Report of...

Compliance Emission Testing

performed for...

Isabella Pellet

Lake Isabella, Michigan

on the

Baghouse Exhaust

January 21, 2012

285.01

Network Environmental, Inc.
Grand Rapids, MI

Performed For:

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I. INTRODUCTION

Network Environmental, Inc. was retained by Isabella Pellet LLC to perform compliance emission testing at the facility in Lake Isabella, Michigan. The purpose of the testing was to show compliance with their Permit to Install #30-11.

The emission testing was performed on January 21, 2012. Stephan K. Byrd, R. Scott Cargill, Richard D. Eerdmans and David D. Engelhardt of Network Environmental, Inc. performed the testing. Assisting with the on-site coordination and data collection was Mr. James Wirtz of Isabella Pellet. Mr. Tom Gasloli and Mr. Ben Witkopp of the MDEQ Air Quality Division were present to observe the testing and source operation.

II. PRESENTATION OF RESULTS

II.1 TABLE 1
TOTAL PARTICULATE/PM_{10}/$PM_{2.5}$ EMISSION RESULTS
ISABELLA PELLET
BAGHOUSE EXHAUST
LAKE ISABELLA, MICHIGAN

Source	Sample	Date	Time	Air Flow Rate DSCFM	Lbs/1000Lbs Dry	Lbs/Hr
Baghouse Exhaust	1	1/21/12	10:25 – 11:28	9,311	0.0010	0.041
	2	1/21/12	12:21 – 13:25	9,183	0.0011	0.047
	3	1/21/12	14:12 – 15:16	9,201	0.0007	0.030
	Average			**9,232**	**0.0010**	**0.039**

II.2 TABLE 2
HCl EMISSION RESULTS
ISABELLA PELLET
BAGHOUSE EXHAUST
LAKE ISABELLA, MICHIGAN

Source	Sample	Date	Time	Air Flow Rate DSCFM	Mass Emission Rate Lbs/Hr
Baghouse Exhaust	1	1/21/12	10:25 – 11:28	9,311	0.0035
	2	1/21/12	12:21 – 13:25	9,183	0.0042
	3	1/21/12	14:12 – 15:16	9,201	0.0050
	Average			**9,232**	**0.0042**

II.3 TABLE 3
FORMALDEHYDE EMISSION RESULTS
ISABELLA PELLET
BAGHOUSE EXHAUST
LAKE ISABELLA, MICHIGAN

Source	Sample	Date	Time	Air Flow Rate DSCFM	Mass Emission Rate Lbs/Hr
Baghouse Exhaust	1	1/21/12	09:20-10:20	9,311	Nd
	2	1/21/12	10:51-11:51	9,183	Nd
	3	1/21/12	12:44-13:44	9,201	Nd
	Average			**9,232**	-

Nd = non detected at a level of detection of 0.0030 PPH

II.4 TABLE 4
ACETALDEHYDE EMISSION RESULTS
ISABELLA PELLET
BAGHOUSE EXHAUST
LAKE ISABELLA, MICHIGAN

Source	Sample	Date	Time	Air Flow Rate DSCFM	Mass Emission Rate Lbs/Hr
Baghouse Exhaust	1	1/21/12	09:20-10:20	9,311	Nd
	2	1/21/12	10:51-11:51	9,183	Nd
	3	1/21/12	12:44-13:44	9,201	Nd
	Average			**9,232**	-

Nd = non detected at a level of detection of 0.0030 PPH

II.5 TABLE 5
ACROLEIN EMISSION RESULTS
ISABELLA PELLET
BAGHOUSE EXHAUST
LAKE ISABELLA, MICHIGAN

Source	Sample	Date	Time	Air Flow Rate DSCFM	Mass Emission Rate Lbs/Hr
Baghouse Exhaust	1	1/21/12	09:20-10:20	9,311	Nd
	2	1/21/12	10:51-11:51	9,183	Nd
	3	1/21/12	12:44-13:44	9,201	Nd
	Average			**9,232**	-

