



**west virginia** department of environmental protection

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**ENGINEERING EVALUATION / FACT SHEET**

BACKGROUND INFORMATION

Application No.: R13-2818E  
Plant ID No.: 051-00125  
Applicant: MarkWest Liberty Midstream & Resources L.L.C. (MarkWest)  
Facility Name: Majorsville Gas Plant  
Location: Majorsville, Marshall County  
NAICS Code: 211112  
SIC Code: 1321  
Application Type: Modification  
Received Date: November 14, 2013  
Engineer Assigned: Jerry Williams, P.E.  
Fee Amount: \$2,000.00  
Date Received: November 26, 2013  
Complete Date: February 10, 2014  
Due Date: May 11, 2014  
Applicant Ad Date: December 11, 2013  
Newspaper: *Wheeling Intelligencer*  
UTM's: Easting: 540.947 km      Northing: 4,423.83 km      Zone: 17  
Description: Modification application to construct two (2) new depropanizer towers (cryogenic plants) to remove liquids from the gas stream. Additionally, one (1) deethanizer will be constructed to remove ethane from the residual natural gas. Two gas fired engines will be removed from the site as commercial electrical power is now available.

## DESCRIPTION OF PROCESS

The following process description was taken from Permit Application R13-2818E:

MarkWest proposes to construct additional processing capability at the natural gas processing plant at the Majorsville site. The processing capability will consist of adding three (3) natural gas processing plants (Majorsville IV, VI, and VII) each with a maximum capacity of 230 million standard cubic feet per day (mmscfd). With the additional units the entire facility will have the processing capacity of 1,500 mmscfd. Two (2) stabilization units will accompany the plants to remove carryover methane and ethane from the natural gas liquids. These plants will be installed with appropriate electric compressor engines and heaters. With these changes the Majorsville Gas Plant will remain a minor source of primary pollutants but will remain a major source for greenhouse gases. Two (2) new emergency generators will be installed. One generator is 60 kW and the other generator is 35 kW. Both generators will be powered by the same Cummins diesel 145 hp engine. All other emissions equipment will remain at the site and operated as previously permitted with the exception of Flare FL-1991, which has not been installed and there are no plans to install the flare at this time.

The Majorsville Gas 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 in the gas stream. The natural gas liquids from the new plants will then pass through a stabilizer to remove any carryover methane and ethane in the liquid 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 compressor engines of 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.

## SITE INSPECTION

No site inspection was performed by the writer. The facility is an existing well known source to DAQ. Steven Sobotka of DAQs Northern Panhandle Regional Office performed a full, on-site inspection on September 4, 2103. The facility was found to be in compliance.

Latitude: 39.963611  
Longitude: -80.520556



ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions associated with this modification application consist of the emissions from the three (3) regeneration heaters (15E, 16E, 17E), two (2) hot medium oil heaters (18E, 19E), two (2) stabilization heaters (20E, 21E), two (2) emergency generators (22E, 23E).

Fugitive emissions for the facility are based on calculation methodologies presented in EPA Protocol for Equipment Leak Emission Estimates and 40CFR98 Subpart W. The following table indicates which methodology was used in the emissions determination:

Emission Unit ID#	Emission Point ID#	Process Equipment	Calculation Methodology
H-5741	15E	7.69 MMBTU/hr Regeneration Heater	EPA AP-42 Emission Factors
H-6741	16E	7.69 MMBTU/hr Regeneration Heater	EPA AP-42 Emission Factors
H-7741	17E	7.69 MMBTU/hr Regeneration Heater	EPA AP-42 Emission Factors
H-4781	18E	16.07 MMBTU/hr Hot Medium Oil Heater	EPA AP-42 Emission Factors
H-7781	19E	16.07 MMBTU/hr Hot Medium Oil Heater	EPA AP-42 Emission Factors
H-4782	20E	10.65 MMBTU/hr Stabilization Heater	EPA AP-42 Emission Factors
H-6782	21E	10.65 MMBTU/hr Stabilization Heater	EPA AP-42 Emission Factors
G-OSBL	22E	145 hp OSBL Emergency Generator	EPA AP-42 Emission Factors / Vendor Data
G-ISBL	23E	145 hp ISBL Emergency Generator	EPA AP-42 Emission Factors / Vendor Data

