



MarkWest Liberty Midstream & Resources, L.L.C.  
1515 Arapahoe Street  
Tower 1, Suite 1600  
Denver, CO 80202-2126  
(800) 730-8388  
(303) 290-8700  
(303) 825-0920 Fax



June 28, 2022

Mr. Mark Gorog  
Regional Air Quality Manager  
PA DEP SW Regional Office  
400 Waterfront Drive  
Pittsburgh, PA 15222

Re: MarkWest Liberty Midstream & Resources, L.L.C.  
Harmon Creek Gas Plant  
Plan Approval Application

Dear Mr. Gorog:

MarkWest Liberty Midstream & Resources, L.L.C. (MPLX) hereby submits a plan approval application for the Harmon Creek Gas Plant located at 123 Point Pleasant Rd in Smith Township, Washington County. The Harmon Creek Gas Plant is currently authorized to operate under GP1-63-01011A and GP5-63-01011A. MPLX seeks authorization to install and operate equipment associated with Harmon Creek Cryo II. In addition to the equipment currently authorized at the facility, MPLX proposes the installation and operation of the following equipment at the facility:

- One (1) 260 mmscfd natural gas processing plant;
- One (1) Cryo plant regenerative heater rated at a maximum heat input of 19.62 MMBtu/hr;
- One (1) 500-gallon methanol storage tank;
- Three (3) electric-driven compressors and associated rod-packing venting; and
- Associated fugitive components.

De minimis emission increases associated with the existing pigging and truck loadout operations, in addition to emissions from maintenance blowdowns and some PSVs will be controlled by the existing process flare.

The following are included with this submittal:

- General Information Form
- Compliance Review Form
- Plan Approval Application Forms
- Proof of Municipal Notification
- Process Flow Diagram
- Detailed Emission Estimates
- Manufacturer's Information

If you have any questions about this application, please contact me at (412) 815-8886 or via email at [ajuarez@marathonpetroleum.com](mailto:ajuarez@marathonpetroleum.com).

Sincerely,

A handwritten signature in blue ink that reads "Alexandra M. Juarez". The signature is written in a cursive style with a large initial 'A' and a long, sweeping tail on the 'z'.

Alexandra M. Juarez  
G&P Engineer I

## General Information Form



COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

**GENERAL INFORMATION FORM – AUTHORIZATION APPLICATION**

Before completing this General Information Form (GIF), read the step-by-step instructions provided in this application package. This form is used by the Department of Environmental Protection (DEP) to inform our programs regarding what other DEP permits or authorizations may be needed for the proposed project or activity. This version of the General Information Form (GIF) must be completed and returned with any program-specific application being submitted to the DEP.

<b>Related ID#s (If Known)</b> <b>Client ID#</b> _____ <b>APS ID#</b> _____ <b>Site ID#</b> 823541 <b>Auth ID#</b> _____ <b>Facility ID#</b> 819388		<b>DEP USE ONLY</b> Date Received & General Notes
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**CLIENT INFORMATION**

<b>DEP Client ID#</b>	<b>Client Type / Code</b> OWOP	<b>Dun &amp; Bradstreet ID#</b>	
<b>Legal Organization Name or Registered Fictitious Name</b> MarkWest Liberty Midstream and Resources, L.L.C.		<b>Employer ID# (EIN)</b> 30-0528059	<b>Is the EIN a SSN?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> NO
<b>State of Incorporation or Registration of Fictitious Name</b> Delaware	<input type="checkbox"/> Corporation <input checked="" type="checkbox"/> LLC <input type="checkbox"/> Partnership <input type="checkbox"/> LLP <input type="checkbox"/> LP <input type="checkbox"/> Sole Proprietorship <input type="checkbox"/> Association/Organization <input type="checkbox"/> Estate/Trust <input type="checkbox"/> Other		
<b>Individual Last Name</b>	<b>First Name</b>	<b>MI</b>	<b>Suffix</b>
<b>Additional Individual Last Name</b>	<b>First Name</b>	<b>MI</b>	<b>Suffix</b>
<b>Mailing Address Line 1</b> 1515 Arapahoe St.		<b>Mailing Address Line 2</b> Tower 1, Suite 1600	
<b>Address Last Line – City</b> Denver	<b>State</b> CO	<b>ZIP+4</b> 80202-2137	<b>Country</b> USA
<b>Client Contact Last Name</b> Juarez	<b>First Name</b> Allie	<b>MI</b> M	<b>Suffix</b>
<b>Client Contact Title</b> G&P Engineer I	<b>Phone</b> 412-815-8886	<b>Ext</b>	<b>Cell Phone</b>
<b>Email Address</b> ajuarez@marathonpetroleum.com	<b>FAX</b> 303-573-4954		

**SITE INFORMATION**

<b>DEP Site ID#</b> 823541	<b>Site Name</b> Harmon Creek Gas Plant		
<b>EPA ID#</b>	<b>Estimated Number of Employees to be Present at Site</b>		25
<b>Description of Site</b> Natural Gas Processing Plant			
<b>Tax Parcel ID(s):</b>			
<b>County Name(s)</b> Washington	<b>Municipality(ies)</b> Smith	<b>City</b> <input type="checkbox"/>	<b>Boro</b> <input type="checkbox"/>
		<b>Twp</b> <input checked="" type="checkbox"/>	<b>State</b> PA
		<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>
<b>Site Location Line 1</b> 123 Point Pleasant Rd	<b>Site Location Line 2</b>		
<b>Site Location Last Line – City</b> Bulger	<b>State</b> PA	<b>ZIP+4</b> 15019	
<b>Detailed Written Directions to Site</b> From Pittsburgh head west on Hwy 22 to Exit 60A, stay left on Steubenville Pike (0.9 mi.), turn left onto Creek Road (0.5 mi.), keep left to stay on Point Pleasant Road (1.3 mi.), turn left into Harmon Creek Gas Plant			

<b>Site Contact Last Name</b> Ettore	<b>First Name</b> David	<b>MI</b> G	<b>Suffix</b>
<b>Site Contact Title</b> Environmental Supervisor		<b>Site Contact Firm</b> MarkWest Liberty Midstream and Resources, L.L.C.	
<b>Mailing Address Line 1</b> 4600 J. Barry Court		<b>Mailing Address Line 2</b> Suite 500	
<b>Mailing Address Last Line – City</b> Canonsburg		<b>State</b> PA	<b>ZIP+4</b> 15317
<b>Phone</b> 724-873-2803	<b>Ext</b>	<b>FAX</b>	<b>Email Address</b> DGEttore@marathonpetroleum.com
<b>NAICS Codes</b> (Two- & Three-Digit Codes – List All That Apply) 211130			<b>6-Digit Code</b> (Optional) NA
<b>Client to Site Relationship</b> OWNOP			

**FACILITY INFORMATION**

<b>Modification of Existing Facility</b>	<b>Yes</b>	<b>No</b>
1. Will this project modify an existing facility, system, or activity?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Will this project involve an addition to an existing facility, system, or activity? <i>If "Yes", check all relevant facility types and provide DEP facility identification numbers below.</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Facility Type	DEP Fac ID#	Facility Type	DEP Fac ID#
<input checked="" type="checkbox"/> Air Emission Plant	819388	<input type="checkbox"/> Industrial Minerals Mining Operation	
<input type="checkbox"/> Beneficial Use (water)		<input type="checkbox"/> Laboratory Location	
<input type="checkbox"/> Blasting Operation		<input type="checkbox"/> Land Recycling Cleanup Location	
<input type="checkbox"/> Captive Hazardous Waste Operation		<input type="checkbox"/> Mine Drainage Treatment / Land Recycling Project Location	
<input type="checkbox"/> Coal Ash Beneficial Use Operation		<input type="checkbox"/> Municipal Waste Operation	
<input type="checkbox"/> Coal Mining Operation		<input type="checkbox"/> Oil & Gas Encroachment Location	
<input type="checkbox"/> Coal Pillar Location		<input type="checkbox"/> Oil & Gas Location	
<input type="checkbox"/> Commercial Hazardous Waste Operation		<input type="checkbox"/> Oil & Gas Water Poll Control Facility	
<input type="checkbox"/> Dam Location		<input type="checkbox"/> Public Water Supply System	
<input type="checkbox"/> Deep Mine Safety Operation -Anthracite		<input type="checkbox"/> Radiation Facility	
<input type="checkbox"/> Deep Mine Safety Operation -Bituminous		<input type="checkbox"/> Residual Waste Operation	
<input type="checkbox"/> Deep Mine Safety Operation -Ind Minerals		<input type="checkbox"/> Storage Tank Location	
<input type="checkbox"/> Encroachment Location (water, wetland)		<input type="checkbox"/> Water Pollution Control Facility	
<input type="checkbox"/> Erosion & Sediment Control Facility		<input type="checkbox"/> Water Resource	
<input type="checkbox"/> Explosive Storage Location		<input type="checkbox"/> Other:	

<b>Latitude/Longitude Point of Origin</b>	<b>Latitude</b>			<b>Longitude</b>		
	<b>Degrees</b>	<b>Minutes</b>	<b>Seconds</b>	<b>Degrees</b>	<b>Minutes</b>	<b>Seconds</b>
Harmon Creek Gas Plant	40	24	4	80	21	26
<b>Horizontal Accuracy Measure</b>	Feet		--or--	Meters		
<b>Horizontal Reference Datum Code</b>	<input type="checkbox"/> North American Datum of 1927 <input type="checkbox"/> North American Datum of 1983 <input checked="" type="checkbox"/> World Geodetic System of 1984					
<b>Horizontal Collection Method Code</b>						
<b>Reference Point Code</b>						
<b>Altitude</b>	Feet	1,171	--or--	Meters		
<b>Altitude Datum Name</b>	<input type="checkbox"/> The National Geodetic Vertical Datum of 1929 <input type="checkbox"/> The North American Vertical Datum of 1988 (NAVD88)					
<b>Altitude (Vertical) Location Datum Collection Method Code</b>						
<b>Geometric Type Code</b>						
<b>Data Collection Date</b>						
<b>Source Map Scale Number</b>	Inch(es)		=	Feet		
--or--	Centimeter(s)		=	Meters		

**PROJECT INFORMATION**

**Project Name**  
Harmon Creek Gas Plant GP-5 Modification

**Project Description**  
Proposed construction and operation of Harmon Creek 2, which includes three (3) electric-driven compressors and associated blowdowns/venting, one (1) 19.62 MMBtu/hr regeneration heater, and associated fugitive components.

Project Consultant Last Name	First Name	MI	Suffix
None used			

Project Consultant Title	Consulting Firm

Mailing Address Line 1	Mailing Address Line 2

Address Last Line – City	State	ZIP+4

Phone	Ext	FAX	Email Address

Time Schedules	Project Milestone (Optional)

1. **Is the project located in or within a 0.5-mile radius of an Environmental Justice community as defined by DEP?**  Yes  No

To determine if the project is located in or within a 0.5-mile radius of an environmental justice community, please use the online [Environmental Justice Areas Viewer](#).

2. **Have you informed the surrounding community prior to submitting the application to the Department?**  Yes  No

**Method of notification:** Municipal notifications per 25 Pa. Code § 127.413

3. **Have you addressed community concerns that were identified?**  Yes  No  N/A

If no, please briefly describe the community concerns that have been expressed and not addressed.

4. **Is your project funded by state or federal grants?**  Yes  No

**Note:** If "Yes", specify what aspect of the project is related to the grant and provide the grant source, contact person and grant expiration date.

Aspect of Project Related to Grant \_\_\_\_\_  
 Grant Source: \_\_\_\_\_  
 Grant Contact Person: \_\_\_\_\_  
 Grant Expiration Date: \_\_\_\_\_

5. **Is this application for an authorization on Appendix A of the Land Use Policy? (For referenced list, see Appendix A of the Land Use Policy attached to GIF instructions)**  Yes  No

**Note:** If "No" to Question 5, the application is not subject to the Land Use Policy.  
 If "Yes" to Question 5, the application is subject to this policy and the Applicant should answer the additional questions in the **Land Use Information** section.

### LAND USE INFORMATION

**Note:** Applicants should submit copies of local land use approvals or other evidence of compliance with local comprehensive plans and zoning ordinances.

<b>1.</b>	<b>Is there an adopted county or multi-county comprehensive plan?</b>	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
<b>2.</b>	<b>Is there a county stormwater management plan?</b>	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
<b>3.</b>	<b>Is there an adopted municipal or multi-municipal comprehensive plan?</b>	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
<b>4.</b>	<b>Is there an adopted county-wide zoning ordinance, municipal zoning ordinance or joint municipal zoning ordinance?</b>	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
<p><b>Note:</b> If the Applicant answers "No" to either Questions 1, 2 or 3, the provisions of the PA MPC are not applicable and the Applicant does not need to respond to questions 4 and 5 below. If the Applicant answers "Yes" to questions 1, 2 and 3, the Applicant should respond to questions 4 and 5 below.</p>					
<b>5.</b>	<b>Does the proposed project meet the provisions of the zoning ordinance or does the proposed project have zoning approval? If zoning approval has been received, attach documentation.</b>	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
<b>6.</b>	<b>Have you attached Municipal and County Land Use Letters for the project?</b>	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No

### COORDINATION INFORMATION

**Note:** The PA Historical and Museum Commission must be notified of proposed projects in accordance with DEP Technical Guidance Document 012-0700-001 utilizing the Project Review Form.

**If the activity will be a mining project** (i.e., mining of coal or industrial minerals, coal refuse disposal and/or the operation of a coal or industrial minerals preparation/processing facility), respond to questions 1.0 through 2.5 below.

**If the activity will not be a mining project**, skip questions 1.0 through 2.5 and begin with question 3.0.

<b>1.0</b>	<b>Is this a coal mining project?</b> If "Yes", respond to 1.1-1.6. If "No", skip to Question 2.0.	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
<b>1.1</b>	<b>Will this coal mining project involve coal preparation/ processing activities in which the total amount of coal prepared/processed will be equal to or greater than 200 tons/day?</b>	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
<b>1.2</b>	<b>Will this coal mining project involve coal preparation/ processing activities in which the total amount of coal prepared/processed will be greater than 50,000 tons/year?</b>	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
<b>1.3</b>	<b>Will this coal mining project involve coal preparation/ processing activities in which thermal coal dryers or pneumatic coal cleaners will be used?</b>	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
<b>1.4</b>	<b>For this coal mining project, will sewage treatment facilities be constructed and treated waste water discharged to surface waters?</b>	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
<b>1.5</b>	<b>Will this coal mining project involve the construction of a permanent impoundment meeting one or more of the following criteria: (1) a contributory drainage area exceeding 100 acres; (2) a depth of water measured by the upstream toe of the dam at maximum storage elevation exceeding 15 feet; (3) an impounding capacity at maximum storage elevation exceeding 50 acre-feet?</b>	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
<b>1.6</b>	<b>Will this coal mining project involve underground coal mining to be conducted within 500 feet of an oil or gas well?</b>	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
<b>2.0</b>	<b>Is this a non-coal (industrial minerals) mining project?</b> If "Yes", respond to 2.1-2.6. If "No", skip to Question 3.0.	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
<b>2.1</b>	<b>Will this non-coal (industrial minerals) mining project involve the crushing and screening of non-coal minerals other than sand and gravel?</b>	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
<b>2.2</b>	<b>Will this non-coal (industrial minerals) mining project involve the crushing and/or screening of sand and gravel with the exception of wet sand and gravel operations (screening only) and dry sand and gravel operations with a capacity of less than 150 tons/hour of unconsolidated materials?</b>	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No

2.3	Will this non-coal (industrial minerals) mining project involve the construction, operation and/or modification of a portable non-metallic (i.e., non-coal) minerals processing plant under the authority of the General Permit for Portable Non-metallic Mineral Processing Plants (i.e., BAQ-PGPA/GP-3)?	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
2.4	For this non-coal (industrial minerals) mining project, will sewage treatment facilities be constructed and treated waste water discharged to surface waters?	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
2.5	Will this non-coal (industrial minerals) mining project involve the construction of a permanent impoundment meeting one or more of the following criteria: (1) a contributory drainage area exceeding 100 acres; (2) a depth of water measured by the upstream toe of the dam at maximum storage elevation exceeding 15 feet; (3) an impounding capacity at maximum storage elevation exceeding 50 acre-feet?	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
3.0	Will your project, activity, or authorization have anything to do with a well related to oil or gas production, have construction within 200 feet of, affect an oil or gas well, involve the waste from such a well, or string power lines above an oil or gas well? If "Yes", respond to 3.1-3.3. If "No", skip to Question 4.0.	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No
3.1	Does the oil- or gas-related project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a watercourse, floodway or body of water (including wetlands)?	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
3.2	Will the oil- or gas-related project involve discharge of industrial wastewater or stormwater to a dry swale, surface water, ground water or an existing sanitary sewer system or storm water system? If "Yes", discuss in <i>Project Description</i> .	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
3.3	Will the oil- or gas-related project involve the construction and operation of industrial waste treatment facilities?	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
4.0	Will the project involve a construction activity that results in earth disturbance? If "Yes", specify the total disturbed acreage.	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
4.0.1	<b>Total Disturbed Acreage</b>				
4.0.2	Will the project discharge or drain to a special protection water (EV or HQ) or an EV wetland?	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
4.0.3	Will the project involve a construction activity that results in earth disturbance in the area of the earth disturbance that are contaminated at levels exceeding residential or non-residential medium-specific concentrations (MSCs) in 25 Pa. Code Chapter 250 at residential or non-residential construction sites, respectively?	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
5.0	Does the project involve any of the following: water obstruction and/or encroachment, wetland impacts, or floodplain project by the Commonwealth/political subdivision or public utility? If "Yes", respond to 5.1-5.3. If "No", skip to Question 6.0.	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
5.1	<b>Water Obstruction and Encroachment Projects</b> – Does the project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a watercourse, floodway or body of water?	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
5.2	<b>Wetland Impacts</b> – Does the project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a wetland?	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
5.3	<b>Floodplain Projects by the Commonwealth, a Political Subdivision of the Commonwealth or a Public Utility</b> – Does the project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a floodplain?	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
5.4	Is your project an interstate transmission natural gas pipeline?	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No



