AP42 Section: 10.6.1

Reference Number: 16

Title: Report Of Air Emissions Tests For Kirby Forest Industries Silsbee OSB Plant, prepared for Louisiana-Pacific Corporation, by Environmental Monitoring Laboratories,

April 1992.

10.6.1

Kirby Forest Industries, Inc.

A wholly-owned subsidiary of
Louisiana-Pacific Corporation

Post Office Box 3107
Conroe, Texas 77305
409/756-0541

RB
~~WR~~
HF0011W

October 10, 1991

Mr. Vic Fair, Regional Director
Texas Air Control Board
4605B Concord Road
Beaumont, Texas 77703

Ref: Kirby Forest Industries
Silsbee Particlebaord Facility

Dear Mr. Fair:

As per my conversation of today with Mr. Richard Black, attached please find a copy of the report of air emissions test for Kirby particleboard, Silsbee, Texas. I regret the confusion over the report. Production during this period of time was equivalent to the permit amendment request for 100 million square feet ona 3/4" basis.

If you need additional information, please contact me, I will be happy to provide it.

Very truly yours,

James T. Boswell

James T. Boswell, Ph.D.
Director, Environmental Control

JTB/ml
Attachment - Report of Air Emissions, May 20-24, 1991

Test received 10/14/91 - WR

REPORT OF
AIR EMISSIONS TESTS
FOR
KIRBY FOREST INDUSTRIES
SILSBEE PARTICLEBOARD PLANT

Silsbee, Texas
May 20 through 24, 1991

Performed By:
Environmental Monitoring Laboratories
Ridgeland, Mississippi
(601-856-3092)

ENVIRONMENTAL MONITORING LABORATORIES, INC.

P.O. Box 655 • 224-B Hwy 51 North
Ridgeland, Mississippi 39158

(601)856-3092

July 16, 1991

Subject: Kirby Forest Industries
Silsbee, Texas Particleboard Plant

On May 20 through 24, 1991, Environmental Monitoring Laboratories conducted air emissions tests for Kirby Forest Industries' particleboard facility in Silsbee, Texas. Testing was performed to determine stack emissions from the core and face dryer multiclones, the dryer furnish multiclone, and from three press vents (Nos. 2, 3, and 4). All sources were tested for particulate (PM). The dryer multiclones were sampled for PM, VOC, CO, and formaldehyde (HCHO). The press vents were sampled for PM and VOC. In addition, ground level sampling upwind and downwind of the facility was done for urea, phenol, and formaldehyde.

A summary of the stack test results in pounds per hour:

		PM	VOC	CO	HCHO
C-004	Furnish Multiclone (5-20-91)....	1.13	n/a	n/a	n/a
C-005	Core Dryer Multiclone (5-22-91).	1.04	3.91	2.87	0.05
C-006	Face Dryer Multiclone (5-21-91).	0.79	6.95	2.15	0.20
V-016	No. 2 Press Vent (5-23-91).....	2.63	7.09	n/a	0.15
V-017	No. 3 Press Vent (5-23-91).....	1.20	1.09	n/a	0.19
V-018	Cooling Wheel Vent (5-24-91)....	1.14	0.88	n/a	0.18

A summary of the ground level test results in ppm:

	Urea	HCHO	Phenol
Average upwind concentrations	<.01	<.2	nd
Average downwind concentrations	<.01	<.2	nd

The testing project was coordinated by Dr. Jim Boswell of Louisiana Pacific. Mr. Bill Randall of the Texas Air Control Board was present to witness the testing. Danny Russell of Environmental Monitoring Laboratories was responsible for the collection and analysis of the samples. Sample custody was limited to Mr. Russell with the exception of samples for HCHO, urea, and phenol. Those samples were delivered to Bonner Analytical Laboratories in Hattiesburg, Mississippi for analysis.

Following is a report of the test.

REPORT OF AIR EMISSIONS TESTS
FOR KIRBY FOREST INDUSTRIES
SILSBEE PARTICLEBOARD PLANT
SILSBEE, TEXAS
MAY 20 THROUGH 24, 1991

CONTENTS

REPORT CERTIFICATION

I certify that I have examined the information submitted herein, and based upon my inquiries of those directly responsible for obtaining the data or upon my direct acquisition of the data, I believe the submitted information is true, accurate and complete.

Signed 

Daniel G. Russell

1.0 Test Results: The following tables present the measured flow parameters and test results for three separate emissions samples for each of 6 emission points at Kirby Forest Industries in Silsbee, Texas on May 20 through 24, 1991, and results of ground level testing upwind and downwind of the facility.

1.1 C-004 Dryer Furnish Multiclone - East of two exhausts:

Results presented in this table are of one of two exhausts from the dryer furnish multiclone. The two stub stacks were equipped with extensions for testing purposes. Only one of the two outlets was tested and deemed to represent one half of the total emissions from the source. Emission rates and volumetric flowrates shown in this table then, can be doubled to determine source rates.

Run. No.		1	2	3	avg.
Date		05-50-91	05-50-91	05-50-91	------
Time start		1259	1514	1643	------
Time end		1416	1162	1754	------
PARTICULATE EMISSIONS	#/hr.	1.68	0.94	0.77	1.13
PARTICULATE EMISSIONS	gr/dscf	0.019	0.011	0.009	0.013
VOLUMETRIC FLOWRATE	acfm	11541	10989	11105	11211
VOLUMETRIC FLOWRATE	dscfm	10193	9822	10004	10006
VELOCITY	ft./sec.	24.4	23.3	23.5	23.7
STACK TEMPERATURE	degrees F	110	108	102	107
MOISTURE	%	4.52	3.81	4.07	4.13
SAMPLE RATE	%isokinetic	102	103	103	103

1.2 C-006 Face Dryer Multiclone: (North of two exhausts)

Results presented in this table are of one of two exhausts from the dryer furnish multiclone. The two stub stacks were equipped with extensions for testing purposes. Only one of the two outlets was tested and deemed to represent one half of the total emissions from the source. Emission rates and volumetric flowrates shown in this table then, can be doubled to determine source rates.

Run. No.		1	2	3	avg.
Date		05-21-91	05-21-91	05-21-91	------
Time start		1207	1514	1716	------
Time end		1317	1625	1824	------
PARTICULATE EMISSIONS	#/hr.	0.63	0.87	0.89	0.79
PARTICULATE EMISSIONS	gr/dscf	0.005	0.006	0.008	0.007
CO EMISSIONS	#/hr.	2.96	1.16	2.34	2.15
CO EMISSIONS	ppm	49	17	41	36
VOC EMISSIONS	#/hr.	4.87	6.33	9.65	6.95
VOC EMISSIONS	ppm as C	189	212	396	266
HCHO EMISSIONS	#/hr.	0.11	0.17	0.34	0.20
HCHO EMISSIONS	ppm	1.6	2.3	5.5	3.0
VOLUMETRIC FLOWRATE	acfm	16568	18976	15636	17060
VOLUMETRIC FLOWRATE	dscfm	13795	15961	13030	14262
VELOCITY	ft./sec.	35.1	40.2	33.1	36.1
STACK TEMPERATURE	degrees F	143	137	138	140
MOISTURE	%	4.65	4.61	5.36	4.87
SAMPLE RATE	%isokinetic	99	102	102	101

1.3 C-005 Core Dryer Polutrol (North of two exhausts)

Results presented in this table are of one of two exhausts from the dryer furnish multiclone. The two stub stacks were equipped with extensions for testing purposes. Only one of the two outlets was tested and deemed to represent one half of the total emissions from the source. Emission rates and volumetric flowrates shown in this table then, can be doubled to determine source rates.

Run. No.		1	2	3	avg.
Date		05-22-91	05-22-91	05-22-91	------
Time start		0957	1144	1504	------
Time end		1107	1256	1617	------
PARTICULATE EMISSIONS	#/hr.	1.24	1.01	0.88	1.04
PARTICULATE EMISSIONS	gr/dscf	0.010	0.008	0.007	0.008
CO EMISSIONS	#/hr.	4.51	2.41	1.68	2.87
CO EMISSIONS	ppm	69	38	25	44
VOC EMISSIONS	#/hr.	4.21	3.66	3.85	3.91
VOC EMISSIONS	ppm	150	133	136	140
HCHO EMISSIONS	#/hr.	0.08	0.02	0.05	0.05
HCHO EMISSIONS	ppm	1.11	0.29	0.75	0.72
VOLUMETRIC FLOWRATE	acfm	18042	18101	18651	18265
VOLUMETRIC FLOWRATE	dscfm	14992	14743	15201	14979
VELOCITY	ft./sec.	38.2	38.3	39.5	38.7
STACK TEMPERATURE	degrees F	151	162	162	158
MOISTURE	%	3.72	4.00	3.94	3.89
SAMPLE RATE	%isokinetic	100	102	104	102

1.4 V-016 Press Vent No. 2

Run. No.		1	2	3	avg.
Date		05-23-91	05-23-91	05-23-91	------
Time start		1136	1355	1530	------
Time end		1236	1455	1630	------
PARTICULATE EMISSIONS	#/hr.	3.47	2.88	1.56	2.63
PARTICULATE EMISSIONS	gr/dscf	0.029	0.020	0.013	0.021
VOC EMISSIONS	#/hr.	3.11	7.40	10.75	7.09
VOC EMISSIONS	ppm	121	242	408	257
HCHO EMISSIONS	#/hr.	0.16	0.17	0.10	0.15
HCHO EMISSIONS	ppm	2.52	2.25	1.55	2.11
VOLUMETRIC FLOWRATE	acfm	27598	27715	27581	27631
VOLUMETRIC FLOWRATE	dscfm	24306	24345	24413	24355
VELOCITY	ft./sec.	33.7	33.9	33.7	33.8
STACK TEMPERATURE	degrees F	115	121	155	117
MOISTURE	%	4.16	3.27	3.58	3.67
SAMPLE RATE	%isokinetic	99	97	97	98

1.5 V-017 Press Vent No. 3

Run. No.		1	2	3	avg.
Date		05-23-91	05-23-91	05-23-91	------
Time start		1743	1909	2030	------
Time end		1843	2009	2130	------
PARTICULATE EMISSIONS	#/hr.	1.23	1.18	1.18	1.20
PARTICULATE EMISSIONS	gr/dscf	0.010	0.010	0.009	0.010
VOC EMISSIONS	#/hr.	1.33	0.85	1.10	1.09
VOC EMISSIONS	ppm	49	33	38	40
HCHO EMISSIONS	#/hr.	0.19	0.28	0.10	0.19
HCHO EMISSIONS	ppm	2.91	4.40	1.37	2.89
VOLUMETRIC FLOWRATE	acfm	26666	26774	26659	26700
VOLUMETRIC FLOWRATE	dscfm	24197	24075	24198	24157
VELOCITY	ft./sec.	32.6	32.7	32.6	32.6
STACK TEMPERATURE	degrees F	101	105	101	102
MOISTURE	%	3.50	3.65	3.53	3.56
SAMPLE RATE	%isokinetic	96	95	94	95

1.6 V-018 Cooling Wheel Vent (Press Vent No. 4)

Run. No.		1	2	3	avg.
Date		05-24-91	05-24-91	05-24-91	------
Time start		0906	1049	1238	------
Time end		1018	1210	1405	------
PARTICULATE EMISSIONS	#/hr.	1.20	1.45	0.76	1.14
PARTICULATE EMISSIONS	gr/dscf	0.005	0.007	0.003	0.005
VOC EMISSIONS	#/hr.	1.02	0.65	0.97	0.88
VOC EMISSIONS	ppm	21	14	20	18
HCHO EMISSIONS	#/hr.	0.16	0.10	0.28	0.18
HCHO EMISSIONS	ppm	1.3	0.8	2.3	1.5
VOLUMETRIC FLOWRATE	acfm	28366	28484	28433	28428
VOLUMETRIC FLOWRATE	dscfm	25748	25586	25606	25647
VELOCITY	ft./sec.	34.7	34.8	34.8	34.8
STACK TEMPERATURE	degrees F	106	112	110	109
MOISTURE	%	2.76	2.68	2.88	2.77
SAMPLE RATE	%isokinetic	96	95	95	96

1.7 Results of ground level sampling: Samples for ambient levels of urea, formaldehyde, and phenol were taken on May 22 and 23, 1991

Calculations:
Sample volume at std. conditions: (minutes)(flow rate)(Pbar/29.92)(528/Ta)
ppm: (mg sample/volume, liters)(24040/mw)
mw HCHO = 30
mw Phenol = 94
mw Urea = 60

Formaldehyde concentration determinations

Sample ID	Date	Minutes Sampled	Calib. Flow, lpm	Pbar in. Hg	Ta Deg F	Volume std ml	Sample wt. ug	HCHO ppm
Downwind R1	05-22-91	244	.0984	29.92	88	23133	3.5	.12
Downwind R2	05-23-91	260	.0984	29.92	87	24695	0	0
Downwind R3	05-23-91	236	.0984	29.90	89	22334	9.7	.35
Upwind R1	05-22-91	226	.0945	29.92	88	20578	4.5	.18
Upwind R2	05-23-91	266	.0945	29.92	87	24264	0	0
Upwind R3	05-23-91	236	.0945	29.90	89	21449	7	.26

Phenol concentration determinations

Sample ID	Date	Minutes Sampled	Calib. Flow, lpm	Pbar in. Hg	Ta Deg F	Volume std ml	Sample wt. ug	Phenol ppm
Downwind R1	05-22-91	244	.0937	29.92	88	22028	nd	nd
Downwind R2	05-23-91	260	.0937	29.92	87	23516	nd	nd
Downwind R3	05-23-91	236	.0937	29.90	89	21253	nd	nd
Upwind R1	05-22-91	226	.0952	29.92	88	20730	nd	nd
Upwind R2	05-23-91	266	.0952	29.92	87	24444	nd	nd
Upwind R3	05-23-91	236	.0952	29.90	89	21593	nd	nd

Urea concentration determinations

Sample ID	Date	Minutes Sampled	Calib. Flow, lpm	Pbar in. Hg	Ta Deg F	Volume liters	Sample wt. ug	Phenol ppm
Downwind R1	05-22-91	244	.909	29.92	88	214	.346	.0006
Downwind R2	05-23-91	260	.909	29.92	87	228	.446	.0008
Downwind R3	05-23-91	236	.909	29.90	89	206	.771	.0015
Upwind R1	05-22-91	226	.896	29.92	88	195	.533	.0011
Upwind R2	05-23-91	266	.896	29.92	87	230	.596	.0010
Upwind R3	05-23-91	236	.896	29.90	89	203	.564	.0011

2.0 Source Description: Kirby Forest Industries in Silsbee, Texas is a producer of particleboard. More detailed descriptions of the processes and operating rates, and operating conditions during the tests are supplied by Kirby Forest Industries.

