Note: This is a reference cited in *AP 42, Compilation of Air Pollutant Emission Factors, Volume I Stationary Point and Area Sources.* AP42 is located on the EPA web site at www.epa.gov/ttn/chief/ap42/

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Interpoll Laboratories, Inc.

Interpoll Laboratories, Inc.

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RESULTS OF THE SEPTEMBER 14 & 15, 1994 AIR EMISSION COMPLIANCE TESTS ON THE NO. 11 BOILER AT THE APPLETON PAPER PLANT IN COMBINED LOCKS, WISCONSIN

Submitted to:

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Report Number 4-3845
October 10, 1994
SP/slp

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1 INTRODUCTION

On September 14 & 15, 1994 Interpoll Laboratories personnel conducted air emission compliance tests on the No. 11 Boiler at the Appleton Papers Locks Mill Located in Combined Locks, Wisconsin. Pollutants measured included particulate, sulfur dioxide, oxides of nitrogen, carbon monoxide, and total hydrocarbons. On-site testing was performed by Mark Kaehler and Jeff Scripter. Coordination between testing activities and plant operation was provided by Scott Heinritz and Dave Wardeche of Appleton Papers. The tests were not witnessed by a member of the Wisconsin Department of Natural Resources.

The No. 11 Boiler is an ABB Combustion Engineering Industrial Type 40-A-16 Boiler which was installed in 1993. The unit can be fired with natural gas or No. 2 Fuel Oil. The boiler was tested once while firing natural gas, and again while firing No. 2 Fuel Oil. The steaming capacity of this boiler is 200,000 LB/HR of superheated steam. The normal steam load ranges from 100 - 110 KLB/HR. Flue gas is exhausted to the atmosphere via a circular double wall steel stack. The boiler is equipped with low NO_x burners & flue gas recirculation.

Particulate determinations were performed in accordance with EPA Methods 1 - 5, CFR Title 40, Part 60, Appendix A (revised July 1, 1993). Previous data collected at this site was used to determine the appropriate nozzle diamter for isokinetic sample withdrawal. An Interpoll Labs sampling train which meets or exceeds specifications in the above-cited reference was used to extract particulate samples by means of a heated glass-lined probe. Wet catch samples were collected in the back half of the Method 5 sampling train and analyzed as per Wisconsin DNR Protocol.

Sulfur dioxide samples were collected in accordance with EPA Method 6, CFR Title 40, Part 60, Appendix A (revised July 1, 1993) using the large impinger version without the isopropanol preimpinger. The recovered samples were transported to the laboratory and analyzed for sulfate by the standard barium/Thorin I titration.

The oxides of nitrogen samples were collected using an all-glass Method 7 sampling train. A heated stainless steel probe was used to extract the samples from the exhaust

stream. A plug of glass-wool was used in the end of the probe to remove particulate material.

The NO_x samples were collected in volume-calibrated two-liter all-glass flasks. An aliquot of 25 cc of absorbing solution was added to each flask on-site; the flask was closed; inserted into the sampling train; and evacuated. The probe was then purged and the sample collected over a 15 second interval. The flask was then closed; the flask removed from the sampling train; shook for two minutes and then secured for transport to the laboratory.

Upon arrival at the laboratory, the NO_x samples are logged in, placed in a designated area and maintained at 72 °F for 24 hours to allow completion of the conversion of NO to NO_2 and absorption in the acidified peroxide reagent. The flasks are then shook to complete absorption; attached to a mercury manometer and the static pressure and temperature recorded. The samples are then recovered and analyzed by ion chromatography.

The concentration of total hydrocarbons (THC) was measured as per EPA Method 25A using a Ratfisch Model RS55 Total Hydrocarbon Analyzer (heated flame ionization detector). The sample gas stream was extracted from the source through a heated probe and filter. The particulate free gas stream was then transported through a heated teflon umbilical (250 °F) into the analyzer oven where a portion of the gas is fed into the heated FID. The analyzer was calibrated with zero, low, mid and high propane in air gas standards. The analog output of each HFID was monitored with stripchart recorders. A volumetric flow rate determination was conducted in accordance with EPA Method 2, CFR Title 40, Part 60, Appendix A (revised July 1, 1993) in order to calculate total hydrocarbon mass rate.

Integrated flue gas samples were extracted simultaneously with each of the above-referenced sample trains from the sampling train exhaust ports using a specially designed gas sampling system as part of the overall project quality assurance . Integrated flue gas samples were collected in 44-liter Tedlar bags housed in a protective aluminum housing. After sampling was complete, the bags were sealed and returned to the laboratory for Orsat analysis. Prior to sampling, the Tedlar bags are leak checked at 15 IN.HG. vacuum with an in-line rotameter. Bags with any detectable inleakage are discarded. Integrated flue gas samples collected were also analyzed for carbon monoxide in accordance with EPA Method 10 (NDIR).

Testing on the Boiler was conducted from four test ports oriented at 90 degrees. These test ports are located 7.8 stack diameters downstream of the nearest flow disturbance and 15 diameters upstream of the stack exit. A 24-point traverse was used to extract representative particulate samples. Each traverse point was sampled 5 minutes to give a total sampling time of 120 minutes per run. A 3-point traverse was used to collect representative sulfur dioxide samples.

The important results of the test are summarized in Section 2. Detailed results are presented in Section 3. Field data and all other supporting information are presented in the appendices.

2 SUMMARY AND DISCUSSION

The results of the air emission compliance tests are presented in Tables 1 - 6. An overview of the results is presented in the Table below:

PARAMETER	FUEL: NATURAL GAS	FUEL: NO. 2 FUEL OIL
Particulate (DRY + WET CATCH)		
..... (GR/DSCF)	0.00530	0.0104
..... (LB/10^6BTU)	0.0083	0.017
Particulate (DRY CATCH ONLY)		
..... (GR/DSCF)	0.00196	0.00546
..... (LB/10^6BTU)	0.0029	0.0089
Sulfur Dioxide		
..... (ppm,d)	1.5	121
..... (LB/10^6BTU)	0.003	0.227
Oxides of Nitrogen		
..... (ppm,d)	31	57
..... (LB/10^6BTU)	0.040	0.078
Carbon Monoxide		
..... (ppm,d)	23	16
..... (LB/10^6BTU)	0.0173	0.0130
Total Hydrocarbons		
..... (ppmC,w)	< 1	< 1
..... (LB/HR)	< 0.11	< 0.11

No difficulties occurred in the field or in the laboratory analysis of the flue gas samples. Based on these facts plus a complete review of all of the data it is our opinion that the results reported herein are accurate and closely reflect the actual values which existed at the time the test was performed.

Table 1a Summary of the Results of the September 14, 1994 Particulate Emission Compliance Test on the No. 11 Boiler Stack at the Appleton Papers, Inc. Plant Located in Combined Locks, Wisconsin.

ITEM	Run 1	Run 2	Run 3
Date of test	09-14-94	09-14-94	09-14-94
Time runs were done (HRS)	1000/1206	1245/1459	1525/1731
Steam flow (KLB/HR)	190.0	188.0	187.0
Volumetric flow			
actual (ACFM)	90273	88709	88545
standard (DSCFM)	47799	46915	46696
Gas temperature (DEG-F)	328	332	336
Moisture content (%V/V)	19.11	18.76	18.64
Gas composition (%V/V,dry)			
carbon dioxide	9.60	9.80	9.90
oxygen	4.00	3.50	3.30
nitrogen	86.40	86.70	86.80
Isokinetic variation (%)	101.4	97.8	98.2
Particulate concentration			
actual (GR/ACF)	.00472	.00204	.00165
standard (GR/DSCF)	.00892	.00386	.00313
Part. emission rate (LB/HR)	3.65	1.55	1.25
Emission factor (LB/MMBTU)	0.014	0.0058	0.0046

Note: Dry + Organic/Inorganic Wet Catch

FUEL : Natural Gas

Table 1b Summary of the Results of the September 14, 1994 Particulate Emission Compliance Test on the No. 11 Boiler Stack at the Appleton Papers, Inc. Plant Located in Combined Locks, Wisconsin.

ITEM		Run 1	Run 2	Run 3
Date of test		09-14-94	09-14-94	09-14-94
Time runs were done	(HRS)	1000/1206	1245/1459	1525/1731
Steam flow	(KLB/HR)	190.0	188.0	187.0
Volumetric flow				
actual	(ACFM)	90273	88709	88545
standard	(DSCFM)	47799	46915	46696
Gas temperature	(DEG-F)	328	332	336
Moisture content	(%V/V)	19.11	18.76	18.64
Gas composition	(%V/V,dry)			
carbon dioxide		9.60	9.80	9.90
oxygen		4.00	3.50	3.30
nitrogen		86.40	86.70	86.80
Isokinetic variation	(%)	101.4	97.8	98.2
Particulate concentration				
actual	(GR/ACF)	.00139	.00110	.00061
standard	(GR/DSCF)	.00263	.00209	.00115
Part. emission rate	(LB/HR)	1.08	0.840	0.460
Emission factor	(LB/MMBTU)	0.0040	0.0031	0.0017

Note: Dry Catch Only

FUEL : Natural Gas

Table 2a Summary of the Results of the September 15, 1994 Particulate Emission Compliance Test on the No. 11 Boiler Stack at the Appleton Papers Plant Located in Combined Locks, Wisconsin.

ITEM	Run 1	Run 2	Run 3
Date of test	09-15-94	09-15-94	09-15-94
Time runs were done (HRS)	955/1200	1248/1452	1510/1713
Steam flow (KLB/HR)	190.0	188.0	193.0
Volumetric flow			
actual (ACFM)	93795	91088	93273
standard (DSCFM)	52169	50786	51289
Gas temperature (DEG-F)	331	334	340
Moisture content (%V/V)	14.20	13.74	14.29
Gas composition (%V/V,dry)			
carbon dioxide	12.00	12.10	11.70
oxygen	4.80	4.50	4.80
nitrogen	83.20	83.40	83.50
Isokinetic variation (%)	95.3	98.4	99.3
Particulate concentration			
actual (GR/ACF)	.00780	.00475	.00479
standard (GR/DSCF)	.0140	.00853	.00871
Part. emission rate (LB/HR)	6.27	3.71	3.83
Emission factor (LB/MMBTU)	0.023	0.014	0.014

Note: Dry + Organic/Inorganic Wet Catch

FUEL : No. 2 Fuel Oil

Table 2b Summary of the Results of the September 15, 1994 Particulate Emission Compliance Test on the No. 11 Boiler Stack at the Appleton Papers Plant Located in Combined Locks, Wisconsin.

ITEM		Run 1	Run 2	Run 3
Date of test		09-15-94	09-15-94	09-15-94
Time runs were done	(HRS)	955/1200	1248/1452	1510/1713
Steam flow	(KLB/HR)	190.0	188.0	193.0
Volumetric flow				
actual	(ACFM)	93795	91088	93273
standard	(DSCFM)	52169	50786	51289
Gas temperature	(DEG-F)	331	334	340
Moisture content	(%V/V)	14.20	13.74	14.29
Gas composition	(%V/V,dry)			
carbon dioxide		12.00	12.10	11.70
oxygen		4.80	4.50	4.80
nitrogen		83.20	83.40	83.50
Isokinetic variation	(%)	95.3	98.4	99.3
Particulate concentration				
actual	(GR/ACF)	.00256	.00322	.00330
standard	(GR/DSCF)	.00461	.00577	.00600
Part. emission rate	(LB/HR)	2.06	2.51	2.64
Emission factor	(LB/MMBTU)	0.0076	0.0093	0.0099

Note: Dry Catch Only

FUEL: No. 2 Fuel Oil

Table 3. Summary of the Results of the September 14 & 15, 1994, **Sulfur Dioxide Determinations** on the **No. 11 Boiler** at the Appleton Papers Plant in Combined Locks, Wisconsin.

Test/Run	Date	Time (HRS)	Concentration (ppm,d)	Emission Factor (LB/10^6BTU)
(NATURAL GAS)				
3/1	9-14-94	1757-1818	1.9	0.003
3/2	9-14-94	1825-1846	0.37	0.001
3/3	9-14-94	1852-1913	1.9	0.003
3/4	9-14-94	1919-1940	1.8	0.003
3/5	9-14-94	1946-2007	1.9	0.003
3/6	9-14-94	2012-2033	1.1	0.002
Avg			1.5	0.003
(NO. 2 FUEL OIL)				
6/1	9-15-94	1750-1811	116	0.219
6/2	9-15-94	1816-1837	121	0.228
6/3	9-15-94	1842-1903	122	0.226
6/4	9-15-94	1908-1929	121	0.229
6/5	9-15-94	1934-1955	122	0.230
6/6	9-15-94	1959-2020	121	0.228
Avg			121	0.227

Table 4. Summary of the Results of the September 14 & 15, 1994 **Oxides of Nitrogen Determinations** on the **No. 11 Boiler** at the the Appleton Papers Plant in Combined Locks, Wisconsin.

Test/Run	Date	Time (HRS)	Concentration (ppm,d)	Emission Factor (LB/10^6BTU)
(NATURAL GAS)				
1/1	9-14-94	1000-1206	31	0.040
1/2	9-14-94	1245-1459	32	0.040
1/3	9-14-94	1525-1731	31	0.038
Avg			31	0.040
(NO. 2 FUEL OIL)				
4/1	9-15-94	0955-1200	61	0.084
4/2	9-15-94	1248-1452	57	0.077
4/3	9-15-94	1510-1713	54	0.074
Avg			57	0.078

Table 5. Summary of the Results of the September 14 & 15, 1994, **Carbon Monoxide Determinations** on the **No. 11 Boiler** at the Appleton Papers Plant in Combined Locks, Wisconsin.

Test/Run	Date	Time (HRS)	Concentration (ppm,d)	Emission Factor (LB/10^6BTU)
(NATURAL GAS)				
1/1	9-14-94	1000-1206	23	0.0180
1/2	9-14-94	1245-1459	23	0.0175
1/3	9-14-94	1525-1731	22	0.0165
Avg			23	0.0173
(NO. 2 FUEL OIL)				
4/1	9-15-94	0955-1200	14	0.0117
4/2	9-15-94	1248-1452	16	0.0131
4/3	9-15-94	1510-1713	17	0.0142
Avg			16	0.0130

Table 6. Summary of the Results of the September 14 & 15, 1994 **Total Hydrocarbon Determinations** on the **No. 11 Boiler** at the Appleton Papers Plant in Combined Locks, Wisconsin.

Test/Run	Date	Time (HRS)	Concentration (ppmC,w)	Emission Rate (LB/HR)
(NATURAL GAS)				
2/1	9-14-94	1323-1424	< 1 10	< 0.11
2/2	9-14-94	1530-1630	< 1 8	< 0.11
2/3	9-14-94	1634-1734	< 1 5	< 0.11
Avg			< 1	< 0.11
(N0. 2 FUEL OIL)				
5/1	9-15-94	1105-1205	< 1	< 0.11
5/2	9-15-94	1256-1356	< 1	< 0.11
5/3	9-15-94	1550-1650	< 1	< 0.11
Avg			< 1	< 0.11

* *Note: All results are total non-methane (methane results are presented in Appendix D).*

3 RESULTS

The results of all field and laboratory evaluations are presented in this section. Gas composition (Orsat and moisture) are presented first followed by the computer printout of the particulate, sulfur dioxide, oxides of nitrogen, and carbon monoxide results. Preliminary measurements including test port locations are given in the appendices.

The results have been calculated on a personal computer using programs written in Extended BASIC specifically for source testing calculations. EPA-published equations have been used as the basis of the calculation techniques in these programs. Emission rates have been calculated using the product of the concentration times flow method. The emission factors have been calculated by the using the F-Factor Method. The calculations are presented in Appendix J.