5.5	Does your project consist of linear construction activities which result in earth disturbance in two or more DEP regions AND three or more counties?	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
5.6	Does your project utilize Floodplain Restoration as a best management practice for Post Construction Stormwater Management?	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
5.7	Does your project utilize Class V Gravity / Injection Wells as a best management practice for Post Construction Stormwater Management?	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
6.0	Will the project involve discharge of construction related stormwater to a dry swale, surface water, ground water or separate storm water system?	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
6.1	Will the project involve discharge of industrial waste stormwater or wastewater from an industrial activity or sewage to a dry swale, surface water, ground water or an existing sanitary sewer system or separate storm water system?	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
7.0	Will the project involve the construction and operation of industrial waste treatment facilities?	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
8.0	Will the project involve construction of sewage treatment facilities, sanitary sewers, or sewage pumping stations? If "Yes", indicate estimated proposed flow (gal/day). Also, discuss the sanitary sewer pipe sizes and the number of pumping stations/treatment facilities/name of downstream sewage facilities in the <i>Project Description</i> , where applicable.	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
	<b>8.0.1 Estimated Proposed Flow (gal/day)</b>				
9.0	Will the project involve the subdivision of land, or the generation of 800 gpd or more of sewage on an existing parcel of land or the generation of an additional 400 gpd of sewage on an already-developed parcel, or the generation of 800 gpd or more of industrial wastewater that would be discharged to an existing sanitary sewer system?	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
	<b>9.0.1 Was Act 537 sewage facilities planning submitted and approved by DEP? If "Yes" attach the approval letter. Approval required prior to 105/NPDES approval.</b>	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
10.0	Is this project for the beneficial use of biosolids for land application within Pennsylvania? If "Yes" indicate how much (i.e. gallons or dry tons per year).	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
	<b>10.0.1 Gallons Per Year (residential septage)</b> _____				
	<b>10.0.2 Dry Tons Per Year (biosolids)</b> _____				
11.0	Does the project involve construction, modification or removal of a dam? If "Yes", identify the dam.	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
	<b>11.0.1 Dam Name</b>				
12.0	Will the project interfere with the flow from, or otherwise impact, a dam? If "Yes", identify the dam.	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
	<b>12.0.1 Dam Name</b>				
13.0	Will the project involve operations (excluding during the construction period) that produce air emissions (i.e., NOX, VOC, etc.)?	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No
	<b>13.0.1</b> If "Yes", is the operation subject to the agricultural exemption in 35 P.S. § 4004.1?	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
	<b>13.0.2</b> If the answer to 13.0.1 is "No", identify each type of emission followed by the estimated amount of that emission. <b>Enter all types &amp; amounts of emissions; separate each set with semicolons.</b> See Emission Estimates Attached				

<b>14.0</b>	<b>Does the project include the construction or modification of a drinking water supply to serve 15 or more connections or 25 or more people, at least 60 days out of the year? If "Yes", check all proposed sub-facilities.</b>	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
<b>14.0.1</b>	<b>Number of Persons Served</b>	_____			
<b>14.0.2</b>	<b>Number of Employee/Guests</b>	_____			
<b>14.0.3</b>	<b>Number of Connections</b>	_____			
<b>14.0.4</b>	<b>Sub-Fac: Distribution System</b>	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
<b>14.0.5</b>	<b>Sub-Fac: Water Treatment Plant</b>	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
<b>14.0.6</b>	<b>Sub-Fac: Source</b>	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
<b>14.0.7</b>	<b>Sub-Fac: Pump Station</b>	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
<b>14.0.8</b>	<b>Sub Fac: Transmission Main</b>	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
<b>14.0.9</b>	<b>Sub-Fac: Storage Facility</b>	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
<b>15.0</b>	<b>Will your project include infiltration of storm water or waste water to ground water within one-half mile of a public water supply well, spring or infiltration gallery?</b>	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
<b>16.0</b>	<b>Is your project to be served by an existing public water supply? If "Yes", indicate name of supplier and attach letter from supplier stating that it will serve the project.</b>	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
<b>16.0.1</b>	<b>Supplier's Name</b>	_____			
<b>16.0.2</b>	<b>Letter of Approval from Supplier is Attached</b>	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
<b>17.0</b>	<b>Will this project be served by on-lot drinking water wells?</b>	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
<b>18.0</b>	<b>Will this project involve a new or increased drinking water withdrawal from a river, stream, spring, lake, well or other water bod(ies)? If "Yes", reference Safe Drinking Water Program.</b>	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
<b>18.0.1</b>	<b>Source Name</b>	_____			
<b>19.0</b>	<b>Will the construction or operation of this project involve treatment, storage, reuse, or disposal of waste? If "Yes", indicate what type (i.e., hazardous, municipal (including infectious &amp; chemotherapeutic), residual) and the amount to be treated, stored, re-used or disposed.</b>	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
<b>19.0.1</b>	<b>Type &amp; Amount</b>	_____			
<b>20.0</b>	<b>Will your project involve the removal of coal, minerals, contaminated media, or solid waste as part of any earth disturbance activities?</b>	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
<b>21.0</b>	<b>Does your project involve installation of a field constructed underground storage tank? If "Yes", list each Substance &amp; its Capacity. <u>Note</u>: Applicant may need a Storage Tank Site Specific Installation Permit.</b>	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
<b>21.0.1</b>	<b>Enter all substances &amp; capacity of each; separate each set with semicolons.</b>	_____			
<b>22.0</b>	<b>Does your project involve installation of an aboveground storage tank greater than 21,000 gallons capacity at an existing facility? If "Yes", list each Substance &amp; its Capacity. <u>Note</u>: Applicant may need a Storage Tank Site Specific Installation Permit.</b>	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
<b>22.0.1</b>	<b>Enter all substances &amp; capacity of each; separate each set with semicolons.</b>	_____			
<b>23.0</b>	<b>Does your project involve installation of a tank greater than 1,100 gallons which will contain a highly hazardous substance as defined in DEP's Regulated Substances List, 2570-BK-DEP2724? If "Yes", list each Substance &amp; its Capacity. <u>Note</u>: Applicant may need a Storage Tank Site Specific Installation Permit.</b>	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
<b>23.0.1</b>	<b>Enter all substances &amp; capacity of each; separate each set with semicolons.</b>	_____			

24.0 Does your project involve installation of a storage tank at a new facility with a total AST capacity greater than 21,000 gallons?  Yes  No  
If "Yes", list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit.

24.0.1 Enter all substances & capacity of each; separate each set with semicolons.

**NOTE:** If the project includes the installation of a regulated storage tank system, including diesel emergency generator systems, the project may require the use of a Department Certified Tank Handler. For a full list of regulated storage tanks and substances, please go to [www.dep.pa.gov](http://www.dep.pa.gov) search term storage tanks

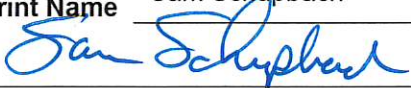
25.0 Will the intended activity involve the use of a radiation source?  Yes  No

### CERTIFICATION

I certify that I have the authority to submit this application on behalf of the applicant named herein and that the information provided in this application is true and correct to the best of my knowledge and information.

For applicants supplying an EIN number: I am applying for a permit or authorization from the Pennsylvania Department of Environmental Protection (DEP). As part of this application, I will provide DEP with an accurate EIN number for the applicant entity. By filing this application with DEP, I hereby authorize DEP to confirm the accuracy of the EIN number provided with the Pennsylvania Department of Revenue. As applicant, I further consent to the Department of Revenue discussing the same with DEP prior to issuance of the Commonwealth permit or authorization.

Type or Print Name Sam Schupbach



VP Operations Processing

Signature

Title

6/29/2022

Date

## Plan Approval Application Forms



Submit in Triplicate

COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
BUREAU OF AIR QUALITY

**PROCESSES**

**Application for Plan Approval to Construct, Modify or Reactivate an Air Contamination Source and/or Install an Air Cleaning Device**

This application must be submitted with the General Information Form (GIF).

Before completing this form, read the instructions provided for the form.

**Section A - Facility Name, Checklist And Certification**

Organization Name or Registered Fictitious Name/Facility Name: MarkWest Liberty Midstream & Resources, LLC  
DEP Client ID# (if known): 30-0528059

Type of Review required and Fees:

- Source which is not subject to NSPS, NESHAPs, MACT, NSR and PSD: ..... \$ \_\_\_\_\_
- Source requiring approval under NSPS or NESHAPS or both: ..... \$ 7,500
- Source requiring approval under NSR regulations: ..... \$ \_\_\_\_\_
- Source requiring the establishment of a MACT limitation: ..... \$ \_\_\_\_\_
- Source requiring approval under PSD: ..... \$ \_\_\_\_\_

**Applicant's Checklist**

Check the following list to make sure that all the required documents are included.

- General Information Form (GIF)**
- Processes Plan Approval Application**
- Compliance Review Form** or provide reference of most recently submitted compliance review form for facilities submitting on a periodic basis: \_\_\_\_\_
- Copy and Proof of County and Municipal Notifications**
- Permit Fees**
- Addendum A:** Source Applicable Requirements (only applicable to existing Title V facility)

**Certification of Truth, Accuracy and Completeness by a Responsible Official**

I, Sam Schubach, certify under penalty of law in 18 Pa. C. S. A. §4904, and 35 P.S. §4009(b) (2) that based on information and belief formed after reasonable inquiry, the statements and information in this application are true, accurate and complete.

(Signature): *Sam Schubach*  
Name (Print): Sam Schubach

Date: 6/29/2022  
Title: VP G&P Operations East

**OFFICIAL USE ONLY**

Application No. \_\_\_\_\_ Unit ID \_\_\_\_\_ Site ID \_\_\_\_\_  
DEP Client ID #: \_\_\_\_\_ APS. ID \_\_\_\_\_ AUTH. ID \_\_\_\_\_  
Date Received \_\_\_\_\_ Date Assigned \_\_\_\_\_ Reviewed By \_\_\_\_\_  
Date of 1<sup>st</sup> Technical Deficiency \_\_\_\_\_ Date of 2<sup>nd</sup> Technical Deficiency \_\_\_\_\_  
Comments: \_\_\_\_\_

## Section B - Processes Information

### 1. Source Information

Source Description (give type, use, raw materials, product, etc). Attach additional sheets as necessary.

Harmon Creek Cryo II (260 MMSCFD) will include one (1) new 19.62 MMBtu/hr heater. Potential de minimis increases at the facility will include maintenance blowdowns from three (3) new electric-driven compressors, fugitive emissions from added components, and one (1) new 500-gallon methanol tank. The existing plant flare PTE will remain unchanged. However, maintenance blowdowns and PSVs from Harmon Creek Cryo II will be controlled by the process flare.

Manufacturer Tulsa Heaters	Model No. H-2711	Number of Sources 1
Source Designation Regen Heater	Maximum Capacity 19.62 MMBtu/r (HHV)	Rated Capacity 16.21 MMBtu/hr

Type of Material Processed  
16.21 MMBtu/hr

### Maximum Operating Schedule

Hours/Day 24	Days/Week 7	Days/Year 365	Hours/Year 8760
-----------------	----------------	------------------	--------------------

Operational restrictions existing or requested, if any (e.g., bottlenecks or voluntary restrictions to limit PTE)

### Capacity (specify units)

Per Hour	Per Day 260 MMSCF	Per Week	Per Year
----------	----------------------	----------	----------

### Operating Schedule

Hours/Day 24	Days/Week 7	Days/Year 365	Hours/Year 8760
-----------------	----------------	------------------	--------------------

Seasonal variations (Months) From \_\_\_\_\_ to \_\_\_\_\_

If variations exist, describe them

### 2. Fuel

Type	Quantity Hourly	Annually	Sulfur	% Ash (Weight)	BTU Content
Oil Number _____	GPH @ 60°F	X 10 <sup>3</sup> Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Oil Number _____	GPH @ 60°F	X 10 <sup>3</sup> Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Natural Gas	SCFH	0.017 X 10 <sup>6</sup> SCF	grain/100 SCF		1153 Btu/SCF
Gas (other) _____	SCFH	X 10 <sup>6</sup> SCF	grain/100 SCF		Btu/SCF
Coal	TPH	Tons	% by wt		Btu/lb
Other *					

\*Note: Describe and furnish information separately for other fuels in Addendum B.



### Section B - Processes Information (Continued)

#### 3. Burner

Manufacturer Tulsa Heaters	Type and Model No. H-2711	Number of Burners 1
-------------------------------	------------------------------	------------------------

Description:  
Cryo II Regeneration Heater

Rated Capacity 16.21 MMBtu/hr	Maximum Capacity 19.62 MMBtu/hr
----------------------------------	------------------------------------

#### 4. Process Storage Vessels

##### A. For Liquids: *(New Source)*

Name of material stored  
Methanol

Tank I.D. No. TK-1102	Manufacturer Exterran	Date Installed Upon Approval
--------------------------	--------------------------	---------------------------------

Design Pressure 16 oz/in <sup>2</sup>	Capacity (gallons/Meter <sup>3</sup> ) 500
--	---

Type of relief device (pressure set vent/conservation vent/emergency vent/open vent)  
N/A

Relief valve/vent set pressure (psig) N/A	Vapor press. of liquid at storage temp. (psia/kPa) N/A
--	---

Type of Roof: Describe:  
None – Horizontal tank

Total Throughput Per Year 3,000 gal	Number of fills per day (fill/day): Filling Rate (gal./min.): Duration of fill hr./fill):
--	---

##### B. For Solids – *Not Applicable*

Type:  Silo  Storage Bin  Other, Describe \_\_\_\_\_ Name of Material Stored \_\_\_\_\_

Silo/Storage Bin I.D. No.	Manufacturer	Date Installed
---------------------------	--------------	----------------

State whether the material will be stored in loose or bags in silos	Capacity (Tons)
---	-----------------

Turn over per year in tons	Turn over per day in tons
----------------------------	---------------------------

Describe fugitive dust control system for loading and handling operations

Describe material handling system

#### 5. Request for Confidentiality

Do you request any information on this application to be treated as "Confidential"?  Yes  No  
If yes, include justification for confidentiality. Place such information on separate pages marked "**confidential**".

## Section B - Processes Information (Continued)

### 6. Miscellaneous Information

Attach flow diagram of process giving all (gaseous, liquid and solid) flow rates. Also, list all raw materials charged to process equipment, and the amounts charged (tons/hour, etc.) at rated capacity (give maximum, minimum and average charges describing fully expected variations in production rates). Indicate (on diagram) all points where contaminants are controlled (location of water sprays, collection hoods, or other pickup points, etc.). Describe collection hoods location, design, airflow and capture efficiency. Describe any restriction requested and how it will be monitored.

See PFD appended.

Describe fully the facilities provided to monitor and to record process operating conditions, which may affect the emission of air contaminants. Show that they are reasonable and adequate.

A fuel usage meter will be installed to monitor fuel consumption by the heater (032).

Describe each proposed modification to an existing source.

Pigging frequency is expected to increase. However, the frequency is not anticipated to be greater than that included in the modification application submitted on 12/10/2020. Therefore, potential emission estimates will remain unchanged. Pigging emissions will be controlled by the plant flare.

The plant flare (C601), currently authorized under GP5-63-01011A, will control the proposed compressor maintenance blowdowns and emissions from pressure relief valves, where feasible. The potential-to-emit from the flare in the applications submitted on 6/12/2017 and 12/10/2020 included Cryo II and is not being increased under this application. However, the construction period for Cryo II has lapsed and requires authorization to construct. The basis for the potential emission estimates in the two previous applications will remain unchanged in this plan approval application.

Identify and describe all fugitive emission points, all relief and emergency valves and any by-pass stacks.

The potential emission estimates attached have accounted for fugitive emission points associated with the new equipment. Some pressure relief devices, where feasible, will be controlled by the plant flare.

Pumps are monitored via weekly inspections and monthly Method 21. MPLX conducts a quarterly LDAR program using a gas leak detector approved for Method 21 and/or an OGI camera. In addition, Harmon Creek operators conduct daily AVO inspections.

Describe how emissions will be minimized especially during start up, shut down, process upsets and/or disruptions.

Consistent with the 2018 Consent Decree (CD), pigging equipment at Harmon Creek is equipped with pig ramps and grounded steel receptacles that are covered when not in use, and vapors from depressurizing pigging barrels are routed to the plant flare. The CD requires high pressure pigging equipment to be connected to a low pressure gathering line where commercially reasonable and technically feasible. The connection of the high pressure launcher to a low pressure line would require MPLX to use more than 100 feet of piping and connect to a line located outside the fence line of the facility. Thus, per the CD, jumper lines at Harmon Creek are not commercially reasonable and technically feasible.

When feasible, emissions from compressor blowdowns and facility outages will be routed to the plant flare.

Anticipated Milestones:

- i. Expected commencement date of construction/reconstruction/installation: January 2023
- ii. Expected completion date of construction/reconstruction/installation: January 2024
- iii. Anticipated date of start-up: January 2024



**Section C - Air Cleaning Device**

**1. Precontrol Emissions\* - See *Emission Calculations Attached***

Pollutant	Maximum Emission Rate			Calculation/ Estimation Method
	Specify Units	Pounds/Hour	Hours/Year	
PM				
PM <sub>10</sub>				
SO <sub>x</sub>				
CO				
NO <sub>x</sub>				
VOC				
Others: (e.g., HAPs)	-----	-----	-----	-----

\* These emissions must be calculated based on the requested operating schedule and/or process rate, e.g., operating schedule for maximum limits or restricted hours of operation and/or restricted throughput. Describe how the emission values were determined. Attach calculations.

**2. Gas Cooling – N/A**

Water quenching <input type="checkbox"/> Yes <input type="checkbox"/> No		Water injection rate _____ GPM	
Radiation and convection cooling <input type="checkbox"/> Yes <input type="checkbox"/> No		Air dilution <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, _____ CFM	
Forced Draft <input type="checkbox"/> Yes <input type="checkbox"/> No		Water cooled duct work <input type="checkbox"/> Yes <input type="checkbox"/> No	
Other			
Inlet Volume _____ ACFM @ _____ °F _____ % Moisture		Outlet Volume _____ ACFM @ _____ °F _____ % Moisture	

Describe the system in detail.

### Section C - Air Cleaning Device (Continued)

#### 12. Flares *(Existing Source)*

##### Equipment Specifications

Manufacturer John Zink	Type <input type="checkbox"/> Elevated flare <input type="checkbox"/> Ground flare <input checked="" type="checkbox"/> Other <u>Air Assisted</u> Describe	Model No. EEF Series	
Design Volume (SCFM) Design Volumes provided by manufacturer varies based on different scenarios. Facility Potential Volume: 100 mmscf/yr	Dimensions of stack (ft.) Diameter <u>6'11"</u> Height <u>199</u>		
Residence time (sec.) and outlet temperature (°F)	Turn down ratio	Burner details Waste gas	
Describe the flare design (air/steam-assisted or nonassisted), essential auxiliaries including pilot flame monitor of proposed flare with a sketch.  Stable in winds up to a velocity of 160 mph in all positions around the flare tip, the WindPROOF Pilot consists of a tip and tip windshield, ignition and fuel piping, venturi mixer, strainer, and a mixer windshield. Also included are two integral thermowells for thermocouple pilot detection. Two blowers to supply low pressure air are provided with the air assisted flare. The motors driving these blowers are designed to operate with a Variable Frequency Drive (VFD). The VFD allows a wide range of rotational speeds (typically from 10 to 100%).			
Describe the operation of the flare's ignition system.  The Zeus Electric Spark Ignitor delivers a spark at the end of a probe mounted on the Zeus equipped pilot. The spark ignites a small slip stream of gas/air mixture taken from the main pilot supply above the pilot mixer. The flame front generated at the probe travels a short distance from the end of the probe to the pilot ignition hood where it lights the pilot. The Zeus ignitor control box located in a panel at grade uses a capacitive discharge to generate a periodic spark approximately once every 8 seconds.			
Describe the provisions to introduce auxiliary fuel to the flare. None needed.			
<b>Operation Parameters</b>			
Detailed composition of the waste gas Conservatively assumes facility inlet. See detailed emission calculations attached.	Heat content 1413.78	Exit velocity Maximum velocity calculated based on manufacturer provided design scenario flowrate is 83.3 ft/s	
Maximum and average gas flow burned (ACFM) Maximum flow rate based on manufacturer provided design scenarios is 558,500 lb/hr. Facility Potential Volume: 100 mmscf/yr	Operating temperature (°F) Varies		
Describe the warning/alarm system that protects against operation when unit is not meeting design requirements.  Alarms are set to trigger when specific conditions are met such as the absence of a pilot flame. The conditions which trigger alarms are determined based on Cause and Effect control documents.			
<b>Emissions Data</b>			
<b>Pollutant</b>	<b>Inlet</b>	<b>Outlet</b>	<b>Removal Efficiency (%)</b>
VOC	673.04 tpy	13.46 tpy	98%
HAP	48.82 tpy	0.98 tpy	98%

**Section C - Air Cleaning Device (Continued)**

**13. Other Control Equipment – N/A**

**Equipment Specifications**

Manufacturer	Type	Model No.
--------------	------	-----------

Design Volume (SCFM)	Capacity
----------------------	----------

Describe pH monitoring and pH adjustment, if any.

