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

B279664842

FACILITY: ST. CLAIR / BELLE RIVER POWER PLANT		**SRN / ID:** B2796
LOCATION: 4505 King Road, CHINA TWP		**DISTRICT:** Warren
CITY: CHINA TWP		**COUNTY:** SAINT CLAIR
CONTACT: Jason Roggenbuck , Technical Supervisor		**ACTIVITY DATE:** 08/11/2022
STAFF: Mark Dziadosz	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MAJOR
SUBJECT: FY 2022 inspection		
RESOLVED COMPLAINTS:		

On August 11, 2022, I, Michigan Department of Environment Great Lakes and Energy-Air Quality Division staff Mark Dziadosz, conducted a scheduled inspection of the Blue Water Energy Center (BWEC) located at 4400 River Road, East China Township, Michigan. The purpose of this 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 Permit to install (PTI) no. 19-18.

St. Clair Power Plant (SCPP) has been in outage since June 2022 and along with the Belle River Power Plant (BRPP), have a history of compliance and both were inspected in 2020 and 2021. Blue Water Energy Center began operation in November 2021 and has never been inspected, therefore this inspection focused on BWEC and PTI No. 19-18. I entered the facility and met with Mr. Jason Roggenbuck, Environmental Engineer; Marie Reid; and Spencer Loiselle, combustion turbine expert. Jason Roggenbuck and Marie Reid escorted me throughout the inspection and provided records.

PTI 19-18: BLUE WATER ENERGY CENTER

The Blue Water Energy Center consists of the two combustion turbines in a combined cycle configuration. A combined cycle electric generating unit consisting of two (2) General Electric "H"-class combustion turbines each with a maximum fuel type-based heat input of 3,658 MMBtu/hr coupled with a heat recovery steam generator (HRSG). Each HRSG is equipped with a natural gas-fired duct burner rated at 800 MMBtu/hr to provide heat for additional steam production. The HRSG is not capable of operating independently from the combustion turbine generators (CTG) on each unit. The CTG/HRSG is equipped with a combined oxidation catalyst for the control of CO and VOCs, and selective catalytic reduction (SCR) with dry low NOx burners for the control of nitrogen oxides. Exhaust emissions from each HRSG will be controlled by oxidation catalyst and SCR.

The facility began trial operation on the CTGs starting in November 2021 and the "market start" date was May 1, 2022. Records for May 1, 2022, to present were requested as part of the record review.

EUAUXBOILER

A natural gas-fired auxiliary boiler, rated at 99.9 MMBTU/hr to facilitate startup of the CTG/HRSG trains and to provide steam to the steam turbine generator seals. The

auxiliary boiler is equipped with low NO_x burners (LNB) and flue gas recirculation (FGR).

Per III.1, On August 6, 2021, the permittee submitted a Malfunction Abatement Plan and Startup, Shutdown, and Malfunction Emissions Minimization Plan.

Per V.1, Within 180 days after commencement of initial startup, the permittee shall verify NOx, CO, PM, and VOCs emission rates from EUAUXBOILER by testing at the owner's expense in accordance with EGLE requirements. The emission test conducted on April 15, 2022, provided the following results:

Total Particulate Matter: 0.1 lb/hr (Permit limit = 0.7),

NOx: 2.8 lb/hr (Permit limit = 3.6),

CO: 0.0 lb/hr (Permit limit = 7.49),

VOC: 0.00831 lb/hr (Permit limit = 0.8).

Per VI.2, the permittee shall maintain hourly and daily natural gas usage records and calculate and keep monthly natural gas usage records. The facility is maintaining the required records.

Per VI.4, for sulfur content of natural gas, the permittee shall maintain a complete record of monthly sulfur content of the natural gas to meet the 0.34 gr per 100 scf or less limit in SC II.1. Records indicate the facility is meeting the limit. The August 2022 monthly sulfur content was 0.049 gr per 100 scf.

