



west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.: R13-2349I
Plant ID No.: 097-00010
Applicant: Appalachia Midstream Services, L.L.C. (AMS)
Facility Name: Alexander Compressor Station
Location: Upshur County
SIC Code: 1311
NAICS Code: 211111
Application Type: Modification
Received Date: November 24, 2010
Engineer Assigned: Jerry Williams II, P.E.
Fee Amount: \$2,000.00
Date Received: November 24, 2010
Complete Date: January 25, 2011
Due Date: April 25, 2011
Applicant Ad Date: January 5, 2011
Newspaper: *The Record Delta*
UTM's: Easting: 570.1 km Northing: 4290.9 km Zone: 17
Description: This permitting action is to reflect a new gas analysis and change in operating hours. In addition NSPS Subpart JJJJ applicability is addressed.

DESCRIPTION OF PROCESS

The following process description was taken from Permit Application R13-2349I:

The natural gas inlet stream from surrounding area wells enters the facility through an inlet suction separator prior to the gas being compressed. After the inlet gas passes through a compressor, it goes through the dehydration process before exiting the facility. The dehydration unit is used to remove water from the gas. In the dehydration process, gas passes through a contactor vessel where water is absorbed by the glycol. The "rich" glycol containing water goes to the glycol reboiler where heat is used to boil off the water. The heat is supplied by a natural gas-fired reboiler that exhausts to the atmosphere. Overhead still column emissions will be

controlled by a thermal oxidizer. An emergency generator is present on site with a maximum use of 1,000 hours per year. Emissions from fugitive components also occur.

SITE INSPECTION

A site inspection was conducted in 2008 by Richard Fenton of the DAQ Enforcement Section. The facility was operating in compliance at that time.

Directions as given in the permit application are as follows:

From I-79, take Exit 99 and go east to Buckhannon. Take the Route 20 exit in Buckhannon and head south. Follow Route 20 south approximately 10 miles through French Creek. Turn left on Secondary Route 11 at the French Creek Game Farm and travel approximately 10 miles to the Y intersection and bear left. Go approximately 2 miles down hill and across the bridge at the bottom. The access road for the station is located at a sharp right hand turn 2.1 miles from the bridge.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

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

Emission Point ID	Emission Unit ID	Process Unit	Pollutant	Maximum Controlled Emission Rate	
				Hourly (lb/hr)	Annual (ton/year)
ENG1	ENG1	540 hp Ajax DPC-540 Compressor Engine	Nitrogen Oxides	10.24	38.40
			Carbon Monoxide	1.55	5.81
			Sulfur Dioxide	0.01	0.04
			Particulate Matter-10	0.22	0.83
			Volatile Organic Compounds	1.67	6.26
			Formaldehyde	0.36	1.35
ENG2	ENG2	540 hp Ajax DPC-540 Compressor	Nitrogen Oxides	10.24	38.40
			Carbon Monoxide	1.55	5.81
			Sulfur Dioxide	0.01	0.04
			Particulate Matter-10	0.22	0.83
			Volatile Organic Compounds	1.67	6.26

		Engine	Formaldehyde	0.36	1.35
ENG3	ENG3	1,380 hp Waukesha L5794 Compressor Engine	Nitrogen Oxides	1.52	6.66
			Carbon Monoxide	1.75	7.67
			Sulfur Dioxide	0.01	0.04
			Particulate Matter-10	0.10	0.44
			Volatile Organic Compounds	0.35	1.53
			Formaldehyde	0.03	0.13
ENG4	ENG4	1,380 hp Waukesha L5794 Compressor Engine	Nitrogen Oxides	1.52	6.66
			Carbon Monoxide	1.75	7.67
			Sulfur Dioxide	0.01	0.04
			Particulate Matter-10	0.10	0.44
			Volatile Organic Compounds	0.35	1.53
			Formaldehyde	0.03	0.13
G4-R	G4-R	70 hp Natural Gas Fired Generator	Nitrogen Oxides	1.37	0.68
			Carbon Monoxide	4.15	2.08
			Sulfur Dioxide	0.01	0.01
			Particulate Matter-10	0.01	0.01
			Volatile Organic Compounds	0.09	0.05
EUDHYR1	EPSTLR1	30 MMscfd Glycol Dehydrator Still Column	Volatile Organic Compounds	0.48	2.10
			Benzene	0.02	0.09
			Ethylbenzene	0.02	0.09
			Toluene	0.04	0.17
			Xylenes	0.22	0.96
			n-Hexane	0.01	0.05
EUDHYR1	EPRBLR1	0.75 mmBTU/hr Glycol Dehydrator Reboiler	Nitrogen Oxides	0.08	0.35
			Carbon Monoxide	0.06	0.26
			Sulfur Dioxide	0.01	0.01
			Particulate Matter-10	0.01	0.04
			Volatile Organic Compounds	0.01	0.01

