*West Virginia Department of Environmental Protection*
*Division of Air Quality*

# Fact Sheet

## *For Final Permitting Action Under 45CSR30 and Title V of the Clean Air Act*

Permit Number: **R30-09500119-2024**
Application Received: **May 10, 2023**
Plant Identification Number: **03-54-09500119**
Permittee: **Antero Midstream LLC**
Facility Name: **Castle Peak Compressor Station**
Mailing Address: **1615 Wynkoop Street, Denver, CO 80202**

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|---|---|
| Physical Location: | New Martinsville, Tyler County, West Virginia |
| UTM Coordinates: | 516.522 km Easting • 4,377.786 km Northing • Zone 17 |
| Directions: | From Middlebourne, WV, drive northwest on WV-18/Main Street for 4.3 miles. Turn right onto WV-180N for 1.2 miles. Turn right onto Wolfpen-Tenmile for 1.5 miles, and then turn right onto New Martinsville Ridge/Wetzel Tyler Ridge Road for 0.9 miles. Turn left onto Wetzel Tyler Ridge Road/Whitman Hill for 1.4 miles. The destination is on the right. |

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**Facility Description**
The Castle Peak Compressor Station separates, compresses, and dries field gas from surrounding production gas wells. The facility operates twelve compressor engines; a microturbine generator; two dehydration units with a still vent, flash tank, and reboiler; three condensate storage tanks; three produced water storage tanks; one settling tank; and a fuel conditioning heater.
SIC Code: 4922, NAICS Code: 486210

## Emissions Summary

**Plantwide Emissions Summary [Tons per Year]**

| Regulated Pollutants | Potential Emissions | 2022 Actual Emissions |
|---|---|---|
| Carbon Monoxide (CO) | 71.60 | 16.95 |
| Nitrogen Oxides ($NO_X$) | 163.05 | 37.88 |
| Particulate Matter ($PM_{2.5}$) | 10.36 | 2.77 |
| Particulate Matter ($PM_{10}$) | 10.36 | 2.94 |
| Total Particulate Matter (TSP) | 10.36 | 2.94 |
| Sulfur Dioxide ($SO_2$) | 0.70 | 0.19 |
| Volatile Organic Compounds (VOC) | 214.30 | 59.24 |

*$PM_{10}$ is a component of TSP.*

| Hazardous Air Pollutants | Potential Emissions | 2022 Actual Emissions |
|---|---|---|
| Acetaldehyde | 4.30 | 1.61 |
| Acrolein | 2.65 | 0.99 |
| Benzene | 0.59 | 0.09 |
| Ethylbenzene | 0.34 | 0.01 |
| Formaldehyde | 9.41 | 3.97 |
| n-Hexane | 0.65 | 0.33 |
| Methanol | 1.29 | 0.48 |
| Toluene | 1.63 | 0.09 |
| Xylenes | 1.04 | 0.05 |
| Other HAPs | 0.82* | 1.65* |
| Total HAPs | 22.72 | 9.27 |

*Some of the above HAPs may be counted as PM or VOCs.*

* Following the issuance of R13-3513D on October 12, 2023, the permittee began to route emissions of hazardous air pollutants (HAPs) from the truck loading operations (LDOUT1) to one of the thermal oxidizers (TO-1 or TO-2). This process change resulted in a decrease of the facility-wide potential emissions of HAPs. As the actual emissions reported in this Fact Sheet cover the facility's emissions from January 01, 2022 to December 31, 2022, the actual emissions of "Other HAPs" are greater than the potential emissions of "Other HAPs" because the 2022 actual emissions were calculated prior to the issuance of R13-3513D and the implementation of the process change and the potential emissions account for the reduction in HAPs due to the process change.

## Title V Program Applicability Basis

This facility has the potential to emit 163.05 tpy of Nitrogen Oxides and 214.30 tpy of Volatile Organic Compounds. Due to this facility's potential to emit over 100 tons per year of criteria pollutants, Antero Midstream LLC is required to have an operating permit pursuant to Title V of the Federal Clean Air Act as amended and 45CSR30.

## Legal and Factual Basis for Permit Conditions

The State and Federally-enforceable conditions of the Title V Operating Permits are based upon the requirements of the State of West Virginia Operating Permit Rule 45CSR30 for the purposes of Title V of the Federal Clean Air Act and the underlying applicable requirements in other state and federal rules.

This facility has been found to be subject to the following applicable rules:

| | | |
|---|---|---|
| Federal and State: | 45CSR2 | To Prevent and Control Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers. |
| | 45CSR6 | Control of Air Pollution from Combustion of Refuse. |
| | 45CSR11 | Standby plans for emergency episodes. |
| | 45CSR13 | Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, Permission to Commence Construction, and Procedures for Evaluation. |
| | 45CSR16 | Standards of Performance for New Stationary Sources. |
| | WV Code § 22-5-4 (a) (14) | The Secretary can request any pertinent information such as annual emission inventory reporting. |
| | 45CSR30 | Requirements for Operating Permits. |
| | 45CSR34 | Emission Standards for Hazardous Air Pollutants. |
| | 40 C.F.R. Part 60 Subpart JJJJ | Standards of Performance for Stationary Spark Ignition Internal Combustion Engines. |
| | 40 C.F.R. 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. |
| | 40 C.F.R. Part 61 | Asbestos Inspection and Removal. |
| | 40 C.F.R. Part 63 Subpart HH | National Emission Standards for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities. |
| | 40 C.F.R. Part 63 Subpart ZZZZ | National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines. |
| | 40 C.F.R. Part 82 Subpart F | Ozone Depleting Substances. |
| State Only: | 45CSR4 | To Prevent and Control the Discharge of Air Pollutants into the Open Air Which Causes or Contributes to an Objectionable Odor or Odors. |
| | 45CSR17 | To Prevent and Control Particulate Matter Air Pollution from Materials Handling, Preparation, Storage and Other Sources of Fugitive Particulate Matter. |

Each State and Federally-enforceable condition of the Title V Operating Permit references the specific relevant requirements of 45CSR30 or the applicable requirement upon which it is based. Any condition of the Title V permit that is enforceable by the State but is not Federally-enforceable is identified in the Title V permit as such.

The Secretary's authority to require standards under 40 C.F.R. Part 60 (NSPS), 40 C.F.R. Part 61 (NESHAPs), and 40 C.F.R. Part 63 (NESHAPs MACT) is provided in West Virginia Code §§ 22-5-1 *et seq.*, 45CSR16, 45CSR34 and 45CSR30.

## Active Permits/Consent Orders

| Permit or Consent Order Number | Date of Issuance |
|---|---|
| R13-3513D | October 12, 2023 |

Conditions from this facility's Rule 13 permit(s) governing construction-related specifications and timing requirements will not be included in the Title V Operating Permit but will remain independently enforceable under the applicable Rule 13 permit(s). All other conditions from this facility's Rule 13 permit(s) governing the source's operation and compliance have been incorporated into this Title V permit in accordance with the "General Requirement Comparison Table," which may be downloaded from DAQ's website.

## Determinations and Justifications

Antero Midstream LLC's Castle Peak Compressor Station was initially permitted under the NSR Permit R13-3513. The facility was constructed in 2021, and operations began May 10, 2022. The potential emissions of nitrogen oxides and volatile organic compounds from the facility each exceed 100 tpy. Therefore, the permittee is required to obtain a Title V operating permit.

This section outlines the applicable requirements that have been included in this initial Title V operating permit.

