I. INTRODUCTION

Network Environmental, Inc. was retained by the Walbec Group of Waukesha, Wisconsin to conduct a compliance emission study on their (Payne and Dolan, Inc. SRN #N2657) Portable Control 28 asphalt plant located in Three Lakes, Michigan. The purpose of the study was to meet the toxic air contaminants (TAC's) emission testing requirements of EGLE Air Permit No. 894-90N.

The following is a list of the applicable emission limits for the baghouse exhaust:

Emission Limit(s)
Acrolein: 6 ug/M^3
Arsenic (As): 1.3 ug/M^3
Benzene: 633 ug/M^3
Carbon Monoxide (CO): 0.201 Lbs/Ton of Paving Material, 70.4 Lbs/Hr & 50.3 Tons/Year
Ethylbenzene: 57,616 ug/M^3
Formaldehyde: 507 ug/M^3
Lead (Pb): 2.02E-06 Lbs/Ton of Paving Material, 7.0E-04 Lbs/Hr & 5.0E-04 Tons/Year
Manganese (Mn): 2.9 ug/M^3
Napthalene: 173 ug/M^3
Nickel (Ni): 27 ug/M^3
Toluene: 23,046 ug/M^3
Xylene: 55,717 ug/M^3

The following reference test methods were employed to conduct the emission sampling:

- CO – U.S EPA Method 10
- BTEX (Benzene, Toluene, Ethylbenzene & Xylene) – U.S. EPA Reference Method 18
- Metals (As, Pb, Mn & Ni) – U.S. EPA Reference Method 29
- Acrolein & Formaldehyde – U.S. EPA Method 0011
- Napthalene – U.S. EPA Method 23
- Exhaust Gas Parameters – U.S. EPA Reference Methods 1 through 4

The sampling was performed over the period of July 26-28, 2022 by Stephan K. Byrd, R. Scott Cargill, Richard D. Eerdmans, and David D. Engelhardt of Network Environmental, Inc.. Assisting with the study were Mr. James Mertes and the operating staff of the facility.

II. PRESENTATION OF RESULTS

II.1 TABLE 1
CARBON MONOXIDE (CO) EMISSION RESULTS
CONTROL 28 BAGHOUSE EXHAUST
PAYNE AND DOLAN, INC.
THREE LAKES, MI

Sample	Date	Time	Air Flow Rate DSCFM (1)	Concentrations	CO Mass Emission Rates		
				PPM (2)	Lbs/Hr (3)	Lbs/Ton (4)	Tons/Year (5)
1	7/26/22	10:00-11:00	41,978	72.7	13.27	0.071	17.75
2	7/26/22	12:14-13:14	43,145	95.3	17.88	0.097	24.25
3	7/26/22	14:23-15:23	43,586	83.3	15.79	0.085	21.25
Average			**42,903**	**83.8**	**15.65**	**0.084**	**21.08**

(1) DSCFM = Dry Standard Cubic Feet Per Minute (STP = 68 °F and 29.92 in. Hg)
(2) PPM = Parts Per Million (v/v) On A Dry Basis
(3) Lbs/Hr = Pounds Per Hour
(4) Lbs/Ton = Pounds Per Ton Of Asphalt Produced. Calculated using asphalt production rates of 186 Tons/Hr for Sample 1, 185 Tons/Hr for Sample 2 and 186 Tons/Hr for Sample 3.
(5) Tons/Year were calculated using 500,000 Tons/Year of maximum paving material production as specified in EGLE Air Permit No. 894-90N.

II.2 TABLE 2
LEAD (Pb) EMISSION RESULTS
CONTROL 28 BAGHOUSE EXHAUST
PAYNE AND DOLAN, INC.
THREE LAKES, MI

Sample	Date	Time	Air Flow Rate DSCFM (1)	Concentration	Pb Mass Emission Rates		
				ug/M^3 (2)	Lbs/Hr (3)	Lbs/Ton (4)	Tons/Year (5)
1	7/26/22	10:05-11:21	41,978	17.60	2.77E-03	1.49E-05	3.72E-03
2	7/26/22	12:14-13:33	43,145	10.85	1.75E-03	9.47E-06	2.37E-03
3	7/26/22	14:23-15:42	43,586	12.28	2.00E-03	1.08E-05	2.69E-03
Average			**42,903**	**13.58**	**2.17E-03**	**1.17E-05**	**2.93E-03**

(1) DSCFM = Dry Standard Cubic Feet Per Minute (STP = 68 °F and 29.92 in. Hg)
(2) ug/M^3 = Micrograms Per Dry Standard Cubic Meter
(3) Lbs/Hr = Pounds Per Hour
(4) Lbs/Ton = Pounds Per Ton Of Asphalt Produced. Calculated using asphalt production rates of 186 Tons/Hr for Sample 1, 185 Tons/Hr for Sample 2 and 186 Tons/Hr for Sample 3.
(5) Tons/Year were calculated using 500,000 Tons/Year of maximum paving material production as specified in EGLE Air Permit No. 894-90N.