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

<b>Pollutant</b>	<b>Maximum Pre-Modification Annual Facility Wide Emissions (tons/year)</b>	<b>Maximum Post-Modification Annual Facility Wide Emissions (tons/year)</b>	<b>Net Facility Wide Emissions Changes (tons/year)</b>
Nitrogen Oxides	72.12	97.31	25.19
Carbon Monoxide	55.06	78.49	23.43
Volatile Organic Compounds	49.60	79.79	30.19
Particulate Matter-10/2.5	5.27	7.87	2.60
Sulfur Dioxide	0.67	1.10	0.43
Total HAPs	11.88	12.74	0.86
Formaldehyde	5.55	5.58	0.03
Greenhouse Gas (CO <sub>2</sub> e)	128,554	182,719	54,165

Maximum detailed controlled point source emissions were calculated by MarkWest and checked for accuracy by the writer and are summarized in the table on the next page.

## MarkWest Liberty Midstream & Resources, L.L.C – Majorsville Gas Plant (R13-2818E)

Emission Point ID#	Source	NO <sub>x</sub>		CO		VOC		PM-10/2.5		SO <sub>2</sub>		Total HAPs		Formaldehyde		CO <sub>2</sub> e	
		lb/hr	ton/year	lb/hr	ton/year	lb/hr	ton/year	lb/hr	ton/year	lb/hr	ton/year	lb/hr	ton/year	lb/hr	ton/year	lb/hr	ton/year
2E	2,370 hp Compressor Engine	2.61	11.44	0.99	4.35	2.09	9.15	0.16	0.69	0.01	0.04	0.72	3.17	0.42	1.83	2081	9114
3E	2,370 hp Compressor Engine	2.61	11.44	0.99	4.35	2.09	9.15	0.16	0.69	0.01	0.04	0.72	3.17	0.42	1.83	2081	9114
4E	2,370 hp Compressor Engine	2.61	11.44	0.99	4.35	2.09	9.15	0.16	0.69	0.01	0.04	0.72	3.17	0.42	1.83	2081	9114
5E	5.6 MMBTU/hr Heater	0.30	1.32	0.46	2.02	0.03	0.13	0.04	0.18	<0.01	0.01	0.01	0.05	<0.01	<0.01	721	3157
6E	15.4 MMBTU/hr Heater	1.34	5.85	1.27	5.56	0.08	0.36	0.11	0.50	<0.01	0.04	0.03	0.13	<0.01	<0.01	1982	8681
7E	Fugitive Equipment Leaks	-	-	-	-	10.30	45.13	-	-	-	-	0.22	0.98	-	-	788	3453
9E	5.6 MMBTU/hr Heater	0.30	1.32	0.46	2.02	0.03	0.13	0.04	0.18	<0.01	0.01	0.01	0.05	<0.01	<0.01	721	3157
10E	7.69 MMBTU/hr Regen Heater	0.41	1.80	0.32	1.38	0.04	0.18	0.06	0.25	<0.01	0.02	0.01	0.06	<0.01	<0.01	990	4335
11E	7.69 MMBTU/hr Regen Heater	0.41	1.80	0.32	1.38	0.04	0.18	0.06	0.25	<0.01	0.02	0.01	0.06	<0.01	<0.01	990	4335
12E	16.07 MMBTU/hr HMO Heater	1.61	7.04	1.32	5.80	0.09	0.38	0.12	0.52	<0.01	0.04	0.03	0.13	<0.01	<0.01	2068	9059
13E	119.2 MMBTU/hr HMO Heater	3.58	15.66	4.77	20.88	0.64	2.82	0.22	0.97	0.07	0.31	0.22	0.97	<0.01	0.04	15341	67195
14E	14.25 MMBTU/hr Regen Heater	0.57	2.50	0.58	2.56	0.27	1.19	0.19	0.81	0.01	0.04	0.03	0.11	<0.01	<0.01	1834	8033
15E	7.69 MMBTU/hr Regen Heater	0.41	1.80	0.32	1.38	0.04	0.18	0.06	0.25	<0.01	0.02	0.01	0.06	<0.01	<0.01	990	4335
16E	7.69 MMBTU/hr Regen Heater	0.41	1.80	0.32	1.38	0.04	0.18	0.06	0.25	<0.01	0.02	0.01	0.06	<0.01	<0.01	990	4335
17E	7.69 MMBTU/hr Regen Heater	0.41	1.80	0.32	1.38	0.04	0.18	0.06	0.25	<0.01	0.02	0.01	0.06	<0.01	<0.01	990	4335
18E	16.07 MMBTU/hr HMO Heater	1.61	7.04	1.32	5.80	0.09	0.38	0.12	0.52	<0.01	0.04	0.03	0.13	<0.01	<0.01	2068	9059
19E	16.07 MMBTU/hr HMO Heater	1.61	7.04	1.32	5.80	0.09	0.38	0.12	0.52	<0.01	0.04	0.03	0.13	<0.01	<0.01	2068	9059
20E	10.65 MMBTU/hr Stabilization Heater	0.63	2.74	0.88	3.84	0.06	0.25	0.02	0.09	<0.01	0.03	0.02	0.09	<0.01	<0.01	1371	6004
21E	10.65 MMBTU/hr Stabilization Heater	0.63	2.74	0.88	3.84	0.06	0.25	0.02	0.09	<0.01	0.03	0.02	0.09	<0.01	<0.01	1371	6004
22E	145 hp OSBL Emergency Generator	0.70	0.18	0.18	0.04	0.02	<0.01	0.23	0.06	0.58	0.14	0.01	<0.01	<0.01	<0.01	629	157
23E	145 hp ISBL Emergency Generator	0.70	0.18	0.18	0.04	0.02	<0.01	0.23	0.06	0.58	0.14	0.01	<0.01	<0.01	<0.01	629	157
FL-991	3.7 mmscf/hr Flare	0.05	0.22	0.04	0.18	<0.01	0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	66	287
FL-3991	3.7 mmscf/hr Flare III & V	0.04	0.18	0.04	0.15	<0.01	0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	55	240
<b>Total</b>	<b>Total Facility PTE</b>	<b>23.53</b>	<b>97.31</b>	<b>18.24</b>	<b>78.49</b>	<b>18.25</b>	<b>79.79</b>	<b>2.23</b>	<b>7.87</b>	<b>1.34</b>	<b>1.10</b>	<b>2.94</b>	<b>12.74</b>	<b>1.28</b>	<b>5.58</b>	<b>42903</b>	<b>182719</b>

