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

N339153709

FACILITY: DTE Gas Company - Washington 10 Compressor Station		**SRN / ID:** N3391
LOCATION: 12700 30 MILE ROAD, WASHINGTON		**DISTRICT:** Southeast Michigan
CITY: WASHINGTON		**COUNTY:** MACOMB
CONTACT: John Leonard , Environmental Specialist		**ACTIVITY DATE:** 03/12/2020
STAFF: Kerry Kelly	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MAJOR
SUBJECT: Evaluate Washington 10's compliance with the Federal Clean Air Act; Part 55, Air Pollution Control of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended; Renewable Operating Permit (ROP) No. MI-ROP-N3391-2017a; 40 CFR Part 63 Subpart ZZZZ and 40 CFR Part 63 Subpart DDDDD.		
RESOLVED COMPLAINTS:		

On March 12, 2020, I (Kerry Kelly, AQD) conducted a scheduled inspection of DTE - Washington 10 Storage Facility (Washington 10), located at 12700 30 Mile Road in Washington Township, Michigan. The purpose of the inspection was to determine the facility's compliance with: the Federal Clean Air Act; Part 55, Air Pollution Control of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended; Renewable Operating Permit (ROP) No. MI-ROP-N3391-2017a; 40 CFR Part 63 Subpart ZZZZ and 40 CFR Part 63 Subpart DDDDD.

FACILITY OVERVIEW

DTE operates a natural gas compressor station in western Macomb County one-tenth of a mile east of M-53 on 30 Mile Road. The area surrounding Washington 10 is rural, sparsely populated with commercial, residential, and industrial properties. The nearest residence is approximately two-tenths of a mile north of Washington 10. There is another natural gas transmission facility, Vector Pipeline L.P. (SRN N7624), located about three-tenths of a mile south of Washington 10. Vector Pipeline's property is accessed through DTE-Washington 10 Compressor Station.

The six RICE (EUENGINE1, EUENGINE2, EUENGINE3, EUENGINE4, EUENGINE5, and EUENGINE6) at Washington 10 are used to drive the natural gas compressors. The compressors pressurize the natural gas to allow it to continue to flow to the pipeline or storage field. When natural gas is taken out of storage at a higher pressure than the pipeline pressure the water in the gas can freeze in the pipeline. Four natural gas-fired indirect heaters (FGINDHEATERS1 and FGINDHEATERS2) are used to prevent the water in the gas from freezing.

Before natural gas is sent to the pipeline for customers, it goes through desiccant towers for the removal of moisture and heavy hydrocarbons that became entrained in the gas during storage. The desiccant towers typically operate December through April. There are five desiccant towers at Washington 10. A maximum of three towers can process gas at the same time with a maximum processing capacity of 30 mcf/hour. In the desiccant towers processing natural gas, desiccant beads adsorb water and hydrocarbons. Following a period of natural gas processing, the beads in the tower need to be regenerated to remove the liquids from the beads. The beads are regenerated by heating wet natural gas, using a direct heater (EUDIRECTHEATER), and then sending the hot gas through the tower. The heated gas absorbs the liquids on the beads. The wet natural gas is then sent through a condenser to separate off water/oil and condensable hydrocarbons. A water/oil separator is used to remove oil from the water. The water, oil, and liquid hydrocarbons are sent to separate storage tanks (FGTANKS).

REGULATORY ANALYSIS

DTE - Washington 10 Compressor Station is considered a major source of Hazardous Air Pollutants (HAP) because the facility's potential to emit (PTE) is greater than 10 tons for any single HAP and 25 tons for aggregate HAP. Renewable operating permit (MI-ROP-N3391-2017a) became effective on July 2, 2019. Equipment covered in MI-ROP-N3391-2017a includes one direct heater, one emergency generator, six reciprocating internal combustion engines (RICE) (three 4,000 horsepower (HP) and three 4,735 HP), four 10 MMBtu/hr indirect heaters, four 29,400 gallon hydrocarbon storage tanks, and cold cleaners.

EUENGINE1, EUENGINE2, EUENGINE3, EUENGINE4, EUENGINE5, EUENGINE6, and EUGENERATOR are subject to the National Emission Standards for Reciprocating Internal Combustion Engines (RICE) promulgated in 40 CFR 63, Subpart ZZZZ. At this time, EUENGINE1, EUENGINE2, and EUENGINE3 do not have to meet the requirements of 40 CFR Part 63, Subparts A and ZZZZ per 40 CFR 63.6590(b)(3)(i) because construction of these RICE commenced prior to December 19, 2002, they each have a site rating greater than 500 HP, and they are located at a major source of HAP. EUGENERATOR does not have to meet the requirements of 40 CFR Part 63, Subparts A and ZZZZ per 40 CFR 63.6590(b)(3)(iii) because construction of EUGENERATOR commenced prior to December 12, 2002, it is an emergency stationary RICE with a site rating greater than 500 HP, and it is located at a major source of HAP.

EUDIRECTHEATER, EUINDIRECT1, EUINDIRECT2, EUINDIRECT3, EUINDHEATER4, EUP1_BMBLR1, EUP1_BMBLR2, EUP1_BMBLR3, EUP1_KC1000, EUP2_BMBLR1, EUP2_BMBLR2, EUP2_KC1000 at the stationary source are subject to the National Emission Standard for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines promulgated in 40 CFR Part 63, Subparts A and DDDDD.

INSPECTION

I arrived at DTE – Washington 10 Compressor Station at approximately 10:00 AM on March 12, 2020. I entered the office at Washington 10 and explained the purpose of the inspection to Mr. John Leonard, Environmental Specialist and Mr. Joe Kotwicki, Supervisor. Mr. Leonard and Mr. Kotwicki answered questions, provided records, and escorted me around the property during the inspection.

