

DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: On-site Inspection

P144771374

FACILITY: BERQ RNG		SRN / ID: P1447
LOCATION: 10560 Freeport Avenue, FREEPORT		DISTRICT: Grand Rapids
CITY: FREEPORT		COUNTY: BARRY
CONTACT: Thomas Lewis , Operations Manager		ACTIVITY DATE: 02/12/2024
STAFF: Eric Grinstern	COMPLIANCE STATUS: Non Compliance	SOURCE CLASS: Minor
SUBJECT: Unannounced inspection		
RESOLVED COMPLAINTS:		

Facility Description

BerQ -RNG - Brook View Dairy is an anaerobic digestion facility that is operated by BerQ RNG at Brook View Dairy, located in Freeport, MI. The facility uses dairy manure from the 3000-head operation to generate gas that is processed through gas clean-up equipment to produce renewable natural gas that is injected into a natural gas pipeline located offsite. The RNG facility had an official startup date of January 2024. Prior to that time, the facility operated the anaerobic digesters (starting around 2000) and burned the resulting biogas in two engines. The facility currently has three (3) digester tanks, two (2) 1148 bhp engines that have been modified twice and currently burn natural gas, a gas upgrading operation, and a flare.

Regulatory Analysis

Brook View Dairy currently does not operate under any air quality permits. The facility previously submitted documentation (April 2023) regarding the use of exemptions from the requirements to obtain air use permits. AQD review of the documentation did not conclude that exemption from the requirement to obtain an air use permit was demonstrated. As part of this inspection, AQD requested information regarding compliance with Rule 278 and Rule 290, as well as additional process and emission information to assist in evaluating the facility's compliance status. The facility's consultant responded on behalf of BerQ RNG.

Rule 278: The documentation provided in April 2023, as well as the documentation provided in response to this inspection, calculated project emissions considering control and operational restrictions that are not federally enforceable. In determining if Rule 278(1)(b) applies to the process equipment, emissions calculations can't take into consideration any control or restrictions that are not federally enforceable. Specifically, since the flare is a control device, and absent any requirement making operation of the flare federally enforceable, actual emission calculations cannot consider control by the flare when demonstrating whether emissions are greater than the significant levels defined in Rule 119 to determine compliance with Rule 278(1)(b). The facility has stated that controlling emissions with the flare provides an economic benefit, however, just because the facility profits from controlling the emissions does

not negate the need for the flare operation to be federally enforceable to allow for the emission reduction to be considered. The provided calculations also assume an H₂S content of 1,000 ppm. The use of 1,000 ppm represents the maximum recent H₂S concentration of the raw gas from the digesters, which have H₂S control in the form of ferric chloride. Without the addition of ferric chloride, the H₂S concentration of the raw gas could be as much or more than 10x the concentration with the use of ferric chloride. Since there are no federally enforceable requirements regarding the use of ferric chloride, compliance with Rule 278(1)(b) needs to be determined without the use of ferric chloride. A rough estimate of H₂S emissions assuming 10,000 ppm H₂S and gas being vented to the flare 15% was evaluated by AQD staff. However, absent any federally enforceable restriction on the amount of time gas is vented, a worst-case scenario would need to be assumed in an actual Rule 278 determination. Assuming 10,000 ppm H₂S and venting 15% of the time results in emissions of 10.55 tpy H₂S (100% operation equates to approximately 70 tons of H₂S). This is greater than the Rule 119 significance level of 10 tpy, without considering maximum operation and without considering facility-wide emissions, therefore not meeting the requirements of Rule 278(1)(b) and eliminating the ability to utilize the Part 2 exemptions.

Compliance Evaluation

Prior to entering the facility, a survey around the facility from the public roadway was conducted. No visible emissions were noted, and only normal odors associated with a dairy farm were noted. At the facility AQD staff consisting of Eric Grinstern met with the Operations Manager for BerQ RNG, Thomas Lewis, as well as the Digester Operator for Brook View Dairy, Aron Zimmerman.

