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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-3091A
Plant ID No.:	103-00067
Applicant:	Ascent Resources - Marcellus, LLC
Facility Name:	Hoyt 403
Location:	Wileyville, Wetzel County
NAICS Code:	211111
Application Type:	Modification
Received Date:	August 26, 2016
Engineer Assigned:	Steven R. Pursley, PE
Fee Amount:	$1,000.00
Date Received:	August 31, 2016
Complete Date:	September 23, 2016
Due Date:	December 22, 2016
Applicant Ad Date:	August 31, 2016
Newspaper:	*Wetzel Chronicle*
UTM's:	Easting: 529.386 Northing: 4,382.669 Zone: 17
Description:	Modification to update combustor information.

DESCRIPTION OF PROCESS

Natural gas, condensate, and produced water flow from the six wellheads located on the Hoyt 403 site. The gas and liquids are first routed through the six 1.5 mmbtu/hr gas production units where the first stage of fluid separation occurs. The GPUs separate the well stream into a high pressure natural gas stream, a condensate liquid stream, and a produced water liquid stream.

Ascent can operate two 0.75 mmbtu/hr condensate heaters at the facility. When the heaters are in operation, the liquids will pass from the GPUs to the condensate heaters. Gas recovered from the heaters is routed to the low pressure sales line and liquids are sent to the gunbarrels.

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The liquids are then sent to the two 178 bbl gunbarrel tanks. Produced water from the gunbarrels is sent to four 210 bbl produced water storage tanks. The condensate from the gunbarrels is sent to the four 210 bbl condensate storage tanks.

The natural gas stream exits the facility via pipeline. Condensate and produced water are transported offsite via truck. Working, breathing, and flashing emissions from the gunbarrels and working and breathing losses from the storage tanks are routed to the onsite enclosed combustor.

SITE INSPECTION

A full, unannounced compliance inspection was conducted by Douglas Hammell of DAQs Enforcement Section on April 08, 2015. The facility was found to be in compliance. However, another inspection by Todd Shrewsbury performed on June 29, 2016 indicated that the "Company wanted to replace the flare prior to issuance of permit modification. Violation resolved with CO-R13-E-2016-11."

Directions to the facility are as follows:

From Charleston, WV, head north on I-77 to exit 179. Then go north on State Route 2 for 43 miles. Next, turn right (west) on WV-7 for 17.2 miles. Next, turn right Barker Run Road and go 1.1 miles, then turn left on County Route 58 and go 0.3 miles. Finally, turn right and go approximately 1.5 miles to the facility location.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions associated with this application consist of the combustion emissions from the (6) GPU burners (1E-6E), two condensate heaters (7E & 8E), two gunbarrel tanks (9E & 10E), four condensate tanks (11E -14E), four produced water tanks (15E - 18E), an enclosed combustor (19E), condensate truck loading (20E), produced water truck loading (21E), and fugitive emissions (22E). The following table indicates which methodology was used in the emissions determination:

Emission Unit ID#	Process Equipment	Calculation Methodology
1E-6E	Six 1.5 MMBTU/hr Gas Production Units	AP-42
7E-8E	Two 0.75 MMBTU/hr Condensate Heaters	AP-42
9E-10E	Two 178 bbl Gun Barrel Storage Tanks	AP-42 (working & breathing), Promax (flash)
11E-14E	Four 210 bbl Condensate Storage Tanks	AP-42 (working & breathing), Promax (flash)
15E-18E	Four 210 bbl Produced Water Storage Tanks	AP-42 (working & breathing), Promax (flash)
19E	One 2.5 MMBtu/hr Vapor Combustor	AP-42
20E	Condensate Truck Loading	AP-42
21E	Produced Water Truck Loading	AP-42
23E	Fugitives	EPA-453 / R95-017

Controlled (assumes a 98% VOC control efficiency for the vapor combustor for all tank emissions) criteria pollutant emissions from the facility will be as follows:

