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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-2694A
Plant ID No.:	079-00046
Applicant:	Cranberry Pipeline Corporation (CPC)
Facility Name:	Heizer Compressor Station
Location:	Poca, Putnam County
SIC Code:	1311
Application Type:	Modification
Received Date:	February 11, 2010
Engineer Assigned:	Jerry Williams II, P.E.
Fee Amount:	$1,000.00
Date Received:	February 16, 2010
Complete Date:	March 3, 2010
Due Date:	June 1, 2010
Applicant Ad Date:	February 16, 2010
Newspaper:	*The Putnam Standard*
UTM's:	Easting: 432.48 km Northing: 4263.99 km Zone: 17
Description:	This application was made to change the glycol dehydration unit control device from a flare to a BTEX Eliminator (Shell and Tube Condenser).

DESCRIPTION OF PROCESS

The following process description was taken from Permit Application R13-2694A:

Natural gas enters the facility via pipeline at a relatively low pressure. Natural gas fired engines power compressors that compress the gas to a higher pressure. The products of combustion from burning pipeline quality natural gas by the engines are vented through exhaust stacks. After compression, the natural gas, which contains water vapor, contacts triethylene glycol (TEG) in a dehydration unit. In the dehydration unit, lean (dry) TEG absorbs water from the gas by contacting the wet gas in a contacting tower. The TEG flows downward and countercurrent to the wet gas flow. Trays or packing media in the tower maximize the contact between the wet gas and the glycol. This process very efficiently removes water from the wet gas stream. A variety of organic impurities, mostly VOCs are removed from the gas stream along with the water. Certain of these VOCs are considered HAPs.

The dehydrated gas (i.e. dry gas) leaves the top of the tower and is delivered to other locations via pipeline. The rich (wet) TEG leaves the bottom of the contacting tower and is routed through a BTEX Eliminator condenser prior to being routed to a reboiler. The rich TEG is used as a coolant in the condenser. The reboiler regenerates the rich TEG for reuse in the contacting tower by boiling off the water through a still vent. The still vent emissions, which also contain the VOCs that were trapped in the TEG along with the water, are transferred to the BTEX Eliminator system that condenses the steam and trace TEG.

The condensate, with trace TEG is sent to storage. The entrained BTEX vapors are separated from the condensate and injected into the reboiler burner when it is operating. When the reboiler burner shuts down, the BTEX vapors are sent to the reboiler exhaust stack where they are contacted with an igniter to achieve thermal degradation. This mode of operation persists until the reboiler is restarted.

The reboiler itself combusts pipeline quality natural gas and vents the combustion products via the exhaust stack. Emissions from the reboiler exhaust stack are comprised of the combustion products of the natural gas fuel and the BTEX vapors extracted from the dehydrator still vent.

SITE INSPECTION

A site inspection was conducted on March 22, 2010 by the writer and Mike Rowe of the DAQ Enforcement Section. We met with Whitney Johnson and John Good of CPC, and John Nelson of ERSG, Inc.

Directions as given in the permit application are as follows:

I-64 West to Nitro exit. Turn right and head south on State Route 62 towards Poca. In Poca, bear right onto CR-27 (Heizer Creek Road). Travel approximately 5.4 miles, the station is located on the left.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Maximum controlled point source emissions from CPC's Heizer Compressor Station are summarized in the table below.

Emission Point ID	Process Unit	Pollutant	Maximum Controlled Emission Rate	
			Hourly (lb/hr)	Annual (ton/year)
001-04	70 MMscfd Glycol Dehydrator Still Column 0.38 mmBTU/hr Glycol Dehydrator Reboiler	Volatile Organic Compounds	0.30	1.28
		Benzene	0.04	0.15
		Toluene	0.02	0.05
		n-Hexane	0.01	0.02
		Nitrogen Oxides	0.04	0.19
		Carbon Monoxide	0.04	0.16
		Sulfur Dioxide	0.01	0.01
		Particulate Matter	0.01	0.02

REGULATORY APPLICABILITY

Unless otherwise stated WVDEP DAQ did not 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 HH and 40 CFR 63, Subpart ZZZZ.

