



west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.: R13-3091
Plant ID No.: 103-00067
Applicant: HG Energy, LLC
Facility Name: Hoyt 403
Location: Wileyville, Wetzel County
NAICS Code: 211111
Application Type: Construction
Received Date: June 7, 2013
Engineer Assigned: David Keatley
Fee Amount: \$2,000
Date Fee Received: June 14, 2013
Complete Date: October 17, 2013
Due Date: January 15, 2013
Applicant Ad Date: June 12, 2013
Newspaper: *Wetzel Chronicle*
UTM's: Easting: 529.407 km Northing: 4,382.687 km Zone: 17
Description: Installation of six (6) gas production unit (GPU) burners, six (6) condensate tanks, four (4) produced water tanks, two (2) flash separator heaters, and one (1) emergency flare.

DESCRIPTION OF PROCESS

The facility is an oil and natural gas exploration and production facility, responsible for the production of natural gas and condensate. Condensate, natural gas, and water come from six (6) natural gas wells to the GPU burners (1E - 6E) where the first stage of separation occurs. The six GPU burners are rated for 1.5 MMBTU/hr each. The natural gas stream from the GPUs exit the facility via the natural gas sales pipeline. Produced water from the GPUs is sent to four (4) produced water tanks (13E - 16E). Condensate from the GPUs is sent to two (2) 0.75 MMBTU/hr flash separator heaters. The vapors from the flash separator heaters exit the facility via the gas sales pipeline. The condensate from the flash separator heaters goes to the six (6) condensate tanks (7E - 12E). Condensate and produced water is transported offsite via truck. Truck loading emissions will

be controlled with vapor return which will have a 70% minimum capture efficiency. Working, breathing, and flash vapors from the storage tanks (7E -16E) will be routed to a vapor recovery unit (VRU) and then exit the facility via the gas sales pipeline. In the event of a shutting down the VRU a 31.25 MMBTU backup flare 20E will be used with a 98% destruction efficiency.

SITE INSPECTION

Douglas Hammell from DAQ's Compliance and Enforcement Section performed a site visit on July 24, 2013. The site seems appropriate for a well pad facility.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

The GPU burner(s) and Flash Separator Heater(s) use emission factors from AP-42. The emission factors in lb/MMscf are: NO_x, 100; CO, 84; SO₂, 0.6; PM, 7.6; and VOC, 5.5.

Emissions for tanks 7E -16E working and breathing emissions were estimated using TANKS 4.0.9d and the flash emissions were estimated using E&P Tanks. Vapors from 7E - 16E will be sent to a VRU with a 98% recovery efficiency.

The backup flare emissions were estimated with the unit running 26 days/year (625 hr/year) with a 98% destruction efficiency. Using 31,250 scf/hr maximum flowrate of waste gas and 625 hr/yr of operation yields 19.54 MMscf/yr.

The following table lists the estimated controlled air emissions:

Source ID	Emission Source	Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (tpy)
1E	GPU Burner 1.5 MMBTU/hr	NO _x	0.12	0.51
		CO	0.10	0.43
		VOC	0.01	0.03
		PM	0.01	0.04
		PM ₁₀	0.01	0.04
		CO _{2,e}	140	613
2E	GPU Burner 1.5 MMBTU/hr	NO _x	0.12	0.51
		CO	0.10	0.43
		VOC	0.01	0.03
		PM	0.01	0.04
		PM ₁₀	0.01	0.04
		CO _{2,e}	140	613
3E	GPU Burner 1.5 MMBTU/hr	NO _x	0.12	0.51
		CO	0.10	0.43
		VOC	0.01	0.03
		PM	0.01	0.04
		PM ₁₀	0.01	0.04

