

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

N160444920

FACILITY: Kent County Waste to Energy Facility		SRN / ID: N1604
LOCATION: 950 Market Ave SW, GRAND RAPIDS		DISTRICT: Grand Rapids
CITY: GRAND RAPIDS		COUNTY: KENT
CONTACT: Terry Madden , Environmental Compliance Specialist		ACTIVITY DATE: 06/26/2018
STAFF: April Lazzaro	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: Unannounced, scheduled inspection.		
RESOLVED COMPLAINTS:		

Air Quality Division Staff, April Lazzaro arrived for an unannounced, scheduled inspection and met with Terry Madden, Environmental Specialist for Covanta Kent.

**FACILITY DESCRIPTION**

The Kent County Waste-to-Energy (KWTE) Facility power plant is located in Grand Rapids, Kent County, Michigan. The plant is owned by the 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 on the Grand River just southwest of downtown Grand Rapids. The immediate surrounding area is largely industrial.

**COMPLIANCE EVALUATION**

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

The language in the source-wide conditions were updated during the recent ROP renewal to include the handling of hazardous or unacceptable waste as was the intend during the Permit to Install process. Additionally, during EPA review, a comment was made that the permit conditions reference recordkeeping requirements, but the plans themselves do not. KWTE conducts weekly fugitive dust inspections and is in the process of amending the plans to include this formally. Additionally, in December 2017, KWTE submitted a draft amendment to the Consolidated Plan for Waste and Odors, but did not submit it with the responsible officials certification form. KWTE will submit both by the due date of July 27, 2018. Attached is an example of the weekly visible observation for fugitive emissions that is carried out by facility staff and signed off on. The facility also owns a street sweeper that they utilize on roadways when needed.

**EMISSION UNIT CONDITIONS:**

**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.

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.

KWTE conducts weekly visual inspection during operation and annual visible emissions performance tests on EU-ASHSYSTEM. Additionally, KWTE always has an observer assessing the system during receipt of product into the silo. This is recorded in the weekly environmental tasks system in place at KWTE, which I observed a record of while on site. This system alerts staff to requirements as entered into the system and requires action to verify the task has been completed. KWTE keeps the hard copy with staff initials as signoff on tasks.

## EU-LIMESYSTEM

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

KWTE conducts monthly visual inspections during operation and a record of this is kept in the weekly environmental tasks system. According to the site Malfunction Abatement Plan, all maintenance procedures and activity is also logged in the environmental tasks system, which I observed a record of while on site.

## EU-COOLINGTOWER

This emission unit includes the counter flow mechanical induced draft cooling tower with mist eliminators.

KWTE has installed mist eliminators as required on EU-COOLINGTOWER. KWTE conducts the required semi-annual inspections on the mist eliminators and keeps a record of the inspections in the environmental tasks system, which I observed a record of while on-site.

## 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

Pollutant	Limit (each unit)	Actual Emissions	Compliance Yes/No
1. Particulate Matter (PM)	25 mg/dscm, corrected to 7% oxygen	Unit 1 2017 Stack Test: 5.63 mg/dscm corrected to 7% oxygen	Yes
2. Particulate Matter (PM)	0.010 grain/dscf, corrected to 7% oxygen	Unit 1 2017 Stack Test: 0.00246 grain/dscf corrected to 7% oxygen	Yes
3. Particulate Matter (PM)	2.6 pounds per hour	Unit 1 2017 Stack Test: 0.665 pounds per hour	Yes
4. Opacity	10%	Unit 1 2017 Stack Test/ COMS readings: 1.9%	Yes
5. Sulfur Dioxide (SO <sub>2</sub> )	29 ppmv on a dry basis (ppmvd), or 25% of uncontrolled emissions, whichever is less stringent, corrected to 7% oxygen	CEMS Reading Unit 1: 5 ppmvd  Unit 2: 4 ppmvd	YES

