



ADVANCED INDUSTRIAL RESOURCES

***CEMS RELATIVE ACCURACY TEST AUDIT  
No. 8 BOILER AND No. 11 BOILER  
ESCANABA PAPER COMPANY  
ESCANABA, MICHIGAN  
PROJECT ID: KR-9482***

PREPARED FOR:



VERSO

**Escanaba Paper Company**

**7100 COUNTY ROAD 426**

**ESCANABA, MICHIGAN 49829**

PREPARED BY:

**ADVANCED INDUSTRIAL RESOURCES, INC.**

**3407 NOVIS POINTE**

**ACWORTH, GEORGIA 30101**

Test Dates:

**MAY 3-4, 2016**



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
AIR QUALITY DIVISION

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**RENEWABLE OPERATING PERMIT  
REPORT CERTIFICATION**

Authorized by 1994 P.A. 451, as amended. Failure to provide this information may result in civil and/or criminal penalties.

Reports submitted pursuant to R 336.1213 (Rule 213), subrules (3)(c) and/or (4)(c), of Michigan's Renewable Operating (RO) Permit program must be certified by a responsible official. Additional information regarding the reports and documentation listed below must be kept on file for at least 5 years, as described in General Condition No. 22 in the RO Permit and be made available to the Department of Environmental Quality, Air Quality Division upon request.

Source Name Escanaba Paper Company County Delta  
Source Address 7100 County Road 426 City Escanaba  
AQD Source ID (SRN) A0884 RO Permit No. MI-ROP-A0884-2 016 RO Permit Section No. 1

Please check the appropriate box(es):

**Annual Compliance Certification (General Condition No. 28 and No. 29 of the RO Permit)**

Reporting period (provide inclusive dates): From \_\_\_\_\_ To \_\_\_\_\_

1. During the entire reporting period, this source was in compliance with ALL terms and conditions contained in the RO Permit, each term and condition of which is identified and included by this reference. The method(s) used to determine compliance is/are the method(s) specified in the RO Permit.

2. During the entire reporting period this source was in compliance with all terms and conditions contained in the RO Permit, each term and condition of which is identified and included by this reference, EXCEPT for the deviations identified on the enclosed deviation report(s). The method used to determine compliance for each term and condition is the method specified in the RO Permit, unless otherwise indicated and described on the enclosed deviation report(s).

**Semi-Annual (or More Frequent) Report Certification (General Condition No. 23 of the RO Permit)**

Reporting period (provide inclusive dates): From \_\_\_\_\_ To \_\_\_\_\_

1. During the entire reporting period, ALL monitoring and associated recordkeeping requirements in the RO Permit were met and no deviations from these requirements or any other terms or conditions occurred.

2. During the entire reporting period, all monitoring and associated recordkeeping requirements in the RO Permit were met and no deviations from these requirements or any other terms or conditions occurred, EXCEPT for the deviations identified on the enclosed deviation report(s).

**Other Report Certification**

Reporting period (provide inclusive dates): From Jan 1, 2016 To Dec 31, 2016

Additional monitoring reports or other applicable documents required by the RO Permit are attached as described:

\_\_\_\_\_

2016 CEMS RATA Test Report

\_\_\_\_\_

\_\_\_\_\_

I certify that, based on information and belief formed after reasonable inquiry, the statements and information in this report and the supporting enclosures are true, accurate and complete, and that any observed, documented or known instances of noncompliance have been reported as deviations, including situations where a different or no monitoring method is specified by the RO Permit.

<u>Matt Archambeau</u>	<u>Mill Manager</u>	<u>906-233-2600</u>
Name of Responsible Official (print or type)	Title	Phone Number
		<u>6/24/16</u>
Signature of Responsible Official		Date

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## 1.0 INTRODUCTION

### 1.1 SUMMARY OF TEST PROGRAM

Escanaba Paper Company (EPC) operates an integrated pulp and paper mill in Escanaba, Michigan. Processes at the facility include the No. 8 Boiler and No. 11 Boiler. The facility is required to operate nitrogen oxides (NO<sub>x</sub>) and oxygen (O<sub>2</sub>) continuous emissions monitoring systems (CEMS) on the No. 8 Boiler and No. 11 Boiler.

