Background Report Reference

AP-42 Section Number: 10.6.1

Background Report Section: 4

Reference Number: 66

Title: Result Of The April 11, 1995 Air Emission Evaluation Testing At The Louisiana-Pacific Plant in Hayward, Wisconsin

Interpoll Laboratories, Inc.

April 1995

4-606

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ENGINEERING

**RESULT OF THE APRIL 11, 1995
AIR EMISSION EVALUATION
TESTING AT THE LOUISIANA PACIFIC PLANT
IN HAYWARD, WISCONSIN**

Submitted to:

LOUISIANA-PACIFIC CORPORATION
Route 8, Box 8263
Hayward, Wisconsin 54843

Attention:

Sue Somers

Approved by:

Report Number 5-5204
April 21, 1995
SP/slp

Daniel Despen
Manager
Stationary Source Testing Department

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APPENDICES:

1 INTRODUCTION

On April 11, 1995 Interpoll Laboratories Personnel conducted Particulate Emission and Cascade Impactor Engineering Tests on the Line 1 Core Dryer Scrubber Inlet and the Line 1 Core Dryer Scrubber Outlet at the Louisiana Pacific Plant in Hayward, Wisconsin. Duane Van Hoever, Gary Hove, Troy Hansen, and Lee Hansen performed the on-site portion of the test. Coordination between testing activities and plant operation was provided by Bob Schultz of Louisiana Pacific. A member of the Wisconsin Department of Natural Resources did not witness the test.

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 particulate emission tests are summarized in Tables 1 and 2. An overview of the results is presented in the table below.

Date	Source	Concentration (GR/DSCF)	Emission Rate (LB/HR)
4-11-95	Line 1 Core Dryer Scrubber Inlet	0.252	50
4-11-95	Line 1 Core Dryer Scrubber Outlet	0.155	35

* ***Please Note: Particulate results in the table above represent Dry + Organic/Inorganic Wet Catch.***

No difficulties were encountered in the field or in the laboratory evaluation of the samples. On the basis of this fact and a complete review of the entire data and results, 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 April 11, 1995 Particulate Emission Performance Test on the Line 1 Core Dyer Scrubber Inlet at the Louisiana - Pacific Plant Located in Hayward, Wisconsin.

ITEM		Run 1	Run 2	Run 3
Date of test		04-11-95	04-11-95	04-11-95
Time runs were done	(HRS)	845/1028	1155/1258	1400/1503
Volumetric flow				
actual	(ACFM)	40718	43616	45621
standard	(DSCFM)	22674	22840	24358
Gas temperature	(DEG-F)	217	236	220
Moisture content	(%V/V)	24.35	26.82	27.07
Gas composition	(%V/V,dry)			
carbon dioxide		4.50	4.70	4.50
oxygen		16.30	16.10	16.30
nitrogen		79.20	79.20	79.20
Isokinetic variation	(%)	93.3	98.5	98.8
Particulate concentration				
actual	(GR/ACF)	0.122	0.160	0.124
standard	(GR/DSCF)	0.219	0.306	0.232
Part. emission rate	(LB/HR)	42.64	59.97	48.49

Note: Dry + Organic/Inorganic Wet Catch

Table 1b. Summary of the Results of the April 11, 1995 Particulate Emission Performance Test on the Line 1 Core Dyer Scrubber Inlet at the Louisiana - Pacific Plant Located in Hayward, Wisconsin.

ITEM	Run 1	Run 2	Run 3
Date of test	04-11-95	04-11-95	04-11-95
Time runs were done (HRS)	845/1028	1155/1258	1400/1503
Volumetric flow			
actual (ACFM)	40718	43616	45621
standard (DSCFM)	22674	22840	24358
Gas temperature (DEG-F)	217	236	220
Moisture content (%V/V)	24.35	26.82	27.07
Gas composition (%V/V,dry)			
carbon dioxide	4.50	4.70	4.50
oxygen	16.30	16.10	16.30
nitrogen	79.20	79.20	79.20
Isokinetic variation (%)	93.3	98.5	98.8
Particulate concentration			
actual (GR/ACF)	.0915	0.111	.0951
standard (GR/DSCF)	0.164	0.213	0.178
Part. emission rate (LB/HR)	31.96	41.60	37.21

Note: Dry Catch Only

Table 2a. Summary of the Results of the April 11, 1995 Particulate Emission Performance Test on the Line 1 Core Dryer Scrubber Outlet at the Louisiana - Pacific Plant Located in Hayward, Wisconsin.

ITEM	Run 1	Run 2	Run 3	Run 4
Date of test	04-11-95	04-11-95	04-11-95	04-11-95
Time runs were done (HRS)	845/1033	1155/1258	1400/1503	1721/1825
Volumetric flow				
actual (ACFM)	46091	46492	46272	40993
standard (DSCFM)	27523	27820	26301	23599
Gas temperature (DEG-F)	166	166	166	165
Moisture content (%V/V)	26.44	26.31	30.02	29.19
Gas composition (%V/V,dry)				
carbon dioxide	4.90	4.60	4.60	4.90
oxygen	15.90	16.30	16.30	16.00
nitrogen	79.20	79.10	79.10	79.10
Isokinetic variation (%)	98.4	100.6	105.2	101.6
Particulate concentration				
actual (GR/ACF)	.0946	.0926	.0854	.0905
standard (GR/DSCF)	0.158	0.155	0.150	0.157
Part. emission rate (LB/HR)	37.38	36.90	33.87	31.82

Note: Dry + Organic/Inorganic Wet Catch

Table 2 Summary of the Results of the April 11, 1995 Particulate Emission Performance Test on the Line 1 Core Dryer Scrubber Outlet at the Louisiana - Pacific Plant Located in Hayward, Wisconsin.

ITEM	Run 1	Run 2	Run 3	Run 4
Date of test	04-11-95	04-11-95	04-11-95	04-11-95
Time runs were done (HRS)	845/1033	1155/1258	1400/1503	1721/1825
Volumetric flow				
actual (ACFM)	46091	46492	46272	40993
standard (DSCFM)	27523	27820	26301	23599
Gas temperature (DEG-F)	166	166	166	165
Moisture content (%V/V)	26.44	26.31	30.02	29.19
Gas composition (%V/V,dry)				
carbon dioxide	4.90	4.60	4.60	4.90
oxygen	15.90	16.30	16.30	16.00
nitrogen	79.20	79.10	79.10	79.10
Isokinetic variation (%)	98.4	100.6	105.2	101.6
Particulate concentration				
actual (GR/ACF)	.0719	.0666	.0652	.0674
standard (GR/DSCF)	0.120	0.111	0.115	0.117
Part. emission rate (LB/HR)	28.40	26.53	25.87	23.70

Note: Dry Catch Only

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 results, cascade impactor results, filter analysis, and impinger analysis. 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. The particulate emission rate has been calculated using the product of the concentration times flow method.

3.1 Results of Orsat & Moisture Analyses

Test No. 1
Line 1 Core Dryer Scrubber Inlet

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

	Run 1	Run 2	Run 3
Date of run	04-11-95	04-11-95	04-11-95
Dry basis (orsat)			
carbon dioxide.....	4.50	4.70	4.50
oxygen.....	16.30	16.10	16.30
nitrogen.....	79.20	79.20	79.20
Wet basis (orsat)			
carbon dioxide.....	3.40	3.44	3.28
oxygen.....	12.33	11.78	11.89
nitrogen.....	59.91	57.96	57.76
water vapor.....	24.35	26.82	27.07
Dry molecular weight.....	29.37	29.40	29.37
Wet molecular weight.....	26.60	26.34	26.29
Specific gravity.....	0.919	0.910	0.908
Water mass flow.....(LB/HR)	20474	23480	25367
FO	1.022	1.021	1.022

Test No. 1
Line 1 Core Dryer Scrubber Outlet

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

	Run 1	Run 2	Run 3
Date of run	04-11-95	04-11-95	04-11-95
Dry basis (orsat)			
carbon dioxide.....	4.90	4.60	4.60
oxygen.....	15.90	16.30	16.30
nitrogen.....	79.20	79.10	79.10
Wet basis (orsat)			
carbon dioxide.....	3.60	3.39	3.22
oxygen.....	11.70	12.01	11.41
nitrogen.....	58.26	58.29	55.35
water vapor.....	26.44	26.31	30.02
Dry molecular weight.....	29.42	29.39	29.39
Wet molecular weight.....	26.40	26.39	25.97
Specific gravity.....	0.912	0.912	0.897
Water mass flow.....(LB/HR)	27742	27856	31646
FO	1.020	1.000	1.000

Test No. 1
Line 1 Core Dryer Scrubber Outlet

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

	Run 4
Date of run	04-11-95
Dry basis (orsat)	
carbon dioxide.....	4.90
oxygen.....	16.00
carbon monoxide.....	0.00
nitrogen.....	79.10
Wet basis (orsat)	
carbon dioxide.....	3.47
oxygen.....	11.33
carbon monoxide.....	0.00
nitrogen.....	56.01
water vapor.....	29.19
Dry molecular weight.....	29.42
Wet molecular weight.....	26.09
Specific gravity.....	0.901
Water mass flow.....(LB/HR)	27285

FO 1.000

Test No. 2
Line 1 Core Dryer Scrubber Inlet
(Cascade Impactor)

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

	Run 1
Date of run	04-11-95
Dry basis (orsat)	
carbon dioxide.....	1.50
oxygen.....	19.50
carbon monoxide.....	0.00
nitrogen.....	79.00
Wet basis (orsat)	
carbon dioxide.....	1.06
oxygen.....	13.76
carbon monoxide.....	0.00
nitrogen.....	55.73
water vapor.....	29.46
Dry molecular weight.....	29.02
Wet molecular weight.....	25.77
Specific gravity.....	0.890
Water mass flow.....(LB/HR)	28198

FO 0.933

Test No. 3
Line 1 Core Dryer Scrubber Outlet
(Cascade Impactor)

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

	Run 1
Date of run	04-11-95
Dry basis (orsat)	
carbon dioxide.....	4.90
oxygen.....	15.90
carbon monoxide.....	0.00
nitrogen.....	79.20
Wet basis (orsat)	
carbon dioxide.....	3.44
oxygen.....	11.17
carbon monoxide.....	0.00
nitrogen.....	55.66
water vapor.....	29.73
Dry molecular weight.....	29.42
Wet molecular weight.....	26.03
Specific gravity.....	0.899
Water mass flow.....(LB/HR)	30007

FO 1.020

3.2 Results of Particulate Determinations

Test No. 1
Line 1 Core Dryer Scrubber Inlet

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

	Run 1	Run 2	Run 3
Date of run	04-11-95	04-11-95	04-11-95
Time run start/end.....(HRS)	845/1028	1155/1258	1400/1503
Static pressure.....(IN.WC)	-7.60	-7.60	-7.60
Cross sectional area (SQ.FT)	12.05	12.05	12.05
Pitot tube coefficient.....	.840	.840	.840
Water in sample gas			
condenser.....(ML)	0.0	0.0	0.0
impingers.....(GRAMS)	237.0	293.0	316.0
desiccant.....(GRAMS)	10.0	6.0	8.0
total.....(GRAMS)	247.0	299.0	324.0
Total particulate material..			
.....collected(grams)	0.5144	0.7637	0.6193
Gas meter coefficient.....	0.9970	0.9970	0.9970
Barometric pressure..(IN.HG)	28.78	28.78	28.78
Avg. orif.pres.drop..(IN.WC)	1.22	1.38	1.60
Avg. gas meter temp..(DEF-F)	67.7	69.5	74.2
Volume through gas meter....			
at meter conditions...(CF)	37.60	40.10	43.25
standard conditions.(DSCF)	36.18	38.47	41.15
Total sampling time....(MIN)	60.00	60.00	60.00
Nozzle diameter.....(IN)	.251	.251	.251
Avg.stack gas temp ..(DEG-F)	217	236	220
Volumetric flow rate.....			
actual.....(ACFM)	40718	43616	45621
dry standard.....(DSCFM)	22674	22840	24358
Isokinetic variation.....(%)	93.3	98.5	98.8
Particulate concentration...			
actual.....(GR/ACF)	0.12213	0.16035	0.12395
dry standard.....(GR/DSCF)	0.21940	0.30634	0.23224
Particle mass rate...(LB/HR)	42.640	59.972	48.487

Test No. 1
Line 1 Core Dryer Scrubber Outlet

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

	Run 1	Run 2	Run 3	Run 4
Date of run	04-11-95	04-11-95	04-11-95	04-11-95
Time run start/end.....(HRS)	845/1033	1155/1258	1400/1503	1721/1825
Static pressure.....(IN.WC)	0.38	0.38	0.38	0.00
Cross sectional area (SQ.FT)	12.31	12.31	12.31	12.31
Pitot tube coefficient.....	.840	.840	.840	.840
Water in sample gas				
condenser.....(ML)	0.0	0.0	0.0	0.0
impingers.....(GRAMS)	328.0	338.0	418.0	335.0
desiccant.....(GRAMS)	15.0	14.0	0.0	13.0
total.....(GRAMS)	343.0	352.0	418.0	348.0
Total particulate material..				
.....collected(grams)	0.4621	0.4663	0.4474	0.4058
Gas meter coefficient.....	0.9956	0.9956	0.9956	0.9956
Barometric pressure..(IN.HG)	28.78	28.78	28.78	28.78
Avg. orif.pres.drop..(IN.WC)	1.80	1.93	1.89	1.42
Avg. gas meter temp..(DEF-F)	53.7	57.4	59.0	60.3
Volume through gas meter....				
at meter conditions...(CF)	45.53	47.36	46.95	40.83
standard conditions.(DSCF)	45.00	46.49	45.94	39.81
Total sampling time....(MIN)	60.00	60.00	60.00	60.00
Nozzle diameter.....(IN)	.250	.250	.250	.250
Avg.stack gas temp ..(DEG-F)	166	166	166	165
Volumetric flow rate.....				
actual.....(ACFM)	46091	46492	46272	40993
dry standard.....(DSCFM)	27523	27820	26301	23599
Isokinetic variation.....(%)	98.4	100.6	105.2	101.6
Particulate concentration...				
actual.....(GR/ACF)	0.09457	0.09256	0.08537	0.09051
dry standard.....(GR/DSCF)	0.15843	0.15475	0.15025	0.15729
Particle mass rate...(LB/HR)	37.376	36.902	33.872	31.82

