

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

M478241675

<b>FACILITY:</b> US ECOLOGY MICHIGAN		<b>SRN / ID:</b> M4782
<b>LOCATION:</b> 49350 N. I 94 SERVICE DR, BELLEVILLE		<b>DISTRICT:</b> Detroit
<b>CITY:</b> BELLEVILLE		<b>COUNTY:</b> WAYNE
<b>CONTACT:</b> Sylwia Scott , Environmental Manager		<b>ACTIVITY DATE:</b> 07/12/2017
<b>STAFF:</b> C. Nazaret Sandoval	<b>COMPLIANCE STATUS:</b> Compliance	<b>SOURCE CLASS:</b> MAJOR
<b>SUBJECT:</b> FY 2017 - Scheduled Inspection		
<b>RESOLVED COMPLAINTS:</b>		

**SRN:** M4782  
**SOURCE NAME:** US Ecology  
**FACILITY ADDRESS:** 49350 North I 94 Service Drive, Belleville, Michigan  
**INSPECTOR:** Nazaret Sandoval, AQD – Detroit District Office  
**EQ MAIN CONTACT:** Sylwia Scott, Environmental Manager (734.699.6294)

The purpose of the inspection was to evaluate the facility's compliance with respect to the requirements of the federal Clean Air Act; Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451), and the conditions of Renewable Operating Permit (ROP) number MI-ROP-M4782-2010a.

US Ecology at Belleville has three major process operations that are regulated under the cited ROP, each comprising a separate section of the permit, as follows: Section 1 regulates the Michigan Disposal Waste Treatment Plant (MDWTP); Section 2 regulates Wayne Energy Recovery (WER); and Section 3 regulates Wayne Disposal Inc. (WDI).

This report summarizes the on-site observations and the evaluation of compliance with the terms and conditions of Sections 1 and Section 2 of the ROP.

Section 3 of the ROP is enforced and regulated by the Environmental Protection Agency (EPA), except for the ROP requirements referring to asbestos disposal. Under the authority of R 336.1942, the Air Quality Division (AQD) has adopted the National Emission Standards for Asbestos (40 CFR Part 61 Subpart M), by reference in R 336.1902. Therefore, the applicable portions of the cited federal regulation are enforced by the asbestos program within the AQD.

The report is divided into five segments:

1. Facility Description
2. Regulatory Applicability
3. Inspection Narrative
4. Compliance Evaluation
5. Final Compliance Determination

Each segment is addressed in the following paragraphs.

## **1. FACILITY DESCRIPTION**

The facility stretches out along the North Interstate 94 Service Drive west of Beck Road and east of Willow Run Creek. Airport Service Drive runs north, along the perimeter, and divides the facility area from the Willow Run Airport. An industrial area lies to the west which includes a wastewater treatment facility and an asphalt plant. A

baseball field and a residential neighborhood lies to the east. There is a rest area directly south of the facility and adjacent to I-94 freeway. There are numerous apartment complexes south and across I-94 freeway. This residential area, which is south of South Interstate 94 Service Drive, is surrounded by Belleville Lake.

#### Michigan Disposal Waste Treatment Plant (MDWTP) - ROP SECTION 1

MDWTP is co-located at the same site as Wayne Disposal Site #2 Hazardous Waste Landfill. MDWTP is a hazardous and non-hazardous waste processing facility with operations that include receiving, storage and treatment. Hazardous waste generated off-site is treated to meet land disposal restrictions and buried in a hazardous waste landfill or sent to a Type II landfill, if permissible. The facility operates five days per week, 24 hours per day. The facility processes bulk liquid waste, bulk solid waste, and containerized waste. The waste is processed in two-separate buildings identified as East Bay and West Bay. The buildings are equipped to handle different waste materials, consisting of waste and reagent storage areas, liquid waste tanks and air pollution control devices.

#### Wayne Energy Recovery (WER) - ROP SECTION 2

There are four landfill gas-fired spark ignition reciprocating internal combustion engines (RICE) identified as Engines 2,3,4, and 5, which are used to generate electricity for the power grid. Typically, two or three of the engines operate 24 hours per day seven days per week whenever possible. As of May 2013, one of the four engines (Engine 3) has been restricted to be utilized as an emergency "only" engine.

#### Wayne Disposal Inc. (WDI) - ROP SECTION 3

WDI is a hazardous and non-hazardous waste processing facility that includes a series of closed municipal solid waste landfills that once received municipal solid waste and hazardous waste (prior to RCRA), and an active hazardous waste landfill. There is no active disposal at any of the municipal solid waste landfill cells and a passive landfill gas collection system operates at those closed sites.

## **2. REGULATORY APPLICABILITY**

This facility is a Title V source of NO<sub>x</sub>, HAPs and CO, and a Synthetic Minor for VOCs. In addition to the requirements of Title V of the Clean Air Act, the following standards are applicable to the operations identified below:

MDWTP-The operations at the East and West Bay are subject to the following National Emissions Standards for Hazardous Air Pollutants (NESHAP) regulations: 40 CFR Part 63 Subpart DD - Offsite Waste and Recovery Operations; 40 CFR Part 61 Subpart FF- Benzene Waste Operations; 40 CFR Part 61 Subpart M – Asbestos; and 40 CFR Part 63 Subpart DDDDD - Industrial, Commercial and Institutional Boilers and Process Heaters (Boiler MACT). Except for the Boiler MACT, all the other applicable requirements for the listed NESHAPs are incorporated into the current ROP. The equipment subject to the Boiler MACT will be added to the ROP during the renewal process. The treatment bays (FG EAST and FG WEST) are subject to Compliance Assurance Monitoring (CAM): FG EAST, for particulate matter and VOC, and FG WEST for particulate matter only. Section 2 and 3 are not subject to CAM.

Wayne Energy Recovery (WER) -The processing/control equipment that treats collected landfill gas for subsequent use in the engines must meet the applicable requirements of 40 CFR Part 63 Subpart AAAA - NESHAP for Municipal Solid Waste Landfills which in turn refer to the requirements of Part 62 Subpart GGG (The Federal Plan) and involve the applicability of 40 CFR Part 60 Subpart WWW (Landfill NSPS) by reference. Having accepted a limit of 190 tons/year for NO<sub>x</sub> emissions, the prevention of significant deterioration (PSD) regulations under Michigan Part 18 rules do not apply. As of October 19, 2013, Engines 2 and 5, which are 4-stroke, rich burn landfill gas fueled engines rated at 500 horsepower are subject to the RICE MACT under 40 CFR Part 63 Subpart ZZZZ. Engine 3, the emergency engine, is subject to the work or management practice cited on Table 2c and Table 6 (item 9) of Part 63 - Subpart ZZZZ. The current ROP does not include the SI RICE MACT requirements for the cited engines but they will be analyzed in this report and will be incorporated during the ROP renewal process. Engine 4 is not subject to the SI RICE MACT requirements pursuant to 63.6590 (b)

(3) (v), because the BHP is above 500 hp. None of the emission units at WER are subject to CAM.

Wayne Disposal (WDI) - The Landfills are four municipal solid waste (MSW) landfill sites called Old Wayne, Fons, Site No. 1 and Site No. 2, located in a contiguous geographical space. Old Wayne, Fons, and Site 1 have passive gas control systems consisting of continuously sparking solar flares. Site No. 2, consisting of Master Cells I, IV, IX and XI, has an active landfill gas collection system. The Landfills are subject to the Federal Plan Requirements for MSW Landfills at 40 CFR Part 62, Subpart GGG (Landfill Federal Plan) since they commenced construction, reconstruction or modification before May 30, 1991, and are existing MSW landfills. The Landfill Federal Plan requires owners and operators of existing MSW landfills with design capacity equal to or greater than 2.5 Million megagrams (Mg) and 2.5 million cubic meters of solid waste to calculate the non-methane organic compound (NMOC) emission rate using the procedures in 40 CFR 10.754. If the NMOC emission rate is greater than 50 Mg/year for the entire landfill, the landfill must install and operate a Gas Collection and Control System, (GCCS) in accordance with the requirements in the New Source Performance Standards for MSW Landfills at 40 CFR, Part 60, Subpart WWW (Landfill NSPS). WDI calculated a NMOC emission rate for the Landfills greater than 50 Mg/year and was required to install a GCCS.

AQD has no jurisdiction over the Landfills because the EPA has not delegated authority to Michigan to implement and/or enforce the requirements of the Federal Plan cited under 40 CFR Part 62, Subpart GGG.

The Landfills are subject to 40 CFR Part 61 Subpart M, the Asbestos NESHAP.

### **3. INSPECTION NARRATIVE**

The inspection for fiscal year 2017 was conducted in two separate days. The first visit on 4/27/2017 included the evaluation and general discussion of the permit conditions, operational parameters, preventive maintenance documentation, and the evaluation of the monitoring/recordkeeping requirements cited on Section 1 of the ROP. The contact information for the facility personnel at US Ecology, Belleville was also updated in the first visit. Stephanie Crocker started a new position in March 2017 as the Compliance Coordinator; Paul Haratyk is the Chief Supervisor for MDWTP; Corey Grider is the Operation Manager for WDI; Cedric Gibson is the Manager for WER; and Sylwia Scott is the Environment Manager at the facility.

The tour of the facility and the evaluation of Section 2 of the ROP (WER) took place on 7/12/2018, the same date AQD witnessed the RTO exhaust stack test.

Facility records for year 2016 were requested on the days of the inspections as well as via email following the visits. Some of the records were handed out and discussed during the meetings, the rest of the requested information was received by AQD via email in the following months.

The tour started at the MDWTP, East & West Treatment buildings and ended with the inspection of the power engine house of WER. The landfills (WDI) were not inspected because they are subject to the Federal Plan and the EPA is the regulatory agency.

Ms. Scott led the inspection both days and Ms. Crocker only attended the meeting on 4/27/2017. Ms. Crocker facilitated the compilation of the records and she will be assisting Ms. Scott in the future with some of the tasks associated with the ROP.

Mr. Haratyk joined us during the walk-through at the East & West Treatment buildings. Mr. Haratyk explained the process and answered most of the question related to the MDWTP. Mr. Gibson, WER Manager, accompanied us during the tour at the power house and answered the questions pertaining the engine operations and landfill gas conditions.

### **Michigan Disposal Waste Treatment Plant (MDWTP) - ROP SECTION 1**

FG EAST - The east side waste treatment processes consist of the following equipment/emission units and control equipment:

A 40,000-gallon sludge tank identified in the ROP as EUSLUDGETANK12 located between the west and east

treatment bays.

There are four waste-storage and treatment tanks E, F, G, and H grouped under emission unit EUSTORAGETANK1. The tanks were installed during the period from 7/1/91 to 6/1/97.

The pug mill (EUPUGMILL1), originally installed at FG EAST used to blend reagents with the waste and transport the mixture into the main treatment tanks, was removed on August 2013. Currently, all mixing occurs in the treatment tanks using excavator buckets.

Pollution control at FG EAST includes the following equipment sequence: 1) a baghouse dust collector; 2) a regenerative thermal oxidizer (RTO); 3) a sodium hydroxide packed bed wet scrubber.

The operations occurring at FG EAST can be described as follows:

Waste is received via trucks and it is transferred to the treatment tanks by one of three methods:

- Bulk liquid non-hazardous waste can be off-loaded into EUSLUDGETANK12. The waste contained in the tank is then transferred to one of the treatment tanks.
- Bulk solid waste is brought by truck into the chemical fixation/stabilization process building and it is dumped into one of the treatment tanks.
- Containerized waste (drums) is off-loaded to the waste storage/staging area. After waste is sampled and tested for acceptance/compatibility, the waste is transferred to one of the treatment tanks.