Each of the Polutrol multiclones exhausts to the atmosphere by way of two stub stacks. In order to be tested by Method 5, stack extensions were temporarily installed on both outlets. Only one of the outlets was tested and results were deemed to represent one half of the total source emissions. The stack extension was a vertical rectangular duct measuring 36 inches vertical by 31.5 inches horizontal by 96 inches long. Flow straighteners were installed at the transition. Five sample ports were installed on the vertical wall of the extension at a location which was 18 inches (.5 diameters) upstream of the exit and 68 inches (2 diameters) downstream of the transition. The press vents are axial fan powered roof ventilators equipped with short stub stacks approximately 48 inches in diameter. Test ports are provided at a location approximately 18 inches below the axial fan and about 15 inches above the roof opening. The diameter at the sample location is 50 inches. These locations do not meet minimum configuration for Method 2. However, a velocity profile and check for cyclonic flow indicated laminar flow at the test location. Testing at this location was done with prior approval of the TACB.

For testing of the V-016 and the V-017 press vents, deviation from standard test procedures described in Section 3.0 was necessary due to the cyclic nature of the operation of those units. Those vents were turned on and off at approximate three minute intervals such that total operating minutes during a one hour period averaged just over 36 minutes. Each sample period was pre-determined to be for 60 minutes total elapsed time but sampling during the 60 minute period was done only when the vent blowers were on and the accumulated operating time was measured. Flow rates for those sources were determined by making preliminary velocity traverses and then sampling at a single representative sample point. Mass rates were calculated based on the hour fraction that the unit operated.

3.0 Test Procedures: Test procedures used are those described in the Code of Federal Regulations, Title 40, Part 60, Appendix A. Specifically those procedures used were Method 1 to determine the number of sample points, Method 3 to determine carbon dioxide and oxygen content of the stack gas, and Method 5 to determine flow rates, moisture content, and particulate emissions. The sampling train used is identical to that described in Method 5. VOC emissions were measured using Method 25A (continuous monitoring with a flame ionization detector). The FID is equipped with multiple scales. The 0 to 100 ppm scale and the 0 to 1000 ppm scale were used for calibrations using zero air, 22.1 ppm propane, and 796 ppm propane. The scales are linear, and in order to obtain best resolution, the 0 to 100 ppm scale was used for recording emissions concentrations. Calibrations are made with propane (C_3H_8). Therefore, to obtain results as methane (CH_3) (or as carbon), measured concentrations were increased by a factor of three. Carbon monoxide concentration was determined using the continuous sampling technique described in Method 10 using a Beckman NDIR instrument.

Particulate filters were recovered by rinsing the front half of the filter holder into the probe wash and securing the filters in glass petri dishes. Part of the sample filter normally adheres to the filter gasket, and some of the adhering material is recovered into the probe wash. Therefore some of the filter weight is attributed to the probe wash weight.

Filters were heated in an oven for 2 hours at 105° C, desiccated at least 24 hours and weighed to constant weight. Probe wash samples in acetone were evaporated to dryness over low heat in tarred beakers, desiccated for at least 24 hours and weighed to constant weight. Weighings are made at 6 hour or greater intervals (samples stored in desiccator). Final weights are considered valid and are recorded if there is no more than 0.5 milligrams difference from the previous weighing.

Ground level sampling for urea, formaldehyde, and phenol was conducted simultaneously at areas generally upwind and downwind of the plant. Three separate sampling periods were made for four hour durations during two of three days when conditions were deemed appropriate. Sampling for urea was done by using a calibrated personnel sampling pump and two midget impingers containing .1 N NaOH. The sample rate was approximately 2 liters per minute. Analyses were made using 40 CFR 136 Method 351.3. Sampling for formaldehyde was done using NIOSH procedure 2541. Samples were collected using a calibrated personnel pump and treated XAD-2 resin tubes and a sample rate of approximately 100 milliliters per minute. Sampling for phenol was done using OSHA procedure 32. Samples were collected using a calibrated personnel pump and XAD-7 resin tubes and a sample rate of approximately 100 milliliters per minute. Because of relatively high blank values, the formaldehyde results may not be representative of true ground level concentrations. Sampling for extended periods may be necessary to satisfactorily quantify ground level formaldehyde.

4.0 Data Reduction

Kirby Forest Industries - Silsbee Particleboard Plant
C-004 Dryer Furnish Polutrol
PM/CO/VOC/HCHO Emissions Tests May 20, 1991

Collected test data	RUN 1	RUN 2	RUN 3	
1. As : sq ft	7.875	7.875	7.875	
2. Dn : in.	.27	.301	.301	
3. Cp : dimensionless	.84	.84	.84	
4. Theta : minutes	60	60	60	
5. Y : dimensionless	1.00	1.00	1.00	
6. Pbar : in. Hg	29.91	29.91	29.91	
7. Pg : in. H2O	-.15	-.15	-.15	
8. Vm : cf (dry gas)	32.84	39.578	40.376	
9. sqr(DP),avg: in.H2O^.5	.4146	.3962	.4023	
10. DH : in. H2O	.8504	1.34	1.386	
11. ts : degrees F	110.40	107.80	101.88	106.69
12. tm : degrees F	94.14	90.86	90.42	
13. Vlc : ml	31.5	32	35	
14. CO2 : percent	.00	.00	.00	
15. O2 : percent	20.90	20.90	20.90	
17. M,PM : milligrams				
a. Front half	36.5	22.5	19.3	
b. Back half	2.6	5.1	3.2	

Kirby Forest Industries - Silsbee Particleboard Plant
C-004 Dryer Furnish Polutrol
PM/CO/VOC/HCHO Emissions Tests May 20, 1991

Calculations:	RUN 1	RUN 2	RUN 3	AVG.
1. Pm : in.Hg (DH/13.6)+Pbar	29.97	30.01	30.01	N/A
2. Ps : in. Hg (Pg/13.6)+Pbar	29.90	29.90	29.90	N/A
3. An : sq ft ((Dn/24)^2)(3.1416)	3.976e-4	4.942e-4	4.942e-4	N/A
4. Vmstd: dscf Vm Y(Pm/Pstd)(Tstd/Tm)	31.34580	38.04781	38.85036	N/A
5. Vwstd: scf (.04707cf/ml)(Vlc)	1.482705	1.50624	1.64745	N/A
6. Bws : dimensionless Vwstd/(Vwstd+Vmstd)	.0451652	.0380806	.0406800	.0413086
7. Md : mol.wt. dry basis .44 CO2+.32 O2+.28(CO+N2)	28.836	28.836	28.836	N/A
8. Ms : mol.wt. wet basis Md(1-Bws)+18 Bws	28.35	28.42	28.40	N/A
9. Vs : ft/sec Kp Cp (sqrDP)sqr(Ts/(Ps Ms))	24.43	23.26	23.50	23.73
10. Q : cfm Vs As(60 sec/min)	11541	10989	11105	11211
11. Qstd : dscfm Q(1-Bws)(Ps/Pstd)(Tstd/Ts)	10193	9822	10004	10006
12. I : percent [(100 Ts)(.002669 Vlc+(Vm Pm/Tm)]/ (60 Theta Vs Ps An)	101.51	102.89	103.15	102.52
13. E,PM : pounds/hr (Mn/Vmstd)(Qstd)(60)/453590				
a. Front half	1.57	.77	.66	1.00
b. Back half	.11	.17	.11	.13
Total	1.68	.94	.77	1.13
14. C,PM : grains/dscf (Mn/Vmstd)(.0154 grains/mg)				
a. Front half	.0179322	.0091070	.0076504	.0115632
b. Back half	.0012774	.0020642	.0012685	.0015367
Total	.0192096	.0111712	.0089188	.0130999

Kirby Forest Industries - Silsbee Particleboard Plant
C-006 Face Dryer Polutrol
PM/CO/VOC/HCHO Emissions Tests May 21, 1991

Collected test data		RUN 1	RUN 2	RUN 3	
1. As	: sq ft	7.875	7.875	7.875	
2. Dn	: in.	.301	.301	.301	
3. Cp	: dimensionless	.84	.84	.84	
4. Theta	: minutes	60	60	60	
5. Y	: dimensionless	1.00	1.00	1.00	
6. Pbar	: in. Hg	29.86	29.86	29.86	
7. Pg	: in. H2O	-.2	-.2	-.2	
8. Vm	: cf (dry gas)	53.511	64.853	52.999	
9. sqr(DP),avg	: in.H2O^.5	.5789	.6664	.5479	
10. DH	: in. H2O	2.608	3.558	2.436	
11. ts	: degrees F	143.16	137.32	138.12	139.53
12. tm	: degrees F	94.26	101.64	103.94	
13. Vlc	: ml	53	63	60	
14. CO2	: percent	.87	1.00	.93	
15. O2	: percent	19.33	19.00	19.17	
16. CO	: ppm (NDIR)	49.20	16.60	41.10	36
17. M,PM	: milligrams				
a. Front half		16.9	21.5	22.6	
b. Back half		.8	3.7	3	
18. C,VOC	: ppm as propane	62.92	70.68	132	89
19. HCHO	: ppm	1.63	2.27	5.51	3

Kirby Forest Industries - Silsbee Particleboard Plant
C-006 Face Dryer Polutrol
PM/CO/VOC/HCHO Emissions Tests May 21, 1991

Calculations:	RUN 1	RUN 2	RUN 3	AVG.
1. Pm : in.Hg (DH/13.6)+Pbar	30.05	30.12	30.04	N/A
2. Ps : in. Hg (Pg/13.6)+Pbar	29.85	29.85	29.85	N/A
3. An : sq ft ((Dn/24)^2)(3.1416)	4.942e-4	4.942e-4	4.942e-4	N/A
4. Vmstd: dscf Vm Y(Pm/Pstd)(Tstd/Tm)	51.20022	61.37940	49.81892	N/A
5. Vwstd: scf (.04707cf/ml)(Vlc)	2.49471	2.96541	2.8242	N/A
6. Bws : dimensionless Vwstd/(Vwstd+Vmstd)	.0464608	.0460862	.0536480	.0487317
7. Md : mol.wt. dry basis .44 CO2+.32 O2+.28(CO+N2)	28.91187	28.92	28.91613	N/A
8. Ms : mol.wt. wet basis Md(1-Bws)+18 Bws	28.40	28.42	28.33	N/A
9. Vs : ft/sec Kp Cp (sqrDP)sqr(Ts/(Ps Ms))	35.07	40.16	33.09	36.11
10. Q : cfm Vs As(60 sec/min)	16568	18976	15636	17060
11. Qstd : dscfm Q(1-Bws)(Ps/Pstd)(Tstd/Ts)	13795	15961	13030	14262
12. I : percent [(100 Ts)(.002669 Vlc+(Vm Pm/Tm)]/ (60 Theta Vs Ps An)	98.58	102.14	101.56	100.76
13. E,PM : pounds/hr (Mn/Vmstd)(Qstd)(60)/453590				
a. Front half	.60	.74	.78	.71
b. Back half	.03	.13	.10	.09
Total	.63	.87	.89	.79
14. C,PM : grains/dscf (Mn/Vmstd)(.0154 grains/mg)				
a. Front half	.0050832	.0053943	.0069861	.0058212
b. Back half	.0002406	.0009283	.0009274	.0006988
Total	.0053238	.0063226	.0079135	.0065200
15. E,CO : pounds/hr (C,CO*7.2708e-8)(60)(Qstd)	2.96	1.16	2.34	2.15
16. C,VOC: ppm (C,VOC as propane)(3)	189	212	396	266
17. E,VOC: pounds/hr (C,VOC*3.1161e-8)(60)(Qstd)	4.87	6.33	9.65	6.95
18. E,HCHO: pounds/hr (C,HCHO)(7.7902e-08)	.11	.17	.34	.20

Kirby Forest Industries - Silsbee Particleboard Plant
C-005 Core Dryer Polutrol
PM/CO/VOC/HCHO Emissions Tests May 22, 1991

Collected test data	RUN 1	RUN 2	RUN 3	
1. As : sq ft	7.875	7.875	7.875	
2. Dn : in.	.301	.301	.301	
3. Cp : dimensionless	.84	.84	.84	
4. Theta : minutes	60	60	60	
5. Y : dimensionless	1.00	1.00	1.00	
6. Pbar : in. Hg	29.92	29.92	29.92	
7. Pg : in. H2O	-.23	-.23	-.23	
8. Vm : cf (dry gas)	59.822	59.42	62.166	
9. sqr(DP),avg: in.H2O^.5	.6282	.6246	.6436	
10. DH : in. H2O	3.17	3.144	3.36	
11. ts : degrees F	151.44	162.00	161.92	158.45
12. tm : degrees F	101.56	99.34	95.22	
13. Vlc : ml	46.5	50	52	
14. CO2 : percent	1.00	1.00	1.00	
15. O2 : percent	19.70	19.80	19.60	
16. CO : ppm (NDIR)	68.90	37.50	25.40	44
17. M,PM : milligrams				
a. Front half	35.1	28.3	24.4	
b. Back half	.3	1	1.8	
18. C,VOC : ppm as propane	50.08	44.32	45.2	47
19. HCHO : ppm	1.11	.29	.75	1

Kirby Forest Industries - Silsbee Particleboard Plant
C-005 Core Dryer Polutrol
PM/CO/VOC/HCHO Emissions Tests May 22, 1991

Calculations:	RUN 1	RUN 2	RUN 3	AVG.
1. Pm : in.Hg (DH/13.6)+Pbar	30.15	30.15	30.17	N/A
2. Ps : in. Hg (Pg/13.6)+Pbar	29.90	29.90	29.90	N/A
3. An : sq ft ((Dn/24)^2)(3.1416)	4.942e-4	4.942e-4	4.942e-4	N/A
4. Vmstd: dscf Vm Y(Pm/Pstd)(Tstd/Tm)	56.68510	56.52406	59.60643	N/A
5. Vwstd: scf (.04707cf/ml)(Vlc)	2.188755	2.3535	2.44764	N/A
6. Bws : dimensionless Vwstd/(Vwstd+Vmstd)	.0371770	.0399728	.0394437	.0388645
7. Md : mol.wt. dry basis .44 CO2+.32 O2+.28(CO+N2)	28.948	28.952	28.944	N/A
8. Ms : mol.wt. wet basis Md(1-Bws)+18 Bws	28.54	28.51	28.51	N/A
9. Vs : ft/sec Kp Cp (sqrDP)sqr(Ts/(Ps Ms))	38.18	38.31	39.47	38.66
10. Q : cfm Vs As(60 sec/min)	18042	18101	18651	18265
11. Qstd : dscfm Q(1-Bws)(Ps/Pstd)(Tstd/Ts)	14992	14743	15201	14979
12. I : percent [(100 Ts)(.002669 Vlc+(Vm Pm/Tm)]/ (60 Theta Vs Ps An)	100.43	101.83	104.15	102.14
13. E,PM : pounds/hr (Mn/Vmstd)(Qstd)(60)/453590				
a. Front half	1.23	.98	.82	1.01
b. Back half	.01	.03	.06	.04
Total	1.24	1.01	.88	1.04
14. C,PM : grains/dscf (Mn/Vmstd)(.0154 grains/mg)				
a. Front half	.0095358	.0077103	.0063040	.0078501
b. Back half	.0000815	.0002725	.0004651	.0002730
Total	.0096173	.0079828	.0067691	.0081231
15. E,CO : pounds/hr (C,CO*7.2708e-8)(60)(Qstd)	4.51	2.41	1.68	2.87
16. C,VOC: ppm (C,VOC as propane)(3)	150	133	136	140
17. E,VOC: pounds/hr (C,VOC*3.1161e-8)(60)(Qstd)	4.21	3.66	3.85	3.91
18. E,HCHO: pounds/hr (C,HCHO)(7.7902e-08)	.08	.02	.05	.05