Relative accuracy test audits (RATAs) are required on each of the CEMS on an annual basis. This Test Report addresses the following required tests:

- NO<sub>x</sub> and O<sub>2</sub> CEMS RATA testing on the No. 8 Boiler
- NO<sub>x</sub> and O<sub>2</sub> CEMS RATA testing on the No. 11 Boiler;

Testing was conducted on May 3-4, 2016. All tests were conducted in accordance with the test methods in Title 40 of the Code of Federal Regulations, Part 60 (40 CFR 60) Appendices A and B. Procedures used in and results from this testing are described in this Final Test Report.

### 1.2 KEY PERSONNEL

The key personnel who coordinated and reviewed this Test Report and their telephone numbers are:

Paula LaFleur, Escanaba Paper Company	906-233-2603
Derek Stephens, <i>QSTI I-IV</i> , Advanced Industrial Resources	404-843-2100
Scott Wilson, Advanced Industrial Resources	800-224-5007
Steven Hajgh, Advanced Industrial Resources	800-224-5007

## 2.0 PLANT AND SAMPLING LOCATION DESCRIPTIONS

### 2.1 PROCESS & CONTROL EQUIPMENT DESCRIPTION

Escanaba Paper Company (EPC) operates an integrated pulp and paper mill in Escanaba, Michigan. Processes at the facility include the No. 8 Boiler and No.11 Combination Boiler.

The No. 8 Boiler burns natural gas and fuel oil to produce steam for the pulping and paper making processes in the mill. The No. 11 Combination Boiler burns woodwaste, wastewater sludge, tire-derived fuel (TDF), engineered fuel pellets, natural gas and coal to produce steam for the pulping and paper making processes in the mill.

The facility is required to operate a NO<sub>x</sub>/O<sub>2</sub> CEMS on the No. 8 Boiler and No. 11 Boiler.

The No. 8 Boiler NO<sub>x</sub> Monitor is a Thermo Electron Instruments (TEI) Model 42I-ANMSPCB (Serial # 0534213658). The O<sub>2</sub> analyzer is a TEI Model 25595003 (Serial # CC111105-5). The system extracts a sample from the process stream and dilutes it at a constant ratio for transport to the analyzer. The captured sample is filtered and passed through a heat exchanger to remove moisture from the sample stream prior to dilution, thereby providing a sample for dry basis measurement.

The NO<sub>x</sub> analyzer measures oxides of nitrogen by chemiluminescence. The O<sub>2</sub> analyzer uses a fuel cell technology to measure oxygen. The NO<sub>x</sub> monitor operates with a span of 0-1,000 PPM and the O<sub>2</sub> operates with a span of 0-25%

The No. 11 Boiler NO<sub>x</sub> analyzer is a TEI Model 42I-ANMSPCB (Serial # 1308857366). The No. 11 Boiler O<sub>2</sub> analyzer is a TEI Model 25595003 analyzer, serial number 932839437. The system extracts the sample gas through a sample probe and through a heated Teflon sample line to the gas conditioning system. The moisture is removed and the sample gas is then passed to the analyzer. The NO<sub>x</sub> analyzer measures oxides of nitrogen by chemiluminescence. The O<sub>2</sub> analyzer uses a fuel cell technology to measure oxygen. The NO<sub>x</sub> monitor operates with a span of 0-1,000 PPM and the O<sub>2</sub> operates with a span of 0-25%.

The No. 11 CO<sub>2</sub> analyzer is an in-situ SICK model GM35-3 (Serial # 10368000) which uses opto-electronic measurement of CO<sub>2</sub> by means of wavelength-specific light absorption.