Once the waste has been transferred to one of the treatment tanks, it is stabilized by adding varying amounts of oxidant such as sodium hypochlorite and dolomitic kiln dust for chemical reduction of metals.

The chemical reactions perform several functions: a) pH adjustment for acidic/basic materials, b) exothermic heat to vaporize the more volatile VOC (which then are controlled by the thermal oxidizer in the east side treatment bay), c) locking the remaining hazardous constituents into the waste mass to ensure they don't leach out in the landfill, and d) the physical solidification of the material so that it meets land disposal criteria. After the reactions, the material is sampled. If the confirmatory sampling demonstrates that the material is properly treated, and the waste meets land disposal restriction criteria, the excavator removes the material from the tanks into a truck, which takes the material to a transfer station. Finally, the waste is deposited by dedicated equipment to the active cell of the landfill.

During the plant tour I observed that the rotary valves under the FG EAST baghouse were operational. The baghouse fines disposal system utilizes wheeled bins instead of bags. No housekeeping issues were observed under the baghouse. No visible emissions were observed from the exhaust stack.

FG WEST - The operations occurring at FG WEST are similar to the ones described for FG EAST, but waste subject to 40 CFR Part 63 Subpart DD is not treated in this building. In other words, only wastes with a minimal VOC content (<500 ppm on a monthly average basis, maximum of 0.5% by weight daily average) are permitted to be treated at this side of the plant. The west treatment bay, contains a 40,000-gallon sludge tank (EUSLUDGETANK11) located between the west and east treatment bays. There are four waste-storage and treatment tanks designated as A, B, C, and D grouped under the emission unit EUSTORAGETANK2. The pug mill (EUPUGMILL2) that used to be part of the west treatment building was removed from the plant during the first quarter of 2015. The equipment at FG WEST is controlled by a baghouse dust collector. During the inspection, the area under the baghouse was free of debris and the bay doors were closed.

FGLIQWASTETKS - Four 20,000-gallon tanks (Tanks 16, 17, 18 and 19) are used as needed to hold various reagents or liquid wastes. The tanks are housed in the open area located to the east of FG EAST toward the north corner. The liquid wastes have generally consisted of landfill leachate or trench water

FGSILOS – Each building (east and west) has three identical silos. Silos 1 through 3 serve the west side building, and silos 4 through 6 serve the east side. Trucks offloading hook up to the silos and have a blower on the truck that is used to blow the kiln dust into the silos. The silos store kiln dust for use in stabilizing the wastes. At the time of inspection, the silos were not being filled. Therefore, visible emission observations could not be

made. However, it looks like this is an air tight enclosed system and we should expect minimum dust emissions while loading the silos.

**FGTMTFACILITY** - For the purpose of the ROP all the emission units conforming the waste treatment facility (MDWTP) are grouped under a flexible group identified as FGTMTFACILITY. This flexible group includes all equipment in the east and west process buildings, the reagent silos, the liquid waste storage tanks and the North, East, and Southeast container storage area.

According to the ROP, except for the waste-storage treatment tanks A to H (installed between 7/1/91 and 6/1/97) the rest of the equipment at MDWTP was installed on July 1991.

The pollution control devices for each treatment process and/or equipment are as follows:

- East side treatment process: Baghouse dust collector, RTO, and wet scrubber in series.
- West side treatment process: Baghouse dust collector.
- Reagent silos: Each treatment reagent silo has its own baghouse.
- Liquid waste storage tanks: The tanks are controlled by two shared carbon adsorption canisters in series.

Other equipment and dismantled units:

**FGTDU** – In late 2009, EQ began the installation of a thermal desorption unit (TDU) process for recovering oils from refinery wastes, which were primarily solid in form. The byproducts of the oil recovery were VOCs, waste water and solids. The facility began trial operation in 2010, and it was extensively modified soon after. EQ decided to cease the TDU operations in October 2011. The equipment was dismantled on July 2012. The area is currently use for storage.

**FGCOLDCLEANERS** - Only one cold cleaner unit remains on site in the vehicle maintenance building. The cold cleaner is supplied by VESCO and employs mineral spirits. We did not go to the location of the cold cleaners during the site inspection.

**FGRULE290 (EUDRUMSTORAGE)** – MDWTP has three container storage locations and can temporarily store containers in the east and west treatment building while operating.

Containerized waste may be staged / stored on-site before and after treatment in one of the following areas: North Container Storage Area (NCSA); East Container Staging Area (ECSA); East and West Loading/Unloading Bays and the Southeast Container Storage Area (SECSA). In the ROP, the North, East and Southeast Container Storage Area are all grouped under emission unit EUDRUMSTORAGE.

The waste drums and dry reagents inside the treatment bays are stored temporarily there in preparation for treatment. The area is equipped with a ventilation system which is ducted to the west side baghouse.

## **Wayne Energy Recovery (WER) – ROP Section 2**

Section 2 covers WER, the first plant built in Michigan using landfill gas (LFG) to generate electricity. It began operations in 1986. The LFG is supplied by numerous wells located in six master cells operated by Wayne Disposal. The LFG is treated before it can be used as a combustible in the existing reciprocate engines. The treatment system is identified in the ROP as EUTREATMENTSYS and the engines are grouped under the flexible group FGENGINES.

**EUTREATMENTSYS** - The treatment system removes particulate to at least the 10-micron level, compresses the landfill gas and removes enough moisture to ensure good combustion of gas for subsequent use. A 12-inch header connects the gas collection systems on each master cell. A rotary vane compressor is used to produce vacuum in the collection system (up to 30 inches water column vacuum) and to compress the gas to 20 psig. Normally, the system vacuum varies from 10 to 18 inches of water and the discharge pressure is 20 psig. A gas to air heat exchanger is used to cool down the compressed LFG. The LFG passes through two coalescing filters to remove any LFG condensate and compressor oil. An automated valve is used to control compressor



discharge pressure by bleeding excess gas back to the compressor inlet. At this point, the gas pressure, temperature and flow rate are measured and recorded. The system could compress up to 600 cfm of LFG; however, production of LFG has dramatically decreased in the last few years.

FGENGINES – LFG is piped to the engines room where it passes through another coalescing filter before feeding the engines. The engines are Caterpillar G-398s, with 12 cylinders and 48-liter displacement. Engines No. 2, 3 and 5 are naturally aspirated engines rated at 500 hp (actual 350 kW). Engine No. 4, rated at 710 hp (actual 500 kW) is turbocharged. Electricity is generated and sold to Detroit Edison.

WER only operates two of the engines at any given time. Engine 3 is used as an emergency engine. Engine 2 was not operating at the time of the inspection and it has not been in operation for about a year. Significant decrease in production of landfill gas and the age of the engines seems to be the cause of this reduced operating schedules. Although the facility is permitted to burn natural gas, only LFG is burned in the engines.

The engines were installed in late 1980s (except for engine 5 – installed circa 2001). The combustion technology is rudimentary compared to modern engines and there have been various modifications to comply with stricter exhaust emission requirements.

First, the engines were operated as lean-burn units (running with excess air), so excess methane concentration changed the combustion properties. Lean-burn engines consistently have lower NO<sub>x</sub> and CO emissions primarily because of the excess O<sub>2</sub> in the combustion chamber and lower exhaust temperatures, which inhibit the formation of NO<sub>x</sub> emissions.

The facility adopted a daily emission monitoring regime in which a hand-held landfill gas analyzer (GEM 2000 – Landfill Gas Extraction Monitor) is used to sample the LFG and a combustion products analyzer (Testo 350 XL portable flue gas analyzer) is used to analyze the exhaust gases from each operating engine. Adjustments to the air/fuel ratio is made based on the data collected daily. The air/fuel valve regulator in the engines was equipped with a color-coded spring associated with the percentage of methane in the fuel, varying from less than 52 % to more than 65% methane. When the need for an adjustment to the air/fuel ratio is indicated by the daily readings of the gas sample, the adjustments were done in two ways: gross adjustment (changing the spring in the regulator to compensate for various ranges of methane content in the fuel) or fine adjustment (by tightening or loosening a screw in the regulator).

During the inspection I was informed that only engine 4 (the turbocharged engine) uses the color-coded spring for air/fuel control. Engines 2 and 5 were modified to comply with stricter emission regulations (refer to NESHAP SI RICE in Section 2- ROP compliance evaluation) controlling CO emissions. They operate as rich-burn engines with a catalyst using an air/fuel ratio controller. The air/fuel ratio controller monitors the amount of O<sub>2</sub> in the exhaust stream, compares it with a desired set point, and then changes the air/fuel ratio accordingly. When the air/fuel ratio of an engine is controlled and held at an ideal setting, the chemical reaction occurring inside the catalyst is maximized.

#### **4. COMPLIANCE EVALUATION**

The following is an evaluation of the facility's compliance with the special conditions (SC) cited on MI-ROP-M4782-2010a for the emission units (EUs) and flexible groups (FG) listed under Sections 1 and Section 2 of the ROP. Section 1 covers the MDWTP and Section 2 covers WER. For compliance evaluation we examined the records for calendar year 2016 and the pollutant emission rates from the more recent stack tests conducted at the facility at the time of the inspection. For simplicity, some of the special conditions listed in ROP – Part D, items I to IX, have been re-stated. The compliance status has been identified at the beginning of each subpart (I to IX). However, when further evaluation is needed to determine compliance with a specific condition, it has been identified under the individual condition.

#### **MI-ROP-M4782-2010a - SECTION 1 - MDWTP**

##### **FG EAST**

**I. EMISSION LIMIT(S) – In Compliance**

The following compares the ROP emission limits specified for FG EAST with the actual records from the facility operations in year 2016. The most recent stack test results are also presented in the table.

Pollutant	Limit (in lb/hr or as noted)	Time Period/Method/ Operating Scenario	Records (in lb/hr or as noted)	Compliance
1. VOC	22.85	Stack testing every five years Refer to V.1	0.30 RTO Avg. Eff. 98.3%	Yes
2. VOC	47.52 tpy	12-month rolling time period* Refer to VI.9	1.47 tpy max on Nov. 2016	Yes
3. Methylene chloride	14.92	Stack testing every five years per V.1	0.02	Yes
4. Benzene	0.71		0.01	Yes
5. 1,1,2,2-Tetrachloroethane	0.16		0.02	Yes
6. Carbon tetrachloride	0.28		0.03	Yes
7. Chloroform	3.02		0.02	Yes
8. Trichloroethene	4.52		0.02	Yes
9. Tetrachloroethene	12.7		0.02	Yes
10. Hydrogen chloride	28.4	Stack testing every five years per V.1 (last test 7/12/2017)	0.55	Yes
11. PM (Instantaneous emissions)	0.028 lb per 1,000 lbs of exhaust air	Monthly records Per Appendix 7-S1 B	see comment under section VI.9	Yes
12. PM-10 (Cumulative emissions)	1.9	Monthly records Per Appendix 7-S1 B	see comment under section VI. 9	Yes
13. PM-10 (Cumulative emissions)	4.0 tpy	12-month rolling time period*, per Appendix 7-S1 B	0.83 tpy see comment under section VI. 9	Yes

\* Tons per year (tpy) shall be based upon a 12-month rolling time period as determined at the end of each calendar month. – Please see attached summary production records for year 2016.

**II. MATERIAL LIMIT(S) – In Compliance**

Material	Limit	Time Period/ Operating Scenario	Monitoring /Testing Method	Compliance
1. VOC in waste	Maximum of 2% by weight for hazardous waste	Daily average for waste accepted for treatment	Records are maintained following NESHAP Subpart DD procedures	According to the records, the facility is in compliance with the cited limits (For details refer to VI.7 below)
2. VOC in waste	Maximum of 20% by weight for nonhazardous waste			

### III. PROCESS/OPERATIONAL RESTRICTION(S) – In Compliance

During the site tour we stopped at the control room located by the east building and I took note of the process / operational conditions showed at the computer screen on the process flow diagram which illustrated the prevailing conditions at the time of the visit. The recorded values, cited on the following paragraphs for SCs III.1, 4, 5, 8 and 9, correspond to reading taken at 12:42 PM during the second run of the stack test. All the values are 5-min averages. The operational parameters cited under SCs III.1, 4, 5, 8 and 9 are continuously monitored and recorded during treatment operations occurring at the east treatment building.