Pollutant	Limit (each unit)	Actual Emissions	Compliance Yes/No
6. 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	CEMS Reading Unit 1: 4 ppmvd  Unit 2: 5 ppmvd	YES
7. 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	Unit 1 2017 Stack Test/ CEMS readings: 1.74 pounds per hour  (Emissions calculated using flowrate from metals train and RATA info.)	YES
8. Oxides of Nitrogen (NO <sub>x</sub> )	205 ppmvd, corrected to 7% oxygen	CEMS Reading Unit 1: 175 ppmvd Unit 2: 184 ppmvd	YES
9. Oxides of Nitrogen (NO <sub>x</sub> )	400 ppmvd, corrected to 7% oxygen	CEMS Reading Unit 1: 184 ppmvd Unit 2: 183 ppmvd	YES
10. Oxides of Nitrogen (NO <sub>x</sub> )	86 pounds per hour when firing MSW	Unit 1 2017 Stack Test/ CEMS readings: 37.1 pounds per hour	YES
11. Oxides of Nitrogen (NO <sub>x</sub> )	350 ppmvd, corrected to 7% oxygen	CEMS Reading: Unit 1: 177 ppmvd Unit 2: 191 ppmvd	YES
12. Oxides of Nitrogen (NO <sub>x</sub> )	75.25 pounds per hour when firing MSW	Unit 1 2017 Stack Test/ CEMS readings: 36.9 pounds per hour	YES
13. Carbon Monoxide (CO)	100 ppmvd, corrected to 7% oxygen	CEMS Reading: Unit 1: 12 ppmvd Unit 2: 18 ppmvd	YES
14. Carbon Monoxide (CO)	200 ppmvd, corrected to 7% oxygen	CEMS Reading: Unit 1: 10 ppmvd Unit 2: 17 ppmvd	YES

<b>Pollutant</b>	<b>Limit (each unit)</b>	<b>Actual Emissions</b>	<b>Compliance Yes/No</b>
15. Carbon Monoxide (CO)	26.05 pounds per hour when firing MSW	Unit 1 2017 Stack Test/ CEMS readings: 0.78 pounds per hour	YES
16. Carbon Monoxide (CO)	50 ppmvd, corrected to 7% oxygen	CEMS Reading: Unit 1: 8 ppmvd Unit 2: 13 ppmvd	YES
17. Carbon Monoxide (CO)	6.51 pounds per hour when firing MSW	Unit 1 2017 Stack Test/ CEMS readings: 0.35 pounds per hour	YES
18. Hydrogen Chloride (HCl)	29 ppmvd, or 5% of uncontrolled emissions, whichever is less stringent, corrected to 7% oxygen	Unit 1 2017 Stack Test: 18.4 ppmvd	YES
19. Hydrogen Chloride (HCl)	8.55 pounds per hour	This limit was tested for in 2018	TBD
20. Total Fluorides	2.5 milligrams per dry standard cubic meter, corrected to 7% oxygen	Unit 1 2017 Stack Test: 0.104 milligrams per dscm	YES
21. Total Fluorides	0.28 pound per hour	Unit 1 2017 Stack Test: 0.0123 pounds per hour	YES
22. Non-methane Hydrocarbons	8.3 milligrams per dry standard cubic meter, corrected to 7% oxygen	Unit 1 2017 Stack Test: 0.810 milligrams per dscm	YES
23. Non-methane Hydrocarbons	0.94 pound per hour <sup>2</sup>	Unit 1 2017 Stack Test: 0.0929 pounds per hour	YES
24. Lead (Pb)	0.400 milligram per dry standard cubic meter, corrected to 7% oxygen	Unit 2 2017 Stack Test: 0.00969 milligram per dry standard cubic meter	YES

Pollutant	Limit (each unit)	Actual Emissions	Compliance Yes/No
25. Lead (Pb)	0.87 milligram per dry standard cubic meter, corrected to 7% oxygen	Unit 2 2017 Stack Test: 0.000969 milligram per dry standard cubic meter	YES
26. Lead (Pb)	0.10 pound per hour	Unit 2 2017 Stack Test: 0.00114 pound per hour	YES
27. Mercury (Hg)	0.050 milligram per dry standard cubic meter, or 15% of potential emissions, whichever is less stringent, corrected to 7% oxygen	Unit 2 2017 Stack Test: 0.000960 milligram per dscm	YES
28. Mercury (Hg)	0.61 milligram per dry standard cubic meter, corrected to 7% oxygen	Unit 2 2017 Stack Test: <0.000655 milligram per dscm	YES
29. Mercury (Hg)	0.07 pound per hour	Unit 1 2017 Stack Test: 0.000113	YES
30. Sulfuric Acid Mist	39 milligrams per dry standard cubic meter, corrected to 7% oxygen	Unit 1 2017 Stack Test: <0.0287 milligrams per dscm	YES
31. Sulfuric Acid Mist	4.4 pounds per hour	Unit 1 2017 Stack Test: <0.00344 pounds per hour	YES
32. Arsenic (As)	6.2 micrograms per dry standard cubic meter, corrected to 7% oxygen	Unit 1 2017 Stack Test: 0.350 micrograms per dscm	YES
33. Arsenic (As)	$7.0 \times 10^{-4}$ pound per hour	Unit 1 2017 Stack Test: $4.11 \times 10^{-4}$ pound per hour	YES
34. Beryllium (Be)	0.16 microgram per dry standard cubic meter, corrected to 7% oxygen	Unit 1 2017 Stack Test: <0.0317 microgram per dry standard cubic meter	YES