## Section 3.0. – Facility-Wide Requirements

The following conditions were added to Section 3.0.:

| Title V Permit Condition | Summary of Permit Condition | Regulatory Citation | R13-3513D Condition |
|---|---|---|---|
| 3.1.8. | A Risk Management Plan (RMP) is required if the permittee becomes subject to Part 68.<br>Part 68 is currently inapplicable to the Castle Peak Compressor Station as prior to entry into a natural gas processing plant, regulated substances in naturally occurring hydrocarbon mixtures (including condensate, field gas, and produced water) are not considered when determining whether more than a threshold quantity is present at a stationary source, per 40 C.F.R. §68.115(b)(2)(iii). | 40 C.F.R. 68 | N/A |
| 3.1.9. | Facility-wide HAP emissions are limited to ensure the facility remains a minor source of HAPs. | 45CSR13 | 4.1.1. |
| 3.1.10. | Operation and Maintenance of Air Pollution Control Equipment. | 45CSR13 | 4.1.2., 9.1.2., and 10.1.3. |
| 3.1.11. | Prevent any substantive fugitive emissions of regulated air pollutants. | 45CSR13 | 4.1.3. |

| Title V Permit Condition | Summary of Permit Condition | Regulatory Citation | R13-3513D Condition |
|---|---|---|---|
| 3.1.12. | Only the permitted emission units and *de minimis* sources are authorized at the facility. | 45CSR13 | 4.1.4. |
| 3.1.13. | Fugitive particulate matter may not be discharged beyond the boundary lines of the facility. | 45CSR§17-3.1. | N/A |
| 3.4.1. | Monitoring Information. | 45CSR13 | 4.2.1. |
| 3.4.2. | Retention of Records. | 45CSR13 | 3.4.1. |
| 3.4.4. | Record of Maintenance of Air Pollution Control Equipment. | 45CSR13 | 4.2.2., 9.3.2., and 10.3.2. |
| 3.4.5. | Record of Malfunctions of Air Pollution Control Equipment. | 45CSR13 | 4.2.3., 9.3.3., and 10.3.3. |
| 3.7.2. | Permit Shield. The standards that are currently inapplicable to the facility and for which the permittee requested a permit shield have been added to this condition. These determinations are also in the Non-Applicability Determinations section of this Fact Sheet. | 45CSR§30-5.6. | N/A |

## Section 4.0. – Compressor Engines [Emission Points: 1E to 12E]

The Castle Peak Compressor Station operates twelve spark ignition (SI) reciprocating internal combustion engines (RICEs) (Emission Units: C-100 to C-1200). Eight of the engines are Caterpillar G3608 engines with a maximum rating of 2,675 horsepower (HP); four of the engines are Caterpillar G3608 A4 Uprate engines which are equipped with a reflash chip to achieve a maximum rating of 2,749 HP.

R13-3513D allows the permittee to have operational flexibility for which of the engines C-100 to C-1200 are equipped with the reflash chip and operated at the higher rating. Engines C-100 to C-800 were identified as operating at 2,675 HP in the initial notification of startup for 40 C.F.R. Part 60 Subparts JJJJ and OOOOa, which was received by the DAQ on May 10, 2022. Engines C-900 to C-1200 were identified as operating at 2,749 HP in the initial notification of startup for 40 C.F.R. Part 60 Subparts JJJJ and OOOOa, which was received by the DAQ on April 08, 2023.

All of the engines are fueled by field gas that is first treated by a fuel conditioning skid with one 0.75 mmBTU/hr heater (Emission Unit: FUEL1). Each engine is associated with an oxidation catalyst that controls emissions of carbon monoxide, volatile organic compounds, and formaldehyde.

The RICEs are subject to the following regulations:

1. **45CSR13** – *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, Permission to Commence Construction, and Procedures for Evaluation*

2. **45CSR16** – *Standards of Performance for New Stationary Sources*

3. **40 C.F.R. Part 60 Subpart JJJJ** – *Standards of Performance for Stationary Spark Ignition Internal Combustion Engines*

   Construction of C-100 through C-1200 commenced after July 12, 2006; the manufacture date of each engine is after July 01, 2007; and each engine has a maximum engine power greater than 1,350 HP. Therefore, these compressor engines are subject to Subpart JJJJ of the NSPS via 40 C.F.R. §60.4230(a)(4)(i). C-100 through

C-1200 are non-emergency, 4-stroke lean burn engines. The engines are subject to the emission standards for $NO_X$, CO, and VOCs that apply to engines manufactured after July 01, 2010. Because the engines are non-certified, compliance with these limits is demonstrated through periodic performance tests as well as reporting and recordkeeping requirements.

4. **45CSR34** – *Emission Standards for Hazardous Air Pollutants*

5. **40 C.F.R. Part 63 Subpart ZZZZ** – *National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*

   In accordance with 40 C.F.R. §63.6675, the Castle Peak Compressor Station is considered a production field facility as the facility is located prior to the point at which natural gas enters a processing plant (the point of custody transfer). Under Subpart ZZZZ, a major source determination for production field facilities is based on the aggregate emissions of HAPs from glycol dehydration units (TEG1 and TEG2), storage vessels with the potential for flash emissions (T01 to T07), combustion turbines (GEN1), and RICEs (C-100 through C-1200). With this consideration, the facility's emissions of aggregate and individual HAPs fall below Title V major source thresholds. Therefore, the Castle Peak Compressor Station is an area source of HAPs under Subpart ZZZZ.

   Furthermore, construction of the engines commenced after June 12, 2006, so C-100 through C-1200 are considered new stationary RICEs per 40 C.F.R. §63.6590(a)(2)(iii). As new stationary RICEs located at an area source of HAPs, these engines demonstrate compliance with the requirements of Subpart ZZZZ through compliance with the requirements of Part 60 Subpart JJJJ per 40 C.F.R. §§63.6590(c) and (c)(1).

The table below describes each condition added to Section 4.0. of the Title V operating permit.

| Title V Permit Condition | Summary of Permit Condition | Regulatory Citation | R13-3513D Condition |
|---|---|---|---|
| 4.1.1. | Emission limits for the RICEs. | 45CSR13 | 5.1.1. |
| 4.1.2. | Requirements for the use of catalytic reduction devices to control emissions from the RICEs. | 45CSR13 | 5.1.2. |
| 4.1.3. | Applicability of 40 C.F.R. Part 60 Subpart JJJJ to the engines C-100 through C-1200. | 45CSR13<br>45CSR16<br>40 C.F.R. §§60.4230(a), (a)(4), and (a)(4)(i) | 11.1.1. |
| 4.1.4. | Emission standards for $NO_X$, CO, and VOCs from 40 C.F.R. Part 60 Subpart JJJJ. | 45CSR13<br>45CSR16<br>40 C.F.R. §60.4233(e) and Table 1 to Subpart JJJJ of Part 60 | 11.1.2. |
| 4.1.5. | The compressor engines must be operated and maintained to achieve the emission standards of 40 C.F.R. §60.4233(e) over the entire life of each engine. | 45CSR13<br>45CSR16<br>40 C.F.R. §60.4234 | 11.1.3. |
| 4.1.6. | Deadline for installing stationary ICE with a maximum engine power over 500 HP that do not meet the requirements of 40 C.F.R. §60.4233. | 45CSR13<br>45CSR16<br>40 C.F.R. §60.4236(b) | 11.2.1. |

| Title V Permit Condition | Summary of Permit Condition | Regulatory Citation | R13-3513D Condition |
|---|---|---|---|
| 4.1.7. | The requirements of 40 C.F.R. §60.4236 do not apply to engines that are modified, reconstructed, or reinstalled at a new location. | 45CSR13<br>45CSR16<br>40 C.F.R. §60.4236(e) | 11.2.2. |
| 4.1.8. | Propane may be used as an alternative fuel during emergency operations for up to 100 hours. | 45CSR13<br>45CSR16<br>40 C.F.R. §60.4243(e) | 11.3.2. |
| 4.1.9. | An air-to-fuel ratio controller must be used with the operation of three-way catalysts/non-selective catalytic reduction. | 45CSR13<br>45CSR16<br>40 C.F.R. §60.4243(g) | 11.3.3. |
| 4.1.10. | Compliance with 40 C.F.R. Part 63 Subpart ZZZZ must be demonstrated upon startup of each RICEs.<br>NOTE: The NSR permit condition contains the date by which an existing SI RICE at an area source of HAPs must be in compliance with the applicable provisions of Subpart ZZZZ, per 40 C.F.R. §63.6595(a)(1). This requirement is inapplicable to the engines at the compressor station which are considered new RICE at an area source under Subpart ZZZZ and has been replaced with the requirement of §63.6595(a)(7). | 45CSR13<br>45CSR34<br>40 C.F.R. §63.6595(a)(7) | 14.1.1. |
| 4.1.11. | Compliance with 40 C.F.R. Part 63 Subpart ZZZZ is demonstrated through compliance with 40 C.F.R. Part 60 Subpart JJJJ. | 45CSR13<br>45CSR34<br>40 C.F.R. §§63.6590(c) and (c)(1) | 14.1.2. |
| 4.2.1. | Inspection and maintenance requirement for catalytic oxidizer control devices. | 45CSR13 | 5.2.1. |
| 4.2.2. | Compliance demonstration requirements for non-certified stationary SI ICEs.<br>A performance test of each engine must be completed every 8,760 hours or 3 years, whichever comes first. | 45CSR13<br>45CSR16<br>40 C.F.R. §§60.4243(b), (b)(2), and (b)(2)(ii) | 11.3.1. |
| 4.3.1. | Procedures for performance tests. | 45CSR13<br>45CSR16<br>40 C.F.R. §60.4244 | 11.4.1. |
| 4.4.1. | Recordkeeping requirement for the hours of operation of each engine. | 45CSR13 | 5.4.1. |
| 4.4.2. | Recordkeeping requirement for the maintenance of catalytic reduction devices. | 45CSR13 | 5.4.2. |

