

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

P089067081

FACILITY: Northern Natural Gas Company		SRN / ID: P0890
LOCATION: M-28 East, WAKEFIELD		DISTRICT: Marquette
CITY: WAKEFIELD		COUNTY: GOGEBIC
CONTACT: Kelly Henry , Division Environmental Specialist		ACTIVITY DATE: 03/14/2023
STAFF: Joe Scanlan	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MINOR
SUBJECT: Announced inspection to determine compliance with PTI 3-18		
RESOLVED COMPLAINTS:		

REGULATORY AUTHORITY

Under the Authority of Section 5526 of Part 55 of NREPA, the Department of Environment, Great Lakes, and Energy may upon the presentation of their card, and stating the authority and purpose of the investigation, enter and inspect any property at reasonable times for the purpose of investigating either an actual or suspected source of air pollution or ascertaining compliance or noncompliance with NREPA, Rules promulgated thereunder, and the federal Clean Air Act.

FACILITY DESCRIPTION

The Northern Natural Gas East Wakefield facility is located on M-28, approximately 3.7 miles north of Harrison Street, near Wakefield, MI. The East Wakefield facility compresses pipeline quality natural gas to facilitate its transmission through the pipeline system. The facility consists of two natural gas-fired stationary combustion turbines (EUTURBINE1 and EUTURBINE2). EUTURBINE1 became operational on December 11, 2018. EUTURBINE2 became operational on January 14, 2019. The facility operates mostly seasonally, operating more frequently in the winter months when demand for natural gas is high.

PROCESS DESCRIPTION

Two compressors, each driven by a natural gas fired turbine (one is a backup). Both combustion turbines (CT) are Solar Saturn 20-1600 gas turbines and rated at 1,679 HP each. Each CT is equipped with dry ultra-low NOx burners and a combustion air inlet filter.

A certified natural gas fired Cummins KTA19G 530HP RICE drives an emergency generator (EUEMERGENGINE). The emergency engine will be used as back-up utility power in the event of a power outage at the facility. The emergency engine has an operational limit of 500 hours per year based on a 12-month rolling time-period.

A 0.09 MMBTU/Hr natural gas-fired process heater (with two stacks) that provides heat for prevention of fuel line freeze ups during cold winter months and to raise the temperature of the natural gas for proper operation of the CT units.

REGULATORY SUMMARY

Facility is a true minor source with respect to Title V ROP and PSD.

The RICE is certified to meet the JJJ NSPS for Stationary Spark Ignition Internal Combustion Engines. This facility is not a major source of HAPs, thus is an area source with respect to Subpart ZZZZ. The State of Michigan has not taken delegation of this area source NESHAP.

The CT units are subject to NSPS KKKK for New Stationary Combustion Turbines which regulates NO_x and SO₂ emissions.

EMISSIONS

Pollutants emitted from the combustion process of natural gas-fired combustion turbine units include nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic compounds (VOCs), and particulate matter (PM). Sulfur oxides emissions are very low since sulfur compounds are removed from natural gas at processing plants. The formation of nitrogen oxides is related to the combustion temperature in the turbines, and CO and VOC emissions are primarily a result of incomplete combustion. PM emissions can include trace amounts of metals and condensable, semi-volatile organics which result from incomplete combustion, volatilized lubricating oil, and engine wear. Emissions vary according to the air-to-fuel ratio, ignition timing, torque, speed, ambient temperature, humidity, and other factors.

EMISSIONS REPORTING

The facility reported the following emissions to MAERS for 2022:

Source Reported Emissions 2022 (tons)	
Ammonia	0.00054
CO	1.5455
NO _x	6.0355
PM10	0.124
PM2.5	0.124
SO ₂	0.00186
VOC	0.04395

MAERS emission factors and stack test results were used for emission reporting.

COMPLIANCE HISTORY

The Northern Natural Gas East Wakefield facility has not previously been inspected and has not had any past compliance issues.

INSPECTION

On March 14, 2023, AQD District Staff (Joe Scanlan) arrived at the Northern Natural Gas East Wakefield facility. On site, staff met with Kelly Henry, Division Environmental Specialist for Northern Natural Gas. The facility was undergoing performance testing for compliance with PTI 3-18 and 40 CFR Part 60, Subparts A and KKKK. The tests were being performed to determine compliance with the NO_x ppm @ 15% O₂, NO_x lb/hr, and SO₂ lb/MMBTU emission limits for EUTURBINE1 and EUTURBINE2 (FGTURBINES).

During the opening conference, there was a brief discussion about the permit and emissions. We then proceeded to tour the facility, discuss operations, and monitor the ongoing testing. During the exit conference, we discussed emissions reporting and records staff would be requesting as a follow-up to the site visit.

