

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

B291845163

FACILITY: Consumers Energy Thetford Combustion Turbine Plant	SRN / ID: B2918
LOCATION: 10500 N Genesee Rd, MOUNT MORRIS	DISTRICT: Lansing
CITY: MOUNT MORRIS	COUNTY: GENESEE
CONTACT: George Eurich , Air Quality Lead	ACTIVITY DATE: 07/12/2018
STAFF: Daniel McGeen	COMPLIANCE STATUS: Compliance
SUBJECT: Partial Compliance Evaluation (PCE) activities, conducted as part of a Full Compliance Evaluation (FCE) activity: 1.) scheduled inspection; and 2.) review of facility logs and recordkeeping.	
RESOLVED COMPLAINTS:	

**Facility environmental contact: George Eurich, Air Quality Lead; 989-891-3317;
george.eurich@cmsenergy.com;**

Emission unit ID	Emission unit description	Installation date	Operating status
EUCOMBTURB1	Unit 1 combustion turbine, heat input rating of 555 million BTU/hr Can be fueled by natural gas or fuel oil	7/1/67	Decommissioned in place.
EUCOMBTURB2	Unit 2 combustion turbine, heat input rating of 555 million BTU/hr Can be fueled by natural gas or fuel oil	7/1/67	Operational
EUCOMBTURB3	Unit 3 combustion turbine, heat input rating of 555 million BTU/hr Can be fueled by natural gas or fuel oil	7/1/67	Operational
EUCOMBTURB4	Unit 4 combustion turbine, heat input rating of 555 million BTU/hr Can be fueled by natural gas or fuel oil	7/1/67	Operational
EUCOMBTURB5	Unit 5 combustion turbine, heat input rating of 265 million BTU/hr Fueled by natural gas Unit 5 startup engine, heat input rating of 2.12 million BTU/hr	7/1/67	Permanently shut down; startup engine physically disconnected from fuel line
EUCOMBTURB6	Unit 6 combustion turbine, heat input rating of 265 million BTU/hr Fueled by natural gas Unit 6 startup engine, heat input rating of 2.12 million BTU/hr	7/1/67	Permanently shut down; startup engine physically disconnected from fuel line
EUCOMBTURB7	Unit 7 combustion turbine, heat input rating of 265 million BTU/hr Fueled by natural gas Unit 7 startup engine Heat input rating of 2.12 million BTU/hr	7/1/67	Permanently shut down, startup engine physically disconnected from fuel line
EUCOMBTURB8	Unit 8 combustion turbine Heat input rating of 265 million BTU/hr Fueled by natural gas Unit 8 startup engine Heat input rating of 2.12 million BTU/hr	7/1/67	Permanently shut down; startup engine physically disconnected from fuel line
EUCOMBTURB9	Unit 9 combustion turbine Heat input rating of 265 million BTU/hr Fueled by natural gas Unit 9 startup engine Heat input rating of 2.12 million BTU per hour	7/1/67	Permanently shut down; startup engine physically disconnected from fuel line

Introduction:

On 7/12/2018, the Department of Environmental Quality (DEQ), Air Quality Division (AQD) conducted the following PCE activities, which are part of a FCE, at the Consumers Energy Thetford Combustion Turbine Plant:

- 1.) a scheduled inspection, and
- 2.) review of records and operational logs.

Facility description:

This facility is a peaking station, with nine generators and associated turbines, soon to be decommissioned. The nine generators and associated turbines may be placed into two groups, as follows:

Group No. 1 has four 36 MW generators, each operated by a single turbine. Each turbine is operated by the exhaust from two jet engines. The jet engines in Group No. 1 are started using blasts of compressed air. Once the units have started rotating, continuing operation is done by compressing cool air into the unit, and then rapidly heating it to expand it, and forcing it through a venturi-style opening. This causes a high speed exhaust stream to rotate the turbine. The air is heated in each jet engine by eight canister style burners, which are fueled by sweetened natural gas. The generators can run up to 3600 rpm.

Group No. 2 has five 20 MW generators, each associated with a single turbine. All the Group 2 units have been permanently shut down, as will be explained later in this report. These units were started using low speed diesel engines using a clutch mechanism. Canister style burners were then lit, and exhaust from the burners would turn the turbines.

The facility's ROP allows units 1-4 to be operated burning fuel oil, as well as natural gas, although in actual practice Consumers has run 1-4 only on natural gas, in recent years. There was once a large oil storage tank at the site, but that was removed years ago.