Washington 10 Compressor Station conducts central processing of natural gas. Natural gas is typically received at Washington 10 from April through September, via the E line,and stored in one of three storage fields. The total capacity of the three storage fields combined is approximately 90 billion cubic feet. Natural gas is typically withdrawn from the storage fields via the F line, and sent to customers October through March. At the time of the inspection, DTE was injecting using EUENGINE1 and EUENGINE2.

COMPLIANCE EVALUATION

EUDIRECTHEATER

EUDIRECTHEATER is a Maxon Model 400, size 487 M, heater. MI-ROP-N3391-2017 permits the use of natural gas or flash gas from FGTANKS to fuel EUDIRECTHEATER. According to Maxon's Technical Catalog for the Model 400 burner (Attachment 1)size 487M has a maximum heat input capacity of 10,060 MBtu/hour.

EUDIRECTHEATER Special Conditions (SC) I. 1. and 2. in the ROP limit the 12-month rolling NOx and CO emissions from EUDIRECTHEATER to 3.2 tons and 3.9 tons respectively. Monthly and 12-month rolling records of NOx and CO emissions, required in SC VI. 2., are used to demonstrate compliance with the NOx and CO emission limits. Mr. Leonard provided NOx and CO emissions calculations for EUDIRECTHEATER (Attachment 2). The emission factor used to calculate NOx emissions from EUDIRECTHEATER is 104 lb/MMCF. DTE uses

an emission factor of 76 lbs/MMCF to calculate CO emissions from EUDIRECTHEATER. The highest reported 12-month rolling NOx emissions for EUDIRECTHEATER during the period of January 2019 through February 2020 was 0.82 tons reported in February 2020. The highest reported 12-month rolling highest reported CO emissions for EUDIRECTHEATER was 0.47 tons between January 2019 through February 2020 reported in February 2020. These records indicate DTE has been operating below the NOx and CO emission limits set forth in EUDIRECTHEATER SC I.1. and 2.

The 12-month rolling total gas usage (natural gas or flash gas) for EUDIRECTHEATER is limited to 45 MMCF in EUDIRECTHEATER SC II. 1. Monthly and 12-month rolling records of the total natural gas and the flash gas used in EUDIRECTHEATER are required to be kept per EUDIRECTHEATER SC VI. 1. Mr. Leonard provided 12-month rolling natural gas and flash gas usage records for January 2019 through February 2020 (Attachment 2). The highest reported 12-month rolling flash gas and natural gas fuel use combined for EUDIRECTHEATER was 12.379 MMCFreported in February 2020. Based on these records it appears DTE is in compliance with the permit limit of 45 MMCF per 12-month rolling time period.

EUDIRECTHEATER SC III. 1. restricts the fuel used in EUDIRECTHEATER to pipeline quality natural gas or flash gas from the liquid hydrocarbon tanks (FGTANKS). Mr. Kotwicki stated that only pipeline quality natural gas or flash gas is used in EUDIRECTHEATER. Records of the fuel used in EUDIRECTHEATER (Attachment 2) indicate DTE did not use flash gas in EUDIRECTHEATER between January 2019 and February 2020.

EUGENERATOR

An emergency generator (EUGENERATOR), located in the Aux 1 Services Building at Washington 10, is used to supply power during an outage. EUGENERATOR is a 1090 kW generator powered by a 1340 HP rated RICE manufactured by Caterpillar (CAT 3516).

EUGENERATOR SC I. 1. and 2. limit the 12-month rolling NOx and CO emission from EUGENERATOR to 2.8 tons and 2.7 tons respectively. Monthly and 12-month rolling NOx and CO emissions calculations, required by EUGENERATOR SC VI.2, for the emergency generator were provided by Mr. Leonard (Attachment 3). The NOx and CO emission factors for EUGENERATOR are 6.14 lbs/hour and 5.72 lbs/hour respectively and are based on manufacturer's data. The highest reported 12-month rolling NOx emissions for EUGENERATOR during the period of January 2019 through February 2020 was 0.26 tons reported in August and September 2019. The highest reported CO emissions for EUGENERATOR was 0.25 tons between January 2019 through February 2020, reported in August and September 2019. These records demonstrate that EUGENERATOR has been operating below the permit limits of 2.8 tons NOx per 12-month rolling time period and 2.7 tons of CO per 12-month rolling time period set forth in EUGENERATOR SC I. 1. and 2.

The 12-month rolling hours of operation of EUGENERATOR are limited to 876 hours in SC III. 1. Mr. Leonard provided records of the monthly and 12-month rolling hours of operation of the emergency generator required per EUGENERATOR SC VI.1. (Attachment 3). The highest 12-month rolling hours of operation for EUGENERATOR between January 2019 through February 2020 was 81 hours. This demonstrates EUGENERATOR was in compliance with the 876 hours per 12-month rolling time period limit.

EUGENERATOR SC III. 2. limits the fuel used in EUGENERATOR to pipeline quality natural gas. According to Mr. Kotwicki, the generator uses only pipeline quality natural gas.

Compliance with all applicable provisions of the National Emission Standards for Hazardous Air Pollutants, as specified in 40 CFR Part 63, Subpart A and Subpart ZZZZ is required in EUGENERATOR SC IX.1. According to 40 CFR 63.6590(b)(3)(iii), located in 40 CFR 63 Subpart ZZZZ; existing RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions do not have to meet the requirements of 40 CFR 63 Subpart A and ZZZZ. Based on the installation date (7/1/99), EUGENERATOR is an existing RICE. In order to be considered an emergency stationary RICE the engine must not run for more than 100 hours per year for non-emergency purposes, including maintenance checks and readiness testing. The use in emergency situations is unlimited. Based on the run hours provided for EUGENERATOR (Attachment 3), EUGENERATOR was operated for readiness testing/maintenance purposes for 56 hours in 2019. This information indicates EUGENERATOR was operated for less than 100 hours between January 2019 and December 2019 for non-emergency purposes (weekly testing/maintenance) and appears to demonstrate that the generator is operating as an emergency generator as described in 40 CFR 63.6640(f).

