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

B610751712

FACILITY: CLOVERLAND ELECTRIC COOPERATIVE - DAFTER		**SRN / ID:** B6107
LOCATION: 2535 W HIGHWAY M-28, DAFTER		**DISTRICT:** Upper Peninsula
CITY: DAFTER		**COUNTY:** CHIPPEWA
CONTACT: ROGER LINE , DIRECTOR OF GENERATION		**ACTIVITY DATE:** 12/11/2019
STAFF: Michael Conklin	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** SM OPT OUT
SUBJECT: Targeted inspection for FY 20.		
RESOLVED COMPLAINTS:		

Regulatory Authority

Under the Authority of Section 5526 of Part 55 of NREPA, the Department of Environment, Great Lakes, and Energy may upon the presentation of their card, and stating the authority and purpose of the investigation, enter and inspect any property at reasonable times for the purpose of investigating either an actual or suspected source of air pollution or ascertaining compliance or noncompliance with NREPA, Rules promulgated thereunder, and the federal Clean Air Act.

Facility Description

Cloverland Electric Cooperative (CEC) is a utility company that serves five counties in the eastern Upper Peninsula (Chippewa, Mackinac, Schoolcraft, Delta and Luce). The Dafter generating facility is a rated 9 MW station and considered a "peaking" station, meaning the station is used during a high demand for electricity and power outages. Diesel generators are commonly used as peak shaving units due to their ability to come online quickly, respond to fluctuation in loads, and provide long durability.

The Dafter station is located in a rural area just west of the I-75 and M-28 crossing in Chippewa County. This facility was constructed in the 1950s and has three Superior diesel engines, identified as Units 1, 2, and 3, and two Nordberg diesel engines, identified as Units 4 and 5. Each of these units are fuel oil-fired, compression ignited (CI) reciprocating internal combustion engines (RICE) that are shaft coupled to electric generators. The three Superior engines were installed in 1954 and are rated at 1,440 BHP, 1,000 KWe. The two Nordberg engines were installed in 1962 and are rated at 4,180 BHP, 3,000 KWe. Each engine is housed inside a warehouse building with exhaust emissions routed outside through five vertical stacks (one for each engine).

Emissions

Pollutants emitted from the combustion process of fuel oil-fired RICE units include nitrogen oxides (NOx), carbon monoxide (CO), volatile organic compounds (VOCs), and particulate matter (PM). Sulfur oxides emissions are directly related to the sulfur content of the fuel. The formation of nitrogen oxides is related to the combustion temperature in the engine cylinder, and CO and VOC emissions are primarily a result of incomplete combustion. PM emissions can include trace amounts of metals and condensable, semi-volatile organics which result from incomplete combustion, volatized lubricating oil, and engine wear. PM in the form of blue smoke is caused by lubricating oil that leaks into the combustion chamber past worn piston rings and is partially burned. Black smoke is a result of carbon particles combining to form soot. Liquid particles that form during an engine cold start, or low operation, appear as white smoke. Emissions vary according to the air-to-fuel ratio, ignition timing, torque, speed, ambient temperature, humidity, and other factors.

Emissions Reporting

CEC – Dafter is considered a synthetic minor source and has obtained an Opt Out Permit To Install (PTI No. 194-09) for NOx. This facility is required to report its annual emissions to Michigan Air Emissions Reporting System (MAERS). For 2018, the facility reported burning 19,000 gallons of fuel oil in EUENGINE4, and 13,000 gallons of fuel oil in EUENGINE5. EUENGINE1, EUENGINE2, and EUENGINE3 were reported as not operating. The table below shows the facility's 2018 MAERS submittal.

Pollutant	Pounds per year (PPY)
CO	4160
NOx	19328
PM10	1360

PM2.5	1360
SO2	1270
VOC	1577

Compliance History

A letter of violation was issued on March 26, 2019, for failing to conduct performance tests and submit compliance reports for 40 CFR Part 63, Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Combustion Engines. CEC recognized the issues and began submitting the semi-annual compliance reports and scheduled performance tests on the engines for August 15, 2019. A semiannual compliance report for CEC – Dafter was received on July 29, 2019, for the certification of compliance with 40 CFR Part 63, Subpart ZZZZ for the time period of January 1 – June 30, 2019. No deviations were reported.

