

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

P046566490

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| <b>FACILITY:</b> HOLLAND BOARD OF PUBLIC WORKS-Holland Energy Park                                 |                                      | <b>SRN / ID:</b> P0465           |
| <b>LOCATION:</b> 1 Energy Park Way, HOLLAND  |                                      | <b>DISTRICT:</b> Grand Rapids    |
| <b>CITY:</b> HOLLAND   |                                      | <b>COUNTY:</b> OTTAWA            |
| <b>CONTACT:</b> Trista Gregorski , Environmental Regulatory Specialist                             |                                      | <b>ACTIVITY DATE:</b> 02/02/2023 |
| <b>STAFF:</b> Kaitlyn DeVries  | <b>COMPLIANCE STATUS:</b> Compliance | <b>SOURCE CLASS:</b> MAJOR       |
| <b>SUBJECT:</b> The purpose of this inspection was to determine compliance with MI-ROP-P0465-2018. |                                      |                                  |
| <b>RESOLVED COMPLAINTS:</b>  |                                      |                                  |

On Thursday February 2, 2023, Department of Environment, Great Lakes, and Energy (EGLE) Air Quality Division (AQD) staff Kaitlyn DeVries (KD) and Hillary Hansen (HH) conducted an unannounced, scheduled inspection of Holland Board of Public Works – Holland Energy Park located at 1 Energy Park Way, Holland Michigan. The purpose of this inspection was to determine compliance with MI-ROP-P0465-2018.

Prior to arrival, AQD Staff surveyed the perimeter for excess odors and opacity. None were noted. Once on site, KD and HH met with Ms. Trista Gregorski, Safety & Regulatory Compliance Manager, who accompanied them on a walkthrough of the facility as well as provided all pertinent records.

### Facility Description

Holland Board of Public Works – Holland Energy Park (HEP) is a combined heat and power plant designed as a combined cycle, cogeneration facility consisting of two (2) natural gas-fired combustion turbine generators (CTG), two (2) heat recovery steam generators (HRSG) equipped with natural gas-fired duct burners and a steam turbine generator (STG). The plant has a capacity of more than 250,000,000 BTU per hour, heat input. The high efficiency CTG/HRSG trains utilize low NOx burners, selective catalytic reduction (SCR) for Nitrogen Oxide (NOx) control and an oxidation catalyst is used for Carbon Monoxide (CO) and Volatile Organic Compound (VOC) control. Aqueous ammonia is used as the reagent.

KD and Ms. Gregorski briefly discussed the ROP renewal application that is due between April 24, 2022, and April 24, 2023. KD reminded Ms. Gregorski that she was available for any questions regarding the application, and that the submittal should be in soon as to be timely and to obtain the permit shield if deemed administratively complete.

### Regulatory Analysis

The facility is a major source of Nitrogen Oxides (NOx), Carbon Monoxide (CO), and Volatile Organic Compounds (VOC), and is subject to the Title V program. Emission units located at the site are subject to various other federal regulations including the Standards of Performance (NSPS) for Small Industrial-Commercial Steam Generating Units 40 CFR Part 60 Part Dc, 40 CFR Part 60 Subpart KKKK for Stationary Combustion Turbines, 40 CFR Part 60 Subpart TTTT for Greenhouse Gas Emissions for Electric Generating Units, 40 CFR Part 60 Subpart JJJJ for Stationary Spark Ignition Internal Combustion Engines, 40 CFR Part 60 Subpart IIII for Stationary Compression Ignition Internal Combustion Engines, to the National Emission Standards for Hazardous Air Pollutants (NESHAP) of 40 CFR Part 63 Subpart ZZZZ for Stationary Reciprocating Internal Combustion Engines,

and to 40 CFR Part 64, Compliance Assurance Monitoring (CAM). The facility maintains compliance with 40 CFR Part 63 Subpart ZZZZ via demonstrating compliance with NSPS Subparts JJJJ and IIII. Details regarding compliance with these Federal regulations will be outlined in the Compliance Evaluation section of this report. Additionally, HEP is subject to the Cross-State Air Pollution Rules (CSAPR) and to Title IV, for Acid Rain.