Pollutant	Limit (each unit)	Actual Emissions	Compliance Yes/No
35. Beryllium (Be)	1.83 x 10 <sup>-5</sup> pound per hour	Unit 1 2017 Stack Test: <3.73 x 10 <sup>-06</sup>	YES
36. Cadmium (Cd)	35 micrograms per dry standard cubic meter, corrected to 7% oxygen	Unit 1 2017 Stack Test: 1.71 micrograms per dscm	YES
37. Cadmium (Cd)	37 micrograms per dry standard cubic meter, corrected to 7% oxygen	Unit 1 2017 Stack Test: 1.71 micrograms per dscm	YES
38. Cadmium (Cd)	4.17 x 10 <sup>-3</sup> pound per hour	Unit 1 2017 Stack Test: 4.17 x 10 <sup>-3</sup> pound per hour	YES
39. Hexavalent Chromium	4.2 micrograms per dry standard cubic meter, corrected to 7% oxygen	Unit 1 2017 Stack Test: 0.833 micrograms per dry standard cubic meter	YES
40. Hexavalent Chromium	4.69 x 10 <sup>-4</sup> pound per hour	Unit 1 2017 Stack Test: 9.79 x 10 <sup>-5</sup> Pound per hour	YES
41. Municipal Waste Combustor Organic Compounds, expressed as total mass dioxins/furans	30 nanograms per dry standard cubic meter, corrected to 7% oxygen	Unit 1 2017 Stack Test: 1.00 nanograms per dscm	YES
42. 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	Unit 1 2017 Stack Test: 0.00856 nanograms per dscm	YES

Pollutant	Limit (each unit)	Actual Emissions	Compliance Yes/No
43. Total Polychlorinated Dibenzop-dioxins (PCDD) and Total Polychlorinated Dibenzofurans (PCDFs) including all tetra through octa isomers	3.38. x 10 <sup>-7</sup> pound per hour, expressed as 2,3,7,8 TCDD toxic equivalents using factors in Appendix 5	Unit 1 2017 Stack Test: 1.01 x 10 <sup>-9</sup> pound per hour	YES

All emissions data presented indicates compliance with the emission limits.

#### MATERIAL LIMITS

The steam load of each combustor is limited to 81,000 pounds of steam per hour. The steam load average at the time of the inspection and 2018 stack testing was 76,300 pounds of steam per hour based on a four-hour average.

The average steam load during the 2017 stack test for Unit 1 was 75,000 pounds, based on the four-hour dioxin furan testing.

Natural gas usage was requested and received timely. Each combustor is limited to 59,524 cubic feet per hour (scfh) and the maximum amount of hourly gas use in the previous 12-months for Unit 1 was: 58,440 scfh, and Unit 2 was: 58,320 scfh. These values indicate compliance. Each unit has a limiter on it so that they can not go over the hourly limit.

Natural gas usage is also limited to 104,000,000 cubic feet per calendar year per unit. The natural gas use during the time frame of July 1, 2016 through July 1, 2018 for Unit 1 was: 12,012,000 cubic feet, and Unit 2 was: 17,760,000 cubic feet. The two year usage is below the limit for one year.

The highest 4-hour average steam rate during the time frame of August 17, 2017 to July 26, 2018 for Unit 1 and Unit 2 was: 77,600 cubic feet indicating they are within the 110% (83,250 cubic feet) of the highest steam rat during the dioxin/furan performance test.