II.3 TABLE 3
ARSENIC (As) EMISSION RESULTS
CONTROL 28 BAGHOUSE EXHAUST
PAYNE AND DOLAN, INC.
THREE LAKES, MI

Sample	Date	Time	Air Flow Rate DSCFM (1)	Concentration	As Mass Emission Rate
				ug/M^3 (2)	Lbs/Hr (3)
1	7/26/22	10:05-11:21	41,978	0.70	1.10E-04
2	7/26/22	12:14-13:33	43,145	0.74	1.19E-04
3	7/26/22	14:23-15:42	43,586	1.08	1.76E-04
Average			**42,903**	**0.84**	**1.35E-04**

(1) DSCFM = Dry Standard Cubic Feet Per Minute (STP = 68 °F and 29.92 in. Hg)
(2) ug/M^3 = Micrograms Per Dry Standard Cubic Meter
(3) Lbs/Hr = Pounds Per Hour

II.4 TABLE 4
MANGANESE (Mn) EMISSION RESULTS
CONTROL 28 BAGHOUSE EXHAUST
PAYNE AND DOLAN, INC.
THREE LAKES, MI

Sample	Date	Time	Air Flow Rate DSCFM (1)	Concentration ug/M3 (2)	Mn Mass Emission Rate Lbs/Hr (3)
1	7/26/22	10:05-11:21	41,978	75.49	1.19E-02
2	7/26/22	12:14-13:33	43,145	86.97	1.40E-02
3	7/26/22	14:23-15:42	43,586	152.72	2.49E-02
Average			**42,903**	**105.06**	**1.69E-02**

(1) DSCFM = Dry Standard Cubic Feet Per Minute (STP = 68 °F and 29.92 in. Hg)
(2) ug/M³ = Micrograms Per Dry Standard Cubic Meter
(3) Lbs/Hr = Pounds Per Hour

II.5 TABLE 5
NICKEL (Ni) EMISSION RESULTS
CONTROL 28 BAGHOUSE EXHAUST
PAYNE AND DOLAN, INC.
THREE LAKES, MI

Sample	Date	Time	Air Flow Rate DSCFM (1)	Concentration ug/M3 (2)	Ni Mass Emission Rate Lbs/Hr (3)
1	7/26/22	10:05-11:21	41,978	3.68	5.79E-04
2	7/26/22	12:14-13:33	43,145	2.35	3.80E-04
3	7/26/22	14:23-15:42	43,586	4.23	6.90E-04
Average			**42,903**	**3.42**	**5.50E-04**

(1) DSCFM = Dry Standard Cubic Feet Per Minute (STP = 68 °F and 29.92 in. Hg)
(2) ug/M³ = Micrograms Per Dry Standard Cubic Meter
(3) Lbs/Hr = Pounds Per Hour

II.6 TABLE 6
BENZENE EMISSION RESULTS
CONTROL 28 BAGHOUSE EXHAUST
PAYNE AND DOLAN, INC.
THREE LAKES, MI

Sample	Date	Time	Air Flow Rate DSCFM (1)	Concentration ug/M³ (2)	Benzene Mass Emission Rate Lbs/Hr (3)
1	7/26/22	12:15-13:15	41,978	N.D.	N.D.
2	7/26/22	14:23-15:23	43,145	N.D.	N.D.
3	7/26/22	16:00-17:00	43,586	N.D.	N.D.
Average			**42,903**	**N.D.**	**N.D.**

(1) DSCFM = Dry Standard Cubic Feet Per Minute (STP = 68 °F and 29.92 in. Hg)
(2) ug/M³ = Micrograms Per Dry Standard Cubic Meter
(3) Lbs/Hr = Pounds Per Hour
(4) N.D. = Non Detected At Detection Limits Of 80.6 ug/M³ & 0.0131 Lbs/Hr

II.7 TABLE 7
TOLUENE EMISSION RESULTS
CONTROL 28 BAGHOUSE EXHAUST
PAYNE AND DOLAN, INC.
THREE LAKES, MI

Sample	Date	Time	Air Flow Rate DSCFM (1)	Concentration ug/M³ (2)	Toluene Mass Emission Rate Lbs/Hr (3)
1	7/26/22	12:15-13:15	41,978	N.D.	N.D.
2	7/26/22	14:23-15:23	43,145	N.D.	N.D.
3	7/26/22	16:00-17:00	43,586	232.1	0.038
Average			**42,903**	**154.0**	**0.029**

(1) DSCFM = Dry Standard Cubic Feet Per Minute (STP = 68 °F and 29.92 in. Hg)
(2) ug/M³ = Micrograms Per Dry Standard Cubic Meter
(3) Lbs/Hr = Pounds Per Hour
(4) N.D. = Non Detected At Detection Limits Of 114.9 ug/M³ & 0.0242 Lbs/Hr

II.8 TABLE 8
ETHYLBENZENE EMISSION RESULTS
CONTROL 28 BAGHOUSE EXHAUST
PAYNE AND DOLAN, INC.
THREE LAKES, MI

Sample	Date	Time	Air Flow Rate DSCFM (1)	Concentration ug/M^3 (2)	Ethylbenzene Mass Emission Rate Lbs/Hr (3)
1	7/26/22	12:15-13:15	41,978	N.D.	N.D.
2	7/26/22	14:23-15:23	43,145	N.D.	N.D.
3	7/26/22	16:00-17:00	43,586	N.D.	N.D.
Average			**42,903**	**N.D.**	**N.D.**

(1) DSCFM = Dry Standard Cubic Feet Per Minute (STP = 68 °F and 29.92 in. Hg)
(2) ug/M^3 = Micrograms Per Dry Standard Cubic Meter
(3) Lbs/Hr = Pounds Per Hour
(4) N.D. = Non Detected At Detection Limits Of 109.8 ug/M^3 & 0.0178 Lbs/Hr