Nd = non detected at a level of detection of 0.0004 PPH

II.6 TABLE 6
PROPIONALDEHYDE EMISSION RESULTS
ISABELLA PELLET
BAGHOUSE EXHAUST
LAKE ISABELLA, MICHIGAN

Source	Sample	Date	Time	Air Flow Rate DSCFM	Mass Emission Rate Lbs/Hr
Baghouse Exhaust	1	1/21/12	09:20-10:20	9,311	Nd
	2	1/21/12	10:51-11:51	9,183	Nd
	3	1/21/12	12:44-13:44	9,201	Nd
	Average			**9,232**	-

Nd = non detected at a level of detection of 0.0008 PPH

II.7 TABLE 7
METHANOL EMISSION RESULTS
ISABELLA PELLET
BAGHOUSE EXHAUST
LAKE ISABELLA, MICHIGAN

Source	Sample	Date	Time	Air Flow Rate DSCFM	Mass Emission Rate Lbs/Hr
Baghouse Exhaust	1	1/21/12	10:25-11:25	9,311	Nd
	2	1/21/12	12:21-13:21	9,183	Nd
	3	1/21/12	14:12-15:12	9,201	Nd
	Average			**9,232**	-

Nd = non detected at a level of detection of 0.0049 PPH

II.8 TABLE 8
PHENOL EMISSION RESULTS
ISABELLA PELLET
BAGHOUSE EXHAUST
LAKE ISABELLA, MICHIGAN

Source	Sample	Date	Time	Air Flow Rate DSCFM	Mass Emission Rate Lbs/Hr
Baghouse Exhaust	1	1/21/12	09:20-10:20	9,311	Nd
	2	1/21/12	10:51-11:51	9,183	Nd
	3	1/21/12	12:44-13:44	9,201	Nd
	Average			**9,232**	-

Nd = non detected at a level of detection of 0.0024 PPH

II.9 TABLE 9
BENZENE, TOLUENE AND XYLENE EMISSION RESULTS
ISABELLA PELLET
BAGHOUSE EXHAUST
LAKE ISABELLA, MICHIGAN

Source	Sample	Date	Time	Air Flow Rate DSCFM	Mass Emission Rate Lbs/Hr
Baghouse Exhaust	1	1/21/12	10:25-11:25	9,311	Nd
	2	1/21/12	12:21-13:21	9,183	Nd
	3	1/21/12	14:12-15:12	9,201	Nd
	Average			**9,232**	-

Nd = non detected at a level of detection of 0.0008 PPH .

III. DISCUSSION OF RESULTS

The results of the testing are summarized in Tables 1 through 9 (Sections II.1 through II.9).

Table II.1 consists of the following test information:

- Sample Dates & Times
- Air Flow Rates in terms of Dry Standard Cubic Feet Per Minute (DSCFM) (STP = 68° F & 29.92 in. Hg)
- Particulate Concentrations in terms of Pounds per Thousand Pounds of exhaust gas (Lbs/1000 lbs)
- Particulate Mass Rates in terms of Pounds Per Hour (Lbs/Hr)

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

Tables II.2 – II.9 consist of the following test information:

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

In addition to the emission testing, Visible Emssion Observations (VEOs) were performed on the baghouse exhaust. All readings were zero percent opacity.

IV. SAMPLING AND ANALYTICAL PROTOCOL

IV.1 Total Particulate/PM_{10}/$PM_{2.5}$ – 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. The stack temperature remained below than 85° F during the three test runs. No back half was required. The PM_{10} and $PM_{2.5}$ are equal to the total particulate results. 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 Aldehydes and Ketones - The acetaldehyde, acrolein, formaldehyde and propionaldehyde determinations were performed in accordance with Method 0011. A midget impinger sampling train with DNPH reagent in the impingers was used to collect the compounds. The sampling train was operated at approximately 1000 cc/min. Three samples of approximately sixty minutes in duration were collected from the exhaust.

