

B2814  
MANILA

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

B281437698

FACILITY: DETROIT THERMAL BEACON HEATING PLANT		SRN / ID: B2814
LOCATION: 541 MADISON AVE, DETROIT		DISTRICT: Detroit
CITY: DETROIT		COUNTY: WAYNE
CONTACT: Tabettha Peebles, Environmental Manager		ACTIVITY DATE: 11/18/2016
STAFF: Todd Zynda	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: Scheduled Inspection		
RESOLVED COMPLAINTS:		

REASON FOR INSPECTION: Targeted Inspection

INSPECTED BY: Todd Zynda, AQD

PERSONNEL PRESENT: Tabettha Peebles, Environmental Manager; Marna Muhammad, Plant Manager; Damian Doerfer, Director, Environmental, Health & Safety

FACILITY PHONE NUMBER: (313) 972-4336

FACILITY WEBSITE: www.detroitthermal.com

### FACILITY BACKGROUND

Detroit Thermal Beacon Heating Plant (DTBHP), a subsidiary of Detroit Renewable Energy, is located in downtown Detroit, at 541 Madison Avenue. To the west of the facility is the 36<sup>th</sup> District Court, to the north is Ford Field Stadium, to the south are the Wayne County Jail and Wayne County Third Circuit Court, and to the east is the Chrysler Freeway (Interstate 375). The facility currently has 23 employees and operates 24 hours a day, 7 days a week.

DTBHP is subject to Title 40 of the Code of Federal Regulations, Part 70, because the potential to emit nitrogen oxides (NOx) and carbon monoxide (CO) each exceeds 100 tons per year. DTBHP is subject to Prevention of Significant Deterioration of Title 40 of the Code of Federal Regulations, Part 52.21, regulations because its potential to emit of NOx and CO each is greater than applicable thresholds.

The facility is a synthetic minor hazardous air pollutant (HAP) source, and therefore not subject to 40 Code of Federal Regulations (CFR) Part 63, Subpart DDDDD, the major source boiler maximum achievable control technology (MACT).

Additionally, DTBHP is subject to the New Source Performance Standards for Industrial-Commercial Institutional steam generating units promulgated in Title 40 of the Code of Federal Regulations, Part 60, Subparts A and Db. Both Boiler 6 and Boiler 7 have capacities of 180.2 million British thermal units per hour (MMBtu/hr) and were constructed after June 19, 1984. Boilers 1 through Boiler 4 have heat input capacities greater than 250 MMBtu/hr, however, they were constructed before June 19, 1984.

### PROCESS OVERVIEW

DTBHP operates six boilers that are used to generate/supply steam to various commercial customers in the downtown Detroit area. The facility operates six boilers that primarily fire natural gas but have the capacity to fire No. 2 fuel oil as a backup. Boilers 1, 2, and 4 were installed in the 1920's and each have a rated heat input capacity of 570 MMBtu/hr. Boiler 3 was installed in the 1959, and has a rated heat input capacity of 600 MMBtu/hr. Boiler 5 was permanently shut down and removed from the facility. Boilers 6 and 7 were installed during 2007 and are rated at 180.2 MMBtu/hr. Boilers 6 and 7 are equipped with low NOx burners and flue gas recirculation.

### COMPLAINT/COMPLIANCE HISTORY

The facility was recently inspected on December 2, 2014, May 31, 2013, April 13, 2010, February 16, 2010, May 12, 2008, May 1, 2007, October 20, 2006, and March 17, 2005. The facility was found to be in compliance during the above listed inspection dates.