II.9 TABLE 9
XYLENE EMISSION RESULTS
CONTROL 28 BAGHOUSE EXHAUST
PAYNE AND DOLAN, INC.
THREE LAKES, MI

Sample	Date	Time	Air Flow Rate DSCFM (1)	Concentration ug/M^3 (2)	Xylene Mass Emission Rate Lbs/Hr (3)
1	7/26/22	12:15-13:15	41,978	N.D.	N.D.
2	7/26/22	14:23-15:23	43,145	N.D.	N.D.
3	7/26/22	16:00-17:00	43,586	N.D.	N.D.
Average			**42,903**	**N.D.**	**N.D.**

(1) DSCFM = Dry Standard Cubic Feet Per Minute (STP = 68 °F and 29.92 in. Hg)
(2) ug/M^3 = Micrograms Per Dry Standard Cubic Meter
(3) Lbs/Hr = Pounds Per Hour
(4) N.D. = Non Detected At Detection Limits Of 98.2 ug/M^3 & 0.0160 Lbs/Hr

II.10 TABLE 10
ACROLEIN EMISSION RESULTS
CONTROL 28 BAGHOUSE EXHAUST
PAYNE AND DOLAN, INC.
THREE LAKES, MI

Sample	Date	Time	Air Flow Rate DSCFM (1)	Concentration	Acrolein Mass Emission Rate
				ug/M^3 (2)	Lbs/Hr (3)
1	7/27/22	10:55-11:46	41,474	629.7	0.098
2	7/27/22	12:06-12:56	41,417	643.7	0.100
3	7/27/22	13:56-14:52	41,730	660.8	0.103
Average			**41,540**	**644.8**	**0.100**

(1) DSCFM = Dry Standard Cubic Feet Per Minute (STP = 68 °F and 29.92 in. Hg)
(2) ug/M^3 = Micrograms Per Dry Standard Cubic Meter
(3) Lbs/Hr = Pounds Per Hour

II.11 TABLE 11
FORMALDEHYDE EMISSION RESULTS
CONTROL 28 BAGHOUSE EXHAUST
PAYNE AND DOLAN, INC.
THREE LAKES, MI

Sample	Date	Time	Air Flow Rate DSCFM (1)	Concentration	Formaldehyde Mass Emission Rate
				ug/M^3 (2)	Lbs/Hr (3)
1	7/27/22	10:55-11:46	41,474	3,960.4	0.62
2	7/27/22	12:06-12:56	41,417	4,269.6	0.66
3	7/27/22	13:56-14:52	41,730	4,705.2	0.74
Average			**41,540**	**4,311.7**	**0.67**

(1) DSCFM = Dry Standard Cubic Feet Per Minute (STP = 68 °F and 29.92 in. Hg)
(2) ug/M^3 = Micrograms Per Dry Standard Cubic Meter
(3) Lbs/Hr = Pounds Per Hour

II.12 TABLE 12
NAPTHALENE EMISSION RESULTS
CONTROL 28 BAGHOUSE EXHAUST
PAYNE AND DOLAN, INC.
THREE LAKES, MI

Sample	Date	Time	Air Flow Rate DSCFM (1)	Concentration	Napthalene Mass Emission Rate
				ug/M^3 (2)	Lbs/Hr (3)
1	7/28/22	08:25-10:18	44,049	1.53E+02	2.52E-02
2	7/28/22	11:02-12:57	44,276	2.10E+02	3.49E-02
3	7/28/22	13:36-15:27	42,433	1.81E+02	2.88E-02
Average			**43,586**	**1.81E+02**	**2.96E-02**

(1) DSCFM = Dry Standard Cubic Feet Per Minute (STP = 68 °F and 29.92 in. Hg)
(2) ug/M^3 = Micrograms Per Dry Standard Cubic Meter
(3) Lbs/Hr = Pounds Per Hour

III. DISCUSSION OF RESULTS

The results of the testing are summarized in Tables 1 through 12 (Sections II.1 through II.12) as follows:

Table 1 – Carbon Monoxide (CO) Emission Results

- Sample
- Date
- Time
- Air Flow Rate (DSCFM) – Dry Standard Cubic Feet Per Minute (STP = 68 °F & 29.92 in. Hg)
- CO Concentration (PPM) – Parts Per Million (v/v) On A Dry Basis
- CO Mass Emission Rates
  - Lbs/Hr – Pounds Per Hour
  - Lbs/Ton – Pounds Per Ton Of Asphalt Produced
  - Tons/Year – Tons Per Year. Calculated using 500,000 Tons/Year of maximum paving material production as specified in EGLE Air Permit No. 894-90N.

Table 2 – Lead (Pb) Emission Results

- Sample
- Date
- Time
- Air Flow Rate (DSCFM) – Dry Standard Cubic Feet Per Minute (STP = 68 °F & 29.92 in. Hg)
- Pb Concentration (ug/M^3) – Micrograms Per Dry Standard Cubic Meter
- Pb Mass Emission Rates
  - Lbs/Hr – Pounds Per Hour
  - Lbs/Ton – Pounds Per Ton Of Asphalt Produced
  - Tons/Year – Tons Per Year. Calculated using 500,000 Tons/Year of maximum paving material production as specified in EGLE Air Permit No. 894-90N.

