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

P046541530

FACILITY: HOLLAND BOARD OF PUBLIC WORKS-East 5th Street		**SRN / ID:** P0465
LOCATION: 1 Energy Park Way, HOLLAND		**DISTRICT:** Grand Rapids
CITY: HOLLAND		**COUNTY:** OTTAWA
CONTACT: Judy Visscher , Environmental Regulatory Specialist		**ACTIVITY DATE:** 09/13/2017
STAFF: Chris Robinson	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MAJOR
SUBJECT: FY '17 on-site inspection to determine the facility's compliance status with PTI No. 107-13E and other applicable air quality rules and regulations.		
RESOLVED COMPLAINTS:		

The Holland Board of Public Works (HBPW) – Holland Energy Park (HEP) is located at one (1) Energy Park Way, in Holland, Michigan. AQD staff Chris Robinson (CR) arrived at this location at approximately 9:00 am on Wednesday September 13, 2017 for the purpose of conducting a scheduled unannounced site inspection to determine compliance with Permit to Install (PTE) No. 107-13E and any other applicable air rules and regulations. Weather conditions were approximately 60°F with calm winds. CR met with Ms. Judy Visscher, Environmental Regulatory Specialist, and Mr. Mike Radakovitz announcing intent to inspect and providing proper identification. Ms. Visscher and Mr. Radakovitz generously provided a tour of the facility as well as pertinent information. No visible emissions or significant odors were observed during this inspection.

FACILITY DESCRIPTION

The HEP is a natural gas-fired electrical generation facility with two (2) 554 MMBtu/hr combined cycle natural gas fired combustion turbines/generators with an output of 53.1MW each and a heat recovery steam generator with an additional output of 43.2MW. Support equipment for the facility includes one 83.5MMBtu/hr gas-fired auxiliary boiler (EUAUXBOILER), a 3.8 MMBtu/hr gas dew point heater (EUFUELHTR), two emergency generators (EUNGENGINE and EUFPENGINE), a diesel fuel tank (EUFUELTANK), and two (2) 1MMBtu/hr space heaters (EUSPACEHTR1&2).

Each of the combustion turbines (EUCTGHRS10 and EUCTGHRS11) are equipped with dry low-NOx combustors, selective catalytic reduction (SCR) and an oxidation catalyst. Emissions from each turbine are monitored by a Continuous Emissions Monitoring System (CEMS) for carbon monoxide and nitrogen oxides.

REGULATORY REQUIREMENTS

The HEP is located in Ottawa County, which is currently designated as attainment/unclassified for all criteria pollutants.

The stationary source is subject to Title 40 of the Code of Federal Regulations (CFR), Part 70, because the potential to emit nitrogen oxides (NOx), carbon monoxide (CO) and volatile organic compounds (VOCs) exceeds 100 tons per year.

The stationary source is considered to be a minor source of HAP emissions because the potential to emit of any single HAP regulated by the federal Clean Air Act, Section 112, is less than 10 tons per year and the potential to emit of all HAPs combined are less than 25 tons per year.

Emission Units EUCTGHRSG10 and EUCTGHRSG11 at the stationary source were subject to review under the Prevention of Significant Deterioration regulations of Part 18, Prevention of Significant Deterioration of Air Quality of Act 451 40 CFR 52.21, because at the time of New Source Review permitting the potential to emit of carbon monoxide (CO)nitrogen oxide (NOx), Particulate Matter (PM, PM10 & PM2.5), Volatile Organic Compounds (VOCs) and Greenhouse Gases (GHGs) were greater than 100 tons per year.

Michigan's Air Pollution Control Rule 210.4 requires a new major stationary source to submit an administratively complete ROP application to the AQD within 12 months of initial operation. The AQD received notification of "Commencement of Commercial Operation" on 2/1/2017 indicating that commercial operation for EUCTGHRSG10 began on 1/30/2017 and 2/1/2017 for EUCTGHRSG11. The facility is currently operating under PTI no. 107-13E but is required to submit an administratively complete ROP application by 1/30/2018. The HEP is subject to the following regulations which will be incorporated into the facility's ROP:

