

## DETROIT RENEWABLE POWER

DETROIT, MICHIGAN

### SHREDDER STACK VISIBLE EMISSIONS REVISED REPORT 2018 SOURCE TESTING PROGRAM

RWDI #1804672

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#### SUBMITTED TO

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## EXECUTIVE SUMMARY

RWDI AIR Inc. (RWDI) was retained by Detroit Renewable Power to conduct emission observations on the Primary and Secondary Shredder (200 Line) exhaust stacks at their facility located at 5700 Russell Street, Detroit, Michigan. The test program was conducted in order to fulfill the requirements of the Michigan Department of Environmental Quality (MDEQ) Title V Renewable Operating Permit (ROP) # MI-ROP-M4148-2011a dated August 19, 2011.

The sampling plan for this testing program was submitted August 2<sup>nd</sup>, 2018 to the Michigan Department of Environmental Quality (MDEQ). Approval for the testing program was granted by the MDEQ on September 13<sup>th</sup>, 2017. Initial testing was conducted on the 200L Primary and Secondary Shredder exhaust stacks October 2<sup>nd</sup>, 2018 and on the Ash Handling Building October 11, 2018 and a report was previously submitted. The opacity the 200L Primary and Secondary shredder exhaust stacks was redone on December 18<sup>th</sup> and 19<sup>th</sup> 2018 to include three (3) 1-hour observation periods as discussed with MDEQ on-site. A copy of the MDEQ approval letter can be found in **Appendix B**.

The following table represents a summary of the opacity observations and the limits set out in Detroit Renewable Power's Renewable Operating Permit.

Parameter	Stack Testing Results		ROP Limit
	Primary Shredder	Secondary Shredder	
Limits from ROP: MI-ROP-M4148-2011a			
Visible Emissions	> Test 1: 0 > Test 2: 0 > Test 3: 0	> Test 1: 0 > Test 2: 0 > Test 3: 0	0

The results of the testing indicate that the opacity is in compliance with respect to the ROP limits. A summary of the opacity observations can be found in the **Tables** section of the report with the field notes and detailed summary in the Appendices.



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# 1 INTRODUCTION

RWDI AIR Inc. (RWDI) was retained by Detroit Renewable Power to conduct emission sampling on the 200L Primary and Secondary Shredder (EUMSWPPROC-LINE200) exhaust stacks at their facility located at 5700 Russell Street, Detroit, Michigan. The test program was conducted in order to fulfill the requirements of the Michigan Department of Environmental Quality (MDEQ) Title V Renewable Operating Permit (ROP) # MI-ROP-M4148-2011a dated August 19, 2011.

The Sampling Plan for this testing program was submitted August 2<sup>nd</sup>, 2018 to the Michigan Department of Environmental Quality (MDEQ). Approval for the testing program was granted by the MDEQ on September 13<sup>th</sup>, 2018. Testing was conducted on the 200L Primary and Secondary Shredder exhaust stack on October 2<sup>nd</sup>, 2018 and on the Ash Handling Building October 11<sup>th</sup>, 2018 and a report was previously submitted. The opacity at 200L Primary and Secondary shredder exhaust stacks was re-done on December 18<sup>th</sup> and 19<sup>th</sup>, 2018 to include three (3) 1-hour observation periods as discussed with MDEQ on-site. A copy of the MDEQ approval letter can be found in **Appendix B**.

This stack testing study consisted of the following parameters:

- Visible Emissions.

## 2 SOURCE DESCRIPTION

### 2.1 Facility Description

Detroit Renewable Power is a refuse-derived fuel (RDF) plant that began commercial operation in October 1991. The facility is permitted to receive up to 20,000 tons of municipal solid waste (MSW) per week. The MSW is processed into RDF, which is then combusted in the furnaces, producing a maximum 362,800 pounds of steam per hour per unit. The steam is used to generate up to 68 megawatts of electricity and supply export steam at a rate of up to 550,000 pounds per hour. The energy products are sold to DTE Corporation and Detroit Thermal.



## 2.2 Process Description- Shredder Building

The Waste processing lines (FGMSWPROC-Lines) have identical sampling ports located in 17-inch diameter stacks for the Primary Shredder baghouse and 45-inch diameter stacks for the Secondary Shredder baghouse. There are three (3) separate lines associated with this process equipment (EUMSWPROC-LINE1, EUMSWPROC-LINE2, and EUMSWPROC-LINE3). 200 Line (EUMSWPROC-LINE2) was tested for the primary and secondary exhaust system.