3.3 Results of Cascade Impactor Results

Test No. 2

Results of the Particle Size Distribution Determination

Sample Identification: Line 1 Core Dryer Scrubber Inlet

Cascade Impactor Sampling

Assigned Density: 1.00 g/cc

Run 1

Stage	um	% ≥
Preimpactor	8.3	28.8
1	5.3	28.9
2	3.5	29.0
3	2.2	29.3
4	1.3	29.5
5	0.83	29.7
6	0.51	31.3
7	0.28	61.6

um — *Aerodynamic equivalent diameter in microns*

% ≥ — Relative cumulative frequency - percent by mass of aerosol with diameters greater than stated size

Test No. 2
Line 1 Core Dryer Scrubber Inlet

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

	Run 1
Date of run	04-11-95
Time run start/end.....(HRS)	1720/1740
Static pressure.....(IN.WC)	-7.60
Cross sectional area (SQ.FT)	12.05
Pitot tube coefficient.....	.840
Water in sample gas	
condenser.....(ML)	90.0
impingers.....(GRAMS)	0.0
desiccant.....(GRAMS)	12.0
total.....(GRAMS)	102.0
Total particulate material..	
.....collected(grams)	0.1259
Gas meter coefficient.....	0.9970
Barometric pressure..(IN.HG)	28.78
Avg. orif.pres.drop..(IN.WC)	1.09
Avg. gas meter temp..(DEF-F)	66.1
Volume through gas meter....	
at meter conditions...(CF)	11.92
standard conditions.(DSCF)	11.50
Total sampling time....(MIN)	20.00
Nozzle diameter.....(IN)	.228
Avg.stack gas temp ..(DEG-F)	205
Volumetric flow rate.....	
actual.....(ACFM)	45484
dry standard.....(DSCFM)	24038
Isokinetic variation.....(%)	101.7
Particulate concentration...	
actual.....(GR/ACF)	0.08922
dry standard.....(GR/DSCF)	0.16888
Particle mass rate...(LB/HR)	34.80

Test No. 2

Results of the Particle Size Distribution Determination

Sample Identification: Line 1 Core Dryer Scrubber Outlet

Cascade Impactor Sampling

Assigned Density: 1.00 g/cc

Run 1

Stage	um	% ≥
Preimpactor	8.3	3.8
1	5.3	9.0
2	3.5	11.2
3	2.2	14.4
4	1.3	16.5
5	0.83	19.8
6	0.51	31.0
7	0.28	46.9

um Aerodynamic equivalent diameter in microns
% ≥ Relative cumulative frequency - percent by mass of aerosol with diameters greater than stated size

Test No. 3
Line 1 Core Dryer Scrubber Outlet

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

	Run 1
Date of run	04-11-95
Time run start/end.....(HRS)	1814/1834
Static pressure.....(IN.WC)	0.38
Cross sectional area (SQ.FT)	12.05
Pitot tube coefficient.....	.840
Water in sample gas	
condenser.....(ML)	100.0
impingers.....(GRAMS)	0.0
desiccant.....(GRAMS)	10.0
total.....(GRAMS)	110.0
Total particulate material..	
.....collected(grams)	0.1141
Gas meter coefficient.....	0.9970
Barometric pressure..(IN.HG)	28.78
Avg. orif.pres.drop..(IN.WC)	1.29
Avg. gas meter temp..(DEF-F)	74.3
Volume through gas meter....	
at meter conditions...(CF)	12.88
standard conditions.(DSCF)	12.24
Total sampling time....(MIN)	20.00
Nozzle diameter.....(IN)	.228
Avg.stack gas temp ..(DEG-F)	166
Volumetric flow rate.....	
actual.....(ACFM)	44245
dry standard.....(DSCFM)	25250
Isokinetic variation.....(%)	103.1
Particulate concentration...	
actual.....(GR/ACF)	0.08207
dry standard.....(GR/DSCF)	0.14387
Particle mass rate...(LB/HR)	31.14

3.4 Results of Filter Analysis

LP/Hayward

Report No. 5-5204

Glass fiber filters
Blank values

Element	Blank #1	Blank #2	Blank #3	Blank #4	Blank #5	Average
Ca	22500	27300	24600	23200	19900	23500
Fe	169	219	209	185	122	181
K	7600	7800	8000	6790	6790	7396
Mn	15	18	17	6.2	6.3	13
P	0	0	0	0	0	0
S	81	85	85	87.8	66	81
Na	63100	80700	81600	93800	83000	80440

CDSO = Core Dryer Scrubber Outlet
CDSI = Core Dryer Scrubber Inlet

Parameter	CDSO 1/1	CDSO 1/2	CDSO 1/3	CDSO 1/4	CDSI 1/1	CDSI 1/2	CDSI 1/3
Date	11-Apr	11-Apr	11-Apr	11-Apr	11-Apr	11-Apr	11-Apr
Filter	GF	GF	GF	GF	GF	GF	GF
UNCORRECTED DATA (ug)							
Ca	31200	25200	27500	30300	34500	23000	39100
Fe	381	327	298	458	2000	1310	913
K	48600	29200	32200	49100	22300	23900	39500
Mn	194	146	184	175	376	298	296
P	1550	2120	607	632	1860	1720	1070
S	2600	3880	1340	1580	2460	2570	1560
Na	115000	93300	101000	112000	88400	79800	104000
BLANK CORRECTED DATA (ug)							
Ca	7700	1700	4000	6800	11000	-500	15600
Fe	200	146	117	277	1819	1129	732
K	41204	21804	24804	41704	14904	16504	32104
Mn	182	134	172	163	364	286	284
P	1550	2120	607	632	1860	1720	1070
S	2519	3799	1259	1499	2379	2489	1479
Na	34560	12860	20560	31560	7960	-640	23560
Total (ug)	87914.74	42562.74	51518.74	82634.74	40285.74	20987.74	74828.74
Total (g)	0.0879	0.0426	0.0515	0.0826	0.0403	0.0210	0.0748
Analyzed Mass (g)	0.3511	0.3353	0.3417	0.3023	0.3856	0.5298	0.4753
Accounted for (%)	25.04	12.69	15.08	27.34	10.45	3.96	15.74

APPENDIX A

VOLUMETRIC FLOW RATE DETERMINATIONS

Test No. 1
Line 1 Core Dryer Scrubber Outlet

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

Date of Determination.....	04-11-95
Time of Determination.....(HRS)	800
Barometric pressure.....(IN.HG)	28.78
Pitot tube coefficient.....	.84
Number of sampling ports.....	1
Total number of points.....	12
Shape of duct.....	Round
Stack diameter.....(IN)	47.5
Duct area.....(SQ.FT)	12.31
Direction of flow.....	UP
Static pressure.....(IN.WC)	.38
Avg. gas temp.....(DEG-F)	164
Moisture content.....(% V/V)	0.00
Avg. linear velocity.....(FT/SEC)	59.6
Gas density.....(LB/ACF)	.06224
Molecular weight.....(LB/LBMOLE)	29.42
Mass flow of gas.....(LB/HR)	164335
Volumetric flow rate.....	
actual.....(ACFM)	44003
dry standard.....(DSCFM)	35850

Test No. 1
Line 1 Core Dryer Scrubber Outlet

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

Date of Determination.....	04-11-95
Time of Determination.....(HRS)	800
Barometric pressure.....(IN.HG)	28.78
Pitot tube coefficient.....	.84
Number of sampling ports.....	1
Total number of points.....	12
Shape of duct.....	Round
Stack diameter.....(IN)	47.5
Duct area.....(SQ.FT)	12.31
Direction of flow.....	UP
Static pressure.....(IN.WC)	.38
Avg. gas temp.....(DEG-F)	164
Moisture content.....(% V/V)	26.44
Avg. linear velocity.....(FT/SEC)	62.9
Gas density.....(LB/ACF)	.05586
Molecular weight.....(LB/LBMOLE)	29.42
Mass flow of gas.....(LB/HR)	155674
Volumetric flow rate.....	
actual.....(ACFM)	46451
dry standard.....(DSCFM)	27838

APPENDIX B

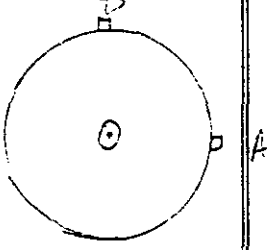
FIELD DATA SHEETS

INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 2 Field Data Sheet

Plant L.P. Hayward
Source Line 1 Coke Dryer Scrubber Inlet
Test 1 Run Date 4/11/95
Stack Dimen. 47 IN.
Dry Bulb ____ °F Wet bulb ____ °F
Manometer ☐ Reg. ☐ Exp ☐ Elec.
Barometric Pressure 28.78 IN.HG
Static Pressure -7.6 IN.WC
Operators D. VanHeuvelen & L. Hansen
Pitot No. V-23-5 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: 6 IN.		Time Start:	HRS
A 1	.021	1.0	7		
2	.067	3.15	9.15	.49	
3	.118	5.55	11.55	.62	
4	.177	8.32	14.32	.41	
5	.25	11.75	17.75	.45	
6	.356	16.73	22.73	.51	
7	.644	30.27	36.27	.64	210
8	.750	35.25	41.25	.70	
9	.823	38.68	44.68	.74	
10	.882	41.45	47.45	.84	
11	.933	43.85	49.85	.86	
12	.974	46.00	52	.82	
B 1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

Temp. Meas. Device & S/N: PDT #35 Time End: 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 L.P. Hayward — Date 4/11/95 Test 1 Run 1
Source Line 1 Core Dryer Scrubber Outlet — No. of traverse points 24
Method 5 Filter holder: Glass — Filter type: Glass fiber
Sample Train Leak Check:
Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☒
Post test: 0 cfm at 14 IN. HG (vac) ☒
Particulate Catch Data:
No. of filters used: — Recovery solvent(s)

☒ acetone
☐ other(s)

No. of probe wash bottles: 1
Sample recovered by: [illegible]
Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1			
Impinger No. 2	537	300	237
Impinger No. 3			
Condenser			
Desiccant	1410	1400	10
Total			247

Integrated Gas Sampling Data:

Bag Pump No. 23A — Box No. 20 — Bag No. 1
Bag Material: 5-layer Aluminized Tedlar — Size: 44 L
Pretest leak check: 0 — cc/min at 15 IN.HG
Time start: 0856 (HRS) — Time end: 1028 (HRS)
Sampling rate: 400 cc/min — Operator: [illegible]

S/N of O_2 Analyzer used to monitor train outlet: 4

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INTERPOLL LABORATORIES, INC.
(612) [illegible]-6020

EPA Method 5 Field Data Sheet

Job L.P. Hayward
Source Line 1 Core Dryer Scrubber Inlet
Date 4/11/95 Test 1 Run 1

Operators DLH & L.H
Meter Box No. 18 ΔH@ 1.81 in.WC
Gasmeter Coeff. .9970

Nozzle No. 7-4
Nozzle Dia. .251 in.
Bar. Press. 28.78 in.Hg

Pitot No. 123-5
C_p .84
H_2O 30 %

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)
	0845	266.10											
A 12	2.5	267.69	.71	1.25	7.66	5	200	251	251	41	47	47	16.9
11	5	269.41	.89	1.54	9.39	6	207				55	47	16.5
10	7.5	271.10	.81	1.44	1.08	6	194				54	55	16.7
9	10	272.81	.82	1.47	2.78	6	195	254	250	42	70	51	18.2
8	12.5	274.56	.78	1.41	4.46	6	195				70	51	17.3
7	15	276.11	.67	1.20	6.01	6	202				71	55	16.4
6	17.5	277.57	.58	1.05	7.45	5	206	254	256	44	73	55	16.6
5	20	278.97	.57	1.02	8.87	5	206				75	57	16.5
4	22.5	280.34	.60	1.07	0.36	5	211				77	58	16.2
3	25	281.94	.62	1.11	1.86	6	213	254	250	44	78	59	16.5
2	27.5	283.46	.62	1.11	3.36	6	213				80	60	16.6
1	30	284.82	.53	.94	4.75	6	219				81	60	16.6
B 12	32.5	286.54	.85	1.51	6.51	7	220	254	256	46	80	61	16.5
11	35	288.30	.92	1.63	8.33	8.5	222				83	62	16.1
10	37.5	290.03	.83	1.48	0.07	7	222				84	63	15.7
9	40	291.71	.76	1.35	1.73	7	227	250	252	46	84	63	15.8
8	42.5	293.38	.73	1.29	3.36	7	227				83	64	17.5
7	45	294.91	.65	1.14	4.87	7	231				83	64	16.8
6	47.5	296.42	.60	1.05	6.36	7	234	250	254	47	84	64	17.2
5	50	297.96	.68	1.19	7.92	7	235				84	65	16.1
4	52.5	299.45	.58	1.03	9.38	7	229	251	253	48	84	66	16.1
3	55	300.91	.53	.94	0.77	7	229				84	66	16.3
2	57.5	302.33	.58	1.03	2.22	7	230				84	66	16.5
1	60	303.70	.59	1.04	3.69	7	230	250	254	48	85	66	16
	1028												
	0 - 60	V_m = 37.60		ΔH = 1.2[illegible]							Avg. = 67.7		

107 est → est within Hect

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job L.P. Hayward Date 4/11/95 Test 1 Run 2
Source Line 1 Corr. Dryer Scrubber Inlet No. of traverse points 24
Method 5 Filter holder: glass Filter type: glass fiber

Sample Train Leak Check:

Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☒
Post test: 0 cfm at 13 IN. HG (vac) ☒

Particulate Catch Data:

No. of filters used: Recovery solvent(s)

☒ acetone
☐ other(s)

No. of probe wash bottles:
Sample recovered by: DAT

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1			
Impinger No. 2	593	300	293
Impinger No. 3			
Condenser			
Desiccant	1346	1340	6
Total			299

Integrated Gas Sampling Data:

Bag Pump No. 234 Box No. 20 Bag No. 2
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: 0 cc/min at 16 IN.HG
Time start: 1250 (HRS) Time end: 1255 (HRS)
Sampling rate: 400 cc/min Operator: Dnf

S/N of O_2 Analyzer used to monitor train outlet: 4

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INTERPOLL LA RATORIES, INC.