3.1 Results of Orsat and Moisture Analyses

Test No. 1
No. 11 Boiler Stack

Results of Orsat & Moisture Analyses-----Methods 3 & 4(%v/v)

	Run 1	Run 2	Run 3
Date of run	09-14-94	09-14-94	09-14-94
Dry basis (orsat)			
carbon dioxide.....	9.60	9.80	9.90
oxygen.....	4.00	3.50	3.30
nitrogen.....	86.40	86.70	86.80
Wet basis (orsat)			
carbon dioxide.....	7.77	7.96	8.05
oxygen.....	3.24	2.84	2.68
nitrogen.....	69.89	70.43	70.62
water vapor.....	19.11	18.76	18.64
Dry molecular weight.....	29.70	29.71	29.72
Wet molecular weight.....	27.46	27.51	27.53
Specific gravity.....	0.949	0.950	0.951
Water mass flow.....(LB/HR)	31668	30393	30014
FO	1.760	1.776	1.778

Test No. 3
No. 11 Boiler Stack

Results of Orsat & Moisture Analyses-----Methods 3 & 4(%v/v)

	Run 1	Run 2	Run 3
Date of run	09-14-94	09-14-94	09-14-94
Dry basis (orsat)			
carbon dioxide.....	9.70	8.90	9.80
oxygen.....	3.60	4.70	3.50
carbon monoxide.....	0.00	0.00	0.00
nitrogen.....	86.70	86.40	86.70
Wet basis (orsat)			
carbon dioxide.....	7.90	7.26	7.86
oxygen.....	2.93	3.84	2.81
carbon monoxide.....	0.00	0.00	0.00
nitrogen.....	70.62	70.52	69.50
water vapor.....	18.55	18.38	19.84
Dry molecular weight.....	29.70	29.61	29.71
Wet molecular weight.....	27.53	27.48	27.39
Specific gravity.....	0.951	0.949	0.946
Water mass flow.....(LB/HR)	30708	30122	33609
FO	1.784	1.820	1.776

Test No. 3
No. 11 Boiler Stack

Results of Orsat & Moisture Analyses-----Methods 3 & 4(%v/v)

	Run 4	Run 5	Run 6
Date of run	09-14-94	09-14-94	09-14-94
Dry basis (orsat)			
carbon dioxide.....	9.80	9.80	9.80
oxygen.....	3.60	3.40	3.30
carbon monoxide.....	0.00	0.00	0.00
nitrogen.....	86.60	86.80	86.90
Wet basis (orsat)			
carbon dioxide.....	8.04	7.96	7.86
oxygen.....	2.95	2.76	2.65
carbon monoxide.....	0.00	0.00	0.00
nitrogen.....	71.02	70.49	69.74
water vapor.....	17.99	18.79	19.75
Dry molecular weight.....	29.71	29.70	29.70
Wet molecular weight.....	27.61	27.50	27.39
Specific gravity.....	0.954	0.950	0.946
Water mass flow.....(LB/HR)	29007	31010	33047

FO 1.765 1.786 1.796

Test No. 4
No. 11 Boiler Stack

Results of Orsat & Moisture Analyses-----Methods 3 & 4(%v/v)

	Run 1	Run 2	Run 3
Date of run	09-15-94	09-15-94	09-15-94
Dry basis (orsat)			
carbon dioxide.....	12.00	12.10	11.70
oxygen.....	4.80	4.50	4.80
nitrogen.....	83.20	83.40	83.50
Wet basis (orsat)			
carbon dioxide.....	10.30	10.44	10.03
oxygen.....	4.12	3.88	4.11
nitrogen.....	71.39	71.94	71.57
water vapor.....	14.20	13.74	14.29
Dry molecular weight.....	30.11	30.12	30.06
Wet molecular weight.....	28.39	28.45	28.34
Specific gravity.....	0.981	0.983	0.979
Water mass flow.....(LB/HR)	24219	22696	23988

FO	1.342	1.355	1.376

Test No. 6
No. 11 Boiler Stack

Results of Orsat & Moisture Analyses-----Methods 3 & 4(%v/v)

	Run 1	Run 2	Run 3
Date of run	09-15-94	09-15-94	09-15-94
Dry basis (orsat)			
carbon dioxide.....	12.10	12.20	12.30
oxygen.....	4.60	4.50	4.40
carbon monoxide.....	0.00	0.00	0.00
nitrogen.....	83.30	83.30	83.30
Wet basis (orsat)			
carbon dioxide.....	10.43	10.50	10.60
oxygen.....	3.97	3.87	3.79
carbon monoxide.....	0.00	0.00	0.00
nitrogen.....	71.80	71.66	71.80
water vapor.....	13.80	13.97	13.81
Dry molecular weight.....	30.12	30.13	30.14
Wet molecular weight.....	28.45	28.44	28.47
Specific gravity.....	0.983	0.982	0.983
Water mass flow.....(LB/HR)	23691	23241	23343
FO	1.347	1.344	1.341

Test No. 6
No. 11 Boiler Stack

Results of Orsat & Moisture Analyses-----Methods 3 & 4(%v/v)

	Run 4	Run 5	Run 6
Date of run	09-15-94	09-15-94	09-15-94
Dry basis (orsat)			
carbon dioxide.....	12.10	12.10	12.00
oxygen.....	4.60	4.60	4.60
carbon monoxide.....	0.00	0.00	0.00
nitrogen.....	83.30	83.30	83.40
Wet basis (orsat)			
carbon dioxide.....	10.54	10.46	10.13
oxygen.....	4.01	3.98	3.88
carbon monoxide.....	0.00	0.00	0.00
nitrogen.....	72.59	72.00	70.38
water vapor.....	12.86	13.56	15.61
Dry molecular weight.....	30.12	30.12	30.10
Wet molecular weight.....	28.56	28.48	28.21
Specific gravity.....	0.987	0.984	0.975
Water mass flow.....(LB/HR)	21050	22188	26089
FO	1.347	1.347	1.358

3.2 Results of Particulate Determinations

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Appleton Papers Inc
Combined Locks, WI

Test No. 1
No. 11 Boiler Stack

Results of Particulate Loading Determinations-------Method 5

	Run 1	Run 2	Run 3
Date of run	09-14-94	09-14-94	09-14-94
Time run start/end.....(HRS)	1000/1206	1245/1459	1525/1731
Static pressure.....(IN.WC)	-0.12	-0.12	-0.12
Cross sectional area (SQ.FT)	38.03	38.03	38.03
Pitot tube coefficient.....	.840	.840	.840
Water in sample gas			
condenser.....(ML)	0.0	0.0	0.0
impingers.....(GRAMS)	362.0	332.0	336.0
desiccant.....(GRAMS)	29.0	30.0	23.0
total.....(GRAMS)	391.0	362.0	359.0
Total particulate material..			
.....collected(grams)	0.0451	0.0185	0.0150
Gas meter coefficient.....	0.9956	0.9956	0.9956
Barometric pressure..(IN.HG)	29.24	29.24	29.24
Avg. orif.pres.drop..(IN.WC)	1.50	1.38	1.39
Avg. gas meter temp..(DEF-F)	98.7	114.9	119.7
Volume through gas meter....			
at meter conditions...(CF)	84.60	82.45	83.10
standard conditions.(DSCF)	78.05	73.90	73.87
Total sampling time....(MIN)	120.00	120.00	120.00
Nozzle diameter.....(IN)	.306	.306	.306
Avg.stack gas temp ..(DEG-F)	328	332	336
Volumetric flow rate.....			
actual.....(ACFM)	90273	88709	88545
dry standard.....(DSCFM)	47799	46915	46696
Isokinetic variation.....(%)	101.4	97.8	98.2
Particulate concentration...			
actual.....(GR/ACF)	0.00472	0.00204	0.00165
dry standard.....(GR/DSCF)	0.00892	0.00386	0.00313
Particle mass rate...(LB/HR)	3.653	1.553	1.254
F-factor .....(DSCF/MMBTU)	8710	8710	8710
Emission factor...(LB/MMBTU)	0.014	0.006	0.005

OR

Test No. 4
No. 11 Boiler Stack

Results of Particulate Loading Determinations-------Method 5

	Run 1	Run 2	Run 3
Date of run	09-15-94	09-15-94	09-15-94
Time run start/end.....(HRS)	955/1200	1248/1452	1510/1713
Static pressure.....(IN.WC)	-0.17	-0.17	-0.17
Cross sectional area (SQ.FT)	38.03	38.03	38.03
Pitot tube coefficient.....	.840	.840	.840
Water in sample gas			
condenser.....(ML)	0.0	0.0	0.0
impingers.....(GRAMS)	253.0	242.0	259.0
desiccant.....(GRAMS)	28.0	30.0	31.0
total.....(GRAMS)	281.0	272.0	290.0
Total particulate material..			
.....collected(grams)	0.0728	0.0445	0.0463
Gas meter coefficient.....	0.9956	0.9956	0.9956
Barometric pressure..(IN.HG)	29.08	29.08	29.08
Avg. orif.pres.drop..(IN.WC)	1.64	1.67	1.74
Avg. gas meter temp..(DEF-F)	118.1	122.2	125.6
Volume through gas meter....			
at meter conditions...(CF)	90.24	91.38	93.62
standard conditions.(DSCF)	80.05	80.50	82.01
Total sampling time....(MIN)	120.00	120.00	120.00
Nozzle diameter.....(IN)	.306	.306	.306
Avg.stack gas temp ..(DEG-F)	331	334	340
Volumetric flow rate.....			
actual.....(ACFM)	93795	91088	93273
dry standard.....(DSCFM)	52169	50786	51289
Isokinetic variation.....(%)	95.3	98.4	99.3
Particulate concentration...			
actual.....(GR/ACF)	0.00780	0.00475	0.00479
dry standard.....(GR/DSCF)	0.01403	0.00853	0.00871
Particle mass rate...(LB/HR)	6.275	3.713	3.830
F-factor .....(DSCF/MMBTU)	8854	8854	8854
Emission factor...(LB/MMBTU)	0.023	0.014	0.014

3.3 Results of Sulfur Dioxide Determinations

Interpoll Labs Report No. 4-3845
Appleton Papers Inc
Combined Locks, Wisconsin

Test No. 3
No. 11 Boiler Stack

Results of Sulfur Dioxide Determinations----------Method 6

	Run 1	Run 2	Run 3
Date of run	09-14-94	09-14-94	09-14-94
Time run start/end.....(HRS)	1757/1818	1825/1846	1852/1913
Barometric pressure..(IN.HG)	29.24	29.24	29.24
Meter temperature....(DEG-F)	122.75	119.17	118.75
Meter correction coefficient	0.9956	0.9956	0.9956
Volume through gas meter....			
at meter conditions...(CF)	15.900	15.980	16.030
standard conditions..(SCF)	14.076	14.234	14.289
Total sampling time....(MIN)	21.0	21.0	21.0
Moisture content.....(%V/V)	18.55	18.38	19.84
Volumetric flow rate (DSCFM)	48061	47674	48414
Oxygen content....(%V/V DRY)	3.60	4.70	3.50
Milliequivalents of SO4 in.. gas sample.....	0.06	0.01	0.06
Sulfur dioxide concentration			
(GR/DSCF).....	0.0022	0.0004	0.0022
(MG/DSCM).....	5.02	0.99	4.95
(PPM-DRY).....	1.89	0.37	1.86
(PPM-WET).....	1.54	0.30	1.49
SO2 Emission rate....(LB/HR)	0.90	0.18	0.90
Sulfur dioxide emission..... .....factor (LB/MMBTU)*	0.003	0.001	0.003

* F = 8710 DSCF/MMBTU

Test No. 3
No. 11 Boiler Stack

Results of Sulfur Dioxide Determinations----------Method 6

	Run 4	Run 5	Run 6
Date of run	09-14-94	09-14-94	09-14-94
Time run start/end.....(HRS)	1919/1940	1946/2007	2012/2033
Barometric pressure..(IN.HG)	29.24	29.24	29.24
Meter temperature....(DEG-F)	118.42	119.42	118.25
Meter correction coefficient	0.9956	0.9956	0.9956
Volume through gas meter....			
at meter conditions...(CF)	16.150	16.020	16.110
standard conditions..(SCF)	14.404	14.264	14.373
Total sampling time....(MIN)	21.0	21.0	21.0
Moisture content.....(%V/V)	17.99	18.79	19.75
Volumetric flow rate (DSCFM)	47151	47776	47884
Oxygen content....(%V/V DRY)	3.60	3.40	3.30
Milliequivalents of SO4 in..			
gas sample.....	0.06	0.06	0.04
<u>Sulfur dioxide concentration</u>			
(GR/DSCF).....	0.0021	0.0022	0.0013
(MG/DSCM).....	4.91	4.96	2.95
(PPM-DRY).....	1.84	1.86	1.11
(PPM-WET).....	1.51	1.51	0.89
SO2 Emission rate....(LB/HR)	0.87	0.89	0.53
Sulfur dioxide emission.....			
.....factor (LB/MMBTU)*	0.003	0.003	0.002

* F = 8710 DSCF/MMBTU

Test No. 6
No. 11 Boiler Stack

Results of Sulfur Dioxide Determinations----------Method 6

	Run 1	Run 2	Run 3
Date of run	09-15-94	09-15-94	09-15-94
Time run start/end.....(HRS)	1750/1811	1816/1837	1842/1903
Barometric pressure..(IN.HG)	29.08	29.08	29.08
Meter temperature....(DEG-F)	121.50	123.92	125.92
Meter correction coefficient	0.9956	0.9956	0.9956
Volume through gas meter....			
at meter conditions...(CF)	16.020	16.190	16.130
standard conditions..(SCF)	14.135	14.226	14.125
Total sampling time....(MIN)	21.0	21.0	21.0
Moisture content.....(%V/V)	13.80	13.97	13.81
Volumetric flow rate (DSCFM)	52750	51018	51936
Oxygen content....(%V/V DRY)	4.60	4.50	4.40
Milliequivalents of SO4 in..			
gas sample.....	3.86	4.06	4.04
Sulfur dioxide concentration			
(GR/DSCF).....	0.1349	0.1411	0.1413
(MG/DSCM).....	308.67	323.00	323.31
(PPM-DRY).....	116.02	121.41	121.53
(PPM-WET).....	100.01	104.45	104.74
SO2 Emission rate....(LB/HR)	60.99	61.72	62.89
Sulfur dioxide emission.....			
.....factor (LB/MMBTU)*	0.219	0.228	0.226

* F = 8854 DSCF/MMBTU

Test No. 6
No. 11 Boiler Stack

Results of Sulfur Dioxide Determinations----------Method 6

	Run 4	Run 5	Run 6
Date of run	09-15-94	09-15-94	09-15-94
Time run start/end.....(HRS)	1908/1929	1934/1955	1959/2020
Barometric pressure..(IN.HG)	29.08	29.08	29.08
Meter temperature....(DEG-F)	124.50	125.00	125.75
Meter correction coefficient	0.9956	0.9956	0.9956
Volume through gas meter....			
at meter conditions...(CF)	16.010	16.100	16.000
standard conditions..(SCF)	14.054	14.121	14.015
Total sampling time....(MIN)	21.0	21.0	21.0
Moisture content.....(%V/V)	12.86	13.56	15.61
Volumetric flow rate (DSCFM)	50836	50403	50265
Oxygen content....(%V/V DRY)	4.60	4.60	4.60
Milliequivalents of SO4 in..			
gas sample.....	4.01	4.05	3.99
Sulfur dioxide concentration			
(GR/DSCF).....	0.1411	0.1418	0.1406
(MG/DSCM).....	322.93	324.40	321.80
(PPM-DRY).....	121.38	121.94	120.96
(PPM-WET).....	105.77	105.40	102.07
SO2 Emission rate....(LB/HR)	61.49	61.24	60.59
Sulfur dioxide emission.....			
.....factor (LB/MMBTU)*	0.229	0.230	0.228

* F = 8854 DSCF/MMBTU

3.4 Results of Oxides of Nitrogen Determinations

Interpoll Labs Report No. 4-3845
Appleton Papers Inc
Combined Locks, Wisconsin

Test No. 1
No. 11 Boiler Stack

Results of Oxides of Nitrogen (NOx) Determinations---------Method 7

	Run 1A	Run 1B	Run 1C	Run 1D
Date of run.....	09-14-94	09-14-94	09-14-94	09-14-94
Time of run.....(HRS)	1022	1048	1107	1136
Flask number.....	9	10	11	12
Volume of flask.....(ML)	2080	2063	2062	2111
Data: time of sampling				
flask temperature..(DEG-F)	92.00	92.00	92.00	92.00
bar. press.....(IN.HG)	29.24	29.24	29.24	29.24
flask vacuum.....(IN.HG)	27.00	26.90	26.90	26.70
flask abs. press...(IN.HG)	2.24	2.34	2.34	2.54
Data: Time of Flask Opening				
flask temperature..(DEG-F)	71.00	71.00	71.00	71.00
lab. bar. press....(IN.HG)	29.02	29.02	29.02	29.02
flask static press.(IN.HG)	-0.50	-1.50	-0.10	0.00
flask abs. press...(IN.HG)	28.52	27.52	28.92	29.02
Volume gas sampled....(DSML)	1800	1711	1805	1842
Moisture content.....(%V/V)	19.11	19.11	19.11	19.11
Oxygen content....(%V/V,DRY)	4.00	4.00	4.00	4.00
Nitrate in gas sample...(JG)	164.0	145.0	143.0	125.0
NO2 in gas sample.....(JG)	121.7	107.6	106.1	92.7
NOx Concentration				
(GR/DSCF).....	0.0295	0.0275	0.0257	0.0220
(MG/DSCM).....	68	63	59	50
(PPM-DRY).....	35	33	31	26
(PPM-WET).....	29	27	25	21
NOX Emission rate....(LB/HR)	12.10	11.26	10.53	9.02
NOx emission factor..... .....(LB/MMBTU)*	0.045	0.042	0.040	0.034

