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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	G70-A192
Plant ID No.:	103-00050
Applicant:	Ascent Resources – Marcellus, LLC
Facility Name:	John Rush 404
Location:	Wileyville, Wetzel County, WV
NAICS Code:	211111
Application Type:	Modification
Received Date:	November 9, 2015
Engineer Assigned:	Caraline Griffith
Fee Amount:	$1,500.00
Date Received:	$500.00 received on November 18, 2015; $1,000.00 received on December 14, 2015.
Complete Date:	December 14, 2015
Due Date:	January 28, 2016
Applicant Ad Date:	November 25, 2015
Newspaper:	Wetzel Chronicle
UTM's:	Easting: 531.112 km Northing: 4,384.674 km Zone: 17S
Description:	The John Rush 404 natural gas production site will remove the existing vapor recovery unit (VRU) and increase the flare operating hours from 450 to 8,760 hours. Fluid throughputs are updated to reflect recent production records.

PROCESS DESCRIPTION

Incoming raw natural gas from the six (6) wells is first routed through the 1.5 mmBTU/hr gas production units (GPUs) (S01-S06) where the first stage of fluid separation occurs. The GPUs separate the well stream flow into a high pressure natural gas sales stream and condensate liquid stream. The liquid stream is routed to one of the two 0.75 mmBTU/hr condensate heaters (S07-S08) to aid in the separation process. Produced water is routed to the eight (8) 210 bbl produced

water storage tanks (S11-S18). The condensate is routed to the two (2) 178 bbl condensate storage tanks (S09-S10).

The natural gas stream will exit the facility for transmission via pipeline. Condensate and produced water are transported offsite via tank truck. Flashing, working, and breathing emissions from the eight (8) 210 bbl produced water storage tanks and two (2) 178 bbl condensate storage tanks are routed to the enclosed combustion device (S21). Tank truck loading operations from the produced water loading operations (S20) and the condensate loading operations (S19) will be vapor balanced to the tanks and controlled by the enclosed combustion device (S21).

The equipment on site is as follows:

- Six (6) gas processing unit (GPU) burners at 1.5 mmBTU/hr heat input each
- Two (2) condensate heaters at 0.75 mmBTU/hr heat input each
- Eight (8) 210 bbl produced water tanks
- Two (2) 178 bbl condensate tanks
- One (1) Hero Flare G30U4 Enclosed Combustion Device with capacity 20.83 mmBTU/hr
- One (1) produced water tank truck loading operation
- One (1) condensate tank truck loading operation

SITE INSPECTION

On April 8, 2015 Douglas Hammell of the DAQ's Compliance and Enforcement Section visited the site. There were no odors nor visible leaks or emissions. There was also no issue with the records that he reviewed. The site received a rating of 30.

Directions:
Traveling east on WV State Route (SR) 7, turn south onto CR 17 for approximately 1.1 miles. When reaching the CR 58 (Hoyt/Criswell Ridge Road) turn left and proceed for approximately 1.4 miles (continue to bear left on the main gravel road) and then turn right onto the John Rush 404 access road. Proceed another 0.5 miles to the location of the existing well-pad.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

The Enclosed Combustion Device, GPU, and Heater emissions were calculated using AP-42 Chapter 1.4. The tank emissions were calculated using E&P Tanks software.

Table 1: PTE Estimates

Unit ID	Unit Description	Pollutant	lb/hr	TPY
S01-S06	Six (6) GPU Burners 1.5 mmBTU/hr	VOC	0.04	0.18
		NOx	0.72	3.06
		CO	0.60	2.58
		PM	0.05	0.24
		SO2	<0.01	0.02
		Hexane	0.01	0.05
S07-S08	Two (2) Condensate	VOC	<0.01	0.02
		NOx	0.12	0.56

	Heaters 0.75 mmBTU/hr	CO	0.10	0.42
		PM	<0.01	0.04
		SO2	<0.01	<0.01
		Hexane	<0.01	0.01
S09-S10	Two (2) Condensate Tanks	VOC	0.06	0.25
		HAPs	<0.01	<0.01
S11-S18	Eight (2) Produced Water Tanks	VOC	0.01	0.06
		HAPs	<0.01	<0.01
S19	Condensate Loading	VOC	<0.01	<0.01
		HAPs	<0.01	<0.01
S20	Produced Water Loading	VOC	<0.01	<0.01
		HAPs	<0.01	<0.01
S21	Hero Flare G30U4	VOC	0.16	0.71
		NOx	1.62	7.11
		CO	1.36	5.97
		PM	0.12	0.54
		SO2	0.01	0.04
		HAPs	0.05	0.23

Table 2: Fugitive Emissions

Unit Description	Pollutant	lb/hr	TPY
Haul Road Emissions	PM	6.37	2.93
Fugitive Leaks	VOC	0.10	0.45
	HAPs	<0.01	0.02

