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BACKGROUND INFORMATION

Application No.:	13-3357
Plant ID No.:	041-00051
Applicant:	CNX Gas Company, LLC
Facility Name:	Rohrbaugh Booster Station
Location:	Camden, Lewis County
NAICS Code:	211111
Application Type:	Construction
Received Date:	January 23, 2017
Engineer Assigned:	Jonathan Carney
Fee Amount:	$2,000.00
Date Received:	January 24, 2017
Complete Date:	February 17, 2017
Due Date:	May 18, 2017
Applicant Ad Date:	January 25, 2017
Newspaper:	The Weston Democrat
UTM's:	Easting: 472.134 Northing: 4,157.092 Zone:17
Description:	This is an after the fact permit to construct one 95 HP compressor and one liquids storage tank. The 95 HP compressor engine is subject to 40CFR60 Subpart JJJJ requirements due to its year of manufacture.

DESCRIPTION OF PROCESS

The following description is taken from Application 13-3357:

CNX Gas Company LLC is applying for an after the fact construction permit in accordance with 45CSR13, for the operation of the Rohrbaugh Booster Station. As a result of DAQ guidance, the engine at this site has been identified as subject to New Source Performance Standards (NSPS) under subpart JJJJ. The small compressor engine is a 95 HP, 4SRB unit that was manufactured in September of 2008, which puts it two months over the applicability timeframe for JJJJ (7-1-2008). The site was originally purchased from Dominion E&P on April 30, 2010.

The Rohrbaugh booster collects gas from conventional gas wells in the area and sends it to a sales line. The small natural gas fired engine will utilize a NSCR catalyst in order to assure compliance with the NSPS regulation. The engine will conduct initial

compliance testing upon permit approval. Additionally, the Rohrbaugh site consists of inlet and outlet gas piping and liquid knock out separators as well as gas metering instrumentation. Liquids removed from the gas stream are sent to a 50 bbl storage vessel. Since the tank was installed prior to August 23, 2011 the storage vessel commenced construction prior to NSPS OOOO applicability. The tank's emissions were estimated based on 1 turnover per year and using representative results predict very low emissions, less than 0.04 tpy VOCs. Additionally, the 1 turnover per year throughput rate takes into account a safety factor of 10 when compared to actual production records.

In accordance with DAQ guidance, the facility wide emission potentials include truck loading, fugitive equipment leaks, and compressor blowdowns in addition to the typical engine and storage vessel point source emissions. The calculations summarized within this application show the facility wide total emissions to be no more than 2.60 tpy NOx, 4.44 tpy CO, and 2.40 tpy VOC, with total HAPs slightly less than 0.3 tpy from formaldehyde.

SITE INSPECTION

A full on-site inspection was performed on November 4, 2016 by DAQ compliance and enforcement inspector, John Moneypenny. The inspector noted the following in his inspection report:

> **This site belongs to CNX Gas. Engine is a 95 hp CAT G3304 with catalyst bed installed. SN NF403357. This engine was installed in 2011 and manufactured on September 13, 2008. Since it was manufactured after July 1, 2008, it is subject to the requirements of NSPS JJJJ. These requirements include doing an initial performance test, which has not been conducted. Since the engine is subject to substantive requirements of a subpart, it thus required a pre-construction permit per 45 CSR 13, which was not received. A NOV will be drafted to address these violations.**

A notice of violation (NOV) was issued on January 13, 2017 and a response to the NOV was received on February 17, 2017.

