Background Report Reference

AP-42 Section Number: 10.6.1

Background Report Section: 4

Reference Number: 63

Title: Result Of The April 4 & 5, 1995 Particulate Emission Enginering Testing at the Louisiana Pacific Plant In Hayward, Wisconsin

Interpoll Laboratories, Inc.

April 1995

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ENGINEERING

RESULT OF THE APRIL 4 & 5, 1995 PARTICULATE EMISSION ENGINEERING 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:

Daniel Despen
Manager
Stationary Source Testing Department

Report Number 5-5158
April 18, 1995
SP/slp

TABLE OF CONTENTS

APPENDICES:

ABBREVIATIONS

ACFM	actual cubic feet per minute
cc (ml)	cubic centimeter (milliliter)
DSCFM	dry standard cubic foot of dry gas per minute
DSML	dry standard milliliter
DEG-F (°F)	degrees Fahrenheit
DIA.	diameter
FP	finished product for plant
FT/SEC	feet per second
g	gram
GPM	gallons per minute
GR/ACF	grains per actual cubic foot
GR/DSCF	grains per dry standard cubic foot
g/dscm	grams per dry standard cubic meter
HP	horsepower
HRS	hours
IN.	inches
IN.HG.	inches of mercury
IN.WC.	inches of water
LB	pound
LB/DSCF	pounds per dry standard cubic foot
LB/HR	pounds per hour
LB/10^6BTU	pounds per million British Thermal Units heat input
LB/MMBTU	pounds per million British Thermal Units heat input
LTPD	long tons per day
MW	megawatt
mg/Nm^3	milligrams per dry standard cubic meter
ug/Nm^3	micrograms per dry standard cubic meter
microns (um)	micrometer
MIN.	minutes
ng	nanograms
ohm-cm	ohm-centimeter
PM	particulate matter
PPH	pounds per hour
PPM	parts per million
ppmC	parts per million carbon
ppm,d	parts per million, dry
ppm,w	parts per million, wet
ppt	parts per trillion
PSI	pounds per square inch
SQ.FT.	square feet
TPD	tons per day
ug	micrograms
v/v	percent by volume
w/w	percent by weight
<	≤ (when following a number)

Standard conditions are defined as 68°F (20°C) and 29.92 IN. of mercury pressure.

g:\stack\wovmisc\abbrev.frm

1 INTRODUCTION

On April 4 & 5, 1995 Interpoll Laboratories Personnel conducted Particulate Emission Engineering Tests on the Line 1 Surface Dryer Scrubber Inlet, Line 1 Surface Dryer Outlet, and the Line 1 Core Dryer Scrubber Outlet at the Louisiana Pacific Plant in Hayward, Wisconsin. Ron Rosenthal, Mark Kaehler, Gary Hove, and Steve Kelker performed the on-site portion of the test. Coordination between testing activities and plant operation was provided by Sue Somers 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 - 4. An overview of the results is presented in the table below.

Date	Source	Concentration (GR/DSCF)	Emission Rate (LB/HR)
4-4-95	Line 1 Surface Dryer Scrubber Inlet	0.250	47
4-4-95	Line 1 Surface Dryer Scrubber Outlet	0.163 35%	37
4-5-95	Line 1 Surface Dryer Scrubber Outlet	0.173 31%	38
4-5-95	Line 1 Core Dryer Scrubber Outlet	0.174	37

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

Additionally, ICP analyses were performed on the samples. The filter/probe wash fraction data is given in Section 3.3, the impinger catches were also analyzed, however, negligible quatities of the target elements were detected. The Test 3, Run 2 (Line 1 Surfce Dryer Scruber Outlet) filter/probe wash sample was split and one-half analyzed for carbon and hydrogen, a summary of the Test 3, Run 2 data is given below:

ICP elements	18.36%
Carbon	49.46%
Hydrogen	4.78%
Total	72.60%

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 4, 1995 Particulate Emission Engineering Test on the Line 1 Surface Dryer Scrubber Inlet at the Louisiana - Pacific Plant Located in Hayward, Wisconsin.

ITEM		Run 1
Date of test		04-04-95
Time runs were done	(HRS)	1530/1658
Volumetric flow		
actual	(ACFM)	41347
standard	(DSCFM)	21756
Gas temperature	(DEG-F)	228
Moisture content	(%V/V)	28.15
Gas composition	(%V/V,dry)	
carbon dioxide		5.20
oxygen		15.50
nitrogen		79.30
Isokinetic variation	(%)	104.1
Particulate concentration		
actual	(GR/ACF)	0.132
standard	(GR/DSCF)	0.250
Part. emission rate	(LB/HR)	46.69

Note: Dry + Organic/Inorganic Wet Catch

Table 1b Summary of the Results of the April 4, 1995 Particulate Emission Engineering Test on the Line 1 Surface Dryer Scrubber Inlet at the Louisiana - Pacific Plant Located in Hayward, Wisconsin.

ITEM		Run 1
Date of test		04-04-95
Time runs were done	(HRS)	1530/1658
Volumetric flow		
actual	(ACFM)	41347
standard	(DSCFM)	21756
Gas temperature	(DEG-F)	228
Moisture content	(%V/V)	28.15
Gas composition	(%V/V,dry)	
carbon dioxide		5.20
oxygen		15.50
nitrogen		79.30
Isokinetic variation	(%)	104.1
Particulate concentration		
actual	(GR/ACF)	.0762
standard	(GR/DSCF)	0.145
Part. emission rate	(LB/HR)	27.02

Note: Dry Catch Only

Table 2a Summary of the Results of the April 4, 1995 Particulate Emission Engineering Test on the Line 1 Surface Dryer Scrubber Outlet at the Louisiana - Pacific Plant Located in Hayward, Wisconsin.

ITEM		Run 1
Date of test		04-04-95
Time runs were done	(HRS)	1835/1935
Volumetric flow		
actual	(ACFM)	44489
standard	(DSCFM)	26596
Gas temperature	(DEG-F)	158
Moisture content	(%V/V)	28.73
Gas composition	(%V/V,dry)	
carbon dioxide		5.00
oxygen		15.60
nitrogen		79.40
Isokinetic variation	(%)	98.0
Particulate concentration		
actual	(GR/ACF)	.0974
standard	(GR/DSCF)	0.163
Part. emission rate	(LB/HR)	37.15

Note: Dry + Organic/Inorganic Wet Catch

Table 2b Summary of the Results of the April 4, 1995 Particulate Emission Engineering Test on the Line 1 Surface Dryer Scrubber Outlet at the Louisiana - Pacific Plant Located in Hayward, Wisconsin.

ITEM		Run 1
Date of test		04-04-95
Time runs were done	(HRS)	1835/1935
Volumetric flow		
actual	(ACFM)	44489
standard	(DSCFM)	26596
Gas temperature	(DEG-F)	158
Moisture content	(%V/V)	28.73
Gas composition	(%V/V,dry)	
carbon dioxide		5.00
oxygen		15.60
nitrogen		79.40
Isokinetic variation	(%)	98.0
Particulate concentration		
actual	(GR/ACF)	.0825
standard	(GR/DSCF)	0.138
Part. emission rate	(LB/HR)	31.48

Note: Dry Catch Only

Table 3a Summary of the Results of the April 5, 1995 Particulate Emission Engineering Test on the Line 1 Surface Dryer Scrubber Outlet at the Louisiana - Pacific Plant Located in Hayward, Wisconsin.

ITEM		Run 1	Run 2
Date of test		04-05-95	04-05-95
Time runs were done	(HRS)	922/1039	1113/1222
Volumetric flow			
actual	(ACFM)	43245	42853
standard	(DSCFM)	25144	26023
Gas temperature	(DEG-F)	159	152
Moisture content	(%V/V)	29.84	27.56
Gas composition	(%V/V,dry)		
carbon dioxide		5.00	5.00
oxygen		15.80	15.70
nitrogen		79.20	79.30
Isokinetic variation	(%)	101.4	99.9
Particulate concentration			
actual	(GR/ACF)	.0971	0.108
standard	(GR/DSCF)	0.167	0.178
Part. emission rate	(LB/HR)	36.00	39.78

Note: Dry + Organic/Inorganic Wet Catch

Table 3b Summary of the Results of the April 5, 1995 Particulate Emission Engineering Test on the Line 1 Surface Dryer Scrubber Outlet at the Louisiana - Pacific Plant Located in Hayward, Wisconsin.

ITEM		Run 1	Run 2
Date of test		04-05-95	04-05-95
Time runs were done	(HRS)	922/1039	1113/1222
Volumetric flow			
actual	(ACFM)	43245	42853
standard	(DSCFM)	25144	26023
Gas temperature	(DEG-F)	159	152
Moisture content	(%V/V)	29.84	27.56
Gas composition	(%V/V,dry)		
carbon dioxide		5.00	5.00
oxygen		15.80	15.70
nitrogen		79.20	79.30
Isokinetic variation	(%)	101.4	99.9
Particulate concentration			
actual	(GR/ACF)	.0815	.0905
standard	(GR/DSCF)	0.140	0.149
Part. emission rate	(LB/HR)	30.21	33.26

Note: Dry Catch Only

Table 4a Summary of the Results of the April 5, 1995 Particulate Emission Engineering Test on the Line 1 Core Dryer Scrubber Outlet at the Louisiana Pacific Plant Located in Hayward, Wisconsin.

ITEM		Run 1
Date of test		04-05-95
Time runs were done	(HRS)	922/1121
Volumetric flow		
actual	(ACFM)	41876
standard	(DSCFM)	24670
Gas temperature	(DEG-F)	163
Moisture content	(%V/V)	28.44
Gas composition	(%V/V,dry)	
carbon dioxide		4.90
oxygen		15.80
nitrogen		79.30
Isokinetic variation	(%)	99.5
Particulate concentration		
actual	(GR/ACF)	0.103
standard	(GR/DSCF)	0.174
Part. emission rate	(LB/HR)	36.86

Note: Dry + Organic/Inorganic Wet Catch

Table 4b Summary of the Results of the April 5, 1995 Particulate Emission Engineering Test on the Line 1 Core Dryer Scrubber Outlet at the Louisiana Pacific Plant Located in Hayward, Wisconsin.

