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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-2694C
Plant ID No.:	079-00046
Applicant:	Cranberry Pipeline Corporation
Facility Name:	Heizer Station
Location:	Putnam County
SIC Codes:	1311, 4922
Application Type:	Modification
Received Date:	October 24, 2012
Engineer Assigned:	Steven R. Pursley, PE
Fee Amount:	$1,000.00
Date Received:	October 29, 2012
Complete Date:	January 17, 2013
Due Date:	May 1, 2013
Applicant Ad Date:	December 4, 2012
Newspaper:	*The Putnam Standard*
UTM's:	Easting: 432.47 km Northing: 4,264.10 km Zone: 10
Description:	Application to limit hours of operation so the facility can become a "Synthetic Minor" under Title V.

DESCRIPTION OF PROCESS

Natural gas enters the facility via pipeline where the wet gas is compressed to a higher pressure. Natural gas fired engines power compressors that compress the gas to a higher pressure. After compression, the compressed gas exits the facility to an underground storage site.

During periods known as "flow back", the compressed wet gas from the underground storage site is directed back to the Heizer facility. Flow back gas will undergo additional compression and dehydrated through the triethylene glycol (TEG) dehydration unit. The TEG dehydration unit removes excess water from the natural gas stream prior to being transferred to customers. The natural gas compressor engines will continue to operate

normally regardless of whether the facility is sending gas to storage or transmitting gas during flow back periods. However, the proposed changes in this permit will limit the compressor engine operational time to 7,500 hours per year to more accurately reflect the facility's operation.

GLYCOL DEHYDRATION

Pipeline quality natural gas has a moisture content of 7 pounds per million standard cubic feet. TEG dehydration units are used to remove water from natural gas streams to prevent the formation of hydrates and corrosion in the pipeline. The natural gas stream is passed through a stream of TEG. At the point of contact, the glycol will absorb water and water vapor from the natural gas stream. During the absorption process, aromatic hydrocarbons including benzene, toluene, ethyl benzene, xylene hexane and other VOCs and HAPs present in the gas stream are absorbed along with the water vapor into the glycol stream. When the glycol is saturated with water, it is considered "rich glycol". The rich glycol is then sent to a glycol still for regeneration to remove water and liquid hydrocarbons. After regeneration, the glycol is considered "lean glycol" and is suitable for reuse. Natural gas boilers provide process heat for the glycol regenerator reboilers.

PROPOSED MODIFICATION

This application involves the following:

* Place a synthetic limitation on the engine operating hours of 7,500 hours per year. The reduced operating hours will limit emissions of all criteria pollutants below Title V major source thresholds.

* Replace a Clark HMB 440 hp compressor engine with a White Superior 1,100 hp compressor engine.

* Reduce the maximum dry gas flow rate of the dehy unit to 30 MMSCF/day. Under the existing Title V permit, the drys gas flow rate is limited to 70 MMSCF/day. The pipeline leading into the Heizer facility can only deliver a volume of less than 30 MMSCF/day.

SITE INSPECTION

A site inspection of the facility was performed by the writer on February 20, 2013. The facility is located in a rural section of Putnam County along Heizer Creek. There are several residences adjacent to the facility. To get to the facility take I-64 West from Charleston to exit 45 (Nitro). Turn right and proceed 3.2 miles. Turn right on County Route 27 (Heizer Creek Road). Go 5.3 miles and the facility is on the left. GPS coordinates taken at the site are 38° 31.4' North and 81° 46.5' West. The following is a picture of the station taken on the day of the inspection:

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Compressor Engines

Potential emissions from both of the two (2) compressor engines that will be/remain at the site are based on the following: Hourly emissions, where applicable, were based on maximum design heat input (MDHI) of each engine. Annual emissions were based on 7,500 hours of operation per year (as will be limited in the permit). The following table details the potential-to-emit (PTE) of the compressor engines:

Table 1: Post-Modification Compressor Engine PTE

Pollutant	Source	Cooper (1S)		White (2S)	
		(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
CO	AP-42/MD	2.47	9.26	7.27	27.26
NO_X	AP-42/MD	20.28	76.05	4.85	18.18
$PM_{2.5}$(1)	AP-42	0.31	1.16	0.08	0.30
PM_{10}(1)	AP-42	0.31	1.16	0.08	0.30
PM(1)	AP-42	0.31	1.16	0.08	0.30
SO_2	AP-42	0.01	0.02	0.01	0.02
VOCs	AP-42	0.77	2.88	0.95	3.54
Formaldehyde	AP-42	0.36	1.33	0.43	1.59
CH_4	40 CFR 98	n/a	0.06	n/a	0.06
N_2O	40 CFR 98	n/a	0.01	n/a	0.01
CO_2	40 CFR 98	n/a	2,804.29	n/a	3,505.36
CO_2e	40 CFR 98	n/a	2,807.04	n/a	3,508.80

(1) Filterable + Condensable.