## **Compliance Evaluation**

### *EUAUXBOILER*

This emission unit is an 83.5 MMBTU/hr natural gas-fired auxiliary boiler used as a backup for snowmelt and district heating when the CTG/HRSG units are offline. The boiler is equipped with dry low NO<sub>x</sub> burners (DLNB) and flue gas recirculation (FGR). This boiler is subject to 40 CFR Part 60 Subpart Dc. The required notification of Commencement was received on February 16, 2016 and the Notification of Start-up received on November 28, 2016. This unit was not in operation at the time of the inspection.

HEP is properly tracking the fuel usage and used 0.004 MMSCF of natural gas during December 2022. HEP has submitted a Malfunction Abatement Plan (MAP) and is following it.

The auxiliary boiler has several emission limits that are verifiable through stack testing. NO<sub>x</sub> is limited to 0.05 lb./MMBTU, CO is limited to 0.077 lb./MMBTU, PM is limited to 0.0018 lb./MMBTU, PM<sub>10</sub> is limited to 0.007 lb./MMBTU, PM<sub>2.5</sub> is limited to 0.007 lb./MMBTU, and VOC is limited to 0.008 lb./MMBTU. Stack testing was most recently conducted in March of 2022. Results of the stack test indicated compliance with the emission limits.

GHGs as CO<sub>2</sub>e is limited to 43,283 tons per year (tpy), based on a 12-month rolling time period. As of December 2022, the 12-month rolling CO<sub>2</sub>e emissions were 819 tpy. The GHG emissions are calculated appropriately, in a manner approved by the AQD.

While not explicitly measured, the stack dimensions appeared to be correct.

### *EUFUELHTR*

EUFUELHTR is a 3.8 MMBTU/HR fuel gas dew point heater for warming the natural gas, with notification of startup of the unit having been received on January 19, 2017. The unit is subject to the provisions of 40 CFR Part 60 Subpart Dc the Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units. The unit is equipped with a continuous flow monitor that tracks the fuel usage. December 2022 fuel usage records indicate 0.748 MMSCF was used.

Emissions from the fuel heater are limited to 0.55 pounds per hour (pph) for NO<sub>x</sub>, 0.41 pph, for CO, 0.007 lb./MMBTU for PM, 0.0075 lb./MMBTU for PM<sub>10</sub>, 0.0075 lb./MMBTU for PM<sub>2.5</sub>, and 0.03 pph for VOC. All of these emissions are verifiable through stack testing. Stack testing was conducted on the unit in 2017 and emissions showed compliance with the limits. This unit also has a 12-month

rolling GHGs as CO<sub>2</sub>e emission limit of 1,934 tpy. Records indicate that as of December 2022 12-month rolling emissions of GHG as CO<sub>2</sub>e were 638 tons.

While not explicitly measured, the stack dimensions appeared to be correct.

#### *EUCOOLTWR*

This emission unit is comprised of a three-cell wet mechanical draft cooling tower with plume abatement using a dry heat exchanger. The drift eliminators control particulate emissions. Vendor certification ensures a maximum drift rate of 0.0005% or less. Testing may be requested to verify the drift loss from EUCOOLTWR, however, AQD is not requesting testing at this time. HEP submitted an inspection and maintenance program for the cooling tower on July 27, 2017 and has been appropriately following it. Records of specific conductivity indicate that the units run about 706 – 1,173 uS/cm range, a total dissolved solids (TDS) ranging from 419 – 768 ppm range, and a water recirculation rate averaging around 28,000 to 37,000 gallons per minute (gpm).

