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

B179263653

FACILITY: Warren Waste Water Treatment Plant		**SRN / ID:** B1792
LOCATION: 32360 Warkop, WARREN		**DISTRICT:** Warren
CITY: WARREN		**COUNTY:** MACOMB
CONTACT: Bryan Clor , Division Head		**ACTIVITY DATE:** 07/06/2022
STAFF: Robert Joseph	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MAJOR
SUBJECT: Scheduled inspection of wastewater treatment plant.		
RESOLVED COMPLAINTS:		

On July 6, 2022, I, Michigan Department Environment, Great Lakes, and Energy-Air Quality Division staff Robert Joseph, conducted a scheduled inspection of Warren Wastewater Treatment Plant, Inc. (SRN: B1792) located at 32360 Warkop Avenue, Warren, Michigan 48093. The purpose of the inspection was to determine the facility's compliance with the requirements of the Federal Clean Air Act; Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451; and the Michigan Department Environment, Great Lakes, and Energy-Air Quality Division (EGLE-AQD) Administrative Rules, and conditions of the facility's Renewable Operating Permit (ROP) MI-ROP-B1792-2021.

General Facility Information

The Warren Wastewater Treatment Plant (WWTP) treats residential wastewater from the city of Warren as well as from industrial sources. WWTP was constructed in the late 1950s. The facility's sewage sludge incinerator is subject 40 CFR 60, Subpart MMMM, Emission Guidelines and Compliance Times for Existing Sewage Sludge Incineration Units. This subpart is for all Sewage Sludge Incinerators that commenced construction before October 14, 2010. In addition, the facility is subject to 40 CFR Part 61, Subpart C and E of the National Emission Standards for Hazardous Air Pollutants (NESHAP).

I arrived at the facility at approximately 10 a.m. and met with Bryan Clor, Facility Director. I introduced myself and presented my identification and credentials and stated the purpose of my visit.

I asked Bryan to provide some general information regarding the plant. The facility processes approximately 22 million gallons of wastewater a day and operates three shifts daily with approximately 36 employees: 7am-3pm, 3pm-11pm, and 11pm-7am. The maximum capacity of the plant is 100 million gallons per day. The wastewater undergoes a series of processes once it enters the facility through a gravity fed system which includes a wet well, grit chamber, primary clarifiers, aeration tanks, secondary clarifiers, tertiary treatment, UV disinfectant, belt presses, and an incinerator.

Facility Tour

Bryan began the tour of the facility where the redundant pumps within the system guide the wastewater as it enters the wet well and where the treatment begins. Exhaust from the wet well is treated using chemical odor control through the usage of sodium hypochlorite (NaClO). The facility decreased the bar screens of the wet well from 2 inches to 5/8 inch in 2019 to prevent large debris from entering the system which can damage the pumps. The wet well process is an enclosed process, and the pH and water flow rate are monitored through the Envirocare Venturi wet scrubber.

The wastewater then enters the grit box which also is an enclosed process. It operates 24 hours a day and is also equipped with odor control. It is composed of a chamber and split box. Prior to entering the atmosphere, the exhaust air is captured and treated through a carbon adsorption treatment unit when the wastewater temperature is above 60 ^{o}F. This typically occurs around May or June. Potassium permanganate ($KMnO_4$) is used to remove the iron (Fe) and hydrogen sulfide (H_2S) from the wastewater and to detect for activated carbon breakthrough from the grit box. The facility monitors the pH of the wastewater as it enters the facility. Lastly, some residual waste from the grit box is sent to a landfill.

The wastewater then enters a primary clarifier which are tanks used to slow the velocity of the wastewater to allow the suspended solids to settle. The facility performs a daily density test to determine the settling time of the particles in the tank. The primary sludge is collected, and the tanks are cleaned yearly. The facility

maintains eight primary clarifiers. Some of the sludge is removed and stored as activated sludge within storage tanks.