Indicate the liquid flow rate and describe equipment provided to measure pressure drop and flow rate, if any.

Attach efficiency curve and/or other efficiency information.

Attach any additional data including auxiliary equipment and operation details to thoroughly evaluate the control equipment.

**Operation Parameters**

Volume of gas handled  
 \_\_\_\_\_ ACFM @ \_\_\_\_\_ °F \_\_\_\_\_ % Moisture

Describe fully giving important parameters and method of operation.

Describe the warning/alarm system that protects against operation when unit is not meeting design requirements.

**Emissions Data**

Pollutant	Inlet	Outlet	Removal Efficiency (%)

**Section C - Air Cleaning Device (Continued)**

**14. Costs**

Indicate cost associated with air cleaning device and its operating cost (attach documentation if necessary)

The plant flare is an existing source.

Device	Direct Cost	Indirect Cost	Total Cost	Annual Operating Cost

**15. Miscellaneous**

Describe in detail the removal, handling and disposal of dust, effluent, etc. from the air cleaning device including proposed methods of controlling fugitive emissions.

N/A

Attach manufacturer's performance guarantees and/or warranties for each of the major components of the control system (or complete system).

The existing plant flare has guaranteed destruction efficiency of 98%

Attach the maintenance schedule for the control equipment and any part of the process equipment that if in disrepair would increase air contaminant emissions.

**Section D - Additional Information**

Will the construction, modification, etc. of the sources covered by this application increase emissions from other sources at the facility? If so, describe and quantify.

No. All sources with the potential to increase in emissions have been included in this application.

If this project is subject to any one of the following, attach a demonstration to show compliance with applicable standards.

- a. Prevention of Significant Deterioration permit (PSD), 40 CFR 52?  YES  NO
- b. New Source Review (NSR), 25 Pa. Code Chapter 127, Subchapter E?  YES  NO
- c. New Source Performance Standards (NSPS), 40 CFR Part 60?  
(If Yes, which subpart) OOOOa, Dc  YES  NO
- d. National Emissions Standards for Hazardous Air Pollutants (NESHAP),  
40 CFR Part 61? (If Yes, which subpart) \_\_\_\_\_  YES  NO
- e. Maximum Achievable Control Technology (MACT) 40 CFR Part 63?  
(If Yes, which part) \_\_\_\_\_  YES  NO

Attach a demonstration showing that the emissions from any new sources will be the minimum attainable through the use of best available technology (BAT).

As requested by the Department, MPLX is including a BAT analysis for the addition of an enclosed combustor to control Harmon Creek Cryo II.

The existing flare at Harmon Creek has a destruction efficiency of at least 98%, which is equivalent to the destruction efficiency of the enclosed combustor. Thus, no emission reductions will result from operating an enclosed combustor to control Harmon Creek II maintenance blowdowns and PSVs, demonstrating that the existing flare meets BAT.

Additional pilot and purge gas would be required to operate an enclosed combustor, increasing emissions at the facility. The PTE increase is summarized in the BAT Cost Table below. The basis for the enclosed combustor emission estimates is provided on page 23 of the application.

The direct cost for the enclosed combustor is provided in the table on page 24 of the application. Indirect costs have been estimated based on costs for similar projects.

As demonstrated in this section, the installation and operation of an enclosed combustor would increase emissions at Harmon Creek and thus, is not economically reasonable.

**Best Available Technology Costs**

Device	Direct Cost	Indirect Cost	Total Cost	Annual Operating Cost	PTE Change (TPY)
Enclosed Combustor	\$10,000,000	\$10,000,000	\$20,000,000		VOC: +0.01 CO: +2.04 NOx: +0.45 PM: +0.05 CO2: +771.55 CH4: +4.90

Provide emission increases and decreases in allowable (or potential) and actual emissions within the last five (5) years for applicable PSD pollutant(s) if the facility is an existing major facility (PSD purposes).

Not Applicable

**Enclosed Combustor  
 Pilot and Purge Emission Estimates**

<b>Source Designation:</b>	
Manufacturer:	Zeeco
Operating Hours: (hr/yr)	8,760
Pilot + Purge Gas Heat Input (MMBtu/hr)	1.503
Pilot + Purge Gas Annual Fuel Use (mmscf/yr)	12.439
Pilot Fuel Consumption (mmscf/hr):	1.10E-03
Purge Fuel Consumption (mmscf/hr):	3.20E-04
Fuel HHV (Btu/scf)	1,059

**Total Emissions**

<b>Pollutant</b>	<b>Emission Factor (lb/MMBtu)</b>	<b>lb/hr</b>	<b>tpy</b>
VOC	--	0.00	0.01
HAP	--	0.00	0.00
NO <sub>x</sub>	0.068	0.10	0.45
CO	0.31	0.47	2.04
SO <sub>2</sub>	0.0006	0.00	0.00
PM Total	0.0075	0.01	0.05
PM Condensable	0.0056	0.01	0.04
PM <sub>10</sub> (Filterable)	0.0019	0.00	0.01
PM <sub>2.5</sub> (Filterable)	0.0019	0.00	0.01
CO <sub>2</sub>	117.05	176.15	771.55
CH <sub>4</sub>	0.002	1.12	4.90
N <sub>2</sub> O	0.0002	0.00	0.00


<sup>a</sup> The NO<sub>x</sub> and CO emission factors are from AP-42 Section 13.5 "Industrial Flares" Table 13.5-1.

<sup>b</sup> Emission factors for GHG pollutants from 40 CFR Part 98, Subpart C. Tables C-1 and C-2.

<sup>c</sup> The remaining factors are from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1 and 1.4-2.

<sup>d</sup> VOC and HAP emissions are based on mass balance.

**PROCESS CONDITIONS**

Description	Deethanizer Plant				Cryo Plant					Global	Plant Inlet
	PSV-251	PSV-155/156/157	PSV-456	PSV-458	PSV-422B	PSV-321	PSV-140/1/2	PSV-521 New	PSV-151/2/3/4D	Multiple	
Case	DeC2 Reboiler Reflux Failure	Refrig Comp Blocked Outlet	C3+ Tank Fire	Ethane Tank Fire	DeC1 Surge Tank Fire	A-321 Control Failure	Refrig Comp Blocked Outlet	Demethanizer LCV Bypass Failure	Residue Comp Blocked Outlet	Power Failure	Slug Catcher Fire
PSV Set Pressure	550	350	550	550	550	540	350	550	1310	--	1440
Flow Rate (lb/hr)	528,094	754,400	843,008	415,642	296,598	711,364	754,400	663,115	1,117,000	1,244,327	732,000
Molecular Weight	48.1	44.1	50.3	29.9	50.87	21.76	44.1	20.88	18.8	21.97	39.46
Lower Heating Value (Btu/SCF)	2515	2317	2624	1610	2651	1187	2317	1149	1039	1205	2068
Temperature @ Inlet (°F)	265	142	60	-127	275	108	142	-38.6	186	58.4	400
Smokeless Requirements (%)	100	100	0	0	100	100	100	0	0	0	0
Allowable pressure @ Inlet (psig)	Vendor	Vendor	Vendor	Vendor	Vendor	Vendor	Vendor	Vendor	Vendor	Vendor	Vendor
Composition (mol%)											
C1	0.00	0.00	0.00	1.97	0.00	74.31	0.00	76.43	81.49	73.06	38.35
C2	2.18	1.00	1.38	97.63	1.32	15.54	1.00	15.32	16.95	16.45	18.10
C3	73.41	98.00	65.54	0.40	62.98	5.87	98.00	5.27	0.89	6.23	13.79
i-C4	5.56	1.00	6.39	0.00	6.75	0.64	1.00	0.50	0.03	0.69	2.68
n-C4	13.51	0.00	16.96	0.00	18.23	1.79	0.00	1.31	0.05	1.91	9.03
C5+	5.34	0.00	9.73	0.00	10.22	1.31	0.00	0.61	0.00	1.14	17.79
H2S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
H2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N2	0.00	0.00	0.00	0.00	0.50	0.39	0.00	0.40	0.43	0.38	0.14
O2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C6H6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NH3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Others-CO2	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.15	0.16	0.15	0.12
<b>ZEECO NOTES BELOW</b>											
<b>No Units</b>	1	1	1	1	1	1	1	1	2	2	1
 Chamber Diameter (FT)		74	78			74	74		68	72	74
Chamber Height (FT)		124	124			122	124		115	113	120
Overall Height (FT)		152	154			150	152		140	140	148
WF Diameter (FT)		105	110			105	105		96	102	105
<b>Budgetary Price</b>		\$ 5,700,000.00	\$ 6,500,000.00			\$ 5,700,000.00	\$ 5,700,000.00		\$ 9,000,000.00	\$ 10,000,000.00	\$ 5,700,000.00
<b>Delivery (Weeks)</b>		58	62			58	58		66	66	58



**Section D - Additional Information (Continued) – *Not Applicable***

Indicate emission increases and decreases in tons per year (tpy), for volatile organic compounds (VOCs) and nitrogen oxides (NOx) for NSR applicability since January 1, 1991 or other applicable dates (see other applicable dates in instructions). The emissions increases include all emissions including stack, fugitive, material transfer, other emission generating activities, quantifiable emissions from exempted source(s), etc.

Permit number (if applicable)	Date issued	Indicate <b>Yes</b> or <b>No</b> if emission increases and decreases were used previously for netting	Source I. D. or Name	VOCs		NOx	
				Emission increases in potential to emit  (tpy)	Creditable emission decreases in actual emissions  (tpy)	Emission increases in potential to emit  (tpy)	Creditable emission decreases in actual emissions  (tpy)

- If the source is subject to 25 Pa. Code Chapter 127, Subchapter E, New Source Review requirements,
- a. Identify Emission Reduction Credits (ERCs) for emission offsets or demonstrate ability to obtain suitable ERCs for emission offsets.
  - b. Provide a demonstration that the lowest achievable emission rate (LAER) control techniques will be employed (if applicable).
  - c. Provide an analysis of alternate sites, sizes, production processes and environmental control techniques demonstrating that the benefits of the proposed source outweigh the environmental and social costs (if applicable).

Attach calculations and any additional information necessary to thoroughly evaluate compliance with all the applicable requirements of Article III and applicable requirements of the Clean Air Act adopted thereunder. The Department may request additional information to evaluate the application such as a standby plan, a plan for air pollution emergencies, air quality modeling, etc.

### Section E - Compliance Demonstration

**Note: Complete this section if source is not a Title V facility. Title V facilities must complete Addendum A.**

**Method of Compliance Type:** Check all that apply and complete all appropriate sections below

- Monitoring                       Testing                                       Reporting  
 Recordkeeping                       Work Practice Standard

**Monitoring: Regen Heater**

- a. Monitoring device type (Parameter, CEM, etc):      Fuel gas meter
- b. Monitoring device location:      Regen heater (032) fuel gas header
- c. Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:  
Daily fuel gas usage

**Monitoring: Fugitive Components**

- a. Monitoring device type (Parameter, CEM, etc):      Method 21 or OGI
- b. Monitoring device location:      Portable
- c. Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

Component Type	Monitoring Frequency	Detection Level (PPMV)
Compressor	Quarterly/Annually	10,000 (OGI) / 500
Connector	Quarterly/Annually	10,000 (OGI) / 500
Pressure Relief	Quarterly	500
Valve	Quarterly	500
Pump	Monthly	2,000

**Recordkeeping:**

Describe what parameters will be recorded and the recording frequency:  
Regen Heater - Daily fuel usage

**Reporting:**

- a. Describe what is to be reported and frequency of reporting:  
Regen Heater – Date of construction (within 30 days) and startup (within 15 days) notifications  
Fugitives - Semiannual reports per 40 CFR § 60.5422a
- b. Reporting start date: Fugitives - 6 months after the initial startup date

## Section F - Flue and Air Contaminant Emission

### 1. Estimated Atmospheric Emissions\*

Pollutant	Maximum emission rate			Calculation/ Estimation Method
	specify units (lb/mmscf) (lb/mmbtu)*	lbs/hr	tons/yr.	
PM	8.59	0.146	0.640	AP-42
PM <sub>10</sub>	2.15	0.037	0.160	AP-42
SO <sub>x</sub>	0.68	0.012	0.051	AP-42
CO	0.04*	0.785	3.438	Manufacturer Guarantee
NO <sub>x</sub>	0.04*	0.785	3.438	Manufacturer Guarantee
VOC	0.019*	0.373	1.633	Manufacturer Guarantee
HAPs	2.135	0.036	0.159	AP-42

\* These emissions must be calculated based on the requested operating schedule and/or process rate e.g., operating schedule for maximum limits or restricted hours of operation and /or restricted throughput. Describe how the emission values were determined. Attach calculations.

### 2. Stack and Exhauster

Stack Designation/Number S032

List Source(s) or source ID exhausted to this stack:  
032

% of flow exhausted to stack: 100

Stack height above grade (ft.) 20  
Grade elevation (ft.) Approx 1170

Stack diameter (ft) or Outlet duct area (sq. ft.)  
2.5

f. Weather Cap  
 YES  NO

Distance of discharge to nearest property line (ft.). Locate on topographic map.  
>500

Does stack height meet Good Engineering Practice (GEP)?  
Yes

If modeling (estimating) of ambient air quality impacts is needed, attach a site plan with buildings and their dimensions and other obstructions. N/A

Location of stack** Latitude/Longitude Point of Origin	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
<u>Approximate Location of Cryo II</u>	<u>40</u>	<u>24</u>	<u>15</u>	<u>80</u>	<u>21</u>	<u>31</u>

Stack exhaust

Volume 15,796 lb/hr

Temperature 461 °F

Moisture N/A %

Indicate on an attached sheet the location of sampling ports with respect to exhaust fan, breeching, etc. Give all necessary dimensions.  
N/A

Exhauster (attach fan curves) \_\_\_\_\_ in. of water \_\_\_\_\_ HP @ \_\_\_\_\_ RPM.

\*\* If the data and collection method codes differ from those provided on the General Information Form-Authorization Application, provide the additional detail required by that form on a separate form.

## Section G - Attachments

Number and list all attachments submitted with this application below:

- 1 - General Information Form
- 2 - Plan Approval Application Forms
- 3 - Compliance Review Form
- 4 - Proof of Municipal Notification
- 5 - Process Flow Diagram
- 6 - Detailed Emission Estimates, including Manufacturer Information and Gas Analyses
- 7 - Supporting Documentation
- 8 - Permitting Fees

## Compliance Review Form



COMMONWEALTH OF PENNSYLVANIA  
 DEPARTMENT OF ENVIRONMENTAL PROTECTION  
 BUREAU OF AIR QUALITY

## AIR POLLUTION CONTROL ACT COMPLIANCE REVIEW FORM

Fully and accurately provide the following information, as specified. Attach additional sheets as necessary.

**Type of Compliance Review Form Submittal (check all that apply)**

- |  |   |
|--|---|
| <input type="checkbox"/> Original Filing           | Date of Last Compliance Review Form Filing: |
| <input checked="" type="checkbox"/> Amended Filing | November 2018                               |

**Type of Submittal**

- |   |   |  |
|---|---|--|
| <input checked="" type="checkbox"/> New Plan Approval | <input type="checkbox"/> New Operating Permit | <input type="checkbox"/> Renewal of Operating Permit   |
| <input type="checkbox"/> Extension of Plan Approval   | <input type="checkbox"/> Change of Ownership  | <input type="checkbox"/> Periodic Submission (@ 6 mos) |
| <input type="checkbox"/> Other: _____                 |   |  |

**SECTION A. GENERAL APPLICATION INFORMATION**

**Name of Applicant/Permittee/("applicant")  
 (non-corporations-attach documentation of legal name)**

MarkWest Liberty Midstream and Resources, L.L.C.

**Address**      1515 Arapahoe Street, Tower 1, Suite 1600  
                     Denver, CO. 80202-2137

**Telephone**      (303) 925-9200      **Taxpayer ID#**      30-0528059

**Permit, Plan Approval or Application ID#**

**Identify the form of management under which the applicant conducts its business (check appropriate box)**

- |  |  |   |
|--|--|---|
| <input type="checkbox"/> Individual                    | <input type="checkbox"/> Syndicate           | <input type="checkbox"/> Government Agency                      |
| <input type="checkbox"/> Municipality                  | <input type="checkbox"/> Municipal Authority | <input type="checkbox"/> Joint Venture                          |
| <input type="checkbox"/> Proprietorship                | <input type="checkbox"/> Fictitious Name     | <input type="checkbox"/> Association                            |
| <input checked="" type="checkbox"/> Public Corporation | <input type="checkbox"/> Partnership         | <input type="checkbox"/> Other Type of Business, specify below: |
| <input type="checkbox"/> Private Corporation           | <input type="checkbox"/> Limited Partnership |   |

**Describe below the type(s) of business activities performed.**

MarkWest Liberty Midstream and Resources, L.L.C. is a natural gas gathering and processing company.

