



west virginia department of environmental protection

Division of Air Quality
601 57th Street SE
Charleston, WV 25304
Phone (304) 926-0475 • FAX: (304) 926-0479

Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.: G70-A074
Plant ID No.: 017-00047
Applicant: EQT Production Company
Facility Name: OXF-134 Pad
Location: New Milton, Doddridge County
NAICS Code: 213111
Application Type: Administrative Update
Received Date: August 1, 2014
Engineer Assigned: Roy F. Kees, PE
Fee Amount: \$500.00
Date Received: August 18, 2014
Complete Date: October 21, 2014
Due Date: December 6, 2014
Applicant Ad Date: October 7, 2014
Newspaper: *The Herald Record*
UTM's: Easting: 515.8 km Northing: 4,339.2 km Zone: 17
Description: Addition of one (1) 11.66 MMBtu/hr enclosed ground flare to control condensate tank emissions.

DESCRIPTION OF PROCESS

EQT Production Company (EQT) has submitted a permit application for the construction and operation of one enclosed ground flare at an existing natural gas production wellpad. This flare will be used to control the emissions from the condensate tanks.

When in production, raw gas from the five (5) wells pass through a separator where the condensate is removed from the gas and sent to one of fifteen existing storage tanks. Gas passing through the separator will be sent to pipeline for transportation. The line heater shall be used to keep the lines at the facility from freezing and to promote gas/liquids flow. Emissions from the condensate tanks are captured and routed to the

vapor destruction unit and destroyed.

Once the existing storage tanks are full and the contents stabilized to atmospheric temperature and pressure, the contents are pumped to the four storage tanks that provide easier access to the trucks. Condensate is then loaded into trucks for removal from the site. Emissions from the truck loading are uncontrolled but the permit will require mitigation by using pipe racks and submerged fill methods. The thermoelectric generators are used to provide small amounts of electricity for switching/monitoring purposes when the facility is unable to generate sufficient solar power.

SITE INSPECTION

A site inspection of the facility was performed by Steve Pursley on March 20, 2013. To get to the well pad from Charleston take I-77 north to exit 176. Go east on US Route 50 approximately 36.3 miles. Take a right on Sunnyside Road (Co. Rt. 50/30). Go approximately 3.1 miles and turn right on Oxford Road (Co. Rt. 21). Then go approximately 4.5 miles and turn left on Hughes River Rd (Co. Rt. 19/11). Travel approximately 2.4 miles and turn left on the access road. Go approximately 200 feet and take a left on an access road going up a steep hill. Travel on the access road approximately 0.75 miles and you arrive at the pad. GPS coordinate taken at the site indicate 39° 12.128' North and 80° 48.995' West. There are no residences close to the well pad (none within 1 mile driving distance).

The following is a picture of the OXF-134 well-pad taken on the day of the inspection:



Fact Sheet G70-A074
EQT Production Company
OXF-134 Pad

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

EQT included in Attachment I of the general permit application air emissions calculations for the new flare at the OXF-134 natural gas production facility. The following will summarize the calculation methodologies used by EQT to calculate the potential-to-emit (PTE) of the proposed equipment.

Storage Tanks & Flare

Working, breathing and flashing emissions from the fifteen (15) existing 400 bbl condensate/produced water storage tanks were calculated using ProMax and assuming 98% control for the flare. Input and summary sheets for ProMax were included in the general permit application. An aggregate annual throughput of 5,000,000 gallons of condensate/liquid per year was used in the calculations for the storage tanks.

Emissions Summary

Based on the above estimation methodology, which is determined to be appropriate, the PTE of the new equipment at the OXF-134 natural gas production facility is given in the following table:

| Emission Unit | Pollutant | Maximum Hourly Emissions (lb/hr) | Maximum Annual Emissions (tpy) |
|--|----------------------------|----------------------------------|--------------------------------|
| S016-S018 (3) 1.5 mmBtu/hr & S019-S020 (2) 0.77 mmBtu/hr Line Heaters (Combined) | Nitrogen Oxides | 0.61 | 2.64 |
| | Carbon Monoxide | 0.51 | 2.24 |
| | Volatile Organic Compounds | 0.03 | 0.16 |
| | Sulfur Dioxide | <0.01 | 0.02 |
| | Particulate Matter-10 | 0.05 | 0.21 |
| | CO ₂ e | 729.01 | 3,193.07 |
| S001-S015 & S023-S026 Condensate Tanks (Combined) | Volatile Organic Compounds | 0.93 | 4.05 |
| | Total HAPs | 0.02 | 0.10 |
| | | | |
| S027 Cond. Loading | Volatile Organic Compounds | 0.10 | 0.46 |
| | Total HAPs | <0.01 | <0.01 |