Per VI.5, the permittee shall calculate and keep records of hourly NOx, CO, PM, PM10, and PM2.5 emissions from EUAUXBOILER. The permittee is keeping the required records. The highest hourly emissions were:

NOx: 0.629 lb/hr

CO: 0.002 lb/hr

PM: 0.02 lb/hr

PM10: 0.02 lb/hr

PM2.5: 0.02 lb/hr

The lb/hr emissions meet the permit limits.

Per VI.6, the permittee shall calculate and keep records of monthly and 12-month rolling CO2 mass emissions from EUAUXBOILER. The permittee is keeping the required records. The highest monthly emissions were in August at 228 tons. The 12-month rolling total CO2 emissions was 4,162 tons at the end of August. The limit is 25,623 TPY. EUAUXBOILER has not operated 12-months yet.

Per VI.8, the permittee shall calculate and keep records of hourly heat input (MMBtu/hr) for EUAUXBOILER based on the monthly heat value and hourly gas usage to show compliance with SC IV.1 (99.9 MMBtu/hr). The permittee is keeping the required records. The highest monthly hourly heat input was in May 2022 at 20.96 MMBtu/hr.

Per SC VII.1, notification of startup of EUAUXBOILER was received on September 13, 2021.

EUEMENGINE

A nominal 2 MW diesel-fueled emergency engine with a model year of 2011 or later, and a displacement of <10 liters/cylinder. The engine is an EPA Tier 2 certified engine subject to NSPS IIII.

Per II.1, the permittee shall only burn diesel fuel with a maximum sulfur content of 15 ppm. The facility provided a SDS for the fuel and it is Ultra Low Sulfur Diesel (ULSD) with a maximum content of 15 ppm sulfur.

Per V.1, Within 180 days after commencement of trial operation, the permittee shall verify VOC mass emissions from EUEMENGINE by testing at the owner's expense in accordance with EGLE requirements. The emission test conducted on April 14, 2022, provided the following results:

VOC: 0.24 lb/hr (Permit limit = 1.89).

Per VI.2.a., the permittee shall maintain records of the manufacturer certification documentation. The facility is maintaining the required records.

Per VI.6, the permittee shall calculate and keep records of hourly PM10, and PM2.5 emissions from EUEMENGINE. The permittee is keeping the required records. The emissions are based on emission factors from the ROP application. The highest hourly emissions were:

PM10: 1.18 lb/hr (Limit-1.18 lb/hr)

PM2.5: 1.18 lb/hr (Limit-1.18 lb/hr)

The lb/hr emissions meet the permit limits.

Per VI.7, the permittee shall calculate and keep records of monthly and 12-month rolling CO2 mass emissions from EUEMENGINE. The permittee is keeping the required records. The highest monthly emissions were in April 2022 at 15 tons. The 12-month rolling total CO2 emissions was 26 tons at the end of September. The limit is 161 TPY. EUEMENGINE has not been operated for 12-months yet.

Per VI.8, for the hours of operation of EUEMENGINE, the permittee shall monitor and record the hours of operation and the hours of operation during non-emergencies for EUEMENGINE, on an hourly, daily, monthly, and 12-month rolling time period basis. The permittee is keeping the required records.

Per VI.9, for the fuel supplier certification records, the permittee shall maintain a record of each delivery of diesel fuel oil used in EUEMENGINE, demonstrating the fuel meets the requirements of 40 CFR 80.510(b), as specified in SC II.1. Records indicate the facility is meeting the limit. The sulfur content of the September 23, 2021, delivery was 10 ppm sulfur.

Per VII.1 and 2. On August 25, 2021, notice of completed installation of EUEMENGINE. This notice states that the first startup (trial operation) occurred on

August 24, 2021, and that the EPA Tier 2 certified engine will be operated in a certified manner.

EUFPENGINE

A 399 brake HP diesel-fueled emergency fire pump engine with a model year of 2011 or later, and a displacement of <10 liters/cylinder. The engine is an EPA Tier 3 certified engine subject to NSPS IIII.

Per II.1, the permittee shall only burn diesel fuel with a maximum sulfur content of 15 ppm. The facility provided a SDS for the fuel and it is Ultra Low Sulfur Diesel (ULSD) with a maximum content of 15 ppm sulfur.

