



Pennsylvania
Department of
Environmental Protection

SOUTHWEST REGIONAL OFFICE – AIR QUALITY PROGRAM

MEMO

TO 63-01011 / PA-63-01011B

FROM Devin P. Tomko, P.E./DPT
Air Quality Engineer

THROUGH Mark R. Gorog, P.E./MRG
Regional Program Manager

Sheri L. Guerrieri, P.E./slg
Environmental Engineer Manager

DATE February 10, 2025

RE Review of Application for Plan Approval
MarkWest Liberty Midstream & Resources, LLC – Harmon Creek Gas Plant
Smith Township, Washington County
AUTH 1514603 APS 1130132 PFID 819388 **Facility Status:** Synthetic Minor
AUTH 1471222 APS 1066962 PFID 819388 **Facility Status:** Major (*Application Replaced*)

BACKGROUND

MarkWest Liberty Midstream & Resources, LLC (“MarkWest”) owns and operates the existing Harmon Creek Gas Processing Plant (“Harmon Creek”), natural gas processing plant located at 123 Point Pleasant Rd, Bulger, PA 15019, in Smith Township, Washington County (40.401111,-80.357222). The facility currently operates under the authority of plan approval PA-63-01011¹ and GP5-63-01011B (AG5-63-00011A)². Harmon Creek receives and processes dehydrated “wet” natural gas from upstream gathering stations. Gas processing operations at Harmon Creek include extracting natural gas liquids (NGLs) from the field gas and partial fractionation of mixed NGLs to natural gas products using stabilization, cryogenic separation, and deethanization fractionation to produce residue gas, condensate, NGLs, and purity ethane.

¹ Issued on April 12, 2023.

² Authorized on June 29, 2022.

On January 19, 2024, the Department received an application for Plan Approval to construct and operate the following air contamination sources and air cleaning devices which comprise the proposed DeEthanizer II and 330 MMscfd Harmon Creek Cryo III projects:

- One (1) Cryo Plant III regenerative heater rated at a maximum heat input of 21.75 MMBtu/hr equipped with flue gas recirculation (FGR).
- Two (2) DeEthanizer II hot medium oil (HMO) heaters rated at a maximum heat input of 73.85 MMBtu/hr and equipped with FGR.
- One (1) 500-gallon methanol storage tank.
- One (1) high-pressure pig receiver controlled by the process flare.
- Three (3) electric-driven centrifugal compressors and associated dry seal gas venting.
- One (1) electric-driven reciprocating compressor.
- Associated fugitive emissions components.

Additionally, emission increases associated with truck loadout operations, emissions from maintenance blowdowns and some pressure relief devices, where feasible, were initially proposed to be controlled by the existing plant flare. The proposed project will increase gas processing capacity at Harmon Creek to accommodate additional production from gas suppliers and was initially proposed to result in potential emissions that would exceed the major source threshold for volatile organic compounds (VOCs).

The application was determined to be administratively complete via email on January 31, 2024.

Per letter sent by the Department via email to MarkWest on May 28, 2024, the Department identified multiple technical deficiencies in the application pursuant to 25 Pa. Code §127.12(a), which specifies in relevant parts, that an application for Plan Approval shall:

- (2) Contain information that is requested by the Department and is necessary to perform a thorough evaluation of the air contamination aspects of the source.
- (3) Show that the source will be equipped with reasonable and adequate facilities to monitor and record the emissions of air contaminants and operating conditions which may affect the emissions of air contaminants and that the records are being and will continue to be maintained and that the records will be submitted to the Department at specified intervals or upon request.
- (5) Show that the emissions from a new source will be the minimum attainable through the use of the best available technology.
- (10) Show that the source and the air cleaning devices are capable of being and will be operated and maintained in accordance with good air pollution control practices.

Responses to the technical deficiency letter were received in three (3) parts from MarkWest, each via email on June 27, July 26, and August 15, 2024. It should be noted that responses to the technical deficiency letter were received twenty-seven (27) business days beyond the timeframe specified in the letter and some items were not addressed. MarkWest also provided additional information in support of its Best Available Technology (“BAT”) analysis to the Department on October 2, 2024.

A second technical deficiency letter/pre-denial letter was sent by the Department via email to MarkWest on November 12, 2024, which identified areas in which the application remained technically deficient and identified additional deficiencies pursuant to 25 Pa. Code §127.12(a)(2, 3, 5, and 10) and also §127.12(a)(4), which states that an application for plan approval shall

- (4) Show that the source will comply with applicable requirements of this article and requirements promulgated by the Administrator of the EPA under the Clean Air Act (42 U.S.C.A. §§7401 – 7706).

Responses to the second technical deficiency letter/pre-denial letter were received from MarkWest on November 26, 2024. All deficiency letters and responses thereto are available as part of the application record.

Throughout the application review process, the Department and MarkWest participated in teleconferences on an approximate bi-weekly basis to discuss details of the proposed project including application deficiencies and MarkWest’s responses thereto. As seen in the Department’s deficiency letters, the most critical deficiency was MarkWest’s initial proposal to utilize the existing plant flare to control emissions from proposed new sources, including those from maintenance blowdowns, closed drain tank loadout operations, dry seal vents associated with the proposed centrifugal compressors, and the proposed pig receiver. Via email on November 5, 2024, MarkWest/Marathon Petroleum Corporation Logistics LP (MPLX) requested a meeting with the Department, including central office Air Quality staff to discuss BAT for the proposed project. The meeting was hosted by the Department’s Central Office in the Rachel Carson State Office Building (with some regional Department Air Quality staff and MarkWest/MPLX staff attending via Teams) on December 4, 2025. The meeting attendees are identified in *Table 1*.

Table 1: Meeting Attendees on December 4, 2025.

MarkWest/MPLX Personnel	Department Personnel
Tim Haley, VP G&P ES&S	Nick Lazor, Director Bureau of Air Quality
Harold Scott, Environmental Director	Viren Trivedi, P.E., Environmental Program Manager
Nathan Wheldon, Environmental Manager	Sean Wenrich, P.E., Environmental Engineer Manager
Allie Juarez, Advanced Environmental Engineer	Mark Gorog, P.E., Regional Program Manager
Shane Hecht, Advanced Senior G&P Engineer	Sheri Guerrieri, P.E., Environmental Engineer Manager
Harold Rinehart, VP Regional G&P Operations	Devin Tomko, P.E., Air Quality Engineer

After extensive discussions with MarkWest regarding what the Department considered BAT for control of emissions from the project, MarkWest committed to constructing a vapor recover unit (VRU) system to capture 100% of emissions that were initially proposed to be controlled by the existing plant flare (including those from maintenance blowdowns, closed drain tank loadout operations, dry seal vents associated with the proposed centrifugal compressors, and the proposed pig receiver), with emissions due to VRU maintenance downtime (estimated at approximately 5% of the year or 438 hours) being sent to the existing plant flare. MarkWest also further refined (reduced) estimates for fugitive emissions using historic leak detection and repair (LDAR) emissions reduction data and enhancing its LDAR program to include semi-annual Method 21 leak detection. The Department will also require semi-annual LDAR using optical gas imaging (OGI). The resulting VOC emissions reductions have lowered the project potential to emit (PTE) to *less* than the major source thresholds which will be practicably enforceable by the imposition of synthetic minor Plan Approval restrictions. Additional details regarding BAT for the project are included in the *EMISSIONS AND CONTROLS and BEST AVAILABLE TECHNOLOGY (BAT) ANALYSIS* section of this memo.

REGULATORY ANALYSIS

Pennsylvania Code

Per relevant part of 25 Pa. Code §127.11, “...a person may not cause or permit the construction or modification of an air contamination source...or the installation of an air cleaning device on an air contamination source...unless the construction, modification, reactivation or installation has been approved by the Department.” Per 25 Pa. Code §121.1, the term *air contamination source* (or *source*) is defined as “[a]ny place, facility or equipment, stationary or mobile, at, from or by reason of which there is emitted into the outdoor atmosphere any air contaminant.” An *air cleaning device* is defined as “[a]n article, chemical, machine,

equipment or other contrivance, the use of which may eliminate, reduce or control the emission of air contaminants into the atmosphere.”