\* Flare emissions are those emissions that exist under routine/planned activities.

## REGULATORY APPLICABILITY

The following rules apply to this modification:

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

The purpose of 45CSR2 (Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers) is to establish emission limitations for smoke and particulate matter which are discharged from fuel burning units. 45CSR2 states that any fuel burning unit that has a heat input under ten (10) million B.T.U.'s per hour is exempt from sections 4 (weight emission standard), 5 (control of fugitive particulate matter), 6 (registration), 8 (testing, monitoring, recordkeeping, reporting) and 9 (startups, shutdowns, malfunctions). However, failure to attain acceptable air quality in parts of some urban areas may require the mandatory control of these sources at a later date.

The individual heat input of the proposed Regeneration Gas Heaters (15E, 16E, 17E) are below 10 MMBTU/hr. Therefore, these units are exempt from the aforementioned sections of 45CSR2.

45CSR2 classifies the HMO Heaters (18E, 19E) and Stabilization Heaters (20E, 21E) as 'type b' units. The allowable PM emission rate for these units would be the product of 0.09 and the total design heat input of the heaters.

<b>Emission Unit</b>	<b>Total Design Heat Input (MMBTU/hr)</b>	<b>45CSR2 Multiplier</b>	<b>Allowable PM Emission Rate (lb/hr)</b>	<b>Proposed PM Emission Rate (lb/hr)</b>
18E, 19E	16.07	0.09	1.45	0.12
20E, 21E	10.65	0.09	0.96	0.08

As shown in the table above, MarkWest would meet this rule.