(612) 6-6020

EPA Method 5 Field Data Sheet

Job L.P. Hayward — Operators Dick & LH — Nozzle No. 7-4 — Pitot No. V23-5

Source LPC / Core Dryer Scrubber In — Meter Box No. 18 ΔH@ 1.81 in.WC — Nozzle Dia. .251 in. — C_p .84

Date 4/11/95 Test 1 Run 2 — Gasmeter Coeff. .9970 — Bar. Press. 28.78 in.Hg — H_2O 25 %

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)
	1155	305.50											
B 12	2.5	307.18	.83	1.49	7.22	6	235	255	261	42	66	66	16.4
11	5	309.01	.86	1.56	9.00	7	235				61	61	16.1
10	7.5	310.80	.82	1.47	0.71	7	238				63	60	15.5
9	10	312.58	.81	1.46	2.42	7	236	254	260	43	66	61	15.9
8	12.5	314.09	.75	1.35	4.07	6.5	238				68	60	16.4
7	15	315.75	.72	1.30	5.68	6.5	236				70	60	16.3
6	17.5	317.27	.68	1.23	7.26	6.5	236	255	263	44	72	61	16.2
5	20	318.93	.71	1.29	8.88	7	234				74	61	16.5
4	22.5	320.53	.68	1.24	0.46	7	233				76	61	15.6
3	25	322.10	.69	1.26	2.06	7	237	249	258	44	77	62	16.0
2	27.5	323.68	.68	1.24	3.65	7	237				78	63	15.8
1	30	325.23	.65	1.19	5.21	7	237				79	63	15.9
A 12	32.5	327.09	.91	1.66	7.05	10	237	250	256	45	79	64	15.7
11	35	328.93	.93	1.70	8.91	10	238				80	64	15.7
10	37.5	330.81	.90	1.65	0.74	10	237				80	64	15.7
9	40	332.61	.83	1.52	2.51	10	235	253	255	46	79	64	15.6
8	42.5	334.41	.81	1.48	4.24	10	240				79	65	15.7
7	45	336.13	.75	1.37	5.92	9.5	237				79	65	16.5
6	47.5	337.58	.68	1.24	7.51	9.5	238	256	254	46	79	65	16.7
5	50	339.16	.68	1.24	9.11	9.5	238				80	65	16.5
4	52.5	340.86	.70	1.29	0.73	9.5	232				81	66	16.2
3	55	342.28	.56	1.03	2.19	9	233	255	252	46	82	67	16.0
2	57.5	343.93	.75	1.37	3.88	11.5	233				82	67	16.0
1	60	345.60	.78	1.44	5.60	11.5	233				84	67	15.7
	(1258)												
	θ - 60	V_m = 40.10		ΔH 1.35							Avg. - 69.5		

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job L.P. Hamilton Date 4/11/95 Test 1 Run 3
Source Line 1 Cove River Scrubber No. of traverse points 24
Method 5 Filter holder: 9/955 In. Filter type: Glass fiber

Sample Train Leak Check:

Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☒
Post test: 0 cfm at 13 IN. HG (vac) ☒

Particulate Catch Data:

No. of filters used:

Recovery solvent(s)

☒ acetone
☐ other(s)

No. of probe wash bottles:
Sample recovered by: DLH

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1			
Impinger No. 2	616	300	316
Impinger No. 3			
Condenser			
Desiccant	1418	1410	8
Total			324

Integrated Gas Sampling Data:

Bag Pump No. 23H
Bag Material: 5-layer Aluminized Tedlar
Pretest leak check: 0
Time start: 1405
Sampling rate: 400 cc/min

Box No. 20 Bag No. 3
Size: 44 L
14 IN.HG
(HRS) Time end: 1523 (HRS)
cc/min Operator: DLH

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

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INTERPOLL LA[illegible]RATORIES, INC.
(612) [illegible]6-6020

EPA Method 5 Field Data Sheet

Job L.P. Hayward Operators Dirk & C.H Nozzle No. 7-4 Pitot No. V23-5
Source Line 1 Core Dryer Scrubber In Meter Box No. 18 ΔH@ 1.81 in.WC Nozzle Dia. .251 in. C_p .84
Date 4/11/95 Test 1 Run 3 Gasmeter Coeff. .9970 Bar. Press. 28.78 in.Hg H_2O 28.78 %

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)						Oxygen (% v/v)
							Stack	Probe	Oven	Imp.	Gas/In	Gas/Out	
	1400	346.50											
A 12	2.5	348.59	1.10	2.04	8.53	9	226	238	227	46	64	64	16
11	5	350.63	1.15	2.11	0.58	9	225				67	67	15.3
10	7.5	352.58	1.05	1.93	2.55	8.5	227				70	64	15.3
9	10	354.57	.97	1.78	4.45	8.5	229	242	238	46	73	66	15.3
8	12.5	356.47	.92	1.71	6.31	8.5	226				75	65	16.0
7	15	358.27	.83	1.54	8.08	8	225				77	65	16.3
6	17.5	359.76	.71	1.32	9.73	7.5	223	256	250	46	78	66	16.8
5	20	361.40	.63	1.18	1.28	7	223				79	66	17.0
4	22.5	363.12	.76	1.43	2.99	8	218				79	67	17.1
3	25	364.76	.79	1.49	4.74	8	217	257	252	48	81	67	17.1
2	27.5	366.58	.83	1.58	6.54	9	213				81	67	16.8
1	30	368.40	.78	1.49	8.28	9	213				83	66	17.2
B 12	32.5	370.26	.98	1.85	6.23	10	218	254	253	48	80	66	16.6
11	35	372.26	1.05	1.97	2.24	11	221				84	68	16.3
10	37.5	374.26	1.0	1.89	4.21	11	219				84	68	16.4
9	40	376.20	.95	1.80	6.13	11	219	256	255	48	85	71	16.6
8	42.5	377.97	.84	1.60	7.95	10.5	218				85	70	16.3
7	45	379.79	.79	1.50	9.71	10	220				55	71	17.0
6	47.5	381.52	.68	1.30	1.35	9	216	255	254	49	86	70	17.4
5	50	382.99	.66	1.26	2.96	8	218				86	71	16.7
4	52.5	384.76	.68	1.30	4.60	8	217				86	71	16.8
3	55	386.39	.73	1.39	6.30	9	220	256	254	50	87	71	16.2
2	57.5	388.08	.76	1.45	8.03	9.5	217				88	72	16.6
1	60	389.75	.73	1.40	9.73	10	217				88	72	16.6
	(1503)												
	θ - 60	V_m - 43.25		ΔH 1.60							Avg. - 74.2		

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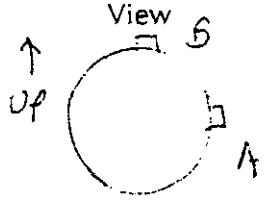
INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 2 Field Data Sheet

Job: LP #HAWARD
Source: LINE 1 COKE DRYER OUTLET
Test: 1 Run 0 Date 4-11-95
Stack Dimen.: 47.5 IN.
Dry Bulb: ____ °F Wet bulb: ____ °F
Manometer: ☐ Reg. ☐ Exp ☐ Elec.
Barometric Pressure: 28.78 IN.HG
Static Pressure: + .38 IN.WC
Operators: GH TH SB
Pitot No.: 24 V 6 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: 9 * IN.		Time Start: 0800	HRS
1	.021	1.0	10.00	.92	163
2	.067	3.15	12.15	.90	
3	.118	5.55	14.55	.94	
4	.177	8.32	17.32	.95	
5	.250	11.75	20.75	.90	
6	.356	16.73	25.73	.85	
7	.644	30.27	39.27	.88	165
8	.750	35.25	44.25	.85	
9	.823	38.68	47.68	.95	
10	.882	41.45	50.45	1.0	
11	.933	43.85	52.85	1.0	
12	.979	46.00	55.00	1.1	166

Temp. Meas. Device & S/N: FDT 25 — 0815 Time End: HRS

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

* INCLUDES VERTICLE PORT CLAMP

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job C. HAYWARD → SCRUBBER OUT Date 4-11-95 Test 1 Run 1
Source LINE 1 COKE DRYER No. of traverse points 24
Method _____ Filter holder: _____ Filter type: 4" QF

Sample Train Leak Check:
Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☒
Post test: .00 cfm at 12 IN. HG (vac) ☒

Particulate Catch Data:
No. of filters used: 7456

Recovery solvent(s)
☒ Acetone
☐ other(s) _____

No. of probe wash bottles: 1
Sample recovered by: GH

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1			
Impinger No. 2	490	296	194
Impinger No. 3	730	496	234
Condenser			
Desiccant	1320	1305	15
Total			443

Integrated Gas Sampling Data:

zero — 100

Bag Pump No. 36 Box No. 24 Bag No. 1 343
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: .00 cc/min at 23 IN.HG
Time start: 0845 (HRS) Time end: 1033 (HRS)
Sampling rate: 400 cc/min Operator: GH

S/N of O_2 Analyzer used to monitor train outlet: 7

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A = side port

INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 5 Field Data Sheet

Job L P HAYWARD — Operators GH TH — Nozzle No. 1-4 — Pitot No. 4-U5
Source LINE 1 CORE DRYER 3 RUBBER OUTLET — Meter Box No. 10 ΔH@ 1.78 in.WC — Nozzle Dia. .250 in. — C_p .84
Date 7-11-95 Test 1 Run 1 — Dgasmeter Coeff. .9956 — Bar. Press. 28.78 in.Hg — H_2O 2.8 %

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)
	(0845	52.70											
A 13	2.5	54.51	.87	1.67	4.49	5.0	163	248	252	38	40	34	13.1
11	5	56.56	1.1	1.98	6.46	5.0	163	250	257	40	40	37	13.3
10	7.5	58.57	1.0	1.90	8.43	5.0	167	251	254	42	44	38	13.3
9	10	60.32	1.0	1.91	0.37	5.0	167	253	261	43	49	44	13.5
8	12.5	62.29	.92	1.77	2.24	5.0	167	254	252	45	56	42	14.8
7	15	64.11	.89	1.73	4.07	5.0	166	261	254	43	58	42	14.8
6	17.5	65.91	.84	1.63	5.90	5.0	167	262	255	44	53	44	14.0
5	20	67.75	.86	1.64	7.71	5.0	167	261	254	43	57	44	14.4
4	22.5	69.43	.75	1.46	9.41	5.5	167	262	255	44	59	44	14.5
3	25	71.19	.79	1.52	1.14	6.0	167	261	254	43	61	45	14.8
2	27.5	73.10	.89	1.74	3.03	7.0	165	263	255	44	62	45	14.6
1	30	74.92	.92	1.80	4.93	7	167	263	255	44	64	46	14.1
B 12	32.5	76.74	.86	1.67	6.76	7	167	262	257	42	65	47	14.5
11	35	78.91	1.2	2.34	8.97	7	165	264	255	42	65	49	14.5
10	37.5	81.13	1.2	2.30	1.13	7	166	263	254	43	65	49	13.9
9	40	83.17	1.0	1.97	3.13	7	166	261	254	43	68	50	13.8
8	42.5	85.07	.96	1.90	5.08	7	166	260	254	42	68	50	13.9
7	45	86.99	.90	1.84	6.96	7	166	262	255	43	68	51	13.7
6	47.5	88.89	.89	1.76	8.84	7	167	261	255	44	68	52	14.1
5	50	90.77	.89	1.76	0.77	7	167	262	257	41	69	52	13.8
4	52.5	92.62	.85	1.68	2.63	8	167	261	255	42	69	53	13.8
3	55	94.48	.85	1.69	4.47	8	167	263	254	43	69	53	13.9
2	57.5	96.34	.84	1.67	6.32	8	167	261	258	44	69	53	13.7
1	60	98.23	.85	1.69	8.17	8	167	262	257	44	69	53	13.9
	(1033												
	θ 60	V_m = 45.53		1.80 ΔH =							Avg. =	53.7	

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job LP HAYWARD (SCRUBBER OUTLET) Date 4-11-95 Test 1 Run 2
Source LINE 1 CORE OVER No. of traverse points 24
Method 5 Filter holder: GLASS Filter type: 4" GF

Sample Train Leak Check:
Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☐
Post test: .00 cfm at 10 IN. HG (vac) ☒

Particulate Catch Data:
No. of filters used: 2433

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

No. of probe wash bottles: 1
Sample recovered by: GH

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1			
Impinger No. 2	558	294	164
Impinger No. 3	768	494	274
Condenser			
Desiccant	1311	1298	14
Total			452 - 100 352

Integrated Gas Sampling Data:

Bag Pump No. 36 Box No. 24 Bag No. 2
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: .00 cc/min at 23 IN.HG
Time start: (HRS) Time end: (HRS)
Sampling rate: 400 cc/min Operator: GH

S/N of O_2 Analyzer used to monitor train outlet: 7

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 5 Field Data Sheet

Job LP HAYWARD OOT Operators GH TH Nozzle No. 1-4 Pitot No. 24 U 6
Source INF / CONVERTER SCRUBBER Meter Box No. 1.0 ΔH@ 1.78 in.WC Nozzle Dia. .350 in. C_p .84
Date 4-11-95 Test 1 Run 3 Gasmeter Coeff. .995C Bar. Press. 28.78 in.Hg H_2O @ 28 26 %

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)
	1155	100.30											
A 12	25	102.43	1.1	.925	2.42	6	166	248	251	42	52	45	14.7
11	5	104.47	1.0	3.05	4.43	6	166	249	247	42	52	46	13.6
10	7.5	106.47	1.0	2.03	6.44	6	166	251	249	43	53	47	14.2
9	10	108.35	.88	1.79	8.33	6	166	253	247	42	58	51	14.5
8	12.5	110.21	.85	1.75	0.20	6	166	254	250	43	61	51	14.2
7	15	112.14	.87	1.79	2.11	5	165	254	242	40	62	51	14.0
6	17.5	114.13	.98	2.02	4.12	5	166	255	241	41	63	51	13.9
5	20	116.00	.84	1.73	6.00	5	167	256	253	42	64	52	14.1
4	22.5	117.94	.90	1.84	7.93	6	167	257	244	41	64	51	14.0
3	25	119.95	.95	1.96	9.93	6	167	256	247	42	64	52	13.7
2	27.5	121.90	.95	1.96	1.92	6	166	251	249	43	67	52	13.9
1	30	123.92	.94	1.95	3.91	7	166	252	248	42	67	53	13.8
B 12	32.5	125.88	.93	1.91	5.87	7	166	251	249	42	67	53	13.7
11	35	127.67	.78	1.61	7.69	7	165	253	251	42	63	53	13.7
10	37.5	129.73	1.0	2.06	9.73	7	166	253	250	42	63	53	13.9
9	40	131.85	1.1	2.27	1.87	7	166	252	254	43	63	53	13.7
8	42.5	133.91	1.0	2.07	3.93	7	165	257	255	44	67	54	13.9
7	45	136.09	1.1	2.28	6.09	7	167	254	253	45	68	54	13.8
6	47.5	138.13	.98	2.04	8.12	10	166	255	254	46	66	54	14.0
5	50	140.16	.99	2.05	0.16	10	166	256	252	45	65	55	14.0
4	52.5	142.15	.95	1.97	2.14	10	166	257	254	42	65	55	14.0
3	55	144.12	.90	1.86	4.11	10	167	257	253	44	65	55	14.2
2	57.5	145.89	.75	1.55	5.89	10	166	255	254	43	66	55	14.2
1	60	147.66	.74	1.54	7.66	10	166	255	251	43	63	56	14.3
	(1258)												
	θ - 60	V_m - 47.36		1.93 ΔH -							Avg. 57.4		