Particulate Matter (PM<sub>10</sub> and PM<sub>2.5</sub>) emissions from the cooling tower have individual limits of 2.37 tpy, based on a 12-month rolling time period. Based on records, the December 2022 12-month rolling PM<sub>2.5</sub> emissions were 0.26 tpy, and the PM<sub>10</sub> emissions were also 0.26 tpy. These calculations are based upon the water circulation rate, the drift loss, and the total dissolved solids of the circulation water, that is calculated based upon the specific conductivity.

HEP conducts regular maintenance on the cooling towers, in accordance with their inspection and maintenance plans, and all three (3) tower cells most recently had an inspection in November 2022, as per the inspection and maintenance plan.

While not explicitly measured, the stack dimensions appeared to be correct.

#### *EUNGENINE*

HEP has a 1,462 Horsepower (HP) natural gas-fired emergency engine that serves a 1,040-kW generator. This engine utilizes an oxidation catalyst for CO and VOC control. This engine is subject to the provisions of NSPS 40 CFR Part 60 Subpart JJJJ as well as NESHAP 40 CFR Part 63 Subpart ZZZZ. As previously mentioned, the AQD does not have delegation for Subpart ZZZZ, however compliance with Subpart ZZZZ is demonstrated via compliance with Subpart JJJJ. Notification of installation and operation was properly sent to AQD, with the notification of operation being received on March 3, 2017.

This engine is a non-certified engine that has hourly emission limits of 2 g/HP-hr for NO<sub>x</sub>, 0.8 g/HP-hr for CO, 0.5 g/HP-hr for VOC, 7.71 E-5 lb./MMBTU for PM, 0.01 lb./MMBTU for PM<sub>10</sub>, 0.01 lb./MMBTU for PM<sub>2.5</sub>. Testing is required every 8760 hours, or 3 years, whichever comes first. Testing was most recently done in August 2020, but per Ms. Gregorski, HEP will be conducting testing again this summer. The results of the 2020 testing indicated emissions of 15.1 ppm, 0.19 pph, and 0.07 g/BHP-Hr for CO, 265.1 ppm, 5.50 pph, and 1.93 g/BHP-hr. for NO<sub>x</sub>, and 38.3 pph, 0.88 pph, and 0.31 g/BHP-hr. for VOC.

GHG emissions as CO<sub>2</sub>e has a 116 tpy limit, based on a 12-month rolling time period. Based on records, as of the end of December 2022 the 12-month rolling CO<sub>2</sub>e emissions were 2.20 tons.

The unit is equipped with a non-resettable hour meter, with the total hours of operation at 6 hours for the calendar year of 2022. All of the hours were for non-emergency purposes due to maintenance and readiness testing, and none were during startup mode for the turbines. According to Ms. Gregorski, there is a standing work order to conduct the readiness testing each month. The engine was not used for emergency purposes over the past year.

While not explicitly measured, stack dimensions appeared to be correct.

#### *EUFENGINE*

This emission unit is a Certified 165 HP diesel-fueled emergency engine, which powers a fire pump used for back up in an emergency. The nameplate was verified during the inspection. This unit is subject to the provisions NSPS 40 CFR Part 60 Subpart IIII and to the NESHAP 40 CFR Part 63 Subpart ZZZZ. Compliance with Subpart ZZZZ is shown through compliance with Subpart IIII.

This is a certified engine and has demonstrated compliance with the emission requirements of 3 g/HP-hr for NO<sub>x</sub>, 3.7 g/HP-hr for CO, 0.22 g/HP-hr for PM, 0.09 lb./MMBTU for PM<sub>10</sub>, 0.09 lb./MMBTU for PM<sub>2.5</sub>, and 0.47 pph for VOC via initial performance testing conducted in 2017. GHGs as CO<sub>2</sub>e has a 55.6 tpy limit, based on a 12-month rolling time period. Based on records, as of the end of December 2022, the 12-month rolling CO<sub>2</sub>e emissions were 3.53 tons. Only ultra-low diesel fuel, with a sulfur content of 15 ppm, and a centane index of 40 is used. Per Ms. Gregorski, HEP utilizes a fuel tank in the back of a truck that is filled at the City of Holland fueling station, which is then used for the Fire Pump Engine Tank.