<b>SECTION B. GENERAL INFORMATION REGARDING "APPLICANT"</b>				
<p>If applicant is a corporation or a division or other unit of a corporation, provide the names, principal places of business, state of incorporation, and taxpayer ID numbers of all domestic and foreign parent corporations (including the ultimate parent corporation), and all domestic and foreign subsidiary corporations of the ultimate parent corporation with operations in Pennsylvania. Please include all corporate divisions or units, (whether incorporated or unincorporated) and privately held corporations. (A diagram of corporate relationships may be provided to illustrate corporate relationships.) Attach additional sheets as necessary.</p>				
Unit Name	Principal Places of Business	State of Incorporation	Taxpayer ID	Relationship to Applicant
No changes				
<b>SECTION C. SPECIFIC INFORMATION REGARDING APPLICANT AND ITS "RELATED PARTIES"</b>				
<p><b>Pennsylvania Facilities.</b> List the name and location (mailing address, municipality, county), telephone number, and relationship to applicant (parent, subsidiary or general partner) of applicant and all Related Parties' places of business, and facilities in Pennsylvania. Attach additional sheets as necessary.</p>				
Unit Name	Street Address	County and Municipality	Telephone No.	Relationship to Applicant
No changes				
<p><b>Provide the names and business addresses of all general partners of the applicant and parent and subsidiary corporations, if any.</b></p>				
Name	Business Address			
MPLX, LP	200 E. Hardin Street, Findlay, OH 45840			
MarkWest Energy Partners, L.P.	1515 Arapahoe St, Tower 1, Suite 1600, Denver, CO. 80016			
MarkWest Liberty M&R, L.L.C.	1515 Arapahoe St, Tower 1, Suite 1600, Denver, CO. 80016			
MarkWest Liberty Bluestone, L.L.C.	1515 Arapahoe St, Tower 1, Suite 1600, Denver, CO. 80202			
<p><b>List the names and business address of persons with overall management responsibility for the process being permitted (i.e. plant manager).</b></p>				
Name	Business Address			
Brandon Belford, Region Manager - Gathering	4600 J. Barry Ct., Canonsburg, PA. 15317			
Jonathan C. Jackson, VP Eastern Region G&P	4600 J. Barry Ct., Canonsburg, PA. 15317			
Gregory S. Floerke, EVP & COO MPLX	1515 Arapahoe St, Tower 1, Suite 1600, Denver, CO. 80016			
Sam Schupbach, VP Operations Processing	4600 J. Barry Ct., Canonsburg, PA. 15317			

**Plan Approvals or Operating Permits. List all plan approvals or operating permits issued by the Department or an approved local air pollution control agency under the APCA to the applicant or related parties that are currently in effect or have been in effect at any time 5 years prior to the date on which this form is notarized. This list shall include the plan approval and operating permit numbers, locations, issuance and expiration dates. Attach additional sheets as necessary.**

<b>Air Contamination Source</b>	<b>Plan Approval/ Operating Permit#</b>	<b>Location</b>	<b>Issuance Date</b>	<b>Expiration Date</b>
Houston Gas Plant	PA-63-00936F	800 Western Ave	10/4/2012	4/2019 (Renewal Submitted 10/25/2018) (Plan Approval Submitted 4/27/2021)
Baker CS	GP5-63-00960E/AG5-63-00013A & GP9-63-00960B	151 Baker Station Road	6/28/2021	6/28/2026
Brigich CS	GP5-63-00954C	340 Brigich Road	10/7/2010	10/7/2015 (SOOP Submitted 8/31/2020)
Carpenter CS	GP5-63-00987A	265 Old National Pike	11/10/2014	10/31/2019 (Renewal Submitted 10/1/2019)
Down Homes CS	GP5-63-1009A	2037 Sunnyhill Road	5/16/2017	5/16/2022
Dryer CS	SOOP-63-00942	819 Scenic Drive	10/13/2020	10/13/2025
Fulton CS	SOOP-63-00937	103 Washington Ave	10/13/2020	10/13/2025
Godwin CS	SOOP-63-00934	2158 Henderson Ave	7/29/2021	7/29/2026
Harmon Creek Gas Plant	GP1-63-01011A GP5-63-01011A	Smith Township	1/17/2018	1/17/2023 (GP-5 Modification Submitted 12/10/2020)
Hoskins CS	GP5-63-00938B	4026 Buffalo Creek Road	8/22/2017	8/22/2022 (SOOP Submitted 9/2020)
Imperial-Cibus Ranch CS	GP5-63-00992A	2213 Quiksilver Rd. 2199 Quiksilver Rd.	3/22/2022	3/22/2027
Johnston CS	SOOP-63-00933	210 Johnston Hill Road	3/22/2022	3/22/2027
Lowry CS	GP5-63-00947B	100 Oakleaf Rd	6/22/2017	6/22/2022 (SOOP Submitted 9/2020)
McMichael CS	GP5-04-00747	1982 Hookstown Grade Rd.	11/19/2018	10/31/2023
Redd CS	GP5-63-00962	576 Redd Run Rd.	7/2/2021	7/2/2026
Shaw CS	GP5-63-00940C	492 Arden Mine Rd	8/18/2011	8/18/2016 (SOOP Submitted 9/2/2020)
Smith CS	SOOP-63-00962	320 Point Pleasant Rd	Issued: 12/2/2019 Modified: 3/22/2022	12/2/2024



Stewart CS	SOOP-63-00939	185 Avella Road	7/6/2021	7/6/2026
Three Brothers CS	GP5-63-00969 & Plan Approval 63- 00969A	858 Atlasburg Road	12/30/2011 (GP5) 8/27/2012 (PA)	12/30/2016 (GP5) 11/2/2015 (PA) (Extension submitted 10/15/2015) (SOOP Submitted 9/12/2018)
Tupta Day CS	GP5-63-00948E	200 Johnson Rd	1/10/2022	1/10/2027
Welling CS	GP5-00958A	165 Carlisle Rd	1/30/2015	1/30/2020 (Renewal Submitted 1/3/2020) (SOOP Submitted 7/12/2021)
Sarsen Gas Plant	SOOP 10-00359	774 Prospect Rd.	12/03/2013	1/31/2024
Voll CS	SOOP-10-00367	318 Woodlands Rd. Evans City, PA	9/9/2020	8/31/2025
Trillith CS	GP5-10-370F	Southeast of intersection of Highway 79 an E Lancaster Rd	12/26/2018	11/30/2023
Royal Oak CS	SOOP 10-00390	961 Brownsdale Rd	12/16/2019	11/30/2024
Bluestone Gas Plant	TV-10-00368 PA-10-368G	440 Hartmann Rd.	2/20/2020 11/3/2020	1/31/2025 5/31/2022 (Administrative Modification Submitted to incorporate Plan App conditions into Title V permit).

**Compliance Background.** (Note: Copies of specific documents, if applicable, must be made available to the Department upon its request.) List all documented conduct of violations or enforcement actions identified by the Department pursuant to the APCA, regulations, terms and conditions of an operating permit or plan approval or order by applicant or any related party, using the following format grouped by source and location in reverse chronological order. Attach additional sheets as necessary. See the definition of "documented conduct" for further clarification. Unless specifically directed by the Department, deviations which have been previously reported to the Department in writing, relating to monitoring and reporting, need not be reported.

Date	Location	Plan Approval/ Operating Permit#	Nature of Documented Conduct	Type of Department Action	Status: Litigation Existing/Continuing or Corrected/Date	Dollar Amount Penalty
No change						\$
						\$
						\$
						\$
						\$
						\$

List all incidents of deviations of the APCA, regulations, terms and conditions of an operating permit or plan approval or order by applicant or any related party, using the following format grouped by source and location in reverse chronological order. This list must include items both currently known and unknown to the Department. Attach additional sheets as necessary. See the definition of "deviations" for further clarification.

Date	Location	Plan Approval/ Operating Permit#	Nature of Deviation	Incident Status: Litigation Existing/Continuing Or Corrected/Date
July 6, 2015	Various	--	Pig Launcher/Receiver Permitting	Signed Consent Decree with USEPA and PADEP. 7/19/2018
2016	Houston Plant and Other Gas Plants	PA-63-00936F	LDAR	Signed Consent Decree with USEPA and PADEP. 1/9/2019
March 23, 2017	Sarsen Gas Processing Plant	SOOP 10-00359	NSPS Subpart KKK	Signed Consent Decree with USEPA. 3/26/2017
August 28, 2020	Sarsen Gas Processing Plant	SOOP 10-00359	NSPS Subpart OOOO LDAR	Signed Consent Agreement and Final Order with USEPA. Filed 8/28/2020.

**CONTINUING OBLIGATION.** Applicant is under a continuing obligation to update this form using the Compliance Review Supplemental Form if any additional deviations occur between the date of submission and Department action on the application.

**VERIFICATION STATEMENT**

Subject to the penalties of Title 18 Pa.C.S. Section 4904 and 35 P.S. Section 4009(b)(2), I verify under penalty of law that I am authorized to make this verification on behalf of the Applicant/Permittee. I further verify that the information contained in this Compliance Review Form is true and complete to the best of my belief formed after reasonable inquiry. I further verify that reasonable procedures are in place to ensure that "documented conduct" and "deviations" as defined in 25 Pa Code Section 121.1 are identified and included in the information set forth in this Compliance Review Form.



6/29/2022

Signature

Date

Sam Schupbach

Name (Print or Type)

VP Operations Processing

Title

## Proof of Municipal Notifications



MarkWest Liberty Midstream and Resources, L.L.C.  
1515 Arapahoe Street  
Tower 1, Suite 1600  
Denver, CO 80202-2137  
(800) 730-8388  
(303) 925-9200  
(303) 825-0902 Fax

June 28, 2022

Tracking Number: 1Z2E23250291333723

Township Supervisors  
Smith Township  
PO Box 94  
Slovan, PA. 15078

Re: MarkWest Liberty Midstream and Resources, L.L.C.  
Harmon Creek Gas Plant  
Plan Approval Application

Dear Supervisors:

This letter is being sent to notify the Township Supervisors that MarkWest Liberty Midstream and Resources, L.L.C (MPLX) has applied to the Pennsylvania Department of Environmental Protection (PADEP) for an Air Quality Plan Approval for the Harmon Creek Gas Plant, located at 123 Point Pleasant Rd in Smith Township, Washington County, Pennsylvania.

MarkWest seeks to authorize the installation and operation of the following equipment at the facility:

- One (1) 260 mmscfd natural gas processing plant;
- One (1) regenerative heater rated at a maximum heat input of 19.62 MMBtu/hr;
- One (1) 500-gallon methanol storage tank;
- Three (3) electric-driven compressors and associated rod-packing venting; and
- Associated fugitive components.

De minimis emission increases associated with the existing pigging and truck loadout operations, in addition to emissions from maintenance blowdowns and some PSVs will be controlled by the existing process flare.

This notice is being provided in accordance with the requirements of 25 Pa. Code § 127.413 for municipal notification.

There is a 30-day comment period which begins upon receipt of this notice by the county. Anyone wishing to view this application may do so by making arrangements with:

Air Quality Program  
PADEP - Southwest Regional Office  
400 Waterfront Drive  
Pittsburgh, PA. 15222  
(412) 442-4000

If you have any questions about this application, please contact me at (412) 815-8886 or via email at [ajuarez@marathonpetroleum.com](mailto:ajuarez@marathonpetroleum.com).

Sincerely,

A handwritten signature in blue ink that reads "Alexandra M. Juarez". The signature is written in a cursive style with a large, stylized initial 'A'.

Alexandra M. Juarez  
G&P Engineer I

cc: MarkWest file

# Proof of Delivery

Dear Customer,

This notice serves as proof of delivery for the shipment listed below.

**Tracking Number**

1Z2E23250291333723

**Service**

UPS 2nd Day Air®

**Shipped / Billed On**

06/13/2022

**Delivered On**

06/29/2022 10:07 A.M.

**Delivered To**

SLOVAN, PA, US

**Received By**

KRENZLAK

Thank you for giving us this opportunity to serve you. Details are only available for shipments delivered within the last 120 days. Please print for your records if you require this information after 120 days.

Sincerely,

UPS

Tracking results provided by UPS: 06/29/2022 10:16 A.M. EST



MarkWest Liberty Midstream and Resources, L.L.C.  
1515 Arapahoe Street  
Tower 1, Suite 1600  
Denver, CO 80202-2137  
(800) 730-8388  
(303) 925-9200  
(303) 825-0902 Fax

June 28, 2022

Tracking Number: 1Z2E23250395329229

Washington County Commissioners  
Courthouse Square  
100 West Beau Street  
Suite 702  
Washington, PA 15301

Re: MarkWest Liberty Midstream and Resources, L.L.C.  
Harmon Creek Gas Plant  
Plan Approval Application

Dear Commissioners:

This letter is being sent to notify the County Commissioners that MarkWest Liberty Midstream and Resources, L.L.C (MPLX) has applied to the Pennsylvania Department of Environmental Protection (PADEP) for an Air Quality Plan Approval for the Harmon Creek Gas Plant, located at 123 Point Pleasant Rd in Smith Township, Washington County, Pennsylvania.

MarkWest seeks to authorize the installation and operation of the following equipment at the facility:

- One (1) 260 mmscfd natural gas processing plant;
- One (1) regenerative heater rated at a maximum heat input of 19.62 MMBtu/hr;
- One (1) 500-gallon methanol storage tank;
- Three (3) electric-driven compressors and associated rod-packing venting; and
- Associated fugitive components.

De minimis emission increases associated with the existing pigging and truck loadout operations, in addition to emissions from maintenance blowdowns and some PSVs will be controlled by the existing process flare.

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Air Quality Program  
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(412) 442-4000



If you have any questions about this application, please contact me at (412) 815-8886 or via email at [ajuarez@marathonpetroleum.com](mailto:ajuarez@marathonpetroleum.com).

Sincerely,

A handwritten signature in blue ink that reads "Alexandra M. Juarez". The signature is written in a cursive style with a large, stylized initial 'A'.

Alexandra M. Juarez  
G&P Engineer I

cc: MarkWest file

# Proof of Delivery

Dear Customer,

This notice serves as proof of delivery for the shipment listed below.

**Tracking Number**

1Z2E23250395329229

**Weight**

1.00 LBS

**Service**

UPS Ground

**Shipped / Billed On**

06/28/2022

**Delivered On**

06/29/2022 10:52 A.M.

**Delivered To**

WASHINGTON, PA, US

**Received By**

JANSETTE

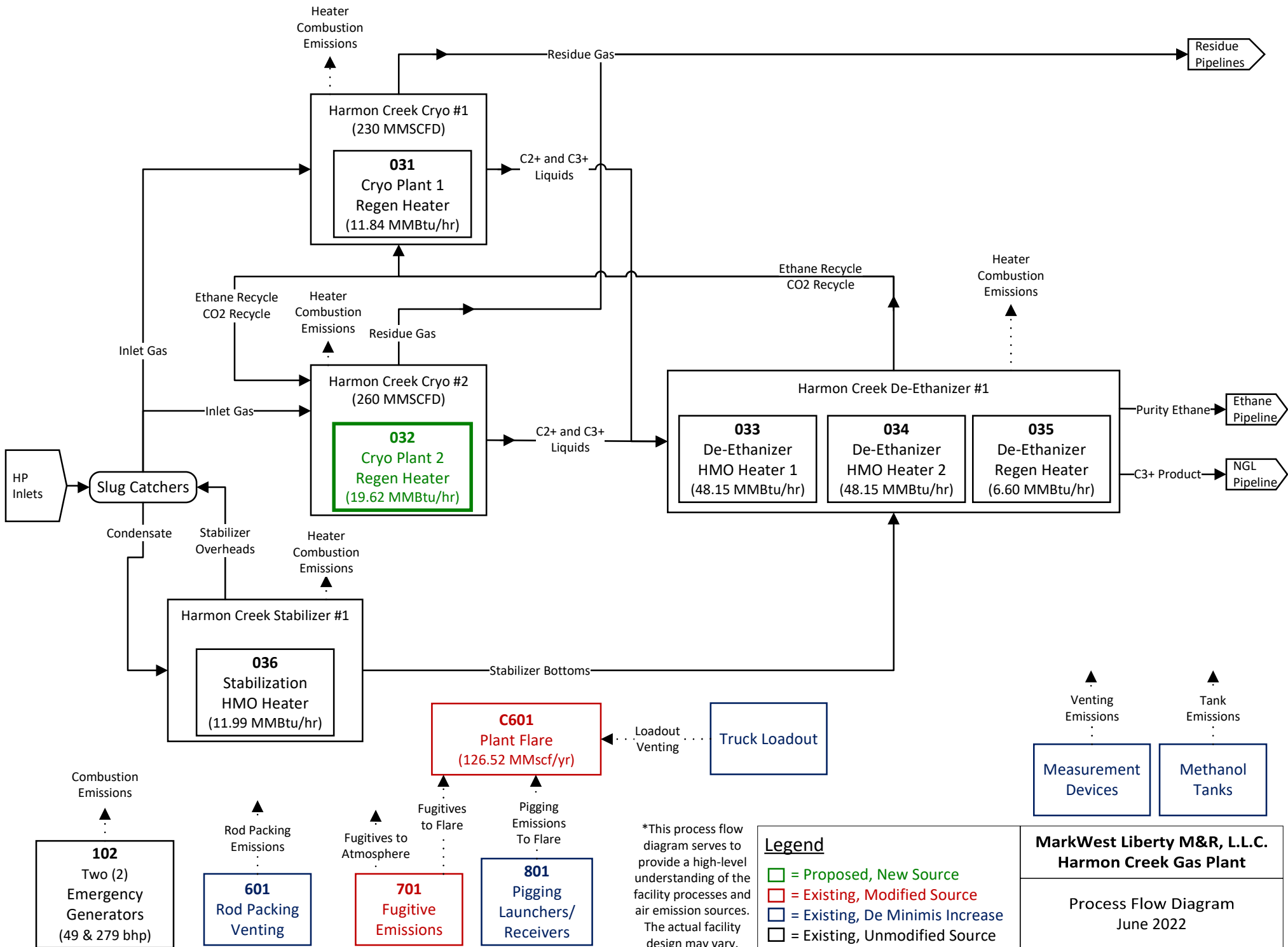
Thank you for giving us this opportunity to serve you. Details are only available for shipments delivered within the last 120 days. Please print for your records if you require this information after 120 days.

Sincerely,

UPS

Tracking results provided by UPS: 06/29/2022 10:55 A.M. EST

## Process Flow Diagram



\*This process flow diagram serves to provide a high-level understanding of the facility processes and air emission sources. The actual facility design may vary.

