

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

N160454296

<b>FACILITY:</b> Kent County Waste to Energy Facility		<b>SRN / ID:</b> N1604
<b>LOCATION:</b> 950 Market Ave SW, GRAND RAPIDS		<b>DISTRICT:</b> Grand Rapids
<b>CITY:</b> GRAND RAPIDS		<b>COUNTY:</b> KENT
<b>CONTACT:</b> Paul Kantola , Environmental Manager		<b>ACTIVITY DATE:</b> 06/23/2020
<b>STAFF:</b> Eric Grinstern	<b>COMPLIANCE STATUS:</b> Compliance	<b>SOURCE CLASS:</b> MAJOR
<b>SUBJECT:</b> Compliance Inspection		
<b>RESOLVED COMPLAINTS:</b>		

### FACILITY DISCRIPTION

The Kent County Waste-to-Energy (KWTE) Facility is located in the City of Grand Rapids, Kent County, Michigan. The plant is owned by Kent County Department of Public Works and operated by Covanta Energy. The facility is a 625 ton per day waste-to-energy facility firing municipal solid waste and natural gas operating two identical municipal solid waste mass burn waterwall combustors that can be co-fired with natural gas. The two combustors produce steam that is converted into electrical generation. Each combustor is equipped with a baghouse, a dry scrubber, a carbon injection system, and a selective non catalytic reaction system. Support equipment and operations on-site consist of ash and lime handling systems. The facility is located near the Grand River just southwest of downtown Grand Rapids. The immediate surrounding area is largely industrial.

The facility was constructed in 1989 and started operation in 1990. The facility operates 24/7/365. The total facility rated output is 18 megawatts, with an actual output of 11-13 megawatts after parasitic consumption. The facility receives approximately 900-1,100 tons of waste a day, of which approximately 550 tons is burned. Excess waste received at the facility is sent to the landfill.

### REGULATORY ANALYSIS

The facility is a Title V source, due to the potential to emit for criteria pollutants exceeds 100 tons and the potential to emit for a single HAP exceeds 10 tons and the potential to emit for combined HAPs exceeds 25 tons. The facility operates under Renewable Operating (ROP) Permit No. MI-ROP-N1604-2018, which was issued (renewed on May 14, 2018). The facility is subject to 40 CFR Part 62 Subpart FFF, Large Municipal Waste Combustors via State Rule 336.1973, NSPS Eb, via the emissions guidelines contained in NSPS Subpart Cb. The ROP is currently going through a reopening to replace references to 40 CFR Part 62 Subpart FFF with R336.1973. This is being done to account for corrections made to R 336.1973, which was re-promulgated on January 2, 2019.

### COMPLIANCE EVALUATION

The inspection was conducted on June 23, 2020, which coincided with the annual compliance and RATA testing at the facility. The compliance evaluation was completed upon receipt of the stack test results, which were received on August 13, 2020. Final acceptance of the stack test results is contingent upon the review and approval of AQD-TPU.

During the inspection, the facility was primarily represented by Brian Foster, Environmental Manager (Indianapolis), and Paul Kantola, Regional Environmental, Health and Safety Manager.

**SOURCE-WIDE CONDITIONS: FUGITIVE DUST CONTROL STRATEGY and CONSOLIDATED PLAN for WASTE and ODORS.**

### PROCESS/OPERATIONAL RESTRICTIONS/RECORDS

Requires the facility to implement the most recent Fugitive Dust Control Strategy as well as the most recent Consolidated Plan for Waste and Odors.

The Consolidated Plan for Waste and Odors outlines the facility's strategy for controlling odors. The plan is based on three elements, handling incoming MSW, facility design and operational procedures. The most recent plan was received on May 16, 2017. No recent odor complaints have been received by

**AQD regarding the facility. No odors were detected outside of the facility building while on the facility's property or off property.**

**The Fugitive Dust Control Strategy outlines potential sources of fugitive dust at the facility and control strategies to reduce fugitive dust. The most recent plan was received on May 16, 2017. As part of the facility's weekly environmental inspection, observations are conducted and recorded regarding odors, dust, roadways and roof vent fugitive dust. Weekly records for the six weeks prior to the June 23, 2020 were requested and received. Review of the records showed no unsatisfactory conditions documented. No fugitive dust was observed during the inspection.**

#### **EU-ASHSYSTEM**

**This emission unit includes the ash storage and handling equipment, and there is a separate ash handling system for each combustor. Rooftop ventilation of the enclosure is equipped with vent filters to control particulate emissions.**