B-12

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job LP HAYWARD Date 4-11-95 Test 1 Run 3
Source LINE 1 CORE DRYER SCRUBBER No. of traverse points 24
Method 5 Filter holder GLASS OUTLET Filter type: 4" GF

Sample Train Leak Check:

Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☒
Post test: .00 cfm at 10 IN. HG (vac) ☒

Particulate Catch Data:

No. of filters used: 7435

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

No. of probe wash bottles: 1
Sample recovered by: GH

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1			
Impinger No. 2	733	494	239
Impinger No. 3	570	292	278
Condenser			
Desiccant			
Total			518-100 (418)

Integrated Gas Sampling Data:

Bag Pump No. 36 Box No. 24 Bag No. 3
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: .00 cc/min at 24 IN.HG
Time start: (HRS) Time end: (HRS)
Sampling rate: 400 cc/min Operator: GH

S/N of O_2 Analyzer used to monitor train outlet: 7

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INTERPOLL LABORATORIES, INC.
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EPA Method 5 Field Data Sheet

Job LP HAYWARD
Source 4 INFL / CORE DRYER OUTLET
Date 4-11-95 Test 1 Run 3

Operators BH TH
Meter Box No. 10 ΔH@ 1.78 in.WC
Gasmeter Coeff. .9956

Nozzle No. 1-4
Nozzle Dia. .250 in.
Bar. Press. 28.78 in.Hg

Pitot No. 24U6
C_p .84
H_2O 36 %

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)
	1400	148.10											
A 12	2.5	150.14	1.0	2.06	0.14	5	166	260	248	39	51	51	13.7
11	5	152.17	1.0	2.04	2.16	5	166	261	246	40	54	51	13.9
10	7.5	154.29	1.1	2.22	4.27	5	167	257	245	40	57	50	14.2
9	10	156.26	.95	1.94	6.25	5	167	261	247	40	61	50	14.1
8	12.5	158.19	.92	1.89	8.20	5	167	260	245	41	61	51	14.1
7	15	160.13	.89	1.82	0.12	5	164	262	247	39	64	51	14.0
6	17.5	162.03	.85	1.76	2.01	5	165	258	243	38	64	52	14.0
5	20	163.94	.87	1.80	3.92	5	165	260	245	40	64	52	13.8
4	22.5	165.74	.79	1.64	5.75	6	167	261	247	40	66	52	13.5
3	25	167.54	.74	1.53	7.57	6	166	262	248	41	67	53	14.3
2	27.5	169.42	.85	1.76	9.40	7	166	263	247	42	68	52	13.9
1	30	171.35	.89	1.85	1.34	7	166	262	250	43	68	51	13.8
B 12	32.5	173.47	1.1	2.28	3.49	7	166	265	251	44	69	53	13.6
11	35	175.63	1.1	2.29	5.65	7	166	264	252	45	69	53	13.8
10	37.5	177.73	1.0	2.08	7.74	8	166	263	249	44	70	54	13.7
9	40	179.79	1.0	2.08	9.77	8	167	261	247	42	70	54	13.7
8	42.5	181.75	.95	1.98	1.77	8	167	262	248	43	670	54	13.6
7	45	183.67	.85	1.77	3.67	8	165	254	247	44	67	55	13.6
6	47.5	185.50	.79	1.65	5.50	8	165	251	249	43	67	55	13.5
5	50	187.39	.80	1.66	7.34	9	167	254	246	42	69	55	13.5
4	52.5	189.29	.89	1.85	9.28	9	167	255	249	43	67	55	13.7
3	55	191.21	.88	1.83	1.21	9	165	254	247	44	67	56	13.9
3	57.5	193.14	.85	1.77	3.12	9	166	257	245	46	67	56	13.5
1	60	195.05	.86	1.77	5.02		165	257	246	49	67	56	13.8
	1503												
	0 - 60	V_m - 46.95		1.89 ΔH -							Avg. - 59.0		

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job CP HAYWARD → SCRUBBER OUT
Date 4-11-95 Test 1 Run 4
Source LINE 1 CORE DRYER
No. of traverse points 24
Method 5 Filter holder: GLASS
Filter type: 4" GF

Sample Train Leak Check:

Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☒
Post test: .00 cfm at 10 IN. HG (vac) ☒

Particulate Catch Data:

No. of filters used: 7457

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

No. of probe wash bottles: 1
Sample recovered by: CH

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1			
Impinger No. 2	698	495	203
Impinger No. 3	532	300	232
Condenser			
Desiccant	1319	1308	13
Total			448-100 348

Integrated Gas Sampling Data:

Bag Pump No. 36
Box No. 23 Bag No. 1
Bag Material: 5-layer Aluminized Tedlar
Size: 44 L
Pretest leak check: .00 cc/min at _____ IN.HG
Time start: 1721
(HRS) Time end: 1825 (HRS)
Sampling rate: 400 cc/min Operator: CH

S/N of O_2 Analyzer used to monitor train outlet: 7

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INTERPOLL LABORATORIES, INC.

(612) 786-6020

SCRUBBER OUTLET EPA Method 5 Field Data Sheet

Job: LP HAYWARD
Source: LINE 1 CORE DRYER
Date: _____ Test 1 Run 4

Operators: CH SB
Meter Box No. 10 ΔH@ 1.78 in.WC
Gasmeter Coeff. .9956

Nozzle No. 1-4
Nozzle Dia. .350 in.
Bar. Press. 29.78 in.Hg

Pitot No. 34 V 6
C_p .84
H_2O 28.0 %

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)
	1721	206.90											
A 12	25	208.61	.80	1.58	8.69	5	166	245	288	39	54	53	16.4
11	5	210.45	.79	1.56	0.46	5	162	246	249	46	55	52	14.1
10	7.5	212.33	.79	1.56	2.23	5	165	247	251	42	55	54	13.5
9	10	213.84	.65	1.29	3.83	5	165	249	255	42	56	54	13.4
8	12.5	215.32	.60	1.18	5.37	5	165	250	257	44	62	52	13.3
7	15	217.03	.68	1.34	7.02	5	165	251	258	45	60	53	13.2
6	17.5	218.68	.67	1.33	8.67	5	163	252	259	46	62	52	13.3
5	20	220.34	.67	1.32	0.31	5	163	253	260	47	65	54	13.4
4	22.5	221.94	.66	1.31	1.94	5	164	254	259	48	68	56	13.2
3	25	223.56	.64	1.27	3.54	5	168	255	260	47	69	58	13.2
2	27.5	225.15	.62	1.24	5.15	5	167	256	261	41	67	57	13.2
1	30	226.71	.60	1.19	6.71	5	166	257	255	40	70	55	13.4
B 12	32.5	228.41	.69	1.37	8.39	5	166	258	256	41	65	51	13.8
11	35	230.05	.67	1.32	0.03	5	166	251	255	39	66	52	13.5
10	37.5	231.81	.78	1.54	1.80	5	166	253	254	40	70	52	13.7
9	40	233.54	.74	1.47	3.53	5	166	254	255	41	72	56	14.2
8	42.5	235.29	.74	1.48	5.27	5	166	253	254	42	69	55	13.6
7	45	237.01	.74	1.47	7.00	5	167	254	255	42	70	55	13.7
6	47.5	238.61	.69	1.37	8.60	5	166	255	252	44	70	56	13.7
5	50	240.46	.76	1.52	0.45	6	164	256	253	45	70	58	13.9
4	52.5	242.29	.82	1.64	2.28	6	166	257	254	44	71	55	13.5
3	55	244.05	.79	1.57	4.07	6	166	258	254	44	71	57	13.7
2	57.5	245.87	.79	1.58	5.87	6	165	259	253	42	74	57	13.9
1	60	247.77	.83	1.64	7.77	6	166	258	252	43	74	57	13.9
	(1825)												
	θ 60	V_m - 40.83		1.42 ΔH -							Avg. - 60.3		

INTERPOLL LABORATORIES, INC.
(612) 786-6020

PM-10 Traverse Point Selection Data Sheet

Job L.P. Harwood
Source Line 1 Coke Drum Scrubber INLET
Test 2 Run 1
Date 4/11/95
Operator T. VanHeusen

Pitot Tube No. V24-5
Barometric Pres. 28.78 IN.HG
Duct Shape: ☒ Round ☐ Rectang.
Duct Dimensions 47 IN.
Length Of Port 6 IN.

PM-10 Guidelines require that the velocity at each of the four selected traverse points be within ± 20%. Record the velocity pressure of the traverse points and perform the indicated calculations. The values in the last column must fall within range of 80 - 120.

Traverse Point	Gas Temp. (Deg-F)	Velocity Pressure ΔP (IN.WC)	$\sqrt{\Delta P}$	$\frac{100\sqrt{\Delta p}}{(\sqrt{\Delta P})Avg}$
# 1	220	.76	.8718	94
2	220	.93	.9643	105
Averages	220		.9180	

The average velocity pressure to be used for the sizing run may now be calculated from the following expression:

$\Delta P = (\sqrt{\Delta P}\ Avg)^2 =$ .84 IN.WC

Traverse points on round ducts .15 D and .85 D
Distance from the duct wall 7.05 13.05 IN.
Distance form the end of port 39.95 45.95 IN.

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job L.P. Hayward Date 4/11/95 Test 2 Run 1
Source Line 1 Core Dryer Scrubber INLET No. of traverse points 2
Method 5 Filter holder: SS Filter type: 9655 Fiber
Sample Train Leak Check:

Pretest: ≤ 0.02 cfm at 15 in. Hg. (vac) ☒
Post test: 0 cfm at 16 in. Hg. (vac) ☒

Particulate Catch Data:

No. of filters used:

Recovery solvent(s)

☒ acetone
☐ other(s)

No. of probe wash bottles: 1
Sample recovered by: Dick

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1			
Impinger No. 2			
Impinger No. 3			
Condenser	90	0	90
Desiccant	1352	1340	12
Total			162

Integrated Gas Sampling Data:

Bag Pump No. 23A Box No. _____ Bag No. 1
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: _____ cc/min at _____ in. Hg.
Time start: _____ (HRS) Time end: _____ (HRS)
Sampling rate: _____ cc/min Operator: _____

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

123093-G:\STACK\WP\METHODS\S-0046RR

CF-011

INTERPOLL LABORATORIES EPA METHOD 5 FIELD DATA SHEET

Job: L.P. Hayward
Source: Line 1 Core Dryer ~~Exhaust~~ Scrubber
Date: 4/11/95 Test: 2 Run: 1 Inlet

Operators: Dwt & L.H
Meter Box No. 28 ^H@ 1.81 IN WC
Gasmeter coeff. .9970

Pitot No. 673-5 Cp .84
Bar. Press. 28.78 inHg H2O 28 %
Nozzle No. Imp Nozzle Dia .228 IN.

Traverse Point No.	Sampling Time (min)	Sample Volume (cf)	Velocity Head (inWC)	Orifice Meter (inWC)	Dev. Vol. (cf)	VAC. inHg	Temperatures (°F) Stack	Probe	Oven	Impg.	Gas/In	Gas/Out	Oxygen (%v/v)
	1720	390.48											
A 2	5	393.45	.84	1.11	3.49	5	203	268	NA	NA	65	65	16.4
2	10	396.50	.84	1.09	6.45	7	203				66	63	16.8
1	15	399.55	.84	1.09	9.41	9	203	270			70	65	15.5
1	20	402.40	.84	1.08	2.37	14	210				71	65	
	1740												
	θ = 20	Vm = 11.92		^H = 1.09							Avg. = 66.1		

S-00378

INTERPOLL LABORATORIES, INC.
(612) 786-6020

PM-10 Traverse Point Selection Data Sheet

Job: L.P. Hayward
Source: Line 1 Core Dryer Scrubber ~~Inlet~~ Outlet
Test: 2 Run: 1
Date: 4/11/95
Operator: D. Van Hecker

Pitot Tube No.: V23-5
Barometric Pres.: 28.78 IN.HG
Duct Shape: ☒ Round ☐ Rectang.
Duct Dimensions: 47 IN.
Length Of Port: 6 IN.

PM-10 Guidelines require that the velocity at each of the four selected traverse points be within ± 20%. Record the velocity pressure of the traverse points and perform the indicated calculations. The values in the last column must fall within range of 80 - 120.

Traverse Point	Gas Temp. (Deg-F)	Velocity Pressure ΔP (IN.WC)	$\sqrt{\Delta P}$	$\frac{100\sqrt{\Delta p}}{(\sqrt{\Delta P})Avg}$
A 1	165	.790	.89	95.6
2	165	.85	.97	104.3
Averages	165		.93	

The average velocity pressure to be used for the sizing run may now be calculated from the following expression:

$\Delta P = (\sqrt{\Delta P}\ Avg)^2 =$ .87 IN.WC

Traverse points on round ducts	.15 D and .85 D	
Distance from the duct wall	7.05	13.05 IN.
Distance form the end of port	13.95	45.95 IN.