## Detailed Emission Estimates

MarkWest Liberty Midstream & Resources, L.L.C.  
Harmon Creek Gas Plant

Summary of Potential Emissions

**Criteria Pollutant Potential Emissions**

Process/Facility	Source ID	Potential Emissions (lb/hr)					
		NOx	CO	VOC	SO <sub>2</sub>	PM <sup>1</sup>	HAPs
Cryo Plant 1 Regen Heater (H-1711)	031	0.47	0.47	0.22	0.01	0.09	0.02
Cryo Plant 2 Regen Heater (H-2711)	032	0.78	0.78	0.37	0.01	0.15	0.04
De-Ethanizer HMO Heater 1 (H-1767)	033	1.93	1.93	0.91	0.03	0.36	0.09
De-Ethanizer HMO Heater 2 (H-1768)	034	1.93	1.93	0.91	0.03	0.36	0.09
Stabilization HMO Heater (H-1769)	036	0.48	0.48	0.23	0.01	0.09	0.02
De-Ethanizer Regen Heater (H-1775)	035	0.26	0.26	0.13	0.00	0.05	0.01
Process Flare	C601	1.23	5.61	3.07	0.01	0.11	0.22
Generac SD015	102	0.26	0.14	0.08	0.10	0.02	0.00
Generac SD150	102	1.31	0.55	0.41	0.10	0.04	0.01
Fugitives Emissions	701	--	--	--	--	--	--
Pigging*	801	--	--	--	--	--	--
Rod Packing	601	--	--	0.17	--	--	0.00
Drain Tank Loadout*	--	--	--	--	--	--	--
Methanol Tanks	--	--	--	0.08	--	--	0.08
Measurement Devices	--	--	--	0.24	--	--	0.02
<b>Future Site-Wide Emissions (lb/hr)</b>		<b>8.66</b>	<b>12.16</b>	<b>6.84</b>	<b>0.30</b>	<b>1.26</b>	<b>0.60</b>

<sup>1</sup> PM = PM<sub>10</sub> = PM<sub>2.5</sub>

Process/Facility	Source ID	Potential Emissions (tpy)					
		NOx	CO	VOC	SO <sub>2</sub>	PM <sup>1</sup>	HAPs
Cryo Plant 1 Regen Heater (H-1711)	031	2.07	2.07	0.98	0.03	0.39	0.10
Cryo Plant 2 Regen Heater (H-2711)	032	3.44	3.44	1.63	0.05	0.64	0.16
De-Ethanizer HMO Heater 1 (H-1767)	033	8.44	8.44	4.01	0.12	1.57	0.39
De-Ethanizer HMO Heater 2 (H-1768)	034	8.44	8.44	4.01	0.12	1.57	0.39
Stabilization HMO Heater (H-1769)	036	2.10	2.10	1.00	0.03	0.39	0.10
De-Ethanizer Regen Heater (H-1775)	035	1.16	1.16	0.55	0.02	0.22	0.05
Process Flare	C601	5.39	24.56	13.46	0.04	0.50	0.98
Generac SD015	102	0.07	0.04	0.02	0.03	0.01	0.00
Generac SD150	102	0.33	0.14	0.10	0.03	0.01	0.00
Fugitives Emissions	701	--	--	10.72	--	--	0.50
Pigging*	801	--	--	--	--	--	--
Rod Packing	601	--	--	0.75	--	--	0.01
Drain Tank Loadout*	--	--	--	--	--	--	--
Methanol Tanks	--	--	--	0.35	--	--	0.35
Measurement Devices	--	--	--	1.03	--	--	0.08
<b>Future Site-Wide Emissions (tpy)</b>		<b>31.42</b>	<b>50.38</b>	<b>38.62</b>	<b>0.47</b>	<b>5.29</b>	<b>3.10</b>

<sup>1</sup> PM = PM<sub>10</sub> = PM<sub>2.5</sub>

\* Emissions are controlled by the flare and thus, are accounted for in the process flare emissions.

**Hazardous Air Pollutant Potential Emissions**

Process/Facility	Source ID	HAPs - Potential Emissions (lb/hr)								
		Acetaldehyde	Acrolein	Benzene	Ethylbenzene	Formaldehyde	Methanol	n-Hexane	Toluene	Xylenes
Cryo Plant 1 Regen Heater (H-1711)	031	--	--	2.44E-05	--	8.70E-04	--	0.02	3.95E-05	--
Cryo Plant 2 Regen Heater (H-2711)	032	--	--	4.04E-05	--	1.44E-03	--	0.03	6.54E-05	--
De-Ethanizer HMO Heater 1 (H-1767)	033	--	--	9.91E-05	--	3.54E-03	--	0.08	1.60E-04	--
De-Ethanizer HMO Heater 2 (H-1768)	034	--	--	9.91E-05	--	3.54E-03	--	0.08	1.60E-04	--
Stabilization HMO Heater (H-1769)	036	--	--	2.47E-05	--	8.82E-04	--	0.02	4.00E-05	--
De-Ethanizer Regen Heater (H-1775)	035	--	--	1.36E-05	--	4.85E-04	--	0.01	2.20E-05	--
Process Flare	C601	--	--	--	--	--	--	--	--	--
Generac SD015	102	2.89E-04	3.48E-05	3.51E-04	--	4.44E-04	--	--	1.54E-04	1.07E-04
Generac SD150	102	1.42E-03	1.72E-04	1.73E-03	--	2.19E-03	--	--	7.59E-04	5.29E-04
Fugitives Emissions	701	--	--	--	--	--	--	--	--	--
Pigging*	801	--	--	--	--	--	--	--	--	--
Rod Packing	601	--	--	--	--	--	--	0.00	--	--
Drain Tank Loadout*	--	--	--	--	--	--	--	--	--	--
Methanol Tanks	--	--	--	--	--	--	8.04E-02	--	--	--
Measurement Devices	--	--	--	--	--	--	--	0.02	--	--
<b>Future Site-Wide Emissions (lb/hr)</b>		<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.01</b>	<b>0.08</b>	<b>0.28</b>	<b>0.00</b>	<b>0.00</b>

Process/Facility	Source ID	HAPs - Potential Emissions (tpy)								
		Acetaldehyde	Acrolein	Benzene	Ethylbenzene	Formaldehyde	Methanol	n-Hexane	Toluene	Xylenes
Cryo Plant 1 Regen Heater (H-1711)	031	--	--	1.07E-04	--	3.81E-03	--	0.09	1.73E-04	--
Cryo Plant 2 Regen Heater (H-2711)	032	--	--	1.77E-04	--	6.32E-03	--	0.15	2.87E-04	--
De-Ethanizer HMO Heater 1 (H-1767)	033	--	--	4.34E-04	--	1.55E-02	--	0.37	7.03E-04	--
De-Ethanizer HMO Heater 2 (H-1768)	034	--	--	4.34E-04	--	1.55E-02	--	0.37	7.03E-04	--
Stabilization HMO Heater (H-1769)	036	--	--	1.08E-04	--	3.86E-03	--	0.09	1.75E-04	--
De-Ethanizer Regen Heater (H-1775)	035	--	--	5.95E-05	--	2.13E-03	--	0.05	9.64E-05	--
Process Flare	C601	--	--	--	--	--	--	--	--	--
Generac SD015	102	7.22E-05	8.70E-06	8.78E-05	--	1.11E-04	--	--	3.85E-05	2.68E-05
Generac SD150	102	3.56E-04	4.29E-05	4.33E-04	--	5.47E-04	--	--	1.90E-04	1.32E-04
Fugitives Emissions	701	--	--	--	--	--	--	--	--	--
Pigging*	801	--	--	--	--	--	--	--	--	--
Rod Packing	601	--	--	--	--	--	--	0.01	--	--
Drain Tank Loadout*	--	--	--	--	--	--	--	--	--	--
Methanol Tanks	--	--	--	--	--	--	3.52E-01	--	--	--
Measurement Devices	--	--	--	--	--	--	--	0.08	--	--
<b>Future Site-Wide Emissions (tpy)</b>		<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.05</b>	<b>0.35</b>	<b>1.22</b>	<b>0.00</b>	<b>0.00</b>

\* Emissions are controlled by the flare and thus, are accounted for in the process flare emissions.

**Greenhouse Gas Potential Emissions**

Process/Facility	Source ID	GHG
		CO <sub>2</sub> e (tpy)
Cryo Plant 1 Regen Heater (H-1711)	031	6857
Cryo Plant 2 Regen Heater (H-2711)	032	11369
De-Ethanizer HMO Heater 1 (H-1767)	033	27893
De-Ethanizer HMO Heater 2 (H-1768)	034	27893
Stabilization HMO Heater (H-1769)	036	6946
De-Ethanizer Regen Heater (H-1775)	035	3824
Process Flare	C601	10622
Generac SD015	102	15
Generac SD150	102	76
Fugitives Emissions	701	306
Pigging*	801	--
Rod Packing	601	45
Methanol Tanks	--	--
Measurement Devices	--	82
<b>Future Site-Wide Emissions (tpy)</b>		<b>95,927.12</b>

\* Emissions are controlled by the flare and thus, are accounted for in the process flare emissions.



MarkWest Liberty Midstream & Resources, L.L.C.  
Harmon Creek Gas Plant

**Potential Emissions Increases from Project**

**Criteria Pollutant Potential Emissions Increase**

Process/Facility	Source ID	Potential Emissions (lb/hr)					
		NOx	CO	VOC	SO2	PM1	HAPs
Cryo Plant 2 Regen Heater (H-2711)	032	0.78	0.78	0.37	0.01	0.15	0.04
Process Flare	C601	0.00	0.00	0.00	0.00	0.00	0.00
Fugitives Emissions	701	--	--	--	--	--	--
Pigging (De Minimis)*	801	--	--	--	--	--	--
Rod Packing (De Minimis)	601	--	--	0.00	--	--	0.00
Drain Tank Loadout (De Minimis)*	--	--	--	--	--	--	--
Methanol Tanks (De Minimis)	--	--	--	0.04	--	--	0.04
Measurement Devices (Exempt)	--	--	--	0.06	--	--	0.00
<b>Future Site-Wide Emissions (lb/hr)</b>		<b>0.78</b>	<b>0.78</b>	<b>0.47</b>	<b>0.01</b>	<b>0.15</b>	<b>0.08</b>

1 PM = PM10 = PM2.5

Process/Facility	Source ID	Potential Emissions (tpy)					
		NOx	CO	VOC	SO2	PM1	HAPs
Cryo Plant 2 Regen Heater (H-2711)	032	3.44	3.44	1.63	0.05	0.64	0.16
Process Flare	C601	0.00	0.00	0.00	0.00	0.00	0.00
Fugitives Emissions	701	--	--	3.95	--	--	0.19
Pigging (De Minimis)*	801	--	--	--	--	--	--
Rod Packing (De Minimis)	601	--	--	0.001	--	--	0.00
Drain Tank Loadout (De Minimis)*	--	--	--	--	--	--	--
Methanol Tanks (De Minimis)	--	--	--	0.18	--	--	0.18
Measurement Devices (Exempt)	--	--	--	0.25	--	--	0.02
<b>Future Site-Wide Emissions (tpy)</b>		<b>3.44</b>	<b>3.44</b>	<b>6.02</b>	<b>0.05</b>	<b>0.64</b>	<b>0.54</b>

1 PM = PM10 = PM2.5

\* Emissions are controlled by the flare and thus, are accounted for in the process flare emissions.

**Hazardous Air Pollutant Potential Emissions**

Process/Facility	Source ID	HAPs - Potential Emissions (lb/hr)								
		Acetaldehyde	Acrolein	Benzene	Ethylbenzene	Formaldehyde	Methanol	n-Hexane	Toluene	Xylenes
Cryo Plant 2 Regen Heater (H-2711)	032	--	--	4.04E-05	--	1.44E-03	--	3.46E-02	6.54E-05	--
Process Flare	C601	--	--	--	--	--	--	--	--	--
Fugitives Emissions	701	--	--	--	--	--	--	--	--	--
Pigging (De Minimis)*	801	--	--	--	--	--	--	--	--	--
Rod Packing (De Minimis)	601	--	--	--	--	--	--	1.59E-07	--	--
Drain Tank Loadout (De Minimis)*	--	--	--	--	--	--	--	--	--	--
Methanol Tanks (De Minimis)	--	--	--	--	--	--	4.02E-02	--	--	--
Measurement Devices (Exempt)	--	--	--	--	--	--	--	4.21E-03	--	--
<b>Future Site-Wide Emissions (lb/hr)</b>		<b>0.00E+00</b>	<b>0.00E+00</b>	<b>4.04E-05</b>	<b>0.00E+00</b>	<b>1.44E-03</b>	<b>4.02E-02</b>	<b>3.88E-02</b>	<b>6.54E-05</b>	<b>0.00E+00</b>

Process/Facility	Source ID	HAPs - Potential Emissions (tpy)								
		Acetaldehyde	Acrolein	Benzene	Ethylbenzene	Formaldehyde	Methanol	n-Hexane	Toluene	Xylenes
Cryo Plant 2 Regen Heater (H-2711)	032	--	--	1.77E-04	--	6.32E-03	--	1.52E-01	2.87E-04	--
Process Flare	C601	--	--	--	--	--	--	--	--	--
Fugitives Emissions	701	--	--	--	--	--	--	--	--	--
Pigging (De Minimis)*	801	--	--	--	--	--	--	--	--	--
Rod Packing (De Minimis)	601	--	--	--	--	--	--	6.95E-07	--	--
Drain Tank Loadout (De Minimis)*	--	--	--	--	--	--	--	--	--	--
Methanol Tanks (De Minimis)	--	--	--	--	--	--	1.76E-01	--	--	--
Measurement Devices (Exempt)	--	--	--	--	--	--	--	1.84E-02	--	--
<b>Future Site-Wide Emissions (tpy)</b>		<b>0.00E+00</b>	<b>0.00E+00</b>	<b>1.77E-04</b>	<b>0.00E+00</b>	<b>6.32E-03</b>	<b>1.76E-01</b>	<b>1.70E-01</b>	<b>2.87E-04</b>	<b>0.00E+00</b>

\* Emissions are controlled by the flare and thus, are accounted for in the process flare emissions.

**Greenhouse Gas Potential Emissions**

Process/Facility	Source ID	GHG
		CO2(e) (tpy)
Cryo Plant 2 Regen Heater (H-2711)	032	1.14E+04
Process Flare	C601	0.00E+00
Fugitives Emissions	701	1.01E+02
Pigging (De Minimis)*	801	--
Rod Packing (De Minimis)	601	1.50E+01
Drain Tank Loadout (De Minimis)*	--	--
Methanol Tanks (De Minimis)	--	2.02E+01
<b>Future Site-Wide Emissions (tpy)</b>		<b>11,504.66</b>

\* Emissions are controlled by the flare and thus, are accounted for in the process flare emissions.

MarkWest Liberty Midstream & Resources, L.L.C.  
 Harmon Creek Gas Plant

**Cryo Plant II Regen Heaters  
 H-2711**

<b>Source Designation:</b>	
Manufacturer:	Tulsa Heaters
Year Installed	<i>Planned 2023</i>
Fuel Used:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,153
Max Design Heat Release (mmbtu/hr)	17.84
Heat Release (HHV) (mmbtu/hr)	19.62
Fuel Consumption (mmscf/hr):	0.0170
Potential Annual Hours of Operation (hr/yr):	8,760

**Criteria and Manufacturer Specific Pollutant Emission Rates**

<b>Pollutant</b>	<b>Emission Factor (lb/mmbtu) (lb/MMscf)<sup>a,b</sup></b>	<b>Potential Emissions</b>	
		<b>(lb/hr)<sup>c</sup></b>	<b>(tons/yr)<sup>d</sup></b>
NOx	0.04	0.785	3.438
CO	0.04	0.785	3.438
VOC	0.019	0.373	1.633
SO <sub>2</sub>	0.68	0.0115	0.0506
PM Total	8.59	0.1462	0.6404
PM Condensable	6.44	0.110	0.480
PM <sub>10</sub> (Filterable)	2.15	0.037	0.160
PM <sub>2.5</sub> (Filterable)	2.15	0.037	0.160
CO <sub>2</sub>	59.9 kg/mmbtu	2,593	11,357
CH <sub>4</sub>	0.001 kg/mmbtu	0.04890	0.214
N <sub>2</sub> O	0.0001 kg/mmbtu	0.00489	0.021

**Hazardous Air Pollutant (HAP) Potential Emissions**

Pollutant	Emission Factor (lb/MMscf) <sup>a</sup>	Potential Emissions	
		(lb/hr) <sup>c</sup>	(tons/yr) <sup>d</sup>
<b>HAPs:</b>			
3-Methylchloranthrene	2.03E-06	3.46E-08	1.52E-07
7,12-Dimethylbenz(a)anthracene	1.81E-05	3.08E-07	1.35E-06
Acenaphthene	2.03E-06	3.46E-08	1.52E-07
Acenaphthylene	2.03E-06	3.46E-08	1.52E-07
Anthracene	2.71E-06	4.62E-08	2.02E-07
Benz(a)anthracene	2.03E-06	3.46E-08	1.52E-07
Benzene	2.37E-03	4.04E-05	1.77E-04
Benzo(a)pyrene	1.36E-06	2.31E-08	1.01E-07
Benzo(b)fluoranthene	2.03E-06	3.46E-08	1.52E-07
Benzo(g,h,i)perylene	1.36E-06	2.31E-08	1.01E-07
Benzo(k)fluoranthene	2.03E-06	3.46E-08	1.52E-07
Chrysene	2.03E-06	3.46E-08	1.52E-07
Dibenzo(a,h) anthracene	1.36E-06	2.31E-08	1.01E-07
Dichlorobenzene	1.36E-03	2.31E-05	1.01E-04
Fluoranthene	3.39E-06	5.77E-08	2.53E-07
Fluorene	3.17E-06	5.39E-08	2.36E-07
Formaldehyde	8.48E-02	1.44E-03	6.32E-03
Hexane	2.03E+00	3.46E-02	1.52E-01
Indo(1,2,3-cd)pyrene	2.03E-06	3.46E-08	1.52E-07
Phenanthrene	1.92E-05	3.27E-07	1.43E-06
Pyrene	5.65E-06	9.62E-08	4.21E-07
Toluene	3.84E-03	6.54E-05	2.87E-04
Arsenic	2.26E-04	3.85E-06	1.69E-05
Beryllium	1.36E-05	2.31E-07	1.01E-06
Cadmium	1.24E-03	2.12E-05	9.27E-05
Chromium	1.58E-03	2.69E-05	1.18E-04
Cobalt	9.50E-05	1.62E-06	7.08E-06
Lead	5.65E-04	9.62E-06	4.21E-05
Manganese	4.30E-04	7.31E-06	3.20E-05
Mercury	2.94E-04	5.00E-06	2.19E-05
Nickel	2.37E-03	4.04E-05	1.77E-04
Selenium	2.71E-05	4.62E-07	2.02E-06
<b>Polycyclic Organic Matter:</b>			
Methylnaphthalene (2-)	2.71E-05	4.62E-07	2.02E-06
Naphthalene	6.90E-04	1.17E-05	5.14E-05
<b>Total HAP</b>	<b>2.135</b>	<b>0.036</b>	<b>0.159</b>

<sup>a</sup> Emission factors from manufacturers guarantees on VOC, NOx, and CO in lb/mmbtu. The remainder from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1, 1.4-2, & 1.4-3 (07/98) for all criteria and HAP pollutants, corrected to site-specific gas heat content.

<sup>b</sup> Emission factors for GHG pollutants from 40 CFR Part 98, Subpart C and corrected to site-specific gas heat content.

<sup>c</sup> Emission Rate (lb/hr) = Rated Capacity (MMscf/hr) × Emission Factor (lb/MMscf).

<sup>d</sup> Annual Emissions (tons/yr)<sub>Potential</sub> = (lb/hr)<sub>Emissions</sub> × (Maximum Allowable Operating Hours, 8760 hr/yr) × (1 ton/2000 lb).