Table 3 – Arsenic (As) Emission Results

- Sample
- Date
- Time
- Air Flow Rate (DSCFM) – Dry Standard Cubic Feet Per Minute (STP = 68 °F & 29.92 in. Hg)
- As Concentration (ug/M^3) – Micrograms Per Dry Standard Cubic Meter
- As Mass Emission Rates (Lbs/Hr) – Pounds Per Hour

Table 4 – Manganese (Mn) Emission Results

- Sample
- Date
- Time
- Air Flow Rate (DSCFM) – Dry Standard Cubic Feet Per Minute (STP = 68 °F & 29.92 in. Hg)
- Mn Concentration (ug/M^3) – Micrograms Per Dry Standard Cubic Meter
- Mn Mass Emission Rates (Lbs/Hr) – Pounds Per Hour

Table 5 – Nickel (Ni) Emission Results

- Sample
- Date
- Time
- Air Flow Rate (DSCFM) – Dry Standard Cubic Feet Per Minute (STP = 68 °F & 29.92 in. Hg)
- Ni Concentration (ug/M^3) – Micrograms Per Dry Standard Cubic Meter
- Ni Mass Emission Rates (Lbs/Hr) – Pounds Per Hour

Table 6 – Benzene Emission Results

- Sample
- Date
- Time
- Air Flow Rate (DSCFM) – Dry Standard Cubic Feet Per Minute (STP = 68 °F & 29.92 in. Hg)
- Benzene Concentration (ug/M^3) – Micrograms Per Dry Standard Cubic Meter
- Benzene Mass Emission Rates (Lbs/Hr) – Pounds Per Hour

Table 7 – Toluene Emission Results

- Sample
- Date
- Time
- Air Flow Fate (DSCFM) – Dry Standard Cubic Feet Per Minute (STP = 68 °F & 29.92 in. Hg)
- Toluene Concentration (ug/M^3) – Micrograms Per Dry Standard Cubic Meter
- Toluene Mass Emission Rates (Lbs/Hr) – Pounds Per Hour

Toluene was identified in the sample blank (tubes). Because of this result, all the samples (including the spike/dupes) were blank corrected.

Table 8 – Ethylbenzene Emission Results

- Sample
- Date
- Time
- Air Flow Fate (DSCFM) – Dry Standard Cubic Feet Per Minute (STP = 68 °F & 29.92 in. Hg)
- Ethylbenzene Concentration (ug/M^3) – Micrograms Per Dry Standard Cubic Meter
- Ethylbenzene Mass Emission Rates (Lbs/Hr) – Pounds Per Hour

Table 9 – Xylene Emission Results

- Sample
- Date
- Time
- Air Flow Fate (DSCFM) – Dry Standard Cubic Feet Per Minute (STP = 68 °F & 29.92 in. Hg)
- Xylene Concentration (ug/M^3) – Micrograms Per Dry Standard Cubic Meter
- Xylene Mass Emission Rates (Lbs/Hr) – Pounds Per Hour

Table 10 – Acrolein Emission Results

- Sample
- Date
- Time
- Air Flow Fate (DSCFM) – Dry Standard Cubic Feet Per Minute (STP = 68 °F & 29.92 in. Hg)
- Acrolein Concentration (ug/M^3) – Micrograms Per Dry Standard Cubic Meter
- Acrolein Mass Emission Rates (Lbs/Hr) – Pounds Per Hour

Table 11 – Formaldehyde Emission Results

- Sample
- Date
- Time
- Air Flow Fate (DSCFM) – Dry Standard Cubic Feet Per Minute (STP = 68 °F & 29.92 in. Hg)
- Formaldehyde Concentration (ug/M^3) – Micrograms Per Dry Standard Cubic Meter
- Formaldehyde Mass Emission Rates (Lbs/Hr) – Pounds Per Hour

Table 11 – Napthalene Emission Results

- Sample
- Date

- Time
- Air Flow Fate (DSCFM) – Dry Standard Cubic Feet Per Minute (STP = 68 °F & 29.92 in. Hg)
- Napthalene Concentration (ug/M^3) – Micrograms Per Dry Standard Cubic Meter
- Napthalene Mass Emission Rates (Lbs/Hr) – Pounds Per Hour

IV. SAMPLING AND ANALYTICAL PROTOCOL

The sampling location was on the 58 x 44 inch exhaust at a location 2.4 duct diameters downstream and 1 duct diameter upstream from the nearest disturbances. There are 5 sample ports.

Prior to the sampling, a preliminary cyclonic/turbulent flow check was conducted on the exhaust stack. The sampling met the requirements of Method 1. Also prior to the sampling, a preliminary gas stratification test was conducted in accordance with U.S. EPA Method 7E. The results of this test showed that no stratification existed, so one (1) sampling point was used for the gas (CO) sampling. The stratification test results can be found in Appendix C.

Twenty-Five (25) sampling points (5 per port) were used for the isokinetic sampling. The sampling point dimensions for the isokinetic sampling were as follows:

Sample Point	Dimension (Inches)
1	4.40
2	13.20
3	22.00
4	30.80
5	39.60

IV.1 Carbon Monoxide – The CO sampling was conducted in accordance with U.S. EPA Reference Method 10. A Thermo Environmental Model 48C gas analyzer was used to monitor the exhaust. A heated teflon sample line was used to transport the exhaust gases to a gas conditioner to remove moisture and reduce the temperature. From the gas conditioner stack gases were passed to the analyzer. The analyzer produces instantaneous readouts of the CO concentrations (PPM).