* F = 8710 DSCF/MMBTU

Test No. 1
No. 11 Boiler Stack

Results of Oxides of Nitrogen (NOx) Determinations---------Method 7

	Run 2A	Run 2B	Run 2C	Run 2D
Date of run.....	09-14-94	09-14-94	09-14-94	09-14-94
Time of run.....(HRS)	1302	1337	1356	1407
Flask number.....	28	38	55	56
Volume of flask.....(ML)	2031	2056	2086	2069
Data: time of sampling				
flask temperature..(DEG-F)	93.00	93.00	93.00	93.00
bar. press.....(IN.HG)	29.24	29.24	29.24	29.24
flask vacuum.....(IN.HG)	26.90	26.80	26.80	26.70
flask abs. press...(IN.HG)	2.34	2.44	2.44	2.54
Data: Time of Flask Opening				
flask temperature..(DEG-F)	71.00	71.00	71.00	71.00
lab. bar. press....(IN.HG)	29.02	29.02	29.02	29.02
flask static press.(IN.HG)	-0.50	-1.20	-2.00	-1.20
flask abs. press...(IN.HG)	28.52	27.82	27.02	27.82
Volume gas sampled....(DSML)	1751	1719	1690	1723
Moisture content.....(%V/V)	18.76	18.76	18.76	18.76
Oxygen content....(%V/V,DRY)	3.50	3.50	3.50	3.50
Nitrate in gas sample...(JG)	135.0	139.0	149.0	140.0
NO2 in gas sample.....(JG)	100.2	103.1	110.6	103.9
NOx Concentration				
(GR/DSCF).....	0.0250	0.0262	0.0286	0.0263
(MG/DSCM).....	57	60	65	60
(PPM-DRY).....	30	31	34	32
(PPM-WET).....	24	25	28	26
NOX Emission rate....(LB/HR)	10.05	10.54	11.50	10.59
NOx emission factor..... .....(LB/MMBTU)*	0.037	0.039	0.043	0.039

* F = 8710 DSCF/MMBTU

Test No. 1
No. 11 Boiler Stack

Results of Oxides of Nitrogen (NOx) Determinations---------Method 7

	Run 3A	Run 3B	Run 3C	Run 3D
Date of run.....	09-14-94	09-14-94	09-14-94	09-14-94
Time of run.....(HRS)	1540	1612	1628	1700
Flask number.....	57	7	44	60
Volume of flask.....(ML)	2062	2081	2090	2066
Data: time of sampling				
flask temperature..(DEG-F)	93.00	93.00	93.00	93.00
bar. press.....(IN.HG)	29.24	29.24	29.24	29.24
flask vacuum.....(IN.HG)	26.70	26.80	26.80	26.80
flask abs. press...(IN.HG)	2.54	2.44	2.44	2.44
Data: Time of Flask Opening				
flask temperature..(DEG-F)	71.00	71.00	71.00	71.00
lab. bar. press....(IN.HG)	29.02	29.02	29.02	29.02
flask static press.(IN.HG)	-1.20	-1.00	-1.00	-1.00
flask abs. press...(IN.HG)	27.82	28.02	28.02	28.02
Volume gas sampled....(DSML)	1718	1754	1761	1741
Moisture content.....(%V/V)	18.64	18.64	18.64	18.64
Oxygen content....(%V/V,DRY)	3.30	3.30	3.30	3.30
Nitrate in gas sample...(JG)	141.0	139.0	132.0	144.0
NO2 in gas sample.....(JG)	104.6	103.1	97.9	106.8
NOx Concentration				
(GR/DSCF).....	0.0266	0.0257	0.0243	0.0268
(MG/DSCM).....	61	59	56	61
(PPM-DRY).....	32	31	29	32
(PPM-WET).....	26	25	24	26
NOX Emission rate....(LB/HR)	10.65	10.29	9.73	10.73
NOx emission factor..... .....(LB/MMBTU)*	0.039	0.038	0.036	0.040

* F = 8710 DSCF/MMBTU

Test No. 4
No. 11 Boiler Stack

Results of Oxides of Nitrogen (NOx) Determinations---------Method 7

	Run 1A	Run 1B	Run 1C	Run 1D
Date of run.....	09-15-94	09-15-94	09-15-94	09-15-94
Time of run.....(HRS)	1022	1040	1108	1137
Flask number.....	20	21	22	23
Volume of flask.....(ML)	2060	2068	2031	2056
Data: time of sampling				
flask temperature..(DEG-F)	90.00	90.00	90.00	90.00
bar. press.....(IN.HG)	29.08	29.08	29.08	29.08
flask vacuum.....(IN.HG)	26.70	26.70	26.80	26.80
flask abs. press...(IN.HG)	2.38	2.38	2.28	2.28
Data: Time of Flask Opening				
flask temperature..(DEG-F)	71.00	71.00	71.00	71.00
lab. bar. press....(IN.HG)	29.02	29.02	29.02	29.02
flask static press.(IN.HG)	-2.00	-1.00	-0.70	-0.10
flask abs. press...(IN.HG)	27.02	28.02	28.32	28.92
Volume gas sampled....(DSML)	1671	1746	1741	1803
Moisture content.....(%V/V)	14.20	14.20	14.20	14.20
Oxygen content....(%V/V,DRY)	4.80	4.80	4.80	4.80
Nitrate in gas sample...(JG)	264.0	272.0	273.0	283.0
NO2 in gas sample.....(JG)	195.9	201.8	202.6	210.0
NOx Concentration				
(GR/DSCF).....	0.0512	0.0505	0.0509	0.0509
(MG/DSCM).....	117	116	116	116
(PPM-DRY).....	61	60	61	61
(PPM-WET).....	53	52	52	52
NOX Emission rate....(LB/HR)	22.90	22.59	22.74	22.76
NOx emission factor..... .....(LB/MMBTU)*	0.084	0.083	0.084	0.084

* F = 8854 DSCF/MMBTU

Test No. 4
No. 11 Boiler Stack

Results of Oxides of Nitrogen (NOx) Determinations---------Method 7

	Run 2A	Run 2B	Run 2C	**Run 2D
Date of run.....	09-15-94	09-15-94	09-15-94	09-15-94
Time of run.....(HRS)	1310	1343	1420	1442
Flask number.....	24	32	14	15
Volume of flask.....(ML)	2031	2092	2048	2045
Data: time of sampling				
flask temperature..(DEG-F)	92.00	92.00	93.00	93.00
bar. press.....(IN.HG)	29.08	29.08	29.08	29.08
flask vacuum.....(IN.HG)	26.80	26.70	26.80	26.70
flask abs. press...(IN.HG)	2.28	2.38	2.28	2.38
Data: Time of Flask Opening				
flask temperature..(DEG-F)	71.00	71.00	71.00	71.00
lab. bar. press....(IN.HG)	29.02	29.02	29.02	29.02
flask static press.(IN.HG)	-0.20	-0.90	-0.90	-2.00
flask abs. press...(IN.HG)	28.82	28.12	28.12	27.02
Volume gas sampled....(DSML)	1774	1774	1743	1660
Moisture content.....(%V/V)	13.74	13.74	13.74	13.74
Oxygen content....(%V/V,DRY)	4.50	4.50	4.50	4.50
Nitrate in gas sample...(JG)	252.0	266.0	264.0	
NO2 in gas sample.....(JG)	187.0	197.4	195.9	
NOx Concentration				
(GR/DSCF).....	0.0460	0.0486	0.0491	
(MG/DSCM).....	105	111	112	
(PPM-DRY).....	55	58	59	
(PPM-WET).....	48	50	51	
NOX Emission rate....(LB/HR)	20.05	21.17	21.38	
NOx emission factor..... .....(LB/MMBTU)*	0.074	0.078	0.079	

* F = 8854 DSCF/MMBTU

** Note: No sample in flask.

Test No. 4
No. 11 Boiler Stack

Results of Oxides of Nitrogen (NOx) Determinations---------Method 7

	Run 3A	Run 3B	Run 3C	Run 3D
Date of run.....	09-15-94	09-15-94	09-15-94	09-15-94
Time of run.....(HRS)	1533	1559	1625	1653
Flask number.....	16	17	18	19
Volume of flask.....(ML)	2067	2054	2045	2069
Data: time of sampling				
flask temperature..(DEG-F)	96.00	96.00	96.00	96.00
bar. press.....(IN.HG)	29.08	29.08	29.08	29.08
flask vacuum.....(IN.HG)	26.70	26.80	26.70	26.70
flask abs. press...(IN.HG)	2.38	2.28	2.38	2.38
Data: Time of Flask Opening				
flask temperature..(DEG-F)	71.00	71.00	71.00	71.00
lab. bar. press....(IN.HG)	29.02	29.02	29.02	29.02
flask static press.(IN.HG)	-0.70	-2.00	-0.80	-0.60
flask abs. press...(IN.HG)	28.32	27.02	28.22	28.42
Volume gas sampled....(DSML)	1767	1674	1741	1775
Moisture content.....(%V/V)	14.29	14.29	14.29	14.29
Oxygen content....(%V/V,DRY)	4.80	4.80	4.80	4.80
Nitrate in gas sample...(JG)	262.0	223.0	234.0	241.0
NO2 in gas sample.....(JG)	194.4	165.5	173.6	178.8
<u>NOx Concentration</u>				
(GR/DSCF).....	0.0481	0.0432	0.0436	0.0440
(MG/DSCM).....	110	99	100	101
(PPM-DRY).....	58	52	52	53
(PPM-WET).....	49	44	45	45
NOX Emission rate....(LB/HR)	21.14	18.98	19.16	19.35
NOx emission factor..... .....(LB/MMBTU)*	0.079	0.071	0.072	0.072

* F = 8854 DSCF/MMBTU

3.5 Results of Carbon Monoxide Determinations

Test No. 1
No. 11 Boiler Stack

Results of CO Determinations ----------Method 10

	Run 1	Run 2	Run 3
Date of run	09-14-94	09-14-94	09-14-94
Time run start/end.....(HRS)	1000/1206	1245/1459	1525/1731
Total sampling time....(MIN)	120.0	120.0	120.0
Moisture content.....(%V/V)	19.11	18.76	18.64
O2 Concentration.....(%V/V)	4.00	3.50	3.30
Volumetric flow rate (DSCFM)	47799	46915	46696
CO concentration.....			
(GR/DSCF).....	0.0116	0.0114	0.0112
(MG/DSCM).....	26.45	26.21	25.63
(PPM-WET).....	18.36	18.28	17.90
(PPM-DRY).....	22.70	22.50	22.00
(PPM-DRY @ 7% O2).....	18.69	18.00	17.40
CO emission rate.....(LB/HR)	4.732	4.604	4.480
CO emission factor.....(LB/MMBTU)	0.0180	0.0175	0.0165

CO = Carbon monoxide

A trailing '<' symbol indicates that the true value is less than or equal to the reported value

Test No. 4
No. 11 Boiler Stack

Results of CO Determinations ----------Method 10

	Run 1	Run 2	Run 3
Date of run	09-15-94	09-15-94	09-15-94
Time run start/end.....(HRS)	0955/1200	1248/1452	1510/1713
Total sampling time....(MIN)	120.0	120.0	120.0
Moisture content.....(%V/V)	14.20	13.74	14.29
O2 Concentration.....(%V/V)	4.80	4.50	4.80
Volumetric flow rate (DSCFM)	52170	50790	51290
CO concentration.....			
(GR/DSCF).....	0.0072	0.0080	0.0088
(MG/DSCM).....	16.54	18.29	20.04
(PPM-WET).....	12.18	13.54	14.74
(PPM-DRY).....	14.20	15.70	17.20
(PPM-DRY @ 7% O2).....	12.27	13.32	14.86
CO emission rate.....(LB/HR)	3.231	3.478	3.848
CO emission factor.....(LB/MMBTU)	0.0117	0.0131	0.0142

CO = Carbon monoxide

A trailing '<' symbol indicates that the true value is less than or equal to the reported value

4 RESULTS OF FUEL ANALYSES

INTERPOLL LABORATORIES, INC.
(612)786-6020

Appleton Paper
Sample Log No. 3845-21

Results of Ultimate Analysis

Source: No. 11 Boiler Stack
Sample Identification: Test 4, Runs 1, 2, 3
Sample Type: No. 2 Fuel Oil Composite

Parameter		Method	As Received
Gross heating value	BTU/LB	ASTM D240	19374
Nitrogen	%	Fisons	0.70
Sulfur	%	ASTM D3177[a]	0.36
Hydrogen	%	Fisons	11.84
Carbon	%	Fisons	84.53
Oxygen	%	Calculation	2.57
Ash	%	ASTM D482	< 0.01
Moisture	%	ASTM D95	< 0.05

Respectfully submitted,

Jeannie F. O'Neil, Manager
Inorganic Chemistry Group

JFO/cg

[a]Modified ASTM Method.

APPENDIX A

VOLUMETRIC FLOW RATE DETERMINATIONS

Interpoll Labs Report No. 4-3845
Appleton Papers Inc
Combined Locks, WI

Test No. 1
No. 11 Boiler Stack

Results of Volumetric Flow Rate Determination-------Method 2

Date of Determination.....	09-14-94
Time of Determination.....(HRS)	925
Barometric pressure.....(IN.HG)	29.24
Pitot tube coefficient.....	.84
Number of sampling ports.....	4
Total number of points.....	12
Shape of duct.....	Round
Stack diameter.....(IN)	83.5
Duct area.....(SQ.FT)	38.03
Direction of flow.....	UP
Static pressure.....(IN.WC)	-.12
Avg. gas temp.....(DEG-F)	312
Moisture content.....(% V/V)	15.58
Avg. linear velocity.....(FT/SEC)	37.4
Gas density.....(LB/ACF)	.04837
Molecular weight.....(LB/LBMOLE)	29.70
Mass flow of gas.....(LB/HR)	247405
Volumetric flow rate.....	
actual.....(ACFM)	85253
dry standard.....(DSCFM)	48090

Test No. 3
No. 11 Boiler Stack

Results of Volumetric Flow Rate Determination-------Method 2

Date of Determination.....	09-14-94
Time of Determination.....(HRS)	1803
Barometric pressure.....(IN.HG)	29.24
Pitot tube coefficient.....	.84
Number of sampling ports.....	4
Total number of points.....	12
Shape of duct.....	Round
Stack diameter.....(IN)	83.5
Duct area.....(SQ.FT)	38.03
Direction of flow.....	UP
Static pressure.....(IN.WC)	-.12
Avg. gas temp.....(DEG-F)	325
Moisture content.....(% V/V)	16.31
Avg. linear velocity.....(FT/SEC)	38.3
Gas density.....(LB/ACF)	.04742
Molecular weight.....(LB/LBMOLE)	29.70
Mass flow of gas.....(LB/HR)	248651
Volumetric flow rate.....	
actual.....(ACFM)	87392
dry standard.....(DSCFM)	48061

Test No. 3
No. 11 Boiler Stack

Results of Volumetric Flow Rate Determination-------Method 2

Date of Determination.....	09-14-94
Time of Determination.....(HRS)	1829
Barometric pressure.....(IN.HG)	29.24
Pitot tube coefficient.....	.84
Number of sampling ports.....	4
Total number of points.....	12
Shape of duct.....	Round
Stack diameter.....(IN)	83.5
Duct area.....(SQ.FT)	38.03
Direction of flow.....	UP
Static pressure.....(IN.WC)	-.12
Avg. gas temp.....(DEG-F)	339
Moisture content.....(% V/V)	17.05
Avg. linear velocity.....(FT/SEC)	39.0
Gas density.....(LB/ACF)	.04633
Molecular weight.....(LB/LBMOLE)	29.61
Mass flow of gas.....(LB/HR)	247450
Volumetric flow rate.....	
actual.....(ACFM)	89023
dry standard.....(DSCFM)	47674

Interpoll Labs Report No. 4-3845
Appleton Papers Inc
Combined Locks, WI

Test No. 3
No. 11 Boiler Stack

Results of Volumetric Flow Rate Determination-------Method 2

Date of Determination.....	09-14-94
Time of Determination.....(HRS)	1904
Barometric pressure.....(IN.HG)	29.24
Pitot tube coefficient.....	.84
Number of sampling ports.....	4
Total number of points.....	12
Shape of duct.....	Round
Stack diameter.....(IN)	83.5
Duct area.....(SQ.FT)	38.03
Direction of flow.....	UP
Static pressure.....(IN.WC)	-.12
Avg. gas temp.....(DEG-F)	340
Moisture content.....(% V/V)	16.38
Avg. linear velocity.....(FT/SEC)	39.4
Gas density.....(LB/ACF)	.04653
Molecular weight.....(LB/LBMOLE)	29.71
Mass flow of gas.....(LB/HR)	250706
Volumetric flow rate.....	
actual.....(ACFM)	89794
dry standard.....(DSCFM)	48414

