

Report of ...

MATS Emission Testing

Performed for ...

Grand Haven Board of Light and Power
J.B. Sims Generating Station

Grand Haven, Michigan

On

Boiler #3 FGD Exhaust

July 30 and 31, 2019

Project #: 245.14

By...

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Grand Rapids, MI

performed for the

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I. INTRODUCTION

Network Environmental, Inc. was retained by Grand Haven Board Of Light and Power of Grand Haven, Michigan to conduct an emission study at the Sims Generating Station. The purpose of the study was to determine the particulate and HCL emissions from the boiler to document compliance with EPA MATS and Michigan ROP# MI-ROP-B1976-2018. The HCL testing was not completed at this time due to plant operational issues. The particulate testing was completed over a two day period from July 30, 2019 to July 31, 2019.

The pollutant monitored and test methods used were as follows:

- Particulate (Filterable) – U.S. EPA Reference Method 5 MATS
- Exhaust Gas Parameters (air flow rate, temperature, moisture & density) – U.S. EPA Methods 1-4

The emission limit for this source is:

Particulate – 0.03 Lbs/mmBTU

The sampling was conducted over the period of July 30 and 31, 2019 by R. Scott Cargill and Richard D. Eerdmans of Network Environmental, Inc. Assisting in the study was Mr. Paul Cederquist of Grand Haven Board of Light and Power

II. PRESENTATION OF RESULTS

**II.1 TABLE 1
PARTICULATE EMISSION RESULTS SUMMARY
BOILER 3
GRAND HAVEN BLP
GRAND HAVEN, MICHIGAN
JULY 30 and 31, 2019**

Compound	Sample	Time	Air Flow Rate DSCFM ⁽¹⁾	%CO ₂ ⁽²⁾	Lbs/Hr ⁽³⁾	Lbs/mmBTU ⁽⁴⁾
Particulate	1	8:27-10:50	190,554	11.6	1.988	0.0027
	2	11:34-13:53	192,201	11.1	2.085	0.0029
	3	14:27-16:02 (7/30) 7:45-8:38 (7/31)	194,638	11.2	1.837	0.0025
	Average		192,465	11.3	1.970	0.0027

- (1) DSCFM = Dry Standard Cubic Feet Per Minute (Standard Temperature & Pressure = 68 °F & 29.92 in. Hg)
- (2) %CO₂ = Percent Carbon Dioxide On A Dry Basis
- (3) Lbs/Hr = Pounds of particulate per hour
- (4) Lbs/MMBTU = Pounds Per Million BTU of Heat Input (Calculated using Equation 2.4 from EPA Method 19 with an F_c of 1,800).

III. DISCUSSION OF RESULTS

The results of the testing are summarized in Table 1 (Section II.1) as follows:

Table 1 – Particulate Emission Results

- Air Flow Rate (DSCFM) – Dry Standard Cubic Feet Per Minute (STP = 68 °F & 29.92 in. Hg)
- % CO₂ – Percent Carbon Dioxide
- Mass Emission Rates (Lbs/MMBTU) – Pounds Per Million BTU Of Heat Input (Calculated Using Equation 2.4 From EPA Method 19 With An F_c Of 1,800) and Pounds Per Hour (Lbs/Hr).

IV. SAMPLING AND ANALYTICAL PROTOCOL

The sampling location for the boiler exhaust was on the 160 inch diameter exhaust at a location that meets the minimum requirements of U.S. EPA Method 1. There were 4 sample ports and 24 sampling points (6 per port) used for the testing.

Prior to the sampling, a preliminary cyclonic/turbulent flow check was conducted on the exhaust stack. The sampling met the requirements of Method 1.

Twenty four (24) sampling points (6 per port) were used for the isokinetic sampling. The sampling point dimensions for the isokinetic sampling were as follows:

<u>Sample Point</u>	<u>Dimension (Inches)</u>
1	3.36
2	10.72
3	18.88
4	28.32
5	40.00
6	56.96

IV.1 Particulate – The particulate emission sampling was conducted by employing U.S. EPA Method 5 MATS. This is an out of stack filtration method, where the sampling probe and filter are heated at 320 °F

(plus or minus 25 °F). Each sample was 120 minutes in duration with a minimum sample volume of 2.0 dry standard cubic meters collected. The samples were collected isokinetically on glass fiber filters.

The nozzle/probe rinses & filters were analyzed for particulate by gravimetric analysis. All the quality assurance and quality control procedures listed in the method were incorporated in the sampling and analysis. Figure 1 is a diagram of the sampling train.


