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

B663652791

FACILITY: Consumers Energy - Ray Compressor Station		**SRN / ID:** B6636
LOCATION: 69333 OMO RD., ARMADA		**DISTRICT:** Warren
CITY: ARMADA		**COUNTY:** MACOMB
CONTACT: Charles E. Kelly , Station Supervisor, Gen Ops-Gas Compression		**ACTIVITY DATE:** 01/30/2020
STAFF: Robert Elmouchi	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MAJOR
SUBJECT: Scheduled inspection.		
RESOLVED COMPLAINTS:		

On January 30, 2020, I conducted a scheduled inspection of Consumers Energy Company Ray Compressor Station (Consumers), located at 69333 Omo Road, Armada, Michigan. The purpose of this inspection was to determine the facility's compliance 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 PA 451, as amended (Act 451); the administrative rules; and the conditions of Renewable Operating Permit (ROP) No. MI-ROP-B6636-2015a.

Consumers Energy, Ray Compressor Station is a natural gas storage and transmission facility that uses natural gas to fuel a variety of emissions units. The permitted emission units that use natural gas as a fuel are reciprocating internal combustion engines (RICE), turbines, boilers, and heaters. The regulated air contaminants generated by this facility mainly result from the combustion of natural gas.

During this inspection, Amy Kapuga, Tom Fox, and Chuck Kelly who answered questions, provided records, and escorted me throughout the facility inspection.

EMISSION UNITS
EUENGINE2-7
I observed the engine in Plant 2. The engine and building interior appeared clean, organized, and operable. The engine was on standby during this inspection. The non-resettable hour meter displayed 47,668.

V.3
Emission testing of NOx and CO is required at least once every five-year period. Test results appear to indicate compliance with the permit NOx and CO limits.

VI.2
The permittee provided a Rate Book for Natural Gas Service, which defines the quality of natural gas transmitted from this facility. This document in conjunction with my on-site inspection appears to satisfactorily demonstrate that the permittee fuels all of their natural gas-fired emission units with pipeline-quality natural gas.

VI.3
The permittee provided records of service, engine RPM, and percent torque as required per this condition.

VI.4
The permittee provided records of average engine speed and average engine torque percent as required per this condition. The records provided covered 1/1/2019 through 12/31/2019.

VI.5
The permittee provided a monthly record of hours of engine operation, horsepower hours accumulated, and fuel consumption as required per this condition.

VI.6
The permittee provided records of annual CO, VOC, and NOx emissions. EUENGINE2-7 did not operate during the calendar year 2019, therefore emissions were zero.
EUDEHY3
V.1 and VI.6
The wet stream natural gas analysis was conducted on 2/18/2019. The calculated gross cubic foot dry BTU

value was 1036.

VI.2
The thermal oxidizer was last calibrated on 9/14/2019.

VI.3 Actual benzene emissions were calculated. 12-month rolling emissions were less than 3% of 0.90 Mg/yr. permit limit.

VI.4
Monthly VOC emissions were calculated. 12-month rolling emissions were less than 1% of 0.90 Mg/yr. permit limit.

VI.5
Records of thermal oxidizer combustion chamber temperature appear to indicate compliance with maintaining a minimum temperature of 1400 F. All recorded temperatures were above 1500 F.

VI.7
The permittee provided actual average benzene emission calculations.

EUAUXGEN2-7
VI.1 and VI.2
Records of hours of operation and reason were provided. Records indicate that the permittee did not exceed the 100 hours per year maintenance and readiness testing limit. The records indicate that permittee did not exceed the 50 hours per year non-emergency operating limit.

EUEMERGGEN3
V.1 and VI.2
An initial performance test was conducted on March 25-28, 2014. A subsequent emissions test was conducted on April 26, 2017. Test results indicate compliance with NOx, CO, and VOC emission limits.

VI.1
Records of hours of operation and reason were provided. Records indicate that the permittee did not exceed the 500 hours per 12-month rolling period.

