west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-2919
Plant ID No.:	103-00044
Applicant:	Equitrans Limited Partnership
Facility Name:	Mercury Dehy Station
Location:	Wetzel County
NAICS Code:	211111
Application Type:	Construction
Received Date:	February 13, 2012
Engineer Assigned:	David Keatley
Fee Amount:	$1,000
Date Fee Received:	February 16, 2012
Complete Date:	June 26, 2012
Due Date:	September 11, 2012
Applicant Ad Date:	April 20, 2012
Newspaper:	*Wetzel Chronicle*
UTM's:	Easting: 538.785 km Northing: 4,378.778 km Zone: 17
Description:	Installation of one (1) 120 MMscf/day TEG dehydration unit with an associated 1.54 MMBTU/hr reboiler. Installation of one (1) 40 hp microturbine and four tanks.

DESCRIPTION OF PROCESS

Installation of one (1) 120 MMscf/day TEG dehydration unit with an associated 1.54 MMBTU/hr reboiler (S2). The dehydration unit is used to lower the water content of the natural gas stream. Flare C1 (S1) is used as a control device for the vapors from the regenerator and flash tank emissions. Installation of a Capstone C30 0.44 MMBTU/hr (30 kW) microturbine natural gas generator (S3). The generator is used to supply power for the facility. Installation of Two (2) 8,820 gallon produced fluids tanks. Installation of one (1) 2,132 gallon new TEG tank and one (1) 2,132 gallon TEG Maintenance Tank.

SITE INSPECTION

Doug Hammell of DAQ's Compliance and Enforcement section preformed a site visit on June 26, 2012.

Directions to the facility from Charleston: Take I77N until exit 179. Turn onto WV 2 N travel until just before New Martinsville. Take a right onto WV 7 E. Just past Veto turn onto WV 20 S. Turn left onto CR 15 near Pine Grove. Travel about 11 miles the facility is just before Mobley (intersection with CR 15/3).

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions from the regenerator and the flash tank are sent to Flare C-1. The combined heat rate from the regenerator waste gas and assist gas is 0.742 MMBTU/hr the combined heat value used was 1,050 BTU/scf. VOC and HAP emissions from flare C-1 were estimated with GRI-GLYCalc and 70 MMscfd and 550 psig was the worst case scenerio within the operating range of the dehy. The emission factors used for natural gas combustion for sources S1 and S2 in lb/MMscf are: NOx, 100; CO, 84; PM, 7.6; VOC, 5.5; and SO_2, 0.6.

Emissions for microturbine S3 are from AP-42 section 3.1 and manufacturers data (Capstone). The emission factor from AP-42 for CO is 8.2×10^{-2} lb/MMBTU and the emission factor from Capstone for NO_x is 0.22 g/bhp-hr.

There are three kinds of emissions (working, breathing, and flash) which were included in estimating emissions for T01 and T02. Working and breathing emissions were estimated with TANKS and flash emissions was estimated with CHEMCAD.

Source ID	Emission Source	Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (tpy)
S1	TEG Combined Regenerator and Flash Tank Emissions from Flare C-1	NO_x	0.071	0.31
		CO	0.06	0.26
		VOC	1.11	4.88
		SO_2	0.0008	0.003
		Particulate Matter	0.005	0.023
		Benzene	0.03	0.14
		Ethylbenzene	0.03	0.12
		Toluene	0.09	0.41
		Xylenes	0.24	1.06
		n-Hexane	0.02	0.08
S2	Reboiler 1.54 MMBTU/hr	NO_x	0.15	0.64
		CO	0.12	0.54
		VOC	0.008	0.04
		SO_2	0.00088	0.0039
		PM	0.01	0.05

S3	Microturbine Generator 0.44 MMBTU/hr	NO_x	0.02	0.09
		CO	0.04	0.16
T01	Produced Fluids Tank 8,820 gallon	VOC	0.921	4.03
		Benzene	0.00134	0.00587
		n-Hexane	0.029	0.0914
T02	Produced Fluids Tank 8,820 gallon	VOC	0.921	4.03
		Benzene	0.00134	0.00587
		n-Hexane	0.029	0.0914

REGULATORY APPLICABILITY

45CSR2 - *To Prevent and Control Particulate Air Pollution From Combustion of Fuel in Indirect Heat Exchangers*

The natural gas reboiler (S2) at this facility meets the definition for fuel burning unit (section 2.10). This reboiler is less than 10 mmBTU and is exempt from the following sections: 4,5,6,8, and 9.

