12/12/14

dep

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

NON-CONFIDENTIAL
ENTIRE DOCUMENT

BACKGROUND INFORMATION

Application No.:	R13-3171A
Plant ID No.:	103-00082
Applicant:	Stone Energy Corporation (Stone Energy)
Facility Name:	Howard Well Pad Production Facility
Location:	New Martinsville, Wetzel County, WV
NAICS Code:	211111 - Crude Petroleum and Natural Gas Extraction
Application Type:	Modification
Received Date:	October 14, 2014
Engineer Assigned:	John Legg
Fee Amount:	$1,000.00 (10/15/14) and $1,000.00 for 40CFR60, Subpart JJJJ (10/21/2014)
Date Received:	October 15, 2014 and October 21, 2014
Complete Date:	October 29, 2014 (legal ad affidavit received by DAQ)
Due Date:	January 29, 2014
Applicant Ad Date:	October 22, 2014
Newspaper:	*Wetzel Chronicle*
UTM's:	Easting: 517.6642 km Northing: 4,382.9305 km Zone: 17
Latitude/Longitude:	39.59589 degrees; -80.79425 degrees
Description:	Install a 97.7 Hp natural gas-fueled emergency generator engine/set.

Id. No. ____ Reg. ____
Company ____
Facility ____ Region 2
Initials JC Legg

On October 14, 2014, Stone Energy submitted permit modification R13-3171A. On October 15, 2014, the $1,000.00 permit modification fee was paid and the writer was assigned as the reviewing engineer. On October 21, 2014, an additional $1,000.00 fee for NSPS, Subpart JJJJ was paid. On October 22, 2014, the company ran their legal ad in the *Wetzel Chronicle*. On October 29, 2014, the DAQ received the original affidavit of publication for the legal ad and the application was deemed complete. Stone Energy proposes to:

> Install a 97.7 Hp, natural gas-fueled, emergency generator engine/set. No other changes to the facility are being requested under this modification.

The facility is an existing facility operating under a permit that had not been modified prior to this modification. The changes made under this modification do not impact/affect the facility's aggregation analysis. For informational purposes only, the writer included Stone's aggregation analysis in Attachment 1 to this evaluation.

DESCRIPTION OF PROCESS

The existing, underlying process will not change as a result of installing the new 97.7 Hp, natural gas-fueled emergency generator engine/set.

The following process description, taken from Permit Application R13-3171, is provided here for informational purposes only:

> Natural gas and produced fluids (condensate and water) will be received from ten (10) wells on this location at approximately 500 psi and pass through heaters (one per well) to avoid ice formation during subsequent pressure drops. These materials will then pass through a three-way separator where gas, condensate and water are separated. The gas will be routed to a gathering pipeline.
>
> Condensate will normally be injected into a liquids pipeline owned and operated by others. However, as a back-up to this pipeline, provisions will be made to stabilize the condensate through heating and pressure reduction, coupled with vapor recovery. The stabilized condensate will be accumulated in four (4) 400 bbl tanks, pending truck transportation by others to a regional processing facility for separation into individual products. Flash, working and breathing losses from these tanks will be routed to two (2) vapor recovery units (VRUs) with the captured vapors routed back to the discharge line. In the event of shut down of the VRU's due to maintenance or equipment failure, the vapors from the condensate tanks will be routed to two vapor combustion units operating in parallel. Vapors generated during truck loading of condensate will be routed to the two vapor combustion units.
>
> The produced water, and water generated during the fuel gas conditioning process will be accumulated in two (2) 400 bbl tanks pending transportation via pipeline to a Stone Energy water management facility. Nominal flash gas vapors from these tanks (modeled at 8 SCFD and conservatively estimated at 120 SCFD for permitting purposes) will be vented to the atmosphere. These vapors are comprised solely of flash gases generated during the drop to atmospheric pressure.
>
> Three (3) gas-fueled generators will also be present to provide electric service for the facility instrumentation and controllers and to operate the pumps.
>
> All natural gas-fueled equipment uses natural gas received at the station.