#### **EMISSION LIMITS/RECORDKEEPING**

**The ash storage and handling equipment (including conveyor transfer points) is subject to visible fugitive ash emissions limit of up to 9 minutes per 3-hour period. The facility is required to conduct weekly visual inspections for opacity. The facility documents visible emission observations on the weekly environmental inspection form. Weekly records for the six weeks prior to June 23, 2020 were requested and received. Review of the records showed no fugitive dust from the roof vents being observed.**

**No visible emissions were observed during the inspections, however, the ash handling system was not operating at the time of the inspection.**

#### **TESTING/SAMPLING**

**On an annual basis, the facility is required to conduct visible emissions testing for fugitive ash from EU-ASHSYSTEM, utilizing Method 22. The last time that VE testing was conducted, for which the results have been received, was during the June 2020 compliance testing. VE readings were taken for three hours. No visible emissions were observed during the testing.**

#### **EU-LIMESYSTEM**

**Emission unit includes the pebble lime storage and handling equipment. The lime is contained in a vented storage silo that is equipped with a vent filter to control particulate emissions. The lime is used in the dry scrubber for acid gas control.**

#### **EMISSION LIMITS/MONITORING/RECORDKEEPING**

**Emission unit restricts particulate matter to 0.015 grains per dry standard cubic foot of exhaust gas, and opacity to 5%, based on a six minute average.**

**Compliance with the emission limits is based on the installation and proper operation of a bin vent filter on the storage silo. The facility is required to conduct monthly visual inspections for opacity while the unit is operating. Records were requested for the 6 months prior to the inspection. Review of the records showed that VE observations are conducted on a monthly basis during the receipt of lime. Additionally, the facility observed the lime silo on a weekly basis and records the results on the weekly environmental inspection report. Weekly records for the six weeks prior to June 23, 2020 were requested and received. Review of the weekly records, as well as the monthly records showed no unsatisfactory conditions documented.**

**During the inspection, no VE was observed from the lime storage silo.**

#### **EU-COOLINGTOWER**

**Emission unit includes the counter flow mechanical induced draft cooling tower with mist eliminators.**

**PROCESS/OPERATIONAL RESTRICTIONS**

KWTE is required to install and operate mist eliminators. KWTE stated that the cooling tower is equipped with mist eliminators.

**MONITORING/RECORDKEEPING**

KWTE is required to conduct and log semiannual inspections to confirm that mist eliminators are installed and operating properly.

Semiannual inspection records were requested for the 2 years prior to June 23, 2020. The records received showing that the inspections were conducted in June 2018, November 2018, May 2019, November 2019 and June 2020.

**FG-COMBUSTORS**

This flexible group includes the two identical municipal solid waste mass burn waterwall combustor units. Each unit is equipped with a baghouse, a dry scrubber, a carbon injection system and a selective non-catalytic reduction system.

**EMISSION LIMITS**

Compliance testing for ROP established emission limits are required to be conducted annually, alternating between Unit 1 and Unit 2. During the most recent testing, 2020, Unit 2 was tested. Additionally, a subset of pollutants for Unit 1 along with Subpart Cb testing was conducted for Unit 1. Review of the test results demonstrated compliance with the permitted emission limits. The report for the full compliance test conducted in 2019 for Unit 1 was previously reviewed and showed compliance with the permitted emission limits.

Results of testing conducted in June 2020 document compliance with the applicable limits, however, a final determination will not be made until completion of review by TPU, which is pending. Below is a summary of results for Unit 2.

Pollutant	Limit (each unit)	Actual Emissions	Compliance Yes/No
1. Particulate Matter (PM)	25 mg/dscm, corrected to 7% oxygen	2020 Stack Test Unit 2: 1.87 mg/dscm corrected to 7% oxygen	Yes
2. Particulate Matter (PM)	0.010 grain/dscf, corrected to 7% oxygen	2020 Stack Test Unit 2: 0.000816 gr/dscf corrected to 7% oxygen	Yes
3. Particulate Matter (PM)	2.6 pounds per hour	2020 Stack Test Unit 2: 0.216 pounds per hour	Yes
4./5. Opacity	10%	2020 Stack Test Unit 2:  COMS readings: 0%	Yes