Random examination of the records for year 2016 was conducted during the first visit. A sample of a daily records showing the operational parameters monitored on was requested and it was handed out by the facility personnel. The records, and the observations during the plant tour on 7/12/2017 suggest that the facility is operating in substantial compliance with the operational restrictions required by the permit conditions, as specified below:

III. 1 - During normal operation the air flow through FG EAST shall be maintained within 19,500 cfm and 26,400 cfm. Refer to ROP, SC III.1, for the definition of “normal operation”.

The air flow through FG EAST at the time of the reading was 20,495 cfm. Air flow records for year 2016 appeared to be within the permit limits with a few deviations (i.e. airflow below lower limit) reported on the semiannual reports. For AQD review/comments of the deviation reports, please refer the compliance activity reports CA M478241705 and CA M478241706 in AQD files. In all cases reported, US Ecology acted upon to fix the problems causing the airflow deviations to prevent recurrences.

III. 2 and 3 - The permittee shall not operate FG EAST unless the baghouse, thermal oxidizer and caustic scrubber are installed and operated properly. The waste treatment building shall be maintained at negative static pressure during normal operation.

All control devices are used during normal operation. It appears as if all control devices were in operation at the time of the facility tour. Compliance with this condition was confirmed by recording the control devices operational variables (i.e. diff. pressure, temperatures, pH, etc.). During the walkthrough it was observed that the overhead doors appeared to be in good condition and were functioning properly. Negative static pressures are maintained at the east waste treatment building. This condition is tested annually by determination of the air flow movement and direction. For year 2016, the verification was conducted on 11/18/2016. A copy of the report was inspected during the visit of 4/27/2017. The results demonstrated an inward airflow direction at each natural draft opening within the east treatment building.

III. 4 - The permittee shall not operate FG EAST, unless the treatment building baghouse pressure drop is maintained between 1.5 and 8 inches of water column.

The value of the baghouse pressure drop on the computer screen was 3.3 inches of water. The semiannual reports showed a few records with differential pressures below 1.5 inches of water. Low pressure drops are inherent to the installation of new filter bags, which occurred in February.

III. 5 - The permittee shall not operate FG EAST, unless the regenerative thermal oxidizer (RTO) maintains a minimum temperature of 1,500°F.

At the time of the reading, the RTO temperature was 1,626°F. The semiannual reports for year 2016 recorded one deviation from the minimum temperature. It occurred during the month of April and was promptly addressed by the facility operators. No exceedance in emissions occurred because waste is not processed in the treatment building when the RTO temperature is below 1,500 °F. For details about the RTO temperature deviations, refer to CA M478241705 - the AQD semiannual deviation report review /comments for year 2016.

III. 6 - The permittee shall maintain a VOC capture efficiency of 100 percent in the FG EAST exhaust system, as determined in accordance with SC V.2.

Refer to SC V.2 below for demonstration of compliance.



III. 7 - The permittee shall not process waste with a VOC concentration greater than 500 ppm in FG EAST unless the destruction efficiency of the RTO is a minimum of 95%.

The most recent testing of the RTO to determine the VOC destruction efficiency was on July 12, 2017. For AQD test observations details refer to CA M478240782 in AQD files. RTO inlet and exhaust streams were monitored simultaneously for three (3) one-hour test periods to determine an average destruction efficiency. A report with the testing results, dated 8/29/2017, was received by AQD Detroit office on 9/11/2017. The average VOC destruction efficiency was reported to be 98.3 %. Please note that maintaining a minimum of 95 % destruction efficiency in the RTO is only required if the VOC concentration in the waste is above 500 ppm. Those levels of VOC in the type of waste regularly treated at US Ecology are very rare. During the cited stack test, in July 2017, they had difficulties to get a high volume of waste with elevated concentrations of VOC to be able to maintain the minimum 95% efficiency. The VOC concentration in the waste when Run No. 1 of the test started, at about 9 AM, was 141 PPM.

III. 8 - The permittee shall not operate FG EAST unless the caustic scrubber maintains a minimum pH of 7.3.

At the time of the reading, the pH was 9.11. During year 2016 the facility operated at or above the minimum pH, except for one reported deviation. For details, refer to the AQD review comments of the semiannual deviation reports for year 2016.

III. 9 - The permittee shall not operate FG EAST unless the liquid flow rate of the caustic scrubber is maintained between 225 and 350 gallons per minute.

At the time of the reading, the flow was 245 gallons per minute. During year 2016 the facility operated within the required range, with no reported deviations.

III. 10 - The permittee shall not have more than one waste treatment process building overhead door open at a time.

This condition was verified during the facility tour.

Note: To prevent the recurrence of deviations from the required operational parameters cited in SCs III.1, 4, 5, 8 and 9, US Ecology installed a notification system (i.e. alarm) that alerts the plant personnel when the system is approaching a deviation from the ROP required operational conditions.

#### **IV. DESIGN/EQUIPMENT PARAMETER(S) – In Compliance**

IV. 1 to IV. 3 and IV. 5, IV. 6 - The permittee shall install, calibrate, maintain and operate in a satisfactory manner the monitoring devices to monitor: the air flow from FG EAST; the pressure-drop of the treatment building baghouse; the combustion chamber temperature of the thermal oxidizer (RTO); the pH of the caustic scrubber and the liquid flow rate of the caustic scrubber. The parameters shall be monitored in a continuous basis and record five-minute block averages of the monitored parameters.

Here is the evaluation of compliance for the above mentioned SCs:

The parameters are monitored and recorded in accordance with the permit conditions. The device calibration for year 2016 was completed on March of 2016. As indicated earlier, some of the operational parameters were verified by reading the computer screen in the control room during the facility tour. The type of monitoring devices and the frequency of calibration are both cited in the following paragraphs.

IV. 1 – There has been a change in the airflow meter at the east treatment building after some faulty readings experienced in March 2016. The former Pilot Tube flow meter fitted with an ABB 2600T pressure transmitter was replaced in April with a Multipoint Air Flow Meter (Ebtron) that is calibrated annually.

IV. 2 - The east baghouse has an ABB 2600T series pressure transmitter. Calibration is annual.

IV. 3 - The RTO has type k thermocouples that are replaced annually.

IV. 4 - The RTO shall be designed to maintain a minimum retention time of 0.4 seconds. The manufacturer guaranteed a minimum retention time of 0.4 seconds. AQD requested the manufacturer retention time calculations for the permit conditions. Sylwia Scott provided the calculations via email dated 8/3/2017. The results showed values ranging from 0.75 seconds to 0.98 seconds for temperatures varying from 1500 °F to 1800 °F at the permitted airflow ranges.

IV. 5 - The scrubber pH is monitored with a Bailey pH sensor calibrated annually.

IV. 6 - The scrubber liquid flow is measured by an ABB electro-magnetic flow meter. The procedure used to confirm that the scrubber pump is pumping out at a minimum of 225 gallons per minute is as follows: They drain the scrubber tank (of known volume) and measure the time it takes to refill the tank.

IV. 7 - The permittee shall install, maintain and operate limit switches in all overhead doors, to restrict the maximum opening heights to 20 feet except as needed for vehicle or equipment ingress and egress.

East overhead doors incorporate limit switches to control opening height. They are maintained by lubrication on a quarterly basis, verifying the opening height and bottom seal.

IV. 8 - Sludge feed and storage tank No. 12 (EUSLUDGETANK12) shall be vented into the FG EAST waste treatment process building.

This condition was verified during the tour of the facility.

## **V. TESTING/SAMPLING – In Compliance**

Records shall be maintained on file for a period of 5 years

V. 1 - Verification of the destruction efficiency of the RTO and demonstration of compliance with the pollutant emission rates from FG EAST specified under SC I.1, and I.3 through I.10 shall be conducted by testing at owner's expense, in accordance with Department requirements at least once every five years, beginning in 2007.

As indicated earlier, the most recent stack test was conducted on July 12, 2017. The test consisted on monitoring, sampling and analysis to determine VOC emission rates and the destruction efficiency of the RTO. The emission rates for the following pollutants were also evaluated during the test: MeCl<sub>2</sub>, C<sub>6</sub>H<sub>6</sub>, 1,1,2,2-TCA, CCl<sub>4</sub>, CHCl<sub>3</sub>, TCE, PCE and HCl. The results showed compliance with the limits specified in SC I.1 to I.10. The test results are included earlier in the summary table, as part of SC I. For AQD test observation details, refer to activity report CA M478240782 in AQD files.

V. 2 - Verification of the VOC capture efficiency of the exhaust system shall be conducted by testing in accordance with Department requirements. The VOC capture efficiency of the exhaust system shall be determined in accordance with Procedure T, and by visual observation of the air movement and direction. Alternative testing procedures shall be approved by AQD District Supervisor. The verification tests shall be conducted at least once every year and shall notify the department prior to conducting the tests.

As required, the facility notified AQD via email on 11/15/2016 that they were tentatively planning Procedure T and negative static pressure testing at FG EAST and FS WEST on 11/18/2016. The fieldwork for the East Buildings was conducted on 11/18/2016. EQ facility personnel verified the air flow direction within the East Building and summarized the results of the field verification activities. A copy of the report was reviewed during the meeting on 4/27/2017. According to the report, the airflow direction observations demonstrate an inward airflow direction at each Natural Draft Openings (NDO) within the East Building. These results, when coupled with the historical calculation of the structural factors supporting the presence of a "permanent total enclosure", indicate that the East Building continues to meet the permanent total enclosure criteria of ROP No. MI-ROP-M4782-2010a, assuring 100% capture efficiency. This procedure is conducted annually, generally during the last months of the year.

## VI. MONITORING/RECORDKEEPING – In Compliance

VI. 1 to VI. 4 – The following parameters from FG EAST are monitored on a continuous basis and five-minute block averages of the monitored parameters are recorded: air flow, baghouse pressure drop, temperature of the RTO, pH and liquid flow rate at the caustic scrubber. Records are maintained on file for a period of 5 years. Excursions from the specified permit requirements are recorded and reported on the semiannual deviation reports submitted to AQD. For details refer to previous paragraphs under SCs III and review comments of the semiannual deviation reports filed at AQD facility files.

VI. 5 and VI. 6 - Written logs are maintained as part of the facility's preventive maintenance procedures and the malfunction abatement program for the air pollution controls system equipment, which consist of: the RTO, the baghouse, the scrubber and the air handling system. The written logs include the date, time and duration of the equipment downtime; the date and description of the maintenance performed on the equipment; and the date and description of repairs performed on the equipment.

Samples of the daily, weekly, monthly, quarterly and annual logs for year 2016 were provided during the inspection. They are attached to the hard copy of this report. The facility submits similar information with comments describing the type of adjustment and/or repairs in the semiannual reports routinely submitted to AQD.

VI. 7 and VI. 8 - The facility maintains the following records for FG EAST: a) Monthly volumes of each waste stream treated; b) daily records of VOC content in percent by weight present in each waste stream prior to treatment, based on generator information; c) Average daily VOC content (% by weight) of waste streams. d) monthly and 12-month rolling total VOC emissions according to the method outlined in Appendix 7-S1-A of the ROP.

