

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

N683845398

FACILITY: Vector Pipeline L.P., Highland Compressor Station		SRN / ID: N6838
LOCATION: 2282 South Duck Lake Road, HIGHLAND		DISTRICT: Southeast Michigan
CITY: HIGHLAND		COUNTY: OAKLAND
CONTACT: Matt DiPaola, Pipeline Operations Coordinator		ACTIVITY DATE: 07/26/2018
STAFF: Sebastian Kallumkal	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: Onsite inspection		
RESOLVED COMPLAINTS:		

On Thursday, July 26, 2018, I, Michigan Department of Environmental Quality-Air Quality Division staff Sebastian Kallumkal, conducted a targeted annual inspection at the Vector Pipeline L. P. – Highland Compressor Station located at 2282 South Duck Lake Road, Highland, Michigan. The purpose of the inspection was to verify facility's compliance with requirements of Article II, Air Pollution Control, Part 55 of Act 451 of 1994, United States Environmental Protection Agency (USEPA) Consent Agreement and Final Order (CAFO)-Docket No. CAA-05-2005-0014, and with the requirements of the Renewable Operating Permit No.: MI-ROP-N6838-2014a.

I arrived at the facility about 10:00 AM. I met with Mike Rylander, I & O Technician, and Alan Shaw, I & O Technician. I introduced myself, provided credentials, and stated the purpose of the inspection. Later, Matt DiPaola, Technical Supervisor, also joined the meeting. This facility could be unmanned occasionally, but Matt (cell: 219 218 4807), Mike (cell: 248 303 4980) or Alan (248 534 6785) would be available upon request.

Prior to the inspection I watched the safety video. During the pre-inspection meeting, we discussed the facility operations and reviewed various records including Preventive Maintenance records of the emergency generator, and the turbines. The natural gas coming through the incoming pipeline is scrubbed before compressing and transporting to the outgoing pipeline. Natural gas used as fuel in the turbines and emergency generator is taken prior to the scrubber.

Matt provided me electronic data of the turbine operations and emission calculations on a USB drive. The facility is currently keeping all operations and emissions data online. We also discussed the due date for the Title V renewal application submittal. I provided them a copy of the title page of the Title V permit and AQD letter dated August 29, 2017, sent to Ms. Belnda Friis, the Responsible Official, to remind the company that an administratively complete application is due between August 26, 2017 and August 26, 2018. Matt agreed to follow up on the status of this requirement.

Facility is keeping records of the blow downs (BLOWDOWN TRACKER) and emergency generator operating hours. The facility has installed BAM system to the control panel to detect and report the condition of the burner. The facility had also installed an electronic fuel system for both turbines which reduced the shutdown incidents of the turbines tremendously. They had installed a "MAXIMO" recordkeeping system which would keep all records (maintenance, performance, etc.) of any equipment at the facility. The facility did not have any process change since the last annual inspection.

The operators at the facility reviews and uploads the turbine data (NGP, Fuel usage, Hours of operation, blowdowns, SoloNOx on/off, etc.) online for the corporate environmental personnel. The ESD testing is done annually. If the turbines operate below the SoloNOx mode, audible and visual alarms are generated in control room in Houston, Texas.

Facility had upgraded the control panel for Unit 100 (EUTURBINE1) and Unit 200 (EUTURBINE2). As noted in the previous (2016) inspection, both turbine engines were replaced with like-kind in 2016.

He informed me that the emergency generator was not operated any purpose other than emergency power generation and testing. The facility conducted oil analysis on 10/5/2016 (hours = 1074) and on September 11, 2017 (hours= 1165). I collected the oil analysis results. Mike told me that Turbine Unit 200 was washed and cleaned on July 17, 2018 and Unit 100 will be washed and cleaned during the week of July 30, 2018.

The facility is a true minor for HAP emissions and hence not subject to the National Emission Standard for Hazardous Air Pollutant (NESHAP) for turbines. Based on the annual emissions reporting (MAERS) the facility's 2017 VOC emissions were 0.98 tons per year. The facility-wide potential to emit for HAP emissions was 2.454 TPY per Permit to Install Application for PTI 166-00A.

Matt indicated that they have a solvent cold cleaner (parts washer) which has not been installed and inquired about the AQD regulatory requirements if installed. I informed him that the cold cleaner could be exempt from permit to install requirements if it meets the exemption requirements for Rule 281(2)(h) but need to be included in the ROP renewal application. I offered send him the applicable cold cleaner rule (R336.1707) and the AQD PTI Exemption booklet.

After the pre-inspection meeting, Mike accompanied for an inspection of the turbines. At the time of my inspection both turbines were operating. I collected the turbine operating data from the control room.