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

### **45CSR10** (To Prevent and Control Air Pollution from the Emissions of Sulfur Oxides)

The purpose of this rule is to establish standards for emissions of sulfur oxides from fuel burning units, manufacturing operations and gas streams. 45CSR10 states that any fuel burning unit that has a heat input under ten (10) million B.T.U.'s per hour is exempt from sections 3 (weight emission standard), 6 (registration), 7 (permits), and 8 (testing, monitoring, recordkeeping, reporting). However, failure to attain acceptable air quality in parts of some urban areas may require the mandatory control of these sources at a later date.

The individual heat input of the proposed Regeneration Gas Heaters (15E, 16E, 17E) are below 10 MMBTU/hr. Therefore, this unit is exempt from the aforementioned sections of 45CSR10.

45CSR10 classifies the HMO Heaters (18E, 19E) and Stabilization Heaters (20E, 21E) as ‘type b’ units. The allowable SO<sub>2</sub> emission rate for these units would be the product of 3.1 and the total design heat input of the heaters.

<b>Emission Unit</b>	<b>Total Design Heat Input (MMBTU/hr)</b>	<b>45CSR10 Multiplier</b>	<b>Allowable SO<sub>2</sub> Emission Rate (lb/hr)</b>	<b>Proposed SO<sub>2</sub> Emission Rate (lb/hr)</b>
18E, 19E	16.07	3.1	49.82	0.01
20E, 21E	10.65	3.1	33.02	0.01

As shown in the table above, MarkWest would meet this rule.

Furthermore, 45CSR10A exempts fuel burning units that combust natural gas from testing and monitoring requirements.

**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’s proposed modification 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 III and OOOO).

MarkWest paid the appropriate application fee and published the required legal advertisement for this modification application.

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

45CSR16 applies to this modification by reference of 40CFR60, Subparts III and OOOO.

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

MarkWest is a major source subject to 45CSR30 due to their greenhouse gas (CO<sub>2</sub>e) emissions exceeding major source thresholds. MarkWest has the duty to update the facility's Title V (45CSR30) permit application to reflect the changes permitted herein.

**40CFR60 Subpart III** (Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (CI ICE))

The 145 hp diesel fired generators (22E, 23E) are USEPA certified stationary compression ignition engines according to 40CFR60 Subpart III. MarkWest provided the USEPA Certificate Number (DCEXL0275AAG-003) with this permit application. Therefore, MarkWest will not be required to conduct an initial performance test and conduct subsequent performance testing every 8,760 hours or three (3) years, whichever comes first, to demonstrate compliance.

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

EPA published in the Federal Register new source performance standards (NSPS) and air toxics rules for the oil and gas sector on August 16, 2012. 40CFR60 Subpart OOOO establishes emission standards and compliance schedules for the control of volatile organic compounds (VOC) and sulfur dioxide (SO<sub>2</sub>) emissions from affected facilities that commence construction, modification or reconstruction after August 23, 2011. The following affected sources which commence construction, modification or reconstruction after August 23, 2011 are subject to the applicable provisions of this subpart:

- a. The group of all equipment, except compressors, within a process unit is an affected facility.
  - Addition or replacement of equipment for the purpose of process improvement that is accomplished without a capital expenditure shall not by itself be considered a modification under this subpart.
  - Equipment associated with a compressor station, dehydration unit, sweetening unit, underground storage vessel, field gas gathering system, or liquefied natural gas unit is covered by §§60.5400, 60.5401, 60.5402, 60.5421 and 60.5422 of this subpart if it is located at an onshore natural gas processing plant. Equipment not located at the onshore natural gas processing plant site is exempt from the provisions of §§60.5400, 60.5401, 60.5402, 60.5421 and 60.5422 of this subpart.
  - The equipment within a process unit of an affected facility located at onshore natural gas processing plants and described in paragraph (f) of this section are exempt from this subpart if they are subject to and controlled according to subparts VVa, GGG or GGGa of this part.