VI.3 and VII.4
A record of inspections and maintenance was provided.
The initial notification required per PTI No. 206-09 was submitted. The 40 CFR Part 63, Subpart ZZZZ initial notification is dated July 12, 2013.

EUBOILER3
VI.2
Records of monthly and 12-month rolling natural gas use were provided.

VII.4 and VII.5
The construction and operation notification is dated January 16, 2013.

FLEXIBLE GROUPS
FGTURBINES
V.1
This emission test is required once every five-year period.
The most recent emissions test occurred on July 23, 2015. A new test report is pending, “No, Turbines 2-5 & 2-6 at the Ray Compressor Station were scheduled to be tested the week of 7/6/2020; however, there was a failure that occurred on 7/5/2020 and the units are still out of service.

PERMIT LIMITS
NOx ppm corrected to 15%O2: Limit = 150
NOx g/bhp-hr.: Limit = 0.8
NOx lb./hr.: Limit = 5.5.
NOx tons/yr.: Limit = 23.2

CO g/bhp-hr.: Limit = 1.0

CO lb./hr.: Limit = 6.7
CO tons/yr.: Limit = 29.0

The EMISSION TEST results are as follows:

TURBINE 2-5
PARAMETER: 95.8% gps
NOx ppm corrected to 15%O2: 31.6
NOx g/bhp-hr.: 0.62
NOx lb./hr.: 4.59
NOx tons/yr.: 20.12

PARAMETER: 92.6% gps
NOx ppm corrected to 15%O2: 30.1
NOx g/bhp-hr.: 0.53
NOx lb./hr.: 3.79
NOx tons/yr.: 17.40

PARAMETER: 95.8% gps
CO g/bhp-hr.: 0.06
CO lb./hr.: 0.41
CO tons/yr.: 1.79

PARAMETER: 92.6% gps
CO g/bhp-hr.: 0.05
CO lb./hr.: 0.35
CO tons/yr.: 1.52

TURBINE 2-6
PARAMETER: 95.2% gps
NOx ppm corrected to 15%O2: 19.6
NOx g/bhp-hr.: 0.40
NOx lb./hr.: 2.82
NOx tons/yr.: 12.34

PARAMETER: 92.8% gps
NOx ppm corrected to 15%O2: 19.0
NOx g/bhp-hr.: 0.36
NOx lb./hr.: 2.52
NOx tons/yr.: 11.05

PARAMETER: 95.2% gps
CO g/bhp-hr.: 0.12
CO lb./hr.: 0.83
CO tons/yr.: 3.65

PARAMETER: 92.8% gps
CO g/bhp-hr.: 0.13
CO lb./hr.: 0.93
CO tons/yr.: 4.06

VI.1.a
The permittee provided records of hours of operation from January through December 2019.

VI.1.b
The permittee provided records of accumulated horsepower hours from January through December 2019.

VI.1.c.
The permittee provided records of fuel consumption from January through December 2019.

VI.2.b.

The permittee provided records of the average gas producer speed percent.

VI.3.a
The permittee's records indicated when the unit was in and out of service.

VI.3.b
The permittee provided records of the average gas producer speed percent.

VI.4
As noted above under EUENGINE2-7, the permittee provided a Rate Book for Natural Gas Service, which defines the quality of natural gas transmitted from this facility. This document in conjunction with my on-site inspection appears to satisfactorily demonstrate that the permittee fuels all of their natural gas-fired emission units with pipeline-quality natural gas.

IX.2
The permittee provided a copy of the current Preventive Maintenance Plan (PMP).

FGLOADLIMIT
VI.1
The permittee provided records of the monthly and 12-month rolling brake horsepower-hour for FGTURBINE.

FGENGINES3
III.3
The permittee provided a copy of their preventative Maintenance/Malfunction Abatement Plan (PM/MAP).