The samples were recovered and refrigerated until they were analyzed. The analysis was performed by high-pressure liquid chromatography (HPLC) for the target compounds. A spiked duplicated sample was collected simultaneously with sample three. The recoveries for the compounds were 81.09% for Acetaldehyde, 62.15% for Acrolein, 78.76% for Formaldehyde and 71.31% for Propionaldehyde. All quality assurance and quality control requirements specified in the method were incorporated in the sampling and analysis. A diagram of the sampling train is shown in Figure 2.

IV.3 BTX - The BTX emissions were determined by following the guidelines of U.S. EPA Method 18. Three (3) samples were collected from the source. Each sample was sixty (60) minutes in duration. The sample gas was extracted at approximately 500 cc/minute through a Teflon sample line, a midget impinger for moisture drop out and then through a charcoal sorbent tube. A sampling pump equipped with a calibrated critical orifice was used to draw the exhaust gas through the sampling train.

The samples were analyzed by gas chromatography with a flame ionization detector (GC-FID) for benzene, toluene and xylene. Duplicate spiked samples were collected simultaneously during the three test runs. The spikes were 110 ug for Benzene, 108 ug for Toluene and 110 ug for Xylene. Recoveries for the samples ranged from 97.86 to 104.05 percent. All results were corrected in accordance with Method 18. All the applicable quality assurance and quality control procedures listed in the method were incorporated in the sampling and analysis. A diagram of the sampling train is shown in Figure 3.

IV.4 Methanol – The sampling was performed in accordance with U.S. EPA Reference Method 308. Three (3) samples, each sixty (60) minutes in duration, were collected from the exhaust. The samples were collected in midget impingers with fifteen mls. of de-ionized water followed by silica gel tubes. The samples were collected using a vacuum pump with a calibrated critical orifice. A spiked duplicate sample was collected during the third sample run. The dupe was spiked with 253 ug of methanol. The recovery for the dupe was 91.40%.

The samples were recovered and transported to the laboratory. The samples were analyzed by GC/FID. 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 4.

IV.5 – Phenol - The phenol sampling was performed in accordance with NCASI Method 98.01. Three (3) samples, each sixty (60) minutes in duration, were collected from the exhaust. The samples were collected in midget impingers with fifteen mls. of de-ionized water followed by XAD tubes. The samples were collected using a vacuum pump with a calibrated critical orifice. A spiked duplicate sample was collected during the third sample run. The dupe was spiked with 201 ug of phenol. The recovery for the dupe was 91.75%.

The samples were recovered and transported to the laboratory. The samples were analyzed by GC/FID. 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 5.

IV.6 HCl – The hydrochloric acid (HCl) emission sampling was conducted in accordance with U.S. EPA Method 26A. The HCl was collected in 100 mls of 0.1 N Sulfuric Acid the first two impingers of the sampling train. Three samples were collected from the source. Each sample was sixty (60) minutes in duration.

The sample line rinse and the impinger catch were combined and analyzed for HCl using Ion-chromatography as described in the method. All the quality assurance and quality control requirements specified in the methods were incorporated in the sampling and analysis. A diagram of the sampling train is shown in Figure 1.

IV.7 Visible Emissions - The VEOs were performed in accordance with EPA Reference Method 9. A certified observer, located in a position with the sun at his back and the exhaust stack in the line of view, recorded observations at fifteen-second intervals during the particulate testing. Readings were rounded to the nearest five percent opacity. The highest readings were reported for each one-hour period.

IV.8 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.