Table 3: Total Facility PTE

Pollutant	TPY
VOC	1.37
NOx	10.68
CO	8.98
PM	3.74
SO2	0.06
CH4	2.56
HAPs	0.23
CO2e	15,075.22

AGGREGATION DETERMINATION

The John Rush 404 facility is located in Wetzel County, WV and operated by Ascent. Stationary sources of air pollutants may require aggregation of total emissions levels to evaluate the potential applicability of Title I, Parts C and D pre-construction permitting programs and the Title V operating permit program if these sources share the same industrial grouping, are operating under common control, and are adjacent or contiguous facilities. Ascent will operate the John Rush 404 facility with the same industrial grouping as nearby facilities, and some of

these facilities are under common control. Ascent is not subject to the aggregation of stationary emission sources because these sites do not meet the definition of contiguous or adjacent facilities.

The John Rush 404 facility operates under SIC Code 1311 (Crude Petroleum and Natural Gas Extraction). There are surrounding wells and compressor stations operated by Ascent that share the same two-digit major SIC Code of 13 for Crude Petroleum and Natural Gas Extraction. Therefore, the John Rush 404 facility does share the same SIC codes as the surrounding wells and compressor stations.

Ascent is the sole operator of the John Rush 404 pad. Ascent is also the sole operator of other production sites and compressor stations in the area. Therefore, Ascent does qualify as having nearby operations under common control.

Nearby sites do not meet the definition of contiguous or adjacent properties since they are not in contact and do not share common boundaries. Surrounding facilities are located further that a quarter of a mile away from the John Rush 404 natural gas production facility. Furthermore, these facilities do not meet the common sense notion of a plant.

Based on the above reasoning, Ascent is not subject to the aggregation of stationary emission sources since the stationary sources are not considered contiguous or adjacent.

REGULATORY APPLICABILITY

The following state and federal regulations apply to sources requesting registration under the G70-A General Permit:

State Regulations:

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

Pursuant to the definition of "fuel burning unit" under 45CSR2 ("producing heat or power by indirect heat transfer"), the limitations on fuel burning units under 45CSR2 do not apply to the GPU burners and flash separator heaters.

The GPUs and the Line Heaters each 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 units are each less than 10 mmBtu/hr, they are 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 reboilers are subject to an opacity limit of 10%. Proper maintenance and operation of the units (and the use of natural gas as fuel) should keep the opacity of the units well below 10% during normal operations.

45CSR4 To Prevent and Control the Discharge of Air Pollutants into the Open Air which Causes or Contributes to an Objectionable Odor or Odors

45CSR4 states that an objectionable odor is an odor that is deemed objectionable when in the opinion of a duly authorized representative of the Air Pollution Control Commission (Division of Air Quality), based upon their investigations and complaints, such odor is objectionable. All facilities are inspected by the DAQ Enforcement Section. The facility-wide requirements of the general permit include the odor standards of 45CSR §4-3.1.

Ascent does not believe at any time will there be objectionable odors coming from the site.

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

Gas flashed off or volatilized from the liquids during separation, storage, and load-out is sent to a flare for destruction. The flare meets the definition of an "incinerator" under 45CSR6 and are, therefore, subject to the requirements therein. The substantive requirements applicable to the flare are discussed below.

<u>45CSR6 Emission Standards for Incinerators - Section 4.1</u>

Section 4.1 limits PM emissions from incinerators to a value determined by the following formula:

Emissions (lb/hr) = F x Incinerator Capacity (tons/hr)

Where, the factor, F, is as indicated in Table I below:

Table I: Factor, F, for Determining Maximum Allowable Particulate Emissions

Incinerator Capacity	Factor F
A. Less than 15,000 lbs/hr	5.43
B. 15,000 lbs/hr or greater	2.72

The flare will operate year round (8,760 hours). When it is combusting gases, it will be fueled by high heat-content waste-gases that should burn cleanly like methane. Therefore, any particulate matter emissions or opacity from the flare during this period should be minimal.

45CSR6 Opacity Limits for - Section 4.3, 4.4

Pursuant to Section 4.3, and subject to the exemptions under 4.4, the flare has a 20% limit on opacity during operation. As stated above, any particulate matter emissions or opacity from the flare should be minimal.

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

Pursuant to the definition of "fuel burning unit" under 45CSR10 ("producing heat or power by indirect heat transfer"), the limitations on fuel burning units under 45CSR10 do not apply to the GPU burners and flash separator heaters.

45CSR10 has requirements limiting SO_2 emissions from "fuel burning units," limiting in-stack SO_2 concentrations of "manufacturing processes," and limiting H_2S concentrations in process gas streams. The only potential applicability of 45CSR10 to the John Rush 404 Natural Gas Production Facility is the limitations on fuel burning units. The GPUs and Line Heaters have been determined to meet the definition of a "fuel burning unit" under 45CSR10. However, pursuant to the exemption given under §45-10-10.1, as the MDHI of the GPUs and the Line Heaters is less than 10 mmBtu/hr, the units are not subject to the limitations on fuel burning units under 45CSR10.