The wastewater is then routed to aeration tanks where air is introduced to allow for aerobic digestion of the pollutants which allows the solids to easily settle. The facility has six aeration tanks with four in service. The wastewater then moves to a series of secondary clarifiers where bio-phosphorus removal occurs, and where the effluent from the wastewater is held for a specified time allowing the activated sludge to settle to the bottom of the tank. The facility maintains eight secondary clarifiers. This activated sludge then moves to two of the three belt presses within the facility. The third belt press is available should any one of the other two become unavailable.

The final treatment phase of the wastewater is the tertiary treatment process which improves the wastewater quality before it is discharged into the Red Run Drain. This process removes all remaining inorganic compounds. The facility applies an ultraviolent (UV) light treatment to the cleansed wastewater before it is routed to the nearby Red Run Drain. The (UV) light treatment consists of a series of UV bulbs which destroy the genetic material of micro-organisms rendering them sterile.

The remaining sludge from the tanks are sent to one of three filter belt presses which are fed into a gravity belt thickener. These belts are used to reduce the moisture of the sludge to a ratio of 80% water/20% solid. There are a series of intake vents with filters. Air is drawn into the carbon adsorption unit for the belt press due to the possible hydrogen sulfide (H_2S) emissions. The carbon adsorption unit changes color when it is time for the unit to be changed indicating the (H_2S) has broken through.

This dewatered sludge is then directed towards the facility's Nichols multi-hearth incinerator. The facility typically sends sludge to the incinerator 3-4 days a week. The incinerator consists of ten hearths with burners located on hearths 2, 4, 6, 8, and 10. The facility monitors the combustion chamber temperature in hearths 5, 6, and 7. The facility inspects the incinerator hearths yearly. The design capacity of the incinerator is 10 tons/hr with a typical sludge feed rate of 4 to 6 tons/hr which is established with each performance test. The sludge feed rate is currently 5.47 tons/hr and is monitored through the facility's water permit by the EGLE-Water Resource Division.

The incinerator temperature increases at a rate of 50 ^{o}F per hour. The control device used to control emissions for the incinerator is a 3-stage EnviroCare Venturi wet scrubber. The facility does not add any chemical compounds to the scrubber to control the pH of the waste. The incinerator contains a bypass which is located on the top floor of the incinerator which lets fresh air in. The bypass only opens when maintenance work is occurring or when the incinerator ID fan fails. The bypass is attached to dead weights and will sound an alarm when opened. The ID fan was installed at the same time as the scrubber and aids in combustion according to the facility. The stack has continuous emission monitoring (CEM) for total hydrocarbons and an oxygen monitor, both monitored through their water permit.

The ash from the incinerator is mixed in with some water and is discharged into the on-site lagoon. The lagoon is cleaned twice a year and the waste material is shipped to a landfill for burial.

Renewable Operating Permit: MI-ROP-B1792-2021. All applicable emission unit sections verified during inspection are referenced below.

EU-Incinerator

I. Emission Limits

Performance tests conducted July 16-17, 2020. I.2 (Mercury) and I.3 (Beryllium) are referenced under the Section VI. Monitoring/Recordkeeping since their Time Period/Operating Scenario is daily. *Tested in June 2021 since they were not 75% below their permit limit.

Pollutant	Limit	Test Result
1. Particulate Matter (PM)	0.2 lbs per 1,000 lbs of exhaust air, corrected to 50% excess air	0.0048 lbs
	80 mg/m^3 (dry standard)	6.15 mg/m^3

Pollutant	Limit	Test Result
4. Particulate Matter (PM)		
5. Hydrogen chloride	1.2 ppmv (dry)	0.56 ppmv
6. Carbon monoxide*	3,800 ppmv (dry)	2,966 ppmv
8. Dioxins/furans (total equivalency basis) b, c	0.32 ngs/m^3 (dry standard)	0.026 ng/m^3
9. Mercury	0.28 mg/m^3 (dry standard)	0.045 mg/m^3
10. Oxides of nitrogen*	220 ppmv dry (dry)	168 ppmv
11. Sulfur Dioxide	26 ppmv (dry)	2.2 ppmv
12. Cadmium	0.095 mg/m^3 (dry standard)	0.004 mg/m^3
13. Lead	0.30 mg/m^3 (dry standard)	0.027 mg/m^3
14. Fugitive Emissions from ash handling	Visible emissions of combustion ash shall be no more than 5 percent for the hourly observation period	0%

