

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

N589045927

FACILITY: Energy Developments Coopersville LLC		SRN / ID: N5890
LOCATION: 15362 68th Avenue, COOPERSVILLE		DISTRICT: Grand Rapids
CITY: COOPERSVILLE		COUNTY: OTTAWA
CONTACT: Dan Young , Operator		ACTIVITY DATE: 09/06/2018
STAFF: David Morgan	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT:		
RESOLVED COMPLAINTS:		

At 10:00 A.M. on September 6, 2018, Air Quality Division (AQD) staff Dave Morgan conducted a scheduled inspection of Energy Developments Coopersville (EDC) LLC (Formerly the Ottawa Generating Station) located in Coopersville. The purpose of the inspection was to determine the facility's compliance with Renewable Operating Permit No. MI-ROP-N5890-2013 and state and federal air pollution regulations. Accompanying AQD staff on the inspection of EDC was Dan Young, Operator.

FACILITY DESCRIPTION

Currently gas from closed and active portions of the Ottawa County Farms Landfill (OCFL) are collected by an active gas collection system and directed to the EDC where internal combustion engines burn the landfill gas to produce electricity. Excess gas is burned in an open flare operated by EDC or used in process equipment at Resource Recovery Corporation (RRC) to recover metal and sand from used foundry sand. The OCFL is a municipal solid waste landfill, subject to the New Source Performance Standard (NSPS) for Municipal Solid Waste Landfills promulgated in 40 CFR Part 60, Subparts A, XXX, and WWW as well as the National Emission Standard for Hazardous Air Pollutants (NESHAP) for Municipal Solid Waste Landfills promulgated in 40 CFR Part 63, Subparts A and AAAA. EDC is subject to NSPS and NESHAP requirements due to treating landfill gas. The EDC and OCFL are considered one stationary source, despite having two separate ROPs. RRC is not considered part of the stationary source.

Currently EDC is subject to ROP No. MI-ROP-N5890-2013, however OCFL and EDC will be combined into one ROP upon renewal due to an AQD policy change.

FGTREATMENTSYS (EULFTREATMENT1 and EULFTREATMENT2):

Under Subpart WWW, landfill gas may be controlled by routing the collected gas to a treatment system that processes the collected gas for subsequent sale or use. The USEPA considers de-watering, filtering through at least a 10 micron screen, and compression prior to the combustion of the gas in energy recovery devices such as boilers, process heaters, turbines, or internal combustion engines to satisfy the definition of treatment.

Each plant at EDC contains a landfill gas treatment system. The Plant 1 (EULFTREATMENT1) treatment system consists of a 36-inch diameter condensate/liquids knockout tank for de-watering, a 42-inch diameter carbon steel scrubber tank with scrubber pad for de-watering, two AC compressors, two radiator style aftercoolers which cool the gas, a coalescing filter with 0.3-micron coalescing filters, and a fuel gas dryer for gas de-watering and temperature control. The Plant 2 (EULFTREATMENT2) treatment system contains a 24-inch diameter condensate/liquids knockout tank for de-watering, a 42-inch diameter carbon steel scrubber tank with scrubber pad for de-watering, one AC compressor, one radiator style aftercoolers which cool the gas, a 0.3-micron coalescing filter, and a fuel gas dryer for gas de-watering and temperature control.

Preventative maintenance is conducted on the treatment systems in accordance with the maintenance plan. According to EDC personnel, the coalescing filters are changed once the pressure drop reaches 3.0 psi across the filters, generally. Upon inspection, the pressure drop on the Plant 1 filter was 3.0 psi and Plant 2 was 0.0 psi. It is noted that the Plant 2 pressure gauge needed maintenance as it did not appear to be functioning. When the filter is replaced, the process takes about five minutes and gas is bypassed around the filter. The engines are still operating during filter replacement.

The presence of a treatment system excludes the engines from the testing and control requirements contained in the NSPS. However, any atmospheric vent from the gas treatment system is subject to the requirements.

Startup, Shutdown, Malfunction:

EDC maintains a start-up, shutdown, malfunction plan as required by Subpart AAAA, for all equipment. It is noted however, that an SSM plan is not required for the engines or the flare under Subpart AAAA because the treatment

system is installed prior to both. However, when the engines are shutdown, there may be no flow through the treatment system. Shutdown event records are attached. EDC response to the events was consistent with the SSM plan and documented.

RICE Engines:

Plant 1 consists of five Caterpillar G3516LE internal combustion engines that were originally installed in 1992 under Rule 285(2)(g) permit exemption because each engine has a heat input capacity of 8.6 Million Btu/hr which is below the permitting threshold of 10 Million Btu/hr.

Plant 2 consists of one Caterpillar G3520C internal combustion engine (EURICEENGINE7) which was initially installed in 2006. Engine 7 was replaced in August 2014 with a rebuilt engine with new serial number and manufacture date. The following table is a summary of each engine at the plant.