The maximum particulate matter control device (baghouse) temperature was determined during the 2017 stack test based on a 4-hour arithmetic average and was 322°F. This is where the limit is set for the year. The highest recorded baghouse inlet temperature for the time frame of August 1, 2017 through July 26, 2018 for Unit 1: 334°F, and Unit 2: 337°F. While the temperature averages are higher than during testing the permit states that the temperature is limited to not more than 30°F more than the most recent test and as such they indicate compliance with the limit.

#### PROCESS/OPERATIONAL RESTRICTIONS

All process/operational restrictions have been met during the compliance period.

#### DESIGN/EQUIPMENT PARAMETERS

The lime slurry feed is automatically modulated and interfaces with the SO<sub>2</sub> CEMS as required. The permittee has installed, calibrate, maintained and operated a continuous temperature monitoring device at the inlet of each baghouse. At the time of the inspection, Unit 2 was at 313°F.

#### 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. The aim to operate at maximum

steam load ~77,000 lbs steam/hour, and will pause testing if the load goes below 72,000 to ensure the best data. As listed in the emission limits table above, Kent Waste to Energy is in compliance with emissions 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.

All required operational parameters are recorded during the testing, however reporting of the information could be made clear. This has been relayed to Mr. Madden for correction going forward.

#### **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.

The facility maintains a certified facility operator on-site as required by the permit. All information pertaining to operator certification is maintained and is available for review.

The facility maintains a record of the occurrence and duration of any startUp, shutdown, or malfunction at the affected facility and the information is available for review. When necessary, the facility has submitted a Rule 912 Excess Emissions report as required.

The facility maintains all records as required by the Malfunction Abatement Plan, which was reviewed on-site and some of which are attached. They recently modified the language in the plan to ensure clarity that records are required and are being maintained.

The newly established Compliance Assurance Monitoring (CAM) parameters used for particulate matter monitoring are being met, and no excursions or exceedance have been reported. The facility is maintaining CAM appropriate monitoring data and monitor performance data as required.

#### **REPORTING**

The facility is submitting the required reports in a timely manner. As indicated in an e-mail (attached), some additions to the stack test report are required. This includes an easy to find tab for operational parameters such as slurry flow rate, baghouse pressure drop etc. Quarterly Excess Emissions and Monitoring Systems Performance Reports are timely and jointly reviewed by district staff and Technical Programs Unit staff.

#### **STACK/VENT RESTRICTIONS**

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

#### **OTHER REQUIREMENTS**

The facility is maintaining records of the other requirements such as the site-specific operating manual located in the control room and appropriate certifications for all operators. The permittee has not requested any changes in the maximum allowed steam load level, and I was told that the feed rate has also remained the same throughout the years.

We discussed information I obtained from the EPA Enforcement and Compliance History Online regarding the facility. I showed Mr. Madden how the reported NO<sub>x</sub> emissions went from 374,900 lbs in 2008 to 683,958 lbs in 2017. Mr. Madden explained that the facility had somehow accidentally plugged in the incorrect elemental weight for NO<sub>x</sub>, and upon review corrected it. That change caused the "apparent" increase in NO<sub>x</sub> emissions, but there was no operational change that corresponded with it. The reality is that the emissions didn't change, just the number reported did.

Attached is additional data that was printed from the permitted data screen during the inspection that identifies control device parameters etc. and indicate compliance.

#### **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 was observed



in the engine house and has a non-resettable hour meter. Oil changes are conducted quarterly whether required or not, and it is operated weekly to ensure reliability.

**FG-CIRICENSPS**

Currently the facility operates one engine subject to the CIRICE new source performance standard (NSPS). This engine was observed in the engine house and is also equipped with a non-resettable hour meter. Oil changes are conducted quarterly whether required or not, and it is operated weekly to ensure reliability.

**Appendix 1a**

Appendix 1a was incorporated into the permit at origination so that there would be no differences in terminology or how to interpret and determine compliance with the various requirements.

**2018 STACK TESTING**

Instantaneous data was received during the inspection, which coincided with the 2018 stack testing and Relative Accuracy Test Audit. Attached is the data collected. No issues with plant operations were identified during the testing.

**CONCLUSION**

Kent County Waste-to-Energy Facility was in compliance at the time of the inspection.

NAME 

DATE 7-30-18

SUPERVISOR 