

DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: On-site Inspection

B426059714

FACILITY: L'ANSE WARDEN ELECTRIC COMPANY LLC		SRN / ID: B4260
LOCATION: 157 S MAIN STREET, LANSE		DISTRICT: Marquette
CITY: LANSE		COUNTY: BARAGA
CONTACT: Chris Anderson , Operations Manager		ACTIVITY DATE: 08/31/2021
STAFF: Joe Scanlan	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: Unannounced inspection to determine compliance with MI-ROP-B4260-2021		
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

L'Anse Warden Electric Company, LLC (LWEC) is a 22 MW power plant located at 157 South Main Street, in the Village of L'Anse, Baraga County. The plant operates a single 324 MMBtu boiler (EUBOILER#1) which powers a steam turbine electrical generator.

LWEC is sited in a mixed-use area, with a city park and Lake Superior to the northwest; commercial and residential structures to the northeast; the Falls River, a childcare facility, school, and church to the southeast; to the southwest is the Falls River and beyond that an industrial zone where the Fuel Aggregation Facility (FAF) and CertainTeed Ceilings Corporation are located.

LWEC began operating in 1959 as a pulverized coal-fired steam/electrical generating unit and the boiler was started using an oil torch firing No. 2 fuel oil. Natural gas firing capabilities were added in the 1960's and in 1975 a multicyclone and a three-series stage electrostatic precipitator were added. The facility curtailed operations in 1994.

The facility returned to energy production in 2007 when LWEC was issued PTI No. 168-07, to convert the coal/natural gas fired boiler to a biomass fired unit and to increase the boiler heat input to 324 million BTU per hour (MMBTU/hr) for steam production. The facility now operates under MI-ROP-B4260-2021 and is currently permitted to burn tire-derived fuel (TDF), engineered fuel pellets, creosote-treated railroad ties, wood chips, wood fines and bark, and natural gas. The facility installed a dry sorbent injection (DSI) system permitted in 2018 to control HCl emissions while burning the engineered fuel pellets.

PROCESS DESCRIPTION

SOLID FUEL MANAGEMENT

LWEC has a Fuel Procurement & Management Plan (FPMP) per the requirements of the ROP. The FPMP was most recently updated 9/02/2020. The boiler is designed and permitted to burn a variety of fuels including wood chips, tire derived fuel (TDF), wood fines and barks, cross-tie

derived fuel (CDF), engineered fuel pellets, and natural gas. CDF is made of processed creosote-treated railroad ties (CTRTR), including bridge timbers and cross braces, that has been ground to a uniform consistency. Natural gas is utilized during boiler start up and periodically fired on a supplemental basis to stabilize combustion.

The FAF is operated by the aggregation contractor M.A. Energy Resources LLC (MAER), a subsidiary of Koppers, and provides wood chips and CDF to LWEC. The FAF is located approximately a third of a mile west of the power plant.

Cross-tie Derived Fuel (CDF)

Creosote-treated railroad ties (CTRTR) are received by the contractor at the FAF via rail; approximately 10 cars per day (70 cars per week) are received. The contractor unloads the whole railroad ties into an uncovered stock yard adjacent to US-41. MAER processes the wood chips and CTRTR, which are sorted, screened, and ground to a uniform size prior to delivering the material to LWEC. The contractor has an uncovered railroad tie chipper/grinder. CTRTR is fed into the grinder and the ground material (CDF) is transported via a front loader to a three-sided enclosure with a roof. CDF is then delivered by a self-unloading truck to an enclosed, on-site fuel storage building in the LWEC yard. CDF may also be received via truck and railroad car. The amount of CDF is monitored (by weight) and recorded in a spreadsheet to track usage and to demonstrate compliance with the permit limitations.

Wood Chips

Wood chips include primarily hardwood species that are received or processed into uniform chips at the FAF. Some softwoods are included under the wood chip classification. Softwood and hardwood used as dimensional lumber that is free from bark and has not been painted or treated in any manner is included in this category but is not currently received. Wood chips also include residuals from the sawmill industry. Wood chips will be supplied to the aggregation contractor from several sources. Processed wood chips are ground to a uniform size of 1-2" and delivered by a self-unloading truck to an enclosed, on-site fuel storage building in the LWEC yard. The amount of wood chips burned are recorded by weight as required by the permit, however there is no material limit. Weights are recorded "as received".