On September 13, 2015, a relative accuracy test audit (RATA) and stack test on EU-BOILER7 were discontinued. Detroit Thermal alleged that a malfunction of the flue gas recirculation system resulted in high NOx emissions from EU-BOILER7. Following correction of the malfunctioning equipment, the test was

rescheduled and took place on September 26, 2015. On November 13, 2015, Detroit Thermal provided the AQD with hourly PEMS data for EU-BOILER7 from September 17, 2014 through September 30, 2015. Based on the records submitted, AQD identified over 1,400 individual exceedances of the hourly NOx emission limit between September 16, 2014 and September 30, 2015. On June 22, 2016 the facility entered Consent Order AQD No. 24-2016. The Consent Order requires the facility to comply with NOx emission limit under FG-BOILER\_6,7 on an hourly basis and requires the facility to submit quarterly NOx excess emission reports.

### **OUTSTANDING CONSENT ORDERS**

As described above, the facility Consent Order AQD No. 24-2016 on June 22, 2016. The Consent Order requires the facility to comply with NOx emission limit under FG-BOILER\_6,7 on an hourly basis and requires the facility to submit quarterly NOx excess emission reports.

### **OUTSTANDING VIOLATION NOTICES**

None

### **INSPECTION NARRATIVE**

On November 18, 2016 the Michigan Department of Environmental Quality (MDEQ) Air Quality Division (AQD) inspector, Mr. Todd Zynda conducted an inspection of DTBHP at 541 Madison Avenue, Detroit, Michigan. During the inspection, Ms. Tabettha Peebles, Environmental Manager, Ms. Marna Muhammad, Plant Manager, and Mr. Damian Doerfer, Director, Environmental, Health & Safety, provided information and a tour of facility operations relating to air quality permits. The inspection was conducted to determine the facility's compliance with the Natural Resources and Environmental Protection Act (NREPA), Act 451, Part 55, and ROP No. MI-ROP-B2814-2014 and Consent Order AQD No. 24-2016.

At 8:50 AM, Mr. Zynda arrived onsite and performed outside observations. No visible emissions were observed at the facility. No odors were detected during the site inspection. At 9:00 AM Mr. Zynda entered the facility, stated the purpose for the inspection, and was greeted by Ms. Peebles and Ms. Muhammad. Mr. Zynda provided an inspection checklist for items contained within MI-ROP-B2814-2014. The records required to demonstrate compliance with ROP conditions were discussed. Ms. Muhammad stated that both EUBOILER3 and EUBOILER4 are not in operation and have been nonfunctioning for several years. Mr. Muhammad stated that both EUBOILER3 and EUBOILER4 would require significant financial investment to get the boilers operating again. Ms. Muhammad stated that over the years parts have been "borrowed" off EUBOILER3 and EUBOILER4 to repair other operating boilers. Ms. Muhammad also stated that none of the boilers have burned No. 2 fuel oil in over seven years. According to Ms. Muhammad, the fuel oil storage tank is empty. Following discussion of record keeping requirements outlined in the inspection checklist, it was agreed between AQD and DTBHP that electronic files (spreadsheets) would be provided to the AQD via email. On November 18, 2016, Ms. Peebles provided the spreadsheets as requested. Correspondence and records are attached to this report.

Following the opening meeting, Ms. Peebles and Ms. Muhammad provided a tour of the facility. The tour began with observation of the maintenance shop area on the first floor. The maintenance shop area contains machining equipment (saws, lathes, grinders, etc.) that is used for boiler repair and maintenance. Emissions from the maintenance shop are released to the general in-plant environment. According to Ms. Muhammad, the facility does not operate a cold cleaner.

The gas inlet room was also observed on the first floor. According to Ms. Muhammad natural gas use is recorded manually at the inlet to facility and individually for each boiler in the control room.

The tour continued with observation of the facility boilers from the second floor. It was observed that boiler 3 has had the fuel oil line cut, and therefore currently not capable of burning fuel oil. Boiler 4 had the feed lines "capped off" eliminating the boiler from any use. The intake lines to all boilers are color-coded. A red line indicates air intake, an orange line indicates oil intake, and a yellow line indicates natural gas. Boilers 6 and 7 are located in the former location of Boiler 5. During the inspection each individual boiler was observed. In addition, the turbine room was observed. None the turbines present at the facility operate.

