DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Scheduled Inspection

B179248176

FACILITY: Warren Waste Water Treatment Plant		**SRN / ID:** B1792
LOCATION: 32360 Warkop, WARREN		**DISTRICT:** Southeast Michigan
CITY: WARREN		**COUNTY:** MACOMB
CONTACT: Bryan Clor , Chief Executive Officer		**ACTIVITY DATE:** 08/08/2019
STAFF: Robert Joseph	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MAJOR
SUBJECT: Scheduled Inspection of Wastewater Treatment Plant		
RESOLVED COMPLAINTS:		

On August 8, 2019, 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-B1792-2016.

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 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. I arrived at the facility at approximately 10:30 a.m. and met with Bryan Clor, Division Head, of the facility. 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 with approximately 40 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

Brian introduced me to Robert Dranberg, plant chief operator, and Robert led me on a tour of the facility. Robert stated the pumps within the system are redundant and wastewater enters the wet well where the wastewater treatment begins. Exhaust from the wet well is treated using chemical odor control. The facility is in the process of replacing the bar screens of the wet well from 2 inches to 5/8 inch. The wet well process is an enclosed process and the pH and water flow rate are monitored through the scrubber.

The wastewater then enters the grit box which is an enclosed process and runs 24 hours a day and is equipped with odor control. This 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 °F. 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. Some 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 of these tanks. Some of the sludge is removed and stored as activated sludge with storage tanks.

The wastewater is 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 tanks with four in-service. The wastewater then moves to 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. This activated sludge moves to a belt press. The facility maintains three belt presses and eight secondary clarifiers.

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 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. The facility's normally operating procedure is to run two of three belt presses. 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 (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 5 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 incinerator was under repair recently and not in operation from mid-May to early July when the brick and mortar of hearth 5 fell onto hearth 6. The design capacity of the incinerator is 10 tons/hr with a typical sludge feed rate of 6 tons/hr. The sludge feed is limited to 6.7 tons/hr due to the facility's water permit with Water Resource Division.

The incinerator temperature increases at a rate of 50 °F per hour. The control device used to control emissions for the incinerator is a 3-stage EnviroCare Venturi 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 and lets fresh air. 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 Bryan. The stack has continuous emission monitoring (CEM) for total hydrocarbons and an oxygen monitor.

The ash from the incinerator is mixed in with water and put into the on-site lagoon. The lagoon is cleaned twice a year as the material is shipped to a landfill.

Renewable Operating Permit: MI-ROP-B1792-2016. All applicable emission unit sections verified during inspection are referenced below.

INCINERATOR-NSPS-MMMM (also INCINERATOR)

EUINCINERATOR-NSPS-MMMM contains the same conditions since EUINCINERATOR contains conditions prior to the facility being subject Subpart MMMM.

I. Emission Limits (performance test July 13-14, 2017, and December 6, 2018*)

Pollutant	Limit	Test Result
1. Particulate Matter (PM)	80 milligrams per dry standard cubic meter	9.0
2. Hydrogen chloride	1.2 ppmv dry	0.86
3. Carbon monoxide	3,800 ppmv dry	2,717*
4. Dioxins/furans (total mass basis) b, c	5.0 nanograms per dry standard cubic meter	0.04
5. Mercury	0.28 milligrams per dry standard cubic meter	0.04
6. Oxides of nitrogen	220 ppmv dry	160*
7. Sulfur Dioxide	26 ppmv dry	2.6
8. Cadmium	0.095 milligrams per dry standard cubic meter	0.006
9. Lead	0.30 milligrams per dry standard cubic meter	0.05

10. Fugitive Emissions from ash handling	Visible emissions of combustion ash shall be no more than 5 percent for the hourly observation period	< 5%

*Pollutants NOx and CO were also tested on June 12, 2018. The CO concentration passed, however, the NOx concentration exceeded the emission limit. Both pollutants were retested on December 6, 2018 with results shown here.

III. PROCESS/OPERATIONAL RESTRICTIONS

The facility operates the scrubber whenever the incinerator is operated. The bypass is only operated when the ID fan fails and when maintenance work is performed on the scrubber.

IV. DESIGN/EQUIPMENT PARAMETERS

The facility has a device that is maintained which records and monitors the combustion chamber temperature of the incinerator continuously, as well as records the sewage sludge feed rate. In addition, the pH and the liquid flow rate of the Enviro-care scrubber are also continuously monitored.

V. TESTING/SAMPLING

The facility analyzes the mercury content of the sludge feed to the incinerator monthly, and the mercury content of the ash from the incinerator once a year. In addition, they analyze the beryllium content of the sludge feed to the incinerator once a month, and beryllium content of the ash from the incinerator once a year. The facility has chosen to show continuous compliance with emission limits using performance testing. The facility has established a minimum combustion temperature, pressure drop across the scrubber, scrubber liquid flow rate, and scrubber liquid pH.

VI. MONITORING/RECORDKEEPING

Records indicate the mercury content of the sludge feed to the incinerator varies from 1.5 to 11.1 grams/day in 2018 and 2019. Permit limit is 3200 grams/day. Records indicate the beryllium content of the sludge feed to the incinerator varies from 2.3 to 8.8 grams/day in 2018 and 2019. Permit limit is 10 grams/day. The daily average cake feed to the incinerator varies from 16.9 to 20 tons/day.