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job L.P. Hayward Date 4/11/95 Test 3 Run 1
Source Line 1 Coke Dryer Scrubber No. of traverse points 2
Method 5/17 Filter holder: SS Out Filter type: 9/655 Fiber
Sample Train Leak Check:

Pretest: ≤ 0.02 cfm at 15 in. Hg. (vac) ☒
Post test: 0 cfm at 20 in. Hg. (vac) ☒

Particulate Catch Data:

No. of filters used:

Recovery solvent(s)

☒ acetone
☐ other(s)

No. of probe wash bottles: 1
Sample recovered by: DWH

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1			
Impinger No. 2			
Impinger No. 3			
Condenser	100	0	100
Desiccant	1362	1352	10
Total			110

Integrated Gas Sampling Data:

Bag Pump No. 23A
Bag Material: 5-layer Aluminized Tedlar
Pretest leak check: 0
Time start: 1816
Sampling rate: 800

Box No. 13 Bag No. 2
Size: 44 L
cc/min at 16 in. Hg.
(HRS) Time end: 1534 (HRS)
cc/min Operator: DWH

S/N of O_2 Analyzer used to monitor train outlet: 4

123095-G:\STACK\WP\METHODS\S-0046RR

INTERPOLL LABORATORIES EPA METHOD 5 FIELD DATA SHEET

Job: L P Hayward
Source: Line 1 Core Dryer Scrubber Outlet
Date: 4/11/95 Test 3 Run 1

Operators: DW & C.H
Meter Box No. 18 ^H@ 1.81 IN WC
Gasmeter coeff. .9970

Pitot No. U23-5 Cp .84
Bar. Press. 28.78 inHg H2O 28 %
Nozzle No. Imp Nozzle Dia. .228 IN.

Traverse Point No.	Sampling Time (min)	Sample Volume (cf)	Velocity Head (inWC)	Orifice Meter (inWC)	Dgs. Vol. (cf)	VAC. inHg	Temperatures (°F) Stack	Probe	Oven	Impg.	Gas/In	Gas/Out	Oxygen (xv/v)
	1814	402.62											
A 1	5	405.96	.87	1.27	5.83	9	166	262	NA	NA	70	68	16.6
1	10	409.20	.87	1.28	9.05	7	166				79	68	16.0
2	15	412.38	.87	1.29	2.31	7	166	263			84	69	16.3
2	20	415.50	.87	1.30	5.58	8	166				87	70	16
	(1834)												
	θ = 20	Vm = 12.88		^H = 1.29							Avg. = 74.3		

S-0037R

APPENDIX C

INTERPOLL LABORATORIES ANALYTICAL DATA

Interpoll Laboratories
(612) 786-6020

EPA Method 3 Data Reporting Sheet
Orsat Analysis

Job LP / Hayward
Team Leader GH
Date Submitted 4-12-95
Test No. 1
Date of Analysis 4-12-95

Source Line 1 Core Dryer
Test Site Scrubber Outlet
Date of Test 4-11-95
No. of Runs Completed 3
Technician B.O

Test/ Run	Sample Log Number and Type	No. of An.	Buret Readings (ml) Zero Pt.	After CO_2	After O_2	Conc. CO_2 %v/v Dry	Conc. O_2 %v/v Dry	F_o
1/1	5204-06	1	0.00	4.90	20.80	4.90	15.90	1.02
		2	0.00	4.90	20.80	4.90	15.90	1.02
	☑B ☐F	Avg				4.90	15.90	
1/2	-07	1	0.00	4.60	20.90	4.60	16.30	1.00
		2	0.00	4.60	20.90	4.60	16.30	1.00
	☑B ☐F	Avg				4.60	16.30	
1/3	-08	1	0.00	4.60	20.90	4.60	16.30	1.00
		2	0.00	4.60	20.90	4.60	16.30	1.00
	☑B ☐F	Avg				4.60	16.30	
1/4	-09	1	0.00	4.90	20.90	4.90	16.00	1.00
		2	0.00	4.90	20.90	4.90	16.00	1.00
	☑B ☐F	Avg				4.90	16.00	
		1						
		2						
	☐B ☐F	Avg						
		1						
		2						
	☐B ☐F	Avg						
		1						
		2						
	☐B ☐F	Avg						
		1						
		2						
	☐B ☐F	Avg						
		1						
		2						
	☐B ☐F	Avg						

☑ Ambient Air QA Check
☑ Orsat Analyzer System Leak Check
☑ F_o Within EPA M-3 Guidelines for fuel type.

Where $F_o = \frac{20.9 - O_2}{CO_2}$

F=Flask (250 cc all glass)
B=Tedlar Bag (5-layer)

EPA Method 3 Guidelines

Fuel Type	F0 Range
Coal:	
Anthracite/Lignite	1.016-1.130
Bituminous	1.083-1.230
Oil:	
Distillate	1.260-1.413
Residual	1.210-1.370
Gas:	
Natural	1.600-1.836
Propane	1.434-1.586
Butane	1.405-1.553
Wood/Wood Bark	1.000-1.130

LSC-04-BR

Interpoll Laboratories
(612) 786-6020

EPA Method 3 Data Reporting Sheet
Orsat Analysis

Job LP / Hayward
Team Leader DVH
Date Submitted 4-12-95
Test No. 1
Date of Analysis 4-12-95

Source Line / Core Dryer
Test Site Scrubber Inlet
Date of Test 4-11-95
No. of Runs Completed 3
Technician B. O.

Test/ Run	Sample Log Number and Type	No. of An.	Buret Readings (ml) Zero Pt.	After CO_2	After O_2	Conc. CO_2 %v/v Dry	Conc. O_2 %v/v Dry	F_o
1/1		1	0.00	4.50	20.80	4.50	16.30	1.02
	5204-14	2	0.00	4.50	20.80	4.50	16.30	1.02
	☑ B ☐ F	Avg				4.50	16.30	
1/2		1	0.00	4.70	20.80	4.70	16.10	1.02
	-15	2	0.00	4.70	20.80	4.70	16.10	1.02
	☑ B ☐ F	Avg				4.70	16.10	
1/3		1	0.00	4.50	20.80	4.50	16.30	1.02
	-16	2	0.00	4.50	20.80	4.50	16.30	1.02
	☑ B ☐ F	Avg				4.50	16.30	
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						

☑ Ambient Air QA Check
☑ Orsat Analyzer System Leak Check
☑ F_o Within EPA M-3 Guidelines for fuel type.

Where $F_o = \frac{20.9 - O_2}{CO_2}$

F=Flask (250 cc all glass)
B=Tedlar Bag (5-layer)

EPA Method 3 Guidelines

Fuel Type	F0 Range
Coal:	
Anthracite/Lignite	1.016-1.130
Bituminous	1.083-1.230
Oil:	
Distillate	1.260-1.413
Residual	1.210-1.370
Gas:	
Natural	1.600-1.836
Propane	1.434-1.586
Butane	1.405-1.553
Wood/Wood Bark	1.000-1.130

LSC-04-BR

Interpoll Laboratories
(612) 786-6020

EPA Method 3 Data Reporting Sheet
Orsat Analysis

Job: LP / Hayward
Team Leader: DOH
Date Submitted: 4-12-95
Test No.: 2
Date of Analysis: 4-12-95

Source: Line 1 Core Dryer
Test Site: Scrubber Inlet
Date of Test: 4-11-95
No. of Runs Completed: 1
Technician: B.J.

Test/ Run	Sample Log Number and Type	No. of An.	Buret Readings (ml) Zero Pt.	After CO_2	After O_2	Conc. CO_2 %v/v Dry	Conc. O_2 %v/v Dry	F_o
2/1	5204-18	1	0.00	1.50	21.00	1.50	19.50	
		2	0.00	1.50	21.00	1.50	19.50	
	☑ B ☐ F	Avg				1.50	19.50	
		1						
	~~20~~ 19	2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						

- ☑ Ambient Air QA Check
- ☑ Orsat Analyzer System Leak Check
- ☐ F_o Within EPA M-3 Guidelines for fuel type.

Where $F_o = \frac{20.9 - O_2}{CO_2}$

EPA Method 3 Guidelines

Fuel Type	F0 Range
Coal:	
Anthracite/Lignite	1.016-1.130
Bituminous	1.083-1.230
Oil:	
Distillate	1.260-1.413
Residual	1.210-1.370
Gas:	
Natural	1.600-1.836
Propane	1.434-1.586
Butane	1.405-1.553
Wood/Wood Bark	1.000-1.130

F=Flask (250 cc all glass)
B=Tedlar Bag (5-layer)

LSC-04-BR

Interpoll Laboratories
(612) 786-6020

EPA Method 3 Data Reporting Sheet
Orsat Analysis

Job: LP / Hayward
Team Leader: DVH
Date Submitted: 4-12-95
Test No.: 3
Date of Analysis: 4-12-95

Source: Line 1 Core Dryer
Test Site: Scrubber Outlet
Date of Test: 4-11-95
No. of Runs Completed: 1
Technician: B.D.

Test/ Run	Sample Log Number and Type	No. of An.	Buret Readings (ml) Zero Pt.	After CO_2	After O_2	Conc. CO_2 %v/v Dry	Conc. O_2 %v/v Dry	F_o
3/1	5204-20	1	0.00	4.90	20.80	4.90	15.90	1.02
		2	0.00	4.90	20.80	4.90	15.90	1.02
	☑ B ☐ F	Avg				4.90	15.90	
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						

☑ Ambient Air QA Check
☑ Orsat Analyzer System Leak Check
☑ F_o Within EPA M-3 Guidelines for fuel type.

Where $F_o = \frac{20.9 - O_2}{CO_2}$

F=Flask (250 cc all glass)
B=Tedlar Bag (5-layer)

EPA Method 3 Guidelines

Fuel Type	F0 Range
Coal:	
Anthracite/Lignite	1.016-1.130
Bituminous	1.083-1.230
Oil:	
Distillate	1.260-1.413
Residual	1.210-1.370
Gas:	
Natural	1.600-1.836
Propane	1.434-1.586
Butane	1.405-1.553
Wood/Wood Bark	1.000-1.130

LSC-04-BR

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Impinger Catch Data Reporting Sheet

Protocol: ☐Minnesota ☒Wisconsin ☐Iowa ☐EPA Method 202 ☐Other_____

Job: LP / Hayward
Source/Site: Line 1 Conv dryer / Scrubber inlet
Date Submitted: 4-12-95
Test No.: 1
Date of Analysis: 4-12-95
Technician: J. Lorenz

	Solvent Phase	Aqueous Phase
Test: 1 Run: 0	Dish No: 609	Dish No: 811
Log No: 5204 - 10 I	Dish + Sample Wt: 45.5599 g	Dish + Sample Wt: 43.3633 g
Color & Appearance: ~~very~~ ~~yellow~~ (JL 4/12/95)	Dish Tare Wt: 45.5596 g	Dish Tare Wt: 43.3630 g
Comments: ~~smokey odor~~ Field Blank	Fraction Wt: .0003 g	Fraction Wt: .0003 g
	Smpl Vol: ml, Aliqt: ml, Factor: 1.000	Smpl Vol: 200 ml, Aliqt: 100 ml, Factor: 2.000
	Sample Wt: .0003 g	Sample Wt: .0006 g
Test: 1 Run: 1	Dish No: 612	Dish No: 818
Log No: -11 I	Dish + Sample Wt: 49.6670 g	Dish + Sample Wt: 45.9175 g
Color & Appearance: very yellow	Dish Tare Wt: 49.6253 g	Dish Tare Wt: 45.9017 g
Comments: smokey odor	Fraction Wt: .0417 g	Fraction Wt: .0158 g
	Smpl Vol: ml, Aliqt: ml, Factor 1.000	Smpl Vol: 557 ml, Aliqt: 100 ml, Factor 5.570
	Sample Wt: .0417 g	Sample Wt: .0880 g
Test: 1 Run: 2	Dish No: 616	Dish No: 820
Log No: -12 I	Dish + Sample Wt: 50.9999 g	Dish + Sample Wt: 44.2236 g
Color & Appearance: very yellow	Dish Tare Wt: 50.9232 g	Dish Tare Wt: 44.1963 g
Comments: smokey odor	Fraction Wt: .0767 g	Fraction Wt: .0273 g
	Smpl Vol: ml, Aliqt: ml, Factor 1.000	Smpl Vol: 579 ml, Aliqt: 100 ml, Factor 5.790
	Sample Wt: .0767 g	Sample Wt: .1581 g
Test: 1 Run: 3	Dish No: 707	Dish No: 821
Log No: -13 I	Dish + Sample Wt: 46.6560 g	Dish + Sample Wt: 45.2685 g
Color & Appearance: very yellow	Dish Tare Wt: 46.6006 g	Dish Tare Wt: 45.2543 g
Comments: smokey odor	Fraction Wt: .0554 g	Fraction Wt: .0142 g
	Smpl Vol: ml, Aliqt: ml, Factor 1.000	Smpl Vol: 630 ml, Aliqt: 100 ml, Factor 6.300
	Sample Wt: .0554 g	Sample Wt: .0895 g

Note: Factor = Sample Volume/Aliquot Volume

Blank Solvent Wt. .0001 g

/SAB

	RUN 0 Field Blank	RUN 1	RUN 2	RUN 3
Results of Solvent Phase g	.0003	.0414	.0764	.0551
Results of Aqueous Phase C-5 g	.0006	.0874	.1575	.0889

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Solvent Rinse Data Reporting Sheet

☒ EPA Method 5 Probe Wash ☐ EPA Method 29 Probe Wash ☐ EPA Method 202 Cup & Tube Wash

Job	LP / Hayward	Source/Site	Line 1 Core Dryer Scrubber / Inlet
Date Submitted	4-12-95	Test No.	1
Date of Analysis	4-12-95	Technician	B. D.
Transport Leakage ☐	None ☒ ml	Solvent	Acetone

Test: 1	Run: 0	Dish No:	1
Log No: 5204-10 P		Dish + Sample Wt:	51.9708 g
Volume of Solvent	100 ml	Dish Tare Wt:	51.9706 g
*Solvent Residue	ug/ml	Sample Wt:	0.0002 g
Test: 1	Run: 1	Dish No:	29
Vol. of Solvent	120 ml	Dish + Sample Wt:	48.9501 g
Log Number -11 P		Dish Tare Wt:	48.8906 g
Comments		Sample Wt:	0.0595 g
Test: 1	Run: 2	Dish No:	618
Vol. of Solvent	160 ml	Dish + Sample Wt:	46.6350 g
Log Number -12 P		Dish Tare Wt:	46.5695 g
Comments		Sample Wt:	0.0655 g
Test: 1	Run: 3	Dish No:	717
Vol. of Solvent	130 ml	Dish + Sample Wt:	46.4918 g
Log Number -13 P		Dish Tare Wt:	46.4450 g
Comments		Sample Wt:	0.0468 g

*Solvent Residue 2.0 ug/ml = [(Sample Wt. 0.0002 g) (10^6)]/Vol. of Sol. 100 ml

EPA-M5 Acetone Residue Blank Spec. ≤ 7.8 ug/ml

	RUN	RUN 1	RUN 2	RUN 3
Results of Solvent Rinse g	C-6	0.0593	0.0652	0.0465

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Filter Gravimetrics Reporting Sheet

Fiter Type: ☒ EPA Method 5 ☐ EPA Method 29 ☐ EPA Method 202 ☐ Other_____

Job	LP / Hayward	Source/Site	Line 1 Core Dryer Scrubber Inlet
Date Submitted	4-12-95	Test No.	1
Date of Analysis	4-12-95	Technician	B. S.