Table 2: GDU PTE

Pollutant	Source	Hourly (lb/hr)	Annual (ton/yr)
VOC	GLYCalc Results(1)	0.07	0.31
Hexane	GLYCalc Results(1)	0.01	0.01
Benzene	GLYCalc Results(1)	0.01	0.03
Toluene	GLYCalc Results(1)	0.01	0.01
Ethyl-benzene	GLYCalc Results(1)	0.01	0.01
Xylene	GLYCalc Results(1)	0.01	0.01
	Total HAPs →	**0.01**	**0.05**

(1)Glycalc Results with a control efficiency of 99.5% (VOC) and 99.9% (HAPs) for the use of a BTEX eliminator

Table 3: Reboiler PTE

Pollutant	Source	Hourly (lb/hr)	Annual (ton/yr)
NO_x	*AP-42*	*0.05*	*0.19*
CO	*AP-42*	*0.04*	*0.16*
VOC	*AP-42*	*0.30*	*1.28*
Toluene	*GRI HAP-Calc*	*0.02*	*0.05*
Hexane	*GRI HAP-Calc*	*0.01*	*0.02*
Benzene	*GRI HAP-Calc*	*0.04*	*0.15*

Table 4: Condensate Tank

Pollutant	Source	Annual (ton/yr)
VOC	GRI HAP-Calc	1.48
Benzene	GRI HAP-Calc	0.01
Toluene	GRI HAP-Calc	0.01
Hexane	GRI HAP-Calc	0.01
Xylene	GRI HAP-Calc	0.17
	Total HAPs →	**0.17**

Table 5: Fugitives

Pollutant	Source	Hourly (lb/hr)	Annual (ton/yr)
VOC	GRI HAP-Calc	0.13	0.56

Emissions Summary

Based on the above estimation methodology, which is determined to be appropriate, the PTE of the Heizer Station is given in the following tables:

Table 6: Existing Facility-Wide Aggregate Hourly (lb/hr) Criteria Pollutant PTE Summary.

Source	CO	NO_x	PM[1]	SO_2	VOCs
Cooper Compressor Engine (1S)	2.47	20.28	0.31	0.01	0.77
Clark Comp. Engine (2S)	1.24	10.14	0.16	0.01	0.39
Reboiler Vent (4S)	0.04	0.05	--	--	0.30
Glycol Dehydration Unit (5S)	--	--	--	--	0.07
Fugitives	--	--	--	--	0.13
Storage Tank (AT01)	--	--	--	--	0.34
Facility-Wide Totals →	**3.75**	**30.47**	**0.47**	**0.02**	**2.00**

(1) Filterable + Condensable.

Table 7: Existing Facility-Wide Aggregate Annual (ton/yr) Criteria Pollutant/GHG PTE Summary.

Source	CO	NO_x	PM[1]	SO_2	VOCs	CO_2e
Compressor Engine (1S)	10.82	88.83	1.36	0.02	3.37	2,804.29
Compressor Engine (2S)	5.41	44.42	0.68	0.01	1.69	4,475.28
Reboiler Vent (4S)	0.16	0.19	--	--	1.28	128.13
Glycol Dehydration Unit (5S)	--	--	--	--	0.31	--
Fugitives	--	--	--	--	0.56	--
Storage Tank (AT01)	--	--	--	--	1.48	--
Facility-Wide Totals	**16.39**	**133.44**	**2.04**	**0.03**	**8.69**	**7,407.70**

(1) Filterable + Condensable.

Table 8: Existing Facility-Wide Aggregate Annual (ton/yr) HAP PTE Summary

Source	Benzene	Ethylbenzene	Toluene	Xylene	Hexane	Formaldehyde
Comp. Eng. (1S)	0.06	0.01	0.03	0.01	0.02	1.55
Comp. Eng. (2S)	0.03	0.01	0.02	0.01	0.01	0.78
Reboiler Vent (4S)	0.15	--	0.05	--	0.02	--
Dehy Unit (5S)	0.03	0.01	0.01	0.01	0.01	--
Fugitives	0.01	0.01	0.01	0.01	--	--
Tank (AT01)	0.01	--	0.01	0.01	0.17	--
Total	**0.29**	**0.04**	**0.13**	**0.05**	**0.23**	**2.33**

Table 9: New Facility-Wide Aggregate Hourly (lb/hr) Criteria Pollutant PTE Summary.