FGENGINES1

In the ROP, EUENGINE1, EUENGINE2, and EUENGINE3 are combined in the flexible group (FG) FGENGINES1. The engines in FGENGINES1 were installed in 1999. Each engine in FGENGINES1 is a 4,000 HP natural gas-fired RICE manufactured by Cooper.

Emissions limits for NOx, CO, and VOC, set forth in FGENGINES1 SC I.1.a through 3.b, are listed in the table below:

Pollutant	Limit	Time Period/ Operating Scenario
NOx	**1.3 grams**	**Per horsepower-hour at 100% torque and 100% speed, per engine**
NOx	**227.0 tons**	**12-month rolling, as determined at the end of each calendar month**
CO	**2.0 grams**	**Per horsepower-hour at 100% torque and 100% speed, per engine**
CO	**228.6 tons**	**12-month rolling, as determined at the end of each calendar month**
VOC	**0.90 gram**	**Per horsepower-hour at 100% torque and 100% speed, per engine**
VOC	**103.8 tons**	**12-month rolling, as determined at the end of each calendar month**

FGENGINES1 SC V. 1. through 3. requires stack testing using Methods 2, 3A, 7E, 10, and 25A, or other acceptable reference methods approved by AQD within one year of issuance of the ROP and repeat stack testing within 180 days if the emission calculations show the 12-month rolling limit is within 25% of the limits in FGENGINES1 SC I. 1b, 2b, or 3b. These testing requirements are used to verify compliance with the emission limits in FGENGINES1 SC I. 1a, 2a, or 3a. The ROP (MI-ROP-N3391-2017) was issued to DTE Gas Company – Washington 10 Compressor Station on November 21, 2017. DTE most recently tested NOx, CO, and VOC emissions from EUENGINE1, EUENGINE2, and EUENGINE3 on May 22, 2018 and April 10 - 11, 2018 respectively, which is within one year of ROP issuance. NOx, CO, and

VOC emissions for each engine were below the limits in FGENGINES1 SC I. 1a, 2a, and 3a based on the 2018 stack test report on file at the AQD Southeast Michigan District office. The test report summary page is attached for reference (Attachment 4). The table below contains the information from the test report summary page:

Pollutant	**2018 Stack Test Results (average of three 1 hour runs)**		
	EUENGINE1	**EUENGINE2**	**EUENGINE3**
NOx	**0.36 grams/bhp-hr**	**0.56 grams/bhp-hr**	**0.58 grams/bhp-hr**
CO	**1.66 grams/bhp-hr**	**1.25 grams/bhp-hr**	**1.46 grams/bhp-hr**
VOC	**Non-Detect**	**Non-Detect**	**Non-Detect**

To show compliance FGENGINES1 SC I. 1b, 2b, and 3b, monthly and 12-month rolling records of the total NOx, CO and VOC emissions, in tons, for FGENGINES1 are required to be kept per FGENGINES1 SC VI. 1. Mr. Leonard provided monthly and 12-month rolling NOx, CO, and VOC emission records and calculations for FGENGINES1. (Attachment 5). These records indicate that the DTE is using hourly emission factors derived from the most recent stack tests and that the engines in FGENGINES1 have been operating below the NOx, CO, and VOC limits in FGENGINES1 SC I. 1b, 2b, and, 3b and are not within 25% of these limits. The highest reported 12-month rolling NOx, CO, and VOC emissions for January 2019 through February 2020 for FGENGINES1 were 28.96 tons, 83.28 tons, and 0 tons respectively.

FGENGINES1 SC III. 1. mandates that each engine in FGENGINES1 not operate unless a clean-burn combustion system is installed and operating properly. Each of the engine in FGENGINES1 is equipped with a pre-combustion chamber according to the 2019 inspection report for the inspection of each engine conducted by the engine manufacturer, Cooper (Attachment 6). The inspection report for EUENGINE1 indicates, under the Ignition and Pre-combustion chamber sections, that the unit had combustion issues and it was recommended all spark plugs and the #1L cylinder, Left Pcc Check valve and the #1R and #3R Left and Right Pcc Check valves be replaced when the unit can be scheduled down. In an email dated May 13, 2020, Mr. Leonard indicated that all spark plugs and Pcc Check Valves were replaced and the cam lobe and follower inspected on EUENGINE1 during maintenance in February (Attachment 7). There were no pre-combustion chamber problems noted during the analysis of EUENGINE2 and EUENGINE3.

DTE is only permitted to use pipeline quality natural gas to fire the engines in FGENGINES1. Mr. Kotwicki said only pipeline quality natural gas is used in the engines in FGENGINES1.

FGENGINES1 SC VI. 2, 3, 6, and 7. require DTE to monitor engine operating parameters on a continuous basis to ensure that engine speed and torque are within ranges for which engine emission factors have been based, maintain on file records of the normal operating ranges, and record critical operating parameters for each engine every four hours of operation. During the inspection I observed that each of the engines in FGENGINES1 was equipped with a monitoring system that displays operating parameters such as torque, engine speed, fuel flow, and horsepower continuously and that each monitoring system was equipped with alarms and engine shut down set points to prevent the engine from being operated out of

normal ranges. EUENGINE1 and EUENGINE2 were being operated during the inspection. The engine operator printed a copy of the operator hourly log for EUENGINE1 and EUENGINE2 which shows the instantaneous operating data from each engine's monitor (Attachment 8). Mr. Leonard provided a copy of the normal operating ranges and alarms (Attachment 9).Records of the engine speed, torque, engines hours, and fuel consumption for each engine in FGENGINES1 for August 2019 were also provided as requested (Attachment 10).