Per VI.4, the permittee shall calculate and keep records of hourly PM10 and PM2.5 emissions from EUFPENGINE. The permittee is keeping the required records. The emissions are based on emission factors from the ROP application. The highest hourly emissions were:

PM10: 0.07 lb/hr

PM2.5: 0.07 lb/hr

The lb/hr emissions meet the permit limits (0.13 lb/hr).

Per VI.5, the permittee shall calculate and keep records of monthly and 12-month rolling CO2 mass emissions from EUFPENGINE. The permittee is keeping the required records. The highest monthly emissions were in July and August at 0.3 tons. The 12-month rolling total CO2 emissions was 1.3 at the end of August. The limit is 86 TPY. EUFPENGINE has not been operated for 12-months yet.

Per VI.6, for the hours of operation of EUFPENGINE, the permittee shall monitor and record the hours of operation and the hours of operation during non-emergencies for EUFPENGINE, on an hourly, daily, monthly, and 12-month rolling time period basis. The permittee is keeping the required records.

Per VI.7, for the fuel supplier certification records, the permittee shall maintain a record of each delivery of diesel fuel oil used in EUFPENGINE, demonstrating the fuel meets the requirements of 40 CFR 80.510(b), as specified in SC II.1. Records indicate the facility is meeting the limit. The sulfur content of the September 23, 2021, delivery was 10 ppm sulfur.

Per VI.8, the permittee shall keep records of maintenance activity on EUFPENGINE, including manufacturers emissions-related instructions and records demonstrating the engine has been maintained according to those instructions. The permittee is keeping the required records.

Per VI.9, the permittee shall calculate and keep records of hourly VOC emissions from EUFPENGINE. The permittee is keeping the required records. The highest hourly emissions were:

0.07 lb/hr

The lb/hr emissions meet the permit limits (0.13 lb/hr).

Per VII.1, On June 4, 2021, notice of completed installation of EUFPENGINE. First startup (trial operation) occurred on June 3, 2021. This notice states the EPA Tier 3 CERTIFIED stationary emergency engine shall be operated in a certified manner.

EUCOLDCLEANER

Per Jason, EUCOLDCLEANER was not installed.

FGCTGHRSG

Two 3,658 MMBTU/hr natural gas-fired combustion turbine generators (CTGs) coupled with heat recovery steam generators (HRSGs). The HRSGs are equipped with natural gas-fired duct burners rated at 800 MMBTU/hr to provide heat for additional steam production. The HRSGs are not capable of operating independently from the CTG. The CTGs/HRSGs are equipped with a combined oxidation catalyst for the control of CO and VOCs, and selective catalytic reduction (SCR) with dry low NO_x burners for the control of NO_x.

Per II.1, the permittee shall only burn pipeline natural gas with a maximum sulfur content of 0.34 grains per 100 scf or less. The facility provided records of the sulfur content and it met the sulfur content requirements. The highest sulfur content recorded was 0.070 grains per 100 scf.

Per III.1 and 2, On September 21, 2021, the permittee submitted the required malfunction abatement plan (MAP) as described in Rule 911(2), and a plan that describes how emissions will be minimized during startup and shutdown, in a single document.

Per IV. 3 and 4, On October 22, 2021, the permittee submitted a monitor installation for CO, NOx, and O2 CEMS from FGCTGHRSG. The CEMS have an installation date of 1/1/2022. The CEMS are meeting the timelines, requirements, and reporting detailed in Appendix A.

Per IV. 5, According to the Part 75 Monitoring Plan submitted to the EPA, each unit has 2 fuel flow meters.

Per V.1, Within 180 days after commencement of initial startup, the permittee shall verify PM, PM10, PM2.5, SO2, VOC, and H2SO4 emission rates from EUCTGHRSG1 and EUCTGHRSG2 of FGCTGHRSG at maximum routine operating conditions by testing at the owner's expense in accordance with EGLE requirements. The emission test was conducted on April 8, 9, 10 & 12, 2022, and provided the following results:

CTG 11 with duct firing

Total Particulate Matter: 8.8 lb/hr (Permit limit = 16),

SO2: 0.000085 lb/MMBtu (Permit limit = 0.0012),

H2SO4: 0.214 lb/hr (Permit limit = 5.04),

H2SO4: 0.000006 lb/MMBtu (Permit limit = 0.0013),

VOC: 0.000 lb/hr (Permit limit = 0.0026).