Fact Sheet G70-A074
EQT Production Company
OXF-134 Pad

| | | | |
|------------------------------|----------------------------|----------|----------|
| Flare C001 | Nitrogen Oxides | 1.14 | 5.01 |
| | Carbon Monoxide | 0.96 | 4.21 |
| | CO ₂ e | 1,939.13 | 8,493.40 |
| S021-S022 (2) | Nitrogen Oxides | <0.01 | 0.01 |
| | Carbon Monoxide | <0.01 | 0.01 |
| Thermoelectric Generators | Volatile Organic Compounds | <0.01 | <0.01 |
| | Formaldehyde | <0.01 | <0.01 |
| | CO ₂ e | 3.08 | 13.48 |
| Fugitives | Volatile Organic Compounds | 0.07 | 0.29 |
| | Total HAPs | 0.01 | 0.03 |

The total facility potential to emit (PTE) is shown in the following table:

| Pollutant | Facility Wide Emissions (tons/year) |
|----------------------------|--|
| Nitrogen Oxides | 7.68 |
| Carbon Monoxide | 6.45 |
| Volatile Organic Compounds | 5.21 |
| Particulate Matter-10/2.5 | 8.82 |
| Sulfur Dioxide | 0.05 |
| Total HAPs | 0.17 |
| Carbon Dioxide Equivalent | 11,734 |

REGULATORY APPLICABILITY

The proposed EQT natural gas production facility is subject to substantive requirements in the following state and federal air quality rules and regulations: 45CSR2, and 45CSR13. Each applicable rule (and ones that have reasoned non-applicability), and EQT's compliance therewith, will be discussed in detail below.

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

The line heaters (S016-S020) have been determined to meet the definition of a “fuel burning unit” under 45CSR2 and are, therefore, subject to the applicable requirements therein. However, pursuant to the exemption given under §45-2-11, as the MDHI of the unit is less than 10 mmBtu/hr, it is not subject to sections 4, 5, 6, 8 and 9 of 45CSR2. The only remaining substantive requirement is under Section 3.1 - Visible Emissions Standards.

Pursuant to 45CSR2, Section 3.1, the line heaters are subject to an opacity limit of 10%. Proper maintenance and operation of the unit (and the use of natural gas as fuel) should keep the opacity of the unit well below 10% during normal operations.

45CSR6: *To Prevent and Control Air Pollution from the Combustion of Refuse*

The purpose of this rule is to prevent and control air pollution from combustion of refuse. EQT has one (1) flare at the facility. The flare is subject to section 4, emission standards for incinerators. The flare has an allowable emission rate of 0.65 pounds of particulate matter per hour (assuming a natural gas density of 0.044 lb/ft³). The flare has negligible amounts of particulate matter emissions per hour. Therefore, the facility’s flare should demonstrate compliance with this section. The facility will demonstrate compliance by maintaining records of the amount of natural gas consumed by the flare and the hours of operation. The facility will also monitor the flame of the flare and record any malfunctions that may cause no flame to be present during operation.

45CSR13: *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation*

The construction of the OXF-134 natural gas production facility does not have a potential to emit a regulated pollutant in excess of six (6) lbs/hour and ten (10) TPY. However, due to the proposed flare, the facility will be subject to 45CSR6, a substantive requirement. Therefore, pursuant to §45-13-2.24, the facility is defined as a “stationary source” under 45CSR13. Pursuant to §45-13-5.1, “[n]o person shall cause, suffer, allow or permit the construction . . . and operation of any stationary source to be commenced without . . . obtaining a permit to construct.” Therefore, EQT is required to obtain a permit registration under 45CSR13 for the construction and operation of the natural gas production facility.

As required under §45-13-8.3 (“Notice Level A”), EQT placed a Class I legal advertisement in a “newspaper of general circulation in the area where the source is . . . located.” The ad ran on October 7, 2014 in *The Herald Record*.

