

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

B663769043

FACILITY: Consumers Energy - St. Clair Compressor Station		SRN / ID: B6637
LOCATION: 10021 MARINE CITY HWY., IRA TWP		DISTRICT: Warren
CITY: IRA TWP		COUNTY: SAINT CLAIR
CONTACT: Amy D Kapuga , Principal Environmental Engineer		ACTIVITY DATE: 03/09/2023
STAFF: Noshin Khan	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: scheduled, on-site inspection		
RESOLVED COMPLAINTS:		

On Thursday, March 9, 2023, I, Noshin Khan, Michigan Department of Environment, Great Lakes, and Energy-Air Quality Division (EGLE-AQD) staff, performed a scheduled, on-site inspection of Consumers Energy St. Clair Compressor Station located at 10021 Marine City Highway, Ira Township, Michigan 48023 (SRN: B6637). The purpose of the inspection was to determine the facility's compliance status with the requirements of the federal Clean Air Act; Article II, Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 Public Act 451, as amended (Act 451); the AQD administrative rules, and the conditions of Renewable Operating Permit (ROP) Number MI-ROP-B6637-2021.

I arrived at the facility at 10AM and met with Amy Kapuga, Principal Environmental Engineer; Tom Fox, Field Environmental Coordinator; Neil Lake, Supervisor; and Paige Eves, Station Administrator. St. Clair Compressor Station is a natural gas storage and transmission facility that uses emission units including reciprocating internal combustion engines (RICE), turbines, boilers, and pipeline heaters to inject and withdraw natural gas from storage fields. Natural gas is typically injected underground between April and November and withdrawn for distribution between November and March. According to Consumers staff, the facility's operating hours are Monday through Friday, 6:30AM to 3:30PM, and the whole site has about 35 employees, with about 15 associated with gas compression and transmission activities.

During my visit, staff informed me that one of the turbines (EUTURBINEC1-2) was out of commission and required major repair that would prevent its use until the end of the summer. Amy later provided the most recent dates of operation for both turbines: May 2, 2022, for EUTURBINEC1-1 and December 28, 2022 for EUTURBINEC1-2. EUENGINE3-4 was undergoing repairs during my visit. Staff informed me that the facility was not processing gas and gas withdrawal was likely finished for the year, but one glycol dehydration system (EUDEHY1) was on standby.

Below, I discuss compliance with permit conditions by emission unit (EU) and flexible group (FG) as organized in MI-ROP-B6637-2021.

Source-Wide Conditions

Special Conditions (S.C.) I.1-I.2, VI.1-VI.2:

Conditions I.1 sets an individual hazardous air pollutant (HAP) emission limit of 9.9 tons per 12-month rolling time period as determined at the end of each calendar month. I.2 sets a total HAP emission limit of 24.9 tons per 12-month rolling time period. In accordance with recordkeeping conditions VI.1 and VI.2, Amy provided monthly and 12-month rolling source-wide individual and total HAP emission calculations. All records I requested for this inspection were requested for the period of April 2021 through February 2023.

The records provided indicate that the highest monthly individual HAP emissions during this period were 1.04 tons of formaldehyde in September 2022. The highest monthly total HAP emissions were 1.46 tons in September 2022. The highest 12-month rolling individual HAP emissions were 5.87 tons of formaldehyde as calculated in July 2021. The highest 12-month rolling total HAP emissions were 8.85 tons as calculated in December 2022. These values are below the permitted limits.

EUEMERGEN3-1

This unit is a natural gas fired emergency generator, rated at 2000 HP per the ROP. During the site walkthrough, I observed the unit and saw that the nameplate showed a rating of 1625 kVA/1300 kW. The

value of 1300 kW converts to about 1743 HP. I observed a non-resettable hour meter, as required by S.C. IV.1, which read 144 hours during the inspection.

