Background Report Reference

AP-42 Section Number: 10.6.1

Background Report Section: 4

Reference Number: 61

Title: Letter and Attachment from Geisler G To R. Schultz, Results of the September 1 & 2, 1993 Performance Evaluation of the Pilot Scale Thermal Oxidizer At The Louisiana Pacific Plant in Hayward, Wisconsin November 23, 1993

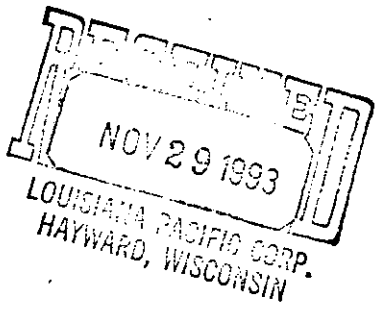
HUNTINGTON ENERGY SYSTEMS INC.

1501 E. Woodfield Rd. • Suite 200 West • Schaumburg, IL 60173
(708) 706-6950 • Fax (708) 706-6955

4-61

November 23, 1993

Louisiana Pacific Corporation
Route 8, Box 8263, Gehrts Road
Hayward, WI. 54843



Attn: Mr. Bob Schultz

Reference: Pilot Unit Test Results

Dear Bob:

Enclosed please find one complete copy of the RTO pilot unit test results from the performance tests conducted by Interpoll Labs on September 1 & 2, 1993.

I feel that these tests were conducted in a very professional and scientific manor an closely represent the performance we would expect to see from a full scale R.T.O. System.

Please review this report and call me if you have any questions or comments.

Feel free to use this data as you require, but please keep in mind that we do consider this data proprietary.

Yours truly,

Gary R. Geisler

cc: T. Schmidt - H.E.S.
R. Eaton - H.E.S.

GG-012

Run #55

Change
Q in 1525
to 1550 @ 945
to 1610 @ 10:15

RTO PILOT UNIT OPERATIONS

shutdown
SP. HAYWARD

DATE 9-1-93

READINGS EVERY 10 MINUTES SP 500 1900

TIME	BURNER % OUT	VFD % OUT	TEMP IN	TEMP OUT	TEMP CC	THERMAL EFF. %	PRESSURE DROP-RTO	PROPANE USED CU.FT.	CH1 LOWER BED TEMP.	CH2 LOWER BED TEMP	CH3 LOWER BED TEMP	P/V CONT. VARIABLE
820	0.3	60	196	322	1525	calc	10	855	607	654	678	2.2
844	9.8	70	191	319	1524		13	855	615	696	654	2.2
903	9.7	73	190	332	1517		12	856	621	643	641	2.1
925	10.3	80	192	322	1515		13.2	856	631	640	624	2.1
956	55	85	189	331	1553		13.0	857	645	636	614	
1016	100	80	193	329	1580		13.0	858	659	636	607	1.9
1032	17.2	80	194	334	1612			858	664	638	609	2.1
1052	5.5	82	192	328	1613		14.0	859	657	639	610	2.0
1112	16.7	81	196	333	1617		14.0	859	650	636	622	1.9
1132	0.6	83	195	331	1628		13.0	860	646	628	623	2.0
1157	11	82.6	198	329	1610		12.0	860	649	625	617	1.9
1210	0	80.6	194	327	1600		12.2	861	648	624	615	1.9
1225	3.4	79	195	334	1604		12.0	861	650	626	617	1.93
1235	5.6	81.3	194	332	1626		12.5	861	651	628	617	1.87
1245	13.2	74.2	193	324	1610		13.0	862	658	630	615	1.80
1255	0.6	71.9	194	325	1624		13.5	862	652	627	618	2.10
1305	0	72.6	196	328	1630		14.5	862	650	626	617	2.06
1315	0.8	77.8	196	333	1620		13.5	862	654	620	613	2.01
1325	0.3	72.9	195	327	1631		13.0	863	650	624	621	2.09
1335	4.8	77.7	192	330	1616		13.5	863	654	621	615	2.04
1345	8.0	79.0	194	331	1612		13.0	863	652	621	614	2.0
1355	0.3	71.2	194	328	1629		12.0	863	650	624	617	2.10
1405	3.0	80.6	198	329	1611		14.0	864	650	625	617	1.82
1415	1.3	79.3	196	330	1614		12.5	864	651	622	615	1.98
1425	0.8	82.5	195	336	1628		13.0	864	649	625	620	1.73
1440	0.8	75.3	196	330	1625		14.0	865	649	622	622	2.17
1458	0.6	70.0	193	329	1629		13.5	865	643	628	626	1.99
1510	17.2	78.0	187	330	1612		13.5	865	638	633	629	1.79
1520	5.1	75.8	126	329	1625		13.5	866	620	629	619	1.98
1530	0.8	77.8	188	323	1636		13.5	866	632	630	626	1.87
1540	0.0	73.0	190	325	1634		12.5	866	629	630	625	1.90
1555	0.0	82.3	186	329	1634		12.5	866	627	628	623	1.73
1600	0.8	75.0	184	324	1635		12.5	867	626	627	623	1.90
1610	16.6	75.5	147	324	1608		11.5	867	626	628	620	2.06
1620	0.3	73.3	185	318	1631		12.5	867	620	628	621	1.90
1630	0.0	64.0	186	320	1629		13.0	867	620	628	620	2.06

RWS#55

RTO PILOT UNIT OPERATIONS

HAYWARD DATE 9-1-93

READINGS EVERY 10 MINUTES

TIME	BURNER % OUT	VFD % OUT	TEMP IN	TEMP OUT	TEMP CC	THERMAL EFF. %	PRESSURE DROP-RTO	PROPANE USED CU.FT	CH1 LOWER BED TEMP	CH2 LOWER BED TEMP.	CH3 LOWER BED TEMP.	P/V CONT. VARIABLE
1640	0.7	77.2	187	331	1635		12.0	868	619	626	621	1.82
1650	0.0	76.0	186	321	1631		12.5	868	617	627	623	2.0
1700	7.0	69.0	185	323	1610		12.0		616	628	622	0.8
1714	0.0	70.0	185	317	1624		12.0	869	617	626	619	1.8
1732	5.8	70.9	186	328	1622			869	616	624	613	1.94
1741	5.8	78.3	186	329	1624		12.0	869	613	628	618	1.90

RWS & SS

temps to 1500

RTO PILOT UNIT OPERATIONS

HAYWARD DATE 9-1-93

READINGS EVERY 10 MINUTES

TIME	BURNER % OUT	VFD % OUT	TEMP IN	TEMP OUT	TEMP CC	THERMAL EFF. %	PRESSURE DROP-RTO	PROPANE USED CU.FT	CH1 LOWER BED TEMP.	CH2 LOWER BED TEMP	CH3 LOWER BED TEMP	P/V CONT. VARIABLE
1750	0.6	86.1	186	1636	324		11.0	869	616	624	613	1.72
1800	1.0	71.0	188	1630	324		13.0	870	615	625	618	1.94
1810	0.0	83.4	187	1635	326		13.0	870	615	623	615	1.70
1824	0.8	76.3	188	1635	337		14.0	870	614	629	616	1.93
1835	4.6	77.7	190	1628	336		13.5	871	610	627	617	1.90
1850	0.0	83.4	191	1525	339		13.0	871	612	626	615	1.86
1905	3.7	80.0	193	1522	343		12.5	871	613	630	617	1.84
1915	15.3	71.1	194	1506	335		13.5	871	609	634	625	1.83
1933	99.7	79.3	197	1436	349		12.5	872	606	629	613	1.59
1946	2.8	79.5	197	1518	346		11.0	872	612	638	621	1.92
1956	24.6	81.1	195	1503	351		12.5	872	609	637	617	1.71

RWS #55

RTO PILOT UNIT OPERATIONS

HAYWARD DATE 9-2-93

READINGS EVERY 10 MINUTES

TIME	BURNER % OUT	VFD % OUT	TEMP IN	TEMP OUT	TEMP CC	THERMAL EFF. %	PRESSURE DROP-RTO	PROPANE USED CU FT	CH1 LOWER BED TEMP.	CH2 LOWER BED TEMP	CH3 LOWER BED TEMP	P/V CONT. VARIABLE
0800	0.5	83.3	197	333	1624		13.0	890	599	626	600	1.76
0810	28.1	80.2	191	341	1607		13.0	890	608	621	600	1.79
0820	21.0	79.5	192	339	1610		12.5	890	600	621	600	1.92
0830	0.3	84.2	194	330	1630		15.0	891	596	626	608	1.73
0840	0.9	79.9	190	341	1630		12.0	891	596	619	604	1.81
0850	0.8	87.1	187	329	1633		12.0	891	595	623	608	1.69
0900	24.6	81.3	190	340	1609		11.0	891	598	620	600	1.80
0910	12.4	80.0	196	329	1615		11.0	892	599	621	600	1.70
0920	0.3	78.0	196	331	1625		10.0	892	596	627	607	1.90
0930	23.6	74.1	195	338	1606		12.0	892	598	625	601	1.94
0940	1.0	85.4	198	335	1635		14.0	893	600	629	615	1.80
0950	—	—					12	893				
1000	3.7	76.8	195	345	1623		12	892	602	630	611	1.89
1010	0.6	75.7	195	336	1622		12.5	893	600	633	611	1.87
1030	17.9	82.3	195	345	1610		12.0	894	607	630	609	1.71
1040	5.3	90.0	196	343	1621		12.0	894	605	630	609	1.77
1050	17.9	86.3	196	347	1610		12.0	894	605	635	609	1.74
1100	6.0	90.0	197	343	1620		12.5	895	605	634	609	1.71
1110	0.0	82.2	197	345	1631		10.5	895	605	636	615	1.60
1120	5.1	81.5	194	342	1624		11.0	895	608	634	608	1.84
1130	0.0	84.1	195	340	1629		10.0	895	605	636	615	1.55
1140	0.3	81.3	195	345	1625		12.0	896	605	634	612	1.60
1150	1.0	84.5	196	340	1631		10.0	896	605	637	616	1.65
1200	15.2	80.0	197	340	1606		13.0	896	607	638	610	1.79
1210	0.3	84.5	196	346	1626		10.0	896	608	637	617	1.61
1220	4.6	87.1	196	345	1624		14.0	897	610	638	609	1.70
1230	0.3	79.0	196	337	1624		12.0	897	609	641	614	1.90
1240	0.5	90.0	197	338	1628		13.0	897	608	642	613	1.80
1250	0.0	89.7	198	347	1629		12.5	897	609	641	618	1.72
1300	10.5	77.7	198	349	1612		11.0	898	613	639	611	1.84
1310	0.1	81.0	200	347	1627		11.5	898	611	643	621	1.80
1320	1.0	84.1	201	339	1627		12.5	898	613	646	621	1.75
1330	0.6	77.0	199	338	1630		13.0	898	613	646	622	1.80
1340	0.6	84.9	201	341	1616		12.0	899	615	649	623	1.75
1350	21.7	83.0	201	351	1607		12.0	899	619	645	619	1.87
1400	0.8	80.0	201	341	1607		13.0	899	617	650	626	1.99

RTO PILOT UNIT OPERATIONS

HAYWARD DATE 9-2-93

READINGS EVERY 10 MINUTES

TIME	BURNER % OUT	VFD % OUT	TEMP IN	TEMP OUT	TEMP CC	THERMAL EFF. %	PRESSURE DROP-RTO	PROPANE USED CU.FT	CH1 LOWER BED TEMP.	CH2 LOWER BED TEMP.	CH3 LOWER BED TEMP.	P/V CONT. VARIABLE
1410	0.0	74.5	201	340	1633		14.0	900	616	650	626	1.96
1420	0.6	80.0	200	336	1631		12.5	900	613	650	638	1.93
1430	4.1	82.5	201	345	1623		11.0	900	607	638	650	1.80

Interpoll Laboratories, Inc.
4500 Ball Road N.E.
Circle Pines, Minnesota 55014-1819

TEL: (612) 786-6020
FAX: (612) 786-7854

RESULTS OF THE SEPTEMBER 1 & 2, 1993 PERFORMANCE EVALUATION OF THE PILOT SCALE THERMAL OXIDIZER AT THE LOUISIANA PACIFIC PLANT IN HAYWARD, WISCONSIN

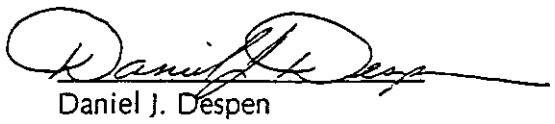
Submitted to:

ARI TECHNOLOGIES
600 North First Bank Drive
Palatine, Illinois 60067

Attention:

Tom Schmidt

Approved by:



Daniel J. Despen
Manager
Stationary Source Testing Department

Report Number 3-9924
October 20, 1993
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 contitions are defined as 68°F (20°C) and 29.92 IN. of mercury pressure.

g:\stack\wp\misc\abbrev.frm

1 INTRODUCTION

On September 1 & 2, 1993 Interpoll Laboratories personnel conducted air emission performance tests on the thermal oxidizer at the Louisiana Pacific Plant located in Hayward, Wisconsin. On-site testing was performed by Ron Rosenthal, Duke Brennan, Steve Lonnes, Gary Hove, and Steve Ertle. Coordination between testing activities and plant operation was provided by Sue Somers of Louisiana Pacific.

Particulate evaluations were performed in accordance with EPA Methods 2-5, CFR Title 40, Part 60, Appendix A (revised July 1, 1992). A preliminary determination of the gas linear velocity profile was made at each test location before the first particulate determination to allow selection of the appropriate nozzle diameter for isokinetic sample withdrawal. An Interpoll Labs sampling train which meets or exceeds specifications in the above-cited reference was used to isokinetically extract particulate samples by means of a heated glass-lined probe. Wet catch samples were collected in the back half of the Method 5 sampling train and analyzed as per Wisconsin DNR Protocol.

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

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

Oxides of nitrogen concentrations at the RTO Stack were determined in accordance with Methods 7E (Ibid). A slip stream of sample gas was withdrawn from the exhaust gas stream using a heated stainless steel probe equipped with a filter to remove interfering particulate material. The particulate-free gas was transported to the analyzers by means of

a heat-traced probe and filter assembly. After passing through the filter, the gas passed through a chilled condenser-type moisture removal system. The particulate-free dry gas was then transported to the analyzers with the excess exhausted to the atmosphere through a calibrated orifice which was used to ensure that the flow from the stack exceeds the requirements of the analyzers. A three-way valve on the probe was used to introduce standard gas for the "system bias check".

The analog response of each analyzer was recorded with a strip chart recorder. The NO_x analyzer was calibrated with National Specialty Gases (EPA Protocol 1) and Certified Master standard gases. The instrument was calibrated before and after each run as per EPA 7E. The sample probe was moved through a three-point traverse (1/6, 3/6, 5/6 of the stack diameter) to measure oxides of nitrogen concentrations.

Formaldehyde samples were collected using EPA Method 0011 (SW 846 3rd Ed.). The samples were collected isokinetically using a Method 5 sampling train with an aqueous acidic 2,4-dinitrophenylhydrazine absorbing solution and analyzed by high performance liquid chromatography.

The total hydrocarbon (THC) concentrations were measured in accordance with EPA Method 25A (Ibid). A Ratfisch Model RS55 Heated Total Hydrocarbon Analyzer (Heated Flame Ionization Detector) was used to measure THC concentrations in the exhaust gas stream. The hydrocarbon analyzer was calibrated with zero gas and low, mid and high level calibration gases (propane in nitrogen) prior to and after each testing period. A strip chart recorder was used to record the analyzer response.

Integrated flue gas samples were extracted with the particulate and formaldehyde samples using a specially designed gas sampling system. Integrated flue gas samples were collected in 44-liter Tedlar bags housed in a protective aluminum container. After sampling was complete, the bags were sealed and returned to the laboratory for Orsat analysis. Prior to sampling, the Tedlar bags are leak checked at 15 IN.HG. vacuum with an in-line rotameter. Bags with any detectable inleakage are discarded. The integrated flue gas samples were also analyzed for carbon monoxide in accordance with EPA Method 10 (NDIR).

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 important results of the results are presented in Tables 1 - 4. The particulate removal effiency averaged 70%. The formaldehyde removal efficiency averaged 65%. The total hydrocarbon removal efficiency averaged 99%. The oxides of nitrogen results are summarized in Table 6.

No difficulties were encountered in the field by Interpoll Labs or in the laboratory evaluation of the samples which were conducted by Interpoll Labs. On the basis of these facts and a complete review of the 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 August 31, 1993 Particulate Emission Test on the RTO Inlet at the Louisiana Pacific Plant Located in Hayward, Wisconsin.

ITEM		Run 1
Date of test		09-01-93
Time runs were done	(HRS)	920/1023
Volumetric flow		
actual	(ACFM)	1363
standard	(DSCFM)	853
Gas temperature	(DEG-F)	196
Moisture content	(%V/V)	19.36
Gas composition	(%V/V,dry)	
carbon dioxide		3.20
oxygen		17.70
nitrogen		79.10
Isokinetic variation	(%)	94.6
Particulate concentration		
actual	(GR/ACF)	0.441
standard	(GR/DSCF)	0.704
Part. emission rate	(LB/HR)	5.15

Note: Dry + Organic/Inorganic Wet Catch

Table 1b. Summary of the Results of the September 1, 1993 Particulate Emission Test on the Line 1 Dryer EFB Stack at the Louisiana Pacific Plant in Hayward, Wisconsin.

ITEM		Run 1
Date of test		09-01-93
Time runs were done	(HRS)	920/1025
Volumetric flow		
actual	(ACFM)	104199
standard	(DSCFM)	60220
Gas temperature	(DEG-F)	238
Moisture content	(%V/V)	20.77
Gas composition	(%V/V,dry)	
carbon dioxide		3.20
oxygen		17.70
nitrogen		79.10
Isokinetic variation	(%)	95.6
Particulate concentration		
actual	(GR/ACF)	.0616
standard	(GR/DSCF)	0.107
Part. emission rate	(LB/HR)	55.01

Note: Dry + Organic/Inorganic Wet Catch

Table 2a Summary of the Results of the September 1, 1993 Particulate Removal Efficiency Test on the RTO at the Louisiana Pacific Plant in Hayward, Wisconsin.