Kirby Forest Industries - Silsbee Particleboard Plant
V-016 Press Vent No. 2
PM/VOC/HCHO Emissions Tests May 23, 1991

Collected test data		RUN 1	RUN 2	RUN 3	
1. As	: sq ft	13.63538	13.63538	13.63538	
2. Dn	: in.	.301	.301	.301	
3. Cp	: dimensionless	.84	.84	.84	
4. Theta	: minutes	33.98333	40.41667	34.66667	
5. Y	: dimensionless	1.00	1.00	1.00	
6. Pbar	: in. Hg	29.92	29.92	29.92	
7. Pg	: in. H2O	0	0	0	
8. Vm	: cf (dry gas)	34.837	41.417	35.526	
9a sqr(DP),avg:	in.H2O^.5 (stack)	.5711	.5711	.5711	
9b sqr(DP),avg:	in.H2O^.5 (point)	.6458	.647	.6458	
10. DH	: in. H2O	3.5643	3.5833	3.5714	
11. ts	: degrees F	114.57	121.44	115.14	117.05
12. tm	: degrees F	91.93	105.83	103.43	
13. Vlc	: ml	31	28	26.5	
14. CO2	: percent	.00	.00	.00	
15. O2	: percent	20.90	20.90	20.90	
16. M,PM	: milligrams				
a. Front half		59.6	48.6	24.2	
b. Back half		4.4	3.2	3.8	
18. C,VOC	: ppm as propane	40.32	80.45	135.91	86
19. HCHO	: ppm	2.52	2.25	1.55	2

Kirby Forest Industries - Silsbee Particleboard Plant
V-016 Press Vent No. 2
PM/VOC/HCHO Emissions Tests May 23, 1991

Calculations:	RUN 1	RUN 2	RUN 3	AVG.
1. Pm : in.Hg (DH/13.6)+Pbar	30.18	30.18	30.18	N/A
2. Ps : in. Hg (Pg/13.6)+Pbar	29.92	29.92	29.92	N/A
3. An : sq ft ((Dn/24)^2)(3.1416)	4.942e-4	4.942e-4	4.942e-4	N/A
4. Vmstd: dscf Vm Y(Pm/Pstd)(Tstd/Tm)	33.61849	38.98830	33.58423	N/A
5. Vwstd: scf (.04707cf/ml)(Vlc)	1.45917	1.31796	1.247355	N/A
6. Bws : dimensionless Vwstd/(Vwstd+Vmstd)	.0415983	.0326986	.0358110	.0367026
7. Md : mol.wt. dry basis .44 CO2+.32 O2+.28(CO+N2)	28.836	28.836	28.836	N/A
8. Ms : mol.wt. wet basis Md(1-Bws)+18 Bws	28.39	28.48	28.45	N/A
9. Vs : ft/sec Kp Cp (sqrDP)sqr(Ts/(Ps Ms)) Stack Point	 33.73 38.14	 33.88 38.38	 33.71 38.12	 33.77 38.22
10. Q : cfm Vs(stack)As(60 sec/min)	27598	27715	27581	27631
11. Qstd : dscfm Q(1-Bws)(Ps/Pstd)(Tstd/Ts)	24306	24345	24413	24355
12. I : percent [(100 Ts)(.002669 Vlc+(Vm Pm/Tm)]/ (60 Theta Vs(point)Ps An)	99.32	96.51	96.83	97.56
13. E,PM : pounds/hr (Mn/Vmstd)(Qstd)(theta)/453590 a. Front half b. Back half Total	 3.23 .24 3.47	 2.70 .18 2.88	 1.34 .21 1.56	 2.43 .21 2.63
14. C,PM : grains/dscf (Mn/Vmstd)(.0154 grains/mg) a. Front half b. Back half Total	 .0273016 .0020156 .0293172	 .0191965 .0012640 .0204605	 .0110969 .0017425 .0128394	 .0191983 .0016740 .0208724
16. C,VOC: ppm (C,VOC as propane)(3)	121	241	408	257
17. E,VOC: pounds/hr (C,VOC*3.1161e-8)(theta)(Qstd)	3.11	7.40	10.75	7.09
18. E,HCHO: pounds/hr (C,HCHO)(7.7902e-08)(theta)Qstd	.16	.17	.10	.15

Kirby Forest Industries - Silsbee Particleboard Plant
V-017 Press Vent No. 3
PM/VOC/HCHO Emissions Tests May 23, 1991

Collected test data	RUN 1	RUN 2	RUN 3	
1. As : sq ft	13.63538	13.63538	13.63538	
2. Dn : in.	.301	.301	.301	
3. Cp : dimensionless	.84	.84	.84	
4. Theta : minutes	35.53333	34.41667	38.83333	
5. Y : dimensionless	1.00	1.00	1.00	
6. Pbar : in. Hg	29.91	29.90	29.90	
7. Pg : in. H2O	-.05	-.05	-.05	
8. Vm : cf (dry gas)	32.711	31.624	35.674	
9a sqr(DP),avg: in.H2O^.5 (stack)	.5589	.5589	.5589	
9b sqr(DP),avg: in.H2O^.5 (point)	.5831	.5843	.582	
10. DH : in. H2O	2.9438	2.8929	2.8875	
11. ts : degrees F	101.25	105.29	100.75	102.43
12. tm : degrees F	98.56	103.93	106.13	
13. Vlc : ml	24	24	26	
14. CO2 : percent	.00	.00	.00	
15. O2 : percent	20.90	20.90	20.90	
16. M,PM : milligrams				
a. Front half	14.4	16.4	16.8	
b. Back half	5.8	2.9	2.2	
18. C,VOC : ppm as propane	16.49	10.94	12.53	13
19. HCHO : ppm	2.91	4.4	1.37	3

Kirby Forest Industries - Silsbee Particleboard Plant
V-017 Press Vent No. 3
PM/CO/VOC/HCHO Emissions Tests May 23, 1991

Calculations:	RUN 1	RUN 2	RUN 3	AVG.
1. Pm : in.Hg (DH/13.6)+Pbar	30.13	30.11	30.11	N/A
2. Ps : in. Hg (Pg/13.6)+Pbar	29.91	29.90	29.90	N/A
3. An : sq ft ((Dn/24)^2)(3.1416)	4.942e-4	4.942e-4	4.942e-4	N/A
4. Vmstd: dscf Vm Y(Pm/Pstd)(Tstd/Tm)	31.13468	29.79983	33.48514	N/A
5. Vwstd: scf (.04707cf/ml)(Vlc)	1.12968	1.12968	1.22382	N/A
6. Bws : dimensionless Vwstd/(Vwstd+Vmstd)	.0350132	.0365243	.0352595	.0355990
7. Md : mol.wt. dry basis .44 CO2+.32 O2+.28(CO+N2)	28.836	28.836	28.836	N/A
8. Ms : mol.wt. wet basis Md(1-Bws)+18 Bws	28.46	28.44	28.45	N/A
9. Vs : ft/sec Kp Cp (sqrDP)sqr(Ts/(Ps Ms)) Stack Point	 32.59 34.01	 32.73 34.21	 32.59 33.93	 32.64 34.05
10. Q : cfm Vs(stack)As(60 sec/min)	26666	26774	26659	26700
11. Qstd : dscfm Q(1-Bws)(Ps/Pstd)(Tstd/Ts)	24197	24075	24198	24157
12. I : percent [(100 Ts)(.002669 Vlc+(Vm Pm/Tm)]/ (60 Theta Vs(point)Ps An)	95.78	94.93	94.43	95.04
13. E,PM : pounds/hr (Mn/Vmstd)(Qstd)(theta)/453590 a. Front half b. Back half Total	 .88 .35 1.23	 1.01 .18 1.18	 1.04 .14 1.18	 .97 .22 1.20
14. C,PM : grains/dscf (Mn/Vmstd)(.0154 grains/mg) a. Front half b. Back half Total	 .0071226 .0028688 .0099914	 .0084752 .0014987 .0099739	 .0077264 .0010118 .0087382	 .0077747 .0017931 .0095678
16. C,VOC: ppm (C,VOC as propane)(3)	49	33	38	40
17. E,VOC: pounds/hr (C,VOC*3.1161e-8)(theta)(Qstd)	1.33	.85	1.10	1.09
18. E,HCHO: pounds/hr (C,HCHO)(7.7902e-08)(theta)Qstd	.19	.28	.10	.19

Kirby Forest Industries - Silsbee Particleboard Plant
V-018 Cooling Wheel Vent (Press Vent No. 4)
PM/VOC/HCHO Emissions Tests May 24, 1991

Collected test data	RUN 1	RUN 2	RUN 3	
1. As : sq ft	13.63538	13.63538	13.63538	
2. Dn : in.	.301	.301	.301	
3. Cp : dimensionless	.84	.84	.84	
4. Theta : minutes	60	60	60	
5. Y : dimensionless	1.00	1.00	1.00	
6. Pbar : in. Hg	29.94	29.94	29.94	
7. Pg : in. H2O	-.08	-.08	-.08	
8. Vm : cf (dry gas)	56.888	55.929	55.853	
9. sqr(DP),avg: in.H2O^.5	.5932	.5924	.5925	
10. DH : in. H2O	3.0146	2.9875	2.9771	
11. ts : degrees F	105.88	112.33	109.67	109.29
12. tm : degrees F	102.60	101.17	99.19	
13. Vlc : ml	32.5	31	33.5	
14. CO2 : percent	.00	.00	.00	
15. O2 : percent	20.90	20.90	20.90	
16. M,PM : milligrams				
a. Front half	11.6	16.2	6.7	
b. Back half	7.4	6.6	5.3	
18. C,VOC : ppm as propane	7.08	4.54	6.75	6
19. HCHO : ppm	1.3	.82	2.32	1

Kirby Forest Industries - Silsbee Particleboard Plant
V-018 Cooling Wheel Vent (Press Vent No. 4)
PM/VOC/HCHO Emissions Tests May 24, 1991

Calculations:	RUN 1	RUN 2	RUN 3	AVG.
1. Pm : in.Hg (DH/13.6)+Pbar	30.16	30.16	30.16	N/A
2. Ps : in. Hg (Pg/13.6)+Pbar	29.93	29.93	29.93	N/A
3. An : sq ft ((Dn/24)^2)(3.1416)	4.942e-4	4.942e-4	4.942e-4	N/A
4. Vmstd: dscf Vm Y(Pm/Pstd)(Tstd/Tm)	53.82060	53.04464	53.15878	N/A
5. Vwstd: scf (.04707cf/ml)(Vlc)	1.529775	1.45917	1.576845	N/A
6. Bws : dimensionless Vwstd/(Vwstd+Vmstd)	.0276380	.0267719	.0288084	.0277394
7. Md : mol.wt. dry basis .44 CO2+.32 O2+.28(CO+N2)	28.836	28.836	28.836	N/A
8. Ms : mol.wt. wet basis Md(1-Bws)+18 Bws	28.54	28.55	28.52	N/A
9. Vs : ft/sec Kp Cp (sqrDP)sqr(Ts/(Ps Ms))	34.67	34.82	34.75	34.75
10. Q : cfm Vs As(60 sec/min)	28366	28484	28433	28428
11. Qstd : dscfm Q(1-Bws)(Ps/Pstd)(Tstd/Ts)	25748	25586	25606	25647
12. I : percent [(100 Ts)(.002669 Vlc+(Vm Pm/Tm)]/ (60 Theta Vs Ps An)	96.13	95.35	95.48	95.65
13. E,PM : pounds/hr (Mn/Vmstd)(Qstd)(60)/453590				
a. Front half	.73	1.03	.43	.73
b. Back half	.47	.42	.34	.41
Total	1.20	1.45	.76	1.14
14. C,PM : grains/dscf (Mn/Vmstd)(.0154 grains/mg)				
a. Front half	.0033192	.0047032	.0019410	.0033211
b. Back half	.0021174	.0019161	.0015354	.0018563
Total	.0054366	.0066193	.0034764	.0051774
16. C,VOC: ppm (C,VOC as propane)(3)	21	14	20	18
17. E,VOC: pounds/hr (C,VOC*3.1161e-8)(60)(Qstd)	1.02	.65	.97	.88
18. E,HCHO: pounds/hr (C,HCHO)(7.7902e-08)(theta)Qstd	.16	.10	.28	.18

Kirby Forest Industries
Formaldehyde concentration determinations
Treated XAD-2 sample tubes collected May 20 through 24, 1991
Stack Emissions Samples Taken with SKC 222-3

Calculations:

Sample volume at std. conditions:
(minutes)(flow rate)(Pbar/29.92)(528/Ta)

ppm: (mg sample/volume, liters)(24040/mw)

mw HCHO = 30

Sample ID	Counter Start	Counter Stop	Count	ml/ct	Pbar in. Hg	Ta Deg F	Volume std ml	Sample wt. ug	HCHO ppm
C006-1	320605	332714	12109	.46	29.86	82	5415	11	1.63
C006-2	332714	342221	9507	.46	29.87	85	4230	12	2.27
C006-3	342221	343814	1593	.46	29.87	82	713	4.9	5.51
C005-1	343852	354519	10667	.46	29.92	84	4763	6.6	1.11
C005-2	354519	366815	12296	.46	29.92	88	5450	2	.29
C005-3	366815	378947	12132	.46	29.92	88	5377	5	.75
PV16-1	378959	384327	5368	.46	29.92	87	2384	7.5	2.52
PV16-2	384327	390367	6040	.46	29.92	89	2672	7.5	2.25
PV16-3	390367	395515	5148	.46	29.91	90	2273	4.4	1.55
PV17-1	395515	401507	5992	.46	29.91	90	2645	9.6	2.91
PV17-2	401507	407208	5701	.46	29.9	83	2548	14	4.40
PV17-3	407208	413033	5825	.46	29.9	78	2628	4.5	1.37
PV18-1	413033	424031	10998	.46	29.94	80	4950	8	1.30
PV18-2	424031	435137	11106	.46	29.94	90	4908	5	.82
PV18-3	435137	446574	11437	.46	29.94	91	5045	14.6	2.32