*Majorsville III-VII were constructed after August 23, 2011. Therefore, Leak Detection and Repair (LDAR) requirements for onshore natural gas processing plants would apply to this equipment.*

- b. Each 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. For the purposes of this subpart, your reciprocating compressor is considered to have commenced construction on the date the compressor is installed (excluding relocation) at the facility. A reciprocating compressor located at a well site, or an adjacent well site and servicing more than one well site, is not an affected facility under this subpart.

*There are two (2) reciprocating internal combustion engines part of this modification (22E, 23E) that were constructed after August 23, 2011. Therefore, the requirements regarding reciprocating compressors under 40 CFR 60 Subpart OOOO would apply. MarkWest would be required to perform the following:*

- *Replace the reciprocating compressor rod packing at least every 26,000 hours of operation or 36 months.*
- *Demonstrate initial compliance by continuously monitoring the number of hours of operation or track the number of months since the last rod packing replacement.*
- *Submit the appropriate start up notifications.*
- *Submit the initial annual report for the reciprocating compressors.*
- *Maintain records of hours of operation since last rod packing replacement, records of the date and time of each rod packing replacement, and records of deviations in cases where the reciprocating compressor was not operated in compliance.*

**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. The emergency generators (22E, 23E) at the Majorsville Gas Plant are subject to the area source requirements for non-emergency compression ignition engines.

The applicability requirements for new stationary RICEs located at an area source of HAPs, is the requirement to meet the standards of 40CFR60 Subpart III. These requirements were outlined above. The proposed engine meets these standards.

The following rules do not apply to this modification:

**40CFR60 Subpart Dc** (Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units)

40CFR60 Subpart Dc applies to steam generating units. The rule further defines a steam generating unit as a device that combusts any fuel and produces steam or heats water or any other heat transfer medium. However, this term does not include process heaters as defined in this subpart. Process heater is defined as a device that is primarily used to heat a material to initiate or promote a chemical reaction in which the material participates as a reactant or catalyst. The process heaters at the Majorsville Gas Plant are dedicated to the removal and separation of NGLs from the gas stream. They do not serve any other purpose such as providing steam for the heating of buildings or for co-generation of electric power. Therefore this rule does not apply to the proposed process heaters.

**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 (Majorsville I & II) 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 (Majorsville IV, VI, VII) 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 as stated above.

**Non-applicable sections of 40CFR60 Subpart OOOO** (Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution)

EPA published in the Federal Register new source performance standards (NSPS) and air toxics rules for the oil and gas sector on August 16, 2012. 40CFR60 Subpart OOOO establishes emission standards and compliance schedules for the control of volatile organic compounds (VOC) and sulfur dioxide (SO<sub>2</sub>) emissions from affected facilities that commence construction, modification or reconstruction after August 23, 2011. The following affected sources which commence construction, modification or reconstruction after August 23, 2011 are subject to the applicable provisions of this subpart:

- a. Each gas well affected facility, which is a single natural gas well.

*There are no gas wells at this facility. Therefore, all requirements regarding gas well affected facilities under 40 CFR 60 Subpart OOOO would not apply.*

- b. Each centrifugal compressor affected facility, which is a single centrifugal compressor using wet seals that is located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment. For the purposes of this subpart, your centrifugal compressor is considered to have

commenced construction on the date the compressor is installed (excluding relocation) at the facility. A centrifugal compressor located at a well site, or an adjacent well site and servicing more than one well site, is not an affected facility under this subpart.

*There are no centrifugal compressors as part of this modification at the Majorsville Gas Plant. Therefore, all requirements regarding centrifugal compressors under 40 CFR 60 Subpart OOOO would not apply.*

c. Pneumatic Controllers

Each pneumatic controller affected facility, which is a single continuous bleed natural gas-driven pneumatic controller which commenced construction after August 23, 2011, and is located at a natural gas processing plant.