New Source Performance Standards (NSPS 40 CFR Part 60):
- EUAUXBOILER; Subpart Dc - Small industrial-commercial-institutional steam generating units
- EUFPENGINE; Subpart IIII - Stationary compression ignition internal combustion engines
- EUNGENGIN; Subpart JJJJ - Stationary spark ignition internal combustion engines
- EUCTGHRS10 & EUCTGHRS11; Subpart KKKK - Stationary combustion turbines

National Emission Standards for Hazardous Air Pollutants (NESHAPS 40 CFR Part 63):
- EUFPENGINE & EUNGENGIN; Subpart ZZZZ - Stationary Reciprocating Internal Combustion Engines (RICE)

Other Regulations:
- EUCTGHRS10 & EUCTGHRS11; Clean Air Act Title IV Subchapter A - Acid deposition control
- EUCTGHRS10 & EUCTGHRS11; Cross-State Air Pollution Rule (CSAPR)
- EUCTGHRS10 & EUCTGHRS11 for VOC's; 40 CFR Part 64 - Compliance Assurance Monitoring (CAM)

COMPLIANCE EVALUATION

➢ **PTI No. 107-13E**

HEP submitted an Excess Emissions and Monitoring Summary Report (Received 7/31/2017) for units 10 and 11 covering a time period of 1/1/2017 through 6/30/2017. CR informed Ms. Visscher that this is required to be submitted quarterly. Future reports will be submitted quarterly, as required. No excess emissions were noted.

All Malfunction Abatement Plans and SSM plans have been received as required by PTI no. 107-13E. As discussed with Ms. Visscher, emission units ***EUAUXBOILER, EUFUELHTR, EUNGENGINE, FGCTGHRSG, FGSPACEHTRS*** are natural gas fired only. All records will be maintained for a minimum of 5-years. At this time because the facility is "new" and began operations in January 2017, 12-month rolling data is not yet available. Control room screen shots were provided by the facility and are included in **Attachment A.**

An emissions testing protocol was received by AQD for FGCTGHRSG, AUXBOILER, NGENGINE and FUELHTR on 3/3/2017. Testing was conducted within the allotted time frame specified in the facility's PTI.

CR did not explicitly measure stack dimensions. However, all stacks discharge unobstructed vertically to ambient air and appeared to meet PTI dimension requirements.

EMISSION LIMITS

Table 1: fuel & CO2e emissions

Emission Unit	Operating Hours		Fuel Usage (mmscf/month)	GHGs as CO_2e (12-month rolling total)	
	ROP Limit	Actual Operating Time		ROP Limit	*Calculation
EUAUXBOILER	N/A	N/A	79.951	43,283	6,651
EUFUELHTR	N/A	N/A	1.751	1,934	146
EUNGENGINE	**144	**66	0.123	116	10.44
EUFPENGINE	500	12	70.255	55.6	0.80
EUCTGHRSG10	N/A	N/A	47,404	312,321	24,710
EUCTGHRSG11	N/A	N/A	337,881	312,321	16,984

* This is a new facility and only 10 months of data is available.
** This is "total" operating time, which includes non-emergency and emergency situations.

- **Emission Unit EUAUXBOILER**

Emission unit EUAUXBOILER, as confirmed during the inspection, is an 83.5 MMBtu/hr boiler used to serve as backup for the snowmelt and district heating for when the turbines are not operating. The boiler is equipped with dry low NOx burners (DLNB) and a continuous fuel flow meter. Although the facility is new, maintenance is conducted to keep equipment in good working condition.

The AQD received a Notification of Commencement on 2/16/2016 and a notification of startup on 11/28/2016 as required in Special Condition (SC) EUAUXBOILER VII. Fuel usage and emission calculations, which includes CO2e was provided by facility and is included in **Attachment B** and summarized in **table 1**. However, because the facility is "new", 12-month rolling data is not yet available. Per discussions with Ms. Visscher, the facility also maintains records required by SC EUAUXBOILER VI.4.

Emission rate testing for NOx, CO, PM, PM10, PM2.5 and VOC was conducted between 3/31/2017 through 4/6/2017 and 5/3/2017. An emission testing protocol was submitted to the AQD on 3/3/2017 and a report of final results was received by AQD on 7/10/2017 as required. Based on these results, which are summarized in **table 2** below, the HEP appears to be in compliance with the emission limits specified in PTI No. 107-13E Special Condition EUAUXBOILER I.1-6. The HEP's EUAUXBOILER is also subject to 40 CFR Part 60 Subparts A and Dc (60.48c) which requires notification of construction, startup and fuel monitoring. As discussed above, the facility submitted notifications and monitors and records fuel usage.