ITEM	RUN 1		RUN 2		RUN 3	
	Inlet	Stack	Inlet	Stack	Inlet	Stack
Date of test	09-01-93	09-01-93	09-01-93	09-01-93	09-01-93	09-01-93
Time runs were done (HRS)	1300/1404	1230/1405	1440/1545	1440/1543	1640/1743	1640/1743
Volumetric flow actual (ACFM)	1358	2314	1319	2340	1354	2355
standard (DSCFM)	820	1230	769	1216	791	1227
Gas temperature (DEG-F)	201	318	201	316	198	313
Moisture content (%V/V)	21.63	18.81	24.27	20.82	24.53	20.97
Gas composition (%V/V,dry)						
carbon dioxide	3.10	3.50	3.70	3.90	3.70	3.70
oxygen	17.70	17.00	17.10	16.50	17.10	16.70
carbon monoxide	0.00	0.00	0.00	0.00	0.00	0.00
nitrogen	79.20	79.50	79.20	79.60	79.20	79.60
Isokinetic variation (%)	101.8	100.8	103.8	103.1	103.2	102.2
Particulate concentration actual (GR/ACF)	0.1708	0.0256	0.0828	0.01491	0.0563	0.01100
standard (GR/DSCF)	0.2831	0.0482	0.1420	0.02871	0.0964	0.02113
Part. emission rate (LB/HR)	1.989	0.508	0.936	0.299	0.654	0.222
Part. removal efficiency (%)		74.47		68.04		66.02

Note: Dry + Organic/Inorganic Wet Catch

Table 2b. Summary of the Results of the September 1, 1993 Particulate Removal Efficiency Test on the RTO Inlet at the Louisiana Pacific Plant in Hayward, Wisconsin.

ITEM	RUN 1		RUN 2		RUN 3	
	Inlet	Stack	Inlet	Stack	Inlet	Stack
Date of test	09-01-93	09-01-93	09-01-93	09-01-93	09-01-93	09-01-93
Time runs were done (HRS)	1300/1404	1230/1405	1440/1545	1440/1543	1640/1743	1640/1743
Volumetric flow						
actual (ACFM)	1358	2314	1319	2340	1354	2355
standard (DSCFM)	820	1230	769	1216	791	1227
Gas temperature (DEG-F)	201	318	201	316	198	313
Moisture content (%V/V)	21.63	18.81	24.27	20.82	24.53	20.97
Gas composition (%V/V,dry)						
carbon dioxide	3.10	3.50	3.70	3.90	3.70	3.70
oxygen	17.70	17.00	17.10	16.50	17.10	16.70
carbon monoxide	0.00	0.00	0.00	0.00	0.00	0.00
nitrogen	79.20	79.50	79.20	79.60	79.20	79.60
Isokinetic variation (%)	101.8	100.8	103.8	103.1	103.2	102.2
Particulate concentration						
actual (GR/ACF)	0.1475	0.0219	0.0578	0.01236	0.0363	0.00871
standard (GR/DSCF)	0.2444	0.0413	0.0992	0.02379	0.0622	0.01673
Part. emission rate (LB/HR)	1.718	0.436	0.654	0.248	0.422	0.176
Part. removal efficiency (%)		74.64		62.08		58.30

931 286 .135 .0273 65%

Note: Dry Catch Only

Table 3. Summary of the Results of the September 1, 1993 **Carbon Monoxide Determinations** on the RTO at Louisiana Pacific Plant in Hayward, Wisconsin.

Time	Concentration (ppm,d)	Emission Rate (LB/HR)
(INLET)		
1300-1404	225	0.805
1440-1545	443	1.49
1640-1743	398	1.37
Average	355	1.22
(STACK)		
99.555% 1230-1405	1	0.005
99.097% 1440-1543	4	0.021
98.995% 1640-1743	4	0.016
AVG 99.2% Average	3	0.014

Table 4. Summary of the Results of the **Formaldehyde Removal Efficiency** Performance Test on the **RTO** at the Louisiana Pacific Plant in Hayward, Wisconsin.

Test/Run	Date	TIME (HRS)	CONCENTRATION (PPM,D) (Inlet)	(Stack)	EMISSION RATE (LB/HR) (Inlet)	(Stack)	REMOVAL EFFIC (%)
3/1	09-02-93	1000-1105	4.0	1.39	0.0161	0.00803	50
3/2	09-02-93	1145-1250	4.0	0.80	0.0163	0.00455	72
3/3	09-02-93	1320-1425	5.2	0.97	0.0219	0.00568	74
Avg			4.4	1.05	0.0181	0.00609	65

Table 5. Summary of the Results of the **Total Hydrocarbon Removal Efficiency** Performance Test on the **RTO** at the Louisiana Pacific Plant in Hayward, Wisconsin.

Test/Run	Date	TIME (HRS)	EMISSION RATE (LB/HR) (Inlet)	(Stack)	REMOVAL EFFICIENCY (%)
4/1	09-01-93	1315-1415	0.666	0.00567	99
4/2	09-01-93	1450-1550	0.596	0.00577	99
4/3	09-01-93	1640-1750	0.839	0.00582	99
4/4	09-01-93	1835-1935	0.608	0.00582	99
Avg			0.677	0.00577	99

Table 6. Summary of the Results of the September 1, 1993 **Oxides of Nitrogen Determinations** on the RTO at Louisiana Pacific Plant in Hayward, Wisconsin.

Time	Concentration (ppm,d)	Emission Rate (LB/HR)
(INLET)		
1230-1405	14	0.08
1440-1543	12	0.07
1640-1743	10	0.06
Average	12	0.07
(STACK)		
1315-1415	26	0.224
1450-1550	27	0.232
1640-1740	25	0.215
Average	26	0.224

+86 %
+125 %
+150 %
120 %

3 RESULTS

The results of all field and laboratory evaluations are presented in this section. Gas moisture results are presented first followed by the computer printout of the particulate, carbon monoxide and formaldehyde determinations. 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 emission rates have been calculated using the product of the concentration times flow method.

3.1 Results of Orsat and Moisture Determinations

Test No. 1
RTO Inlet

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

	Run 1
Date of run	09-01-93
Dry basis (orsat)	
carbon dioxide.....	3.20
oxygen.....	17.70
carbon monoxide.....	0.00
nitrogen.....	79.10
Wet basis (orsat)	
carbon dioxide.....	2.58
oxygen.....	14.27
carbon monoxide.....	0.00
nitrogen.....	63.79
water vapor.....	19.36
Dry molecular weight.....	29.22
Wet molecular weight.....	27.05
Specific gravity.....	0.934
Water mass flow.....(LB/HR)	574

FO 1.000

Test No. 1
Line 1 Dryer EFB Stack

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

	Run 1
Date of run	09-01-93
Dry basis (orsat)	
carbon dioxide.....	3.20
oxygen.....	17.70
carbon monoxide.....	0.00
nitrogen.....	79.10
Wet basis (orsat)	
carbon dioxide.....	2.54
oxygen.....	14.02
carbon monoxide.....	0.00
nitrogen.....	62.67
water vapor.....	20.77
Dry molecular weight.....	29.22
Wet molecular weight.....	26.89
Specific gravity.....	0.929
Water mass flow.....(LB/HR)	44291

FO 1.000

Test No. 2
RTO Inlet

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

	Run 1	Run 2	Run 3
Date of run	09-01-93	09-01-93	09-01-93
Dry basis (orsat)			
carbon dioxide.....	3.10	3.70	3.70
oxygen.....	17.70	17.10	17.10
nitrogen.....	79.20	79.20	79.20
Wet basis (orsat)			
carbon dioxide.....	2.43	2.80	2.79
oxygen.....	13.87	12.95	12.90
nitrogen.....	62.07	59.98	59.77
water vapor.....	21.63	24.27	24.53
Dry molecular weight.....	29.20	29.28	29.28
Wet molecular weight.....	26.78	26.54	26.51
Specific gravity.....	0.925	0.917	0.916
Water mass flow.....(LB/HR)	635	692	721
FO	1.032	1.027	1.027

Test No. 2
RTO Outlet

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

	Run 1	Run 2	Run 3
Date of run	09-01-93	09-01-93	09-01-93
Dry basis (orsat)			
carbon dioxide.....	3.50	3.90	3.70
oxygen.....	17.00	16.50	16.70
nitrogen.....	79.50	79.60	79.60
Wet basis (orsat)			
carbon dioxide.....	2.84	3.09	2.92
oxygen.....	13.80	13.06	13.20
nitrogen.....	64.55	63.03	62.91
water vapor.....	18.81	20.82	20.97
Dry molecular weight.....	29.24	29.28	29.26
Wet molecular weight.....	27.13	26.93	26.90
Specific gravity.....	0.937	0.930	0.929
Water mass flow.....(LB/HR)	799	897	913
FO	1.114	1.128	1.135

Test No. 3
RTO Inlet

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

	Run 1	Run 2	Run 3
Date of run	09-02-93	09-02-93	09-02-93
Dry basis (orsat)			
carbon dioxide.....	4.20	4.10	3.90
oxygen.....	16.60	16.60	17.00
nitrogen.....	79.20	79.30	79.10
Wet basis (orsat)			
carbon dioxide.....	3.06	2.98	2.90
oxygen.....	12.09	12.08	12.66
nitrogen.....	57.69	57.70	58.89
water vapor.....	27.16	27.23	25.55
Dry molecular weight.....	29.34	29.32	29.30
Wet molecular weight.....	26.26	26.24	26.42
Specific gravity.....	0.907	0.906	0.912
Water mass flow.....(LB/HR)	0.00	0.00	0.00
FO	1.024	1.049	1.000

Test No. 3
RTO Outlet

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

	Run 1	Run 2	Run 3
Date of run	09-02-93	09-02-93	09-02-93
Dry basis (orsat)			
carbon dioxide.....	4.20	4.20	3.80
oxygen.....	16.10	16.20	16.60
nitrogen.....	79.70	79.60	79.60
Wet basis (orsat)			
carbon dioxide.....	3.28	3.24	2.99
oxygen.....	12.57	12.49	13.07
nitrogen.....	62.24	61.35	62.68
water vapor.....	21.91	22.93	21.25
Dry molecular weight.....	29.32	29.32	29.27
Wet molecular weight.....	26.84	26.72	26.88
Specific gravity.....	0.927	0.923	0.928
Water mass flow.....(LB/HR)	0.00	0.00	0.00
FO	1.143	1.119	1.132

3.2 Results of Particulate Determinations

Test No. 1
RTO Inlet

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

	Run 1
Date of run	09-01-93
Time run start/end.....(HRS)	920/1023
Static pressure.....(IN.WC)	-0.12
Cross sectional area (SQ.FT)	0.92
Pitot tube coefficient.....	.840
Water in sample gas	
condenser.....(ML)	0.0
impingers.....(GRAMS)	219.0
desiccant.....(GRAMS)	32.0
total.....(GRAMS)	251.0
Total particulate material..	
.....collected(grams)	2.2503
Gas meter coefficient.....	0.9972
Barometric pressure..(IN.HG)	28.86
Avg. orif.pres.drop..(IN.WC)	2.47
Avg. gas meter temp..(DEF-F)	74.5
Volume through gas meter....	
at meter conditions...(CF)	51.59
standard conditions.(DSCF)	49.30
Total sampling time....(MIN)	60.00
Nozzle diameter.....(IN)	.415
Avg.stack gas temp ..(DEG-F)	196
Volumetric flow rate.....	
actual.....(ACFM)	1363
dry standard.....(DSCFM)	853
Isokinetic variation.....(%)	94.6
Particulate concentration...	
actual.....(GR/ACF)	0.44071
dry standard.....(GR/DSCF)	0.70424
Particle mass rate...(LB/HR)	5.15

Test No. 1
Line 1 Dryer EFB Stack

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

	Run 1
Date of run	09-01-93
Time run start/end.....(HRS)	920/1025
Static pressure.....(IN.WC)	-0.12
Cross sectional area (SQ.FT)	27.49
Pitot tube coefficient.....	.840
Water in sample gas	
condenser.....(ML)	0.0
impingers.....(GRAMS)	218.0
desiccant.....(GRAMS)	18.0
total.....(GRAMS)	236.0
Total particulate material..	
.....collected(grams)	0.2931
Gas meter coefficient.....	1.0011
Barometric pressure..(IN.HG)	28.86
Avg. orif.pres.drop..(IN.WC)	1.73
Avg. gas meter temp..(DEF-F)	71.7
Volume through gas meter....	
at meter conditions...(CF)	44.08
standard conditions.(DSCF)	42.44
Total sampling time....(MIN)	60.00
Nozzle diameter.....(IN)	.249
Avg.stack gas temp ..(DEG-F)	238
Volumetric flow rate.....	
actual.....(ACFM)	104199
dry standard.....(DSCFM)	60220
Isokinetic variation.....(%)	95.6
Particulate concentration...	
actual.....(GR/ACF)	0.06156
dry standard.....(GR/DSCF)	0.10657
Particle mass rate...(LB/HR)	55.01

Test No. 2
RTO Inlet

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

	Run 1	Run 2	Run 3
Date of run	09-01-93	09-01-93	09-01-93
Time run start/end.....(HRS)	1300/1404	1440/1545	1640/1743
Static pressure.....(IN.WC)	-0.15	-0.15	-0.15
Cross sectional area (SQ.FT)	0.92	0.92	0.92
Pitot tube coefficient.....	.840	.840	.840
Water in sample gas			
condenser.....(ML)	0.0	0.0	0.0
impingers.....(GRAMS)	201.0	229.0	235.0
desiccant.....(GRAMS)	15.0	11.0	14.0
total.....(GRAMS)	216.0	240.0	249.0
Total particulate material..			
.....collected(grams)	0.7191	0.3708	0.2667
Gas meter coefficient.....	0.9972	0.9972	0.9972
Barometric pressure..(IN.HG)	28.86	28.86	28.86
Avg. orif.pres.drop..(IN.WC)	1.40	1.26	1.35
Avg. gas meter temp..(DEF-F)	86.9	87.2	89.8
Volume through gas meter....			
at meter conditions...(CF)	39.61	37.94	38.98
standard conditions.(DSCF)	36.90	35.31	36.11
Total sampling time....(MIN)	60.00	60.00	60.00
Nozzle diameter.....(IN)	.353	.353	.353
Avg.stack gas temp ..(DEG-F)	201	201	198
Volumetric flow rate.....			
actual.....(ACFM)	1358	1319	1354
dry standard.....(DSCFM)	820	769	791
Isokinetic variation.....(%)	101.8	103.8	103.2
Particulate concentration...			
actual.....(GR/ACF)	0.18139	0.09451	0.06655
dry standard.....(GR/DSCF)	0.30067	0.16203	0.11395
Particle mass rate...(LB/HR)	2.113	1.069	0.773

Test No. 2
RTO Outlet

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

	Run 1	Run 2	Run 3
Date of run	09-01-93	09-01-93	09-01-93
Time run start/end.....(HRS)	1230/1405	1440/1543	1640/1743
Static pressure.....(IN.WC)	-0.08	-0.08	-0.08
Cross sectional area (SQ.FT)	2.02	2.02	2.02
Pitot tube coefficient.....	.840	.840	.840
Water in sample gas			
condenser.....(ML)	0.0	0.0	0.0
impingers.....(GRAMS)	177.0	204.0	204.0
desiccant.....(GRAMS)	12.0	13.0	15.0
total.....(GRAMS)	189.0	217.0	219.0
Total particulate material..			
.....collected(grams)	0.1201	0.0724	0.0533
Gas meter coefficient.....	1.0011	1.0011	1.0011
Barometric pressure..(IN.HG)	28.86	28.86	28.86
Avg. orif.pres.drop..(IN.WC)	1.44	1.48	1.48
Avg. gas meter temp..(DEF-F)	80.7	84.3	83.8
Volume through gas meter....			
at meter conditions...(CF)	40.66	41.40	41.37
standard conditions.(DSCF)	38.47	38.91	38.92
Total sampling time....(MIN)	60.00	60.00	60.00
Nozzle diameter.....(IN)	.438	.438	.438
Avg.stack gas temp ..(DEG-F)	318	316	313
Volumetric flow rate.....			
actual.....(ACFM)	2314	2340	2355
dry standard.....(DSCFM)	1230	1216	1227
Isokinetic variation.....(%)	100.8	103.1	102.2
Particulate concentration...			
actual.....(GR/ACF)	0.02559	0.01491	0.01100
dry standard.....(GR/DSCF)	0.04818	0.02871	0.02113
Particle mass rate...(LB/HR)	0.508	0.299	0.222

3.3 Results of Oxides of Nitrogen Determinations

Test No. 3
RTO Inlet

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

	Run 1A	Run 1B	Run 1C	Run 1D
Date of run.....	09-01-93	09-01-93	09-01-93	09-01-93
Time of run.....(HRS)	1230	1245	1330	1410
Flask number.....	8	9	10	11
Volume of flask.....(ML)	2088	2080	2063	2062
Data: time of sampling				
flask temperature..(DEG-F)	77.00	78.00	79.00	79.00
bar. press.....(IN.HG)	28.86	28.86	28.86	28.86
flask vacuum.....(IN.HG)	27.50	27.60	27.70	27.60
flask abs. press...(IN.HG)	1.36	1.26	1.16	1.26
Data: Time of Flask Opening				
flask temperature..(DEG-F)	76.00	76.00	76.00	76.00
lab. bar. press....(IN.HG)	29.23	29.23	29.23	29.23
flask static press.(IN.HG)	-2.20	-0.80	-1.80	-1.80
flask abs. press...(IN.HG)	27.03	28.43	27.43	27.43
Volume gas sampled....(DSML)	1743	1838	1762	1755
Moisture content.....(%V/V)	21.63	21.63	21.63	21.63
Nitrate in gas sample...(JG)	72.5	63.0	62.0	60.5
NO2 in gas sample.....(JG)	53.8	46.7	46.0	44.9
NOx Concentration				
(GR/DSCF).....	0.0135	0.0111	0.0114	0.0112
(MG/DSCM).....	31	25	26	26
(PPM-DRY).....	16	13	14	13
(PPM-WET).....	13	10	11	10
NOX Emission rate....(LB/HR)	0.09	0.08	0.08	0.08

Avg 14 ppmd

11 ppmw

Test No. 3
RTO Inlet

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

	Run 2A	Run 2B	Run 2C	Run 2D
Date of run.....	09-01-93	09-01-93	09-01-93	09-01-93
Time of run.....(HRS)	1440	1450	1512	1554
Flask number.....	12	26	13	15
Volume of flask.....(ML)	2111	2035	2060	2045
Data: time of sampling				
flask temperature..(DEG-F)	82.00	83.00	82.00	82.00
bar. press.....(IN.HG)	28.86	28.86	28.86	28.86
flask vacuum.....(IN.HG)	27.70	27.60	27.60	27.50
flask abs. press...(IN.HG)	1.16	1.26	1.26	1.36
Data: Time of Flask Opening				
flask temperature..(DEG-F)	76.00	76.00	76.00	76.00
lab. bar. press....(IN.HG)	29.23	29.23	29.23	29.23
flask static press.(IN.HG)	-0.70	-1.40	0.00	-3.00
flask abs. press...(IN.HG)	28.53	27.83	29.23	26.23
Volume gas sampled....(DSML)	1880	1759	1874	1654
Moisture content.....(%V/V)	24.27	24.27	24.27	24.27
Nitrate in gas sample...(JG)	60.5	49.0	70.0	47.5
NO2 in gas sample.....(JG)	44.9	36.4	51.9	35.2
<u>NOx Concentration</u>				
(GR/DSCF).....	0.0104	0.0090	0.0121	0.0093
(MG/DSCM).....	24	21	28	21
(PPM-DRY).....	12	11	14	11
(PPM-WET).....	9	8	11	8
NOX Emission rate....(LB/HR)	0.07	0.06	0.08	0.06