S.C. I.1-I.3, V.1, VI.2.d: Per S.C. I.1-I.3, the generator is subject to NO_x, CO, and VOC emission limits of 2.0 g/HP-hr, 4.0 g/HP-hr, and 1.0 g/HP-hr, respectively. This generator is not a certified engine and is consequently required to undergo testing under S.C. V.1 and 40 CFR Part 60 Subpart JJJJ to determine compliance with these emission limits. This testing is required every 8,760 hours or three years. In accordance with S.C. VI.2.d, Amy provided a copy of the results summary with the last emissions test performed on July 24, 2020. The table below summarizes the emission rate results and limits specified by Subpart JJJJ and the ROP. 2023 testing was performed on July 13 and July 17 and meets the required timeline.

Parameter	Units	Average Results of 3 Test Runs	Emission Limit	
			Subpart JJJJ	ROP
NO _x	g/HP-hr	0.7	2.0	2.0
	ppmvd at 15% O ₂	81	160	NA
CO	g/HP-hr	1.5	4.0	4.0
	ppmvd at 15% O ₂	289	540	NA
VOC	g/HP-hr	0.2	1.0	1.0
	ppmvd at 15% O ₂	27	86	NA

The results from this test show compliance with the permitted emission limits.

S.C. II.1: According to Consumers staff, only natural gas is burned in this unit.

S.C. III.1, III.4, VI.1: In accordance with recordkeeping requirement VI.1, Amy provided a log of the monthly and 12-month rolling hours of operation for the generator, and the log notes how many hours are spent for emergency or non-emergency purposes. The highest 12-month rolling hours of operation was 50.58 hours as calculated in April 2022. According to 40 CFR Part 60 Subpart JJJJ and as specified under S.C. III.4, the following conditions apply in order for the generator to be considered an emergency stationary ICE: the generator may be operated up to 50 hours per calendar year in non-emergency situations and up to 100 hours per calendar year for maintenance, testing, and emergency demand response. In calendar year 2022, the generator was used for 1.06 hours of emergency use and 11.87 hours of non-emergency use, so the facility meets the operating requirements.

S.C. III.2-III.3, VI.2: As discussed, the engine is not certified and is consequently subject to periodic testing to show compliance with the emission standards in 40 CFR Part 60 Subpart JJJJ, and Amy provided a copy of the results from the test performed in 2020 that indicate compliance with emission limits. Conditions III.2 and III.3 require implementation of a maintenance plan to ensure that the generator meets emission limits. Amy provided a log of maintenance done on the engine as required by S.C. VI.2.b. The log indicates that specific maintenance activities are scheduled monthly, every three months, every 6 months, and every year.

EUBOILER3-1

This unit is a natural gas fired boiler for providing building heat, rated at 12.3 MMBtu/hr, according to the ROP. During my walkthrough I observed this unit and the nameplate matched the rating in the ROP.

S.C. II.1, VI.3: Material limit II.1 requires that only natural gas is burned in EUBOILER3-1. Amy provided a natural gas tariff sheet that indicates that only pipeline quality natural gas is burned in the boiler.

S.C. III.1: This condition requires that the facility follow a preventative maintenance/malfunction abatement plan (PM/MAP) for the boiler, and Amy provided a copy of this plan. The MAP includes equipment covered by the plan, operating variables to be monitored, procedures for malfunction events, and supervisory personnel responsible for maintenance of the boiler. I did not evaluate if the facility has implemented the MAP.

S.C. IV.1, VI.1-VI.2: According to Consumers staff and based on the records provided, a device is operated to monitor the natural gas usage in the boiler on a monthly basis as required by S.C. IV.1. I did not observe this device during my walkthrough. I asked Amy to provide records for emissions and operating information required by 40 CFR Part 60 Subparts A and Dc, and she provided monthly fuel use records for the boiler. The record includes monthly and 12-month rolling natural gas usage in the boiler. The highest monthly natural gas usage was 5146.6 Mscf in January 2022, and the highest 12-month rolling sum of natural gas usage was 23,160 Mscf as calculated in April 2022.