ITEM		Run 1
Date of test		04-05-95
Time runs were done	(HRS)	922/1121
Volumetric flow		
actual	(ACFM)	41876
standard	(DSCFM)	24670
Gas temperature	(DEG-F)	163
Moisture content	(%V/V)	28.44
Gas composition	(%V/V,dry)	
carbon dioxide		4.90
oxygen		15.80
nitrogen		79.30
Isokinetic variation	(%)	99.5
Particulate concentration		
actual	(GR/ACF)	.0820
standard	(GR/DSCF)	0.139
Part. emission rate	(LB/HR)	29.44

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. 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 Surface Dryer Scrubber Inlet

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

	Run 1
Date of run	04-04-95
Dry basis (orsat)	
carbon dioxide.....	5.20
oxygen.....	15.50
carbon monoxide.....	0.00
nitrogen.....	79.30
Wet basis (orsat)	
carbon dioxide.....	3.74
oxygen.....	11.14
carbon monoxide.....	0.00
nitrogen.....	56.98
water vapor.....	28.15
Dry molecular weight.....	29.45
Wet molecular weight.....	26.23
Specific gravity.....	0.906
Water mass flow.....(LB/HR)	23909

FO 1.038

Test No. 1
Line 1 Surface Dryer Scrubber Outlet

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

	Run 1
Date of run	04-04-95
Dry basis (orsat)	
carbon dioxide.....	5.00
oxygen.....	15.60
carbon monoxide.....	0.00
nitrogen.....	79.40
Wet basis (orsat)	
carbon dioxide.....	3.56
oxygen.....	11.12
carbon monoxide.....	0.00
nitrogen.....	56.59
water vapor.....	28.73
Dry molecular weight.....	29.42
Wet molecular weight.....	26.14
Specific gravity.....	0.903
Water mass flow.....(LB/HR)	30071

FO 1.060

Test No. 3
Line 1 Surface Dryer Scrubber Outlet

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

	Run 1	Run 2
Date of run	04-05-95	04-05-95
Dry basis (orsat)		
carbon dioxide.....	5.00	5.00
oxygen.....	15.80	15.70
carbon monoxide.....	0.00	0.00
nitrogen.....	79.20	79.30
Wet basis (orsat)		
carbon dioxide.....	3.51	3.62
oxygen.....	11.08	11.37
carbon monoxide.....	0.00	0.00
nitrogen.....	55.56	57.45
water vapor.....	29.84	27.56*
Dry molecular weight.....	29.43	29.43
Wet molecular weight.....	26.02	26.28
Specific gravity.....	0.899	0.908
Water mass flow.....(LB/HR)	30004	30540

* Free or condensed water in the gas stream.

FO	1.020	1.040

Test No. 4
Line 1 Core Dryer Scrubber Outlet

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

	Run 1
Date of run	04-05-95
Dry basis (orsat)	
carbon dioxide.....	4.90
oxygen.....	15.80
carbon monoxide.....	0.00
nitrogen.....	79.30
Wet basis (orsat)	
carbon dioxide.....	3.51
oxygen.....	11.31
carbon monoxide.....	0.00
nitrogen.....	56.74
water vapor.....	28.44
Dry molecular weight.....	29.42
Wet molecular weight.....	26.17
Specific gravity.....	0.904
Water mass flow.....(LB/HR)	27506

FO 1.041

3.2 Results of Particulate Determinations

Test No. 1
Line 1 Surface Dryer Scrubber Inlet

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

	Run 1
Date of run	04-04-95
Time run start/end.....(HRS)	1530/1658
Static pressure.....(IN.WC)	-10.50
Cross sectional area (SQ.FT)	12.05
Pitot tube coefficient.....	.840
Water in sample gas	
condenser.....(ML)	0.0
impingers.....(GRAMS)	296.0
desiccant.....(GRAMS)	8.0
total.....(GRAMS)	304.0
Total particulate material..	
.....collected(grams)	0.5936
Gas meter coefficient.....	1.0086
Barometric pressure..(IN.HG)	29.33
Avg. orif.pres.drop..(IN.WC)	1.21
Avg. gas meter temp..(DEF-F)	51.6
Volume through gas meter....	
at meter conditions...(CF)	35.76
standard conditions.(DSCF)	36.59
Total sampling time....(MIN)	60.00
Nozzle diameter.....(IN)	.244
Avg.stack gas temp ..(DEG-F)	228
Volumetric flow rate.....	
actual.....(ACFM)	41347
dry standard.....(DSCFM)	21756
Isokinetic variation.....(%)	104.1
Particulate concentration...	
actual.....(GR/ACF)	0.13168
dry standard.....(GR/DSCF)	0.25035
Particle mass rate...(LB/HR)	46.69

Test No. 1
Line 1 Surface Dryer Scrubber Outlet

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

	Run 1
Date of run	04-04-95
Time run start/end.....(HRS)	1835/1935
Static pressure.....(IN.WC)	0.27
Cross sectional area (SQ.FT)	12.05
Pitot tube coefficient.....	.840
Water in sample gas	
condenser.....(ML)	0.0
impingers.....(GRAMS)	182.0
desiccant.....(GRAMS)	4.0
total.....(GRAMS)	186.0
Total particulate material..	
.....collected(grams)	0.2298
Gas meter coefficient.....	0.9983
Barometric pressure..(IN.HG)	29.33
Avg. orif.pres.drop..(IN.WC)	1.79
Avg. gas meter temp..(DEF-F)	46.5
Volume through gas meter....	
at meter conditions...(CF)	21.24
standard conditions.(DSCF)	21.76
Total sampling time....(MIN)	30.00
Nozzle diameter.....(IN)	.248
Avg.stack gas temp ..(DEG-F)	158
Volumetric flow rate.....	
actual.....(ACFM)	44489
dry standard.....(DSCFM)	26596
Isokinetic variation.....(%)	98.0
Particulate concentration...	
actual.....(GR/ACF)	0.09739
dry standard.....(GR/DSCF)	0.16298
Particle mass rate...(LB/HR)	37.15

Test No. 3
Line 1 Surface Dryer Scrubber Outlet

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

	Run 1	Run 2
Date of run	04-05-95	04-05-95
Time run start/end.....(HRS)	922/1039	1113/1222
Static pressure.....(IN.WC)	0.61	0.61
Cross sectional area (SQ.FT)	12.05	12.05
Pitot tube coefficient.....	.840	.840
Water in sample gas		
condenser.....(ML)	0.0	0.0
impingers.....(GRAMS)	375.0	376.0
desiccant.....(GRAMS)	9.0	9.0
total.....(GRAMS)	384.0	385.0
Total particulate material..		
.....collected (grams)	0.4608	0.5015
Gas meter coefficient.....	0.9983	0.9983
Barometric pressure..(IN.HG)	29.04	29.04
Avg. orif.pres.drop..(IN.WC)	1.79	1.90
Avg. gas meter temp..(DEF-F)	59.5	68.8
Volume through gas meter....		
at meter conditions...(CF)	43.04	44.65
standard conditions.(DSCF)	42.56	43.39
Total sampling time....(MIN)	60.00	60.00
Nozzle diameter.....(IN)	.248	.248
Avg.stack gas temp ..(DEG-F)	159	152
Volumetric flow rate.....		
actual.....(ACFM)	43245	42853
dry standard.....(DSCFM)	25144	26023
Isokinetic variation.....(%)	101.4	99.9
Particulate concentration...		
actual.....(GR/ACF)	0.09709	0.10826
dry standard.....(GR/DSCF)	0.16706	0.17835
Particle mass rate...(LB/HR)	36.00	39.78

Test No. 4
Line 1 Core Dryer Scrubber Outlet

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

	Run 1
Date of run	04-05-95
Time run start/end.....(HRS)	922/1121
Static pressure.....(IN.WC)	0.34
Cross sectional area (SQ.FT)	12.05
Pitot tube coefficient.....	.840
Water in sample gas	
condenser.....(ML)	0.0
impingers.....(GRAMS)	342.0
desiccant.....(GRAMS)	9.0
total.....(GRAMS)	351.0
Total particulate material..	
.....collected(grams)	0.4704
Gas meter coefficient.....	1.0086
Barometric pressure..(IN.HG)	29.04
Avg. orif.pres.drop..(IN.WC)	1.48
Avg. gas meter temp..(DEF-F)	43.6
Volume through gas meter....	
at meter conditions...(CF)	40.43
standard conditions.(DSCF)	41.63
Total sampling time....(MIN)	60.00
Nozzle diameter.....(IN)	.250
Avg.stack gas temp ..(DEG-F)	163
Volumetric flow rate.....	
actual.....(ACFM)	41876
dry standard.....(DSCFM)	24670
Isokinetic variation.....(%)	99.5
Particulate concentration...	
actual.....(GR/ACF)	0.10266
dry standard.....(GR/DSCF)	0.17433
Particle mass rate...(LB/HR)	36.86

3.3 Results of Filter Analysis

LP/Hayward

Glass fiber filters
Blank values

Element	Blank #1	Blank #2	Blank #3	Average
Ca	22500	27300	24600	24800
Fe	169	219	209	199
K	7600	7800	8000	7800
Mn	15	18	17	17
P	0	0	0	0
S	81	85	85	84
Na	63100	80700	81600	75133

SDSO = Surface Dryer Scrubber Outlet
SDSI = Surface Dryer Scrubber Inlet

Parameter	SDSO 3/1	SDSO 3/2	SDSO 3/3	SDSI 1/1	CDSO 4/1
Date	4-Apr	5-Apr	5-Apr	5-Apr	5-Apr
Filter	GF	GF	GF	Pallflex	GF
UNCORRECTED DATA (ug)					
Ca	27300	31200	26200	5250	26400
Fe	247	560	222	67	3200
K	38300	49800	46100	14300	29200
Mn	129	124	140	88	123
P	328	226	165	233	820
S	1870	2300	1930	1080	2240
Na	92300	94800	92500	3160	82700
BLANK CORRECTED DATA (ug)					
Ca	2500	6400	1400	5250	1600
Fe	48	361	23	67	3000
K	30500	42000	38300	14300	21400
Mn	112	107	123	88	106
P	328	226	165	233	820
S	1786	2216	1846	1080	2156
Na	17167	19667	17367	3160	7567
Total (ug)	52441	70977	59224	24178	36649
Total (g)	0.0524	0.0710	0.0592	0.0242	0.0366
Analyzed Mass (g)	0.1947	0.3866	0.4193	0.1449	0.3757
Accounted for (%)	26.93	18.36	14.12	16.69	9.75

3.4 Results of Impinger Analysis

INTERPOLL LABORATORIES, INC.

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Metals Data Reporting Sheet

3/1

ILI Log #	5158-01 I	Sample Collected	
Client	ID020 / LP Hayward	Date Received	
Sample Type	Imp. Catch	Date Due	4/14/95
Sample ID			

Parameter	Units	Detection Limit	Analysis Date & Initials	Method	Analytical Result
Aluminum					
Arsenic					
Boron					
Barium					
Beryllium					
Calcium	x10	5.2	BMS 4-7-95	6010A	761
Cadmium					
Cobalt					
Chromium					
Copper					
Iron	x	8.1			37.4
Potassium	x	192			
Magnesium					
Manganese	x	0.81			54.3
Molybdenum					
Sodium	x	12			871
Nickel					
Lead					
Selenium					
Silicon					
Antimony					
Tin					
Strontium					
Titantium					
Thallium					
Vanadium					
Zinc					
Silver					
Sulfur	x	10			813
phosphorus	x	12			21.5

Footnotes:

BMS 4-10-95

In-House Comments:

INTERPOLL LABORATORIES, INC.

