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**west virginia** department of environmental protection

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## **ENGINEERING EVALUATION / FACT SHEET**

### BACKGROUND INFORMATION

Application No.: R13-2818D  
Plant ID No.: 051-00125  
Applicant: MarkWest Liberty Midstream & Resources, LLC  
Facility Name: Majorsville Gas Plant  
Location: Marshall County  
SIC Code: 1311  
Application Type: Modification  
Received Date: August 27, 2012  
Engineer Assigned: Steven R. Pursley, PE  
Fee Amount: \$2,000.00  
Date Received: August 29, 2012  
Complete Date: October 18, 2012  
Due Date: January 16, 2012  
Applicant Ad Date: September 7, 2012  
Newspaper: *Wheeling News Register*  
UTM's: Easting: 540.947 km Northing: 4,423.829 km Zone: 17  
Description: Installation of two new depropanizer towers and a deethanizer. Additionally, two gas-fired compressor engines will be removed.

### DESCRIPTION OF PROCESS

MarkWest Liberty Midstream & Resources, LLC proposes to construct additional processing capability at the natural gas processing plant at the Majorsville site. The processing capability will consist of adding two natural gas processing plants (Majorsville III and IV) both with a maximum capacity of 230 mmscf/day and a deethanizer plant to recover ethane from the residual natural gas stream from the processing plants.

The Majorsville processing plant is used as a gathering station for gas wells throughout southwest Pennsylvania and West Virginia. Upon entering the plant the gas goes through a mol sieve which is designed to remove liquids from the gas stream. Heaters are used to regenerate the mol sieve on a regular basis to remove the water and

hydrocarbons. After the mol sieve, the gas will be cooled through a cryogenic plant with mechanical refrigeration which serves to remove propane and heavier hydrocarbons from the gas stream. The remaining gas stream (mostly methane and ethane) will pass through the deethanizer, which will cryogenically chill the gas so that ethane can be separated and recovered from the gas stream. The ethane will then be transferred via pipeline to market. The remaining natural gas will pass through the existing compression engines or one of the electric driven engines prior to entering the downstream pipeline to market. Electric pumps will be located on site to transfer the recovered liquids to another facility for disposal or further processing.

The modification will consist of the following:

- \* Installation of two new depropanizer processing trains to remove liquids from gas streams, each rated at 230 mmscf/day.
- \* Installation of one new deethanizer unit to separate ethane from the residual natural gas stream.
- \* Installation of process heaters to support the depropanizers and deethanizer. Specifically,
  - \* two regenerators rated at 7.69 mmbtu/hr
  - \* one hot oil heater rated at 16.07 mmbtu/hr
  - \* one deethanizer hot medium oil heater rated at 14.25 mmbtu/hr
  - \* one deethanizer regeneration heater rated at 119.20 mmbtu/hr
- \* Two new emergency flares
- \* Removal of the Caterpillar G3615LE and G3616 natural gas fired engines (to be replaced with electric compression)

## SITE INSPECTION

No site inspection was performed by the writer. The facility is an existing well known source to DAQ. Steven Sobutka of DAQ's Northern Panhandle Regional Office performed a full, on site inspection on September 13, 2011. The facility was found to be in compliance.

## ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

### CRITERIA EMISSIONS

Existing Emissions (taken directly from Engineering Evaluation R13-2818C):

Pollutant	Annual Emissions (tpy)
NO <sub>x</sub>	94.40
CO	34.04
VOCs	40.53
PM <sub>10</sub>	0.53
SO <sub>2</sub>	0.07

### Emissions After Modification

Emissions from the compressor engines were based on 8,760 hours of operation per year and 122.44 mmscf/yr of fuel usage. SO<sub>2</sub> and particulate emissions were based on AP-42. All other emissions were based on manufacturer data.

Emissions from the MI and MII regeneration heaters were based on 8,760 hours of operation per year and 5.6 mmbtu/hr heat input. NO<sub>x</sub> emissions were based on manufacturer data. All other pollutants were based on AP-42.

Emissions from the MI & MII hot oil heater were based on 8,760 hours of operation per year and 15.4 mmbtu/hr heat input. NO<sub>x</sub> emissions were based on manufacturer data. All other pollutants were based on AP-42.