Test No. 3
No. 11 Boiler Stack

Results of Volumetric Flow Rate Determination-------Method 2

Date of Determination.....	09-14-94
Time of Determination.....(HRS)	1923
Barometric pressure.....(IN.HG)	29.24
Pitot tube coefficient.....	.84
Number of sampling ports.....	4
Total number of points.....	12
Shape of duct.....	Round
Stack diameter.....(IN)	83.5
Duct area.....(SQ.FT)	38.03
Direction of flow.....	UP
Static pressure.....(IN.WC)	-.12
Avg. gas temp.....(DEG-F)	339
Moisture content.....(% V/V)	17.05
Avg. linear velocity.....(FT/SEC)	38.6
Gas density.....(LB/ACF)	.04647
Molecular weight.....(LB/LBMOLE)	29.71
Mass flow of gas.....(LB/HR)	245473
Volumetric flow rate.....	
actual.....(ACFM)	88047
dry standard.....(DSCFM)	47151

Test No. 3
No. 11 Boiler Stack

Results of Volumetric Flow Rate Determination-------Method 2

Date of Determination.....	09-14-94
Time of Determination.....(HRS)	2001
Barometric pressure.....(IN.HG)	29.24
Pitot tube coefficient.....	.84
Number of sampling ports.....	4
Total number of points.....	12
Shape of duct.....	Round
Stack diameter.....(IN)	83.5
Duct area.....(SQ.FT)	38.03
Direction of flow.....	UP
Static pressure.....(IN.WC)	-.12
Avg. gas temp.....(DEG-F)	338
Moisture content.....(% V/V)	16.46
Avg. linear velocity.....(FT/SEC)	38.8
Gas density.....(LB/ACF)	.04663
Molecular weight.....(LB/LBMOLE)	29.70
Mass flow of gas.....(LB/HR)	247515
Volumetric flow rate.....	
actual.....(ACFM)	88467
dry standard.....(DSCFM)	47776

Test No. 3
No. 11 Boiler Stack

Results of Volumetric Flow Rate Determination-------Method 2

Date of Determination.....	09-14-94
Time of Determination.....(HRS)	815
Barometric pressure.....(IN.HG)	29.24
Pitot tube coefficient.....	.84
Number of sampling ports.....	4
Total number of points.....	12
Shape of duct.....	Round
Stack diameter.....(IN)	83.5
Duct area.....(SQ.FT)	38.03
Direction of flow.....	UP
Static pressure.....(IN.WC)	-.12
Avg. gas temp.....(DEG-F)	339
Moisture content.....(% V/V)	17.05
Avg. linear velocity.....(FT/SEC)	39.2
Gas density.....(LB/ACF)	.04645
Molecular weight.....(LB/LBMOLE)	29.70
Mass flow of gas.....(LB/HR)	249198
Volumetric flow rate.....	
actual.....(ACFM)	89415
dry standard.....(DSCFM)	47884

Test No. 6
No. 11 Boiler Stack

Results of Volumetric Flow Rate Determination-------Method 2

Date of Determination.....	09-15-94
Time of Determination.....(HRS)	1753
Barometric pressure.....(IN.HG)	29.08
Pitot tube coefficient.....	.84
Number of sampling ports.....	4
Total number of points.....	12
Shape of duct.....	Round
Stack diameter.....(IN)	83.5
Duct area.....(SQ.FT)	38.03
Direction of flow.....	UP
Static pressure.....(IN.WC)	-.17
Avg. gas temp.....(DEG-F)	327
Moisture content.....(% V/V)	13.43
Avg. linear velocity.....(FT/SEC)	41.0
Gas density.....(LB/ACF)	.04823
Molecular weight.....(LB/LBMOLE)	30.12
Mass flow of gas.....(LB/HR)	270522
Volumetric flow rate.....	
actual.....(ACFM)	93492
dry standard.....(DSCFM)	52750

Test No. 6
No. 11 Boiler Stack

Results of Volumetric Flow Rate Determination-------Method 2

Date of Determination.....	09-15-94
Time of Determination.....(HRS)	1820
Barometric pressure.....(IN.HG)	29.08
Pitot tube coefficient.....	.84
Number of sampling ports.....	4
Total number of points.....	12
Shape of duct.....	Round
Stack diameter.....(IN)	83.5
Duct area.....(SQ.FT)	38.03
Direction of flow.....	UP
Static pressure.....(IN.WC)	-.17
Avg. gas temp.....(DEG-F)	340
Moisture content.....(% V/V)	13.43
Avg. linear velocity.....(FT/SEC)	40.3
Gas density.....(LB/ACF)	.04746
Molecular weight.....(LB/LBMOLE)	30.13
Mass flow of gas.....(LB/HR)	261733
Volumetric flow rate.....	
actual.....(ACFM)	91915
dry standard.....(DSCFM)	51018

Test No. 6
No. 11 Boiler Stack

Results of Volumetric Flow Rate Determination-------Method 2

Date of Determination.....	09-15-94
Time of Determination.....(HRS)	1850
Barometric pressure.....(IN.HG)	29.08
Pitot tube coefficient.....	.84
Number of sampling ports.....	4
Total number of points.....	12
Shape of duct.....	Round
Stack diameter.....(IN)	83.5
Duct area.....(SQ.FT)	38.03
Direction of flow.....	UP
Static pressure.....(IN.WC)	-.17
Avg. gas temp.....(DEG-F)	338
Moisture content.....(% V/V)	13.03
Avg. linear velocity.....(FT/SEC)	40.7
Gas density.....(LB/ACF)	.04768
Molecular weight.....(LB/LBMOLE)	30.14
Mass flow of gas.....(LB/HR)	265766
Volumetric flow rate.....	
actual.....(ACFM)	92906
dry standard.....(DSCFM)	51936

Test No. 6
No. 11 Boiler Stack

Results of Volumetric Flow Rate Determination-------Method 2

Date of Determination.....	09-15-94
Time of Determination.....(HRS)	1913
Barometric pressure.....(IN.HG)	29.08
Pitot tube coefficient.....	.84
Number of sampling ports.....	4
Total number of points.....	12
Shape of duct.....	Round
Stack diameter.....(IN)	83.5
Duct area.....(SQ.FT)	38.03
Direction of flow.....	UP
Static pressure.....(IN.WC)	-.17
Avg. gas temp.....(DEG-F)	343
Moisture content.....(% V/V)	14.57
Avg. linear velocity.....(FT/SEC)	40.8
Gas density.....(LB/ACF)	.04704
Molecular weight.....(LB/LBMOLE)	30.12
Mass flow of gas.....(LB/HR)	262905
Volumetric flow rate.....	
actual.....(ACFM)	93159
dry standard.....(DSCFM)	50836

Test No. 6
No. 11 Boiler Stack

Results of Volumetric Flow Rate Determination-------Method 2

Date of Determination.....	09-15-94
Time of Determination.....(HRS)	1930
Barometric pressure.....(IN.HG)	29.08
Pitot tube coefficient.....	.84
Number of sampling ports.....	4
Total number of points.....	12
Shape of duct.....	Round
Stack diameter.....(IN)	83.5
Duct area.....(SQ.FT)	38.03
Direction of flow.....	UP
Static pressure.....(IN.WC)	-.17
Avg. gas temp.....(DEG-F)	345
Moisture content.....(% V/V)	15.10
Avg. linear velocity.....(FT/SEC)	40.8
Gas density.....(LB/ACF)	.04681
Molecular weight.....(LB/LBMOLE)	30.12
Mass flow of gas.....(LB/HR)	261690
Volumetric flow rate.....	
actual.....(ACFM)	93168
dry standard.....(DSCFM)	50403

Test No. 6
No. 11 Boiler Stack

Results of Volumetric Flow Rate Determination-------Method 2

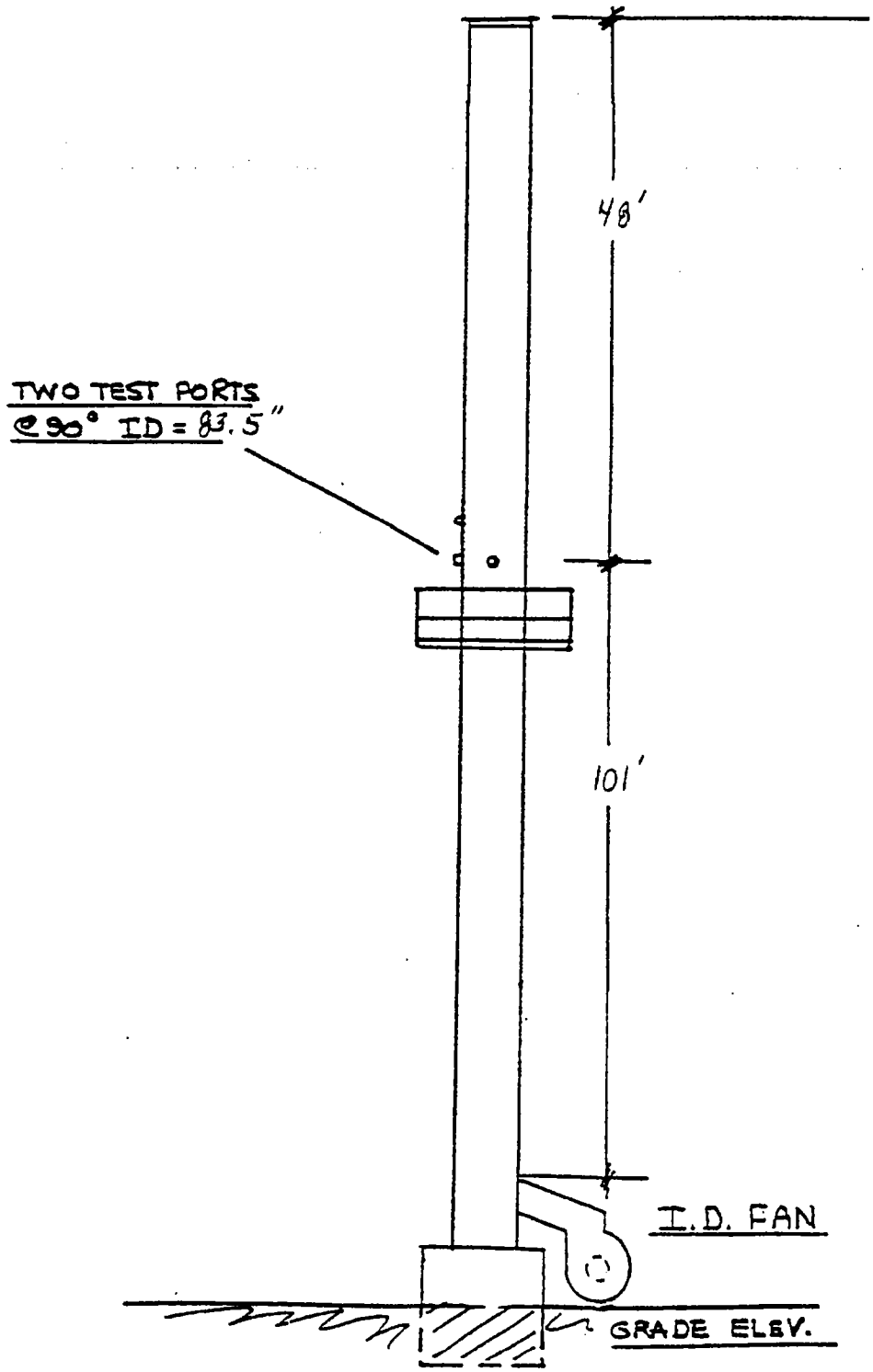
Date of Determination.....	09-15-94
Time of Determination.....(HRS)	2004
Barometric pressure.....(IN.HG)	29.08
Pitot tube coefficient.....	.84
Number of sampling ports.....	4
Total number of points.....	12
Shape of duct.....	Round
Stack diameter.....(IN)	83.5
Duct area.....(SQ.FT)	38.03
Direction of flow.....	UP
Static pressure.....(IN.WC)	-.17
Avg. gas temp.....(DEG-F)	345
Moisture content.....(% V/V)	13.92
Avg. linear velocity.....(FT/SEC)	40.2
Gas density.....(LB/ACF)	.04703
Molecular weight.....(LB/LBMOLE)	30.10
Mass flow of gas.....(LB/HR)	258562
Volumetric flow rate.....	
actual.....(ACFM)	91635
dry standard.....(DSCFM)	50265

APPENDIX B

LOCATION OF TEST PORTS

APPLETON PAPERS / LOCKSMILL PLANT

NO. 11 BOILER STACK



DHD 11/89

NOT TO SCALE

APPENDIX C

FIELD DATA SHEETS

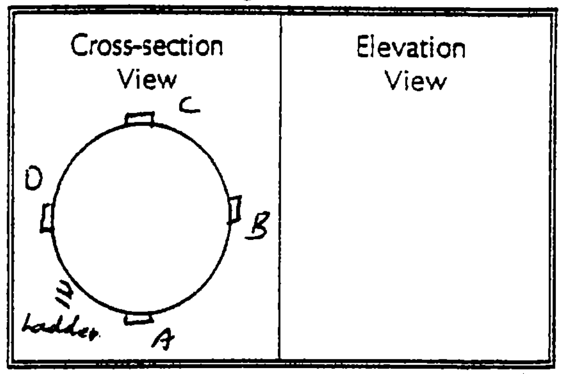
INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 2 Field Data Sheet

Job: Appleton Papers / Combined Locks, WI
Source: No. 11 Boiler) Stack
Test: 1 Run: 0 Date: 5-
Stack Dimen.: 53.5 IN.
Dry Bulb: 312 °F Wet bulb: 143 °F
Manometer: ☒ Reg. ☐ Exp ☐ Elec.
Barometric Pressure: 29.24 IN.HG
Static Pressure: -.12 IN.WC
Operators: M. Knoebler + J. Sempter
Pitot No.: 22V-4 C_p: .84

PM/NOx/CO

Drawing of Test Site



Traverse Point No.	Fraction of Diameter	Distance From Stack Wall (IN.)	Distance From End of Port (IN.)	Velocity	Temp. of Gas (°F)
		Port Length: 17 IN.		Time Start: 0925 HRS	
A-1	.044	3.67	20.67	.32	
2	.146	12.19	29.19	.29	
3	.296	24.72	41.72	.28	
B-1				.31	
2				.33	↑
3				.33	
C-1				.28	312
2				.27	
3				29	↓
D-1				.22	
2				.24	
3				.28	
Temp. Meas. Device & S/N: PDT-31 / TC				Time End: 0929 HRS	

R or nothing = reg. manometer; S = expanded; E = electronic

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job Appleton Papers / Combined Cycle Date 9-14-94 Test 1 Run 1
Source Mill Boiler / Stack No. of traverse points 12 X 2
Method 5 Filter holder: Glass Filter type: 4" Glass

Sample Train Leak Check:
Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☒
Post test: <0.02 cfm at 7 IN. HG (vac) ☒

Particulate Catch Data:
No. of filters used: 6970

Recovery solvent(s)
☒ acetone
☐ other(s)

No. of probe wash bottles: 1
Sample recovered by: M. Koehler & T. Scrivener

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1	662	473	189
Impinger No. 2	363	190	173
Impinger No. 3			
Condenser			
Desiccant	1549	1520	29
Total			391

Integrated Gas Sampling Data:

Bag Pump No. 22 Box No. 24 Bag No. 1
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: 0 cc/min at 15 IN.HG
Time start: 1000 (HRS) Time end: 1206 (HRS)
Sampling rate: 200 cc/min Operator: M. Koehler

S/N of O_2 Analyzer used to monitor train outlet: 11

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LABO

(612) 786-6020

EPA Method 5 Field Data Sheet

Job: Appleton Papers / Combined Facility
Source: Mill Boiler / Stack
Date: _____ Test 1 Run 1

Operators: M. Knehla + S. Swiatek
Meter Box No. 1B ΔH@ 1.84 in.WC
Gasmeter Coeff. .9956

