west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-3007C
Plant ID No.:	103-00049
Applicant:	Eureka Hunter Pipeline, LLC
Facility Name:	Carbide Site
Location:	Wetzel County
NAICS Code:	211111
Application Type:	Modification
Received Date:	July 22, 2015
Engineer Assigned:	David Keatley
Fee Amount:	$2,000
Date Fee Received:	September 4, 2015
Complete Date:	November 3, 2015
Due Date:	February 1, 2015
Applicant Ad Date:	September 9, 2015
Newspaper:	*Wetzel Chronicle*
UTM's:	Easting: 528.737 km Northing: 4,376.709 km Zone: 17
Description:	Installation and operation of one (1) 2,750 bhp compressor engine. Removal of two (2) 1,380 bhp compressor engine.

DESCRIPTION OF PROCESS

This facility compresses/dehydrates natural gas. Raw gas and produced liquids will be received from local production wells via three pipelines entering the station. Lower pressure wet inlet gas will be passed through an inlet separator, compressed, dehydrated, and sent to an exiting pipeline. The inlet separator creates a velocity drop in which liquids fall out of the natural gas stream. These liquids flow from the bottom of the inlet separator to a three-way separator. From the three-way separator water is sent to a brine water tank (T05), condensate is sent to ten (10) condensate tanks (T12 - T22), and the vapors from the three-way separator are compressed and sent to the inlet side of the compressor engines. The engine that provides power for the compressor associated with the three-way separator is S5A which is a Caterpillar 3406 NA (DOM September 22, 2005) four-stroke rich-burn 215 bhp natural gas fired compressor engine equipped with a Miratech Catalyst. The

catalyst for associated with engine S5A will have the following reductions in emissions: NO_x, 94%; CO, 94%; VOC, 50%; and formaldehyde, 50%. The liquids from the condensate tanks will be trucked off site and the liquids from the brine tank will be used for the development of other wells. During truck loading a 2.4 MMBTU/hr vapor combustor will be used to control emissions. Truck loading will be limited to 4,380 hours per year. The flash vapors from the condensate tanks are compressed and sent to the inlet side of the compressor engines. To help ensure complete combustion auxiliary fuel will be included for combustion S15-A. S6A is a Caterpillar 3306 NA (DOM September 28, 1993) four-stroke rich-burn 215 bhp natural gas fired compressor engine which provides power for the compressor which compresses the flash emissions from the condensate tanks and is equipped with a Miratech Catalyst. The catalyst associated with engine S6A will have the following reductions in emissions: NO_x, 94%; CO, 94%; VOC, 50%; and formaldehyde, 50%.

The gas streams that come from the inlet separator, compressed condensate flash vapors, and compressed three-way separator vapors are combined and compressed. S1 - S4 and S8 - S11 are Caterpillar 3516B four-stroke lean-burn 1,380 bhp natural gas fired compressor engines which power the associated compressors to compress the combined natural gas stream. The compressor engines are equipped with an EMIT oxidation catalyst which reduces emission of: carbon monoxide, VOCs, and formaldehyde. This facility proposes installing one (1) four-stroke lean-burn 2,370-bhp Caterpillar 3608 natural gas fired engine equipped with a DCL oxidation catalyst. After compression the natural gas stream is sent to a Valerus dehydration unit. In the contactor the natural gas stream will flow countercurrent to circulating lean TEG. The rich TEG from the contactor will be sent to the regenerator where TEG is heated by a 1.5 MMBTU/hr reboiler (S7) to remove the moisture. The maximum dry natural gas flow rate is 80 MMCF/day. The vapors from the regenerator are sent to a condenser. The liquids from the condenser are sent to the condensate tanks. The vapors from the condenser are sent to the reboiler S7 to achieve a 95% combustion efficiency.

SITE INSPECTION

Doug Hammell from the DAQ's Compliance and Enforcement Section performed a site visit of this facility on November 20, 2014 and the facility was deemed in compliance.

Directions: From the intersection of SR 2 and SR7. Take SR7 east until you reach SR 20. Take SR 20 east until approximately two miles past Hastings. Turn right onto Union Carbide Road (gravel). Travel on Union Carbide Road for approximately 1 mile and the facility is on the right.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions from engine S20 were estimated with DCL catalyst emission factors (CO, VOC, and CH2O, Caterpillar engine emission factors (NOx), and AP-42 for the other emission factors.

