

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

B614550302

FACILITY: DTE Electric Company - Greenwood Energy Center		SRN / ID: B6145
LOCATION: 7000 KILGORE ROAD, AVOCA		DISTRICT: Southeast Michigan
CITY: AVOCA		COUNTY: SAINT CLAIR
CONTACT: Jason Roggenbuck, Staff Environmental Engineer		ACTIVITY DATE: 08/27/2019
STAFF: Kaitlyn Leffert	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: FY2019 Scheduled Inspection. Based on the inspection and review of the required recordkeeping, Greenwood Energy Center appears to be in compliance all conditions of ROP-B6145-2018 and all applicable air quality rules and regulations.		
RESOLVED COMPLAINTS:		

On August 27, 2019, I conducted a scheduled inspection of DTE Greenwood Energy Center (B6145), located at 7000 Kilgore Road, Avoca, MI. Greenwood Energy Center is an electric generating facility which operates a 785-Megawatt gross output boiler-electric generator, two auxiliary boilers, and three natural gas-fired combustion turbine electric generator peaking units. The purpose of the inspection was to determine the facility's compliance with the requirements of the Federal Clean Air Act; Article II, part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451); the administrative rules; and the conditions of Renewable Operating Permit (ROP) No. MI-ROP-B6145-2018.

Greenwood Energy Center's ROP is divided into two sections. Section 1 covers the main electric generating unit, which includes the main boiler, auxiliary boilers, cold cleaners, and gasoline dispensing tanks. Section 2 covers the three natural gas-fired peaking units.

Michigan Department of Environment, Great Lakes, and Energy (EGLE) staff Bob Elmouchi and I arrived at the facility and were greeted by Jason Roggenbuck, Senior Engineer, and Alexis Thomas, Associate Engineer. We first went over the required recordkeeping for both sections of the ROP, followed by a walk-through of the main plant facility and an inspection of the three peaking units on the property.

#### Recordkeeping: Section 1

Attached to this report are fuel data records for Greenwood Energy Center, an SDS for the No. 2 Fuel Oil, daily VE records for the East Auxiliary Boiler, the cold cleaner inventory, gasoline throughput records, and fuel usage and emission records for the Peaker Units. The required records for each emission unit and flexible group are further discussed below.

#### *Main Boiler*

Greenwood Energy Center is required to maintain monthly records of heating value of oil fuels, heat input to the main boiler from natural gas and from oil fuels, sulfur content of oil fuels, total operating hours, and the quantity of fuels burned in the main boiler (EUBOILER1, S.C. VI.2). The fuel use records indicate that natural gas is the primary fuel burned in the main boiler and that No. 2 is burned occasionally in small quantities. No. 6 fuel oil was only burned during the month of July during the PM stack testing.

Records of the sulfur content of the oil fuels indicate that the No.2 fuel oil burned at the facility has a sulfur content of 0.001% and the No. 6 fuel oil burned is 0.62% sulfur. The specification used oil has a sulfur content of 0.87%, but this fuel is not currently burned in the boiler. S.C. I.1 sets a sulfur dioxide emission limit of the fuel to 0.80 lb per million Btu heat input. Compliance with this emission limit is based upon the CEMS. According to footnote (a) of the emission limit table, the emission limit is considered equivalent to using oil fuels with 0.78% sulfur content and a heat value of 19,390 Btu's per pound. The heat value of the No.6 fuel oil is 17,490 Btu's per pound. Accounting for the differences in heat value, the prorated sulfur content of No. 6 fuel oil is 0.69% sulfur content using a heat value of 19,390 Btu's per pound. This prorated sulfur content appears to satisfy S.C. I.1.

The ROP contains material limits on the quantity of halogens, lead, cadmium, chromium, arsenic, and PCBs in any specification used oil burned in the main boiler. The facility is not currently using any specification used oil, which is confirmed by the fuel use data records provided by the facility. Mr. Roggenbuck informed me that specification used oil may be used again in the boiler in the future, particularly once coal-fired power plants in the area close down.

