly across from Bailey Drive). Go approximately 1,000 feet and the road dead ends at the facility.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

NO_x emissions from the compressor engine are based on manufacturer data. PM, VOC and SO_2 emissions from the compressor engine are based on AP-42 emission factors. Uncontrolled CO emissions form the engine are based on manufacturer data. Controlled CO emissions from the engine (due to the catalytic oxidizer) were calculated by applying a 93% control factor to the uncontrolled emissions. All HAP emissions from the compressor engine were calculated using AP-42 emission factors. Emissions of greenhouse gasses were based on 40 CFR 98. Annual emissions were based on 8,760 hours of operation per year. The following table details the potential-to-emit (PTE) of the compressor engine:

Table 1: Compressor Engine PTE

Pollutant	White Superior GTL-825 (CE-1)	
	(lb/hr)	(ton/yr)
CO	0.51	2.23
NO_X	4.85	21.23
$PM_{2.5}$(1)	0.08	0.35
PM_{10}(1)	0.08	0.35
PM(1)	0.08	0.35
SO_2	0.01	0.03
VOCs	0.95	4.14

Pollutant	White Superior GTL-825 (CE-1)	
	(lb/hr)	(ton/yr)
CH_4	n/a	0
N_2O	n/a	0.01
CO_2	n/a	3,714.25
CO_2e	n/a	4,099

(1) Filterable + Condensable.

Tank emissions from the drip tank were calculated using E&P Tank V2.0. Tank emissions from the oil tank were calculated using TANKS 4.0.9d

Table 2: Tanks PTE

Pollutant	Hourly (lb/hr)	Annual (ton/yr)
VOCs	0.07	0.28

Fugitive emissions (both VOCs and HAPs) were calculated using GRI-HAPCalc 3.01. Fugitive emissions for GHGs were based on 40 CFR 98.

Table 3: Fugitives/Blowdown Emissions

Pollutant	Hourly (lb/hr)	Annual (ton/yr)
VOC	0.13	0.56
GHG (CO_{2e})	--	13.46

Table 4: Facility-Wide Aggregate Hourly (lb/hr) Criteria Pollutant PTE Summary

Source	CO	NO_x	PM	SO_2	VOCs
CE-1	0.51	4.85	0.08	0.01	0.95
Tanks	--	--	--	--	0.07
Fugitives	--	--	--	--	0.13
Facility-Wide Totals	**0.51**	**4.85**	**0.08**	**0.01**	**1.15**

Table 5: Facility-Wide Aggregate Annual (tpy) Criteria/GHG Pollutant PTE Summary

Source	CO	NO_x	PM	SO_2	VOCs	CO_{2e}
CE-1	2.23	21.23	0.35	0.03	4.14	4,099.00
Tanks	--	--	--	--	0.28	--
Fugitives	--	--	--	--	0.56	14.00
Facility-Wide Totals	**2.23**	**21.23**	**0.35**	**0.03**	**4.98**	**4,113.00**

Table 6: Facility-Wide Aggregate Annual (ton/yr) HAP PTE Summary (HAPs ≥0.01 tpy)

Source	Benzene	Toluene	Ethylbenzene	Xylene	Hexane	Formaldehyde
CE-1	0.02	0.02	0.01	0.01	0.04	1.85
Fugitives	0.01	0.01	--	0.01	--	--
Totals	**0.02**	**0.03**	**0.01**	**0.01**	**0.04**	**1.85**
Total HAPs	**1.94**					

REGULATORY APPLICABILITY

The Rocky Fork Station is subject to the following substantive state and federal air quality rules and regulations: 45CSR13, and 40 CFR 63, Subpart ZZZZ. Each applicable rule (and those that have questionable non-applicability) and Cranberry's compliance therewith will be discussed in detail below.

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 engine.

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 facility installed lean burn technology on the compressor engine in 2004 in order to become a minor source of emissions under Title V. This change was never incorporated

into a Rule 13 permit.

As required under §45-13-8.3 ("Notice Level A"), Cranberry 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 3, 2013 in the *Charleston Gazette* and the affidavit of publication for this legal advertisement was submitted on September 17, 2013.

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 shown in Table 12 above, the facility-wide PTE of formaldehyde is 1.85 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 - (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 Rocky Fork 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 (and, in the case of CO_2e, does not exceed 100,000 TPY). Additionally, the facility-wide PTE does not exceed 10 TPY of any individual HAP or 25 TPY of aggregate HAPs.