Avg 12 d
9 ppm w

Test No. 3
RTO Inlet

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

	Run 3A	Run 3B	Run 3C	Run 3D
Date of run.....	09-01-93	09-01-93	09-01-93	09-01-93
Time of run.....(HRS)	1640	1650	1715	1740
Flask number.....	16	74	75	81
Volume of flask.....(ML)	2067	2071	2066	2093
Data: time of sampling				
flask temperature..(DEG-F)	81.00	80.00	77.00	75.00
bar. press.....(IN.HG)	28.86	28.86	28.86	28.86
flask vacuum.....(IN.HG)	27.50	27.60	27.60	27.50
flask abs. press...(IN.HG)	1.36	1.26	1.26	1.36
Data: Time of Flask Opening				
flask temperature..(DEG-F)	76.00	76.00	76.00	76.00
lab. bar. press....(IN.HG)	29.23	29.23	29.23	29.23
flask static press.(IN.HG)	-0.80	-3.50	-1.40	-3.30
flask abs. press...(IN.HG)	28.43	25.73	27.83	25.93
Volume gas sampled....(DSML)	1820	1648	1785	1672
Moisture content.....(%V/V)	24.53	24.53	24.53	24.53
Nitrate in gas sample...(JG)	38.5	49.0	50.0	43.0
NO2 in gas sample.....(JG)	28.6	36.4	37.1	31.9
NOx Concentration				
(GR/DSCF).....	0.0069	0.0096	0.0091	0.0083
(MG/DSCM).....	16	22	21	19
(PPM-DRY).....	8	12	11	10
(PPM-WET).....	6	9	8	8
NOX Emission rate....(LB/HR)	0.05	0.07	0.06	0.06

avg 10 ppm-d
7.8 ppm w

3.4 Results of Carbon Monoxide Determinations

Test No. 2
RTO Inlet

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

	Run 1	Run 2	Run 3
Date of run	09-01-93	09-01-93	09-01-93
Time run start/end.....(HRS)	1300-1404	1440-1545	1640-1743
Total sampling time....(MIN)	60.0	60.0	60.0
Moisture content.....(%V/V)	21.63	24.27	24.53
O2 Concentration.....(%V/V)	17.70	17.10	17.10
Volumetric flow rate (DSCFM)	820	769	791
CO concentration.....			
(GR/DSCF).....	0.1145	0.2254	0.2025
(MG/DSCM).....	262.13	516.09	463.67
(PPM-WET).....	176.33	335.48	300.37
(PPM-DRY).....	225.00	443.00	398.00
(PPM-DRY @ 7% O2).....	954.55	1590.	1428.
CO emission rate.....(LB/HR)	0.805	1.486	1.373

CO = Carbon monoxide

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

Test No. 2
RTO Stack

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

	Run 1	Run 2	Run 3
Date of run	09-01-93	09-01-93	09-01-93
Time run start/end.....(HRS)	1230-1405	1440-1543	1640-1743
Total sampling time....(MIN)	60.0	60.0	60.0
Moisture content.....(%V/V)	18.81	20.82	20.97
O2 Concentration.....(%V/V)	17.00	16.50	16.70
Volumetric flow rate (DSCFM)	1230	1216	1227
CO concentration.....			
(GR/DSCF).....	0.0005	0.0020	0.0015
(MG/DSCM).....	1.17	4.66	3.50
(PPM-WET).....	0.81	3.17	2.37
(PPM-DRY).....	1.00	4.00	3.00
(PPM-DRY @ 7% O2).....	3.50	12.44	9.77
CO emission rate.....(LB/HR)	0.005	0.021	0.016

CO = Carbon monoxide

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

Test No. 3
RTO Outlet

Results of Formaldehyde Tests ---------- EPA Method 0011

	Run 1	Run 2	Run 3
Date of run	09-02-93	09-02-93	09-02-93
Time run start/end.....(HRS)	1000/1106	1145/1249	1320/1425
Static pressure.....(IN.WC)	-0.08	-0.08	-0.08
Cross sectional area (SQ.FT)	2.02	2.02	2.02
Pitot tube coefficient.....	.840	.840	.840
Water in sample gas			
condenser.....(ML)	0.0	0.0	0.0
impingers.....(GRAMS)	290.0	287.0	270.0
desiccant.....(GRAMS)	14.0	29.0	17.0
total.....(GRAMS)	304.0	316.0	287.0
Formaldehyde in sample..(uG)	2500	1400	1700
Gas meter coefficient.....	1.0011	1.0011	1.0011
Barometric pressure..(IN.HG)	28.56	28.56	28.56
Avg. orif.pres.drop..(IN.WC)	2.52	2.42	2.49
Avg. gas meter temp..(DEF-F)	74.4	76.9	86.6
Volume through gas meter....			
at meter conditions...(CF)	53.78	52.99	53.99
standard conditions.(DSCF)	51.09	50.09	50.14
Total sampling time....(MIN)	60.00	60.00	60.00
Nozzle diameter.....(IN)	.498	.498	.498
Avg.stack gas temp ..(DEG-F)	331	331	333
Volumetric flow rate.....			
actual.....(ACFM)	2477	2496	2515
dry standard.....(DSCFM)	1233	1225	1258
Isokinetic variation.....(%)	103.2	101.9	99.3
CH2O concentration.....			
(GR/DSCF).....	0.0008	0.0004	0.0005
(MG/DSCM).....	1.74	0.99	1.21
(PPM-DRY).....	1.39	0.80	0.97
(PPM-WET).....	1.09	0.61	0.76
CH2O emission rate...(LB/HR)	0.00803	0.00455	0.00568

CH2O = Formaldehyde

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

APPENDIX A

RESULTS OF VOLUMETRIC FLOW RATE DETERMINATIONS

Test No. 2
RTO Outlet

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

Date of Determination.....	09-01-93
Time of Determination.....(HRS)	1150
Barometric pressure.....(IN.HG)	28.86
Pitot tube coefficient.....	.84
Number of sampling ports.....	2
Total number of points.....	20
Shape of duct.....	Round
Stack diameter.....(IN)	19.25
Duct area.....(SQ.FT)	2.02
Direction of flow.....	UP
Static pressure.....(IN.WC)	-.08
Avg. gas temp.....(DEG-F)	320
Moisture content.....(% V/V)	18.81
Avg. linear velocity.....(FT/SEC)	22.7
Gas density.....(LB/ACF)	.04599
Molecular weight.....(LB/LBMOLE)	29.24
Mass flow of gas.....(LB/HR)	7610
Volumetric flow rate.....	
actual.....(ACFM)	2758
dry standard.....(DSCFM)	1462

Test No. 3
RTO Outlet

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

Date of Determination.....	09-02-93
Time of Determination.....(HRS)	945
Barometric pressure.....(IN.HG)	28.56
Pitot tube coefficient.....	.84
Number of sampling ports.....	2
Total number of points.....	20
Shape of duct.....	Round
Stack diameter.....(IN)	19.25
Duct area.....(SQ.FT)	2.02
Direction of flow.....	UP
Static pressure.....(IN.WC)	-.08
Avg. gas temp.....(DEG-F)	313
Moisture content.....(% V/V)	21.91
Avg. linear velocity.....(FT/SEC)	20.1
Gas density.....(LB/ACF)	.04543
Molecular weight.....(LB/LBMOLE)	29.32
Mass flow of gas.....(LB/HR)	6653
Volumetric flow rate.....	
actual.....(ACFM)	2441
dry standard.....(DSCFM)	1243

APPENDIX B

FIELD DATA SHEETS

INTERPOLL LABORATORIES EPA METHOD 5/17 SAMPLE LOG SHEET

Job L.P. / Haynes Date 9/1/93 Test 1 Run 1
Source R.T.O. INLET No. of traverse points 24
Method 5 Filter holder: GLASS Filter type: Y' G.F.

Sample Train Leak Check:

Pretest: 0.02 cfm at 15 in. Hg. (vac)
Postest: .000 cfm at 19 in. Hg. (vac)

Particulate Catch Data:

No.s of filters used: 1, 5688

Recovery solvent(s)
☒ acetone PROBE + NOZZLE
☐ other(s)

No. of probe wash bottles: 1
Sample recovered by: D. BRENNAN

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1	718	499	219
Impinger No. 2			
Impinger No. 3			
Condenser			
Desiccant	1299	1267	32
Total			251

Integrated Gas Sampling Data:

Bag Pump No. 24B Box No. ~~24B~~ 8 Bag No. 1
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: .00 cc/min at 22 in. Hg.
Time start: 0920 (HRS) Time end: 1023 (HRS)
Sampling rate: 400 cc/min Operator: D. BRENNAN
S/N of O_2 Analyzer used to monitor train outlet: 3

CF-023

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CF-011

INTERPOLL LABORATORIES EPA METHOD 5 FIELD DATA SHEET

Job: L.P. / HAYWARD
Source: P.T.O. INLET
Date: 7/1/93 Test: 1 Run: 1

Operators: BRENNAN + ERTLE
Meter Box No: 5 ΔH: .9932 IN WC
Cassette audit: 2.78

Pitot No. 24-26 (CLASS) Cp .84
Bar. Press. 29.82 inHg H2O 24 %
Nozzle No. 1-7 Nozzle Dia .415 IN.

Traverse Point No.	Sampling Time (min)	Sample Volume (cf)	Velocity Head (inWC)	Orifice Meter (inWC)	Dec. Vol. (cf)	VAC. inHg	Temperatures (°F) Stack	Probe	Oven	Impy.	Gas/In	Gas/Out	Oxygen (xv/v)
	(0)(0)	316.900											
A-12	2.5	318.86	.11	1.73	8.77	6.5	195	268	256	49	64	61	19.8
11	5.0	320.60	.095	1.48	0.51	5.5	196	256	255	46	70	62	20.0
10	7.5	322.35	.10	1.57	2.31	6.0	196	255	261	45	72	63	19.8
9	10.0	324.07	.095	1.50	4.06	6.0	195	265	261	45	74	64	20.2
8	12.5	325.66	.075	1.19	5.63	5.0	195	267	268	45	76	65	20.3
7	15.0	326.93	.05	.79	6.91	3.5	195	262	270	44	77	65	20.4
6	17.5	328.85	.12	1.91	8.89	7.0	195	265	269	44	77	66	20.4
5	20.0	331.50	.22	3.49	1.57	13.0	195	263	252	44	82	68	20.1
4	22.5	334.29	.24	3.83	4.39	15.5	195	264	257	44	81	68	20.1
3	25.0	337.00	.215	3.43	7.05	13.5	195	243	257	44	80	68	20.3
2	27.5	339.61	.19	3.04	9.55	13.0	194	239	258	45	80	68	20.2
1	30.0	342.065	.19	3.04	2.06	13.0	194	249	266	46	80	69	20.4
B-12	32.5	345.02	.29	4.61	5.14	16.0	196	260	269	48	83	70	20.4
11	35.0	348.33	.33	5.26	8.43	16.5	196	267	270	48	83	70	20.3
10	37.5	351.59	.315	5.01	1.65	16.0	198	264	269	49	83	70	20.5
9	40.0	354.75	.315	5.01	4.86	16.0	198	265	267	51	83	71	20.4
8	42.5	357.72	.27	4.30	7.85	16.0	199	248	251	52	83	70	20.4
7	45.0	360.03	.16	2.56	0.15	15.0	198	249	255	53	84	71	20.6
6	47.5	361.63	.675	1.20	1.74	12.0	198	249	248	54	84	71	20.3
5	50.0	363.10	.06	.96	3.16	6.5	196	246	254	55	84	72	20.4
4	52.5	364.45	.05	.80	4.46	5.0	196	252	258	55	86	72	26.2
3	55.0	365.75	.055	.89	5.83	5.5	195	255	251	57	88	72	20.3
2	57.5	367.16	.05	.81	7.13	5.0	195	255	250	57	90	73	19.9
1	60.0	368.486	.05	.81	8.44	5.0	195	258	253	57	92	73	26.1
	(1023)												
	Θ = 60	Vm = 51.586		ΔH 2.47							Avg. = 74.5		

INTERPOLL LABORATORIES - EPA METHOD 2 FIELD DATA SHEET

Job L.P. HAYWARD

Source LINE 1 DRYER EFF STACK

Test 1 Run 0 Date 9-1-93

Stack dimen. 71 IN.

Dry bulb 248 °F Wet bulb 153 °F

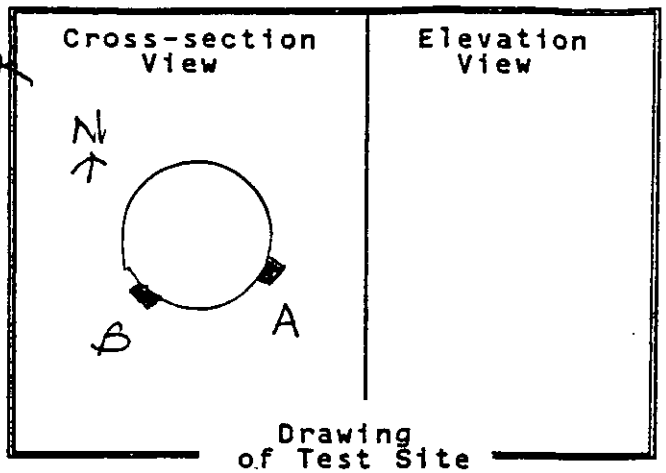
Manometer: ☒ Reg. ☐ Exp. ☐ Elec.

Barometric pressure 28.86 in Hg

Static pressure ~~+.02~~ -.12 in WC

Operators G HOVE S CONNES

Pitot No. ~~39~~ V 6 C_p .84



Traverse Point No.		Fraction of Diameter	Distance from Stack Wall (in)	Distance from End of Port (in)	Velocity Pressure (in WC)	Temperature of gas (°F)
			Port length: 4.5 in.		Time start: 0740 hrs	
A	1	.021	1.49	5.99		248
	2	.067	4.57	9.25		
	3	.118	.837	12.87		
	4	.177	12.56	17.06		
	5	.250	17.75	22.25		
	6	.356	25.27	29.77		
	7	.644	45.72	50.22		
	8	.750	5325	57.75		
	9	.823	58.43	62.33		
	10	.882	62.62	67.17		
	11	.933	66.24	70.74		
	12	.979	69.50	74.00		
B	1				.61	
	2				.65	
	3				.76	
	4				.75	
	5				.68	
	6				.70	
	7				.68	
	8				.75	
	9				.89	
	10				1.1	
	11				1.1	
	12				1.1	
Temp. meas. device & S/N: PDT NO 24					Time end: 0755 hrs	

R or nothing = reg. manometer; S= expanded; E=electronic S-3921

INTERFOLL LABORATORIES EPA METHOD 5/17 SAMPLE LOG SHEET

Job L.P. HAYWARD Date 9-1-93 Test 1 Run 1
Source LINE 1 EFB DRYER STACK No. of traverse points 24
Method 5 Filter holder: GLASS Filter type: 4" GLASS FIBER

Sample Train Leak Check:

Pretest: < 0.02 cfm at 15 in. Hg. (vac) ☒
Postest: .00 cfm at 12 in. Hg. (vac) ☒

Particulate Catch Data:

No.s of filters used: 5486

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

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

Condensate Data:

Item	Weight(g)		
	Final	Tare	Difference
Impinger No. 1			
Impinger No. 2			
Impinger No. 3	713	495	218
Condenser			
Desiccant	1300	1282	18
Total			236

Integrated Gas Sampling Data:

Bag Pump No. 31B Box No. 15 Bag No. 1
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: .00 cc/min at 25 in. Hg.
Time start: 0920 (HRS) Time end: 1025 (HRS)
Sampling rate: 400 cc/min Operator: GH
S/N of O_2 Analyzer used to monitor train outlet: 12

CF-023

INTERPOLL LABORATORIES EPA METHOD 5 FIELD DATA SHEET

Job L-P HAYWARD
Source LINE 1 DRYER EFB STACK
Date 9-1-93 Test 1 Run 1

Operators G HOVE SL
Meter Box No. 8 ΔH 1.85 ΔH@ 1.71 IN WC
Counter coeff. 1.001

Pitot No. 31-06 Cp .84
Bar. Press. 28.96 inHg H2O 25 X
Nozzle No. 9-4 Nozzle Dia .247 IN.

Traverse Point No.	Sampling Time (min)	Sample Volume (cf)	Velocity Head (inWC)	Orifice Meter (inWC)	Dry. Vol. (cf)	VAC. inHg	Temperatures (°F) Stack	Probe	Oven	Impg.	Gas In	Gas Out	Oxygen (xv/v)
	09.20	326.30											
6 12	2.5	328.37	1.1	2.18	8.36	7	238	263	259	40	63	62	17.3
11	5	330.39	1.1	2.15	0.40	7	238	261	260	42	68	63	17.2
10	7.5	332.41	1.1	2.16	2.46	7	238	259	262	44	65	63	16.8
9	10	334.38	.98	1.92	4.39	8	238	260	261	45	67	63	17.1
8	12.5	336.28	.92	1.81	6.27	9	237	260	263	41	68	64	18.3
7	15	337.97	.75	1.48	7.97	9	237	261	261	42	69	64	18.3
6	17.5	339.64	.72	1.42	9.63	8	237	262	259	43	71	65	18.5
5	20	341.25	.66	1.30	1.24	5	238	261	258	44	72	66	16.6
4	22.5	342.84	.65	1.31	2.84	5	238	260	259	45	72	66	18.2
3	25	344.49	.69	1.36	4.48	5	239	262	258	42	73	66	17.6
2	27.5	346.19	.72	1.49	6.19	6	238	261	257	43	75	68	17.7
1	30	347.91	.75	1.49	7.91	6	237	262	258	44	76	69	17.9
A 12	32.5	350.03	1.15	2.29	0.03	8	238	263	259	41	77	68	17.9
11	35	352.21	1.20	2.39	2.20	9	238	262	258	42	78	70	17.5
10	37.5	354.28	1.1	2.19	4.28	9	239	261	257	43	78	71	17.8
9	40	356.27	1.0	2.00	6.27	10	239	263	258	42	79	72	17.6
8	42.5	358.11	.85	1.70	8.11	8	239	260	259	45	79	72	18.1
7	45	359.78	.70	1.40	9.78	8	239	258	261	46	80	73	18.0
6	47.5	361.47	.70	1.41	1.46	8	237	259	263	45	80	73	18.2
5	50	363.12	.69	1.39	3.12	6	237	260	259	42	81	73	18.1
4	52.5	364.96	.84	1.69	4.96	6	237	259	261	43	81	73	18.3
3	55	366.80	.85	1.71	6.80	6	238	259	260	45	81	74	18.3
2	57.5	368.60	.80	1.61	8.60	6	238	260	262	44	80	75	18.0
1	60	370.38	.79	1.59	0.38	6	239	263	261	43	83	75	18.0
	0.1025												
	θ = 60	Vm = 44.08		ΔH = 1.73							Avg. =	71.7	

INTERPOLL LABORATORIES - EPA METHOD 2 FIELD DATA SHEET

Job: L.P. / HAYWARD

Source: R.T.O. INLET

Test 2 Run 0 Date 9/1/93

Stack dimen. 13" IN.