5.0 NOMENCLATURE

SYMBOL	UNITS	DESCRIPTION
An	ft^2	Nozzle area
As	ft^2	Stack area
Bws	dimensionless	Proportion of water vapor
CO2	percent	Carbon dioxide content by volume
CO	percent	Carbon monoxide content by volume
Cp	dimensionless	Pitot correction factor
C,PM	grains/dscf	Particulate concentration
C'PM	gr/dscf@12% CO2	Particulate emissions corrected to 12% excess air
Dn	inches	Nozzle diameter
delta H	in. H2O	Pressure drop across meter orifice (also DH)
delta P	in. H2O	Stack velocity pressure head (also DP)
E,PM	#/hr	Particulate emission rate
F	dscf	Volume of flue gas per 10^6 BTU
I	per cent	Per cent isokinetic sampling
Kp	consistent	Pitot tube constant = 85.49
M,PM	milligrams	Particulate sample weight
Md	#/# mole	Dry molecular wt. of stack gas
Ms	#/# mole	Wet molecular wt. of stack gas
N2	percent	Nitrogen content by volume
O2	percent	Oxygen content by volume
Pbar	in. Hg	Barometric pressure
Pg	in. H2O	Static pressure
Pm	in. Hg	Meter pressure = Pbar+(delta H/13.6)
Ps	in. Hg	Stack pressure = Pbar+(Pg/13.6)
Pstd	in. Hg	Standard pressure = 29.92
Q	ft^3/min	Volumetric flow rate at stack conditions
Qstd	dscf/min	Volumetric flow rate at dry, std. conditions
Theta	minutes	Sampling time per run
tm	^oF	Meter temperature (Tm denotes ^oR)
ts	^oF	Stack temperature (Ts denotes ^oR)
Tstd	^oR	Standard temperature = 528^o
Vlc	ml	Volume of water collected
Vm	ft^3	Volume of dry gas sampled
Vmstd	dscf	Sample volume at standard conditions
Vwstd	scf	Sample volume of water vapor
Y	dimensionless	Meter correction factor
Xsair	percent	Excess air

6.0 CALIBRATIONS: Measurement devices used by Environmental Monitoring Laboratories and subject to changes in measurement precision are initially calibrated prior to use. Those instruments for which calibration factors are subject to change or for which calibration checks are required, are calibrated following each field use or as otherwise directed and noted. Calibration procedures for specific equipment are as follows.

Dry Gas Meter: Dry gas meters are periodically removed from the sampling consoles and cleaned and repaired (new gaskets etc. as required). Following the overhaul of a meter, the measuring precision is checked by the Bell Prover Method and adjusted when necessary to read to within 2% of 100% accuracy. This service is provided by Big Three Meter Company in Jackson, Mississippi. Overhaul service or any six month period is followed by a five point calibration described in APTD-0576 using either a wet test meter or calibrated dry gas meter (used exclusively for calibrations) as a standard reference. Following field use, a gas meter calibration is checked in one of two ways. [1] Three calibration checks at intermediate orifice settings are performed or [2] orifice meter coefficients are used.

If a meter coefficient obtained from pre-test and post-test checks differs by more than 5%, the coefficient (Y) giving the lower sample volume is used in the calculations.

Orifice: The orifice coefficient is initially determined and is rechecked following a major gas meter repair and calibration.

Nozzles: Nozzles are checked before each field use with a precision (.001 in.) dial caliper. Three measurements on different axes are made; an average of those three readings is used in calculations. If the tolerance among measurements exceeds 0.004 inches (highest to lowest reading) the nozzle is repaired and recalibrated or discarded.

Pitot Tubes: Pitot tubes meeting EPA geometry standards are assigned a coefficient of 0.84. Pitot tubes are visually inspected for damage before, during and after use. Those pitot tubes not meeting the geometry standards are assigned a coefficient from the manufacturer's calibration which it retains unless damaged. All pitot tubes used by Environmental Monitoring Laboratories are manufactured by NAPP, Inc.

Temperature Measuring Instruments: Most temperature measurements are made with a type K thermocouple and an Omega digital thermocouple thermometer which has an initial calibration traceable to NBS. Other measurements are made using bimetallic dial thermometers. The thermocouples and dial thermometers are checked following or during a test series against an ASTM mercury in glass thermometer.

Barometer: Aneroid field barometers are checked against and adjusted to readings from a mercury barometer or readings obtained from local weather authorities.

Differential Pressure Gauges: Velocity head (delta P) and orifice pressure differential (delta H) measurements are made using water manometers of the appropriate range unless otherwise noted in the test data. Manometers do not require calibration.

Flame Ionization Detector (FID): VOC measurements were made with a Ratfisch portable flame ionization detector set in a range of 0 to 100 ppm or 0 to 1000 ppm propane. Following a sufficient warm up period the instrument was set to respond to and measure 22.1 ppm and 796 ppm calibration propane. Prior to and following each sample run, the instrument's zero and span were checked and adjusted if necessary using supplies of air and calibration propane.

Non-dispersive Infrared Analyzer (NDIR): Carbon monoxide measurements are made with a Beckman 864 infrared instrument calibrated in ranges of 0 to 1000 ppm and 0 to 5000 ppm. Following a sufficient warm up period of at least 1 hour and prior to each sample run, the instrument's zero and span are checked and adjusted if necessary using a supply of 100% nitrogen and 600 ppm CO respectively. An intermediate check at 300 ppm CO is also performed. These calibrations and adjustments are repeated at the conclusion of each sampling period.

Personnel Sample Pumps: Sample pumps used for ground level monitoring and for formaldehyde sampling from emission points were calibrated with a bubble meter. Once adjusted, the pumps were calibrated three times for 60 seconds. The average of the three calibrations was used for the calibrated flow rate.

7.0 Appendices

A. Sampling and Analytical Data
B. CO Trace
C. Ambient Monitor Data
D. Calibration Data
E. Analytical Report for HCHO, Phenol, and Urea
F. Miscellaneous

A. SAMPLING AND ANALYTICAL DATA

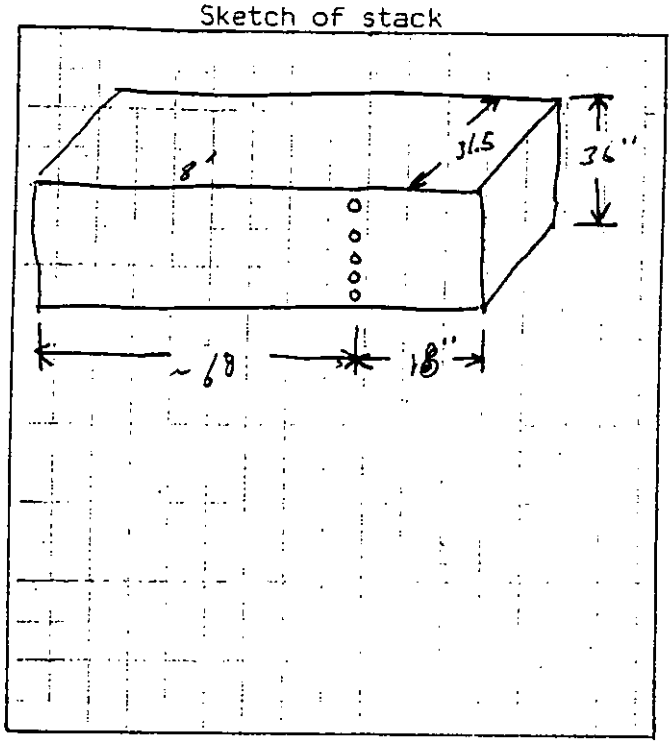
STACK CONFIGURATION / SAMPLE AND VELOCITY POINTS

Stack Extension for

Plant Name Norbay Forest Products (L.P.) Silsbee Source 004, 005, 006 Pelleted

Data For: Particleboard Dryer Date

Sketch of stack



PERCENT OF DIAMETER

Point No	Points on a Diameter							
	2	4	6	8	10	12	14	16
1	14.6	6.7	4.4	3.2	2.6	2.1	1.8	1.6
2	85.4	25.0	14.6	10.5	8.2	6.7	5.7	4.9
3		75.0	29.6	19.4	14.6	11.8	9.9	8.5
4		93.3	70.4	32.3	22.6	17.7	14.6	12.5
5			85.4	67.7	34.2	25.0	20.1	16.9
6			95.6	80.6	65.8	35.6	26.9	22.0
7				89.5	77.4	64.4	36.6	28.3
8				96.8	85.4	75.0	63.4	37.5
9					91.8	82.3	73.1	62.5
10					97.4	88.2	79.9	71.7
11						93.3	85.4	78.0
12						97.9	90.1	83.1
13							94.3	87.5
14							98.2	91.5
15								95.1
16								98.4

Stack diameter 31.5"d x 36.0 33.6=dc

Distance from ports to disturbance:

distance to upstream disturbance ~ 68"

distance to downstream disturbance 18"

upstream diameters 2.0

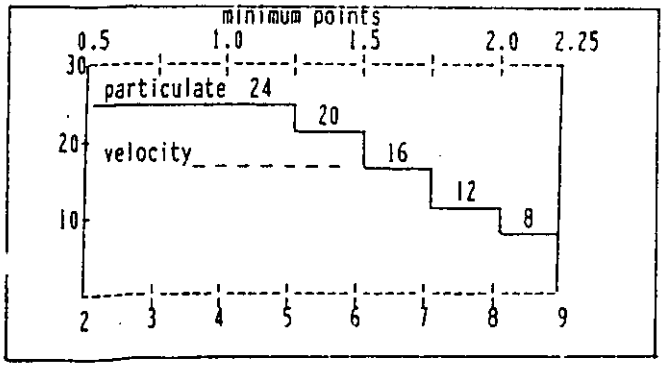
downstream diameters 0.5

Minimum No. points required 25

No. points selected 5x5

Nipple length 4"

Point	inches from wall	velocity head 1	2	3	4	5
1	3.15	.72		.40		
2	9.45	.72		.40		
3	15.95	.70		.39		
4	22.25	.40		.37		
5	~~2655~~	.36		.28		
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
Pg =			Ts =			
Pitot ID			Cp =			



REMARKS

C-004

Plant Fraser Forest Industries - Gibsboro Particleboard Plant
Sampling Location Exhaust Fan Inlet From Pollution Aside (East) C-004
Test For PM
Test Operators Russell/Moore

RUN No. 1
Date 5-20-90
Time start 1259 end 1416

Meter Box	1AC591349	No. Sample Pts.	5x5	Gas Analysis	Exit Air	Remarks:	
Sample Box	No. 1	Minutes/Pt.	2.5	CO_2	0.0		
Probe/Pitot	3' Teflon			O_2	21	D .269	
Pitot Cp	.84	NOMOGRAPH		CO		θ .270	Dn = .270
Nozzle Dia.	.270	ΔH@	1.95	Time		D .271	
Filter No.		Meter Temp.	83				
		% H_2O	10	Condensate:		dn @ 1332	
Amb. Temp. °F	86	C-Factor	1.00	tare 200	fin 218	ypa 1340	
Bar. Press. "Hg	29.91	Stack Temp.	110	Silica gel:			
Static Press. "H_2O	-.15	Ref. ΔP	.38	tare 662	fin 675.5	48 to 50K #/hr	

Port Point	El. Time, Min.	DGM Reading, Ft.³	Velocity Head ΔP, in. H_2O	Orifice ΔH in. H_2O	Stack Temp. °F	Meter Temp., °F In	Meter Temp., °F Out	Oven Temp. °F	Imp. Temp. °F	Vac in. Hg
1	0.00	622.084	0.17	0.85	108	83	82	250	72	2
2	2.30	623.6	0.20	0.96	108	85	84	250	68	2
3	5.00	625.1	0.23	1.10	108	87	83	235	68	2
4	7.30	626.3	0.18	0.87	110	89	83	230	68	2
5	10.00	627.7	0.15	0.75	110	92	84	250	67	2
1	12.30/0	628.930	0.18	0.87	108	93	84	250	68	2
2	2.30	630.2	0.18	0.87	110	96	85	220	67	2
3	5.00	631.6	0.26	1.25	111	98	86	250	66	2
4	7.30	633.3	0.18	0.87	109	100	86	230	65	2
5	10.00	634.7	0.18	0.87	111	102	86	230	65	2
1	25/00	635.838	0.17	0.85	114	99	88	250	65	2
2	2.30	637.3	0.20	0.96	113	101	90	250	65	2
3	5.00	639.3	0.26	1.25	113	96	89	250	65	2
4	7.30	640.6	0.26	1.25	112	99	89	230	65	2
5	10.00	641.6	0.23	1.10	112	100	90	220	65	2
1	12.30/0	643.370	0.15	0.73	110	101	90	190	68	2
2	2.30	644.8	0.14	0.70	112	104	92	180	67	2
3	5.00	646.0	0.16	0.77	109	104	94	170	65	2
4	7.30	647.3	0.22	1.05	107	105	95	170	65	2
5	10.00	648.9	0.21	1.00	108	106	92	165	65	2
1	50/00	650.018	0.10	0.48	111	106	95	175	65	2
2	2.30	651.0	0.09	0.43	112	105	96	185	66	2
3	5.00	652.2	0.08	0.38	112	107	97	190	66	2
4	7.30	653.1	0.09	0.43	112	106	98	190	66	2
5	10.00	654.0	0.13	0.62	110	107	98	200	68	2
end	12.30	654.924								
		Leak check: .079 →		.085 = .056 fe		10 ft				
		pitot + vc 4.8								
		pitot - vc 3.6		.8504	110.40	94.14				
		32.8400 .4146								

C004

Plant Kirby Forest Industries
Sampling Location Finish Slot Feed Pulpstrl (East Side) C004
Test For EA
Test Operators Russell / Moore

RUN No. 2
Date 5-20-91
Time start 1514 end 1622

Meter Box	RAC 591749	No. Sample Pts.	5 x 5	Gas Analysis	Air	Remarks:	
Sample Box	No 3	Minutes/Pt.	2.5	CO_2			
Probe/Pitot	3' Teflon	NOMOGRAPH		O_2		.301	
Pitot Cp	.84	ΔH@	1.95	CO		.301	Dn = .301
Nozzle Dia.	.301	Meter Temp.	100	Time		.300	
Filter No.		% H_2O	10	Condensate:			
Amb. Temp. °F	84	C-Factor	1.00	tare 200	fin 218		
Bar. Press. "Hg	29.91	Stack Temp.	110	Silica gel:			
Static Press. "H_2O	-.15	Ref. Δ P	.22	tare 611	fin 625		

