

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

B172959367

<b>FACILITY:</b> GRAND RAPIDS WASTEWATER TREATMENT PLANT		<b>SRN / ID:</b> B1729
<b>LOCATION:</b> 1300 MARKET AVE SW, GRAND RAPIDS		<b>DISTRICT:</b> Grand Rapids
<b>CITY:</b> GRAND RAPIDS		<b>COUNTY:</b> KENT
<b>CONTACT:</b> William Kaiser , Wastewater Plant Superintendent		<b>ACTIVITY DATE:</b> 06/23/2021
<b>STAFF:</b> Kaitlyn DeVries	<b>COMPLIANCE STATUS:</b> Non Compliance	<b>SOURCE CLASS:</b> SM OPT OUT
<b>SUBJECT:</b>		
<b>RESOLVED COMPLAINTS:</b>		

On Wednesday June 23, 2021, Department of Environment, Great Lakes, and Energy (EGLE) Air Quality Division (AQD) staff Kaitlyn DeVries (KD) conducted an announced, scheduled inspection of the City of Grand Rapids Water Resource Recovery Facility located at 1300 Market Street, SW, Grand Rapids, Michigan. The purpose of this inspection was to determine compliance with Permit to Install (PTI) No. 37-19B, Consent Order AQD No. 2020-16, and other applicable air quality rules and regulations.

The inspection was announced to ensure proper staff was on-site for the inspection. Additionally, in order to prevent the spread of COVID-19, KD donned a facial covering in addition to the appropriate personal protective equipment, and social distancing was practiced when it could be.

KD arrived on site at approximately 1:00 pm and met with Mr. Bill Kaiser, WRRF Superintendent, Mr. Mike Greiner Environmental Services Manager, Mr. Jared Grabinski, Wastewater Operations and Maintenance Supervisor, and Mr. Todd Williams, Industrial Pretreatment Program Inspector. With the exception of Mr. Kaiser, who had to be in another meeting, the other three (3) individuals accompanied KD on a site walkthrough.

### Facility Description

The City of Grand Rapids Water Resource Recovery Facility is a wastewater treatment facility that also operates an anaerobic digester, for which this aforementioned PTI is for. Prior to issuance of the PTI, construction had commenced on the facility. Violation Notices were issued to the facility, but these Violations have been resolved upon issuance of the PTI. These violations, however, did result in the Consent Order, AQD No. 2020-16.

The anaerobic digester portion of the facility consists of three (3) biodigesters and three (3) combined heat and power engines as well as other equipment, such as flares for control and a gas processing system to turn the biogas into renewable natural gas. So far, only two (2) combined heat and power engines have been installed. Further description of the emission units will follow in the Compliance Evaluation portion of this report.

### Regulatory Analysis

As previously mentioned, the facility holds one (1) permit, Opt-Out PTI No. 37-19B, containing synthetic minor limits for Carbon Monoxide, and Hazardous Air Pollutants, specifically, Formaldehyde. In addition to the permit the facility has emission units that are subject to the

provisions of the New Source Performance Standards (NSPS) of 40 CFR Part 60 Subpart JJJJ for Stationary Spark Ignition Internal Combustion Engines, and subject to the National Emissions Standards for Hazardous Air Pollutants (NESHAP) for Stationary Reciprocating Internal Combustion Engines 40 CFR Part 63 Subpart ZZZZ. Further discussion of these regulations can be found in the Compliance Evaluation portion of this report.

## **Compliance Evaluation**

### *EUCONDYS*

This emission unit is for the biogas conditioning system, using a membrane filtering technology to condition the biogas into renewable natural gas. It consists of parallel absorption vessels for H<sub>2</sub>S removal and media adsorption for VOC and siloxane removal. Water and CO<sub>2</sub> are also removed. Renewable natural gas is compressed after processing. Processed gas can either route to the flares, the engines or a natural gas pipeline. There is a bypass after the H<sub>2</sub>S removal system to the flares.

