



EMISSIONS COMPLIANCE STUDY

Performed At The

USG-Otsego Paper, Inc.

USG-Otsego Facility

EUTURBINE2 (South – Unit 25)

Otsego, Michigan

Test Date(s)

March 25, 2022

Report No.

TRC Environmental Corporation Report 475911B

Report Submittal Date

April 26, 2022

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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".

Gavin Lewis
Project Manager

April 26, 2022
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".

Bruce Randall
TRC Emission Testing Technical Director



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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 March 25, 2022. 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 (NO_x) to demonstrate compliance with Michigan Department of Environment, Great Lakes, and Energy (EGLE) Renewable Operating Permit (ROP) No. MI-ROP-A0023-2019a and 40CFR, Part 60 subpart KKKK. The test program was conducted according to the TRC Test Protocol 475911 dated March 1, 2022.

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 7521 Brush Hill Road Burr Ridge, Illinois 60527	Chris Miller Project Manager 815-341-1883 (phone) cmiller@trccompanies.com
State Representative	EGLE – Air Quality Division 120 West Chapin Street Cadillac, Michigan 49601-2158	Trevor Drost Environmental Quality Analyst Air Quality Division 517-245-5781 (phone) drostt@michigan.gov

The tests were coordinated through Franklin Knowles, Environmental Compliance Supervisor of Otsego Paper, and conducted by Ryan Novosel and Chris Miller of TRC. Trevor Drost of Michigan Department of EGLE-AQD observed the testing. Documentation of the on-site ASTM D7036-04 Qualified Individual(s) (QI) can be located in the appendix to this report.



2.0 FACILITY DESCRIPTION

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

The Otsego Paper facility produces electricity from two (2) Mars T-15000 gas turbines, 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 ₂	USEPA 3A	3	63
	NO _x	USEPA 7E	3	63



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)	NOx	ppmvd @ 15% O ₂	14.9	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 during the RATA test program and each run was comprised of three (3) 21-minute RATA test runs for a total of 63 minutes for each compliance test run.

Test run 5 on EUTURBINE2 was aborted due to a failed reference method NOx analyzer post-test calibration. After sustaining minor damages during run 5 on March 25, 2022, TRC's primary NOx analyzer was removed from service and a back-up NOx analyzer was calibrated and used to complete the RATA and compliance test programs.

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 Method 7E specifications.

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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 each test run.

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 O₂ Determination by USEPA Method 3A

This method is applicable for the determination of O₂ concentrations in controlled and uncontrolled emissions from stationary sources only when specified within the regulations. The O₂ analyzer was equipped with a paramagnetic-based detector.

5.1.2 NO_x Determination by USEPA Method 7E

This method is applicable for the determination of NO_x concentrations in controlled and uncontrolled emissions from stationary sources only when specified within the regulations. The NO_x 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

Instrumental Reference Method Calibration Corrected Test Data

Project Number:	475911	Start Date:	3/25/22
Customer:	USG-Otsego Paper	End Date:	3/25/22
Unit Identification:	EUTURBINE2 (South-U25)	Facility:	Otsego, MI
Sample Location:	Stack	Recorded by:	C. Miller
RM Probe Type:	Extractive (Dry)	Fc Factor:	-
Load Level/Condition:	Normal	Fd Factor:	8710

Reference Method Results, As Measured Moisture Basis							
Run #	Date	Start Time	End Time	NOX ppmvd	-	-	O2 % v/v dry
1	3/25/22	7:26	9:07	15.7	-	-	14.6
2	3/25/22	12:00	13:49	16.8	-	-	14.3
3	3/25/22	14:12	15:57	17.1	-	-	14.2
Average				16.5	-	-	14.4

Results Corrected to a Reference O ₂ Concentration			
Run #	NO _x ppmvd corrected to 15% Oxygen	-	-
1	14.7	-	-
2	14.9	-	-
3	15.2	-	-
Average	14.9	-	-

APPENDIX