The analyzer was calibrated by direct injection prior to the testing. A span gas of 998.0 PPM was used to establish the initial instrument calibration. Calibration gases of 251.0 PPM and 498.0 PPM were used to determine the calibration error of the analyzer. The sampling system (from the back of the stack probe to the analyzer) was injected using the 498.0 PPM gas to determine the system bias.. After each sample, a system zero and system injection of 498.0 PPM were performed to establish system drift and system bias during the test period. All calibration gases were EPA Protocol 1 Certified.

The analyzer was calibrated to the output of the data acquisition system (DAS) used to collect the data from the exhaust. The analyzer averages were corrected for calibration error and drift using formula EQ.7E-5 from 40 CFR Part 60, Appendix A, Method 7E. A diagram of the sampling train is shown in Figure 1.

IV.2 Metals – The metals emission sampling was conducted by employing U.S. EPA Method 29. This is an out of stack filtration method, where the sampling probe and filter are heated at 250 °F (plus or minus 25 °F).

Each sample was 62.5 minutes in duration. The samples were collected isokinetically on quartz filters, and in a nitric acid/hydrogen peroxide solution.

The nozzle/probe rinses, filters and nitric acid/hydrogen peroxide solutions were analyzed for all the above listed metals by inductively coupled argon plasma/mass spectrophotometry (ICAP/MS) analysis in accordance with Method 29. All the quality assurance and quality control procedures listed in the method were incorporated in the sampling and analysis. Figure 2 is a diagram of the sampling train.

IV.3 BTEX (Benzene, Toluene, Ethylbenzene & Xylene) – The BTEX emissions were determined by following the guidelines of U.S. EPA Method 18. A duplicate spiked sample was run simultaneously with each sampling run. Six (6) samples (3 sample runs & 3 spiked/duplicates) were collected from the exhaust. Each sample was sixty (60) minutes in duration. The sample gas was extracted at approximately 500 cc/per minute through a teflon sample line, a midget impinger and then through two (2) charcoal sorbent tubes (in series) using a sampling pump equipped with a calibrated critical orifice.

The samples were analyzed by gas chromatography with a flame ionization detector (GC-FID). All the applicable quality assurance and quality control procedures listed in the method were incorporated in the

sampling and analysis. The recovery efficiencies for the spiked duplicate samples can be found in Appendix F. Figure 3 is a diagram of the sampling train

IV.4 Acrolein & Formaldehyde – The acrolein and formaldehyde emissions were determined by employing U.S. EPA RCRA Method 0011. Each sample was forty-five (45) minutes in duration. In addition, a spiked duplicate train was run during one of the samples to document recovery efficiencies for acrolein and formaldehyde. The recovery efficiencies can be found in Appendix F.

The samples were collected isokinetically in dinitrophenylhydrazine (DNPH) and analyzed for acrolein and formaldehyde by HPLC analysis. All the quality assurance and quality control procedures listed in the method were incorporated in the sampling and analysis. Figure 4 is a diagram of the sampling train.

IV.5 Napthalene – Napthalene emission sampling was performed in accordance with U.S. EPA Method 23. A Modified Method 5 (MM5) sampling train, as described in Method 23, was used to collect the samples. The sampling train consisted of a heated glass lined probe followed by a heated pre-cleaned quartz filter. A condenser coil followed by an XAD sorbent trap followed the heated filter. An impinger train containing HPLC water followed the XAD trap. All sampling train components were pre-cleaned in accordance with the method.

Three (3) samples were collected. Each sample was one hundred (100) minutes in duration, and had a minimum sample volume of thirty (30) dry standard cubic feet. The sampling system operation was consistent with U.S. EPA Method 5. The three samples and the blank train were recovered in pre-cleaned sample bottles with Teflon lined caps. The probe rinse and filter rinse were combined with the XAD extract for analysis. The back-half impinger condensate was also analyzed. The analytes were extracted from the sample, separated by high resolution gas chromatography, and measured by high resolution mass spectrometry. The analysis followed the procedures of SW-846 Method 8290. All the quality assurance and quality control procedures listed in the methods were incorporated in the sampling and analysis. Figure 5 is a diagram of the Method 23 sampling train.

IV.6 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.

Integrated bag samples were collected off of the isokinetic sampling trains and analyzed by Orsat in order to determine the oxygen (O_2) and carbon dioxide (CO_2) content of the exhaust to determine gas density.

This report was prepared by:

David D. Engelhardt
Vice President

This report was reviewed by:

R. Scott Cargill
Project Manager

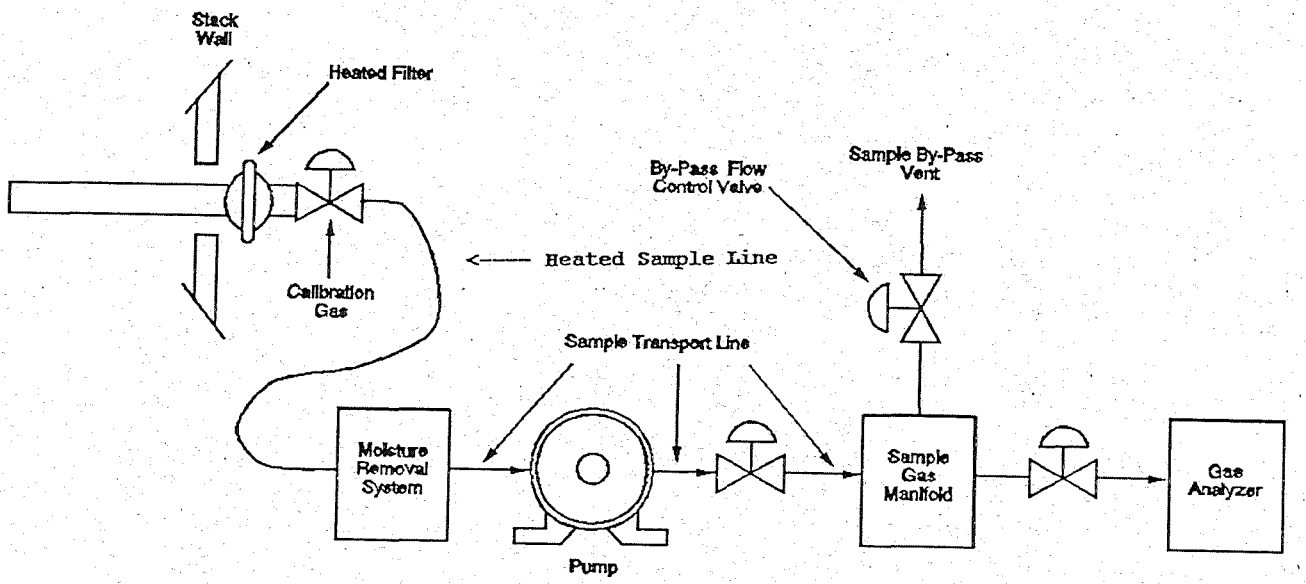

Figure 1

CO
Sampling Train

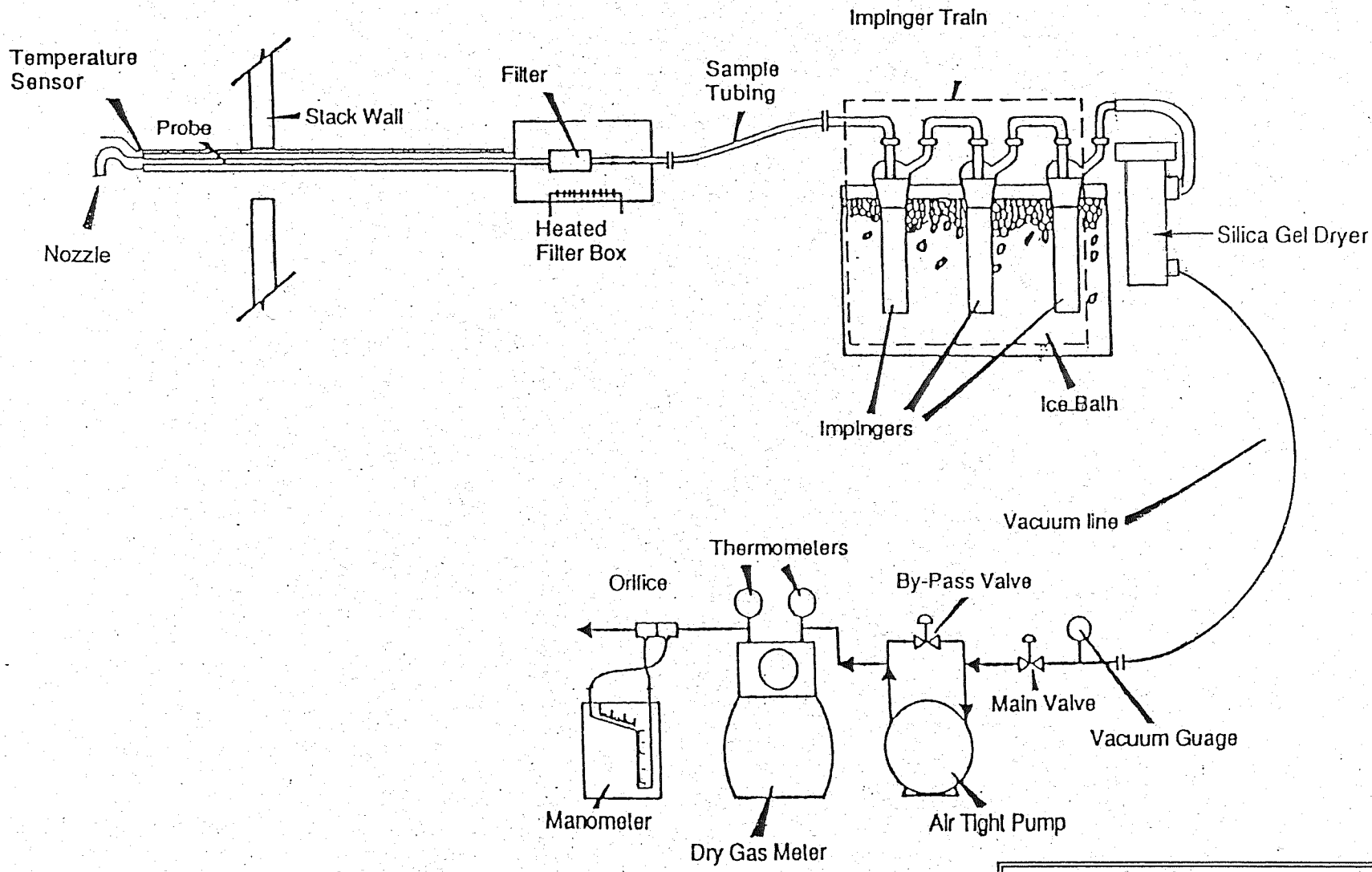