		CO _e	140	613
4E	GPU Burner 1.5 MMBTU/hr	NO _x	0.12	0.51
		CO	0.10	0.43
		VOC	0.01	0.03
		PM	0.01	0.04
		PM ₁₀	0.01	0.04
		CO _e	140	613
5E	GPU Burner 1.5 MMBTU/hr	NO _x	0.12	0.51
		CO	0.10	0.43
		VOC	0.01	0.03
		PM	0.01	0.04
		PM ₁₀	0.01	0.04
		CO _e	140	613
6E	GPU Burner 1.5 MMBTU/hr	NO _x	0.12	0.51
		CO	0.10	0.43
		VOC	0.01	0.03
		PM	0.01	0.04
		PM ₁₀	0.01	0.04
		CO _e	140	613
7E-12E	Six (6) Condensate Tanks 210-bbl	VOC	0.67	2.95
13E-16E	Four (4) Produced Water Tanks 210-bbl	VOC	0.04	0.16
17E	Flash Separator Heater 0.75 MMBTU/hr	NO _x	0.06	0.26
		CO	0.05	0.21
		VOC	<0.01	0.01
		PM	<0.01	0.02
		PM ₁₀	<0.01	0.02
		CO _e	70.01	306.66
18E	Flash Separator Heater 0.75 MMBTU/hr	NO _x	0.06	0.26
		CO	0.05	0.21
		VOC	<0.01	0.01
		PM	<0.01	0.02
		PM ₁₀	<0.01	0.02
		CO _e	70.01	306.66
19E	Fugitive Emissions	VOC	1.85	8.10
		n-Hexane	0.10	0.44
		Benzene	<0.01	0.01
		Toluene	0.01	0.06
		Ethylbenzene	<0.01	0.01
		Xylenes	0.03	0.11
		CO _e	0.01	0.03
20E	Backup Flare 1.0 MMBTU/hr	NO _x	0.17	0.05
		SO ₂	0.02	0.01
		CO	11.56	3.61

		VOC	0.17	0.05
		PM	0.24	0.07
		PM ₁₀	0.24	0.07
		CO _e	3,652.8	1,139.7
21E	Condensate Truck Loading 4,600,000 gallons/year	VOC	3.03	13.29
		n-Hexane	0.16	0.72
		Benzene	<0.01	0.01
		Toluene	0.02	0.10
		Ethylbenzene	<0.01	0.01
		Xylenes	0.04	0.18
22E	Produced Water Truck Loading	VOC	0.04	0.16

The following table represents the total controlled facility emissions:

Pollutant	Maximum Annual Facility Wide Emissions (tons/year)
Nitrogen Oxides	4.24
Carbon Monoxide	6.61
Volatile Organic Compounds	24.92
Total Particulate Matter	1.25
Particulate Matter	1.25
Sulfur Dioxide	0.03
Benzene	0.02
n-Hexane	1.23
Ethylbenzene	0.02
Toluene	0.16
Xylenes	0.29
Total HAPs	1.01
Carbon Dioxide Equivalent	5,660

The following table indicates the control device efficiencies that are required for this facility:

Emission Unit	Pollutant	Control Device	Control Efficiency
7E - 16E Storage Tanks	Volatile Organic Compounds	VRU or 20E	98.00 %
	Total HAPs		98.00 %
21E and 22E Loadout Racks	Volatile Organic Compounds	Vapor Return	70.00 %

REGULATORY APPLICABILITY

The following rules and regulations apply to this facility:

45CSR2 (Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers)

The purpose of 45CSR2 (Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers) 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 - 6E, 17E, and 18E) are below 10 MMBTU/hr. Therefore, these units are exempt from the aforementioned sections of 45CSR2. However this facility would be subject to the opacity requirements in 45CSR2, which is 10% opacity based on a six minute block average.

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

This facility shall not cause the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public. 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.

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.

This facility will have one (1) shutdown (emergency) flare. The flare is subject to section 4, emission standards for incinerators. The flare has an allowable emission rate of 1.01 pounds of particulate matter per hour. The vapor combustor has an emission limit of 0.05 pounds of particulate matter per hour. Therefore, the facility's vapor combustor should not exceed the standard due to this rule. The facility will demonstrate compliance by maintaining records of the amount of natural gas consumed by the vapor combustor and the hours of operation. The facility will also monitor the flame of the vapor combustor and record any malfunctions that may cause no flame to be present during operation. The opacity limit for the is flare is 20%.

45CSR10 (To Prevent and Control Air Pollution from the Emissions of Sulfur Oxides)

45CSR10 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 3 (weight emission standard), 6 (registration), 7 (permits), and 8 (testing, monitoring, recordkeeping, reporting). 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 - 6E, 17E, and 18E) are below 10 MMBTU/hr. Therefore, these units are exempt from the aforementioned sections of 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)

45CSR13 applies to this source due to the fact that the changes proposed under this permitting action results in an emissions increase above permitting thresholds. Therefore HG Energy is required to submit a construction application. HG Energy has published the required Class I legal advertisement notifying the public of their permit application.

45CSR16 - (Standards of Performance for New Stationary Sources Pursuant to 40CFR60)

45CSR16 incorporates by reference the standards of performance for new stationary sources (40CFR60). This facility has six (6) wells subject to 40CFR60 Subpart OOOO, and is therefore this facility is subject to 45CSR16.