Approval for construction and temporary operation of the sources and air cleaning devices (or controls) associated with the proposed DeEthanizer II and 330 MMscfd Cryo II projects has been requested via the subject application for Plan Approval PA-63-01011B. The proposed sources and air cleaning devices include the following and are categorized by the indicated AIMS source/subfacility IDs (SFIDs) and Source Code Classification (SCC) codes:

- 330 MMscfd Cryo Plant III: SFID 405 – 31000299 – *Industrial Processes, Oil and Gas Production, Other Not Classified.*
- De-Ethanizer 2: SFID 406 – 31000299 – *Industrial Processes, Oil and Gas Production, Other Not Classified.*
- One (1) Cryo Plant III regenerative heater rated at a maximum heat input of 21.75 MMBtu/hr equipped with flue gas recirculation (FGR): SFID 038 – 10200602 – *External Combustion Boilers, Industrial, Natural Gas, 10-100 MMBtu/hr.*
- Two (2) DeEthanizer II hot medium oil (HMO) heaters rated at a maximum heat input of 73.85 MMBtu/hr and equipped with FGR. SFIDs 039 and 040 – 10200602 – *External Combustion Boilers, Industrial, Natural Gas, 10-100 MMBtu/hr.*
- One (1) 500-gallon methanol storage tank: SFID 303 – 31000214 – *Natural Gas Production; Natural Gas Liquid Storage Tank*
- One (1) high-pressure pig receiver: SFID 801 – 31000299 – *Industrial Processes, Oil and Gas Production, Other Not Classified.*
- Three (3) electric-driven centrifugal compressors and associated dry seal gas venting: SFID 603 – 31000203 – *Industrial Processes, Oil and Gas Production, Natural Gas Production; Compressors.*
- One (1) electric-driven reciprocating compressor. SFID 105 – 31000203 – *Industrial Processes, Oil and Gas Production, Natural Gas Production; Compressors*
- One (1) Vapor Recovery Unit (VRU): SFID C603
- Equipment blowdowns and venting: SFID 601 – 31000299 – *Industrial Processes, Oil and Gas Production, Other Not Classified.*
- Fugitive emissions components: SFID 701 – 31000220 – *Natural Gas Production, All Equipment Leak Fugitives (Valves, Flanges, Connections, Seals, Drains).*

Since the installation of the proposed equipment constitutes the construction of *new sources*, the requirements of 25 Pa. Code §127.1 apply, which specify that “[n]ew sources shall control the emission of air pollutants to the maximum extent, consistent with the best available technology as determined by the Department as of the date of issuance of the Plan Approval for the new source.” *Best available technology* (BAT) is defined in 25 Pa. Code §121.1 as “[e]quipment, devices, methods or techniques as determined by the Department which will prevent, reduce or control emissions of air contaminants to the maximum degree possible and which are available or may be made available.”

New Source Performance Standards (NSPS)

Title 25 Chapter 122 of the Pa. Code adopts the NSPS promulgated by the United States Environmental Protection Agency (EPA) under the Clean Air Act (42 U.S.C.A. §§7401—7642) in 40 CFR Part 60. These standards regulate the construction of new or modification of existing stationary sources and have been adopted by the Department to implement a delegation of Federal authority under section 111(c) of the Clean Air Act (42

U.S.C.A. §7411). The applicability of an NSPS Subpart depends on the type of source and date of construction, reconstruction, or modification as these terms are defined in the General Provisions of the NSPS in 40 CFR Part 60 Subpart A or as specifically defined in the associated subpart. With respect to the proposed sources at Harmon Creek, the following potentially applicable NSPS are evaluated in the Federal Requirements—*New Source Performance Standards* section of this document:

- 40 CFR Part 60 Subpart Db—*Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units*
- 40 CFR Part 60 Subpart Dc—*Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units*
- 40 CFR Part 60 Subpart Kb—*Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984, and On or Before October 4, 2023*
- 40 CFR Part 60 Subpart KKK—*Equipment Leaks of VOC From Onshore Natural Gas Processing Plants, and on or Before August 23, 2011*
- 40 CFR Part 60 Subpart LLL—*Standards of Performance for SO₂ Emissions From Onshore Natural Gas Processing for Which Construction, Reconstruction, or Modification Commenced After January 20, 1984, and on or Before August 23, 2011*
- 40 CFR Part 60 Subpart OOOO—*Standards of Performance for Crude Oil and Natural Gas Facilities for Which Construction, Modification, or Reconstruction Commenced After August 23, 2011, and on or before September 18, 2015*
- 40 CFR Part 60 Subpart OOOOa—*Standards of Performance for Crude Oil and Natural Gas Facilities for Which Construction, Modification or Reconstruction Commenced After September 18, 2015 and On or Before December 6, 2022*
- 40 CFR Part 60 Subpart OOOOb—*Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After December 6, 2022*
- 40 CFR Part 60 Subpart OOOOc—*Emissions Guidelines for Greenhouse Gas Emissions from Existing Crude Oil and Natural Gas Facilities*

National Emissions Standards for Hazardous Air Pollutants (NESHAPs)

Title 25 Chapter 124 of the Pa. Code adopts the National Emission Standards for Hazardous Air Pollutants (NESHAPs) of 40 CFR Part 61. NESHAPs are found in both 40 CFR Part 61 and 40 CFR Part 63 and are stationary source standards established by EPA for hazardous air pollutants (HAPs) which are those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. The Part 61 NESHAPs regulate only 7 hazardous air pollutants, including asbestos, beryllium, mercury, vinyl chloride, benzene, arsenic, and radon/radionuclides. None of the Part 61 standards apply to the proposed sources at Harmon Creek.

The 1990 Clean Air Act Amendments significantly expanded EPA's authority to regulate hazardous air pollutants. Section 112 of the Clean Air Act lists 187 hazardous air pollutants to be regulated by source category. The NESHAPs promulgated after the 1990 Clean Air Act Amendments are found in 40 CFR Part 63. These standards require application of technology-based emissions standards, referred to as Maximum Achievable Control Technology (MACT), or MACT standards. Most NESHAPs are delegated to the states but both EPA and the states implement and enforce these standards. With respect to the proposed sources at Harmon Creek, each of the following potentially applicable NESHAPs is evaluated in the Federal Requirements—*National Emission Standards for Hazardous Air Pollutants* section of this document:

- 40 CFR Part 63 Subpart HH— *National Emission Standards for Hazardous Air Pollutants From Oil and Natural Gas Production Facilities*
- 40 CFR Part 63 Subpart JJJJJ— *National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources*

Standards for Contaminants

Per 25 Pa. Code §123.1—*Prohibition of Certain Fugitive Emissions*, no person may permit the emission into the outdoor atmosphere of a fugitive air contaminant from a source other than those identified in §123.1(1-7, and 9). Further, in accordance with §123.2—*Fugitive Particulate Matter*, a person may not at any time permit fugitive particulate matter to be emitted into the outdoor atmosphere from a source specified in §123.1(a)(1-9) if the emissions are visible at the point the emissions pass outside the property on which the source is located. Although the proposed equipment should not be potential sources of particulate matter, the limitations of §§123.1 and 123.2 using the same language specified for facility-wide inspections in PA-63-01011, as appropriate, have been incorporated into PA-63-01011B.

Per 25 Pa. Code §121.1, a *process* is defined in relevant part as “[a] method, reaction or operation in which materials are handled or whereby materials undergo...chemical change”—that is, a substance with different chemical composition or properties is formed or created. The term includes all of the equipment, operations and facilities necessary for the completion of the transformation of the materials to produce a physical or chemical change. The existing elevated plant flare (to which emissions will be directed during VRU outages) at Harmon Creek is a process and is subject to §123.13. Emissions limitations applicable to processes are found in 25 Pa. Code §123.13—*Processes*, where with respect to that specified for processes not listed in §123.13(b)(1) since Harmon Creek will not include any of the listed processes, no person may permit the emission of particulate matter from a process in a manner that the concentration of particulate matter in the effluent gas exceeds 0.04 grain per dry standard cubic foot when the effluent gas volume is less than 150,000 dry standard cubic feet per minute per §123.13(c)(1)(i). Based on the Department’s calculations, the flare is rated at approximately 41,797 scfm (200,000 acfm at 2,000°F).