Test: 1	Run: 0	Filter No:	7500	
Field Blank:		Filter Type:	41GF	
Log No: 52040F		Filter + Sample Wt:	.9902	g
Color:		Filter Tare Wt:	.9902	g
		Sample Wt:	0.0000	g
Test: 1	Run: 1	Filter No:	7497	
Log No: -11F		Filter Type:	41GF	
Color:		Filter + Sample Wt:	1.3035	g
		Filter Tare Wt:	.9772	g
		Sample Wt:	0.3263	g
Test: 1	Run: 2	Filter No:	7254	
Log No: -12F		Filter Type:	41GF	
Color:		Filter + Sample Wt:	1.3786	g
		Filter Tare Wt:	.9140	g
		Sample Wt:	0.4646	g
Test: 1	Run: 3	Filter No:	7498	
Log No: -13F		Filter Type:	41GF	
Color:		Filter + Sample Wt:	1.4150	g
		Filter Tare Wt:	.9862	g
		Sample Wt:	0.4288	g

		RUN	RUN 1	RUN 2	RUN 3
Results of Filter Analysis	g		0.3263	0.4646	0.4288

		RUN	RUN 1	RUN 2	RUN 3
Total Mass	g		0.5144	0.7637	0.6193

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Impinger Catch Data Reporting Sheet

Protocol: ☐Minnesota ☒Wisconsin ☐Iowa ☐EPA Method 202 ☐Other

Job: LP Hayward
Source/Site: Line 1 core dryer / scrubber outlet
Date Submitted: 4-12-95
Test No.: 1
Date of Analysis: 4-12-95
Technician: J. Lorenz

	Solvent Phase	Aqueous Phase
Test: 1 Run: 0	Dish No: 327	Dish No: 801
Log No: 5204-01 I	Dish + Sample Wt: 44.5157 g	Dish + Sample Wt: 44.9848 g
Color & Appearance:	Dish Tare Wt: 44.5155 g	Dish Tare Wt: 44.9847 g
	Fraction Wt: .0002 g	Fraction Wt: .0001 g
Comments: Field Blank	Smpl Vol: ml, Aliqt: ml, Factor: 1.000	Smpl Vol: 200 ml, Aliqt: 100 ml, Factor: 2.000
	Sample Wt: .0002 g	Sample Wt: .0002 g
Test: 1 Run: 1	Dish No: 325	Dish No: 803
Log No: -02 I	Dish + Sample Wt: 47.7325 g	Dish + Sample Wt: 41.4511 g
Color & Appearance: cloudy yellow	Dish Tare Wt: 47.6624 g	Dish Tare Wt: 41.4445 g
	Fraction Wt: .0701 g	Fraction Wt: .0066 g
Comments: Smokey odor	Smpl Vol: ml, Aliqt: ml, Factor 1.000	Smpl Vol: 625 ml, Aliqt: 100 ml, Factor 6.250
	Sample Wt: .0701 g	Sample Wt: .0413 g
Test: 1 Run: 2	Dish No: 400	Dish No: 804
Log No: -03 I	Dish + Sample Wt: 47.1922 g	Dish + Sample Wt: 46.6898 g
Color & Appearance: cloudy yellow	Dish Tare Wt: 47.1012 g	Dish Tare Wt: 46.6842 g
	Fraction Wt: .0910 g	Fraction Wt: .0056 g
Comments: Smokey odor	Smpl Vol: ml, Aliqt: ml, Factor 1.000	Smpl Vol: 722 ml, Aliqt: 100 ml, Factor 7.220
	Sample Wt: .0910 g	Sample Wt: .0404 g
Test: 1 Run: 3	Dish No: 401	Dish No: 806
Log No: -04 I	Dish + Sample Wt: 49.6114 g	Dish + Sample Wt: 46.4006 g
Color & Appearance: cloudy yellow	Dish Tare Wt: 49.5256 g	Dish Tare Wt: 46.3978 g
	Fraction Wt: .0858 g	Fraction Wt: .0028 g
Comments: Smokey odor	Smpl Vol: ml, Aliqt: ml, Factor 1.000	Smpl Vol: 726 ml, Aliqt: 100 ml, Factor 7.260
	Sample Wt: .0858 g	Sample Wt: .0203 g

Note: Factor = Sample Volume/Aliquot Volume

Blank Solvent Wt. .0001 g

	RUN 0 Field Blank	RUN 1	RUN 2	RUN 3
Results of Solvent Phase g	.0002	.0699	.0908	.0856
Results of Aqueous Phase C-8 g	.0002	.0411	.0402	.0201

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Solvent Rinse Data Reporting Sheet

☒ EPA Method 5 Probe Wash ☐ EPA Method 29 Probe Wash ☐ EPA Method 202 Cup & Tube Wash

Job	LP / Hayward	Source/Site	Line 1 Core Dryer Scrubber / Outlet
Date Submitted	4-12-95	Test No.	1
Date of Analysis	4-12-95	Technician	B.O.
Transport Leakage ☐	None ☒ ml	Solvent	Acetone

Test: 1	Run: 0	Dish No:	409
Log No:	5204-01P	Dish + Sample Wt:	46.1915 g
Volume of Solvent	100 ml	Dish Tare Wt:	46.1913 g
*Solvent Residue	2.0 ug/ml	Sample Wt:	0.0002 g
Test: 1	Run: 1	Dish No:	411
Vol. of Solvent	50 ml	Dish + Sample Wt:	46.6925 g
Log Number	-02P	Dish Tare Wt:	46.6847 g
Comments		Sample Wt:	0.0078 g
Test: 1	Run: 2	Dish No:	501
Vol. of Solvent	50 ml	Dish + Sample Wt:	47.2652 g
Log Number	-03P	Dish Tare Wt:	47.2500 g
Comments		Sample Wt:	0.0152 g
Test: 1	Run: 3	Dish No:	502
Vol. of Solvent	50 ml	Dish + Sample Wt:	46.9113 g
Log Number	-04P	Dish Tare Wt:	46.9015 g
Comments		Sample Wt:	0.0098 g

*Solvent Residue 2.0 ug/ml = [(Sample Wt. 0.0002 g) (10^6)]/Vol. of Sol. 100 ml

EPA-M5 Acetone Residue Blank Spec. ≤ 7.8 ug/ml

VSHB

	RUN	RUN 1	RUN 2	RUN 3
Results of Solvent Rinse g	C-9	0.0077	0.0151	0.0097

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Filter Gravimetrics Reporting Sheet

Filter Type: ☒ EPA Method 5 ☐ EPA Method 29 ☐ EPA Method 202 ☐ Other_____

Job	LP / Hayward	Source/Site	Line 1 Core Dryer Scrubber / Outlet
Date Submitted	4-12-95	Test No.	1
Date of Analysis	4-12-95	Technician	B.O.

Test: 1	Run: 0	Filter No:	7436	
Field Blank:		Filter Type:	41GF	
Log No: 5204-01F		Filter + Sample Wt:	.9474	g
Color:		Filter Tare Wt:	.9474	g
		Sample Wt:	0.0000	g
Test: 1	Run: 1	Filter No:	7456	
Log No: -02F		Filter Type:	41GF	
Color:		Filter + Sample Wt:	1.3268	g
		Filter Tare Wt:	.9834	g
		Sample Wt:	0.3434	g
Test: 1	Run: 2	Filter No:	7433	
Log: -03F		Filter Type:	41GF	
Color:		Filter + Sample Wt:	1.3058	g
		Filter Tare Wt:	.9856	g
		Sample Wt:	0.3202	g
Test: 1	Run: 3	Filter No:	7435	
Log No: -04F		Filter Type:	41GF	
Color:		Filter + Sample Wt:	1.2799	g
		Filter Tare Wt:	.9479	g
		Sample Wt:	0.3320	g

		RUN	RUN 1	RUN 2	RUN 3
Results of Filter Analysis	g		0.3434	0.3202	0.3320

		RUN	RUN 1	RUN 2	RUN 3
Total Mass	g		0.4621	0.4663	0.4474

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Impinger Catch Data Reporting Sheet

Protocol: ☐Minnesota ☒Wisconsin ☐Iowa ☐EPA Method 202 ☐Other ______

Job: LP Hayward
Date Submitted: 4-12-95
Date of Analysis: 4-12-95

Source/Site: line 1 core dryer / scrubber outlet
Test No.: 1
Technician: J. Lorenz

	Solvent Phase	Aqueous Phase
Test: 1 Run: 4	Dish No: 404	Dish No: 810
Log No: 5204 - 05 I	Dish + Sample Wt: 47.7266 g	Dish + Sample Wt: 45.2528 g
Color & Appearance: cloudy yellow	Dish Tare Wt: 47.6410 g	Dish Tare Wt: 45.2499 g
	Fraction Wt: .0856 g	Fraction Wt: .0029 g
Comments: smokey odor	Smpl Vol: ml, Alqt: ml, Factor:	Smpl Vol: 630 ml, Alqt: 100 ml, Factor: 6.300
	Sample Wt: .0856 g	Sample Wt: .0183 g
Test: Run:	Dish No:	Dish No:
Log No:	Dish + Sample Wt: g	Dish + Sample Wt: g
Color & Appearance:	Dish Tare Wt: g	Dish Tare Wt: g
	Fraction Wt: g	Fraction Wt: g
Comments:	Smpl Vol: ml, Alqt: ml, Factor	Smpl Vol: ml, Alqt: ml, Factor
	Sample Wt: g	Sample Wt: g
Test: Run:	Dish No:	Dish No:
Log No:	Dish + Sample Wt: g	Dish + Sample Wt: g
Color & Appearance:	Dish Tare Wt: g	Dish Tare Wt: g
	Fraction Wt: g	Fraction Wt: g
Comments:	Smpl Vol: ml, Alqt: ml, Factor	Smpl Vol: ml, Alqt: ml, Factor
	Sample Wt: g	Sample Wt: g
Test: Run:	Dish No:	Dish No:
Log No:	Dish + Sample Wt: g	Dish + Sample Wt: g
Color & Appearance:	Dish Tare Wt: g	Dish Tare Wt: g
	Fraction Wt: g	Fraction Wt: g
Comments:	Smpl Vol: ml, Alqt: ml, Factor	Smpl Vol: ml, Alqt: ml, Factor
	Sample Wt: g	Sample Wt: g

Note: Factor = Sample Volume/Aliquot Volume   5204-01 I   Blank Solvent Wt. .0001 g

		RUN 0 Field Blank	RUN 4	RUN	RUN
Results of Solvent Phase	g	.0002	.0854		
Results of Aqueous Phase	g	.0002	.0181	C-11	

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Solvent Rinse Data Reporting Sheet

☒ EPA Method 5 Probe Wash ☐ EPA Method 29 Probe Wash ☐EPA Method 202 Cup & Tube Wash

Job	LP / Haywood	Source/Site	Line 1 Cone Dryer Scrubber Outlet
Date Submitted	4-12-95	Test No.	1
Date of Analysis	4-12-95	Technician	B. D.
Transport Leakage☐	None☒ ml	Solvent	Acetone

Test:	Run:	Dish No:	
Log No:		Dish + Sample Wt:	g
Volume of Solvent	ml	Dish Tare Wt:	g
*Solvent Residue	2.0 ug/ml	Sample Wt:	g
Test: 1	Run: 4	Dish No:	783
Vol. of Solvent	50 ml	Dish + Sample Wt:	43.1298 g
Log Number	5204-05P	Dish Tare Wt:	43.0880 g
Comments		Sample Wt:	0.0418 g
Test:	Run:	Dish No:	
Vol. of Solvent	ml	Dish + Sample Wt:	g
Log Number		Dish Tare Wt:	g
Comments		Sample Wt:	g
Test:	Run:	Dish No:	
Vol. of Solvent		Dish + Sample Wt:	g
Log Number		Dish Tare Wt:	g
Comments		Sample Wt:	g

*Solvent Residue_____ug/ml = [(Sample Wt._____g) (10^6)]/Vol. of Sol. _____ml

EPA-M5 Acetone Residue Blank Spec. ≤ 7.8 ug/ml

V5AB

	RUN	RUN 4	RUN	RUN
Results of Solvent Rinse g	C-12	0.0417		

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Filter Gravimetrics Reporting Sheet

Fiter Type: ☒ EPA Method 5 ☐ EPA Method 29 ☐ EPA Method 202 ☐ Other_____

Job	LP / Hayward	Source/Site	Line 1 Core Dryer Scrubber Outlet
Date Submitted	4-12-95	Test No.	1
Date of Analysis	4-12-95	Technician	B.D.