The tour continued with observation of the boiler control room. During the inspection Boiler 7 was operating at approximately 21 thousand pounds of steam per hour (k lb/hr) and Boiler 2 was operating at approximately 180 k lb/hr. Boiler 1 and Boiler 6 were offline.

**APPLICABLE RULES/PERMIT CONDITIONS****Renewable Operating Permit No. MI-ROP-B2814-2014**

The ROP was renewed with an effective date of April 23, 2014. The ROP expiration date is April 23, 2019 with an application due date of October 23, 2018. The Special Conditions (SC) are listed as appropriate. For brevity, permit conditions and the language of federal and state rules have been paraphrased.

**FG-FACILITY**

SC I. 1. and 2., and SC VI. 1. **COMPLIANCE.** Individual hazardous air pollutant (HAP) shall not exceed 9 tons based on a 12 month rolling time period. Total HAP shall not exceed 22.5 tons based on 12 month rolling time period. The highest reported 12-month rolling total HAP occurred at the end of December 2015 and was 0.99 tons.

SC II.1. **COMPLIANCE.** Sulfur content of No. 2 fuel oil and on-specification oil used in FG-FACILITY shall not exceed 0.30% by weight. Fuel oil has not been fired in any boiler for the last two years. It is unknown when and if on-specification has ever been fired at the facility (Boiler 4 only).

SC III.1. and SC VI. 4. **COMPLIANCE.** Shall only fire natural gas, on-specification oil, or No. 2 fuel oil in EUBOILER 4, and maintain fuel specifications. The facility has not operated Boiler 4 in the last two years.

SC I. 3. And SC V.1. **COMPLIANCE.** Sulfur dioxide emissions (SO<sub>2</sub>) shall not exceed 120 ppmv in exhaust gas (50 percent excess air). Testing shall be conducted at the request of the AQD. At this time AQD has not requested SO<sub>2</sub> testing. It should be noted, that absent testing, compliance is determined through sulfur in fuel testing per SC II.1.

SC VI. 2. **COMPLIANCE.** Shall keep records, individually, for each boiler of the number of hours during each calendar year that the boiler combust liquid fuel. The records provided indicate that the facility has not combusted No. 2 fuel oil since the last inspection.

SC VI. 3. **NOT APPLICABLE.** Shall perform a daily non certified visible emission observation when the boilers are combusting fuel oil continuously for more than 24 hours. The facility has not combusted fuel oil and operates entirely on natural gas.

SC IX. 1. **NOT APPLICABLE.** Shall comply with 40 CFR Part 63, Subpart JJJJJJ if liquid fuel is combusted for more than 48 hours. The facility has not combusted fuel oil and operates entirely on natural gas.

**EU-BOILER3**

DTBHP has not operated EUBOILER3 in the last 2 years. ROP conditions were not evaluated.

**EU-BOILER4**

DTBHP has not operated EUBOILER4 in the last 2 years. ROP conditions were not evaluated.

**FG-BOILER 1,2**

SC I. 1. **COMPLIANCE.** NO<sub>x</sub> emission rate shall not exceed 0.20 lb/MMBtu when burning natural gas. The maximum NO<sub>x</sub> emissions at Boiler 1 and Boiler 2 were approximately 0.18 lb/MMBtu during the reporting period.

SC I. 2. **NOT EVALUATED.** NO<sub>x</sub> emission rate shall not exceed 0.3 lb/MMBtu when using distillate oil. The facility has not combusted No. 2 fuel oil, and currently operates entirely on natural gas.

SC VI. 1. **COMPLIANCE.** Shall keep records of NO<sub>x</sub> emissions as required by special condition SC I. 2. Records shall be expressed as tons per cumulative 5 month time period beginning May 1<sup>st</sup> through September 30<sup>th</sup> each year. The facility has maintained records for NO<sub>x</sub> emissions as required by SC I.1.