APCTO	APCTO	Thermal Oxidizer	Nitrogen Oxides	0.40	1.75
			Carbon Monoxide	1.54	6.75
FUG	FUG	Fugitive Emissions	Volatile Organic Compounds	NA	7.18
			Hazardous Air Pollutants	NA	0.85

This modification is to reflect the emissions changes due to a new extended gas analysis. In addition, a limit has been proposed on the hours of operation of the engines. The emission changes associated with this application are shown in the following table:

Pollutant	Annual Emissions Before R13-2349I (tons/year)	Annual Emissions After R13-2349I (tons/year)	Emissions Change (tons/year)
Nitrogen Oxides	96.78	92.90	-3.88
Carbon Monoxide	38.01	36.05	-1.96
Volatile Organic Compounds	27.27	25.17	-2.10
Particulate Matter-10	3.03	2.77	-0.26
Sulfur Dioxide	0.21	0.21	0
Formaldehyde	3.43	2.97	-0.46
Benzene	0.31	0.36	0.05
Toluene	0.21	0.38	0.17
Ethylbenzene	0.09	0.09	0
Xylenes	1.12	1.12	0

The following table indicates the control device efficiencies that are being utilized:

Control Device ID	Emission Point ID	Control Device Description	Control Efficiency
APCTO	APCTO	Thermal Oxidizer	98% (VOC & HAPs)
NSCR	ENG3	Non Selective Catalytic Reduction (NSCR)	NO _x – 95% CO – 90% VOC – 60% CH ₂ O – 75%

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:

45CSR2 (Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers)

AMS would be subject to the opacity requirements in 45CSR2, which is 10% opacity based on a six minute block average.

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.

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 AMS exceeds the regulatory emission threshold for criteria pollutants of 6 lb/hr and 10 ton/year, and AMS is subject to a substantive requirement of an emission control promulgated by the Secretary.

This permitting action is subject to Notice Level C as outlined in 45CSR13 Section 8.5. This is because AMS has taken an operational limit to remain below major stationary source threshold. Therefore, in addition to the Class I legal advertisement that the DAQ will place in the *The Record Delta* notifying the public of our intent to issue this permit, AMS is responsible for placing a commercial display ad in *The Record Delta* and posting a visible and accessible sign at the entrance to the source.

45CSR16 (Standards of Performance for New Stationary Sources Pursuant to 40 CFR Part 60)

45CSR16 applies to this source by reference of 40CFR60, Subpart JJJJ. AMS is subject to the recordkeeping, monitoring, and testing required by 40CFR60, Subpart JJJJ.

45CSR22 (Air Quality Management Fee Program)

AMS is not subject to 45CSR30. Therefore, they are a nonmajor source that is required to submit the appropriate fees listed in 45CSR22 and to keep their Certificate to Operate (CTO) current.

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

AMS's engines (ENG-3, ENG-4) are subject to 40CFR60 Subpart JJJJ, which sets forth emission limits, fuel requirements, installation requirements, and monitoring requirements based on the year of installation of the subject internal combustion engine.

The two (2) 1,380 hp Waukesha L5794 compressor engines (ENG-3, ENG-4) will be subject to this rule. The emission limits for each engine is the following: NO_x – 2.0 g/hp-hr (6.08 lb/hr); CO – 4.0 g/hp-hr (12.16 lb/hr); and VOC – 1.0 g/hp-hr (3.04 lb/hr). Based on the manufacturer's specifications for these engines and the use of NSCR, the emission standards will be met.

Because the engines will not be certified by the manufacturer, AMS will be required to perform an initial performance test within 180 days from startup, and subsequent testing every 8,760 hours or 3 years, whichever comes first.

The following rules may apply to the facility:

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.

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.

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

AMS will be required to perform the following monitoring:

1. Monitor and record quantity of natural gas consumed for all engines, and combustion sources.

AMS will be required to perform the following recordkeeping:

1. Maintain records of the amount of natural gas consumed in each combustion source.
2. 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
3. Maintain the corresponding records specified by the on-going monitoring requirements of and testing requirements of the permit.
4. Maintain records of the visible emission opacity tests conducted per the permit.
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 AMS for a period of five (5) years.

RECOMMENDATION TO DIRECTOR

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

Jerry Williams II, P.E.
Engineer

Date