CTG 11 without duct firing

Total Particulate Matter: 11.53 lb/hr (Permit limit = 12.2),

SO2: 0.000086 lb/MMBtu (Permit limit = 0.0012),

H2SO4: 0.0125 lb/hr (Permit limit = 5.04),

H2SO4: 0.000004 lb/MMBtu (Permit limit = 0.0013),

VOC: 0.000 lb/hr (Permit limit = 0.0013).

CTG 12 with duct firing

Total Particulate Matter: 8.9 lb/hr (Permit limit = 16),

SO2: 0.000086 lb/MMBtu (Permit limit = 0.0012),

H2SO4: 0.0303 lb/hr (Permit limit = 5.04),

H2SO4: 0.000008 lb/MMBtu (Permit limit = 0.0013),

VOC: 0.000 lb/hr (Permit limit = 0.0026).

CTG 12 without duct firing

Total Particulate Matter: 8.13 lb/hr (Permit limit = 12.2),

SO2: 0.000086 lb/MMBtu (Permit limit = 0.0012),

H2SO4: 0.0383 lb/hr (Permit limit = 5.04),

H2SO4: 0.000011 lb/MMBtu (Permit limit = 0.0013),

VOC: 0.000 lb/hr (Permit limit = 0.0026).

Per VI.3, the permittee shall calculate and keep records of hourly, and 24-hour rolling average NOx concentration and mass emission records, and 30-day rolling average NOx concentration from FGCTGHRSG. The permittee is keeping the required records and the emissions are meeting the limits. The highest NOx emissions on either unit for the time period reviewed were approximately 24 lbs/hr. (Limit-28.9 lbs/hr)

Per VI.4, the permittee shall calculate and keep records of hourly, and 24-hour rolling average CO concentration and mass emission records from FGCTGHRSG. The permittee is keeping the required records and the emissions are meeting the limits. The highest CO emissions on either unit for the time period reviewed were approximately 3.5 lbs/hr. (Limit-17.59 lbs/hr)

Per VI.5, the permittee shall monitor and records the natural gas usage records on a monthly basis. The facility is maintaining the required records.

Per VI.6, the permittee shall calculate and keep records of monthly and 12-month rolling CO2 mass emissions from FGCTGHRSG. The permittee is keeping the required records. The highest monthly emissions were in July (Unit 11-131,906 tons) and August (Unit 12-137,746 tons). The 12-month rolling total CO2 emissions was

485,986 for Unit 11 and 604,814 tons for Unit 12 at the end of August. The limit is 2,042,773 TPY. FGCTGHRSG has not been operated for 12-months yet.

Per VI.7, the permittee shall calculate and keep records of hourly CO2 mass emissions and gross energy output from FGCTGHRSG. The permittee is keeping the required CO2 and gross energy output records. The highest hourly CO2 emissions were on May 1 (Unit 11-199 tons) and (Unit 12-200 tons).

Per VI.9, the permittee shall keep records of the monthly and 12-month rolling total hours of startup and shutdown for EUCTGHRSG1 and EUCTGHRSG2. The facility is maintaining the required records.

Per VI.10, the permittee shall maintain records of all information necessary for all notification and reports as specified and information necessary to demonstrate compliance with the emission limits. The facility is maintaining the required records.

FGCOOLINGTOWER

A 14-cell wet mechanical draft cooling tower equipped with drift eliminators.