III. PROCESS/OPERATIONAL RESTRICTIONS

The facility has submitted a malfunction abatement plan outlining staff personnel and the parameters monitored - including the ash handling system which is sent to the landfill. The facility inspects the equipment daily to ensure the equipment is in operating condition. According to Bryan, the facility operates the EnviroCare Venturi scrubber whenever the incinerator is operating, and the bypass is only operated when the ID fan fails and when maintenance work is performed on the scrubber. The following operating limits are being met by the facility:

-Incinerator minimum combustion chamber temperature (hearths #4, #5, #6): 1346 F
-Sewage sludge maximum feed rate: 5.47 tons/hr (131.28 tons/day)
-Scrubber liquid pH limit (minimum): 6.26
-Scrubber liquid flowrate (minimum): 806 gal/min
-Scrubber minimum pressure drop (minimum): 24.29 inches H_2O

IV. DESIGN/EQUIPMENT PARAMETERS

The facility maintains an electronical monitoring device (SCADA) which continuously records and monitors the incinerator combustion chamber temperature, the EnviroCare Venturi scrubber pH, pressure drop, liquid flow rate and sewage sludge feed rate. Calibrations occurred on June 2, 2022.

V. TESTING/SAMPLING

The facility analyzes both the mercury and beryllium content of the sludge feed to the incinerator monthly as provided by facility records, and the mercury and beryllium content of the ash from the incinerator once a year with the most recent test occurring in March 2022. The Mercury concentration was 0.010 mg/L, and the Beryllium concentration was 0.10 mg/L. The have been no process changes at the facility and no visible emissions have been observed due to the combustion of ash particulates. The facility has chosen to show

continuous compliance with emission limits using performance testing. The most recent test for all pollutants occurred in June 2020 which established the operating limits for minimum combustion temperature, sewage sludge feed rate, scrubber liquid pH, scrubber liquid flow rate, and pressure drop across the scrubber. The next performance test for all pollutants must occur no later than July 2023.

VI. MONITORING/RECORDKEEPING

Records indicate the mercury content of the sludge feed to the incinerator varied from 2.0 - 10.0 grams/day in 2021 and 2022. The permit limit is 3200 grams/day. Records indicate the beryllium content of the sludge feed to the incinerator varied from 3.0 - 6.0 grams/day in 2021 and 2022. Permit limit is 10 grams/day. Monthly emissions for Mercury and Beryllium varies between 94 – 285 grams and 94 – 164 grams, respectively.The daily sewage sludge feed to the incinerator averages 103 tons/day during that time span.

Bryan indicated the transducer is calibrated annually and was calibrated this spring. The differential pressure of the scrubber is monitored continuously. The sewage sludge feed rate at the time of inspection was 5.2 tons/hr with an average of 4.63 tons/hr the last 12 months. Records indicate the daily average sewage sludge feed rate ranging from 3 - 5 tons/hr on operational days. The facility also monitors and records the moisture content of the sewage sludge by obtaining multiple daily grab samples of the sewage sludge. The daily average moisture content for the samples is calculated and has a moisture content of approximately 85% the last 12 months.

The facility monitors and records the combustion chamber temperature for the Incinerator on a continuous basis and it is recorded every 15 minutes. The following temperatures were viewed electronically via the facility's database during the inspection:

Hearth 1: 943 F; Hearth 2: 1175 F; Hearth 3: 1071 F; Hearth 4: 1403 F; Hearth 5: 1354 F; Hearth 6: 1554 F; Hearth 7: 1420 F; Hearth 8: 988 F; Hearth 9: 285 F; Hearth 10: 135 F

Facility electronic records indicate the incinerator hearths (4, 5, and 6) are meeting the established operating limit when the incinerator is operating.