The cited records are maintained pursuant the National Emission Standards for Hazardous Air Pollutants (NESHAP) from Off-Site Waste and Recovery Operations as specified in 40 CFR Part 63 Subparts A and DD. As such, they are labeled "DD VOHAP WASTE REPORTS" and are submitted to AQD as part of the VOC emissions semiannual reports. The reports identify the building where the waste is treated (east or west) and flag the waste as hazardous or no-hazardous.

In addition, the facility prepares monthly report summarizing the amount and the VOC content (in percent by weight) of waste treated and the total VOC input to monitor the cumulative VOC emissions for the preceding 12 months.

An analysis of the semiannual reports for year 2016 shows:

- monthly volumes of waste treated in FG EAST varying from 660,000 gallons recorded in August, to a maximum of 1.3 million gallons, recorded in May;
- waste treated at FG EAST, calculated as a 12-month rolling, varied from 10.85 to 14.3 million gallons;
- daily records with percentage of VOCs in the waste treated varying from 0% to 2% for hazardous waste, and from 0% up to a maximum of 16.7 % for non-hazardous wastes;
- VOC monthly emissions varying from 0.029 tons in April, to a maximum of 0.2683 tons in July;
- 12-month rolling VOC emissions of 0.60 tons in January, up to a maximum of 1.47 tons recorded in November.

To estimate the cumulative VOC emission rates from FG EAST/ RTO exhaust stack, US Ecology uses a procedure similar to the one cited in the ROP Appendix 7-S1-A, but the determination of the VOC weight fraction in the waste stream follows a more comprehensive evaluation. The procedure includes the evaluation of the Michigan Toxic Air Constituents (TAC), HAPS, as well as volatile and semi-volatile constituents listed on ASTM 8260 and ASTM 8270. For details of the calculation methodology please refer to a document titled "VOC Concentration Determination" dated August 14, 2015 submitted by Sylwia Scott (US Ecology) and filed in the AQD files. According to the document, US Ecology uses a monitoring/reporting database that collects extensive information about the properties of waste to be treated. The data is incorporated into the calculation/

methodology to estimate the VOC concentration in the waste and the estimate of VOC emissions.

A 100% VOC capture efficiency and a conservative 95 % control device efficiency is used for the calculations of the VOC emission rate. Please note that the stack test result in 7/12/2017 showed 98.3% RTO efficiency. The emission factor for VOC released from waste during treatment process and delivered to the RTO continues to be as it is indicated in appendix 7-S1-A, which establishes 60% evaporation rate by weight for calculation and compliance purposes. According to AQD records, this evaporation rate was approved when the RTO was first permitted. It seems to be based on the results documented in the "Air/Superfund National Technical Guidance, Study Series, Emission Factors for Superfund Remediation Technologies," EPA-450/1-901-001, March 1991. US Ecology incorporates in their calculations the daily average for waste accepted for treatment in FG EAST, which is limited to a maximum of 2% by weight for hazardous waste and 20% by weight for non-hazardous waste.

VI. 9 - On a monthly basis, the facility maintains the following records for FG EAST: a) PM concentration in pounds per thousand pounds of exhaust gas according to the method outlined in Appendix 7-S1 B of the ROP; b) hourly PM-10 emission rate according to the method outlined in Appendix 7-S1 B of the ROP; c) monthly and 12-month rolling total PM-10 emissions according to the method outlined in Appendix 7-S1 B of the ROP.

To show compliance with the permit limit requirements for PM and PM10 (SC. I.11 and SC.I.12) the facility uses the worse-case scenarios proposed by the calculation method outlined in Appendix 7-S1 B of the ROP. When using the equation in Appendix 7-S1-B the resulting estimated emissions are constant values every year because the plug-in values are design data and not actual monitoring data, testing results and/or operational values.

The only particulate matter emission rate estimated based on actual conditions is the PM-10 emissions in tons per year. For their annual emission inventory report on the Michigan Air Emission Report System (MAERS), the facility estimates PM-10 emissions in tons per year at FG EAST based on an emission factor (tons of PM-10 per weight of waste treated) in combination with the amount of waste treated at FG EAST. The emission factor seems to be derived from a stack test conducted on September 26, 2007 at FG WEST. For calendar year 2016, the reported PM-10 emissions were estimated as 0.8305 tons per year; which is below the ROP emission limit of 4 tons per year.

VI. 10 – The VOC and PM and PM-10 emissions from FG EAST are calculated according to the methods outlined in Appendix 7-S1-A and B. Refer to VI. 7 and VI. 8 for VOC emissions and VI. 9 for particulate matter emissions.

VI. 11 and VI. 12 - The startup, shutdown and malfunction plan operating procedures are met. Upon detecting a deviation on the RTO combustion temperature or differential pressure, the facility ceases the treatment on FG EAST and restores operations to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices.

The following comments were provided by the facility in 2015 in response to AQD's request in reference to procedures used to identify deviations, maintenance logs and/or during start up or shut-down.

These comments apply to both, FG EAST and FG WEST: The east and west side monitoring is done by a data logging program. The facility compares the information to the requirements of the ROP to determine if there was a deviation. The daily checklist is completed each morning prior to beginning waste processing. This is to ensure the equipment is functioning properly. If maintenance needs to be done, notes will be placed on the maintenance forms. Then, periodically throughout the day, an operator checks the function of the pollution control devices to make sure everything is running properly.

For example, at FG\_EAST, they have a light outside the control room that turns on if the RTO is down which signals all processing to stop. Once the data is reviewed and it is determined that there has been a deviation, the maintenance logs are reviewed, and the deviation is discussed with the maintenance personnel that worked on the issue. They populate the RTO maintenance log with the deviation comments to have the information available in a convenient format.

Throughout start up, shutdown and malfunction activities the parameter requirements may not meet the requirements of the ROP. It's not likely to expect an emission unit to be within the ROP parameters if it is shut

down or if start-up activities require adjustments in order to get parameters in compliance. Waste is not processed until the ROP operational parameters are in place. Adjustments are not necessarily made because there is a deviation. There are a number of factors that could warrant a change, and the maintenance personnel have to identify them. The parameters are in place to ensure a device is operating in a manner that will allow it to control the emissions from the process.

## **VII. REPORTING – In Compliance**

Deviations are reported pursuant to ROP Part A, General Conditions 21 and 22.

The reporting requirements cited below have been evaluated earlier in this report but are provided here as a summary. With the exception of SC VII .4, the following conditions are applicable to both, FG EAST and FG WEST.

VII. 1 - Semiannual reports of monitoring and deviations pursuant to General Condition 23 of Part A were received by AQD Detroit district office on 3/15/2017 for reporting period July 1 to December 31, 2016 and on 9/15/2016 for reporting period January 1 to June 30, 2016

VII. 2 - Annual certification of compliance pursuant to General Conditions 19 and 20 of ROP Part A. Reports were received by AQD Detroit district office on 3/15/2017 for calendar year 2016.

VII. 3 - The permittee submits, on a semi-annual basis, the monthly VOC reports in order to monitor the cumulative VOC emissions for the preceding 12 months. Reports received on 3/15/2017 for reporting period July 1 to December 31, 2016, and on 9/15/2016 for reporting period January 1 to June 30, 2016.

VII. 4 - Results of stack tests have been submitted to the department in the format prescribed by the applicable reference test method and within the 60-days timeframe required by the ROP. The most recent stack test required under FG East was conducted on July 12, 2017. The report with test results, dated 8/29/2017, was received by AQD Detroit on 9/11/2017.

VII. 5 - Each semiannual report of monitoring deviations includes summary information on the number, duration and cause of excursions and/or exceedances and the corrective actions taken. If there were no excursions and/or exceedances in the reporting period, the report includes a statement that there were no excursions and/or exceedances. For AQD review comments of the semiannual report of monitoring deviations, refer to reports CA M478241705 (for period 1/1 to 6/30) and CA M478241706 (for period 7/1 to 12/31).

VII. 6 - Each semiannual report of monitoring deviations includes a summary information on monitor downtime. If there were no periods of monitor downtime in the reporting period, the report includes a statement that there were no periods of monitor downtime. For AQD review comments of the 2016 semiannual reports refer to CA M478241708 (for period 1/1 to 6/30) and CA M478241704 (for period 7/1 to 12/31).

## **VIII. STACK/VENT RESTRICTION(S) – In Compliance**

The design of the stack at FG EAST has not been modified since the last re-issuance of the ROP. According to the ROP, the maximum diameter for the exhaust stack shall be 54 inches in diameter and the maximum height above the ground shall be 75 feet. The system has been designed so that the exhaust gases from the stack discharge unobstructed vertically upwards to the ambient air. Visible emissions from the stack were not detected during the tour of the facilities.

## **IX. OTHER REQUIREMENTS – For compliance status refer to the individual items cited below**

IX. 1 - The facility complies with the applicable provisions of the National Emission Standards for Benzene Waste Operations as specified in 40 CFR Part 61 Subparts A and FF.



Compliance with the provisions of the above cited regulation is analyzed later in this report under a separate section identified as “Benzene Waste NESHAP requirements”.

IX. 2 – Not Evaluated - The emissions of asbestos, the filter fabric, the operation of the fabric filter baghouse dust collectors and the process and disposal of all asbestos containing waste shall comply with the specifications found in the NESHAP (National Emission Standards for Hazardous Air Pollutants) for Asbestos in 40 CFR Part 61 Subpart M.

IX. 3 –The permittee complies with the applicable provisions of the National Emission Standards for Hazardous Air Pollutants from Off-Site Waste and Recovery Operations as specified in 40 CFR Part 63 Subparts A and DD. Refer to section VI.7 and VI.8.

IX. 4 - The permittee implements the “Preventive Maintenance and Malfunction Abatement Program, Air Pollution Control Systems.” Refer to comments cited under section VI. 5 and VI. 6 and VI. 11 and VI.12.

IX. 5 and IX. 6 - The permittee shall notify the AQD for the need to modify the Compliance Assurance Monitoring (CAM) plan if the approved monitoring is found to be inadequate and shall submit a proposed modification to the plan if appropriate. The permittee shall comply with all requirements of 40 CFR Part 64 (CAM)

No changes have been made at the facility; therefore, the CAM requirements remain the same. A copy of the approved CAM program is attached.

## FG WEST

### I. EMISSION LIMIT(S) – In Compliance

I. 1 to I.9 - Except for the HCl limit (no-applicable to FG WEST), and the VOC limit of 40.2 tpy cited under special condition SC I.2 for FG WEST, the rest of the pollutants and the corresponding emission rates limits listed on the ROP for FG WEST under SC I.1 and SC I.3 to SC I.9 are the same as those cited for FG EAST, including the time periods and operating scenarios. However, stack testing is not required at FG WEST to evaluate the listed pounds per hour VOCs and HAPs emission rates limits. Instead, the facility uses accepted procedures cited later in sections V.1 and VI.5 to VI.9 of this report for calculations, reporting and compliance demonstration of the 12-month rolling VOC emission rate limit. Refer to those section for the evaluation of compliance.

I. 10 and I. 12 – The particulate matter limits for FG WEST are: PM = 0.028 pounds per 1,000 pounds of exhaust air; PM10 = 9.6 pounds per hour, and 20 tons per year [12-month rolling time period]. According to the ROP, the emissions rates should be estimated based on the procedure cited in Appendix 7-S1B or other alternative method approved by AQD.

Refer to the comments cited under FG EAST – VI.9 for particulate matter emission calculations using Appendix 7-S1B; the comments are also valid for FG WEST. Similarly, for their annual emission submittal on MAERS, the facility estimates PM-10 emissions in tons per year at FG WEST based on an emission factor (tons of PM-10 per weight of waste treated) in combination with the amount of waste treated at FG WEST. The emission factor seems to be derived from a stack test conducted on September 26, 2007 at FG WEST. For calendar year 2016, the PM-10 from FG WEST was about 4.3 tons per year; which is below the ROP emission limit of 20 tons per year.