This report was prepared by:

Stephan K. Byrd
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This report was reviewed by:

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Vice President

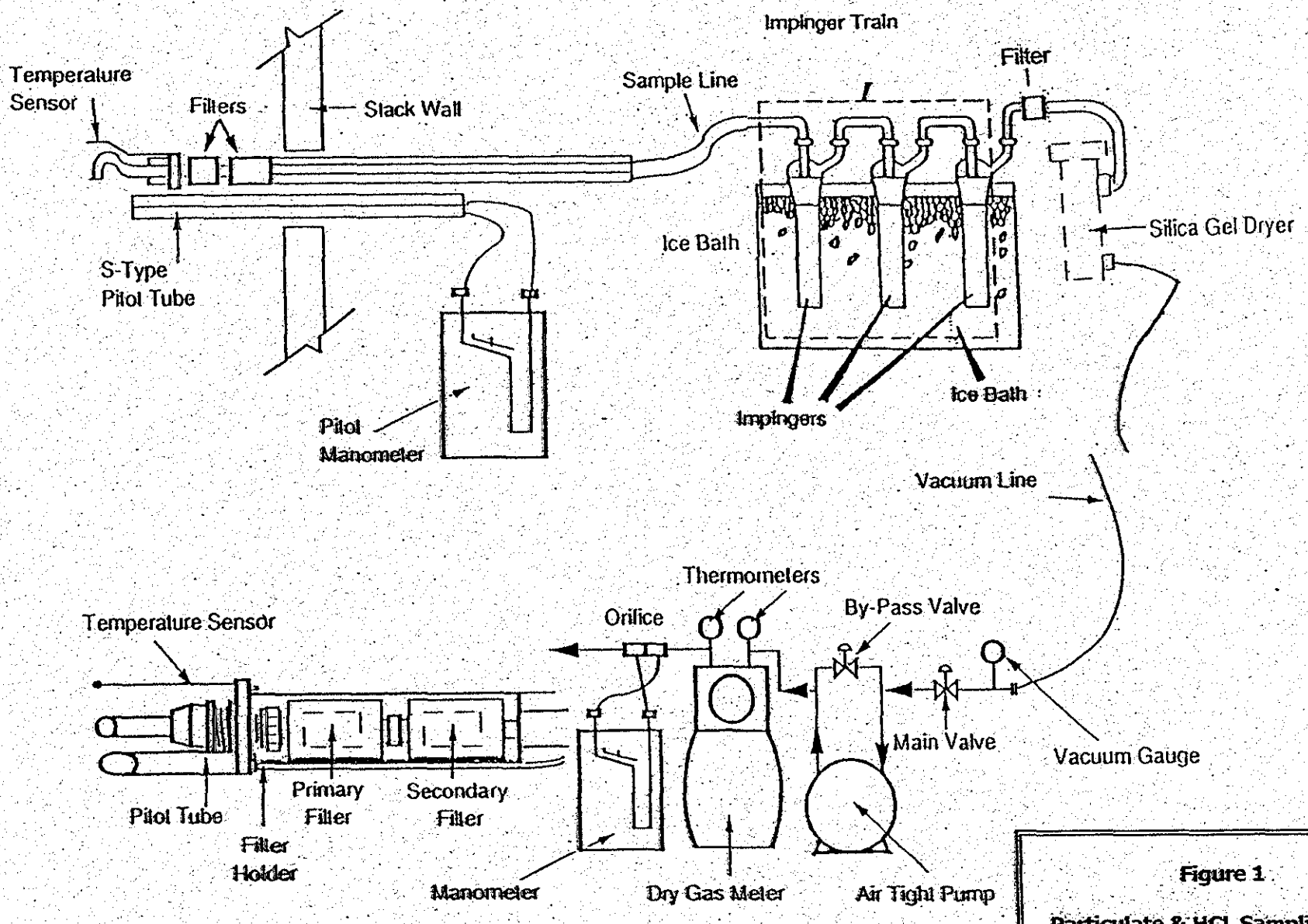

Figure 1

Particulate & HCL Sampling Train