Source	CO	NO_x	PM[(1)]	SO_2	VOCs
Cooper Comp Engine (1S)	2.47	20.28	0.31	0.01	0.77
White Comp. Engine (2S)	7.27	4.85	0.08	0.01	0.95
Reboiler Vent (4S)	0.04	0.05	--	--	0.30
Glycol Dehydration Unit (5S)	--	--	--	--	0.07
Fugitives	--	--	--	--	0.13
Storage Tank (AT01)	--	--	--	--	0.34
Facility-Wide Totals ➔	**9.78**	**25.18**	**0.39**	**0.02**	**2.56**

(1) Filterable + Condensable.

Table 10: New Facility-Wide Aggregate Annual (ton/yr) Criteria Pollutant/GHG PTE Summary.

Source	CO	NO_x	PM[(1)]	SO_2	VOCs	CO_{2e}
Cooper Comp. Engine (1S)	9.26	76.05	1.16	0.02	2.88	2,807.01
White Comp. Engine (2S)	27.26	18.18	0.30	0.02	3.54	3,508.63
Reboiler Vent (4S)	0.16	0.19	--	--	1.28	128.13
Glycol Dehydration Unit (5S)	--	--	--	--	0.31	--
Fugitives	--	--	--	--	0.56	--
Storage Tank (AT01)	--	--	--	--	1.48	--
Facility-Wide Totals ➔	**36.68**	**94.42**	**1.46**	**0.04**	**10.05**	**6,443.77**

(1) Filterable + Condensable.

Table 11: New Facility-Wide Aggregate Annual (ton/yr) HAP PTE Summary

Source	Benzene	Ethylbenzene	Toluene	Xylene	Hexane	Formaldehyde
Comp. Eng. (1S)	0.05	0.01	0.03	0.01	0.02	1.33
Comp. Eng. (2S)	0.02	0.01	0.02	0.01	0.04	1.59
Reboiler Vent (4S)	0.15	--	0.05	--	0.02	--
Dehy Unit (5S)	0.03	0.01	0.01	0.01	0.01	--
Fugitives	0.01	0.01	0.01	0.01	--	--
Tank (AT01)	0.01	--	0.01	0.01	0.17	--
Total	**0.27**	**0.04**	**0.13**	**0.05**	**0.26**	**2.92**
Total HAPs	**3.67**					

Table 12: Change in Facility Wide Criteria Emissions

CO		NO_x		PM		SO_2		VOCs		CO_{2e}
lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	tpy
6.03	20.29	-5.29	-39.02	-0.08	-0.58	0.00	0.01	0.56	1.36	-963.9

Table 13: Change in Facility Wide HAP Emissions

Benzene	Ethylbenzene	Toluene	Xylene	Hexane	Formaldehyde
tpy	tpy	tpy	tpy	tpy	tpy
-0.02	0.00	0.00	0.00	0.03	0.59

REGULATORY APPLICABILITY

The Heizer Compressor Station is subject to the following substantive state and federal air quality rules and regulations: 45CSR2, 45CSR13, and 40 CFR 60 Subpart JJJJ. Each applicable rule (and those that have questionable non-applicability) and Cranberrys' 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.

The GDU Reboiler, however, has been determined to meet the definition of a “fuel burning unit” under 45CSR2 and is, therefore, subject to the applicable requirements therein. However, pursuant to the exemption given under §45-2-11, as the MDHI of the GDU Reboiler is less than 10 mmBtu/hr, the unit is 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 reboiler is subject to an opacity limit of 10%. Proper maintenance and operation of the reboiler (and the use of regenerator vapors/natural gas as fuel) should keep the opacity of the units well below 10% during normal operations.

45CSR10: To Prevent and Control Air Pollution from the Emission of Sulfur Oxides (non-applicability)

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 Heizer Compressor Station is the limitations on fuel burning units. The GDU Reboiler has been determined to meet the definition of a "fuel burning unit" under 45CSR2. However, pursuant to the exemption given under §45-10-10.1, as the MDHI of the GDU Reboiler is less than 10 mmBtu/hr, the unit is not subject to the limitations on fuel burning units under 45CSR10.

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.

