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**west virginia** department of environmental protection

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Earl Ray Tomblin, Governor  
Randy C. Huffman, Cabinet Secretary  
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## **ENGINEERING EVALUATION / FACT SHEET**

### BACKGROUND INFORMATION

Permit No.: R13-2557C  
Plant ID No.: 039-00483  
Applicant: Mark West Energy Appalachia, LLC (Mark West)  
Facility Name: Cobb Dewpoint Control Plant  
Location: Clendenin, Kanawha County, WV  
SIC Code: 1321 - Natural gas liquids extraction  
4922 - Electric, Gas and Sanitary Services - Natural Gas Transmission  
NAIC Code: 211112 - Natural Gas Liquids Extraction  
Application Type: Modification  
Received Date: September 27, 2010  
Engineer Assigned: John Legg  
Date Assigned: September 29, 2010  
Fee Amount: \$1,000.00  
Date Received: September 29, 2010  
Applicant Ad Date: October 18, 2010  
Newspaper: *Charleston Gazette*  
Additional Info  
Received: December 7, 2010  
UTM's: Easting: 471.8 km    Northing: 4,260.6 km    Zone: 17

Description: After-the-fact modification to:

- 1) Remove old emissions from the glycol dehydration system (GDS1) from the permit. GDS1 was disconnected in 2006 and removed from service in 2007.
- 2) Include new emissions from the new 2.5 mm Btu/hr Dehydrator Regenerator Heater (HTR3) in the permit. Heater was installed in 2009.
- 3) Re-calculate fugitive emissions for equipment leaks (FUG) to reflect the upgraded components put in place in 2008.
- 4) Increase the annual amount of natural gas liquids loaded from the truck loadout (TL1) to 71,000,000 gal/yr from 8,760,000 gal/yr (an 8.1 fold increase).

## SUMMARY

This evaluation is for an after-the-fact modification described above under "Description." Mark West estimates the increase in emissions resulting from the above changes to equal:

Table 1: Increase in Emissions Resulting from R13-2557C.

Pollutant	Amount (ton/yr)
Nitrogen Oxides (NO <sub>x</sub> )	+1.03
Carbon Monoxide (CO)	+0.87
Particulate Matter (PM)	+0.08
Sulfur Dioxide (SO <sub>2</sub> )	+0.01
Volatile Organic Compounds (VOC)	+10.9
Hazardous Air Pollutants (HAP)	0.003

## PROCESS DESCRIPTION

### Existing Facility

The following process description came from the permit application:

The Mark West Cobb Dewpoint Control Plant is located on land leased from Columbia Gas Transmission Corporation (Columbia Gas). The facility processes wet natural gas received from the Columbia Gas Cobb Compressor Station (located adjacent to the Mark West facility), by drying the gas and extracting a condensable liquids mixture including propane, butanes and natural gasoline. The dry residue gas, with fewer heavy hydrocarbons is returned to Columbia Gas. Natural gas liquids are trucked from the facility by third party trucking companies.

The Cobb Dewpoint Control Plant is a natural gas liquids extraction facility covered under Standard Industrial Classification (SIC) Code 1321. The station has the potential to operate 24 hours per day, 7 days per week.

The plant currently consists of the following equipment:

- Zirco Heater (HTR1) - 1.5 mm Btu/hr;
- Dehydrator Regenerator Heater (HTR2) - 2.5 mmBtu/hr;
- Emergency Flare (FL2) - 0.8 mm Btu/hr; and
- Truck Loadout (TL1).

## Proposed Changes

The following changes are addressed in this application:

- Installation (in 2009) of a new Dehydrator Regenerator Heater (HTR3) rated at a maximum design heat input of 2.5 mm Btu/hr;
- Re-calculate fugitive emissions for equipment leaks (FUG) to reflect upgraded components installed in 2008; and
- Increase the annual amount of natural gas liquids loaded from the plant's truck loadout (TL1) to tank truck by 71,000,000 gal/yr from 8,760,00 gal/yr.

Mark West also requests to modify the current permit language to reflect the removal of the Glycol Dehydration System (GDS1). This equipment was disconnected in 2006 and was permanently removed from service in 2007.