Dry bulb ____ °F Wet bulb ___ °F

Manometer: (R Reg) ☐ Exp. ☐ Elec.

Barometric pressure 28.86 in Hg

Static pressure -.15 in WC

Operators DUKE BRENDAN & STEVE ERTLE

Pitot No. 24-2½ (GLASS) C_p .84

Cross-section View	Elevation View
Drawing of Test Site	

Traverse Point No.		Fraction of Diameter	Distance from Stack Wall (in)	Distance from End of Port (in)	Velocity Pressure (in WC)	Temperature of gas (°F)
			Port length: 3 in.		Time start:	hrs
A	1	.021	.50 / .273	3.50		
	2	.067	.871	3.87		
	3	.118	1.53	4.53		
	4	.177	2.30	5.30		
	5	.250	3.25	6.25		
	6	.356	4.63	7.63		
	7	.644	8.37	11.37		
	8	.750	9.75	12.75		
	9	.823	10.70	13.70		
	10	.882	11.47	14.47		
	11	.933	12.13	15.13		
	12	.979	12.50 / 12.73	15.5 / 15.73		
B	1					
	2					
	3					
	4					
	5					
	6					
	7					
	8					
	9					
	10					
	11					
	12					
Temp. meas. device & S/N: PDT-22					Time end:	hrs

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

S-3921

INTERFOLL LABORATORIES EPA METHOD 5/17 SAMPLE LOG SHEET

Job L. P. / Hayward Date 9/1/93 Test 2 Run 1
Source R.T.O. INLET No. of traverse points 24
Method 5 Filter holder: GLASS Filter type: 4" G.F.

Sample Train Leak Check:

Pretest: ≤ 0.02 cfm at 15 in. Hg. (vac)
Postest: .000 cfm at 12 in. Hg. (vac)

Particulate Catch Data:

No.s of filters used: 1, 5711

Recovery solvent(s)
☒ acetone PROBE & NOZZLE
☐ other(s)

No. of probe wash bottles: 1
Sample recovered by: D. BRENNAN

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1	690	489	201.0
Impinger No. 2			
Impinger No. 3			
Condenser			
Desiccant	1416	1401	15.0
Total			21L

Integrated Gas Sampling Data:

Bag Pump No. 24B Box No. 8 Bag No. 1
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: .00 cc/min at 16 in. Hg.
Time start: 1300 (HRS) Time end: 1404 (HRS)
Sampling rate: 400 cc/min Operator: D. BRENNAN
S/N of O_2 Analyzer used to monitor train outlet: 3

CF-023

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CF-011

INTERPOLL LABORATORIES EPA METHOD 5 FIELD DATA SHEET

Job L.P./HAYWARD Operators BRENNAN & ERTLE Pitot No. 24-24 Cp
Source R.T.O. INLET Meter Box No. 5 ΔH 1.78 IN WC Bar. Press. 28.86 inHg H2O 2a X
Date 9/1/93 Test 2 Run 1 Coeff.: .9972 Nozzle No. 1-6 Nozzle Dia .353 IN.

Traverse Point No.	Sampling Time (min)	Sample Volume (cf)	Velocity Head (inWC)	Orifice Meter (inWC)	Dec. Vol. (cf)	VAC. inHg	Temperatures (°F) Stack	Probe	Oven	Impg.	Gas/In	Gas/Out	Oxygen (x v/v)
	(1300)	368.940											
B- 12	2.5	371.35	.30	2.77	1.33	8.5	203	231	230	60	82	74	20.0
11	5.0	373.64	.29	2.67	3.69	8.5	203	246	233	56	85	75	20.1
10	7.5	376.07	.305	2.82	6.12	9.5	203	242	232	55	86	75	20.0
9	10.0	378.37	.27	2.56	8.41	9.0	204	245	237	55	90	76	20.0
8	12.5	380.54	.22	2.05	0.48	7.5	203	243	240	55	93	77	20.2
7	15.0	382.28	.145	1.35	2.18	5.5	207	246	244	54	93	77	20.1
6	17.5	383.45	.075	.70	3.39	3.5	207	245	243	54	92	78	20.0
5	20.0	384.71	.08	.74	4.65	3.5	206	248	245	54	92	78	20.1
4	22.5	385.90	.075	.70	5.87	3.5	206	246	251	54	93	78	20.1
3	25.0	387.03	.06	.56	6.96	3.0	206	240	242	54	94	79	20.1
2	27.5	388.05	.055	.52	8.02	3.0	199	239	246	53	94	78	20.1
1	30.0	389.086	.06	.56	9.11	3.0	198	244	246	53	95	79	20.2
A 12	32.5	390.42	.095	.89	0.50	4.0	200	239	252	55	92	81	20.3
11	35.0	391.74	.09	.85	1.85	4.0	196	242	266	55	95	82	20.2
10	37.5	393.21	.085	.80	3.16	3.5	198	242	268	56	97	82	20.3
9	40.0	394.49	.075	.71	4.40	3.5	198	243	268	56	97	82	20.2
8	42.5	395.69	.07	.66	5.59	3.0	198	250	259	58	97	82	20.2
7	45.0	396.72	.055	.52	6.65	3.0	199	245	261	58	97	82	20.2
6	47.5	398.11	.11	1.04	8.14	4.5	202	244	257	58	96	82	20.3
5	50.0	400.03	.185	1.74	0.07	6.5	203	243	265	60	99	82	20.3
4	52.5	402.17	.23	2.19	2.23	7.5	198	241	266	60	101	83	20.2
3	55.0	404.30	.22	2.10	4.35	7.5	197	238	254	61	101	83	20.2
2	57.5	406.44	.21	2.00	6.42	7.5	197	242	258	61	101	83	20.4
1	60.0	408.554	.22	2.11	8.55	7.5	195	240	261	62	101	83	20.4
	(1404)												
	θ = 60	Vm = 39.614		ΔH = 1.40							Avg. = 86.9		

B-8

S 00270

INTERPOLL LABORATORIES EPA METHOD 5/17 SAMPLE LOG SHEET

Job L.P. / HAYWARD Date 9/1/93 Test 2 Run 2
Source R.T.O INLET No. of traverse points 24
Method 5 Filter holder: GLASS Filter type: 4" G.F.

Sample Train Leak Check:

Pretest: (0.02 cfm at 15 in. Hg. (vac) ☒
Postest: .000 cfm at 16 in. Hg. (vac) ☒

Particulate Catch Data:

No.s of filters used: 1 / 5735

Recovery solvent(s)
☒ acetone PROBE + NOZZLE
☐ other(s)

No. of probe wash bottles: 1
Sample recovered by: D. BRENNAN

Condensate Data:

Item	Weight(g)		
	Final	Tare	Difference
Impinger No. 1	726	497	229
Impinger No. 2			
Impinger No. 3			
Condenser			
Desiccant	1307	1296	11
Total			240

Integrated Gas Sampling Data:

Bag Pump No. 24B Box No. 8 Bag No. 2
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: .00 cc/min at 21 in. Hg.
Time start: 1440 (HRS) Time end: 1545 (HRS)
Sampling rate: 400 cc/min Operator: D. BRENNAN
S/N of O_2 Analyzer used to monitor train outlet: 3

CF-023

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INTERPOLL LABORATORIES EPA METHOD 5 FIELD DATA SHEET

Job L.P./HAYWARD
Source R.T.O. INLET
Date 9/1/92 Test 2 Run 2

Operators BRENNAN & ERTLE
Meter Box No. 5 ΔH 1.78 IN WC
Counter coeff. .9972

Pitot No. 24-242 Cp .84
Bar. Press. 28.84 inHg H2O x
Nozzle No. 1-2 Nozzle Dia .353 IN.

Traverse Point No.	Sampling Time (min)	Sample Volume (cf)	Velocity Head (inWC)	Orifice Meter (inWC)	Dec. Vol. (cf)	VAC. inHg	Temperatures (°F) Stack	Probe	Oven	Impy.	Gas/In	Gas/Out	Oxygen (x v/v)
	(1440)	408.820											
A 12	2.5	411.15	.295	2.65	1.18	9.5	210	250	228	59	86	81	20.0
11	5.0	413.48	.30	2.68	3.56	9.5	210	246	231	57	88	81	20.0
10	7.5	415.85	.295	2.64	5.92	9.5	210	241	234	54	91	82	20.0
9	10.0	418.01	.25	2.25	8.10	9.0	209	244	236	53	92	82	20.1
8	12.5	420.05	.20	1.81	0.06	7.5	207	250	233	52	95	83	20.0
7	15.0	421.71	.13	1.18	1.65	5.5	207	248	235	52	97	84	20.0
6	17.5	423.10	.09	.82	2.98	4.0	201	251	238	52	97	84	19.9
5	20.0	424.11	.06	.55	4.07	3.0	203	260	234	50	97	85	20.1
4	22.5	425.20	.06	.55	5.16	3.0	200	266	232	50	96	85	19.9
3	25.0	426.19	.05	.46	6.15	2.5	200	257	236	48	97	85	20.0
2	27.5	427.24	.06	.55	7.24	3.0	196	242	235	47	97	85	20.1
1	30.0	428.235	.055	.51	8.29	3.0	195	245	239	47	98	85	20.1
A 12	32.5	429.78	.10	.92	9.70	4.5	198	239	255	47	98	86	20.2
11	35.0	431.11	.09	.84	1.05	4.0	190	235	251	47	98	86	20.2
10	37.5	432.39	.085	.79	2.35	4.0	196	255	257	48	98	86	20.2
9	40.0	433.73	.09	.83	3.69	4.0	197	261	261	48	99	86	20.2
8	42.5	434.96	.075	.69	4.92	4.0	199	266	261	50	99	86	20.3
7	45.0	436.11	.065	.60	6.05	3.5	200	262	246	51	98	86	20.3
6	47.5	437.44	.10	.92	7.46	4.5	200	268	253	52	100	86	20.4
5	50.0	439.22	.165	1.53	9.28	6.5	200	251	257	54	101	87	20.4
4	52.5	441.05	.17	1.58	1.12	7.0	198	245	262	55	101	87	20.3
3	55.0	442.90	.165	1.53	2.94	6.5	198	238	268	56	102	87	20.4
2	57.5	444.82	.18	1.68	4.84	7.0	197	240	248	57	102	88	20.5
1	60.0	446.758	.195	1.82	6.82	8.0	196	237	246	58	102	88	20.5
	1545												
	θ = 60	Vm = 37.938		ΔH 1.26							Avg. = 87.2		

S-10

INTERFOLL LABORATORIES EPA METHOD 5/17 SAMPLE LOG SHEET

Job L.P. / HAYWARD Date 9/1/93 Test 2 Run 3
Source R.T.O. INLET No. of traverse points 24
Method 5 Filter holder: 66655 Filter type: 4" 6.F.

Sample Train Leak Check:

Pretest: 0.02 cfm at 15 in. Hg. (vac) ☒
Postest: .000 cfm at 16 in. Hg. (vac) ☒

Particulate Catch Data:

No.s of filters used: 1 - 5765

Recovery solvent(s)
☒ acetone PROBE & NOZZLE
☐ other(s)

No. of probe wash bottles: 1
Sample recovered by: D. BRENNAN

Condensate Data:

Item	Weight(g)		
	Final	Tare	Difference
Impinger No. 1	733	498	235
Impinger No. 2			
Impinger No. 3			
Condenser			
Desiccant	1430	1416	14.0
Total			249

Integrated Gas Sampling Data:

Bag Pump No. 21B Box No. 8 Bag No. 3
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: .00 cc/min at 18 in. Hg.
Time start: 1640 (HRS) Time end: 1743 (HRS)
Sampling rate: 400 cc/min Operator: D. BRENNAN
S/N of O_2 Analyzer used to monitor train outlet: 3

CF-023

INTERPOLL LABORATORIES EPA METHOD 5 FIELD DATA SHEET

DF-011

Job L.P. / HAYWARD
Source R.T.O INLET
Date 9/1/93 Test 2 Run 3
Operators BRENNAN & ERTLE
Meter Box No. 5 ΔH 1.78 IN WC
Calibr coeff. .9922
Pitot No. 24-2½ Cp .84
Bar. Press. 28.86 inHg H2O X
Nozzle No. 1-C Nozzle Dia .353 IN.

Traverse Point No.	Sampling Time (min)	Sample Volume (cf)	Velocity Head (inWC)	Orifice Meter (inWC)	Dgm. Vol. (cf)	VAC. inHg	Temperatures (°F) Stack	Probe	Oven	Impg.	Gas/In	Gas/Out	Oxygen (x v/v)
	(1640)	447.100											
A-12	2.5	448.30	.065	.59	8.23	3.0	197	249	250	57	80	80	20.2
11	5.0	449.58	.085	.76	9.49	3.5	202	253	244	54	84	81	20.1
10	7.5	450.95	.10	.90	0.87	3.5	200	252	256	53	87	81	20.2
9	10.0	452.26	.10	.90	2.25	3.5	199	252	255	53	89	82	20.1
8	12.5	453.48	.075	.68	3.45	3.0	199	251	255	51	90	82	20.2
7	15.0	454.62	.07	.63	4.62	3.0	198	250	254	51	90	82	20.1
6	17.5	456.14	.13	1.18	6.20	5.0	199	257	246	51	92	83	20.2
5	20.0	458.00	.175	1.59	8.04	5.5	197	255	263	51	92	83	20.2
4	22.5	459.87	.18	1.63	9.90	6.0	198	251	269	50	96	84	20.2
3	25.0	461.75	.185	1.69	1.81	6.0	196	258	252	50	97	85	20.2
2	27.5	463.83	.21	1.92	3.84	7.0	196	250	246	47	98	85	20.3
1	30.0	465.725	.19	1.75	5.77	6.5	195	245	247	46	98	88	26.3
B-12	32.5	468.13	.30	2.74	8.19	9.5	198	242	257	48	97	85	20.3
11	35.0	470.61	.32	2.93	0.69	10.5	196	248	260	48	99	86	20.3
10	37.5	473.15	.315	2.89	3.18	10.5	196	254	259	47	98	86	20.2
9	40.0	475.41	.28	2.57	5.52	10.0	195	250	241	47	99	86	20.2
8	42.5	477.66	.24	2.19	7.69	8.5	200	252	249	48	99	87	20.4
7	45.0	479.43	.16	1.47	9.47	6.5	199	251	259	48	100	87	20.4
6	47.5	480.67	.08	.73	0.73	3.5	197	260	250	49	99	87	20.3
5	50.0	481.80	.065	.59	1.86	3.0	198	247	243	51	99	87	20.4
4	52.5	482.89	.055	.50	2.91	3.0	198	265	246	53	99	87	20.4
3	55.0	484.02	.06	.55	4.00	3.0	198	257	240	55	99	87	20.5
2	57.5	485.12	.055	.50	5.04	3.0	196	248	247	56	99	87	20.4
1	60.0	486.678	.055	.50	6.09	3.0	195	253	245	56	99	87	20.5
	(1743)												
	θ = 60	Vm = 38.978		ΔH 1.35							Avg. = 89.8		

B-12

Interpoll Laboratories
(612)786-6020

EPA Method 7 Sample Collection
Field Data Sheet

Job LP / Hayward | Date 9/1/93 | Bar. Pressure 28.86 IN.HG.
Test Location R.T.O Inlet | Fuel Type WOOD | Sample Train No. CREEN
Technician S. Erthe | Pump No. 24

No.	Test Run Point	Flask No.	Time (HRS)	Vacuum (IN.HG.)	Flask Temp. (°F)	Leak Rate <0.4 IN.HG./MIN.
1	3-1-1	8	1230	27.5	77	☑ Yes ☐ No
2	3-1-2	9	1245	27.6	78	☑ Yes ☐ No
3	3-1-3	10	1330	27.7	79	☑ Yes ☐ No
4	3-1-1	11	1410	27.6	79	☑ Yes ☐ No
5	3-2-1	12	1440	27.7	82	☑ Yes ☐ No
6	3-2-2	26	1450	27.6	83	☑ Yes ☐ No
7	3-2-3	73	1512	27.6	82	☑ Yes ☐ No
8	3-2-1	15	1554	27.5	82	☑ Yes ☐ No
9	3-3-1	16	1640	27.5	81	☑ Yes ☐ No
10	3-3-2	74	1650	27.6	80	☑ Yes ☐ No
11	3-3-3	75	1715	27.6	77	☑ Yes ☐ No
12	3-3-1	81	1740	27.5	75	☑ Yes ☐ No
13	BLANK	21				☐ Yes ☐ No
14						☐ Yes ☐ No
15						☐ Yes ☐ No
16						☐ Yes ☐ No
17						☐ Yes ☐ No
18						☐ Yes ☐ No
19						☐ Yes ☐ No
20						☐ Yes ☐ No
21						☐ Yes ☐ No
22						☐ Yes ☐ No
23						☐ Yes ☐ No
24						☐ Yes ☐ No
25						☐ Yes ☐ No
26						☐ Yes ☐ No
27						☐ Yes ☐ No

S-263R

INTERPOLL LABORATORIES - EPA METHOD 2 FIELD DATA SHEET

Job L P HAYWARD

Source RTO OUTLET

Test 2 Run 0 Date 9-1-93

Stack dimen. 19.25 IN.

Dry bulb 320 °F Wet bulb 134 °F

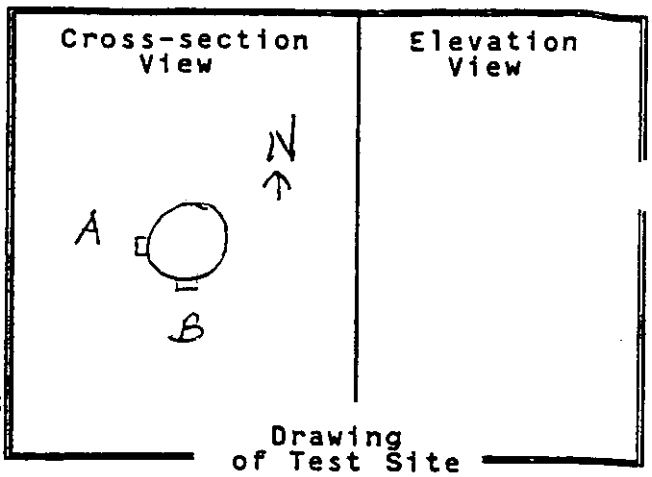
Manometer: ☐ Reg. ☒ Exp. ☐ Elec.