Port Point	El. Time, Min.	DGM Reading, Ft.³	Velocity Head Δ P, in. H_2O	Orifice Δ H in. H_2O	Stack Temp. °F	Meter Temp., °F In	Meter Temp., °F Out	Oven Temp. °F	Imp. Temp. °F	Vac. in. Hg
1	0.00	655.234	0.16	1.30	105	84	84	270	74	2
2	2.30	656.8	0.18	1.50	107	86	84	250	67	2
3	5.00	658.4	0.21	1.75	109	88	84	250	65	3
4	7.30	660.2	0.16	1.30	109	91	85	255	62	4
5	10.00	662.2	0.17	1.20	110	96	86	250	66	3
1	12.30/6	663.727	0.16	1.35	111	94	84	255	65	3
2	2.30	665.6	0.16	1.35	108	93	84	250	64	3
3	5.00	667.0	0.23	1.95	105	96	84	270	65	3
4	7.30	668.9	0.16	1.35	105	97	85	250	65	3
5	10.00	670.5	0.17	1.40	105	98	85	260	66	3
1	25/00	672.000	0.16	1.35	107	97	85	225	65	4
2	2.30	673.7	0.18	1.50	108	97	86	250	66	4
3	5.00	675.2	0.25	2.10	107	98	85	260	66	4
4	7.30	677.0	0.25	2.10	107	99	86	230	66	5
5	10.00	679.1	0.22	1.85	108	101	87	250	66	6
1	37.30/6	680.642	0.14	1.20	112	97	86	260	65	3
2	2.30	682.2	0.12	1.00	109	97	89	266	64	3
3	5.00	683.8	0.13	1.10	107	102	89	250	64	3
4	7.30	685.4	0.19	1.60	109	99	86	255	64	3
5	10.00	686.4	0.19	1.60	108	100	87	250	64	3
1	50/00	688.536	0.10	0.85	112	98	86	260	67	3
2	2.30	690.6	0.08	0.66	111	98	89	270	63	3
3	5.00	691.1	0.08	0.66	100	94	86	250	63	2
4	7.30	692.2	0.08	0.66	106	97	87	255	62	2
5	10.00	693.4	0.12	1.00	110	96	87	250	62	2
end	62.30	694.812								
			leak check .005	→ .014	= .009 cfm	7"Hg				
			pitot fc 6.0							
		35.5780	tot fc 5.1 .3962	1.3400	107.80	90	86			

C004

Plant: Kirby Forest Industries
Sampling Location: C-004 Furnish Feed Inlet Pollutant (East Side)
Test For: PM
Test Operators: Russell / Brown

RUN No. 3
Date 5-20-91
Time start 1643 end 1754

Meter Box	RAC 99379	No. Sample Pts.	5 x 5	Gas Analysis	Air
Sample Box	No. 1	Minutes/Pt.	2.5	CO_2	
Probe/Pitot	3' teflon	NOMOGRAPH		O_2	
Pitot Cp	.84	ΔH@	1.95	CO	
Nozzle Dia.	.201	Meter Temp.		Time	
Filter No.		% H_2O			
Amb. Temp. °F	83	C-Factor		Condensate:	
Bar. Press. "Hg	29.91	Stack Temp.		tare 200 fin 223	
Static Press. "H_2O	-.15	Ref. Δ P	.22	Silica gel:	
				tare 700.5 fin 712.5	

Remarks:

Port Point	El. Time, Min.	DGM Reading, Ft.³	Velocity Head Δ P, in. H_2O	Orifice Δ H in. H_2O	Stack Temp. °F	Meter Temp., °F In	Meter Temp., °F Out	Oven Temp. °F	Imp. Temp. °F	Vac in. Hg
1	000	695.126	0.17	1.40	103	90	84	245	69	2
2	230	697.5	0.17	1.40	103	92	83	250	65	2
3	500	699.0	0.22	1.85	102	91	87	260	65	2
4	730	700.7	0.18	1.50	101	96	86	250	63	2
5	1000	702.2	0.16	1.35	100	97	87	250	64	2
1	1230	703.792	0.19	1.60	99	98	87	255	64	2
2	230	705.6	0.19	1.60	98	94	86	275	65	2
3	500	707.1	0.23	1.90	101	96	88	265	63	2
4	730	709.1	0.17	1.40	104	96	86	265	63	2
5	1000	710.8	0.17	1.40	105	97	88	260	62	2
1	1230	712.435	0.18	1.50	102	92	85	260	65	2
2	230	714.4	0.20	1.70	103	93	87	260	60	2
3	500	716.3	0.24	2.00	104	94	86	250	60	2
4	730	718.3	0.26	2.20	102	97	88	255	60	2
5	1000	719.7	0.23	1.90	99	98	87	260	62	2
1	1230	721.594	0.14	1.20	102	95	86	265	62	2
2	230	723.1	0.12	1.00	102	97	86	270	64	2
3	500	725.0	0.12	1.00	101	94	87	260	65	2
4	730	726.2	0.18	1.50	100	93	87	260	67	2
5	1000	727.6	0.18	1.50	100	95	87	260	63	2
1	1230	729.266	0.10	0.84	103	93	87	250	62	2
2	230	730.6	0.09	0.75	105	94	88	240	62	2
3	500	731.9	0.08	0.66	103	93	87	250	63	2
4	730	733.0	0.08	0.66	102	93	88	250	64	2
5	1000	734.4	0.10	0.84	102	91	87	250	65	2
end	1230	735.502								

leak check .006 → .007 = .001 @ 6 "Hg

pitot pre 4.8
pitot post 3.2

40.3760 .4023 1.3860 101.88 90.42

PARTICULATE CATCH ANALYSIS:

SAMPLES: Kirby C-004

DATE TAKEN: 5-20-91 DATE ANALYZED: 5-25-91

SAMPLES DELIVERED BY: DGR RECEIVED BY: DGR

ANALYZED BY: DGR

Filter treatment: Filters oven dried 2 hours at 105° C, desiccated at least 24 hours, weighed to constant weight

FILTERS:

RUN NO.	1	2	3	
FILTER NO.	551	552	553	
FILTER TARE, gms	.4116	.4112	.4102	
1st weighing	.7319	.4256	.4264	
2nd weighing	.4322	.4254	.4264	
3rd weighing				
FINAL WEIGHT, gms.	.4322	.4254	.4264	
NET GAIN, gms.	.0206	.0142	.0162	

Probe wash treatment: Transferred to a tared beaker, acetone evaporated over low heat, desiccated at least 24 hours, weighed to constant weight. Impinger Water evaporated over heat

PROBE WASH:

RUN NO.	Run 1 Front	Run 1 Back	Run 2 Front	Run 2 Back	Run 3 Front	Run 3 Back	Blank Acetone	Blank Water
CONTAINER ID								
VOLUME INTACT?	✓	✓	✓	✓	✓	✓		
VOLUME, ml	150	250	200	250	200	250		
TARE WT., gms.	(4) 108.4648	(2) 104.2567	(47) 104.1176	40 103.0252	(72) 111.3465	(67) 112.5854		
1st weighing	108.4811	104.7594	104.1267	103.0416	111.3500	112.5888		
2nd weighing	108.4807	104.7595	104.1260	103.0414	111.3496	112.5886		
3rd weighing			104.1259					
FINAL WEIGHT, gms.	108.4807	104.7595	104.1259	103.0414	111.3496	112.5886		
NET GAIN, gms.	.0159	.0026	.0083	.0051	.0031	.0032		
LESS BLANK, gms.								

PARTICULATE SAMPLE WEIGHT, mg.

RUN NO.	1F	1B	2F	2B	3F	3B	
filter + probe	36.5	2.6	22.5	5.1	19.3	3.2	

Plant: Kirby Forest Industries - Silsbee Particleboard Plant
Sampling Location: Face Dryer Pollutant (East Side) G-006
Test For: PM/CO/VOC/HCHO
Test Operators: Russell/Moore

RUN No. 1
Date 5-21-91
Time start 1207 end 1367

Meter Box	RAC591249	No. Sample Pts.	5x5	Gas Analysis	init.	orsat	
Sample Box	No. 1	Minutes/Pt.	2.5	CO_2	1.0	0.8	0.8
Probe/Pitot	3' Teflon	NOMOGRAPH		O_2	20.2	20.2	20.2
Pitot Cp	.84	ΔH@	1.95	CO	49.2 ppm NDIR		
Nozzle Dia.	.301	Meter Temp.	100	Time			
Filter No.		% H_2O	16	Condensate:	235		
Amb. Temp. °F	82	C-Factor	.93	tare 200	fin [illegible]		
Bar. Press. "Hg	29.86	Stack Temp.	125	Silica gel:			
Static Press. "H_2O	-.20	Ref. ΔP	.245	tare 680	fin 698.0		

Remarks:
Nozzle Cal:
θ .301
θ .301
θ .301
HCHO Start 320605
HCHO Stop 322714

Port Point	El. Time, Min.	DGM Reading, Ft.³	Velocity Head ΔP, in. H_2O	Orifice ΔH in. H_2O	Stack Temp. °F	Meter Temp., °F In	Meter Temp., °F Out	Oven Temp. °F	Imp. Temp. °F	Vac in. Hg	ppm VOC FID
1	0.00	735.883	0.27	2.00	148	78	78	270	67	2	61
2	2.30	737.8	0.26	1.95	149	80	78	260	62	2	60
3	5.00	739.9	0.28	2.10	150	85	78	260	62	2	63
4	7.30	741.6	0.25	1.85	151	89	79	260	60	2	63
5	10.00	743.9	0.25	1.85	152	91	80	270	61	2	60
1	12.30/00	745.323	0.29	2.20	145	91	81	235	63	2	60
2	2.30	747.5	0.30	2.20	145	93	83	225	60	2	60
3	5.00	749.4	0.30	2.20	144	94	83	200	60	2	62
4	7.30	751.6	0.30	2.20	145	100	83	220	61	3	61
5	10.00	753.2	0.30	2.20	142	100	85	225	60	2	63
1	25/00	755.379	0.31	2.30	148	102	86	225	61	2	67
2	2.30	757.5	0.32	2.30	147	100	87	225	60	2	66
3	5.00	759.5	0.31	2.30	149	100	89	225	60	2	60
4	7.30	761.7	0.44	3.30	149	107	90	250	60	3	60
5	10.00	764.1	0.47	3.50	145	112	89	250	62	3	63
1	37.30/00	766.431	0.38	2.80	138	107	90	250	63	3	63
2	2.30	769.5	0.37	2.80	142	110	90	265	65	3	66
3	5.00	771.6	0.38	2.80	139	111	90	250	65	3	66
4	7.30	773.4	0.46	3.45	137	114	93	250	65	3	65
5	10.00	775.8	0.46	3.45	136	114	93	255	60	3	64
1	50/00	778.500	0.30	2.20	138	117	93	250	60	3	60
2	2.30	781.0	0.29	2.15	138	112	93	255	60	3	68
3	5.00	783.0	0.35	2.60	134	113	96	270	65	3	68
4	7.30	784.8	0.41	3.10	133	109	94	255	63	3	62
5	10.00	787.2	0.41	3.10	135	112	97	225	60	3	62
end	62.30	789.394									
											62.9

leak check: .057 → .067 = .010 cfm @ 9" Hg
pitot + = 6.0
pitot - = 4.8
53.5110 .5789 2.6080 143.16 GH 26

Plant Kirby Forest

Sampling Location C-006 Face Dryer Exhaust

Test For PM/CO/VOC/HCHO

Test Operators Russell / Moon TACB Bill Randall

RUN No. 2

Date 5-21-91

Time start 1514 end 1625

Meter Box	RAC591799	No. Sample Pts.	5 x 5	Gas Analysis	int.	start	
Sample Box	No. 3	Minutes/Pt.	2.5	CO_2	6.0	6.0	6.0
Probe/Pitot	3' Tef	NOMOGRAPH		O_2	20.0	20.0	20.0
Pitot Cp	.84	ΔH@	1.95	CO	16.6 ppm	CO	
Nozzle Dia.	.301	Meter Temp.	100	Time			
Filter No.		% H_2O	10				
Amb. Temp. °F	85	C-Factor	1.0	Condensate:			
Bar. Press. "Hg	29.87	Stack Temp.	150	tare 200	fin 251		
Static Press. "H_2O	-.20	Ref. Δ P	.235	Silica gel:			
				tare 710	fin 722		

Remarks:

HCHO start 332714

HCHO stop 342221

50,000 #/hr

Port Point	El. Time, Min.	DGM Reading, Ft.³	Velocity Head Δ P, in. H_2O	Orifice Δ H in. H_2O	Stack Temp. °F	Meter Temp., °F In	Meter Temp., °F Out	Oven Temp. °F	Imp. Temp. °F	Vac in. Hg	VOC ppm
1	0.00	789.727	0.36	2.90	149	80	80	260	67	Y	64
2	2.30	792.4	0.36	2.90	139	91	80	265	65	4	63
3	5.00	794.4	0.39	3.10	136	91	80	275	65	4	63
4	7.30	797.6	0.28	3.05	138	99	82	260	63	4	62
5	10.00	799.3	0.37	3.00	139	100	82	270	65	4	60
1	12.30/00	801.351	0.43	3.50	138	100	84	250	66	5	60
2	2.30	804.3	0.38	3.05	134	103	84	250	60	4	65
3	5.00	806.8	0.46	3.70	139	106	86	250	60	5	64
4	7.30	809.3	0.46	3.70	144	110	88	250	60	5	63
5	10.00	811.9	0.40	3.20	140	114	89	250	65	5	66
1	25/00	814.716	0.45	3.50	145	113	90	245	66	5	69
2	2.30	817.5	0.46	3.70	139	117	93	250	65	5	65
3	5.00	819.6	0.60	4.50	129	118	95	250	65	8	64
4	7.30	823.0	0.67	5.50	133	121	94	270	65	8	72
5	10.00	825.8	0.58	4.60	133	122	94	250	65	7	69
1	37.30/0	828.763	0.45	3.50	134	120	96	260	67	5	70
2	2.30	832.1	0.47	3.75	127	120	96	250	65	6	68
3	5.00	834.2	0.55	4.40	132	123	96	250	65	6	66
4	7.30	836.9	0.56	4.50	132	125	98	270	65	6	67
5	10.00	839.8	0.52	4.20	137	125	98	260	63	6	76
1	50/00	843.009	0.40	3.20	139	122	97	250	66	6	85
2	2.30	847.0	0.31	2.50	139	123	98	250	60	6	84
3	5.00	848.4	0.38	2.50	140	120	100	235	60	4	88
4	7.30	850.0	0.40	3.20	139	122	99	250	62	6	95
5	10.00	852.4	0.41	3.30	137	120	99	255	65	5	70.
end	6.30	854.580									70.68

leak check: .050 → .060 = .010 CFM 8 CFM

pitot + 8.0

pitot - 6.0

2.0

1.4530 .6664 3.5580 137.32 101 64

Plant: Kirby Forest Industries - Silsbee Particleboard
Sampling Location: C006 Face Dryer Pollrol
Test For: PM/CO/VOC/HCHO
Test Operators: Russell / Moore