Per V.1, Within 180 days after start-up of the plant, and every seven years thereafter, the permittee shall determine drift loss from each cooling tower by testing, at owner's expense, in accordance with Department requirements. The emission test was conducted on July 15-16, 2022, and provided the following drift loss results: 0.00088%, which exceeds the 0.0005% maximum drift rate required by S.C IV.1. The facility has certification from the vendor certifying the drift loss to 0.0005% or less. According to an e-mail from Mark Grigereit on 9/14/2022, the cooling tower manufacturer was brought onsite to inspect and provide any repairs and sealants, as necessary. A re-test was performed on 9/21-9/23/2022, results are not yet available. The PM/PM10/PM2.5 emissions have not exceeded the limits. A violation notice will not be issued.

Per VI.2, the permittee shall maintain a record of the vendor's certification required by SC IV.1. The facility has a vendor certification indicating the drift eliminator will have a drift rate of 0.0005% or less.

Per VI.3, the permittee shall monitor the following: parameters to determine the total dissolved solids of the circulating water on a weekly basis; and parameters needed to determine the water recirculation rate on a monthly basis. The facility is maintaining the required records.

Per VI.4, the permittee shall calculate and keep records of the TDS in the circulating water for each cooling tower in FG-COOLTWRS on a monthly basis. The permittee is keeping the required records.

Per VI.5, the permittee shall keep a record of the date of the 2 most recent drift loss tests. Only one drift loss test has occurred as of 9/15/2022. A re-test was performed on 9/21-9/23/2022, results are not yet available. The permittee is keeping the required records.

Per VI.6, the permittee shall calculate and keep records of the PM, PM10, and PM2.5 emission rates, as specified in SC I.1 through SC I.3, for each cooling tower in FG-

COOLTWRS on a monthly basis. The permittee is keeping the required records. The highest PM emissions was in June 2022 at 1.1 lb/hr (Permit limit = 4.03 lb/hr). The highest PM10/PM2.5 emissions were in June 2022 at 0.13 lb/hr (Permit limit = 0.48 lb/hr).

FGFUELHTR

Two (2) natural gas-fired fuel gas heaters. One heater (EUFUELHTR1) is a high pressure heater rated at 20.8 MMBtu/hr and the other heater (EFFUELHTR2), is a low pressure heater rated at 3.8 MMBtu/hr.

Per VI.2, Within 180 days after commencement of initial startup, the permittee shall verify PM emission rates, as an emission factor and pph, from each unit in FGFUELHTR by testing at the owner's expense, in accordance with Department requirements. The emission test was conducted on April 13 and 14, 2022, and provided the following results:

HP Heater

PM: 0.017 lb/hr (limit 0.15 lb/hr)

LP Heater

PM: 0.005 lb/hr (limit 0.03 lb/hr)

The lb/hr emissions meet the permit limits.

Per VI.2, the permittee shall keep hourly and monthly natural gas usage records, indicating the amount used, in cubic feet, on a clock hour basis for each unit in FGFUELHTR, and shall calculate and keep monthly natural gas usage records, in cubic feet, on a calendar month basis and a 12-month rolling time period basis. The permittee is keeping the required records.

Per VI.3, The permittee shall maintain monthly records of the heating value content of the natural gas based on information from the natural gas supplier. The permittee is keeping the required records. The heating value averages approximately 1065 BTU/CF.

Per VI.4, The permittee shall calculate and keep records of hourly heat input (MMBtu/hr) for each heater in FGFUELHTR based on the monthly heat value of natural gas and the hourly gas usage to show compliance with SC IV.1 (maximum heat input capacity of 20.8 MMBtu/hr Unit 1 and 3.8 MMBtu/hr Unit 2). The permittee is keeping the required records. The maximum heat input for Unit 1 was 12.2 MMBtu/Hr on 3/7/2022 the maximum heat input Unit 2 was 2.4 MMBtu/hr on 2/11/2022.