Barometric pressure 28.86 in Hg

Static pressure -.08 in WC

Operators 6 ABLE 5 DONNES

Pitot No. 31 11 25 C_p .84



Traverse Point No.	Fraction of Diameter	Distance from Stack Wall (in)	Distance from End of Port (in)	Velocity Pressure (in WC)	Temperature of gas (°F)
		Port length: 4 in.		Time start: 1150 hrs.	
A 1	.026	.5	4.5	.07	320
2	.082	1.58	~~6.58~~ 5.58	.07	
3	.146	2.81	6.8	.09	
4	.226	4.35	8.35	.09	
5	.342	6.58	10.58	.09	
6	.658	12.66	16.66	.08	
7	.774	14.89	18.89	.08	
8	.854	16.44	20.44	.09	
9	.918	17.67	21.67	.09	
10	.974	18.75	22.75	.09	
B 1				.05	
2				.06	
3				.065	
4				.065	
5				.075	
6				.075	
7				.095	
8				.095	
9				.095	
10				1.0	
Temp. meas. device & S/N: PDT 24				Time end: 1200 hrs	

R or nothing = reg. manometer; S= expanded; E=electronic S-3921

INTERFOLL LABORATORIES EPA METHOD 5/17 SAMPLE LOG SHEET

Job L.P. HAYWARD Date 9-1-93 Test 2 Run 1
Source RTO OUTLET No. of traverse points 20
Method 5 Filter holder: GLASS Filter type: GF 41

Sample Train Leak Check:

Pretest: < 0.02 cfm at 15 in. Hg. (vac) ☒
Postest: .00 cfm at 10 in. Hg. (vac) ☒

Particulate Catch Data:

No.s of filters used: 5487

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			
Impinger No. 3	676	499	177
Condenser			
Desiccant	1347	1335	12
Total			189

Integrated Gas Sampling Data:

Bag Pump No. 31B Box No. 15 Bag No. 2
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: .00 cc/min at 25 in. Hg.
Time start: 1230 (HRS) Time end: 1405 (HRS)
Sampling rate: 400 cc/min Operator: CH
S/N of O_2 Analyzer used to monitor train outlet: 13

CF-023

S-0046RR

INTERPOLL LABORATORIES EPA METHOD 5 FIELD DATA SHEET

CF-011

Job L-P HAYWARD
Source RTO OUTLET
Date 9-1-93 Test 2 Run 1

Operators G HOVE S LOWES
Meter Box No: 8 ΔH 1.85 ΔH@ 1.0011
Pitot No. 22-44 Cp .84
Bar. Press: 28.96 inHg H2O .18 x
Nozzle No. 4-7 Nozzle Dia .438 IN.

Traverse Point No.	Sampling Time (min)	Sample Volume (cf)	Velocity Head (inWC)	Orifice Meter (inWC)	Dec. Vol. (cf)	VAC. inHg	Temperatures (°F) Stack	Probe	Oven	Impg.	Gas/In	Gas/Out	Oxygen (x v/v)
	(1230)	370.72											
A 10	3	372.97	.090	1.79	2.96	6	320	260	258	39	79	74	16.9
9	6	375.29	.095	1.91	5.29	6	316	261	259	43	75	74	16.5
8	9	377.50	.085	1.70	7.50	5	317	262	261	43	79	75	16.8
7	12	379.71	.085	1.710	9.71	5	317	261	265	44	79	75	16.9
6	15	381.85	.080	1.60	1.85	5	321	262	267	43	78	76	17.1
5	18	383.78	.065	1.30	3.78	5	320	261	263	44	82	77	17.3
4	21	385.81	.070	1.41	5.80	5	316	262	261	42	83	77	17.1
3	24	387.60	.055	1.11	7.60	4	316	261	258	45	84	78	17.0
2	27	389.41	.055	1.11	9.39	4	317	262	259	46	84	78	17.1
1	30	391.10	.105	1.01	1.10	4	317	259	261	44	85	79	17.0
B 10	33	393.13	.07	1.42	3.13	4	317	260	262	43	80	78	16.9
9	36	395.07	.065	1.31	5.07	4	318	261	264	42	80	78	16.9
8	39	397.09	.070	1.40	7.09	5	321	262	258	45	84	79	17.3
7	42	399.18	.075	1.50	9.17	5	321	261	259	46	85	80	17.1
6	45	401.20	.070	1.42	1.20	5	320	262	257	40	87	80	17.0
5	48	403.30	.075	1.52	3.30	5	319	263	259	41	87	81	17.3
4	51	405.35	.070	1.42	5.34	5	314	260	255	43	88	81	16.4
3	54	407.28	.065	1.32	7.30	5	317	261	257	44	88	81	17.1
2	57	409.34	.070	1.42	9.34	5	317	262	259	41	88	82	17.4
1	60	411.38	.070	1.43	1.38	5	317	260	260	43	89	82	16.9
	(1405)												

n = 8-7

INTERFOLL LABORATORIES EPA METHOD 5/17 SAMPLE LOG SHEET

Job L.P. HAYWARD
Source RTO OUTLET
Method 5 Filter holder: GLASS

Date 9-1-93 Test 2 Run 3
No. of traverse points 20
Filter type: GF

Sample Train Leak Check:

Pretest: (0.02 cfm at 15 in. Hg. (vac) ☒
Postest: .00 cfm at 10 in. Hg. (vac) ☒

Particulate Catch Data:

No.s of filters used: 5488

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			
Impinger No. 3	707	503	204
Condenser			
Desiccant	1313	1300	13
Total			217

Integrated Gas Sampling Data:

Bag Pump No. 318 Box No. 15 Bag No. 3

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

Pretest leak check: .00 cc/min at 25 in. Hg.

Time start: 1230 (HRS) Time end: 1405 (HRS)

Sampling rate: 400 cc/min Operator: GH

S/N of O_2 Analyzer used to monitor train outlet: 12

CF-023

S-0046RR

INTERPOLL LABORATORIES EPA METHOD 5 FIELD DATA SHEET

CF-011

Job LP HAYWARD
Source RTO OUTLET
Date 9-1-93 Test 2 Run 2

Operators G Howe
Meter Box No 185 ΔH 1.85 IN WC
Counter coeff: 1.0011

Pitot No. 04 Cp .84
Bar. Press. 31.86 inHg H2O .18 x
Nozzle No. 4-7 Nozzle Dia .438 IN.

Traverse Point No.	Sampling Time (min)	Sample Volume (cf)	Velocity Head (inWC)	Orifice Meter (inWC)	Dry. Vol. (cf)	VAC. inHg	Temperatures (°F) Stack	Probe	Oven	Impg.	Gas/In	Gas/Out	Oxygen (x v/v)
	1440	411.70											
B 10	3	413.66	.065	1.31	3.64	6	320	261	258	40	79	79	17.2
9	6	415.66	.070	1.40	5.65	6	321				81	79	16.3
8	9	417.67	.070	1.40	7.67	6	321	262	259	42	82	80	16.0
7	12	419.70	.070	1.41	9.69	6	321				83	80	16.4
6	15	421.79	.075	1.51	1.78	6	322	261	260	44	85	80	16.6
5	18	423.80	.070	1.41	3.80	6	322				85	81	16.9
4	21	425.90	.075	1.52	5.90	6	320	260	263	44	87	82	16.6
3	24	427.93	.070	1.42	7.93	6	321				87	82	16.2
2	27	430.99	.075	1.52	0.03	5	321	261	262	45	88	82	16.3
1	30	431.90	.060	1.22	1.92	5	321				88	82	16.5
A 10	33	434.22	.090	1.82	4.22	7	320	264	265	46	88	81	16.3
9	36	436.62	.095	1.97	6.61	7	303				88	83	16.7
8	39	439.01	.095	1.97	9.01	7	303	265	267	45	89	83	16.0
7	42	441.27	.085	1.73	1.26	7	317				89	83	16.9
6	45	443.45	.080	1.64	3.45	7	311	267	259	46	89	83	16.3
5	48	445.43	.065	1.34	5.43	6	311				89	83	17.1
4	51	447.48	.070	1.44	7.48	6	311	268	260	44	89	84	16.8
3	54	449.30	.055	1.13	9.30	6	311				89	84	16.6
2	57	451.20	.060	1.24	1.20	6	310	267	259	45	90	84	16.8
1	60	453.10	.060	1.24	3.10	6	310				90	84	
	1543												

Avg = 6 Avg .1.C' 1.4 Avg = 8.3

8-18

INTERPOLL LABORATORIES EPA METHOD 5/17 SAMPLE LOG SHEET

Job LP. HAYWARD
Source RTO OUTLET
Method 5 Filter holder: GLASS

Date 9-1-93 Test 2 Run 3
No. of traverse points 20
Filter type: GF 411

Sample Train Leak Check:

Pretest: < 0.02 cfm at 15 in. Hg. (vac) ☒
Postest: .00 cfm at 12 in. Hg. (vac) ☒

Particulate Catch Data:

No.s of filters used: 5489

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			
Impinger No. 3	699	495	204
Condenser			
Desiccant	1349	1334	15
Total			219

Integrated Gas Sampling Data: RON ANALYZED

Bag Pump No. 3/B Box No. 4 Bag No. 1 ←

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

Pretest leak check: .00 cc/min at 25 in. Hg.

Time start: 1640 (HRS) Time end: 1743 (HRS)

Sampling rate: 400 cc/min Operator: GH

S/N of O_2 Analyzer used to monitor train outlet: 12

CF-023

S-0046RR

INTERPOLL LABORATORIES EPA METHOD 5 FIELD DATA SHEET

CF-011

Job LP HAYWARD
Source RTO OUTLET
Date 9-7-93 Test 2 Run 3

Operators G HOVE — SLONAKER
Meter Box No 8 ΔH 1.85 ΔH@ 1.9944
Counter coeff. 1.0044

Pitot No. 31V2.5 Cp .84
Bar. Press. 28.86 inHg H2O 14 X
Nozzle No. 4-7 Nozzle Dia .380 in.

Traverse Point No.	Sampling Time (min)	Sample Volume (cf)	Velocity Head (inWC)	Orifice Meter (inWC)	Dec. Vol. (cf)	VAC. inHg	Temperatures (°F) Stack	Probe	Oven	Impy.	Gas/In	Gas/Out	Oxygen (xv/v)
	1640	453.30											
A 10	3	455.64	.095	1.89	5.64	6	320	261	263	39	79	78	17.5
9	6	458.03	.100	1.98	8.02	5	315				80	78	16.0
8	9	460.34	.095	1.88	0.34	5	315	262	259	40	82	80	16.6
7	12	462.55	.085	1.69	2.54	5	315				84	80	16.6
6	15	464.75	.085	1.69	4.75	5	315	263	261	42	85	80	16.6
5	18	466.72	.065	1.30	6.70	5	311				86	81	16.7
4	21	468.59	.060	1.20	8.57	5	311	262	260	43	87	81	16.6
3	24	470.45	.060	1.21	0.44	5	310				87	81	16.4
2	27	472.32	.060	1.21	2.32	4	310	262	261	43	87	82	16.6
1	30	474.11	.055	1.11	4.11	4	310				87	83	16.3
B 10	33	476.14	.070	1.41	6.14	4	310	659	260	43	85	82	16.3
9	36	478.16	.070	1.41	8.16	4	310				88	82	17.0
8	39	480.20	.070	1.42	0.20	4	305	250	259	42	88	82	16.4
7	42	482.24	.070	1.42	2.23	4	306				88	82	16.6
6	45	484.40	.080	1.62	4.40	5	306	256	260	46	89	83	16.2
5	48	486.50	.075	1.51	6.50	6	312				88	83	17.1
4	51	488.58	.075	1.49	8.58	6	322	257	262	47	89	82	16.0
3	54	490.67	.075	1.49	0.67	6	320				89	83	16.3
2	57	492.74	.075	1.50	2.77	6	315	258	261	48	89	83	16.8
1	60	494.67	.060	1.20	4.64	5	315				89	83	16.9
	1743												
	0 =60	Vm = 41.37		ΔH = 1.48							Avg. = 82		

B-20

INTERPOLL LABORATORIES - EPA METHOD 2 FIELD DATA SHEET

Job L.P. / HAYWARD

Source R.T.O. INLET

Test 3 Run 0 Date 9/2/93

Stack dimen. 13° IN.

Dry bulb 218 °F Wet bulb 154 °F

Manometer: (R) Reg. ☐ Exp. ☐ Elec.

Barometric pressure 28.56 in Hg

Static pressure -.13 in WC

Operators DUKE BRENNAN & STEVE ERTLE

Pitot No. 24-2½ C_p .84

Cross-section View	Elevation View
Drawing of Test Site	

Traverse Point No.		Fraction of Diameter	Distance from Stack Wall (in)	Distance from End of Port (in)	Velocity Pressure (in WC)	Temperature of gas (°F)
			Port length: 3 in.		Time start:	hrs
A	1	.021	.50 / .273	3.50		
	2	.067	.871	3.87		
	3	.118	1.53	4.53		
	4	.177	2.30	5.30		
	5	.250	3.25	6.25		
	6	.356	4.63	7.63		
	7	.644	8.37	11.37		
	8	.750	9.75	12.75		
	9	.823	10.70	13.70		
	10	.882	11.47	14.47		
	11	.933	12.13	15.13		
	12	.979	12.50/12.73	15.5/15.73		
B	1					
	2					
	3					
	4					
	5					
	6					
	7					
	8					
	9					
	10					
	11					
	12					
Temp. meas. device & S/N: PIT-22					Time end:	hrs

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

0011

INTERPOLL LABORATORIES EPA METHOD ~~5~~ 0011 SAMPLE LOG SHEET

Job L.P. / HAYWARD Date 9/2/93 Test 3 Run 1
Source R.T.O. INLET No. of traverse points 24
Method 0011 Filter holder: N/A Filter type: N/A

Sample Train Leak Check:

Pretest: < 0.02 cfm at 15 in. Hg. (vac) ☒
Postest: .000 cfm at 19 in. Hg. (vac) ☒

Particulate Catch Data:

No.s of filters used: N/A

Recovery solvent(s)
☐ acetone
☒ other(s) CH_2Cl_2 + D.I H_2O

No. of probe wash bottles: 1
Sample recovered by: D. BRENNAN

Condensate Data:

Item	Weight(g)		
	Final	Tare	Difference
Impinger No. 1	776	470	306.0
Impinger No. 2			
Impinger No. 3	320	265	55.0
Condenser			
Desiccant	1320	1270	50.0
Total			411.0

Integrated Gas Sampling Data:

Bag Pump No. 24B Box No. 29 Bag No. 1
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: .00 cc/min at 18 in. Hg.
Time start: 1000 (HRS) Time end: 1105 (HRS)
Sampling rate: 400 cc/min Operator: D. BRENNAN
S/N of O_2 Analyzer used to monitor train outlet: 3

CF-023

INTERPOLL LABORATORIES EPA METHOD 5 FIELD DATA SHEET

Job C.P. / HAYWARD
Source R.T.O. INLET
Date 9/2/92 Test 3 Run 1

Operators BRENNAN & ERTLE
Meter Box No. 5 ΔH@ 1.78 IN WC
Calibration coeff.: .9972

Pitot No. 24-4 (GLASS) Cp .84
Bar. Press. 29.56 inHg H2O 21 X
Nozzle No. GLASS Nozzle Dia .398 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.	Out/In	Out/Out	Oxygen (xx/v)
	(1000)	503.240											
B- 12	2.5	506.13	.30	4.31	6.25	15.0	214	267	252	55	78	73	18.8
11	5.0	509.06	.295	4.18	9.20	15.0	217	261	248	53	79	73	18.8
10	7.5	512.01	.29	4.12	2.14	15.0	216	269	257	52	81	74	19.1
9	10.0	515.00	.30	4.28	5.13	15.0	215	259	258	52	82	74	19.5
8	12.5	517.75	.25	3.58	7.87	15.0	215	256	265	52	84	74	19.5
7	15.0	520.06	.175	2.52	0.18	12.0	214	250	255	52	84	75	19.7
6	17.5	521.59	.095	1.08	1.70	5.5	214	257	267	52	85	75	19.9
5	20.0	523.18	.07	1.01	3.16	5.0	214	264	258	50	85	75	19.9
4	22.5	524.89	.10	1.44	4.91	6.5	214	269	252	50	87	75	19.7
3	25.0	526.77	.12	1.75	6.84	7.0	210	266	253	50	88	76	19.6
2	27.5	528.79	.125	1.82	8.81	7.5	210	268	257	49	94	77	20.0
1	30.0	530.718	.12	1.77	0.75	7.0	208	269	261	49	95	77	19.9
A- 12	32.5	532.62	.115	1.68	2.65	7.0	214	255	247	47	92	78	20.1
11	35.0	534.55	.12	1.74	4.58	7.0	216	246	260	46	95	78	20.2
10	37.5	536.54	.13	1.91	6.61	7.5	210	257	264	47	97	79	20.2
9	40.0	538.65	.15	2.21	8.78	9.5	211	250	268	48	98	79	20.1
8	42.5	540.72	.12	1.76	6.73	7.0	212	242	261	49	99	80	20.2
7	45.0	542.67	.125	1.84	2.73	7.5	211	261	250	51	100	81	26.5
6	47.5	545.16	.20	2.94	5.25	13.5	213	252	258	52	99	81	19.9
5	50.0	548.03	.245	3.60	8.02	15.5	213	256	267	54	98	81	19.7
4	52.5	551.04	.285	4.19	1.02	15.5	211	253	256	54	97	81	26.3
3	55.0	553.64	.24	3.53	3.77	15.5	210	250	259	54	94	82	20.0
2	57.5	556.32	.225	3.31	6.43	15.5	210	248	261	56	93	82	19.9
1	60.0	559.131	.23	3.39	9.12	15.5	208	244	265	56	93	82	20.0
	(1105)												
	θ = 60	Vm = 55.891		ΔH 2.66							Avg. = 84.1		

B-23

S-00370

INTERPOLL LABORATORIES EPA METHOD ~~5~~ 0011 SAMPLE LOG SHEET

Job C. P. / HAYWARD Date 9/2/93 Test 3 Run 2
Source R.T.O. INLET No. of traverse points 24
Method 0011 Filter holder: N/A Filter type: N/A

Sample Train Leak Check:

Pretest: < 0.02 cfm at 15 in. Hg. (vac)
Postest: .000 cfm at 16 in. Hg. (vac)

Particulate Catch Data:

No.s of filters used: N/A

Recovery solvent(s)
☐ acetone
■ other(s) MECl₂ + D.I. H₂O

No. of probe wash bottles: 1
Sample recovered by: D. BRENNAN

Condensate Data:

Item	Weight(g)		
	Final	Tare	Difference
Impinger No. 1	770	470	300.0
Impinger No. 2			
Impinger No. 3	295	266	29.0
Condenser			
Desiccant	1450	1430	20.0
Total			349

Integrated Gas Sampling Data:

Bag Pump No. 24B Box No. 29 Bag No. 2
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: .00 cc/min at 20 in. Hg.
Time start: 1145 (HRS) Time end: 1250 (HRS)
Sampling rate: 400 cc/min Operator: D. BRENNAN
S/N of O_2 Analyzer used to monitor train outlet: 3

CF-023

INTERNAL LABORATORIES — [illegible]

Job L.P. / HAYWARD
Source R.T.O. INLET
Date 9/2/93 Test 3 Run 2

Operators BRENNAN & ERTLE
Meter Box No. 5 ΔH 1.78 IN WC
Counter coeff. .9976

Pitot No. 24-4(GLASS) Cp .84
Bar. Press. 28.56 inHg H2O 25 %
Nozzle No. GLASS Nozzle Dia .370 IN.