The following rules apply to the facility:

45CSR4 (To Prevent and Control the Discharge of Air Pollutants into the Open Air which Causes or Contributes to an Objectionable Odor or Odors)

45CSR4 states that an objectionable odor is an odor that is deemed objectionable when in the opinion of a duly authorized representative of the Air Pollution Control Commission (Division of Air Quality), based upon their investigations and complaints, such odor is objectionable. No odors have been deemed objectionable.

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

45CSR10 Section 10.1 states that any fuel burning units having a design heat input under ten (10) million BTU's per hour will be exempt from section 3 and sections 6 through 8. However, failure to attain acceptable air quality in parts of some urban areas may require the mandatory control of these sources at a later date. Therefore, the 0.38 MMBTU/hr Glycol Dehydrator Reboiler would meet this criteria.

45CSR10 Section 4.1 states that no person shall cause, suffer, allow or permit the emission into the open air from any source operation an in-stack sulfur dioxide concentration exceeding 2,000 parts per million by volume from existing source operations. Therefore, the Glycol Dehydrator Reboiler is limited to a maximum of 2,000 ppm_v. Calculations performed by CPC indicate that this value will be approximately 343 ppm_v.

45CSR10 Section 5.1 states no person shall cause, suffer, allow or permit the combustion of any refinery process gas stream or any other process gas stream that contains hydrogen sulfide in a concentration greater than 50 grains per 100 cubic feet of gas except in the case of a person operating in compliance with an emission control and mitigation plan approved by the Director and U. S. EPA. In certain cases very small units may be considered exempt from this requirement if, in the opinion of the Director, compliance would be economically unreasonable and if the contribution of the unit to the surrounding air quality could be considered negligible. Compliance with the Federal Energy Regulatory Commission (FERC) limit for H_2S is 0.25 grains per 100 cubic feet. Pipeline quality natural gas has a low H_2S content, therefore if the incoming pipeline quality natural gas meets the FERC limit, this standard will be met.

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)

45CSR13 applies to this source due to the fact that CPC is changing the control device that will enable them to remain a minor source of HAPs.

45CSR30 (Requirements for Operating Permits)

This facility does have two (2) grandfathered reciprocating internal combustion engines and has the potential to emit 147.91 tons of NO_x. Due to this facility's potential to emit over 100 tons per year of criteria pollutant, CPC is required to have an operating permit pursuant to Title V of the Federal Clean Air Act as amended and 45CSR30.

40CFR63 Subpart ZZZZ (National Emission Standards for Reciprocating Ignition Internal Combustion Engines)

40CFR63 Subpart HH (National Emission Standards for Hazardous Air Pollutants: Oil and Natural Gas Production and National Emission Standards for Hazardous Air Pollutants: Natural Gas Transmission and Storage)

40CFR63 Subpart HHH (National Emission Standards for Hazardous Air Pollutants: Natural Gas Transmission and Storage)

> WVDEP DAQ did not 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 HH and 40 CFR 63, Subpart ZZZZ.
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> These promulgated national emission standards for hazardous air pollutants (NESHAP) limit emissions of hazardous air pollutants (HAP) from oil and natural gas production and natural gas transmission and storage facilities. These final rules implement section 112 of the Clean Air Act (Act) and are based on the Administrator's determination that oil and natural gas production and natural gas transmission and storage facilities emit HAP identified on the EPA's list of 188 HAPs.

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.

The following information was obtained from USEPA's Air Toxic Website.

Formaldehyde
Formaldehyde is used mainly to produce resins used in particleboard products and as an intermediate in the synthesis of other chemicals. Exposure to formaldehyde may occur by breathing contaminated indoor air, tobacco smoke, or ambient urban air. Acute (short-term) and chronic (long-term) inhalation exposure to formaldehyde in humans can result in respiratory symptoms, and eye, nose, and throat irritation. Limited human studies have reported an association between formaldehyde exposure and lung and nasopharyngeal cancer. Animal inhalation studies have reported an increased incidence of nasal squamous cell cancer. EPA considers formaldehyde a probable human carcinogen (Group B1).