| Title V Permit Condition | Summary of Permit Condition | Regulatory Citation | R13-3513D Condition |
|---|---|---|---|
| 4.4.3. | Recordkeeping requirements from 40 C.F.R. Part 60 Subpart JJJJ that are applicable to uncertified engines. | 45CSR13<br>45CSR16<br>40 C.F.R. §§60.4245(a), (a)(1), (a)(2), and (a)(4) | 11.5.1.a. |
| 4.5.1. | The permittee must report which engines have a reflash chip installed within thirty days of the installation. | 45CSR13 | 5.5.2. |
| 4.5.2. | Subpart JJJJ requirement for the submission of performance test reports. | 45CSR13<br>45CSR16<br>40 C.F.R. §60.4245(d) | 11.5.1.c. |

NOTE: The following conditions of R13-3513D have not been included in this operating permit:

1. Conditions 11.3.1.a. and 11.5.1.a.3. – 11.3.1.a. contains the requirement of 40 C.F.R. §60.4243(b)(1), and 11.5.1.a.3. contains the requirement of §60.4245(a)(3). Both of these conditions are applicable to engines that are certified under 40 C.F.R. Part 60 Subpart JJJJ by the manufacturer. However, all of the engines at the Castle Peak Compressor Station are non-certified, and, therefore, these requirements are inapplicable.

2. Condition 11.5.1.b. – This condition contains the requirements of 40 C.F.R. §60.4245(c) which required the permittee to submit initial notification as required under 40 C.F.R. §60.7(a)(1). The initial notification of construction for the facility was received by the DAQ on January 24, 2022.

## Sections 5.0. and 6.0. – 40 C.F.R. Part 60 Subpart OOOOa Requirements

Sections 5.0. and 6.0. contain the applicable requirements of 40 C.F.R. Part 60 Subpart OOOOa. Subpart OOOOa of the NSPS contains the standards for the control of VOC, $SO_2$, and Greenhouse Gas (GHG) emissions from crude oil and natural gas facilities. The Castle Peak Compressor Station is located prior to the natural gas processing plant (the point of custody transfer to the natural gas transmission and storage segment) and is included in the crude oil and natural gas production source category.

Subpart OOOOa applies to those affected facilities for which construction, modification, or reconstruction commenced after September 18, 2015. Potential affected facilities at the Castle Peak Compressor Station include reciprocating compressors (§60.5365a(c)), pneumatic controllers (§60.5365a(d)), storage vessels (§60.5365a(e)), and the fugitive emissions components (§60.5365a(j)).

1. The reciprocating compressors associated with the RICEs C-100 through C-1200 were constructed after the date of applicability of Subpart OOOOa. Therefore, the reciprocating compressors are subject to Subpart OOOOa. The requirements applicable to the reciprocating compressors have been included in Section 5.0. of this operating permit.

2. Only natural gas-driven pneumatic controllers are affected facilities under Subpart OOOOa. The pneumatic devices installed at the Castle Peak Compressor Station are either air-actuated or electric. Therefore, the pneumatic controllers are not subject to Subpart OOOOa.

3. Subpart OOOOa applies to storage vessels with potential VOC emissions greater than 6 tpy. As the maximum throughput of the storage tanks results in potential VOC emissions less than 6 tpy, the storage tanks are not subject to Subpart OOOOa.

4. The collection of fugitive emissions components at a compressor station is an affected facility under Subpart OOOOa. The applicable requirements have been included in Section 6.0. of the operating permit.

On June 30, 2021, a joint resolution of Congress that disapproved the final rule titled "Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Review", 85 FR 57018 (September 14, 2020) (the 2020 Policy Rule), was signed into law. Due to this resolution, sources in the production and processing segments of the natural gas industry that are subject to Subpart OOOOa must meet two sets of standards: the VOC standards of 85 FR 57438 (September 15, 2020) and the methane standards of 81 FR 35898 (June 03, 2016) as amended by 83 FR 10638 (March 12, 2018). The permittee has elected to demonstrate compliance with the VOC standards through compliance with the more stringent methane standards. Therefore, the VOC standards have been streamlined with the methane standards.

## Section 5.0. – 40 C.F.R. Part 60 Subpart OOOOa Requirements for Reciprocating Compressors C-100 to C-1200

The reciprocating compressors C-100 to C-1200 are subject to the following regulations:

1. **45CSR13** – *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, Permission to Commence Construction, and Procedures for Evaluation*

2. **45CSR16** – *Standards of Performance for New Stationary Sources*

3. **40 C.F.R. 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*

The table below describes each condition added to Section 5.0. of the Title V operating permit.

| Title V Permit Condition | Summary of Permit Condition | Regulatory Citation | R13-3513D Condition |
|---|---|---|---|
| 5.1.1. | Affected facilities must be maintained and operated in a manner consistent with good air pollution control practice. | 45CSR16<br>40 C.F.R. §60.5370a(b) | N/A |
| 5.1.2. | GHG and VOC standards for reciprocating compressor affected facilities. | 45CSR13<br>45CSR16<br>40 C.F.R. §60.5385a | 12.1.1. |
| 5.2.1. | Initial compliance demonstration requirements. | 45CSR13<br>45CSR16<br>40 C.F.R. §§60.5410a and 60.5410a(c) | 12.2.1. |
| 5.2.2. | Continuous compliance demonstration requirements. | 45CSR13<br>45CSR16<br>40 C.F.R. §60.5415a(c) | 12.3.1. |
| 5.4.1. | Applicable recordkeeping requirements for the reciprocating compressors. | 45CSR13<br>45CSR16<br>40 C.F.R. §§60.5420a(c), (c)(3), (c)(6) to (c)(9), and (c)(17) | 12.4.3. |

| Title V Permit Condition | Summary of Permit Condition | Regulatory Citation | R13-3513D Condition |
|---|---|---|---|
| 5.5.1. | Applicable reporting requirements for the reciprocating compressors. | 45CSR13<br>45CSR16<br>40 C.F.R. §§60.5420a(b), (b)(1), (b)(4), (b)(11), and (b)(12) | 12.4.2. and 12.4.3. |

NOTE: Condition 12.4.1. of R13-3513D has not been included in this operating permit. This condition requires the permittee to submit the notifications specified in 40 C.F.R. §§60.5420a(a)(1) and (a)(2). However, (a)(1) does not require the notifications of 40 C.F.R. §§60.7(a)(1), (a)(3), and (a)(4) for reciprocating compressors, and the notifications of (a)(2) are applicable to well affected facilities.

## Section 6.0. – 40 C.F.R. Part 60 Subpart OOOOa Requirements for Fugitive Emissions Components

Per 40 C.F.R. §60.5430a, a fugitive emissions component is "any component that has the potential to emit fugitive emissions of methane or VOCs at a compressor station, including but not limited to valves, connectors, pressure relief devices, open-ended lines, flanges, covers and closed vent systems not subject to §60.5411a, thief hatches or other openings on a controlled storage vessel not subject to §60.5395a, compressors, instruments, and meters. Devices that vent as part of normal operations, such as natural gas-driven pneumatic controllers or natural gas-driven pumps, are not fugitive emissions components, insofar as the natural gas discharged from the device's vent is not considered a fugitive emission. Emissions originating from other than the device's vent, such as the thief hatch on a controlled storage vessel, would be considered fugitive emissions."

