Report of...

Compliance Emission Testing

performed for...

Cleveland Cliffs – Michigan Operations
Ishpeming, Michigan

On the...

17.1 to 17.2 Conveyor Scrubber Exhaust

At the...

Tilden Mine
National Mine, Michigan

March 22 and 23, 2016

053.22

Network Environmental, Inc.
Grand Rapids, MI

I. INTRODUCTION

Network Environmental, Inc. was retained by the Cleveland-Cliffs Michigan Operations to perform Taconite MACT compliance emission testing at the Tilden Mine located in National Mine, Michigan. The purpose of the testing was to show compliance with 40 CFR Part 63, Subpart RRRRR for existing grate kiln indurating furnaces, ore crushing and handling emission units and finished pellet handling emission units. The unit tested was the 17.1 to 17.2 product conveyor scrubber exhaust.

The total filterable particulate sampling was conducted in accordance with U.S. EPA Reference Method 17. Exhaust gas parameters (airflow rate, temperature, moisture and density) were determined by employing U.S. EPA Reference Methods 1 through 4.

The emission testing was performed on March 22 and 23, 2016. R. Scott Cargill and Richard D. Eerdmans of Network Environmental, Inc. performed the testing. Assisting with the on-site coordination and data collection were Mr. Brent Ketzenberger and Mr. Tom Obrien of Cliffs Michigan Operations.

II. PRESENTATION OF RESULTS

II.1 TABLE 1
TACONITE MACT PARTICULATE EMISSION RESULTS
17.1 to 17.2 PRODUCT CONVEYOR SCRUBBER EXHAUST
CLIFFS MICHIGAN OPERATIONS
TILDEN MINE
NATIONAL MINE, MICHIGAN
MARCH 22 AND 23, 2016

Sample	Date	Time	Air Flow Rate SCFM(1)	Scrubber Pressure Drop dP (in)	Scrubber Flow (gpm)	Concentration Grains/DSCF	Mass Rate Lbs./Hr
1	3/23/16	8:21-10:25	12,291	5.4	29.0	0.00165	0.170
2		10:35-12:38	12,719	5.4	28.9	0.00150	0.160
3		12:53-14:56	12,819	5.4	28.8	0.00152	0.164
Average			**12,610**	**5.4**	**28.9**	**0.00156**	**0.165**

1 = Standard Cubic feet Per Minute @ STP (68°F and 29.92" Hg).

III. DISCUSSION OF RESULTS

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

Tables consist of the following test information:

- Sample Dates & Times
- Air Flow Rates in terms of Standard Cubic Feet Per Minute (SCFM) (STP = 68°F & 29.92 in. Hg)
- Particulate Concentrations in terms of Grains Per Dry Standard Cubic Foot (Grains/DSCF)
- Particulate Mass Rates in terms of Pounds Per Hour (Lbs/Hr)

The Taconite MACT Limits are as follows:

1. Existing ore crushing and handling emission units = 0.008 gr/dscf

A more detailed breakdown of each individual sample can be found in Appendix A.

IV. SAMPLING AND ANALYTICAL PROTOCOL

IV.1 Total Particulate – The sampling was performed in accordance with U.S. EPA Reference Method 17. Three (3) samples, each one hundred twenty (120) minutes in duration, were collected from the source sampled. The samples were collected isokinetically on in-stack filters

The samples were recovered and transported to the laboratory where the particulate was determined from the front half (filter and nozzle wash) by gravimetric analysis. All the quality assurance and quality control procedures listed in the methods were incorporated in the sampling and analysis. A diagram of the sampling train is shown in Figure 1.

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 Reference Methods 1 through 4. All the quality assurance and quality control procedures listed in the methods were incorporated in the sampling and analysis. 24 (12 per port) points were used for the sampling. The point locations can be seen in Appendix B and D. A cyclonic flow check was performed and no cyclonic flow was detected. The results can be seen in Appendix D.