Figure 2

Metals Sampling Train

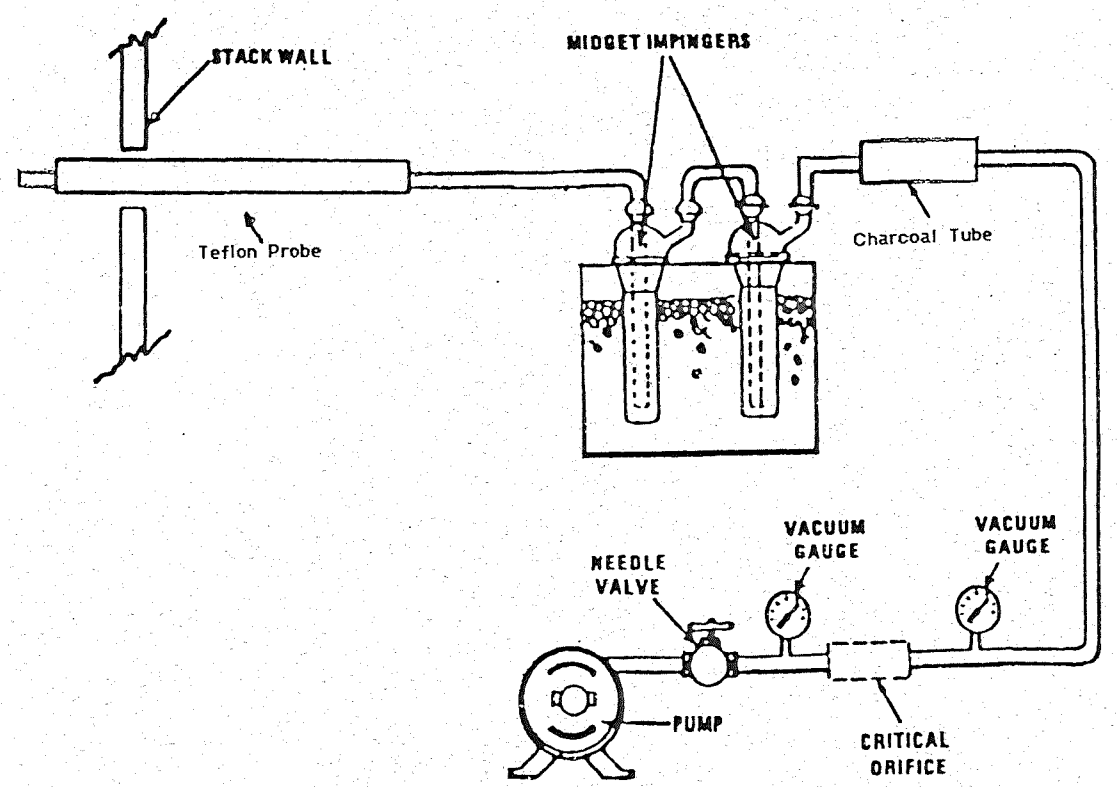

Figure 3

BTX
Sampling Train

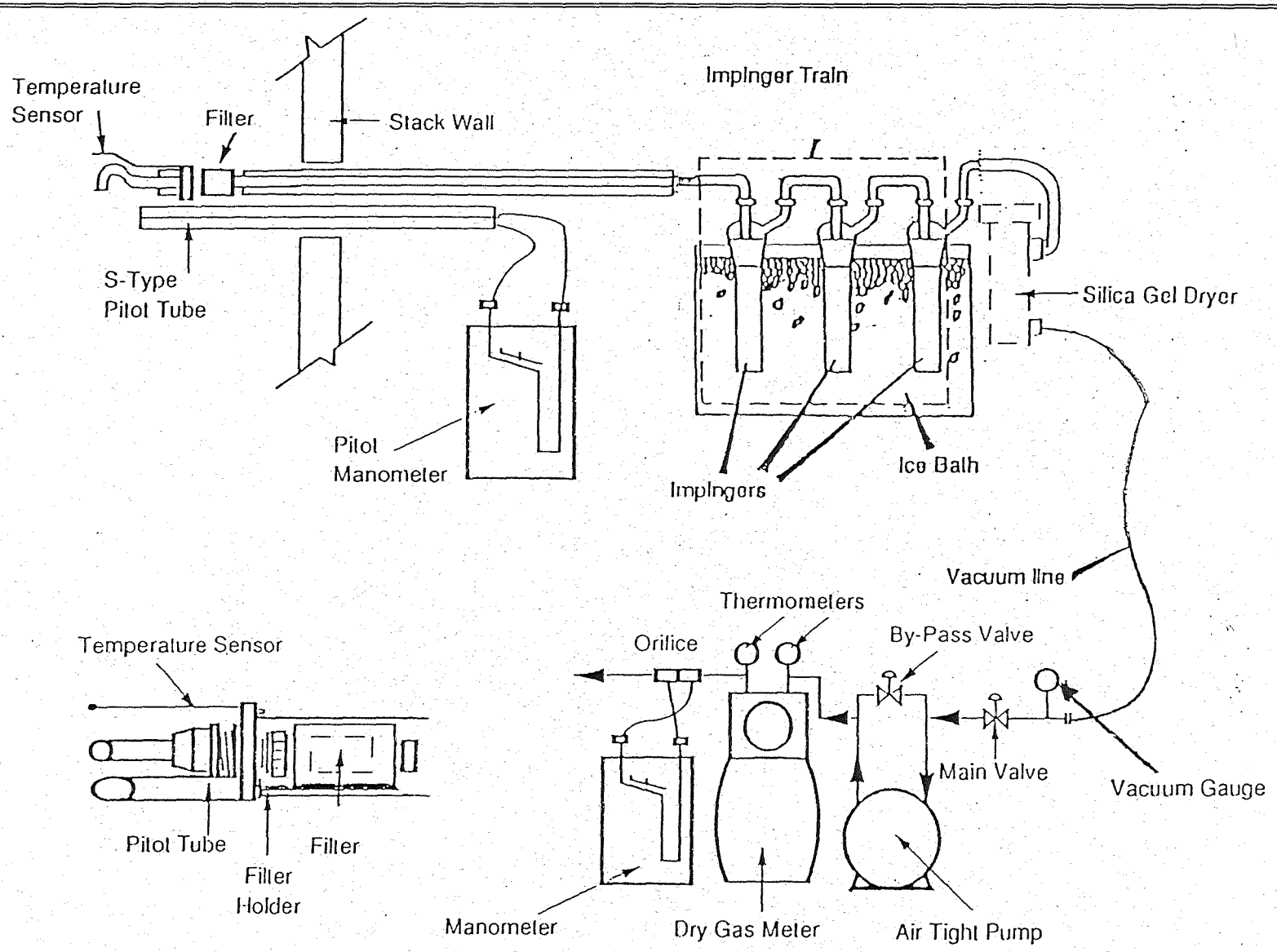