45CSR22 *Air Quality Management Fee Program*

The OXF-134 Facility is not subject to 45CSR30. The facility is subject to 40CFR60 Subpart OOOO, however they are exempt from the obligation to obtain a permit under 40 CFR part 70 or 40 CFR part 71, provided they are not required to obtain a permit for a reason other than their status as an area source, therefore, the facility is not subject and will pay its annual fees through the Rule 22 program.

40 CFR 60, Subpart OOOO *Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution*

Subpart OOOO applies to facilities that commence construction, reconstruction, or modification after August 23, 2011 (October 15, 2012 for well completions). Since the OXF-134 pad will begin operation after August 23, 2011 it is subject to the requirements of Subpart OOOO. The tanks at the OXF-134 facility will utilize a flare, therefore the tanks will not have the potential to emit more than 6 tpy of VOC’s, therefore the tanks will not be subject to the rule. The site will also include pneumatic controllers that were ordered and installed after August 23, 2011 with a bleed rate equal to or less than 6 scfd, therefore the controllers will not be subject to the applicable provisions of Subpart OOOO. The gas wells at the OXF-134 pad will also be affected facilities subject to Subpart OOOO.

Non Applicability Determinations

45CSR10: *To Prevent and Control Air Pollution from the Emission of Sulfur Oxides*

Pursuant to the exemption given under §45-10-10.1, as the MDHI of the line heaters (S016-S020) are less than 10 mmBtu/hr, the units are not subject to the substantive sections of 45CSR10.

45CSR14: Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution for the Prevention of Significant Deterioration.

The facility-wide potential-to-emit of the OXF-134 natural gas production facility is below the levels that would define the source as "major" under 45CSR14 and, therefore, the construction evaluated herein is not subject to the provisions of 45CSR14.

Classifying multiple facilities as one "stationary source" under 45CSR13, 45CSR14, and 45CSR19 is based on the definition of "Building, structure, facility, or installation" as given in §45-14-2.13 and §45-19-2.12. The definition states:

"Building, Structure, Facility, or Installation" means all of the pollutant-emitting activities which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under the control of the same person (or persons under common control). Pollutant-emitting activities are a part of the same industrial grouping if they belong to the same "Major Group" (i.e., which have the same two (2)-digit code) as described in the Standard Industrial Classification Manual, 1987 (United States Government Printing Office stock number GPO 1987 0-185-718:QL 3).

OXF-134 shares the same SIC code as several other well pads owned by EQT in the area. Therefore, the potential classification of the OXF-134 facility as one stationary source any other facility depends on the determination if these stations are considered "contiguous or adjacent properties."

"Contiguous or Adjacent" determinations are made on a case by case basis. These determinations are proximity-based, and it is important to focus on this and whether or not it meets the common sense notion of one stationary source. The terms "contiguous" or "adjacent" are not defined by USEPA. Contiguous has a dictionary definition of being in actual contact; *touching along a boundary or at a point*. Adjacent has a dictionary definition of not distant; nearby; *having a common endpoint or border*.

The OXF-134 natural gas production facility is not located contiguous with, or directly adjacent to any other EQT facility. The closest EQT facilities operating under the same SIC code is the OXF-136 and OXF-153 pads located 0.8 miles east and south respectively of the proposed OXF-134 Pad.

40 CFR 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

Pursuant to §60.110b, 40 CFR 60, Subpart Kb applies 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.” The largest storage tanks located at the OXF-134 facility are each 16,800 gallons, or 63.5 m³. Therefore, Subpart Kb does not apply to any of the storage tanks.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

This section provides an analysis for those regulated pollutants that may be emitted from the OXF-134 natural gas production facility and that are not classified as “criteria pollutants.” Criteria pollutants are defined as Carbon Monoxide (CO), Lead (Pb), Oxides of Nitrogen (NO_x), Ozone, Particulate Matter (PM), Particulate Matter less than 10 microns (PM₁₀), Particulate Matter less than 2.5 microns (PM_{2.5}), and Sulfur Dioxide (SO₂). These pollutants have National Ambient Air Quality Standards (NAAQS) set for each that are designed to protect the public health and welfare. Other pollutants of concern, although designated as non-criteria and without national concentration standards, are regulated through various federal programs designed to limit their emissions and public exposure. These programs include federal source-specific Hazardous Air Pollutants (HAPs) standards promulgated under 40 CFR 61 (NESHAPS) and 40 CFR 63 (MACT). Any potential applicability to these programs were discussed above under REGULATORY APPLICABILITY.