Table 2: AUXBOILER Air Compliance Test Results

Pollutant	Load	Result	Limit
NOx	Maximum	0.04 lb/MMBtu	<= 0.05 lb/MMBtu
CO		0.033 lb/MMBtu	<= 0.077 lb/MMBtu
PM		0.0009 lb/MMBtu	<= 0.0018 lb/MMBtu
PM10		0.004 lb/MMBtu	<= 0.007 lb/MMBtu
PM2.5		0.004 lb/MMBtu	<= 0.007 lb/MMBtu
VOC		0.001 lb/MMBtu	<= 0.008 lb/MMBtu
VE		0% opacity	<= 20%

- **Emission Unit EUFUELHTR**

Emission unit EUFUELHTR, as verified during the inspection, is a 3.8 MMBtu/hr fuel gas dew point heater used to warm natural gas fuel prior to utilization in the turbines. PTI No. 107-13E specifies that the maximum heater to be installed shall not exceed a heat input of 3.7MMBtu/hr. CR discussed the 0.1MMBtu/hr discrepancy with Ms. Visscher and AQD's District Supervisor Heidi Hollenbach and AQD's Permit Section. Based on these discussions, the facility will submit a permit application to increase the maximum allowed heat input to the installed boiler's rating of 3.8MMBtu/hr. This unit is also equipped with a continuous fuel flow meter maintained as required.

The AQD received a notification of startup on 1/19/2017 as required by SC EUFUELHTR VII. Fuel usage and emission calculations, which includes CO2e was provided by the facility and is included in **Attachment B** and summarized in **table 1**. Per discussions with Ms. Visscher, the facility also maintains records required by SC EUFUELHTR VI.3.

- **Emission Unit EUCOOLTWR**

This emission unit is considered a three (3) cell wet mechanical draft cooling tower with a plume abatement system which utilizes a dry heat exchanger. Particulate in the water is controlled with drift eliminators. Per discussions with Ms. Visscher the drift eliminators are vendor-certified for a maximum drift rate of 0.0005% or less. Certification is maintained on site as required. Although the AQD has not requested drift loss testing, the facility is going to conduct the testing. A testing date has yet to be determined.

The AQD received a notification of startup for the cooling tower on 2/16/2017 as required in SC EUCOOLTWR VII. Particulate emission records and an "Operations and Maintenance" manual has been submitted to the AQD as required. EUCOOLTWR is subject to a PM10 and PM2.5 emission limit of 2.37tpy each. Based on the monthly records provided by the facility and included in **Attachment B**, PM10 and 2.5 emissions were 0.48lbs. (0.0024 tons) each in August 2017. Special Conditions EUCOOLTWR VI.2a and VI.2b require the facility to monitor and record total dissolved solids weekly. Per discussions with Ms. Visscher, the facility monitors and records these parameters automatically and continuously with the systems "Pi" software.

As discussed with Ms. Visscher, preventative maintenance, which is based on manufacturer recommendations, will be conducted and recorded as required in SC EUCOOLTWR VI.5. Maintenance conducted thus far was considered part of the initial installation/startup and shake down process.

- **Emission Unit EUNGENGINE**

This noncertified emergency generator is a 1,462 HP natural gas fired engine with a 1,040kW generator. It is used to charge the batteries in the facility's uninterruptible power supply battery system. The engine is equipped with an oxidation catalyst system for controlling VOC's and CO and a non-resettable hour meter indicating a total operating time of 30 hours. The AQD received a notification of startup on 3/3/2017 as required in SC EUNGENGINE VI.1.

Monthly Fuel usage, operating hours and emission calculations, which includes CO2e was provided by the facility and is included in **Attachment B** and summarized in table 1. Per discussions with Ms. Visscher, the facility also maintains records required by SC VI.5. Fuel flow is monitored and recorded from a continuous fuel flow meter.