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Metals Data Reporting Sheet

3/2

ILI Log #	5158-02 I	Sample Collected	
Client	IDOJO / LP Hayward	Date Received	
Sample Type	Imp. Catch	Date Due	4/10/95
Sample ID			

Parameter	Units	Detection Limit	Analysis Date & Initials	Method	Analytical Result
Aluminum					
Arsenic					
Boron					
Barium					
Beryllium					
Calcium	x UG	7.7	SMS 4-7-95	6010A	1163
Cadmium					
Cobalt					
Chromium					
Copper					
Iron	x	12			54.16
Potassium	x	280	SMS 4-10-95		—
Magnesium					
Manganese	x	1.2	SMS 4-7-95		41.4
Molybdenum					
Sodium	x	18			219
Nickel					
Lead					
Selenium					
Silicon					
Antimony					
Tin					
Strontium					
Titantium					
Thallium					
Vanadium					
Zinc					
Silver					
Sulfur	x	15	SMS 4-7-95		145
phosphorus	x	18			—

Footnotes:

In-House Comments: Sample must be shared with fuels

LCI-04R3

g:\chem\excel\forms\lci-04.xls

INTERPOLL LABORATORIES, INC.

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Metals Data Reporting Sheet

3/3

ILI Log #	5158-03 I	Sample Collected	
Client	ID020/ LP Hayward	Date Received	
Sample Type	Imp. Catch	Date Due	4/10/95
Sample ID			

Parameter	Units	Detection Limit	Analysis Date & Initials	Method	Analytical Result
Aluminum					
Arsenic					
Boron					
Barium					
Beryllium					
Calcium	MG	7.5	SM54-7-95	6010A	73.4
Cadmium					
Cobalt					
Chromium					
Copper					
Iron	x	12			51.0
Potassium	x	270			
Magnesium					
Manganese	x	1.2	SM54-7 95		29.2
Molybdenum					
Sodium	x	17			273
Nickel					
Lead					
Selenium					
Silicon					
Antimony					
Tin					
Strontium					
Titantium					
Thallium					
Vanadium					
Zinc					
Silver					
Sulfur	x	14			164
phosphorus	x	17			

Footnotes:

In-House Comments:

INTERPOLL LABORATORIES, INC.

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Metals Data Reporting Sheet

4/1

ILI Log #	5158-07 I	Sample Collected	
Client	1D020 / LP Hayward	Date Received	
Sample Type	Imp. Catch	Date Due	4/10/95
Sample ID			

Parameter	Units	Detection Limit	Analysis Date & Initials	Method	Analytical Result
Aluminum					
Arsenic					
Boron					
Barium					
Beryllium					
Calcium	x	7.6	BMS 4-7 95	1001OA	271
Cadmium					
Cobalt					
Chromium					
Copper					
Iron	x	12			23.7
Potassium	x	277			500
Magnesium					
Manganese	x	1.2	BMS 4-7 95		5.83
Molybdenum					
Sodium	x	17			330
Nickel					
Lead					
Selenium					
Silicon					
Antimony					
Tin					
Strontium					
Titantium					
Thallium					
Vanadium					
Zinc					
Silver					
Sulfur	x	15			203
phosphorus	x	17			

Footnotes:

In-House Comments:

LCI-04R3

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APPENDIX A

VOLUMETRIC FLOW RATE DETERMINATIONS

Test No. 1
Line 1 Surface Dryer Scrubber Inlet

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

Date of Determination.....	04-04-95
Time of Determination.....(HRS)	1208
Barometric pressure.....(IN.HG)	29.33
Pitot tube coefficient.....	.84
Number of sampling ports.....	2
Total number of points.....	24
Shape of duct.....	Round
Stack diameter.....(IN)	47
Duct area.....(SQ.FT)	12.05
Direction of flow.....	DOWN
Static pressure.....(IN.WC)	-10.5
Avg. gas temp.....(DEG-F)	230
Moisture content.....(% V/V)	28.15
Avg. linear velocity.....(FT/SEC)	45.9
Gas density.....(LB/ACF)	.04975
Molecular weight.....(LB/LBMOLE)	29.45
Mass flow of gas.....(LB/HR)	98970
Volumetric flow rate.....	
actual.....(ACFM)	33158
dry standard.....(DSCFM)	17400

Test No. 1
Line 1 Surface Dryer Scrubber Outlet

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

Date of Determination.....	04-04-95
Time of Determination.....(HRS)	1142
Barometric pressure.....(IN.HG)	29.33
Pitot tube coefficient.....	.84
Number of sampling ports.....	2
Total number of points.....	20
Shape of duct.....	Round
Stack diameter.....(IN)	47
Duct area.....(SQ.FT)	12.05
Direction of flow.....	UP
Static pressure.....(IN.WC)	.27
Avg. gas temp.....(DEG-F)	148
Moisture content.....(% V/V)	25.51
Avg. linear velocity.....(FT/SEC)	56.5
Gas density.....(LB/ACF)	.05865
Molecular weight.....(LB/LBMOLE)	29.42
Mass flow of gas.....(LB/HR)	143602
Volumetric flow rate.....	
actual.....(ACFM)	40811
dry standard.....(DSCFM)	25897

Test No. 4
Line 1 Core Dryer Scrubber Inlet

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

Date of Determination.....	04-04-95
Time of Determination.....(HRS)	825
Barometric pressure.....(IN.HG)	29.04
Pitot tube coefficient.....	.84
Number of sampling ports.....	1
Total number of points.....	8
Shape of duct.....	Round
Stack diameter.....(IN)	47
Duct area.....(SQ.FT)	12.05
Direction of flow.....	UP
Static pressure.....(IN.WC)	.34
Avg. gas temp.....(DEG-F)	160
Moisture content.....(% V/V)	28.44
Avg. linear velocity.....(FT/SEC)	64.9
Gas density.....(LB/ACF)	.05622
Molecular weight.....(LB/LBMOLE)	29.42
Mass flow of gas.....(LB/HR)	158342
Volumetric flow rate.....	
actual.....(ACFM)	46941
dry standard.....(DSCFM)	27789

APPENDIX B

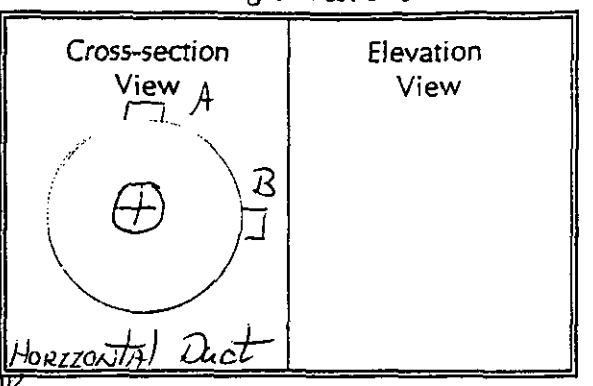
FIELD DATA SHEETS

INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 2 Field Data Sheet

Job LP / HAYWARD 5158 Inlet
Source LINE No. 1 FACE DRYER SCRUBBER ~~Outlet~~
Test 1 Run Date 4-4-95
Stack Dimen. 47 IN.
Dry Bulb 230 ~~160~~ °F Wet bulb 125 °F
Manometer ☐ Reg. ☐ Exp ☐ Elec.
Barometric Pressure 29.33 IN.HG
Static Pressure = 7.6 - 10.5 SMS IN.WC
Operators RON ROSENTHAL & STEVE KELKER
Pitot No. 4MS-6 C_p .840
NOTE: PORT LENGTH 6" plus 3" FOR PORT CLAMP

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: 9" w/clp IN.		Time Start: ~~0445~~ HRS 1103		
B - 1	.021	1.00	10.00	.33	.95	97
2	.067	3.15	12.15	.34	.92	1.02
3	.118	5.55	14.55	.31	.81	1.28
4	.177	8.32	17.32	.30	1.04	1.30
5	.250	11.75	20.75	.28	1.40	1.20 ~~1.07.5~~
6	.356	16.73	25.73	.27	1.02	1.04
7	.644	30.27	39.27	.40	.76	.61
8	.750	35.25	44.25	.56	.61	.60
9	.823	38.68	47.68	.69	.52	.48
10	.882	41.45	50.45	.72	.53	.49
11	.933	43.85	52.85	.72	.58	.47
12	.979	46.01	55.01	.52	.65	.55
A 1				.65	.75	.66
2				.77	.72	.66
3				.60	.66	.64
4			61.33	.71	.63	.64
5		10.1	44.34	.45	.63	.67
6			25.909	.42	.66	.68
7				.34	.76	.80
8			ft/sec 42.80	.31	.90	.90
9			ACFM = 30945	.28	.99	.96
10			DSCFM 30273	.29	1.02	1.11
11				.31	1.20	1.23
12				.25	1.30	1.20
				Probe w/o nozzle	Pitot	Probe w/o nozzle

Temp. Meas. Device & S/N: Time End: ~~0455~~ HRS

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

1.19 1.244

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.227 .49

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job LP/HAYWARD 5158 Date 4-4-95 Test 1 Run 1
Source LINE No. 1 FACE DRYER SCRUBBER Outlet No. of traverse points 24
Method 5 & 29 Filter holder: MACE Inlet Filter type: PALLFLEX

Sample Train Leak Check:

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

Particulate Catch Data:

No. of filters used: Recovery solvent(s)

____ ☒acetone ____
____ ☒other(s) MECL

No. of probe wash bottles: 2
Sample recovered by: R.R. & S.K.