#### *East and West Auxiliary Boilers*

Greenwood is required to keep monthly records of hours of operation, total volume of natural gas consumed, and heat input expressed in MMBtu for the East and West Auxiliary boilers. During the previous inspection in 2017, it was identified that the West Auxiliary boiler was no longer operating. Mr. Roggenbuck informed me that this is still the case and that there is no intention to run that unit. According to Mr. Roggenbuck, the unit would need to be fully serviced and repaired before it could run again. The facility still maintains records for this unit, which all indicate that there were zero hours of operation and zero fuel processed in the West Auxiliary boiler.

The East Auxiliary boiler is still regularly operated, and all required records were supplied. The east auxiliary boiler uses natural gas. In July 2019, the boiler ran for a total of 29 hours and the volume of natural gas consumed was 547 KSCF (Kilo Standard Cubic Feet). The heat input in July 2019 was 571 MMBTU.

The facility is required to make regular visible emission observations at the unit and to keep records of these observations. The permit specifies a schedule of when these observations must be made based on the operating hours of the unit. The facility chooses to make these observations more frequently than is required and does them on a daily basis. The daily VE observations for January through July of 2019 are attached. There were not any visible emissions detected during the observations. The facility has a plan in place if visible emissions are detected, as is required by the permit.

#### *Cold Cleaners*

The ROP contains a flexible group for cold cleaners at Greenwood Energy Center. The facility operates two cold cleaners that operate at room temperature and use Zep Dyna 143 as a solvent. All required recordkeeping for the cold cleaners was supplied and is attached. According to Mr. Roggenbuck, the cold cleaners are serviced on an as needed basis. When filters start to get clogged, the filters are changed and the solvent is sent off for proper disposal.

#### *Rule 290 Exempt Sources*

The facility is required to keep an inventory of emission units that are claiming a permit exemption under Rule 290, as well as records of the type and quantity of air contaminants emitted from these units. The facility does not have any emission units covered by this permit exemption, so did not have any such records.

#### *Gasoline Distribution Area MACT*

The facility has a gasoline storage tank that is used to fuel vehicles at the energy center. This gasoline storage tank is subject to the Gasoline Distribution Area MACT, which limits total monthly gasoline throughput to 10,000 gallons. The monthly gasoline throughput for July 2019 was 209.8 gallons. The month with the highest throughput during the period of January 2018 through July 2019 was in April 2019 when the gasoline throughput was 747.9 gallons. Records indicate that the facility is well under the permitted limit of 10,000 gallons/month.

#### **Recordkeeping: Section 2**

Section 2 of the ROP covers three natural gas-fired combustion turbine peaking units, which comprise one flexible group in the ROP (FG-CTGS). The ROP has 12-month rolling emission limits for nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), formaldehyde (HCHO), and particulate matter (PM-10). Based on the records provided by Greenwood Energy Center, the annual emissions of these pollutants are well below the permitted emission limits. The following table summarizes the permitted 12-month rolling average permit emission limits, the 12-month rolling average as of July 2019, as well as the highest recorded 12-month rolling average for FG-CTGS. The highest 12-Month rolling average occurred in February 2019 for all pollutants.

Table 1: Annual Emission Limits Summary for FG-CTGS

Pollutant	12-Month Rolling Average Emission Limit (tpy)	12-Month Rolling Average as of July 2019 (tpy)	Highest 12-Month Rolling Average (tpy)
Nitrogen Oxides	522	20.622	28.645
Carbon Monoxide	856	23.86	32.81
Formaldehyde	9.9	0.3	0.42
Particulate Matter	102	2.27	3.15

FG-CTGS also has a visible emission limit of 10% over a 6-minute average (S.C. I.4) and is required to maintain records of visible emission readings (S.C. VI.4). I reviewed the visible emission records for the Peaker Units and found that no visible emissions had been observed.

The ROP limits natural gas usage to 27,300 million cubic feet per 12-month rolling time average for FG-CTGS (S.C. II). Records of natural gas usage indicate that Greenwood is far below the permitted material limits in the ROP for FG-CTGS. In particular, the 12-month rolling average natural gas usage in July 2019 was 1,410.69 million cubic feet. The highest reported annual average was February and was 1,946.45 million cubic feet.

FG-CTGS S.C. III.2 limits total hours of startup, shutdown, and malfunction to 500 hours per 12-month rolling period. Records supplied by the facility demonstrate compliance with this requirement. Total hours of startup, shutdown, and malfunction in July 2019 were 52.8 hours for CTG 11-1 and 11-2, and 61.4 hours for CTG 12-1.

