



**west virginia** department of environmental protection

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**ENGINEERING EVALUATION / FACT SHEET**

BACKGROUND INFORMATION

Application No.: R13-2878A  
Plant ID No.: 103-00042  
Applicant: MarkWest Liberty Midstream & Resources LLC (MarkWest)  
Facility Name: Mobley Gas Plant  
Location: Smithfield, Wetzel County  
NAICS Code: 211112  
Application Type: Modification  
Received Date: September 26, 2011  
Engineer Assigned: Roy F. Kees, P.E.  
Fee Amount: \$2,000.00  
Date Received: March 20, 2012  
Complete Date: March 23, 2012  
Due Date: May 23, 2012  
Applicant Ad Date: September 23, 2011  
Newspaper: *The Wetzel Chronicle*  
UTM's: Easting: 538.099 km      Northing: 4,378.315 km      Zone: 17  
Description: Modification permit application to replace a currently permitted single engine generator set with a three engine generator set, and to take a operational limitation of 8400 total hours.

DESCRIPTION OF PROCESS

The following process description was taken from Permit Application R13-2878A:

The Mobley Gas Plant will be used for processing natural gas. In the original permit R13-2878, a Caterpillar G3612 engine had been planned to provide power until permanent power could be obtained at the site. This modification seeks to replace the Caterpillar G3612 engine (not yet installed) with a generator set comprised of three (3) 1,945 hp Cummins 1400 GQKA engines. Engineering controls limit the gen set to a maximum of two engines operating at the same time. Additionally, Mark West is requesting administrative restrictions to limit the total number of hours of the three engines to 8400. This works to an average of 2800 hours per engine and that is what the calculations are based on; however, Mark West would like to request a permit condition of 8400 hours for all the engines combined as all the engines are the same and

with only two engines able to operate at a time, it is unknown whether they will have equal utilization. It is expected that full-time power will be available shortly after facility startup and the engines will be removed; however, Mark West would like to keep the option for running the engines for emergency purposes up to the administrative limit that has been requested in the application.

All other equipment at the Mobley Gas Plant will be the same as in the current permit.

SITE INSPECTION

A site inspection was conducted on June 28, 2011 by the writer and Jerry Williams. The facility had not been constructed at that time. The site was remote and there were no visible residences.

Directions as given in the permit application are as follows:

*From Smithfield, head southwest on County Road 2/1/Mannington Road toward WV 20S. Turn right at WV 20N and go 1.1 miles. Take the first right onto County Road 7/8/Fallen Timber Run Road and go 2.8 miles. Continue onto County Road 80/Fallen Timber Road/Shuman Hill for 0.8 miles. Turn right at County Road 80/Shuman Hill and go 1.5 miles. Turn right at County Road 15/North Fork Road and go 2.8 miles. The site will be on the left.*

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions associated with this modification will consist of three (3) natural gas fired generator engines. The estimated emission calculations, based on manufacturer data and AP-42, were performed by MarkWest and checked for accuracy and completeness by the writer. The following tables include the emission source, and controlled emission rate based on a total operation of 8400 hours for the three new engines combined:

Emission Point ID#	Source	Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (tpy)
G-1001	3,550 hp Caterpillar G3612 LE Generator Engine (To Be Removed)	Nitrogen Oxides	3.91	17.14
		Carbon Monoxide	1.08	4.71
		Particulate Matter-10	0.01	0.01
		Sulfur Dioxide	0.01	0.06
		Volatile Organic Compounds	2.03	8.91
		Formaldehyde	0.20	0.89

G-1001	1,945 hp	Nitrogen Oxides	12.84	17.97
		Carbon Monoxide	2.19	3.06
G-1002	Cummins 1400GQKA Generator	Particulate Matter-10	0.03	0.03
G-1003		Sulfur Dioxide	0.03	0.03
Combined	Engines (New)	Volatile Organic Compounds	6.18	8.64
		Formaldehyde	0.51	0.72