## SITE INSPECTION

The writer did not inspect Mark West's Cobb Dewpoint Control Plant because the facility is routinely inspected by DAQ's Main Office located in Charleston, WV. Enforcement Inspector Jamie Jarrett last inspected the facility on July 30, 2010. At that time Mr. Jarrett conducted a targeted inspection of the whole facility/station, finding the station to be in violation of the annual loadout limit (8,760,000 gal/yr) for natural gas liquids (NGL) loaded to tank truck from loadout area TL1. The station was given the inspection code of 10 indicating that a violation was found, specifically:

NGL loadout exceeded the permit limit (set in section 4.1.5.) by a factor of 2.3. The new proposed limit increases the amount of NGL that can be load annually to 71,000,000gal/yr (an increase of 8.1 times the amount of the old limit) from 8,760,000 gal/yr.

Also, the NGL vapor pressure needed to be measured and corrected in the MSDS for NGL. The MSDS before this permit application showed the vapor pressure for NGL to be 30-90 psi @ 100°F. **Note that the MSDS was corrected in this application (R13-2557C) to 134 psia.**

The permit application also incorrectly used a low vapor pressure for the NGL of 6.9 psia @ 100 °F to calculate speciated emissions for condensate loadout (TL1). **Note that was corrected by MarkWest in their revision to application R13-2557C received December 7, 2010.**

Directions to the Cobb Dewpoint Control Plant as given in application:

Follow State Route 4 two miles north of Clendenin. The plant is located on the east side of the street.

## ENFORCEMENT'S COMMENTS

James Jarrett send the following e-mail to the permit writer on 10/25/2010:

FYI. I am comparing the inspection report with the NOV response. I noticed a typo in the calculations they sent me. The density of the NGL is stated as lbs/1000 gal. It should be lbs/gal. Therefore, the VOC emissions are off by a factor of 1,000. There is also another issue. They are claiming the NGL contains a maximum of 85% VOC per AP-42. The 8/3/2010 sample analysis shows it is 97.7% by weight. The only non-VOC component is ethane (2.3% by weight). If they have specific analyses then they need to use it instead of AP-42 defaults. If you'd like to discuss let me know. Thanks.

MarkWest response (in writing dated December 2, 2010, received December 7, 2010):

The calculations for truck loadout will be corrected as noted above and resubmitted as part of Attachment N.

### **MARKWEST RESPONSE TO QUESTIONS**

MarkWest response (in a written submission dated December 2, 2010, received at the DAQ on December 7, 2010) to e-mail questions from the permit writer sent 11/17/2010:

- 1) What year was the glycol dehydration system (GDS1) disconnected? 2006 or 2007?  
Answer: 2006
- 2) What year was the glycol dehydration system (GDS1) permanently removed? 2006 or 2007?  
Answer: 2007
- 3) Did the elimination of glycol dehydration system (GSD1) cause emissions to increase somewhere else in the plant/facility?  
Answer: No.
- 4) Was the 8,760,000 gal/yr limit set for the NGL truckload TL1 originally set too low? Why the big (8.1 times) increase to 71,000,000 gal/yr?  
Answer: The 8,760,000 gal/year number was mistakenly the plant output to the "old" straight refrigeration gas plant instead of truck load capacity. The plant was upgraded in 2008 to a cryogenic plant which increased the NGL output and the truck loadout.
- 5) For re-calculating fugitive emissions from equipment leaks, the equipment components are said to have been updated to 2008. Do the 2008 equipment components still represent the equipment components for now, 2010?  
Answer: Yes, they are the same.
- 6) The components listed in the Fugitive Emissions from Equipment Leaks page, is that a listing for the whole plant/facility or is it for one particular area of the plant, say the Natural Gas Liquies Loadout Area?  
Answer: Whole facility.
- 7) Estimated amount left in hose after loading is 0.432 gal/truck load. How was that arrived at? Calculated? Measuree?