However, as the facility is subject to a Maximum Achievable Control Technology (MACT) rule - 40 CFR 63, Subpart ZZZZ the facility would, in most cases, be subject to Title V as a "deferred source." However, pursuant to§63.6585(d), as a non-major "area source," Cranberry is not required to obtain a Title V permit for the proposed facility. Therefore, the Rocky Fork Station is not subject to 45CSR30.

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 storage tanks at the Rocky Fork Station are both well under $75m^3$. Therefore, Subpart Kb does not apply to the storage tanks.

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

The compressor engine is not subject to Subpart JJJJ because it was constructed prior to June 12, 2006.

40 CFR 60, Subpart OOOO: Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution - (NON APPLICABILITY).

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. 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 discussed earlier, the engine was installed well before 2011.

Pneumatic Controllers

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. Any pneumatic controllers that meet the above definition will be required to meet the substantive requirement for pneumatic controllers as given under §60.5390.

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."

Rocky Fork has two storage tanks. However, their emissions are well under 6 tons per year. Additionally, they were constructed in 2005. Therefore, the storage tanks are not subject to the control requirements of Subpart OOOO.

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

On June 1, 2013 the DAQ took delegation of the area source provisions of 40 CFR 63, Subpart HH. The Rocky Fork Station is defined as an area source (see Table 6) subject to the applicable provisions under Subpart HH. However, the only requirements for area sources under Subpart HH pertain to dehydration units. There are no dehydration units at the Rocky Fork Station.

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 Rocky Fork Station is defined as an areas source of HAPs (see Table 6), the facility is subject to applicable requirements of Subpart ZZZZ. Since the engine is a non-remote, existing, 4 stroke lean burn engine greater than 500 hp Cranberry must install an oxidation catalyst per §63.6603(a). The engine and oxidation catalyst must meet one of the requirements of §63.6640(c) e.g. reduce CO emissions by 93%.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

This section provides an analysis for those regulated pollutants that may be emitted from the Rocky Fork natural gas 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), Particulate Matter less than 10 microns

(PM_{10}), Particulate Matter less than 2.5 microns ($PM_{2.5}$), 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 programs designed to limit their emissions and public exposure. These programs include federal source-specific Hazardous Air Pollutants (HAPs) standards 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. Cranberry included the HAPs listed in the following table as emitted in substantive amounts (at least 0.01 lb/hr or 0.01 tpy) in their emissions estimate. The following table lists each HAP's carcinogenic risk (as based on analysis provided in the Integrated Risk Information System (IRIS)):

HAPs	Type	Known/Suspected Carcinogen	Classification
Benzene	VOC	Yes	Category A - Known Human Carcinogen
Ethylbenzene	VOC	No	Category D - Not Classifiable as to Human Carcinogenity
Formaldehyde	VOC	Yes	Category B1 - Probable Human Carcinogen
n-Hexane	VOC	No	Inadequate Data
Toluene	VOC	No	Inadequate Data
Xylene	VOC	No	Inadequate Data

AIR QUALITY IMPACT ANALYSIS

Because this modification reduces emissions, no modeling was performed.

MONITORING OF OPERATIONS

The following substantive monitoring, compliance demonstration, and record-keeping requirements (MRR) shall be required:

* For the purposes of demonstrating compliance with maximum limit for the aggregate production of condensate/liquids to Tank T1 set forth in 4.1.2 of the draft permit,

Cranberry shall be required to monitor and record the monthly and rolling twelve month total of condensate/liquids (in gallons) produced in the wells. Monitoring and recording the monthly and rolling twelve month total of condensate/liquids (in gallons) unloaded from the storage tanks can be used to show compliance with this requirement.

* Per §60.4243(b)(2)(i) for the compressor engine, the permittee will have to "keep a maintenance plan and records of conducted maintenance and must..."

The permittee shall perform the following tests:

* Testing to determine the emission rates of CO from the compressor engine per §63.6640.

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 R13-3117 for the modification of the Rocky Fork Compressor Station near, Sissonville, Kanawha County, be granted to Cranberry Pipeline Corporation.

Steven R. Pursley, PE
Engineer

November 25, 2013