Data collected for Unit 100

NGP: 102.4 % (Turbine Speed) SOLONOX ENABLED
NPT: 93.7% (Compressor Speed)
T5 Topping (temperature of the combustor of the engine, monitored all around it) =1357°F
Inlet Gas Pressure = 633 psig at 54°F; Outlet Gas Pressure = 916 psig at 108°F
Run Hours = 7807 hours
No. of Starts = 130 starts

Data collected for Unit 200

NGP: 101.9 % (Turbine Speed) SOLONOX ENABLED
NPT: 94.1% (Compressor Speed)
T5 Topping (temperature of the combustor of the engine, monitored all around it) =1362°F
Inlet Gas Pressure = 631 psig at 54°F; Outlet Gas Pressure = 916 psig at 108°F
Run Hours = 6808 hours
No. of Starts = 121 starts

Next, we went to the compressor room for the inspection of the turbines. I noticed that both turbines were running. I did not observe any visible emissions at either of the stacks.

Highland Compressor Station aids in the transportation of natural gas in the pipeline system from Joliet, Illinois to Dawn Township, Ontario, Canada. This facility is operated 24 hours and all year around. It operates two Solar Turbines Incorporated (Solar) Mars 100S natural gas fired turbines. These turbines are operated in parallel and operate independent to each other. Each turbine is rated at 15,000 Horse Power with a maximum heat input rate of 112.35 MMBTU/hr. These turbines are designed with nitrogen oxides (NOx) emission control referred to as dry low

NO_x (DLN) or SoLoNO_x. The facility also has one natural gas-fired internal combustion engine, 9.654 MMBTU/hr, emergency generator. The turbine operations can also be controlled by office in Houston, Texas.

Turbine maintenance includes washing and emergency testing. The natural gas from the turbine testing and from the annual full station ESD testing is vented to the atmosphere through a muffler. Emergency shut down and natural gas venting need to be reported to the Michigan Public Service Commission. The wash water from turbine cleaning and spent oil (from filters) are stored in tank and hauled away by Usher Oil, Inc. Detroit, MI.

The facility has a gas chromatography which analyzes natural gas composition continuously. The sulfur in the gas is analyzed at Athens, Belle River, Highland, Milford Junction, Joliet, and Washington compressor stations. All analyses on 2/14, 3/15, 7/29, 7/30 and 7/31/2018 show H₂S concentration as "NULL". The website (www.vector-pipeline.com, Informational Postings; Gas Quality, Gas Quality Report) provides gas analyses for each day from each station. The gas Tariff is also available from the website. The facility recently updated its recordkeeping of the hourly emissions data and operations data are available electronically. This makes review of the data easier.

Inspection:

Source-Wide Conditions:

The Carbon Monoxide emissions are limited to 224 tons per year based on a rolling 12-month time period. The calculated total CO emission rate as of December 2017 was 5.01 Tons and as for June 2018, the CO emissions were 4.69 Tons based on a rolling 12-month time period.

The facility is monitoring and keeping records of the natural gas fired in FGTURBINES during each calendar day.

Based on the information from Tariff (copy of gas quality section attached) the facility is burning natural gas, as defined in 40 CFR Part 72.2. Facility is monitoring and recording the usage of natural gas in FGTURBINES and EUSPU3 on a daily basis.

EUSPU3

As of December 2017, and June 2018, the annual NO_x emissions were 1.798 TPY and 0.355 TPY respectively, (Permit Limit = 9.85 Tons) based on a rolling 12-month time period as determined at the end of each calendar month.

The hourly NO_x emissions are limited to 39.4 pounds. The hourly emissions calculated based on monthly emissions from 12-month rolling period emissions and monthly hours of operation appears to be in compliance with the emission limit.

The 12 month rolling CO emissions were 0.14 tons as of December 2017 and 0.028 TPY as of June 2018, respectively (Permit limit = 0.765 TPY). The permit limits the hourly CO emissions to 3.06 pounds. The hourly emissions calculated based on monthly emissions from 12-month rolling period emissions and monthly hours of operation appears to be in compliance with the emission limit.

Under the quality of gas section in the Tariff (posted in Vector-Pipeline.com), the sulfur content is limited to 20 grains per 100 cubic feet (1/4 grain H₂S per 100 cubic feet of gas) which is in compliance with 40 CFR Part 72.2 which defines that natural gas contains 20.0 grains or less of total sulfur per 100 standard cubic feet. The Vector Gas Quality Report from the Vector-Pipeline.com shows that the sulfur content is "NULL" as of July 30, 2018.

The records show that the emergency generator was operated 91.3 hours in 2017 and 18 hours in 2018, as of June. Facility is keeping daily hours of operation for emergency and non-emergency purposes. The permit limits the operating hours to 500 hours per calendar year.

The permittee keeps records for each calendar month and based on 12-month rolling time period the hours of engine operation, fuel usage, and also calculates NOX and CO emissions in tons as required. The 12-month rolling fuel consumption as of December 2017 was 386.5 MCF. The stack dimensions of the SPU were not verified. I did not inspect the emergency engine during this inspection.

Facility is maintaining a preventive maintenance plan (PMP) per Section IX, Condition 1. I reviewed PMP records during the inspection.