This fuel burning unit (S2) is however subject a 10% opacity limit.

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

This facility shall not cause the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public.

45CSR6 - *Control of Air Pollution From Combustion of Refuge*

From section 2.7 this facilities ground level flare (C1) meets the definition of an incinerator and is therefore subject to applicable Rule 6 requirements. From section 4.1 the maximum allowable total particulate matter emission rate is 1.30 lb/hr. This facilities potential to emit of total particulate matter (0.07 lb/hr) is well below this threshold. The opacity limit for the emergency flare is 20%.

45CSR10 - *To Prevent and Control Air Pollution From the Emissions of Sulfur Oxides*
Natural gas reboiler S2 is a fuel burning unit which has a 1.54 MMBTU heat capacity rate. S2 is a Type 'b' fuel burning unit, which is below the 10 MMBTU threshold and therefore S2 are exempt from sections 3, 6, 7, and 8 (Section 10.1). This facility is in Wetzel County and is in Priority Classification II. This reboiler is not consider a manufacturing process, refinery, or process gas stream.

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 they exceed the regulatory emission threshold for regulated air pollutants of 6 lb/hr and 10 ton/year (NO_x, CO and VOCs). Since this source required a Construction Permit a $1,000 application was paid.

45CSR22 - *Air Quality Management Fee Program*

The facility is subject to the requirements of 45CSR22. This source is a 9M source and shall pay an annual fee of $200.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

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

Benzene

Benzene is found in the air from emissions from burning coal and oil, gasoline service stations, and motor vehicle exhaust. Acute (short-term) inhalation exposure of humans to benzene may cause drowsiness, dizziness, headaches, as well as eye, skin, and respiratory tract irritation, and, at high levels, unconsciousness. Chronic (long-term) inhalation exposure has caused various disorders in the blood, including reduced numbers of red blood cells and aplastic anemia, in occupational settings. Reproductive effects have been reported for women exposed by inhalation to high levels, and adverse effects on the developing fetus have been observed in animal tests. Increased incidence of leukemia (cancer of the tissues that form white blood cells) have been observed in humans occupationally exposed to benzene. EPA has classified benzene as a Group A, human carcinogen.

Ethyl Benzene

Ethyl benzene is mainly used in the manufacturing of styrene. Acute (short-term) exposure to ethyl benzene 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 ethyl benzene 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 ethyl benzene. Limited information is available on the carcinogenic effects of ethyl benzene in humans. In a study by the National Toxicology Program (NTP), exposure to ethyl benzene by inhalation resulted in an increased incidence of kidney and testicular tumors in rats, and lung and liver tumors in mice. EPA has classified ethyl benzene 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.

Xylene

Commercial or mixed xylene usually contains about 40-65% m-xylene and up to 20% each of o-xylene and p-xylene and ethylbenzene. Xylenes are released into the atmosphere as fugitive emissions from industrial sources, from auto exhaust, and through volatilization from their use as solvents. Acute (short-term) inhalation exposure to mixed xylenes in humans results in irritation of the eyes, nose, and throat, gastrointestinal effects, eye irritation, and neurological effects. Chronic (long-term) inhalation exposure of humans to mixed xylenes results primarily in central nervous system (CNS) effects, such as headache, dizziness, fatigue, tremors, and incoordination; respiratory, cardiovascular, and kidney effects have also been reported. EPA has classified mixed xylenes as a Group D, not classifiable as to human carcinogenicity.

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.

AIR QUALITY IMPACT ANALYSIS

Based on the annual emission rates this facility will not be a major source as defined by 45CSR14, so air quality modeling was not required.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates Equitrans Limited Partnership natural gas transmission station should meet applicable requirements of state rules and federal regulations. It is recommended that Equitrans Limited Partnership's proposed Mercury Dehy Station natural gas production station should be granted a 45CSR13 construction permit for their facility.

David Keatley
Permit Writer

Date