Due to the disapproval of the 2020 Policy Rule, the fugitive emissions components are subject to varying requirements for methane and VOCs. The permittee has elected to demonstrate compliance with the VOC standards through the more stringent methane standards of 81 FR 35898 as amended by 83 FR 10638. Therefore, the VOC standards have been streamlined with the methane standards in the operating permit.

Additionally, certain Subpart OOOOa requirements related to fugitive emissions components vary from those included in R13-3513D. The following applicable requirements included in the operating permit have been updated since initially included in the NSR permit:

1. The standards of §§60.5397a(f), (g)(2), and (h);

2. The recordkeeping requirements of §60.5420a(c)(15)(ii); and

3. The reporting requirements of §60.5420a(b)(7).

The fugitive emissions components are subject to the following regulations:

1. **45CSR13** – *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, Permission to Commence Construction, and Procedures for Evaluation*

2. **45CSR16** – *Standards of Performance for New Stationary Sources*

3. **40 C.F.R. 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*

The table below describes each condition added to Section 6.0. of the Title V operating permit.

| Title V Permit Conditions | Summary of Permit Condition | Regulatory Citation | R13-3513D Condition |
|---|---|---|---|
| 6.1.1. | Affected facilities must be maintained and operated in a manner consistent with good air pollution control practice. | 45CSR16<br>40 C.F.R. §60.5370a(b) | N/A |
| 6.1.2. | VOC and Methane Standards for fugitive emissions components affected facilities.<br>Refer to 81 FR 35898 (June 03, 2016) as amended by 83 FR 10638 (March 12, 2018). | 45CSR13<br>45CSR16<br>40 C.F.R. §§60.5397a(a) through (e), (f)(2), (g), (g)(2) through (4), and (h) through (j) | 13.1.1. |
| 6.2.1. | Initial compliance demonstration for the VOC and Methane Standards. | 45CSR13<br>45CSR16<br>40 C.F.R. §§60.5410a and 60.5410a(j) | 13.2.1. and 13.2.2. |
| 6.2.2. | Continuous compliance demonstration for the VOC and Methane Standards. | 45CSR13<br>45CSR16<br>40 C.F.R. §60.5415a(h) | 13.3.1. |
| 6.4.1. | Recordkeeping requirements.<br>Refer to 81 FR 35898 (June 03, 2016) as amended by 83 FR 10638 (March 12, 2018). | 45CSR13<br>45CSR16<br>40 C.F.R. §§60.5420a(c), (c)(15), and (c)(15)(i) to (ii) | 13.4.3. |
| 6.5.1. | Reporting requirements.<br>Refer to 81 FR 35898 (June 03, 2016) as amended by 83 FR 10638 (March 12, 2018). | 45CSR13<br>45CSR16<br>40 C.F.R. §§60.5420a(b), (b)(1), (b)(7), and (b)(11) | 13.4.2. |

NOTE: The following conditions of R13-3513D have not been included in the operating permit:

1. Condition 13.1.1.(g)(4) – This condition contains the requirements of 40 C.F.R. §60.5397a(g)(5). The requirement is inapplicable to the Castle Peak Compressor Station as the requirement applies to the collection of fugitive emissions components at a compressor station located within an area that has an average calendar month temperature below 0° Fahrenheit for two of three consecutive calendar months of the quarterly monitoring period.

2. Condition 13.4.1. – This condition requires the permittee to submit the notifications specified in 40 C.F.R. §§60.5420a(a)(1) and (a)(2). However, (a)(1) does not require the notifications of 40 C.F.R. §§60.7(a)(1), (a)(3), and (a)(4) for the collection of fugitive emissions components at a compressor station, and the notifications of (a)(2) are applicable to well affected facilities.

## Section 7.0. – Microturbine Generator [Emission Point: 13E]

The Castle Peak Compressor Station operates one 800 kWe microturbine generator (GEN1) which combusts field natural gas to provide power generation support. The microturbine is a Capstone C-800 which is composed of four individual 200 kWe units each of which may function independently.

The microturbine generator is subject to the following regulations:

1. **45CSR13** – *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, Permission to Commence Construction, and Procedures for Evaluation*

The table below describes each condition added to Section 7.0. of the Title V operating permit.

| Title V Permit Condition | Summary of Permit Condition | Regulatory Citation | R13-3513D Condition |
|---|---|---|---|
| 7.1.1. | Specifications for the permitted microturbine. | 45CSR13 | 6.1.1. |
| 7.1.2. | Emission limits for the microturbine. | 45CSR13 | 6.1.2. |
| 7.1.3. | No limits have been placed on the annual hours of operation or the amount of natural gas consumed. | 45CSR13 | 6.1.3. |
| 7.1.4. | Maintenance performed according to manufacturer's instructions or the site's maintenance plan. | 45CSR13 | 6.1.4. |
| 7.4.1. | Records of the maintenance performed on the microturbine must be kept. | 45CSR13 | 6.3.1. |

## Section 8.0. – Dehydration Units [Emission Points: 14E, 15E, 17E, and 18E]

Two triethylene glycol (TEG) dehydration units are in use at the facility. Each unit consists of a regenerator (Emission Units: DEHY1 and DEHY2), a flash tank (Emission Units: DFLSH1 and DFLSH2), and a 1.5 mmBTU/hr reboiler (Emission Units: DREB1 and DREB2). Section 8.0. of this operating permit contains the applicable requirements for the regenerators and the flash tanks.

The primary pollutants emitted from the dehydration units are VOCs and organic HAPs. The vent gas from each flash tank is routed to the unit's respective reboiler where it is consumed as fuel. Before being emitted to the atmosphere, the vent gas from each regenerator as well as any excess gas from the flash tank is routed to one of two dedicated thermal oxidizers (TO-1 and TO-2). The thermal oxidizers each have a design heat input of 6 mmBTU/hr and a control efficiency of 98% for VOCs and HAPs. The permittee has installed a temperature monitor on each of the thermal oxidizers. In the event of a low temperature alarm, the thermal oxidizer and the dehydration units are shut down.

The dehydration units and associated thermal oxidizers are subject to the following regulations:

1. **45CSR6** – *Control of Air Pollution from Combustion of Refuse*

   This rule establishes emission standards to control the particulate matter emissions from the combustion of refuse. Under 45CSR§6-2.7., incineration is defined as "the destruction of combustible refuse by burning in a furnace designed for that purpose. For the purposes of this rule, the destruction of any combustible liquid or gaseous material by burning in a flare or flare stack, thermal oxidizer, or thermal catalytic oxidizer stack shall be considered incineration". As the thermal oxidizers combust waste vapors from the dehydration units, the emission standards of 45CSR§6-4 are applicable to TO-1 and TO-2.

   a. Per 45CSR§6-4.1., PM emission limits for each unit are established using the following formula:

$$F \times Incinerator\ Capacity\ (tons/hr) = Emissions\ (lbs/hr)$$

Based on the maximum volume of gas sent to each unit and the average HHV, the maximum rate at which the gas/waste gas is loaded into each thermal oxidizer is 715 lbs/hr (0.3575 tons/hr). Since the incinerator capacity of each thermal oxidizer is less than 15,000 lbs/hr, the factor F is 5.43 for each unit in accordance with Table I of 45CSR§6-4.1.

The PM emission limit of each thermal oxidizer is:

$$5.43 \times 0.3575\ tons/hr = 1.94\ lbs/hr$$

TO-1 and TO-2 are smokeless design, and each has the potential-to-emit particulate matter (PM) at a rate of less than 0.01 lbs/hr and 0.01 tpy. Therefore, as the limit established above is much greater than the potential emissions from either thermal oxidizer, compliance should be demonstrated through the requirements to route vapors to the reboiler/thermal oxidizer (Condition 8.1.2.) and to operate the thermal oxidizer with a flame present (Condition 8.1.4.).

b. The combustors must also meet the 20% opacity limit of 45CSR§6-4.3., except as specified in 45CSR§6-4.4. As the potential PM emissions from the thermal oxidizers are minimal, compliance with the requirements should be demonstrated by operating the units with no visible emissions except for periods not to exceed five minutes in any two-hour period (Condition 8.1.7.), by operating the thermal oxidizer with a flame present (Condition 8.1.4.), and by conducting a Method 22 opacity test (Condition 8.3.1.).

c. The thermal oxidizers are also subject to the standards in 45CSR§§6-4.5. and -4.6. which prohibit the emission of unburned refuse and require the prevention of objectionable odors from the combustor, respectively.

d. At the discretion of the Secretary, the permittee may also be required to conduct stack testing to determine particulate matter loading in accordance with 45CSR§§6-7.1. and -7.2.