RUN No. 3
Date 5-21-91
Time start 1716 end 1824

Meter Box	RAL 591349	No. Sample Pts.	5x5	Gas Analysis	int.	onset	
Sample Box	No	Minutes/Pt.	2.5	CO_2	1.0	1.0	0.8
Probe/Pitot	#4 3' Teflon	NOMOGRAPH		O_2	20.1	20.0	20.2
Pitot Cp	.84	ΔH@	1.95	CO	41.1	ppm	
Nozzle Dia.	.301	Meter Temp.		Time			
Filter No.		% H_2O					
Amb. Temp. °F	82	C-Factor		Condensate:			
Bar. Press. "Hg	29.87	Stack Temp.		tare 200 fin 264			
Static Press. "H_2O	-.20	Ref. ΔP	.235	Silica gel:			
				tare 667.5 fin 677.5			

Remarks:
HCHO Stat 342221
HCHO Stop 343814

Port Point	El. Time, Min.	DGM Reading, Ft.³	Velocity Head ΔP, in. H_2O	Orifice ΔH in. H_2O	Stack Temp. °F	Meter Temp., °F In	Meter Temp., °F Out	Oven Temp. °F	Imp. Temp. °F	Vac. in. Hg	
1	0.00	855.561	0.27	2.20	129	89	88	260	68	3	120
2	2.30	857.7	0.28	2.25	139	93	89	250	70	3	150
3	5.00	859.7	0.30	2.40	139	99	97	250	66	3	150
4	7.30	861.6	0.29	2.30	137	101	90	260	65	3	150
5	10.00	863.6	0.26	2.20	138	105	90	250	65	3	150
1	12.30/00	865.619	0.29	2.30	137	105	89	250	65	3	150
2	2.30	867.8	0.28	2.25	142	108	93	265	63	3	150
3	5.00	869.8	0.31	2.50	140	110	91	250	60	3	150
4	7.30	872.0	0.35	2.80	141	113	93	260	60	3	150
5	10.00	874.0	0.30	2.40	141	114	93	260	60	3	150
1	25/00	876.203	0.32	2.60	137	114	94	260	61	3	150
2	2.30	878.3	0.36	2.90	139	114	95	250	60	4	140
3	5.00	880.6	0.36	2.90	142	116	96	260	65	4	140
4	7.30	883.0	0.43	3.50	140	119	96	260	64	5	125
5	10.00	885.4	0.36	2.90	141	120	97	250	65	5	120
1	37.30	887.768	0.30	2.40	135	118	96	260	65	4	125
2	2.30	890.0	0.31	2.50	139	120	98	250	65	4	120
3	5.00	892.0	0.34	2.70	138	120	98	250	63	4	110
4	7.30	894.6	0.37	3.00	138	122	98	250	65	4	120
5	10.00	896.8	0.32	2.60	138	122	99	250	67	4	120
1	50/00	898.903	0.23	1.85	135	120	99	250	68	4	120
2	2.30	901.6	0.20	1.60	138	119	100	260	66	4	110
3	5.00	903.1	0.23	1.85	137	118	100	255	67	4	110
4	7.30	905.3	0.25	2.00	137	116	100	250	70	4	110
5	10.00	906.8	0.25	2.00	136	122	101	250	70	4	110
end	62.30	908.560									~~132~~ 132.00
			leak check: .025 → .028 = .003 cfm			9"Hg					
			pitot + fc 5.8								
			pitot - fc 4.8								
		5.9990	.5479	2.4360	138.12	103	94				

PARTICULATE CATCH ANALYSIS:

SAMPLES: Kirby ~~C-005~~ C-006 Face Dryer

DATE TAKEN: 5-21-91 DATE ANALYZED: 5-25-91

SAMPLES DELIVERED BY: DSR RECEIVED BY: DSR

ANALYZED BY: DSR

Filter treatment: Filters oven dried 2 hours at 105° C, desiccated at least 24 hours, weighed to constant weight

FILTERS:

RUN NO.	1	2	3	
FILTER NO.	555	554	556	
FILTER TARE, gms	.4114	.4069	.4113	
1st weighing	.4273	.4260	.~~4~~4326	
2nd weighing	.4273	.4259	.4324	
3rd weighing				
FINAL WEIGHT, gms.	.4273	.4259	.4324	
NET GAIN, gms.	.0159	.0190	.0211	

Probe wash treatment: Transferred to a tared beaker, acetone evaporated over low heat, desiccated at least 24 hours, weighed to constant weight.

PROBE WASH:

RUN NO.	1 Front	1 Back	2 Front	2 Back	3 Front	3 Back	
CONTAINER ID							
VOLUME INTACT?							
VOLUME, ml							
TARE WT., gms.	(27) 98.8571	(22) 99.0915	(32) 97.5793	(45) 107.2592	(44) 107.9112	(31) 115.8247	
1st weighing	98.8581	99.0924	97.5822	107.2613	107.9130	115.8278	
2nd weighing	98.8581	99.0923	97.5818	107.2627	107.9127	115.8277	
3rd weighing							
FINAL WEIGHT, gms.	98.8581	99.0923	97.5818	107.2627	107.9127	115.8277	
NET GAIN, gms.	.0010	.0008	.0025	.0037	.0015	.0030	
LESS BLANK, gms.							

PARTICULATE SAMPLE WEIGHT, mg.

RUN NO.	1F	1B	2F	2B	3F	3B	
filter + probe	16.9	0.8	21.5	3.7	22.6	3.0	

Plant: Kirby Forest Industries
Sampling Location: C-005 Core Dryer Pollutant (South side)
Test For: PM / CO / VOC / HCHO
Test Operators: Russell / Moore

RUN No. 1
Date 5-22-91
Time start 0957 end 1107

Meter Box	RAC 591349	No. Sample Pts.	5x5	Gas Analysis	int.	duct	
Sample Box	No. 1	Minutes/Pt.	2.5	CO_2	1.0	1.0	1.0
Probe/Pitot	3' Tof	NOMOGRAPH		O_2	20.8	20.7	20.6
Pitot Cp	.84	ΔH@	1.9	CO	68.9		
Nozzle Dia.	.301	Meter Temp.	95	Time			
Filter No.		% H_2O	10				
Amb. Temp. °F	84	C-Factor	1.0	Condensate: tare 200 fin 232			
Bar. Press. "Hg	29.92	Stack Temp.	150	Silica gel: tare 651 fin 665.5			
Static Press. "H_2O	-.23	Ref. ΔP	.235				

Remarks:
① .301
② .302 } .301
③ .300
HCHO start 343852
HCHO stop 354519

Port Point	El. Time, Min.	DGM Reading, Ft.³	Velocity Head ΔP, in. H_2O	Orifice ΔH in. H_2O	Stack Temp. °F	Meter Temp., °F In	Meter Temp., °F Out	Oven Temp. °F	Imp. Temp. °F	Vac in. Hg	
1	000	909.000	0.34	2.75	153	85	84	260	70	4	48
2	230	911.1	0.36	2.90	154	86	84	275	66	4	53
3	500	913.2	0.44	3.50	155	89	83	250	68	4	56
4	730	915.6	0.40	3.20	153	96	85	250	68	4	56
5	1000	917.9	0.31	2.50	150	100	85	250	68	4	61
1	1230/00	920.246	0.35	2.80	149	102	85	255	67	4	54
2	230	922.7	0.41	3.30	160	105	86	260	65	4	53
3	500	924.9	0.46	3.70	152	109	87	250	65	5	48
4	730	927.3	0.37	2.90	150	113	88	250	65	4	47
5	1000	929.7	0.34	2.75	146	115	89	250	65	4	48
1	25/00	931.807	0.42	3.35	151	112	90	255	66	5	45
2	230	934.3	0.47	3.70	156	114	93	250	62	5	56
3	500	936.9	0.53	4.30	153	117	92	255	63	5	58
4	730	939.7	0.49	3.90	151	121	93	255	65	5	47
5	1000	942.5	0.44	3.50	152	123	95	255	65	6	44
1	3730/00	944.934	0.41	3.25	151	120	94	260	65	6	46
2	230	947.5	0.46	3.60	149	120	96	250	66	6	42
3	500	949.9	0.47	3.70	155	122	97	250	64	6	49
4	730	952.8	0.42	3.35	150	124	99	255	63	6	50
5	1000	955.1	0.40	3.20	152	126	99	255	60	6	49
1	50/00	957.774	0.33	2.65	152	121	97	250	64	5	50
2	230	960.3	0.40	3.20	152	121	99	255	60	5	54
3	500	962.7	0.34	2.70	147	118	97	250	60	5	50
4	730	965.0	0.27	2.15	148	116	97	250	63	5	45
5	1000	967.2	0.30	2.40	145	114	97	250	65	5	43
end	1230	968.822									50.0
		leak check: 0.072	→	.076	= .004	cfm @	10"	Hg			
		pitot + = 6.0									
		pitot - = 5.8									
		59.8220	.6282	3.1900	151.44	101.56					

Plant: Kirby Forest Industries - Silsbee Particle Board
Sampling Location: 006 Fine Dryer Cyclone
Test For: PM/CO/VOC/HCHO
Test Operators: Russell / Moore

RUN No. 2
Date 5-22-91
Time start 1144 end 1256

Meter Box	RAC591379	No. Sample Pts.	5x5	Gas Analysis	ind. bag		
Sample Box	No. 3	Minutes/Pt.	2.5	CO_2	1.0	1.0	1.0
Probe/Pitot	3' Teflon			O_2	20.9	20.9	20.9
Pitot Cp	.84	NOMOGRAPH		CO	325 ppm		
Nozzle Dia.	.	ΔH@	1.95	Time			
Filter No.		Meter Temp.					
		% H_2O		Condensate:			
Amb. Temp. °F	88	C-Factor		tare 200	fin 237		
Bar. Press. "Hg	29.92	Stack Temp.		Silica gel:			
Static Press. "H_2O	-.23	Ref. ΔP	.235	tare 691	fin 704		

Remarks:
start 354519
HCHO stop 366815

Port Point	El. Time, Min.	DGM Reading, Ft.³	Velocity Head ΔP, in. H_2O	Orifice ΔH in. H_2O	Stack Temp. °F	Meter Temp., °F In	Meter Temp., °F Out	Oven Temp. °F	Imp. Temp. °F	Vac in. Hg	
1	000	969.157	0.32	2.60	153	88	88	260	70	4	41
2	2.30	971.6	0.34	2.70	158	92	89	250	67	4	40
3	5.00	973.8	0.43	3.45	156	96	89	275	68	5	42
4	7.30	976.2	0.35	2.80	160	99	89	260	65	4	40
5	10.00	978.4	0.26	2.05	161	103	91	250	65	3	42
1	12.30/00	980.583	0.36	2.90	160	96	90	265	68	4	50
2	2.30	983.0	0.40	3.20	161	99	91	250	60	4	46
3	5.00	985.3	0.48	3.80	160	104	91	250	60	4	48
4	7.30	987.5	0.38	3.00	161	106	93	250	65	4	44
5	10.00	989.8	0.32	2.60	163	105	92	260	65	4	45
1	25/00	991.797	0.38	3.00	159	104	92	260	65	4	43
2	2.30	994.2	0.46	3.60	162	105	92	255	63	5	44
3	5.00	996.7	0.54	4.30	162	109	93	250	65	6	42
4	7.30	999.4	0.53	4.30	163	111	93	250	65	6	43
5	10.00	002.3	0.45	3.60	166	114	94	250	64	6	44
1	37.30/00	004.952	0.39	3.10	162	109	96	255	66	5	42
2	2.30	007.6	0.47	3.65	167	110	98	250	65	5	42
3	5.00	009.8	0.44	3.55	165	112	96	275	68	5	46
4	7.30	012.6	0.45	3.60	168	110	96	270	68	6	48
5	10.00	015.3	0.38	3.00	166	113	96	275	69	6	48
1	50/00	017.563	0.38	3.00	164	109	95	240	70	5	44
2	2.30	019.9	0.37	3.00	162	109	96	225	70	5	45
3	5.00	022.0	0.35	3.00	162	110	97	235	66	5	45
4	7.30	024.6	0.31	2.50	161	111	98	230	67	4	46
5	10.00	026.7	0.29	2.30	168	111	97	250	68	4	48
1	62.30	028.577									
											44.32
		leak check: .076		→ .044	= .008	cfm	9" Hg				
		pitot tube 6.6									
		pitot-up 4.0									
		59.4200	.6246	3.1440	162.00	99	3400				

Plant Kirby

Sampling Location 005 - Coen Dryer Control

Test For PM/CO/VOC/HCHO

Test Operators Rinnell/Moore

RUN No. 3

Date 5-22-91

Time start 1504 end 1617

Meter Box	RAC591749	No. Sample Pts.	5x5	Gas Analysis	int-exact			Remarks:	
Sample Box	No.	Minutes/Pt.	2.5	CO_2	1.0	1.0	1.0		
Probe/Pitot	3' Teflon			O_2	20.5	20.6	20.7		
Pitot Cp	.84	NOMOGRAPH		CO	25.4 ppm				
Nozzle Dia.	.301	ΔH@	1.95	Time				HCHO start 366815	
Filter No.		Meter Temp.						stop 378947	
Amb. Temp. °F	88	% H_2O		Condensate:					
Bar. Press. "Hg	29.92	C-Factor		tare 200	fin 276				
Static Press. "H_2O	-.23	Stack Temp.		Silica gel:					
		Ref. ΔP	.235	tare 603	fin 615				