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

Since the Heizer Compressor Station has a potential to emit in excess of six (6) lbs/hour and ten (10) TPY of a regulated pollutant it is considered an existing stationary source. Cranberry submitted this application to voluntarily limit their emissions to less than 100 tons per year of any criteria pollutant and less than 10 tons per year of any individual HAP and less than 25 tons per year of aggregate HAPs in order to become a "synthetic minor" source under 45CSR30.

As required under §45-13-8.5 ("Notice Level C"), 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 December 4, 2012 in *The Putnam Standard* and the affidavit of publication for this legal advertisement was submitted on December 19, 2012. Per §45-13-8.5 ("Notice Level C"), the applicant will be required to place a sign at the entrance to the facility and publish a commercial display ad "Within one week prior to the Secretary's placement of a Class I legal advertisement of intent to issue or within three (3) working days of the Secretary's placement of the advertisement".

45CSR22 Air Quality Management Fee Program

As shown below (45CSR30 non-applicability), as a result of this permitting action, establishing a synthetic minor, the facility is not subject to 45CSR 30 and, therefore, will pay its annual fees through the Rule 22 program.

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 11 above, the facility-wide PTE of formaldehyde is 2.92 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 modified Heizer Compressor 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). Similarly, the facility-wide PTE does not exceed 10 TPY of any individual HAP or 25 TPY of aggregate HAPs. Therefore, the Heizer Compressor Station is not subject to 45CSR30. Additionally, the facility is not subject to any NSPS or NESHAP which would make it a deferred source under Title V.

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

Per §40.4230(a)(4), Subpart JJJJ does not apply to engines that "commenced construction" before June 12, 2006 unless that engine is reconstructed or modified per §40.4230(a)(5). Cranberry has stated that both the existing Cooper engine and the "new" White Superior engine were constructed before June of 2006. Additionally, per §60.14(e)(6), the relocation of an existing unit does not meet the definition of "modification".

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

Subpart OOOO applies only to compressors "between the wellhead and the point of custody transfer to the natural gas transmission and storage segment". Heizer is a natural gas transmission facility because all gas received and stored is transferred from transmission pipelines (Tennessee pipeline). Therefore, Subpart OOOO does not apply.

40 CFR 63 Subpart HHH: National Emission Standards for Hazardous Air Pollutants From Natural Gas Transmission and Storage Facilities (non-applicability)

Subpart HHH applies only to major sources of HAPs. Since the facility is a synthetic minor source of HAPs, Subpart HHH does not apply.

40 CFR 63 Subpart ZZZZ: Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (non-delegation)

The compressor engines appear to be subject to the area source (as shown above in Table 11, the individual and aggregate HAP emission rates of the facility define the proposed facility as an"area source" of HAPs) requirements of 40 CFR 63, Subpart ZZZZ. However, the DAQ has not been delegated authority from USEPA to enforce the area source requirements of this rule. Therefore, unless otherwise stated, DAQ did not formally determine whether the permittee is subject to an area source air toxics standard requiring Generally Achievable Control Technology (GACT) promulgated after January 1, 2007 pursuant to 40 CFR 63, including the area source air toxics provisions of 40 CFR 63, Subpart ZZZZ.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

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 following HAPs as emitted in substantive amounts in their emissions estimate: Benzene, Ethylbenzene, Hexane, Formaldehyde, Toluene, and Xylene. 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
Formaldehyde	VOC	Yes	Category B1 - Probable Human Carcinogen
Benzene	VOC	Yes	Category A - Known Human Carcinogen
Ethylbenzene	VOC	No	Inadequate Data
Hexane	VOC	No	Inadequate Data
Toluene	VOC	No	Inadequate Data
Xylenes	VOC	No	Inadequate Data

AIR QUALITY IMPACT ANALYSIS

Since the facility will be a minor source as defined in 45CSR14, no modeling was performed.

MONITORING OF OPERATIONS

The permittee shall perform monitoring, testing and recordkeeping according to the following:

* Monthly operating hours of the compressor turbines (1S) and (2S) shall be monitored and recorded.

* Emissions testing shall be done on the two engines to confirm NO_x emissions.

* Daily wet gas throughput to the Dehy shall be monitored and recorded.

* Throughput to tank AT01 shall be monitored on a monthly basis.

CHANGES TO PERMIT R13-2694B

The existing permit addresses only the Dehy system and the storage tank. Those conditions will be updated as needed. Additionally, conditions will be added to address the compressor engines.

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 R13-2694C for the modification of the Heizer compressor station near, Poca, Putnam County, be granted to Cranberry Pipeline Corp.

Steven R. Pursley, PE
Engineer

February 27, 2013