2. **45CSR13** – *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, Permission to Commence Construction, and Procedures for Evaluation*

3. **45CSR34** – *Emission Standards for Hazardous Air Pollutants*

4. **40 C.F.R. Part 63 Subpart HH** – *National Emission Standards for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities*

Subpart HH of the NESHAP is applicable to facilities in the oil and natural gas production source category, which includes compressor stations that transport natural gas prior to a natural gas processing plant or the point of custody transfer. As the Castle Peak Compressor Station is located prior to this point, the compressor station is a "production field facility" subject to Subpart HH.

Per the definition of a major source in 40 C.F.R. §63.761, the major source determination for production field facilities is determined by aggregating HAP emissions from only the glycol dehydration units and the storage vessels. The total controlled potential-to-emit of these units are below major source thresholds. Therefore, the Castle Peak Compressor Station is an area source of HAPs under this subpart, and, per 40 C.F.R. §63.760(b)(2), the TEG dehydration unit is the only affected source subject to Subpart HH.

Provided that the actual average benzene emissions from each TEG dehydration unit remain less than 1 tpy, 40 C.F.R. §§63.764(e)(1) and (e)(1)(ii) exempt the TEG dehydration units from the standards set forth in §63.764(d). With this exemption, the permittee is subject to the general requirement of §63.764(j), the monitoring requirement of §63.772(b)(2)(i), and the recordkeeping requirements of §§63.774(d)(1) and (d)(1)(ii). The conditional requirement of 40 C.F.R. §63.760(c) has also been included in the operating permit; the permittee is subject to this requirement if actual emissions of HAPs exceed or previously exceeded 5 tpy for a single HAP or 12.5 tpy for a combination of HAPs.

The table below describes each condition added to Section 8.0. of the Title V operating permit.

| Title V Permit Condition | Summary of Permit Condition | Regulatory Citation | R13-3513D Condition |
|---|---|---|---|
| 8.1.1. | Maximum throughput of dry natural gas for each dehydration unit. | 45CSR13 | 7.1.1. |
| 8.1.2. | Maximum hourly and annual limits for emissions of VOCs and Benzene from each dehydration unit. | 45CSR13 | 7.1.2. |
| 8.1.3. | Vapors controlled by the thermal oxidizer must be routed to the thermal oxidizer at all times. | 45CSR13 | 7.1.3. |
| 8.1.4. | Each thermal oxidizer must be operated with a flame present when vapors are routed to the thermal oxidizer. | 45CSR13 | 7.1.4. |
| 8.1.5. | Each thermal oxidizer must be operated according to the manufacturer's specifications for residence time and the minimum combustion chamber temperature. The thermal oxidizers must be operated with a minimum combustion zone temperature of 1,450˚F. | 45CSR13<br>45CSR§30-5.1.c. | 7.1.5. |
| 8.1.6. | Each thermal oxidizer must be operated at all times when emissions are routed to the thermal oxidizer. | 45CSR13 | 7.1.6. and 7.1.7. |
| 8.1.7. | Visible emissions limit for the thermal oxidizers. | 45CSR13 | 7.1.8. |
| 8.1.8. | The thermal oxidizers must be operated and maintained as designed. | 45CSR13 | 7.1.9. |
| 8.1.9. | Conditional requirement that the permittee must update the facility's major source determination annually if actual emissions of a single HAP or any combination of HAPs exceeds 50% of the major source thresholds. | 45CSR34<br>40 C.F.R. §63.760(c) | N/A |
| 8.1.10. | Exemption to the requirements of 40 C.F.R. §63.764(d) if actual average emissions of benzene from the TEG dehydration unit are less than 1 tpy. | 45CSR34<br>40 C.F.R. §§63.764(e), (e)(1), and (e)(1)(ii) | N/A |
| 8.1.11. | Any affected source and control equipment must be operated and maintained in a manner consistent with safety and good air pollution control practices for minimizing emissions. | 45CSR34<br>40 C.F.R. §63.764(j) | N/A |
| 8.1.12. | 45CSR6 particulate matter emission limits for TO-1 and TO-2. | 45CSR§6-4.1. | N/A |
| 8.1.13. | Opacity limit for any visible emissions from TO-1 and TO-2 allowed under Condition 8.1.7. | 45CSR§6-4.3. | N/A |
| 8.1.14. | Exception for the opacity limit of 45CSR§6-4.3. | 45CSR§6-4.4. | N/A |

| Title V Permit Condition | Summary of Permit Condition | Regulatory Citation | R13-3513D Condition |
|---|---|---|---|
| 8.1.15. | Prohibits the emission of partially burned refuse or ash. | 45CSR§6-4.5. | N/A |
| 8.1.16. | Prevent objectionable odors from incinerators. | 45CSR§6-4.6. | N/A |
| 8.2.1. | A thermocouple must be used to monitor the flame of each thermal oxidizer. | 45CSR13 | 7.2.1. |
| 8.2.2. | Monitor the dry natural gas throughput for each dehydration unit. | 45CSR13 | 7.2.2. |
| 8.3.1. | Method 22 visible emissions testing must be conducted for each thermal oxidizer. | 45CSR13 | 7.3.1. |
| 8.3.2. | The Director may require the permittee to conduct a thermal oxidizer compliance assessment to demonstrate compliance with Condition 8.1.2. | 45CSR13 | 7.3.2. |
| 8.3.3. | Upon request of the Director, compliance shall be demonstrated with the HAP emission limits of Condition 3.1.9. using GLYCalc Version 3.0 or higher. | 45CSR13 | 7.3.3. |
| 8.3.4. | Procedure to determine the actual average benzene emissions from the glycol dehydration units. | 45CSR13<br>45CSR34<br>40 C.F.R. §§63.772(b), (b)(2), and (b)(2)(i) | 7.3.4. |
| 8.3.5. | Parameters that must be included in the software if the ProMax model is used as an alternative to the GLYCalc model. | 45CSR13 | 7.3.5. |
| 8.3.6. | The permittee must notify the responsible agency of the use of an alternative model. | 45CSR13 | 7.3.6. |
| 8.3.7. | The permittee must continue to use the ProMax model as an alternative until approved to use another method. | 45CSR13 | 7.3.7. |
| 8.3.8. | Particulate matter emissions testing for each combustor. | 45CSR§§6-7.1. and -7.2. | N/A |
| 8.4.1. | Maintain records of periods when the pilot flame is absent. | 45CSR13 | 7.4.1. |
| 8.4.2. | Maintain records of the thermal oxidizer design evaluation. | 45CSR13 | 7.4.2. |
| 8.4.3. | Maintain records of visible emissions tests conducted in accordance with Condition 8.3.1. | 45CSR13 | 7.4.3. and 7.4.5. |
| 8.4.4. | Maintain records specified in the monitoring requirements of Conditions 8.2.1. and 8.2.2. | 45CSR13 | 7.4.4. |

| Title V Permit Condition | Summary of Permit Condition | Regulatory Citation | R13-3513D Condition |
|---|---|---|---|
| 8.4.5. | Maintain records of the potential-to-emit calculations for hazardous air pollutants. | 45CSR13 | 7.4.6. |
| 8.4.6. | Maintain records of the dry natural gas throughput through each dehydration unit. | 45CSR13 | 7.4.7. |
| 8.4.7. | Maintain records of the actual average benzene emissions to demonstrate that the permittee is exempt from the requirements of 40 C.F.R. §63.764(d). | 45CSR13<br>45CSR34<br>40 C.F.R. §§63.764(e), 63.774(d)(1) and (d)(1)(ii) | 7.4.8. |
| 8.4.8. | Maintain records of Section 8.4. in accordance with Condition 3.4.2. | 45CSR13 | 7.4.9. |
| 8.4.9. | Maintain a copy of the manufacturer's operation and maintenance specifications on-site. | 45CSR§30-5.1.c. | N/A |
| 8.5.1. | Reporting requirement if the permittee is required to conduct the testing described in Condition 8.3.2. | 45CSR13 | 7.5.1. |
| 8.5.2. | Reporting requirement for any deviations from the visible emission requirements. | 45CSR13 | 7.5.2. |
| 8.5.3. | Reporting requirement for any deviation from the design and operation criteria of the thermal oxidizers. | 45CSR13 | 7.5.3. |
| 8.5.4. | Exemption to the reporting requirements for area sources meeting the benzene exemption and subject to 40 C.F.R. Part 63 Subpart HH. | 45CSR34<br>40 C.F.R. §§63.775(c) and (c)(8) | N/A |

## Section 9.0. – Reboilers and Fuel Conditioning Heater [Emission Points: 16E, 19E, and 27E]

Each TEG dehydration unit is associated with a 1.5 mmBTU/hr reboiler (Emission Units: DREB1 and DREB2). Vent gas from the flash tank is routed to and used as fuel for each unit's respective reboiler. Emissions from the reboilers are then routed to the atmosphere.