This engine has not had to be used for an emergency and has only run for required maintenance and readiness testing. During calendar year 2022, the engine ran for a total of 24.4 hours.

While not explicitly measured, stack dimensions appeared to be correct.

#### *EUFUELTANK*

The ROP lists this emission unit as a 572 gallon above ground storage day tank for storage of ultra-low sulfur diesel fuel for the fire pump. It has previously been verified with Ms. Gregorski and on the nameplate, this is a 185-gallon tank and not a 572-gallon tank as indicated in the permit. It has previously been discussed that HEP could come in to get this revised via a PTI, however the decrease in size would likely not have any effect on the requirements for the unit. This tank meets the National Fire Protection Association Standards. The fuel tank appeared to be properly equipped with conservation vents, for VOC control.

Maintenance records for the tank are attached to this report.

#### *FGCTGHRSG*

This flexible group is comprised of two (2) combined-cycle natural gas-fired combustion turbine generator (CTG) coupled with a heat recovery steam generator (HRSG) in a 2x1 configuration with a STG. Each CTG/HRSG is equipped with dry low NO<sub>x</sub> burners, selective catalytic reduction (SCR), and an oxidation catalyst. Both units were in operation at the time of the inspection, each operating at a load of around 46 Mw.

Both units within this flexible group are subject to the provisions of NSPS 40 CFR Part 60 Subparts KKKK and Subpart TTTT. NSPS Subpart KKKK has emission limitations for SO<sub>2</sub> and NO<sub>x</sub>, while Subpart TTTT is for Green House Gas (GHG) Emissions. The two (2) units are also subject to the provisions of 40 CFR Part 64, Compliance Assurance Monitoring (CAM), for VOC emissions.

The notification of commencement of operation was received on February 2, 2017. HEP submitted an updated Startup/Shutdown and Malfunction Abatement Plan in October 2021. The updates to the plan were due to clarifying the definition of an operating hour during startup and shutdown. This had not previously been formally defined, and now it is. HEP has expressed that this be clarified during the upcoming ROP renewal as well. KD and Ms. Gregorski discussed this issue in the opening meeting and discussed some of the changes that HEP will be requesting in the pending ROP renewal.

HEP is tracking the gross energy output for both units on an hourly and calendar day basis. The total hours of start-up and shut-down for FGCTGHRSG has a limit of 635 hours during a 12-month rolling time period. Per the records, the 12-month rolling hours of start-up and shut-down, as of December 2022, was 37 hours. HEP properly tracks the amount of natural gas used by each unit. A total of 258,764 mscf, was combusted in Unit 10, and 302,183 mscf was combusted in Unit 11 in December 2022.

The units are equipped with continuous emissions monitoring systems (CEMS) that continuously monitor and record the CO and NO<sub>x</sub> emissions of the exhaust gas. Record of the daily calibration and a screenshot of the day's operational parameters are attached to this report. At the time of the inspection the control room NO<sub>x</sub> CEMS was reading at 2.7 ppmv for both Unit 10 and Unit 11, and CO CEMS data was reading 0.7 ppmvd for Unit 10, and 0.4 ppmvd for Unit 11. When the CEMS shelter was also visited, both the NO<sub>x</sub> and the CO readings were very similar to that of the control room, with the exception that they are uncorrected readings in the CEMS shelter. The CO CEMS data is used as a surrogate for CAM to demonstrate compliance with the VOC limit of 4 ppmvd at 15% O<sub>2</sub>. In addition to the CO monitoring as an indicator for the VOC limit, the most recent stack testing conducted in March 2022 demonstrated compliance with this limit at 0.09 ppmvd at 15% O<sub>2</sub>.