Port Point	El. Time, Min.	DGM Reading, Ft.³	Velocity Head ΔP, in. H_2O	Orifice ΔH in. H_2O	Stack Temp. °F	Meter Temp., °F In	Meter Temp., °F Out	Oven Temp. °F	Imp. Temp. °F	Vac in. Hg	
1	0.00	028.788	0.34	2.70	153	82	82	235	68	2	40
2	2.30	031.2	0.43	3.50	158	85	82	225	69	2	43
3	5.00	033.5	0.47	3.75	157	91	83	230	69	2	36
4	7.30	036.0	0.35	2.80	160	95	83	220	64	2	41
5	10.00	038.3	0.33	2.65	160	98	85	225	65	2	1004
1	1230/00	040.541	0.39	3.10	161	92	85	240	64	2	38
2	2.30	042.8	0.45	3.60	163	94	86	250	60	2	40
3	5.00	045.6	0.48	3.85	165	99	89	250	60	2	54
4	7.30	048.3	0.34	2.75	166	105	87	250	60	2	58
5	10.00	051.1	0.33	2.65	162	107	90	255	60	2	58
1	2500	052.674	0.47	3.70	160	103	90	260	60	2	60
2	2.30	055.4	0.57	4.50	168	106	90	250	60	2	58
3	5.00	058.4	0.64	5.20	157	110	91	255	60	2	38
4	7.30	061.4	0.63	5.10	155	114	91	255	60	2	45
5	10.00	065.0	0.52	4.20	150	116	92	255	62	2	35
1	3730	067.196	0.44	3.50	166	108	94	260	65	2	30
2	2.30	070.3	0.47	3.75	162	107	94	255	60	2	37
3	5.00	072.6	0.47	3.75	165	112	94	265	60	2	42
4	7.30	075.2	0.43	3.50	164	113	95	260	61	2	45
5	10.00	077.5	0.37	2.90	169	113	96	265	60	2	42
1	5000	079.067	0.37	2.90	165	106	95	255	63	2	42
2	2.30	082.6	0.38	3.00	160	107	97	270	64	2	40
3	5.00	084.9	0.32	2.55	166	109	95	275	65	2	37
4	7.30	087.3	0.26	2.10	167	109	95	250	67	2	35
5	10.00	089.1	0.25	2.00	170	110	98	235	68	2	38
end	6230	090.954									45.2

leak check: .087 → .098 = .011 cfm @ 8" Hg

pitot + cfm 6.5

pitot - cfm 7.2

62.1660 .6436 33600 161.92 95.22

PARTICULATE CATCH ANALYSIS:

SAMPLES: Kirby C-005 Pdtrol

DATE TAKEN: 5-22-91 DATE ANALYZED: 5-25-91

SAMPLES DELIVERED BY: DGR RECEIVED BY: DGR

ANALYZED BY: DGR

Filter treatment: Filters oven dried 2 hours at 105° C, desiccated at least 24 hours, weighed to constant weight

FILTERS:

RUN NO.	1	2	3	
FILTER NO.	558	557	559	
FILTER TARE, gms	.4087	.4091	.4066	
1st weighing	.4430	.4360	.4300	
2nd weighing	.4430	.4361	.4302	
3rd weighing				
FINAL WEIGHT, gms.	.4430	.4361	.4302	
NET GAIN, gms.	.0343	.0270	.0237	

Probe wash treatment: Transferred to a tared beaker, acetone evaporated over low heat, desiccated at least 24 hours, weighed to constant weight.

PROBE WASH:

RUN NO.	1 Front	1 Back	2 Front	2 Back	3 Front	3 Back	
CONTAINER ID	005 R1	005 R1 B	005 R2	005 R2B	005 R3	005 R3B	
VOLUME INTACT?	—	—	✓	✓	✓	—	
VOLUME, ml	150	250	150	250	200	250	
TARE WT., gms.	(2) 111.5575	(1) 103.1978	(4) 111.2063	(3) 104.8303	(62) 112.5462	(25) 97.0943	
1st weighing	111.5581	103.1986	111.8076	104.8315	112.5474	97.1042	
2nd weighing	111.5582	103.1981	111.8070	104.8313	112.5429	97.0961	
3rd weighing			111.8074				
FINAL WEIGHT, gms.	111.5583	103.1981	111.8074	104.8313	112.5429	97.0961	
NET GAIN, gms.	.0008	.0003	.0013	.0010	.0007	.0018	
LESS BLANK, gms.							

PARTICULATE SAMPLE WEIGHT, mg.

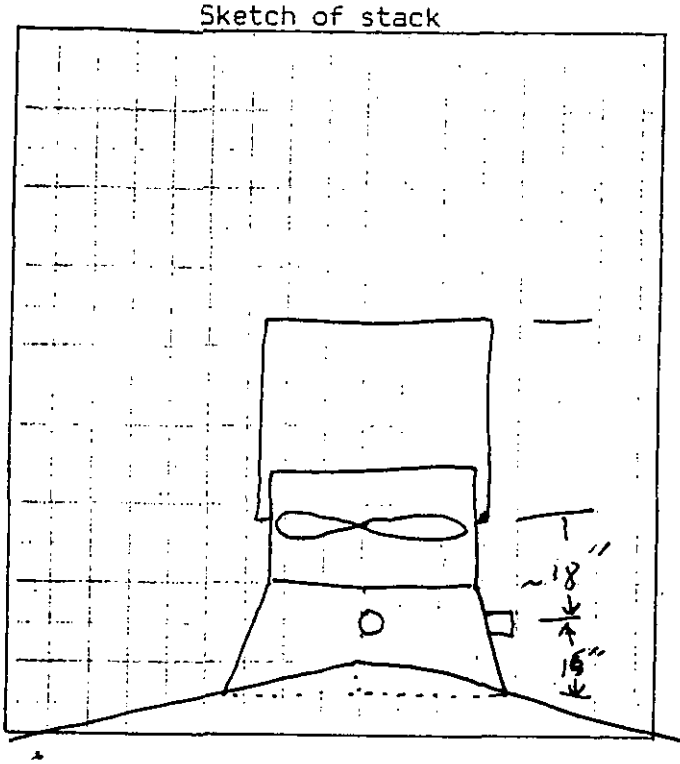
RUN NO.	F 1	B	F 2	B	F 3	B	
filter + probe	35.1	.3	28.3	1.0	24.4	1.8	

STACK CONFIGURATION / SAMPLE AND VELOCITY POINTS

Plant Name Kirby Source Pre Vent

Data For: Date

Sketch of stack



PERCENT OF DIAMETER

Point No	Points on a Diameter 2	4	6	8	10	12	14	16
1	14.6	6.7	4.4	3.2	2.6	2.1	1.8	1.6
2	85.4	25.0	14.6	10.5	8.2	6.7	5.7	4.9
3		75.0	29.6	19.4	14.6	11.8	9.9	8.5
4		93.3	70.4	32.3	22.6	17.7	14.6	12.5
5			85.4	67.7	34.2	25.0	20.1	16.9
6			95.6	80.6	65.8	35.6	26.9	22.0
7				89.5	77.4	64.4	36.6	28.3
8				96.8	85.4	75.0	63.4	37.5
9					91.8	82.3	73.1	62.5
10					97.4	88.2	79.9	71.7
11						93.3	85.4	78.0
12						97.9	90.1	83.1
13							94.3	87.5
14							98.2	91.5
15								95.1
16								98.4

Stack diameter 500" @ port

Distance from ports to disturbance:

distance to upstream disturbance

distance to downstream disturbance

upstream diameters

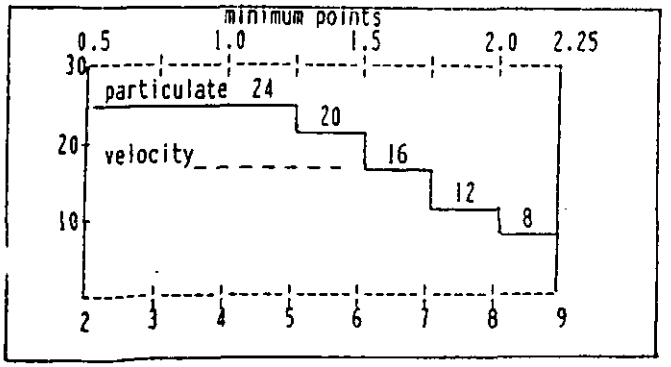
downstream diameters

Minimum No. points required

No. points selected

Nipple length 3" p.n. 3"/bmg

mrails



PV - 17 (No. 2)

Point	inches from wall	velocity head 1	α°	2	α
1	1.05	.28	0	.15	<5
2	3.35	.26	<5	.23	<5
3	5.9	.32	<5	.30	<5
4	8.5	.39	<5	.30	<5
5	12.5	.43	<5	.40	<5
6	17.8	.23	<5	.29	<5
7	32.2	.39	<5	.30	<5
8	37.5	.40	<5	.42	<5
9	41.2	.40	<5	.43	<5
10	44.1	.38	<5	.39	<5
11	46.7	.34	<5	.32	<5
12	49.0	.28	<5	.30	<5
13					
14					
15				.571	
16					
Pg =		Ts =			
Pitot ID		Cp =			

REMARKS

Plant Kirby Forest Industries
Sampling Location No. 2 Prim Vent ~~R-05~~ V-016
Test For PM / VOC / HCHO
Test Operators Russell / Moore

RUN No. 1
Date 5-22-91
Time start ~~1036~~ 1136 end 1236

Meter Box	RAC 591749	No. Sample Pts.	1	Gas Analysis	Air
Sample Box	No. 1	Minutes/Pt.	33'59 sec	CO_2	
Probe/Pitot	5' inc.	NOMOGRAPH		O_2	
Pitot Cp	.84	ΔH@	1.95	CO	
Nozzle Dia.	.301	Meter Temp.	90	Time	
Filter No.		% H_2O	10	Condensate:	
Amb. Temp. °F	87	C-Factor	1.0	tare 200 fin 222	
Bar. Press. "Hg	29.92	Stack Temp.	125	Silica gel:	
Static Press. "H_2O	Neg.	Ref. Δ P	.22	tare 656 fin 665	

Remarks:
HCHO start 278959
HCHO stop 284327

Port Point	El. Time, Min.	DGM Reading, Ft.³	Velocity Head Δ P, in. H_2O	Orifice Δ H in. H_2O	Stack Temp. °F	Meter Temp., °F In	Meter Temp., °F Out	Oven Temp. °F	Imp. Temp. °F	Vac in. Hg
1	0:00	091.232	0.44	3.75	111	82	81	260	69	3
2	5	096.8	0.42	3.60	110	90	84	235	66	3
3	10	102.5	0.42	3.60	116	95	85	250	62	3
4	15	106.7	0.42	3.60	122	99	88	260	68	3
5	20	111.8	0.40	3.40	115	100	91	265	66	3
6	25	117.0	0.42	3.60	114	102	91	260	68	3
5	30	122.2	0.40	3.40	114	106	93	250	65	3
end	3359	126.069								
		leak check: .025	→ .032	= .007 cfm			8" Hg			
		pitot + ve 4.6								
		pitot - ve 8.5								
		34.839	.6456	3.5643	114.57	91.1	93			

Environmental Monitoring Laboratories — Ridgeland, Mississippi — 601-856-3092

Plant Kirby
Sampling Location ◆V-006 No.2 Pwr Vent
Test For PM/VOC/HCHO
Test Operators Russell/moore

RUN No. 2
Date 5-23-91
Time start 1355 end 1455

Meter Box	RAC 5/1649	No. Sample Pts.		Gas Analysis	Am
Sample Box	No 3	Minutes/Pt.		CO_2	
Probe/Pitot	5' inc.	NOMOGRAPH		O_2	
Pitot Cp	.84	ΔH@	1.95	CO	
Nozzle Dia.	.221	Meter Temp.		Time	
Filter No.		% H_2O			
Amb. Temp. °F	89	C-Factor		Condensate:	
Bar. Press. "Hg	29.92	Stack Temp.		tare 203 fin 219	
Static Press. "H_2O	neg.	Ref. ΔP	.22	Silica gel:	
				tare 619 fin 228	

Remarks:
HCHO start 384327
HCHO stop 390367

Port Point	El. Time, Min.	DGM Reading, Ft.³	Velocity Head ΔP, in. H_2O	Orifice ΔH in. H_2O	Stack Temp. °F	Meter Temp., °F In	Meter Temp., °F Out	Oven Temp. °F	Imp. Temp. °F	Vac in. Hg
1/9	0	126.498	0.36	3.00	125	88	87	265	70	4
	5	130.9	0.45	3.90	119	95	88	260	66	6
	10	136.6	0.42	3.65	116	102	89	235	67	6
	15	141.7	0.42	3.60	122	106	93	235	69	6
	20	146.8	0.42	3.60	123	107	92	250	68	6
	25	152.0	0.43	3.70	123	110	94	260	67	6
	30	157.2	0.42	3.60	122	112	96	240	68	6
	35	162.5	0.42	3.60	122	117	98	250	68	6
	40	167.5	0.42	3.60	121	117	97	260	65	6
	40'25"	167.915								

leak chk .022 → .026 = .004 cfm @ 6"Hg
pitot +ve 4.6
pitot -ve 3.2

41.4170 .420 3.5833 121.44 105.83 T 84.71

Environmental Monitoring Laboratories — Ridgeland, Mississippi — 601-856-3092

Plant Libby

Sampling Location ~~PM-10~~ V-016 No. 2 Pres Vent

Test For PM/VOC/HCHO

Test Operators Rmmm / Mmm

RUN No. 3

Date 5-23-91

Time start 1530 end 1630

Meter Box	RAC 59/649	No. Sample Pts.		Gas Analysis	Air	Remarks:	
Sample Box	No. 1	Minutes/Pt.		CO_2			
Probe/Pitot	S'ias	NOMOGRAPH		O_2			
Pitot Cp	.84	ΔH@	1.95	CO			
Nozzle Dia.	.301	Meter Temp.		Time		HCHO start 390267	
Filter No.		% H_2O		Condensate:		395515	
Amb. Temp. °F	90	C-Factor		tare 200 fin 217			
Bar. Press. "Hg	29.91	Stack Temp.		Silica gel:			
Static Press. "H_2O	neg.	Ref. ΔP	.22	tare 635.5 fin 645.0			

Port Point	El. Time, Min.	DGM Reading, Ft.³	Velocity Head ΔP, in. H_2O	Orifice ΔH in. H_2O	Stack Temp. °F	Meter Temp., °F In	Meter Temp., °F Out	Oven Temp. °F	Imp. Temp. °F	Vac in. Hg
9	0	168.050	0.40	3.40	115	97	95	265	66	7
	5	173.0	0.42	3.60	116	106	95	260	68	7
	10	178.2	0.42	3.60	116	110	96	255	64	7
↓	15	183.0	0.42	3.60	118	112	97	260	69	7
	20	188.3	0.42	3.60	113	113	97	265	69	8
	25	194.0	0.43	3.70	114	116	98	240	67	8
	30	199.3	0.41	3.50	114	115	101	230	65	8
3440	~~35~~	203.526								
		35.526	.6458	3.574	115.14	103	98			

leak check .070 → .076 = .006 @ 12 "Hg

pitot + ve 4.8

pitot - ve 5.8

Plant Kirby Forest Industries - Silsbee Particleboard | RUN NO. 1
Source V-016 No. 2 Press Vent | Date 5-22-91
Test For VOC | Time start 1136
Test Operators Russell / Moore | Time end 1236