One 0.75 mmBTU/hr fuel conditioning heater (Emission Unit: FUEL1) is also operated with a fuel conditioning skid which is used to treat the fuel gas for the compressor engines.

The reboilers and the heater are subject to the following regulations:

1. **45CSR2** – *To Prevent and Control Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers*

   45CSR2 establishes particulate matter emission standards and requirements for fuel burning units. Per 45CSR§2-2.10., a fuel burning unit includes any furnace, boiler apparatus, device, mechanism, stack, or structure used in the process of burning fuel or other combustible material for the primary purpose of producing heat or power by indirect heat transfer. Therefore, the reboilers and the heater are subject to the particulate matter emission standards of this rule.

The reboilers and the heater are subject to the visible emissions standards in 45CSR§2-3. The 10% opacity limit of 45CSR§2-3.1. has been included in the operating permit as Condition 9.1.2. Compliance with this limit is demonstrated through visible emission checks conducted in accordance with Method 9 of 40 C.F.R. Part 60 Appendix A, as designated by the Director. The permittee is also required to maintain records of each visible emission check and to report any deviations discovered during the observations.

As the reboilers and the heater each have a design heat input less than 10 mmBTU/hr, the permittee is exempt from the weight emission standards of Section 4; the fugitive emissions control standards of Section 5; the registration standards of Section 6; the testing, monitoring, recordkeeping, and reporting requirements of Section 8; and the start-up, shutdown, and malfunction requirements of Section 9 of this rule per 45CSR§2-11.1.

2. **45CSR10** – *To Prevent and Control Air Pollution from the Emission of Sulfur Oxides*

   45CSR10 establishes sulfur oxides emission standards and requirements for fuel burning units. Per 45CSR§10-2.8., a fuel burning unit includes any furnace used in the process of burning fuel or other combustible material for the primary purpose of producing heat or power by indirect heat transfer. Therefore, the reboilers and the heater are subject to the emission standards of this rule.

   However, per 45CSR§10-10.1., fuel burning units with a design heat input of less than 10 mmBTU/hr are exempt from the weight emission standards of Section 3; the registration requirements of Section 6; the permit requirements of Section 7; and the testing, monitoring, recordkeeping, and reporting requirements of Section 8. Furthermore, Section 4 is inapplicable because the reboilers and the heater are not part of a manufacturing process, and Section 5 is inapplicable because the units do not combust a refinery or other process gas stream. Therefore, although DREB1, DREB2, and FUEL1 are subject to 45CSR10, the emission units currently have no applicable requirements under this rule.

3. **45CSR13** – *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, Permission to Commence Construction, and Procedures for Evaluation*

The table below describes each condition added to Section 9.0. of the Title V operating permit.

| Title V Permit Condition | Summary of Permit Condition | Regulatory Citation | R13-3513D Condition |
|---|---|---|---|
| 9.1.1. | Maximum design heat input of the reboilers. | 45CSR13 | 8.1.1. |
| 9.1.2. | 45CSR2 visible emission limit. | 45CSR13<br>45CSR§2-3.1. | 8.1.2. |
| 9.2.1. | Method 9 visible emissions observations shall be conducted at times designated by the Secretary. | 45CSR13 | 8.2.1. |
| 9.3.1. | Testing methods for visible emissions observations. | 45CSR13<br>45CSR§2-3.2. | 8.3.1. |
| 9.4.1. | Maintain any records required under Section 9.4. of the operating permit in accordance with Condition 3.4.2. | 45CSR13 | 8.4.1. |
| 9.4.2. | Maintain records of monitoring data required under Condition 9.2.1. in accordance with Condition 3.4.2. | 45CSR13 | 8.4.2. |

| Title V Permit Condition | Summary of Permit Condition | Regulatory Citation | R13-3513D Condition |
|---|---|---|---|
| 9.5.1. | Reporting requirement for deviations from the allowable visible emissions limit. | 45CSR13 | 8.5.1. |

## Section 10.0. – Condensate Storage Tanks, Settling Tank, and Produced Water Storage Tanks [Emission Points: 20E to 26E]

Fluids produced during operations at the compressor station are routed to a 500 barrel (bbl) settling tank (T04). The fluids settle and separate to either condensate or produced water. The condensate is routed to three 400 bbl condensate tanks (T01 to T03), and the produced water is routed to three 400 bbl produced water tanks (T05 to T07).

The primary pollutants potentially emitted from the tanks are VOCs and HAPs. Tanks T01 through T07 are connected to two vapor recovery units (VRU-100 and VRU-200) to control these emissions. The vapors from the tanks are collected and recycled back into the system. VRU-100 functions as the primary control, and VRU-200 functions as a backup.

The condensate storage tanks, settling tank, and produced water storage tanks are subject to the following regulations:

1. **45CSR13** – *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, Permission to Commence Construction, and Procedures for Evaluation*

The table below describes each condition added to Section 10.0. of the Title V operating permit.

| Title V Permit Condition | Summary of Permit Condition | Regulatory Citation | R13-3513D Condition |
|---|---|---|---|
| 10.1.1. | VOC and HAP emissions from tanks T01 to T07 must be routed through the VRU. The system must achieve a capture efficiency of 98% for VOCs and HAPs. | 45CSR13 | 9.1.1. |
| 10.1.2. | Maximum annual throughput for the condensate tanks, the settling tank, and the produced water tanks. | 45CSR13 | 9.1.3. |
| 10.1.3. | VOC emissions limit for the tanks T01 to T07. | 45CSR13 | 9.1.4. |
| 10.1.4. | Additional equipment is required to be installed and used with VRU-100 and VRU-200. | 45CSR13 | 9.1.5. |
| 10.1.5. | The storage tanks must be designed and operated in accordance with the requirements of this condition. | 45CSR13 | 9.1.6. |
| 10.1.6. | Closed vent system requirements for the storage tanks. | 45CSR13 | 9.1.7. |
| 10.2.1. | Monitor the throughput of produced fluids through the storage tanks. | 45CSR13 | 9.2.1. |
| 10.2.2. | To demonstrate compliance with Condition 10.1.1., the permittee shall monitor each VRU according to the plans and specifications and the manufacturer's recommendations. | 45CSR13 | 9.2.2. |

| Title V Permit Condition | Summary of Permit Condition | Regulatory Citation | R13-3513D Condition |
|---|---|---|---|
| 10.2.3. | Compliance demonstration requirements for the closed vent system requirements of Conditions 10.1.5. and 10.1.6. | 45CSR13 | 9.2.3. |
| 10.4.1. | Maintain records required under Section 10.4. according to Condition 3.4.2. of the operating permit. | 45CSR13 | 9.3.1. |
| 10.4.2. | Maintain records of the aggregate throughput for the storage tanks. | 45CSR13 | 9.3.4. |
| 10.4.3. | Maintain records of the process design, maintenance, and operation of the VRUs. | 45CSR13 | 9.3.5. |
| 10.5.1. | At the request of the Director, report deviations from the parameters of the monitoring plan for the VRUs. | 45CSR13 | 9.4.1. |
| 10.5.2. | Report any downtime of the VRUs in excess of 2% based on the 12 month rolling total. | 45CSR13 | 9.4.2. |

## Section 11.0. – Truck Loading [Emission Point: 30E]

The produced water and condensate stored at the facility are removed as needed via tanker trucks (Emission Unit: LDOUT1). Emissions of volatile organic compounds (VOCs) and hazardous air pollutants (HAPs) from the truck loading operations are controlled by the thermal oxidizers TO-1 and TO-2. As a minimum of 70% of VOC and HAP emissions must be routed to one of the thermal oxidizers and as the thermal oxidizers have a control efficiency of 98%, the minimum capture and control efficiency of VOCs and HAPs from the truck loading operations is 68.6%.