Figure 4

Acrolein & Formaldehyde Sampling Train

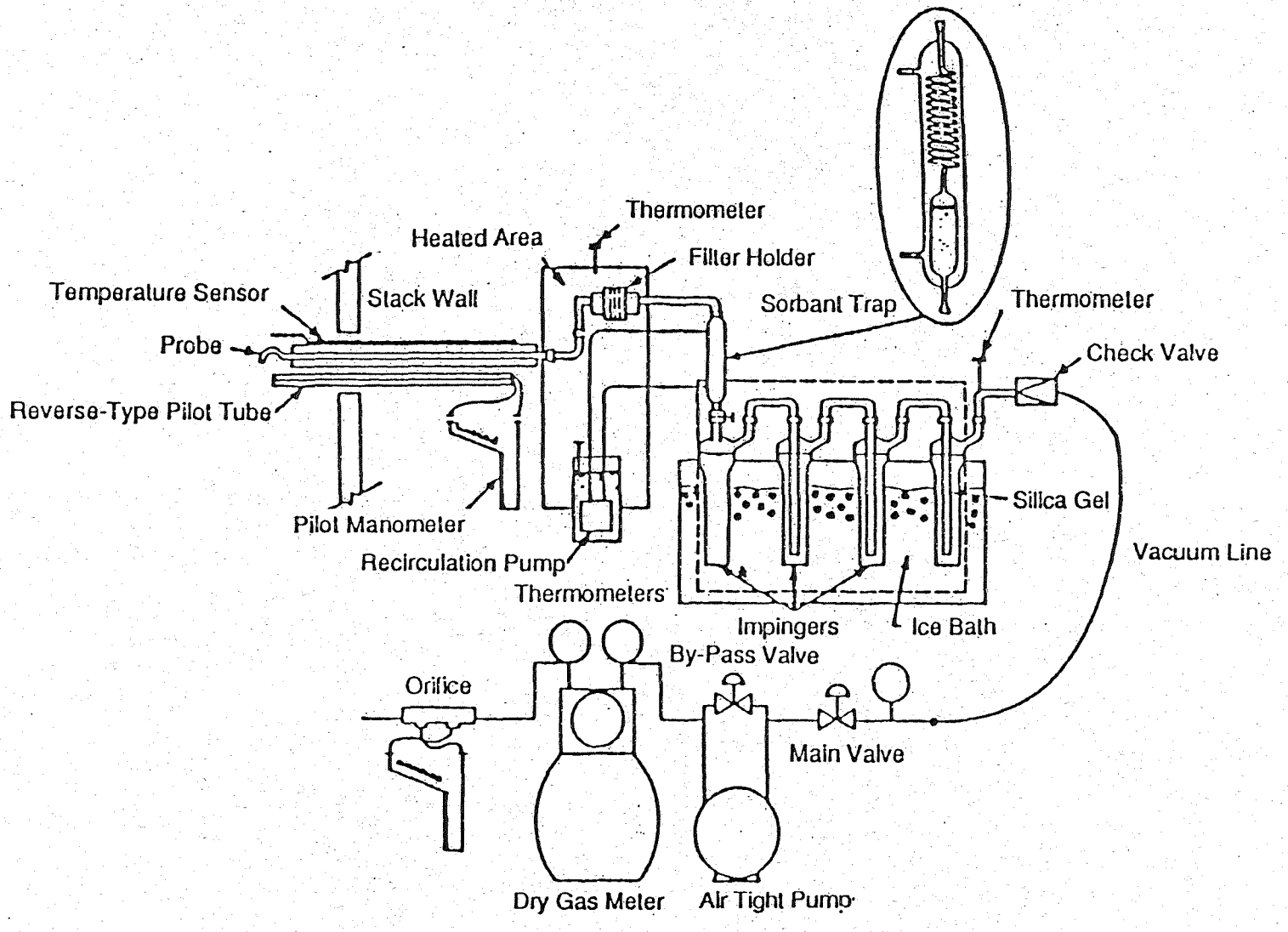

Figure 5

Napthalene Sampling Train