### II. MATERIAL LIMIT(S) – In Compliance

Material	Limit	Time Period/ Operating Scenario	Compliance
1. VOC in waste	Maximum of 500 ppm	Monthly average	YES - Refer to “Monitoring/Recordkeeping” under VI.5
2. VOC in	Maximum of 0.5% by weight	Daily average	YES - According to the records for

ste		for waste accepted for treatment	2016, the percentage of VOC in the waste received at the west treatment facility was below 0.5%, varying from 0 to 0.045 %.
3. VOC	VOC evaporation rate from the waste treatment process shall not exceed 60% by weight.	Per ROP - SC V.1	YES - Refer to V.1
4. Volatile Organic HAP in waste	Less than 500 ppmw based on the HAP content of the off-site material stream at the point-of-delivery	Annual average per off-site material stream	YES - Refer to the evaluation of SCs VI.8 / VI. 9

### III. PROCESS/OPERATIONAL RESTRICTION(S) – In Compliance

Random examination of the operational records for year 2016 was conducted during the first day of the inspection, on 4/27/2017. A sample of a daily records with the operational parameters monitored on 4/27/2017 was requested and it was handed out during the meeting.

III. 1 - During normal operation defined (as defined in the ROP). The required airflow through FG WEST shall be maintained between 80,000 cubic feet per minute (cfm) and up to a maximum of 110,000 cfm.

According to the semiannual reports for 2016, the airflow through FG WEST has been maintained within the permitted operational ranges with a few occasions in the month of June and July where airflows were below 80,000 cfm. The problems were promptly addressed. According to the record collected on 4/27/2017, the airflow recorded by the operator was 84,923 scfm.

III. 2, III. 3 and III. 4 - The facility shall operate the baghouse dust collector 24 hours a day and maintain negative static pressure in the waste treatment building at all times during normal operation. The west bag differential pressure shall be maintained between 1.5 and 8.0 inches of water column (wc).

Negative static pressures are maintained in the building at all times during treatment. Not more than one waste treatment process building overhead door is open at a time. Refer to paragraph V.3 comments for verification of the negative static pressure.

According to the semiannual reports for 2016, the differential pressure at FG WEST has been maintained within the permitted operational ranges with no deviations reported. The west bag house differential pressure on the collected record on 4/27/17 was 3.8 inches wc.

III. 5, III. 6 and V. 2 - No waste subject to the control requirements of Benzene NESHAP is treated at FG WEST or stored in FGLIQWASTETKS. No wastes containing any of the prohibited compounds listed on Section 1, FGWEST, SC III.6 (replicated under section 1, FGLIQWASTETKS, SC III.2) are treated at FG WEST or FGLIQWASTETKS. Each waste stream for the compounds listed in SC III.6 are screened using a method acceptable to the AQD.

Benzene concentration and Total Annual Benzene (TAB) quantity for MDWTP are calculated in accordance to 40 CFR 61, subpart FF (see detailed evaluation under section "Benzene Waste NESHAP requirements"). To assure that permit conditions III.5, III.6 and V.2 are met, the facility has a very strict control/evaluation of the type of waste that is accepted for treatment. Their clients shall provide a waste profile/waste characterization to US Ecology before a waste is brought to the treatment site. US Ecology takes about two days to review the paperwork before accepting or rejecting the waste. AQD has not received any notification of new compounds to be added to the list of compounds cited in ROP SC III.6.

### IV. DESIGN/EQUIPMENT PARAMETER(S) – In Compliance

IV.1 & 2 and VI.1 & 2 (records) — -The permittee shall install, calibrate, maintain and operate in a satisfactory manner the monitoring devices to monitor on a continuous basis, and record five-minute block averages of: the air flow through FG WEST and the pressure drop of the treatment building baghouse dust collector.

The parameters are monitored and recorded in accordance with the permit conditions. During the visit on 07/12/2017 AQD inspector observed the screen in the control room and verified continuous monitoring of the operational parameters. The device calibration for year 2016 was completed on March of 2016. The monitoring devices and the frequency of calibration are both cited on the following paragraphs.

The former west airflow meter (Pitot Tube style flowmeter fitted with an ABB 600 T series smart pressure transmitter) has been replaced with a multipoint flow meter that is calibrated annually. (IV .1)

The west bag house has an ABB 600T series pressure transmitter calibrated annually. (IV.2)

IV. 3 - The permittee shall install, maintain and operate limit switches in all overhead doors, so as to restrict the maximum operation opening heights to 20 feet except as needed for vehicle or equipment ingress and egress.

The west overhead doors incorporate limit switches to control opening height. They are maintained by lubrication on a quarterly basis, verifying the opening height and bottom seal.

IV. 4 - Sludge feed and storage tank No. 11 (EUSLUDGETANK11) shall be vented into the FGWEST waste treatment process building.

The installation was built to accommodate this venting.

## **V. TESTING/SAMPLING – In Compliance**

V. 1 – As indicated for FG EAST, the VOC evaporation rate from the waste treatment process in FG West is also established at 60% by weight. To establish an alternate evaporation rate, the facility could use site specific data, based on testing, with the approval of the AQD District Supervisor.

V. 2 – Screening of prohibited compounds – This condition was evaluated above under III.6.

V. 3 - Once a year, the facility is required to verify the negative static pressure in the waste treatment building by testing in accordance with DEQ requirements. AQD has to be notified prior to conducting the test.

The facility conducts the negative static pressure verification test once every year. The smoke test was performed on 11/18/2016 and AQD was notified via email on 11/15/2016. The smoke test and airflow direction observations demonstrated a negative static pressure condition within the west building, and consequently indicate that the west building continues to meet the negative static pressure criteria.

## **VI. MONITORING/RECORDKEEPING – In Compliance**

Compliance with VI.1 and VI.2 was evaluated earlier under IV.1 and IV.2.

VI. 3 - Written logs are maintained as part of their Preventive Maintenance Procedures, Malfunction Abatement Program, Air Pollution Control Systems Samples. Excursions from the specified permit limits are recorded and reported on the semiannual deviation reports submitted to AQD.

Samples of their daily, weekly, monthly, and quarterly maintenance logs were provided during the inspection and they are attached to the hard copy of this report. For FG WEST the records include: the date, time and duration of baghouse downtime (if any); the description of maintenance performed on the baghouse (if any) and the date and description of repairs performed on the baghouse (if any).

VI. 4 and VI. 6 - For monitoring/recordkeeping and compliance evaluation with PM and PM-10 emission limits, refer to comments under FG WEST - SC I.10 to I.12

VI. 5 and VI. 7 - The facility prepares monthly reports summarizing the volume of waste stream treated at FG WEST, the VOC content in the waste (daily % by weight) and the monthly and 12-month rolling total VOC emissions. The "DD VOHAP WASTE REPORTS" are submitted to AQD as part of the VOC emissions semiannual reports.

An analysis of the semiannual reports for year 2016 shows:

- monthly average volume of waste treated in FG EAST varying from 834,000 gallons recorded in January to a maximum of 1.44 million gallons, recorded in May;
- waste treated at FG WEST calculated as a 12-month rolling varying from 11.7 to 13.7 million gallons;
- daily records showing percentage of VOCs in the waste treated varying from 0% to under 0.05 %, the highest value was reported on 10/21/2016 at 0.045% (that's less than the 500-ppm limit);
- VOC monthly emissions varying from 0.00 tons to a maximum of 0.0099 tons in October;
- 12-month rolling VOC emissions varied from 0.0127 tons in August, up to a maximum of 0.0543 tons recorded in February. The maximum is significantly below the 40.2 tpy limit.

VI.8 - The facility conducts an initial determination of the average Volatile Organic HAP (VOHAP) concentration for each off-site material stream using the procedures specified in §63.694(b) prior to the first time any portion of the off-site material stream was treated in FG WEST. Thereafter, the facility reviews and updates, as necessary, this determination at least once every 12 months following the date of the initial VOHAP determination.

VI. 9 - The facility keeps records of the VOHAP concentration of each off-site material stream processed in FG WEST for each month and 12-month rolling time period. The records submitted under the titled "DD VO HAP WASTE REPORTS" received with the semiannual reports seem to satisfy this condition.

VI.10 - The facility maintains records for each waste stream treated in FG WEST sufficient to demonstrate that the waste was not subject to the controls requirements of the National Emission Standard for Benzene Waste Operations (NESHAP) 40 CFR Part 61 Subpart FF. For compliance details refer to "Benzene NESHAP requirements" in this report.

VI. 11 - The facility develops and maintains written operating procedures to assure that the operational parameters required per S.C. III.1 are met before the air flow through FG WEST is reduced below the minimum air flow specified in S.C. III.1, or before the permittee no longer maintains negative static pressure as specified in S.C. III.2. Records are maintained indicating the time, date and duration of air flow reduction and/or non-negative static pressure, to assure the operating procedures are being met as specified in the startup, shutdown and malfunction plan. Samples of those records are included in the semiannual reports submitted to AQD. Samples of the daily, weekly, monthly, quarterly and annual logs for year 2016 were provided during the inspection. They are attached to the hard copy of this report.

VI. 12 - Upon detecting an excursion or exceedance through the parametric monitoring of the pressure drop, the operators restore operation of FG WEST to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions. Refer to the comments applicable to both FG EAST and FG WEST, which were included earlier under FG EAST VI.11 /VI.12.

## VII. REPORTING – In Compliance

The requirements listed under this section of the ROP for FG WEST were addresses earlier under FG EAST, paragraph VII.

## **VIII. STACK/VENT RESTRICTION(S) – In Compliance**

The design of the stack at FG WEST has not been modified since the last re-issuance of the ROP. According to the ROP, the maximum diameter for the exhaust stack shall be 54 inches in diameter and the maximum height above the ground shall be 75 feet. The system has been designed so that the exhaust gases from the stack discharge unobstructed vertically upwards to the ambient air. Visible emissions from the stack were not detected during the tour of the facilities.

## **IX. OTHER REQUIREMENT(S) – In Compliance**

This section of the ROP contains the same special conditions cited for FG EAST. Refer to FG EAST for compliance evaluation.

### **BENZENE WASTE NESHAP REQUIREMENTS**

These requirements are applicable to the following flexible groups and ROP Special Conditions (SC): FG EAST (SC IX.1), FG WEST (SC III.5, VI.10 and IX.1), FGLIQWASTETKS (SC III.1 and VI.5) and FGTMTFACILITY (SC IX.3)

The following analysis refers to the National Emission Standards for Benzene Waste Operations (BWON) specified in 40 CFR Part 61 Subparts A and FF as they apply to the MDWTP facility at US Ecology. Compliance status with the applicable provisions of the cited regulation is evaluated here.

MDWTP is a Treatment, Storage and Disposal Facility (TSDF) that receives hazardous waste from offsites facilities (i.e. petroleum refinery, chemical manufacturing plants) listed under section 61.340(a) of Subpart FF. The listed offsite facilities are subject to BWON. Per section 61.340(b), a TSDF that receives/manages benzene-containing hazardous waste streams generated at the listed offsites facilities is also subject to the specific provisions of Subpart FF as they apply to TSDFs.

The main parameter that defines the applicability of the management, treatment and control standards identified in BWON is the value of the Total Annual Benzene (TAB) quantity from the facility waste. The TAB is the total annual mass of benzene contained in certain wastes determined at the point of waste generation. For the MDWTP the TAB is determined in accordance with section 61.342(a). If the TAB is more than 10 Megagrams per year (Mg/yr) (11 ton/yr), the waste is subject to the control requirements specified under section 61.342 (c).

