



**EMISSIONS COMPLIANCE STUDY**

*Performed At The*  
**USG-Otsego Paper, Inc.**  
**USG-Otsego Facility**  
**EUTURBINE2 (South – Unit 25)**  
**Otsego, Michigan**

*Test Date(s)*  
**May 17, 2023**

*Report No.*  
**TRC Environmental Corporation Report 525974B**

*Report Submittal Date*  
**June 19, 2023**

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**JUN 27 2023**

**AIR QUALITY DIVISION**



### Report Certification

I certify that to the best of my knowledge:

- Testing data and all corresponding information have been checked for accuracy and completeness.
- Sampling and analysis have been conducted in accordance with the approved protocol and applicable reference methods (as applicable).
- All deviations, method modifications, or sampling and analytical anomalies are summarized in the appropriate report narrative(s).

A handwritten signature in black ink, appearing to read "Gavin Lewis".

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Gavin Lewis  
Project Manager

June 19, 2023  
Date

TRC was operating in conformance with the requirements of ASTM D7036-04 during this test program.

A handwritten signature in black ink, appearing to read "Bruce Randall".

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Bruce Randall  
TRC Emission Testing Technical Director



## TABLE OF CONTENTS

1.0 INTRODUCTION .....	4
1.1 Project Contact Information .....	4
2.0 FACILITY DESCRIPTION .....	4
3.0 SUMMARY OF RESULTS .....	5
4.0 DISCUSSION OF RESULTS .....	6
5.0 SAMPLING AND ANALYSIS PROCEDURES .....	6
5.1 Determination of the Concentration of Gaseous Pollutants Using a Multi-Pollutant Sampling System .....	6
5.1.1 O <sub>2</sub> Determination by USEPA Method 3A .....	6
5.1.2 NO <sub>x</sub> Determination by USEPA Method 7E .....	7
6.0 QUALITY ASSURANCE PROCEDURES .....	7
7.0 TEST RESULTS SUMMARIES .....	8
APPENDIX	
AETB and QI Information Summary .....	11
Qualified Individual Certificate(s) .....	12
Process Operating Data .....	14
Sample Location Information .....	15
Sample Train Diagram .....	16
Calculation Nomenclature and Formulas .....	17
Processed Field Data and Results .....	19
Gaseous Calibration Data .....	23
NO <sub>2</sub> -to-NO Conversion Data .....	29
Response Time Data .....	30
Analyzer Interference Test Data .....	31
Calibration Gas Certificates .....	33
EGLE Acknowledgement Letter and Test Protocol .....	38



## EMISSIONS COMPLIANCE STUDY

### 1.0 INTRODUCTION

TRC Environmental Corporation (TRC) performed an emissions compliance test program on EUTURBINE2 (South-Unit 25) at the USG-Otsego Facility of USG-Otsego Paper, Inc. in Otsego, Michigan on May 17, 2023. The tests were authorized by and performed for USG-Otsego Paper, Inc.

The purpose of this test program was to determine emissions of nitrogen oxides (NOx) to demonstrate compliance with Michigan Department of Environment, Great Lakes, and Energy (EGLE) Renewable Operating Permit (ROP) No. MI-ROP-A0023-2019b and 40CFR, Part 60 subpart KKKK. The test program was conducted according to the TRC Test Protocol 525974 dated February 27, 2023.

#### 1.1 Project Contact Information

Participants		
Test Facility	USG-Otsego Paper, Inc. USG-Otsego Facility 320 N. Farmer Street Otsego, Michigan 49078	Franklin Knowles Environmental Compliance Supervisor 269-384-6351 (phone) fknowles@usg.com
Air Emissions Testing Body (AETB)	TRC Environmental Corporation 207C Eisenhower Lane South Lombard, Illinois 60148	Gavin Lewis Project Manager 219-613-0163 (phone) glewis@trccompanies.com

The tests were coordinated through Franklin Knowles, Environmental Compliance Supervisor of Otsego Paper, and conducted by Anthony sakellariou and Gavin Lewis of TRC. Documentation of the on-site ASTM D7036-04 Qualified Individual(s) (QI) can be located in the appendix to this report.

No personnel from the Michigan Department of Environment, Great Lakes, and Energy (EGLE), Air Quality Division (AQD) observed the testing.

### 2.0 FACILITY DESCRIPTION

Otsego Paper, Inc is a subsidiary of the United States Gypsum Company. The facility manufactures gypsum paper.

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The Otsego Paper facility produces electricity from two (2) Mars gas turbines. Turbine 1 is a Mars T-15000 gas turbine and Turbine 2 is a Mars T-16000 designated as EUTURBINE1 and EUTURBINE2, with a maximum heat input rate of 141.5 million British thermal unit per hour (MMBtu/hr) on EUTURBINE1 and a maximum heat input rate of 150.8 MMBtu/hr on EUTURBINE2 at low temperature operating conditions as measured on a higher heating value (HHV) basis. Energy is generated at the combustion turbine by drawing in ambient air by means of burning fuel and expanding the hot combustion gases in the turbine. The hot exhaust gases of each turbine are directed to a multi-pressure ABCO heat recovery steam generator (HRSG). There are also natural gas-fired duct burners associated with each HRSG and coupled to a turbine, designated as EUDUCTBURNER1 and EUDUCTBURNER2, respectively.

The facility has one paper machine, No. 1 Paper Machine (EUPAPERMACHINE1), used to produce paper from 100 percent recycle stock and corrugated material. The paper machine has three fourdriniers and is capable of producing a triple ply sheet.

Plant capacity for base load operations is 11 megawatts (MW) for each turbine and 160,000 pounds per hour (lb/hr) of steam for each HRSG.