*There are no continuous bleed gas-driven pneumatic controllers at the Majorsville Gas Plant. All pneumatic controllers at the Majorsville Gas Plant are air driven. Therefore, there are no applicable requirements regarding pneumatic controllers under 40 CFR 60 Subpart OOOO that would apply.*

d. Each 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.

40CFR60 Subpart OOOO defines a storage vessel as a unit that is constructed primarily of nonearthen materials (such as wood, concrete, steel, fiberglass, or plastic) which provides structural support and is designed to contain an accumulation of liquids or other materials. The following are not considered storage vessels:

- Vessels that are skid-mounted or permanently attached to something that is mobile (such as trucks, railcars, barges or ships), and are intended to be located at a site for less than 180 consecutive days. If the source does not keep or are not able to produce records, as required by §60.5420(c)(5)(iv), showing that the vessel has been located at a site for less than 180 consecutive days, the vessel described herein is considered to be a storage vessel since the original vessel was first located at the site.
- Process vessels such as surge control vessels, bottoms receivers or knockout vessels.
- Pressure vessels designed to operate in excess of 204.9 kilopascals and without emissions to the atmosphere.

This rule requires that the permittee determine the VOC emission rate for each storage vessel affected facility utilizing a generally accepted model or calculation methodology within 30 days of startup, and minimize emissions to the extent practicable during the 30 day period using good engineering practices. For each

storage vessel affected facility that emits more than 6 tpy of VOC, the permittee must reduce VOC emissions by 95% or greater within 60 days of startup. The compliance date for applicable storage vessels is October 15, 2013.

*The storage vessels located at the Majorsville Gas Plant emit less than 6 tpy of VOC. Therefore, MarkWest is not required by this section to reduce VOC emissions by 95%.*

- e. Sweetening units located at onshore natural gas processing plants that process natural gas produced from either onshore or offshore wells.
- Each sweetening unit that processes natural gas is an affected facility; and
  - Each sweetening unit that processes natural gas followed by a sulfur recovery unit is an affected facility.
  - Facilities that have a design capacity less than 2 long tons per day (LT/D) of hydrogen sulfide (H<sub>2</sub>S) in the acid gas (expressed as sulfur) are required to comply with recordkeeping and reporting requirements specified in §60.5423(c) but are not required to comply with §§60.5405 through 60.5407 and paragraphs 60.5410(g) and 60.5415(g) of this subpart.
  - Sweetening facilities producing acid gas that is completely reinjected into oil-or-gas-bearing geologic strata or that is otherwise not released to the atmosphere are not subject to §§60.5405 through 60.5407, 60.5410(g), 60.5415(g), and 60.5423 of this subpart.

*There are no sweetening units at the Majorsville Gas Plant. Therefore, all requirements regarding sweetening units under 40 CFR 60 Subpart OOOO would not apply.*

**45CSR14** (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollutants)

**45CSR19** (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution which Cause or Contribute to Nonattainment)

On September 30, 2013, EPA approved a redesignation request and State Implementation Plan (SIP) revision submitted by the State of West Virginia. The West Virginia Department of Environmental Protection (WVDEP) requested that the West Virginia portion of the Wheeling, WV–OH fine particulate matter (PM<sub>2.5</sub>) nonattainment area (“Wheeling Area” or “Area”) be redesignated as attainment for the 1997 annual PM<sub>2.5</sub> national ambient air quality standard (NAAQS).

The Majorsville Gas Plant is located in Marshall County, which is located in this metropolitan statistical area and is an attainment county for all pollutants. Therefore the Majorsville Gas Plant is not subject to 45CSR19.

The Majorsville Gas Plant currently has annual CO<sub>2</sub>e emissions of 128,554 tpy. The proposed changes in this application results in a CO<sub>2</sub>e emissions increase of 54,165 tpy. Because MarkWest is an existing major source for CO<sub>2</sub>e emissions, the emissions increase must be analyzed. If the annual CO<sub>2</sub>e emissions increase exceeds 75,000 tpy, a Prevention of Significant Deterioration (PSD) significant modification occurs. However, MarkWest is not subject to PSD review because the CO<sub>2</sub>e emissions increase associated with this permit application is below the significant threshold.