From Charleston: I-79 North to Weston exit state route 20 west to Camden. At Camden Post Office, turn right on to Churchville Road, continue 2.3 miles to left turn on Kemper Hollow Road. First locked gate is 0.3 mi. on left, 2nd locked gate is 0.5 mi. up hill at Rohrbaugh Station

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed/Modified	Design Capacity	Type and Date of Change	Control Device
CE-1	E01	Reciprocating Engine/Integral Compressor; Caterpillar G3304 NA; 4SRB	2011	95 hp	Existing	C1

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed/Modified	Design Capacity	Type and Date of Change	Control Device
T-1	E02	Pipeline Liquids AST	Pre - August 2011	2,100 gal	Existing	NA
TL-1	E03	Pipeline Liquids – Truck Loading	2011	2,100 gal/yr	Existing	NA

The following table indicates the control device efficiency that are required for this facility:

Emission Unit	Pollutant	Control Device	Control Efficiency
CE-1 Caterpillar/G3304	NOx	NSCR	79.5
NA	CO		64.9

The total facility PTE (excluding fugitives) for the Station is shown in the following table:

Pollutant	R13-3357 PTE (tons/year)
Nitrogen Oxides	2.60
Carbon Monoxide	4.44
Volatile Organic Compounds	0.75
Particulate Matter-10/2.5	0.07
Formaldehyde	0.25
Total HAPs	0.30
Carbon Dioxide Equivalent	437.02

Maximum detailed controlled point source emissions were calculated by CNX Gas Company LLC and checked for accuracy by the writer and are summarized in the tables on the next page.

				Maximum Controlled* PTE	
Emission Unit ID	Emission Point ID	Emission Unit Description	All Regulated Pollutants	lb/hr	tpy
CE-1	E01	4SRB RICE CAT	NO_x	0.59	2.60
			CO	1.01	4.44

		G3304 NA	VOC	0.11	0.48
			SO_2	0.01	0.01
			PM_{10}	0.02	0.07
			CH2O	0.06	0.25
			HAPs	0.07	0.29
			CO_2e	99.78	437.02
T-1	E02	Pipeline Liquids AST	VOC	0.01	0.04
Truck Loading			VOC		0.00
Compressor Blowdown			VOC		0.23
Fugitive			VOC		1.65
			CO_2e		38.39

*The emissions from T-1 are uncontrolled

REGULATORY APPLICABILITY

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

The facility is subject to the requirements of 45CSR4 and shall not allow the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public.

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 is subject to 45CSR13 because is subject to a substantive requirement of an emission control rule promulgated by the Secretary (40 CFR 60 Subpart JJJJ,)

CNX Gas Company LLC paid the appropriate fee of $2000.00 on January 24, 2017 and published the required legal advertisement for a construction permit application in the *The Weston Democrat* on January 25, 2017.

45CSR16 - *Standards of Performance for New Stationary Sources Pursuant to 40CFR60*

45CSR16 incorporates by reference the standards of performance for new stationary sources (40CFR60). Rohrbaugh Station is subject to 40CFR60 Subpart JJJJ and is therefore subject to 45CSR16.

45CSR22 - *Air Quality Management Fee Program*

The facility is subject to the requirements of 45CSR22 and shall pay fees according to the application fee schedule. The proper application fee ($1,000 for construction application fee and $1,000 for additional NSPS fee) $2,000 was received on January 24, 2017.

40CFR60 Subpart JJJJ - *Standards of Performance for Stationary Spark Ignition Internal Combustion Engines*

40CFR60 Subpart JJJJ sets forth emission limits, fuel requirements, installation requirements, and monitoring requirements based on the year of installation of the subject spark ignition internal combustion engine. This subpart applies to the one compressor engine, CE-1, because it was manufactured on or after July 1, 2007. Engine CE-1 must comply with the emission standards for field testing in 40 CFR 1048.101(c) HC + NO_x standard is 3.8 g/kW-hr and the CO standard is 6.5 g/kW-hr. The permittee must keep a maintenance plan and records of conducted maintenance to demonstrate compliance and must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. The non-certified engine (CE-1) will have to undergo initial performance testing to demonstrate compliance [40CFR4243(b)(2)i.]

40CFR63 Subpart ZZZZ – *National Emission Standards for Hazardous Air Pollutants For Stationary Reciprocating Internal Combustion Engines (RICE).*

Subpart ZZZZ applies to stationary RICE at a major or area source of HAP emissions. Subpart ZZZZ applies to the Rohrbaugh Compressor Station as the compressor engine is a new RICE. The engine shall comply with Subpart ZZZZ by complying with 40 CFR Part 60, Subpart JJJJ in accordance with 40 CFR 63.6590(c).