For the specific case of MDWTP, there are two TABs associated with the facility; the generator's TAB (which is the TAB of the waste generated at the offsite facility) and the TAB for the TSDF. The determination of the TAB for wastes that are received from offsite facilities is made at the point where the waste enters the TSDF. For TAB calculations, US Ecology uses the procedure cited on 61.355 (a). The determination of the flow-weighted average benzene concentration is based on the criteria cited on 61.355 (c) (1) (C) in combination with the "Knowledge of the waste" (records of chemical waste analysis) per 61.355 (c) (2).

Based on the TAB value (TAB > 10 Mg/yr.), which is updated annually by US Ecology and submitted to AQD as part of the reporting requirements cited on 61.357, the storage and treatment of benzene-containing hazardous waste streams subject to the emission controls of Subpart FF is restricted to the East Treatment Building - flexible group FG EAST in the ROP. However, the facility must still comply with the recordkeeping requirements of 61.356 and the reporting requirements of 61.357(d) (7) (iv) for both FG EAST and FG WEST.

The facility maintains records for each waste stream treated at FG WEST and FG EAST. The identification of the waste is done in accordance with the procedure cited on 61.355 (c) (2) [Knowledge of the Waste].]

Permit conditions within FGWEST and FGLIQWASTETKS prohibit waste stream subject to the control requirements of BWON from being processed in the process units associated with the cited flexible groups. The 2016 annual report submitted by US Ecology on March 15, 2017 (pursuant section 61.357) summarizes the regulatory status of each waste stream subject to the control requirements of BWON. The report only listed tanks



E, F, G and H (located in East Building), demonstrating that benzene-containing wastes are not processed in FG WEST or in FGLIQWASTETKS.

MDWTP is exempt from the reporting requirements cited on 40 CFR 357 (d)(7) (i-ii) for the following reasons: 1) It complies with 40 CFR 348(d)(3) by treating waste streams to a level that meets benzene-specific treatments standards in accordance with the Land Disposal Restrictions (LDR), under 40 CFR Part 268. 2) The treatment process is designed and operated with a closed-vent system and control device meeting the requirements of 61.349 by operating an enclosed combustion device – the RTO-at a minimum temperature of 1,500 °F and a minimum residence time of 0.5 seconds.

Per 40 CFR 357(d)(7)(iv)(A) – The RTO is what this subpart defines as a Thermal Vapor Incinerator. Continuous monitoring records for the RTO, which includes temperature, are maintained on-site.

Per 40 CFR 357(d)(7)(v) – At all times, FGEAST is operated with negative static pressure in the treatment building and negative air pressure is maintained except when the system is not operating. Procedure T, to demonstrate “Permanent Total Enclosure” and explained earlier in this report, has been performed annually and records are on site.

The 2016 annual report was reviewed by AQD. The reports included the updated Total Annual Benzene (TAB) from 01/01/2016 to 12/31/2016 as required per 40 CFR 61.357 (d)(2). The summary tables list the hazardous waste streams identifying: the waste generator and the Standard Industrial Code (SIC), the average water content (%), the receipt date, the disposal date, the transship location if the waste is disposed on-site, the waste quantity in Kgs., the benzene concentration in ppm, the generator’s TAB and US Ecology’s TAB at the point of waste receipt and whether or not the waste is control exempt.

Based on AQD review of the annual report for year 2016, US Ecology appears to be substantially in compliance with the applicable requirements pertaining Benzene Waste NESHAP.

## **FGLIQWASTETKS**

This flexible group includes four 20,000-gallon liquid waste holding tanks: EULIQWASTETK16, EULIQWASTETK17, EULIQWASTETK18, EULIQWASTETK19.

### **I. EMISSION LIMITS – In Compliance**

I.1 to I.5 - There are hourly, monthly and yearly (12-month rolling time period) emission rates limits for VOC and halogenated VOC but there are not testing requirements associated with the listed emission limits. Proper operation and maintenance of the control equipment connected to the process tanks (i.e. carbon adsorption canister) as well as proper monitoring and recordkeeping, are indicators of compliance with the cited limits. Those requirements are addressed under section IV and VI.1 below.

### **II. MATERIAL LIMITS – In Compliance**

II.1 - The holding tanks can be used to store waste containing “Volatile Organic HAP” (VOHAP) up to less than 500 ppmw based on the HAP content of the off-site material stream at the point-of-delivery. The monitoring requirements and compliance status with the cited limit are evaluated under section VI.3 and VI.4.

### **III. & V. PROCESS /OPERATIONAL RESTRICTIONS and TESTING/SAMPLING – In Compliance**

III.1, III.2 and V. – Waste subject to the controls requirements of BWON or waste containing any of the prohibited compounds listed in special condition III.2, is not stored in FGLIQWASTETKS.

To assure compliance with SC III.1, SC III.2 and SC V, the facility implements strict controls for the screening and approval of waste to be treated at the site (for details see item III.6 under FG WEST in previous section of

this report).

#### **IV. DESIGN/EQUIPMENT PARAMETER(S) – In Compliance**

IV.1 Vents of the tanks are routed through two activated carbon canisters (Siemens Vent Scrub-TM) connected in series and properly operated.

IV.2 The canisters were observed to be equipped with saturation indicators as required by this ROP permit condition. The indicators are monitored as part of the facility's daily preventive maintenance check-list. Examples of preventive maintenance forms were collected during the inspection and the list showed monitoring the saturation indicators as an item to be evaluated within their daily routine.

IV.3 The replacement of the carbon canisters should be done when the activated carbon is spent (70 percent used). They achieve compliance implementing proper maintenance procedures. The canisters are replaced annually even if the carbon bed doesn't show 70% saturation in a year of usage.

IV.4 The tanks are sealed to prevent VOC emissions to the ambient air. They are connected to carbon canisters that capture VOCs through carbon adsorption. The carbon canister can't be bypassed. AQD did not request records to verify if "bypass conditions" have occurred. It is assumed that the tanks have been operated properly since the facility has not reported such condition in their routine semi-annual ROP reporting.

#### **V. TESTING /SAMPLING – In Compliance**

This condition was addressed earlier under together with SC III.2.

#### **VI. MONITORING/RECORDKEEPING – In Compliance**

The following records are maintained for a 5-year period:

VI.1 – The facility keeps written logs for maintenance and replacement of the activated carbon from the carbon canisters. The logs include: the date of observation, saturation status, and the activated carbon replacement date. Template formats used for the collection of maintenance records were provided during the inspection; however, the actual maintenance records for year 2016 were not collected.

VI.2 – The facility calculates and maintains records of VOC and halogenated VOC emission rates from FGLIQWASTETKS. According to the report submitted by US Ecology under the Michigan Emission Report System (MAERS) the combined throughput (waste processed in all four holding tanks) in 2016 was 82,605 gallons. The VOC annual emission rate was reported as zero and the halogenated VOCs not listed. The absence of VOC emissions from these tanks is expected. Based on the information provided by facility personnel and supported by MAERS historical records, the waste material handled in tanks 16, 18, and 19 have always been storm water and leachate waste with non-detectable quantities of VOC. Tank 17 has been the only tank used to store VOC containing material. From 7/2007 to 6/2008, tank 17 stored leachate with a VOC contain of less than 500 ppmw and from 5/2013 to 6/2013, the tank accepted Marathon waste with less than 500 ppmw. Since 2013, the facility has not reported VOC emissions from all cited holding tanks.

VI.3 to VI.5 –The requirements listed under SC VI. 3 to SC VI.5 for FGLIQWASTETKS are the same requirements that were evaluated earlier in this report for FG WEST under sections VI.8 to VI.10. Please refer to those sections for details.

VI.6, VI.7 – Further evaluation is needed to determine compliance with these conditions.

These two ROP conditions require the facility to keep the following records for all storage tanks subject to 40 CFR Part 60 Subpart Kb: 1) operating plan and the measured values of the parameters monitored in accordance with the plan; 2) dimensions of the storage vessel and an analysis showing the capacity of the storage vessel.

The second set of records should be kept for the life of the source.

It appears that when the storing operations were first evaluated/permitted, it was determined that the holding tanks (No. 16 to No. 19) were subject to subpart Kb because each tank has a design capacity above 71 cubic meters (18,756 gallons) and the tanks would be holding VOL that, as stored, has a maximum true vapor pressure equal to or greater than 27.6 kPa but less than 76.6 kPa. Therefore, the tanks were equipped with control device (carbon adsorption canisters) meeting the specifications cited on 60.112b (3): "A closed vent system designed to collect all VOC vapors and gases discharged from the storage vessel and operated with no detectable emissions as indicated by an instrument reading of less than 500 ppm above background". However, as it was noted in section VI.2, it seems like the tanks have not been used to store VOL containing waste. Therefore, for a better understanding of the current storage operations and to evaluate the applicability of subpart Kb (cited in SC VI.6 and VI.7) to the tanks, AQD needs to review additional records such as; the type of waste, true vapor pressures of the stored liquid wastes, maintenance of the control device, as well as the procedures in place for general monitoring and recordkeeping.

## **VII. REPORTING – In Compliance**

The requirements listed under this section of the ROP for FGLIQWASTETKS were addresses earlier under FG EAST, paragraph VII.

## **VIII. STACK/VENT RESTRICTIONS - In Compliance**

The discharge of exhaust gases is through carbon canister installed at each tank.

## **IX. OTHER REQUIREMENTS – Refer to cited sections for compliance status (as applicable)**

IX.1 – Refer to VI.6 and VI.7 for FGLIQWASTETKS

IX.2 – The facility keeps records of the VOHAP concentration of each off-site material stream processed in FGLIQWASTETKS for each month and 12-month rolling time period. The records submitted under the titled "DD VO HAP WASTE REPORTS" received with the semiannual reports seem to satisfy this condition.

IX.3 – The Preventive and Malfunction Abatement Plan was not requested during this inspection.

## **FGSILOS**

EUSILO1-3 and EUSILO4-6 are used to store reagent, including (but not limited to) fly ash, lime, and cement kiln dust. Silos 1 through 3 serve the west side treatment plant, and silos 4 through 6 serve the east.

### **I to IX - In Compliance**

All special conditions listed for FGSILOS are evaluated here:

The ROP SC I.1 and SC I.2 specifies a PM limit of 0.028 lb per 1,000 lbs of exhaust air and PM10 emission limit of 0.12 pph. Each silo is equipped with a baghouse dust collector that should be properly installed and operated to minimize visible emissions.

To demonstrate compliance with the cited emission limits the facility is required to monitor and record visible emission observations (as described in Appendix 3-S1) of each reagent silo baghouse exhaust once per calendar month during a period when that silo is being filled. The activities shall be recorded in accordance with the air pollution control system written procedures stated in the Preventive Maintenance and Malfunctioning Abatement Plan (MAP). Deviations from the cited requirements, as well as corrective measures, are to be

reported to AQD in the semi-annual reports.

In compliance with SC III.1, SC V. 1 and SC VI.1 and as it is described in Appendix 3-S1 of the ROP, the operators conduct visible emissions observations once per calendar month during a period when each silo is being loaded. They keep monthly logs of their observations (per SC VI.1). Records are kept for a period of five years. A monthly log with the collected visual observations was provided during the inspection. The log indicated the absence of visible emissions for all readings during the month. Semi-annual reports were submitted with no reported deviations for year 2016. AQD did not request/review the MAP.

The 2016 MAERS reported a total throughput of 16,687 tons of material stored in the silos and an estimated PM emission rate of 148.51 pounds on that year. The estimate was based on a controlled emission factors of 0.0089 pounds of PM per ton of material loaded to the silos - obtained from AP-42, Table 11.12-2 (year 2011 edition). For compliance purposes, this PM rate of emission seems to be less than the permit limit of 0.12 pph.

## FGTMTFACILITY

### II. MATERIAL LIMITS - In Compliance

The overall requirements on the treatment facility (FGTMTFACILITY) limit the waste throughput to 576,000 gallons per calendar day and to 210,240,000 gallons per 12-month rolling time period. The 12-month rolling total VOC in waste is limited to 1,584 tons per year (tpy).