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1	794	498	296
Impinger No. 2			
Impinger No. 3			
Condenser			
Desiccant	1371	1363	8
Total			304

Integrated Gas Sampling Data:

Bag Pump No. 22A Box No. 12 Bag No. 1
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: 0 cc/min at 15 IN.HG
Time start: ____ (HRS) Time end: ____ (HRS)
Sampling rate: 400 cc/min Operator: RR

S/N of O_2 Analyzer used to monitor train outlet: 8

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 5 Field Data Sheet

Job: LP/HAYWARD 5158 | Operators: R.R. & S.K. | Nozzle No.: G1-4 | Pitot No.: 4M5-6'
Source: LINE NO. 1 FACE DRYER SCRUBBER INLET | Meter Box No.: 14 ΔH@ 1.675 in.WC | Nozzle Dia.: .227 in. | C_p: .840
Date: 4-4-95 Test: 1 Run: 1 | Gasmeter Coeff.: 1.0086 | Bar. Press.: 29.33 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)
	1530	493.20					233	225	254	33	45	46	17.0
B-12	2.5	494.55	.51	.82	4.46	5	201				46	46	16.1
11	5	495.54	.32	.54	5.48	4	201	229	250	33	49	49	16.0
10	7.5	496.69	.43	.73	6.67	4	219				51	45	15.9
9	10	497.89	.45	.75	7.88	5	226	231	250	33	53	45	15.4
8	12.5	499.13	.40	.66	9.01	6	226				55	46	15.6
7	15	500.43	.58	.95	0.37	7	226	228	225	34	56	45	15.6
6	17.5	501.87	.80	1.32	1.97	11	226				57	47	15.6
5	20	503.86	1.20	1.98	3.93	14	232	229	228	34	57	47	15.7
4	22.5	505.85	1.30	2.13	5.97	15	232				58	48	16.0
3	25	507.87	1.20	1.97	7.92	14	228	235	230	34	56	48	14.0
2	27.5	509.75	1.10	1.82	9.81	13	228				56	49	17.9
1	30	511.39	.70	1.16	1.31	12	228	234	232	35	55	49	16.1
A-12	32.5	512.42	.36	.59	2.39	5	228				55	49	16.2
11	35	513.48	.32	.52	3.40	5	231	232	228	34	55	49	16.1
10	37.5	514.59	.40	.65	4.53	6	239				56	49	15.8
9	40	515.76	.38	.62	5.63	6	238	232	227	34	56	49	16.0
8	42.5	516.98	.40	.65	6.76	6	234				56	49	15.9
7	45	518.03	.45	.74	7.97	7	234	234	230	34	57	46	15.7
6	47.5	519.32	.64	1.05	9.40	10	233				60	48	15.6
5	50	521.16	1.10	1.80	1.27	14	232	232	228	33	60	49	15.3
4	52.5	523.12	1.20	1.98	3.24	16	232				60	50	15.3
3	55	524.91	1.05	1.73	5.08	15	232	230	230	33	60	50	15.2
2	57.5	526.97	1.15	1.90	7.01	16	233				60	52	15.5
1	60	528.96	1.15	1.90	8.93	16							
	1658												
	θ = 60	V_m = 35.76		ΔH = 1.71							Avg. = 57.6		

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INTERPOLL LABORATORIES, INC.

(612) 786-6020

EPA Method 2 Field Data Sheet

Job (FACE) Line 1 Surface Dryer Scrubber Outlet

Source UP-Hayward

Test 1 Run 0 Date 4-4-95

Stack Dimen. ~~35~~ 47 IN.

Dry Bulb 153 ~~144~~ °F Wet bulb ~~146~~ 150 °F

Manometer ☐ Reg. ☐ Exp ☐ Elec.

Barometric Pressure 29.33 IN.HG

Static Pressure ~~-.23~~ +.27 IN.WC

Operators MK - GH

Pitot No. 4M5-8 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: ~~1436~~ HRS ~~1437~~ 1142	
A-1	~~.044~~ .026	~~1.72~~ 1.22	10.22	.46 .54	
2	~~.146~~ .082	~~5.69~~ 3.95	11.95 ~~14.69~~	.49 .71	
3	~~.296~~ .146	~~11.54~~ 6.96	15.96 ~~20.54~~	.44 .94	
4	~~.704~~ .226	~~27.46~~ 10.62	19.62 ~~36.46~~	.46 .87	
5	~~.854~~ .342	~~33.31~~ 16.07	25.07 ~~42.31~~	.45 .83	
6	~~.956~~ .658	~~37.28~~ 30.93	39.93 ~~46.28~~	.47 .86	
7	.774	34.97	43.97	.48 .87	
8	.854	40.14	49.14	.49 .88	
9	.918	43.15	52.15	.49 .87	
10	.974	45.78	59.78	.49 .83	148
				.45 .47	
				.50 .56	
		56.46 ft/sec		.52 .73	
		40815 ACFM		.49 .80	
		26424 DSCFM		.48 .85	
				.46 .82	
				.43 .81	
				.42 90	
		32.63 ft/sec		.42 .91	
		27207 ACFM		.42 .89	
		23279 DSCFM			
Temp. Meas. Device & S/N: PDT-31 /TC				Time End: ~~1444~~ HRS 1148	

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

* includes verticle port clamp

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

Job LP/Hayward, WI
Date 4-4-95 Test 3 Run 1
Source 4" Screw Auger
No. of traverse points 10
Method 5 Filter holder: Glass
Filter type: 4" GF

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:

Recovery solvent(s)

☒ acetone
☐ other(s)

No. of probe wash bottles: 1
Sample recovered by: M. Kuehler + G. Hove

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1	679	497	182
Impinger No. 2			
Impinger No. 3			
Condenser			
Desiccant	1397	1393	4
Total			196

Integrated Gas Sampling Data:

Bag Pump No. _____ Box No. _____ Bag No. _____
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: _____

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INTERPOLL LABORATORIES, INC.

(612) 786-6020

EPA Method 5 Field Data Sheet

Job: LP / Hagenswig, [illegible]
Source: LL Scrubber / Carrier
Date: 4-4-95 Test: 3 Run: 1

Operators: M. Kuehler + G. Heve
Meter Box No.: 6 ΔH@ 1.99 in.WC
Gasmeter Coeff.: .9983

Nozzle No.: 4-4
Nozzle Dia.: .248 in.
Bar. Press.: 29.33 in.Hg

Pitot No.: 220-5
C_p: .84
H_2O: ~~[illegible]~~ 31 %

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)
	1935	84.40											
A-10	3	86.49	.97	1.72	6.17	4	158				40	43	16.0
9	6	88.58	.85	1.65	8.50	4	158				42	43	16.2
8	9	90.63	.89	1.73	0.57	5	157				46	42	15.9
7	12	92.85	.94	1.83	2.71	5	159				48	42	15.7
6	15	94.93	.98	1.91	4.89	6	155				51	42	15.5
5	18	97.14	.93	1.93	7.03	6	156				52	43	15.6
4	21	99.24	.94	1.85	9.18	6	157				54	43	16.1
3	24	101.42	.94	1.85	1.34	6.5	157				56	43	16.0
2	27	103.52	.91	1.79	3.46	6.5	158				57	43	15.9
1	30	105.64	.88	1.74	5.56	6.5	157				52	43	16.0
	(1935)												
	θ = 30	V_m = 21.24		ΔH = 1.79							Avg. = 46.5		

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 2 Field Data Sheet

Job LP-HAYWARD
Source LINE NO. 1 FACE DRYER SCRUBBER OUTLET
Test 3 Run __ Date 4-5-95
Stack Dimen. 47 IN.
Dry Bulb ____ °F Wet bulb ____ °F
Manometer ☐ Reg. ☐ Exp ☐ Elec.
Barometric Pressure 29.04 IN.HG
Static Pressure 0.61 IN.WC
Operators MK, GH
Pitot No. 22-5 C_p 0.84

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:	HRS
Temp. Meas. Device & S/N:				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 4-5-95 Test 3 Run 2

Source L1 Scrubber Face Dryer /Outlet No. of traverse points 20

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 10 IN. HG (vac) ☑

Particulate Catch Data:

No. of filters used: Recovery solvent(s)

7407

☒acetone

☐other(s)

No. of probe wash bottles: 1

Sample recovered by: M. Kaehler + C. Hove

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1	717	496	221
Impinger No. 2	344	190	154
Impinger No. 3			
Condenser			
Desiccant	1406	1397	9
Total	▒▒▒▒▒▒▒▒▒▒		384

Integrated Gas Sampling Data:

Bag Pump No. 22B Box No. 5 Bag No. 2

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

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

Time start: ~~400~~ 0922 (HRS) Time end: 1039 (HRS)

Sampling rate: 400 cc/min Operator: M. Kaehler

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

Job L.P./Hayward, WI (FACE)   Operators M. Kaehler & G. Heve   Nozzle No. 4-4   Pitot No. 22V-5

Source L1 Scrubber / Outlet Surface Dryer   Meter Box No. 6   ΔH@ 1.98 in.WC   Nozzle Dia. .248 in. C_p .84

Date 4-5-95   Test 3   Run 2   Gasmeter Coeff. .9993   Bar. Press. 29.04 in.Hg H_2O 20.7 %

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)
	0922	114.40											
A-10	3	116.54	.87	1.77	6.50	5	158	243	250	38	50	43	17.5
9	6	118.63	.99	1.82	8.64	5	162	244	256	38	53	42	16.8
8	9	120.61	.78	1.60	0.65	4.5	163	240	249	38	60	43	17.1
7	12	122.75	.86	1.76	2.79	5.5	167	245	253	38	64	45	16.6
6	15	124.91	.84	1.73	4.88	5.5	167	242	250	40	66	46	17.0
5	18	127.00	.89	1.95	7.07	6	165	239	254	40	68	46	17.3
4	21	129.13	.95	1.77	9.20	6	164	244	250	41	69	47	17.2
3	24	131.36	.99	1.87	1.40	7	160	241	257	40	69	48	16.9
2	27	133.51	.94	1.98	3.66	8	157	238	252	42	71	49	16.6
1	30	135.75	.86	1.82	5.84	7.5	156	234	248	42	71	49	16.4
B-10	33	138.00	.87	1.85	8.03	7.5	156	240	245	43	69	51	16.8
9	36	140.13	.83	1.76	0.17	7.5	155	236	249	43	72	52	17.1
8	39	142.38	.98	1.89	2.38	8	154	244	252	43	73	52	17.4
7	42	144.54	.82	1.25	4.51	8	157	247	250	45	75	53	17.0
6	45	146.77	.87	1.85	6.71	8.5	159	242	250	45	75	54	17.3
5	48	149.09	.96	2.04	9.02	9.5	159	238	246	42	76	54	17.5
4	51	151.24	.83	1.77	1.19	9	159	242	243	42	76	55	17.2
3	54	153.36	.77	1.65	3.26	9	155	241	247	41	76	56	17.0
2	57	155.37	.74	1.59	5.30	9	156	237	244	42	76	56	16.7
1	60	157.44	.74	1.59	7.34	9	157	244	241	42	76	56	16.4
	(1039)												
	θ = 100	V_m = 43.04		ΔH̄ = 1.79							Avg. = 59.5		

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job L.P. / Hayward, WI — Source L1 Scrubber / Outlet (Face Dryer) — Method 5 — Filter holder: Glass

Date 4-5-95 — Test 3 — Run 3

No. of traverse points 20

Filter type: 4" G.F.