FGMSWPROC-LINES includes all activities from receipt of MSW in the facility, weighing, delivery of MSW into the MSW Process Building, unloading in the tipping floor area, MSW loading into RDF process conveyor lines, RDF processing, storage, loading into 2 boiler feed conveyor lines, and conveying RDF into the Power Block Building. Refuse Derived Fuel (RDF) processing starts from the loaders feeding MSW into 3 lines each consisting of a feed conveyor, magnetic separator, primary shredder (controlled by a baghouse fabric filter system), screens, secondary shredder (controlled by a cyclone and a baghouse fabric filter system) and conveyor feed into RDF storage room. Fugitive particulate in MSW Process Building are controlled by ventilation exhaust fans with vent filters.

## 3 SAMPLING LOCATION

### 3.1 Compliance Source Sample Location Description

The primary stack is 17 inches in diameter and has two sampling ports, 90 degrees apart and 6 inches in diameter. The sampling ports were located 14 duct diameters downstream from the ID fan and 42 duct diameters upstream before the stack outlet. The secondary stack is 45 inch in diameter and has two sampling ports, 90 degrees apart and 6 inches in diameter. The sampling ports were located 11 duct diameters downstream from the ID fan and 16 duct diameters upstream before the stack outlet.



Figure 3.1a: Diagram of Flow Disturbance Distance and Stack Diameters for EUMSWPROC-LINE2 (Primary Shredder Baghouse)

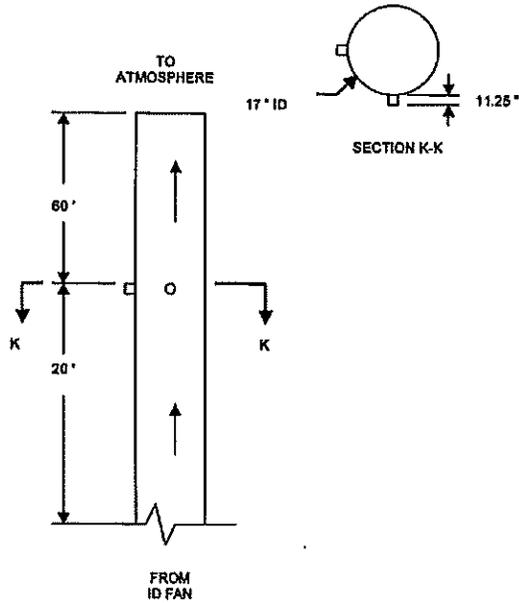
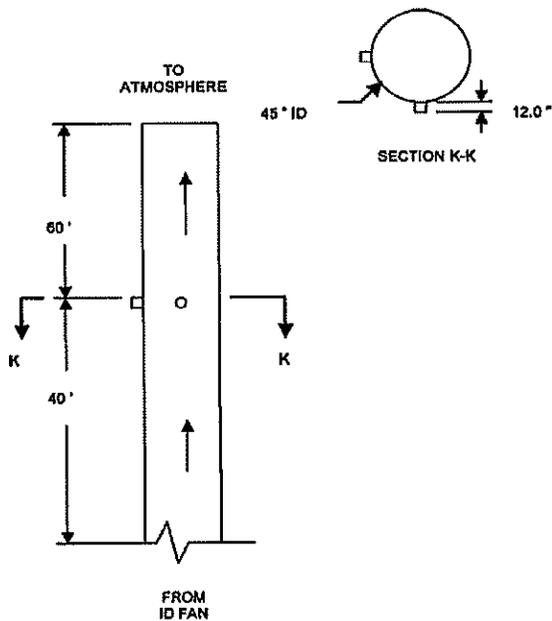


Figure 3.1b: Diagram of Flow Disturbance Distance and Stack Diameters for EUMSWPROC-LINE2 (Secondary Shredder Baghouse)





## 4 SAMPLING METHODOLOGY

The following section provides an overview of the sampling methodologies used in this program. **Table 1**, located in the **Tables** section, summarizes the testing parameters and corresponding methodologies.

### 4.1 Sampling for Opacity

Visible emissions were determined in accordance with U.S. EPA Reference Method 9, "Visual Determination of the Opacity of Emissions from Stationary Sources". For the opacity tests, readings were observed every 15 seconds for 60 continuous minutes. The opacity of emissions from stationary sources was determined by a certified observer.