According to the AQD analysis of the semi-annual reports for year 2016, the highest rate of waste processed at the facility was during the month of May. The highest daily volume was 153,040 gallons, recorded on 5/31/2016, representing 26.5 % of the ROP daily limit.

The highest 12-month rolling total for 2016 was 28,010,550 gallons recorded at the end of January. This figure is about 13% of the limit set for FGTMTFACILITY in SC. II.2. Additionally, as indicated in previous sections of this report, the facility maintains (daily, monthly, and 12-month rolling -as determined at the end of each calendar month) records of the type of waste (hazardous & nonhazardous) and the amount of waste processed, as well as the VOC concentrations of the waste. Most of the information is included in the semi-annual reports submitted to AQD.

To minimize errors and to ensure accuracy in the calculations, the facility doesn't use waste densities to calculate the tons of VOC in the waste treated and the VOC emitted (as it is suggested in Appendix 7-S1. A of the ROP). Instead, they use the actual weights in pounds of bulk loads. Therefore, conversion from gallons or yard to pounds is unnecessary. In addition, when calculating VOC weights of waste received in containers, the facility assumes that all containers are full and standard weights are assigned to each container size as follows:

Container Type	Weights in Pounds	Container Type	Weight in Pounds
cubic yard boxes	2,000	20-gallon buckets	168
275-gallon totes	2,295	10-gallon buckets	84
85-gallon containers	709	5-gallon buckets	42
55-gallon containers	409		

These equivalents-weights in pounds were established during the discussions that took place when the permit to install the RTO was issued in 1998.

The records for year 2016 showed a maximum of 98.08 tpy for the 12-moth rolling total at the end of November 2016, which represents 6.2 % of the total amount of VOC in waste (1,584 tons per year) that MDWTP could potentially treat.

### **III. PROCESS/OPERATIONAL RESTRICTIONS – In Compliance**

III. 1 - The required fugitive dust emission control measures are maintained; sweeping logs and dust suppressant applications are routinely recorded. An example was collected during the inspection

### **IV. DESIGN/EQUIPMENT PARAMETERS – In Compliance**

IV.1 - The applicable paragraphs of 40 CFR Part 63 Subparts A and DD identified in this condition were evaluated earlier in this report under the specific emission units and/or flexible groups described in ROP Section 1.

IV.2 – The applicable paragraphs of 40 CFR Part 61 Subpart A and FF identified in this condition are evaluated earlier in this report, under Benzene Waste NESHAP requirements.

**V. TESTING/SAMPLING** – This requirement is analyzed under section VI.4 to VI.7.

### **VI. MONITORING/RECORDKEEPING – In Compliance**

The records cited below are maintained on file for a 5-year period

VI.1 and VI.2 - These two conditions were evaluated earlier under the monitoring and recordkeeping section for each flexible group (FG) or emission unit (EU).

VI.3 - A written daily log of the wetting or sweeping of all paved roads and parking lots is kept on file. AQD did not request a sample of this record during the inspection.

VI.4 to VI.7 (Also V.1 and V.2 and IX.1 to IX. 3)– For the evaluation of compliance with the applicable testing, inspections, monitoring and recordkeeping requirements of Part 61 Subpart FF, refer to “Benzene Waste NESHAP requirements”. For the evaluation of compliance with the applicable NESHAP regulations from Off-Site Waste and Recovery Operations (40 CFR Part 63 Subparts A and DD) grouped under this ROP condition, refer to the individual emission units discussed earlier in this report.

### **FGCOLDLEANERS**

The concentration of halogenated compounds in the cleaning solvent used at the facility for parts-washing is limited to 5% by weight. The VESCO cold cleaner located in the vehicle maintenance building employs mineral spirits. Maintenance procedures, as recommended by VESCO, are regularly conducted. According to MAERS, the facility only used 10 gallons of solvent in 2016. VOC emission were reported to be 65.6 pounds.

AQD did not visit the area of the cold cleaner, so the equipment design parameters and operating procedures (i.e. presence of device for draining clean parts, cover open or close, written operating procedures posted) were not evaluated.

### **FG RULE 290 – EUDRUM STORAGE – Further information is needed**

Rule 290 limits the total emissions of air pollutants as follows,

Up to 1,000 pounds per month of uncontrolled emissions and up to 500 pounds per month (controlled):

- For noncarcinogenic VOC and noncarcinogenic materials listed in Rule 122(f) [compounds not contributing appreciably to ozone formation].



- For noncarcinogenic air contaminants with initial threshold screening levels (ITSL) equal to or greater than 2 mg per cubic meter - excluding noncarcinogenic VOC and noncarcinogenic materials listed in Rule 122(f).

The emission limit drops to 20 pounds per month (uncontrolled emissions) and to 10 pounds per month (controlled emissions):

- For noncarcinogenic air contaminants with ITSL greater or equal to 0.04 mg per cubic meter and less than 2 mg per cubic meter - excluding noncarcinogenic VOC and noncarcinogenic materials listed in Rule 122(f).
- For carcinogenic air contaminants with IRSL greater than or equal to 0.04 mg per cubic meter.

Zero emissions:

- For air contaminants with IRSL of less than 0.04 mg per cubic meter - excluding noncarcinogenic VOC and noncarcinogenic materials listed in Rule 122(f).

MAERS report for year 2016 recorded a total annual throughput of 36,470 gallons for EUDRUMSTORE and the VOC emissions totaled 52.64 pounds per year, which would translate into an average of 0.14 pounds per day.

Further information is needed about the carcinogenic levels of the waste stored in the drum storage area to evaluate compliance with Rule 290. The facility would be in compliance with the cited emission limits if the drums contain noncarcinogenic materials.

In future inspections AQD will request records identifying each air contaminant that is emitted and information about the quality, nature, and quantity of the air contaminant emissions in sufficient detail to demonstrate that the actual emissions of the emission unit meet the emission limits outlined in Rule 290.

## **MI-ROP-M4782-2010a - SECTION 2 – WER**

### **EUOPENFLARE**

An open flare is an open combustor without enclosure or shroud. The facility does not currently have an operational open flare; therefore, the standard conditions included in the ROP for EUOPENFLARE are not applicable.

### **EUTREATMENTSYS**

This treatment system removes particulate to at least the 10-micron level, collects and compresses the landfill gas (LFG) and removes enough moisture to ensure good combustion of gas for subsequent use. The system was installed as part of the controls for the LFG. The underlined applicable requirements are part of the regulatory frame covered under the Landfill Federal Plan which is enforced by USA EPA. AQD does not have authorization for compliance evaluation. (Refer to ROP Section 3 for the applicable regulatory requirements).

### **FGENGINES**

DESCRIPTION - Three 500 Hp Caterpillar G-398 naturally aspirated engines and one 710 Hp Caterpillar G-398 turbo aspirated engine, all fired with landfill gas and supplemented with natural gas as needed to maintain combustion.

Emission Units: EUENGINE2, EUENGINE3, EUENGINE4 and EUENGINE5

POLLUTION CONTROL EQUIPMENT – Not applicable

## **I. EMISSION LIMIT(S)**

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Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/Testing Results	Compliance
1. Nitrogen oxides (NO <sub>x</sub> )	14.28 pounds per hour	Three-hour average, based on stack test	Engine 2 Engine 3 Engine 4 Engine 5	3.4 lb/hr 3.1 lb/hr 4.9 lb/hr 3.4 lb/hr	Yes - Refer to section V.1 for details about testing dates
2. Nitrogen oxides (NO <sub>x</sub> )	190 tons per year	12 month rolling time period as determined at the end of each calendar month.	FGENGINES	39 tons per year (max. for year 2016)	Yes – Refer to section VI.4 for details
3. Carbon monoxide (CO)	3.43 pounds per hour	Three-hour average, based on stack test	Engine 2 Engine 3 Engine 4 Engine 5	1.6 lb/hr 2.8 lb/hr 2.6 lb/hr 1.8 lb/hr	Yes - Refer to section V.1 for details about testing dates
4. Carbon monoxide (CO)	39.9 tons per year	12 month rolling time period as determined at the end of each calendar month.	FGENGINES	20.237 tons per year (max for year 2016)	Yes - – Refer to section VI.4 for details about recordkeeping

## II. MATERIAL LIMIT (S)

Material	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Compliance
1. Landfill Gas	70% methane by volume	Daily average	FGENGINES	For 7/1/2016 the daily average was 59.8%	Yes – Refer to SC VI.5 for details

### FGENGINES (PARTS III, IV and VI) - In Compliance

The evaluation of of interrelated conditions from Parts III, IV and VI applicable to FGENGINES are grouped here:

III. 1, III. 3, IV.2 and VI.2 - The permittee limits the power output of each engine as indicated on the table below. The permittee installed, operates and properly maintains a kilowatt meter on each engine. The electrical output, in kilowatts, is continuously monitored and recorded every fifteen minutes for each engine.

#### Engine Maximum Output

EUENGINE2 370 kW (496 hp)

EUENGINE3 370 kW (496 hp)

EUENGINE4 520 kW (697 hp)

EUENGINE5 370 kW (496 hp)

Operational records reviewed during the inspection showed a range of power output within the maximum rated values cited for each engine. Engine 3 has been used as an emergency engine and was not in operation during year 2016.

The following electrical output readings were recorded at the engines-room during the inspection:

EUENGINE2     0 kW (not in operation at the time of the inspection)

EUENGINE3     0 kW (emergency engine - not in operation)

EUENGINE4     210.72 kW

EUENGINE5     235.14 kW

III. 2, III.4, IV.1, VI.1 and VI.5 - The permittee operates and properly maintains a fuel gas flow metering system for determining the instantaneous flow rate of landfill gas (or natural gas) to the engines and operates and maintains a device to measure the landfill gas methane (CH<sub>4</sub>) concentration. The permittee monitors and records the amount of landfill gas and natural gas used in FGENGINEs for each month and 12-month rolling time period, as determined at the end of each calendar month. Records are maintained in file for a period of five years.

WER uses a GEM 2000 a landfill gas extraction monitor for analyzing landfill gas composition and calculating flow in a daily basis. The instrument provides automatic sampling and analysis of gas composition % volume CH<sub>4</sub>, CO<sub>2</sub>, O<sub>2</sub> and % balance gas. It also calculates gas flow rates in SCFM as well as Btu content. The instrument is calibrated once a year. The facility is not using natural gas.

Monthly LFG consumption records for year 2016 were collected during the inspection. The annual consumption was approximately 125 million cubic feet and the highest 12-month rolling LFG consumption was 145 million cubic feet, recorded in June 2016.

#### **IV. DESIGN/EQUIPMENT PARAMETER(S) - In Compliance**

IV.1 - The permittee maintains all engines, to the extent practicable, in a condition to enable the start-up of an idle engine should one of the active units experience a failure.

Preventive maintenance is routinely practiced, and the malfunction abatement plan is updated in a frequent basis. If malfunctions occur, they have one of the other engines available until the malfunction is corrected.

IV.2 - The permittee verifies that the proper air/fuel regulator spring is installed for engine 4 based on the observed landfill gas methane content. This is done daily, excluding weekends and holidays when an operator is not scheduled to be on-site. The other two engines (2 and 5) have a different system for air/fuel regulation.

#### **V. TESTING/SAMPLING - In Compliance**

Records are maintained on file for a period of five years.

V.1 – Verification of NO<sub>x</sub> and CO emission rates from each engine during normal operation is required at least once during the term of the ROP.

Within the five-year term of the ROP from 2010 to 2015, the facility conducted an emission test for each engine on June 28-30, 2011. Testing consisted of triplicate 60-minute test runs for each pollutant (NO<sub>x</sub> and CO) at each engine. The results for the four engines are cited above on the summary table. They were below the NO<sub>x</sub> and CO limits.