Per 25 Pa. Code §121.1, a *combustion unit* is defined as a “stationary equipment used to burn fuel primarily for the purpose of producing power or heat by indirect heat transfer”. The proposed Cryo Plant III 21.75 MMBtu/hr regenerative heater and two (2) DeEthanizer II 73.85 MMBtu/hr hot medium oil (HMO) heaters at Harmon Creek meet the definition of *combustion unit* since each produces heat by means of indirect heat transfer. Emissions limitations subject to combustion units are found in 25 Pa. Code §123.11—*Combustion Units*, which specifies that a person may not permit the emission of particulate matter from a combustion unit in excess of the 0.4 lb/MMBtu for units with heat input greater than 2.5 MMBtu/hr and less than 50 MMBtu/hr as in specified in §123.11(a)(1). Although the manufacturers specifications did not identify particulate matter emissions rates for the reboiler burner and flare, MarkWest utilized a more conservative total particulate matter emissions factor of 0.012 lb/MMBtu (or approximately 13.84 lb/MMscf) in lieu of approximately 0.007 lb/MMBtu (7.6 lb/MMscf) from AP-42 Section 1.4 “Natural Gas Combustion” Table 1.4-2 to conservatively estimate emissions of PM-10 and PM-2.5 from the proposed heaters.

Table 2 identifies the applicable particulate matter standard for each affected process and combustion unit at Harmon Creek.

Table 2: Particulate Matter Emissions Standards Summary (§123.11 and §123.13).

Source	Citation	Heat Input (MMBtu/hr), each	Exhaust Flow Rate (scfm), each	Applicable PM Emission Rate Limit	
				(lb/MMBtu)	(gr/dscf)
Cryo Plant III Regen Heater	§123.11(a)(1) ^a	21.75	-	0.04	-
Two (2) Deethanizer II Hot Medium Oil (HMO) Heaters	§123.11(a)(2) ^b	73.85	-	0.032	-
Plant Flare	§123.13(c)(1)(i) ^c	-	43,137 ^d	-	0.04

^a Combustion unit rated at greater than 2.5 MMBtu/hr but less than 50 MMBtu/hr.

^b Combustion unit rated at equal to or greater than 50 MMBtu/hr and less than 600 MMBtu/hr.

^c Processes with effluent gas less than 150,000 dry standard cubic feet per minute.

^d Estimated maximum dry standard exhaust flow rate based on a flare maximum blower rating of 200,000 acfm, 3% moisture, and at an operating temperature of approximately 2,000°F, as calculated by the Department.

Sulfur compound emissions standards are established in §123.21—*General*. The sulfur compound emissions standard applicable to all proposed sources is found in §123.21(b) which establishes that no person may permit the emission into the outdoor atmosphere of sulfur oxides from a source in a manner that the concentration of the sulfur oxides, expressed as SO₂, in the effluent gas exceeds 500 parts per million, by volume, dry basis. Harmon Creek will comply with this limitation since it will process dehydrated field gas of which, based on the supplied gas analysis, the hydrogen sulfide content in the gas is non-detect or less than 0.10 mol%.

Particulate emissions limitations applicable to the proposed equipment are found in 25 Pa. Code §123.11—*Combustion Units* and 25 Pa. Code §123.13—*Processes*. The limitations of these sections and the same language specified for facility-wide inspections in PA-63-01011, as appropriate, have been incorporated into PA-63-01011B.

Odor emissions are regulated under 25 Pa. Code §123.31—*Limitations* where §123.31(b) specifies that “[a] person may not permit the emission into the outdoor atmosphere of any malodorous air contaminants from any source, in such a manner that the malodors are detectable outside the property of the person on whose land the source is being operated” where a *malodor* is defined in §121.1 as “[a]n odor which causes annoyance or discomfort to the public and which the Department determines to be objectionable to the public.” The limitations of §123.31 and the requirement to conduct odor surveys as part of facility-wide inspections at least once per operating day using the same language specified for facility-wide inspections in PA-63-01011 have been incorporated into PA-63-01011B.

Visible emissions from sources are regulated under 25 Pa. Code §123.41—*Limitations* which prohibits the emission of visible air contaminants into the outdoor atmosphere in such a manner that the opacity of the emission is either equal to or greater than 20% for a period or periods aggregating more than 3 minutes in any 1 hour, or equal to or greater than 60% at any time. Since the potential for stack opacity from near-pipeline quality gas natural gas-fired combustion unit stacks and flare stacks is minimal (if operated properly) and the regulatory standards of §123.41 would be unreasonably excessive, stack opacity from all proposed sources will be limited by condition to 10% at all times as previously specified in PA-63-01011. Pursuant to 25 Pa. Code §127.12b(a), to ensure compliance with the specified case-by-case visible emission limitation(s), the requirement to conduct odor surveys as part of facility-wide inspections at least once per operating day have been incorporated into the Plan Approval for Harmon Creek using the language specified for facility-wide inspections in PA-63-01011. If any visible emissions are apparent, the owner or operator will be required to take immediate corrective action. The owner or operator shall maintain records of all such inspections and any corrective action.

Standards for Sources

Storage Tanks

Per **25 Pa. Code §129.57**, tanks with capacity equal to or greater than 2,000 gallons (and less than or equal to 40,000 gallons) which contain volatile organic compounds with vapor pressure greater than 1.5 psia (10.5 kilopascals) under actual storage conditions shall be equipped with pressure relief valves which are maintained in good operating condition and which are set to release at no less than .7 psig (4.8 kilopascals) of pressure or .3 psig (2.1 kilopascals) of vacuum or the highest possible pressure and vacuum in accordance with state or local fire codes or the National Fire Prevention Association guidelines. The actual vapor pressure must be determined per §129.56(g), which specifies that “[f]or volatile organic compounds whose storage temperature is governed by ambient weather conditions, the vapor pressure under actual storage conditions shall be determined using a temperature which is representative of the average storage temperature for the hottest month of the year in which the storage takes place.”

The proposed project at Harmon Creek will include the modification of one (1) 4,200-gallon closed drain storage tank. In its emissions estimations using EPA AP-42, MarkWest estimated the vapor pressure of the closed drain tank fluids to be 8.16 psia per AP-42 Table 7.1-2 (gasoline, RVP-15, @ 60°F). As such, the tank is subject to 25 Pa. Code §129.57 but will meet the more stringent requirements of 25 Pa. Code §129.56 which requires that tanks are “...capable of maintaining working pressures sufficient at all times to prevent vapor or gas loss to the atmosphere or is designed and equipped with one of the [specified] vapor loss control devices...”, which includes the option to utilize a vapor recovery system and which has been proposed by MarkWest. As discussed in more detail in the *Analysis of Federal Requirements* section of this memo, since the closed drain tank will be modified, it is a Subpart OOOOb-*storage vessel affected facility* from which, pursuant to 40 CFR §60.5411(c)(1), “...all gases, vapors, and fumes from the affected facility are routed to the control device or process and that the control device or process is of sufficient design and capacity to accommodate all emissions from the affected facility.”

The proposed project at Harmon Creek will also include the construction and operation of one (1) 500-gallon methanol storage tank. Since the capacity of the methanol storage tank is less than 2,000 gallons, the tank is not subject to the requirements of §129.57.

State Monitoring and Reporting Requirements

25 Pa. Code Chapter 135 establishes a means of obtaining data required to evaluate the effectiveness of regulations, identify available or potential emission offsets, and maintain an accurate inventory of air contaminant emissions for air quality assessment and planning activities. In its current authorizations for Harmon Creek (PA-63-01011 and GP5-63-01011B (AG5-63-00011A)), MarkWest is currently required to maintain records necessary for the identification and quantification of potential and actual air contaminant emissions, including but not limited to hours of operation, fuel usage, maintenance of process or pollution control equipment; and to submit a source emissions report by March 1 of each year for the preceding calendar year.