Fines/Bark

Fines/bark are waste products from the lumber and paper mill industries. Fines/bark normally consist of sawdust fines collected during the production process, and tree bark removed during the production process. Fines/bark will be supplied to the aggregation contractor from several sources. The fines must be of a uniform consistency with no large slab waste included, the fines may be from various species of tree. The bark must be of a uniform consistency with no large slab waste included. Large pieces of bark are unacceptable and must be processed by the aggregation contractor to achieve the proper size and consistency. The amount of fines/bark burned is recorded by weight as required by the permit. Weights are recorded "as received".

Tire-Derived Fuel (TDF)

TDF used as fuel by the power plant is supplied to the aggregation contractor from several sources and delivered directly to the power plant. The tires have already been processed and

chipped. Shredded TDF only with an average size of 1-2 inches may be used and must only consist of small individual pieces. Whole tires or large pieces of rubber are unacceptable, and no foreign materials may be present within the TDF. TDF is delivered via truck and stored in an outdoor bunker adjacent to the fuel storage building. Four times per day, the LWEC adds tires to a hopper with a front loader to maintain a constant supply of TDF. The amount of TDF burned is recorded by weight, as required by the permit. Weights are recorded "as received".

Engineered Fuel Pellets

The engineered fuel pellets are manufactured for Convergen from pre-consumer material and are designated as a non-waste fuel. Pellets will be delivered directly to the power plant. The fuel pellets contain a mixture of 60 to 85% paper and cardboard and 15 to 40% plastics including polyethylene, polypropylene, polyester, nylon, and trace amounts of other plastics. The pellets shall comply with the criteria established for non-hazardous secondary materials that are not solid wastes and used as fuel as outlined in 40 CFR Part 241. Fuel pellets shall be ½-inch to ¾-inch diameter and up to 3-inches in length and shall have less than 20% fines under ¼-inch in size. Engineered fuel pellets will be delivered to an outdoor bunker adjacent to the fuel storage building. The amount of engineered fuel pellets burned is recorded by weight as required by the permit. Weights are recorded "as received".

FUEL DELIVERY & ASH HANDLING

From the receiving hopper, wood chips and CDF are conveyed into the fuel storage building, referred to by the LWEC as the "reclaimers." Fuel is deposited into one of three bins in the reclaimer building. Metal drag bars (rakers) are constantly rotating across the top of each reclaimer pile to move fuel towards the boiler conveyer. Only wood chips and railroad ties are stored in the reclaimer building. The building can store enough fuel to run the power plant for a day to a day and a half. As the fuel leaves the reclaimer building, tires are added onto the conveyor belt prior to being directed into the boiler. The fuel is fed into the boiler through a screw conveyor.

After the fuel has been burned, the remaining ash is moved along a shaker grate and it is deposited into a wet ash conveying system. The system is water sealed within the boiler. The ash is pulled through on a chain and drained slightly before being deposited into the wet ash storage building. The dust from the ESP is handled in a similar manner. The ash is sent to a landfill via truck.

EMISSION CONTROLS

Multicyclones

As a pre-control for PM prior to the ESP, the boiler exhaust stream passes through two multicyclones in a series.

Electrostatic Precipitator (ESP)

An ESP was installed to control particulate matter in the spring of 1975. The ESP was designed for a boiler operating at 250,000 pounds of steam an hour, while the LWEC achieves 210,000 pounds of steam an hour. The system is a Wheelabrator Frye unit. The ESP unit is made up of a series of

wire plates that are rapped clean every four minutes. All material that is collected by the ESP unit is conveyed to the wet ash conveyor system.

Dry Sorbent Injection (DSI) System

Permitted in PTI# 128-18, the DSI system is operated in conjunction with pellet usage for HCl emission control. The sorbent is sodium-based and manufactured by Trona. The DSI system consists of a supersack feeder, gravimetric weigh feeder, rotary air lock, blower, piping, an 8-way spiltter, and eight injection lances that penetrate the ductwork at a point between the high temperature and low temperature air heaters, just past the multi-cyclone and before the ESP. The DSI flow rate is adjusted using a gravimetric weigh feeder that is programmed to provide a specific reagent flow rate for a specific pellet burn rate.