This report was prepared by:

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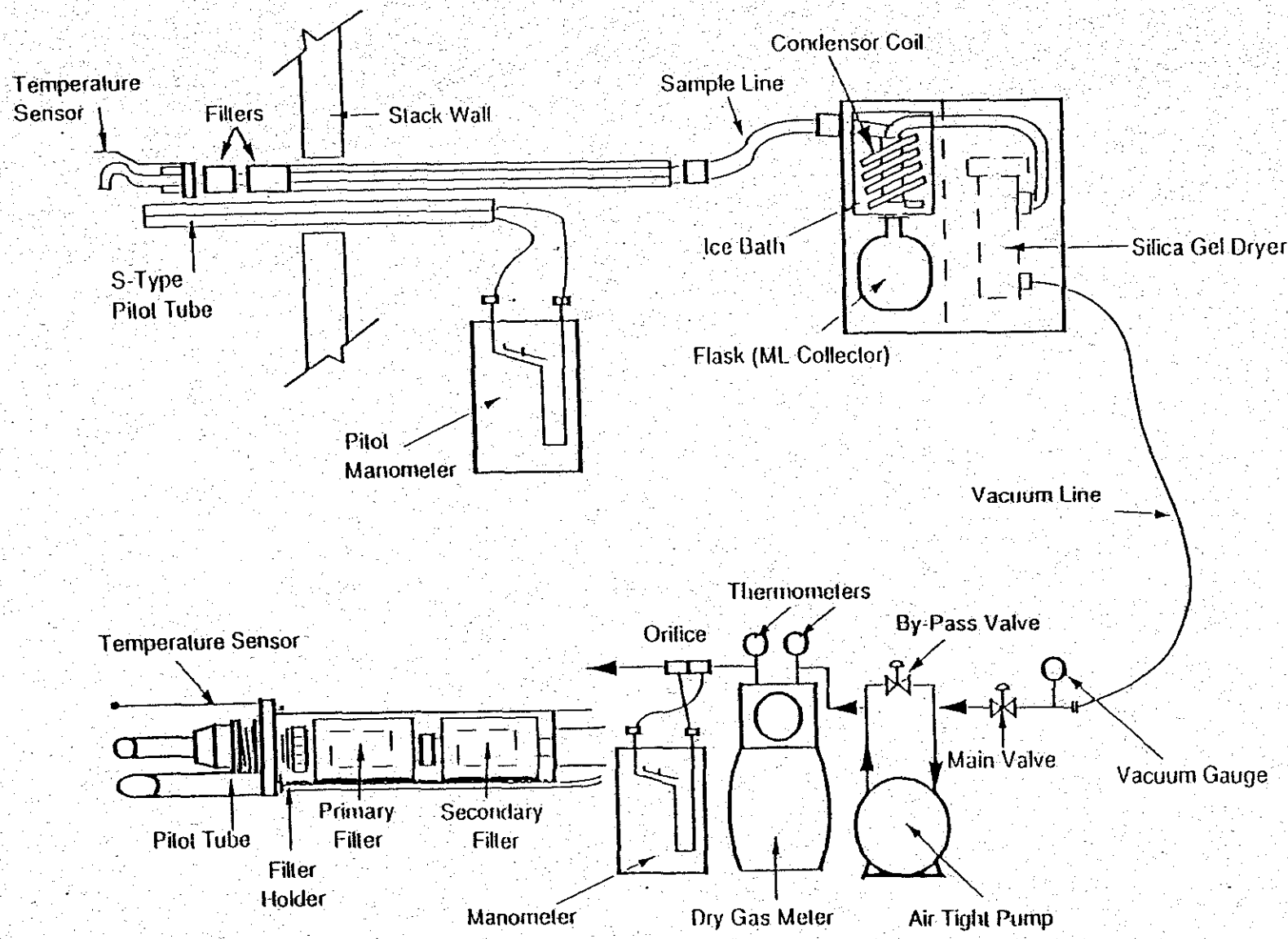

Figure 1

Particulate Sampling Train