### 3.0 SUMMARY OF RESULTS

The table below summarizes the test methods used, as well as the number and duration of each at each test location:

Unit ID	Parameter Measured	Test Method	No. of Runs/Unit	Run Duration (Min)
EUTURBINE2 (Unit 25)	O <sub>2</sub>	USEPA 3A	3	21
	NO <sub>x</sub>	USEPA 7E	3	21

The results of this test program are summarized in the tables below. Detailed individual run results are presented in Section 7.0.

Unit ID	Test Results			Permitted Emission Limits
	Pollutant	Units	Measured Emissions	
EUTURBINE2 (Unit 25)	NO <sub>x</sub>	ppmvd @ 15% O <sub>2</sub>	14.3	42



#### 4.0 DISCUSSION OF RESULTS

Source operation appeared normal during the entire test program. EUTURBINE2 was operated near base load (>75% of maximum load) with EUDUCTBURNER2 on during the test program.

The compliance test program was conducted separate from the RATA test program. Each run was 21-minutes in length.

#### 5.0 SAMPLING AND ANALYSIS PROCEDURES

All testing, sampling, analytical, and calibration procedures used for this test program were performed in accordance with the methods presented in the following sections. Where applicable, the Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III, Stationary Source Specific Methods, USEPA 600/R-94/038c, September 1994 was used to supplement procedures.

##### 5.1 Determination of the Concentration of Gaseous Pollutants Using a Multi-Pollutant Sampling System

Concentrations of the pollutants in the following sub-sections were determined using one sampling system. The number of points at which sample was collected was determined in accordance with Part 75 specifications.

A straight-extractive sampling system was used. A data logger continuously recorded pollutant concentrations and generated one-minute averages of those concentrations. All calibrations and system checks were conducted using USEPA Protocol gases. Three-point linearity checks were performed prior to sampling, and in the event of a failing system bias or drift test (and subsequent corrective action). System bias and drift checks were performed using the low-level gas and either the high- or mid-level gas (as specified in the appendices) prior to and following the test runs.

The Low Concentration Analyzers (those that routinely operate with a calibration span of less than 20 ppm) used by TRC are ambient-level analyzers. Per Section 3.12 of Method 7E, a Manufacturer's Stability Test is not required for ambient-level analyzers. Analyzer interference tests were conducted in accordance with the regulations in effect at the time that TRC placed an analyzer model in service.

##### 5.1.1 O<sub>2</sub> Determination by USEPA Method 3A

This method is applicable for the determination of O<sub>2</sub> concentrations in controlled and uncontrolled emissions from stationary sources only when specified within the regulations. The O<sub>2</sub> analyzer was equipped with a paramagnetic-based detector.



### 5.1.2 NO<sub>x</sub> Determination by USEPA Method 7E

This method is applicable for the determination of NO<sub>x</sub> concentrations in controlled and uncontrolled emissions from stationary sources only when specified within the regulations. The NO<sub>x</sub> analyzer utilized a photomultiplier tube to measure the linear and proportional luminescence caused by the reaction of nitric oxide and ozone.

## 6.0 QUALITY ASSURANCE PROCEDURES

TRC integrates our Quality Management System (QMS) into every aspect of our testing service. We follow the procedures specified in current published versions of the test Method(s) referenced in this report. Any modifications or deviations are specifically identified in the body of the report. We routinely participate in independent, third-party audits of our activities, and maintain:

- Accreditation from the Louisiana Environmental Laboratory Accreditation Program (LELAP).
- Accreditation from the Stack Testing Accreditation Council (STAC) and the American Association for Laboratory Accreditation (A2LA) that our operations conform with the requirements of ASTM D 7036 as an Air Emission Testing Body (AETB).

These accreditations demonstrate that our systems for training, equipment maintenance and calibration, document control and project management will fully ensure that project objectives are achieved in a timely and efficient manner with a strict commitment to quality.

All calibrations are performed in accordance with the test Method(s) identified in this report. If a Method allows for more than one calibration approach, or if approved alternatives are available, the calibration documentation in the appendices specifies which approach was used. All measurement devices are calibrated or verified at set intervals against standards traceable to the National Institute of Standards and Technology (NIST). NIST traceability information is available upon request.

ASTM D7036-04 specifies that: *“AETBs shall have and shall apply procedures for estimating the uncertainty of measurement. Conformance with this section may be demonstrated by the use of approved test protocols for all tests. When such protocols are used, reference shall be made to published literature, when available, where estimates of uncertainty for test methods may be found.”* TRC conforms with this section by using approved test protocols for all tests.



## 7.0 TEST RESULTS SUMMARIES





### GASEOUS TEST RESULTS SUMMARY

Project Number:	<u>525974</u>	Start Date:	<u>5/17/23</u>
Customer:	<u>USG-Otsego Paper</u>	End Date:	<u>5/17/23</u>
Unit Identification:	<u>EUTURBINE2 (South-U25)</u>	Facility:	<u>Otsego, MI</u>
Sample Location:	<u>Stack</u>	Recorded by:	<u>Gavin Lewis</u>
RM Probe Type:	<u>Extractive (Dry)</u>	Fc Factor:	<u>-</u>
Load Level/Condition:	<u>&gt;75%</u>	Fd Factor:	<u>8710</u>

Reference Method Results, As Measured Moisture Basis					
Run #	Date	Start Time	End Time	NOX ppmvd	O2 % v/v dry
1	5/17/23	10:20	10:40	15.1	14.6
2	5/17/23	10:41	11:01	15.4	14.6
3	5/17/23	11:03	11:23	15.4	14.6
Average				15.3	14.6

Results Corrected to a Reference O <sub>2</sub> Concentration			
Run #	NO <sub>x</sub> ppmvd corrected to 15% Oxygen		
1	14.1	-	-
2	14.4	-	-
3	14.4	-	-
Average	14.3	-	-