**FG-BOILER 6,7**

SC I. 1.1a. **COMPLIANCE.** CO emission rates shall not exceed 0.073 lb/MMBtu (for each boiler individually) when burning natural gas; testing required once during the term of the permit. On September 12 and September 26, 2015 the facility completed CO testing on Boiler 6 (0.0014 lb/MMBtu) and Boiler 7 (0.0111 lb/MMBtu).

SC I. 1.1b. **UNKNOWN.** CO emission rates shall not exceed 0.155 lb/MMBtu (for each boiler individually) when burning No. 2 fuel oil. At this time, DTBHP has not completed the required CO testing when combusting No. 2 fuel oil. Per SC V. 2., Testing is required once during the term of the ROP if No. 2 fuel oil is combusted for more than 48 hours. At this time the facility has not combusted fuel oil during the term of the ROP.

SC I. 1.1c. **COMPLIANCE.** CO emission rates shall not exceed 84.6 lb/hour (collectively for Boiler 6 and 7).

The CO limit is evaluated over the length of the performance test when testing, and is evaluated over a calendar month, based on operation, otherwise. On September 12 and September 26, 2015 the facility completed CO testing on Boiler 6 (0.1 lb/hour) and Boiler 7 (1.7 lb/hour). The facility also maintains the CO emission rates as outlined in Appendix 7C of the ROP. The highest reported CO emissions for Boiler 6 occurred at the end of January 2015 at 1.552 lb/hour. The highest reported CO emissions for Boiler 7 occurred at the end of April 2016 at 1.179 lb/hour. Collective CO emissions from Boilers 6 and 7 are significantly less than 84.6 lb per hour.

SC I. 1.1d, 1.1e, and 1.1f. **COMPLIANCE.** NOx emission rates shall not exceed 0.036 lb/MMBtu (for each boiler individually) when burning natural gas, 0.140 lb/MMBtu (for each boiler individually) when burning No. 2 fuel oil, and 76.4 lb per hour (collectively for Boiler 6 and 7). The emission limit of 0.140 lb/MMBtu is not applicable as the facility has not burned No. 2 fuel oil. The facility monitors and records the NOx emission rate using the PEMS. The NOx emission rate of 0.036 lb/MMBtu is an hourly rate (see Consent Order AQD No. 24-2016, Condition 9.A.1). The facility provided PEMS data for July 1, 2016 through November 10, 2016. The highest PEMS reading for Boiler 6 occurred on October 31, 2016 at 23:00 at 0.024 lb/MMBtu and 4.1545 lb/hour. The highest PEMS reading for Boiler 6 occurred on October 30, 2016 at 17:00 at 0.0218 lb/MMBtu and 3.7927 lb/hour. Collective NOx emissions from Boilers 6 and 7 are significantly less than 76.4 lb per hour.

SC I. 1.1g. **COMPLIANCE.** NOx emissions shall not exceed 155.3 tons per year (collectively for Boiler 6 and 7) based on a 12 month rolling period. The highest 12-month rolling NOx emission rate for Boiler 6 occurred at the end of February 2016 at 3.590 tons. The highest 12-month rolling NOx emission rate for Boiler 7 occurred at the end of December 2015 at 3.532 tons.

SC I. 1.1h. **COMPLIANCE.** PM10 emission shall not exceed 0.007 lb/MMBtu (for each boiler individually) when burning natural gas. On September 12 and September 26, 2015 the facility completed PM10 testing on Boiler 6 (0.0033 lb/MMBtu) and Boiler 7 (0.0020 lb/MMBtu).

SC I. 1.1i. **UNKNOWN.** PM10 emission shall not exceed 0.040 lb/MMBtu (for each boiler individually) when burning No. 2 fuel oil. At this time, DTBHP has not completed the required PM10 testing when combusting No. 2 fuel oil. Per SC V. 2, Testing is required once during the term of the ROP if No. 2 fuel oil is combusted for more than 48 hours.