The compliance performance tests were being performed by TRC Environmental Corporation (TRC). NO_x O₂ parameters were measured using test method USEPA 1, 3A, 7E, & 19. Each CT unit underwent 3 test runs each. SO₂ parameters were measured with a grab sample and tested using ASTM D6228 Fuel Analysis protocol. The performance test report was received April 24, 2023, and demonstrated that the CT units and fuel analysis are in compliance with the applicable limits in PTI 3-18.

EUEMERGENGINE

A nominally rated 530 HP natural gas-fired emergency engine driving a generator for emergency electrical power.

SC I, V.1, VI.1-2: The EU is an EPA-certified engine that meets the emission limits in SC I.

SC II.1: The engine only fires natural gas. Piped natural gas into the unit was observed on-site. For 2022, EUEMERGENGINE burned 0.06621 MMCF of natural gas.

SC III.1-7, IV.1-2: The engine went online December 11, 2018. The unit is operated in a certified manner and is only used for emergency purposes or for maintenance and readiness testing. Records provided showed a total of 14.3 hours of use in 2019, 14.3 hours of use in 2020, 22.5 hours of use in 2021, and 31.6 hours of use in 2022. During the inspection, an hour meter was seen on the control screen and listed 85 hours of total use. The nameplate of the engine states C350NG with a rated power output of 350KW. Records provided show preventative maintenance is done monthly, every 6 months, and annually.

SC VIII.1: SVEMGRICE1 is vertical and verified to be 23 feet above the ground using a 3-point measurement on a Range Finder, measured from the building grade to the top of the stack. Diameter appeared to be no more than 10.4 inches.

SC IX.1-2: EUEMERGENGINE appears to be in compliance with all provisions of NSPS Subparts JJJJ and ZZZZ.

EUPROCESSHEATER

One 0.09 MMBU/HR natural gas-fired heater (with two stacks).

SC II.1, IV.1: Piped natural gas was observed into EUPROCESSHEATER. The nameplate capacity on EUPROCESSHEATER is listed as 0.09 MMBTU/Hr.

SC VII.1: SVHO1A and SVHO1B are vertical and verified to be 10 feet above the ground using a 3-point measurement on a Range Finder, measured from the building grade to the top of the stack. Diameter appeared to be no more than 6.6 inches.

FGTURBINES

Two 1,679 HP simple-cycle natural gas-fired combustion turbines (CT) for compressing natural gas.

Emission Limits

Pollutant	Limit	Time Period / Operating Scenario	Compliance Performance Test Results from 3/14/23
SC I.1 NOx	100 ppm @ 15% oxygen	Test Protocol	EUTURBINE1: 75.5ppm @ 15% O2 EUTURBINE2: 71.4ppm @ 15% O2
SC I.2 NOx	7.24 lb/hr	Hourly	EUTURBINE2: 4.86 lb/hr
SC I.3 SO2	0.06 lb/MMBtu	Test Protocol	0.0000441 lb/MMBtu

Material Limits

SC II.1-2: EUTURBINE1 and EUTURBINE2 only fire on natural gas. Piped natural gas into the CT units was observed on-site. Sulfur content is verified to be less than 5 grams of sulfur per 100scf by the supplier.

Process/Operational Restrictions

SC III.1-2: The facility submitted an adequate MAP within 180 days of initial startup and also has a SSM on file.

Design/Equipment Parameters

SC IV.1: Each CT unit is rated at 1,679 HP.

Testing/Sampling

SC V.1-3 Initial testing to verify NOx emissions was successfully performed on February 26, 2019. The most recent performance test was completed on March 14, 2023, and results continue to demonstrate compliance with 40 CFR Part 60 Subpart KKKK and well as the lb/hr limit. For the lb/hr limit EUTURBINE2 was used as a representative unit of FGTURBINES.

Because the March 14, 2023, NOx test result (75.5ppm) for EUTURBINE1 was in excess of 75% of the emission limit (100ppm), the facility is required to complete another annual performance test within 14 months of the previous test, which is by May 14, 2024.

Monitoring/Recordkeeping

SC VI.1-3: The facility completes and maintains emission and fuel calculations, natural gas usage for FGTURBINES on a monthly basis, compliance tests, monitoring data, and additional records in an acceptable format. Records were provided for this inspection and are on file in the district office.

Stack/Vent Restrictions

SC VII.1: SVTURBINE1 and SVTURBINE2 are vertical and verified to be 36 feet above the ground using a 3-point measurement on a Range Finder, measured from the building grade to the top of the stack. Stack diameters were not verified but appeared to be within the maximum dimensions of 28 inches.

CONCLUSION

The facility appears to be in compliance with the Michigan Air Pollution Control Rules and conditions in PTI No. 3-18.

NAME Joseph Seaman

DATE 5/10/2023

SUPERVISOR Michael Kiplin