Answer: Original estimate of 0.432 gal/truck load has been adjusted and calculations are show in the Attachment N Loading Calculations table attached to this letter. The new estimate is 0.53 gal/truck load which is based on a 2" schedule 80 pipe with an inside diameter of 1.939 inches and a 12 inch length of pipe. The original estimate appeared to be a miscommunication between the plant site personnel and the MarkWest corporate office as to the dimensions of the connection pipe. Please disregard the previous estimate given in the original application. The new estimates reflect both this change and the change identified by James Jarrett listed above.

- 8) What portion of the 11.3 ton/yr VOC emissions emitted from disconnection of hose from the high pressure cargo tank are HAPs? Please document any HAP emissions in the permit application, Attachments J and N.

Answer: The 11.3 tpy VOC amount is incorrect. It should be 4.01 TPY VOC since the hose calculation (0.432 gal/truckload) is incorrect as is stated in question 7. The HAP emissions from the truck loadout hose is enclosed in Attachment J, K, and L, and from the speciated emissions table for truck loadout in the Attachment N calculations attached.

- 9) For the calculation of Speciated Emissions/HAPs for Condensate Loadout (TL1) - Disconnection of Hose from High Pressure Cargo Tanks, the total vapor pressure of liquid mixture ( $P_{VA}$ ) is given in the calculation as being 6.9 psia (see Attachment N, last page). With the recent change in vapor pressure (Reid) for the natural gas liquids increasing to 134 psia, should this pressure (134 psia) be used for  $P_{VA}$ ?

Answer: The vapor pressure has been changed to 134 psig for the speciated emissions/HAPs and is reflected in Attachment N spreadsheet as well as Attachments J, K and L attached.

### **Facility Natural Gas Consumption Rate**

#### 11/18/10 Questions from John Legg (DAQ) to Jennifer Krzak (MarkWest Consultant):

The new dehydrator regenerator heater (HTR3) has a 2.5 MM Btu/hr max. design rating (20.2 MM scf/yr based on burning natural gas containing 1085 Btu/scf and running the heater no stop for 8,760 hr/yr).

Will the new heater's natural gas usage be individually monitored? Or will natural gas usage for HTR3 be added/clumped with the Zirco Heater (HTR1 @1.5 MM Btu/hr), dehydrator regenerator heater (HTR3 @2.5 MM Btu/hr), and the Flare System (FL2 @0.08 MM Btu/hr).

In the current permit R13-2557B, section 4.1.3., the Zircon heater (HTR1), dehydrator regenerator heater (HTR2), and Flare System (FL2) are not allowed to exceed an annual natural gas consumption rate of 52,061,960 scf/yr. Will HTR3's natural gas consumption be metered with HTR1, HTR3, and FL2?

Also, what exactly makes up the 52,061,960 scf/yr natural gas consumption rate given in section 4.1.3?

HTR1 = 1.5 MM Btu/hr  
HTR2 = 2.5 MM Btu/hr  
FL2 = 0.08 MM Btu/hr  
Total = 4.08 MM Btu/hr

Annual natural consumption rate for:

$$\begin{aligned} \text{HTR1} + \text{HTR2} + \text{FL2} &= 4.08 \text{ MM Btu/hr} * 1/(1085 \text{ Btu/scf}) * 8,760 \text{ hr/yr} \\ &= 32,941,000 \text{ scf/yr} \end{aligned}$$

Unaccounted natural gas usage = 52,061,960 scf/yr - 32,941,000 scf/yr = 19,122,000 scf/yr

11/18/10 Answers From Jennifer Krzak (MarkWest Consultant) to John Legg (DAQ):

It should be clumped in with the other heater units total gas consumption (HTR1, HTR2 and FL2) like it was done in the current permit. Based on your analysis, I believe I may not have gone back to correct the proposed new gas consumption limit including HTR3 because I was stuck on the same thing you are.

Based on the historical data I have, I found the consumption rate of 52,061,960 scf/yr listed in a Class II Administrative Update to Modify dated 5/7/2004. In this 2004 permit, the units listed under this limit were a reciprocating engine/generator (G1), the Zirco Heater (HTR1), a dehydrator reboiler (BL1) and the Flare System (FL2). From what I have been able to piece together, G1 was 150 HP or 1.14 MMBtu/hr, HTR1 is 1.5 MMBtu/hr, BL1 was 2.5 MMBtu/hr and FL2 is 0.08 MMBtu/hr for a total of 5.22 MMBtu/hr. This calculates to about 42,145,000 scf/yr (based on 1085 Btu/scf and 8,760 hours/yr). Not quite the 52 mmscf/yr in the permit but a little closer. I may have assumed the wrong heat inputs or something for the units no longer existing, perhaps you have historical data that would show this better.