SC I. 1.1j. **COMPLIANCE.** PM10 emission shall not exceed 21.8 lb/hour (collectively for Boiler 6 and 7). The facility maintains the PM10 emission rates as outlined in Appendix 7C of the ROP. The highest reported PM10 emissions for Boiler 6 occurred at the end of January 2015 at 0.366 lb/hour. The highest reported PM10 emissions for Boiler 7 occurred at the end of April 2016 at 0.212 lb/hour. The September 12 and 26, 2016 stack testing results did not include PM10 emissions in lb/hour. Collective PM10 emissions from Boilers 6 and 7 are significantly less than 21.8 lb per hour.

SC I. 1.1k. **COMPLIANCE.** Sulfur dioxide emissions shall not exceed 39 tons per year (collectively for Boiler 6 and 7) based on a 12-month rolling time period. The facility has not fired No. 2 fuel oil at the facility since early 2007. Calculated SO<sub>2</sub> emissions calculated from natural gas combustion are significantly below 39 tons per year. The highest reported 12-month rolling SO<sub>2</sub> emissions occurred at the end of December 2015 at 0.1128 tons per year.

SC V. 3. **COMPLIANCE.** A RATA of the PEMS shall be conducted annually. The most recent RATA was completed on September 22 and 23, 2016. Please see the Detroit District Office files for RATA report and results. Completion of the RATA satisfied requirement of 40 CFR Part 60, Subpart Db.

SC V. 4. **COMPLIANCE.** Quality assurance of the NOx PEMS shall be conducted by a relative accuracy audit (RAA). The 2016 first quarter RAAs were conducted on March 18, 2016 (see facility file). The 2016 second quarter RAAs were conducted on June 16, 2016 (see facility file).

SC VI. 3. **COMPLIANCE.** Shall maintain records of the amount of natural gas consumed, fuel oil consumed, sulfur content and heat content of No. 2 fuel oil, and sulfur dioxide emissions. The facility maintains the amount of natural gas consumed in boilers 6 and 7. The facility currently does not combust No. 2 fuel oil.

SC VI. 4. **COMPLIANCE.** Shall maintain records of the predicted NOx emission rate and monitored boiler operating conditions. The facility maintains the required records.

SC VI. 5. **COMPLIANCE.** Shall calculate the pound per hour CO and PM10 emission rates based upon calendar monthly average for both natural gas and fuel oil. The facility maintains the CO emission rates as outlined in Appendix 7C of the ROP. The facility maintains CO and PM10 emission rate calculations as required.

SC VI. 6. **COMPLIANCE.** Shall keep records individually for Boilers 6 and 7, or the number of hours during each year that the boiler combusts No. 2 fuel oil. No. 2 fuel oil has not been combusted at the facility.

SC VIII. **COMPLIANCE.** The facility appears to be in compliance with stack requirements. Measurements were not collected.

#### FG-BOILER 3,6,7

SC III. 1. **COMPLIANCE.** Shall not operate EU-BOILER3 while either of the package boilers are in operation. Boiler 3 is currently not operational, and is likely not going to be operated for the foreseeable future.

#### FG-BOILER 4,6,7

SC I. 1. **COMPLIANCE.** Sulfur dioxide emissions shall not exceed 39 tons per year based on a 12-month rolling time period. The highest reported 12-month rolling SO<sub>2</sub> emissions occurred at the end of December 2015 at 0.1128 tons per year (collective for EU-BOILER6 and EU-BOILER7).

SC III. 1. **COMPLIANCE.** Shall only fire natural gas, No. 2 fuel oil and/or on-specification oil in the boilers. The facility currently only fires natural gas in operational boilers.

SC VI. 1. **COMPLIANCE.** Shall obtain and maintain fuel receipts from the fuel oil supplier which certify that on-spec oil meets definition outline in Appendix 3. The facility does not combust on-spec oil. Boiler 4 is not operational.