The truck loading operations are subject to the following regulations:

1. **45CSR6** – *Control of Air Pollution from Combustion of Refuse*

2. **45CSR13** – *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, Permission to Commence Construction, and Procedures for Evaluation*

The table below describes each condition added to Section 11.0. of the Title V operating permit.

| Title V Permit Condition | Summary of Permit Condition | Regulatory Citation | R13-3513D Condition |
|---|---|---|---|
| 11.1.1. | Maintain above-ground piping, valves, pumps, etc. to prevent fugitive emissions. | 45CSR13 | 10.1.1. |
| 11.1.2. | At least 70% of VOC and HAP emissions from the truck loading operations must be captured and routed to the thermal oxidizers to achieve a minimum capture and control efficiency of 68.6% for VOCs and HAPs.<br>The thermal oxidizers must be operated in accordance with Conditions 8.1.3. through 8.1.8. of the permit. | 45CSR13<br>45CSR§30-5.1.c. | 10.1.2. |

| Title V Permit Condition | Summary of Permit Condition | Regulatory Citation | R13-3513D Condition |
|---|---|---|---|
| 11.1.3. | The thermal oxidizers are subject to the applicable requirements of 45CSR6 included in the operating permit as Conditions 8.1.12. to 8.1.16. | 45CSR§§6-4.1. and -4.3. to -4.6. | N/A |
| 11.1.4. | Maximum annual throughput of produced water in truck loading operations. | 45CSR13 | 10.1.4. |
| 11.1.5. | Maximum annual throughput of condensate in truck loading operations. | 45CSR13 | 10.1.5. |
| 11.1.6. | Submerged filling must be used for truck loading operations. | 45CSR13 | 10.1.6. |
| 11.2.1. | The throughput of produced water and condensate must be monitored on a monthly basis. | 45CSR13 | 10.2.1. |
| 11.2.2. | The thermal oxidizers TO-1 and TO-2 must be monitored according to the plans and specifications and manufacturer's recommendations. | 45CSR13<br>45CSR§30-5.1.c. | 10.2.2. |
| 11.3.1. | Reference to the opacity testing requirements of Condition 8.3.1. and the 45CSR6 testing requirements of Condition 8.3.8. | N/A | N/A |
| 11.4.1. | Maintain records of periods when the pilot flame was absent. | 45CSR13 | 10.2.3. |
| 11.4.2. | Maintain records required under Section 11.4. on-site and for a period of five years. | 45CSR13 | 10.3.1. |
| 11.4.3. | Maintain records of the throughput for truck loading operations. | 45CSR13 | 10.3.4. |
| 11.4.4. | Maintain design records, maintenance records, and records of any downtime associated with the thermal oxidizers. | 45CSR13 | 10.3.5. |
| 11.5.1. | At the request of the Director, report any deviations from the monitoring plan for the thermal oxidizers. | 45CSR13 | 10.4.1. |
| 11.5.2. | Any deviations from the thermal oxidizer design and operation criteria must be reported. | 45CSR13 | 10.4.2. |

## Section 12.0. – Compressor Blowdowns, Compressor Startups, Pigging Operations, and Plant Shutdowns [Emission Point: 31E]

Pigging, venting, blowdown operations, facility startup and shutdowns, and vessel cleaning/maintenance events result in emissions which are vented to the atmosphere. These operations are identified in the permit as emission unit VENT1.

The venting operations are subject to the following regulations:

1. **45CSR13** – *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, Permission to Commence Construction, and Procedures for Evaluation*

The table below describes each condition added to Section 12.0. of the Title V operating permit.

| Title V Permit Condition | Summary of Permit Condition | Regulatory Citation | R13-3513D Condition |
|---|---|---|---|
| 12.1.1. | Maximum annual limits for the number of compressor blowdown events and the volume per event. | 45CSR13 | 15.1.1. |
| 12.1.2. | Maximum annual limits for the number of compressor startup events and the volume per event. | 45CSR13 | 15.1.2. |
| 12.1.3. | Maximum annual limits for the number of pigging events and the volume per event. | 45CSR13 | 15.1.3. |
| 12.1.4. | Maximum annual limits of the number of vessel cleaning/maintenance events and the volume per event. | 45CSR13 | 15.1.4. |
| 12.4.1. | Maintain the records required by Section 12.4. according to Condition 3.4.2. | 45CSR13 | 15.2.1. |
| 12.4.2. | Maintain records of the number and volume of compressor blowdown events. | 45CSR13 | 15.2.2. |
| 12.4.3. | Maintain records of the number and volume of compressor startup events. | 45CSR13 | 15.2.3. |
| 12.4.4. | Maintain records of the number and volume of pigging events. | 45CSR13 | 15.2.4. |
| 12.4.5. | Maintain records of the number and volume of vessel cleaning/maintenance events. | 45CSR13 | 15.2.5. |

### Non-Applicability Determinations

The following requirements have been determined not to be applicable to the subject facility due to the following:

a. **45CSR21** – *Regulation to Prevent and Control Air Pollution from the Emission of Volatile Organic Compounds* – This rule is applicable to sources in Putnam County, Kanawha County, Cabell County, Wayne County, and Wood County. As the Castle Peak Compressor Station is located in Tyler County, the facility is not subject to 45CSR21.

b. **45CSR27** – *To Prevent and Control the Emissions of Toxic Air Pollutants* – This rule does not apply to the Castle Peak Compressor Station because, per 45CSR§27-2.4., the equipment used in the production and distribution of petroleum products is not considered a chemical processing unit, provided that such equipment does not produce or contact materials containing more than 5% benzene by weight.

c. **40 C.F.R. 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* – Per 40 C.F.R. §§60.110b(d) and (d)(4) vessels with a design capacity less than 1,589.874 $m^3$ (10,000 bbl) that are used for condensate stored, processed, or treated prior to custody transfer are not subject to Subpart Kb. Therefore, Subpart Kb is not applicable to the storage tanks T01 to T07.

d. **40 C.F.R. Part 60 Subpart GG** – *Standards of Performance for Stationary Gas Turbines* – Per 40 C.F.R. §60.330(a), this subpart applies to turbines with a heat input equal to or greater than 10.7 gigajoules per hour (10 mmBTU/hr). The facility's generator GEN1 consists of four microturbines each with a heat input less than 10 mmBTU/hr. Therefore, Subpart GG is inapplicable to GEN1.

e. **40 C.F.R. Part 60 Subpart KKK** – *Standards of Performance for 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* – The Castle Peak Compressor Station was constructed in 2021. Therefore, Subpart KKK is inapplicable to the Castle Peak Compressor Station as construction began after the date of applicability.

f. **40 C.F.R. Part 60 Subpart LLL** – *Standards of Performance for $SO_2$ Emissions from Onshore Natural Gas Processing for Which Construction, Reconstruction, or Modification Commenced After January 20, 1984 and On or Before August 23, 2011* – The Castle Peak Compressor Station was constructed in 2021. Therefore, Subpart LLL is inapplicable to the Castle Peak Compressor Station as construction began after the date of applicability.

g. **40 C.F.R. Part 60 Subpart KKKK** – *Standards of Performance for Stationary Combustion Turbines* – Per 40 C.F.R. §60.4305(a), this subpart applies to turbines with a heat input equal to or greater than 10.7 gigajoules per hour (10 mmBTU/hr), based on the higher heating value of the fuel. The facility's generator GEN1 consists of four individual microturbines, each with a heat input less than 10 mmBTU/hr. Therefore, Subpart KKKK is inapplicable to GEN1.

h. **40 C.F.R. 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* – The Castle Peak Compressor Station was constructed in 2021. Therefore, Subpart OOOO is inapplicable to the Castle Peak Compressor Station as construction began after the date of applicability.