Nozzle No. 4-5
Nozzle Dia. .306 in.
Bar. Press. 29.24 in.Hg

Pitot No 220-4
C_p .84
H_2O 16 %

Traverse Point No.	Sampling Time (min)	Sample Vol. (cf)	Velocity Head (in.WC)	Orifice Meter (in.WC)	Des. Vol. (cf)	VAC. (in.Hg)	Temperatures (°F) Stack	Probe	Oven	Imp.	Gas/In	Gas/Out	Oxygen (% v/v)
	1000	283.80											
A-3	5	287.37	.32	1.60	7.40	4	314	237	234	55	84	82	3.8
3	10	290.94	.34	1.60	1.00	4	327	241	240	52	89	83	3.2
2	15	294.37	.31	1.46	4.44	4	330	239	242	50	93	84	3.3
2	20	297.74	.29	1.38	2.80	3.5	324	244	237	50	95	84	3.2
1	25	300.93	.26	1.22	0.97	3.5	338	241	243	50	98	86	3.3
1	30	304.15	.27	1.28	4.21	3.5	335	240	249	49	101	86	3.3
B-3	35	308.00	.37	1.76	8.02	4.5	331	235	242	48	100	88	3.3
3	40	311.81	.38	1.80	1.88	4.5	334	241	254	48	104	89	3.2
2	45	315.88	.41	1.97	5.92	5	328	236	250	50	107	91	3.3
2	50	319.92	.39	1.88	9.88	4.5	328	237	246	50	107	91	3.3
1	55	323.72	.36	1.74	3.68	4.5	328	242	247	50	108	92	3.3
1	60	327.51	.37	1.79	7.54	4.5	329	241	250	50	108	93	3.3
C-3	65	331.26	.35	1.69	1.30	4	330	236	252	48	106	94	3.4
3	70	335.03	.35	1.70	5.06	4	327	234	249	48	110	95	3.3
2	75	338.44	.29	1.41	9.51	3.5	326	238	247	48	110	95	3.3
2	80	341.75	.27	1.32	1.83	3.5	326	235	249	51	111	96	3.3
1	85	345.02	.26	1.27	5.10	3.5	326	241	252	51	112	96	3.3
1	90	348.32	.25	1.22	8.30	3.5	328	246	248	51	112	97	3.3
D-3	95	351.77	.30	1.46	1.80	4	330	243	251	50	109	98	3.4
3	100	355.19	.29	1.42	5.25	4	326	238	252	50	112	98	3.3
2	105	358.67	.29	1.42	8.71	4	327	239	250	52	111	98	3.3
2	110	362.20	.29	1.41	2.16	4	330	235	247	52	113	99	3.3
1	115	365.33	.23	1.13	5.24	3.5	326	240	245	52	113	99	3.4
1	120	368.40	.23	1.13	9.33	3.5	326	238	244	53	114	100	3.3
	(1206)												
	θ - 120	V_m - 84.60		ΔH - 1.50							Avg. -	99.7	

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job Appleton Papers/Combined Locks, WI Date 9-14-94 Test 1 Run 2
Source Mill Boiler-/Stack No. of traverse points 12 x 2
Method 5 Filter holder: Glass Filter type: 4" GLF

Sample Train Leak Check:
Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☒
Post test: <0.02 cfm at 7 IN. HG (vac) ☒

Particulate Catch Data:
No. of filters used: 6871

Recovery solvent(s)
☒ acetone
☐ other(s)

No. of probe wash bottles: 1
Sample recovered by: M. Koehler + T. Scrupton

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1	635	470	165
Impinger No. 2	357	190	167
Impinger No. 3			
Condenser			
Desiccant	1377	1347	30
Total			362

Integrated Gas Sampling Data:

Bag Pump No. 224 Box No. 24 Bag No. 2
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: 0 cc/min at 15 IN.HG
Time start: 1245 (HRS) Time end: 1459 (HRS)
Sampling rate: 2000 cc/min Operator: M. Koehler

S/N of O_2 Analyzer used to monitor train outlet: 11

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(612) 786-6020

EPA Method 5 Field Data Sheet

Source: Appleton Paper / Combined boilers, w/ No. 11 Boiler / Stack
Date: 9-14-94 Test 1 Run 2

Operators: M. Koehler & T. Sweyler
Meter Box No. 1B ΔH@ 1.84 in.WC
Gasmeter Coeff. .9956

Nozzle No. 4-5
Nozzle Dia. .306 in.
Bar. Press. 29.24 in.Hg

Pitot No. 22V-4
C_p .84
H_2O 19.1 %

Traverse Point No.	Sampling Time (min)	Sample Vol. (cf)	Velocity Head (in.WC)	Orifice Meter (in.WC)	Des. Vol. (cf)	VAC. (in.Hg)	Temperatures (°F) Stack	Probe	Oven	Imp.	Gas/In	Gas/Out	Oxygen (% v/v)
	1245	368.70											
D-3	5	372.05	.29	1.33	2.02	3.5	323	238	258	50	109	103	2.9
3	10	375.37	.29	1.34	5.39	3.5	323	241	250	48	115	104	3.3
2	15	378.55	.26	1.20	8.58	3.5	330	246	247	48	117	104	3.3
2	20	381.04	.28	1.29	1.90	3.5	332	244	252	47	120	102	3.2
1	25	384.08	.23	1.06	4.91	3	331	240	255	48	121	103	3.3
1	30	387.92	.23	1.07	2.93	3	330	239	251	47	122	104	3.2
C-3	35	391.29	.30	1.39	1.38	3.5	330	244	253	47	120	104	3.3
3	40	394.67	.29	1.34	4.77	3.5	330	245	258	47	123	105	3.3
2	45	398.10	.28	1.30	8.11	3.5	331	242	254	49	124	105	3.3
2	50	401.43	.29	1.35	1.50	3.5	332	240	251	49	124	106	3.3
1	55	404.96	.29	1.35	4.90	4	333	237	249	49	125	105	3.3
1	60	408.14	.27	1.25	8.18	4	333	242	245	50	125	106	3.3
B-3	65	411.62	.31	1.45	1.71	4	328	240	242	50	124	107	3.4
3	70	415.27	.33	1.54	5.34	4	331	237	246	50	125	108	3.3
2	75	418.81	.31	1.44	8.97	4	333	244	249	53	127	108	3.3
2	80	422.44	.32	1.49	2.45	4	335	241	253	52	127	109	3.3
1	85	426.06	.34	1.58	6.13	4	338	236	250	52	128	110	3.3
1	90	429.43	.27	1.25	9.43	4	338	238	252	52	128	110	3.3
A-3	95	433.00	.32	1.49	3.01	4	335	241	248	53	120	109	3.3
3	100	436.61	.33	1.53	6.63	4	335	245	246	51	123	109	3.3
2	105	440.25	.34	1.57	0.31	4	337	247	243	51	126	110	3.2
2	110	443.85	.34	1.57	3.99	4.5	339	246	243	51	127	110	3.3
1	115	447.52	.32	1.49	7.57	4.5	338	242	250	52	128	110	3.2
1	120	451.15	.33	1.54	1.22	4.5	332	239	252	52	128	111	3.2
	(1459)												
	θ - 120	V_m - 82.45		ΔH - 1.38							Avg. - 114.9		

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job Appleton Papers / Combined Locks WI
Date 9-14-94 Test 1 Run 3
Source N. 11 Boiler / Stack
No. of traverse points 12 x 2
Method 5 Filter holder: Glass
Filter type: 4" G.F.

Sample Train Leak Check:

Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☒
Post test: <0.02 cfm at 7 IN. HG (vac) ☒

Particulate Catch Data:

No. of filters used: 6074

Recovery solvent(s)
☒ acetone
☐ other(s)

No. of probe wash bottles: 1
Sample recovered by: M. Kuehler + S. Sarpaler

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1	647	477	170
Impinger No. 2	364	198	166
Impinger No. 3			
Condenser			
Desiccant	1572	1549	23
Total			359

Integrated Gas Sampling Data:

Bag Pump No. 22A
Box No. 24 Bag No. 3
Bag Material: 5-layer Aluminized Tedlar
Size: 44 L
Pretest leak check: 0 cc/min at 15 IN.HG
Time start: 1525 (HRS) Time end: (HRS)
Sampling rate: 200 cc/min Operator: M. Kuehler

S/N of O_2 Analyzer used to monitor train outlet: 11

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RPC ABC TOR INC
(612) 786-6020

EPA Method 5 Field Data Sheet

Lab: Appleton Papers / Combined bark, w/
Source: No. 11 Boiler / Stack
Date: 9-14-94 Test: 1 Run: 3

Operators: M. Knoblauch + J. Sampler
Meter Box No.: 18 ΔH@ 1.84 in.WC
Gasmeter Coeff.: .9950

Nozzle No.: 4-5
Nozzle Dia.: .306 in.
Bar. Press.: 29.24 in.Hg

Pitot No.: 220-4
C_p: .84
H_2O: 18.7 %

Traverse Point No.	Sampling Time (min)	Sample Vol. (cf)	Velocity Head (in.WC)	Orifice Meter (in.WC)	Des. Vol. (cf)	VAC. (in.Hg)	Temperatures (°F) Stack	Probe	Oven	Imp.	Gas/In	Gas/Out	Oxygen (% v/v)
	1525	451.40											
A-3	5	455.10	.35	1.64	5.14	4	332	232	238	43	120	109	3.1
3	10	458.70	.33	1.54	8.77	4	335	237	241	43	124	108	3.2
2	15	462.33	.33	1.54	2.41	4	337	240	242	43	127	109	3.1
2	20	466.07	.34	1.59	6.11	4	337	246	238	44	128	108	3.2
1	25	469.69	.32	1.50	9.70	4	338	248	240	44	129	109	3.2
1	30	473.40	.35	1.64	3.46	4	339	245	246	44	130	109	3.3
B-3	35	477.04	.32	1.50	7.07	4	336	249	245	44	124	110	3.3
3	40	480.53	.31	1.45	0.60	4	337	244	249	46	128	110	3.3
2	45	484.07	.31	1.45	4.14	4	337	246	253	45	129	109	3.2
2	50	487.63	.29	1.36	7.57	4	338	250	247	45	129	111	3.3
1	55	490.28	.25	1.17	0.76	3.5	337	248	247	45	129	111	3.3
1	60	493.72	.22	1.04	3.26	3	332	244	249	48	130	111	3.2
C-3	65	497.03	.28	1.32	7.15	4	333	245	252	48	127	111	3.2
3	70	500.45	.27	1.27	0.46	4	334	250	246	48	129	112	3.1
2	75	503.88	.28	1.32	3.84	4	335	243	249	47	130	111	3.2
2	80	507.18	.27	1.27	7.15	4	339	240	248	47	131	111	3.3
1	85	510.62	.29	1.36	0.59	4	337	237	248	47	130	112	3.2
1	90	513.94	.28	1.31	3.97	4	339	244	251	47	131	112	3.3
D-3	95	517.27	.28	1.32	7.36	4	335	244	255	49	129	113	3.2
3	100	520.84	.32	1.51	0.98	4	333	242	256	49	130	113	3.3
2	105	524.50	.31	1.47	4.54	4	334	246	252	49	131	113	3.2
2	110	527.95	.26	1.23	7.81	4	334	247	249	51	131	113	3.5
1	115	531.31	.29	1.37	1.26	4	336	242	248	51	132	112	3.4
1	120	534.50	.26	1.23	4.53	4	335	243	250	51	131	113	3.3
	(1731)												
	θ - 120	V_m - 83.10		ΔH - 1.39							Avg. - 119.7		

Interpoll Laboratories
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EPA Method 7 Sample Collection
Field Data Sheet

Job Appleton Papers Date 9-14-94 Bar. Pressure 29.24 IN.HG.
Test Location No. 11 Boiler Stack Fuel Type Natural Gas Sample Train No. Green
Technician J. Scripter Pump No. 1

No.	Test Run Point	Flask No.	Time (HRS)	Vacuum (IN.HG.)	Flask Temp. (°F)	Leak Rate <0.4 IN.HG./MIN.
1	1/1/A	9	1022	27.00	92	☒ Yes ☐ No
2	1/1/B	10	1049	26.90	92	☒ Yes ☐ No
3	1/1/C	11	1107	26.90	92	☒ Yes ☐ No
4	1/1/D	12	1136	26.70	92	☒ Yes ☐ No
5	1/2/A	29	1302	26.90	93	☒ Yes ☐ No
6	1/2/B	38	1337	26.80	93	☒ Yes ☐ No
7	1/2/C	55	1356	26.80	93	☒ Yes ☐ No
8	1/2/D	56	1407	26.70	93	☒ Yes ☐ No
9	1/3/A	57	1540	26.70	93	☒ Yes ☐ No
10	1/3/B	7	1612	26.80	93	☒ Yes ☐ No
11	1/3/C	~~70~~ 44	1628	26.80	93	☒ Yes ☐ No
12	1/3/D	60	1700	26.80	93	☒ Yes ☐ No
13	Blank	2				☐ Yes ☐ No
14						☐ Yes ☐ No
15						☐ Yes ☐ No
16						☐ Yes ☐ No
17						☐ Yes ☐ No
18						☐ Yes ☐ No
19						☐ Yes ☐ No
20						☐ Yes ☐ No
21						☐ Yes ☐ No
22						☐ Yes ☐ No
23						☐ Yes ☐ No
24						☐ Yes ☐ No
25						☐ Yes ☐ No
26						☐ Yes ☐ No
27						☐ Yes ☐ No

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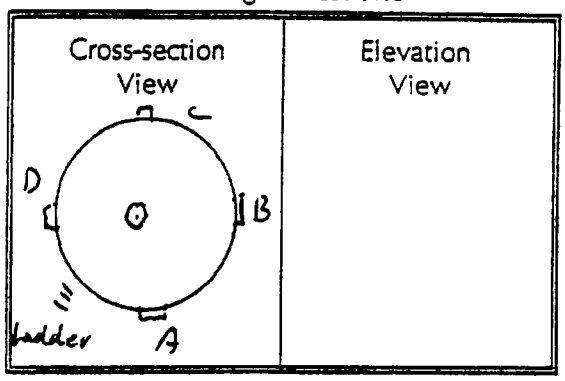
EPA Method 2 Field Data Sheet

Job: Appleton Papers / Combined Locks, WI
Source: No. 11 Boiler / Stack
Test: 3 Run: 1 Date: 9-14-94
Stack Dimen.: 83.5 IN.
Dry Bulb: 72.5 °F Wet bulb: 14.5 °F
Manometer: ☐ Reg. ☐ Exp ☐ Elec.
Barometric Pressure: 29.24 IN.HG
Static Pressure: -.12 IN.WC
Operators: M. Kuehler & T. Scripter
Pitot No.: 22V-4 C_p: .94

Drawing of Test Site



Traverse Point No.	Fraction of Diameter	Distance From Stack Wall (IN.)	Distance From End of Port (IN.)	Velocity	Temp. of Gas (°F)
		Port Length: 17 IN.		Time Start: 1803 HRS	
A-1				.33	
2				.32	
3		Refer to Test No. 1		.33	
B-1		For pts used.		.24	
2				.30	↑
3				.31	
C-1				.28	32.5
2				.28	
3				.27	↓
D-1				.27	
2				.29	
3				.32	

Temp. Meas. Device & S/N: PDT-31 / TC
Time End: 1806 HRS

R or nothing = reg. manometer; S = expanded; E = electronic

INTERPOLL LABORATORIES, INC.
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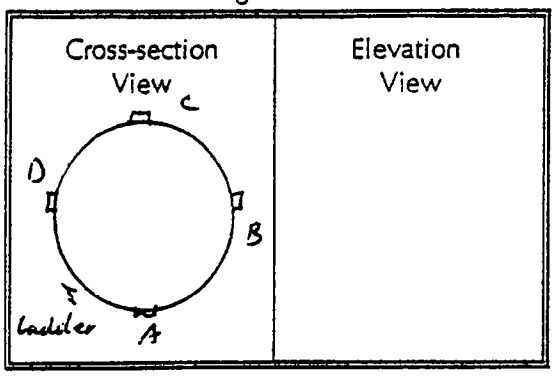
EPA Method 2 Field Data Sheet

Job: Appleton Papers / Combined Lists, WI
Source: No. 11 Boiler / Stack
Test: 3 Run: 2 Date: 9-14-94
Stack Dimen.: 83.5 IN.
Dry Bulb: 339 °F Wet bulb: 147 °F
Manometer: ☐ Reg. ☐ Exp ☐ Elec.
Barometric Pressure: 29.24 IN.HG
Static Pressure: -.12 IN.WC
Operators: M. Koehler + J. Scripter
Pitot No.: ~~[illegible]~~ 22V-4 C_p: ~~[illegible]~~ .84

Drawing of Test Site



Traverse Point No.	Fraction of Diameter	Distance From Stack Wall (IN.)	Distance From End of Port (IN.)	Velocity	Temp. of Gas (°F)
		Port Length: 17	IN.	Time Start: 1829	HRS
A-1				.33	
2				.34	
3		Refer to Test No. 1		.32	
B-1		for pts used		.31	↑
2				.32	
3				.32	339
C-1				.28	↓
2				.29	
3				.29	
D-1				.23	
2				.27	
3				.29	
--				-	

Temp. Meas. Device & S/N: PDT-31 / TC
Time End: 1833 HRS

R or nothing = reg. manometer; S = expanded; E = electronic

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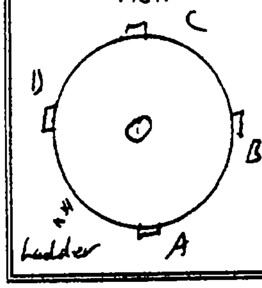
EPA Method 2 Field Data Sheet

Job: Appleton Papers / Combined Locks, WI
Source: No. 11 Boiler / Stack
Test: 3 Run 3 Date 9-14-94
Stack Dimen.: 83.5 IN.
Dry Bulb: 340 °F Wet bulb 146 °F
Manometer: ☐ Reg. ☐ Exp ☐ Elec.
Barometric Pressure: 29.24 IN.HG
Static Pressure: -.12 IN.WC
Operators: McKuehler + S. Scripter
Pitot No.: 22U-4 C_p .84