6. Sulfur Dioxide (SO <sub>2</sub> )	29 ppmvd on a dry basis (ppmvd), or 25% of uncontrolled emissions, whichever is less stringent, corrected to 7% oxygen (24 hr)	2020 Stack Test Unit 2:  6 ppmvd	YES
7. Sulfur Dioxide (SO <sub>2</sub> )	50 ppmvd, or 25% of uncontrolled emissions, whichever is less stringent, but not to exceed 75 ppmvd, corrected to 7% oxygen (8 hr)	2020 Stack Test Unit 2:  7 ppmvd	YES
8. Sulfur Dioxide (SO <sub>2</sub> )	15 pounds per hour, or 25% of uncontrolled emissions, whichever is less stringent, but not to exceed 22.45 pounds per hour	2020 Stack Test Unit 2:  2.09 pounds per hour	YES
9. Oxides of Nitrogen (NO <sub>x</sub> )	205 ppmvd, corrected to 7% oxygen	2020 Stack Test Unit 2:  Unit 2: 190 ppmvd	YES
10. Oxides of Nitrogen (NO <sub>x</sub> )	400 ppmvd, corrected to 7% oxygen (1 hr)	2020 Stack Test Unit 2: 190 ppmvd	YES
11./12. Oxides of Nitrogen (NO <sub>x</sub> )	86 pounds per hour when firing	2020 Stack Test Unit 2:	YES

	<b>MSW (1 hr)</b>	<b>42.8 pounds per hour</b>	
<b>13. Oxides of Nitrogen (NO<sub>x</sub>)</b>	<b>350 ppmvd, corrected to 7% oxygen</b>	<b>2020 Stack Test Unit 2:  189 ppmvd</b>	<b>YES</b>
<b>14./15. Oxides of Nitrogen (NO<sub>x</sub>)</b>	<b>75.25 pounds per hour when firing MSW (3 hr)</b>	<b>2020 Stack Test Unit 2:  42.6 pounds per hour</b>	<b>YES</b>
<b>16. Carbon Monoxide (CO)</b>	<b>100 ppmvd, corrected to 7% oxygen (4 hr)</b>	<b>2020 Stack Test Unit 2:  5 ppmvd</b>	<b>YES</b>
<b>17. Carbon Monoxide (CO)</b>	<b>200 ppmvd, corrected to 7% oxygen (1 hr)</b>	<b>2020 Stack Test Unit 2:  6 ppmvd</b>	<b>YES</b>
<b>18./19. Carbon Monoxide (CO)</b>	<b>26.05 pounds per hour when firing MSW (1 hr)</b>	<b>2020 Stack Test Unit 2: 0.772 pounds per hour</b>	<b>YES</b>
<b>20. Carbon Monoxide (CO)</b>	<b>50 ppmvd, corrected to 7% oxygen (8 hr)</b>	<b>2020 Stack Test Unit 2: 5 ppmvd</b>	<b>YES</b>
<b>21./22. Carbon Monoxide (CO)</b>	<b>6.51 pounds per hour when firing MSW</b>	<b>2020 Stack Test Unit 2:  0.704 pounds per hour</b>	<b>YES</b>
<b>23. Hydrogen Chloride (HCl)</b>	<b>29 ppmvd, or 5% of uncontrolled emissions, whichever is less stringent, corrected to 7% oxygen</b>	<b>2020 Stack Test Unit 2: 13.2 ppmvd</b>	<b>YES</b>
<b>24. Hydrogen Chloride (HCl)</b>	<b>8.55 pounds per hour</b>	<b>2020 Stack Test Unit 2:  2.24 pph</b>	<b>YES</b>
<b>25. Total Fluorides</b>	<b>2.5 milligrams per dry standard cubic meter, corrected to 7% oxygen</b>	<b>2020 Stack Test Unit 2:  &lt;0.0852 milligrams per dscm</b>	<b>YES</b>
<b>26. Total Fluorides</b>	<b>0.28 pound per hour</b>	<b>2020 Stack Test Unit 2:  &lt;0.00994 pounds per hour</b>	<b>YES</b>

27. Non-methane Hydrocarbons	8.3 milligrams per dry standard cubic meter, corrected to 7% oxygen	2020 Stack Test Unit 2: 1.41 milligrams per dscm	YES
28. Non-methane Hydrocarbons	0.94 pound per hour <sup>2</sup>	2020 Stack Test Unit 2: 0.166 pounds per hour	YES
29. Lead (Pb)	0.400 milligram per dry standard cubic meter, corrected to 7% oxygen	2020 Stack Test Unit 2: 0.0689 milligram per dry standard cubic meter	YES
30. Lead (Pb)	0.87 milligram per dry standard cubic meter, corrected to 7% oxygen	2020 Stack Test Unit 2: 0.0689 milligram per dry standard cubic meter	YES
31. Lead (Pb)	0.10 pound per hour	2020 Stack Test Unit 2: 0.00287 pound per hour	YES
32. Mercury (Hg)	0.050 milligram per dry standard cubic meter, or 15% of potential emissions, whichever is less stringent, corrected to 7% oxygen	2020 Stack Test Unit 2: 0.0245 milligram per dscm	YES
33. Mercury (Hg)	0.61 milligram per dry standard cubic meter, corrected to 7% oxygen	2020 Stack Test Unit 2: 0.0245 milligram per dscm	YES
34. Mercury (Hg)	0.07 pound per hour	2020 Stack Test Unit 2: 0.00278 pounds per hour	YES
35. Sulfuric Acid Mist	39 milligrams per dry standard cubic meter, corrected to 7% oxygen	2020 Stack Test Unit 2: <0.0476 milligrams per dscm	YES
36. Sulfuric Acid	4.4 pounds per	2020 Stack Test	YES