The current ROP was approved on 7/31/2015, and expires on 7/31/2020. A renewal application would be due between 1/31/2019 and 1/31/2020, but it is my understanding that Consumers Energy may retire the facility, around September 2018.

The turbine engines at this facility are not subject to 40 CFR Part 60 Subpart GG, Standards of Performance for Stationary Gas Turbines. This is because they were constructed before 10/3/1977, and Subpart GG applies to certain stationary gas turbines which were constructed, modified, or reconstructed after 10/3/1977. It should be noted that the periodic repair or replacement of gas turbine components, including the gas generator, for overhaul or repair, using like kind units, does not subject the facility to the requirements of Subpart GG unless the periodic replacement does meet the definition of "modification" as defined in 40 CFR 60.14 or "reconstruction" as defined in 40 CFR 60.15. Future modification and/or installation may be subject to this subpart.

When all 9 turbines were operational, in years past, the turbines were considered subject to the MACT, 40 CFR Part 63, Subpart YYYYY, National Emissions Standards for Hazardous Air Pollutants for Stationary Combustion Turbines. This is because the facility was a major source of Hazardous Air Pollutant (HAP) emissions, as the Potential to Emit (PTE) for formaldehyde was 11.2 tons per year (actual emissions were much smaller). Because the units are considered existing they were not subject to the emission and operating limitations, and testing was not required. With the permanent shutdown of the Group 2 turbines and the remaining units no longer burning fuel oil the PTE for formaldehyde has been reduced significantly.

When all 9 turbines were capable of operating, Consumers staff believe that this facility was subject to the RICE MACT, 40 CFR Part 63 Subpart ZZZZ, for Stationary Reciprocating Internal Combustion Engines (RICE). The 5 diesel startup engines were considered an affected source, because they had a site rating of less than or equal to 500 brake horsepower (HP) each, were located at a major source of

HAP emissions, and were built before 6/12/2006. This classified them as existing stationary RICE, under Section 63.6590(a)(1)(ii). Under Section 63.6590(c), compression ignition stationary RICE with a site rating of less than or equal to 500 HP must meet the requirements of ZZZZ by meeting the requirements of 40 CFR Part 60 Subpart IIII, which is the NSPS for CI engines. However, review of Subpart IIII shows that they were not subject. Essentially, although the facility was subject to ZZZZ, there were no requirements that applied. Now that the diesel startup engines are not capable of operating, the facility is no longer subject to the RICE MACT.

Fee status:

This facility is classified as a category I fee-subject source, because it is a major source for formaldehyde. The facility is required to report to the Michigan Air Emission Reporting System (MAERS), on an annual basis.

Location:

This facility is located in a rural, agricultural area. The nearest residences are about 1,800 feet to the east, 2,500 feet to the north, 2,400 feet to the west, and 1,900 feet to the south, as measured from the buildings of the combustion turbine plant itself, in ArcGIS.

Recent history:

PTI No. 191-12 was issued on 7/25/2013, for a natural gas-fired combined cycle power generating station proposed to be built at this site. Construction of the project did not take place. The permit was voided because construction did not commence within an 18-month period, nor within an extension to that time period.

Arrival:

I arrived at the site at 9:59AM. This inspection had been arranged in advance, as Consumers Energy environmental staff needed to travel to the site, for this meeting. The Thetford plant rarely operates, and staff are not onsite, on a daily basis. I met with Mr. George Eurich, Air Quality Lead for the Consumers Energy Karn Complex.

Weather conditions were mostly sunny, humid, and 73 degrees F. Winds were calm. There were neither visible emissions nor odors at the facility. It did not appear to be operating at this time. A natural gas pipeline is being worked on nearby.

The boiler NESHAP card was not needed, because there is no boiler onsite. There is only a hot water heater for the office restrooms, which has a hot water capacity of about 30 gallons, as observed during the previous inspection here.

PCE activity No. 1; Inspection:

Mr. Eurich explained that Consumers Energy may retire this facility, around September 2018. He indicated it has been used less this year than even in previous years. No turbines were running, at the time of this inspection.

The Thetford Combustion Turbine Plant was a peaking station many years ago, but is now a black start facility. It is not used for electric generation, but in the event that a facility needs a black start. Then Thetford will start-up, and send power to the desired facility. The plant only operates in this situation, or to run the units for operating and maintenance checks. Group 1 turbines are the only units available for use at this time and only units 2,3 and 4 are operational. Unit 1 was decommissioned in place, I was told during the 2016 inspection. It is my understanding that fuel oil has not been used at the site in at least 6 years,. Units 2-4 are currently operated as natural gas-fired units.