Sample Train Leak Check:

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

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

Particulate Catch Data:

No. of filters used: 7399

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

No. of probe wash bottles: 1

Sample recovered by: M. Kuehler + C. Heyer

Condensate Data:

Item	Weight (g) Final	Tare	Difference
Impinger No. 1	731	496	235
Impinger No. 2	336	195	141
Impinger No. 3			
Condenser			
Desiccant	1405	1396	9
Total			385

Integrated Gas Sampling Data:

Bag Pump No. 2213 — Box No. 5 — Bag No. 3

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

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

Time start: 1113 (HRS) Time end: 1222 (HRS)

Sampling rate: 400 cc/min Operator: M. Kuehler

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

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[redacted] INTERPOLL LABORATORIES, [redacted]
(612) 786-6020

EPA Method 5 Field Data Sheet

Job A.P. / Hayward, WI FAKE DRYER
Source #1 Scrubber Outlet
Date 4-5-95 Test 3 Run 3

Operators M. Buchholz & G. Hove
Meter Box No. 6 ΔH@ 1.98 in.WC
Gasmeter Coeff. .9903

Nozzle No. 4-4
Nozzle Dia. .248 in.
Bar. Press. 29.04 in.Hg

Pitot No. 22U-5
C_p .84
H_2O 29.8 %

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)
[redacted]	1113	159.30	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
A-10	3	160.35	.05	1.75	0.42	4.5	158	233	246	37	62	56	16.4
9	6	162.21	.65	1.33	2.28	4	160	241	245	37	71	57	15.8
8	9	164.45	.09	1.97	4.49	5.5	152	239	250	39	74	59	15.9
7	12	166.64	.97	1.93	6.69	5.5	151	244	253	37	76	59	15.9
W=27 6	15	168.99	.99	2.01	9.99	6.5	152	240	249	38	77	60	16.2
5	18	171.31	.87	1.97	1.26	7	149	243	245	39	78	60	16.2
4	21	173.48	.96	1.95	3.53	8	150	246	243	41	78	61	16.2
3	24	175.85	.95	2.15	5.91	8.5	152	250	246	41	78	60	16.3
2	27	178.40	.97	2.21	8.33	9	147	248	252	41	78	61	16.7
1	30	180.73	.93	2.11	0.68	9	151	247	254	40	78	61	16.7
13-10	33	182.90	.87	1.96	2.96	9	153	243	254	40	77	62	16.7
9	36	185.17	.04	1.89	5.20	9	154	240	251	42	78	62	16.6
8	39	187.49	.01	1.90	7.44	9.5	154	237	251	41	78	62	16.7
7	42	189.60	.03	1.88	9.67	9.5	151	241	248	41	79	62	16.7
6	45	191.87	.05	1.93	1.92	10	152	245	248	41	79	62	16.8
5	48	194.12	.06	1.95	4.19	10.5	152	245	247	43	79	62	16.7
4	51	196.33	.03	1.88	6.42	11	152	250	244	43	79	63	16.6
3	54	198.64	.05	1.93	8.69	11	151	247	250	43	79	63	16.9
2	57	200.84	.79	1.79	0.86	11	153	244	251	44	79	63	16.8
1	60	202.95	.75	1.70	2.99	11	152	243	246	44	79	63	17.0
	(1122)												
[redacted]	θ = 60	V_m = 44.65	[redacted]	1.90 ΔH =	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	Avg. = 68.8		[redacted]

INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 2 Field Data Sheet

Job LP/HAYWARD 5758
Source LINE No.1 CORE DRYER SCRUBBER OUTLET
Test 4 Run Date 4-5-95
Stack Dimen. 47 IN.
Dry Bulb °F Wet bulb °F
Manometer ☐ Reg. ☐ Exp ☐ Elec.
Barometric Pressure 24.04 IN.HG
Static Pressure 24.04 -.34 IN.WC
Operators RON ROSENTHAL ; STEVE KELLER
Pitot No. 4MS-6' C_p .840
NOTE: Port length 6" plus 3" with port clamp

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" w/clmp IN.		Time Start: 4-5-95 HRS 825	
1	.021	1.00	10.00	1.1	
2	.067	3.15	12.15		
3	.118	5.55	14.55		
4	.177	8.32	17.32		
5	.250	11.75	20.75	.78	
6	.356	16.73	25.73	.85	
7	.644	30.27	39.27	.98	
8	.750	35.25	44.25	1.00	
9	.823	38.68	47.68	1.05	
10	.882	41.45	50.45	1.05	
11	.933	43.85	52.85	1.15	
12	.979	46.00	55.00	1.20	
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

Temp. Meas. Device & S/N:
Time End: HRS

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

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

Job LP/HAYWARD 5158 Date 4-5-95 Test 4 Run 1
Source LINE No. 1 CORE DRYER SCRUBBER OUTLET No. of traverse points 24
Method 5/29 Filter holder: GLASS Filter type: PALLFLEX

Sample Train Leak Check:
Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☑
Post test: 0.0 cfm at 12 IN. HG (vac) ☑

Particulate Catch Data:
No. of filters used: 7397

Recovery solvent(s)
☑acetone
☑other(s) MEOH

No. of probe wash bottles: 2
Sample recovered by: R.R. & S.K.

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1	731	496	235
Impinger No. 2	302	195	107
Impinger No. 3			
Condenser			
Desiccant	1467	1458	9
Total			351

Integrated Gas Sampling Data:

Bag Pump No. 22A Box No. 12 Bag No. 2
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: 0 cc/min at 15 IN.HG
Time start: 922 (HRS) Time end: _____ (HRS)
Sampling rate: 400 cc/min Operator: RR

S/N of O_2 Analyzer used to monitor train outlet: 8

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INTERPOLL LABORATORIES, INC.
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EPA Method 5 Field Data Sheet

Job LP/HAYWARD 5158 OUTLET Operators R.R. & S.K. Nozzle No. _____ Pitot No. 22y-6'
Source/ZONE No.1 CORE DRYER SCRUBBER Meter Box No. 14 ΔH@ 1.75 in.WC Nozzle Dia. .250 in. C_p .840
Date 4-5-95 Test 4 Run 1 Gasmeter Coeff. 1.0086 Bar. Press. 29.04 in.Hg H_2O 28 %

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)
	(922)	530.10											
A-12	2.5	532.10	1.10	2.07	2.09	9	160	225	250	34	30	27	17.1
11	5	534.08	1.15	4.07	2.09	9	166				34	27	17.0
10	7.5	535.97	1.05	1.92	5.96	9	166	227	258	35	36	28	16.9
9	10	537.93	1.20	2.21	8.01	10	162				41	30	16.9
8	12.5	539.84	.93	1.73	9.82	9	161	241	266	35	44	30	17.0
7	15	541.54	.86	1.60	1.57	8	161				46	32	16.6
6	17.5	543.20	.70	1.31	3.16	7	161	242	263	35	47	32	16.9
5	20	544.82	.68	1.27	4.72	7	163				48	32	17.0
4	22.5	546.34	.66	1.24	6.27	7	161	242	243	35	48	33	17.1
3	25	547.79	.62	1.17	7.77	6	160				51	34	16.7
2	27.5	549.32	.62	1.17	9.27	7	162	242	275	36	52	35	16.5
1	30	550.76	.64	1.18	0.78	7	162				53	37	16.4
B-12	32.5	552.54	.85	1.57	2.53	9	161	241	272	33	40	40	16.9
11	35	554.23	.90	1.67	4.33	10	160				55	40	16.6
10	37.5	555.98	.84	1.56	6.07	10	162	240	275	34	56	41	16.4
9	40	557.71	.83	1.55	7.81	10	161				57	41	16.5
8	42.5	559.38	.75	1.36	9.45	9	162	233	260	34	50	44	16.5
7	45	561.10	.74	1.34	1.07	9	166				50	44	16.3
6	47.5	562.65	.61	1.10	2.54	9	166	235	257	35	51	48	16.3
5	50	563.99	.58	1.05	3.97	8	166				52	47	16.5
4	52.5	565.56	.64	1.16	5.48	8	166	242	274	35	53	45	16.3
3	55	567.15	.73	1.33	7.10	8	163				56	45	16.0
2	57.5	568.73	.76	1.38	8.74	8	167	240	273	36	58	46	15.8
1	60	570.53	.84	1.52	0.47	10	167				60	48	15.9
	(1121)												
	θ = 60	V_m = 40.43		1.48 ΔH =							Avg. =	43.6	

= CORE DRYER DOWN @ 1002 HRS

B-14

APPENDIX C

INTERPOLL LABORATORIES ANALYTICAL DATA

Interpoll Laboratories
(612) 786-6020

EPA Method 3 Data Reporting Sheet
Orsat Analysis

Job: *L.P./Hayward*	Source: *Line No. 1 Face Dryer Scrubber*
Team Leader: *RR*	Test Site: *Inlet*
Date Submitted: *4-5-95*	Date of Test: *4-4-95*
Test No.: *2*	No. of Runs Completed: *1*
Date of Analysis: *4-6-95*	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 9W *2/1*	*5158-11*	1	*0.00*	*5.20*	*20.70*	*5.20*	*15.50*	*1.04*
		2	*0.00*	*5.20*	*20.70*	*5.20*	*15.50*	*1.04*
	☑ B ☐ F	Avg				*5.20*	*15.50*	
		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
(612) 786-6020

EPA Method 3 Data Reporting Sheet
Orsat Analysis

Job LP / Hayward
Team Leader MK
Date Submitted 4-5-95
Test No. 3
Date of Analysis 4-6-95

Source L1 Face Dryer Scrubber
Test Site Outlet
Date of Test 4-5-95
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
(Test 1) 3/1 SW	5158-04	1	0.00	5.00	20.60	5.00	15.60	1.06
		2	0.00	5.00	20.60	5.00	15.60	1.06
	☑ B ☐ F	Avg				5.00	15.60	
~~3/2~~ 3/1 SW	-05	1	0.00	5.00	20.80	5.00	15.80	1.02
		2	0.00	5.00	20.80	5.00	15.80	1.02
	☑ B ☐ F	Avg				5.00	15.80	
~~3/3~~ 3/2 SW	-06	1	0.00	5.00	20.70	5.00	15.70	1.04
		2	0.00	5.00	20.70	5.00	15.70	1.04
	☑ B ☐ F	Avg				5.00	15.70	
		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: L.P. Hayward
Team Leader: R.R.
Date Submitted: 4-5-95
Test No.: 4
Date of Analysis: 4-6-95

Source: Line No. 1 ~~Face~~ Core Dryer Scrubber
Test Site: Outlet
Date of Test: 4-5-95
No. of Runs Completed: 1
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
4/2	5158-08	1	0.00	4.90	20.70	4.90	15.80	1.04
		2	0.00	4.90	20.70	4.90	15.80	1.04
	☑ B ☐ F	Avg				4.90	15.80	
		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.
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Impinger Catch Data Reporting Sheet

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

Job	I P Hayward	Source/Site	U Face Dryer Inlet
Date Submitted	4/7/95	Test No.	21 SLP
Date of Analysis	4/7/95	Technician	BB

	Solvent Phase	Aqueous Phase
Test: 21 Run: 1	Dish No: 25	Dish No: 702
Log No: 5158-10I	Dish + Sample Wt: 44.4164 g	Dish + Sample Wt: 46.2565 g
Color & Appearance: dark	Dish Tare Wt: 44.3429 g	Dish Tare Wt: 46.2212 g
brown w/ strong odor	Fraction Wt: .0735 g	Fraction Wt: .0353 g
Comments: filtered sample	Smpl Vol: 500 ml, Alqt: — ml, Factor: 1	Smpl Vol: 500 ml, Alqt: 100 ml, Factor: 5.000
initially before extracting	Sample Wt: .0735 g	Sample Wt: .1765 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