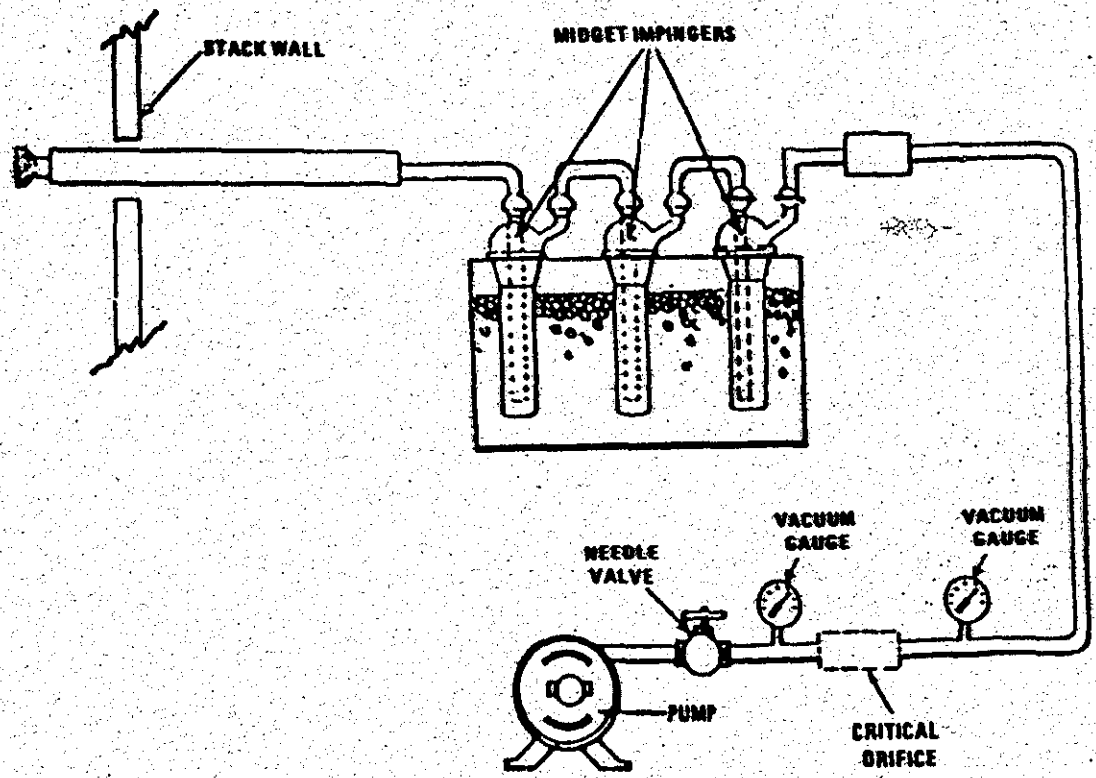

Figure 2

Aldehyde/Ketone Sampling Train

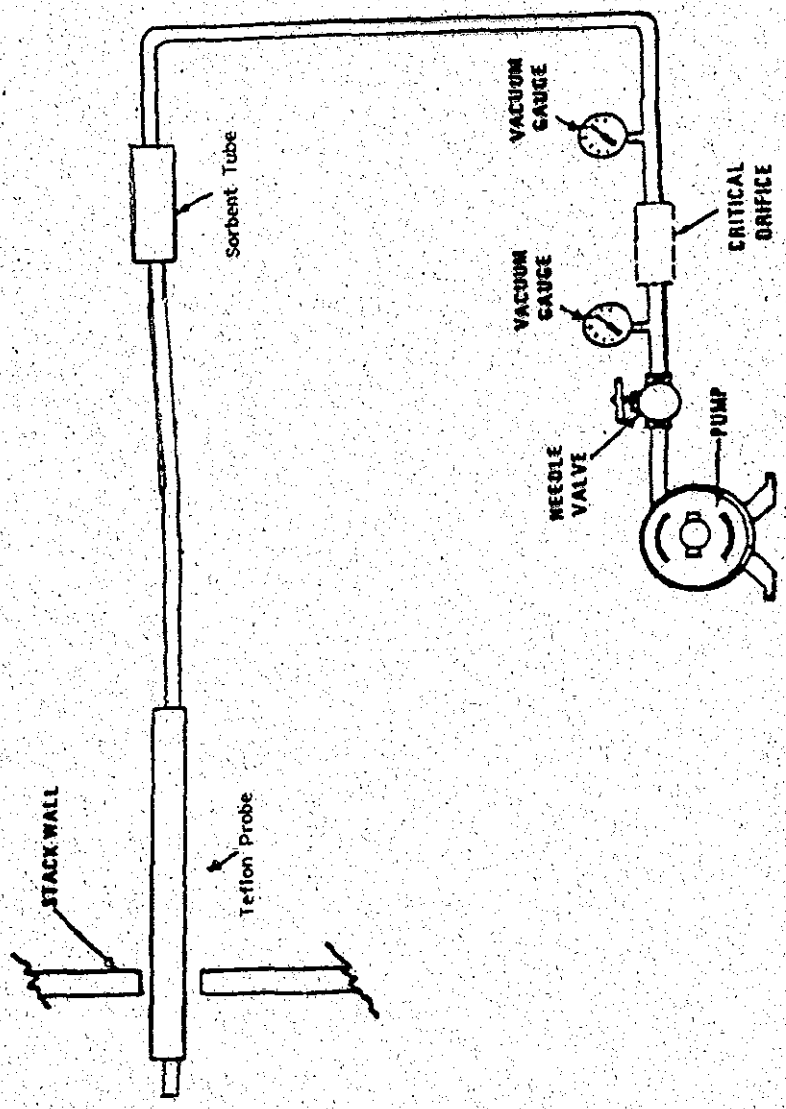

Figure 3
BTX Sampling Train