Facility blowdowns, or controlled releases of pressurized gas, are necessary at natural gas processing plants to facilitate equipment repairs or to place a piece of equipment into service following a repair or shutdown. MarkWest has proposed to capture emissions from maintenance blowdowns, closed drain tank loadout operations, dry seal vents associated with the proposed centrifugal compressors, and the proposed pig receiver. Certain equipment malfunctions or shutdowns will trigger an emergency shutdown (ESD) of the entire facility where most of the pressurized gas contained within the equipment and piping must be released. Given the potential volume of gas associated with a facility-wide ESD, all gas from such events will be directed to the

facility emergency flare. In its application and subsequent revisions, MarkWest provided estimates of blowdown emissions at Harmon Creek. The Plan Approval will require MarkWest to measure, maintain records of, and report emissions associated with all blowdowns and ESDs at Harmon Creek. Appropriate reporting and record keeping requirements have been included in Plan Approval PA-63-01011B using the same language specified in PA-63-01011.

State Source Testing Requirements

25 Pa. Code Chapter 139 establishes requirements for sampling and testing and will be applicable to the proposed sources at this facility. The Plan Approval will require that all source testing be conducted in accordance with the most recent version of the Department's *Source Testing Manual* pursuant to §139.3 as well as any additional requirements specified in applicable Federal Regulations. Pursuant to Code §139.5(f), a person proposing test methods, procedures and guidance for the reporting of emissions different from those contained in the *Source Testing Manual* shall have the burden of proof to demonstrate that test methods, procedures and guidance accurately characterize the emissions from the source. If the Department has cause to believe that air contaminant emissions from the sources listed in Plan Approval PA-63-01011B may exceed the limitations specified in, or established pursuant to this plan approval, the Department may require that testing is conducted to determine the actual emissions rate(s).

Additional Regulatory and Policy Considerations

In addition to regulations promulgated under the Air Pollution Control Act and Clean Air Act, the Department utilizes policies and procedures established in technical guidance documents to supplement existing regulatory and statutory requirements. These guidance documents establish a framework within which DEP can exercise its administrative discretion in a variety of areas. Since these policies and procedures are not regulation, DEP reserves its discretion to deviate from the policy statements when circumstances warrant.

Land Use Policy

Under Act 247, as amended by Acts 67, 68, and 127 of the Municipalities Planning Code, the Department and other state agencies “shall consider and may rely upon comprehensive plans and zoning ordinances when reviewing applications” for the permitting of facilities. The Department's *Final Revision of Policy for Consideration of Local Comprehensive Plans and Zoning Ordinances in DEP Review of Permits for Facilities and Infrastructure* (012-0200-001; March 6, 2004) established procedures for how the Department considers, and under certain conditions relies upon, comprehensive planning and zoning ordinances in its permit decision making process related to facilities to avoid or minimize conflict with local land use decisions. Harmon Creek is located in Smith Township, Washington County, wherein a municipal comprehensive plan and a county comprehensive plan have been enacted and municipal zoning ordinances have been enacted. Via UPS on January 17, 2024, MarkWest provided notification of the proposed project to Smith Township Supervisors and Washington County Commissioners. No comments were received by the Department in response to the notifications.

Although the subject application is an authorization type to which the Land Use Policy may apply, since Harmon Creek is an existing facility located on property of which the land use will not change due to the proposed project, no land use conflicts exist. As such, no further action is required pursuant to the Department's Land Use Policy.

Environmental Justice

The Department's *Environmental Justice Policy* (015-0501-002; September 16, 2023) ("EJP") was established to facilitate environmental justice in communities across the Commonwealth of Pennsylvania and to ensure equity and environmental justice in the administration of the Department's constitutional, statutory, and regulatory duties. The EJP applies to the review of applications administered by DEP for environmental authorizations, as well as to the review of DEP permits as described in this policy and to DEP program areas and initiatives specifically named and included within this policy. The EJP does not supersede the Permit Decision Guarantee or other policies, or any applicable executive orders, regulations, or statutes.

With respect to permitting of air pollution sources under 25 Pa. Code Chapter 127, the EJP only applies to the air quality *Trigger Projects* as this term is defined in the EJP, which includes approvals of *new major sources of hazardous air pollutants or criteria pollutants* and/or *major modifications of major sources (subject to Prevention of Significant Deterioration or Nonattainment New Source Review)* when such sources are located in Environmental Justice Areas. For the purposes of the EJP, an area is designated an "Environmental Justice Area" if the Department's *Pennsylvania Environmental Justice Mapping and Screening Tool (PennEnviroScreen³)* score is greater than 80.

Although the project was initially subject to the EJP, since the revised application no longer proposes either of the air quality *Trigger Projects* listed above, it is not subject to the Enhanced Public Participation Process established by the EJP. It should be noted that the Harmon Creek Compressor Station is located in an area with a *PennEnviroScreen* score of 94, which is therefore an Environmental Justice Area. Although the subject application no longer a *Trigger Permit*, given the general public interest in the facility, the Department has elected to hold a public hearing and conference on March 11, 2025, from 6:30 PM to 8:30 PM at Burgettstown Area Middle/High School's LGI Room, 100 Bavington Road, Burgettstown, PA 15021. Notice of the hearing appeared in the *Pa. Bulletin* on February 8, 2024.

Permit Review Policy/Decision Guarantee

Under Executive Order 2012-11, the *Policy for Implementing the Department of Environmental Protection (Department) Permit Review Process and Permit Decision Guarantee* (021-2100-001) was made effective on November 2, 2012. This policy established a standardized review process and processing times for all Department permit applications. For permits contained in the Permit Decision Guarantee ("PDG"), the Department guarantees to provide permit decisions within the published timeframes, provided that applicants submit complete, technically adequate applications that address all applicable regulatory and statutory requirements in the first submission. This policy established a Department-wide standard process for receiving, prioritizing, accepting, reviewing, denying, and approving applications for permits or other authorizations. This policy covers Major Facility Plan Approvals (State Regulation) and provides a permit decision guarantee of 150 business days after the application is determined to be administratively complete, provided that the application is not technically deficient.

The Plan Approval application for the proposed project at Harmon Creek was received on January 17, 2024, and was determined to be administratively complete via email on January 31, 2024. Via technical deficiency letter dated May 28, 2024, additional technical information was requested from the applicant. Since the requested information was scientific, engineering, and project design related information necessary to address specific regulatory requirements, these deficiencies voided the permit decision guarantee for the application. The deficiencies have also stopped the PAYback program review clock established under Executive Order 2023-07, which provides a review timeframe for this application type of 160 business days. Responses to the deficiency items were received via emailed letter and attachments from MarkWest on via email on June 27, July

³ <https://gis.dep.pa.gov/PennEnviroScreen/>.

26, and August 15, 2024. Additional technical information was requested via technical deficiency letter/pre-denial letter from the Department dated November 12, 2024, to which responses were received from MarkWest on November 26, 2024. Since significant application revisions were made since the application was received (the proposed project will no longer result in the facility becoming major for VOCs per written commitment from MarkWest received on January 17, 2025), the initial *major facility Plan Approval application* has been replaced in eFACTS with a *minor facility Plan Approval application* which will establish a new 140-day PAyBack clock with start date of January 17, 2025.

Analysis of Federal Requirements

New Source Performance Standards

Per §60.1(a) of **40 CFR Part 60 Subpart A—General Provisions**, the provisions of 40 CFR Part 60 apply to the owner or operator of any stationary source which contains an affected facility of which the construction or modification commenced after the date of publication in this part of any standard (or, if earlier, the date of publication of any proposed standard) applicable to that facility. For the purposes of Part 60, an *affected facility* means “with reference to a stationary source, any apparatus to which a standard is applicable.” The affected facility to which a standard (or Subpart) applies is specifically defined within each subpart. Part 60 Subpart A specifies general regulatory provisions—including but not limited to definitions, notification and recordkeeping requirements, and performance testing requirements—which apply in each of the subsequent Part 60 subparts.