The majority of non-criteria regulated pollutants fall under the definition of HAPs which, with some revision since, were 188 compounds identified under Section 112(b) of the Clean Air Act (CAA) as pollutants or groups of pollutants that EPA knows or suspects may cause cancer or other serious human health effects. EQT included the following HAPs as emitted in substantive amounts in their emissions estimate: Benzene, n-Hexane, Toluene, and Trimethylpentane. The following table lists each HAP's carcinogenic risk (as based on analysis provided in the Integrated Risk Information System (IRIS)):

Potential HAPs - Carcinogenic Risk

| HAPs | Type | Known/Suspected Carcinogen | Classification |
|------------------|------|----------------------------|-------------------------------------|
| n-Hexane | VOC | No | Inadequate Data |
| Benzene | VOC | Yes | Category A - Known Human Carcinogen |
| Toluene | VOC | No | Inadequate Data |
| Xylene | VOC | No | Inadequate Data |
| Trimethylpentane | VOC | No | Inadequate Data |

All HAPs have other non-carcinogenic chronic and acute effects. These adverse health effects may be associated with a wide range of ambient concentrations and exposure times and are influenced by source-specific characteristics such as emission rates and local meteorological conditions. Health impacts are also dependent on multiple factors that affect variability in humans such as genetics, age, health status (e.g., the presence of pre-existing disease) and lifestyle. As stated previously, *there are no federal or state ambient air quality standards for these specific chemicals*. For a complete discussion of the known health effects of each compound refer to the IRIS database located at www.epa.gov/iris.

AIR QUALITY IMPACT ANALYSIS

The estimated maximum emissions from the proposed OXF-134 natural gas production facility are less than applicability thresholds that would define the proposed facility as a "major stationary source" under 45CSR14 and, therefore, no air quality impacts modeling analysis was required. Additionally, based on the nature of the proposed construction, modeling was not required under 45CSR13, Section 7.

MONITORING OF OPERATIONS

The following substantive monitoring, compliance demonstration, and record-keeping requirements (MRR) shall be required:


- For the purposes of demonstrating compliance with maximum limit for the aggregate production of condensate/liquids from the wells set forth in Section 4.0 of the general permit registration, EQT shall be required to monitor and record the monthly and rolling twelve month total of condensate/liquids (in gallons) produced in the wells. Monitoring and recording the monthly and rolling twelve month total of condensate/liquids (in gallons) unloaded from the storage tanks can be used to show compliance with this requirement.
- For the purposes of demonstrating compliance with visible emissions limitations set forth in Section 7.0 of the G70-A general permit, EQT shall be required to:

Fact Sheet G70-A074
 EQT Production Company
 OXF-134 Pad

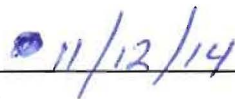
- (1) Conduct an initial Method 22 visual emission observation on the line heaters to determine the compliance with the visible emission provisions. EQT shall be required to take a minimum of two (2) hours of visual emissions observations on the line heaters.
 - (2) Conduct monthly Method 22 visible emission observations of the heater treater stack to ensure proper operation for a minimum of ten (10) minutes each month the line heaters are in operation.
 - (3) In the event visible emissions are observed in excess of the limitations given under Section 7.5 of the G70-A general permit, EQT shall be required to take immediate corrective action.
- EQT shall be required to maintain records of all visual emission observations pursuant to the monitoring required under Section 7.2 of the G70-A general permit including any corrective action taken.
 - EQT shall be required to report any deviation(s) from the allowable visible emission requirement for any emission source discovered during observations using 40CFR Part 60, Appendix A, Method 9 or 22 to the Director of the Division of Air Quality as soon as practicable, but in any case within ten (10) calendar days of the occurrence and shall include at least the following information: the results of the visible determination of opacity of emissions, the cause or suspected cause of the violation(s), and any corrective measures taken or planned.
 - EQT shall be required to maintain records of the amount of natural gas burned in all engines, heaters or other fuel burning units.

RECOMMENDATION TO DIRECTOR

Information supplied in the registration application indicates that compliance with all applicable regulations will be achieved. Therefore it is the recommendation of the writer that general permit registration G70-A074 for the construction of a natural gas production facility near New Milton, Doddridge County, be granted to EQT Production Company.



Roy F. Kees, P.E.
Engineer - NSR Permitting



DATE