Emissions from the MIII and MIV regeneration heaters were based on 8,760 hours of operation per year and 7.69 mmbtu/hr heat input. NO<sub>x</sub> and CO emissions were based on manufacturer data. All other pollutants were based on AP-42.

Emissions from the MIII & MIV hot oil heater were based on 8,760 hours of operation per year and 16.07 mmbtu/hr heat input. NO<sub>x</sub> and CO emissions were based on manufacturer data. All other pollutants were based on AP-42.

Emissions from the deethanizer regeneration heater were based on 8,760 hours of operation per year and 14.25 mmbtu/hr heat input. NO<sub>x</sub>, CO, VOC and PM emissions were based on manufacturer data. All other pollutants were based on AP-42.

Emissions from the deethanizer hot oil heater were based on 8,760 hours of operation per year and 119.2 mmbtu/hr heat input. NO<sub>x</sub> and CO<sub>2</sub> emissions were based on manufacturer data. All other pollutants were based on AP-42.

Emissions from the MI & MII and deethanizer flares based on 8,760 hours of operation per year (pilot light) and 3.7 mmscf/yr heat input. All emissions were based on AP-42.

Emissions from the MIII & MIV flare based on 8,760 hours of operation per year (pilot light) and 2.92 mmscf/yr heat input. All emissions were based on AP-42.

Fugitive emissions based on EPA document number 453/R-95-017 and the appropriate component counts.

	NO <sub>x</sub>		CO		VOC		SO <sub>2</sub>		PM/PM <sub>2.5</sub>	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
C-102	2.61	11.44	0.99	4.35	1.67	7.32	0.01	0.04	0.16	0.69
C-103	2.61	11.44	0.99	4.35	1.67	7.32	0.01	0.04	0.16	0.69
C-104	2.61	11.44	0.99	4.35	1.67	7.32	0.01	0.04	0.16	0.69
H-741	0.30	1.32	0.46	2.02	0.03	0.13	0.01	0.02	0.04	0.18
H-2741	0.30	1.32	0.46	2.02	0.03	0.13	0.01	0.02	0.04	0.18
H-3741	0.41	1.80	0.32	1.38	0.05	0.18	0.01	0.02	0.06	0.25
H-4741	0.41	1.80	0.32	1.38	0.05	0.18	0.01	0.02	0.06	0.25
H-781	1.33	5.85	1.27	5.55	0.09	0.37	0.01	0.04	0.11	0.50
H-3781	1.61	7.04	1.32	5.80	0.09	0.38	0.01	0.05	0.12	0.52
H-1782	3.58	15.66	4.77	20.88	0.65	2.82	0.08	0.31	0.89	3.89
H-1731	0.57	2.50	0.58	2.56	0.28	1.19	0.01	0.04	0.19	0.81
FL-991	0.04	0.18	0.04	0.15	0.01	0.01	0.01	0.01	0.01	0.01
FL-3991	0.04	0.18	0.04	0.15	0.01	0.01	0.01	0.01	0.01	0.01
FL-1991	0.03	0.15	0.03	0.12	0.01	0.01	0.01	0.01	0.01	0.01
Blowdowns	--	--	--	--	0.35	1.50	--	--	--	--
Fugitives	--	--	--	--	--	15.18	--	--	--	--
<b>Total</b>	<b>16.45</b>	<b>72.12</b>	<b>12.58</b>	<b>55.06</b>	<b>6.66</b>	<b>44.05</b>	<b>0.21</b>	<b>0.67</b>	<b>2.02</b>	<b>8.68</b>

**Change** in Criteria Emissions

<b>Pollutant</b>	<b>Annual Emissions (tpy)</b>
NO <sub>x</sub>	-22.28
CO	-21.02
VOCs	+3.52
PM <sub>10</sub>	+8.15
SO <sub>2</sub>	+0.60

HAZARDOUS AIR POLLUTANTS

Existing Emissions (taken directly from engineering evaluations R13-2818C and R13-2818A, note that Formaldehyde was the only HAP speciated).

<b>Pollutant</b>	<b>Annual Emissions (tpy)</b>
Formaldehyde	8.48
Total HAPs	9.56

Emissions After Modification

Formaldehyde emissions from the compressor engines were based on manufacturer data. All other HAP emissions were based on AP-42.