Blank Solvent Wt. ________ g

		RUN	RUN	RUN	RUN
Results of Solvent Phase	g	0.0735			
Results of Aqueous Phase	g	0.1765	C-4		

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 No.1 Face Dryer Scrubber / Inlet
Date Submitted	4-7-95	Test No.	2 1 SLP
Date of Analysis	4-7-95	Technician	B.D.
Transport Leakage ☐	None ☒ ml	Solvent	MeCl2

Test:	Run:	Dish No:	
Log No:		Dish + Sample Wt:	g
Volume of Solvent	ml	Dish Tare Wt:	g
*Solvent Residue	ug/ml	Sample Wt:	g
Test: 2	Run: 1	Dish No:	754
Vol. of Solvent	250 ml	Dish + Sample Wt:	45.4306 g
Log Number	5158-10P	Dish Tare Wt:	45.2820 g
Comments		Sample Wt:	0.1486 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

	RUN	RUN	RUN	RUN
Results of Solvent Rinse g	0.1486	C-5		

INTERPOLL LABORATORIES, INC.
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Filter Gravimetrics Reporting Sheet

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

Job	LP/Hayward	Source/Site	L1 Face Dryer Inlet
Date Submitted	4-5-95	Test No.	1
Date of Analysis	4-6-95	Technician	BD

Test: Run:	Filter No:
Field Blank:	Filter Type:
Log No:	Filter + Sample Wt: g
Color:	Filter Tare Wt: g
	Sample Wt: g
Test: 2 Run: 1	Filter No: 7501
Log No:	Filter Type: 4" GF
Color:	Filter + Sample Wt: 1.0436 g
	Filter Tare Wt: 0.9935 g
	Sample Wt: 0.0501 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

		RUN	RUN	RUN	RUN
Results of Filter Analysis	g	0.0501			

		RUN	RUN	RUN	RUN
Total Mass	g				

INTERPOLL LABORATORIES, INC.
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Filter Gravimetrics Reporting Sheet

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

Job	LP / Hayward	Source/Site	Line No. 1 Face Dryer Scrubber/Inlet
Date Submitted	4-5-95	Test No.	I-1
Date of Analysis	4-6-95	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: 2	Run: 1	Filter No:	1455
Log No:	5158-09	Filter Type:	3.52" Pallflex
Color:		Filter + Sample Wt:	.5266 g
		Filter Tare Wt:	.3817 g
		Sample Wt:	0.1449 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

		RUN 1	RUN	RUN	RUN
Results of Filter Analysis	g	0.1449			

		RUN	RUN	RUN	RUN
Total Mass	g	0.5936			

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Impinger Catch Data Reporting Sheet

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

Job: L.P. / Hayward
Date Submitted: 4-5-95
Date of Analysis: 4-6-95
Source/Site: 21 Scrubber/Outlet
Test No.: 3
Technician: J. Lorenz

	Solvent Phase	Aqueous Phase
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: no blank	Smpl Vol: ml, Aliqt: ml, Factor:	Smpl Vol: ml, Aliqt: ml, Factor:
	Sample Wt: g	Sample Wt: g
Test: 3 (1) Run: 1	Dish No: 781	Dish No: 716
Log No: 5158-01I	Dish + Sample Wt: 47.1941 g	Dish + Sample Wt: 45.6452 g
Color & Appearance: yellowish, clear,	Dish Tare Wt: 47.1797 g	Dish Tare Wt: 45.6401 g
	Fraction Wt: .0144 g	Fraction Wt: .0051 g
Comments: burnt smell	Smpl Vol: 405 ml, Aliqt: ml, Factor	Smpl Vol: 405 ml, Aliqt: 101 ml, Factor 4.050
	Sample Wt: .0144 g	Sample Wt: .0207 g
Test: 3 Run: 2	Dish No: 785	Dish No: 729
Log No: -02I	Dish + Sample Wt: 45.1981 g	Dish + Sample Wt: 46.5042 g
Color & Appearance: yellowish, cloudy	Dish Tare Wt: 45.1523 g	Dish Tare Wt: 46.4994 g
	Fraction Wt: .0458 g	Fraction Wt: .0048 g
Comments: burnt smell	Smpl Vol: 592 ml, Aliqt: ml, Factor	Smpl Vol: 592 ml, Aliqt: 100 ml, Factor 5.920
	Sample Wt: .0458 g	Sample Wt: .0284 g
Test: 3 Run: 3	Dish No: 790	Dish No: 756
Log No: -03I	Dish + Sample Wt: 43.3948 g	Dish + Sample Wt: 46.0523 g
Color & Appearance: yellowish, cloudy	Dish Tare Wt: 43.3402 g	Dish Tare Wt: 46.0475 g
	Fraction Wt: .0546 g	Fraction Wt: .0048 g
Comments: burnt smell	Smpl Vol: 576 ml, Aliqt: ml, Factor	Smpl Vol: 576 ml, Aliqt: 101 ml, Factor 5.76
	Sample Wt: .0546 g	Sample Wt: .0276 g

Note: Factor = Sample Volume/Aliquot Volume

(Test 1) (Test 3)

Blank Solvent Wt. .0000 g

	RUN	RUN 1	RUN 2	RUN 3
Results of Solvent Phase g		.0144	.0458	.0546
Results of Aqueous Phase g	C-8	.0207	.0284	.0276

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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	L 1 Scrubber / outlet
Date Submitted	4-5-95	Test No.	3
Date of Analysis	4-6-95	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	ug/ml	Sample Wt:	g
Test: 3	Run: 1	Dish No:	745
Vol. of Solvent	100 ml	Dish + Sample Wt:	46.6008 g
Log Number	5158-01P	Dish Tare Wt:	46.5956 g
Comments		Sample Wt:	0.0052 g
Test: 3	Run: 2	Dish No:	746
Vol. of Solvent	120 ml	Dish + Sample Wt:	48.3420 g
Log Number	-02P	Dish Tare Wt:	48.3159 g
Comments		Sample Wt:	0.0261 g
Test: 3	Run: 3	Dish No:	748
Vol. of Solvent	120 ml	Dish + Sample Wt:	45.4044 g
Log Number	-03P	Dish Tare Wt:	45.3864 g
Comments		Sample Wt:	0.0180 g

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

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

	RUN	RUN 1	RUN 2	RUN 3
Results of Solvent Rinse g	C-9	0.0052	0.0261	0.0180

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Filter Gravimetrics Reporting Sheet

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

Job	LP / Hayward	Source/Site	L / Scrubber / outlet
Date Submitted	4-5-95	Test No.	3
Date of Analysis	4-6-95	Technician	B.O.

Test: 3	Run:	Filter No:		
Field Blank:		Filter Type:		
Log No:		Filter + Sample Wt:		g
Color:		Filter Tare Wt:		g
		Sample Wt:		g
Test: 3	Run: 1	Filter No:	7391	
Log No:	5158-01F	Filter Type:	4"GF	
Color:		Filter + Sample Wt:	1.1092	g
		Filter Tare Wt:	.9197	g
		Sample Wt:	0.1895	g
Test: 3	Run: 2	Filter No:	7407	
Log No:	-02F	Filter Type:	4"GF	
Color:		Filter + Sample Wt:	1.3073	g
		Filter Tare Wt:	.9468	g
		Sample Wt:	0.3605	g
Test: 3	Run: 3	Filter No:	7349	
Log No:	-03F	Filter Type:	4"GF	
Color:		Filter + Sample Wt:	1.3180	g
		Filter Tare Wt:	.9167	g
		Sample Wt:	0.4013	g

		RUN	RUN 1	RUN 2	RUN 3
Results of Filter Analysis	g		0.1895	0.3605	0.4013

		RUN	RUN 1	RUN 2	RUN 3
Total Mass	g		0.2298	0.4608	0.5015

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Impinger Catch Data Reporting Sheet

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

Job	L.P. Hayward	Source/Site	Line #1 corn dryer/scrubber outlet
Date Submitted	4-5-95	Test No.	4
Date of Analysis	4-6-95	Technician	J Lorenz

	Solvent Phase	Aqueous Phase
Test: 4 Run: 1	Dish No: 795	Dish No: 840
Log No: 5158-07 I	Dish + Sample Wt: 44.0979 g	Dish + Sample Wt: 47.9195 g
Color & Appearance: yellowish,	Dish Tare Wt: 44.0306 g	Dish Tare Wt: 47.9148 g
cloudy	Fraction Wt: .0673 g	Fraction Wt: .0047 g
Comments: burnt smell	Smpl Vol: ml, Alqt: ml, Factor:	Smpl Vol: 583 ml, Alqt: 100 ml, Factor: 5.830
	Sample Wt: .0673 g	Sample Wt: (J.L. 4-7-95) .0274 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

Blank Solvent Wt. ________ g

	RUN 1	RUN	RUN	RUN
Results of Solvent Phase g	.0673			
Results of Aqueous Phase g	.0274			

INTERPOLL LABORATORIES, INC.
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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 No.1 Core Dryer Scrubber / Outlet
Date Submitted	4-5-95	Test No.	4
Date of Analysis	4-6-95	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	ug/ml	Sample Wt:	g
Test: 4	Run: 1	Dish No: 753	
Vol. of Solvent	120 ml	Dish + Sample Wt: 45.7001	g
Log Number 5158-07P		Dish Tare Wt: 45.6202	g
Comments		Sample Wt: 0.0799	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

	RUN 1	RUN	RUN	RUN
Results of Solvent Rinse g	.0799	C-12		

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Filter Gravimetrics Reporting Sheet

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

Job	LP / Hayward	Source/Site	Line No. 1 Cane Dryer Scrubber Outle
Date Submitted	4-5-95	Test No.	4
Date of Analysis	4-6-95	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: 4	Run: 1	Filter No:	7397	
Log No: 5158-07F		Filter Type:	41'GF	
Color:		Filter + Sample Wt:	1.2096	g
		Filter Tare Wt:	.9138	g
		Sample Wt:	0.2958	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

		RUN 1	RUN	RUN	RUN
Results of Filter Analysis	g	0.2958			

		RUN	RUN	RUN	RUN
Total Mass	g	0.4704			

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Filter Gravimetrics Reporting Sheet

Fiter Type: ☐ EPA Method 5 ☐ EPA Method 29 ☐ EPA Method 202 ☒ Other M-17

Job: L2 Maynard / Gas Engine
Date Submitted:
Date of Analysis: 6-3-96
Source/Site: Line 2 cond dryer E-Tube Inlet
Test No.: 5
Technician: SCB