CONTINUOUS OPACITY MONITOR (COM)

LWEC operates a COM, a Monitoring Solutions model D-R 290 opacity monitoring system on the exit stack, after the ESP. The D-R 290 utilizes an optical transmitter/receiver. The COM is monitored in real time and records 1 and 6-minute averages, 1-hour average, and 24-hour rolling average opacity emissions. The COM unit undergoes a performance audit (RATA) once every quarter.

LWEC conducts soot blowing three times a day for 25-30 minutes. Soot blowing is done in order to clean the boiler system of any material build-up. The plant attempts to soot blow on a set schedule: 8:00am, 2:00pm, and 11:00 pm daily. The ESP is operated during soot blowing.

CONTINUOUS EMISSIONS MONITOR (CEM)

LWEC operates a California Analytical Instruments (CAI) Model 601 gas analyzer CEM, located on the exit stack after the ESP. The CEM monitors CO and O2 in real time, and records 1-minute and 1-hour block averages. The CEM unit undergoes a performance audit (RATA) once every quarter.

EMISSIONS REPORTING

LWEC is required to report its annual emissions through the Michigan Air Emissions Reporting System (MAERS). The following table lists stationary source emission information as reported to MAERS for the year 2020.

POLLUTANT	QUANTITY (LB)
Ammonia	3.35
CO	310,336
Lead	4.90
NOx	462,471

PM10, FLTRBLE	4,074
PM10, Primary	12,269
PM2.5, FLTRBLE	35,804
PM2.5, Primary	10,853
SO2	673,344
VOC	1,190

COMPLIANCE HISTORY

There have been no violations at the facility since the previous inspection in 2019.

REGULATORY ANALYSIS

LWEC is a major stationary source as defined by the federal operating permit program (40 CFR Part 70) and the federal new source review (NSR) program (40 CFR Part 52). In addition, LWEC is also subject to the Michigan Title V Renewable Operating Permit (ROP) regulations, Permit-to-Install/New Source Review (PTI/NSR) regulations, and Prevention of Significant Deterioration (PSD) Michigan Air Pollution Control Rules. LWEC currently operates under Renewable Operating Permit (ROP) No. MI-ROP-B4260-2021. LWEC is also subject to NSPS and MACT federal regulations.

INSPECTION

I arrived unannounced at the facility on August 31, 2021. My contacts at the facility upon arrival was Boiler Operator Mr. Chad Cichosz. The plant was operating; however, we started the inspection by touring the grounds near the Fuel Storage Building.

After touring the Fuel Storage area of the plant Mr. Cichosz and myself went to the control room to observe operating conditions of the boiler, fuel feed rates, and control equipment. The plant was burning engineered fuel pellets and wood biomass as fuel at the time of inspection. The boiler, multicyclone, and ESP were operating in a satisfactory manner.

PARAMETER	RATE
Boiler steam output	195 klbs/hr @ 870 PSI drum pressure
Turbine/generator output	19.05 MW @ 3638 RPM

Main fuel belt totalizer	0.30 tons (all fuels)
Fuel reclaimer speed	Reclaimer #1 @ 8%, #2 @ 10%, & #3 @ 13%
TDF bin output	27%
ESP outlet pressure	12" WC
CO lbs/MMBTU	0.130 (24 hr avg)
CO ppm	217.1 ppm
O2 ppm	-6.2 ppm
Opacity	5.7% (6-min avg) and 3.7% (instantaneous)

PERMIT CONDITIONS

MI-ROP-B4260-2021

EUBOILER#1

EUBOILER#1 is a boiler with capability of burning tire derived fuel (TDF), creosote treated railroad ties (CTRT), wood chips, wood fines and bark, engineered fuel pellets and natural gas. The boiler has a maximum heat input rating of 324 million BTU per hour and will produce steam and electricity. The existing electrical generator is rated at 22.0 megawatts. The boiler is controlled by a multicyclone followed by a three (series) section electrostatic precipitator. While burning engineered fuel pellets, dry sorbent injection (DSI) will be utilized.