Mist	hour	Unit 2:	
		0.00578 pounds per hour	
37. Arsenic (As)	6.2 micrograms per dry standard cubic meter, corrected to 7% oxygen	2020 Stack Test Unit 2: <2.54 micrograms per dscm	YES
38. Arsenic (As)	$7.0 \times 10^{-4}$ pound per hour	2020 Stack Test Unit 2: < $2.88 \times 10^{-4}$ pound per hour	YES
39. Beryllium (Be)	0.16 microgram per dry standard cubic meter, corrected to 7% oxygen	2020 Stack Test Unit 2: <0.0417 microgram per dry standard cubic meter	YES
40. Beryllium (Be)	$1.83 \times 10^{-5}$ pound per hour	2020 Stack Test Unit 2: < $4.78 \times 10^{-6}$ pound per hour	YES
41. Cadmium (Cd)	35 micrograms per dry standard cubic meter, corrected to 7% oxygen	2020 Stack Test Unit 2: 5.04 micrograms per dscm	YES
42. Cadmium (Cd)	37 micrograms per dry standard cubic meter, corrected to 7% oxygen	2020 Stack Test Unit 2: 5.04 micrograms per dscm	YES
43. Cadmium (Cd)	$4.17 \times 10^{-3}$ pound per hour	2020 Stack Test Unit 2: $5.73 \times 10^{-4}$ pound per hour	YES
44. Hexavalent Chromium	4.2 micrograms per dry standard cubic meter, corrected to 7% oxygen	2020 Stack Test Unit 2: 1.02 micrograms per dry standard cubic meter	YES
45. Hexavalent Chromium	$4.69 \times 10^{-4}$ pound per hour	2020 Stack Test Unit 2: $1.19 \times 10^{-4}$ Pound per hour	YES
46. Municipal	30 nanograms	2020 Stack Test	YES

Waste Combustor Organic Compounds, expressed as total mass dioxins/furans	per dry standard cubic meter, corrected to 7% oxygen	Unit 2: 2.32 nanograms per dscm	
47. Total Polychlorinated Dibenzo-p-dioxins (PCDD) and Total Polychlorinated Dibenzo-furans (PCDFs) including all tetra through octa isomers	3.0 nanograms per dry standard cubic meter, expressed as 2,3,7,8 TCDD toxic equivalents using factors in Appendix 5, corrected to 7% oxygen	2020 Stack Test Unit 2: 0.0121 nanograms per dscm	YES
48. Total Polychlorinated Dibenzo-p-dioxins (PCDD) and Total Polychlorinated Dibenzo-furans (PCDFs) including all tetra through octa isomers	$3.38 \times 10^{-7}$ pound per hour, expressed as 2,3,7,8 TCDD toxic equivalents using factors in Appendix 5	2020 Stack Test Unit 2: $1.37 \times 10^{-9}$ pound per hour	YES

**MATERIAL LIMITS**

**Steam Load**

The steam load of each combustor is limited to maximum 81,000 pounds of steam per hour, based on a four-hour block average. The MACT further limits the steam flow rate to 10% greater than that achieved during stack testing. Since the maximum four-hour block average, plus 10%, would be greater than 81,000 pounds, the state limit of 81,000 pounds is the maximum allowed steam rate.

The steam load average at the time of the inspection was 77,300 pounds for Unit 1, and 75,800 pounds for Unit 2 (per hour based on a four-hour average). The facility provided records documenting that the highest (four-hour block average) steam load for the previous 12 months for Unit 1 was 78,700 pounds and the highest (four-hour block average) steam load for the previous 12 months for Unit 2 was 78,500 pounds.

The observed/recorded steam loads are below the established state limit of 81,000 pounds for each unit.

**Natural Gas Usage**

Each combustor is limited to 59,524 cubic feet per hour (scfh).