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

Emission Point ID	Control Device	Emission Unit	Pollutant	Control Efficiency
G-1001, 1002 & 1003	Oxidation Catalyst	Cummins 1400GQKA Generator Engines	Carbon Monoxide	90.0 %
			Volatile Organic Compounds	50.0 %

The total facility emissions after this proposed modification are shown in the following table:

Pollutant	Annual Emissions (tons/year)	Change (tons/year)
Nitrogen Oxides	96.48	+0.85
Carbon Monoxide	53.82	-1.64
Volatile Organic Compounds	49.68	-0.29
Particulate Matter	11.74	-1.00
Sulfur Dioxide	0.53	-0.01
Formaldehyde	4.24	-0.18
Total Hazardous Air Pollutants	15.37	-1.03

Maximum fuel usage for each engine, found in the manufacturer data was 12.96 mmbtu/hr. Using a higher heating value of 1,124 Btu/scf, the maximum hourly fuel consumption rate was 11,531 scf/hr, for each engine and the maximum annual usage was 97.0 mmscf/yr for the three engines combined.

#### REGULATORY APPLICABILITY

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.

**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 MarkWest exceeds the regulatory emission threshold for criteria pollutants of 6 lb/hr and 10 ton/year, and they are also subject to a substantive requirement of an emission control rule promulgated by the Secretary (40CFR60 Subpart JJJJ). Because the addition of the new engines will make this source major for NO<sub>x</sub> (over 100 tpy), Mark West is proposing an administrative limit of 8400 hours making the source a synthetic minor subject to Notice Level 'C'.

**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. MarkWest is subject to the recordkeeping, monitoring, and testing required by 40CFR60 Subpart JJJJ.

**45CSR30** (Requirements for Operating Permits)

MarkWest is a nonmajor source subject to 45CSR30. They are a deferred source because the source is subject to 40CFR60 Subpart KKK.

**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 internal combustion engine. 40CFR60 Subpart JJJJ is applicable to owners and operators of new stationary spark ignition internal combustion engines manufactured after July 1, 2007, for engines with a maximum rated power capacity greater than 500 hp. The three proposed engines will be subject to this rule. The emission limits for the three 1,945 hp Cummins 1400 GKQA generator engines (G-1001 – G-1003) are the following: NO<sub>x</sub> – 2.0 g/hp-hr (8.56 lb/hr); CO – 4.0 g/hp-hr (17.12 lb/hr); and VOC – 1.0 g/hp-hr (4.29 lb/hr).

Based on the manufacturer's specifications for these engines, the emission standards will be met. Because the engines will not be certified by the manufacturer, MarkWest will demonstrate compliance by conducting initial and subsequent performance testing. MarkWest will also be required to maintain a maintenance plan and associated records.

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.

### 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 facility will not be a major source of HAP's as defined by 45CSR14. Based on the nature of the emissions and the annual emission rate, no air quality impact analysis was performed.

The gas wells that feed this processing facility are not owned by MarkWest. The facility that the outlet gas is delivered to is in Washington County, Pennsylvania. Therefore, the emissions from any other facility would not be aggregated with this facility.

### MONITORING OF OPERATIONS

MarkWest will be required to perform the following monitoring:

1. Monitor and record quantity of natural gas consumed for all engines and combustion sources.
2. Monitor hours of operation for engines G-1001 – G-1003, not to exceed a total of 8400 hours.

MarkWest will be required to perform the following recordkeeping:

1. Maintain records of the amount of natural gas consumed and hours of operation of engines G-1001 – G-1003.
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 MarkWest for a period of five (5) years.

CHANGES TO PERMIT R13-2878

- Sections 5.1.5 and 5.1.6 were changed to reflect the new triple-engine generator
- Section 5.1.7 was added for an hourly limitation for the generators.

RECOMMENDATION TO DIRECTOR

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

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Roy F. Kees, P.E.  
Engineer

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Date