V.6 and VI.7
EMISSIONS TEST CONDUCTED JULY 17-19, 2017.
JJJJ Limits:
NOx g/bhp-hr.: Limit = 1.0
CO g/bhp-hr.: Limit = 2.0
VOC g/bhp-hr.: Limit = 0.7

ZZZZ Limits:
Minimum CO Reduction Efficiency %: ≥ 93

ROP Limits:
NOx g/bhp-hr.: Limit = 0.5
CO g/bhp-hr.: Limit = 0.2
VOC g/bhp-hr.: Limit = 0.19

TEST RESULTS SUMMARY
EUENGINE31 (also known as EUENGINE3-1)
NOx g/bhp-hr.: 0.32
CO g/bhp-hr.: 0.03
Minimum CO Reduction Efficiency %: 98.5
VOC g/bhp-hr.: 0.044

EUENGINE32 (also known as EUENGINE3-2)
NOx g/bhp-hr.: 0.3
CO g/bhp-hr.: 0.01
Minimum CO Reduction Efficiency %: 99.3
VOC g/bhp-hr.: 0.041

EUENGINE33 (also known as EUENGINE3-3)
NOx g/bhp-hr.: 0.36
CO g/bhp-hr.: 0.02
Minimum CO Reduction Efficiency %: 99.0
VOC g/bhp-hr.: 0.074

EUENGINE34 (also known as EUENGINE3-4)

NOx g/bhp-hr.: 0.43
CO g/bhp-hr.: 0.04
Minimum CO Reduction Efficiency %: 97.3
VOC g/bhp-hr.: 0.048

EUENGINE35 (also known as EUENGINE3-5)
NOx g/bhp-hr.: 0.35
CO g/bhp-hr.: 0.02
Minimum CO Reduction Efficiency %: 98.8
VOC g/bhp-hr.: <0.03

VI.2
The permittee provided records of maintenance activities for the five engines in this flexible group.

VI.3, VI.5, and VI.7.v
The permittee provided records of the pressure drop across the catalyst for each engine in this flexible group.

VI.5 and VI.7.ii, iii and iv
The permittee provided records of the 4-hour rolling averages catalyst temperature for each engine in this flexible group.

VI.6a, VII.6, and VII.7
The permittee submitted an initial notification dated May 2, 2013, and an updated notification dated December 19, 2013.
All engines in this flexible group are, “Natural gas-fired, spark ignition, 4-stroke, lean-burn reciprocating engine with the two-way catalyst for control – Caterpillar G3616, 4735 hp.”
EUENGINE3-1 Initial Startup Date: April 22, 2013.
EUENGINE3-2 Initial Startup Date: April 22, 2013.
EUENGINE3-3 Initial Startup Date: April 23, 2013.
EUENGINE3-4 Initial Startup Date: April 26, 2013.
EUENGINE3-5 Initial Startup Date: April 26, 2013.

VI.6a, VII.6, and VI.9
The permittee provided the required notification copies that were submitted per permit conditions.

VI.6b, VI.10, and VII.4
The permittee provided records of startup, shutdown, and malfunctions.

VI.6.d
The permittee provided records of malfunction and maintenance as required per 40 CFR 63.10(b)(2)(x) and (xi).

VI.6.e
The permittee provided records of malfunction and maintenance as required per 40 CFR 63.8(d)(3).

VI.8
The permittee provided a log of maintenance activities conducted according to the PM / MAP.

VII.6
The permittee provided a copy of a notification of performance testing dated May 1, 2018.

VII.6 and VII.9
The permittee provided a copy of the emission test results dated September 11, 2017. Test results appear to indicate compliance with NOx, CO and VOC permit limits.

IX.1
Per 40 CFR Part 63, Subpart ZZZZ (§ 63.6645) a copy of the initial notification letter dated July 12, 2013, was provided.
NOTE: This initial notification is a one-time requirement. Therefore, this requirement appears to have been satisfied with this flexible group.

FGGLYCDEHYDS

IV.2
The permittee provided maintenance records.

VI.2
The permittee provided records of the temperature in the combustion chamber of the thermal oxidizer on a continuous basis. Temperatures were recorded at 15-minute intervals.