On November 20, 2019, the AQD received a copy of the test results from the August stack test. The results for EUENGINE4 showed an average CO concentration of 4.7 ppmv at 15% O_2. Per 40 CFR Part 63, Subpart ZZZZ, the CO concentration allowable limit must be less than 23 ppm at 15% O2 or meet the CO removal efficiency requirement of 70%. The Superior engines (EUENGINE1, EUENGINE2, and EUENGINE3) were last operated in 2012 and are no longer in operation. The other Nordberg engine, EUENGINE5, had a catastrophic malfunction in 2018 and has not been repaired or operated since. According to facility personnel, EUENGINE5 is permanently decommissioned. Since EUENGINE4 had an average CO concentration of 4.7 ppmv at 15% O2, this shows compliance with the Subpart ZZZZ requirements for the facility.

Regulatory Analysis

CEC – Dafter is currently subject to PTI No. 194-09 for five RICE generator units. Each engine is also subject to the federal NESHAP 40 CFR Part 63, Subpart ZZZZ. The RICE units are not subject to the federal NSPS for Stationary Compression Ignition Internal Combustion Engines (40 CFR Part 60 Subpart IIII) because the engines were manufactured prior to 2006. The 30,000 gallon fuel oil storage tank is considered exempt per Rule 336.1284(d).

Inspection

On December 11, 2019, I conducted a targeted inspection on the CEC – Dafter station. I arrived at the station and met with Roger Line, Director of Generation. I explained to Mr. Line that the purpose of the inspection was to ensure compliance with PTI No. 194-09 and all other applicable air pollution control rules and federal regulations.

The inspection began by reviewing records for FGENGINES and FGFACILITY. The permittee is required to monitor and record KW-h production, NOx emissions on a facility wide basis, and sulfur content of the diesel fuel. Records were provided for years 2008 through 2019. The 12 month rolling NOx emissions for a given period during these years were all below 90 tpy, and the KW-hr production for each 12 month rolling period were all below 5,080,000 KW-hr. Fuel oil invoices provided stated that the product was "ULS#2", which stands for No.2 diesel ultra-low sulfur. This fuel is certified to contain 0-15 ppm of sulfur. This shows compliance with SC II.1, under FGENGINES, that states the sulfur content of the diesel fuel shall not be greater than 0.005%.

During the inspection, EUENGINE4 was running while the other four engines were not. According to Mr. Line, the three Superior engines have not operated since 2012. These engines are not equipped with oxidation catalysts for the control of CO and VOCs, and have not been tested to show compliance with the RICE MACT. The Nordberg engines contain oxidation catalysts and have been the primary engines operating the past five years at the facility. In 2017, EUENGINE5 seized a piston and the engine has not been repaired since. Mr. Line stated that it Is not in the current plans of the company to repair the engine because a repair of this caliber is not an economically viable option. During the inspection it was observed the fuel line was closed off and the cylinder head of the seized cylinder was removed from the engine. This engine was not tested in August 2019 and is stated to be in the permanently decommissioned state.

EUENGINE4 was operating for peak load shaving. Though the engine is rated for 3,000 KW, Cloverland does not operate the engine past 2,000 KW due to stress on the crankshaft. After observing the engine and verifying nameplate capacity, a visible emissions check was performed. At the time of the

inspection the weather was clear, and the temperature was 8 degrees Fahrenheit outside. Visible emissions of black smoke appeared to be 5-10% opacity. No emissions observed appeared to be over 20% opacity.

At the end of the inspection, future plans of changes to the facility or additions were discussed. Mr. Line stated that the company plans to replace their current peak shaving stations with a new generation station providing up to 50 MW of power through natural gas-fired engines. Cloverland is in the process of submitting an Integrated Resource Plan (IRP) to be reviewed by the Michigan Public Service Commission (MPSC).

Compliance

Based on this inspection, it appears that Cloverland Electric Cooperative – Dafter is in compliance with PTI No. 194-09 and all other applicable air pollution control rules and federal regulations.

Image 1(EUENGINE1) : Superior VDSS-8 diesel generator.

Image 2(EUENGINE4) : Nordberg FS-1316-HSC diesel generator.