Test: Run:	Filter No:
Field Blank:	Filter Type:
Log No:	Filter + Sample Wt: g
Color:	Filter Tare Wt: g
	Sample Wt: g
Test: 1 Run: 4	Filter No: 7457
Log No: 5204-05F	Filter Type: 4"GF
Color:	Filter + Sample Wt: 1.2500 g
	Filter Tare Wt: .9894 g
	Sample Wt: 0.2606 g
Test: Run:	Filter No:
Log No:	Filter Type:
Color:	Filter + Sample Wt: g
	Filter Tare Wt: g
	Sample Wt: g
Test: Run:	Filter No:
Log No:	Filter Type:
Color:	Filter + Sample Wt: g
	Filter Tare Wt: g
	Sample Wt: g

√SAB

	RUN	RUN 4	RUN	RUN
Results of Filter Analysis g		0.2606		

	RUN	RUN 4	RUN	RUN
Total Mass g		0.4058		

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Sample Chain of Custody

Job: Lil' Hayward — Source: Unit 1, Core Dryer — Site: Scrubber Inlet — Log No.: 5204
Field Engineer: DH — Date of Test: 4/11/95 — Test No.: 1 — No. of Runs: 3

No. Items	Sample Type		Analysis		Sequence No.	Comments
4	**Probe Wash:** ☒ Acetone ☐ $MeCl_2$	☐ DI Water ☐ _____	☒ EPA M-5 ☐ EPA M-29	☐ EPA M-201A ☐ _____		
4	**Filter:** ☒ 4" Glass ☐ SS Thimble	☐ Pallflex ☐ 2.5" Glass	☒ EPA M-5 ☐ EPA M-29 ☐ EPA M-201A	☐ EPA M-17		
4	**Impingers:** ☒ DI Water ☐ 3% H_2O_2 ☐ 1N NaOH ☐ 2,4-DNPH	☐ H_2SO_4 ☐ HNO_3/H_2O_2 ☐ $KMnO_4/H_2SO_4$ ☐ _____	☐ MN Protocol ☒ WI Protocol ☐ EPA M-202 ☐ EPA M6,8 ☐ Acid Gases	☐ IA Protocol ☐ Formaldehyde ☐ EPA M-29 ☐ EPA M-26 ☐ _____		
3	**Integrated Gas:** ☒ Tedlar Bag	☐ _____	☒ EPA M-3 ☐ _____	☐ EPA M-10		
	Oxides of Nitrogen:		☐ EPA M-7A ☐ _____			
	Fuel Lab: ☐ Fuel Sample	☐ Aggregate	☐ Per S-0163			
	Particle Sizing:		☐ X-Ray Sdgraph ☐ _____	☐ Cascade Imp		
	Miscellaneous:	☐ _____	☐ _____			

Fuel Type: Coal: ☐ Bituminous ☐ Anthracite ☐ Lignite — Wood: ☒ Wood Waste ☐ Dust ☐ Bark — Oil: ☐ Waste Oil ☐ No. 2 ☐ No. 6 — Misc: ☐ Natural Gas ☐ RDF ☐ _____

Relinquished by/Affiliation	Accepted by/Affiliation	Date
Duane Van Voorhees	Interpoll	4/11/95 0830

033094-G:\STACK\WP\FORMS\S-278.2

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Sample Chain of Custody

Job LP Source LINE 1 COKE DRYER OUTLET Site _____ Log No. 5304
Field Engineer G HOWE Date of Test 4-11-95 Test No. 1 No. of Runs 4

No. Items	Sample Type		Analysis		Sequence No.	Comments
5	**Probe Wash:** ☒ Acetone ☐ $MeCl_2$	☐DI Water ☐_____	☒EPA M-5 ☐EPA M-29	☐EPA M-201A ☐_____		
5	**Filter:** ☒ 4" Glass ☐ SS Thimble	☐Pallflex ☐2.5" Glass	☒EPA M-5 ☐EPA M-29 ☐EPA M-201A	☐EPA M-17		
9	**Impingers:** ☒DI Water ☐3%H_2O_2 ☐1N NaOH ☐2,4-DNPH	☐H_2SO_4 ☐HNO_3/H_2O_2 ☐$KMnO_4/H_2SO_4$ ☐_____	☐MN Protocol ☒WI Protocol ☐EPA M-202 ☐EPA M6,8 ☐Acid Gases	☐IA Protocol ☐Formaldehyde ☐EPA M-29 ☐EPA M-26 ☐_____		
4	**Integrated Gas:** ☒Tedlar Bag	☐_____	☒EPA M-3 ☐_____	☐EPA M-10		
0	**Oxides of Nitrogen:**		☐EPA M-7A ☐_____			
0	**Fuel Lab:** ☐Fuel Sample	☐Aggregate	☐Per S-0163			
0	**Particle Sizing:**		☐X-Ray Sdgraph ☐_____	☐Cascade Imp		
0	**Miscellaneous:**	☐_____	☐_____			

Fuel Type: Coal: ☐Bituminous ☐Anthracite ☐Lignite Wood: ☐Wood Waste ☐Dust ☐Bark Oil: ☐Waste Oil ☐No. 2 ☐No. 6 Misc: ☐Natural Gas ☐RDF ☐_____

Relinquished by/Affiliation	Accepted by/Affiliation	Date
Gary Howe / Stack	Carl / Interpoll	4/12/95 0830

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

Sample Chain of Custody

Job: L.P. Hayward — Source: Line 1 Core Dryer — Site: Scrubber Inlet / Outlet — Log No. 5204
Field Engineer: Dirt — Date of Test: 4/11/95 — Test No.: 2 & 3 — No. of Runs: 1

No. Items	Sample Type		Analysis		Sequence No.	Comments
2	**Probe Wash:** ☒ Acetone ☐ $MeCl_2$	☐DI Water ☐_____	☐EPA M-5 ☐EPA M-29	☐EPA M-201A ☒ Preimpacta Wash		
	Filter: ☐ 4" Glass ☐ SS Thimble	☐Pallflex ☐2.5" Glass	☐EPA M-5 ☐EPA M-29 ☐EPA M-201A	☐EPA M-17		
	Impingers: ☐DI Water ☐3%H_2O_2 ☐1N NaOH ☐2,4-DNPH	☐H_2SO_4 ☐HNO_3/H_2O_2 ☐$KMnO_4/H_2SO_4$ ☐_____	☐MN Protocol ☐WI Protocol ☐EPA M-202 ☐EPA M6,8 ☐Acid Gases	☐IA Protocol ☐Formaldehyde ☐EPA M-29 ☐EPA M-26 ☐_____		
2	**Integrated Gas:** ☒Tedlar Bag	☐_____	☒EPA M-3 ☐_____	☐EPA M-10		
	Oxides of Nitrogen:		☐EPA M-7A ☐_____			
	Fuel Lab: ☐Fuel Sample	☐Aggregate	☐Per S-0163			
2	**Particle Sizing:**		☐X-Ray Sdgraph ☐_____	☒Cascade Imp		
	Miscellaneous:	☐_____	☐_____			

Fuel Type: Coal: ☐Bituminous ☐Anthracite ☐Lignite — Wood: ☐Wood Waste ☐Dust ☐Bark — Oil: ☐Waste Oil ☐No. 2 ☐No. 6 — Misc: ☐Natural Gas ☐RDF ☐_____

Relinquished by/Affiliation	Accepted by/Affiliation	Date
Duane Van Haren	Interpoll	4/11/95 0830

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APPENDIX D

SAMPLING TRAIN CALIBRATION DATA

INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 5 Gas Metering System Quality Control Check Data Sheet

Job LP HAYWARD Date 4-11-95

Operator C Hodle Module No. 10

Instructions:
Operate the control module at a flow rate equal to ΔH@ for 10 minutes before attaching the umbilical.

Record the following data:

Bar press 28.78 in.Hg θ = .9956 ΔH@ 1.78 in.WC.

Time (min)	Volume (CF)	Meter Temp (°F)	
		Inlet	Outlet
	(198.70)		
2.5	200.60	61	60
5.0		65	54
7.5	204.60	67	54
10	206.54	69	54
	V_m =	Avg(t_m) = 60.5	°F

Calculate Y_{cn} as follows:

$$Y_{cn} = \frac{1.786}{\theta\ V_m}\left[\frac{(t_m + 460)}{P_b}\right]^{0.5}$$

$$Y_{cn} = \frac{1.786}{(.9956)(7.84)}\left[\frac{(60.5) + 460}{(\quad)}\right]^{0.5}$$

Y_{cn} = .9731

If Y_{cn} is not within the range of 0.97 to 1.03, "the volume metering system should be investigated before beginning."

CFR Title 40, Part 60, Appendix A, Method 5, Section 4.4.1

7.84

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 5 Gas Metering System Quality Control Check Data Sheet

Job [illegible] Date 4/11/95

Operator [illegible] Module No. 18

Instructions:
Operate the control module at a flow rate equal to ΔH@ for 10 minutes before attaching the umbilical.

Record the following data:

Bar press 28.78 in.Hg θ = .9970 ΔH@ 1.5 in.WC.

Time (min)	Volume (CF)	Meter Temp (°F)	
		Inlet	Outlet
	(258.60)		
2.5	260.460	50	38
5.0	262.40	52	39
7.5	264.24	55	39
10	266.10	58	39
	V_m = 7.50	Avg(t_m) = 46.25	°F

Calculate Y_{cn} as follows:

$$Y_{cn} = \frac{1.786}{\theta\ V_m}\ \left[\frac{(t_m + 460)}{P_b}\right]^{0.5}$$

$$Y_{cn} = \frac{1.786}{(.9970)\ (7.50)}\ \left[\frac{(46.25 + 460}{28.78}\right]^{0.5}$$

$$Y_{cn} = 1.002$$

If Y_{cn} is not within the range of 0.97 to 1.03, "the volume metering system should be investigated before beginning."

CFR Title 40, Part 60, Appendix A, Method 5, Section 4.4.1

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Interpoll Laboratories, Inc.
(612) 786-6020

Meter Box Calibration and Usage Status

Date of Report: April 12, 1995

Meter Box No. : 10 (Rockwell Dry Test Meter Serial No. 1334112)

Date of Last Calibration: January 4, 1995
Calibration Technician: D. Van Hoever
Wet Test Meter No.: American Meter AL-20

Date of Use	Report No.	Initial Meter Reading	Final Meter Reading	Volume/Job (cu. ft.)	Total Volume* (cu. ft.)
March 07, 1995	5-4964	389.21	626.85	237.64	237.64
March 14, 1995	5-5001	635.50	908.22	272.72	510.36
March 23, 1995	5-5061	920.10	1050.51	130.41	640.77
April 11, 1995	5-5204	1052.70	1247.73	195.03	835.80

* Total volume through meter since last calibration.

Interpoll Laboratories, Inc.
(612) 786-6020

Meter Box Calibration and Usage Status

Date of Report: April 12, 1995

Meter Box No. : 18 (Rockwell Dry Test Meter Serial No. 1334117)

Date of Last Calibration: February 8, 1995
Calibration Technician: E. Trowbridge
Wet Test Meter No.: American Meter AL-20

Date of Use	Report No.	Initial Meter Reading	Final Meter Reading	Volume/Job (cu. ft.)	Total Volume* (cu. ft.)
March 10, 1995	5-4963	364.40	505.97	141.57	141.57
March 17, 1995	5-5004	514.94	704.41	189.47	331.04
March 21, 1995	5-5062	712.80	851.43	138.63	469.67
March 28, 1995	5-5088	861.18	1008.50	147.32	616.99
April 4, 1995	5-5157	1017.20	1257.39	240.19	857.18
April 11, 1995	5-5204	1266.10	1402.62	136.52	993.70

*. Total volume through meter since last calibration.

INTERPOLL LAB[illegible]ATORIES, INC.
(612) 786-6020

Meter Calibration Sheet EPA/Method 5

Date 1/4/95
Bar. Press. 29.50 IN.HG
Wet Test Meter No. AL-20

Control Module No. 10
Serial No. DTM 1334112
Technician D. Van Hoever

ΔH (IN.WC)		Gas Volume Wet Test Meter	* Cal. Index φ	* Diff. Wet Test Meter ΔP_w	Gas Volume Dry Test Meter (ft³)		Gas Temperatures			Time θ	Meter Coeff.	Orifice Const.	C_f
							Wet Test t_w (°F)	Dry Test					
Nominal	Actual	(ft³)	(%)	(IN.WC.)	V_{di}	V_{df}		t_{di} (°F)	t_{do} (°F)	(Min/Sec)	Y	ΔH@	
0.5	.5	2	99.85	0.01	386.99	389.055	64.0	84	71	5:01	.9907	1.73	
1.2	1.2	3	99.91	0.025	383.40	386.485	63.9	85	71	5:01	.9946	1.84	
2.0	2.0	3	99.93	0.055	379.82	382.88	63.9	85	70	3:51	1.0000	1.81	
3.3	3.3	5	100.00	0.09	368.67	373.74	64.0	77	68	4:54	.9938	1.76	
4.7	4.7	5	100.02	0.12	374.25	379.31	63.9	83	69	4:07	.9992	1.75	
	2	3	4	5	6	7	8	9	10	11/12 Avg	.9956	1.78	

Positive leak check performed by DH
Meter was in tolerance ☒
Approved by [signature]

Meter was not in tolerance
Meter was not in tolerance
Date 1/10/95

☐: readjusted linkage
☐: changed dry test meter

*Based on AL-20 wet test meter calibration in Nov. 1991 against Bell Prover (NBS Traceable) - Carl Poe Co.

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

Meter Calibration Sheet EPA/Method 5

Date 2-8-95
Bar. Press. 29.35 IN.HG
Wet Test Meter No. AL-20

Control Module No. 18
Serial No. DTM 1334117
Technician [signature]

ΔH (IN.WC)		Gas Volume Wet Test Meter	* Cal. Index	* Diff. Wet Test Meter	Gas Volume Dry Test Meter (ft³)		Gas Temperatures			Time θ	Meter Coeff.	Orifice Const.	C_i
							Wet Test	Dry Test					
Nominal	Actual	(ft³)	(%)	ΔP_w (IN.WC.)	V_{di}	V_{df}	t_w (°F)	t_{di} (°F)	t_{do} (°F)	(Min/Sec)	Y	ΔH@	
0.5	.5	2	99.85	0.01	329.300	331.321	67	77	68	4/56	.9971	1.72	
1.2	1.2	3	99.91	0.025	326.000	329.046	67	74	66	4/55	.9904	1.82	
2.0	2.0	3	99.93	0.055	332.000	335.024	67	80	68	3/51	.9993	1.85	
3.3	3.3	5	100.00	0.09	335.500	340.535	67	84	70	4/58	1.0033	1.82	
4.7	4.7	5	100.02	0.12	341.000	346.080	67	87	71	4/13	.9948	1.86	
		2	3	4	5	6	7	8	9	10	11/12 Avg	.9970	1.81	

Positive leak check performed by [signature]
Meter was in tolerance [X]
Approved by [signature]

Meter was not in tolerance ☐: readjusted linkage
Meter was not in tolerance ☐: changed dry test meter
Date

*Based on AL-20 wet test meter calibration in Nov. 1991 against Bell Prover (NBS Traceable) - Carl Poe Co.