If normal operating ranges specified by the manufacturer or established through stack testing are exceeded, DTE is required to implement and record preventive maintenance activities necessary to ensure that system parameters are operated within normal operating ranges. Each engine in FGENGINES1 is programmed to shut down before normal operating ranges are exceeded, preventing the engines from being operated outside of normal ranges. In February 2019, DTE chose to shut down EUENGINE3 due to an oil filter differential pressure alarm. DTE Reliability staff investigated and discovered liquids from the field entered the compressor associated with EUENGINE3 and all compressors at the facility. According to the Principal Reliability Engineer for DTE Washington 10, Mary Savalle, the liquids did not get into the engines or fuel gas of any engine in FGENGINES1. Each engine in FGENGINES1 was inspected after it was discovered the liquids got into the compressors. Mr. Leonard provided a copy of the scope of work done on each engine (Attachment 11) which included a full overhaul of EUENGINE2 and EUENGINE3.

FGENGINES1 SC VI. 8. mandates that DTE conduct preventive maintenance activities in accordance with the Manufacturer's Commercial Engine Maintenance Schedule. Mr. Leonard provided a list of the maintenance activities performed on each engine between January 2019 and January 2020 (Attachment 12). Annual engine inspection reports for FGENGINES1, which describe the findings of the inspection and recommended repairs/maintenance, were also provided (Attachment 6). According to the annual inspection reports, there were no repairs/issues that were recommended to be addressed as soon as possible. It was noted in the inspection report for EUENGINE1 that the unit had combustion issues that should be addressed, by replacing all spark plugs and some pcc check valves, the next time the unit is scheduled down. Mr. Leonard stated the spark plugs and pcc check valves on EUENGINE1 were replaced during scheduled maintenance after the inspection.

FGENGINES1 SC VII.4. and 6. require the testing date and test plan for stack tests be submitting to AQD 30 days prior to the test. Stack tests were conducted on each engine in FGENGINES1 May 22, 2018 and April 10 - 11, 2018. A stack test plan and report was received on time (February 15, 2018 and June 4, 2018 respectively). A copy of the test plan and report are on file at the Warren District office. DTE is required to notify the AQD Technical Programs Unit Supervisor and the District Supervisor no less than 7 days prior to the anticipated test date. DTE notified AQD more than a month prior of the dates the engines in FGENGINES1 were last tested in April 2018.

I inspected each of the stacks for the emission units in FGENGINES1. Each of the stacks associated with the emission units in FGENGINES1 appeared to meet the stack parameter limits set forth in FGENGINES1 SC VIII. 1. through 3, however, actual measurements were not taken. There were no visible emissions emanating from the stacks of EUENGINE1 nor EUENGINE2 during the inspection.

Compliance with all applicable provisions of the National Emission Standards for Hazardous Air Pollutants, as specified in 40 CFR Part 63, Subpart A and Subpart ZZZZ is required in EUGENERATOR SC IX.1. According to 40 CFR 63.6590(b)(3)(i), located in 40 CFR 63 Subpart ZZZZ; existing stationary 2-stroke lean burn RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions do not have to meet the requirements of 40 CFR 63 Subpart A and ZZZZ. FGENGINES1 are existing 2-stroke lean burn RICE and DTE – Washington 10 Compressor Station is a major source of HAP.

FGENGINES2

EUENGINE4, EUENGINE5, and EUENGINE6 are combined in the ROP and named FGENGINES2.

Each engine in FGENGINES2 is a new 4,735 HP, 4-stroke lean burn RICE manufactured by Caterpillar. CO and VOC emissions from each engine in FGENGINES2 are controlled using a catalytic oxidizer.

Emissions limits for NOx, CO, and VOC, set forth in FGENGINES2 SC I.1 through 7, are listed in the table below:

Pollutant	Limit	Time Period/ Operating Scenario
NOx	**0.9 gram**	**Per horsepower-hour at 100% torque and 100% speed, per engine**
NOx	**130.4 tons**	**12-month rolling, as determined at the end of each calendar month**
CO	**2.5 grams**	**Per horsepower-hour at 100% torque and 100% speed, per engine (pre-catalyst)**
CO	**25.4 tons**	**12-month rolling, as determined at the end of each calendar month**
VOC	**1.0 gram**	**Per horsepower-hour at 100% torque and 100% speed, per engine**
VOC	**144.8 tons**	**12-month rolling, as determined at the end of each calendar month**

Compliance with the 0.9 gram/hp-hr NOx limit and 1.0 gram/hp-hr VOC limit is demonstrated through compliance with SC V. 1 in FGENGINES2. FGENGINES2 SC V. 1 requires stack testing to determine theNOx and VOC emissions within 5 years of the previous stack test. DTE most recently tested NOx and VOC emissions from EUENGINE4, EUENGINE5, and EUENGINE6 on April 10 - 11, 2018. The previous stack test for NOx and VOC was conducted in February 2013. A copy of the summary table from the 2018 stack test report is attached (Attachment 4). The complete stack test report is on file at the AQD Warren District office. Based on the data in the stack test summary, the NOx and VOC emissions from each engine were below the limits in FGENGINES2 SC I. 1 and 6. The table below contains the information from the test report summary page:

Pollutant	2018 Stack Test Results

	(average of three 1 hour runs)		
	EUENGINE4	**EUENGINE5**	**EUENGINE3**
NOx	**0.27 grams/bhp-hr**	**0.36 grams/bhp-hr**	**0.33 grams/bhp-hr**
VOC	**ND**	**ND**	**ND**

