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February 14, 2020

Ms. Samantha Davis
Michigan Department of Environment, Great Lakes and Energy
Lansing District Air Quality Division
Constitution Hall
525 W. Allegan St., 1 South
Lansing, MI 48909-7760

RE: December 12, 2019 emission test at Great Lakes Gas Transmission Compressor Station 13 – Otisville Unit 1303
SRN: N3818, Renewable Operating Permit No. MI-ROP-N3818-2016

Dear Ms. Davis,

As you are aware, the emission test that was scheduled on December 12, 2019 at Great Lakes Gas Transmission (GLGT) Compressor Station 13 – Otisville (CS-13) Unit 1303 was not started. The events leading to the decision to not start the emission test and our plans to correct any potential issues with the unit and complete the emission test are summarized below.

Summary:

On the day of the test, Unit 1303 was started and brought up to operating temperature. Once the unit was at operating temperature, load was increased to maximum to start the first test run at high load. At this point, the emission testing crew calibrated their analyzers. Once the unit reached the highest load the unit could achieve under the operating conditions present at the time, it was noted that the NOx emissions were above permit limits based on spot-checked instantaneous data. To ensure that the NOx emission values were correct, a second calibration was performed. The NOx emissions were determined by calculating NOx emissions based on real-time data and not test run data during this time, as the emission test had not officially started.

Operators at the facility discussed options to reduce NOx emissions for the test with other internal resources. It was determined that there are several possible issues that may cause the high NOx emissions, and that none of them were able to be resolved the day of the test.

Unit horsepower varies with ambient conditions, with cold conditions favoring the ability to increase load on the unit. Further, gas pipeline conditions also affect the maximum horsepower a unit can achieve, where higher pipeline flows allow the unit to operate at higher load. GLGT performs emission tests during winter months due to lower temperatures and higher pipeline flows because conditions that allow the unit to achieve a higher load are more likely to occur. The decision to not the test was made because unit

load was dropping due to pipeline conditions and because the preliminary NOx data appeared to be over the permit emission limit.

Per MI-ROP-N3818-2016 Section C.V.2., the unit is required to "complete an emission test to establish the range of % load/fuel consumption within which the turbine can operate in compliance limits once during the term of the RO Permit". In the case of Unit 1303, the unit needs to be operated above 90% of the ISO rating of 23,000 HP during the emission test to ensure ongoing compliance with the air permit. This is because there are no means to control the unit to a set horsepower. Instead, the unit typically reaches the maximum rated exhaust temperature or turbine speed at a point that is below the ISO horsepower rating. On the day of the test, the highest load recorded was approximately 20,000 HP. The unit was able to maintain this load for approximately 1 hour while it was heat-soaking. After approximately 45 minutes, load began to fall off and continued to decrease until it reached approximately 19,500 HP over a period of less than 1 hour. At the time the test was cancelled, unit load was approximately 85% of the maximum load for the unit. Testing under these operating conditions would not allow GLGT to demonstrate continuous compliance with the % load/fuel consumption ratio required by permit condition C.V.2.

While 40 CFR Part 60 Subpart GG does not require the unit to operate at maximum load, permit condition C.V.2. limits unit operation based on the emission test results. The control logic in Unit 1303 does not allow the unit to be controlled to a set horsepower limit, therefore a complete range of operation during the emission test is needed to ensure continuous compliance with the ROP.

The NOx emission limit of 89.0 lb/hr is based on a one hour averaging period. Compliance with this limit is demonstrated using emission test data required under permit condition C.V.2. The test runs for the Subpart GG emission test required under permit condition C.V.2 are required to be a minimum of 21 minutes in length, and three runs are required to be performed at each load. Both NOx concentration and NOx emission rate (lb/rh) increase with increasing load for Unit 1303, so the highest load achieved during the Subpart GG emission test is used to demonstrate compliance with the emission rate limit. The three 21-minute runs at high load are used to demonstrate compliance with the NOx emission rate limit.

Actions Taken to Address Violation Notice:

Unit 1303 has been taken out of service to determine whether there were any problems that would cause NOx emissions to be above permit limits. The following items were inspected to ensure proper operation:

1. Suction and discharge pressure and temperature transmitters were checked for accuracy. All transmitters were found to be within the required range.
2. Elbow/Eye transmitters were checked for accuracy. All transmitters were found to be within the required range.
3. Fuel gas differential pressure transmitter calibration was checked for accuracy. All transmitters were found to be within the required range.
4. Fuel gas orifice plate was inspected. No abnormalities were found.
5. The unit was inspected with a borescope. Slight irregularities with the fuel nozzles were found. Fuel nozzles have been replaced, and the nozzles that were removed have been sent to a 3rd party contractor for flow testing. No results have been received at this time.
6. Unit fuel gas filters were inspected and were found to be clean.
7. Unit air intake filters were inspected and found to be clean.
8. Investigation into whether liquids are present in the fuel gas has been started. No determination has been made at this time.
9. Oil leaks were investigated due to the presence of oil on the plenum floor. This issue was resolved by washing plenum enclosure and using cleaning agent on the plenum gasket that was

oil saturated. The gasket was vacuumed to ensure no oil further contamination. The oil leaks were determined to be minor were unlikely to impact emissions.

Currently, pipeline flows are insufficient to retest the unit. Current projections for pipeline flows indicate that we will be able to test the unit in April 2020. At that point, the unit will be started up and emissions will be checked with either a portable analyzer or a hand-held analyzer to verify whether the engine wash and fuel nozzle replacement resolved the potential emission issues noted above. Once operating, the engine control parameters will be verified to ensure that the air to fuel ratio is correct. Any additional issues discovered during the test runs will be resolved as quickly as possible. The emission test will be rescheduled using the current emission test protocol once it has been determined that the unit is operating properly.

Conclusion:

Given that the compliance demonstration for the NOx emission rate limit is a completed emission test at high load, and that an emission test was not started, GLGT disagrees that a Violation Notice should be issued for pre-test data showing NOx emissions. While spot-check data indicated that the unit may have exceeded the emission limit, the limit is based on an hourly average. Since there was not an hourly average created using the methods cited in 40 CFR 60 Subpart GG, conclusive evidence that the unit emitted NOx in exceedance of the permit limit based on a one-hour test is lacking. For this reason, GLGT respectfully requests that the Michigan Department of Environment, Great Lakes and Energy rescind Violation Notice

If you have any questions regarding this submittal or require any additional information, please feel free to contact Chris Waltman at (715) 758-3341 or at chris_waltman@transcanada.com

Sincerely,

W. Craig Rundle
Director – Great Lakes Region

Cc: Ms. Jenine Camilleri
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