Hexane
Hexane is used to extract edible oils from seeds and vegetables, as a special-use solvent, and as a cleaning agent. Acute (short-term) inhalation exposure of humans to high levels of hexane causes mild central nervous system (CNS) effects, including dizziness, giddiness, slight nausea, and headache. Chronic (long-term) exposure to hexane in air is associated with polyneuropathy in humans, with numbness in the extremities, muscular weakness, blurred vision, headache, and fatigue observed. Neurotoxic effects have also been exhibited in rats. No information is

available on the carcinogenic effects of hexane in humans or animals. EPA has classified hexane as a Group D, not classifiable as to human carcinogenicity.

Ethylbenzene
Ethylbenzene is mainly used in the manufacture of styrene. Acute (short-term) exposure to ethylbenzene in humans results in respiratory effects, such as throat irritation and chest constriction, irritation of the eyes, and neurological effects such as dizziness. Chronic (long-term) exposure to ethylbenzene by inhalation in humans has shown conflicting results regarding its effects on the blood. Animal studies have reported effects on the blood, liver, and kidneys from chronic inhalation exposure to ethylbenzene. Limited information is available on the carcinogenic effects of ethylbenzene in humans. In a study by the National Toxicology Program (NTP), exposure to ethylbenzene by inhalation resulted in an increased incidence of kidney and testicular tumors in rats, and lung and liver tumors in mice. EPA has classified ethylbenzene as a Group D, not classifiable as to human carcinogenicity.

Toluene
Toluene is added to gasoline, used to produce benzene, and used as a solvent. Exposed to toluene may occur from breathing ambient or indoor air. The central nervous system (CNS) is the primary target organ for toluene toxicity in both humans and animals for acute (short-term) and chronic (long-term) exposures. CNS dysfunction and narcosis have been frequently observed in humans acutely exposed to toluene by inhalation; symptoms include fatigue, sleepiness, headaches, and nausea. CNS depression has been reported to occur in chronic abusers exposed to high levels of toluene. Chronic inhalation exposure of humans to toluene also causes irritation of the upper respiratory tract and eyes, sore throat, dizziness, and headache. Human studies have reported developmental effects, such as CNS dysfunction, attention deficits, and minor craniofacial and limb anomalies, in the children of pregnant women exposed to toluene or mixed solvents by inhalation. Reproductive effects, including an association between exposure to toluene and an increased incidence of spontaneous abortions, have also been noted. However, these studies are not conclusive due to many confounding variables. EPA has classified toluene as a Group D, not classifiable as to human carcinogenicity.

AIR QUALITY IMPACT ANALYSIS

The changes to this facility do not constitute a major modification under 45CSR14. Based on the nature of the emissions and the annual emission rate, no air quality analysis was performed. However, air dispersion modeling will be required if the Director finds existing circumstances and/or submitted data that provide cause for an assessment to be made concerning whether this facility may interfere with attainment or maintenance of an applicable ambient air quality standard or cause or contribute to a violation of an applicable air quality increment.

MONITORING OF OPERATIONS

CPC will be required to perform the following monitoring, recordkeeping, and reporting:

1. Monitor and record quantity of condensate produced by the BTEX Eliminator.
2. Monitor and report any malfunctions associated with the BTEX Eliminator.
3. Maintain records of the natural gas throughput to the glycol dehydration unit.
4. Maintain records of testing conducted in accordance with the permit. Said records shall be maintained on-site or in a readily accessible off-site location
5. Maintain a record of all potential to emit (PTE) HAP calculations for the entire facility. These records shall include the natural gas compressor engines and ancillary equipment.
6. The records shall be maintained on site or in a readily available off-site location maintained by CPC for a period of five (5) years.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates CPC's Heizer Compressor Station meets all the requirements of applicable regulations. Therefore, impact on the surrounding area should be minimized and it is recommended that the Putnam County location should be granted a 45CSR13 modification permit for their facility.

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Jerry Williams II, P.E.
Engineer

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Date