Drawing of Test Site

Cross-section View	Elevation View
	

Traverse Point No.	Fraction of Diameter	Distance From Stack Wall (IN.)	Distance From End of Port (IN.)	Velocity	Temp. of Gas (°F)
		Port Length: 17 IN.		Time Start: 1904 HRS	
A-1				.27	
2				.30	
3		Refer to Test No. 1		.33	
B-1		for pts used		.36	
2				.40	↑
3				.34	
C-1				.25	340
2				.28	
3				.33	↓
D-1				.23	
2				.29	
3				.30	
--					

Temp. Meas. Device & S/N: PDT-31 / Tc — Time End: 1907 HRS

R or nothing = reg. manometer; S = expanded; E = electronic

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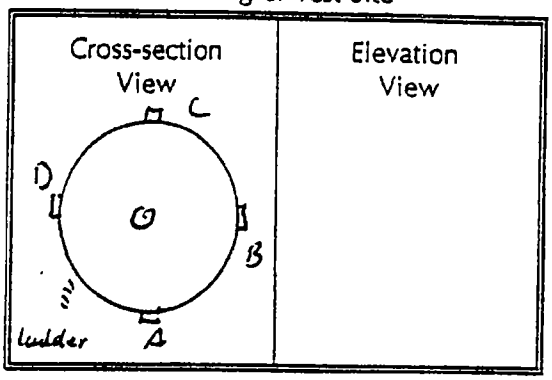
EPA Method 2 Field Data Sheet

Job: Appleton Papers / Combined Locks, WI
Source: Mill Boiler / Stack
Test: 3 Run: 4 Date: 9-14-94
Stack Dimen.: 83.5 IN.
Dry Bulb: 334 °F Wet bulb: 147 °F
Manometer: ☒ Reg. ☐ Exp ☐ Elec.
Barometric Pressure: 29.24 IN.HG
Static Pressure: -.12 IN.WC
Operators: Mikeschlar + J. Scriptor
Pitot No.: 22V-4 C_p: .84

Drawing of Test Site



Traverse Point No.	Fraction of Diameter	Distance From Stack Wall (IN.)	Distance From End of Port (IN.)	Velocity	Temp. of Gas (°F)
		Port Length: 17 IN.		Time Start: 1923 HRS	
A-1				.30	
2				.32	
3		Refer to Test	No. 1	.31	
B-1		for pts used		.29	
2				.32	1
3				.32	
C-1				.29	339
2				.28	
3				.30	
D-1				.23	
2				.27	
3				.29	
--				-	

Temp. Meas. Device & S/N: PDT-31 / TC
Time End: 1926 HRS

R or nothing = reg. manometer; S = expanded; E = electronic

INTERPOLL LABORATORIES, INC.
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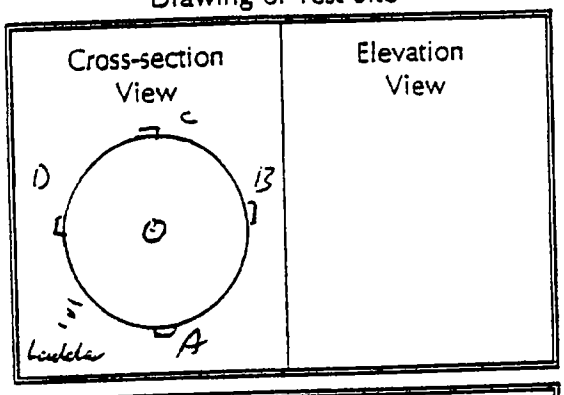
EPA Method 2 Field Data Sheet

Job: Appleton Papers / Combined Locks w/
Source: No. 11 Boiler / Stack
Test: 3 Run: 5 Date: 9.14.94
Stack Dimen.: Ø 3.5' IN.
Dry Bulb: 338 °F Wet bulb: 146 °F
Manometer: ☒ Reg. ☐ Exp ☐ Elec.
Barometric Pressure: 29.24 IN.HG
Static Pressure: -.12 IN.WC
Operators: M. Kuehler + J. Sengler
Pitot No.: 22U-4 C_p .84

Drawing of Test Site



Traverse Point No.	Fraction of Diameter	Distance From Stack Wall (IN.)	Distance From End of Port (IN.)	Velocity	Temp. of Gas (°F)
		Port Length: 17 IN.		Time Start: 2001 HRS	
A-1				.33	
2				.34	
3		Refer to Test No. 1 for		.33	
B-1		pts used		.27	
2				.32	↑
3				.33	
C-1				.27	338
2				.29	↓
3				.29	
D-1				.23	
2				.28	
3				.29	
--					

Temp. Meas. Device & S/N: PDT-31 / TC
Time End: 2003 HRS

R or nothing = reg. manometer; S = expanded; E = electronic

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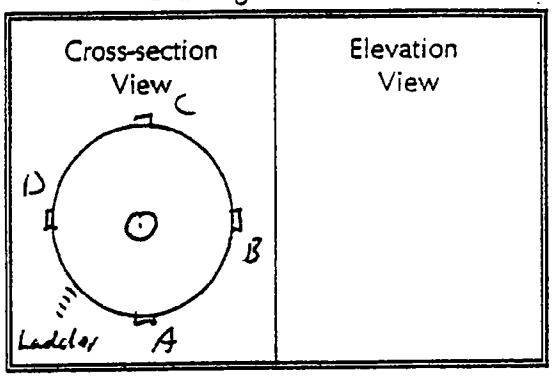
EPA Method 2 Field Data Sheet

Job: Appleton Papers / Combined tests, w/
Source: No. 11 Boiler / Stack
Test: 3 Run: 6 Date: 9-14-94
Stack Dimen.: 83.5 IN.
Dry Bulb: 339 °F Wet bulb: 147 °F
Manometer: ☒ Reg. ☐ Exp ☐ Elec.
Barometric Pressure: 29.24 IN.HG
Static Pressure: -.12 IN.WC
Operators: M. Cochlan + T. Scripter
Pitot No.: 22W-4 C_p: .84

Drawing of Test Site



Traverse Point No.	Fraction of Diameter	Distance From Stack Wall (IN.)	Distance From End of Port (IN.)	Velocity	Temp. of Gas (°F)
		Port Length: 17	IN.	Time Start: 0915	HRS
A-1				.35	
2				.33	
3		Refer to Test	No. 1	.34	
B-1		for pts	used	.25	
2				.31	
3				.32	339
C-1				.29	
2				.28	
3				.28	
D-1				.29	
2				.31	
3				.28	
--				-	
Temp. Meas. Device & S/N:		PDT-31 / TC		Time End: 0919	HRS

R or nothing = reg. manometer; S = expanded; E = electronic

INTERPOLL LABORATORIES, INC.
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Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job Appleton Papers/Combined Locks, WI
Date 9-14-94 Test 3 Run 1
Source No. 11 Boiler/Stack
No. of traverse points 3
Method 6 Filter holder: NA
Filter type: NA

Sample Train Leak Check:

Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☒
Post test: <0.02 cfm at 7 IN. HG (vac) ☒

Particulate Catch Data:

No. of filters used:

NA

Recovery solvent(s)

☐ acetone NA
☐ other(s)

No. of probe wash bottles: 0
Sample recovered by: M. Kuehler + J. Scrupter

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1	540	477	63
Impinger No. 2			
Impinger No. 3			
Condenser			
Desiccant	1434	1429	5
Total			68

Integrated Gas Sampling Data:

Bag Pump No. 22A
Bag Material: 5-layer Aluminized Tedlar
Pretest leak check: 0
Time start: 1757
Sampling rate: 1000

Box No. 25 Bag No. 1
Size: 44 L
cc/min at 15 IN.HG
(HRS) Time end: 1918 (HRS)
cc/min Operator: M. Kuehler

S/N of O_2 Analyzer used to monitor train outlet: 11

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INTERPOLL LABORATORIES, INC.
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EPA Method 4 and 6 Field Data Sheet

Job Appleton Papers / Combined Locks, WI
Source No. 11 Boiler / Stack
Date 9-14-94 Test 3 Run 1

Operator(s) M. Kloehler + T. Scrivener
Meter Box No. 18 Gasmeter Coef. .9956
ΔH@ 1.84 IN.WC Bar.Press ____ IN.HG
29.24

Sample Train Leak Check:
Pretest: < 0.02 cfm at 15 IN.HG ☒
Post Test: <0.02 cfm at 2 IN.HG ☒

Trav. Point No.	Sample Time (Min)	Sample Volume (cf)	Orif. Meter (IN.WC)	Vac. IN.HG	Temperatures (°F) Stack	Probe	Oven	Impg.	Gas/ In	Gas/ Out	O_2 (%v/v)
	(1757)	534.70									
B-3	3.5	537.39	1.84	4.5	330	241	248	45	127	114	3.4
3	7	540.07	1.84	4.5	322	244	250	45	129	114	3.3
2	10.5	542.77	1.84	4.5	315	244	253	44	132	114	3.2
2	14	545.35	1.84	4.5	325	248	249	46	133	114	3.3
1	17.5	548.00	1.84	4.5	325	245	251	46	134	113	3.2
1	21	550.60	1.84	4.5	324	242	247	46	135	114	3.3
	(1919)										
	θ = 21	V = 15.90	ΔH =	1.84	323.50 ξ =				ξ = 122.75		

Condensate Data:

Item	Weight (g) Final	Tare	Difference
Impingers			
Condenser			
Desiccant			
		Total	

Preliminary Results of SO_2 Concentration Determination	
V_{std} =	DSCF
Moisture Gravimetric =	%v/v
Moisture Psychrometric =	%v/v
SO_2 DRY =	PPM
SO_2 WET =	PPM
LB/MMBtu=	

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INTERPOLL LABORATORIES, INC.
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Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job Appleton Papers / Combined Locks, WI Date 9-14-94 Test 3 Run 2
Source Mill Bldg / Stack No. of traverse points 3
Method 6 Filter holder: NA Filter type: NA

Sample Train Leak Check:

Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☑
Post test: <0.02 cfm at 9 IN. HG (vac) ☑

Particulate Catch Data:

No. of filters used: NA

Recovery solvent(s)
☐ acetone NA
☐ other(s)

No. of probe wash bottles: 0
Sample recovered by: M. Kuehler + J. Scryter

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1	535 ~~537~~	475	60
Impinger No. 2			
Impinger No. 3			
Condenser			
Desiccant	1383	1375	8
Total			68

Integrated Gas Sampling Data:

Bag Pump No. 22A Box No. 25 Bag No. 2
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: 0 cc/min at 15 IN.HG
Time start: 1825 (HRS) Time end: 1946 (HRS)
Sampling rate: 1000 cc/min Operator: M. Kuehler

S/N of O_2 Analyzer used to monitor train outlet: 11

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INTERPOLL LABORATORIES, INC.
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EPA Method 4 and 6 Field Data Sheet

Job Appleton Papers / Combined Locks, WI
Source No. 11 Boiler / Stack
Date 9-14-94 Test 3 Run 2

Operator(s) M. Kuehler & D. Scripter
Meter Box No. 18 Gasmeter Coef. .9956
ΔH@ 1.84 IN.WC Bar.Press 29.24 IN.HG

Sample Train Leak Check:
Pretest: < 0.02 cfm at 15 IN.HG ☒
Post Test: <0.02 cfm at 8 IN.HG ☒

Trav. Point No.	Sample Time (Min)	Sample Volume (cf)	Orif. Meter (IN.WC)	Vac. IN.HG	Temperatures (°F) Stack	Probe	Oven	Impg.	Gas/ In	Gas/ Out	O_2 (%v/v)
	1925	550.90									
B-3	3.5	553.61	1.84	4.5	338	247	256	47	123	109	3.8
3	7	556.27	1.84	4.5	340	244	253	47	128	109	3.3
2	10.5	558.96	1.84	4.5	339	248	251	47	129	109	3.2
2	14	561.61	1.84	4.5	340	247	250	49	130	110	3.3
1	17.5	564.30	1.84	4.5	336	246	247	50	131	110	3.2
1	21	566.88	1.84	4.5	336	240	249	49	132	110	3.2
	(1946)										
	θ = 21	V_m = 15.98	ΔH =	1.84	338.17 ξ =				ξ = 119.17		

Condensate Data:

Item	Weight (g) Final	Tare	Difference
Impingers			
Condenser			
Desiccant			
		Total	

Preliminary Results of SO_2 Concentration Determination	
V_{std} =	DSCF
Moisture Gravimetric =	%v/v
Moisture Psychrometric =	%v/v
SO_2 DRY =	PPM
SO_2 WET =	PPM
LB/MMBtu=	

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INTERPOLL LABORATORIES, INC.
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Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job Appleton Papers Kimberly Clark, WI Date 9-14-94 Test 3 Run 3
Source Mill Boiler / Stack No. of traverse points 3
Method 6 Filter holder: NA Filter type: NA

Sample Train Leak Check:
Pretest: ≤ 0.02 cfm at 15 IN.HG (vac)
Post test: <0.02 cfm at 10 IN. HG (vac)

Particulate Catch Data:
No. of filters used: NA

Recovery solvent(s)
☐acetone NA
☐other(s)

No. of probe wash bottles: 0
Sample recovered by: M. Kuehler + T. Scripter

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1	540	472	68
Impinger No. 2			
Impinger No. 3			
Condenser			
Desiccant	1342	1335	7
Total			75

Integrated Gas Sampling Data:

Bag Pump No. 22A Box No. 25 Bag No. 3
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: 0 cc/min at 15 IN.HG
Time start: 1852 (HRS) Time end: 1913 (HRS)
Sampling rate: 1000 cc/min Operator: M. Kuehler

S/N of O_2 Analyzer used to monitor train outlet: N

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INTERPOLL LABORATORIES, INC.
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EPA Method 4 and 6 Field Data Sheet

Job: Appleton Papers / Combined Locks, WI
Source: No. 11 Boiler / Stack
Date: 9-14-94 Test: 3 Run: 3

Operator(s): M. Kuehl + J. Scrypter
Meter Box No.: 18
ΔH@: 1.84 IN.WC
Gasmeter Coef.: .9956
Bar.Press: 29.24 IN.HG

Sample Train Leak Check:
Pretest: < 0.02 cfm at 15 IN.HG
Post Test: <0.02 cfm at 0 IN.HG

Trav. Point No.	Sample Time (Min)	Sample Volume (cf)	Orif. Meter (IN.WC)	Vac. IN.HG	Temperatures (°F) Stack	Probe	Oven	Impg.	Gas/ In	Gas/ Out	O_2 (%v/v)
	1052	567.10									
B.3	3.5	569.83	1.84	8	340	248	251	46	125	110	3.2
3	7	572.46	1.84	8	341	245	247	46	127	110	3.3
2	10.5	575.17	1.84	8	340	249	246	46	127	110	3.2
2	14	577.84	1.84	8	339	249	244	47	128	110	3.2
1	17.5	580.59	1.84	8	339	246	248	47	129	110	3.2
1	21	583.13	1.84	8	340	242	245	47	129	110	3.3
	(1913)										
	θ = 21	V_m = 16.03	ΔH =	1.84	339.53 $\bar{t}$ =				$\bar{t}$ = 118.75		

Condensate Data:

Item	Weight (g) Final	Tare	Difference
Impingers			
Condenser			
Desiccant			
		Total	

Preliminary Results of SO_2 Concentration Determination	
V_{std} =	DSCF
Moisture Gravimetric =	%v/v
Moisture Psychrometric =	%v/v
SO_2, DRY =	PPM
SO_2, WET =	PPM
LB/MMBtu=	

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job Appleton Papers/Combined Locks, WI Date 9-14-94 Test 3 Run 4
Source #11 Boiler/Stack No. of traverse points 3
Method 6 Filter holder: NA Filter type: NA

Sample Train Leak Check:

Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☒
Post test: <0.02 cfm at 7 IN. HG (vac) ☒

Particulate Catch Data:

No. of filters used: NA

Recovery solvent(s)
☐ acetone NA
☐ other(s) _____

No. of probe wash bottles: 0
Sample recovered by: M. Kuehler + J. Scripter

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1	538	477	61
Impinger No. 2			
Impinger No. 3			
Condenser			
Desiccant	1440	1434	6
Total			67

Integrated Gas Sampling Data:

Bag Pump No. 22A Box No. 19 Bag No. 1
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: 0 cc/min at 15 IN.HG
Time start: 1919 (HRS) Time end: 1940 (HRS)
Sampling rate: 1000 cc/min Operator: M. Kuehler

S/N of O_2 Analyzer used to monitor train outlet: 11

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INTERPOLL LABORATORIES, INC.
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EPA Method 4 and 6 Field Data Sheet

Job Appleton Papers / Combined Locks, WI
Source No. 11 B. Line / Stack
Date 9-14-94 Test 3 Run 4