The transducer is calibrated annually and was performed earlier this year, and the differential pressure of the scrubber is monitored continuously.
The sewage sludge feed rate at the time of inspection was 5.9 tons/hr and is monitored continuously according to the facility's software data. The facility also monitors and records the moisture content of the sewage sludge by taking a grab sample of the sewage sludge. The facility takes more than more one grab sample in a day, and the daily average moisture content for the samples is calculated. Records indicate it ranging from 14% to 22% moisture.

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 recorded during the inspection;

Hearth 1: 970 F; Hearth 2: 1023 F; Hearth 3: 990 F; Hearth 4: 1330 F; Hearth 5: 1261 F; Hearth 6: 1574 F; Hearth 7: 1551 F; Hearth 8: 1188 F; Hearth 9: 523 F; Hearth 10: 32 F

The facility also monitors and records the pressure drop across the scrubber for the Incinerator on a continuous basis and it is recorded every 15 minutes. Scrubber temperature was 82 °F at 25.4 inches H_2O at the time of inspection. Minimum pressure is 24.6 inches H_2O.

The facility has submitted a site-specific monitoring plan for each continuous monitoring system. The facility continuously monitors the liquid flow rate for each scrubber stage every 15 minutes. In addition, measurements of the scrubber liquid pH for the venturi scrubber shall be recorded every 15 minutes. Records indicates the pH to above the 6.5 limit with values ranging between 6.5 and 7.0.

There did not appear to be any visible opacity emanating from the stack.

Belt Press

III. PROCESS/OPERATIONAL RESTRICTIONS

The pressure differential unit is maintained by the facility to ensure the pressure drop is below 10 inches H_2O. This reading was observed on the digital screen.

IV. DESIGN/EQUIPMENT PARAMETERS

The carbon adsorption unit is maintained and installed by the facility. The change in pressure drop indicates maintenance must occur. The carbon adsorption unit is maintained and changed according to color code. The unit was recently changed as the color was near purple. The color coding changes from purple to black indicating that H_2S breakthrough has occurred. The facility had a supply of air intake filters available and indicated they were changed within the last six months.

VI. MONITORING/RECORDKEEPING

The facility indicated the carbon adsorption unit is monitored frequently by staff and it is documented with a clipboard. Records show readings occurred on May 16, June 24 and on July 15, 2019. The facility indicated the air intake filters were recently changed and had several in-stock.

Wet Well

III. PROCESS/OPERATIONAL RESTRICTIONS

The wet well operates continuously and is an enclosed system. The oxidative scrubber is installed and operates per the manufacturer's specification. The area is also vented with two axial fans. The system is equipped with a liquid flow meter and a pH meter. In addition, the chemical feed system is monitored electronically and can be adjusted. The facility maintains a corrective action should the pH fall below 7.0.

VI. MONITORING/RECORDKEEPING

The facility continuously monitors the scrubber on a daily basis. The facility can adjust the chemical feed as necessary. The pH at the time of inspection was 9.3. The facility also monitors the liquid flow rate. At the time of inspection, the wet well level was 18.1 feet. The facility is equipped with 8 pumps that provide wastewater to the grit chamber and all pumps were in operation.

Grit Box

III. PROCESS/OPERATIONAL RESTRICTIONS

The facility operates the blower when the wastewater temperature is above 60 °F. The facility indicates this generally occurs in the late Spring. The grit chamber and splitter box are covered at all times, however, there was construction work being performed on the chamber during the time of inspection. The grit chamber screen size openings were being replaced from 5/8" to 2 inches. 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 constant operation since June 8. The facility monitors the H_2S breakthrough on a weekly basis according to the records. The facility maintains a clipboard indicating the date and percentage breakthrough of the H_2S through carbon bed. It appeared to be near 25% saturation level at the time of inspection.

Generator

III. PROCESS/OPERATIONAL RESTRICTIONS

The facility shall not operate the existing emergency stationary RICE (EUGenerator) with a site rating of more than 500 brake HP located at a major source of HAP emissions, for more than 15 hours per calendar year for the purposes specified in 40 CFR 63.6640(f)(2)(ii) and (iii).

According to the facility, it has not operated the site generator for more than 15 hours per calendar year. It is a

2.1 MW generator and is used only during power outages.

VI. MONITORING/RECORDKEEPING

According to the facility the generator is from the early 1970s and uses diesel fuel. A logbook detailing the maintenance work performed on the generator is maintained by the facility. This included oil changes. The facility appeared to be in-compliance with the requirements.

House Generator

III. PROCESS/OPERATIONAL RESTRICTIONS

The facility maintains an 82 hp generator on site and it was installed approximately 12 years ago according to the facility. It is used to start backup power for EUGenerator after total loss of power. The facility maintains that this is a certified engine and maintains a logbook of all maintenance work performed on the generator. The initial performance test of the engine indicates the NOx to be below the permit limit of 6.9 g/HP-hr.

VI. MONITORING/RECORDKEEPING

The facility has been recording the hours the generator has been in use. In addition, the facility indicates it is only used for emergency purposes when there is a total loss of power to the facility. Records show this occurred during major storms. The facility logs the annual inspection, diesel fuel usage, and oil changes as part of its recordkeeping. The facility also maintains the sulfur content of the fuel through safety data sheets from the manufacture.

ColdCleaners

II. MATERIAL LIMITS

The facility does not use any of the compounds listed.

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 and appears to be in-compliance with all applicable rules.

Conclusion

Based on the AQD inspection and records review, it appears the Warren Wastewater Treatment Plant is in 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 ROP MI-ROP-B1792-2016.

NAME Robert Joseph DATE 09/25/19 SUPERVISOR SK