EUNGENGINE is subject to operational restrictions of no more than 144 hrs/year based on a 12-month rolling time period and 100 hrs/month for maintenance checks and readiness testing. A total of 50 hrs/year of the 100 hrs/month is allowed for non-emergency situations. Based on the records included in **Attachment C,** EUNGENGINE has not operated for emergency situations, 37 hours for maintenance and readiness testing and 29 hours for non-emergency situations.

Per Ms. Visscher and required by SC EUNGENGINE III.1 the facility does not operate EUNGENGINE while FGCTGHRSG is in startup mode. Ms. Visscher was unaware if there was a program or procedure in place to prevent this from occurring automatically.

Initial Performance testing for NOx, CO and VOCs, as required for non-certified engines and specified in SC EUNGENGINE IV(1), was conducted as on 5/3/2017 as required. A test protocol was received by the AQD on 3/16/2017 and a final report was received on 7/10/2017. Results indicate that the emergency generator can meet the emission limits specified in PTI no. 107-13E. See **table 3** below for results. As discussed with Ms. Visscher, subsequent testing is required every 8,760 hours of operation or three (3) years, whichever comes first. A maintenance plan was received by AQD on 4/17/2017 and is maintained on-site.

Table 3: EUNGENGINEn Initial Performance Test Results

Pollutant	Test Results	PTI Limit
NOx	1.7 g/hp-hr	2 g/hp-hr
CO	0.04 g/hp-hr	0.8 g/hp-hr
VOC	0.038 g/hp-hr	0.5 g/hp-hr
VE	0%	20%

- **Emission Unit EUFPENGINE**

This certified emergency generator is a 165 HP john deere diesel fired engine which provides power to the fire pump during an emergency. The engine is equipped with a non-resettable hour meter indicating a total operating time of 3 hours. The AQD received a notification of commencement of trial operation on 11/17/2016 as required in SC EUFPENGINE VI.1. An engine specification sheet is included in **Attachment D.** Monthly Fuel usage, operating hours and emission calculations, which includes CO2e are included in **Attachment B** and summarized in **table 1**. Fuel flow is monitored and recorded using the level on the fuel tank.

EUFPENGINE is subject to operational restrictions of NSPS Subpart IIII of no more than 500 hrs/year based on a 12-month rolling time period and 100 hrs/year for maintenance checks and readiness testing. A total of 50 hrs/year of the 100 hrs/month is allowed for non-emergency situations. Based on the records included in **Attachment C**, EUFPENGINE has not operated for non-emergency or emergency situations, but has operated 12 hours for maintenance and readiness testing.

Per Ms. Visscher and required by SC EUFPENGINE III.1, the facility does not operate EUNGENGINE while FGCTGHRSG is in startup mode. Ms. Visscher was unaware if there was a program or procedure in place to prevent this from occurring automatically.

Based on discussions with Ms. Visscher and a fuel invoice (**Attachment E**) provided by Barton Malow, this emission unit only burns ultra-low sulfur diesel with a maximum sulfur content of 15 ppm or less by weight. The facility operates and maintains EUFPENGINE according to manufacturer's recommendations and in accordance to the Malfunction Abatement Plan received by the AQD on April 17, 2017.

- **Emission Unit EUFUELTANK**

This emission unit is a 572 gallon above ground diesel storage tank. The facility is required to install, maintain and operate conservation vent valves and maintain records for five (5) years. Conservation vent valves have been installed and records will be kept as required.

- **Flexible Group FGCTGHRSG**

Consists of two (2) 593 MMBtu/hr combined-cycle natural gas-fired CTG's with HRSG in a 2x1 configuration with a STG. Each CTG/HRSG is equipped with DLNB, SCR and an oxidation catalyst. A notification of "Commencement of Trial Operation" was received by the AQD on February 2, 2017.

Monthly Fuel usage and emission calculations, which includes CO2e are included in **Attachment B** and summarized in **table 1**. Fuel flow is monitored and recorded by the continuous fuel flow meter installed on both units. Per SC FGCTGHRSG III.3 the total hours of startup and shutdown shall not exceed 635 hours. As of this inspection, startup and shutdowns totaled 44 hours.