All in all, in the most recent permit the consumption rate limit of 52,061,960 scf/yr did not change even though the units listed under this limit (HTR1, HTR2 and FL2) are different then the 2004 permit.

That being said, revise section 4.1.3 of the permit to include HTR3 with a max consumption of 53,141,000 scf/yr. (32,941,000 scf/yr from HTR1, 2 and FL1 + 20,200,000 scf/yr for HTR3).

**ESTIMATE OF EMISSIONS**

Emission increases for the after-the-fact changes detailed by Mark West in application R13-2557C are summarized in Table 2 below:

<b>Table 2: Hourly and Annual Emissions Increases Resulting from After-the-fact Changes Detailed in Permit Application R13-2557C to West Mark's Cobb Dewpoint Control Plant, Located in Clendenin, Kanawha County, WV.</b>							
<b>Pollutant</b>		<b>Maximum Emissions (Uncontrolled)</b>					
		<b>Dehydrator Regenerator Heater (HTR3)</b>		<b>Equipment Leaks/Component Losses (FUG)</b>		<b>Loading Losses Truck Loadout (TL1)</b>	
		<b>(lb/hr)</b>	<b>(ton/yr)<sup>(1)</sup></b>	<b>(lb/hr)</b>	<b>(ton/yr)<sup>(1)</sup></b>	<b>(lb/hr)</b>	<b>(ton/yr)<sup>(1)</sup></b>
Criteria Pollutants	Nitrogen Oxides (NO <sub>x</sub> )	0.235	1.03	--	--	--	--
	Carbon Monoxide (CO)	0.197	0.863	--	--	--	--
	Particulate Matter (PM)	0.018	0.0789	--	--	--	--
	Sulfur Dioxide (SO <sub>2</sub> )	0.0014	0.0062	--	--	--	--
	Volatile Organic Compounds (VOC)	0.013	0.057	1.56	6.83	0.92	4.01
Hazardous Air Pollutants (HAP)		4.43E-05	1.94E-05	--	--	6.9 E-04	3.0 E-03
(1) Annual Based on 8,760 hr/yr of operation.							

**Dehydrator Regenerator Heater (HTR3)**

Mark West's emissions calculations for the 2.55 MM Btu/hr Dehydrator Regenerator Heater (HTR3) were reviewed by the writer and are summarized below in Table 3.

<b>Table 3: Mark West's Emission Calculations for the 2.55 MM Btu/hr Dehydrator Regenerator Heater (HTR3) at the Control Plant located in Clendenin, Kanawha County, WV.</b>					
Pollutant	Emission Factor (lb/10 <sup>6</sup> scf)	Heating Value of Gas <sup>(1)</sup> (Btu/scf)	Maximun Natural Gas Consumed (scf/hr)	Maximun Emissions	
				(lb/hr)	(ton/yr) <sup>(3)</sup>
NOx	100	1085	2346	0.235	1.03
CO	84	1085	2346	0.197	0.863
PM	7.6	1085	2346	0.018	0.078
SO2	0.6	1085	2346	0.0014	0.0062
VOC	5.5	1085	2346	0.013	0.057
HAP	AP-42 <sup>(2)</sup>	1085	2346	0.0000044	0.000019
(1) Average heating value of natural gas at Cobb = 1,085 Btu/scf					
(2) AP-42 Tables 1.4-3 and 1.4-4					
(3) Based on operating 8,760 hr/yr.					

### **Fugitive Emissions from Equipment Leaks**

Mark West's fugitive emission calculations for the Cobb Dewpoint Control Plant were reviewed by the writer and are based on Oil and Gas Production Average Emission Factors (US EPA Protocol for Equipment Leak Estimates, EPA 453/R-95-017, November 1995). The results of these calculates are summarized below in Table 4.