<b>Pollutant</b>	<b>lb/hr</b>	<b>tpy</b>
Benzene	0.02	0.09
Ethylbenzene	0.01	0.01
Toluene	0.02	0.09
Xylene	0.01	0.04
Hexane	0.39	1.71
Formaldehyde	1.27	5.55
Total HAPs	2.52	11.88

As can be seen, the modification results in an increase of 2.32 tons per year of total HAPs.

## GREENHOUSE GASSES

### Existing Emissions

Greenhouse gasses were not calculated in the previous application or engineering evaluation (application was submitted and the permit was issued pre tailoring rule). Therefore, MarkWest submitted calculations with this permit showing their existing status with respect to GHGs.

	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	Total
	tpy	tpy (CO <sub>2e</sub> )	tpy (CO <sub>2e</sub> )	tpy (CO <sub>2e</sub> )
C-101 (to be removed)	5,693.15	2.26	3.33	5,698.74
C-102	8,846.91	3.51	5.17	8,855.59
C-103	8,846.91	3.51	5.17	8,855.59
C-104	8,846.91	3.51	5.17	8,855.59
C-2101 (to be removed)	17,611.90	6.98	10.30	17,629.18
H-741	2,867.06	1.14	1.68	2,869.88
H-2741	2,867.06	1.14	1.68	2,869.88
H-781	7,884.40	3.12	4.61	7,892.13
FL-991	274.49	25.35	--	299.84
Blowdowns	--	165.00	--	165.00
Fugitives	--	282.70	--	282.70
<b>Total</b>	<b>63,738.79</b>	<b>498.22</b>	<b>37.11</b>	<b>64,274.12</b>

### Emissions After Modification

Emission calculations from compressor engines and heaters were based on 40 CFR Part 98 Subpart C Tier 1 methodology. Emission calculations from the flares were performed using API Compendium Section 4.6.

	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	Total
	tpy	tpy (CO <sub>2e</sub> )	tpy (CO <sub>2e</sub> )	tpy (CO <sub>2e</sub> )
C-102	8,846.91	3.51	5.17	8,855.59
C-103	8,846.91	3.51	5.17	8,855.59
C-104	8,846.91	3.51	5.17	8,855.59
H-741	2,867.06	1.14	1.68	2,869.88
H-2741	2,867.06	1.14	1.68	2,869.88
H-3741	3,937.08	1.56	2.31	3,940.95
H-4741	3,937.08	1.56	2.31	3,940.95
H-781	7,884.40	3.12	4.61	7,892.13
H-3781	8,227.43	3.27	4.81	8,235.51
H-1782	61,027.26	24.18	35.69	61,087.13
H-1731	7,295.63	2.89	4.27	7,302.79
FL-991	274.49	25.35	--	299.84
FL-3991	219.86	20.31	--	240.17
FL-1991	274.49	25.35	--	299.84
Blowdowns	--	2,576.70	--	2,576.70
Fugitives	--	431.30	--	431.30
<b>Total</b>	<b>125,352.57</b>	<b>3,128.40</b>	<b>72.87</b>	<b>128,553.84</b>

As can be seen from the above tables, with this modification, the facility is an existing minor source of GHGs becoming a **major** source for GHGs and must now apply for a Title V permit.

#### REGULATORY APPLICABILITY

The portion of the facility covered by this permit is subject to the following state and federal rules.

## STATE RULES

### ***45CSR2: To Prevent and Control Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers***

The process heaters have been determined to meet the definition of a “fuel burning units” under 45CSR2 and are, therefore, subject to the applicable requirements therein. However, pursuant to the exemption given under §45-2-11, as the MDHI of the MIII and MIV regeneration heaters (H-3741 and H-4741 respectively) are less than 10 mmBtu/hr, the units are not subject to sections 4, 5, 6, 8 and 9 of 45CSR2. The only remaining substantive requirement is under Section 3.1 - Visible Emissions Standards.

Pursuant to 45CSR2, Section 3.1, H-1731, H-1782, H-3781, H-3741 and H-4741 are all subject to an opacity limit of 10%. Proper maintenance and operation of the units (and the use of natural gas as fuel) should keep the opacity of the units well below 10% during normal operations.

However, the two deethanizer heaters (H-1731 and H-1782) along with the MIII hot oil heater (H-3781) are subject to the PM limits of the rule.