IV.2 Exhaust Gas Parameters – The exhaust gas parameters (air flow rate, temperature, moisture and density) were determined in conjunction with the other sampling by employing U.S. EPA Methods 1 through 4. Air flow rates, temperatures and moistures were determined using the isokinetic sampling trains. Oxygen & carbon dioxide were determined by Orsat in order to determine gas density.

This report was prepared by:

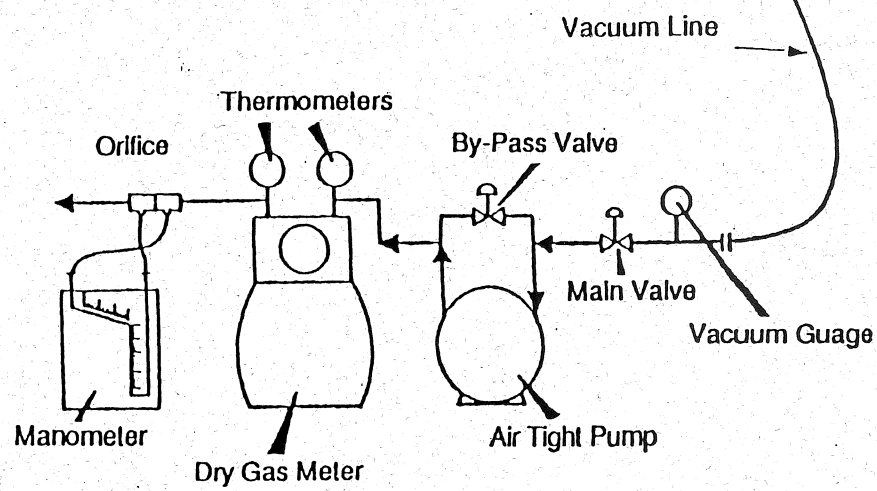
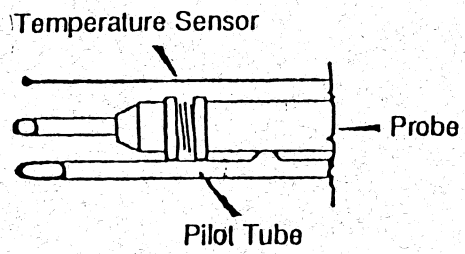
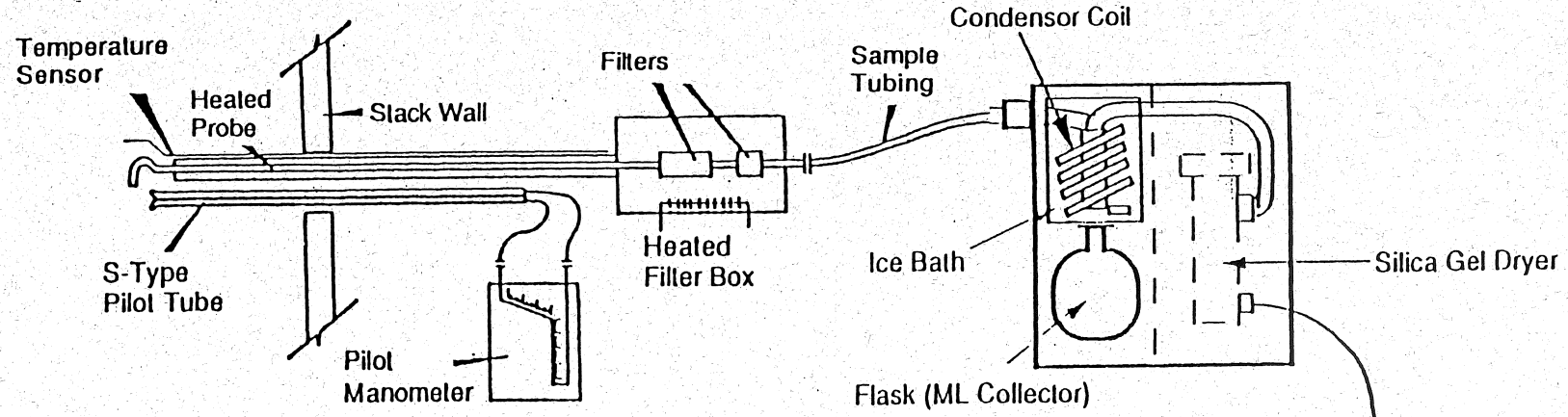


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Figure 1
Particulate
Sampling Train