Below is an evaluation of the facility operations.

The process starts with manure from a storage lagoon/pit that is pumped to the three anaerobic digester tanks at a rate of 36,000 to 40,000 gallons per day. The facility has two (2) Caterpillar engines (G3516) that provide heat for the digesters as well as electricity for the farm or grid. The facility provided specifications for each engine (which are identical) as follows: 6,912 Btu/bhp-hr and 1148 bhp, which equates to 7,934,976 BTU/hr. The engines were manufactured in 2000 and were relocated and installed at Brook View in 2007/2008 and originally operated on natural gas. The engines were modified to burn biogas in 2008 and then converted back to burn natural gas in 2022. The facility's response dated March 21, 2024, states that the engines are subject to 40 CFR Part 60 Subpart JJJJ based on the size, fuel, and modifications that occurred in 2008 and 2022. Each engine is subject to the standards within 40 CFR 60.4233(f)(4): (Nitrogen oxides (NO_x) emission standard of 3.0 grams per HP-hour (g/HP-hr), a CO emission standard of 4.0 g/HP-hr, and a volatile organic compounds (VOC) emission standard of 1.0 g/HP-hr, or a NO_x emission standard of 250 ppmvd at 15 percent oxygen (O₂), a CO emission standard 540 ppmvd at 15 percent O₂, and a

VOC emission standard of 86 ppmvd at 15 percent O₂). Each engine is subject to the requirements of 40 CFR 60.4243(i) as a modified engine, since the engines were modified after June 12, 2006. The facility did not supply documentation that the engines were issued an EPA Certification of Conformity. AQD staff searched the EPA database and did not find the engines to be certified for the year they were constructed. The engines were required to have demonstrated compliance with the emission limits within 60 days after each engine commenced operation after the modification to burn biogas. No documentation has been provided demonstrating compliance with the emission limits through performance testing.

During the onsite inspection, the roof of the building was observed to be stained brown around the stacks associated with the engines. The staining was possibly caused by the emissions associated with previously burning biogas.

Adjacent to the digesters is an old flare that Mr. Lewis stated was decommissioned.

Biogas from the digesters is routed to the gas cleaning and upgrading operation. Prior to entering the cleanup process is a gas flow meter. The first stage of cleanup is the H₂S scrubbing system. H₂S scrubbing consists of three (3) scrubbers (Lead, lag and a reserve) that contain iron sponge H₂S scrubbing media that do not appear to have any vents or stacks. The outlet of each of the H₂S scrubbers has a port that allows for the H₂S content of the gas to be sampled daily. After H₂S scrubbing, gas can either be sent to a flare or continue in the cleanup and upgrading process. The gas then passes through a chiller followed by three (3) carbon polishing units that removes siloxanes as well as other constituents in the gas. The carbon polishing units do not appear to have any vents or stacks. Following the polishing units, the gas passes through a compressor, followed by a membrane system. The membrane system removes CO₂ that is then vented. After the membranes, the gas is either piped to a truck where is transported to be injected in a natural gas pipeline, or sent to the flare or recirculated through the cleanup process if it is off spec. Along with the CO₂ that is vented at the membranes, methane slip is approximately 2% by volume.

CONCLUSION

Based on this inspection and the facility provided records, the facility is operating out of compliance with Rule 201 by not having a PTI for the two (2) engines, gas upgrading operation, and flare. Those operations are not eligible to use Part 2 exemptions because of Rule 278 applicability by exceeding the emission thresholds in Rule 119.

Additionally, the two (2) engines are subject to NSPS Subpart JJJJ and have been modified twice. Since the engines have been modified, documentation would need to be provided demonstrating the engines have been certified or conduct performance testing to demonstrate compliance with the emission limits. The facility did not provide any documentation of certification or performance testing.

A violation notice will be issued to address the above violations.

NAME Eric Grinstern DATE 04/10/2024 SUPERVISOR HH