Source	NOx		VOC		CO		$PM/PM_{2.5}$		HAPs	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
1E	0.15	0.64	0.01	0.04	0.12	0.54	0.01	0.05	0.01	0.01
2E	0.15	0.64	0.01	0.04	0.12	0.54	0.01	0.05	0.01	0.01
3E	0.15	0.64	0.01	0.04	0.12	0.54	0.01	0.05	0.01	0.01
4E	0.15	0.64	0.01	0.04	0.12	0.54	0.01	0.05	0.01	0.01
5E	0.15	0.64	0.01	0.04	0.12	0.54	0.01	0.05	0.01	0.01
6E	0.15	0.64	0.01	0.04	0.12	0.54	0.01	0.05	0.01	0.01
7E	0.07	0.32	0.01	0.02	0.06	0.27	0.01	0.02	0.01	0.01
8E	0.07	0.32	0.01	0.02	0.06	0.27	0.01	0.02	0.01	0.01
9E	--	--	0.09	0.38	--	--	--	--	0.01	0.02
10E	--	--	0.09	0.38	--	--	--	--	0.01	0.02
11E	--	--	0.01	0.02	--	--	--	--	0.01	0.01
12E	--	--	0.01	0.02	--	--	--	--	0.01	0.01
13E	--	--	0.01	0.02	--	--	--	--	0.01	0.01
14E	--	--	0.01	0.02	--	--	--	--	0.01	0.01
15E	--	--	0.01	0.01	--	--	--	--	0.01	0.01
16E	--	--	0.01	0.01	--	--	--	--	0.01	0.01
17E	--	--	0.01	0.01	--	--	--	--	0.01	0.01
18E	--	--	0.01	0.01	--	--	--	--	0.01	0.01
19E	0.17	0.74	0.23	1.01	0.78	3.39	0.02	0.08	0.01	0.01
20E	--	--	52.47	1.81	--	--	--	--	1.34	0.05
21E	--	--	0.52	0.07	--	--	--	--	0.01	0.01
23E	--	--	2.03	8.87	--	--	--	--	0.01	0.02
Total	**1.21**	**5.22**	**55.59**	**12.92**	**1.62**	**7.17**	**0.10**	**0.42**	**1.55**	**0.29**

Controlled (assumes a 98% control efficiency for the vapor combustor for all tank emissions) HAP emissions from the facility will be as follows:

Source	n-Hexane		Benzene		Toluene	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
1E	0.01	0.01	0.01	0.01	0.01	0.01
2E	0.01	0.01	0.01	0.01	0.01	0.01
3E	0.01	0.01	0.01	0.01	0.01	0.01
4E	0.01	0.01	0.01	0.01	0.01	0.01
5E	0.01	0.01	0.01	0.01	0.01	0.01
6E	0.01	0.01	0.01	0.01	0.01	0.01
7E	0.01	0.01	0.01	0.01	0.01	0.01
8E	0.01	0.01	0.01	0.01	0.01	0.01
9E	0.01	0.01	0.01	0.01	0.01	0.01
10E	0.01	0.01	0.01	0.01	0.01	0.01
1E	0.01	0.01	0.01	0.01	0.01	0.01
12E	0.01	0.01	0.01	0.01	0.01	0.01
13E	0.01	0.01	0.01	0.01	0.01	0.01
14E	0.01	0.01	0.01	0.01	0.01	0.01
15E	0.01	0.01	0.01	0.01	0.01	0.01
16E	0.01	0.01	0.01	0.01	0.01	0.01
17E	0.01	0.01	0.01	0.01	0.01	0.01
18E	0.01	0.01	0.01	0.01	0.01	0.01
19E	0.01	0.01	0.01	0.01	0.01	0.01
20E	0.72	0.03	0.49	0.02	0.13	0.01
21E	0.01	0.01	0.01	0.01	0.01	0.01
23E	0.01	0.01	0.01	0.01	0.01	0.01
Total	**0.93**	**0.24**	**0.70**	**0.23**	**0.34**	**0.22**

Emissions from the existing facility (as taken directly from engineering evaluation G70-A191) are as follows (tons per year):

NO_x	CO	VOCs	$PM/PM_{2.5}$	HAPs
10.68	8.98	3.18	2.47	0.27

Therefore, the total change in emissions due to this modification is as follows (tons per year):

NO_x	CO	VOCs	$PM/PM_{2.5}$	HAPs
-5.46	-1.81	9.74	-2.05	0.02

REGULATORY APPLICABILITY

The modifications to the proposed Hoyt 403 Well Pad are subject to the following substantive state and federal air quality rules: 45CSR2, 45CSR6, 45CSR13, and 40 CFR 60 Subpart OOOO. Each applicable rule (and those that have questionable non-applicability) and EQM's compliance therewith will be discussed in detail below.

STATE RULES

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

The purpose of 45CSR2 is to establish emission limitations for smoke and particulate matter which are discharged from fuel burning units.

45CSR2 states that any fuel burning unit that has a heat input under ten (10) million B.T.U.'s per hour is exempt from sections 4 (weight emission standard), 5 (control of fugitive particulate matter), 6 (registration), 8 (testing, monitoring, recordkeeping, reporting) and 9 (startups, shutdowns, malfunctions). However, failure to attain acceptable air quality in parts of some urban areas may require the mandatory control of these sources at a later date.

The heat input of all of the proposed fuel burning units (1E-8E) are below 10 MMBTU/hr. Therefore, these units are exempt from the aforementioned sections of 45CSR2. However, the facility would be subject to the opacity requirements in 45CSR2, which is 10% opacity based on a six minute block average.