**COMBUSTION DESIGN CONDITIONS**

1							
2							
3	Overall Performance:						
4	Operating Case	---	Design	Norm(Rej)	Norm(Rec)	Turndown	
5	Service	---	Regen Gas Heater	Regen Gas Heater	Regen Gas Heater	Regen Gas Heater	
6	Excess Air	mol%	15.0%	15.0%	15.0%	15.0%	
7	Calculated Heat Release (LHV)	MMBTU/ hr	16.21	14.58	13.93	9.26	
8	Guaranteed Efficiency	HR%	84.7%	84.7%	84.7%	84.7%	
9	Calculated Efficiency	HR%	87.7%	88.7%	89.1%	92.1%	
10	Radiation Loss	HR%	2.00%	2.00%	2.00%	2.00%	
11	Flow Rate, Combustion Gen./ Imp.	Lb/ hr	15,796	14,201	13,574	9,025	
12	Flue Gas Temp. Leaving (R/C)	°F	1,427 / 461	1,379 / 425	1,359 / 408	1,190 / 295	
13	Flue Gas Mass Velocity	Lb/ sec ft2	0.378	0.340	0.325	0.216	
14							

15	Fuel(s) Data:	Gas 1	Gas 2		Burner Design:		
16		Mol.Wt.	Mol.Wt.		OEM	---	Zeeco USA, LLC
17	LHV	BTU/ scf	910	1,037	Type	---	Enhanced IFGR
18	LHV	BTU/ Lb	21,397	20,449	Quantities	---	1 ULTRA Low NOx
19	P @ Burner	psig	150	150	Model No.	---	GLSF-12 Cylindrical
20	T @ Burner	°F	100	100	Windbox	---	yes ...
21	MW	Lb/ Lbmole	16.14	19.24	Location	---	EndWall Center ... Horizontally Fired
22	m @ ??? °F	cp	---	---	Pilot Design:		
23	m @ ??? °F	cp	---	---	Type / Model	Self-Inspiring	/ by O.E.M.
24	Atomizing Media		---	---	Ignition	---	Electric requires elec.ign.system
25	Atom. Media P & T		---	---	Heat Release	> 90000	BTU/ hr on ... Gas 1
26							

27	Components:				Burner Performance:		
28	N	wt%	---	---	Minimum Heat Release	MMBTU/ hr	3.57
29	S	wt%	---	---	Design Heat Release	MMBTU/ hr	16.21
30	Ash	wt%	---	---	Maximum Heat Release	MMBTU/ hr	17.84
31	Ni	ppm	---	---	Burner Turndown	Max:Min	5.00
32	Va	ppm	---	---	Volumetric Ht. Release	BTU/ hr ft3	6,967
33	Na	ppm	---	---	Pressure @ Arch	inH2O	0.30
34	Fe	ppm	---	---	Pressure @ Burner	inH2O	4.35
35					Combustion Air T @ Burner	°F	60
36	H2	mol%	0.0%	0.0%	Flue Gas T @ Burner	°F	1,230
37	O2	mol%	0.0%	0.0%			
38	N2 + Ar	mol%	0.2%	1.5%			

39	CO	mol%	0.0%	0.0%	Guaranteed Emissions:		
40	CO2	mol%	0.0%	0.5%	Basis of Guarantee	---	3.0% O2, dry (LHV)
41	CH4	mol%	99.3%	80.2%	NOx Emissions	Lb/MMBTU	0.040 30 ppm
42	C2H6	mol%	0.4%	15.3%	SOx Emissions	Lb/MMBTU	no quote
43	C2H4	mol%	0.0%	0.0%	CO Emissions	Lb/MMBTU	0.040 49 ppm
44	C3H8	mol%	0.0%	2.4%	VOC Emissions	Lb/MMBTU	0.019 15 ppm
45	C3H6	mol%	0.0%	0.0%	UHC Emissions	Lb/MMBTU	0.007 15 ppm
46	C4H10	mol%	0.0%	0.2%	SPM10 Emissions	Lb/MMBTU	0.013 15 ppm
47	C4H8	mol%	0.0%	0.0%	Noise Emissions	dBA @ 3ft	85
48	C5H12	mol%	0.0%	0.0%			
49	C5H10	mol%	0.0%	0.0%			

50	C6+	mol%	0.0%	0.0%	Net Flame Clearances:		
51	H2S	ppmv	0.0%	0.0%	Est. Flame Size	approx. 14 ft L x 3 ft Diameter	
52	SO2	mol%	0.0%	0.0%	Hor Clearance	1.5 ft NET Tube Clearance	
53	NH3	mol%	0.0%	0.0%	Vert. Clearance	1.5 ft NET Tube Clearance	
54	H2O	mol%	0.0%	0.0%	Axial Clearance	10.08 ft NET Refractory Clearance (to Arch hot face)	
55	spare	mol%	0.0%	0.0%			

56					Nominal Flame Clearances:		
57					from burner CL ...	Vertical	Horizontal
58	Blower/Fan Performance:				to Tube CL, API	ft 8.94	5.96
59	Volumetric Flow	acfm	3,800		to Tube CL, calc.	ft 4.50	4.50
60	Rated Power	HP	7.5		to Refrac., calc.	ft n / a	24.08
61	Fan Speed	RPM	1,800				
62	Sound Pressure	dBA	< 85				
63	Area Classification	NEC	Class I, Div. II, Groups C&D				
64							

MarkWest Liberty Midstream & Resources, L.L.C.  
 Harmon Creek Gas Plant

**Flare**

<b>Source Designation:</b>	
Manufacturer:	John Zink
Operating Hours: (hr/yr)	8,760
Pilot + Purge Gas Heat Input (MMBtu/hr)	3.205
Pilot + Purge Gas Annual Fuel Use (mmscf/yr)	26.518
Pilot Fuel Consumption (mmscf/hr):	2.00E-04
Purge Fuel Consumption (mmscf/hr):	2.83E-03
Fuel HHV (Btu/scf)	1,059

**Combustion of Hydrocarbons**

<b>Source Designation:</b>	
Annual Gas Flow (mmscf/yr)	100.00
Heating value (btu/scf)	1,303.99
Maximum Heat Release of Flare (mmbtu/yr)	130,399

**Total Emissions**

Pollutant	Emission Factor (lb/MMBtu)	lb/hr	tpy
VOC	--	3.07	13.46
HAP	--	0.22	0.98
NO <sub>x</sub>	0.068	1.23	5.39
CO	0.31	5.61	24.56
SO <sub>2</sub>	0.0005	0.01	0.04
PM Total	0.0063	0.11	0.50
PM Condensable	0.0047	0.09	0.37
PM <sub>10</sub> (Filterable)	0.0016	0.03	0.12
PM <sub>2.5</sub> (Filterable)	0.0016	0.03	0.12
CO <sub>2</sub>	117.05	2119.50	9283.43
CH <sub>4</sub>	0.002	12.18	53.33
N <sub>2</sub> O	0.0002	0.00	0.02

- <sup>a</sup> The NO<sub>x</sub> and CO emission factors are from AP-42 Section 13.5 "Industrial Flares" Table 13.5-1.
- <sup>b</sup> Emission factors for GHG pollutants from 40 CFR Part 98, Subpart C. Tables C-1 and C-2.
- <sup>c</sup> The remaining factors are from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1 and 1.4-2.
- <sup>d</sup> VOC and HAP emissions are based on mass balance.
- <sup>e</sup> The flare calculations assume the composition to the flare is inlet gas. Additionally, the flare volume is conservative as the actual flow to the flare during the 2019 reporting period was approximately 26.5

MarkWest Liberty Midstream and Resources, L.L.C.  
 Harmon Creek Gas Plant

**Condensate Truck Loadout Emissions**

Source	Volume Loaded (gal/yr)	Saturation Factor <sup>1</sup>	Vapor Pressure <sup>2</sup> (psia)	Vapor Molecular Weight <sup>2</sup> (lb/lb-mol)	Liquid Temp <sup>3</sup> (°F)	Liquid Temp (°R)	Loading Loss <sup>4</sup> (lb VOC/1000 gal)	Loading Loss (lb/yr)	Loading Loss (tpy)
Harmon Creek Closed Drain Tank	220,000	0.6	8.1621	60	58.5	518.2	7.1	1,554.44	0.78

<sup>1</sup> From AP-42 Table 5.2-1, for tank trucks in submerged loading: dedicated normal service

<sup>2</sup> From AP42 Table 7.1-2, Gasoline (RVP 15), 60 deg

<sup>3</sup> Daily average liquid surface temperature (TANKS 4.09d)

<sup>4</sup> Loading Loss (lb VOC/1000 gal) =  $(12.46 * S * P * M) / T$  [AP42 Section 5.2 (1/95)]

<sup>5</sup> Loading losses are controlled by the flare. Thus, emissions associated with the Condensate Truck Loadout Emissions are captured under the Flare Emission estimates.

Fugitive Emissions

Component Type	Stream Type (Gas Vapor, Light Liquid, Heavy Liquid)	Gas Type	From LeakDAS	Number of Components <sup>a</sup>	AP-42 Leak Emission Factors kg/hr/component <sup>b</sup>	Reduction Factors <sup>c</sup>	Final Leak Factor lb/hr/component	Weight Percent <sup>e</sup>				Total Emissions (tpy)	Potential VOC Emissions		Potential HAP Emissions		Potential CH4 Emissions		Potential CO2 Emissions	
								VOC	HAP	CH4	CO2		(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Compressor	GV	INLET	7	11	8.80E-03	80%	3.88E-03	23.6%	1.7%	75.1%	0.2%	0.190	0.01	0.04	0.00	0.00	0.03	0.14	0.00	0.00
Compressor	GV	RESIDUE	12	19	8.80E-03	0%	1.94E-02	0.1%	0.0%	87.5%	0.3%	1.633	0.00	0.00	0.00	0.00	0.33	1.43	0.00	0.01
Compressor	GV	ETHAN	3	5	8.80E-03	0%	1.94E-02	0.5%	0.1%	0.0%	0.0%	0.408	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Compressor	GV	CO2	2	3	8.80E-03	0%	1.94E-02	0.5%	0.1%	0.0%	100.0%	0.272	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.27
Compressor	GV	PROPANE	11	18	8.80E-03	80%	3.88E-03	100.0%	0.0%	0.0%	0.0%	0.299	0.07	0.30	0.00	0.00	0.00	0.00	0.00	0.00
Compressor	LL	INLET	4	6	7.50E-03	80%	3.31E-03	23.6%	1.7%	75.1%	0.2%	0.093	0.01	0.02	0.00	0.00	0.02	0.07	0.00	0.00
Connector	GV	INLET GAS	19	30	2.00E-04	75%	1.10E-04	23.6%	1.7%	75.1%	0.2%	0.015	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Connector	GV	C3+	424	678	2.00E-04	75%	1.10E-04	100.0%	0.0%	0.0%	0.0%	0.328	0.07	0.33	0.00	0.00	0.00	0.00	0.00	0.00
Connector	GV	REFRIG C3	42	67	2.00E-04	75%	1.10E-04	100.0%	0.0%	0.0%	0.0%	0.032	0.01	0.03	0.00	0.00	0.00	0.00	0.00	0.00
Connector	GV	REGEN De-Eth	10	16	2.00E-04	75%	1.10E-04	0.5%	0.1%	0.0%	0.0%	0.008	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Connector	GV	FLARE GAS	1254	2006	2.00E-04	75%	1.10E-04	23.6%	1.7%	75.1%	0.2%	0.969	0.05	0.23	0.00	0.02	0.17	0.73	0.00	0.00
Connector	GV	C3+	1	2	2.00E-04	75%	1.10E-04	100.0%	0.0%	0.0%	0.0%	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Connector	GV	INLET	69	110	2.00E-04	75%	1.10E-04	23.6%	1.7%	75.1%	0.2%	0.053	0.00	0.01	0.00	0.00	0.01	0.04	0.00	0.00
Connector	GV	REGEN GAS De-Eth	13	21	2.00E-04	75%	1.10E-04	0.5%	0.1%	0.0%	0.0%	0.010	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Connector	GV	C2+	112	179	2.00E-04	75%	1.10E-04	51.4%	5.3%	0.1%	0.1%	0.087	0.01	0.04	0.00	0.00	0.00	0.00	0.00	0.00
Connector	GV	INLET	252	403	2.00E-04	75%	1.10E-04	23.6%	1.7%	75.1%	0.2%	0.195	0.01	0.05	0.00	0.00	0.03	0.15	0.00	0.00
Connector	GV	REGEN De-Eth	1	2	2.00E-04	75%	1.10E-04	0.5%	0.1%	0.0%	0.0%	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Connector	GV	C3+	3	5	2.00E-04	75%	1.10E-04	100.0%	0.0%	0.0%	0.0%	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Connector	LL	FLARE GAS	1	2	2.10E-04	75%	1.16E-04	23.6%	1.7%	75.1%	0.2%	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Connector	LL	METHANOL	102	163	2.10E-04	75%	1.16E-04	100.0%	100.0%	0.0%	0.0%	0.083	0.02	0.08	0.02	0.08	0.00	0.00	0.00	0.00
Connector	LL	REGEN GAS De-Eth	108	173	2.10E-04	75%	1.16E-04	0.5%	0.1%	0.0%	0.0%	0.088	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Connector	LL	ETHAN	47	75	2.10E-04	75%	1.16E-04	0.5%	0.1%	0.0%	0.0%	0.038	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Connector	LL	ETHAN	20	32	2.10E-04	75%	1.16E-04	0.5%	0.1%	0.0%	0.0%	0.016	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Connector	LL	C3+	857	1371	2.10E-04	75%	1.16E-04	100.0%	0.0%	0.0%	0.0%	0.696	0.16	0.70	0.00	0.00	0.00	0.00	0.00	0.00
Connector	LL	METHANOL	25	40	2.10E-04	75%	1.16E-04	100.0%	100.0%	0.0%	0.0%	0.020	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00
Connector	LL	INLET GAS	238	381	2.10E-04	75%	1.16E-04	23.6%	1.7%	75.1%	0.2%	0.193	0.01	0.05	0.00	0.00	0.03	0.15	0.00	0.00
Connector	LL	C3+	310	496	2.10E-04	75%	1.16E-04	100.0%	0.0%	0.0%	0.0%	0.252	0.06	0.25	0.00	0.00	0.00	0.00	0.00	0.00
Connector	LL	INLET GAS	100	160	2.10E-04	75%	1.16E-04	23.6%	1.7%	75.1%	0.2%	0.081	0.00	0.02	0.00	0.00	0.01	0.06	0.00	0.00
Pressure Relief	GV	REGEN De-Eth	28	45	8.80E-03	97%	5.82E-04	0.5%	0.1%	0.0%	0.0%	0.114	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pressure Relief	GV	FLARE	467	747	8.80E-03	97%	5.82E-04	23.6%	1.7%	75.1%	0.2%	1.906	0.10	0.45	0.01	0.03	0.33	1.43	0.00	0.00
Pressure Relief	GV	FLARE GAS	344	550	8.80E-03	97%	5.82E-04	23.6%	1.7%	75.1%	0.2%	1.404	0.08	0.33	0.01	0.02	0.24	1.05	0.00	0.00
Pressure Relief	LL	C3	148	237	7.50E-03	97%	4.96E-04	100.0%	0.0%	0.0%	0.0%	0.515	0.12	0.51	0.00	0.00	0.00	0.00	0.00	0.00
Pressure Relief	LL	C2+	782	1251	7.50E-03	97%	4.96E-04	51.4%	5.3%	0.1%	0.1%	2.720	0.32	1.40	0.03	0.14	0.00	0.00	0.00	0.00
Pressure Relief	LL	REGEN GAS De-Eth	337	539	7.50E-03	97%	4.96E-04	0.5%	0.1%	0.0%	0.0%	1.172	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Pressure Relief	LL	FLARE	79	126	7.50E-03	97%	4.96E-04	23.6%	1.7%	75.1%	0.2%	0.275	0.01	0.06	0.00	0.00	0.05	0.21	0.00	0.00
Pressure Relief	LL	C3+	4	6	7.50E-03	97%	4.96E-04	100.0%	0.0%	0.0%	0.0%	0.014	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Pressure Relief	LL	REGEN GAS	26	42	7.50E-03	97%	4.96E-04	23.6%	1.7%	75.1%	0.2%	0.090	0.00	0.02	0.00	0.00	0.02	0.07	0.00	0.00
Pressure Relief	LL	REGEN GAS	80	128	7.50E-03	97%	4.96E-04	23.6%	1.7%	75.1%	0.2%	0.278	0.02	0.07	0.00	0.00	0.05	0.21	0.00	0.00
Pressure Relief	LL	C3	403	645	7.50E-03	97%	4.96E-04	100.0%	0.0%	0.0%	0.0%	1.402	0.32	1.40	0.00	0.00	0.00	0.00	0.00	0.00
Pump	GV	FLARE	5	8	2.40E-03	0%	5.29E-03	23.6%	1.7%	75.1%	0.2%	0.186	0.01	0.04	0.00	0.00	0.03	0.14	0.00	0.00
Pump	GV	FLARE	129	206	2.40E-03	0%	5.29E-03	23.6%	1.7%	75.1%	0.2%	4.786	0.26	1.13	0.02	0.08	0.82	3.59	0.00	0.01
Pump	LL	C2+	6	10	1.30E-02	85%	4.30E-03	51.4%	5.3%	0.1%	0.1%	0.181	0.02	0.09	0.00	0.01	0.00	0.00	0.00	0.00