### 4.2 Quality Assurance/Quality Control Activities

Applicable quality assurance measures were implemented during the sampling program to ensure the integrity of the results. These measures included detailed documentation of field data. **Table 2** summarizes the sampling dates and times.

## 5 RESULTS

The average emission results for this study are presented in the **Tables** section of this report. A minimum of three (3) tests on the stack was performed in the study. Detailed information regarding each test run can be found in **Appendix C**.

### 5.1 Discussion of Results

There was no visible emission observed during any of the tests for the Primary or Secondary Shredders. **Table 3** presents the detailed observations by the certified observer.



## 6 OPERATING CONDITIONS

Operating conditions during the sampling were monitored by Detroit Renewable Power personnel. All equipment was operated under normal maximum operating conditions.

### Primary Processing:

#### Run 1 – Dec. 18<sup>th</sup> Start: 2:00 | End: 3:00

Data	Unit	Run Start (0)	Stop (1)
Fabric Filter Differential Pressure	psig	4.5	4.5
Municipal Solid Waste Process Rate	ton/hr	31.1	31.1

#### Run 2 – Dec 18<sup>th</sup> Start: 3:40 | End: 4:40

Data	Unit	Run Start (0)	Stop (1)
Fabric Filter Differential Pressure	psig	4.5	4.5
Municipal Solid Waste Process Rate	ton/hr	31.1	31.1

#### Run 3 – Dec 19<sup>th</sup> Start: 3:00 | End: 4:00

Data	Unit	Run Start (0)	Stop (1)
Fabric Filter Differential Pressure	psig	4.2	4.2
Municipal Solid Waste Process Rate	ton/hr	31	31

### Secondary Processing:

#### Run 1 – Dec. 18<sup>th</sup> Start: 2:00 | End: 3:00

Data	Unit	Run Start (0)	Stop (1)
Fabric Filter Differential Pressure	psig	9	9
Municipal Solid Waste Process Rate	ton/hr	31.1	31.1

#### Run 2 – Dec 18<sup>th</sup> Start: 3:40 | End: 4:40

Data	Unit	Run Start (0)	Stop (1)
Fabric Filter Differential Pressure	psig	9	9
Municipal Solid Waste Process Rate	ton/hr	31.1	31.1