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

Ascent has proposed a vapor combustor for control of the waste gas produced from the liquids tanks. The vapor combustors meet the definition of an "incinerator" under 45CSR6 and is, therefore, subject to the requirements therein. The substantive requirements applicable to the vapor combustors are discussed below.

45CSR6 Emission Standards for Incinerators - Section 4.1

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

Based on information included in the application, the maximum vapor mass sent to the 2.5 mmbtu/hr vapor combustor will be 11.48 lbs/hr. Based on the above equation, the particulate matter limit of the vapor combustor is 0.03 lbs/hr. Particulate matter emissions from the vapor combustor are expected to be 0.02 pounds per hour.

45CSR6 Opacity Limits for - Section 4.3, 4.4

Pursuant to Section 4.3, and subject to the exemptions under 4.4, the vapor combustor has a 20% limit on opacity during operation. Proper design and operation of the vapor combustor should prevent any substantive opacity from the vapor combustor.

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 proposed modification of the Hoyt 403 Well Pad has a potential (uncontrolled) to emit in excess of six (6) lbs/hour and ten (10) TPY of a regulated pollutant and, therefore, pursuant to §45-13-2.24, the modification 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, Ascent is required to obtain a permit under 45CSR13 for the modification and operation of the facility.

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 August 31, 2016 in the *Wetzel Chronicle* and the affidavit of publication for this legal advertisement was submitted on September 12, 2016.

45CSR22: Air Quality Management Fee Program

45CSR30 provides for the establishment of a comprehensive air quality permitting system consistent with the requirements of Title V of the Clean Air Act. The modified Hoyt 4012 Well Pad does not meet the definition of a "major source under §112 of the Clean Air Act" as outlined under §45-30-2.26 and clarified (fugitive policy) under 45CSR30b. The proposed facility-wide PTE of any regulated pollutant does not exceed 100 TPY. Additionally, the facility-wide PTE does not exceed 10 TPY of any individual HAP or 25 TPY of aggregate HAPs.

However, as the facility is subject to an NSPS (Subpart OOOO), the facility would, in most cases, be subject to Title V as a "deferred source." However, pursuant to §60.5370(c), as a non-major "area source," Ascent is not required to obtain a Title V permit for the proposed facility. Therefore, the Hoyt 403 Well Pad is not subject to 45CSR30 and therefore is subject to 45CSR22.

FEDERAL RULES

40CFR60 Subpart OOOO: Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution

EPA issued it new source performance standards (NSPS) and air toxics rules for the oil and gas sector on April 17, 2012. 40CFR60 Subpart OOOO establishes emission standards and compliance schedules for the control of volatile organic compounds (VOC) and sulfur dioxide (SO_2) emissions from affected facilities that commence construction, modification or reconstruction after August 23, 2011. The following affected sources which commence construction, modification or reconstruction after August 23, 2011 are subject to the applicable provisions of this subpart:

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

The gas wells that currently exist at the Hoyt 403 were drilled principally for the production of natural gas and were done so after August 23, 2011. Therefore, these wells would be considered affected facilities under this subpart.

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. For the purposes of this subpart, your centrifugal compressor is considered to have commenced construction on the date the compressor is installed (excluding relocation) at the facility. 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 at the Hoyt 403 Pad. Therefore, this section would not apply.

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. For the purposes of this subpart, your reciprocating compressor is considered to have commenced construction on the date the compressor is installed (excluding relocation) at the facility. 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 at the Hoyt 403 Pad. Therefore, this section would not apply.

d. 1. 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 which commenced construction after August 23, 2011, and is located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment and not located at a natural gas processing plant.

2. Each pneumatic controller affected facility, which is a single continuous bleed natural gas-driven pneumatic controller which commenced construction after August 23, 2011, and is located at a natural gas processing plant.

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.

40CFR60 Subpart OOOO defines a storage vessel as a unit that is constructed primarily of nonearthen materials (such as wood, concrete, steel, fiberglass, or plastic) which provides structural support and is designed to contain an accumulation of liquids or other materials. The following are not considered storage vessels:

1. Vessels that are skid-mounted or permanently attached to something that is mobile (such as trucks, railcars, barges or ships), and are intended to be located at a site for less than 180 consecutive days. If the source does not keep or are not able to produce records, as required by §60.5420(c)(5)(iv), showing that the vessel has been located at a site for less than 180 consecutive days, the vessel described herein is considered to be a storage vessel since the original vessel was first located at the site.

2. Process vessels such as surge control vessels, bottoms receivers or knockout vessels.

3. Pressure vessels designed to operate in excess of 204.9 kilopascals and without emissions to the atmosphere.

This rule requires that the permittee determine the VOC emission rate for each storage vessel affected facility utilizing a generally accepted model or calculation methodology within 30 days of startup, and minimize emissions to the extent practicable during the 30 day period using good engineering practices. For each storage vessel affected facility that emits more than 6 tpy of VOC, the permittee must reduce VOC emissions by 95% or greater within 60 days of startup.