FG-CTGS S.C. VI.5 requires the facility to maintain records of the capacity factor for each individual peaking unit. If the capacity factor for a single year exceeds 20% for an individual unit, or exceeds 10% averaged over three calendar years, then the facility is required to install a Continuous Emission Monitor System (CEMS) for NOx. The highest capacity factor at any single unit for a single year in the previous three years was 7.2%. The three-year average for the three units were 4.4%, 4.5%, and 5.0%. Based on the capacity factors, Greenwood does not need to install a CEMS for NOx.

### **Site Inspection**

Following records review, Mr. Roggenbuck and Ms. Thomas led AQD staff on a tour of the Greenwood Energy Center. We first observed the main boiler room. Part of the boiler was undergoing maintenance, so the boiler was not operating during the inspection.

Mr. Roggenbuck explained that Greenwood Energy Center is considered a "cycling plant", which means that operation of the plant varies based on system demand. In contrast to a peaker plant, which runs during peak demand times, Greenwood operates to fill long-term gaps in electricity demand. For instance, a peaker plant may run only during peak afternoon hours, while Greenwood may need to run for weeks or months at a time to help meet electricity demand. Due to the shutdown and phaseout of coal-fired electric generating facilities, Greenwood has been operating more in the last two years than in previous years.

I observed the East and West Auxiliary boilers. Observation of these units confirmed that the West Auxiliary boiler was not in condition to operate, as parts of the unit had been removed. The East Auxiliary boiler appeared operational and had clearly had maintenance work to upgrade parts of the unit. Per the records and discussion with Mr. Roggenbuck, natural gas is the only fuel burned in the East Auxiliary boiler and has been since 2014.

As we were walking through the facility, Mr. Roggenbuck identified the two cold cleaners located in the facility. Both cold cleaners had their lids closed and operating instruction were clearly posted near the cold cleaners.

We visited the room that houses the CEMS and Continuous Opacity Monitoring System (COMS). Since the main boiler was not in operation, there were not currently any emission measured by the CEMS or COMS. The CEMS readout read 10.2ppm for carbon dioxide and negative or near-zero values for the other pollutants. The CEMS and COMS units are calibrated daily, regardless of whether the emission unit is running.

The ROP specifies that the stack for the main boiler should have a maximum diameter of 279 inches, and a minimum height of 496 feet. The stack for the east auxiliary unit should have a maximum diameter of 144 inches and a minimum height of 220 feet. Both stacks appear to meet these stack dimension requirements.

Finally, we ended the inspection by visiting the peaking units (FG-CTGS). These are three identical natural-gas fired boilers, located adjacent to the main energy center facility. We were introduced to Tim Barth, Combustion Turbine Specialist, DTE. Mr. Barth provided an overview of the peaking unit operations and show us the inside of one of the units that was not operating. The peaking units are all equipped with a dry-low NOx combustor control. Stack restrictions for the peaking units is a max dimension of 228 by 108 inches and a minimum height of 56 feet. The stacks appeared to satisfy these requirements.

### **Emission Limits and Reporting Requirements**

Compliance with the permitted SO<sub>2</sub>, NOx, and opacity emission limits for the main boiler is demonstrated through the CEMS and COMS (EUBOILER, S.C. I. 1, 3, and 4). DTE has submitted all quarterly Excess Emissions Reports in a timely manner. The reports indicate that the facility is in compliance with the permitted emission limits for EUBOILER.

Greenwood is also required to submit semiannual reporting of monitoring and deviations, as well as an annual

certification of compliance. All required reports were previously submitted in a timely manner and demonstrated compliance with the ROP conditions.

Compliance with the particulate matter emission limit for EUBOILER1 (S.C. 2) is demonstrated through stack testing. The PM Stack Test was completed on July 9, 2019. The results of the test indicated an emission rate of 0.001 lbs per 1,000 lbs of exhaust gases, which is in compliance with the permitted limit of 0.10 lbs/1,000 lbs.

**Conclusion**

Based on my inspection and review of the required recordkeeping, Greenwood Energy Center appears to be in compliance with all conditions of ROP-B6145-2018, as well as all applicable air quality rules and regulations.

NAME



DATE

9/26/19

SUPERVISOR

SK