Table 1: Emission Units Table (Attachment I in Application)
(Changes High-lighted in Red)

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed/ Modified	Design Capacity	Control Device
CE-1	1E	Flash Gas Compressor Engine (Cummins GTA855)	2014	225 Hp	1C (NSCR)
CE-2	2E	Flash Gas Compressor Engine (Cummins GTA855)	2014	225 Hp	2C (NSCR)
VCU-1	3E-A	Thermal Oxidizer	2014	100 MSCFD	N/A
VCU-2	3E-B	Thermal Oxidizer	2014	100 MSCFD	N/A
---	---	Truck Loading	2014	10 Million gal/yr	VCU-1/ VCU-2
T05-6	4E	Produced Water Tanks	2014	400 Barrel each	None
GN-1	5E	Generator Engine	2014	25 Hp	None
GN-2	6E	Generator Engine	2014	25 Hp	None
GN-3	10E	Generator Engine	2014	637 Hp	3C(SCR)
GN-4	12E	Emergency Generator	2014	98 Hp	None
T01-T04	---	Condensate Tanks	2014	400 Barrel each	CE-3/CE-4 VRU-1/ VRU-2
HTR-1	7E	Ten Line Heaters	2014	0.75 MMBTU/hr each	None
HTR-2	11E	Two Condensate Heaters	2014	0.75 MMBTU/hr each	None
CE-3	8E	VRU Compressor Engine (Cummins G8.3)	2014	118 Hp	4C(NSCR)
CE-4	9E	VRU Compressor Engine (Cummins G8.3)	2014	118 Hp	5C(NSCR)
---	---	Fugitive Emissions	2014	N/A	None
----	---	Haul Roads	2014	4 Trucks per day max.	None

Table 2: Information on New, Natural Gas-fueled Emergency Generator Engine (GN-4)			
Unit ID		GN-4	
Manufacturer		Ford	Cummins Inc. is the generator set manufacturer.
Model		WSG-1068	
EPA Emission Regulation	Certification	Yes	Complies with EPA emission regulations under the provisions of 40 CFR Part 60, Stationary Emergency Spark-Ignited emission limits.
	Engine Family	ECEXB06.8GDC	
	Certificate Number	ECEXB06.8GDC-005	
	Emission Standards	387 (CO)	(g/HP-hr)
		10 (HC + NOx)	(g/HP-hr)
		519 (CO)	(g/kW-hr)
		13.4 (HC + NOx)	(g/kW-hr)
		13.4 (NMHC + Nox)	(g/kW-hr)
Type		Four (4) Stroke Rich Burn	
Cylinders	Number of	V-10	
	Bore (in)	3.55	
	Stroke (in)	4.17	
	Displacement (cu. in)	412.5	
Fuel		Raw Natural Gas	
Design Class		4S-RB	4 stroke rich burn
Output: Net Intermittent	kW	73.08	@ Maximum Speed of 1,800 rpm
	bhp	97.7	
	ps		
H2S (gr/100 scf)		< 1	
Fuel Use (Btu/kW-hr)		12,250	Calculated by writer from BSFC (Btu/bhp-hr).
BSFC (Btu/bhp-hr)		9135	

Table 2: Information on New, Natural Gas-fueled Emergency Generator Engine (GN-4)		
Fuel Use (scfh)	707	
Annual Fuel Use (mmscf/yr)	0.35	
Fuel Use (mm Btu/hr)	0.89	Calculated by writer.
Fuel Heating Value (Btu/scf)	1,266	Calculated by writer from BSFC (Btu/bhp-hr).
Manufacture Date	> 1/1/12	4/15/14 - Build Date per E-mail from Bill King to Roger Dhonau, Attachment M in the permit application.
Date Installed	Estimated 9/30/14	
Operating Hours	500	
Emissions Control Device	Electronics Air to Fuel Ratio Control and Closed-loop Breather System	

SITE INSPECTION

No site inspection was conducted for this update.

A site inspection was conducted for the original construction permit (R13-3171) by Doug Hammell on February 27, 2014. The closest residence was 1,800 feet away. Pictures of the site are available in the file.

UTM coordinates (per application, page 2 of 4, entry 12.E, F, and G):

Northing 4,382.9305 KM
Easting 517.6642 KM
Zone 17

Latitude & Longitude Coordinates (per Stone Energy's October 15, 2014 legal advertisement):

Latitude: 39.59589
Longitude -80.79425

Directions (per application, entry 12A, page 2 of 4):

From the intersection of State Route 7 and State Route 20 east of New Martinsville travel 4.6 miles east on State Route 7 until you reach Turkey Run Road. Make a right turn onto Turkey Run Road and travel 0.6 miles. Make the first available right onto Maury Lang Road. Travel 0.4 miles on Maury Lang Road. Stay left at intersection onto well pad access road. The facility is located at the end of the well pad access road.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Summarized below are the hourly and annual estimated emissions increases resulting from the installation of the new 97.7 Hp, natural gas-fueled emergency generator engine proposed under Permit Update R13-3171A for Stone Energy's Howard Well Pad Production Facility, New Martinsville, Wetzel County, WV:

Table 5: Hourly and Annual Emissions Increase Resulting from New 97.7 Hp Emergency Generator/Engine.