Traverse Point No.	Sampling Time (min)	Sample Volume (cf)	Velocity Head (inWC)	Orifice Meter (inWC)	Dec. Vol. (cf)	VAC. inHg	Temperatures (°F) Stack	Probe	Oven	Impg.	Gas In	Gas Out	Oxygen (%v/v)
	(1145)	559.500											
A- 12	2.5	561.47	.180	1.80	1.46	6.0	213	262	248	60	80	78	19.8
11	5.0	563.35	.170	1.68	3.34	6.0	213	260	252	57	85	78	19.7
10	7.5	565.23	.170	1.69	5.24	6.0	213	260	256	56	87	79	19.8
9	10.0	566.88	.125	1.24	6.87	5.0	213	259	264	55	90	79	20.0
8	12.5	568.46	.110	1.10	8.40	4.5	212	261	270	55	93	80	19.9
7	15.0	569.86	.100	1.00	9.87	4.0	214	268	255	52	94	80	19.9
6	17.5	571.60	.135	1.36	1.58	5.5	212	259	246	52	95	80	20.1
5	20.0	573.48	.170	1.71	3.50	6.5	212	258	260	52	98	81	20.2
4	22.5	575.74	.245	2.47	5.80	9.0	211	256	267	50	99	82	20.1
3	25.0	578.03	.245	2.48	8.11	9.0	210	260	264	50	99	82	20.1
2	27.5	580.39	.250	2.53	0.45	9.5	210	251	263	50	100	82	20.1
1	30.0	582.643	.225	2.29	2.67	9.0	208	262	258	49	99	83	20.3
B- 12	32.5	585.30	.330	3.33	5.35	13.5	212	269	259	47	98	84	20.2
11	35.0	587.79	.295	2.98	7.88	12.5	211	257	265	47	98	84	20.5
10	37.5	590.48	.320	3.21	0.51	13.5	215	257	262	47	98	84	20.4
9	40.0	592.88	.275	2.76	2.95	11.0	216	263	255	46	98	84	20.4
8	42.5	595.36	.280	2.81	5.42	11.0	215	259	261	46	99	84	20.4
7	45.0	597.38	.190	1.92	7.45	7.5	214	256	258	47	99	85	20.4
6	47.5	598.93	.100	1.01	8.94	4.5	212	266	264	48	101	85	20.4
5	50.0	600.11	.065	.66	0.14	3.0	210	258	255	50	101	85	20.4
4	52.5	601.37	.070	.71	1.39	3.5	210	263	252	51	101	85	26.3
3	55.0	603.02	.125	1.27	3.05	5.0	210	260	259	53	103	85	26.3
2	57.5	605.03	.155	1.58	4.91	6.0	209	262	253	54	103	86	20.2
1	60.0	607.366	.190	1.94	6.97	7.5	208	257	246	55	103	86	20.3
	(1250)												
	θ = 60	Vm = 47.866		ΔH 1.90							Avg. = 89.6		

B-25

S-0037R

INTERPOLL LABORATORIES EPA METHOD 0011 SAMPLE LOG SHEET

Job L.P. / HAYWARD Date 9/2/93 Test 3 Run 3
Source R.T.O. INLET No. of traverse points 24
Method 0011 Filter holder: N/A Filter type: N/A

Sample Train Leak Check:

Pretest: < 0.02 cfm at 15 in. Hg. (vac)
Postest: .000 cfm at 15 in. Hg. (vac)

Particulate Catch Data:

No.s of filters used: N/A

Recovery solvent(s)
☐ acetone
■ other(s) MeCl₂ + D.I. H₂O

No. of probe wash bottles: 1
Sample recovered by: D. BRENNAN

Condensate Data:

Item	Weight(g)		
	Final	Tare	Difference
Impinger No. 1	785	484	301.0
Impinger No. 2			
Impinger No. 3			
Condenser			
Desiccant	1290	1270	26.0
Total			321.0

Integrated Gas Sampling Data:

Bag Pump No. 24B Box No. 29 Bag No. 3
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: .00 cc/min at 21 in. Hg.
Time start: 1320 (HRS) Time end: 1425 (HRS)
Sampling rate: 400 cc/min Operator: D. BRENNAN
S/N of O_2 Analyzer used to monitor train outlet: 3

CF-023

...TER ... LI ... AID ... S I ... LI ... M I ... D C ... SH

Job: L.P. / HAYWARD
Source: R.T.O. INLET
Date: 9/2/92 Test: 3 Run: 3

Operators: BRENNAN + ERTLE
Meter Box No: 5 ΔH: 1.28 IN WC
Calendar coeff.: .9972

Pitot No.: 24-4 (Glass) Cp: .84
Bar. Press.: 28.52 inHg H2O 27.7 x
Nozzle No.: Glass Nozzle Dia: .375 IN.

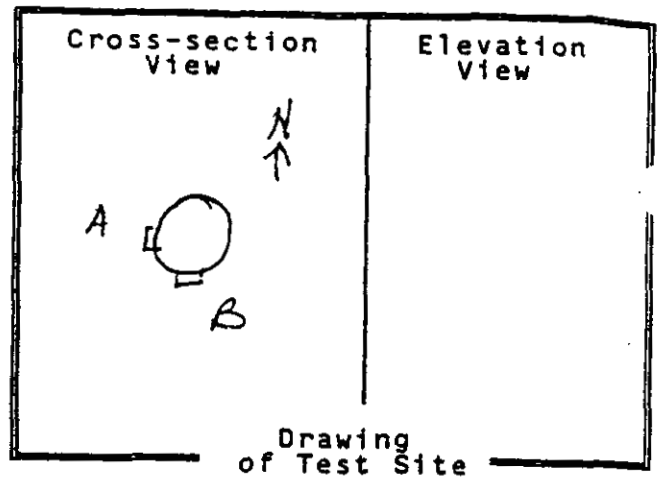
Traverse Point No.	Sampling Time (min)	Sample Volume (cf)	Velocity Head (inWC)	Orifice Meter (inWC)	Dec. Vol. (cf)	VAC. inHg	Temperatures (°F) Stack	Probe	Oven	Impy.	Gas In	Gas Out	Oxygen (x v/v)
	(1320)	607.700			0.31	12.0	210	236	251	59	84	81	20.2
B- 12	2.5	610.36	.330	3.18	2.87	12.0	219	240	256	56	87	81	20.0
11	5.0	612.61	.330	3.10	5.39	11.5	218	235	252	53	88	81	20.1
10	7.5	615.35	.315	2.97	7.84	11.0	218	234	256	52	91	82	20.1
9	10.0	617.98	.360	2.83	0.14	10.0	217	233	254	52	92	82	20.1
8	12.5	620.08	.260	2.47	2.06	7.0	216	233	255	52	95	83	20.1
7	15.0	622.02	.180	1.72	3.39	4.0	216	236	255	52	97	83	20.0
6	17.5	623.36	.085	.81	4.65	3.5	212	239	259	49	98	84	26.0
5	20.0	624.61	.075	.72	6.13	5.0	210	237	261	49	98	84	26.1
4	22.5	626.11	.105	1.02	7.75	5.0	209	235	269	48	101	85	19.8
3	25.0	627.75	.125	1.21	9.54	6.0	209	232	264	48	101	85	19.7
2	27.5	629.60	.150	1.46	1.46	6.5	208	234	265	48	102	85	19.8
1	30.0	631.438	.175	1.71	3.36	6.5	212	230	261	46	102	86	19.6
A- 12	32.5	633.40	.170	1.65	5.38	7.0	214	233	262	47	103	86	19.6
11	35.0	635.33	.195	1.89	7.43	7.0	218	234	265	48	104	87	19.6
10	37.5	637.39	.200	1.93	9.18	6.5	218	235	269	48	104	87	19.6
9	40.0	639.13	.145	1.40	0.84	5.5	217	231	267	50	104	87	19.5
8	42.5	640.85	.130	1.26	2.40	5.5	217	239	260	53	105	88	19.3
7	45.0	642.46	.115	1.11	4.24	6.5	217	240	263	53	105	88	19.4
6	47.5	644.24	.160	1.55	6.24	7.5	219	237	265	53	106	88	19.3
5	50.0	646.23	.190	1.83	8.42	8.5	218	233	262	54	106	88	19.2
4	52.5	648.37	.225	2.18	0.72	9.5	218	236	261	55	106	88	19.3
3	55.0	650.75	.250	2.42	2.95	9.0	216	236	257	56	106	89	19.2
2	57.5	653.03	.235	2.28	5.41	11.0	216	232	251	56	106	89	19.2
1	60.0	656.949	.285	2.76									
	(1425)												
	θ = 60	V_s = 48.249		$\sqrt{\Delta H}$ = 1.89							Avg. = 92.4		

R-27

S-0037R

INTERPOLL LABORATORIES - EPA METHOD 2 FIELD DATA SHEET

Job L-P HAXWARD
Source RTO OUTLET
Test 3 Run 0 Date 9-2-93
Stack dimen. 19.25 IN.
Dry bulb 320 °F Wet bulb 135 °F
Manometer: [X] Reg. [X] Exp. [ ] Elec.
Barometric pressure 28.56 in Hg
Static pressure -.08 in WC
Operators G HOVE S LONNES
Pitot No. 31 V 2.5 C_p .84



Traverse Point No.		Fraction of Diameter	Distance from Stack Wall (in)	Distance from End of Port (in)	Velocity Pressure (in WC)	Temperature of gas (°F)
			Port length: 4 in.		Time start: 0945 hrs	
A	1	.026	.5	4.5	.07	313
	2	.082	1.58	5.58	.07	
	3	.146	2.81	6.8	.08	
	4	.226	4.35	8.35	.085	
	5	.342	6.58	10.58	.080	
	6	.658	12.66	16.66	.085	
	7	.774	14.89	18.89	.080	
	8	.854	16.44	20.44	.080	
	9	.918	17.67	21.67	.070	
	10	.974	18.75	22.75	.070	
B	1				.065	
	2				.060	
	3				.075	
	4				.075	
	5				.075	
	6				.090	
	7				.090	
	8				.1	
	9				.1	
	10				.065	
Temp. meas. device & S/N:		PDT N 24			Time end: 0950 hrs	

R or nothing = reg. manometer; S= expanded; E=electronic S-3921

INTERFOLL LABORATORIES EPA METHOD 5/17 SAMPLE LOG SHEET

Job LP HAYWARD
Source RTO OUTLET
Method COIL Filter holder: NONE

Date 9-2-93 Test 3 Run 1
No. of traverse points 20
Filter type: NONE

Sample Train Leak Check:

Pretest: < 0.02 cfm at 15 in. Hg. (vac) ☒
Postest: .00 cfm at 15 in. Hg. (vac) ☒

Particulate Catch Data:

No.s of filters used: NA

Recovery solvent(s)
☐ acetone
☒ other(s) HECl + DI

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

Condensate Data:

Item	Weight(g)		
	Final	Tare	Difference
Impinger No. 1			
Impinger No. 2			
Impinger No. 3	758	468	290
Condenser			
Desiccant			
	1345	1331	14
Total			304

Integrated Gas Sampling Data:

Bag Pump No. 313 Box No. 4 Bag No. 1 2

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

Pretest leak check: .00 cc/min at 25 in. Hg.

Time start: 1000 (HRS) Time end: 1106 (HRS)

Sampling rate: 400 cc/min Operator: CH

S/N of O_2 Analyzer used to monitor train outlet: 12

CF-023

S-0046RR

INTERPOLL LABORATORIES EPA METHOD 5 FIELD DATA SHEET

Job L.P HAYWARD
Source RIG OUTLET
Date 9-2-93 Test 3 Run 1

Operators GLOVE SLONNES
Meter Box No. 8 ΔH 1.85 IN WC
Counter conft. 1.001

Pitot No. 31-V-25 Cp .84
Bar. Press. 28.56 inHg H2O X
Nozzle No CLASS 8 Nozzle Dia .498 IN.

Traverse Point No.	Sampling Time (min)	Sample Volume (cf)	Velocity Head (inWC)	Orifice Meter (inWC)	Dry. Vol. (cf)	VAC. inHg	Temperatures (°F) Stack	Probe	Oven	Impg.	Gas In	Gas Out	Oxygen (xx/x)
	1000	495.20											
A 10	3	497.75	.070	2.28	7.75	7	313	265	267	39	67	67	17.2
9	6	500.43	.080	2.54	0.43	7	328				69	67	16.7
8	9	503.26	.075	2.39	3.04	7	326	264	269	42	69	67	16.4
7	12	505.63	.075	2.36	5.63	7	336				72	68	16.2
6	15	508.15	.070	2.22	8.15	7	334	265	267	43	74	69	15.9
5	18	510.76	.075	2.38	0.76	7	335				75	69	16.5
4	21	513.63	.090	2.86	3.62	8	334	261	260	44	76	70	17.2
3	24	516.41	.085	2.70	6.41	8	335				78	71	17.0
2	27	519.04	.075	2.40	9.04	8	332	261	259	45	77	71	16.7
1	30	521.68	.075	2.40	1.66	8	332				80	72	16.2
B 10	33	524.21	.070	2.25	4.21	7	332	262	256	40	78	71	16.5
9	36	527.09	.090	2.88	7.09	8	332				79	73	16.9
8	39	530.13	.10	3.20	0.13	9	332	260	257	40	79	73	16.9
7	42	533.17	.10	3.20	3.14	9	334				81	74	16.2
6	45	536.06	.090	2.90	6.06	9	330	260	258	42	81	74	16.5
5	48	538.76	.080	2.58	8.79	8	330				81	74	16.5
4	51	541.45	.075	2.42	1.44	7	331	261	259	43	82	75	16.2
3	54	544.01	.070	2.27	4.01	7	329				83	75	16.1
2	57	546.48	.065	2.11	6.48	7	329	262	260	44	83	75	16.1
1	60	548.98	.065	2.11	8.96	7	327				83	75	15.4
	(1106)												
	θ = 60	Vs = 53.7		ΔH 2.52							Avg. = 74.4		

INTERFOLL LABORATORIES EPA METHOD 5/17 SAMPLE LOG SHEET

Job LP. HAYWARD Date 9-2-93 Test 3 Run 3
Source RTO OUTLET No. of traverse points 20
Method 0011 Filter holder: N/A Filter type: N/A

Sample Train Leak Check:

Pretest: < 0.02 cfm at 15 in. Hg. (vac) ☒
Postest: .00 cfm at 15 in. Hg. (vac) ☒

Particulate Catch Data:

No.s of filters used: NA

Recovery solvent(s)
☐ acetone
☒ other(s) MECl2 01

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

Condensate Data:

Item	Weight(g)		
	Final	Tare	Difference
Impinger No. 1			
Impinger No. 2			
Impinger No. 3	760	473	287
Condenser			
Desiccant	1404	1375	29
Total			316

Integrated Gas Sampling Data:

Bag Pump No. 31B Box No. 4 Bag No. 32
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: .00 cc/min at 25 in. Hg.
Time start: 1145 (HRS) Time end: 1249 (HRS)
Sampling rate: 400 cc/min Operator: GH
S/N of O_2 Analyzer used to monitor train outlet: 12

CF-023

INTERPOLL LABORATORIES EPA METHOD 5 FIELD DATA SHEET

Job L.P. HAYWARD
Source RTO OUTLET STACK
Date 9-2-93 Test 3 Run 2

Operators G HOWE S CONNES
Meter Box No. Y ΔH 1.85 IN WC
Barometer coeff: 1.0017

Pitot No. 31 U 2.5 Cp .84
Bar. Press. 28.56 inHg H2O 28 X
Nozzle No G455 X Nozzle Dia .498 IN.

