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**COMPLIANCE TEST REPORT**  
Great Lake Gas Transmission Partnership Company  
Crystal Falls Compressor Station #8  
Combustion Turbine No. 802

**AIR QUALITY DIV.**

Prepared for:



TransCanada's Great Lakes Gas Transmission Partnership  
Crystal Falls, MI

Prepared by:



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PN: 050614.0023

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## PREFACE

I, Karl Mast, do hereby certify that the source emissions testing conducted at TransCanada in Crystal Falls, MI was performed in accordance with the procedures set forth by the United States Environmental Protection Agency, and that the data and results submitted within this report are an exact representation of the testing.

A handwritten signature in black ink that reads "Karl Mast".

Karl Mast  
Test Supervisor

I, Karl Mast, do hereby attest that all work on this project was performed under my direct supervision, and that this report accurately and authentically presents the source emissions testing conducted at Great Lakes Gas Transmission's Crystal Falls Compressor Station in Crystal Falls, MI.

A handwritten signature in black ink that reads "Karl Mast".

Karl Mast  
Test Supervisor



**SUMMARY**

The compliance testing was performed on the Combustion Turbine No.802 system in accordance with the requirements of the Title 40, Code of Federal Regulations, Part 60, Subpart GG, §60.335(B)(2) and at ambient temperature greater than 0 °F. The results of the testing are detailed in the following tables.

<b>EU-UNIT 802, Turbine GE LM1600. GLGT Crystal Falls</b>				
Parameter	Load 1 High	Load 2 Mid High	Load 3 Mid Low	Load 4 Low
HP	20,026	16,199	12,771	10,303
% Load	88.7	70.4	55.5	44.8

<b>EU-UNIT 802 Permit Limit NOx: 175.2 ppmvd @ 15% O<sub>2</sub> - 89.0 lb/hr</b>				
Parameter	Load 1 High	Load 2 Mid High	Load 3 Mid Low	Load 4 Low
NOx ppmvd @ 15% O <sub>2</sub>	147.06	115.69	94.24	78.86
NOx lb/hr	78.41	51.20	35.33	25.36

<b>EU-UNIT 802 Permit Limit CO: 31.9 ppmvd - 14.8 lb/hr</b>				
Parameter	Load 1 High	Load 2 Mid High	Load 3 Mid Low	Load 4 Low
CO ppmvd	17.80	15.31	24.68	25.80
CO lb/hr	6.09	5.16	6.39	7.03



## 1. INTRODUCTION

This report presents the results of the source emissions testing conducted by Environmental Quality Management, Inc. (EQ) for TransCanada's Great Lakes Gas Transmission Partnership (GLGT) at Crystal Falls compressor station, near Crystal Falls, MI, which is located in Iron County.

The primary purpose of this testing program was to conduct emissions testing to determine compliance with operating permit No. MI-ROP-3760-2011 for Combustion EU-UNIT 802 Turbine (No. 802) at GLGT's gas compressor facility.

EQ's responsibility was to conduct the compliance testing for the O<sub>2</sub>, CO and NO<sub>x</sub> emissions rates and perform data reduction for conformance evaluation. Great Lakes Gas Transmission Partnership's responsibility was to maintain process operating parameters and to assist in providing process operating data per compliance test requirements.

The following report provides information pertaining to TransCanada's process operations, and Compliance testing. The Compliance testing conducted on the Combustion Turbine No. 802 was performed on Tuesday, March 4, 2014, from 4:05 P.M. to 8:58 P.M.

The following requirements were specific for the testing program:

1. Equipment calibrations performed and calibration data provided.
2. Three (3) twenty (20) minute O<sub>2</sub>, CO, and NO<sub>x</sub> test runs performed at the Combustion Turbine No. 802 at four (4) load conditions, with the highest load at maximum achievable horsepower considering pipeline conditions and ambient temperature pursuant to EPA, Title 40, Code of Federal Regulations, Part 60 Subpart GG.
3. Process manufacturing operations maintained at 100%-50% of capacities and production and fuel consumption rates recorded during the emissions testing periods.
4. All testing and analyses performed in accordance with current EPA test methodologies and analytical procedures for O<sub>2</sub>, CO, and NO<sub>x</sub> emissions determinations.
5. Stratification was found to be less than 5% in both turbine exhausts.



The testing program was approved by and/or coordinated with Pedro Amieva, TransCanada's GLGT Partnership. The emission testing was performed by Karl Mast, Manager, Emission Measurement and Project Manager, EQ, T.J. Wigmore, Project Scientist, EQ. The emission testing was observed by Nathaniel Hude of Michigan DEQ.



## 2. TEST RESULTS SUMMARY

The compliance testing was performed on the Combustion Turbine No. 802 system in accordance with the requirements of the Title 40, Code of Federal Regulations, Part 60, Subpart GG, §60.335(B)(2) and at ambient temperature greater than 0 °F. A summary of the test results is given below:

**Table 1. Test Results Summary-Operating Parameters-Turbine No. 802**

<b>EU-UNIT 802, Turbine GE LM1600-GLGT Crystal Falls</b>				
Parameter	Load 1 High	Load 2 Mid High	Load 3 Mid Low	Load 4 Low
HP	20,026	16,199	12,771	10,303
% Load	88.7	70.4	55.5	44.8

**Table 2. Test Results Summary-NO<sub>x</sub>-Turbine No. 802**

<b>EU-UNIT 802 Permit Limit NO<sub>x</sub>: 175.2 ppmvd @ 15% O<sub>2</sub> - 89.0 lb/hr</b>				
Parameter	Load 1 High	Load 2 Mid High	Load 3 Mid Low	Load 4 Low
NO <sub>x</sub> ppmvd @ 15% O <sub>2</sub>	147.06	115.69	94.24	78.86
NO <sub>x</sub> lb/hr	78.41	51.20	35.33	25.36

**Table 3. Test Results Summary-CO-Turbine No. 802**

<b>EU-UNIT 802 Permit Limit CO: 31.9 ppmvd - 14.8 lb/hr</b>				
Parameter	Load 1 High	Load 2 Mid High	Load 3 Mid Low	Load 4 Low
CO ppmvd	17.80	15.31	24.68	25.80
CO lb/hr	6.09	5.16	6.39	7.03

Based on the information provided above, the Combustion Turbine No. 802 and met the acceptance criteria during the course of the testing. A complete list of performance parameters for each test run that was performed at the stack sampling locations can be found in Table 4-14.

Additional testing information may be found in Appendix A.