<b>Table 4: Mark West's Fugitive Emission Calculations for the Cobb Dewpoint Control Plant located in Clendenin, Kanawha County, WV.</b>					
Equipment Type	Service	Number of Components	Emission Factor (kg/hr source)	VOC Emissions	
				(lb/hr)	ton/yr)
Valves	Light Liquid	185	0.0025	1.02	4.47
	Residue Gas	15	0.0045	0.149	0.652
Pump Seals	Light Liquid	2	0.13	0.057	0.251
	Residue Gas	0	0.0024	0.000	0.000
Pressure Safety Valve	Light Liquid	19	0.0075	0.314	1.38
	Residue Gas	1	0.0088	0.019	0.085
Total				1.56	6.83

## **Truck Loadout (TL1)**

Truck loadout (TL1) emissions are controlled through the use of a high pressure cargo tank which is the only type of tank loaded at the Cobb facility. VOC/HAP emissions result from evaporation of Natural Gas Liquids left in loading hose(s) after the loading of the high pressure cargo tank. The loading hose emissions, as originally submitted, were found by Jamie Jarrett to be in error. MarkWest re-calculated and re-submitted the emission estimates on 12/07/10. Emissions are estimated at 0.92 lb/hr and 4.01 ton/yr.

## **REGULATORY APPLICABILITY**

MarkWest's Cobb Dewpoint Control Plant, located near Clendenin, Kanawha County, WV, is considered to be a non-major source, i.e., it does not emit 250 TPY or more of any regulated air pollutant, nor does it emit or have the potential to emit 10 tons of a single HAP or 25 tons of aggregated HAPs, and it is not one of the stationary sources named in 45CSR14, Table 1. State and Federal rules that apply to the facility are listed below:

### State Rules

- 45CSR4 - "Control of Air Pollution from Combustion of Refuse."  
The facility has a flare system (FL2).
  
- 45CSR6 - "Control of Air Pollution from Combustion of Refuse."  
Smoke from incinerators limited to less than 20% opacity.
  
- 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 facility exceeds the regulatory emission threshold for criteria pollutants of 6 lb/hr and 10 tons/yr. The facility is also subject to the New Source Performance Standards (NSPS) of 40 CFR 60 and per 45CSR13-5, a permit is required.

This after-the-fact modification permit adds a small 2.5 MM Btu/hr process heater (HTR3) and increases the annual amount of NGL loaded from the plant's truck loadout (TL1) to 71,000,000 gal/yr from 8,760,00 gal/yr. Mark West also requested that the new permit reflect the removal of the Glycol Dehydration System (GDS1). This equipment was disconnected in 2006 and was permanently removed from service in 2007. MarkWest re-calculated facility-wide fugitive emissions for equipment leaks (FUG) to reflect upgraded components installed in 2008, but the fugitive emission number does not appear in the old or new permits.

- 45CSR16      “Standards of Performance for New Stationary Sources”
- Adopts by reference the standards of performance for new stationary sources promulgated by the United States Environmental Protection Agency pursuant to section 111(b) of the federal Clean Air Act, as amended (CAA). This rule codifies general procedures and criteria to implement the standards of performance for new stationary sources set forth in 40 CFR Part 60. The rule also adopts associated reference methods, performance specifications and other test methods which are appended to these standards.
- 40 CFR 60, Subpart KKK applies. See below.
- 
- 45CSR21      Regulations to Prevent and Control Air Pollution from the Emissions of Volatile Organic Compounds.
- Section 29 of Rule 21 entitled "Leaks from Natural Gas/Gasoline Processing Equipment" applies to the facility because it deals with volatile organic compound (VOC) service in any process unit at any natural gas/gasoline processing facility. The facility will demonstrate compliance with this rule by following the recordkeeping, monitoring, and reporting requirements of 40CFR60 Subpart KKK (more stringent recordkeeping and monitoring requirements). Design calculations and other data will remain onsite to demonstrate that certain pieces of equipment are not subject to the requirements of rule 45CSR21 and 40CFR60 Subpart KKK.
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- 40CSR30 -      "Requirements for Operating Permits."
- The facility is considered to be a non-major source subject to Title V.