Operator(s) W. Kwekkeboom + J. Scrupter
Meter Box No. 18 Gasmeter Coef. .9956
ΔH@ 1.84 IN.WC Bar.Press 29.24 IN.HG

Sample Train Leak Check:
Pretest: < 0.02 cfm at 15 IN.HG ☒
Post Test: <0.02 cfm at 2 IN.HG ☒

Trav. Point No.	Sample Time (Min)	Sample Volume (cf)	Orif. Meter (IN.WC)	Vac. IN.HG	Temperatures (°F) Stack	Probe	Oven	Impg.	Gas/ In	Gas/ Out	O_2 (%v/v)
	1919	583.50									
B-3	3.5	586.30	1.84	4.5	337	240	243	47	123	109	3.2
3	7	589.33	1.84	4.5	338	243	250	47	126	109	3.3
2	10.5	591.62	1.84	4.5	340	242	254	49	126	109	3.2
2	14	594.30	1.84	4.5	340	248	247	49	129	109	3.2
1	17.5	596.98	1.84	4.5	339	244	246	49	130	110	3.2
1	21	599.65	1.84	4.5	339	246	246	49	130	109	3.2
	(1940)										
	θ = 21	V_m = 16.15	ΔH =	1.84	338.83 $\bar{t}$ =				$\bar{t}$ = 118.42		

Condensate Data:

Item	Weight (g) Final	Tare	Difference
Impingers			
Condenser			
Desiccant			
		Total	

Preliminary Results of SO_2 Concentration Determination	
$V_{m(std)}$ =	DSCF
Moisture Gravimetric =	%v/v
Moisture Psychrometric =	%v/v
SO_2, DRY =	PPM
SO_2, WET =	PPM
LB/MMBtu=	

INTERPOLL LABORATORIES, INC.
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Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job Appleton Papers/Combined Lock, WI Date 9-14-94 Test 3 Run 5
Source No 11 Boiler/Stack No. of traverse points 3
Method 6 Filter holder: NA Filter type: NA

Sample Train Leak Check:
Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☒
Post test: 0.02 cfm at 7 IN. HG (vac) ☒

Particulate Catch Data:
No. of filters used: NA

Recovery solvent(s)
☐acetone NA
☐other(s)

No. of probe wash bottles: 0
Sample recovered by: M. Kuehlow + J. Scripter

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1	545	482	63
Impinger No. 2			
Impinger No. 3			
Condenser			
Desiccant	1390	1393	7
Total			70

Integrated Gas Sampling Data:

Bag Pump No. 22A
Bag Material: 5-layer Aluminized Tedlar
Pretest leak check: 0
Time start: 1946
Sampling rate: 1000

Box No. 19 Bag No. 2
Size: 44 L
cc/min at 15 IN.HG
(HRS) Time end: 2007 (HRS)
cc/min Operator: M. Kuehlow

S/N of O_2 Analyzer used to monitor train outlet: 11

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 4 and 6 Field Data Sheet

Job Appleton Papers / Combined Locks, WI
Source No. 11 Boiler / Stack
Date 9-14-94 Test 3 Run 5

Operator(s) M. Kuehler + J. Scripter
Meter Box No. 18 Gasmeter Coef. .9956
ΔH@ 1.84 IN.WC Bar.Press 29.24 IN.HG

Sample Train Leak Check:
Pretest: < 0.02 cfm at 15 IN.HG
Post Test: ≤ 0.02 cfm at 7 IN.HG

Trav. Point No.	Sample Time (Min)	Sample Volume (cf)	Orif. Meter (IN.WC)	Vac. IN.HG	Temperatures (°F) Stack	Probe	Oven	Impg.	Gas/ In	Gas/ Out	O_2 (%v/v)
	1946	579.90									
B-3	3.5	602.58	1.84	4.5	339	243	250	49	127	109	3.3
3	7	605.26	1.84	4.5	341	247	252	49	129	109	3.5
2	10.5	607.94	1.84	4.5	340	244	255	49	130	109	3.2
2	14	610.63	1.84	4.5	333	241	258	49	131	109	3.2
1	17.5	613.27	1.84	4.5	339	246	254	49	131	109	3.3
1	21	615.92	1.84	4.5	339	244	250	49	131	109	3.3
	(2007)										
	θ = 21	V_m = 16.02	ΔH =	1.84	338.50 $\bar{t}$ =				$\bar{t}_s$ = 119.42		

Condensate Data:

Item	Weight (g) Final	Tare	Difference
Impingers			
Condenser			
Desiccant			
		Total	

Preliminary Results of SO_2 Concentration Determination	
V_{std} =	DSCF
Moisture Gravimetric =	%v/v
Moisture Psychrometric =	%v/v
SO_2, DRY =	PPM
SO_2, WET =	PPM
LB/MMBtu=	

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INTERPOLL LABORATORIES, INC.
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Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job Appleton Papers/Combined Cycle, WI
Date 9-14-94 Test 3 Run 6
Source No. 11 Boiler / Stack
No. of traverse points 3
Method 6 Filter holder: NA
Filter type: NA

Sample Train Leak Check:

Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☒
Post test: <0.02 cfm at 9 IN. HG (vac) ☒

Particulate Catch Data:

No. of filters used: NA

Recovery solvent(s)
☒ acetone NA
☐ other(s)

No. of probe wash bottles: 0
Sample recovered by: M. Koehler + T. Scupter

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1	538	472	66
Impinger No. 2			
Impinger No. 3			
Condenser			
Desiccant	1349	1342	7
Total			75

Integrated Gas Sampling Data:

Bag Pump No. 22A
Bag Material: 5-layer Aluminized Tedlar
Pretest leak check: 0
Time start: 2012
Sampling rate: 1000

Box No. 19 Bag No. 3
Size: 44 L
cc/min at 15 IN.HG
(HRS) Time end: 2033 (HRS)
cc/min Operator: M. Koehler

S/N of O_2 Analyzer used to monitor train outlet: 11

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 4 and 6 Field Data Sheet

Job Appleton Papers / Combined Locks, WI
Source Mill Boiler / Stack
Date 9-14-94 Test 3 Run 6

Operator(s) M. Kuehler + J. Scripter
Meter Box No. 18
ΔH@ 1.84 IN.WC
Gasmeter Coef. .9956
Bar.Press 29.24 IN.HG

Sample Train Leak Check:
Pretest: < 0.02 cfm at 15 IN.HG ☒
Post Test: <0.02 cfm at 8 IN.HG ☒

Trav. Point No.	Sample Time (Min)	Sample Volume (cf)	Orif. Meter (IN.WC)	Vac. IN.HG	Temperatures (°F) Stack	Probe	Oven	Impg.	Gas/ In	Gas/ Out	O_2 (%v/v)
	2012	616.10									3.3
B-3	3.5	618.78	1.84	6	336	248	244	49	125	109	3.3
3	7	621.46	1.84	6	340	243	248	47	127	108	3.3
6	10.5	624.14	1.84	6	342	245	248	47	126	108	3.4
2	14	626.84	1.84	6	340	246	252	47	129	109	3.3
1	17.5	629.53	1.84	6	342	249	251	48	130	109	3.2
1	21	632.21	1.84	6	339	245	248	48	129	108	
	2033										
	θ = 21	V_m = 16.11	$\overline{\Delta H}$ = 1.84		$\bar{t}$ =				$\bar{t}$ = 118.25		

Condensate Data:

Item	Weight (g) Final	Tare	Difference
Impingers			
Condenser			
Desiccant			
		Total	

Preliminary Results of SO_2 Concentration Determination	
$V_{m(std)}$ =	DSCF
Moisture Gravimetric =	%v/v
Moisture Psychrometric =	%v/v
SO_2, DRY =	PPM
SO_2, WET =	PPM
LB/MMBtu=	

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Interpoll Laboratories
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EPA Method 7 Sample Collection
Field Data Sheet

Job Appleton Papers
Test Location No. 11 Boiler Stack
Date 9-15-94
Fuel Type No. 2 Fuel Oil
Technician J. Scripter
Bar. Pressure 29.08 IN.HG.
Sample Train No. Green
Pump No. 1

No.	Test Run Point	Flask No.	Time (HRS)	Vacuum (IN.HG.)	Flask Temp. (°F)	Leak Rate <0.4 IN.HG./MIN.
1	4/1/A	20	1022	26.70	90	☒ Yes ☐ No
2	4/1/B	21	1040	26.70	90	☒ Yes ☐ No
3	4/1/C	22	1108	26.80	90	☒ Yes ☐ No
4	4/1/D	23	1137	26.80	90	☒ Yes ☐ No
5	4/2/A	24	1310	26.80	92	☒ Yes ☐ No
6	4/2/B	25	1343	26.70	92	☒ Yes ☐ No
7	4/2/C	14	1420	26.80	93	☒ Yes ☐ No
8	4/2/D	15	1442	26.70	93	☒ Yes ☐ No
9	4/3/A	16	1533	26.70	96	☒ Yes ☐ No
10	4/3/B	17	1559	26.80	96	☒ Yes ☐ No
11	4/3/C	18	1625	26.70	96	☒ Yes ☐ No
12	4/3/D	19	1653	26.70	96	☒ Yes ☐ No
13	Blank	1				☐ Yes ☐ No
14						☐ Yes ☐ No
15						☐ Yes ☐ No
16						☐ Yes ☐ No
17						☐ Yes ☐ No
18						☐ Yes ☐ No
19						☐ Yes ☐ No
20						☐ Yes ☐ No
21						☐ Yes ☐ No
22						☐ Yes ☐ No
23						☐ Yes ☐ No
24						☐ Yes ☐ No
25						☐ Yes ☐ No
26						☐ Yes ☐ No
27						☐ Yes ☐ No

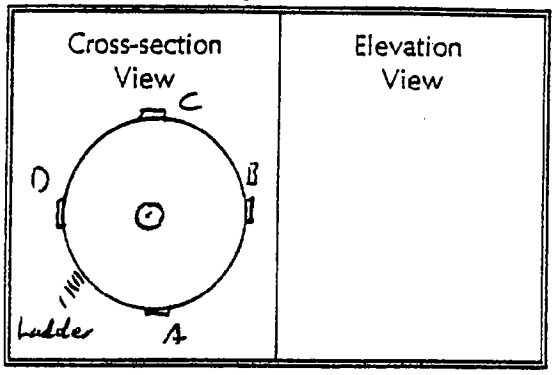
TH S-263R

INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 2 Field Data Sheet

Job: Appleton Papers / Combined Heat, w/
Source: No. 11 Boiler / Stack
Test: 4 Run: 0 Date: 9-15-94
Stack Dimen.: 83.5 IN.
Dry Bulb: 332 °F Wet bulb: 142 °F
Manometer: ☒ Reg. ☐ Exp ☐ Elec.
Barometric Pressure: 29.08 IN.HG
Static Pressure: -.17 IN.WC
Operators: M. Kuehler + J. Scripter
Pitot No.: 22V- C_p .84
PM/NOx/CO

Drawing of Test Site



Traverse Point No.	Fraction of Diameter	Distance From Stack Wall (IN.)	Distance From End of Port (IN.)	Velocity	Temp. of Gas (°F)
		Port Length: 17	IN.	Time Start: NA	HRS
		Refer to Test No. 1			
		for pts and flows			
--					

Temp. Meas. Device & S/N: PDT-31/TC
Time End: NA HRS

R or nothing = reg. manometer; S = expanded; E = electronic

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job Appleton Papers / Combined Cycle
Source Mill Boiler / Stack
Method 5 Filter holder: Glass

Date 9-15-94 Test 4 Run 1
No. of traverse points 12 X 2
Filter type: 4" G.F.

Sample Train Leak Check:
Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☒
Post test: <0.02 cfm at 7 IN. HG (vac) ☒

Particulate Catch Data:
No. of filters used:

6976

Recovery solvent(s)

☒ acetone
☐ other(s)

No. of probe wash bottles: 1
Sample recovered by: M. Koehler + J. Scrupter

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1	725	472	253
Impinger No. 2			
Impinger No. 3			
Condenser			
Desiccant	1470	1442	28
Total			281

Integrated Gas Sampling Data:

Bag Pump No. 224
Bag Material: 5-layer Aluminized Tedlar
Pretest leak check: 0
Time start: 0955
Sampling rate: 200

Box No. 21 Bag No. 1
Size: 44 L
cc/min at 15 IN.HG
(HRS) Time end: 1200 (HRS)
cc/min Operator: M. Koehler

S/N of O_2 Analyzer used to monitor train outlet: 11

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INTERPOLL LABORATORIES EPA METHOD 5 FIELD DATA SHEET

Job: Appleton Papers / Combyack Locks, WI
Source: No. 11 Boiler / Stack
Date: 9-15-94 Test 4 Run 1

Operators: M. Knobler + J. Snyder
Meter Box No. 18 ΔH@ 1.94 in WC
Gasmeter coeff.: .9956

Pitot No. 22V-4 Cp .84
Bar. Press. 29.05 in Hg H2O 18 %
Nozzle No. 4-5 Nozzle Dia .306 in.

Traverse Point No.	Sampling Time (min)	Sample Volume (cf)	Velocity Head (in WC)	Orifice Meter (in WC)	Dry Vol. (cf)	VAC. in Hg	Temperatures (°F) Stack	Probe	Oven	Impy.	Gas/In	Gas/Out	Oxygen (%v/v)
	0955	697.60											
B-3	5	701.24	.34	1.58	1.26	4	334	238	249	47	113	104	4.4
3	10	704.82	.32	1.51	4.84	4	331	240	244	47	118	104	4.5
2	15	708.40	.32	1.51	8.43	4	332	247	245	48	121	105	4.5
2	20	711.95	.31	1.47	1.98	4	333	242	250	46	123	104	4.5
1	25	715.60	.33	1.58	5.67	4	325	245	244	46	123	105	4.4
1	30	719.18	.31	1.49	9.25	4	321	243	247	46	124	106	4.4
A-3	35	723.10	.37	1.78	3.16	4.5	324	248	245	46	122	107	4.4
3	40	727.13	.39	1.86	7.16	5	327	245	248	45	125	107	4.8
2	45	731.18	.38	1.83	1.13	4.5	324	250	253	45	127	108	4.7
2	50	734.90	.35	1.68	4.95	4.5	326	252	250	47	128	108	4.6
1	55	738.73	.36	1.73	8.82	4.5	327	246	245	48	128	108	4.5
1	60	742.75	.38	1.82	2.74	4.5	328	243	251	48	129	109	4.5
C-3	65	746.77	.39	1.87	6.82	5	328	248	250	49	129	110	4.7
3	70	750.60	.36	1.72	0.65	4.5	335	248	246	49	130	111	4.2
2	75	754.25	.38	1.66	4.31	4	334	252	245	51	131	111	4.1
2	80	758.37	.34	1.77	8.40	4.5	335	246	249	52	131	111	4.4
1	85	761.75	.28	1.34	1.91	4	335	246	253	52	131	112	4.5
1	90	765.16	.27	1.29	5.17	4	335	247	250	52	132	111	4.5
D-3	95	768.90	.34	1.03	8.94	4	335	252	247	52	130	111	4.4
3	100	772.64	.34	1.62	2.70	4	335	253	245	50	132	111	4.4
2	105	776.50	.36	1.72	6.56	4.5	338	250	249	50	132	113	4.4
2	110	780.29	.34	1.63	0.33	4	337	248	252	48	132	113	4.4
1	115	784.10	.33	1.58	4.04	4	337	244	255	48	133	113	4.4
1	120	787.84	.33	1.58	7.76	4	335	245	252	48	133	113	4.4
	(1200)												
	θ = 120	Vm = 90.24		ΔH 7.64							Avg. = 118.1		

S-0037R

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job: Appleton Papers/Combined Locks, WI — Date: 9-15-94 — Test: 4 — Run: 2

Source: No. 11 Boiler/Stack — No. of traverse points: 16 x 2

Method: 5 — Filter holder: Glass — Filter type: 4" Glass

Sample Train Leak Check:

Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☒

Post test: < 0.02 cfm at 7 IN. HG (vac) ☒

Particulate Catch Data:

No. of filters used: 6984

Recovery solvent(s): ☒ acetone ☐ other(s)

No. of probe wash bottles: 1

Sample recovered by: M. Kuehler + J. Scripter

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1	719	477	242
Impinger No. 2			
Impinger No. 3			
Condenser			
Desiccant	1592	1552	30
Total			272

Integrated Gas Sampling Data:

Bag Pump No.: 224 — Box No.: 21 — Bag No.: 2

Bag Material: 5-layer Aluminized Tedlar — Size: 44 L

Pretest leak check: 0 cc/min at 15 IN.HG

Time start: 1148 (HRS) — Time end: (HRS)