As of the time of the inspection the gas produced from the digesters was not being put into this system yet and was just being sent to the flares. The complete installation of this system was not yet complete. A PM/MAP is required for this emission unit no later than 45 days after the completion of the installation of the equipment. GRWRRF is currently preparing this plan.

### *FGSLTANKS*

This flexible group is for sludge blending tanks and volute thickening units prior to the digesters. Emissions are controlled from all of them by a communal biofilter odor control system. This communal biofilter odor control system also reduces sulfur-bearing compounds.

This unit was operational at the time of the inspection, and per GRWRRF staff they monitor daily differential pressures across the filter as well as check the pH weekly. These checks, as well as others, are required by the PM/MAP that was submitted to the AQD. Records indicate a differential pressure around 0.1 inches water column and a media temperature of 70 °F.

### *FGDIGESTERS*

This flexible group is for three (3) digester tanks that have a combined biogas maximum production rate of 800 cubic feet per minute with a 60% methane content. The gas made from these digesters routes to the conditioning system or to the flares. As of the date of the inspection only digester 2 had been seeded, and it was seeded the last week of May. The gas being made was either going to the storage sphere or to the flares (See FGFLARES for more information). The digesters were operating at 60.3% methane and 39.57% CO<sub>2</sub>.

GRWRRF was required to submit a PM/MAP for the digesters, for which one was received by the AQD on July 7, 2020. In addition to routine maintenance, operational parameters such as pH and process temperature are required to be recorded. Records indicate a pH of digester 2 at around 7, with temperatures of the inlet around 72° F and the top of the tank at 80 – 90 °F.

### FGDS

This flexible group covers the digested sludge transfer (DST) tanks, CO<sub>2</sub> release (CO<sub>2</sub>R) tanks, and the Schwing Nutrient Removal System. The DST tank and the CO<sub>2</sub>R tank are both vented to an activated carbon system to control odors and sulfur-bearing compounds.

KD was able to observe the activated carbon system and did not notice any odors emanating from the system. A PM/MAP is also required for the activated carbon system. At the time of this report, the AQD has only received a partial PM/MAP for this flexible group for the digested sludge transfer tank, but not the CO<sub>2</sub>R release tank or the activated carbon system. Per confirmation with Mr. Kaiser, the Schwing system and the CO<sub>2</sub>R is not in operation at this time.

### FGCHP

This flexible group is for three (3) combined heat and power engines each with a nominal rating of 1.411 MW (12.07 MMBTU/hr), used for electricity generation and heat for a heat loop for the digester tanks and incidental building heat. Each engine is equipped with an oxidation catalyst for control of CO, VOC, and Formaldehyde. These units are subject to the provisions of 40 CFR Part 60 Subpart JJJ for stationary reciprocating internal combustion engines.

GRWRRF has only two (2) of the three (3) permitted combined heat and power (CHPs) installed. While these units are installed, they are not yet operational. Per Mr. Grabinski, these units are still undergoing internal checks to make sure they are installed. KD reminded GRWRRF staff that an initial notification of startup is required, and subsequent emission testing is required within 180 days after startup. KD was able to view these units and see that they were not in operation but appeared to be fully installed.

Once operational, these units will be subject to the emission limits outlined in table 1. Since they are not operational, there is no actual emissions reported, just the emission limits. Unless otherwise noted, the emission limits apply to each CHP individually.

Pollutant	Emission Limit	Averaging Time
NO <sub>x</sub>	0.55 g/bhp-hr	Hourly
NO <sub>x</sub>	1. g/hp-hr or 82 ppmvd @ 15% O <sub>2</sub>	Hourly
CO	0.44 g/bhp-hr	Hourly
CO	1. g/hp-hr or 270 ppmvd @ 15% O <sub>2</sub>	Hourly
VOC	0.105 g/bhp-hr	Hourly
VOC	0.7 g/hp-hr Or 60 ppmvd @15%O <sub>2</sub>	Hourly

Formaldehyde	0.056 pph	Hourly
Formaldehyde	0.25 tons per year (tpy)	12-month rolling time period as determined at the end of each calendar month

Only pipeline quality natural gas or renewable natural gas from the facility that meets the requirements of entry into the natural gas pipeline is allowed to be combusted in these units.