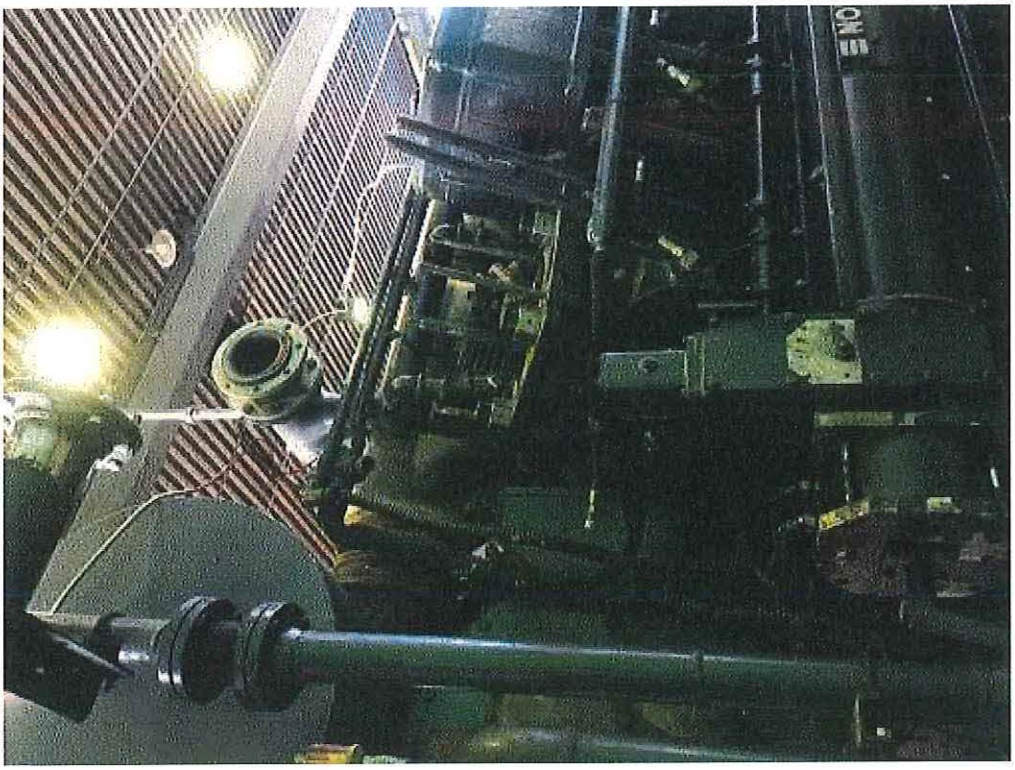

Image 3(EUENGINE5) : Fuel line disconnected and cylinder head removed on EUENGINE5.

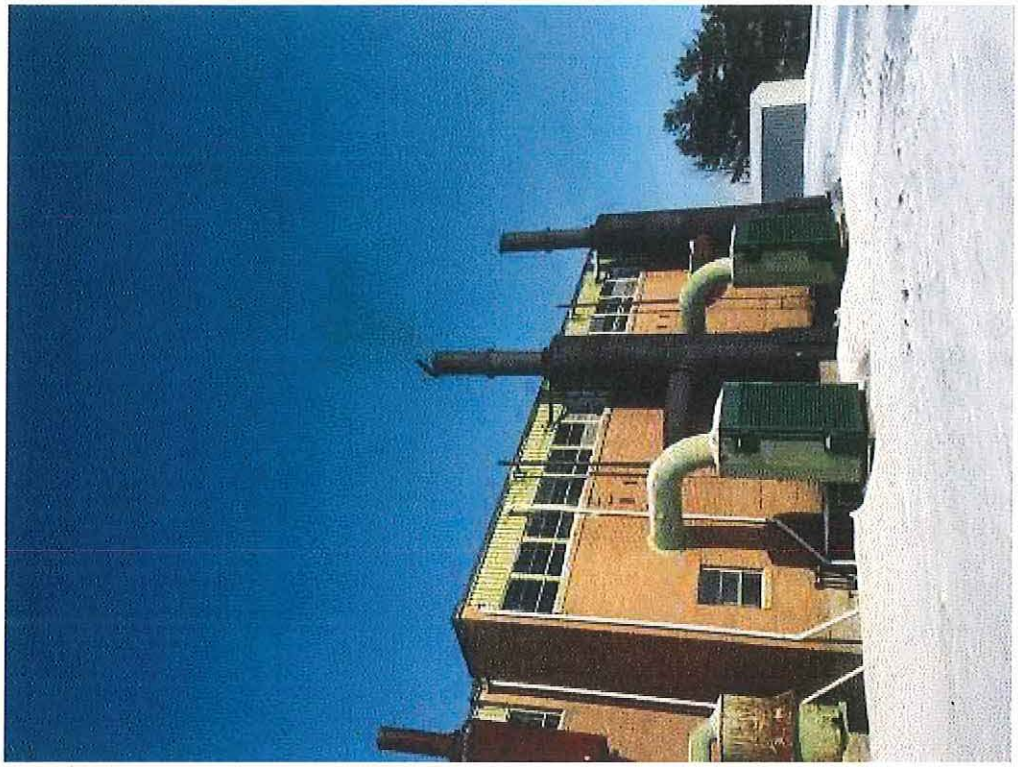

Image 4(Stack) : Visible emissions and stack for EUENGINE4.

NAME Michael Miller DATE 12/17/2019 SUPERVISOR EHL