According to the ROP, compliance with the 2.5 gram/hp-hr CO limit and the CO destruction efficiency (DE) of the catalytic system is shown through compliance with SC V. 2 in FGENGINES2. FGENGINES2 SC V. 2 requires stack testing to determine the CO emissions and the CO destruction efficiency within 180 days of the previous catalytic oxidation system performance test. After two consecutive passing events, the test plan can be changed to annually. Each engine in FGENGINES2 passed the previous two consecutive stack tests for CO. DTE most recently tested CO emissions from EUENGINE4, EUENGINE5, and EUENGINE6 on June 4-6, 2019. The previous stack test for CO was conducted in April 10 - 11, 2018. A copy of the results tables from the 2019 stack test report is attached (Attachment 13). The complete stack test report is on file at the AQD Warren District office. Based on the data in the stack test summary for 2019, the CO emissions from each enginein FGENGINES2 were below the limit in FGENGINES2 SC I.3 and 5. The table below contains the information from the test report:

Pollutant	**2019 Stack Test Results (average of three 1 hour runs)**		
	EUENGINE4	**EUENGINE5**	**EUENGINE6**
CO (g/HP-hour)	**1.83 grams/bhp-hr**	**1.90 grams/bhp-hr**	**1.59 grams/bhp-hr**
CO DE	**96.9%**	**96.4%**	**99.3%**

Compliance with the 12-month rolling NOx, CO, and VOC limits is demonstrated through compliance with SC VI. 4 and 5 in FGENGINES2, according to the ROP. FGENGINES2 SC VI. 4 and 5 require monthly and 12 month rolling records of the total NOx and VOC emissionsfrom FGENGINES2, in tons, be kept. Mr. Leonard provided monthly and 12-month rolling NOx, CO, and VOC emission records and calculations for FGENGINES2 (Attachment 5). These records indicate that the DTE is using the emission factors derived from the most recent stack tests and that NOx, CO, and VOC emissions from all engines in FGENGINES2 combined are less than the NOx, CO, and VOC limits in FGENGINES2 SC I. 2, 4, and, 7. The highest reported 12-month rolling NOx, CO, and VOC emissions for January 2019 through February 2020 for FGENGINES2 were 21.70 tons, 2.27 tons, and 0.0 tons respectively.

DTE is limited to using only pipeline quality natural gas to fire the engines in FGENGINES2. Mr. Kotwicki said only natural gas is used in the engines in FGENGINES2.

Operation of any engine in FGENGINES2 is prohibited unless a preventative maintenance plan as specified in Rule 911(2) is implemented and maintained. Mr. Leonard provided a copy of the preventative maintenance plan. Rule 911(2)(a) requires a complete preventative

maintenance program be included in the MAP. The MAP submitted state operating rounds are performed during each shift that the engines are in operation to check for leaks and look for any unusual operating conditions. The oil is checked monthly to detect maintenance problems that might be developing. Routine engine maintenance is performed at manufacturer recommended intervals (quarterly and 2000 hr operating maintenance) and typically covers bearings, powerheads, combustion, etc. According to records previously submitted by Washington 10 staff, the MAP preventative maintenance section is not complete. I sent an email to DTE asking them to revise and re-submit the MAP to include the complete preventative maintenance program.

FGENGINES2 SC VI. 6. requires records of all maintenance done on each engine in FGENGINES2 be kept. Mr. Leonard provided maintenance records for FGENGINES2 between January 2019 through January 2020 (Attachment 12 & 15). The annual engine inspection reports from Cooper, which describe the findings of the inspection and recommended repairs/maintenance, were also provided (Attachment 14). According to the annual inspection, EUENGINE4 was the unit in FGENGINES2 that had issues that needed to be addressed as soon as possible. In the inspection report for EUENGINE4, it is recommended that compressor cylinder #3 be inspected and corrected ASAP to avoid additional damage to other components. Maintenance records provided by DTE indicate all compressor cylinders on unit 4 were inspected in 2019-2020 and two of the cylinders were replaced.

FGENGINES2 SC III. 2. requires FGENGINES2 operate within normal operating ranges specified by the manufacturer or established through stack testing. I observed that each of the engines in FGENGINES2 is equipped with a monitoring system that will sound alarms and shut the engine down before normal operating ranges are exceeded, preventing the engines from operating outside of normal ranges established by the manufacturer or through stack testing. Mr. Leonard submitted operating ranges for the engines as required in SC VI.6 (Attachment 9) and records of the engine speed, torque, engines hours, and fuel consumption for each engine in FGENGINES2 for August 2019 were also provided as requested (Attachment 10).

FGENGINES2 SC III.3. states the total break-in hours for each engine in FGENGINES2 shall not exceed 200 hours. The underlying applicable requirement (40 CFR 63.6640(d)) states: “For new, reconstructed, and rebuilt stationary RICE, deviations from the emission or operating limitations that occur during the first 200 hours of operation from engine startup (engine burn-in period) are not violations.” This exemption from receiving a violation notice for FGENGINES2 emissions and operating deviations does not appear to apply for January 2019 through December 2019 because there were no emissions or operating deviations reported for FGENGINES2.

DTE is required, per SC III.4, to implement and maintain a start-up, shut-down, and malfunction abatement (SSM) plan. Mr. Leonard provided a copy of the SSM plan. A copy of the plan is on file at the EGLE Warren District Office.

Compliance with the 93% CO destruction efficiency and the operating limits in 40 CFR 63 Subpart ZZZZ apply at all times except during periods of start-up, shut-down, or malfunction as allowed in SC III.2, per SC III.5. The amount of time spent at idle during start-up must be minimized to a period of time necessary for safe loading, not to exceed 30 minutes, after which time the emissions standards in 40 CFR 63 Subpart ZZZZ apply. According to Mr. Kotwicki, there were no events in 2019 when an engine in FGENGINES2 operated for more

than 30-minutes during start-up.

Operation and maintenance of any engine subject to 40 CFR 63 Subpart ZZZZ in a manner consistent with safety and good air pollution control practices for minimizing emissions, including associated air pollution control equipment and monitoring equipment, is required per FGENGINES SC III. 6. According to the MAP and SSM plan provided for FGENGINES2, routine engine and catalyst maintenance is performed at manufacturer recommended intervals and the engines are equipped by the manufacturer with controls that automatically shut down the engine if it should
operate outside its normal operating ranges or otherwise malfunction.