In 2016 I was informed that the Group 2 turbines are no longer capable of operating, because the fuel

lines which supplied fuel oil to the diesel startup engines have been physically disconnected. Also, the fuel tanks for storing fuel oil have been drained. The last delivery of fuel oil to the Thetford site was in 2011. A manifest/receipt for that shipment, was provided to AQD staff during the 9/7/2011 inspection of this site. The turbines themselves from Group 2 are still onsite.

I was advised that a combustion turbine from another site had been brought here in a disassembled state, as a spare parts source, with no intention of it being operated. This unit was being stored outdoors, and was clearly not connected to any other equipment. It could not be expected to run, in its current configuration.

PCE activity No. 2; Review of records and operational logs:

The monitoring and recordkeeping requirements of the ROP require that visible emission readings be done for each emission unit of the flexible group for Turbines 2 through 4 which are burning fuel oil, during peak operating conditions. Because Units 2-4 no longer burn any fuel oil, and because they never reach peak operating conditions, this condition is not applicable.

Regarding 40 CFR Part 97, Subparts AAAAA, BBBBB, and CCCCC, it is my understanding that since the turbines here rarely run, and therefore use minute amounts of fuel, they do not have any reportable quantities of emissions under those subparts. Subpart AAAAA is the Transport Rule NOx Annual trading Program, Subpart BBBBB is the Transport Rule NOx Ozone Trading Program, and Subpart CCCCC is the Transport Rule SO2 Group 1 Trading Program.

Units 2, 3 and 4 are the only units currently operational. Their dates of operation in 2016-2018 are as follows:

2016:

- Unit 2 ran on 6/7 and 6/15/2016.
- Unit 4 ran on 8/23 and 8/25/2016.

2017:

- Unit 2 ran on 7/12, 8/28, 8/29, again on 8/29, and 9/19/2017 for tests.
- Unit 3 was identified as being out of service for all of 2017.
- Unit 4 ran on 1/18, 1/19, 5/21 again on 5/21, 6/1, and 8/3/2017.

2018:

- Unit 2 ran on 5/31 (for a line inspection) and 6/1/2018 (for testing).*
- Unit 3 did not run at all in 2018.
- Unit 4 ran on 5/22 and 5/31/2018, for two "pig runs."

*In the original records, Unit 2's 5/31 and 6/1 dates of operation were mistakenly listed as taking place in 2017, but they actually took place in 2018, Mr. Eurich informed me.

Natural gas usage in 2016-2017 was reported, in units of one thousand cubic feet (mscf), in MAERS for the most recent operating years. Please see below.

2016 natural gas use:

- Unit 2: 1,739.0 MCF
- Unit 3: 2,197.1 MCF**
- Unit 4: 4,190.5 MCF

**On 9/13/2018, I compared the MAERS data with the data on dates of operation for the turbines. I did not have mention of Unit 3 operating during 2016 in my notes, but natural gas usage was attributed to it

in 2016. I e-mailed Mr. Eurich on 9/13/2018, and asked for any dates Unit 3 may have operated on during 2016, to ensure that AQD's records are accurate.

2017 natural gas use:

- Unit 2: 6,264.8 MCF
- Unit 3: 1.0 MCF***
- Unit 4: 3,776.2 MCF

***Since unit 3 was out of service for all of 2017, Mr. Eurich believed the 1.0 MCF of natural gas use attributed to it that year was a typographical error.

MAERS reporting:

Emissions from the 2016 operating year were reported to MAERS as follows:

Pollutant	Emissions in lbs	Emissions in tons
CO	679.71	0.34
NOx	5,973.10	2.99
PM10, primary	54.71	0.03
PM2.5, primary	54.71	0.03
SO2	5.12	0.003
VOC	17.41	0.009

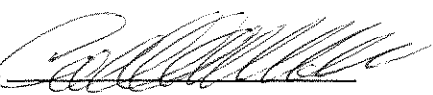
Emissions from the 2017 operating year were reported to MAERS as follows:

Pollutant	Emissions in lbs	Emissions in tons
CO	839.91	0.42
NOx	7,380.80	3.69
PM10, primary	67.60	0.03
PM2.5, primary	67.60	0.03
SO2	6.33	0.003
VOC	21.51	0.01

Spreadsheets provided to AQD as part of the MAERS documentation for the 2016 and 2017 operating years are attached to this activity report, for reference.

Conclusion:

I did not observe any instances of noncompliance. Consumers Thetford may be decommissioned and dismantled as of September 2018, I was informed.

NAME  DATE 9/17/2018 SUPERVISOR 