i. **40 C.F.R. Part 63 Subpart HHH** – *National Emission Standards for Hazardous Air Pollutants from Natural Gas Transmission and Storage Facilities* – Per 40 C.F.R. §63.1270, a compressor station that transports natural gas prior to the point of custody transfer or to a natural gas processing plant is not considered a part of the natural gas transmission and storage source category. The Castle Peak Compressor Station is located prior to a natural gas processing plant and, therefore, is not subject to Subpart HHH.

j. **40 C.F.R. Part 63 Subpart EEEE** – *National Emission Standards for Hazardous Air Pollutants: Organic Liquids Distribution (Non-Gasoline)* – Per 40 C.F.R. §§63.2334(c) and (c)(1), organic liquid distribution operations do not include the activities and equipment at oil and natural gas production field facilities. Therefore, Subpart EEEE is inapplicable to the Castle Peak Compressor Station.

k. **40 C.F.R. Part 63 Subpart YYYY** – *National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines* – This subpart establishes standards for stationary combustion turbines located at major sources of HAPs. Per 40 C.F.R. §63.6175, only HAP emissions from glycol dehydration units, storage vessels with the potential for flash emissions, combustion turbines, and reciprocating internal combustion engines are

aggregated for a major source determination for production field facilities. Thus, the Castle Peak Compressor Station is not a major source of HAPs and is not subject to Subpart YYYY.

l. **40 C.F.R. Part 63 Subpart DDDDD** – *National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters* – This subpart establishes standards for boilers and process heaters located at major sources of HAPs. Per 40 C.F.R. §63.7575, only HAP emissions from glycol dehydration units and storage vessels with the potential for flash emissions shall be aggregated for a major source determination for natural gas production field facilities. Thus, the Castle Peak Compressor Station is not a major source of HAPs and is not subject to Subpart DDDDD.

m. **40 C.F.R. Part 64** – *Compliance Assurance Monitoring (CAM)*

Emissions of CO, VOCs, and formaldehyde from the engines C-100 through C-1200 are controlled by oxidation catalysts, and emissions of VOCs and HAPs from the truck loading operations are controlled by the thermal oxidizers. However, neither the engines nor the truck loading operations have pre-control device emissions that exceed major source thresholds. Therefore, per 40 C.F.R. §64.2(a)(3), the engines and the truck loading operations are not considered Pollutant Specific Emission Units and are not subject to CAM.

a. CAM is applicable to the storage tanks (T01 to T07) which meet the applicability requirements in 40 C.F.R. §64.2(a):

i. Emissions of VOCs from the condensate tanks, the settling tank, and the produced water tanks are controlled by the vapor recovery unit VRU-100 with VRU-200 operated as a back-up.

ii. The storage tanks are collectively subject to emission limits for VOCs under the NSR permit R13-3513D.

iii. The storage tanks are not subject to any individual limits for each tank. The tanks are collectively subject to a VOC limit of 4.45 tpy, and the vapor recovery unit operates with a capture efficiency of 98%. Therefore, the aggregate pre-control device emissions of VOCs from the tanks are:

$$\frac{4.45\ tpy}{(1-0.98)} = 222\ tpy$$

Since this exceeds 100 tpy of VOCs, the aggregate pre-control device emissions are greater than the major source thresholds for Title V.

b. CAM is also applicable to the dehydration units (DEHY1/DFLSH1 and DEHY2/DFLSH2) which meet the applicability requirements in 40 C.F.R. §64.2(a):

i. Emissions of VOCs from the dehydration units are controlled by the thermal oxidizers TO-1 and TO-2.

ii. The thermal oxidizers are each subject to emission limits for VOCs under the NSR permit R13-3513D.

iii. The post-control emissions of VOCs from each of the thermal oxidizers is limited to 12.27 tpy, and the thermal oxidizers have a control efficiency of 98%. Therefore, the pre-control device emissions of VOCs from the dehydration units are:

$$\frac{12.27\ tpy}{(1-0.98)} = 613\ tpy$$

Since this exceeds 100 tpy of VOCs, the aggregate pre-control device emissions are greater than the major source thresholds for Title V.

However, as post-control device emissions of VOCs are less than the major source thresholds, the storage tanks and the dehydration units are considered "other pollutant-specific emissions units" per 40 C.F.R. §64.5(b). Therefore, the submission of a CAM plan for each unit is deferred until the renewal application for this Title V operating permit.

## Request for Variances or Alternatives

None.

## Insignificant Activities

Insignificant emission unit(s) and activities are identified in the Title V application.

## Comment Period

Beginning Date: January 24, 2024
Ending Date: February 23, 2024

## Point of Contact

All written comments should be addressed to the following individual and office:

Sarah Barron
West Virginia Department of Environmental Protection
Division of Air Quality
601 57th Street SE
Charleston, WV 25304
304/926-0499 ext. 41915
sarah.k.barron@wv.gov

## Procedure for Requesting Public Hearing

During the public comment period, any interested person may submit written comments on the draft permit and may request a public hearing, if no public hearing has already been scheduled. A request for public hearing shall be in writing and shall state the nature of the issues proposed to be raised in the hearing. The Secretary shall grant such a request for a hearing if he/she concludes that a public hearing is appropriate. Any public hearing shall be held in the general area in which the facility is located.

## Response to Comments (Statement of Basis)

On February 23, 2024, Gwendolyn Supplee (EPA) submitted via email the following comments from the EPA for the Castle Peak Compressor Station's Draft Initial Title V Permit. Antero Midstream, LLC submitted a response to the comments via email on March 20, 2024.

1. The EPA recommended Condition 8.1.5. include the manufacturer-specifications to assure compliance with the VOC emissions limit for the thermal oxidizers which control emissions from the dehydration units.

    a. Antero Midstream, LLC submitted both a performance test report conducted on a thermal oxidizer of the same model as TO-1 and TO-2 and the manufacturer's design conditions for TO-1 and TO-2. After discussion with Antero Midstream, LLC, Condition 8.1.5. was updated with the specification that the thermal oxidizer must be operated with a minimum combustion zone temperature of 1,450°F.

2. For Condition 11.1.2., the EPA recommended the permit record include the calculation method for the 70% capture efficiency required for emissions from truck loading operations as well as the addition of a once per term monitoring requirement in the operating permit to demonstrate compliance with the control efficiencies specified. The EPA also recommended that the DAQ clarify the use of the term "control efficiency" which was used to reference both the destruction efficiency of the thermal oxidizers and the overall percentage of VOC and HAP emissions captured and destroyed.

a. In their response to the EPA comments, Antero Midstream, LLC stated that the 70% capture efficiency for emissions from truck loading operations is not a calculated value but rather an assumed worst-case value provided by Section 5.2 of AP-42. Section 5.2.2.1.1 allows the assumption of a 70% capture efficiency from tanker trucks that do not pass either the MACT-level annual leak test (assumed capture efficiency of 99.2%) or the NSPS-level annual leak test (assumed capture efficiency of 98.7%).

b. Since the capture efficiency is an assumed worst-case value, additional monitoring was not added to the operating permit. Compliance with the thermal oxidizers' destruction efficiency is demonstrated through compliance with the design and operation requirements specified in Conditions 8.1.3. through 8.1.8. of the operating permit.

c. The following footnotes were added to Condition 11.1.2. to clarify the origins of the 70% capture efficiency of truck loading emissions, the 98% destruction efficiency of the thermal oxidizer, and the overall 68.6% control efficiency.

[1] *The 70% capture efficiency is an assumed value under AP-42 Section 5.2 for tanker trucks that do not pass either the MACT-level annual leak test or the NSPS-level annual leak test.*

[2] *The thermal oxidizers TO-1 and TO-2 were designed to achieve a 98% destruction efficiency when operated as described in Conditions 8.1.3. through 8.1.8. of this operating permit.*

[3] *The required 68.6% overall control efficiency for truck loading operations is based on the 70% capture efficiency and the 98% destruction efficiency. (68.6% = 70% $\times$ 98%)*

3. The EPA also recommended including the specific monitoring recommended by the manufacturer of the thermal oxidizer to demonstrate compliance with the 98% destruction efficiency and the proper operation of the thermal oxidizers.

a. To address this comment, a reference to Conditions 8.1.3. through 8.1.8. of the operating permit has been added to Condition 11.2.2. Conditions 8.1.3. through 8.1.8. contain operating requirements of the thermal oxidizers TO-1 and TO-2. The manufacturer's recommended combustion chamber temperature is specified in Condition 8.1.5.