**Fugitive Emissions**

Component Type	Stream Type (Gas Vapor, Light Liquid, Heavy Liquid)	Gas Type	From LeakDAS	Number of Components <sup>a</sup>	AP-42 Leak Emission Factors kg/hr/component <sup>b</sup>	Reduction Factors <sup>c</sup>	Final Leak Factor lb/hr/component	Weight Percent <sup>e</sup>				Total Emissions (tpy)	Potential VOC Emissions		Potential HAP Emissions		Potential CH4 Emissions		Potential CO2 Emissions											
								VOC	HAP	CH4	CO2		(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)										
Valve	GV	REGEN GAS De-Eth	63	101	4.50E-03	97%	2.98E-04	0.5%	0.1%	0.0%	0.0%	0.131	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00										
Valve	GV	C2+	44	70	4.50E-03	97%	2.98E-04	51.4%	5.3%	0.1%	0.1%	0.092	0.01	0.05	0.00	0.00	0.00	0.00	0.00	0.00										
Valve	GV	C3	3	5	4.50E-03	97%	2.98E-04	100.0%	0.0%	0.0%	0.0%	0.006	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00										
Valve	GV	INLET GAS	44	70	4.50E-03	97%	2.98E-04	23.6%	1.7%	75.1%	0.2%	0.092	0.00	0.02	0.00	0.00	0.02	0.07	0.00	0.00										
Valve	GV	C3+	113	181	4.50E-03	97%	2.98E-04	100.0%	0.0%	0.0%	0.0%	0.236	0.05	0.24	0.00	0.00	0.00	0.00	0.00	0.00										
Valve	GV	C3	489	782	4.50E-03	97%	2.98E-04	100.0%	0.0%	0.0%	0.0%	1.021	0.23	1.02	0.00	0.00	0.00	0.00	0.00	0.00										
Valve	GV	REFRIG C3	154	246	4.50E-03	97%	2.98E-04	100.0%	0.0%	0.0%	0.0%	0.321	0.07	0.32	0.00	0.00	0.00	0.00	0.00	0.00										
Valve	GV	INLET	12	19	4.50E-03	97%	2.98E-04	23.6%	1.7%	75.1%	0.2%	0.025	0.00	0.01	0.00	0.00	0.00	0.02	0.00	0.00										
Valve	GV	REFRIG C3	2	3	4.50E-03	97%	2.98E-04	100.0%	0.0%	0.0%	0.0%	0.004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00										
Valve	GV	C3	140	224	4.50E-03	97%	2.98E-04	100.0%	0.0%	0.0%	0.0%	0.292	0.07	0.29	0.00	0.00	0.00	0.00	0.00	0.00										
Valve	LL	C2+	290	464	2.50E-03	97%	1.65E-04	51.4%	5.3%	0.1%	0.1%	0.336	0.04	0.17	0.00	0.02	0.00	0.00	0.00	0.00										
Valve	LL	INLET	935	1496	2.50E-03	97%	1.65E-04	23.6%	1.7%	75.1%	0.2%	1.084	0.06	0.26	0.00	0.02	0.19	0.81	0.00	0.00										
Valve	LL	REGEN GAS	2	3	2.50E-03	97%	1.65E-04	23.6%	1.7%	75.1%	0.2%	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00										
Valve	LL	METHANOL	2	3	2.50E-03	97%	1.65E-04	100.0%	100.0%	0.0%	0.0%	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00										
Valve	LL	INLET	390	624	2.50E-03	97%	1.65E-04	23.6%	1.7%	75.1%	0.2%	0.452	0.02	0.11	0.00	0.01	0.08	0.34	0.00	0.00										
Valve	LL	C3+	2	3	2.50E-03	97%	1.65E-04	100.0%	0.0%	0.0%	0.0%	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00										
Valve	LL	METHANOL	1	2	2.50E-03	97%	1.65E-04	100.0%	100.0%	0.0%	0.0%	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00										
Valve	LL	REFRIG C3	181	290	2.50E-03	97%	1.65E-04	100.0%	0.0%	0.0%	0.0%	0.210	0.05	0.21	0.00	0.00	0.00	0.00	0.00	0.00										
Valve	LL	REFRIG C3	92	147	2.50E-03	97%	1.65E-04	100.0%	0.0%	0.0%	0.0%	0.107	0.02	0.11	0.00	0.00	0.00	0.00	0.00	0.00										
Valve	LL	FLARE	19	30	2.50E-03	97%	1.65E-04	23.6%	1.7%	75.1%	0.2%	0.022	0.00	0.01	0.00	0.00	0.00	0.02	0.00	0.00										
Valve	LL	FLARE	3	5	2.50E-03	97%	1.65E-04	23.6%	1.7%	75.1%	0.2%	0.003	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00										
Connector	HL	HMO		1708	7.50E-06	0%	1.65E-05	100.0%	0.0%	0.0%	0.0%	0.124	0.03	0.12	0.00	0.00	0.00	0.00	0.00	0.00										
Valve	HL	HMO		569	8.40E-06	0%	1.85E-05	100.0%	0.0%	0.0%	0.0%	0.046	0.01	0.05	0.00	0.00	0.00	0.00	0.00	0.00										
Pressure Relief	HL	HMO		16	3.20E-05	0%	7.06E-05	100.0%	0.0%	0.0%	0.0%	0.005	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00										
Connector	HL	CO2		569	7.50E-06	0%	1.65E-05	0.5%	0.1%	0.0%	100.0%	0.041	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.04										
Valve	HL	CO2		190	8.40E-06	0%	1.85E-05	0.5%	0.1%	0.0%	100.0%	0.015	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02										
Pressure Relief	HL	CO2		5	3.20E-05	0%	7.06E-05	0.5%	0.1%	0.0%	100.0%	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00										
Connector	GV	Residue		1900	2.00E-04	75%	1.10E-04	0.1%	0.0%	87.5%	0.3%	0.918	0.00	0.00	0.00	0.00	0.18	0.80	0.00	0.00										
Valve	GV	Residue		600	4.50E-03	97%	2.98E-04	0.1%	0.0%	87.5%	0.3%	0.783	0.00	0.00	0.00	0.00	0.16	0.69	0.00	0.00										
<b>21,343</b>																														
												<b>Total</b>	<b>2.45</b>	<b>10.72</b>	<b>0.11</b>	<b>0.50</b>	<b>2.79</b>	<b>12.23</b>	<b>0.09</b>	<b>0.38</b>										

**Notes:**

- <sup>a</sup> Component counts are based on a combination of counts from LeakDas and PIDs and estimates based on studies at similar facilities.
- <sup>b</sup> Table 2-4. Oil & Gas Production Operations Average Emission Factors, Protocol for Equipment Leak Emission Estimates, EPA 453/R-95-017, November 1995. Emission factors based on average measured TOC from component types indicated in gas or light oil service at O&G Production Operations.
- <sup>c</sup> Table V: Control Efficiencies for LDAR for 28VHP programs, Air Permit Technical Guidance for Chemical Sources Fugitive Guidance, TCEQ (APDG 6422v2, Revised 06/2018). Compressors are monitored quarterly via OGI.
- <sup>d</sup> Table 5-1. Summary of Equipment Modifications, Protocol for Equipment Leak Emission Estimates, EPA 453/R-95-017, November 1995.
- <sup>e</sup> CO2 and C2 service are estimated at 0.5 VOC wt% to be conservative.



**MarkWest Liberty Midstream & Resources, L.L.C.**  
**Harmon Creek Gas Plant**  
**Rod Packing Emissions**

<b>Rod Packing</b>
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**Total Rod Packing Emissions**

Pollutant	Emissions	
	lb/hr	tpy
VOC	0.17	0.75
Total HAPs	0.00	0.01
Methane	0.41	1.81
Carbon Dioxide	0.00	0.01
n-Hexane	0.00	0.01
Total HAPs	0.00	0.01

Residue Compressors

Emission Factor <sup>a</sup>	0.018	(scf CH <sub>4</sub> /min)
Mole fraction Methane	0.930	
Total Emission Factor	0.019	(scf/min)
MW	17.041	(lb/lbmole)
Number of Compressors	7	
Total Emissions	0.366	(lb/hr)

<sup>a</sup>Based on 40 CFR Part 98 Subpart W Section 233 Emissions Factors

Pollutant	Mass %	Emissions	
		lb/hr	tpy
VOC	0.15%	0.00	0.00
Total HAPs	0.00%	0.00	0.00
Methane	87.54%	0.32	1.40
Carbon Dioxide	0.31%	0.00	0.01
n-Hexane	0.00%	0.00	0.00
Total HAPs	0.00%	0.00	0.00

Stabilization Compressors

Emission Factor <sup>a</sup>	0.018	(scf CH <sub>4</sub> /min)
Mole fraction Methane	0.440	
Total Emission Factor	0.041	(scf/min)
MW	29.162	(lb/lbmole)
Number of Compressors	2	
Total Emissions	0.378	(lb/hr)

<sup>a</sup>Based on 40 CFR Part 98 Subpart W Section 233 Emissions Factors

Pollutant	Mass %	Emissions	
		lb/hr	tpy
VOC	44.89%	0.17	0.74
Total HAPs	0.60%	0.00	0.01
Methane	24.26%	0.09	0.40
Carbon Dioxide	0.24%	0.00	0.00
n-Hexane	0.60%	0.00	0.01
Total HAPs	0.60%	0.00	0.01

CO2 Compressor

Emission Factor<sup>a</sup> 0.018 (scf CH<sub>4</sub>/min)

Mole fraction Methane 0.025

Total Emission Factor 0.719 (scf/min)

MW 43.568 (lb/lbmole)

Number of Compressors 1

Total Emissions 4.960 (lb/hr)

<sup>a</sup>Based on 40 CFR Part 98 Subpart W Section 233 Emissions Factors

Pollutant	Mass %	Emissions	
		lb/hr	tpy
VOC	0.02%	0.00	0.00
Total HAPs	0.00%	0.00	0.00
Methane	0.01%	0.00	0.00
Carbon Dioxide	97.82%	0.00	0.00
n-Hexane	0.00%	0.00	0.00
Total HAPs	0.00%	0.00	0.00

**Pigging Emissions (Controlled by Flare)**

Description	Gas Source Basis	Pressure Type	High to Low Pressure Jumper	Control Device	L/R	Size	Max Events/Yr	Pressure (PSIG) <sup>a</sup>		Temp (deg F)	Vessel Volume (acf)	Z Factor <sup>a</sup>		R Factor <sup>b</sup>	MW of Gas <sup>a</sup>	Maximum Volume		Controlled VOC		Controlled HAP	
								Pre-Jump				Pre-Jump				Per Event (scf)	Annually (scf/yr)	Wt% <sup>a</sup>	tpy <sup>c</sup>	Wt% <sup>a</sup>	tpy <sup>c</sup>
Houston Plant HP NGL Launcher	Harmon Creek Plant	HP	N	Flare	Launcher	12	1	1100		85	19.04	0.956		1,545	21.6	1,509.8	1,510	23.6%	0.000	1.72%	0.0000
Mariner West HP Ethane Launcher	Harmon Creek Plant	HP	N	Flare	Launcher	10	1	1100		85	15.95	0.956		1,545	21.6	1,264.8	1,265	23.6%	0.000	1.72%	0.0000
National Fuel Line N HP Residue Launcher	Harmon Creek Plant	HP	N	Flare	Launcher	20	1	1300		85	55.07	0.956		1,545	21.6	5,150.3	5,150	23.6%	0.001	1.72%	0.0001
Rover HP Interconnect Launcher	Harmon Creek Plant	HP	N	Flare	Launcher	24	1	1300		85	108.94	0.758		1,545	21.6	12,852.0	12,852	23.6%	0.002	1.72%	0.0002
Smith CS to Harmon Creek Plant HP Receiver	Harmon Creek Plant	HP	N	Flare	Receiver	20	365	1060		54.2	26.50	0.956		1,545	21.0	2,025.9	739,460	20.2%	0.099	1.67%	0.0082
<b>Total</b>																<b>760,236</b>		<b>0.102</b>		<b>0.008</b>	

\* Pigging emissions are controlled by the flare and emission associated with pigging events are accounted for in the flare emissions section.

<sup>a</sup> Actual factors for PSIG, Z-factor, MW of gas, VOC wt% of gas and LHV of gas have been calculated but the numbers in the spreadsheet are provided to be very conservative in the event that the composition of the gas field changes over time.

<sup>b</sup> R Factor = (psfa\*ft3\* lbmol)/(lb\*R))

<sup>c</sup> Per the Consent Decree filed in April 2018, the mass of VOC emissions from pigging operations are multiplied by a factor of:

1.2

CO<sub>2</sub> wt% 0.24%  
 CH<sub>4</sub> wt% 75.1%  
 CO<sub>2</sub> emissions 0.001 tpy  
 CH<sub>4</sub> emissions 0.32 tpy

**Methanol Emission Estimates**

Source Information:	
Contents:	Methanol
Quantity:	2
Tank Orientation/Geometry:	Horizontal Cylinder
Approx. Height (ft):	5.0
Approx. Diameter (ft):	4.2
Volume (gal):	500
Turnovers per year:	0.10
Maximum Fill Level:	90%
Insulation:	None
Tank Color:	Red
Control Percentage:	0
Site-Wide Throughput (gal/yr)	100
Site-Wide Throughput (bbl/day)	0.007

**Total Methanol Emissions (Sum of Tank Emissions + Process Emissions below):**

Pollutant	Conservative Losses	
	lb/hr	tpy
Total VOC	0.080	0.352
Total HAP	0.080	0.352

Tank Emissions:

Pollutant	Tank Losses	
	lb/hr	tpy
Total VOC	0.003	0.013
Total HAP	0.003	0.013

Methanol tank losses are conservatively based on 50 gallons of use annually and modeled using ProMax 5.0. Please note, MarkWest uses no more than five (5) gallons of methanol per year.

Process Emissions:

Pollutant	Conservative Losses	
	lb/hr	tpy
Total VOC	0.077	0.339
Total HAP	0.077	0.339

Methanol losses from the process conservatively assumes all methanol injected into the system is emitted to the atmosphere, however, only a portion of the injected methanol will be emitted. Additionally, MarkWest uses no more than five (5) gallons of methanol per year, however, emission estimates are based on 10 times that quantity.

Sample Calculation:

$$\text{Methanol emissions (tpy)} = \text{Methanol usage (gal/yr)} * \text{Density (lb/gal)} / 2000 \text{ (ton/lbs)}$$

MarkWest Liberty Midstream & Resources, L.L.C.  
 Harmon Creek Gas Plant

**Measurement Devices**  
*Exempt under Section 127.14(a) #7*

Source Information:	
Analyzer Vent Rate (scf/hr)	2.12
Spectra Analyzers	8.00
GC Vent Rate (scf/hr)	0.04
GC Streams	17.00
Total Number of Measurement Vents to Atm	25.0
Potential Annual Hours of Operation (hr/yr)	8,760
Potential Volume Emitted (scf/yr)	18,561

Pollutant	Per Analyzer		Per GC Stream		Total	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Carbon Dioxide	0.000	0.001	0.000	0.000	0.00	0.011
Methane	0.09	0.397	0.00	0.007	0.75	3.285
VOC	0.03	0.125	0.00	0.002	0.24	1.033
n-Hexane	2.07E-03	0.009	3.45E-05	0.000	0.02	0.075
Total HAPs	2.07E-03	0.009	3.45E-05	0.000	0.02	0.075

**MarkWest Liberty Midstream & Resources, L.L.C.**  
**Harmon Creek Gas Plant**

**Harmon Creek Gas Analysis**

Component	MW	Unit	Inlet Gas	Residue Gas - Recovery	Residue Gas	Stabilizer Overhead	CO2	C2+
Nitrogen	28.0135	mole %	0.44	0.51	0.48	0.10	0.00	0.00
CO2	44.01	mole %	0.12	0.20	0.12	0.16	96.84	0.06
H2S	34.1	mole %	0.00	0.00	0.00	0.00	0.00	0.00
Methane	16.042	mole %	75.08	97.41	92.99	44.04	0.03	0.10
Ethane	30.069	mole %	15.76	1.84	6.35	29.62	3.12	59.23
Propane	44.096	mole %	5.12	0.04	0.06	17.14	0.02	23.38
i-Butane	58.122	mole %	0.53	0.00	0.00	1.86	0.00	2.95
n-Butane	58.122	mole %	1.40	0.00	0.00	4.96	0.00	7.05
i-Pentane	72.149	mole %	0.32	0.00	0.00	0.79	0.00	1.69
n-Pentane	72.149	mole %	0.45	0.00	0.00	1.06	0.00	2.18
n-Hexane	86.175	mole %	0.43	0.00	0.00	0.20	0.00	3.46
n-Heptane	100.202	mole %	0.32	0.00	0.00	0.05	0.00	0.00
n-Octane	114.229	mole %	0.01	0.00	0.00	0.00	0.00	0.00
n-Nonane	128.255	mole %	0.00	0.00	0.00	0.00	0.00	0.00
n-Decane	142.282	mole %	0.00	0.00	0.00	0.00	0.00	0.00

Component	MW	Unit	Inlet Gas	Residue Gas - Recovery	Residue Gas	Stabilizer Overhead	CO2	C2+
23 Nitrogen	28.0135	wt%	0.5707	0.8738	0.7852	0.0965	0.0000	0.0000
24 CO2	44.01	wt%	0.2445	0.5278	0.3121	0.2440	97.8220	0.1187
25 H2S	34.1	wt%	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
26 Methane	16.042	wt%	75.0800	95.1232	87.5426	24.2604	0.0092	0.0736
27 Ethane	30.069	wt%	21.9424	3.3662	11.2128	30.5465	2.1522	48.5233
28 Propane	44.096	wt%	10.4539	0.1031	0.1442	25.9200	0.0166	27.2355
29 i-Butane	58.122	wt%	1.4263	0.0025	0.0011	3.7135	0.0000	3.8104
30 n-Butane	58.122	wt%	3.7677	0.0035	0.0013	9.8881	0.0000	9.4580
31 i-Pentane	72.149	wt%	1.0690	0.0000	0.0002	1.9617	0.0000	2.4280
32 n-Pentane	72.149	wt%	1.5033	0.0000	0.0005	2.6260	0.0000	3.1565
33 n-Hexane	86.175	wt%	1.7158	0.0000	0.0001	0.5960	0.0000	5.3212
34 n-Heptane	100.202	wt%	1.4847	0.0000	0.0000	0.1622	0.0000	0.0000
35 n-Octane	114.229	wt%	0.0529	0.0000	0.0000	0.0192	0.0000	0.0000
36 n-Nonane	128.255	wt%	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
37 n-Decane	142.282	wt%	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

*Dry Basis	VOC wt %	23.62	0.11	0.15	44.89	0.02	51.41
	LHV =	1178.81	916.57	949.85	1562.36	51.09	
	HHV =	1303.99	1022.94	1058.62	1715.11	61.37	
	Density (lb	0.0569	0.0433	0.0449	0.0768	0.1148	
	Gas MW=	21.60	16.43	17.04	29.16	43.57	
	HAP wt%=	1.7158	0.0000	0.0001	0.5960	0.0000	5.3212

Notes:

<sup>a</sup> The inlet gas composition is based on a sample collected on 6/3/2021 from the Harmon Creek plant feed inlet and a 10% factor is applied for conservatism. An inlet sample analyzed in 2022, see appended, was lower in VOC than the 2021 sample. The residue gas and C2+ gas compositions are the annual average from GC readings.

<sup>b</sup> Stabilizer Overhead and CO2 compositions are modeled.