GRWRRF was required to submit a PM/MAP for these units within 45 days of issuance of the permit, for which the AQD received the plan on September 2, 2020.

The stack parameters, while not explicitly measured, appeared to be correct.

*FGFLARES*

This flexible group is for two (2) open flares that may burn raw biogas, biogas with H2S removed, or off-spec renewable natural gas. The flares were put into operation on May 25, 2021, per notification from Mr. Kaiser, as required. KD was able to see the flares in operation at the time of the inspection. The gas being made so far from the digesters has only been combusted through the flares. Since being put into operation, the flares have not been bypassed.

GRWRRF is limited to 103.68 million scf per year based upon a 12-month rolling time period of H2S conditioned biogas and pipeline quality natural gas burned. They are also limited to burning 34.56 million scf per year, based upon a 12-month rolling time period of raw biogas. As of July 26, 2021, only 6 million cubic feet of H2S conditioned biogas had been burned, and no raw biogas. The biogas has an average H2S content of 0.115 ppm, for which GRWRRF has a device to monitor and record the H2S concentration of the biogas and the volumetric flow rate of the gas burned in the flares.

SO2 emissions from the flare are limited to 3.57 tons per year (tpy) based upon a 12-month rolling time period. At the time of this report, GRWRRF did not have the SO2 emissions calculated. This is a Violation of PTI 37-19B, FGFLARES Special Condition VI.6. A Violation Notice will be issued.

The Flares are also required to have a PM/MAP. GRWRRF submitted a plan to the AQD on June 15, 2020. The Stack parameters, while not explicitly measured, appeared to be correct.

*FGSPACEHEAT*

This flexible group covers two (2) natural gas, direct-fired heating units, one (1) natural gas-fired water heater, and four (4) natural gas-fired boilers. Only pipeline quality natural gas or renewable natural gas from the facility that meets the requirements of entry into the natural gas pipeline are allowed to be combusted in these units. At the time of the inspection GRWRRF had not yet started putting renewable natural gas back into the natural gas pipeline.

The maximum heat input for each unit in this flexible group is required to be kept. KD was able to view the nameplate capacities for these units as the maximum combined design heat input capacity for FGSPACEHEAT shall not exceed 12.4 MMBTU per hour on a fuel heat input basis.

#### *FGSTORAGETANKS*

This flexible group consists of eight (8) storage tanks for various liquids. These storage tanks include a 1,000-gallon storage tank for engine lube oil, a 1,000-gallon storage tank for engine used oil, two (2) 1,000-gallon storage tanks for polymer resins, and two (2) 6,000-gallon storage tanks for sodium hydroxide. These tanks are required to be closed when not in use.

A MAP/PM plan is required for these storage tanks. GRWRRF submitted a plan to the AQD on April 22, 2021. GRWRRF is following that plan.

#### *FGSTORAGETOTES*

This flexible group consists of three (3) storage tanks for various liquids including a 300-gallon storage tote for sodium hypochlorite, a 200-gallon storage tote for citric acid, and a 200-gallon or smaller storage tote for foam suppressant. These totes are required to be closed when not in use.

These totes are also required to have a PM/MAP, for which GRWRRF submitted a plan to the AQD on April 22, 2020; GRWRRF is adhering to this plan.

#### **Compliance Determination**

Based upon the observations made during the inspection and a subsequent review of the records, it appears that the City of Grand Rapids Water Resource Recovery Facility is not in compliance with PTI No. 37-19B and other applicable Air Quality Rules and Regulations. A Violation will be issued for the failure to maintain records of SO<sub>2</sub> emissions as required by FGFLARES Special Condition VI.6. Compliance with the permit is also required by Consent Order AQD Number 2020-16.

NAME 

DATE 8/17/2021

SUPERVISOR 