## 2.2 SAMPLING LOCATION

NO<sub>x</sub> and O<sub>2</sub> concentrations were sampled from the dedicated stack servicing the No. 8 Boiler. This stack is 161 feet tall with an inside diameter of 84 inches (7 feet). The sampling ports are located 5.6 stack diameters (39 feet) from the last upstream disturbance and 9.0 diameters (63 feet) from the stack discharge. A stratification check was conducted during Run 1 by utilizing three traverse points in one sampling port at distances of 16.7, 50.0 and 83.3 percent of the total traverse distance. Stratification within the stack was determined to be less than 5%; therefore, three traverse points were used for the remaining O<sub>2</sub>, and NO<sub>x</sub> sampling runs, in accordance with 40 *CFR* 60 Appendix B, Performance Specification 2, Section 8.1.3.2.

The No. 11 Boiler sampling point for the NO<sub>x</sub>, and O<sub>2</sub> probe is located in the duct prior to the stack. The duct has a rectangular cross-section of 66 inches by 300 inches. Testing was performed at the breach from the centrally located port. Previous testing indicated that stratification was not present in the stack, therefore, three traverse points were used for the remaining O<sub>2</sub>, and NO<sub>x</sub> sampling runs, in accordance with 40 *CFR* 60 Appendix B, Performance Specification 2, Section 8.1.3.2.

### 3.0 SUMMARY AND DISCUSSION OF TEST RESULTS

#### 3.1 OBJECTIVES

The purpose of the test program was to determine the relative accuracy of each source's applicable CEM systems and compare the results with the specifications in 40 *CFR* 60 Appendix B.

#### 3.2 FIELD TEST CHANGES AND PROBLEMS

No significant problems were encountered during testing that required deviation from the planned test protocol.

#### 3.3 PRESENTATION OF TEST RESULTS

##### 3.3.1 CEMS RATA RESULTS

Table 3-1 provides the RATA summary for each source tested. Relative accuracy calculation results are presented in Appendix A. Reduced data is presented in Appendix B and raw field data is presented in Appendix D. Facility CEMS data is presented in Appendix F.

Table 3-1

Source	NO <sub>x</sub> CEMS (lb/MMBtu) 40 CFR 60 Appendix B Performance Specification 2			O <sub>2</sub> CEMS (% dry) 40 CFR 60 Appendix B Performance Specification 3		
	Relative Accuracy	Limit	RATA Test Result	Relative Accuracy	Limit	RATA Test Result
No. 8 Boiler	5.9%	20%	Passed	0.693	1.0	Passed
No. 11 Boiler	1.1%	20%	Passed	0.263	1.0	Passed

### 3.3.1.1 No. 8 Boiler CEMS NO<sub>x</sub>/O<sub>2</sub> RATA Results

The relative accuracy of the No. 8 Boiler NO<sub>x</sub> emission factor CEMS was determined to be **5.9%**, which is less than the 20% limit established in 40 *CFR* 60 Appendix B, Performance Specification 2, Section 13.2. Therefore, the NO<sub>x</sub> emission factor CEMS **passed** the Relative Accuracy Test Audit.

The average difference of the No. 8 Boiler O<sub>2</sub> CEMS was determined to be **0.693** O<sub>2</sub>, which is less than the 1% O<sub>2</sub> limit established in 40 *CFR* 60 Appendix B, Performance Specification 3, Section 13.2. Therefore, the O<sub>2</sub> CEMS **passed** the Relative Accuracy Test Audit.

### 3.3.1.2 No. 11 Boiler CEMS NO<sub>x</sub>/O<sub>2</sub> RATA Results

The relative accuracy of the No. 11 Boiler NO<sub>x</sub> emission factor CEMS was determined to be **1.1%**, which is less than the 20% limit established in 40 *CFR* 60 Appendix B, Performance Specification 2, Section 13.2. Therefore, the NO<sub>x</sub> emission factor CEMS **passed** the Relative Accuracy Test Audit.

The average difference of the No. 11 Boiler O<sub>2</sub> CEMS test was determined to be **0.263%** O<sub>2</sub>, which is less than the 1% O<sub>2</sub> limit established in 40 *CFR* 60 Appendix B, Performance Specification 3, Section 13.2. Therefore, the O<sub>2</sub> CEMS **passed** the Relative Accuracy Test Audit.

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