Engine Slot	Type	Serial #	Rating	Manufacture Date	Online Date	Installed under PTI/Rule	Known Replacement	NSPS JJJJ	MACT ZZZZ	Last Top end
Engine 1	Caterpillar G3516LE	4EK00134	800 Kw (1148 hp)	12/16/1993	6/21/1994	Rule 285(2)(g)		N	Y	3/2018
Engine 3	Caterpillar G3516LE	4EK00136	800 Kw (1148 hp)	12/10/1993	6/21/1994	Rule 285(2)(g)		N	Y	6/2016
Engine 4	Caterpillar G3516LE	4EK00126	800 Kw (1148 hp)	12/16/1993	6/21/1994	Rule 285(2)(g)	Removed 1-23-14 and replaced 2-3-14	N	Y	7/2018
Engine 5	Caterpillar G3516LE	4EK00135	800 Kw (1148 hp)	12/17/1993	6/21/1994	Rule 285(2)(g)		N	Y	1/2017
Engine 6	Caterpillar G3516LE	4EK00467	800 Kw (1148 hp)	3/23/1995	6/21/1994	Rule 285(2)(g)		N	Y	7/2016
Engine 7	Caterpillar G3520C	GZJ00681	1600 KW (2233 hp)	9/1/2005 & 2/17/2010	8/2014	173-05 (subsequently revised as 173-05A)	Removed 7-31-14	Y	Y	9/2017

EDC monitors the gas flow rate from the main header as well as the gas flow rate into the engines on a continuous basis and the gas is analyzed at regular intervals to verify the quality of the gas. At the time of the inspection, the following operating parameters were recorded:

Parameter	Plant 1	Plant 2
Methane %	54.4%	48.6%
O2 %	1.25%	0.8%
Flow	1,505 scfm	519 scfm

Engine 7 is limited to a landfill gas feed rate of 264.4 million cubic feet per year based on a 12-month rolling time period as determined at the end of each month. From September 2017 through August 2018, the unit had a gas feed rate of 247.79 million cubic feet which is below the applicable permit limit of 264.4 million cubic feet.

Records are maintained on-site in accordance with with the preventative maintenance plan. A daily record sheet is used to record various engine and treatment system parameters including kilowatt output, fuel flow, landfill gas

quality, coalescing filter pressure drop and others. It is noted that the company uses non-resettable hours meters to record engine hours. The company maintains appropriate records to determine compliance with the permit.

Based on facility records and EDC personnel, a preventative maintenance program is conducted. Routine maintenance is conducted on the engines in accordance with manufacturer and company specifications which include replacing engine spark plugs, oil, and lubrication. Maintenance is also conducted on an as needed basis. In addition, "top-end" overhauls, which includes replacing/cleaning cylinder heads, turbochargers and valves, are conducted on each engine after approximately 10,000 hours of operation. This is typically completed on site. A record of engine maintenance is attached.

"Major" overhauls are conducted every 50,000 to 100,000 hours of operation. Major overhauls includes all of the work of a top end overhaul plus disassembling all of the bearings, seals, gaskets, and components that wear and may even include replacing the crankshaft. When an engine is due for a major overhaul, it is swapped out with another overhauled engine. When the engine is swapped, it is removed from the facility and either replaced with an engine with a different serial number and manufacture date or the same unit is brought back after being rebuilt and will have the same serial number and manufacture date. Swapping engines in this manner is an industry standard for maintaining the engines.

Stack Testing:

A stack test was last performed on February 27, 2018 pursuant to ROP No. MI-ROP-N5890-2013, Special Condition No. V.1 and 40 CFR Part 60, Subpart JJJJ. Per Subpart JJJJ, affected engines are also to be tested every 8,760 hours or three years which ever comes first. For NOx, emissions were 2.71 lb/hr (4.92 lb/hr limit), CO emissions were 12.4 lb/hr (16.2 lb/hr limit) and VOC emissions were 0.77 lb/hr (3.2 lb/hr). All emissions were within applicable limits.

Stack dimensions for EURICEENGINE7 appear to meet the minimum height of 25 feet above ground and a maximum diameter of 14.5 inches.

40 CFR Part 60, Subpart JJJJ:

Engine 7 is subject to the requirements of 40 CFR Part 60, Subpart JJJJ based on the engine installation and manufacture date. The company submitted an initial notification on June 6, 2012. The company performed an initial performance test for Subpart JJJJ on April 14, 2011 which was within 180 days of the Engine 7 installation date of October 2010. The most recent performance test was conducted in February 2018. EDC appears to be meeting other applicable requirements of Subpart JJJJ at this time.

40 CFR Part 63, Subpart ZZZZ:

In May 2012 it was determined that the potential to emit of formaldehyde from Engines 1 through 7 is 28.9 tons which is above the major source threshold of 10 tons for a single HAP. Because the engines are considered a major source of HAPs and were installed after December 12, 2002, they are subject to the requirements of 40 CFR Part 63, Subpart ZZZZ. The company submitted an initial notification on June 6, 2012. EDC appears to be meeting Subpart ZZZZ requirements at this time.

Open Flare (EUOPENFLARE):

EDC also operates an open flare which is used when there is extra gas that the engines cannot process, or in the event of a catastrophic failure of the engines and bypass is needed. Since the flare is installed after the treatment system, the flare is not subject to the testing and control requirements. Gas going to the flare is sent though the treatment system in Plant 2. At the time of the inspection, the flare was not operating.

The company has a separate monitor on the gas flow rate to the flare when it is used, but does not monitor the presence of a pilot flame. A pilot flame is not lit continuously in the flare.

SUMMARY

EDC appears to be in compliance with applicable requirements. Records obtained during the inspection are included in AQD files.

NAME  DATE 9/10/18 SUPERVISOR 