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

As required under §45-13-8.3 ("Notice Level A"), Ascent placed a Class I legal advertisement in a "newspaper of general circulation in the area where the source is . . . located." The ad ran on November 25, 2015 in *The Wetzel Chronicle.*

45CSR22 Air Quality Management Fee Program

Ascent paid the $500 Modification fee associated with a G70-A general permit registration, and also paid the $1,000 NSPS fee.

Federal Regulations:

40CFR60, Subpart OOOO (Standards of Performance for Crude oil and Natural Gas Production, Transmission and Distribution)

EPA published its new source performance standards (NSPS) and air toxics rules for the oil and gas sector on August 16, 2012. EPA published final amendments to the subpart on September 23, 2013.

40CFR60 Subpart OOOO establishes emission standards and compliance schedules for the control of volatile organic compounds (VOC) and sulfur dioxide (SO2) emissions from affected facilities that commence construction, modification or reconstruction after August 23, 2011. The

affected sources which commence construction, modification or reconstruction after August 23, 2011 are subject to the applicable provisions of this subpart as described below:

a. Each gas well affected facility, which is a single natural gas well.

The wells at this facility were drilled principally for the extraction of natural gas, therefore this is a natural gas well affected facility.

b. Each centrifugal compressor affected facility, which is a single centrifugal compressor using wet seals that is located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment. A centrifugal compressor located at a well site, or an adjacent well site and servicing more than one well site, is not an affected facility under this subpart.

There are no centrifugal compressors located at this facility.

c. Each reciprocating compressor affected facility, which is a single reciprocating compressor located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment. A reciprocating compressor located at a well site, or an adjacent well site and servicing more than one well site, is not an affected facility under this subpart.

There are no reciprocating compressors located at this facility.

d. For the natural gas production segment (between the wellhead and the point of custody transfer to the natural gas transmission and storage segment and not including natural gas processing plants), each pneumatic controller affected facility, which is a single continuous bleed natural gas-driven pneumatic controller operating at a natural gas bleed rate greater than 6 scfh.

Pneumatic controllers that would be located at this facility will not have a continuous bleed rate of greater than 6 scfh.

e. Each storage vessel affected facility, which is a single storage vessel located in the oil and natural gas production segment, natural gas processing segment or natural gas transmission and storage segment, and has the potential for VOC emissions equal to or greater than 6 tpy as determined according to this section by October 15, 2013 for Group 1 storage vessels and by April 15, 2014, or 30 days after startup (whichever is later) for Group 2 storage vessels. A storage vessel affected facility that subsequently has its potential for VOC emissions decrease to less than 6 tpy shall remain an affected facility under this subpart.

The tanks at this site have uncontrolled emissions greater than 6 TPY. Ascent has fitted them with a flare that will reduce the emissions to below 6 TPY. This device is legally and practically enforceable.

f. Processing units, sweetening units and compressor stations are outside the scope of the G70-A general permit and are excluded from applicability for the general permit. The

G70-A general permit is focused on activities at the production pad facility and is not intended to be a comprehensive NSPS, Subpart OOOO general permit.

This facility is not a sweetening facility.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

Small amounts of non-criteria regulated hazardous air pollutants such as benzene, toluene, and formaldehyde will be emitted from this site, and is considered a minor source of HAPs as seen in Table 3 when natural gas is combusted in reciprocating engines, combusted in the fuel burning units, or combusted in one of the combustion type air pollution control devices.

All natural gas production facilities that are issued a G70-A general permit registration by the Director will be limited to those that are classified as minor sources of hazardous air pollutants. Minor sources of hazardous air pollutants are defined as those that have a potential to emit of less than 10 tons per year of any hazardous air pollutant or less than 25 tons per year of any combination of hazardous air pollutants.

More information about certain hazardous air pollutants can be found at [http://www.epa.gov/ttn/atw/hlthef/hapindex.html].

AIR QUALITY IMPACT ANALYSIS

The estimated maximum emissions from the revised John Rush 404 natural gas production facility are less than applicability thresholds that would define the 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 modification, 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, Ascent Resources 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, Ascent Resources shall be required to:

(1) Conduct an initial Method 22 visual emission observation on the GPUs and Flash Separator Heaters to determine the compliance with the visible emission provisions. Ascent Resources shall be required to take a minimum of two (2) hours of visual emissions observations on the GPU and Flash Separator Heaters.

(2) Conduct monthly Method 22 visible emission observations of the GPU and Flash Separator Heater 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, Ascent Resources shall be required to take immediate corrective action.

- Ascent Resources 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.

- Ascent Resources 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.

RECOMMENDATION TO DIRECTOR

General permit G70-A192 meets all requirements of applicable state and federal regulations. Therefore, it is recommended that General Permit G70-A192 should be issued to Ascent Resources – Marcellus, LLC.

Caraline Griffith

Caraline Griffith
Permit Engineer

12/31/15
Date