The requirements of **40 CFR Part 60 Subpart Db—Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units** do not apply to the proposed Cryo Plant III 21.75 MMBtu/hr regenerative heater two (2) Deethanizer II 73.85 MMBtu/hr hot medium oil (HMO) heaters at Harmon Creek. Although the proposed heaters are each considered “a device that combusts any fuel or byproduct/waste and produces steam or heats water or heats any heat transfer medium...” and a *steam generating unit* by definition in 40 CFR §60.41b, since each does not have a rated heat input capacity of greater than 29 megawatts (MW) (100 million British thermal units per hour (MMBtu/hr)) per §60.40b, each heater is not an affected facility under Subpart Db.

The requirements of **40 CFR Part 60 Subpart Dc—Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units** apply to the proposed Cryo Plant III 21.75 MMBtu/hr regenerative heater two (2) Deethanizer II 73.85 MMBtu/hr hot medium oil (HMO) heaters at Harmon Creek. Each heater is considered “a device that combusts any fuel or byproduct/waste and produces steam or heats water or heats any heat transfer medium...” and therefore a *steam generating unit* by definition in 40 CFR §60.41c. Since on each has have a rated heat input capacity of a maximum design heat input capacity of 29 megawatts (MW) (100 million British thermal units per hour (MMBtu/h)) or less, but greater than or equal to 2.9 MW (10 MMBtu/h) per §60.40c, each is an affected facility under Subpart Dc. The proposed heaters are subject to limited reporting and recordkeeping requirements pursuant to §60.48c, which have been incorporated as plan approval conditions.

The requirements of **40 CFR Part 60 Subpart Kb—Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984** do not apply to the proposed storage tanks at Harmon Creek. Per 40 CFR §60.110b, the requirements of 40 CFR Part 60 Subpart Kb, apply to “...each storage vessel with a capacity greater than or equal to 75 cubic meters (m³) that is used to store volatile organic liquids (VOL) for which construction, reconstruction, or modification is commenced after July 23, 1984.” Additionally, per §60.110b(d), “This subpart does not apply to “...[v]essels with a design capacity less than or equal to 1,589.874 m³ used for petroleum or condensate stored, processed, or treated prior to custody transfer...”.

For the purposes of Subpart Kb, the term *condensate* is defined as “hydrocarbon liquid separated from natural gas that condenses due to changes in the temperature or pressure, or both, and remains liquid at standard conditions.” The term *volatile organic liquid (VOL)* is defined as “any organic liquid which can emit volatile organic compounds (as defined in 40 CFR 51.100) into the atmosphere.”

The previously installed 4,200-gallon closed drain tank at Harmon Creek (which will be modified as part of the project) has an equivalent capacity of approximately 15.89 m³ and will temporarily store liquids containing condensate prior to custody transfer to tanker trucks. Although the tank was constructed and will be modified after July 23, 1984, since the tank has a capacity of less than 1,589.874 m³ (or 420,000 gallons), the requirements of 40 CFR Part 60 Subpart Kb do not apply.

The proposed project at Harmon Creek also includes one (1) 500 methanol storage tank. Since the capacity of this ancillary storage tank is less than 75 m³ (or 19,812 gallons), the requirements of 40 CFR Part 60 Subpart Kb do not apply.

The requirements of **40 CFR Part 60 Subpart KKK—*Equipment Leaks of VOC From Onshore Natural Gas Processing Plants for Which Construction, Reconstruction, or Modification Commenced After January 20, 1984, and on or Before August 23, 2011*** do not apply to Harmon Creek. Per 40 CFR §60.630(a)(1), Subpart KKK applies to affected facilities in onshore natural gas processing plants that commenced construction, reconstruction, or modification after January 20, 1984, and on or before August 23, 2011. Harmon Creek does not and will not incorporate any Subpart KKK-affected facilities for which construction, reconstruction, or modification commenced after January 20, 1984, and on or before August 23, 2011.

The requirements of **40 CFR Part 60 Subpart LLL—*Standards of Performance for SO₂ Emissions From Onshore Natural Gas Processing for Which Construction, Reconstruction, or Modification Commenced After January 20, 1984, and on or Before August 23, 2011*** do not apply to Harmon Creek. Per 40 CFR §60.640(a), Subpart LLL applies to the following affected facilities that process natural gas: each sweetening unit, and, each sweetening unit followed by a sulfur recovery unit. Per §60.641, a *sweetening unit* is a process device that separates the H₂S (hydrogen sulfide) and CO₂ (carbon dioxide) contents from the sour natural gas stream, and a *sulfur recovery unit* is a process device that recovers elemental sulfur from acid gas. Although Harmon Creek incorporates an amine unit which removes CO₂ from process gas, it is not a Subpart LLL-affected facility since it was not constructed after January 20, 1984, and on or before August 23, 2011.

The requirements of **40 CFR Part 60 Subpart OOOO—*Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution for which Construction, Modification or Reconstruction Commenced After August 23, 2011, and on or before September 18, 2015*** do not apply at Harmon Creek since it does not incorporate any onshore affected facilities that commenced construction, modification or reconstruction after August 23, 2011, and on or before September 18, 2015.

The requirements of **40 CFR Part 60 Subpart OOOOa—*Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015, and on or before December 6, 2022*** apply at Harmon Creek since it incorporates onshore affected facilities that commenced construction, modification or reconstruction after September 18, 2015 and on or before December 6, 2022. The requirements of Subpart OOOOa are included in Plan Approval PA-63-01011 for the Harmon Creek II project. Any affected facilities constructed or modified as part of the Harmon Creek III project are potentially affected under **40 CFR Part 60 Subpart OOOOb—*Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After December 6, 2022***.

The requirements of **40 CFR Part 60 Subpart OOOOb—*Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After December***

6, 2022 (final rule published in the *Federal Register* on March 8, 2024) applies at Harmon Creek since one or more Subpart OOOOb potentially affected facilities is proposed to be constructed or modified at Harmon Creek after December 6, 2022. Subpart OOOOb applies to affected facilities⁴ in the *crude oil and natural gas source category*, which as defined in 40 CFR §60.5430b, includes “[n]atural...processing...” and establishes emission standards and compliance schedules from for the control of greenhouse gases (GHG) (through standards in the form of limitations on methane emissions), volatile organic compounds (VOC), and sulfur dioxide (SO₂) emissions. Per §60.5370b(a), MarkWest must be in compliance with the standards of Subpart OOOOb upon initial startup except as specified in §60.5370b for each potentially affected facility type. The applicable requirements of Subpart OOOOb have been included as conditions in the Plan Approval.

Centrifugal Compressors

Per §60.5365b(b), Subpart OOOOb applies to each *centrifugal compressor affected facility* constructed or modified after December 6, 2022, which, per 40 CFR §60.5430b(d), is a “...machine for raising the pressure of a natural gas by drawing in low pressure natural gas and discharging significantly higher-pressure natural gas by means of mechanical rotating vanes or impellers.” Each proposed centrifugal compressor at Harmon Creek is a *centrifugal compressor affected facility* and subject to the Subpart OOOOb requirements applicable thereto and must comply with the applicable standards upon startup per 40 CFR §60.5370b(a). Per 40 CFR §60.5370b(a), each centrifugal compressor affected facility that uses dry seals must comply §60.5380b(a)(6 through 8) (limits the volumetric flow rate from a seal vent to 10 scfm and requires scheduled seal replacements if flow rates exceed 10 scfm) or with of the alternatives in paragraph §60.5380b(a)(9) (requires reducing methane and VOC emissions from each centrifugal compressor dry seal system by 95.0 percent). MarkWest has elected to comply with the alternative requirements of §60.5380b(a)(9) and will equip each centrifugal compressor dry seal system with a cover that meets the requirements of §60.5411b(b) connected through a closed vent system that meets the requirements of §60.5411b(a) and (c). The closed vent system will be routed to a process, or to a control device (facility emergency flare) that meets the conditions specified in §60.5412b.