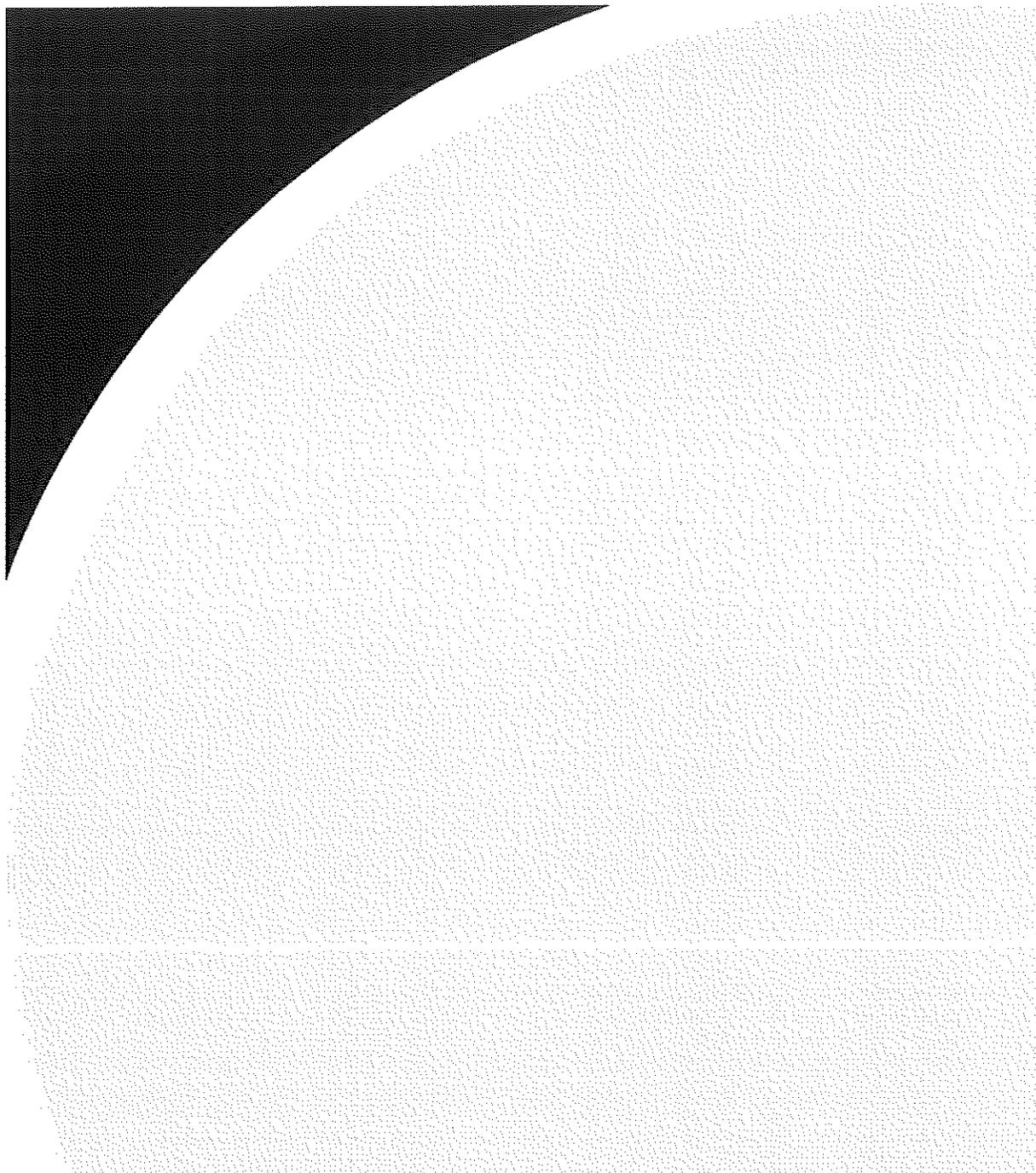
#### Run 3 – Dec 19<sup>th</sup> Start: 3:00 | End: 4:00

Data	Unit	Run Start (0)	Stop (1)
Fabric Filter Differential Pressure	psig	9.5	9.5
Municipal Solid Waste Process Rate	ton/hr	31	31

## 7 CONCLUSIONS

Testing was conducted on the 200L Primary and Secondary Shredder exhaust stacks (EUMSWPPROC-LINE200) December 18<sup>th</sup> and 19<sup>th</sup>, 2018. All sources were tested in accordance with referenced methodologies following the MDEQ approved Sampling Plan submitted August 2<sup>nd</sup>, 2018.

# TABLES



**Table 1: Summary of Sampling Parameters and Methodology**

Source Location	No. of Tests per Stack	Sampling Parameter	Sampling Method
Primary Shredder - 200L	3	Opacity	U.S. EPA <sup>[1]</sup> Method 9
Secondary Shredder - 200L	3	Opacity	U.S. EPA <sup>[1]</sup> Method 9

**Notes:**

[1] U.S. EPA - United States Environmental Protection Agency

**Table 2: Sampling Summary and Sample Log**

Source and Test #	Sampling Date	Start Time	End Time	Filter ID / Trap ID	Lab Sample ID
<b>Primary Shredder - 200L</b>	<b>Opacity</b>				
Test #1	18-Dec-18	2:00 PM	3:00 PM	-	-
Test #2	18-Dec-18	3:40 PM	4:40 PM	-	-
Test #3	19-Dec-18	3:00 PM	4:00 PM	-	-
<b>Secondary Shredder - 200L</b>	<b>Opacity</b>				
Test #1	18-Dec-18	2:00 PM	3:00 PM	-	-
Test #2	18-Dec-18	3:40 PM	4:40 PM	-	-
Test #3	19-Dec-18	3:00 PM	4:00 PM	-	-

**Table 3: Opacity - Averaged Results**

Parameter	Primary Shredder - 200L			Secondary Shredder - 200L		
	T1	T2	T3	T1	T2	T3
Opacity	0	0	0	0	0	0

**Notes:**

[1] Sampling followed Modified U.S. EPA Method 9 (Visual Opacity); Average of three tests

[2] Sampling results represent the max 6 minute average (% Opacity) during the observation period

**Detailed sampling results including individual test results can be found in Appendix C**