VI.3
he permittee provided records of monthly natural gas throughput.
FGDEHYHHH
III.5
The minimum operating temperatures established per emissions test are:
EUGLYHCDEHYD01: 1553 F (January 14-15, 2020),
EUGLYHCDEHYD02: 1538 F (January 14-15, 2020),
EUDEHY3: 1530 F (December 10, 2019).

Records indicate that the thermal oxidizer temperature has been maintained above 1500 F.

V.4, IX.1, and IX.2

BTEX EMISSION TEST SUMMARY

EMISSION UNIT: EUGLYCDHEYD01
BTEX Compound Concentration (ppmv): <0.07
BTEX Emission Rate (Mg/year): <0.01
BTEX Emission Limit (Mg/year): 2.1
Combustion Chamber Temperature (F): 1553
Current [Permit] Benzene Emission Limit (Mg/year): 0.90
Control Device: Vapor recovery system with thermal oxidizer.

EMISSION UNIT: EUGLYCDHEYD02
BTEX Compound Concentration (ppmv): <0.06
BTEX Emission Rate (Mg/year): <0.01
BTEX Emission Limit (Mg/year): 1.8
Combustion Chamber Temperature (F): 1538
Current [Permit] Benzene Emission Limit (Mg/year): 0.90
Control Device: Vapor recovery system with thermal oxidizer.

EMISSION UNIT: EUDHEY3
BTEX Compound Concentration (ppmv): <0.06
BTEX Emission Rate (Mg/year): <0.02
BTEX Emission Limit (Mg/year): 1.9
Combustion Chamber Temperature (F): 1530.
Current [Permit] Benzene Emission Limit (Mg/year): 0.90
Control Device: Vapor recovery system with thermal oxidizer.

VI.2 and VI.7
Records of thermal oxidizer combustion chamber temperature appear to indicate compliance with the minimum temperature requirements.

VI.7 and 14.b
The permittee provided records of the average daily operating temperature of the thermal oxidizer.

EMISSION UNIT: EUGLYCDHEYD01
Facility Actual Annual Natural Gas Throughput, January through December 2019 (MMSCFDry): 17,684.24

EMISSION UNIT: EUGLYCDHEYD02
Facility Actual Annual Natural Gas Throughput, January through December 2019 (MMSCFDry): 263.816

EMISSION UNIT: EUDHEY3
Facility Actual Annual Natural Gas Throughput, January through December 2019 (MMSCFDry): 2624.98

IX.3
The permittee has complied with the requirement to create a site-specific monitoring plan for the glycol dehydration system continuous parametric monitoring system.
FGPIPEHEATERS3
VI.1
The permittee maintains records of monthly natural gas usage from January through June 2018.

VII.4
The permittee submitted the required notification dated March 12, 2013.

FG-BLRMACT-NATGAS
VI.1
The permittee submitted the initial notifications dated May 21, 2013, and November 14, 2014.

FG-RULE285(mm)
VII.4, 5 and 6
On August 10, 2020, a violation notice citing violations of MI-ROP-B6636-2015a, FG-RULE285(mm) VII.6, and R 336.1285(2)(mm)(iv) because the permittee failed to notify the pollution emergency alert system within 24 hours of an emergency pipeline venting of natural gas in amounts greater than 1,000,000 standard cubic feet. On August 31, 2020, the AQD received a written response, which described corrective actions taken by Consumers Energy. The corrective actions appear to resolve this violation notice.

FGTANKS3
No control devices, emission limits, material limits, process/operational restrictions, equipment parameters, testing/sampling, monitoring/recordkeeping, stack/vent restrictions, or other requirements exist in this table. Reporting requirements are satisfied with each submittal of the annual and semiannual certifications of compliance.

CONCLUSION
The permittee appears to be in compliance with all evaluated permit conditions.

NAME Robert Ulmanchi DATE September 29, 2020 SUPERVISOR Joyce