FGTURBINES

Nitrogen oxides (NOx) emissions are limited to 37.9 pounds per hour and 126.7 tons per year based on a 12-month rolling time period. The records for 2017 and as of June 2018 show that hourly NOx emissions are less than the permit limit. The 12-month rolling period NOx emissions, as of December 2017 and June 2018, were 19.10 tons and 14.41 tons, respectively, for both engines combined.

The Carbon monoxide emissions are limited to 800 pounds per hour while the natural gas producer speed (NGP) is between 86 to 92% and 25.14 pounds per hour while operating above 92%. The facility is calculating and keeping hourly emissions data for each engine on a monthly basis and the annual emissions on a 12-month rolling time period basis. They provided me the records for 2017 and up to June 2018 records. The records show that the turbines did not run below 92% during these times except for startup and shutdown. Records show that during few occasions during 2017 and 2018 turbines ran below 92% but appears to be during start up or shut down. The records did not show that turbines ran below 86% NGP.

From the reviewed records for 2017 and to June 2018 show that the turbines were run in SoloNOx Mode "ON (ENABLED)". Both turbines had ran "SoLoNOX Out and below 92% NGP during start up and/or shutdown. The NOx emissions were less than 12 pounds per hour and CO emissions were less than 5 pounds per hour while the SoloNOX is enabled. The hourly emissions are calculated based on stack results and the NGP for that hour.

Records showed that during several days in 2017 and 2018 the hourly CO emissions were "0.0". This was discussed with the facility contact. He explained that this occurred because they used one decimal place. He sent me data using 3 decimal places which corrected this issue. (See attached email dated August 9, 2018)

Sulfur dioxide emissions are limited to an instantaneous concentration of 150 ppm by volume at 15% oxygen and dry gas basis and 100% load, 13.52 pounds per hour and 59.21 tons per year based on 12-month rolling time period. The facility is limited to burn only natural gas with sulfur content of 20 grains per CCF and the gas analysis shows that the H2S content was below detectable (NULL). As of December 2017, and up to June 2018, the SO2 emissions for both turbines combined were 0.16 tons and 0.11 Tons, respectively, based on a 12-month rolling time period. The records show that the SO2 emissions from EUTURBINE1 were 0.092 tons (as of 12/2017) and 0.068 (as of 6/2018) and EUTURBINE2 was 0.067 (as of 12/2017) and 0.04 tons (as of 6/2018), respectively. Based on these emissions the facility is expected to be in compliance with the emission limits.

Section III, Condition 1 prohibits the facility to operate the turbines at loads less than 86% NGP, except during start up and shut down. Based on the records review, the facility did not

operate the turbines below 86% NGP except for shut down/start up. Facility keeps operational records by hour. The facility is in compliance with this condition.

Section III, Condition 2 and Condition 3 require the facility to burn natural gas, defined in 40 CFR Part 72.2 and limits the sulfur content to 0.8 per cent by weight. Facility uses the natural gas they transport as fuel in the turbines. The approved Custom Fuel Monitoring Program (CFMP) allows the facility exempt from sulfur content monitoring required by 40 CFR Part 60, Subpart GG if the facility maintains a valid tariff in place with the Federal Energy Regulatory Commission (FERC) that limits the sulfur content of natural gas combusted in the turbines to not more than 20 grains of total sulfur per 100 standard cubic feet of natural gas. 40 CFR 72.2 specifies that natural gas contains 20.0 grains or less of total sulfur per 100 standard cubic feet. Facility's tariff (under Quality of Gas) requires that the gas to be received by the facility (Transporter) shall conform to the following specifications:

"Shall contain no more than 1/4 grain of hydrogen sulfide per 100 cubic feet of Gas nor more than 20 grains of total sulfur per 100 cubic feet of Gas". Email from Vector Pipeline (8/6/2018, Analysis done on August 4, 2018) show that total sulfur is 0.1069 grains and 1.7078 PPM. See attached.

Facility records show that the turbines operated at all times in compliance with the NOx and CO emission limits. AQD has not requested emission testing recently (Section V).

Permittee conducted tests to verify NOx and CO emissions from the EUTURBINE1 and EUTURBINE2 on July 1 & 2, 2014. The testing complied with the requirements of Section V, Conditions 1-6. The report showed that the engine emissions were in compliance with the emission limits.

Facility is keeping records specified in Section VI, Condition 1 (hourly % NGP, SoloNox Indicator, CO & NOx hourly and annual emission calculations, and the Tariff). Facility appears be in compliance with the 40 CFR 60, Subpart GG requirements.

The stack dimensions were not verified. Facility keeps records of the start up/shut down/malfunction operations and maintains and implements a Preventive Maintenance Plan (PMP). Copies of data received during inspection are attached for review.

Conclusion: From the facility inspection, records and reports review, this facility appears to be in compliance with the applicable requirements. Records are attached for review.

NAME Sebastiany Kallembal DATE 8/9/2018 SUPERVISOR Joyce B