SC VI. 2. **COMPLIANCE.** Shall maintain records of the amount of natural gas consumed, fuel oil consumed, on-spec oil consumed, sulfur content and heat content of No. 2 fuel oil, and sulfur dioxide emissions. The facility maintains the amount of natural gas consumed. The facility currently does not combust No. 2 fuel oil or on-spec oil.

#### CONSENT ORDER NO. AQD 24-2016

On November 16, 2015 and February 23, 2016, a violation notice was issued to DTBHP. Both violation notices cited an exceedance of the hourly NOx emission limit of 0.036 lb/MMBtu for EU-BOILER7. The violation notices were resolved by entry into Consent Order AQD No. 24-2016 on June 22, 2016. Compliance program and implementation conditions of the Consent Order are listed below.

9.A. 1. On and after the effective date of this Consent Order, the Company shall comply with the NOx pound per million British thermal unit (lb/MMBtu) limit for FG-BOILER\_6,7, in MI-ROP-B2814-2014, as amended, on an hourly basis.

Since the effective date of the Consent Order, DTBHP has been in compliance with the hourly NOx emission limit at Boiler 6 and Boiler 7.

9.A.2. If prior to the termination of this Consent Order the Company is issued a Permit to Install which modifies the NOx lb/MMBtu limit for FG-BOILER\_6,7, then the new limit shall replace the current limit and become enforceable by this Consent Order.

At this time a permit to install has not been issued.

9.B. 1. On and after the effective date of this Consent Order, the Company shall submit quarterly NOx excess emissions of reports. The reports shall contain the information referenced in Title 40 Code of Federal Regulations (CFR) 60.7(c) and (d) and in the format prescribed by Figure 1 of 40 CFR 60.7(d). The reports shall be delivered no later than 30 days following the end of each calendar quarter.

The facility has submitted quarterly excess emission reports for 2016. Since the effective date of Consent Order No. AQD 24-2016, the facility has reported no excess emissions and no monitor time for Boiler 6, and no excess emissions and 1 hour of monitor downtime for Boiler 7.

#### **PERMIT TO INSTALL EXEMPT EQUIPMENT**

##### Underground Storage Tank

The 500,000 gallon underground storage tank used for storage of No. 2 fuel oil is exempt from PTI requirements under the following rule.

R 336.1284(d): "Storage of ...diesel fuel oils nos. 2-D and 4-D specified in ASTM-D-975."

At this time, the facility does not store No. 2 fuel oil. According to Ms. Muhammad, the storage tank is empty.

##### Maintenance Shop Area

The machining equipment (saws, lathes, grinders, etc.) in the maintenance shop area are exempt from PTI requirements under the following rule.

R336.1285(l)(vi)(B): "Equipment for carving, cutting, routing, turning, drilling, machining, sawing, surface grinding, sanding, planing, buffing, ... which has emissions that are released only into the general in-plant environment."

#### **APPLICABLE FUGITIVE DUST CONTROL PLAN CONDITIONS:**

Not applicable. All lots are paved.

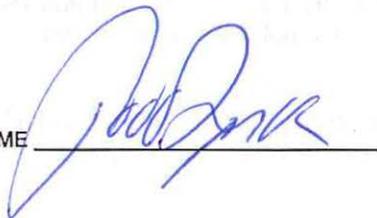
#### **MAERS REPORT REVIEW:**

The 2015 Michigan Air Emission Reporting System (MAERS) report was submitted on time. A MAERS audit was conducted and the emissions reported were considered representative of the facility operations. Please see MACES report CA\_B281433988 for information regarding the MAERS audit.

#### **FINAL COMPLIANCE DETERMINATION:**

At this time, DTBHP appears to be in compliance with ROP No. MI-ROP-B2814-2014 and Consent Order No. AQD 24-2016. Boilers 3 and 4 are currently not operating, and are not expected to be operating for the foreseeable future. It is recommended that during the next ROP renewal, that Boiler 3 and 4 be assessed for inclusion in the ROP.

NAME



DATE

11/30/16

SUPERVISOR

JK