DTE is prohibited from operating an engine in FGENGINES2 unless the engine's respective catalytic oxidation system is installed, maintained, and operated in a satisfactory manner. Satisfactory operation includes; a. replacing the catalyst based on the manufacturer's recommended schedule, b. maintaining the temperature of each RICE exhaust so that the catalyst bed inlet temperature is greater than or equal to 450 °F and less than or equal to 1350 °F., and c. maintaining each RICE catalyst so that the pressure drop across the catalyst does not change by more than 2 inches of water from the pressure drop across the catalyst that was measured during the initial performance test (at 100 percent load plus or minus 10 percent).

Operations/station repairmen maintain the catalysts. The catalysts are taken out, inspected, and cleaned approximately annually and replaced when necessary or recommended by the manufacturer. Mr. Leonard provided the manufacturer maintenance recommendations for the catalysts (Attachment 16). According the manufacturer's recommendations, the frequency of cleaning is dependent upon the amount of particles in the gas, diesel engines often require cleaning more often than gas-fired engines, and frequently an annual inspection is all that is needed. Testing is done annually on the catalysts to ensure CO destruction efficiency.

During the inspection I observed that each engine was equipped with a device that monitors the catalyst inlet temperature. None of the engines in FGENGINES2 that were being operated during the inspection. Continuous monitoring and recording of the inlet temperature of each catalytic oxidizer in FGENGINES2 is required per FGENGINES2 SC VI. 2. and
8. Mr. Leonard provided records of the 4-hour rolling average catalyst inlet temperatures for EUENGINE4, EUENGINE5, and EUENGINE6 between May 2018 through October 2018 (File location: S:\Air Quality Division\STAFF\Kerry Kelly\Temp Records\N3391). These records indicate the 4-hour rolling average catalyst inlet temperature for each engine's associated catalyst was greater than or equal to 450 °F and less than or equal to 1350 °F when the respective engine was being operated.

FGENGINES2 SC IV. 2. requires a continuous parameter monitoring system be installed, operated, and maintained in a satisfactory manner according to the requirements in 40 CFR 63.6625(b)(1) through (6), which includes developing a site-specific monitoring plan addressing the design and data collection of the CPMS and testing the accuracy of the thermocouple annually. The temperature sensor must have a minimum tolerance of 2.8 degrees Celsius (5 degrees Fahrenheit) or 1 percent of the measurement range, whichever is larger. Mr. Kotwicki provided the catalyst thermocouple calibration log for each catalyst in FGENGINES2 (Attachment 17). These records indicate the accuracy of the thermocouple for each catalyst was tested between September 4, 2019 and September 11, 2019, within a year of the previous accuracy check, conducted between October 23, 2018 and November 8, 2018, and that each thermocouple's accuracy was within one percent or 4.0 degrees

Fahrenheit.

Ms. Kelly Guertin, Senior Environmental Engineer, DTE, provided a copy of the site-specific monitoring plan for the CPMS. SC IV.2.vii. requires the monitoring plan address data recording, calculations, and reporting. The monitoring plan that was submitted does not thoroughly describe how data is averaged, in particular, whether measurements taken during start-up, shut-down or malfunctions will be used in calculations and how many data points are required for averaging. I sent an email to DTE asking them to revise and re-submit the site-specific monitoring plan.

Satisfactory installation, calibration, maintenance and operation of a device to monitor, by observation, the pressure drop across each catalytic oxidizer in FGENGINES2 once per month is required in FGENGINES2 SC VI. 3. I inspected and observed that each engine in FGENGINES2 was equipped with a monitoring system that continuously monitors and displays the pressure drop. Mr. Leonard provided records of the monthly pressure drop readings for each catalytic oxidizer for January 2019 through March 2020 (Attachment 18). These records indicate the recorded pressure drop values were within 2 inches of water gauge pressure of the pressure drop established during testing. The largest measured difference was 1.5 inches water column recorded for the catalyst on EUENGINE5 on March 5, 2019.

DTE provided the requested records required in SC VI.9 including CMS calibration checks; site-specific monitoring plan and SSM plan; and results of performance tests. According to Mr. Kotwicki, there were no malfunctions of the air pollution control or monitoring equipment.

I inspected each of the stacks for the emission units in FGENGINES2. Each of the stacks associated with the emission units in FGENGINES2 appeared to meet the permit's stack/parameter limits set forth in FGENGINES2 SC VIII. 1. through 3.

FGENGINES2 SC IX. requires compliance with all applicable provisions of National Emission Standards for Hazardous Air Pollutants specified in 40 CFR 63 Subpart A and ZZZZ. Compliance with these conditions will be evaluated in FGNESHAPZZZZ.

DTE is required, in FGNESHAPZZZZ SC VII.4, to submit to the AQD District Supervisor, a semi-annual compliance report, as specified in 40 CFR 63.6650, which contains all deviations during the reporting period from any applicable emission limitation or operating limitation and all periods during which the CPMS or CEMS was out of control as defined in 40 CFR 63.8(c)(7). If there were no deviations from any applicable emission limitations or operating limitations or no periods that the CPMS or CEMS was out of control, the report shall contain a statement that there were no deviations and no periods during which the CPMS or CEMS was out of control during the reporting period. In the semi-annual and annual deviation reports submitted by Mr. Leonard for July 1, 2019 through December 31, 2019 there were statements that there were no periods during which the CPMS was out of control.

SC VII. 6. states the permittee shall submit a startup, shutdown and malfunction report if actions addressing the startup, shutdown and malfunction were not consistent with the Startup/Shutdown/Malfunction Plan. There were no abnormal startup, shutdown or malfunction events recorded in 2019.