#### PSD Applicability Determination

The Majorsville Gas Plant is an existing Major Stationary Source with respect to PSD because they have potential emissions of greenhouse gases (CO<sub>2</sub>e) in excess of 100,000 tons per year. In order for a project to become subject to PSD review, the major stationary source must have a significant emissions increase from the project and a significant net emissions increase as calculated over the 5 year contemporaneous period. The first step is to determine if the proposed project results in a significant emissions increase utilizing the calculation procedures in 45CSR14 (Permits for Construction and Major Modification of Major Stationary Sources for the Prevention of Significant Deterioration of Air Quality) Section 3.4. The procedure for calculating whether a significant emissions increase will occur depends on the type of emissions units being modified. The procedure for calculating whether a significant net emissions increase will occur at the major stationary source, which is the second step in the process, is contained in 45CSR14 Section 2.46. Regardless of any such preconstruction projections, a major modification results if the project causes a significant emissions increase and a significant net emissions increase.

In determining whether a significant emissions increase occurs, 45CSR14 provides two (2) ways to make that determination. These calculations are based on whether or not it is an existing emissions unit or a new emissions unit.

45CSR14 Section 2.27 defines an ‘emissions unit’ as any part of a stationary source that emits or would have the potential to emit any regulated NSR pollutant and includes an electric utility steam generating unit as defined in subsection 2.25. For the purposes of this rule, there are two types of emissions units as described in subdivisions 2.27.a and 2.27.b.

2.27.a. A new emissions unit is any emissions unit that is (or will be) newly constructed and that has existed for less than 2 years from the date such emissions unit first operated.

2.27.b. An existing emissions unit is any emissions unit that does not meet the requirements in subdivision 2.27.a. A replacement unit, as defined in subsection 2.68, is an existing emissions unit.

Because this modification is a new source they will fall under 2.27.a.

Therefore, since emissions units at the Majorsville Gas Plant would be considered new units, 45CSR14 Section 3.4.d states that an Actual-to-Potential test would be utilized. A significant emissions increase of a regulated NSR pollutant is projected to occur if the sum of the difference between the potential to emit (as defined in subsection 2.58) and the baseline actual emissions

(as defined in subdivisions 2.8.a and 2.8.b), for each existing emissions unit, equals or exceeds the significant amount of that pollutant (as defined in subsection 2.74).

The first step is to determine whether or not the proposed project results in a significant emissions increase utilizing the Actual-to-Potential test. The result of that test will be compared to PSD Significant Emission Rates (SER) to determine PSD applicability. If the resultant emissions are below the PSD SER then the project is not subject to PSD review. If the project's emissions are greater than the PSD SER then all contemporaneous increases and decreases must be examined to determine if the project is subject to PSD Review.

The potential to emit from the emissions units associated with this project were based on the proposed heaters, generators, and the increased associated fugitive equipment leaks.

The following table indicates what Majorsville Gas Plant's potential emissions increase would be from the proposed modifications:

<b>Pollutant</b>	<b>R13-2818E Emissions increase (tpy)</b>	<b>PSD SER (tpy)</b>	<b>Subject to PSD Review (Y or N)</b>
NO <sub>x</sub>	25.19	40	N
CO	23.43	100	N
SO <sub>2</sub>	0.43	40	N
PM <sub>10</sub>	2.60	15	N
VOC	30.19	100	N
GHG (CO <sub>2</sub> e)	54,165	75,000	N

As shown in the table above, none of the pollutants exceeded the SER. Because a SER did not occur, it is not necessary to determine if a SER over a 5 year contemporaneous period occurred.

#### Final Conclusion

Because there was no emissions increase over the SER, PSD review is not required.