Traverse Point No.	Sampling Time (min)	Sample Volume (cf)	Velocity Head (inWC)	Orifice Meter (inWC)	Dry. Vol. (cf)	VAC. inHg	Temperatures (°F) Stack	Probe	Oven	Impy.	Gas In	Gas Out	Oxygen (v/v)
	(1145)	549.20											
B 10	3	551.98	.090	2.70	1.98	6	335	269	258	39	74	74	16.8
9	6	554.80	.090	2.78	4.80	6	311				76	74	16.2
8	9	557.67	.095	2.84	7.66	7	336	270	259	40	79	75	16.2
7	12	560.46	.090	2.71	0.46	7	336				80	75	16.3
6	15	563.40	.10	3.01	3.41	8	335	272	260	42	81	75	16.1
5	18	566.15	.085	2.57	6.14	8	335				83	76	17.0
4	21	568.71	.075	2.28	8.71	7	330	271	245	43	84	77	16.8
3	24	571.29	.075	2.29	1.30	6	329				85	78	16.5
2	27	573.70	.065	1.98	3.70	6	332	272	269	44	85	78	17.4
1	30	576.12	.065	1.98	6.11	6	331				86	78	16.5
A 10	33	578.62	.070	2.14	8.61	5	330	263	258	45	84	78	16.6
9	36	581.28	.080	2.45	1.28	5	329				86	79	16.0
8	39	583.79	.070	2.15	3.79	6	327	262	263	40	86	79	16.9
7	42	586.38	.075	2.30	6.38	5	329				87	80	16.6
6	45	588.97	.075	2.28	8.97	6	336	261	260	42	88	80	16.7
5	48	591.64	.080	2.44	1.64	6	335				88	80	16.9
4	51	594.33	.080	2.46	4.33	6	330	259	255	44	88	81	16.0
3	54	597.09	.085	2.60	7.09	6	333				88	81	16.1
2	57	599.68	.075	2.30	9.68	6	333	258	257	45	90	81	16.9
1	60	602.19	.070	2.15	2.19	6	332				90	81	16.5
	(1249)												
	θ = 60	Vm = 52.99		ΔH 2.42							Avg. = 76.9		

INTERPOLL LABORATORIES EPA METHOD 5/17 SAMPLE LOG SHEET

Job 2P HAYWARD
Source RTO OUTLET STACK
Method 0011 Filter holder: N/A

Date 9-2-93 Test 3 Run 3
No. of traverse points 20
Filter type: N/A

Sample Train Leak Check:

Pretest: < 0.02 cfm at 15 in. Hg. (vac) ☒
Postest: .00 cfm at 12 in. Hg. (vac) ☒

Particulate Catch Data:

No.s of filters used: NA

Recovery solvent(s)
☐ acetone
☒ other(s) MEK2-01

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

Condensate Data:

Item	Weight(g)		
	Final	Tare	Difference
Impinger No. 1			
Impinger No. 2			
Impinger No. 3	745	475	270
Condenser			
Desiccant	1482	1465	17
Total			287

Integrated Gas Sampling Data:

Bag Pump No. 318 Box No. 4 Bag No. 3
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: .00 cc/min at 25 in. Hg.
Time start: 1320 (HRS) Time end: 1425 (HRS)
Sampling rate: 400 cc/min Operator: CH
S/N of O_2 Analyzer used to monitor train outlet: 12

CF-023

S-0046RR

INTERPOLL LABORATORIES EPA METHOD 5 FIELD DATA SHEET

Job L-P HAYWARD
Source RTO OUTLET STACK
Date 9-2-93 Test 3 Run 3

Operators C HOVE S LOWNES
Meter Box No. 8 ΔH 1.85 IN WC
Coeff: 1.0011

Pitot No. 31 V 2.5 Cp .84
Bar. Press. 29.56 inHg H2O 29 %
Nozzle No G158 Nozzle Dia .188 IN.
229a436

Traverse Point No.	Sampling Time (min)	Sample Volume (cf)	Velocity Head (inWC)	Orifice Meter (inWC)	Dgm. Vol. (cf)	VAC. inHg	Temperatures (°F) Stack	Probe	Oven	Impg.	Gas/In	Gas/Out	Oxygen (xv/v)
	(1320)	602.50											
A 10	3	604.89	.065	1.97	4.88	4	330	258	256	40	79	79	16.5
9	6	607.27	.065	1.96	7.27	5	337				81	79	16.9
8	9	609.82	.075	2.28	9.85	5	331	259	257	41	84	80	16.9
7	12	612.42	.075	2.28	2.43	5	336				87	81	16.9
6	15	615.01	.075	2.28	5.01	5	338	260	258	42	87	81	16.9
5	18	617.75	.085	2.63	7.79	5	324	260			88	82	17.1
4	21	620.54	.085	2.61	0.55	6	332	259	259	44	89	82	16.5
3	24	623.32	.085	2.61	3.32	6	332				91	83	16.9
2	27	626.01	.080	2.46	6.01	6	333	261	258	43	91	83	16.9
1	30	628.62	.075	2.31	8.62	6	332				91	84	15.3
B 10	33	631.57	.095	2.92	1.56	7	332	262	259	44	91	84	15.9
9	36	634.57	.10	3.07	4.56	7	333				91	84	16.8
8	39	637.57	.10	3.06	7.57	7	336	263	259	45	92	85	16.1
7	42	640.58	.10	3.07	0.57	7	336				92	85	16.5
6	45	643.50	.095	2.91	3.51	7	337	262	258	40	92	86	15.9
5	48	646.42	.095	2.89	6.43	7	343				92	86	16.4
4	51	649.30	.090	2.79	9.30	7	330	262	261	45	93	86	16.7
3	54	651.74	.065	2.01	1.74	7	332				94	87	16.4
2	57	654.09	.06	1.86	4.09	7	332	258	259	44	94	87	17.0
1	60	656.49	.06	1.86	6.44	7	333				94	87	17.0
	(1425)												
	θ = 60	Vm = 53.99		ΔH 2.49							Avg. 86.6		

APPENDIX C

INTERPOLL LABORATORIES ANALYTICAL RESULTS

Interpoll Laboratories
(612) 786-6020

EPA Method 3 Data Reporting Sheet
Orsat Analysis

Job C.P. Hayward
Team Leader GH
Date Submitted 9-3-93
Test No. 1
Date of Analysis 9-7-93

Source Line 1 EF B · Dryer
Test Site Stack
Date of Test 9-1-93
No. of Runs Completed 1
Technician C. Helgeson

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	9924-08	1	0.00	3.20	20.90	3.20	17.70	1.00
		2	0.00	3.20	20.90	3.20	17.70	1.00
	☑ B ☐ F	Avg				3.20	17.70	
		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						
		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)

Interpoll Laboratories
(612) 786-6020

EPA Method 3 Data Reporting Sheet
Orsat Analysis

Job: L.P. Hayward
Team Leader: DB
Date Submitted: 9-3-93
Test No.: 2
Date of Analysis: 9-7-93

Source: RTO Inlet
Test Site: Inlet
Date of Test: 9-1-93
No. of Runs Completed: 3
Technician: C. Halverson

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	9924-15	1	0.00	3.10	20.80	3.10	17.70	1.03
		2	0.00	3.10	20.80	3.10	17.70	1.03
	☑ B ☐ F	Avg				3.10	17.70	
2/2	-19	1	0.00	3.70	20.80	3.70	17.10	1.03
		2	0.00	3.70	20.80	3.70	17.10	1.03
	☑ B ☐ F	Avg				3.70	17.10	
2/3	-23	1	0.00	3.70	20.80	3.70	17.10	1.03
		2	0.00	3.70	20.80	3.70	17.10	1.03
	☑ B ☐ F	Avg				3.70	17.10	
		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)

Interpoll Laboratories
(612) 786-6020

EPA Method 3 Data Reporting Sheet
Orsat Analysis

Job L.P. Hayward
Team Leader GB
Date Submitted 9-3-93
Test No. 2
Date of Analysis 9-7-93

Source RTO Outlet
Test Site Stack
Date of Test 9-1-93
No. of Runs Completed 2
Technician C. Nelson

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	9924-27	1	0.00	3.50	20.50	3.50	17.00	1.11
		2	0.00	3.50	20.50	3.50	17.00	1.11
	☑B ☐F	Avg				3.50	17.00	
2/2	-31	1	0.00	3.90	20.40	3.90	16.50	1.13
		2	0.00	3.90	20.40	3.90	16.50	1.13
	☑B ☐F	Avg				3.90	16.50	
		1						
		2						
	☐B ☐F	Avg				3.30	17.00	*
		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						
		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 $F_o = \frac{20.9 - O_2}{CO_2}$

* Field Analyzed by RR

F=Flask (250 cc all glass)

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	1.000-1.120

Interpoll Laboratories
(612) 786-6020

EPA Method 3 Data Reporting Sheet
Orsat Analysis

Job: L.P. Hayward
Team Leader: DB
Date Submitted: 9-3-93
Test No.: 3
Date of Analysis: 9-7-93

Source: RTO
Test Site: Inlet
Date of Test: 9-2-93
No. of Runs Completed: 3
Technician: C. Helgeson

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	9924-59	1	0.00	4.20	20.80	4.20	16.60	1.02
		2	0.00	4.20	20.80	4.20	16.60	1.02
	☑ B ☐ F	Avg				4.20	16.60	
3/2	-60	1	0.00	4.10	20.70	4.10	16.60	1.05
		2	0.00	4.10	20.70	4.10	16.60	1.05
	☑ B ☐ F	Avg				4.10	16.60	
3/3	-61	1	0.00	3.90	20.90	3.90	17.00	1.00
		2	0.00	3.90	20.90	3.90	17.00	1.00
	☑ B ☐ F	Avg				3.90	17.00	
		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						
		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)

Interpoll Laboratories
(612) 786-6020

EPA Method 3 Data Reporting Sheet
Orsat Analysis

Job L.P. Hayward
Team Leader OH
Date Submitted 9-3-93
Test No. 3
Date of Analysis 9-7-93

Source RTO outlet
Test Site Stack
Date of Test 9-2-93
No. of Runs Completed 3
Technician C. Hetjesen

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	9924-62	1	0.00	4.20	20.30	4.20	16.10	1.14
		2	0.00	4.20	20.30	4.20	16.10	1.14
	☑ B ☐ F	Avg				4.20	16.10	
3/2	-63	1	0.00	4.20	20.40	4.20	16.20	1.12
		2	0.00	4.20	20.40	4.20	16.20	1.12
	☑ B ☐ F	Avg				4.20	16.20	
3/3	-64	1	0.00	3.80	20.40	3.80	16.60	1.13
		2	0.00	3.80	20.40	3.80	16.60	1.13
	☑ B ☐ F	Avg				3.80	16.60	
		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	F_o 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)

INTERPOLL LABORATORIES
(612) 786-6020

S-305RR
(9/90)

EPA Method 10 NDIR Analysis

Job Name L.P. Hayward
Source RTO Inlet
Date of Analysis 9-7-93
Technician C. Nelson

NDIR Analyzer:
- ☐ Fuji ACS Model 3300
- ☐ Mon. Lab Model 8310
- ☑ Dasibi Model 3003

Range: 0 - 200 ppm
Flow rate: 1000 cc/min

Pretest Calibration

	Conc.	Reading	Vendor	Cyl. Number
Zero gas:	0 ppm	0 ppm	T.C.Ox	0643-31
Upscale gas:	40 ppm	40 ppm	Scott	ALM 030329
Upscale gas:	144 ppm	144 ppm	National	CC 114 302
Upscale gas:	ppm	ppm		

Post-test Calibration

	Conc.	Reading	Vendor	Cyl. Number
Zero gas:	0 ppm	0 ppm	T.C.Ox	0643-31
Upscale gas:	40 ppm	40 ppm	Scott	ALM 030329
Upscale gas:	144 ppm	144 ppm	National	CC 114 302
Upscale gas:	ppm	ppm		

Sample Description Test/Run	Sample Log Number	CO Conc. (ppm, Dry)		
		Dilution Factor	Reading	Actual ppm
2/1	9924-15	10	22.5	225
2/2	-19	10	44.3	443
2/3	-23	10	39.8	398

Sample Description Test/Run	Sample Log Number	CO Conc. (ppm, Dry)		
		Dilution Factor	Reading	Actual ppm

Note 1: If sample dilution is requried the sample is diluted with CO-free gas prior to analysis.
Note 2: The Fuji ACS model 3300 has a rejection ratio for CO to CO_2 greater then 100,000: 1 and the Mon. Labs Model 8310 and Dasibi Model 3003 have rejection ratios greater then 200,000:1 and thus CO_2 removal prior to analysis is not required.
Note 3: The analyzer must be zeroed and spanned immediately before and after sample analysis. Additional checks may be performed between sample analyses if required.

INTERFACE LABORATORIES
(612) 786 3020

EPA Method 10 NDIR Analysis

Job Name L.P. Hayward
Source RTO outlet Stack
Date of Analysis 9-1-93
Technician C. Helgeson

NDIR Analyzer:
- ☐ Fuji ACS Model 3300
- ☐ Mon. Lab Model 8310
- ☑ Dasibi Model 3003

Range: 0 - 200 ppm
Flow rate: 1000 cc/min

Pretest Calibration

	Conc.	Reading	Vendor	Cyl. Number
Zero gas:	0 ppm	0 ppm	T.C.Or	0693-31
Upscale gas:	40 ppm	40 ppm	Scott	ALM 030329
Upscale gas:	144 ppm	144 ppm	National	CC114302
Upscale gas:	___ ppm	___ ppm		

Post-test Calibration

	Conc.	Reading	Vendor	Cyl. Number
Zero gas:	0 ppm	0 ppm	T.C.Or	0693-31
Upscale gas:	40 ppm	40 ppm	Scott	ALM 030329
Upscale gas:	144 ppm	144 ppm	National	CC114302
Upscale gas:	___ ppm	___ ppm		

Sample Description Test/Run	Sample Log Number	CO Conc. (ppm, Dry)		
		Dilution Factor	Reading	Actual ppm
2/1	9924-27	—	1.0	1.0
2/2	-31	—	4.0	4.0
2/3		—	—	4.0 *

Sample Description Test/Run	Sample Log Number	CO Conc. (ppm, Dry)		
		Dilution Factor	Reading	Actual ppm

Note 1: If sample dilution is required the sample is diluted with CO-free gas prior to analysis.
Note 2: The Fuji ACS model 3300 has a rejection ratio for CO to CO_2 greater then 100,000: 1 and the Mon. Labs Model 8310 and Dasibi Model 3003 have rejection ratios greater then 200,000:1 and thus CO_2 removal prior to analysis is not required.
Note 3: The analyzer must be zeroed and spanned immediately before and after sample analysis. Additional checks may be performed between sample analyses if required.

* - Field Analyzed by RR

Interpoll Laboratories
(612) 786-6020

EPA Method 5 Data Reporting Sheet
Impinger Catch/Wisconsin Protocol

Job L.P. Hayward
Team Leader DB
Date Submitted 9-3-93
Test No. 1
Date of Analysis 9-9-93

Source RTO Inlet
Test Site Inlet Duct
Date of Test 9-1-93
No. of Runs Completed 1
Technician C. Hefferon

		Solvent Phase	Aqueous Phase
0	Test ___ Run 0 Field Blank Log Number ___ Comments ___	Dish No. ___ Dish Tare Wt. ___ g Dish+Sample Wt. ___ g Sample Wt. ___ g	Dish No. ___ Dish Tare Wt. ___ g Dish+Sample Wt. ___ g Sample Wt. ___ g
1	Test 1 Run 1 Log Number 9424-03 Comments ___	Dish No. 24 Dish Tare Wt. 45.7886 g Dish+Sample Wt. 45.8279 g Sample Wt. 0.0393 g	Dish No. 115 Dish Tare Wt. 45.0702 g Dish+Sample Wt. 45.1412 g Sample Wt. 0.0710 g
2	Test ___ Run ___ Log Number ___ Comments ___	Dish No. ___ Dish Tare Wt. ___ g Dish+Sample Wt. ___ g Sample Wt. ___ g	Dish No. ___ Dish Tare Wt. ___ g Dish+Sample Wt. ___ g Sample Wt. ___ g
3	Test ___ Run ___ Log Number ___ Comments ___	Dish No. ___ Dish Tare Wt. ___ g Dish+Sample Wt. ___ g Sample Wt. ___ g	Dish No. ___ Dish Tare Wt. ___ g Dish+Sample Wt. ___ g Sample Wt. ___ g
4	Test ___ Run ___ Log Number ___ Comments ___	Dish No. ___ Dish Tare Wt. ___ g Dish+Sample Wt. ___ g Sample Wt. ___ g	Dish No. ___ Dish Tare Wt. ___ g Dish+Sample Wt. ___ g Sample Wt. ___ g
5	Test ___ Run ___ Log Number ___ Comments ___	Dish No. ___ Dish Tare Wt. ___ g Dish+Sample Wt. ___ g Sample Wt. ___ g	Dish No. ___ Dish Tare Wt. ___ g Dish+Sample Wt. ___ g Sample Wt. ___ g

Results Solvent Phase: Blank Solvent Wt. 0.0004 g

Field Blk.	Run 1	Run 2	Run 3	Run 4	Run 5
	0.03889				

Results Aqueous Phase:

Field Blk.	Run 1	Run 2	Run 3	Run 4	Run 5
	0.0706				

LSC-03WYP

Interpoll Laboratories
(612) 786-6020

EPA Method 5 Data Reporting Sheet
Probe/Cyclone Wash

Job LP/HAYWARD
Team Leader RON ROSENTHAL
Date Submitted 9-1-93
Test No. 1
Date of Analysis 9-1-93
Transport Leakage ☒ None ☐ _____ ml

Source RTO
Test Site INLET
Date of Test 9-1-93
No. of Runs Completed 1
Technician R.R.
Solvent ACETONE

0
Test _____ Run 0
Field Blank
Log Number _____
Vol. of Solvent _____ ml
*Solvent Residue _____ ug/ml

Dish No. _____
Dish Tare Wt. _____ g
Dish+Sample Wt. _____ g
Sample Wt. _____ g

1
Test 1 Run 1
Vol. of Solvent 100 ml
Log Number _____
Comments _____

Dish No. 29
Dish Tare Wt. 48.8991 g
Dish+Sample Wt. 50.9568 g
Sample Wt. 2.0577 g

2
Test _____ Run _____
Vol. of Solvent _____ ml
Log Number _____
Comments _____

Dish No. _____
Dish Tare Wt. _____ g
Dish+Sample Wt. _____ g
Sample Wt. _____ g

3
Test _____ Run _____
Vol. of Solvent _____ ml
Log Number _____
Comments _____

Dish No. _____
Dish Tare Wt. _____ g
Dish+Sample Wt. _____ g
Sample Wt. _____ g

4
Test _____ Run _____
Vol. of Solvent _____ ml
Log Number _____
Comments _____

Dish No. _____
Dish Tare Wt. _____ g
Dish+Sample Wt. _____ g
Sample Wt. _____ g

5
Test _____ Run _____
Vol. of Solvent _____ ml
Log Number _____
Comments _____

Dish No. _____
Dish Tare Wt. _____ g
Dish+Sample Wt. _____ g
Sample Wt. _____ g

*Solvent Residue ___ ug/ml = [(Sample Wt. _____ g)(10⁶)]/Vol. of Sol. _____ ml
EPA-M5 Acetone Residue Blank Spec. ≤ 7.8 ug/ml

Results:

Field Blk.	Run 1	Run 2	Run 3	Run 4	Run 5
	2.0577		C-9		

LSC-01YR

Interpoll Laboratories
(612) 786-6020

EPA Method 5 Data Reporting Sheet
Filter Gravimetrics

Job LP/HAYWARD
Team Leader Ron Rosenthal
Date Submitted 9-1-93
Test No. 1
Date of Analysis 9-1-93

Source RTO
Test Site INLET
Date of Test 9-1-93
No. of Runs Completed 1
Technician R.R.