Notifications in 40 CFR 63.7(b) and (c), 63.8 (e), (f)(4) and (f)(6), and 63.9(b) through (e), (g)

and (h), 40 CFR 63.9(h)(2)(ii), and 63.10(d)(2), referenced in SC VII. 7 through 8, are required to be submitted on time. Records of 40 CFR 63 Subpart ZZZZ initial notifications are on file at the AQD office.

FGINDIRECTHEATERS1 The flexible group FGINDIRECTHEATERS1 consists of EUINDHEATER1, EUINDHEATER2, and EUINDHEATER3. I inspected EUINDHEATER1, EUINDHEATER2, EUINDHEATER3. EUINDHEATER1, EUINDHEATER2, and EUINDHEATER3, each have two, 5 MMBtu, Maxon Model 487M burners.

Monthly and 12-month rolling NOx and CO emissions records for FGINDHEATERS1, required in FGINDHEATERS1 SC VI.3., were provided by Mr. Leonard (Attachment 19). These records indicate EUINDHEATERS1 were operating below the 7.1 tons NOx per 12-month rolling time period limit specified in FGINDHEATERS1 SC I. 1. and the 4.4 tons of CO per 12-month rolling time period in FGINDHEATERS1 SC I. 2. from January 2019 to February 2020. The highest 12-month rolling NOx emissions reported was 3.36 tons reported in February 2020. The highest reported 12-month rolling CO emissions were 2.16 tons reported in February 2020.

FGINDIRECTHEATERS1 SC II. 1. limits the 12-month rolling natural gas throughput for FGINDIRECTHEATERS1 to 100 million standard cubic feet. Mr. Kotwicki provided natural gas usage records for the indirect heaters required per FGINDIRECTHEATERS1 SC VI.2. (Attachment 19). The records indicate that DTE is in compliance with the permit limit of 100 MMCF per 12-month rolling time period for FGINDIRECTHEATERS1. Note: the company only has one gas meter for all four line heaters at the facility. They calculate natural gas usage for FGINDHEATERS1 by multiplying the total gas usage by 0.75. The natural gas usage for FGINDHEATERS2 is calculated by multiplying the total gas usage by 0.25. Using one meter for all four line heaters is permitted as long as their records show the total usage is below the lower of the two usage limits (67 million standard cubic feet for FGINDIRECTHEATERS2). The highest fuel usage for EUINDHEATERS1 and EUINDHEATERS2 combined was 64.08 million standard cubic feet between January 2019 and February 2020, which is below the lesser of the fuel usage limits of 67 MMCF. DTE appears to be in compliance with the permit material limits for both FGINDHEATERS1 and FGINDHEATERS2.

FGINDHEATERS1 SC III. 1 stipulates only natural gas shall be burned in FGINDHEATERS1 and FGINDHEATERS2. According to Mr. Kotwicki, FGINDHEATERS1 and FGINDHEATERS2 only use by pipeline quality natural gas as fuel.

I inspected each of the stacks for the emission units in EUINDHEATERS1. Each of the stacks associated with the emission units in EUINDHEATERS1 appear to meet the stack parameters set forth in EUINDHEATERS1 SC VIII. 1. through 3.

FGINDIRECTHEATERS2

FGINDIRECTHEATERS2 consists of EUINDIRECTHEATER4. I inspected EUINDIRECTHEATER4. EUINDIRECTHEATER4 has two, 5 MMBtu, Maxon Model 487M burners.

Mr. Leonard provided NOx and CO emission records for EUINDHEATERS2 (Attachment 19). These records demonstrate EUINDHEATERS2 has been operating below the 1.8 pounds per hour NOx limit specified in EUINDHEATERS2 SC I. 1. and the 1.1 pounds per hour of CO limit SC I. 2. from January 2019 to February 2020. The highest reported NOx emissions for EUINDHEATERS2 were 1.04 pounds/hr and the highest reported CO emissions was 0.67 pounds/hr both reported in January 2020.

The 12-month rolling natural gas throughput for FGINDIRECTHEATERS2 is limited to 67 million standard cubic feet in FGINDIRECTHEATERS2 SC II. 1. Mr. Leonard provided natural gas usage records for the indirect heaters required per FGINDIRECTHEATERS2 SC VI.2 (Attachment 19). The records indicate that DTE is in compliance with the permit limits of 67 MMCF per 12 month rolling time period from FGINDHEATERS2. See discussion in FGINDIRECTHEATERS1 regarding fuel usage calculations.

FGINDHEATERS1 SC III. 1 and FGINDHEATERS2 SC III. 1. stipulates only natural gas shall be burned in FGINDHEATERS1 and FGINDHEATERS2. According to Mr. Kotwicki, FGINDHEATERS2 only use pipeline quality natural gas as fuel.

I inspected the stack for EUINDHEATERS2. The stack appeared to meet the stack parameter set forth in FGINDHEATERS2 SC VIII.1.

FGHCTANKS

During the facility walk-through I observed four tanks on the south end of the property which Mr. Kotwicki said were EUHCTANK1, EUHCTANK2, EUHCTANK3, and EUHCTANK4 and are combined in the flexible group FGHCTANKS. The emissions from the tanks are controlled using an enclosed flare or the direct fired heater.

FGHCTANKS SC III. 1. requires that DTE properly maintain and operate a flame sensor for the pilot flame on the enclosed flare. The flare used to control FGTANKS must be installed, and continuously operate a burning pilot flame during times of natural gas withdrawal, according to FGHCTANKS SC IV. 1. and 2. DTE continuously monitors for presence of a pilot flame during periods of natural gas withdrawal using a UV Scanner – 5600-91 Eclipse Combustion. If the pilot flame were to go out, an alarm is triggered and the valve which allows the hydrocarbons to vent to the flare is shut-off. It appears the tanks are operating in compliance with FGHCTANKS SC III.1 and FGHCTANKS SC IV. 1. and 2.