V.2 - Pipeline natural gas has not exceeded 10 percent of the fuel supply to an engine; therefore, testing to verify NO<sub>x</sub> and CO emission rates from the engine during normal operation has not been required.

V.3 - All testing, sampling, analytical and calibration procedures used for testing have been performed in accordance with Appendix A of 40 CFR Part 60, or other acceptable reference methods approved by AQD.

## **VI. MONITORING/RECORDKEEPING - In Compliance**

Records shall be maintained on file for a period of five years

VI. 3 and VI.4 - On a daily basis, excluding weekends and holidays when an operator is not scheduled to be on-site, the permittee monitors and records the NOx and CO concentrations in the exhaust stream of each operating engine with a properly calibrated handheld monitor (Testo 350 XL portable flue gas analyzer). The permittee calculates and records the NOx and CO emission rates from FGEngines for each month and 12-month rolling time period, as determined at the end of each calendar month. Refer to records collected during inspection.

VI.6 - The permittee keeps a record of the identity of the air/fuel regulator spring installed in each engine and note if the spring is changed on a daily basis excluding weekends and holidays when an operator is not scheduled to be on-site.

Engine 4 is the only engine that still uses this type color coded spring. The other engines don't use a "spring" to regulate air/fuel ratio.

## **VII. REPORTING – In Compliance**

Deviations are reported pursuant to ROP Part A, General Conditions 21 and 22.

VII. 1 –Semiannual reports of monitoring and deviations pursuant to General Condition 23 of Part A were received by AQD Detroit district office on 3/15/2017 for reporting period July 1 to December 31, 2016 and on 9/15/2016 for reporting period January 1 to June 30, 2016. No deviations were reported.

VII. 2 – WER annual certification of compliance reports pursuant to General Conditions 19 and 20 of ROP Part A. were received by AQD Detroit district office on 3/15/2017 for calendar year 2016.

VII. 3 - VII. 4 – Test plans as well as reports of stack tests results have been submitted to AQD in the format prescribed by the applicable reference test method and within the 60-days timeframe required by the ROP. The most recent stack test for FGEngines are described in Part V of and under SI RICE NESHAP.

VII. 5 - Each semiannual report that describes the malfunction events includes a summary information with the date, the duration, the equipment affected, and the description of the malfunction. It also indicates if the procedures in the WER Start-up Shutdown Malfunction (SSM) were followed. There were no excursions or exceedances in the reporting period, the report includes a statement that there were no excursions and/or exceedances. Engine 4 seems to have been the engine with more problems in year 2016.

## **VIII. STACK/VENT RESTRICTION(S) - In Compliance**

The exhaust gases from the engine stacks listed in the ROP discharge unobstructed vertically upwards to the ambient air.

## **SI RICE NESHAP - Spark Ignition Stationary Reciprocating Internal Combustion Engines**

Engines 2 and 5 owned and operated by WER are SI RICE engines subject to the emissions standards and testing requirements in Title 40 of the Code of Federal Regulations (40 CFR) Part 63 Subpart ZZZZ (i.e. 40 CFR Part 63 Subpart ZZZZ). They are existing non-emergency, non-black start stationary RICE with a power output  $100 \leq \text{HP} \leq 500$ , which combust landfill gas and are located at a major source of hazardous air pollutant (HAP) emissions. Pursuant to 40 CFR Part 63 Subpart ZZZZ – Table 2c, and 63.6603 (a), an owner /operator of an existing SI RICE must limit CO emissions to an outlet concentration of 177 parts per million in a dry basis

corrected at 15% oxygen by volume (ppmvd). Engines 3 and 4 are not subject to the cited regulation; Engine 3 has been used as an emergency generator and Engine 4 has an output power above 500 HP

Initial performance test is required under SI RICE NESHAP for Engines 2 and 5. The verification of the CO emissions from each Caterpillar G-398, 4-stroke rich burn landfill gas fueled internal combustion engines was done through testing conducted on July 23, 2014 at the WER facility. AQD staff observed the emission test for Engine 2. The test was performed in accordance with the test plan and methods submitted to AQD on February 5, 2014 and approved on March 19, 2014. The test consisted of three (3), one-hour test runs during which the engine exhaust gas, at the outlet of the catalyst emission control system, was measured for O<sub>2</sub> content and CO concentration using instrumental analyzers and USEPA Methods 3A and 10. AQD inspector witnessed the test for Engine No. 2 and verified that the engine operating conditions (generator output in KW, landfill gas methane content in % volume, and the catalyst inlet temperature of the exhaust) were continuously recorded throughout each test period. The maximum rated output for each engine is 500 hp and each engine is connected to a separate generator that has the capacity to produce approximately 350 kW of electricity. The load was kept within 10% of the maximum load.

A report (dated August 12, 2014) presenting the testing results was submitted to AQD within 30 days after the test. The report was postmarked by AQD Detroit office on August 18, 2014.

The emission testing was performed in accordance with test plan. Each SI RICE generator output operated between 228 kW and 260 kW. The landfill gas used as fuel in the SI RICE contained between 54 % to 56 % methane by volume. The engine exhaust gas temperature at the catalyst was always greater than 900 F (within the proper range for the catalytic reaction) and recorded at 15-minute intervals.

The average results for the three-hour test runs measured at catalyst outlet, showed the following CO emission concentrations for each engine tested:

Engine 2 = 113 ppmvd - Corrected CO at 15 % O<sub>2</sub>-vol

Average Operating parameters for Engine 2: generator output = 257 kW, methane content = 54.9 %

Engine 5 = < 0.1 ppmvd – Corrected CO at 15 % O<sub>2</sub>-vol

Average Operating parameters for Engine 5: generator output = 229 kW, methane content = 54.9 %

The test results showed significant differences in the measured CO outlet concentrations for each engine. CO emissions were considerably higher for Engine 2 when compared to the CO emissions of Engine 5. This was attributed to the catalyst service life for each engine at the moment of the test. The catalyst for Engine 5 had been replaced shortly before the test was conducted, whereas the catalyst for Engine 2 was rather close to the end of its service life. However, both tested engines were in compliance with the CO emission limit of 177 ppmvd @ 15% O<sub>2</sub>. Based on the testing results WER modified the routine maintenance schedule for the catalysts, adopting a shorter catalyst changeout. According to SI RICE NESHAP -Table 2c and 63.6602, "Non-emergency Landfill Gas Fired Engine ≥ 500 hp" at Major Sources of HAP - as Engines 2 and 5 – only require Initial Performance Testing.

According to WER records, at the end of December 2016 the operating hours added up to 3742.8 hours for Engine 2, and a total of 5346.6 hours were recorded for Engine 5.

WER developed and keeps a routine maintenance plan for all engines and control devices. The WER operator maintains records of the daily, monthly, quarterly and annual activities. AQD requested a sample of the daily preventive maintenance check list. For details of the list of activities that are conducted in a daily basis please refer to the record dated 7/1/2016.

The SI RICE requirements for the emergency engine (Engine 3) are:

- Operate/maintain engine & control device per manufacturer's instructions or owner-developed maintenance plan
- May use oil analysis program instead of prescribed oil change frequency



- Use an hour meter and record hours of operation
- Keep records of maintenance

More specifically: Change oil/filter & inspect hoses/belts every 500 hours or annually; inspect air cleaner (CI) or spark plugs (SI) every 1,000 hours or annually.

During this inspection AQD did not collect records of the operating hours and maintenance activities for Engine 3. Those conditions will be evaluated in future inspections.

### **MI-ROP-M4782-2010a - SECTION 3 -WDI**

Part C of Section 3 outlines the terms and conditions that are specific to the individual emission units described below.

**EULANDFILLS:** This emission unit represents the general Municipal Solids Waste (MSW) Landfills. There are four contiguous sites in which municipal waste was co-disposed with hazardous waste. Site 2 uses an active landfill gas collection and control system. Site 1, Old Wayne, and Fons, has a passive landfill gas collection and passive vent flares. The control plan was approved by the U.S. EPA.

**EUALGCS:** Active Landfill Gas Collection System - This emission unit represents the active landfill gas collection system at the landfill that uses gas mover equipment to draw landfill gas from the wells and moves the gas to the treatment equipment.

**EUASBESTOS:** Any active or inactive asbestos disposal site.

**EUPLGCS:** Passive Landfill Gas Collection System - a landfill gas collection system that solely uses positive pressure within the landfill to move the landfill gas rather than using gas mover equipment.

**EUVENTFLARE:** Self-igniting (solar powered) flares - open combustor without enclosure or shroud.

The Landfill Federal Plan / Delegation of Authority:

- WDI landfills are subject to Part 62, subpart GGG – The Federal Plan (promulgated on November 8, 1999). The landfill meets the conditions cited on Section §62.14352, paragraph (a) (1) and (a) (2). Landfills were constructed before May 30, 1991, have not been modified after May 30, 1991, and accepted waste after November 8, 1987.
- Delegation of Authority - Section §62.14350 defines the scope and delegation of authority for the municipal solid waste landfills covered under this regulation. This section states in part: "...This municipal solid waste landfills Federal Plan applies to each designated facility as defined in Section §62.14352 of this subpart that is not covered by an EPA approved and currently effective State or Tribal plan". When the Federal Plan was promulgated, Michigan did not have an EPA approved and effective State Plan regulating this type of landfills. Therefore, WDI landfills have been governed by the requirements and compliance schedules of the Federal Plan. The delegated authority for its implementation is the EPA and not the MDEQ/AQD.
- Applicable Requirements - Part 62, Subpart GGG does not explicitly cite the provisions and regulatory requirements applicable to landfills; instead, it refers to the provisions included in Part 60, Subpart WWW - "Standards of Performance for MSW Landfills". Likewise, Section 3 of the Title V permit for US Ecology "MI-ROP-M4782-2010a", cites the regulatory requirements for WDI and the language refers to the provisions in Part 60, Subpart WWW.

For details about enforcement/compliance issues related to Section 3 of the ROP please refer to the AQD files for WDI MSW landfills. The revised Final Control Plan (FCP) submitted to EPA on February 4, 2004 for MSW landfills was approved by EPA on April 26, 2004. Additional revisions to the FCP, as well as EPA enforcement

**Landfill Gas Collection Control Systems Decommissioning Update:**

An EPA approval letter dated May 16, 2017 was received by AQD Detroit office for the decommissioning of the active and passive landfill gas collection control systems (GCCS). The letter explained in detail that WDI had satisfied the three criteria and reporting requirements specified in the applicable regulations. The EPA established October 6, 2017 as the approval date for the removal of the GCCS. However, for Master Cell IV in Site 2, EPA approved the decommissioning at an earlier date (May 2017) to allow for the construction of a new hazardous waste cell overlaying the current Cell IV. EPA's approval requires WDI to place a liner (with the specifications cited on the letter) on top of the current Cell IV before the construction of the new Subtitle C (Hazardous Waste -HW) landfill cell.

The construction of the new HW cell has been under discussion with AQD but at the time of completion of this report concrete actions have not transpired from the discussions.

**5. FACILITY COMPLIANCE DETERMINATION**

Based upon the on-site inspections and the review of the monitoring/reporting records and semiannual reports for year 2016, the Michigan Disposal Waste Treatment Plant (MDWTP) and Wayne Energy Recovery (WER) appears to be in substantial compliance with the special conditions and requirements cited on Section 1 and Section 2 of the ROP No. MI-ROP-M4782-2010a as well as the federal applicable requirements evaluated during this inspection. As noted in the report, some of the conditions in the ROP were either not assessed during this inspection or needed further evaluation to determine compliance. Those requirements will be evaluated in future inspections.

NAME OffandvoalDATE 5/29/2018 SUPERVISOR JK