Records of the highest hourly usage for the previous 12 months was requested and supplied by the



facility. Unit 1 had an hourly high of 59,136 scfh ( based on 985.6 cubic feet per minute). Unit 2 had an hourly high of 58,980 scfh ( based on 983 cubic feet per minute).

Natural gas usage is limited to 104,000,000 cubic feet per calendar year per unit.

Natural gas usage for 2019, per records provided by the facility (MAERS) was: Unit 1: 7,480,000 cubic feet, Unit 2: 5,022,000 cubic feet

### Baghouse Temperature

The maximum baghouse temperature established during stack testing based on a 4-hour arithmetic average, with the allowed +30°F, is 352 °F for Unit 1 and Unit 2

During the inspection, the observed baghouse temperature for Unit 1 was 319 °F and 320 °F for Unit 2. Review of the requested records for the time period of 7 days prior to testing and the highest temperatures recorded within 6 months prior to the date of the inspection, showed there to be no 4-hour temperature averages over the established maximums for either Unit 1 or Unit 2. The highest documented temperature for Unit 1 was 328 °F and the highest temperature for Unit 2 was 333 °F

### Baghouse Carbon Injection

During testing conducted in 2019, the average carbon feed rate, based on an eight hour average, was established at 9.4 pounds per hour.

During testing, it was observed that the carbon feed rate was 9.4 pounds on an 8hr average, for both Unit 1 and Unit 2. Review of the lime injection records for the 7 days prior to the date of the inspection showed injection rates below the minimum of 9.4 pounds per hour (9.2 pounds per hour). The federal rules allow for the facility to request for the suspension of the carbon injection limits for a period of two weeks prior to and during compliance testing. The facility requested and received approval for the suspension of the carbon injection limits.

### PROCESS/OPERATIONAL RESTRICTIONS

Process and operational restrictions include the following:

- dry scrubber and baghouse installed, maintained and operating
- selective non-catalytic reduction system installed, maintained and operating
- carbon injection system installed, maintained and operating
- only sweet natural gas as an auxiliary fuel
- establish the maximum unit load during D/F testing using the highest 4-hour average
- establish the particulate matter control device temperature during testing using a 4-hour block period plus 30 degrees.

Based on this inspection and information provided by the facility, the facility is complying with the process/operational restrictions.

### DESIGN/EQUIPMENT PARAMETERS

The facility is required to install a lime slurry feed that automatically modulated and interfaces with the SO<sub>2</sub> CEMS as required.

The lime slurry feed rate has an established feed rate of 20 pounds of lime per ton of waste fed. This rate is based on controlling the pH in the ash. The facility monitors the specific gravity of the lime slurry every 6 hours and adjusts the flow to maintain 20 pounds of lime per ton of waste. The lime feed system is also tied to the SO<sub>2</sub> CEMS. The lime slurry feed rate automatically increases with an increase in SO<sub>2</sub> emissions. The feed rate returns to normal when the SO<sub>2</sub> emissions decrease.

The permittee is also required to installed, calibrate, maintained and operated a continuous temperature monitoring device at the inlet of each baghouse.

Based on this inspection and provided records, the facility is in compliance with the above requirements.

#### TESTING/SAMPLING

On an annual basis, the permittee conducts testing as required by the permit, alternating between Unit 1 and Unit 2 each year to verify compliance with the emission limits. All stack test methodology is reviewed and evaluated by the AQD Technical Programs Unit staff, who attend testing as well to ensure its validity.

#### MONITORING/RECORDKEEPING

Much of the monitoring/recordkeeping is evaluated by the AQD Technical Programs Unit with regards to the Continuous Emissions Monitoring Systems (CEMS) and those requirements. At this time, it is believed that all the CEMS requirements are being met.

In addition to the CEMs and COMs requirements, monitoring of the process and control equipment paraments are detailed. Based on this inspection, including the information provided and reported by the facility, they appear to be in compliance with the monitoring and recordkeeping requirements.

#### REPORTING

The facility is submitting the required reports in a timely manner.

#### STACK/VENT RESTRICTIONS

The stacks were not physically measured however no changes have been made.

#### FG-CIRICEMACT

Currently the facility operates one engine subject to the compression ignition reciprocating internal combustion engine (RICE) maximum achievable control technology (MACT). This engine has a non-resettable hour meter. Oil changes are conducted quarterly whether required or not, and it is operated weekly to ensure reliability.

#### CONCLUSION

Kent County Waste-to-Energy Facility appeared to be in compliance with applicable air quality rules and regulations at the time of the inspection.

Note: A final determination regarding the acceptance of the June 2020 performance testing is pending until the completion of review by TPU.

NAME Eric Grinstern

DATE 8/31/2020

SUPERVISOR HH