Table 1: Estimated Modified Maximum Controlled PTE

Emission Point	Emission Source	Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (tpy)
E20	Caterpillar G3608 Compressor Engine	Nitrogen Oxides	2.61	11.44
		Carbon Monoxide	1.04	4.58
		Volatile Organic Compounds	1.72	7.55
		Sulfur Dioxide	0.01	0.04
		PM_{10}	0.16	0.71
		Formaldehyde	0.31	1.37

Table 2: Total Facility Wide PTE

Pollutant	Proposed Maximum Facility Wide Air Emissions (tons/year)
Nitrogen Oxides	70.10
Carbon Monoxide	31.34
Volatile Organic Compounds	49.36
Total Particulate Matter	4.70
Sulfur Dioxide	0.27
Formaldehyde	8.35
Benzene	0.07
n-Hexane	0.05
Toluene	0.03
Xylenes	0.02
Total HAPs	15.98
Carbon Dioxide Equivalent	67,440

REGULATORY APPLICABILITY

The following rules were reviewed for this modification.

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. 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.

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*

This modification is subject to 40CFR60 subpart JJJJ which is considered a substantive requirement and therefore will require a modification permit.

45CSR22 - *Air Quality Management Fee Program*

This facility is subject to 45CSR22. This facility is a minor source for all regulated air pollutants as seen from the proposed facility wide air emissions column in Table 2. This facility is also not subject to 45CSR30 because the NSPS are Title V exempt. Since this facility has a total reciprocating engine capacity of greater than 1,000 hp this facility is a 8D source with an annual fee of $500. The permittee will be required to keep their Certificate to Operate current.

40CFR60 Subpart JJJJ (Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (SI ICE))

Engines (CE-1R through CE-5R) are subject to 40CFR60 Subpart JJJJ because construction was after June 12, 2006. Engines CE-1R through CE-5R were manufactured after July 1, 2010 (non-emergency SI natural gas lean-burn greater than 1,350 bhp).
[40CFR60.4230(4)]

40CFR60.4248 Table 1 provides the allowable emission standards for stationary spark ignition internal combustion engines. Engine S20 is a non-emergency lean-burn hp≥1,350 bhp manufacturer date after July 1, 2010 the allowable emission standards in g/hp-hr are: NO_x, 1.0; CO, 2.0; and VOC, 0.7. The estimated emissions were estimated in g/hp-hr with: NO_x, 0.5; CO, 0.2; and VOC, 0.33 which are below the allowable standards. This engine will also have operating limits, performance tests, notification requirements, and recordkeeping requirements.

40CFR63 Subpart ZZZZ *National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines*

Subpart ZZZZ establishes national emission limitations and operating limitations for HAPs emitted from stationary 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 facility is subject to the area source requirements for non-emergency spark ignition engines.

Engine S20 is a "New Stationary RICE" sources at an area source of HAPs and is an affected source because construction commenced after June 12, 2006 [63.6590(a)(2)(iii)] due to the installation dates of the engines being after June 12, 2006. Engine S20 must meet the requirements of 40CFR60 subpart JJJJ and has no additional requirements due to this regulation.

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. This facility has the the following HAPs as emitted in substantive amounts (at least 20 pounds (0.01 tons) per year) in their emissions estimate: Formaldehyde. The following table lists each HAP's carcinogenic risk (as based on analysis provided in the Integrated Risk Information System (IRIS)):

Table 4: Potential HAPs - Carcinogenic Risk

HAPs	Type	Known/Suspected Carcinogen	Classification
Formaldehyde	VOC	Yes	Category B1 - Probable Human Carcinogen

All HAPs have other non-carcinogenic chronic and acute effects. These adverse health affects may be associated with a wide range of ambient concentrations and exposure times and are influenced by source-specific characteristics such as emission rates and local meteorological conditions. Health impacts are also dependent on multiple factors that affect variability in humans such as genetics, age, health status (e.g., the presence of pre-existing disease) and lifestyle. As stated previously, *there are no federal or state ambient air quality standards for these specific chemicals*. For a complete discussion of the known health effects of each compound refer to the IRIS database located at *www.epa.gov/iris*.

AIR QUALITY IMPACT ANALYSIS

Modeling was not performed of this source due to the fact that the facility is not subject to 45CSR14 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollutants) as can be seen in Table 2.

RECOMMENDATION TO DIRECTOR

The information provided in this facility's permit application indicates that compliance with all state and federal air quality requirements will be achieved. It is recommended that Eureka Hunter should be granted a 45CSR13 Modification permit for their Carbide Site facility.

David Keatley
Permit Writer - NSR Permitting

November 3, 2015

Date