Each Unit (Unit 10 and Unit 11) have individual NO<sub>x</sub>, CO, PM, PM<sub>10</sub>, PM<sub>2.5</sub>, VOC and GHGs as CO<sub>2</sub>e limitations. GHGs as CO<sub>2</sub>e are limited to 312,321 tpy, based on a 12-month rolling time period. Records indicate CO<sub>2</sub>e emission of 181,907 tons and 144,223 tons for Units 10 and 11, respectively. HEP is properly tracking the 24-hour rolling average of CO and NO<sub>x</sub> in pph for both units. On the day of the inspection, the 24-hour rolling averages for CO for Units 10 and 11 were 0.7 pph for Unit 10 and 0.4 pph for Unit 11, while the 24-hour rolling averages for NO<sub>x</sub> was 2.7, and 2.8 pph, each.

Start-up and Shut-down emission limitations also exist for both CO and NO<sub>x</sub>. The start-up limits for NO<sub>x</sub> and CO are 43.7 pph, and 247.3 pph and the shut-down limits for NO<sub>x</sub> and CO are 43.1 pph and 551.3 pph. Ms. Gregorski had previously informed KD that HEP had discovered the definition of startup and shut down in the ROP was not correctly aligned with what was being used for the CEMS equipment. Ms. Gregorski promptly notified the AQD when this was discovered. The misalignment was there was no signal to the CEMS for startup and shutdown for closure and opening of the breaker, which is defined in the ROP. The definitions in the ROP are: Startup is defined as the period of time from synchronization to the grid (generator breaker closed) until the unit reaches steady state operation (loads greater than 50 percent of design capacity). Shutdown is defined as that period of time from the initial lowering of the turbine output below 50 percent of full operating load, with the intent to shut down, until the point at which the generator breaker opens. Upon discovering this, HEP re-calculated the startup/shutdown hours and emissions, and has subsequently hardwired the breaker opening/closing into the CEMS. This change became effective on October 1, 2021.

The particulate limits of 0.007 lb./MMBTU of PM and the individual 0.0014 lb./MMBTU PM<sub>10</sub> and PM<sub>2.5</sub>, limits were verified during the most recent stack test conducted in 2022 at a rate of 0.003 lb./MMBTU of PM, and of 0.0013 lb./MMBTU for PM<sub>10</sub> and PM<sub>2.5</sub>.

40 CFR Part 60 Subpart TTTT requires compliance with a CO<sub>2</sub> emission limit of 1000 lb./MWh based upon a 12-month rolling time period. As of December 2022, the 12-month rolling CO<sub>2</sub> emissions were 855 lb./MWh for Unit 10, and 859 lb./MWh for Unit 11. A monitoring plan to quantify the hourly CO<sub>2</sub> mass emission rate (tons/hr) is required per Subpart TTTT. HEP has successfully submitted this to ECMPS.

HEP conducted a Net Heat Rate test in 2022 indicating compliance with the requirement for the net heat rate for the CTG/HRST pair (EUCTGHRSG10 plus EUCTGHSG11) to not exceed 2,361 Btu/kW-hr (HHV-net) at an ambient temperature of 84°F, 56% relative humidity, ambient pressure at the mean site elevation, base load operation, and not accounting for transformer losses. Testing indicated compliance.

While not explicitly measured, stack dimensions appeared to be correct.

#### *FGSPACEHTRS*

This flexible group covers two (2) 1 MMBTU/hr natural gas-fired space heaters used for comfort heat. KD verified the capacity of each unit, and they do not exceed the allowable 1 MMBTU.

The 2021 MAERS submittal was reviewed as part of this Full Compliance Evaluation, and the emissions reported in MAERS were similar to that reported during the inspection, as the 2022 MAERS report has not yet been submitted. All reporting has properly been done.

#### **Compliance Determination**

Based on the observations made during the inspection and a subsequent review of the records, it appears Holland Board of Public Works – Holland Energy Park is in compliance with MI-ROP-P0465-2018.

NAME Kaitlyn Dehn

DATE 03/02/2023

SUPERVISOR HH