EUCTGHRSG10 and EUCTGHRSG11 are equipped with a Continuous Emission Monitoring System (CEMS) and a Continuous Emission Rate Monitoring System (CERMS) for continuously monitoring and recording NOx and CO emissions (**Attachment A**). At the time of this inspection Unit 10 NOx/CO was 2.7/0.2 ppm and unit 11 was 3.0/0.00 ppm. The natural gas flow rate is monitored from a continuous flow meter. Units 10 and 11 were operating with a fuel flow rate of 5.5 lb/s. The gross energy output from these units is also monitored and recorded continuously. Both units were operating with a gross energy output of approximately 44.0 MW (**Attachment A**).

Per special condition V, the facility shall verify PM and VOC emission rates from EUCTGHRSG10 and EUCTGHRSG11 within 180 days of initial start-up. A CEMS RATA and emission verification for NOx, CO and O2 testing was conducted for both Units 10 and 11 from 3/31/2017 through 5/18/2017 and 3/30/2017 through 5/18/2017 respectively for 40 CFR Part 60 and 40 CFR part 75 requirements. The report indicated that the analyzers were within the EPA and AQD's requirements for all parameters. A test plan was submitted to the AQD on 3/3/2017 and a report of final results was received by AQD on 7/10/2017 as required. Based on these results, the HEP appears to be in compliance with the emission limits specified in PTI No. 107-13E.

A test plan for net heat rate performance testing was received by the AQD on 3/16/2017 testing was conducted on 5/6/2017. A report of final results was received by the AQD on 7/17/2017. Based on these results the corrected facility net plant heat rate output was 6,482 Btu/kW-hr. Special condition IV(6) allows the facility 8,361 Btu/kW-hr (HHV-net).

The following records are maintained as required and included in **Attachment B.**

- Hourly and 24-hour rolling average CO emission rate and mass emission records
- A log of monthly hours of startup and shutdown

- **Flexible Group FGSPACEHTRS**

The facility utilizes two (2) 1MMBtu/hr natural gas-fired space heaters. CR confirmed heat input capacities of each heater, which is the maximum allowed per special condition FGSPACEHTRS IV.1. Documentation is maintained on-site.

➢ Acid Rain

The facility's turbines (EUCTGHRSG10 and EUCTGHRSG11) are subject to the federal Acid Rain program promulgated in 40 CFR Part 72. The facility submitted an Acid Rain permit application to the AQD on 9/7/2017. New Facilities subject to the Acid Rain program are required to submit an application to the AQD 24 months prior to commencement of operation. The HEP submitted a Commencement of Commercial Operation to the AQD on 2/1/2017 for emission units EUCTGHRSG10 and EUCTGHRSG11 with start dates of 1/30/2017 and 2/1/2017 respectively. Based on a start date of 1/30/2017, an Acid Rain permit application was required to be submitted to the AQD no later than January 30, 2015. The AQD notified the EPA of this late submittal.

A CEMS RATA was conducted and CEMS certification report was submitted to AQD as required, indicating that the analyzers met EPA and AQD requirements.

➢ CSAPR

The facility appears to have met the requirements of CSAPR.

➢ CAM

The emission limitations or standards for NOx and CO from EUEUCTGHRSG10 and EUEUCTGHRSG11, at the stationary source appear exempt from the federal CAM regulation under 40 CFR Part 64, because 40 CFR 64.2 (b)(1)(vi) meets the CAM exemption for a continuous compliance determination method. However, the facility cannot meet this exemption for VOC emissions. Therefore, EUEUCTGHRSG10 and EUEUCTGHRSG11 appear to be subject to CAM for VOC emission limitations or standards. The facility is currently determining applicability status with respect to CAM. A CAM Plan and amended Initial ROP application forms will be submitted if necessary.

➢ 2016 MAERS Submittal

The facility was not required to submit to MEARS in 2017 but will begin submitting in 2018.

COMPLIANCE DETERMINATION

Based on observations, discussions and a records review, the Holland Energy Park appears to be in compliance with PTI No. 107-13E and any other applicable air rules and regulations.

Attachments

A - Control room screen shots
B - Fuel records and Emission calculations
C - Emergency generator operating hours
D - Manufacturer's Information for EUFPENGINE
E - Diesel Fuel Invoice

NAME _____ DATE 10/31/2017 SUPERVISOR _____