Pollutant	Emission Factors (g/bhp-hr)	Emissions	
		(lb/hr)	*(TPY)
NOx	7.0	1.51	0.38
CO	387.0	83.36	20.84
VOC (NMNEHC)	3.0	0.65	0.16
SO_2	----	< 0.01	<0.01
PM/PM_{10}	----	0.02	< 0.01
Benzene	----	0.0014	0.0004
Formaldehyde	----	0.02	< 0.01
Total HAPs	----	0.03	0.01
CO2e	----	104	26

* Based on operating the generator a maximum of 500 hours per year.

Summarized below are hourly, annual and net/delta changes in facility emissions resulting from changes proposed under Permit Modification R13-3171A to Stone Energy's Howard Well Pad Production Facility, New Martinsville, Wetzel County, WV:

Table 4: Hourly, Annual and Delta Change in Emissions Resulting from Permit Modification R13-3171A.						
Pollutant	Hourly Emissions (lb/hr)			Annual Emissions (TPY)		
	Before (R13-3171)	After (R13-3171A)	Delta*	Before (R13-3171)	After (R13-3171A)	(1) Advertised Delta*
Nox	5.26	6.77	1.51	18.03	18.41	0.38
CO	15.80	99.16	83.36	42.03	62.87	20.84
VOC	26.31	26.95	0.65	47.96	48.12	0.16
Benzene	0.09	0.09	0.00	0.06	0.06	Not Advertised
Formaldehyde	0.34	0.36	0.02	1.50	1.50	0.00
HAPs	0.97	1.00	0.03	2.85	2.86	(2) 0.01
SO2	0.01	0.02	0.00	0.05	0.05	0.00
PM	4.69	4.71	0.02	3.30	3.30	0.00
CO_2e	4,671	4,775	103.82	11,578	11,604	25.95

* + Delta = Emission Increase; - Delta = Emission Decrease.
(1) Legal Advertisement Run by Stone Energy in the Intelligencer on October 22, 2014.
(2) Not Advertised in newspaper, but calculated in application.

REGULATORY APPLICABILITY

The new 97.7 Hp natural gas-fueled compressor engine (GN-4) was added to permit R13-3171, section 5.0 (Engines, CE-1 thru CE-4, GN-1 thru GN-4) and section 6.0 (40CFR60 Subpart JJJJ Requirements, CE-1 thru CE-4, GN-1 thru GN-4).

On June 1, 2013, West Virginia took delegation for area sources subject to 40CFR63, Subpart ZZZZ. Section10.0 (40CFR63 Subpart ZZZZ Requirements, GN-4) was added to permit R13-3171.

Only the rules related to the changes made under this modification are discussed below. Please see the previous engineering evaluation for a complete discussion of the rules applicable to this facility.

45 CSR 13 "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"

Stone Energy's Howard Well Pad Production Facility is a stationary source under Rule 13, Section 2.24.a. Before this modification, the facility operated under construction permit R13-3171. The emergency generator proposed for installation under this modification has the potential to increase CO emissions by 6 lb/hr and 10 ton/yr or more, or more than 144 pounds per calendar day. Stone Energy submitted an application, published a Class I legal advertisement to notify the public, and paid the appropriate application fee(s).

The changes made to the permit are detailed in the compare file found in Attachment 2 to this evaluation.

45CSR16 "Standards of Performance for New Stationary Sources"

This rule establishes and adopts standards of performance for new stationary sources promulgated by the United States Environmental Protection Agency pursuant to section 111(b) of the federal Clean Air Act, as amended. This rule codifies general procedures and criteria to implement the standards of performance for new stationary sources set forth in 40 CFR Part 60. The Secretary hereby adopts these standards by reference. The Secretary also adopts associated reference methods, performance specifications and other test methods which are appended to these standards.

40CFR60, Subpart JJJJ "Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (SI ICE))"

The new 97.7 Hp, natural gas-fueled, emergency generator engine was manufactured in 2014, and is subject to this rule. The changes made to the permit (section 6.0) are detailed in the compare file which is found in Attachment 2 to this evaluation.