§45-2-4.1.b limits the amount of PM released into the air from H-1731 to 1.28 pounds per hour. Actual emissions of PM from H-1731 should be less than 0.19 pounds per hour. Therefore this requirement should be met.

§45-2-4.1.b limits the amount of PM released into the air from H-1782 to 10.72 pounds per hour. Actual emissions of PM from H-1782 should be less than 0.89 pounds per hour. Therefore this requirement should be met.

§45-2-4.1.b limits the amount of PM released into the air from H-3781 to 1.44 pounds per hour. Actual emissions of PM from H-3781 should be less than 0.12 pounds per hour. Therefore this requirement should be met.

### ***45CSR10 To Prevent and Control Air Pollution from the Emission of Sulfur Oxides***

The process heaters have been determined to meet the definition of a “fuel burning units” under 45CSR10 and are, therefore, subject to the applicable requirements therein. However, pursuant to the exemption given under §45-10-10.1, as the MDHI of the MIII and MIV regeneration heaters (H-3741 and H-4741 respectively) are less than 10 mmBtu/hr, the units are not subject to the limitations on fuel burning limits.

However, the two deethanizer heaters (H-1731 and H-1782) along with the MIII hot oil heater (H-3781) are subject to the SO<sub>2</sub> limits of the rule.

§45-10-3.1.e limits the amount of SO<sub>2</sub> released into the air from H-1731 to 44.175 pounds per hour. Actual emissions of SO<sub>2</sub> from the entire facility should be less than 1.0 pounds per hour. Therefore this requirement should be met.

§45-10-3.1.e limits the amount of SO<sub>2</sub> released into the air from H-1782 to 369.52 pounds per hour. Actual emissions of SO<sub>2</sub> from the entire facility should be less than 1.0 pounds per hour. Therefore this requirement should be met.

§45-10-3.1.e limits the amount of SO<sub>2</sub> released into the air from H-3781 to 49.81 pounds per hour. Actual emissions of SO<sub>2</sub> from the entire facility should be less than 1.0 pounds per hour. Therefore this requirement should be met.

**45CSR13      *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits, and Procedures for Evaluation.***

The source is subject to 45CSR13 because emissions from the new equipment exceed 6 pounds per hour and 10 tons per year of several criteria pollutants. Additionally, the new equipment is subject to substantive requirements of several rules.

**45CSR14:      *Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution for the Prevention of Significant Deterioration. (non-applicability)***

As shown in the “Estimate of Emissions” section above, the facility is an existing minor source as defined in 45CSR14. However, it is important to note that with this modification, the facility will become a major source of Greenhouse Gasses.

**45CSR16      *Standards of Performance for New Stationary Sources.***

The source is subject to 45CSR16 because it is subject to 40 CFR 60 Subparts KKK, JJJJ and OOOO.

**45CSR30      *Requirements for Operating Permits.***

The source is subject to 45CSR30 because it is subject to 40 CFR 60 Subparts KKK. Additionally, the facility is now a major source of greenhouse gasses and must apply for Title V permit.

## FEDERAL REGULATIONS:

### ***40CFR60 Subpart KKK: Standards of Performance for Equipment Leaks of VOC from Onshore Natural Gas Processing Plants***

This modification does not affect Subpart KKK applicability. 40CFR60 Subpart KKK applies to onshore natural gas processing plants that commenced construction after January 20, 1984 but before August 23, 2011. The equipment at the existing Majorsville Gas Plant is currently subject to this rule due to the natural gas processing facility and this modification does not change that. MarkWest must continue meet the LDAR requirements of Subpart KKK. However, since the new equipment will be constructed after August 23, 2011, it is not subject to Subpart KKK (§60.630(b)). It will, however, be subject to Subpart OOOO (see below).

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

This modification does not affect Subpart JJJJ applicability. The compressor engines at the facility are currently subject to Subpart JJJJ and this modification does not affect that.

### ***40CFR60 Subpart OOOO: Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution***

On April 27, 2012 the USEPA issued a final rule (Federal Register Date: August 16, 2012, with an effective date of October 5, 2012) that consists of federal air standards for natural gas wells that are hydraulically fractured, along with requirements for several other sources of pollution in the oil and gas industry that currently are not regulated at the federal level. Additionally, for equipment located at onshore natural gas processing plants (except compressor engines) constructed after August 23, 2011, Subpart OOOO replaces Subpart KKK. As this is a new rule, all applicable requirements shall be discussed even those on equipment/processes not being modified as part of this permitting action.