The facility has submitted a site-specific monitoring plan for each continuous monitoring system, and records the pressure drop across the scrubber, scrubber liquid flowrate, and scrubber liquid pH for the incinerator on a continuous basis and they are each recorded every 15 minutes. Facility electronic records at the time of inspection indicated the liquid scrubber flowrate was 894 gal/min with an operational temperature of 75 ^{o}F. In addition, the pressure measured 24.9 inches H_2O and displayed a pH of 6.4. Facility electronic records indicate the parameters are operating within the established operating limits.

Lastly, there appeared to be zero opacity emanating from the stack.

EU-Belt Press

IV. DESIGN/EQUIPMENT PARAMETERS

The pressure differential unit is maintained to ensure the pressure drop is below 10 inches H_2O. A reading of 1.0 inches H_2O was observed on the digital screen and logged by the facility. The carbon adsorption unit is maintained and installed, and a pressure drop indicates maintenance must occur. The carbon adsorption unit is maintained and replaced according to a color code change from purple (new) to black (H_2S breakthrough) indicating that replacement is necessary. The unit was last changed in April 2020. The facility maintains a supply of ductwork air intake filters on-site available for replacement and they are replaced bi-annually.

VI. MONITORING/RECORDKEEPING

The color changes of the carbon adsorption unit (H_2S breakthrough) and the ductwork air intake filters are monitored by facility staff and documented. Records show readings have occurred monthly. The facility indicated the air intake filters were recently changed last month in June 2022.

EU- Wet Well

III. PROCESS/OPERATIONAL RESTRICTIONS

The wet well operates continuously and is an enclosed system. The oxidative scrubber is installed and appears to be operating per the manufacturer's specification. The area is vented with two axial fans and is equipped with liquid flow meter and a pH meter. In addition, the chemical feed system is monitored electronically and can be adjusted. The pH logbook did not indicate any readings to be below 7.0 the last 12-months and the facility maintains a corrective action plan should the pH fall below that.

VI. MONITORING/RECORDKEEPING

The facility continuously monitors the scrubber on a daily basis and can adjust the chemical feed as necessary. The pH at the time of inspection was 8.6 and wet well level was 16.1 feet. The facility is equipped with eight pumps that provide wastewater to the grit chamber and all pumps were in operation at 7 gallons/minute.

EU-Grit Box

III. PROCESS/OPERATIONAL RESTRICTIONS

The facility operates the blower when the wastewater temperature is above 60 ^{o}F occurring in late May/early June. The grit chamber and splitter box was covered and the gate screen openings were reduced in 2019 from 2 inches to a 5/8 inch to better collect debris before entering the system. The facility's activated carbon adsorption canister controls the blower (odor control fan) from the grit chamber through the use of potassium permanganate ($KMnO_4$).

VI. MONITORING/RECORDKEEPING

The facility continuously monitors the wastewater temperature and records indicate the blower has been in operation since early June. The facility monitors the carbon adsorption canister for H_2S breakthrough on a weekly basis and was last replaced in March 2021.

EU-Generator

III. PROCESS/OPERATIONAL RESTRICTIONS

EU-Generator, per 40 CFR 63.6590(b)(3), does not have to meet the requirements of 40 CFR Part 63, Subparts A and ZZZZ, including initial notification requirements because EU-Generator is an existing emergency RICE with a site rating greater 500 HP located at a major source of HAP.

Compliance date for this emergency generator was June 15, 2007. Per Subpart ZZZZ (NESHAP for Stationary Reciprocating Internal Combustion Engines), the facility shall not operate the existing emergency stationary RICE (EU-Generator) with a site rating of more than 500 brake HP located at a major source for than 15 hours specified in 40 CFR 63.6640(f)(2)(ii) and (iii). It is only used during storm power outages and has not been used in part with another entity as defined.

VI. MONITORING/RECORDKEEPING

The generator is 2.1 MW, 2,855 HP, diesel-fueled, and installed in 1971. A logbook detailing the maintenance work performed on the generator is maintained which includes oil changes, battery checks, and air intake louver checks. The facility appears to be in-compliance with the permit requirements per the record logbook.