Test: Run: 1	Filter No: 7
Field Blank:	Filter Type: S.S. THIMBLE
Log No: 7684-16F	Filter + Sample Wt: 40.6039 g
Color: Brown	Filter Tare Wt: 39.9857 g
	Sample Wt: .6182 g
Test: Run: 2	Filter No: 26
Log No: -17F	Filter Type: SS. THIMBLE
Color: CLEAN	Filter + Sample Wt: 41.1492 g
	Filter Tare Wt: 41.0857 g
	Sample Wt: .0635 g
Test: Run: 2	Filter No: 17
Log No: -17F	Filter Type: S.S. THIMBLE
Color: BROWN	Filter + Sample Wt: 40.7980 g
	Filter Tare Wt: 40.3299 g
	Sample Wt: .4681 g
Test: Run: 3	Filter No: 19
Log No: -18F	Filter Type: S.S. THIMBLE
Color: Brown	Filter + Sample Wt: 40.7115 g
	Filter Tare Wt: 40.2238 g
	Sample Wt: .4877 g

		RUN 1	RUN 2	RUN 2	RUN 3
Results of Filter Analysis	g	.6182	.0635	.4681	.4877

0.5316

		RUN 1	RUN 2	RUN 3	RUN
Total Mass	g	0.8860	0.8868	0.8987	

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Ion Chromatography Laboratory

DIONEX MODEL 4000i WITH ANION MICRO MEMBRANE SUPRESSION

Analyst: TPW Date of Analysis: 6/3/96

Job: ID020 / LP Hayward Source: Line 2 Dryer LTD Site: Inlet

Chromatography Conditions

Column		Flow Rate	Eluent	Flow Rate	Suppressor Acid
	AS3	ml/min	2.4 mM Na_2CO_3 & 3.0 mM $NaHCO_3$	ml/min	12.5 mM Sulfuric Acid
✓	AS4A	~~ml~~/min	1.8 mM Na_2CO_3 & 1.7 mM $NaHCO_3$	ml/min	
	AS5	ml/min	100 mM NaOH		Isocratic
		ml/min			Gradient(List program below)

Gradient Program	Time (Min.)									
Eluent	0.0									
% A										
% B										

Results of Sulfate Determination

Sample Name	Interpoll Log Number	Tot. Sample Volume (ml)	Dilution	Solution Conc.(ug/ml)	Total ug Sulfate	meq of Sulfate
Imp. Catch	7684-01	220	1	< 0.025	< 5.5	$< 1.1 \times 10^{-4}$
↓	-02	475	1	1.20	570	1.2×10^{-2}
↓	-03	475	1	0.380	180	3.8×10^{-3}
↓	-04	500	1	0.216	110	2.3×10^{-3}

REVIEWED

Total ug = (Sample Vol.) x (Dilution) x (Solution Conc.)
meq = Total ug / 48000

Gregg M. Holman

LSC-08RR

Interpoll Laboratories, Inc.
(612)786-6020

Ion Chromatography Laboratory

DIONEX MODEL 4000i WITH ANION MICRO MEMBRANE SUPRESSION

Analyst: TPW Date of Analysis: 6/3/96

Job: IDO20/LP Hayward Source: Line 2 Dryer Exit Site: Inlet

Chromatography Conditions

Column		Flow Rate	Eluent	Flow Rate	Suppressor Acid
	AS3	ml/min	2.4 mM Na_2CO_3 & 3.0 mM $NaHCO_3$	ml/min	12.5 mM Sulfuric Acid
✓	AS4A	2 ml/min	1.8 mM Na_2CO_3 & 1.7 mM $NaHCO_3$	ml/min	
	AS5	ml/min	100 mM NaOH		Isocratic
		ml/min			Gradient(List program below)

Gradient Program	Time (Min.)									
Eluent	0.0									
% A										
% B										

REVIEWED

George W. Holman

Results of Sulfate Determination

Sample Name	Interpoll Log Number	Tot. Sample Volume (ml)	Dilution	Solution Conc.(ug/ml)	Total ug Sulfate	meq of Sulfate
Imp Catch	7684-08	195	1	<0.025	< 4.9	$< 1.0 \times 10^{-4}$
	09	475	1	0.291	140	2.9×10^{-3}
	10	390	1	0.105	41	8.5×10^{-4}
	11	410	1	1.67	680	1.4×10^{-2}
	15	195	1	0.050	9.8	2.0×10^{-4}
	16	475	1	1.67	790	1.7×10^{-2}
	17	380	1	0.394	150	3.1×10^{-3}
	18	490	1	0.193	95	2.0×10^{-3}

Total ug = (Sample Vol.) x (Dilution) x (Solution Conc.)
meq = Total ug / 48000

LSC-08RR

EPA Method 202 Calculations
Job: Geoenergy - LP/Hayward
Date: 05-14-96

Report No. 6-7684

Test 1 Line 2 E - Tube Outlet

RUN	Vlc (ml)	Sulfate (mg/ml)	Mc (mg)	Mr (mg)	Ml (mg)	Mo (mg)	Mb (mg)	CPM (mg)	**ENTER IN COMPUTER (g)**
1	475	1.20E-03	0.10	26.2	26.10	19.7	0.4	45.40	0.04539512
2	475	3.80E-04	0.03	19.5	19.47	16.1	0.4	35.17	0.035166788
3	500	2.16E-04	0.02	20.2	20.18	20.8	0.4	40.58	0.040580128

EPA Method 201A/202 Totals

RUN	Probe (mg)	Filter (mg)	CPM (mg)	Total (mg)
1	9.6	5.1	45.40	60.09512
2	10.7	6	35.17	51.86679
3	6.7	4	40.58	51.28013

Test 3 Line 2 Surface Dryer E - Tube Inlet

RUN	Vlc (ml)	Sulfate (mg/ml)	Mc (mg)	Mr (mg)	Ml (mg)	Mo (mg)	Mb (mg)	CPM (mg)	**ENTER IN COMPUTER (g)**
1	475	2.91E-04	0.03	146	145.97	66.3	0.4	211.87	0.211874567
2	390	1.05E-04	0.01	202	201.99	77.3	0.4	278.89	0.278892465
3	410	1.67E-03	0.13	255.1	254.97	105	0.4	359.57	0.359574015

EPA Method 201A/202 Totals

RUN	Probe (mg)	Filter (mg)	CPM (mg)	Total (mg)
1	211.4	538.5	211.87	961.7746
2	146.2	501.2	278.89	926.2925
3	191.8	514.6	359.57	1065.974

Test 5 Line 2 Core Dryer E - Tube Inlet

RUN	Vlc (ml)	Sulfate (mg/ml)	Mc (mg)	Mr (mg)	Ml (mg)	Mo (mg)	Mb (mg)	CPM (mg)	**ENTER IN COMPUTER (g)**
1	475	1.67E-03	0.15	64.7	64.55	84.5	0.4	148.65	0.148654042
2	380	3.94E-04	0.03	178.6	178.57	64.7	0.4	242.87	0.242872452
3	490	1.93E-04	0.02	166	165.98	70.7	0.4	236.28	0.236282599

EPA Method 201A/202 Totals

RUN	Probe (mg)	Filter (mg)	CPM (mg)	Total (mg)
1	119.1	618.2	148.65	885.954
2	112.3	531.6	242.87	886.7725
3	174.7	487.7	236.28	898.6826

INTERPOLL LABORATORIES, INC.
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Sample Chain of Custody

Job LP/HAYWARD Source LINE No. 1 CORE DRYER Site SCRUBBER OUTLET Log No. 5758
Field Engineer RON ROSENTHAL Date of Test 4-5-95 Test No. 4 No. of Runs 1

No. Items	Sample Type		Analysis		Sequence No.	Comments
1	**Probe Wash:** ☒ Acetone ~~☒ $MeCl_2$~~	☐DI Water ☐_____	☒EPA M-5 ☒EPA M-29	☐EPA M-201A ☐_____		
1	**Filter:** ☒ 4" Glass ☐ SS Thimble	~~☒Pallflex~~ ☐2.5" Glass	☒EPA M-5 ☒EPA M-29 ☐EPA M-201A	☐EPA M-17		
1	**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 ☐_____		
1	**Integrated Gas:** ☒Tedlar Bag	☐_____	☒EPA M-3 ☐_____	☐EPA M-10		BAG No. 2
—	**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
Ron Rosenthal / INTERPOLL LABS	E. Thomas / Interpoll	~~4-4-95~~ 4-5-95
	R. Q / Interpoll	4/5/95 1600

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C-17

APPENDIX D

SAMPLING TRAIN CALIBRATION DATA

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EPA Method 5 Gas Metering System Quality Control Check Data Sheet

Job L.P. / Hayward, WI Date 4-4-91

Operator M. Kaehler Module No. 6

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 29.33 in.Hg θ = .9993 ΔH@ 1.95 in.WC.

Time (min)	Volume (CF)	Meter Temp (°F)	
		Inlet	Outlet
	(70.90)		
2.5	72.72	22	17
5.0	74.56	26	19
7.5	76.42	29	20
10	78.23	32	21
	V_m = 7.33	Avg(t_m) =	23.25 °F

Calculate Y_{cn} as follows:

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

$$Y_{cn} = \frac{1.786}{(\quad)(7.33)}\ \left[\frac{(23.25) + 460}{(29.33)}\right]^{0.5}$$

$$Y_{cn} = .991$$

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.
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EPA Method 5 Gas Metering System Quality Control Check Data Sheet

Job L.P. / Hayward, Wi Date 4-5-95

Operator M. Kuebler Module No. 6

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 29.04 in.Hg θ = .9993 ΔH@ 1.99 in.WC.

Time (min)	Volume (CF)	Meter Temp (°F)	
		Inlet	Outlet
[redacted]	(106.80)	[redacted]	
2.5	109.65	28	22
5.0	110.50	31	23
7.5	112.32	34	23
10	114.13	35	24
[redacted]	V_m = 7.33	Avg(t_m) = 27.5	°F

Calculate Y_{cn} as follows:

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

$$Y_{cn} = \frac{1.786}{(.9993)(7.33)} \left[\frac{(27.5) + 460}{(29.04)}\right]^{0.5}$$

$$Y_{cn} = 1.000$$

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.
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EPA Method 5 Gas Metering System Quality Control Check Data Sheet

Job LP/HAYWARD Date 4-4-95

Operator R. ROSENTHAL Module No. 14

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 29.33 in.Hg Y = 1.0086 ΔH@ 1.75 in.WC.