Federal Rules

- 40 CFR 60
- Subpart KKK      Standards of Performance for Equipment Leaks of VOC from Onshore Natural Gas Processing Plants

The provisions of this subpart apply to affected facilities in onshore natural gas processing plants. A natural gas processing plant is defined by this rule as any processing site engaged in the extraction of natural gas liquids from field gas, fractionation of mixed natural gas liquids to natural gas products, or both. The facility is involved in both of the processes described above. Therefore, this facility is subject to the recordkeeping, monitoring, and testing required by this rule.

## TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

When natural gas is burned in MarkWest's Zirco Heater (HTR1), two dehydrator regenerator heaters (HTR2 and HTR3) and the Flare System (FL2), small amounts of Hazardous Air Pollutants (HAP) are produced. Also, small amounts of HAPs are released by Mark West from the evaporation of natural gas liquids left in loading hoses. Anticipated species of HAPs released to the air are discussed below:

Benzene - 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.

Ethyl-benzene - 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.

n-Hexane - A solvent that has many uses in the chemical and food industries, either in pure form or as a component of commercial hexane. The latter is a mixture that contains approximately 52% n-hexane; the balance is made up of structural analogs and related chemicals such as methylpentane and methylcyclopentane. Highly purified n-hexane is used as a reagent for chemical or chromatographic separations. Other grades of n-hexane are used as solvents for extracting edible fats and oils in the food industry and as a cleaning agent in the textile, furniture, and printing manufacturing industries. Hexane is the solvent base for many commercial products, such as glues, cements, paint thinners, and degreasers. n-Hexane is a minor constituent of crude oil and natural gas and occurs in different petroleum distillates. No data are available regarding the potential toxicity of n-hexane in humans orally exposed to n-hexane. However, as might be expected for a chemical with such wide application, the potential exists for persons to be environmentally and/or occupationally exposed to n-hexane via other routes of exposure.

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.

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.

### **Changes made to R13-2557B**

1. The following changes were made to the front cover of the permit:
  - Governor's Name changed to Earl Ray Tombson from Joe Manchin, III.
  - Secretary's Name changed to Randy Huffman from Stephanie R. Timmermyer.
  - Permit Number changed to R13-2557C from R13-2557B.
  - Issued date changed to December 20, 2010 from April 12, 2006.
  
2. Permit number changed to R13-2557C from R13-2557B at the top of every page.
  
3. On page 2, the permit superceded statement was updated  
Before: This permit will supercede and replace Permit R13-2557, and R13-2557A.  
After: This permit will supercede and replace Permit R13-2557B, approved April 12, 2006.
  
4. On page 2, "Description of Change" replaced:  
Before: Delete the reciprocating engine/generator (G1) as it is no longer in service and will not be used by MarkWest; add the existing natural gas liquids truck loadout (TL1) facility to the existing permit; eliminate the requirement to perform opacity observations on equipment burning pipeline quality natural gas as a fuel.  
  
After: 1) Remove the glycol dehydration system (GDS1) emissions from permit. GDS1 was disconnected from service in 2006 and

permanently removed in 2007.

- 2) Include new 2.5 mm Btu/hr Dehydrator Regenerator Heater (HTR3) in permit. Heater installed in 2009.
  - 3) Upgrade component fugitives (FUG) to reflect upgraded components in 2008.
  - 4) Increase the annual amount of natural gas loaded from the truck loadout (TRL) to 71,000,000 gal/yr from 8,760,000 gal/yr.
5. The following deletion (003-01) and addition (007-03) were made to the Emission Units table in Section 1.0:

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed	Design Capacity	Control Device
<del>003-01</del>	<del>GDS1</del>	<del>Glycol Dehydration System</del>	<del>2004</del>	<del>24 mm scf/day</del>	<del>NA</del>
003-02	HTR1	Zirco Heater	2004	1.5 mmBtu/hr	NA
NA	FL2	Callidus Technologies Flare (Emergency Flare)	2004	0.08 mmBtu/hr	NA
001-01	HTR2	Dehydrator Regenerator Heater	1967	2.5 mmBtu/hr	NA
005-01	FUG	Component Fugitives		NA	NA
NA	TL1	Truck Loadout		NA	NA
<b>007-03</b>	<b>HTR3</b>	<b>Dehydrator Regenerator Heater</b>	<b>2009</b>	<b>2.5 mm Btu/hr</b>	<b>NA</b>

6. The glycol dehydration system (GDS1) emissions was deleted from Section 4.1.2. and were replaced with the condition that the facility has to remain a minor source of HAPs.