Reciprocating Compressors

Subpart OOOOb applies to each *reciprocating compressor affected facility* constructed or modified after December 6, 2022, which, per 40 CFR §60.5365b(c), is a single reciprocating compressor. The project will include one (1) reciprocating compressor which must meet, per the specified schedules, either the standard or alternate requirements of §60.5385b, as selected by MarkWest and as specified in §60.5410b(e).

Process Controllers

Subpart OOOOb applies to each *process controller affected facility* constructed or modified after December 6, 2022, which, per 40 CFR §60.5365b(d), is the “collection of natural gas-driven process controllers at...an onshore natural gas processing plant...”, wherein, per §60.5430b, a *process controller* is defined as “...an automated instrument used for maintaining a process condition such as liquid level, pressure, delta-pressure and temperature. No *process controller affected facilities* are proposed with the Cryo III and DeEthanizer II projects.

⁴ In general, per 40 CFR §60.5365b(a-h), potentially affected facilities under Subpart OOOOb include each well, centrifugal compressor, reciprocating compressor, natural gas-driven process controller, storage vessel, process unit, sweetening unit, natural gas-driven pump, and collection of fugitive emissions components.

Storage Vessels/Tank Batteries

Per §60.5365b, Subpart OOOOb applies to each *storage vessel affected facility* constructed or modified after December 6, 2022, which, per 40 CFR §60.5365b(e), is a *tank battery*⁵ that has the potential for emissions as specified in §60.5365b(e)(1)(i)⁶ or (ii)⁷ as determined per §60.5365b(e)(2). Per §60.5365b(e)(2)(iii), for each tank battery not located at a well site or centralized production facility, including each tank battery located at an onshore natural gas processing plant, per §60.5365b(e)(3)(ii)(F)⁸, per §60.5365b(e)(2)(ii) for each potentially affected storage vessel at Harmon Creek, MarkWest must determine the potential for VOC and methane emissions prior to startup of the compressor station, onshore natural gas processing plant, or other facility within 30 days after an action specified in §60.5365b(e)(3)(i and ii)⁹, using either method described in paragraph §60.5365b(e)(2)(iii)(A) or (B). Per §60.5365b(e)(3)(ii)(D), a *modification* of a tank battery at an onshore natural gas processing plant occurs when an existing tank battery receives additional fluids which cumulatively exceed the throughput used in the most recent determination of the potential for VOC or methane emissions. Since the previously installed closed drain tank will receive additional fluids as a result of the proposed project, the closed drain tank will be modified upon commencement of operation of the Cryo III and/or DeEthanizer II projects and therefore subject to the requirements of Subpart OOOOb.

Process Unit Equipment

Per §60.5365(f), each *process unit equipment affected facility*, which is the group of all equipment within a process unit at an onshore natural gas processing plant is an affected facility. Per §60.5430b, a *process unit* is the "...components assembled for the extraction of natural gas liquids from field gas, the fractionation of the liquids into natural gas products, or other operations associated with the processing of natural gas products...." Since the *process unit* at Harmon Creek includes all previously installed and proposed natural gas processing equipment (the plant units operate in parallel and share upstream and downstream equipment), the entire Harmon Creek plant is *process unit equipment affected facility* under Subpart OOOOb which will be modified after December 6, 2022. Therefore, MarkWest must comply with the requirements of §60.5400b or §60.5401b to reduce methane and VOC emissions from equipment leaks for all process unit equipment affected facilities at Harmon Creek as soon as practicable, but no later than 180 days after the initial startup of the Cryo III and/or DeEthanizer II projects. Per §60.5400b(b), MarkWest must monitor for leaks by implementing bimonthly monitoring surveys using optical gas imaging (OGI) in accordance with 40 CFR Part 60 Appendix K.

Sweetening Units

Per §60.5365b(g)(1 and 2), each *sweetening unit affected facility* that processes natural gas produced from either onshore or offshore wells AND that processes natural gas followed by a sulfur recovery unit is an affected facility under Subpart OOOOb. Per §60.5430b, a *sweetening unit* is "...a process device that removes hydrogen sulfide and/or carbon dioxide from the sour natural gas stream" and *acid gas* is "...a gas stream of hydrogen sulfide (H₂S) and carbon dioxide (CO₂) that has been separated from sour natural gas by a sweetening

⁵ Per 40 CFR §60.5430b, a *tank battery* means a group of all storage vessels that are manifolded together for liquid transfer. A tank battery may consist of a single storage vessel if only one storage vessel is present.

⁶ VOC emissions equal to or greater than 6 tons per year.

⁷ Methane emissions equal to or greater than 20 tons per year.

⁸ A quantitative production limit and quantitative operational limit(s) for the equipment, or quantitative operational limits for the equipment; an averaging time period for the production limit in §60.5365b(e)(2)(i)(A), if a production-based limit is used, that is equal to or less than 30 days; established parametric limits for the production and/or operational limit(s) in §60.5365b(e)(1)(i)(A), and where a control device is used to achieve an operational limit, an initial compliance demonstration (i.e., performance test) for the control device that establishes the parametric limits; ongoing monitoring of the parametric limits in §60.5365b(e)(2)(i)(C) that demonstrates continuous compliance with the production and/or operational limit(s) in §60.5365b(e)(2)(i)(A); recordkeeping by the owner or operator that demonstrates continuous compliance with the limit(s) in §60.5365b(e)(2)(i)(A) through (D); and periodic reporting that demonstrates continuous compliance.

⁹ Reconstruction or modification, respectively, as specified therein.

unit.” Although Harmon Creek incorporates an amine gas treating unit to remove CO₂ from its final products, since Harmon Creek does not process sour gas, the amine unit is not a *sweetening unit* as defined in §60.5430b and therefore not a *sweetening unit affected facility* under Subpart OOOOb.

Pumps

Subpart OOOOb applies to each *pump affected facility* which is, in relevant part, the collection of natural gas-driven pumps at an onshore natural gas processing plant. Although pumps will be constructed as part of the Cryo III and DeEthanized II projects, the pumps will be electric or instrument air-driven and are therefore not *pump affected facilities*.

Fugitive Emissions Components

Subpart OOOOb applies to each *fugitive emissions components* affected facility constructed or modified at a well site, centralized production facility, or a compressor station after December 6, 2022. Since Harmon Creek is an onshore natural gas processing plant, it is a *process unit* by definition in §60.5430b. Each *process unit affected facility* is subject to the fugitive GHG and VOC standards applicable to *process unit equipment affected facilities* as specified in §60.5400b which are not subject to the requirements for each *fugitive emissions components* affected facility.

The requirements of **40 CFR Part 60 Subpart OOOOc—Emissions Guidelines for Greenhouse Gas Emissions from Existing Crude Oil and Natural Gas Facilities** (whether the “model rule” portion of Subpart OOOOc in §§60.5385c—60.5430c OR state standards established pursuant to §§60.5360c—60.5481c of Subpart OOOOc) will apply to designated facilities of which construction, modification, or reconstruction commenced on or before December 6, 2022, at Harmon Creek, no later than March 8, 2027. Per §60.5386c, Subpart OOOOc will apply at Harmon Creek to each *centrifugal compressor designated*, each *reciprocating compressor designated facility*, each *storage vessel designated facility*, each *process unit equipment designated facility*, and to each *fugitive emissions components designated facility* as these terms are defined in 40 CFR §60.5430c. The specific applicable requirements will be determined after the Department’s submittal of its plan to implement the emission guidelines of Subpart OOOOc to the United States Environmental Protection Agency (USEPA).

National Emissions Standards for Hazardous Air Pollutants

The requirements of **40 CFR Part 63 Subpart HH—National Emission Standards for Hazardous Air Pollutants From Oil and Natural Gas Production Facilities** do not apply at MarkWest Harmon Creek. Per 40 CFR Part §63.760(a), Subpart HH applies to certain affected sources at *oil and natural gas production facilities* that process, upgrade, or store natural gas prior to the point at which natural gas enters the natural gas transmission and storage source category and are major or area sources of HAPs. Harmon Creek is classified as an *area source*, and per §63.760(b)(2), the affected facility at an area source is each triethylene glycol (TEG) dehydration unit. Since Harmon Creek does not or will not include a TEG dehydration unit, Subpart HH does not apply.