EUGASHEATER3-1

This unit is a natural gas fired fuel gas heater rated at 0.75 MMBtu/hr, according to the ROP. During my walkthrough I observed this unit and the rating on the nameplate matched that in the ROP. The unit heats fuel gas prior to combustion in other natural gas fired equipment.

S.C. II.1: According to Consumers staff, only natural gas is burned in this unit.

S.C. III.1: This condition requires that the facility follow a preventative maintenance/malfunction abatement plan (PM/MAP) for the gas heater and Amy provided a copy of this plan. The MAP includes equipment covered by the plan, operating variables to be monitored, procedures for malfunction events, and supervisory personnel responsible for maintenance of the heater. I did not evaluate if the facility is operating in accordance with the MAP for this inspection.

FGDEHY

This conditions of this flexible group are applicable to two natural gas glycol dehydration systems (EUDEHY1 and EUDEHY2) and their common thermal oxidizer. The ROP describes each of the systems as consisting of an absorber, flash tank, glycol regenerator, and 3 MMBtu/hr natural gas fired regenerator boiler. The ROP describes that the thermal oxidizer is rated at 6 MMBtu/hr. I observed these units during my walkthrough but was not able to locate the nameplate on the thermal oxidizer to verify the heat input capacity. As discussed previously, EUDEHY1 and the thermal oxidizer were on standby during my inspection, and I observed the thermal oxidizer temperature monitor showing a value of 1335° F in the combustion chamber. According to Amy, the dehydration systems were processing natural gas from October 2021 through May 2022, and November 2022 through February 2023.

In the previous inspection report, Bob Elmouchi (EGLE-AQD) mentions that the facility had determined that the welding material used to construct the thermal oxidizer was not designed to continuously operate at 1400°F and would eventually cause premature failure. I asked Consumers staff if this issue was resolved and they informed me that a thicker material was added at 8 locations along the welded sections and that the facility's research is showing that operation at 1400°F should continue without causing premature failure.

S.C. I.1, IV.1, VI.3: The flexible group is subject to a VOC emission limit of 7.4 tpy based on a 12-month rolling time period as determined each calendar month. During my inspection, Consumers staff confirmed that flash tank exhaust gases from each dehydrator are routed either to the regenerator boiler as fuel or to the thermal oxidizer, as required by S.C. IV.1. As required by recordkeeping condition VI.3, Amy provided monthly and 12-month rolling VOC emissions calculations for the dehydration systems. According to Amy, GRI-GLYCalc is used to calculate VOC emission rates and uses the most recent wet gas analysis as inputs. These records indicate that from April 2021 through February 2023, the highest monthly VOC emissions were 212.16 lbs in December 2022, and the highest 12-month rolling emissions were 0.36 tons as calculated in December 2022. This is below the 7.4 ton limit.

S.C. III.1: Consumers staff informed me during my inspection that stripping gas is not used in either dehydrator in FGDEHY.

S.C. III.2, IV.2, VI.2, VI.4, VI.6: As required by recordkeeping requirements, Amy provided thermal oxidizer combustion chamber temperature records. The facility maintains a thermocouple to monitor the temperature of the thermal oxidizer combustion zone continuously and record the temperature every 15 minutes, as required by S.C. VI.2 and VI.6, and maintains daily average temperature records.

Satisfactory operation of the thermal oxidizer is defined maintaining a daily average minimum combustion chamber temperature of 1400°F and a minimum retention time of 0.5 seconds. I reviewed the daily average temperature records and found one day, January 19, 2023, on which the daily average temperature was recorded as 1196°F. The remaining days of operation show operation of the thermal oxidizer above the minimum required temperature. The facility did not report this deviation in semiannual reporting, and I followed up with the company to see if reporting of an excursion was missed. Amy was able to confirm that the dehydrator unit was in standby (not processing wet gas) for the last 5 hours and 45 minutes of the day on January 19th, and that the provided calculation was inaccurate because it included a greater number of operating hours. The facility has recently migrated their data to a new server which is causing a delay in obtaining the data necessary to recalculate the daily average for January 19th. A determination of whether the operating conditions for the thermal oxidizer were violated will be made once the data is obtained.