45CSR22 (Air Quality Management Fee Program)

This facility is a minor source, not subject to 45CSR30, and the NSPS are Title V exempt. HG Energy is required to keep their Certificate to Operate current. HG Energy paid a \$1,000 construction application fee and \$1,000 NSPS fee.

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

EPA issued its 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 (SO₂) 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 six (6) gas wells that currently exist at the Hoyt 403 was 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. 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.

HG Energy proposes no compressors at this well site. 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.

The pneumatic controllers at this facility will be intermittent and therefore this section of this regulation does not apply.

- 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.

All six (6) 7S - 12S tanks located at the Hoyt 403 emit more than 6 tpy of VOC uncontrolled (24.60 tpy each). HG Energy has proposed routing the vapors from these tanks to a VRU to reduce the estimated emissions below 6 tpy and is therefore this facility is not subject to this section.

- 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 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. Therefore, this section would not apply.

40CFR60 Subpart A - 60.18 (General Control Device and Work Practice Requirements)

40CFR60 Subpart 60.18 contains requirements for control devices when they are used to comply with applicable subparts of 40CFR60 and 40CFR61. This facilities backup flare 20E is subject to section 60.18 of subpart A. Backup flare 20E shall be operated with no visible emissions except for periods not to exceed a total of 5 minutes during any 2 consecutive hours. Flare 20E will be operated with a flame present at all times. Method 22 shall be used to demonstrate compliance with the visual emissions requirements of this subpart.

The following rules and regulations do not apply to the facility:

40CFR60 Subpart Kb (Standards of Performance for VOC Liquid Storage Vessels)

40CFR60 Subpart Kb does not apply to storage vessels with a capacity less than 75 cubic meters. The tanks that HG Energy has proposed to install are 33.4 cubic meters each. Therefore, HG Energy would not be subject to this regulation.

40CFR60 Subpart KKK (Standards of Performance for Equipment Leaks of VOC from Onshore Natural Gas Processing Plants)

40CFR60 Subpart KKK applies to onshore natural gas processing plants that commenced construction after January 20, 1984. The Hoyt 403 is not a natural gas processing plant, therefore, this facility would not be subject to this regulation.

45CSR14 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollutants)

This facility does not meet or exceed the thresholds of this rule.

45CSR19 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution which Cause or Contribute to Nonattainment)

The Hoyt 403 is located in Wetzel County which is an attainment county for Particulate Matter 2.5.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

There will be small amounts of various non-criteria regulated pollutants emitted from the combustion of natural gas. However, due to the concentrations emitted, detailed toxicological information is not included in this evaluation.

AIR QUALITY IMPACT ANALYSIS

Based on the annual emission rates this facility will not be a major source as defined by 45CSR14, so air quality modeling was not performed.

MONITORING OF OPERATIONS

HG Energy will be required to perform the following monitoring associated with this permit application:

1. Monitor and record quantity of natural gas consumed for all combustion sources.
2. Monitor the presence of the flare pilot flame with a thermocouple or equivalent when in operation.
3. Monitor opacity from all fuel burning units.
4. Monitor the tanks to ensure that all vapors are sent to the VRU.
5. Monitor the condensate truck loading to ensure that vapor return is used.

HG Energy will be required to perform the following recordkeeping associated with this modification application:

1. Maintain records of the amount of natural gas consumed in each combustion source.
2. Maintain records of testing conducted in accordance with the permit. Said records shall be maintained on-site or in a readily accessible off-site location
3. Maintain the corresponding records specified by the on-going monitoring requirements of and testing requirements of the permit.
4. Maintain records of the visible emission opacity tests conducted per the permit.
5. Maintain a record of all potential to emit (PTE) HAP calculations for the entire facility. These records shall include the natural gas compressor engines and ancillary equipment.
6. The records shall be maintained on site or in a readily available off-site location maintained by HG Energy for a period of five (5) years.
7. Monitor the tanks to ensure that the tanks vapors will be sent to the VRU.
8. Monitor the condensate truck loading to ensure that vapor return is used.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates HG Energy's natural gas well pad site should meet all applicable requirements. It is recommended that HG Energy's proposed facility Hoyt 403 should be granted a 45CSR13 construction permit for their facility.

David Keatley
Permit Writer

October 18, 2013
Date

Fact Sheet R13-3091
HG Energy, LLC
Hoyt 403