45 CSR 34 "Emission Standards for Hazardous Air Pollutants for Source Categories Pursuant to 40 CFR, Part 63"

This rule establishes and adopts a program of national emission standards for hazardous air pollutants (NESHAPS) and other regulatory requirements promulgated by the United States Environmental Protection Agency pursuant to 40 CFR Parts 61, 63 and section 112 of the federal Clean Air Act, as amended (CAA). This rule codifies general procedures and criteria to implement emission standards for stationary sources that emit (or have the potential to emit) one or more of the eight substances listed as hazardous air pollutants in 40 CFR §61.01(a), or one or more of the substances listed as hazardous air pollutants in section 112(b) of the CAA. The Secretary hereby adopts these standards by reference. The Secretary also adopts associated reference methods, performance specifications and other test methods which are appended to these standards.

40CFR63, Subpart ZZZZ "Nation Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combust Engines"

Subpart ZZZZ establishes national emission limitations and operating limitations for HAPs emitted from stationary RICE located at major and area sources of HAP emissions. The subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limitations and operating limitations.

The new engine (GN-4) is subject to the area source requirements for emergency spark ignition engines.

For a new stationary RICE located at an area source of HAPs, the applicability requirement is to meet the standards of 40CFR60, Subpart JJJJ. Section 10 was added to R13-3171 and states this.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

Various non-criteria regulated pollutants are emitted from the combustion of natural gas. However, due to the low concentrations levels of these emitted pollutants, detailed toxicological information was not included in this evaluation.

AIR QUALITY IMPACT ANALYSIS

Stone Energy's Howard Well Pad facility is considered to be an non-major source of emissions. For that reason, no air modeling study was conducted for the source.

MONITORING OF OPERATIONS

Stone Energy will:

1. Monitor on a monthly and yearly basis, the amount of natural gas consumed by the emergency generator engine.

2. Keep records of conducted maintenance to demonstrate compliance with the emergency generator engine manufacturer's emission-related written instructions. If engine settings need adjusted, the adjustment are to be documented and are to be made according to and consistent with the engine manufacturer's instructions to maintain the engine's certification.

CHANGES TO PERMIT R13-3171

The changes made to permit R13-3171 to arrive at permit R13-3171A are detailed in RED in the compare file which can be found in Attachment 2 to this evaluation.

RECOMMENDATION TO DIRECTOR

Stone Energy's request for a modification permit to add a 97.7 Hp, natural gas-fueled emergency generator at their Howard Well Pad Production Facility located near New Martinsville, Wetzel County, WV meets the requirements of all applicable rules and therefore should be granted said modification permit (R13-3171A).

John Legg, Permit Writer

12/12/14

December 12, 2014

Attachment 1

Aggregation Analysis
Stone Energy Corporation
Howell Well Pad Production Facility
New Martinsville, Wetzel County, WV
Permit Modification R13-317IA

The following aggregation information was taken from permit application R13-3171A, Attachment D, Section 1.3 entitled, "Aggregation":

The proposed modification to this facility will not impact the aggregation status.

Source aggregation determinations are typically made based on the following criteria:

- Whether the facilities are under common control,
- Whether the facilities belong to the same Major Group (i.e., the first two digit code) as described in the Standard Industrial Classification Manual, 1972, as amended by the 1977 Supplement;
- Whether the facilities are located on one or more contiguous or adjacent properties; and the distance between all pollutant emitting activities,
- Whether the facilities can operate independently.

Only if all criteria are met does a permitting authority aggregate the facilities into a single source.

The facility receives and manages raw natural gas and associated produced fluids exclusively from the wells on the adjoining Stone Energy Howell Well Pad. After separation of the liquids, the gas is injected into

a gathering line for transportation to Ohio Valley Midstream's Stillwagner Compressor Station.

There is no gas from other well pads routed to this facility and no gas or liquids from this facility are routed to any other Stone Energy facility. Hence, no other Stone Energy well pads or other facilities in the area should be aggregated with this facility.

The receiving Stillwagner Compressor station, while under the same general SIC Code, has completely separated ownership and there is no sharing of staff. In addition, the compressor station, while only approximately 0.3 miles from the site of this facility, receives gas from various other production facilities. Thus, there is not a dependency relationship and not all of the criteria are met for aggregation of this facility and Stillwagner Compressor Station. Emissions from the Howell Wed Pad Production Facility has not been aggregated with the Stillwagner Compressor Station.

Attachment 2

Compare File
(Old R13-3171 to New R13-3171A)

Stone Energy Corporation
Howell Well Pad Production Facility
New Martinsville, Wetzel County, WV
Permit Modification R13-317IA