MarkWest provides services to natural gas producers. Each plant construction project undertaken by MarkWest is a complete and independent project. Plants are built solely upon a producer's request and commitment to supply natural gas for the plant under negotiated processing and fractionation agreements. MarkWest designs, builds and permits a plant based upon contractual capacity commitments. If, in the future, one or more producer customers develop new or additional production, those producers may enter into a separate contractual commitment to deliver additional quantities of gas, and depending on those quantities, another plant may be necessary. In such a circumstance, the producer will negotiate with MarkWest for the construction an additional plant, and MarkWest will apply for a corresponding permit. Plant construction and permitting is contingent upon producer customer's operations and business plans, which are variable and unpredictable. According to MarkWest the current modification

that is being requested was unknown at the time of prior permit submissions, and therefore, could not have been included in any prior permitting activities.

### 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

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) as seen in the table listed in the Regulatory Discussion Section.

### 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 Majorsville Gas Plant will operate under the SIC code of 1321 (Natural Gas Liquid Extraction). There are other facilities operated by MarkWest that share the same two-digit major SIC code of 13 for natural gas transmission. Therefore, the Majorsville Gas Plant does share the same SIC code as other MarkWest facilities.
- MarkWest is the sole operator of the Majorsville Gas Plant. The production facilities that send natural gas to this facility are owned and operated by other entities. MarkWest has no operational control over any equipment ownership stake in upstream corporate entities. All employees at the Majorsville Gas Plant are under the exclusive direction of MarkWest and have no reporting authority to any other entity. In addition, no work forces are shared between MarkWest and the upstream entities. Therefore, these facilities are not under common control.
- “Contiguous or Adjacent” determinations are made on a case by case basis. These determinations are proximity based, and it is important to focus on this and whether or not it meets the common sense notion of a plant. The terms “contiguous” or “adjacent” are not defined by USEPA. Contiguous has a dictionary definition of being in actual contact; touching along a boundary or at a point. Adjacent has a dictionary definition of not distant; nearby; having a common endpoint or border. There are no MarkWest properties in question that are considered to be on contiguous or adjacent property with the Majorsville Gas Plant. The closest MarkWest facility is more than one (1) mile from this site. The land between these sites is not owned or managed by MarkWest. Operations separated by these distances do not meet the common sense notion of a plant.

Therefore, the properties in question are not considered to be on contiguous or adjacent property.

The Majorsville Gas Plant does share the same industrial grouping with other nearby facilities. However, the facilities in question are not under common control, nor are located on contiguous or adjacent properties. Therefore, the emissions from the Majorsville Gas Plant should not be aggregated with other facilities in determining major source or PSD status.

### MONITORING OF OPERATIONS

MarkWest will be required to perform the following monitoring:

1. Monitor and record quantity of natural gas consumed for all combustion sources.
2. Monitor and record quantity of natural gas routed through the process flare.
3. Monitor the presence of the flare pilot flame with a thermocouple or equivalent.
4. Establish a Leak Detection and Repair (LDAR) program for all equipment in VOC or wet gas service according to 40CFR60 Subparts KKK (Majorsville I and II) and OOOO (Majorsville III, IV, V, VI and VII).
5. Monitor and record quantity of constituents transferred from the storage tanks.

MarkWest will be required to perform the following recordkeeping:

1. Maintain records of the amount of natural gas consumed and hours of operation for each heater.
2. Maintain records of the amount of constituents transferred from the storage tanks.
3. Maintain records of the flare design evaluation.
5. 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
6. Maintain the corresponding records specified by the on-going monitoring requirements of and testing requirements of the permit.
7. Maintain records of the visible emission opacity tests conducted per the permit.
8. 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.
9. 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 R13-2818D

R13-2818E will supersede and replace R13-2818D that was issued on January 17, 2013.

MarkWest is proposing to modify this permit to add three (3) additional processing plants at the Majorsville Gas Plant. This involves the construction of two (2) new depropanizer towers (cryogenic plants) to remove liquids from the gas stream. Additionally, one (1) deethanizer will be constructed to remove ethane from the residual natural gas. Two gas fired engines will be removed from the site as commercial electrical power is now available.

Since the issuance of the original permit DAQ has taken delegation of the area source provisions of 40CFR63 Subpart ZZZZ and the applicable regulatory requirements were added to the permit.

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 Majorsville Gas Plant should be granted a 45CSR13 modification for their facility.

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Jerry Williams, P.E.  
Engineer

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Date