S.C. III.3: This condition requires that the facility follow a preventative maintenance/malfunction abatement plan (PM/MAP) for the glycol dehydration systems, and Amy provided a copy of this plan. The MAP includes equipment covered by the plan, operating variables to be monitored, procedures for malfunction events, and supervisory personnel responsible for maintenance of the glycol dehydration systems. I did not evaluate if the facility operates in accordance with the MAP for this inspection.

S.C. V.1, VI.5: As required by S.C. VI.5, Amy provided records for the wet gas composition analyses performed in 2021 and 2022, indicating that this testing is done annually as required by S.C. V.1.

S.C. VI.7: This condition requires that records be made and maintained when a bypass line is utilized, and the record should indicate the length of time that a bypass line is opened for. According to Amy, if the thermal oxidizer temperature drops below 1400°F, then liquids from the glycol regenerators are sent to a knockout tank and not vented to the atmosphere through a bypass, so these records are not generated.

S.C. VI.8: This condition requires that the temperature monitor for the combustion chamber of the thermal oxidizer be calibrated at least annually. While I was on site I reviewed a work order dated September 5, 2022, for the 2022 calibration performed, and Amy provided a copy of the work order for the 2021 calibration that was performed on August 16, 2021. According to Consumers staff, two thermocouples are maintained in case one fails. The calibration is done using a previously calibrated heat pack. The thermocouples are adjusted to match the heat pack value.

FGENGINES-P3

The conditions of this flexible group apply to four natural gas fired compressor engines, each rated at 4835 HP according to the ROP. During the inspection, I observed these units and saw that the nameplate for EUENGINE3-2 showed a rating not exceeding 4835 HP, as required by S.C. IV.1. The four engines are identical and are equipped with oxidation catalyst for control.

S.C. I.1-I.6, VI.1, VI.3, V.1-V.3: According to Amy, the engines are not certified and are consequently subject to periodic testing to show compliance with the emission standards in 40 CFR Part 60 Subpart JJJJ. Amy provided copies of the results from testing performed in 2020. EUENGINE3-2 was tested on December 15, 2020, and EUENGINE3-1, EUENGINE3-3, and EUENGINE3-4 were tested on September 29 and September 30, 2020. The results indicate compliance with Subpart JJJJ and with the emission limits established in S.C. I.1-I.6 and are summarized below. Testing is required every 8,760 hours or three years, and 2023 testing was scheduled for the week of September 11 in accordance with this timeline.

Parameter	Average Result (g/HP-hr)	Emission Limit	
		40 CFR 60, Subpart JJJJ	ROP Limit
EUENGINE3-1			
NOx	0.47	1.0	0.6
CO	0.03	2.0	0.36
VOC	0.02	0.7	0.2

EUENGINE3-2			
NOx	0.4	1.0	0.6
CO	0.03	2.0	0.36
VOC	<0.04	0.7	0.2
EUENGINE3-3			
NOx	0.46	1.0	0.6
CO	0.05	2.0	0.36
VOC	0.02	0.7	0.2
EUENGINE3-4			
NOx	0.46	1.0	0.6
CO	0.03	2.0	0.36
VOC	0.01	0.7	0.2

S.C. II.1, VI.4: Material limit II.1 requires that only natural gas is burned in the engines. Amy provided a natural gas tariff sheet that indicates that only pipeline quality natural gas is burned in the engines.