DTE is required to record the presence of a pilot flame on the flare associated with FGHCTANKS on a daily basis in a manner acceptable to the AQD District Supervisor according to FGTANKS SC VI. 2. The flare system is designed to ensure the presence of a pilot flame when gas is flowing to the flare. The flare operation begins when a blower turns on to remove any gas that may be left in the stack. Following the blower cycle, the ignitor will light the pilot flame. Once the pilot flame is ignited, the UV scanner will then check for presence of a flame. If a flame is detected by the UV scanner the gas will begin to flow. If a flame is not detected, the gas valve will not open and an alarm will notify the operator of the lack of flame. In addition, if the flame is not ignited, the gas does not need to be immediately vented to prevent pressure build up because the tanks have eight hours of pressure capacity.

During the inspection I observed the flare height which appeared to meet the stack parameter set forth in FGTANKS SC VIII.1.

FGCOLD CLEANERS

There are 2 cold cleaners at Washington 10 Compressor Station. Both cold cleaners have an air/vapor interface of not more than ten square feet and are equipped with a device for draining parts as required by FGCOLDCLEANERS SC IV.1.a and 2. During the inspection the lids to the cold cleaners were closed as required by FGCOLDCLEANERS SC IV.3. The solvent in the cold cleaners does not appear to be heated or agitated. Records of the size of the cold cleaners, installation date, applicable Rule 201 exemption, and the serial numbers, as required by FGCOLDCLEANERS SC VI.2, were provided by Mr. Leonard (Attachment 20). I inspected the cold cleaners and waste storage. The operating procedures for the cold

cleaners were posted in a conspicuous area near the cold cleaner as required by FGCOLDCLEANERS SC VI. 3. The solvent waste drums I observed were covered as required by FGCOLDCLEANERS SC VI.4.

FGBOILERS

This flexible group includes EUDIRECTHEATER, EUINDHEATER1, EUINDHEATER2, EUINDHEATER3, EUINDHEATER4, and seven natural gas fired boilers used to heat fuel gas before it goes into the engines and to heat buildings in the winter. Two of the boilers are rated at 1 MMBtu/hr and the other five are rated at 2 MMBtu/hr.

The emission units in FGBOILERS are subject to the National Emissions Standards for Boilers and Process Heaters at major sources of Hazardous Air Pollutants (40 CFR 63 Subpart DDDDD). FGBOILERS contains requirements from 40 CFR 63 Subpart DDDDD for "units designed to burn gas 1 subcategory" and that only fire natural gas. A unit designed to burn gas 1 subcategory includes any boiler or process heater that burns only natural gas, refinery gas, and/or other gas 1 fuels.

FGBOILERS requires a one-time energy assessment be performed on the line heaters and boilers no later than January 31, 2016. On January 27, 2016 AQD received an Initial Notification of Compliance Status, including statements that an initial tune-up and a one-time energy assessment were conducted, as required by 40 CFR 63 Subpart DDDDD. A tune-up is required every 13 months for the direct heaters and line heaters and every 61 months for the boilers. Records provided by Ms. Kotwicki (Attachment 21), indicate tune-ups were conducted on the direct heater and line heaters on January 16, 2020,which was 12 months after the previous tune-up. A repeat tune-up was conducted on the boilers on February 14, 2020 and February 19, 2020.

The boilers in FGBOILERS are exempt from the requirement in Rule 201 to obtain a permit to install per Rule 282(2)(b) because they are used for space heating or process heat, fire sweet natural gas, and have a heat input capacity less than 50,000,000 Btu/hr.

FGRULE285(mm)

FGRULE285(mm) pertains to routine and emergency venting of natural gas from transmission and distribution systems or field gas from gathering lines. For safety purposes each engine, each pipeline, and the dehydration unit has an emergency shut-down vent. Mr. Leonard notified AQD on October 21, 2019 of unplanned emergency natural gas venting event that occurred at the DTE Gas Company Washington 10 on October 18, 2019 at approximately 5:25 pm. The venting occurred due to an accidental emergency shutdown. It is estimated that 1.2 MMSCF was vented to the atmosphere. For emergency venting of natural gas in amounts greater than 1,000,000 standard cubic feet per event, DTE is required to notify the pollution emergency alert system (PEAS) within 24 hours of an emergency pipeline venting. Failure to report the venting to PEAS within 24 hours of the venting is a deviation of SC VII. 6. Mr. Leonard reported the failure to notify PEAS within 24 hours as a deviation in the semi-annual and annual reports received March 16, 2020.

SEMI-ANNUAL AND ANNUAL REPORTING

The following requirements are applicable to each emission unit and flexible group in the ROP:

Prompt reporting of deviations pursuant to General Conditions 21 and 22 of Part A.

Semiannual reporting of monitoring and deviations pursuant to General Condition 23 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by

rch 15 for reporting period July 1 to December 31 and September 15 for reporting period January 1 to June 30.
Annual certification of compliance pursuant to General Conditions 19 and 20 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for the previous calendar year

Certified semi-annual and annual deviation reports were received by AQD on March 16, 2020. For the reporting periods January 1, 2019 through June 30, 2019, DTE reported the following deviations at Washington 10:
Failure to notify EGLE within 24 hours of natural gas venting of more than one million standard cubic feet.

MICHIGAN AIR EMISSIONS REPORTING SYSTEM (MAERS) REPORTING

DTE submitted the 2019 criteria pollutant emissions from Washington 10 to MAERS on time. The emissions reported to MAERS appear to be consistent with emission records collected during this inspection.

CONCLUSION

Based on the information I gathered during the inspection, I determined that DTE Gas Company - Washington 10 Compressor Station appears with MI-ROP-N3391-2017a and the evaluated air quality rules and regulations.

NAME K. Kelly DATE 6/15/2020 SUPERVISOR Joyce Zhu