Section I Emission Limits

EUBOILER#1 contains emission limits for Visible Emissions, PM10 & 2.5, SO2, NOx, CO, VOC, Lead, and HCl. Compliance with these emission limits is demonstrated through performance testing, continuous emission monitoring (CEMS), continuous opacity monitoring system (COMS), recordkeeping, and reporting.

Section II Material Limits:

EUBOILER#1 has material limits for Natural Gas, TDF, Creosote-treated railroad ties (CTRT), Fines & Bark, Engineered Fuel Pellets, and Chlorine content for railroad ties.

In LWEC's 2020 MAERS, the Company reported the boiler consumed the following fuels and DSI during 2020 (SC II.1-9):

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FUEL	THROUGHPUT	LIMIT
Natural Gas	1.05 MMCF	Less than 25% of annual heat input (1,046 MMBTU of 2,084,658 MMBTU = <1%)
Tire Derived Fuel (TDF)	1,802 tons	24,000 tons per year
Creosote-treated railroad ties (CTRT)	44,921	72,078 tons per year
Wood fines & bark	0 tons	44,280 tons per year
Wood chips	97,257 tons	NA
Engineered fuel pellets	20,471 tons	50,000 tons per year
Dry Sorbent Injection	399.28 tons	NA

SC II.10 & SC III.7 Chlorine content for railroad ties is addressed in the FPMP under 2.3.3 Quality Control Procedures. Railroad ties are screened for elevated levels of chlorine upon arrival to the FAF.

Section III Process/Operational Restrictions:

SC III.1 Based on BTU values for each fuel, supplied by the company, the total heat input for 2020 was 2,102,872 MMBTU, below the limit of 2,656,800 in SC III.1.

SC III.2 The facility only burns the fuels described in SC II.1-9.

SC III.4 & 6 The facility has an approved Preventive Maintenance and Malfunction Abatement Plan (PMMAP) which was updated in September 2020.

SC III.5 The facility has an approved Fuel Procurement and Monitoring Plan (FPMP) which was updated in September 2020.

Section IV Design/Equipment Parameters:

SC IV.1 At the time of the inspection, the boiler, multicyclone, and ESP appeared to be operating properly.

SC IV.2 & 3 The DSI system is installed and operated in a satisfactory manner per SC IV.2 and is the DSI rate of injection is recorded and monitored via a loss & weight system per SC IV.3.

Section V Testing/Sampling:

SC V.1 The facility completed satisfactory testing for HCl, Lead, and VOC emissions as required in SC V.1 on 6/08 and 6/09/2021. Stack emissions for PM, SO₂, and NO_x levels were tested 6/19 and 6/20/2018.

SC V.3&4 Emissions testing for HCl must be completed by 6/19/2021; testing was satisfactorily completed on 5/26/21.

SC V.5 Sampling and analysis of each solid fuel to demonstrate compliance with SO₂ and HCl emission limits. Monthly and weekly sampling results for the wood chips, creosote-treated railroad ties, and TDF have been conducted (see file).

Section VI Monitoring/Recordkeeping:

SC VI.1, 3, 4, 5, 8, 9 The company monitors and records the parameters required and has completed all required calculations and made them available upon request (see file).

SC VI.2 an approved CMS is in place and was last updated 10/29/2020.

SC VI.6&7 CEMS and COMs are calibrated, maintained, and operated correctly. CEMS RATA was completed satisfactorily on 5/26/2021.

Section VII. Reporting:

SC VII.1-3 A review of the 1st and 2nd semiannual Excess Emission Reports for 2021 show 12 minutes of excess opacity emissions due to Process Problems, approximately 0.01% of total operating time during the 1st quarter of 2021. 30 minutes of excess CO emissions were reported during the 1st quarter, however these were all related to startup/shutdown events.

SC VII.4 All performance test reports have been submitted to TPU and the Marquette District office in an acceptable format.

SC VII.5 Review of the Excursion Report for CAM Requirements report received 9/10/2021 show no CAM excursions or exceedances were reported for opacity or DSI during the monitoring period. There was 0 monitor downtime, no excursions exceeding 10% opacity, and no downtime or excursions for DSI throughput reported for EUBOILER#1.