EU-House Generator

II. MATERIAL LIMITS

The EU-HouseGenerator must not burn diesel fuel with a maximum sulfur content of 15 ppm. The sulfur content of the fuel (ultra-low sulfur diesel) is 10 ppm via safety data sheets from the manufacturer.

III. PROCESS/OPERATIONAL RESTRICTIONS

This is a certified engine, and the facility maintains a logbook of all maintenance work performed on the generator. The initial performance test of the engine indicated the NOx to be below the permit limit of 6.9 g/HP -hr. It is used to start backup power for EU-Generator after total loss of power.

It is subject to the Standards of Performance for Stationary Compression Ignition Internal Combustion Engines promulgated in 40 CFR Part 60, Subparts A and IIII. It is also subject to the National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE) promulgated in 40 CFR Part 63, Subparts A and ZZZZ given its site rating is equal to or less than 500 brake HP at major source of HAP emissions that commenced on or after June 12, 2006.

40 CFR 63, Subpart ZZZZ (40 CFR 63.6590) states that an affected source that is a new or reconstructed stationary RICE, located at a major source of HAP emissions and is a compression ignition (CI) stationary RICE with a site rating of less than or equal to 500 brake HP, must meet the requirements of this subpart by meeting the requirements of 40 CFR part 60 subpart IIII, for compression ignition engines. No further requirements apply for such engines under 40 CFR 63, Subpart ZZZZ.

IV. DESIGN/EQUIPMENT PARAMETER(S)

The unit is a 60 kW, 82 HP, certified diesel-fueled generator that was installed in October 2006. The hour meter and logbook indicate 20 hours of usage this year due to storm events.

VI. MONITORING/RECORDKEEPING

The EU-HouseGenerator may operate no more than 100 hours per calendar which includes 50 hours per calendar year in non-emergency situations. According to the facility logbook it has not operated for more than 100 hours per calendar year or 50 hours in non-emergency situations. The facility indicates it is only used for emergency purposes when there is a total loss of power to the facility. Records show this occurs during storm events and has operated for 20 hours this year and 81 hours on a 12-month rolling basis. Monthly usage varies between 0 to 36 hours the 12-months. The facility logs the annual inspection, diesel fuel usage, and oil changes as part of its recordkeeping requirements.

FG-Coldcleaners

II. MATERIAL LIMITS

The facility does not use any of the compounds listed as indicated on the SDS.

III. PROCESS/OPERATIONAL RESTRICTIONS

The washer was not in use at the time of inspection.

IV. DESIGN/EQUIPMENT PARAMETERS

The washer was closed during the time of inspection. The air/vapor interface appeared to be less than ten square feet and is equipped with a device for draining parts. This is exempt per Rule 281(2)(h).

VI. MONITORING/RECORDKEEPING

The facility washer is manufactured by Safety Kleen Corporation, Inc. and the operating procedures are posted near the washer and is in-compliance with all applicable rules.

FG-Boilers

III. PROCESS/OPERATIONAL RESTRICTIONS
The facility maintains two boilers that are less than 5 MMBtu/hr and burn natural gas. They are located in Building D of the facility in room 134 and are used for providing warmth for human comfort. They are subject to 40 CFR Part 63, Subpart DDDDD due to being under 10 MMBtu/hr located at major source of HAP emissions. The facility performs monthly inspections on the boilers to optimize performance, as well as yearly testing.

The facility has also scheduled a one-time energy assessment in October 2022 per 40 CFR Part 63, Subpart DDDDD. Given that the boilers are only used to provide heat for the facility they are currently shut down for the summer season and are not in operation.

VI. MONITORING/RECORDKEEPING

The facility maintains yearly test data, and both units are natural gas-fired hot water heating tube boilers with a 2 MMBtu heat input capacity. They were installed in 2012 and are manufactured by Aerco International and classified as benchmark 2.0 low NO_x boilers.

Conclusion

Based on the AQD inspection and records review, the Warren Wastewater Treatment Plant is in compliance with the aforementioned requirements and the conditions of the facility's ROP MI-ROP-B1792-2021.

NAME Robert Joseph DATE 07-26-22 SUPERVISOR Joyce