#### Compressor Engines

Pursuant to §60.5365(c) each “[e]ach reciprocating compressor affected facility, which is a single reciprocating compressor located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment” that is constructed after August 23, 2011 is subject to the applicable provisions of Subpart OOOO. As the compressor engines are located at a natural gas processing plant, they are potentially applicable to Subpart OOOO (note though that compressor engines are exempted from the leak standards of Subpart OOOO). However, according to MarkWest’s application, no engine has been “constructed” after August 23, 2011.

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### Pneumatic Controllers

Pursuant to §60.5365(d)(3), “[f]or natural gas processing plants, each pneumatic controller affected facility, which is a single continuous bleed natural gas-driven pneumatic controller” that is constructed after August 23, 2011 is subject to the applicable provisions of Subpart OOOO. The substantive requirements for pneumatic controllers are given under §60.5390.

### Storage Tanks

Pursuant to §60.5365(e), for “[e]ach storage vessel affected facility, which is a single storage vessel, located in the oil and natural gas production segment, natural gas processing segment or natural gas transmission and storage segment” that is constructed after August 23, 2011 is subject to the applicable provisions of Subpart OOOO. No storage tanks are covered by this permit application.

### Equipment Leaks (applicable only to onshore natural gas processing facilities)

Per §60.5400 all equipment except compressor engines (and the exemptions of §60.5401) constructed after August 23, 2011 are subject to the equipment leak provisions of Subpart OOOO. The standards are given under §60.5400(a) through (f) and largely reference the standards of Subpart VVa.

## TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

The modification will result in emissions of several pollutants identified in section 112(b) of the Clean Air Act. Pollutants which will be emitted in amounts of at least 0.01 pound per hour or 0.01 tons per year are as follows:

### **Formaldehyde**

Formaldehyde is used mainly to produce resins used in particleboard 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).

**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:**

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.

**Ethylbenzene:**

Ethylbenzene is mainly used in the manufacture of styrene. Acute (short-term) exposure to ethylbenzene 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 ethylbenzene 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 ethylbenzene. Limited information is available on the carcinogenic effects of ethylbenzene in humans. In a study by the National Toxicology Program (NTP), exposure to ethylbenzene by inhalation resulted in an

increased incidence of kidney and testicular tumors in rats, and lung and liver tumors in mice. EPA has classified ethylbenzene 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

Because this is a minor source, as defined in 45CSR14, no modeling was performed.

## MONITORING OF OPERATIONS

The permittee shall be required to monitor the total wet natural gas throughput through the two gas processing plants (III & IV). Since the heaters will be permitted for the maximum capacity and operation (8,760 hours per year), no additional monitoring of the heaters are necessary. The pilot light on the flares shall be monitored via thermocouples.

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Additionally, the permittee will be required to monitor and record the number of hours the flare operates in upset mode and the estimated quantity of gas destroyed.

#### CHANGES TO PERMIT R13-2818C

The following changes were made to permit R13-2818C:

- \* The permit was put into the most recent boilerplate
- \* Table 1.0 was updated to include the new equipment and new capacities of modified equipment. Additionally, compressors C-101 (mis-labeled C-111 in permit R13-2818C) and C-2102 were removed.
- \* Conditions 5.1.1, 5.1.2, 5.1.5 and 5.1.6 were removed.
- \* Conditions 6.1.1 through 6.1.4 were modified to reflect new throughputs and emissions.
- \* Section 8.0 was changed to make its requirement applicable to flares FL-1991 and FL-3991 in addition to FL-991.
- \* Section 9.0 was changed to remove the references to engines C-101 (erroneously labeled C-111) and C-2102.
- \* Section 10 was added.
- \* Section 11 was added.

#### RECOMMENDATION TO DIRECTOR

Information supplied in the application indicates that compliance with all applicable regulations will be achieved. Therefore it is the recommendation of the writer that permit R13-2818D for the modification of a natural gas processing facility near Majorsville, Marshall County, be granted to MarkWest Liberty Midstream & Resources, LLC.

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Steven R. Pursley, PE  
Engineer

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November 28, 2012

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