Per VI.5, The permittee shall calculate and keep, in a satisfactory manner, records of hourly NO_x, CO, PM, PM10, PM2.5, and VOC mass emissions for each unit in FGFUELHTR. The permittee is keeping the required records. The NOx, CO, and VOC emissions are based on emission factors from the ROP application. The highest hourly emissions were:

Unit 1

NOx: 0.75 lb/hr (Limit-0.75 lb/hr)

CO: 0.77 lb/hr (Limit-0.77 lb/hr)

PM: 0.017 lb/hr (Limit-0.15 lb/hr)

PM2.5: 0.017 lb/hr (Limit-0.15 lb/hr)

PM10: 0.017 lb/hr (Limit-0.15 lb/hr)

VOC: 0.001 lb/hr (Limit-0.17 lb/hr)

Unit 2

NOx: 0.14 lb/hr (Limit-0.14 lb/hr)

CO: 0.14 lb/hr (Limit-0.14 lb/hr)

PM: 0.005 lb/hr (Limit-0.03 lb/hr)

PM2.5: 0.005 lb/hr (Limit-0.03 lb/hr)

PM10: 0.005 lb/hr (Limit-0.03 lb/hr)

VOC: 0.001 lb/hr (Limit-0.03 lb/hr)

The lb/hr emissions meet the permit limits.

Per VI.6, the permittee shall calculate and keep records of monthly and 12-month rolling CO2 mass emissions from FGFUELHTR. The permittee is keeping the required records. The highest monthly emissions were in July at 344 tons. The 12-month rolling total CO2 emissions was 1,513 tons at the end of August. The limit is 6,310 TPY. FGFUELHTR has not been operated for 12-months yet.

Per VII.1, The permittee shall provide written notification of the date construction commences and actual startup for EUFUELHTR1 in accordance with 40 CFR 60.7 and 60.48c. The notification shall include the design heat input, an identification of the fuels to be combusted, and the annual capacity factor. The permittee provided notification of start up on September 10, 2021.

FGTANKS
Miscellaneous storage tanks.

According to Jason, EUGCLUBEOILTNKS was not installed.

FGMACT

All equipment subject to the Industrial Boiler MACT.

SC VII.1, initial notification for EUAUXBOILER was received on September 13, 2021.

FGPROJECT

All equipment associated with the natural gas combined cycle power plant.

Per II.1, for sulfur content of natural gas, the permittee shall only burn pipeline natural gas with a sulfur content of 0.34 gr per 100 scf or less limit in SC II.1. Records

indicate the facility is meeting the limit. The August 2022 monthly sulfur content was 0.049 gr per 100 scf.

Per II.2, the permittee shall only burn diesel fuel with a maximum sulfur content of 15 ppm. The facility provided a SDS for the fuel and it is Ultra Low Sulfur Diesel (ULSD) with a maximum content of 15 ppm sulfur. According to the DTE laboratory report, the sulfur content of the September 18, 2021, delivery was 10 ppm sulfur.

Per II. 3, for the natural gas usage, the permittee shall not exceed 81,158 million cubic feet (MMCF) per year on a 12-month rolling time period, as determined at the end of each month. The facility is keeping the required records. The 12-month rolling total was 13,172 MMCF at the end of July 2022.

Per II. 4, for the diesel fuel usage, the permittee shall not exceed 35,731 gallons per year on a 12-month rolling time period, as determined at the end of each month. The facility is keeping the required records. The 12-month rolling total was 3,123 gallons at the end of July 2022.

Per VI. 4, for the SO2 emissions, the permittee shall calculate monthly and 12-month rolling time period SO2 mass emissions for FGPROJECT, using the most recent natural as sampling results. as determined at the end of each month. The facility is keeping the required records. The monthly emissions were 0.41 tons in July 2022 and 12-month rolling total was 1.08 tons at the end of July 2022. The limit for FGPROJECT is 39.42 tpy.

Per VI. 5, for the natural gas usage, the permittee shall monitor and record the natural gas usage for FGPROJECT on monthly basis and 12-month rolling time period. The 12-month rolling total was 13,172 MMCF at the end of July 2022.

Per VI. 6, for the diesel fuel usage, the permittee shall monitor and record the diesel usage for FGPROJECT on monthly basis and 12-month rolling time period. The 12-month rolling total was 3,123 gallons at the end of July 2022.

Conclusion

BWEC appears to be in compliance with all evaluated permit conditions.

NAME _____ DATE September 29, 2022 SUPERVISOR _____