Section VIII. Stack/Vent Restrictions:

SC VIII.1 Staff did not confirm stack dimensions during the inspection; however, no modifications have been made recently. Repairs were made in 2018 to repair corrosion on the boiler stack.

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Section I Emission Limits

SC I.1 Visible Emissions are limited to less than 10% opacity. The facility has had minor excursions (12 minutes total) in the 1st quarter of 2021 related to process operations. No excursions were reported in the 2nd quarter of 2021.

Section II Material Limits

NA

Section III Process/Operational Restrictions

SC III.1 An approved PMMAP is in place and was last updated 9/2020.

Section IV Design/Equipment Parameters

SC IV.1 The bin vent for the DSI system is installed, maintained, and operated correctly.

Section V Testing/Sampling

NA

Section VI Monitoring/Recordkeeping

SC VI.1 Records associated with the PMMAP are on file and were made available to staff when requested (see file)

SC VI.2 The facility maintains non-certified VE observances on a daily basis while operating the DSI system. No excursions have been reported for 2021.

Section VII Reporting

All annual and semiannual reporting is being submitted and satisfactorily.

FGBOILERMACT-6J

No special conditions associated with emission limits; material limits; design/equipment parameters; testing/sampling; nor State of Michigan EGLE reporting are required for this emission unit.

On March 11, 2021, AQD district staff received notification that LWEC had submitted to EPA Compliance and Emissions Data Reporting Interface (CEDRI) a report notifying of their compliance status with the NESHAP for Area Source Boilers, Subpart JJJJJ (Boiler MACT), in compliance with Special Conditions in Sections III, VI, and IX. LWEC completed a boiler tune-up during a shutdown in January 2021, per requirements of the Boiler MACT.

FGFUEL (EUFUEL & EUFAF)

Fuel handling, processing and storage equipment, road(s), and storage pile(s) located at the L'Anse Warden Electric Company, LLC (LWEC) Generating Station and the Fuel Aggregation Facility (FAF). The solid fuels handled include tire derived fuel (TDF), creosote treated railroad ties (CTRT) (whole and processed), wood chips, engineered fuel pellets, and wood fines and bark. TDF is delivered directly to the LWEC. CTRT (whole and processed), wood chips, wood fines and bark are delivered to the FAF for temporary storage prior to transfer to the facility. Whole CTRT is

processed at the FAF using a horizontal grinder that controls fugitive emissions using a water spray bar.

SC I.1 Prior to the inspection I observed the FAF and monitored visible emissions from the wood processing and handling. No fugitive emissions were observed from processes or material handling during my observation.

The Fuel Storage Building for wood waste CTRT is fully enclosed and the unloading area was well-kept, and no fugitive emissions were noted. During the inspection a load of ground CTRT was being delivered to the plant from the fuel yard by a self-unloading semi-trailer. No fugitive emissions were observed during the unloading.

TDF is stored in an uncovered pile outside the unloading area and appeared well-maintained; the material is heavy enough that it is not susceptible to being blown around. TDF was not being burned at the time of inspection because the facility was burning engineered fuel pellets (see SC III.3 of EUBOILER#1).

Engineered fuel pellets are stored outside in an open top 3-sided bunker made of concrete barriers. Pellets were mounded over the top of the concrete barrier walls. A small amount the engineered fuel pellets had become unbound from the binding matrix, either from the force of scooping by the loader or being crushed by its tires, and had become light enough in weight that the material was noticeable on the adjacent asphalt and grass nearby. None of the material was near the fence line or appeared to be embedded in the mesh on the fence. The facility needs to address the fugitive emissions from the unenclosed engineered fuel pellet storage bunker. Ideally a fully-enclosed bunker should be constructed; at a minimum the pile should be kept below the height of the concrete barriers or an additional layer of concrete barriers should be added.

SC III.1 The Fuel Procurement and Monitoring Plan (FPMP) and Fugitive Emissions Control Plan (FECF) were updated in September 2020. Modifications may be made required to both plans to ensure practical enforceability.

COMPLIANCE

Based on the inspection performed and records reviewed, LWEC appears to be in compliance with MI-ROP-B4260-2021.

NAME Joseph Scandam

DATE 9/30/21

SUPERVISOR_ ESJ