Sampling rate: 200 cc/min — Operator: M. Kuehler

S/N of O_2 Analyzer used to monitor train outlet: 11

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 5 Field Data Sheet

Job: Appleton Papers / Combined heads, #1
Source: No. 11 Boiler / Stack
Date: 9-15-94 Test 4 Run 2
Operators: M. Kuehler + T. Scripter
Meter Box No. 1B ΔH@ 1.84 in.WC
Gasmeter Coeff. .9956
Nozzle No. 4-5
Nozzle Dia. .306 in.
Bar. Press. 29.08 in.Hg
Pitot No. 22W-4
C_p .84
H_2O 14.2 %

Traverse Point No.	Sampling Time (min)	Sample Vol. (cf)	Velocity Head (in.WC)	Orifice Meter (in.WC)	Des. Vol. (cf)	VAC. (in.Hg)	Temperatures (°F) Stack	Probe	Oven	Imp.	Gas/In	Gas/Out	Oxygen (% v/v)
	1248	788.30											
D-3	5	792.33	.38	1.95	2.40	4.5	334	239	251	49	123	110	4.5
3	10	796.22	.34	1.75	6.29	4	329	244	247	49	122	108	4.6
2	15	800.22	.36	1.84	0.27	4.5	333	242	244	51	125	109	4.5
2	20	803.95	.31	1.60	3.99	4	326	238	240	50	127	110	4.3
1	25	807.25	.32	1.66	7.78	4	326	245	248	49	129	109	4.4
1	30	811.58	.33	1.71	1.63	4	328	250	251	47	129	110	4.2
C-3	35	815.21	.29	1.50	5.24	4	330	247	247	49	130	110	4.3
3	40	818.92	.28	1.44	8.78	4	332	253	248	50	129	110	4.4
2	45	822.34	.29	1.49	2.39	4	333	252	252	50	131	111	4.4
2	50	825.80	.27	1.40	5.98	4	329	248	255	50	133	111	4.3
1	55	829.40	.29	1.50	9.50	4	333	251	250	52	134	111	4.4
1	60	833.09	.29	1.50	3.11	4	334	246	251	52	134	112	4.4
B-3	65	837.00	.34	1.77	7.04	4.5	330	243	250	53	133	114	4.4
3	70	840.90	.31	1.61	0.79	4	332	249	247	51	135	115	4.4
2	75	844.63	.31	1.63	4.57	4	324	245	247	50	135	114	4.4
2	80	848.20	.30	1.55	8.26	4	335	248	245	48	134	114	4.5
1	85	851.85	.29	1.50	1.89	4	336	242	249	48	135	113	4.4
1	90	855.49	.30	1.55	5.56	4	338	245	250	47	135	115	4.4
A-3	95	859.55	.37	1.92	9.66	5	335	248	246	47	133	115	4.5
3	100	863.80	.39	2.02	3.87	5	333	249	251	48	135	115	4.5
2	105	867.73	.34	1.76	7.79	4.5	337	249	254	48	135	116	4.4
2	110	871.75	.36	1.86	1.83	5	339	245	256	48	137	116	4.5
1	115	875.60	.33	1.70	5.70	4.5	340	247	251	49	137	115	4.5
1	120	879.69	.36	1.86	9.73	5	340	240	253	49	136	118	4.4
	1452												
	θ - 120	V_m - 91.39		ΔH - 1.67							Avg. - 122.2		

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job Appleton Papers / Combined Cycle, Co
Date 9-15-94 Test 4 Run 3
Source Mill Boiler / Stack
No. of traverse points 12 x 2
Method 17 Filter holder: Glass
Filter type: 4" G.F.

Sample Train Leak Check:

Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☑
Post test: 0.02 cfm at 7 IN. HG (vac) ☑

Particulate Catch Data:

No. of filters used: 6985

Recovery solvent(s)
☒ acetone
☐ other(s)

No. of probe wash bottles: 1
Sample recovered by: M. Kuehler + J. Scripter

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1	738	479	259
Impinger No. 2			
Impinger No. 3			
Condenser			
Desiccant	1379	1348	31
Total			290

Integrated Gas Sampling Data:

Bag Pump No. 22A
Bag Material: 5-layer Aluminized Tedlar
Pretest leak check: 0
Time start: 1510
Sampling rate: 200

Box No. 21 Bag No. 3
Size: 44 L
cc/min at 15 IN.HG
(HRS) Time end: 1713 (HRS)
cc/min Operator: M. Kuehler

S/N of O_2 Analyzer used to monitor train outlet: 11

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 5 Field Data Sheet

Job: Appleton Papers / Combined Locks
Source: No. 11 Bi. Tex / Stack
Date: 9-15-94 Test 4 Run 3

Operators: M. Kuehler & S. Sciarpter
Meter Box No. 18 ΔH@ 1.64 in.WC
Gasmeter Coeff. .9956

Nozzle No. 4-5
Nozzle Dia. .306 in.
Bar. Press. 29.08 in.Hg

Pitot No. 22 U-4
C_p .94
H_2O 13.7 %

Traverse Point No.	Sampling Time (min)	Sample Vol. (cf)	Velocity Head (in.WC)	Orifice Meter (in.WC)	Des. Vol. (cf)	VAC. (in.Hg)	Temperatures (°F) Stack	Probe	Oven	Imp.	Gas/In	Gas/Out	Oxygen (% v/v)
	1510	879.90											
A-3	5	884.03	.37	1.94	4.00	5.5	330	243	240	47	126	115	4.4
3	10	888.14	.36	1.86	8.02	5.5	340	241	243	47	129	114	4.2
2	15	892.22	.38	1.96	2.15	5.5	342	248	239	45	133	113	4.1
2	20	896.21	.36	1.86	6.18	5.5	342	245	244	46	134	113	4.3
1	25	900.15	.35	1.81	0.16	5	343	249	246	46	134	115	4.3
1	30	904.00	.33	1.71	4.02	5	342	252	250	46	135	114	4.5
B-3	35	907.86	.34	1.77	7.96	5	340	253	249	48	134	114	4.4
3	40	912.00	.36	1.87	2.00	5.5	340	250	247	48	135	114	4.2
2	45	915.77	.32	1.67	5.82	5	338	255	244	49	135	116	4.5
2	50	919.55	.31	1.62	9.59	5	338	251	246	48	136	115	4.7
1	55	923.45	.33	1.72	3.47	5	338	250	244	50	136	116	4.7
1	60	927.17	.31	1.62	7.24	5	339	253	248	50	136	117	4.6
C-3	65	931.00	.31	1.62	1.01	5	338	251	250	47	134	116	4.7
3	70	934.95	.34	1.77	4.95	5.5	339	249	254	47	137	115	4.6
2	75	938.83	.33	1.72	8.84	5	339	248	255	47	136	117	4.6
2	80	942.40	.28	1.46	2.42	5	339	249	250	49	137	117	4.7
1	85	946.04	.28	1.46	6.01	5	338	245	248	49	137	117	5.0
1	90	949.62	.27	1.41	9.54	4.5	339	242	253	49	137	118	4.9
D-3	95	953.74	.38	1.99	3.72	6	339	244	250	52	135	117	5.1
3	100	957.70	.34	1.77	7.66	5.5	339	248	247	52	139	118	4.8
2	105	961.81	.38	1.98	1.84	6	341	249	244	53	139	117	5.2
2	110	965.77	.32	1.67	5.68	5.5	341	250	248	53	139	119	5.0
1	115	969.68	.34	1.77	9.63	5.5	343	247	244	54	139	118	5.2
1	120	973.52	.34	1.77	3.58	5.5	342	244	240	54	139	118	5.1
	(1713)												
	θ - 120	V_m - 83.62		ΔH - 1.74							Avg. - 125.6		

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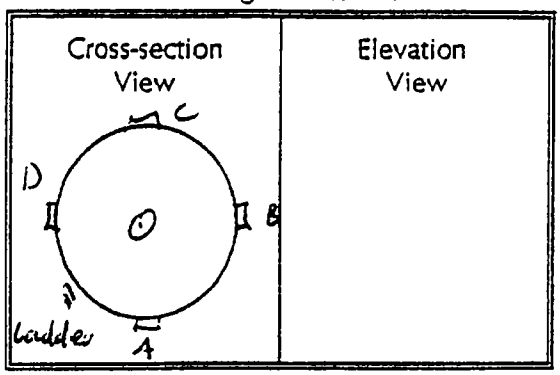
INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 2 Field Data Sheet

Job: Appleton Papers/Combined heads, w/
Source: No. 11 Boiler/Stack
Test: 6 Run: 1 Date: 9-15-94
Stack Dimen.: 83.5 IN.
Dry Bulb: 327 °F Wet bulb: 140 °F
Manometer: ☒ Reg. ☐ Exp ☐ Elec.
Barometric Pressure: 29.08 IN.HG
Static Pressure: -.17 IN.WC
Operators: M. Knehler + J. Scripter
Pitot No.: 221-4 C_p: .84

Drawing of Test Site



Traverse Point No.	Fraction of Diameter	Distance From Stack Wall (IN.)	Distance From End of Port (IN.)	Velocity	Temp. of Gas (°F)
		Port Length: 17 IN.		Time Start: 1753 HRS	
A-1				.37	
2				.37	
3		Refer to Test No. V		.38	
B-1		for pts used		.52	↑
2				.52	
3				.33	327
C-1				.27	
2				.36	↓
3				.34	
D-1				.33	
2				.35	
3				.34	
--				-	

Temp. Meas. Device & S/N: PDT-31 / TC
Time End: 1757 HRS

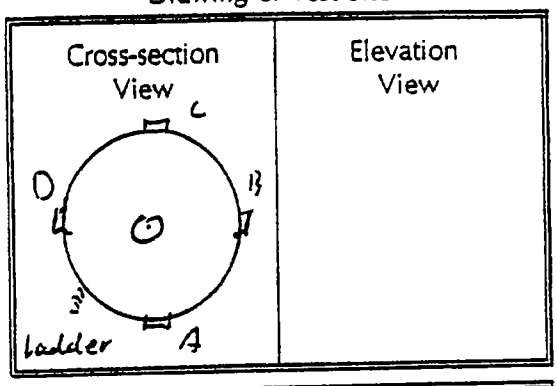
R or nothing = reg. manometer; S = expanded; E = electronic

INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 2 Field Data Sheet

Job: Appleton Papers/Combined Locks, WI
Source: No. 11 Boiler / Stack
Test: 6 Run: 2 Date: 9-15-94
Stack Dimen.: 83.5 IN.
Dry Bulb: 340 °F Wet bulb: 142 °F
Manometer: ☒ Reg. ☐ Exp ☐ Elec.
Barometric Pressure: 29.08 IN.HG
Static Pressure: -.17 IN.WC
Operators: M. Kuehler + J. Scrivner
Pitot No.: 22V-4 C_p: .84

Drawing of Test Site



Traverse Point No.	Fraction of Diameter	Distance From Stack Wall (IN.)	Distance From End of Port (IN.)	Velocity	Temp. of Gas (°F)
		Port Length: 17 IN.		Time Start: 1020 HRS	
A-1				.33	
2				.36	
3		Refer to Test No. 4		.37	
B-1		for pts used		.30	
2				.31	4
3				.34	
C-1				.29	340
2				.28	
3				.29	
D-1				.32	
2				.36	
3				.37	
--					
				Time End: 1823 HRS	

Temp. Meas. Device & S/N: PDT-31 / TC

R or nothing = reg. manometer; S = expanded; E = electronic

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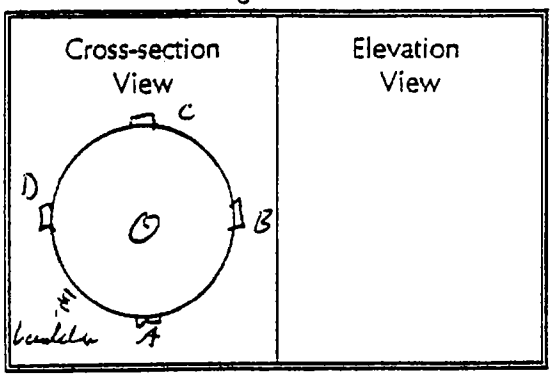
INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 2 Field Data Sheet

Job: Appleton Papers / Combined Locks, WI
Source: Nicoll Boiler / Stack
Test: 6 Run: 3 Date: 9-15-94
Stack Dimen.: 83.5 IN.
Dry Bulb: 339 °F Wet bulb: 140 °F
Manometer: ☒ Reg. ☐ Exp ☐ Elec.
Barometric Pressure: 29.08 IN.HG
Static Pressure: -.17 IN.WC
Operators: M. Kuehler + T. Scripter
Pitot No.: 22V-4 C_p: .84

Drawing of Test Site



Traverse Point No.	Fraction of Diameter	Distance From Stack Wall (IN.)	Distance From End of Port (IN.)	Velocity	Temp. of Gas (°F)
		Port Length: 17	IN.	Time Start: 1850	HRS
A-1				.34	
2				.36	
3		Refer to Test No. 4		.36	
B-1		for pts used		.32	
2				.32	
3				.35	
C-1				.28	338
2				.31	
3				.31	
D-1				.34	
2				.37	
3				.36	
--				-	

Temp. Meas. Device & S/N: PDT-31 / TC
Time End: 1953 HRS

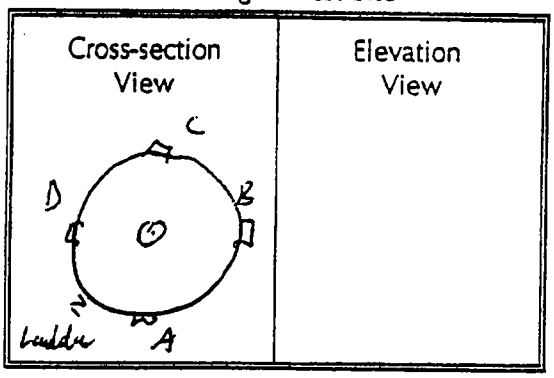
R or nothing = reg. manometer; S = expanded; E = electronic

INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 2 Field Data Sheet

Job: Appleton Papers / Combined heads, w/
Source: No. 11 Boiler / Stack
Test: 6 Run Y Date 9-15-94
Stack Dimen.: 83.5 IN.
Dry Bulb: 343 °F Wet bulb: 143 °F
Manometer: ☒ Reg. ☐ Exp ☐ Elec.
Barometric Pressure: 29.08 IN.HG
Static Pressure: -.17 IN.WC
Operators: [illegible] & T. Scripter
Pitot No.: 22V-4 C_p .84

Drawing of Test Site



Traverse Point No.	Fraction of Diameter	Distance From Stack Wall (IN.)	Distance From End of Port (IN.)	Velocity	Temp. of Gas (°F)
		Port Length: 17 IN.		Time Start: 1913 HRS	
A-1				.34	
2				.38	
3		Refer to Test No. 4		.35	
B-1		for pts used		.31	
2				.32	
3				.36	343
C-1				.28	
2				.31	
3				.30	
D-1				.31	
2				.35	
3				.38	
--					

Temp. Meas. Device & S/N: PDT 131 / TC
Time End: 1917 HRS

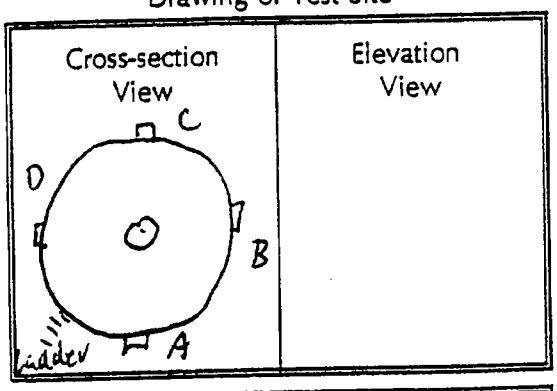
R or nothing = reg. manometer; S = expanded; E = electronic

INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 2 Field Data Sheet

Job: Appleton Papers / Combined Locks, WI
Source: Drill Boiler / Stack
Test: 6 Run: 5 Date: 9-15-94
Stack Dimen.: 83.5 IN.
Dry Bulb: 345 °F Wet bulb: 144 °F
Manometer: ☒ Reg. ☐ Exp ☐ Elec.
Barometric Pressure: 29.08 IN.HG
Static Pressure: -.17 IN.WC
Operators: M. Kaehler + T. Sziglar
Pitot No.: 22V-4 C_p .84

Drawing of Test Site



Traverse Point No.	Fraction of Diameter	Distance From Stack Wall (IN.)	Distance From End of Port (IN.)	Velocity	Temp. of Gas (°F)
		Port Length: 17 IN.		Time Start: 1430 HRS	
A -1				.37	
2				.36	
3		Refer to Test No. 4		.36	
B -1		for pts used		.30	
2				.33	↑
3				.34	
C -1				.29	345
2				.31	
3				.30	↓
D -1				.31	
2				.36	
3				.34	
--					
				Time End: 1435 HRS	

Temp. Meas. Device & S/N: PDT-31 / TC

R or nothing = reg. manometer; S = expanded; E = electronic

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