### Certificate of Analysis

<b>Vessel / Object:</b>	TBD	<b>Job No:</b>	178-21-00177
<b>Location:</b>	Bulger, PA / MarkWest - Harmon Creek Facility (United States)	<b>Date Sampled:</b>	06/03/21
<b>Job Type:</b>	Sample & Analysis	<b>Date Tested:</b>	06/15/21
<b>Product Grade:</b>	Other Pressurized Product	<b>Version:</b>	1 / 15 Jun 2021 18:45
<b>Client Reference:</b>	MarkWest Liberty Resources / Phillip Jereza		

<u>Sample</u>	<u>Sample ID, Type &amp; Description</u>		
178-21-00177-001	Harmon Creek Inlet Gas Line		
<u>Method</u>	<u>Test</u>	<u>Result</u>	<u>Units</u>
ASTM D1945	Natural Gas Analysis		
	Hydrogen	0.02	Mol %
	Oxygen	< 0.01	Mol %
	Nitrogen	0.44	Mol %
	Carbon Dioxide	0.12	Mol %
	Methane	75.08	Mol %
	Ethane	15.76	Mol %
	Propane	5.12	Mol %
	Isobutane	0.53	Mol %
	n-Butane	1.40	Mol %
	Isobutylene	0.01	Mol %
	cis-2-Butene	< 0.01	Mol %
	Isopentane	0.32	Mol %
	n-Pentane	0.45	Mol %
	n-Hexane	0.43	Mol %
	n-Heptane	0.28	Mole
	Benzene	0.04	Mol %
	C8+	0.01	Mol %
ASTM D5504	Hydrogen Sulfide	< 0.1	ppmw
ASTM D7423	Oxygenates by FID GC on 400° Cut Back Calculated to Whole Crude		
	Acetaldehyde	1.0	ppmw
	Acetone	1.5	ppmw
	Methanol	None Detected	ppmw
	Ethanol	0.9	ppmw
	Total Oxygenates	3.4	ppmw
GPA2286	Full Scan	See Attached	

William L. Cochran - Lab Technician



**Customer**

Markwest  
Harmon Creek

Site	Harmon Creek				
Sample Name	Inlet Gas				
Lab#	13337991				
Date Sampled	6/21/22				
Time Sampled					
Gas Temp, °F					
Gas Press, psi					
Cylinder#					

Pressure base 14.696psi

Analysis	Units	Method	13337991				
Hydrogen	Mol %	<b>GPA 2286</b>	0.02				
Helium	Mol %		0.02				
Oxygen	Mol %		0.00				
Nitrogen	Mol %		0.05				
Carbon Dioxide	Mol %		0.11				
Methane	Mol %		76.26				
Ethane	Mol %		15.44				
Propane	Mol %		5.19				
Isobutane	Mol %		0.50				
n-Butane	Mol %		1.31				
Isopentane	Mol %		0.25				
n-Pentane	Mol %		0.34				
Hexanes Plus	Mol %		0.51				
Total	Mol %		100.00				
Molecular Weight	##-#-mol		21.19				
Molar Mass Ratio			0.7318				
Relative Density			0.7343				
Compressibility Factor			0.9962				
Gross Heating Value (Dry/Ideal)	BTU/CF		1283.3				
Gross Heating Value (Dry/Real)	BTU/CF		1288.2				
Net Heating Value (Dry/Ideal)	BTU/CF		1164.7				
Net Heating Value (Dry/Real)	BTU/CF		1169.1				
<i>@ Pressure base 14.73psi</i>							
<i>Gross Heating Value (Dry/Ideal)</i>	<i>BTU/CF</i>		<i>1286.3</i>				
<i>Gross Heating Value (Dry/Real)</i>	<i>BTU/CF</i>		<i>1291.2</i>				
<i>Net Heating Value (Dry/Ideal)</i>	<i>BTU/CF</i>		<i>1167.4</i>				
<i>Net Heating Value (Dry/Real)</i>	<i>BTU/CF</i>		<i>1171.8</i>				
2,2-Dimethylbutane	Mol %		0.005				
2-Methyl Pentane	Mol %		0.066				
3-Methyl Pentane	Mol %		0.052				
n-Hexane	Mol %		0.109				
Methylcyclopentane	Mol %		0.015				
Benzene	Mol %		0.004				
Cyclohexane	Mol %		0.015				
2-Methyl Hexane	Mol %		0.027				
3-Methyl Hexane	Mol %		0.023				
Dimethylcyclopentanes	Mol %		0.008				
n-Heptane	Mol %		0.045				
Methylcyclohexane	Mol %		0.030				
Trimethylcyclopentanes	Mol %		0.008				
Toluene	Mol %		0.008				
2-Methylheptane	Mol %		0.026				
3-Methylheptane	Mol %		0.012				
Dimethylcyclohexanes	Mol %		0.007				
n-Octane	Mol %		0.024				
Ethyl Benzene	Mol %		0.000				
Xylenes (Total)	Mol %		0.004				
C9 Naphthenes	Mol %		0.002				
C9 Paraffins	Mol %		0.010				
n-Nonane	Mol %		0.003				
Decanes Plus	Mol %		0.006				
Hexanes Plus Mol Wt	##-#-mol		95.79				
Hexanes Plus Relative Density	60/60		0.6992				
Hexanes Plus Heating Value	BTU/CF (Ideal)		5215.5				
Hexanes Plus Vapor Equivalent	CF/gal		23.09				



## Supporting Documentation

Fugitive Components  
Support Documentation

28VHP Boilerplate Special Condition Language	MPLX Practices
<p>A The requirements of paragraphs F and G shall not apply (1) where the Volatile Organic Compound (VOC) has an aggregate partial pressure or vapor pressure of less than 0.044 pounds per square inch, absolute (psia) at 68°F or (2) operating pressure is at least 5 kilopascals (0.725 psi) below ambient pressure. Equipment excluded from this condition shall be identified in a list or by one of the methods described below to be made readily available upon request. The exempted components may be identified by one or more of the following methods:</p> <ul style="list-style-type: none"> <li>• piping and instrumentation diagram (PID);</li> <li>• a written or electronic database or electronic file;</li> <li>• color coding;</li> <li>• a form of weatherproof identification; or</li> <li>• designation of exempted process unit boundaries.</li> </ul>	
<p>B Construction of new and reworked piping, valves, pump systems, and compressor systems shall conform to applicable American National Standards Institute (ANSI), American Petroleum Institute (API), American Society of Mechanical Engineers (ASME), or equivalent codes.</p>	<p>Construction of new and reworked piping, valves, pump systems, and compressor systems will conform with all applicable codes. The construction bid language that will be required for Harmon Creek II is appended.</p>
<p>C New and reworked underground process pipelines shall contain no buried valves such that fugitive emission monitoring is rendered impractical. New and reworked buried connectors shall be welded.</p>	<p>No new or reworked underground process pipelines are associated with Harmon Creek. Any new underground drain piping will be welded.</p>
<p>D To the extent that good engineering practice will permit, new and reworked valves and piping connections shall be so located to be reasonably accessible for leak checking during plant operation.</p> <p>Difficult-to-monitor and unsafe-to-monitor valves, as defined by Title 30 Texas Administrative Code Chapter 115 (30 TAC Chapter 115), shall be identified in a list to be made readily available upon request. The difficult-to-monitor and unsafe-to-monitor valves may be identified by one or more of the methods described in subparagraph A above. If an unsafe to monitor component is not considered safe to monitor within a calendar year, then it shall be monitored as soon as possible during safe to monitor times. A difficult to monitor component for which quarterly monitoring is specified may instead be monitored annually.</p>	<p>To the extent possible, MPLX ensures that all valves and piping connections are reasonably accessible.</p> <p>There are no difficult-to-monitor or unsafe-to-monitor components at Harmon Creek. Should such components exist at a facility, they would be identified in a list that is available upon request.</p>
<p>E New and reworked piping connections shall be welded or flanged. Screwed connections are permissible only on piping smaller than two-inch diameter.</p>	<p>MPLX construction practices are consistent with these conditions.</p>

<p>Gas or hydraulic testing of the new and reworked piping connections at no less than operating pressure shall be performed prior to returning the components to service or they shall be monitored for leaks using an approved gas analyzer within 15 days of the components being returned to service. Adjustments shall be made as necessary to obtain leak-free performance.</p> <p>Connectors shall be inspected by visual, audible, and/or olfactory means at least weekly by operating personnel walk-through.</p> <p>Each open-ended valve or line shall be equipped with an appropriately sized cap, blind flange, plug, or a second valve to seal the line. Except during sampling, both valves shall be closed.</p> <p>If the isolation of equipment for hot work or the removal of a component for repair or replacement results in an open ended line or valve, it is exempt from the requirement to install a cap, blind flange, plug, or second valve for 72 hours. If the repair or replacement is not completed within 72 hours, the permit holder must complete either of the following actions within that time period;</p> <ul style="list-style-type: none"> <li>(1) a cap, blind flange, plug, or second valve must be installed on the line or valve; or</li> <li>(2) the open-ended valve or line shall be monitored once for leaks above background for a plant or unit turnaround lasting up to 45 days with an approved gas analyzer and the results recorded.</li> </ul> <p>For all other situations, the open-ended valve or line shall be monitored once within the 72 hour period following the creation of the open ended line and monthly thereafter with an approved gas analyzer and the results recorded.</p> <p>For turnarounds and all other situations, leaks are indicated by readings of 500 ppmv and must be repaired within 24 hours or a cap, blind flange, plug, or second valve must be installed on the line or valve</p>	<p>Hydraulic testing of new or reworked piping connections is conducted prior to installation. Any modified piping would undergo field nondestructive examination (NDE). Leak checks are performed prior to putting systems into service.</p> <p>Operations conducts daily AVO inspections. LDAR conducts weekly AVO inspections on pumps.</p> <p>MPLX's LDAR Program at the facility requires OEVs and OELs to be equipped with an appropriately sized cap, blind flange, plug, or a second valve to seal the line.</p> <p>MPLX's standard is to only allow OELs and/or OEVs to exist on equipment that is not in service and follows the lockout and tagout procedures.</p>
<p>F Accessible valves shall be monitored by leak checking for fugitive emissions at least quarterly using an approved gas analyzer.</p> <p>Sealless/leakless valves (including, but not limited to, welded bonnet bellows and diaphragm valves) and relief valves equipped with a rupture disc upstream or venting to a control device are not required to be monitored. If a relief valve is equipped with rupture disc, a pressure-sensing device shall be installed between the relief valve and rupture disc to monitor disc integrity.</p>	<p>Valves are monitored quarterly using Method 21.</p> <p>Sealless/leakless valves are not part of the Harmon Creek processes. There will be no relief valves with rupture discs in VOC service. Any relief valves with a rupture disc are equipped with a pressure-sensing device. All valves and relief valves in VOC service are monitored quarterly at Harmon Creek.</p>

	<p>A check of the reading of the pressure-sensing device to verify disc integrity shall be performed at least quarterly and recorded in the unit log or equivalent. Pressure sensing devices that are continuously monitored with alarms are exempt from recordkeeping requirements specified in this paragraph. All leaking discs shall be replaced at the earliest opportunity but no later than the next process shutdown.</p> <p>The gas analyzer shall conform to requirements listed in Method 21 of 40 CFR part 60, appendix A. The gas analyzer shall be calibrated with methane. In addition, the response factor of the instrument for a specific VOC of interest shall be determined and meet the requirements of Section 8 of Method 21. If a mixture of VOCs is being monitored, the response factor shall be calculated for the average composition of the process fluid. A calculated average is not required when all of the compounds in the mixture have a response factor less than 10 using methane. If a response factor less than 10 cannot be achieved using methane, then the instrument may be calibrated with one of the VOC to be measured or any other VOC so long as the instrument has a response factor of less than 10 for each of the VOC to be measured.</p> <p>Replacements for leaking components shall be re-monitored within 15 days of being placed back into VOC service.</p>	<p>There are no relief valves equipped with rupture discs in VOC service at Harmon Creek. However, it is standard that any rupture discs at the facility are equipped with a transmitter or switch which would alarm if the disc failed. Transmitters/switches are considered critical and thus, would be inspected during critical instrumentation rounds.</p> <p>The gas analyzer used for monitoring equipment under this program meets Method 21 requirements.</p> <p>The resurvey requirements described in this section are consistent with MPLX's LDAR Program at the facility.</p>
G	<p>Except as may be provided for in the special conditions of this permit, all pump, compressor, and agitator seals shall be monitored with an approved gas analyzer at least quarterly or be equipped with a shaft sealing system that prevents or detects emissions of VOC from the seal.</p> <p>Seal systems designed and operated to prevent emissions or seals equipped with an automatic seal failure detection and alarm system need not be monitored. These seal systems may include (but are not limited to) dual pump seals with barrier fluid at higher pressure than process pressure, seals degassing to vent control systems kept in good working order, or seals equipped with an automatic seal failure detection and alarm system. Submerged pumps or sealless pumps (including, but not limited to, diaphragm, canned, or magnetic-driven pumps) may be used to satisfy the requirements of this condition and need not be monitored.</p>	<p>All pumps in VOC service are monitored via Method 21 monthly. Compressors in VOC service are monitored at least quarterly via OGI.</p>
H	<p>Damaged or leaking valves or connectors found to be emitting VOC in excess of 500 parts per million by volume (ppmv) or found by visual inspection to be leaking (e.g., dripping process fluids) shall be tagged and replaced or repaired.</p>	<p>Valves or connectors found to be emitting VOC in excess of 500 ppmv are tagged and replaced or repaired.</p> <p>Upon detection of a leak from pump seals or compressor seals, the component is tagged and replaced or repaired.</p>

	<p>Damaged or leaking pump, compressor, and agitator seals found to be emitting VOC in excess of 2,000 ppmv or found by visual inspection to be leaking (e.g., dripping process fluids) shall be tagged and replaced or repaired.</p> <p>A first attempt to repair the leak must be made within 5 days and a record of the attempt shall be maintained.</p>	<p>The first attempt repair requirements described in this section are consistent with MPLX's LDAR Program at the facility.</p>
I	<p>A leaking component shall be repaired as soon as practicable, but no later than 15 days after the leak is found.</p> <p>If the repair of a component would require a unit shutdown that would create more emissions than the repair would eliminate, the repair may be delayed until the next scheduled shutdown.</p> <p>All leaking components which cannot be repaired until a scheduled shutdown shall be identified for such repair by tagging within 15 days of the detection of the leak. A listing of all components that qualify for delay of repair shall be maintained on a delay of repair list.</p> <p>The cumulative daily emissions from all components on the delay of repair list shall be estimated by multiplying by 24 the mass emission rate for each component calculated in accordance with the instructions in 30 TAC 115.782 (c)(1)(B)(i)(II).</p> <p>The calculations of the cumulative daily emissions from all components on the delay of repair list shall be updated within ten days of when the latest leaking component is added to the delay of repair list. When the cumulative daily emission rate of all components on the delay of repair list times the number of days until the next scheduled unit shutdown is equal to or exceeds the total emissions from a unit shutdown as calculated in accordance with 30 TAC 115.782 (c)(1)(B)(i)(I), the TCEQ Regional Manager and any local programs shall be notified and may require early unit shutdown or other appropriate action based on the number and severity of tagged leaks awaiting shutdown. This notification shall be made within 15 days of making this determination.</p>	<p>The repair requirements described in this section are consistent with MPLX's LDAR Program at the facility.</p> <p>Emissions from a unit shutdown are evaluated to determine if a DOR is appropriate.</p> <p>DORs are identified with a weatherproof tag and tracked via the LeakDas database.</p> <p>30 TAC 115.782 (c)(1)(B)(i)(II) requires mass emission rates to be calculated using the EPA correlation approach. MPLX uses the LeakDas database to track leaks, which calculates emissions using the EPA correlation approach.</p> <p>MPLX has reviewed DOR data and at no point has cumulative daily emissions from all components on the DOR list exceeded the emissions that would result from the next scheduled shutdown. MPLX will perform the calculation as required and make the appropriate notifications to PADEP.</p>
J	<p>Records of repairs shall include date of repairs, repair results, justification for delay of repairs, and corrective actions taken for all components.</p> <p>Records of instrument monitoring shall indicate dates and times, test methods, and instrument readings. The instrument monitoring record shall include the time that monitoring took place for no less than 95% of the instrument readings</p>	<p>The recordkeeping requirements described in this section are consistent with MPLX's LDAR Program at the facility.</p> <p>Operations conducts daily AVO inspections via walkthroughs and makes note of such inspections.</p>

	recorded. Records of physical inspections shall be noted in the operator's log or equivalent.	
K	Alternative monitoring frequency schedules of 30 TAC " 115.352 - 115.359 or National Emission Standards for Organic Hazardous Air Pollutants, 40 CFR Part 63, Subpart H, may be used in lieu of Items F through G of this condition.	
L	Compliance with the requirements of this condition does not assure compliance with requirements of 30 TAC Chapter 115, an applicable New Source Performance Standard (NSPS), or an applicable National Emission Standard for Hazardous Air Pollutants (NESHAPS) and does not constitute approval of alternative standards for these regulations.	

# Construction Bid Language

## MARKWEST Energy Partners, L.P.

### *Harmon Creek #1 Project*

### ***CONSTRUCTION SCOPE of WORK – MECHANICAL, STRUCTURAL & ELECTRICAL***

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## **3.0 SPECIFICATIONS**

The PROJECT shall be constructed in accordance with all applicable OWNER codes, standards, and specifications as identified in *APPENDIX A*, as well as all applicable Federal, State and local laws, rules, regulations and permit conditions. In addition, the project shall be constructed in accordance with the current edition of the following industry codes, standards, and specifications:

Pressure vessels	ASME VIII Div.1
Air-cooled heat exchangers	API-661 & ASME VIII Div.1
Shell & tube heat exchangers	TEMA class C & ASME VIII Div.1
Plate & frame heat exchangers	ASME VIII Div.1
Fired Heaters	NFPA & API-560
Centrifugal pumps – hydrocarbon	API-610 or ANSI B73
Reciprocating compressors	API-618
Packaged Rotating Eqmt. Lube systems	API-614
Atmospheric Above Ground Tanks	UL-142
Atmospheric FRP Tanks	API-12P
Pipelines – liquid & gas	ASME B31.4 & ASME B31.8 (CFR 49 Parts 195 & 192)
Piping – process & utility	ASME B31.3
Pressure Safety Valves	ASME VIII Div.1
Area classification	API RP-500
Cast-in-place concrete	ACI-318
Masonry Structures	ACI-530
Structural steel	AISC Manual of Steel Construction
Structural steel buildings	AISC 360
Structural steel welding	AWS D1.1
High strength bolting	AISC – Specification for Structural Joints using ASTM A325 or A490 Bolts
International Building Code	IBC
Inspection of Pressure Vessels	NB-23 API-510

## Permitting Fees



## AIR QUALITY FEES FOR NEW PLAN APPROVAL

Company Information				
Federal Tax ID: 30-0528059		Firm Name: MarkWest Liberty Midstream and Resources, L.L.C.		
Permit # (If any): 63-01011A		Facility Name: Harmon Creek Gas Plant		
Municipality: Smith Township		County: Washington		
Contact Person Name: Allie Juarez		Telephone Number: 412-815-8886		
E-mail: <a href="mailto:ajuarez@marathonpetroleum.com">ajuarez@marathonpetroleum.com</a>				
New Plan Approval (The following fees are cumulative.)				
Line #	Check the appropriate boxes below	Type of review requested	Fee 2021 - 2025	Total Fees
1	Base Fee	Subchapter B	\$2,500	\$2,500
2	<input type="checkbox"/>	New Source Review, Subchapter E	\$7,500	
3	<input type="checkbox"/>	<p style="text-align: center;">NSPS/NESHAP /MACT standard</p> <p>A. # of NSPS: <span style="float: right;">_____ 2 _____</span></p> <p>B. # of NESHAP/MACT: <span style="float: right;">_____</span></p> <p>C. Add lines A and B: <span style="float: right;">_____</span></p> <p>D. Maximum applicable standards: <span style="float: right;">_____ 3 _____</span></p> <p>E. Enter smaller of line C or line D: <span style="float: right;">_____ 2 _____</span></p> <p>Multiply line E by \$2,500 and enter the amount in the "Total Fees" column.</p>	\$5,000	\$5,000
4	<input type="checkbox"/>	Case-by-Case MACT	\$9,500	
5	<input type="checkbox"/>	Prevention of Significant Deterioration (PSD) requirements. Subchapter D	\$32,500	
6	<input type="checkbox"/>	Plantwide Applicability Limit (PAL) for NSR regulated pollutants or PAL for PSD regulated pollutants or both	\$7,500	
7	<input type="checkbox"/>	Risk Assessment Analysis – Inhalation only	\$10,000	
8	<input type="checkbox"/>	Risk Assessment Analysis – Multi-pathway	\$25,000	
Add Lines 1 thru 8 of Total Fees column and write it here. <span style="color: blue;">—————→</span>				\$7,500