S.C. III.1, III.4, IV.2: These conditions require that the facility follow a preventative maintenance/malfunction abatement plan (PM/MAP) for the engines, and Amy provided a copy of this plan. The MAP includes equipment covered by the plan, operating variables to be monitored, a maintenance schedule, procedures for malfunction events, oxidation catalyst maintenance and operating parameters, and supervisory personnel responsible for maintenance of the glycol dehydration systems. Satisfactory operation of the oxidation catalyst for each engine, as defined by S.C. IV.2, includes operating and maintaining each oxidation catalyst in accordance with the MAP. Amy provided a log of maintenance activities performed on the engines which indicates proper upkeep and operation of the units.

S.C. VI.2: This condition requires fuel use records for the purposes of demonstrating compliance with the individual and total HAP limits in FGFACILITY of MI-ROP-B6637-2010. Amy provided monthly fuel use records for the engines. From April 2021 through February 2023, the highest fuel use was 37359.9 MCF in September 2022.

FGTURBINES

The conditions of this flexible group apply to two natural gas fired combustion turbine compressors, EUTURBINEC1-1 and EUTURBINEC1-2. I observed these units during my inspection. Neither were operating, and as discussed previously EUTURBINEC1-2 was out of commission.

S.C. I.1-I.6, V.1-V.2: The permittee is required to perform testing to confirm compliance with NOx and CO emission rates listed in S.C. I.1-I.6 and establish the range of gas producer speeds (GPS) within which the turbines should operate to be in compliance with emission limits. Amy provided copies of test reports from the tests performed on December 16, 2020 for EUTURBINEC1-1 and March 30, 2021 for EUTURBINEC1-2. Testing is required at least once every five years for each turbine. The results provided are summarized below.

Parameter	Units	90% GPS Result	100% GPS Result	Emission Limit	Applicability
NOx	lb/hr	7.3	10.4	12.6	Both turbines combined
	tpy	22.7	32.0	39.0	Both turbines combined
	ppmvd at 15% O2	31.4	40.4	150	EUTURBINEC1-1
	ppmvd at 15% O2	27.6	24.6	150	EUTURBINEC1-2
CO	lb/hr	1.0	0.7	20.7	Both turbines combined
	tpy	3.2	2.3	90.6	Both turbines combined

	g/HP-hr corrected to 15% O ₂ on a dry basis	0.16	0.05	1.09	EUTURBINEC1-1
	g/HP-hr corrected to 15% O ₂ on a dry basis	0.11	0.05	1.09	EUTURBINEC1-2

S.C. III.1, VI.4: These conditions require that the fuel burned in FGTURBINES is natural gas, as defined in 40 CFR 60.331(u). Amy provided a natural gas tariff sheet which specifies that the total sulfur content of the gas shall not contain more than 5.0 grains of total sulfur per 100 cubic feet, which is less than the 20.0 grains/100 scf specified in VI.4.a.

S.C. III.3, VI.1, VI.2: As required by recordkeeping requirements, Amy provided monthly records for the hours of operation, accumulated horsepower hours, and fuel consumption for each turbine, and 12-month rolling hours of operation. From April 2021 through February 2023, the highest monthly hours of operation for each turbine was 255 hours for EUTURBINEC1-1 in January 2022, and 273 hours for EUTURBINEC1-2 in January 2022. The highest 12-month rolling hours for both turbines combined was 1,494 hours as calculated in May 2021. This is below the limit of 12,380 hours per year established by S.C. III.3. Amy also provided records that track average horsepower levels and average gas producer speed (%) on a daily basis as required by S.C. VI.2.

S.C. VI.3: Amy provided records that track when units are in or out of service, as required by S.C. VI.3.a.

S.C. I.2, I.5, I.8, VI.5: The permittee is required to calculate yearly emission rates for NO_x, CO, and VOC for each turbine based on a 12-month rolling time period. Amy provided emissions calculations for April 2021 through February 2023. The highest NO_x emissions in this period were 5.01 tons as calculated in May 2021, which is below the 39.0 ton limit in S.C. I.2. The highest CO emissions were 0.55 tons as calculated in May 2021, which is less than the 90.6 ton limit in S.C. I.5. The highest VOC emissions were 0.15 tons as calculated in May 2021, which is less than the 1.0 ton limit specified in S.C. I.8. CO and NO_x emissions are calculated using the results from emissions tests and VOCs emission calculations are done using MAERS emission factors.