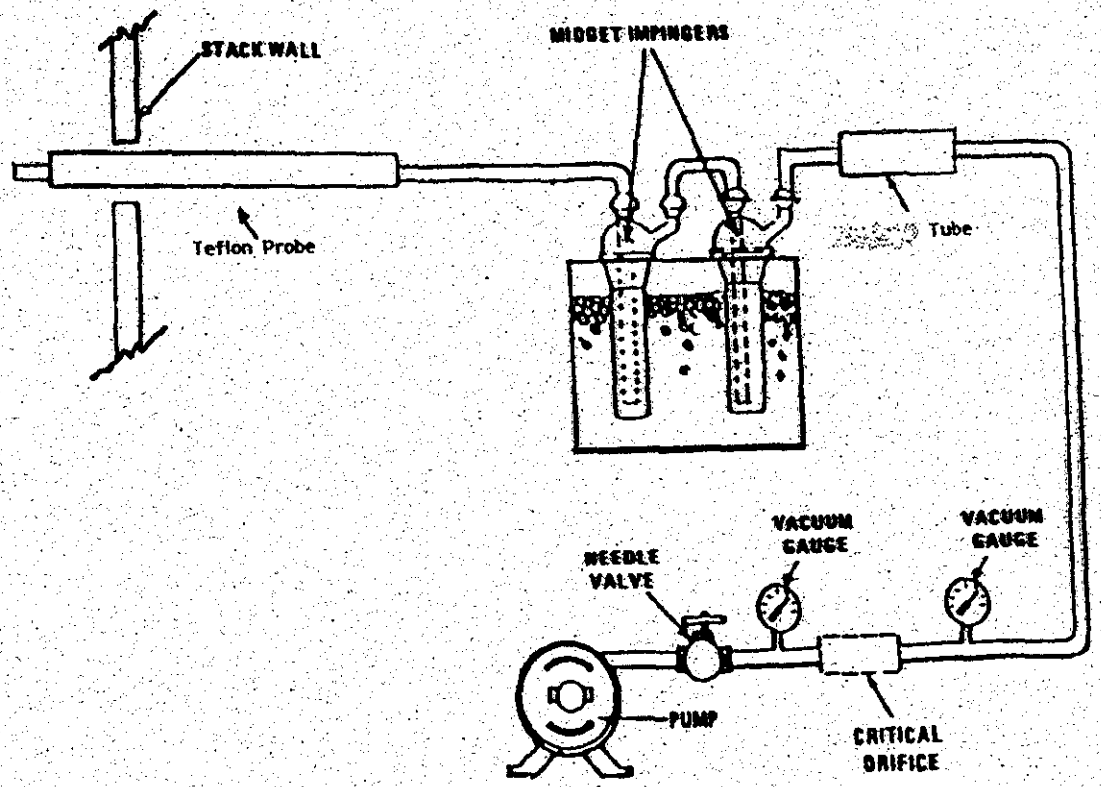

Figure 4

Methanol Sampling Train

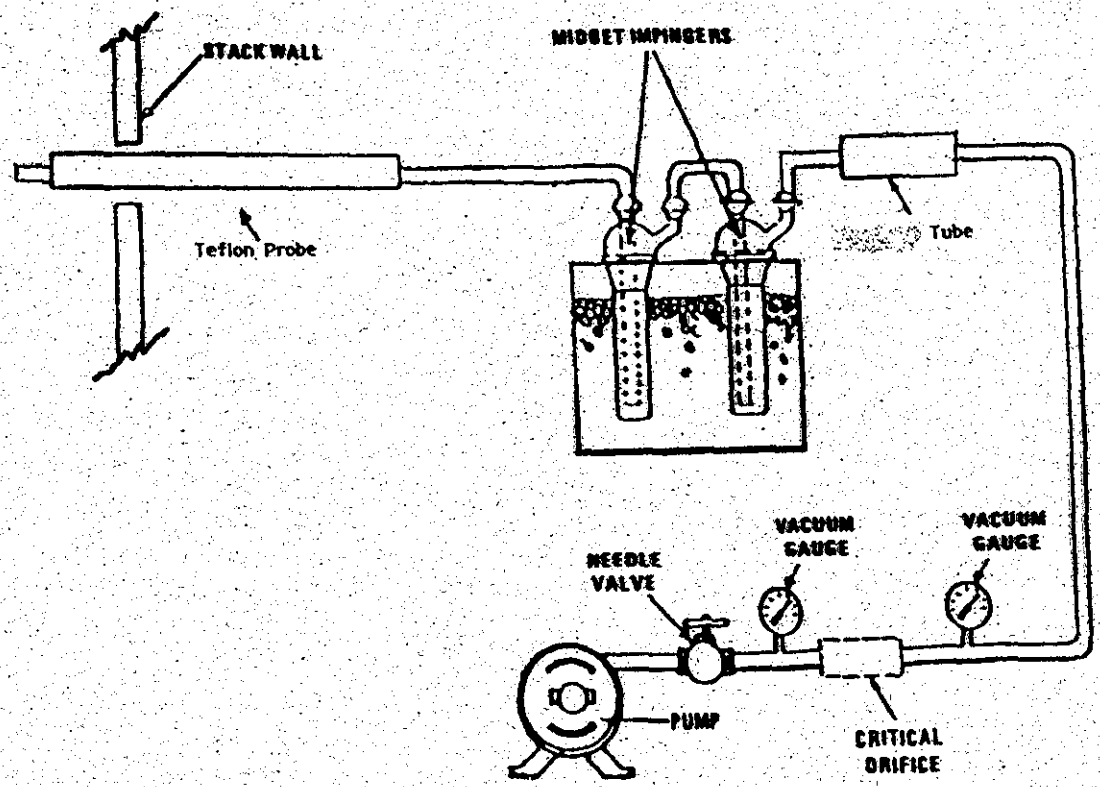

Figure 5

Phenol Sampling Train