Time (min)	Volume (CF)	Meter Temp (°F)	
		Inlet	Outlet
	(482.50)		
2.5	484.31	37	44
5.0	486.06	41	30
7.5	487.85	45	31
10	489.66	44	30
	V_m = 7.16	Avg(t_m) = 37.75	°F

Calculate Y_{cn} as follows:

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

7.22 7.18 .2487 4.1195

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

Y_{cn} = 1.019

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.
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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. 6
Serial No. DTM 964548
Technician D. Van Hoever

ΔH (IN.WC)		Gas Volume Wet Test Meter	* Cal. Index	* Diff. Wet Test Meter ΔP_w	Gas Volume Dry Test Meter (ft^3)		Gas Temperatures			Time	Meter Coeff.	Orifice Const.	C_f
							Wet Test	Dry Test					
Nominal	Actual	(ft^3)	(%)	(IN.WC.)	V_{di}	V_{df}	t_w (°F)	t_{di} (°F)	t_{do} (°F)	θ (Min/Sec)	Y	ΔH@	
0.5	.5	2	99.85	0.01	648.045	650.08	63.5	77	68	5'13	.9969	1.88	
1.2	1.2	~~2.5~~	99.91	0.025	656.116	658.71	63.5	84	69	4:19	1.0008	1.97	
2.0	2	3	99.93	0.055	640.94	643.965	63.6	72	67	4:01	.9971	2.0	
3.3	3.3	5	100.00	0.09	638.435	640.44	63.8	70	66	2:06	.9971	2.03	
4.7	4.7	5	100.02	0.12	650.59	655.65	63.5	84	68	4:26	.9999	2.03	
		3	4	5	6	7	8	9	10	11/12 Avg	.9983	1.98	

Positive leak check performed by DHH
Meter was in tolerance
Approved by

Meter was not in tolerance ☐: readjusted linkage
Meter was not in tolerance ☐: changed dry test meter
Date 1/10/95

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

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D-4

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Meter Calibration Sheet EPA/Method 5

Date 2-27-95
Bar. Press. 29.38 IN.HG
Wet Test Meter No. AL-20

Control Module No. 14
Serial No. DTM 1334123
Technician E Trowbridge

ΔH (IN.WC)		Gas Volume Wet Test Meter	* Cal. Index ϕ	* Diff. Wet Test Meter ΔP_w	Gas Volume Dry Test Meter (ft^3)		Gas Temperatures			Time θ	Meter Coeff.	Orifice Const.	C_I
							Wet Test t_w (°F)	Dry Test					
Nominal	Actual	(ft^3)	(%)	(IN.WC.)	V_{di}	V_{df}		t_{di} (°F)	t_{do} (°F)	(Min/Sec)	Y	ΔH@	
0.5	.5	2	99.85	0.01	161.300	163.310	66	80	69	4/54	1.0083	1.68	
1.2	1.2	3	99.91	0.025	158.000	161.000	66	77	67	4/50	1.0024	1.75	
2.0	2.0	3	99.93	0.055	163.500	166.520	66	86	69	3/47	1.0091	1.72	
3.3	3.3	5	100.00	0.09	167.000	172.045	66	91	70	4/56	1.0098	1.77	
4.7	4.7	5	100.02	0.12	172.500	177.558	66	94	72	4/09	1.0085	1.78	
	2	3	4	5	6	7	8	9	10	11/12 Avg	1.0086	1.75	

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

Meter was not in tolerance ☐: readjusted linkage
Meter was not in tolerance ☐: changed dry test meter
Date 2/28/95

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

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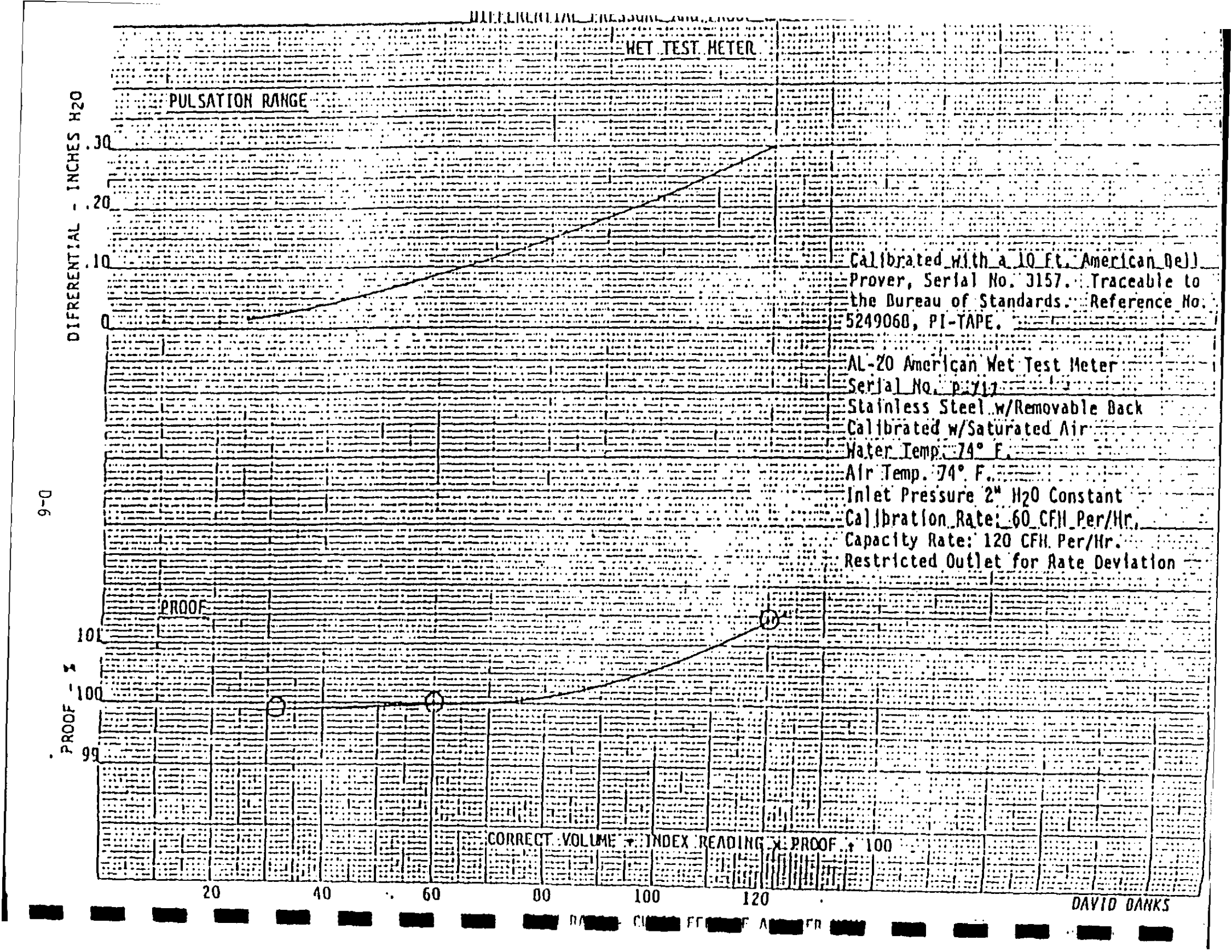
WET TEST METER
PULSATION RANGE
DIFRERENTIAL - INCHES H2O
.30
.20
.10
0
Calibrated with a 10 Ft. American Bell Prover, Serial No. 3157. Traceable to the Bureau of Standards. Reference No. 5249060, PI-TAPE.
AL-20 American Wet Test Meter
Serial No. P 717
Stainless Steel w/Removable Back
Calibrated w/Saturated 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

Interpoll Laboratories, Inc.
(612) 786-6020

Nozzle Calibration
Data Sheet

Date of Calibration: 04-04-95 Nozzle Number 5-4
Technician: Ron Rosenthal

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: 04-04-95 Nozzle Number 6-4
Technician: Mark Kaehler

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	.241
2	.242
3	.243
Average:	.242

Interpoll Laboratories, Inc.
(612) 786-6020

Nozzle Calibration
Data Sheet

Date of Calibration: 04-05-95 Nozzle Number 4-4
Technician: Mark Kaehler

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	.247
2	.247
3	.250
Average:	.248

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Temperature Measurement Device Calibration Sheet

Unit Under Test:
Vendor: Omega
Model: HH81
Range: 0-2100 °F
Date of Calibration: 2-27-95
Method of Calibration:
Serial Number: 735X1495
Thermocouple Type: K
Technician: Mark Gardner
PDT No. 31

☐ 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)	(%)
0	0	-3	3	.65
100	100	98	2	.36
200	200	199	1	.15
300	300	298	2	.26
400	400	397	3	.35
500	500	497	3	.31
600	600	599	1	.09
700	700	697	3	.26
800	800	800	0	0
900	900	899	1	.07
1000	1000	999	1	.07
1100	1100	1098	2	.13
1200	1200	1199	1	.06
1300	1300	1297	3	.17
1400	1400	1400	0	0
1500	1500	1498	2	.10
1600	1600	1600	0	0
1700	1700	1699	1	.05
1800	1800	1801	1	.04
1900	1900	1899	1	.04
2000	2000	2000	0	0
2100	2100	2096	4	.16
		Averages:	1.59	.15

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.

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Interboll Laboratories. Inc.

Temperature Measurement Device
Calibration Sheet

Unit under test: #32

Vendor Omega

Model HH 81 Serial Number 73SX 1495

Range 2200 °F Thermocouple Type K

Date of Calibration 1-10-95 Technician BCB

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	.35
200	200	200	0	0
300	300	298	2	.26
400	400	398	2	.23
500	500	498	2	.21
600	600	600	0	0
700	700	698	2	.17
800	800	801	1	.08
900	900	899	1	.07
1000	1000	1000	0	0
1100	1100	1098	2	.13
1200	1200	1200	0	0
1300	1300	1298	2	.11
1400	1400	1401	1	.05
1500	1500	1499	1	.05
1600	1600	1602	2	.09
1700	1700	1700	0	0
1800	1800	1802	2	.08
1900	1900	1899	1	.04
2000	2000	2000	0	0
2100	2100	2097	3	.11
		Averages:	1.04	.06

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. 22-5

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" .02

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) .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: 4-8-94

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. MM-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" .03
9. W <.0625" .025

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) .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: 4-8-94

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. 4M5-8

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" 0
9. W <.0625" .02

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) .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: 4-7-93

Inspected by: [signature]

CFR Title 40 Part 60 Appenidix A Method 2

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4-7-93 G:\STACK\WP\FORMS\S-348

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Stack Sampling Department - QA
Aneroid Barometer Calibration Sheet

Date 2-27-95
Technician Mark Kaehler
Mercury Column Barometer No. Lab 1
Aneroid Barometer No. 21029004

Actual Mercury Barometer Read	Ambient Temp.	Temperature Correction Factor	Adjusted Mercury Barometer Read	Initial Aneroid Barometer Read	Difference (P_{ba} - P_{bm})
29.400	73	.119	29.281	29.28	.001

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. 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 1-10-95

Technician Bob (Ron's barometer)

Mercury Column Barometer No. 1

Aneroid Barometer No. XXXXXX

Actual Mercury Barometer Read	Ambient Temp.	Temperature Correction Factor	Adjsted Mercury Barometer Read	Initial Aneriod Barometer Read	Difference (P_{ba}-P_{bm})
29.28	70	.107	29.173	29.17	.003

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

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

*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