S.C. IX.2: This condition requires that the facility follow a preventative maintenance plan (PMP) for the turbines, and Amy provided a copy of this plan. The PMP specifies the GPS range (90%-100%) that the turbines should operate at, as required by the condition.

FGPIPEHEATERS-P3

The conditions of this flexible group apply to two natural gas fired pipeline heaters, each rated at 15 MMBtu/hr according to the ROP. I observed these units during my inspection and confirmed that the rating on the nameplates are consistent with the description in the ROP.

S.C. II.1: Consumers staff confirmed that only natural gas is burned in these units.

S.C. III.1: This condition requires that the facility follow a preventative maintenance/malfunction abatement plan (PM/MAP) for the pipeline heaters, and Amy provided a copy of this plan. The MAP includes equipment covered by the plan, operating variables to be monitored, procedures for malfunction events, and supervisory personnel responsible for maintenance of the pipeline heaters.

S.C. IV.1, VI.1-VI.3: Amy provided records of monthly and 12-month rolling fuel use records for the pipe heaters. A device monitors the fuel use as required by S.C. IV.1. The highest monthly fuel use in the pipe heaters from April 2021 through February 2023 was 8,746 MSCF in January 2022. The highest 12-month rolling sum of fuel use was 30,257 MSCF as calculated in January 2022.

FGWESTDRHTRS-P1

This flexible group covers two natural gas fired pipeline heaters, each rated at 5 MMBtu/hr according to the ROP. I observed both units during my inspection and confirmed that the rating on the nameplates are consistent with the description in the ROP.

S.C. II.1: Consumers staff confirmed that only natural gas is burned in these units.

FGCOLDCLEANERS

During my inspection I observed one cold cleaner on site that had an air/vapor interface of no more than 10 square feet, as required by S.C. IV.1.a. According to Consumers staff, that was the only cold cleaner on site. I observed that the cleaner was equipped with a device for draining cleaned parts and a cover, as required by S.C. IV.2 and IV.3. I observed that the cover was open and reminded staff that the conditions require the cover to be closed when the cleaner is not in use. Consumers staff said they would reiterate this requirement to other staff. According to the cleaner information Amy provided, the Reid vapor pressure of the solvent used (Dyna 143) is 0.391 mm Hg at 20°C, or about 0.0077 psia. Since this is below 0.3 psia and the cleaner is not heated, the cold cleaner is not required to be mechanically assisted. I observed instructions for operation of the cleaner posted in an accessible, conspicuous location as required by S.C. VI.3.

S.C. II.1: This condition requires that the solvent shall not contain more than 5% by weight of the following halogenated compounds: methylene chloride, perchloroethylene, trichloroethylcane, 1, 1, 1-trichloroethane, carbon tetrachloride, chloroform, or any combination thereof. The SDS for Dyna 143 shows that it is composed of 90-100% light hydrotreated distillate.

S.C. VI.4: I observed that waste solvent was stored in closed containers, and according to Consumers staff the waste is collected by ERG for disposal.

FGRULE285(2)(mm)

Rule 285(2)(mm) requires notification for venting of natural gas of amounts greater than 1,000,000 scf for routine maintenance or relocation of transmission and distribution systems. According to reports received by the AQD between April 2021 and February 2023, Consumers St. Clair notified the AQD for two venting incidents. One was on February 9, 2022 for a release of 1.4 MMcf of natural gas, and the other was on July 9, 2022 for a release of 5.1 MMcf. During the inspection, staff informed me that no other venting incidents had occurred. The facility meets the reporting requirements for this rule.

Based on my observations during my inspection and the records reviewed, the facility is operating in compliance with the evaluated rules and regulations.

NAME Nordin Khan

DATE 10/02/2023

SUPERVISOR K. Kelly