The storage vessels located at the Hoyt 403 Pad emit less than 6 tpy of VOC each after the controls Ascent has proposed (a vapor combustor with 98% control efficiency).

f. The group of all equipment, except compressors, within a process unit is an affected facility.

1. Addition or replacement of equipment for the purpose of process improvement that is accomplished without a capital expenditure shall not by itself be considered a modification under this subpart.

2. Equipment associated with a compressor station, dehydration unit, sweetening unit, underground storage vessel, field gas gathering system, or liquefied natural gas unit is covered by §§60.5400, 60.5401, 60.5402, 60.5421 and 60.5422 of this subpart if it is located at an onshore natural gas processing plant. Equipment not located at the onshore natural gas processing plant site is exempt from the provisions of §§60.5400, 60.5401, 60.5402, 60.5421 and 60.5422 of this subpart.

3. The equipment within a process unit of an affected facility located at onshore natural gas processing plants and described in paragraph (f) of this section are exempt from this subpart if they are subject to and controlled according to subparts VVa, GGG or GGGa of this part.

The Hoyt 403 Pad is not a natural gas processing plant. Therefore, LDAR for onshore natural gas processing plants would not apply.

g. Sweetening units located at onshore natural gas processing plants that process natural gas produced from either onshore or offshore wells.

1. Each sweetening unit that processes natural gas is an affected facility; and

2. Each sweetening unit that processes natural gas followed by a sulfur recovery unit is an affected facility.

3. Facilities that have a design capacity less than 2 long tons per day (LT/D) of hydrogen sulfide (H2S) in the acid gas (expressed as sulfur) are required to comply with recordkeeping and reporting requirements specified in §60.5423(c) but are not required to comply with §§60.5405 through 60.5407 and paragraphs 60.5410(g) and 60.5415(g) of this subpart.

4. Sweetening facilities producing acid gas that is completely reinjected into oil-or-gas-bearing geologic strata or that is otherwise not released to the atmosphere are not subject to §§60.5405 through 60.5407, 60.5410(g), 60.5415(g), and 60.5423 of this subpart.

There are no sweetening units at the Hoyt 403 Pad. Therefore, this section would not apply.

40CFR60 Subpart OOOOa: Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution *(non applicability)*

None of the affected sources listed in Subpart OOOOa are being modified with this application.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

This section provides an analysis for those regulated pollutants that may be emitted from the Hoyt 403 Well Pad 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 (PM_{10}), Particulate Matter less than 2.5 microns ($PM_{2.5}$), and Sulfur Dioxide (SO_2). 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. EQM included the HAPs listed in the following table as emitted in substantive amounts (at least 0.01 lb/hr or 0.01 tpy). The following table lists each HAP's carcinogenic risk (as based on analysis provided in the Integrated Risk Information System (IRIS)):

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

AIR QUALITY IMPACT ANALYSIS

Since this is a minor modification to an existing non major source (as defined in 45CSR14), no modeling was performed.

MONITORING OF OPERATIONS

The following Monitoring and Recordkeeping will be required by R13-3091A:

* The permittee shall maintain records of the amount of natural gas consumed in each of the 1.5 MMBTU/hr GPU burners (1S-6S).

* The permittee shall maintain records of the amount of natural gas consumed in the 0.75 MMBTU/hr Condensate Heaters (7S-8S).

* The vapor combustor shall have a constant pilot flame at all times that waste gas is directed to it. The pilot flame shall be continuously monitored by a thermocouple or an infrared monitor. Each monitoring device shall be accurate to, and shall be calibrated at a frequency in accordance with manufacturer's specifications.

* The permittee shall monitor the throughput to the vapor combustor (19S) on a monthly basis.

* The permittee shall maintain records of the amount of condensate production, produced water production, and the volumes loaded into tank trucks (9S-18S, 20S, 21S). The permittee shall calculate the monthly throughput to the vapor combustor

19S by ratio of the recorded condensate, produced water and tank truck loading volumes against the process modeling and throughput information within the plans and specifications filed in Permit Application R13-3091A.

* The permittee shall maintain all records required by 40 CFR 60 Subpart OOOO, including but not limited to documentation showing that emissions from any individual tank do not exceed 6 tons per year.

CHANGES TO PERMIT G70-A191

Since the existing facility is covered by a General Permit and this is an individual R13 permit, it is essentially a completely new permit.

RECOMMENDATION TO DIRECTOR

Information supplied in the application indicates that compliance with all applicable regulations will be achieved. Therefore it is the recommendation of the writer that permit R13-3091A for the modification of the Hoyt 403 Well Pad near, Wileyville, Wetzel County, be granted to Ascent Resources-Marcellus, LLC.

Steven R. Pursley, PE
Engineer

1-25-17
January 25, 2017