	Test ____ Run 0	Filter No. ____
	Field Blank	Filter Type ____
0	Log Number ____	Filter Tare Wt. ____ g
	Comments ____	Filter+Sample Wt. ____ g
	____	Sample Wt. ____ g
	Test 1 Run 1	Filter No. 5688
	Log Number ____	Filter Type glass fibre (4")
1	Comments ____	Filter Tare Wt. .9216 g
	____	Filter+Sample Wt. 1.0047 g
	____	Sample Wt. .0831 g
	Test ____ Run ____	Filter No. ____
	Log Number ____	Filter Type ____
	Comments ____	Filter Tare Wt. ____ g
	____	Filter+Sample Wt. ____ g
	____	Sample Wt. ____ g
	Test ____ Run ____	Filter No. ____
	Log Number ____	Filter Type ____
3	Comments ____	Filter Tare Wt. ____ g
	____	Filter+Sample Wt. ____ g
	____	Sample Wt. ____ g
	Test ____ Run ____	Filter No. ____
	Log Number ____	Filter Type ____
4	Comments ____	Filter Tare Wt. ____ g
	____	Filter+Sample Wt. ____ g
	____	Sample Wt. ____ g
	Test ____ Run ____	Filter No. ____
	Log Number ____	Filter Type ____
5	Comments ____	Filter Tare Wt. ____ g
	____	Filter+Sample Wt. ____ g
	____	Sample Wt. ____ g

Results:

Field Blk.	Run 1	Run 2	Run 3	Run 4	Run 5
	.0831				

Field Blk.	Run 1	Run 2	Run 3	Run 4	Run 5
	2.1408				

LSC-02PR

Interpoll Laboratories
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EPA Method 5 Data Reporting Sheet
Impinger Catch/Wisconsin Protocol

Job C.P. Hayward
Team Leader GH
Date Submitted 9-3-93
Test No.
Date of Analysis 9-9-93

Source Line 1 EFB Dryer
Test Site Stack
Date of Test 9-1-93
No. of Runs Completed 1
Technician C. Hebson

		Solvent Phase	Aqueous Phase
0	Test ___ Run 0 Field Blank Log Number ___ Comments ___	Dish No. ___ Dish Tare Wt. ___ g Dish+Sample Wt. ___ g Sample Wt. ___ g	Dish No. ___ Dish Tare Wt. ___ g Dish+Sample Wt. ___ g Sample Wt. ___ g
1	Test 1 Run 1 Log Number ___ Comments ___	Dish No. 25 Dish Tare Wt. 44.3442 g Dish+Sample Wt. 44.3908 g Sample Wt. 0.0466 g	Dish No. 200 Dish Tare Wt. 44.9387 g Dish+Sample Wt. 45.0760 g Sample Wt. 0.1373 g
2	Test ___ Run ___ Log Number ___ Comments ___	Dish No. ___ Dish Tare Wt. ___ g Dish+Sample Wt. ___ g Sample Wt. ___ g	Dish No. ___ Dish Tare Wt. ___ g Dish+Sample Wt. ___ g Sample Wt. ___ g
3	Test ___ Run ___ Log Number ___ Comments ___	Dish No. ___ Dish Tare Wt. ___ g Dish+Sample Wt. ___ g Sample Wt. ___ g	Dish No. ___ Dish Tare Wt. ___ g Dish+Sample Wt. ___ g Sample Wt. ___ g
4	Test ___ Run ___ Log Number ___ Comments ___	Dish No. ___ Dish Tare Wt. ___ g Dish+Sample Wt. ___ g Sample Wt. ___ g	Dish No. ___ Dish Tare Wt. ___ g Dish+Sample Wt. ___ g Sample Wt. ___ g
5	Test ___ Run ___ Log Number ___ Comments ___	Dish No. ___ Dish Tare Wt. ___ g Dish+Sample Wt. ___ g Sample Wt. ___ g	Dish No. ___ Dish Tare Wt. ___ g Dish+Sample Wt. ___ g Sample Wt. ___ g

Results Solvent Phase: Blank Solvent Wt. 0.0004 g

Field Blk.	Run 1	Run 2	Run 3	Run 4	Run 5
	0.0462				

Results Aqueous Phase:

Field Blk.	Run 1	Run 2	Run 3	Run 4	Run 5
	0.1369				

LSC-03WYP

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EPA Method 5 Data Reporting Sheet
Probe/Cyclone Wash

Job LP/HAYWARD
Team Leader RON ROSENTHAL
Date Submitted 9-1-93
Test No. 1
Date of Analysis 9-1-93
Transport Leakage [X] None [ ] _____ ml

Source LINE No. 1 DRYER
Test Site STACK
Date of Test 9-1-93
No. of Runs Completed 1
Technician R.R.
Solvent ACETONE

B	Test ____ Run 0 Field Blank Log Number ____ Vol. of Solvent ____ ml *Solvent Residue ____ ug/ml	Dish No. ____ Dish Tare Wt. ____ g Dish+Sample Wt. ____ g Sample Wt. ____ g
1	Test 1 Run 1 Vol. of Solvent 100 ml Log Number ____ Comments ____	Dish No. 105 Dish Tare Wt. 47.8751 g Dish+Sample Wt. 47.9113 g Sample Wt. .0362 g
2	Test ____ Run ____ Vol. of Solvent ____ ml Log Number ____ Comments ____	Dish No. ____ Dish Tare Wt. ____ g Dish+Sample Wt. ____ g Sample Wt. ____ g
3	Test ____ Run ____ Vol. of Solvent ____ ml Log Number ____ Comments ____	Dish No. ____ Dish Tare Wt. ____ g Dish+Sample Wt. ____ g Sample Wt. ____ g
4	Test ____ Run ____ Vol. of Solvent ____ ml Log Number ____ Comments ____	Dish No. ____ Dish Tare Wt. ____ g Dish+Sample Wt. ____ g Sample Wt. ____ g
5	Test ____ Run ____ Vol. of Solvent ____ ml Log Number ____ Comments ____	Dish No. ____ Dish Tare Wt. ____ g Dish+Sample Wt. ____ g Sample Wt. ____ g

*Solvent Residue ___ ug/ml = [(Sample Wt. ____ g)(10⁶)]/Vol. of Sol. ____ ml
EPA-M5 Acetone Residue Blank Spec. ≤ 7.8 ug/ml

Results:

Field Blk.	Run 1	Run 2	Run 3	Run 4	Run 5
	.0362		C-12		

LSC-01YR

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EPA Method 5 Data Reporting Sheet
Filter Gravimetrics

Job LP/HAYWARD
Team Leader Ron Rosenthal
Date Submitted 9-1-93
Test No. 1
Date of Analysis 9-1-93

Source LIME No. 1 DRYER
Test Site STACK
Date of Test 9-1-93
No. of Runs Completed 1
Technician R.R.

	Test ____ Run 0 ____ Field Blank Log Number ____ Comments ____	Filter No. ____ Filter Type ____ Filter Tare Wt. ____ g Filter+Sample Wt. ____ g Sample Wt. ____ g
1	Test 1 Run 1 Log Number ____ Comments ____	Filter No. 5486 Filter Type glass fiber (4") Filter Tare Wt. .9364 g Filter+Sample Wt. 1.0102 g Sample Wt. .0738 g
	Test ____ Run ____ Log Number ____ Comments ____	Filter No. ____ Filter Type ____ Filter Tare Wt. ____ g Filter+Sample Wt. ____ g Sample Wt. ____ g
3	Test ____ Run ____ Log Number ____ Comments ____	Filter No. ____ Filter Type ____ Filter Tare Wt. ____ g Filter+Sample Wt. ____ g Sample Wt. ____ g
4	Test ____ Run ____ Log Number ____ Comments ____	Filter No. ____ Filter Type ____ Filter Tare Wt. ____ g Filter+Sample Wt. ____ g Sample Wt. ____ g
5	Test ____ Run ____ Log Number ____ Comments ____	Filter No. ____ Filter Type ____ Filter Tare Wt. ____ g Filter+Sample Wt. ____ g Sample Wt. ____ g

Results:

Field Blk.	Run 1	Run 2	Run 3	Run 4	Run 5
	.0738				

Field Blk.	Run 1	Run 2	Run 3	Run 4	Run 5
	.1100				

LSC-02PR

Interpoll Laboratories
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EPA Method 5 Data Reporting Sheet
Impinger Catch/Wisconsin Protocol

Job L.P. Hayward — Source RTO
Team Leader DB — Test Site Inlet
Date Submitted 9-3-93 — Date of Test 9-1-93
Test No. 2 — No. of Runs Completed 3
Date of Analysis 9-9-93 — Technician C. Halvorson

		Solvent Phase	Aqueous Phase
0	Test 2 Run 0 Field Blank Log Number 9924-11 Comments	Dish No. 1 Dish Tare Wt. 51.9706 g Dish+Sample Wt. 51.9710 g Sample Wt. 0.0004 g	Dish No. 26 Dish Tare Wt. 48.3849 g Dish+Sample Wt. 48.3853 g Sample Wt. 0.0004 g
1	Test 2 Run 1 Log Number 9924-14 Comments	Dish No. 2 Dish Tare Wt. 46.2270 g Dish+Sample Wt. 46.2743 g Sample Wt. 0.0473 g	Dish No. 27 Dish Tare Wt. 52.4446 g Dish+Sample Wt. 52.5326 g Sample Wt. 0.0880 g
2	Test 2 Run 2 Log Number 9924-18 Comments	Dish No. 10 Dish Tare Wt. 47.5465 g Dish+Sample Wt. 47.5968 g Sample Wt. 0.0503 g	Dish No. 46 Dish Tare Wt. 42.4270 g Dish+Sample Wt. 42.5214 g Sample Wt. 0.0944 g
	Test 2 Run 3 Log Number 9924-22 Comments	Dish No. 12 Dish Tare Wt. 48.1492 g Dish+Sample Wt. 48.1942 g Sample Wt. 0.0450 g	Dish No. 49 Dish Tare Wt. 46.8796 g Dish+Sample Wt. 46.9565 g Sample Wt. 0.0769 g
4	Test ____ Run ____ Log Number ____ Comments ____	Dish No. ____ Dish Tare Wt. ____ g Dish+Sample Wt. ____ g Sample Wt. ____ g	Dish No. ____ Dish Tare Wt. ____ g Dish+Sample Wt. ____ g Sample Wt. ____ g
5	Test ____ Run ____ Log Number ____ Comments ____	Dish No. ____ Dish Tare Wt. ____ g Dish+Sample Wt. ____ g Sample Wt. ____ g	Dish No. ____ Dish Tare Wt. ____ g Dish+Sample Wt. ____ g Sample Wt. ____ g

Results Solvent Phase: Blank Solvent Wt. 0.0004g

Field Blk.	Run 1	Run 2	Run 3	Run 4	Run 5
	0.0469	0.0499	0.0446		

Results Aqueous Phase:

Field Blk.	Run 1	Run 2	Run 3	Run 4	Run 5
	0.0876	0.0940	0.0765		

LSC-03WYP

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EPA Method 5 Data Reporting Sheet
Probe/Cyclone Wash

Job L.P. Hayward
Team Leader DB
Date Submitted 9-3-93
Test No. 2
Date of Analysis 9-7-93
Transport Leakage [1] None [ ] _____ ml

Source RTO
Test Site Inlet
Date of Test 9-1-93
No. of Runs Completed 3
Technician C. Helveson
Solvent Acetone

	Test 2 Run 0 Field Blank Log Number 9424-09 Vol. of Solvent 140 ml *Solvent Residue 3.57 ug/ml	Dish No. 16 Dish Tare Wt. 49.1413 g Dish+Sample Wt. 49.1418 g Sample Wt. 0.0005 g
1	Test 2 Run 1 Vol. of Solvent 175 ml Log Number -12 Comments	Dish No. 17 Dish Tare Wt. 48.3907 g Dish+Sample Wt. 48.9149 g Sample Wt. 0.5242 g
2	Test 2 Run 2 Vol. of Solvent 165 ml Log Number -16 Comments	Dish No. 22 Dish Tare Wt. 51.3603 g Dish+Sample Wt. 51.5256 g Sample Wt. 0.1653 g
3	Test 2 Run 3 Vol. of Solvent 150 ml Log Number -20 Comments	Dish No. 31 Dish Tare Wt. 45.2707 g Dish+Sample Wt. 45.3496 g Sample Wt. 0.0789 g
4	Test ____ Run ____ Vol. of Solvent ____ ml Log Number ____ Comments	Dish No. ____ Dish Tare Wt. ____ g Dish+Sample Wt. ____ g Sample Wt. ____ g
5	Test ____ Run ____ Vol. of Solvent ____ ml Log Number ____ Comments	Dish No. ____ Dish Tare Wt. ____ g Dish+Sample Wt. ____ g Sample Wt. ____ g

*Solvent Residue 3.57 ug/ml = [(Sample Wt. 0.0005 g)(10^6)]/Vol. of Sol. 140 ml
EPA-MS Acetone Residue Blank Spec. < 7.8 ug/ml

Results:

Field Blk.	Run 1	Run 2	Run 3	Run 4	Run 5
	0.5236	0.1647	0.0784		

LSC-01YR

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EPA Method 5 Data Reporting Sheet
Filter Gravimetrics

Job L.P. Hayward
Team Leader DB
Date Submitted 9-3-93
Test No. 2
Date of Analysis 9-7-93

Source RTO
Test Site Inlet
Date of Test 9-1-93
No. of Runs Completed 3
Technician C. Nelson

0	Test 2 Run 0 Field Blank Log Number 9924-10 Comments	Filter No. 5712 Filter Type 4"6F Filter Tare Wt. .9043 g Filter+Sample Wt. .9048 g Sample Wt. 0.0005 g
1	Test 2 Run 1 Log Number -13 Comments	Filter No. 5711 Filter Type 4"6F Filter Tare Wt. .9180 g Filter+Sample Wt. .9790 g Sample Wt. 0.0610 g
	Test 2 Run 2 Log Number -17 Comments	Filter No. 5735 Filter Type 4"6F Filter Tare Wt. .9163 g Filter+Sample Wt. .9785 g Sample Wt. 0.0622 g
3	Test 2 Run 3 Log Number -21 Comments	Filter No. 5765 Filter Type 4"6F Filter Tare Wt. .9217 g Filter+Sample Wt. .9889 g Sample Wt. 0.0672 g
4	Test ____ Run ____ Log Number ____ Comments	Filter No. ____ Filter Type ____ Filter Tare Wt. ____ g Filter+Sample Wt. ____ g Sample Wt. ____ g
5	Test ____ Run ____ Log Number ____ Comments	Filter No. ____ Filter Type ____ Filter Tare Wt. ____ g Filter+Sample Wt. ____ g Sample Wt. ____ g

Results:

Field Blk.	Run 1	Run 2	Run 3	Run 4	Run 5
	0.0610	0.0622	0.0672		

Field Blk.	Run 1	Run 2	Run 3	Run 4	Run 5
	0.7191	0.3708	0.2667		

LSC-02PR

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EPA Method 5 Data Reporting Sheet
Impinger Catch/Wisconsin Protocol

Job C.P. Hayward — Source RTO outlet
Team Leader GH — Test Site Stack
Date Submitted 9-3-93 — Date of Test 9-1-93
Test No. 2 — No. of Runs Completed 3
Date of Analysis 9-9-93 — Technician C. Helgeson

		Solvent Phase	Aqueous Phase
0	Test ___ Run 0 Field Blank Log Number ___ Comments ___	Dish No. ___ Dish Tare Wt. ___ g Dish+Sample Wt. ___ g Sample Wt. ___ g	Dish No. ___ Dish Tare Wt. ___ g Dish+Sample Wt. ___ g Sample Wt. ___ g
1	Test 2 Run 1 Log Number 9924-26 Comments ___	Dish No. 18 Dish Tare Wt. 49.9875 g Dish+Sample Wt. 50.0001 g Sample Wt. 0.0126 g	Dish No. 28 Dish Tare Wt. 46.0417 g Dish+Sample Wt. 46.0470 g Sample Wt. 0.0053 g
2	Test 2 Run 2 Log Number -30 Comments ___	Dish No. 20 Dish Tare Wt. 48.5141 g Dish+Sample Wt. 48.8229 g Sample Wt. 0.0088 g	Dish No. 61 Dish Tare Wt. 44.5913 g Dish+Sample Wt. 44.5957 g Sample Wt. 0.0044 g
	Test 2 Run 3 Log Number -34 Comments ___	Dish No. 21 Dish Tare Wt. 47.5281 g Dish+Sample Wt. 47.5360 g Sample Wt. 0.0079 g	Dish No. 69 Dish Tare Wt. 47.9900 g Dish+Sample Wt. 47.9940 g Sample Wt. 0.0040 g
4	Test ___ Run ___ Log Number ___ Comments ___	Dish No. ___ Dish Tare Wt. ___ g Dish+Sample Wt. ___ g Sample Wt. ___ g	Dish No. ___ Dish Tare Wt. ___ g Dish+Sample Wt. ___ g Sample Wt. ___ g
5	Test ___ Run ___ Log Number ___ Comments ___	Dish No. ___ Dish Tare Wt. ___ g Dish+Sample Wt. ___ g Sample Wt. ___ g	Dish No. ___ Dish Tare Wt. ___ g Dish+Sample Wt. ___ g Sample Wt. ___ g

Results Solvent Phase: Blank Solvent Wt. 0.0004 g

Field Blk.	Run 1	Run 2	Run 3	Run 4	Run 5
	0.0122	0.0084	0.0075		

Results Aqueous Phase:

Field Blk.	Run 1	Run 2	Run 3	Run 4	Run 5
	0.0049	0.0040	0.0036		

LSC-03WYP

Interpoll Laboratories
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EPA Method 5 Data Reporting Sheet
Probe/Cyclone Wash

Job L.P. Hayward
Team Leader GH
Date Submitted 9-3-93
Test No. 2
Date of Analysis 9-7-93
Transport Leakage ☒ None ☐ _____ ml

Source RTO outlet
Test Site Stack
Date of Test 9-1-93
No. of Runs Completed 3
Technician C. Helgeson
Solvent Acetone

	Test _____ Run 0 Field Blank Log Number _____ Vol. of Solvent _____ ml *Solvent Residue 3.57 ug/ml	Dish No. _____ Dish Tare Wt. _____ g Dish+Sample Wt. _____ g Sample Wt. _____ g
1	Test 2 Run 1 Vol. of Solvent 60 ml Log Number 9924-24 Comments _____	Dish No. 3 Dish Tare Wt. 52.1204 g Dish+Sample Wt. 52.2113 g Sample Wt. 0.0909 g
2	Test 2 Run 2 Vol. of Solvent 55 ml Log Number -28 Comments _____	Dish No. 6 Dish Tare Wt. 48.2711 g Dish+Sample Wt. 48.3232 g Sample Wt. 0.0521 g
3	Test 2 Run 3 Vol. of Solvent 50 ml Log Number -32 Comments _____	Dish No. 11 Dish Tare Wt. 47.7599 g Dish+Sample Wt. 47.7960 g Sample Wt. 0.0361 g
4	Test _____ Run _____ Vol. of Solvent _____ ml Log Number _____ Comments _____	Dish No. _____ Dish Tare Wt. _____ g Dish+Sample Wt. _____ g Sample Wt. _____ g
5	Test _____ Run _____ Vol. of Solvent _____ ml Log Number _____ Comments _____	Dish No. _____ Dish Tare Wt. _____ g Dish+Sample Wt. _____ g 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

Results:

Field Blk.	Run 1	Run 2	Run 3	Run 4	Run 5
	0.0907	0.0519	0.0359	C-18	

LSC-01YR