The requirements of **40 CFR Part 63 Subpart HHH—National Emission Standards for Hazardous Air Pollutants From Natural Gas Transmission and Storage Facilities** do not apply to MarkWest at Harmon Creek since the facility is not a natural gas transmission and storage facility and not a major source of hazardous air pollutants (HAP) emissions as defined in §63.1271.

The requirements of **40 CFR Part 63 Subpart JJJJJJ—National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources** do not apply to MarkWest at

Harmon Creek. The term *boiler* is defined in §63.11237 in relevant part as “an enclosed device using controlled flame combustion in which water is heated to recover thermal energy in the form of steam and/or hot water” and also specifies in relevant part that “...process heaters...are excluded from the definition of [*b*]oiler.” The term *process heater* is defined in relevant part in §63.11237 as any “...an enclosed device using controlled flame [combustion], and the unit's primary purpose is to transfer heat indirectly to a process material (liquid, gas, or solid) or to a heat transfer material (e.g., glycol or a mixture of glycol and water) for use in a process unit, instead of generating steam.” The proposed Cryo Plant III 21.75 MMBtu/hr regenerative heater two (2) Deethanizer II 73.85 MMBtu/hr hot medium oil (HMO) heaters at Harmon Creek meet the definition of *process heater* in 40 CFR §63.11237. Therefore, the requirements of Subpart JJJJJ do not apply to MarkWest for these heaters.

EMISSIONS AND CONTROLS and BEST AVAILABLE TECHNOLOGY (BAT) ANALYSIS

As discussed previously in this memo, the proposed new sources at Harmon Creek meet the 25 Pa. Code §121.1 definition of *new source*. Per 25 Pa. Code §127.12(a)(5):

“New sources shall control the emission of air pollutants to the maximum extent, consistent with the best available technology as determined by the Department as of the date of issuance of the Plan Approval for the new source.”

Best available technology (BAT) is defined in 25 Pa. Code §121.1 as the:

“Equipment, devices, methods or techniques as determined by the Department which will prevent, reduce or control emissions of air contaminants to the maximum degree possible and which are available or may be made available.”

The Department’s *Best Available Technology and Other Permitting Criteria* (275-2101-007; February 23, 1996) (“BAT-TGD”) a collection of policies and procedures intended to supplement existing requirements and establishes the framework for DEP’s administrative discretion. Although the recommendations in the BAT-TGD should be adhered to for all sources that fall into a specified source category, DEP retains the ability to deviate from these policy statements if circumstances warrant. These documents and other reference materials, including the manufacturer’s specifications, prior Plan Approvals issued for the construction of similar sources, and other technical resources as identified throughout this memo, were evaluated to determine if the proposed sources meet the applicable BAT recommendations and requirements. Although the proposed equipment is not specifically discussed in the in the BAT-TGD, applicable BAT requirements for the proposed sources are found in the Department’s *General Plan Approval and/or General Operating Permit for Gas and No. 2 Oil Fired Small Combustion Units* (GP-1) and *General Plan Approval and/or General Operating Permit for Natural Gas Compression Stations, Processing Plants, and Transmission Stations* (GP-5).

In summary, the construction of new sources must be approved by the Department, and, at the time of approval, emissions from the new sources must be controlled to the maximum extent by the application of available equipment, devices, methods, or techniques which have been determined by the Department to meet these criteria. Establishing BAT for a given source or class of sources requires evaluating the technical feasibility and the ability to reduce emissions of criteria and hazardous air pollutants on a case-by-case basis using available equipment, devices, methods, or techniques. The applicability of BAT to each of the sources proposed in the subject application is discussed for each proposed source.

Heaters

During its evaluation of the proposed Cryo Plant III 21.75 MMBtu regenerative heater with flue gas recirculation (FGR) and guaranteed NO_x and CO emissions rates of 9 ppm_{vd} and 49 ppm_{vd}, respectively, the Department obtained publicly available information which indicated that natural gas burners with heat input

ratings between approximately 10 MMBtu/hr and 42 MMBtu/hr were currently available and capable of achieving <5ppm NO_x with FGR and without selective catalytic reduction (SCR). In its second Technical Deficiency Letter/Pre-Denial Notification dated November 12, 2024, the Department requested that MarkWest evaluate and revise the BAT analysis, as necessary, for the one (1) proposed Cryo Plant III regenerative heater rated at 21.75 MMBtu/hr. In its response, MarkWest, in consultation with two vendors, determined that <5ppm NO_x units are available, but would achieve only a nominal annual NO_x reduction (less than 0.51 tpy NO_x) and are also cost prohibitive with an annual cost of approximately \$84,700 per ton of NO_x controlled. The Department was unable to obtain information on the availability of heaters with a maximum heat input of 73.85 MMBtu/hr and capable of achieving <5ppm NO_x with FGR and without selective catalytic reduction (SCR). As such, the has determined that MarkWest's proposal to construct and operate one (1) 21.75 MMBtu Cryo Plant III regenerative heater and two (2) 73.85 MMBtu/hr DeEthanizer II hot medium oil (HMO) heaters, each with flue gas recirculation (FGR) and guaranteed NO_x and CO emissions rates of 9 ppm_{vd} and 49 ppm_{vd}, respectively, constitutes BAT for the proposed project.

Blowdown, Venting, and Tank Emissions

As discussed in the ***Background*** section of this memo, MarkWest had initially proposed to utilize the previously installed elevated (open) plant flare to control emissions from blowdown, venting, and tank emissions. The sources/activities proposed to be controlled in this manner included equipment and compressor blowdowns, dry seal vents associated with three (3) proposed centrifugal compressors, the modified 4,200-gallon closed drain tank, and one (1) proposed high-pressure pig receiver.

In its second Technical Deficiency Letter/Pre-Denial Notification dated November 12, 2024, the Department indicated that the information provided in the subject application for Plan Approval, in responses to technical deficiencies, and in other supplemental information provided by MarkWest, did not demonstrate that the proposed project met BAT for the source category or similar source categories from which control technologies could feasibly be transferred. The Department reiterated that per the Department's *General Plan Approval and/or General Operating Permit for Natural Gas Compression and/or Processing Facilities* ("GP-5") (2700-PM-BAQ0267; 6/2018), open flares may only be approved for control of new and modified sources at remote locations and for infrequent operations. The Department further noted that MarkWest had not demonstrated that the proposed gas venting controls meet BAT and that it had failed to evaluate other available control alternatives like gas recompression and requested. A BAT analysis that evaluates all available alternatives for control of emissions from equipment blowdown operations.

After extensive discussions with MarkWest regarding what the Department considered BAT for control of emissions from the project, MarkWest committed to constructing and operating a vapor recover unit (VRU) system to capture 100% of the emissions that were initially proposed to be controlled by the existing plant flare (including those from maintenance blowdowns, closed drain tank loadout operations, dry seal vents associated with the proposed centrifugal compressors, and the proposed pig receiver). Emissions associated with VRU bypass due to VRU maintenance or outage (estimated at approximately 5% of the year or 438 hours) will be sent to the existing plant flare and controlled by 98% per manufacturer rating. The proposed use of a VRU will achieve an overall destruction and removal efficiency (DRE) of 98% or greater when accounting for maintenance outages, will reduce combustion emissions from the flare, and will recover previously wasted product (and associated value), and therefore constitutes BAT for the control of VOC, HAP, and methane (CH₄) from blowdowns, venting, and tanks.