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. The Station is classified as an area source of hazardous air pollutants. Listed below is a description of the primary hazardous air pollutants for this facility.

Acetaldehyde
Acetaldehyde is mainly used as an intermediate in the synthesis of other chemicals. It is common in the environment and may be formed in the body from the breakdown of ethanol. Acute (short-term) exposure to acetaldehyde results in effects including irritation of the eyes, skin, and respiratory tract. Symptoms of chronic (long-term) intoxication of acetaldehyde resemble those of alcoholism. Acetaldehyde is considered a probable human carcinogen (Group B2) based on human cancer studies and animal studies that have shown nasal tumors in rats and laryngeal tumors in hamsters.

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.

Toluene
The acute toxicity of toluene is low. Toluene may cause eye, skin, and respiratory tract irritation. Short-term exposure to high concentrations of toluene (e.g., 600 ppm) may produce fatigue, dizziness, headaches, loss of coordination, nausea, and stupor; 10,000 ppm may cause death from respiratory failure. Ingestion of toluene may cause nausea and vomiting and central nervous system depression. `Contact of liquid toluene with the eyes causes temporary irritation. Toluene is a skin irritant and may cause redness and pain when trapped beneath clothing or shoes; prolonged or repeated contact with toluene may result in dry and cracked skin. Because of its odor and irritant effects, toluene is regarded as having good warning properties. The chronic effects of exposure to toluene are much less severe than those of benzene. No carcinogenic effects were reported in animal studies. Equivocal results were obtained in studies to determine developmental effects in animals. Toluene was not observed to be mutagenic in standard studies.

Ethylbenzene
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.

Xylenes
Commercial or mixed xylene usually contains about 40-65% m-xylene and up to 20% each of o-xylene and p-xylene and ethyl benzene. 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. Mixed xylenes are used in the production of ethylbenzene, as solvents in products such as paints and coatings, and are blended into gasoline.

Formaldehyde
Formaldehyde is used mainly to produce resins used in particle board 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).

All HAPs have other non-carcinogenic chronic and acute effects. These adverse health effects 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 required 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) or 45CSR19 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution which Cause or Contribute to Nonattainment) as seen in the table listed in the Regulatory Discussion section under 45CSR14/45CSR19.

SOURCE AGGREGATION

"Building, structure, facility, or installation" is defined as all the pollutant emitting activities which belong to the same industrial grouping, are located on one or more contiguous and adjacent properties, and are under the control of the same person.

The Source Determination Rule for the oil and gas industry was published in the Federal Register on June 3, 2016 and became effective on August 2, 2016. EPA defined the term "adjacent" and stated that equipment and activities in the oil and gas sector that are under common control will be considered part of the same source if they are located on the same site or on sites that share equipment and are within ¼ mile of each other.

"Contiguous or Adjacent" determinations are made on a case by case basis. There are no other equipment and activities in the oil and gas sector that are under common control of CNX Gas Company LLC that are located on the same site or on sites that share equipment and are within ¼ mile of each other.

Because the Station is not located on contiguous or adjacent properties with other facilities under common control, the emissions from this facility shall not be aggregated with other facilities for the purposes of making Title V and PSD determinations.

The Station will operate under NAICS code 211111 (Natural Gas Compressor Station).

MONITORING OF OPERATIONS

The permittee is required to conduct initial performance testing on the compressor engine (CE-1).

The permittee is required to operate and maintain CE-1 in a manner consistent with good air pollution control practice for minimizing emissions.

The permittee is required to maintain records of maintenance performed on the compressor engine and the non-selective catalytic reduction device.

The permittee is required to monitor the throughput of pipeline liquids of the storage tank.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates that the CNX Gas Company LLC natural gas compressor station should meet all the requirements of applicable rules and regulations. Therefore, impact on the surrounding area should be minimized and it is recommended that the facility at the Lewis County location should be granted a 45CSR13 construction permit.

Jonathan Carney
Permit Writer

May 16, 2017
DATE