Before 4.1.2. The maximum emissions from the glycol dehydration system (GDS1) shall not exceed the following:

Pollutant	Hourly Emissions (lb/hr)	Annual Emissions (ton/yr)
VOC	1.0	4.1
Total HAPs	0.20	0.90

After 4.1.2. **Minor Source of Hazardous Air Pollutants (HAP).** HAP

emissions from the affected facility shall be less than 10 ton/yr of any single HAP or 25 ton/yr of any combination of HAPs. Compliance with this Section shall ensure that the affected facility is a minor HAP source.

7. The dehydrator regenerator heater (HTR3) was added to Section 4.1.3 as a source that burns natural gas. The annual limit on the amount of natural gas burned at Mark West's facility was recalculated to be 53,141,000 cubic feet per year (from 52,061,960 cubic feet per year). See the previous discussion (above) entitled Facility Natural Gas Consumption Rate.

Before 4.1.3. The Zirco Heater (HTR1), dehydrator regenerator heater (HTR2), and Flare System (FL2) shall not exceed a combined annual natural gas consumption rate of 52,061,960 cubic feet per year. The facility wide natural gas consumption rate shall be calculated using a twelve (12) month rolling total. A twelve (12) month rolling total shall mean the sum of natural gas consumed at any given time for the previous twelve (12) calendar months.

After 4.1.3. The Zirco Heater (HTR1), two (2) dehydrator regenerator heaters (HTR2 and HTR3), and Flare System (FL2) shall not exceed a combined annual natural gas consumption rate of 53,141,000 cubic feet per year. The facility wide natural gas consumption rate shall be calculated using a twelve (12) month rolling total. A twelve (12) month rolling total shall mean the sum of natural gas consumed at any given time for the previous twelve (12) calendar months.

7. In Section 4.1.5, the annual loadout of natural gas liquids at TL1 was increased:

Before 4.1.5. The hourly and annual loadout of natural gas liquids at TL1 shall not exceed 10,667 gallons per hour or 8,760,000 gallons per year.

After 4.1.5. The hourly and annual loadout of natural gas liquids at TL1 shall not exceed 10,667 gallons per hour or 71,000,000 gallons per year.

8. Section 4.2.1, was replaced with the word "Reserved."

Before 4.2.1. For the purpose of demonstrating compliance with the operational requirements set forth in 4.1.1 and 4.1.2, the permittee shall maintain accurate records of the amount of natural gas processed by the glycol dehydration system (GDS1) onsite. Also, the permittee shall measure and record the following parameters for the glycol dehydration system (GDS1).

- a. Operating times for the glycol dehydration system (GDS1).
- b. Daily checks of the temperature, flash tank pressure, and glycol/water mixture flow rate of the glycol dehydration system (GDS1).
- c. Any and all malfunctions of the glycol dehydration system (GDS1). Information to be record shall include: equipment involved, cause of malfunction, corrective step as taken, duration, estimated change in emissions, steps taken to prevent reoccurrences.

All the operational parameters list above shall be gathered while the glycol dehydration system (GDS1) is in full operation. Said records shall be made available to the Director of the Division of Air Quality or his/her duly authorized representative upon request and shall be certified by a responsible official upon the submittal.

After 4.2.1. Reserved.

- 8. MarkWest re-calculated fugitive emissions for the facility based on the components in use in 2008. The fugitive emission number did not appear in R13-2557B and does not appear in R13-2557C.

**RECOMMENDATION TO DIRECTOR**

Mark West's after-the-fact modify to their permit meets the requirements of 45CSR13 (Rule 13) and all other applicable rules, and therefore should be granted a Rule 13 modification permit (R13-2557C).

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John Legg  
Permit Writer

December 20, 2010  
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Date