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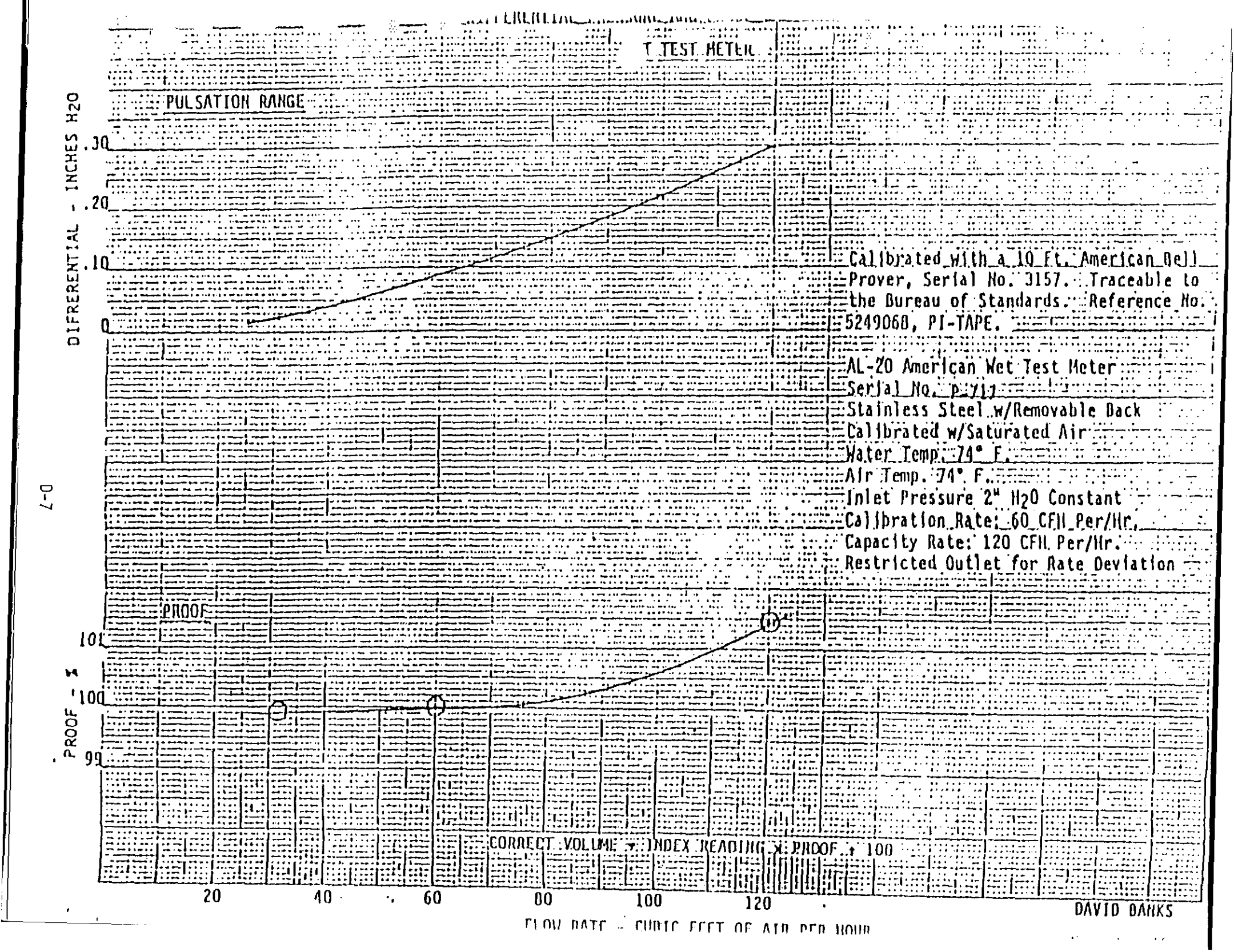
T TEST METER
PULSATION RANGE
DIFFERENTIAL - INCHES H20
.30
.20
.10
0
Calibrated With a 10 Ft. American Bell Prover, Serial No. 3157. Traceable to the Bureau of Standards. Reference No. 5249068, PI-TAPE.
AL-20 American Wet Test Meter
Serial No. P-711
Stainless Steel w/Removable Back
Calibrated w/Saturated Air
Water Temp. 74° F.
Air Temp. 74° F.
Inlet Pressure 2" H2O Constant
Calibration Rate: 60 CFH Per/Hr.
Capacity Rate: 120 CFH Per/Hr.
Restricted Outlet for Rate Deviation
PROOF
101
100
99
PROOF - %
CORRECT VOLUME = INDEX READING X PROOF ÷ 100
20
40
60
80
100
120
DAVID BANKS
FLOW RATE - CUBIC FEET OF AIR PER HOUR

Interpoll Laboratories, Inc.
(612) 786-6020

Nozzle Calibration
Data Sheet

Date of Calibration: 04-11-95 Nozzle Number 1-4
Technician: Gary Hove

The nozzle is rotated in 60 degree increments and the diameter at each point is measured to the nearest 0.001 inch. The observed readings and average are shown below.

Position	Diameter (inches)
1	.249
2	.250
3	.251
Average:	.250

Interpoll Laboratories, Inc.
(612) 786-6020

Nozzle Calibration
Data Sheet

Date of Calibration: 04-11-95 Nozzle Number 7-4
Technician: Duane Van Hoever

The nozzle is rotated in 60 degree increments and the diameter at each point is measured to the nearest 0.001 inch. The observed readings and average are shown below.

Position	Diameter (inches)
1	.250
2	.251
3	.251
Average:	.251

Interpoll Laboratories, Inc.
(612) 786-6020

Nozzle Calibration
Data Sheet

Date of Calibration: 04-11-95 Nozzle Number IMP
Technician: Duane Van Hoever

The nozzle is rotated in 60 degree increments and the diameter at each point is measured to the nearest 0.001 inch. The observed readings and average are shown below.

Position	Diameter (inches)
1	.228
2	.229
3	.228
Average:	.228

Interboll Laboratories. Inc.

Temperature Measurement Device
Calibration Sheet

NO 25

Unit under test:

Vendor BECKMAN

Model HD110T

Range _____ °F

Serial Number 25

Thermocouple Type K

Date of Calibration 10-28-94

Technician GH

Method of Calibration:

☐ Comparison against ASTM mercury in glass thermometer using a thermostatted and insulated aluminum block designed to provide uniform temperature. The temperature is adjusted by adjusting the voltage on the block heater cartridge.

☐ Omega Model CL-300 Type K Thermocouple Simulator which provides 22 precise temperature equivalent millivolt signals. The CL-300 is cold junction compensated. Calibration accuracy is ± 0.1% of span (2100 °F) ± 1 degree (for negative temperatures add ± 2 degrees. The CL-300 simulates exactly the millivoltage of a Type K thermocouple at the indicated temperature.

Desired Temp (°F) Nominal	Temperature of Standard or Simulated Temp (°F)	Response of Unit Under Test (°F)	Deviation Δt (°F)	Deviation (%)
0	0	0	0	0
100	100	91	9	1.61
200	200	194	6	.909
300	300	291	9	1.84
400	400	390	10	1.16
500	500	489	11	1.04
600	600	592	8	.75
700	700	693	9	.69
800	800	798	2	.15
900	900	900	0	0
1000	1000	1005	5	.37
1100	1100	1108	8	.47
1200	1200	1191	9	.59
1300	1300	1315	15	.85
1400	1400	1397	3	.17
1500	1500	1498	2	.10
1600	1600	1602	2	.009
1700	1700	1697	3	.139
1800	1800	1796	4	.185
1900	1900	1889	11	.466
2000	2000	1984	16	.650
2100				
		Averages:	7.14	.0096

OF = off scale response by unit under test (°F)

% dev = 100 Δt / (460 + t)

☐ Unit in tolerance

☐ Unit was not in tolerance: recalibrated - See new calibration sheet.

S-433

Interpoll Laboratories, Inc.

Temperature Measurement Device Calibration Sheet

Unit under test:
Vendor Omega
Model HH 81
Range -160°C — 1372°C °F
Date of Calibration 3/24/95
Serial Number 35
Thermocouple Type K
Technician D. VanHoever

Method of Calibration:

☐ Comparison against ASTM mercury in glass thermometer using a thermostatted and insulated aluminum block designed to provide uniform temperature. The temperature is adjusted by adjusting the voltage on the block heater cartridge.

☒ Omega Model CL-300 Type K Thermocouple Simulator which provides 22 precise temperature equivalent millivolt signals. The CL-300 is cold junction compensated. Calibration accuracy is ± 0.1% of span (2100 °F) ± 1 degree (for negative temperatures add ± 2 degrees. The CL-300 simulates exactly the millivoltage of a Type K thermocouple at the indicated temperature.

Desired Temp (°F) Nominal	Temperature of Standard or Simulated Temp (°F)	Response of Unit Under Test (°F)	Deviation Δt (°F)	Deviation (%)
0	0	-3	-3	.65
100	100	98	2	.135
200	200	200	0	0
300	300	299	1	.13
400	400	398	2	.23
500	500	498	2	.21
600	600	600	0	0
700	700	699	1	.09
800	800	802	2	.16
900	900	900	0	0
1000	1000	1001	1	.07
1100	1100	1100	0	0
1200	1200	1201	1	.06
1300	1300	1299	1	.06
1400	1400	1402	2	.11
1500	1500	1500	0	0
1600	1600	1603	3	.14
1700	1700	1701	1	.05
1800	1800	1804	4	.18
1900	1900	1901	1	.04
2000	2000	2001	1	.04
2100	2100	2099	1	.04
		Averages:		.12

OF = off scale response by unit under test (°F)
% dev = 100 Δt / (460 + t)

☒ Unit in tolerance
☐ Unit was not in tolerance: recalibrated - See new calibration sheet.

S-433

Interpoll Laboratories, Inc.
(612) 786-6020

S-Type Pitot Tube Inspection Sheet

Pitot Tube No. 23-5

Pitot tube dimensions:

1. External tubing diameter (D_t) .316 IN.
2. Base to Side A opening plane (P_A) .460 IN.
3. Base to Side B opening plane (P_B) .460 IN.

Alignment:

4. α_1 < 10° 0
5. α_2 < 10° 0

6. B_1 < 5° 0
7. B_2 < 5° 0

8. Z <.125" .02
9. W <.0625" .01

Distance from Pitot to Probe Components:

10. Pitot to 0.500 IN. nozzle .760 IN.
11. Pitot to probe sheath 3.0 IN.
12. Pitot to thermocouple (parallel to probe) 3.0 IN.
13. Pitot to thermocouple (perpendicular to probe) .760 IN.

☒ Meets all EPA design criteria thus C_p = 0.84
☐ Does not meet EPA design criteria - thus calibrate in wind tunnel.
C_p = _____

Date of Inspection: 2-8-94

Inspected by: [signature]

CFR Title 40 Part 60 Appenidix A Method 2

S-348

Interpoll Laboratories, Inc.
(612) 786-6020

S-Type Pitot Tube Inspection Sheet

Pitot Tube No. 24-5

Pitot tube dimensions:

1. External tubing diameter (D_t) .316 IN.
2. Base to Side A opening plane (P_A) .460 IN.
3. Base to Side B opening plane (P_B) .460 IN.

Alignment:

4. α_1 < 10° 0
5. α_2 < 10° 0

6. B_1 < 5° 0
7. B_2 < 5° 0

8. Z <.125" .02
9. W <.0625" 0

Distance from Pitot to Probe Components:

10. Pitot to 0.500 IN. nozzle .760 IN.
11. Pitot to probe sheath 3.0 IN.
12. Pitot to thermocouple (parallel to probe) 3.0 IN.
13. Pitot to thermocouple (perpendicular to probe) .750 IN.

☒ Meets all EPA design criteria thus C_p = 0.84
☐ Does not meet EPA design criteria - thus calibrate in wind tunnel.
C_p = _____

Date of Inspection: 1-8-91

Inspected by: [signature]

CFR Title 40 Part 60 Appenidix A Method 2

S-348

Interpoll Laboratories, Inc.
(612) 786-6020

S-Type Pitot Tube Inspection Sheet

Pitot Tube No. 24-6

Pitot tube dimensions:

1. External tubing diameter (D_t) .316 IN.
2. Base to Side A opening plane (P_A) .460 IN.
3. Base to Side B opening plane (P_B) .460 IN.

Alignment:

4. α_1 < 10° 0
5. α_2 < 10° 0

6. B_1 < 5° 0
7. B_2 < 5° 0

8. Z <.125" .02
9. W <.0625" 0

Distance from Pitot to Probe Components:

10. Pitot to 0.500 IN. nozzle .750 IN.
11. Pitot to probe sheath 3.0 IN.
12. Pitot to thermocouple (parallel to probe) 3.0 IN.
13. Pitot to thermocouple (perpendicular to probe) .750 IN.

☒ Meets all EPA design criteria thus C_p = 0.84
☐ Does not meet EPA design criteria - thus calibrate in wind tunnel.
C_p = _____

Date of Inspection: 4-5-94

Inspected by: [signature]

CFR Title 40 Part 60 Appenidix A Method 2

S-348

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Stack Sampling Department - QA
Aneroid Barometer Calibration Sheet

Date 2-2-95
Technician Scott Fielsta
Mercury Column Barometer No. 1
Aneroid Barometer No. GARY HOUSE

Actual Mercury Barometer Read	Ambient Temp.	Temperature Correction Factor	Adjusted Mercury Barometer Read	Initial Aneroid Barometer Read	Difference (P_{ba} - P_{bm})
29.20	76	.124	29.08	29.08	0

Has this barometer shown any consistent problems with calibration? Yes/No. If yes, explain. NO

Has problem been alleviated? Yes/No. How?

Note: Aneroid barometers will be calibrated periodically against a mercury column barometer. The aneroid barometer to be calibrated should be placed in close proximity to the mercury barometer and left to equilibrate for 20 - 30 minutes before calibrating. Aneroid barometer will be calibrated to the adjusted mercury barometer readings.

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INTERPOLL LABORATORIES
(612)786-6020

Stack Sampling Department - QA
Aneroid Barometer Calibration Sheet

Date 3/24/95
Technician D. Van Hoever
Mercury Column Barometer No. 861216
Aneroid Barometer No. DV#5

Actual Mercury Barometer Read	Ambient Temp.	Temperature Correction Factor	Adjsted Mercury Barometer Read	Initial Aneriod Barometer Read	Difference (P_{ba}-P_{bm})
29.350	76	.134	29.22	29.16	-.06

Has this barometer shown any consistent problems with calibration? Yes/(No.) If yes, explain. _____

Has problem been alleviated? Yes/No. How? _____

*Note

Aneroid barometers will be calibrated periodically against a mercury column barometer. The aneroid barometer to be calibrated should be placed in close proximity to the mercury barometer and left to equilibrate for 20-30 minutes before calibrating. Aneriod barometer will be calibrated to the adjusted mercury barometer readings.

S-312