Fugitive Emissions Components

MarkWest's proposal to implement BAT for the control of fugitive emissions is two-fold and incorporates both low-emissions valves and welded or flanged connections. As previously required in PA-63-01011 (Harmon Creek II Project), MarkWest will implement the requirements specified by the Texas Commission on

Environmental Quality (TCEQ) in its *28VHP LDAR Program* and implement the piping construction standards specified in the TCEQ *Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance* (APDG 6422v2; Revised 6/2018). Implementing these component and piping construction techniques will allow MarkWest to claim the emissions reductions credits specified in the *28VHP LDAR Program*. For valves equal to or greater than 1” in diameter, Mark West will utilize valves designated as *Low-Emissions Valve* (or *Low-E Valve*) which are warranted by the manufacturer(s) to either not emit greater than 100 ppm of fugitive emissions within the first seven (7) years of service, valves that have been tested by the manufacturer or qualified testing firm to not emit greater than 500 ppm at any time (but 100 ppm on average), and valve extensions (valves of the same type, stem motion, tolerances, surface finishes, loading arrangement, and stem (packing) and body seal material, design, and construction). MarkWest has estimated that the use of Low-Emissions Valves will reduce fugitive emissions from valves by 99% or greater as compared to EPA AP-42 emissions factors.

MarkWest will also implement an enhanced facility-wide leak detection and repair (LDAR) program on connector and flange components in support its proposed fugitive emissions reduction claims which have reduced the PTE for the project to below the major source thresholds for VOC emissions. MarkWest’s initial proposal was to utilize optical gas imaging (OGI) but given the Department’s concerns regarding instrument detection levels (approximately 10,000 ppm for OGI and 500 ppm for Method 21), MarkWest agreed to implement semi-annual leak detection using 40 CFR Part 60, Appendix A-7, Method 21 on connector and flange components. This method and frequency will supersede the previous LDAR requirements specified in PA-63-01011 (quarterly LDAR using OGI) for the Cryo II project. Although EPA indicates in its *Background Technical Support Document for the Final New Source Performance Standards: 40 CFR Part 60 Subpart OOOOa* (May 2016) that semi-annual LDAR using OGI can achieve a 60% reduction in fugitive emissions, given the difference in instrument detection levels (approximately 10,000 ppm for OGI and 500 ppm for Method 21) it was the Department’s position that utilizing Method 21 will ensure that the estimated reductions are achieved in practice. Lastly, since equipment components associated with the Cryo III and DeEthanizer II projects constitute *process unit equipment affected facilities* under 40 CFR Part 60 Subpart OOOOb, bimonthly monitoring surveys will be required using OGI pursuant to 40 CFR §60.5400b(b)(1). Additionally, since the Cryo III and DeEthanizer II projects will operate in parallel to and share equipment with the existing process units, the addition of the Cryo III and DeEthanizer II projects constitutes the construction and modification of *process unit equipment affected facilities* after December 6, 2022, and therefore subjects each process unit at Harmon Creek to the monitoring requirements of 40 CFR §60.5400b.

Emissions Estimates

Emissions from the proposed project and associated equipment were estimated by MarkWest using AP-42 emissions factors, ProMax simulations, manufacturers’ equipment ratings and emission guarantees, an inlet extended gas fractional analysis of a gas sample taken from Harmon Creek on August 1, 2023, and the specified maximum gas throughput. The gas fractional gas analysis is presented in *Table 3*. Emissions estimates for the proposed equipment in conjunction with total facility-wide PTE are presented in *Table 4*.

Table 3: MarkWest Harmon Creek – Inlet Gas Fractional Analysis

Component	Mol. %	Wt. %
Methane	77.01	59.3858
Ethane	14.79	21.3779
Propane	5.15	10.9165
i-Butane	0.54	1.5087
n-Butane	1.26	3.5204
i-Pentane	0.25	0.8671
n-Pentane	0.29	1.0058
n-Hexane	0.05	0.2071
n-Heptane	0.04	0.1927
n-Octane	0.00	0.0000
Benzene	0.008	0.0300
Toluene	0.012	0.0531
Ethylbenzene	0.001	0.0051
Xylene	0.002	0.0102
Nonanes	0.002	0.0123
Decanes+	0.021	0.1436
Nitrogen	0.41	0.5520
Carbon Dioxide	0.10	0.2116
Total	~100.00	~100.00 ^a

^a The inlet gas contains approximately 18.47% VOC and 0.65% HAPs.

CONCLUSION AND RECOMMENDATION

Based on the Department’s evaluation of its application for Plan Approval, responses to technical deficiencies, supporting documentation, emissions calculations, and proposed technology, MarkWest has demonstrated that the sources and controls associated with proposed Cryo III and DeEthanizer II to be constructed at the Harmon Creek Gas Plant in Smith Township, Washington County meet the Best Available Technology requirements of 25 Pa. Code Chapter 127. Therefore, the Department intends to issue the subject Plan Approval PA-63-01011B with the special conditions therein specified for a term of 18 months from the date of issuance. The notice of intent to issue Plan Approval PA-63-01011B was published on February 8, 2025, thus commencing the 30-day public comment period. I recommend that the draft permit package is placed on the Department’s community information webpage.

Table 4: Facility-wide PTE

Source	Source ID	NO _x	CO	VOC	SO ₂	PM-10	PM-2.5	HAPs	n-Hexane	CH ₄	CO _{2e}
Cryo Plant 1 Regen Heater (H-1711)	031	2.07	2.07	0.98	0.03	0.39	0.39	0.10	0.09	0.13	6,857
Cryo Plant 2 Regen Heater (H-2711)	037	0.86	3.13	1.48	0.05	1.02	1.02	0.14	0.14	0.20	10,335
Cryo Plant 3 Regen Heater (H-3711)^a	038	1.14	3.79	1.83	0.06	1.24	1.24	0.18	0.17	0.24	12,600
DeEthanizer HMO Heater 1 (H-1767)	033	8.44	8.44	4.01	0.12	1.57	1.57	0.39	0.37	0.53	27,893
DeEthanizer HMO Heater 2 (H-1768)	034	8.44	8.44	4.01	0.12	1.57	1.57	0.39	0.37	0.53	27,893
DeEthanizer 2 HMO Heater 1 (H-3767)^a	039	3.88	12.87	6.21	0.19	4.21	4.21	0.60	0.57	0.53	42,783
DeEthanizer 2 HMO Heater 2 (H-3768)^a	040	3.88	12.87	6.21	0.19	4.21	4.21	0.60	0.57	0.81	42,783
Stabilization HMO Heater (H-1769)	036	2.10	2.10	1.00	0.03	0.39	0.39	0.10	0.09	0.13	6,946
De-Ethanizer Regen Heater (H-1775)	035	1.16	1.16	0.55	0.02	0.22	0.22	0.05	0.05	0.07	3,824
Generac SD015	102	0.07	0.04	0.02	0.03	0.01	0.01	0.00	-	0.001	15
Generac SD150	102	0.33	0.14	0.10	0.03	0.01	0.01	0.00	-	0.003	76
Fugitive Emissions	701	-	-	4.86	-	-	-	0.15	-	7.05	198
Process Flare	C601	4.88	22.24	12.01	0.04	0.46	0.46	0.21	0.10	49.25	9,790
HC3/De-Eth 2 Venting VRU	C602	-	-	0.18	-	-	-	0.00	0.00	0.58	16
Pigging^a	801	-	-	-	-	-	-	-	-	-	-
Blowdowns^a	601	-	-	-	-	-	-	-	-	-	-
Closed Drain Tank Loadout^a	702	-	-	-	-	-	-	-	-	-	-
Regen Compressor Dry Seal Vents^a	603	-	-	-	-	-	-	-	-	-	-
Rod Packing^a	601	-	-	1.20	-	-	-	0.01	0.01	107.49	3,234
Residue Compressor Dry Seal Vents^a	604	-	-	1.34	-	-	-	0.00	0.01	801.40	22,442
500-Gallon Methanol Tank^a	303	-	-	0.53	-	-	-	0.53	-	-	-
Measurement Devices	-	-	-	1.81	-	-	-	0.03	0.01	5.82	163
Total		37.25	77.29	48.33	0.91	15.30	15.30	3.48	2.55	974.75	217,848

^a New or modified source(s).