FID Calibration:	time: 1100	time:	time:
Range setting: 0-1000			
Zero gas Air			
Span gas 1 21.2 ppm C_3H_8			
Span gas 2 ~~76~~ ppm C_3H_8			

Data:

elapsed time	FID Scale ppm	FID Range ppm	Sample Pressure mBar	Fuel Pressure psi	Air Pressure psi	Oven Temp °C set ±1°C	Line Temp °F set 250°	Chart Speed cm/hr
0								
1	~~78~~	0-1000	4.0	6.75	12.0	254	250	N/A
2								
3	62							
4								
5								
6								
7								
8								
9								
10								
11	200							
12	22							
13	17							
14	27							
15	64							
16	18							
17	14							
18	40							
19	46							
20	22							
21	14							
22	46							
23	68							
24	22							
25	14							
26	31							
27	50							
28	20							
29	—							
30	19							
31	52							
32	18							
33	15							
34	32							

Remarks: recorded @ 1 min. intervals

Avg = 40.32 ppm @ propane

Plant Kirby | RUN NO. 2
Source V-016 No. 2 pleasant
Date 5-23-91
Test For VOC
Time start 1355
Test Operators Russell/Moore
Time end 1455

FID Calibration:	time: 1320	time:	time:
Range setting: 0-1000			
Zero gas Air	✓		
Span gas 1 21.2 ppm	✓		
Span gas 2 796 ppm	✓		

Data:

elapsed time	FID Scale ppm	FID Range ppm 0-1000	Sample Pressure mBar 4.0	Fuel Pressure psi 6.75	Air Pressure psi 120	Oven Temp °C 151±2	Line Temp °F 250	Chart Speed cm/hr
0	—							
1	10							n/a
2	96							
3	750							
4	40							
5	11							
6	88							
7	190							
8	27							
9	14							
10	35							
11	91							
12	100							
13	23							
14	41							
15	45							
16	12							
17	13							
18	10							
19	62							
20	120							
21	16							
22	50							
23	68							
24	280							
25	21							
26	48							
27	36							
28	225							
29	15							
30	12							
31	72							
32	260							
33	12							
34	13							
35	97							
36	66							
37	25							
38	18							
39	96							
40	510							

Remarks:

Avg = 80.45

Plant Kirby
Source V-016 No. 2 Press Vent
Test For VOC
Test Operators Russell / Moore

RUN NO. 3
Date 5-22-91
Time start 1530
Time end 1630

FID Calibration:	time: 1520	time:	time: .
Range setting: 0-1000			
Zero gas Air			
Span gas 1 21.2 ppm			
Span gas 2 796 ppm			

Data:

elapsd time	FID Scale ppm	FID Range ppm	Sample Pressure mBar	Fuel Pressure psi	Air Pressure psi	Oven Temp °C	Line Temp °F	Chart Speed cm/hr
0								
1	20							
2	52	0-1000	4.0	6.75	12.0	150°C	250	n/a
3	860							
4	19							
5	11							
6	60							
7	100							
8	11							
9	-							
10	49							
11	510							
12	10							
13	14							
14	100							
15	80							
16	22							
17	15							
18	93							
19	460							
20	19							
21	49							
22	98							
23	110							
24	18							
25	12							
26	44							
27	570							
28	25							
29	15							
30	100							
31	600							
32	110							
33	110							
34	120							
~~35~~								
36								

Remarks:

Avg = 135.9 ppm

PARTICULATE CATCH ANALYSIS:

SAMPLES: Kirby - ~~PV-01B~~ V-016 Pum Vat No. 2

DATE TAKEN: 5-23-9 DATE ANALYZED: 5-25-91

SAMPLES DELIVERED BY: DGR RECEIVED BY: DGR

ANALYZED BY: DGR

Filter treatment: Filters oven dried 2 hours at 105° C, desiccated at least 24 hours, weighed to constant weight

FILTERS:

RUN NO.	1	2	3	
FILTER NO.	561	560	562	
FILTER TARE, gms	.4108	.4101	.4112	
1st weighing	.4470	.4426	.4317	
2nd weighing	.4469	.4426	.4317	
3rd weighing				
FINAL WEIGHT, gms.	.4469	.4426	.4317	
NET GAIN, gms.	.0361	.0325	.0205	

Probe wash treatment: Transferred to a tared beaker, acetone evaporated over low heat, desiccated at least 24 hours, weighed to constant weight.

PROBE WASH: Front Back Front Back Front Back

RUN NO.	1		2		3		
CONTAINER ID	PV2R1	PV2R1B	PV2R2	PV2R2B	PV2R3	PV2R3B	
VOLUME INTACT?	✓	✓	✓	✓	✓	✓	
VOLUME, ml	180	250	210	250	200	250	
TARE WT., gms.	(23) 98.3998	(63) 96.6325	(31) 95.7694	(50) 103.8856	(62) 113.2251	(70) 113.8384	
1st weighing	98.4235	96.6373	95.7859	103.8885	113.2259	113.8365	
2nd weighing	98.4233	96.6369	95.7855	103.8888	113.2250	113.8362	
3rd weighing					113.2251		
FINAL WEIGHT, gms.	98.4233	96.6369	95.7855	103.8888	113.2248	113.8362	
NET GAIN, gms.	.0235	.0044	.0161	.0032	.0037	.0038	
LESS BLANK, gms.							

PARTICULATE SAMPLE WEIGHT, mg.

RUN NO.	1F	1B	2F	2B	3F	3B	
filter + probe	59.6	4.4	48.6	3.2	24.2	3.8	

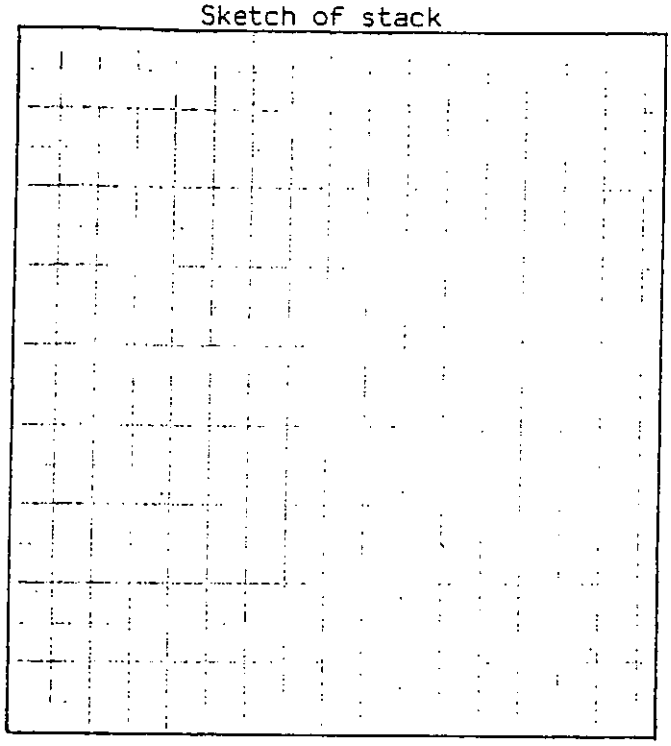
STACK CONFIGURATION / SAMPLE AND VELOCITY POINTS

V-017

Plant Name Kirby Source ~~PT-18~~ Prim Vent #3

Data For: Kirby Date 1/7°

Sketch of stack



PERCENT OF DIAMETER

Point No	Points on a Diameter							
	2	4	6	8	10	12	14	16
1	14.6	6.7	4.4	3.2	2.6	2.1	1.8	1.6
2	85.4	25.0	14.6	10.5	8.2	6.7	5.7	4.9
3		75.0	29.6	19.4	14.6	11.8	9.9	8.5
4		93.3	70.4	32.3	22.6	17.7	14.6	12.5
5			85.4	67.7	34.2	25.0	20.1	16.9
6			95.6	80.6	65.8	35.6	26.9	22.0
7				89.5	77.4	64.4	36.6	28.3
8				96.8	85.4	75.0	63.4	37.5
9					91.8	82.3	73.1	62.5
10					97.4	88.2	79.9	71.7
11						93.3	85.4	78.0
12						97.9	90.1	83.1
13							94.3	87.5
14							98.2	91.5
15								95.1
16								98.4

Stack diameter _____

Distance from ports to disturbance:

distance to upstream disturbance _____

distance to downstream disturbance _____

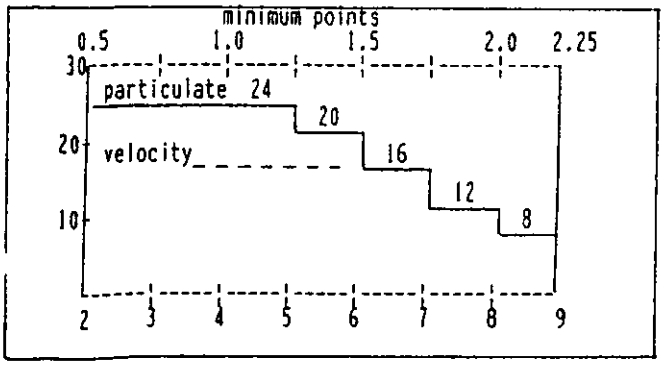
upstream diameters _____

downstream diameters _____

Minimum No. points required _____

No. points selected _____

Nipple length _____



Point	inches from wall	velocity head 1	Δ	velocity head 2	Δ
1		.32	<5	.30	<5
2		.33		.31	
3		.36		.30	
4		.36		.29	
5		.33		.30	
6		.29		.27	
7		.33		.36	
8		.32		.37	
9		.37		.35	
10		.34		.28	
11		.26		.26	
12		.25		.23	
13					
14					
15					
16					
Pg =			Ts =		
Pitot ID			Cp =		

.5589

REMARKS _____

Plant Kirby

Sampling Location [redacted] (Prim Vent No. 3) V-017

Test For PM / VOC / HCHO

Test Operators Russell / Moore

RUN No. 1

Date 5-23-91

Time start 1743 end 1843

Meter Box	RAC591349	No. Sample Pts.		Gas Analysis	Air	Remarks:	
Sample Box	No. 3	Minutes/Pt.		CO_2			
Probe/Pitot	5' inc	NOMOGRAPH		O_2			
Pitot Cp	.84	ΔH@	1.95	CO			
Nozzle Dia.	.301	Meter Temp.		Time			
Filter No.		% H_2O		Condensate:		HCHO start 395515	
Amb. Temp. °F	90	C-Factor		tare 200	fin 214	HCHO stop 401507	
Bar. Press. "Hg	29.91	Stack Temp.		Silica gel:			
Static Press. "H_2O	-.05	Ref. Δ P	.22	tare 642	fin 652		

Port Point	El. Time, Min.	DGM Reading, Ft.³	Velocity Head Δ P, in. H_2O	Orifice Δ H in. H_2O	Stack Temp. °F	Meter Temp., °F In	Meter Temp., °F Out	Oven Temp. °F	Imp. Temp. °F	Vac. in. Hg
8	0	203.893	0.34	2.95	103	92	91	245	70	2
	5	208.3	0.33	2.80	100	95	89	250	66	4
	10	213.2	0.34	2.95	101	93	89	240	67	4
	15	217.7	0.34	2.95	100	98	92	245	68	4
	20	222.3	0.34	2.95	105	109	95	265	69	4
	25	226.6	0.34	2.95	105	110	96	250	67	4
	30	231.4	0.35	3.00	100	114	98	260	67	4
	35	235.9	0.34	3.00	96	118	98	260	69	4
35	32"	236.604								
		leak check: .037 → .037 = 0.000				one 6		n/a		
		pitot + re								
		pitot - re								
		32.7110	.5831	2.9438	101.25	98.54				

Plant Kirby
Sampling Location [redacted] (No. 3 Power Vent) V-017
Test For PM/VOC/HCHO
Test Operators Russell / Massa

RUN No. 2
Date 5-23-91
Time start 1909 end 2009

Meter Box	RAC591329	No. Sample Pts.		Gas Analysis	Air	Remarks:	
Sample Box	No. 1	Minutes/Pt.		CO_2			
Probe/Pitot	S' inc.	NOMOGRAPH		O_2			
Pitot Cp	.84	ΔH@	1.95	CO			
Nozzle Dia.		Meter Temp.		Time			
Filter No.		% H_2O		Condensate:			
Amb. Temp. °F	83	C-Factor		tare 200 fin 215			
Bar. Press. "Hg	29.90	Stack Temp.		Silica gel:			
Static Press. "H_2O	-.05	Ref. Δ P	.22	tare 622 fin 631			

Port Point	El. Time, Min.	DGM Reading, $Ft.^3$	Velocity Head Δ P, in. H_2O	Orifice Δ H in. H_2O	Stack Temp. °F	Meter Temp., °F In	Meter Temp., °F Out	Oven Temp. °F	Imp. Temp. °F	Vac in. Hg
8	0	238.502	0.33	2.80	105	101	96	220	65	6
	5	243.3	0.34	2.90	106	105	96	235	66	6
	10	247.7	0.34	2.90	105	111	97	220	67	6
	15	252.3	0.33	2.80	108	110	96	250	68	6
	20	257.3	0.36	3.00	103	117	96	260	67	6
	25	261.4	0.35	2.95	104	116	99	265	64	6
	30	266.0	0.34	2.90	106	117	101	260	65	6
34' 25"		270.126								

leak check: .078 → 085 = .007 @ 9" Hg.
pitot +ve 6.0
pitot -ve 4.1

31.6240 .5843 2.4929 105.29 103.93

Plant Kirby
Sampling Location ~~RK-8~~ V-017 Press Vent No. 3
Test For PM / VOC / HCHO
Test Operators Russell / Moore

RUN No. 3
Date 5-23-90
Time start 2030 end 2130

Meter Box	RAC59045	No. Sample Pts.		Gas Analysis	Air	Remarks:	
Sample Box	No 3	Minutes/Pt.		CO_2			
Probe/Pitot	S'inc.	NOMOGRAPH		O_2			
Pitot Cp	.84	ΔH@	1.95	CO			
Nozzle Dia.	.301	Meter Temp.		Time			
Filter No.		% H_2O		Condensate:		HCHO start 407208	
Amb. Temp. °F	78	C-Factor		tare 200	fin 216	HCHO stop: 413033	
Bar. Press. "Hg	29.90	Stack Temp.		Silica gel:			
Static Press. "H_2O	-.05	Ref. ΔP	.22	tare 655	fin 665		

Port Point	El. Time, Min.	DGM Reading, Ft.³	Velocity Head ΔP, in. H_2O	Orifice ΔH in. H_2O	Stack Temp. °F	Meter Temp., °F In	Meter Temp., °F Out	Oven Temp. °F	Imp. Temp. °F	Vac in. Hg
	0	270.424	0.34	2.90	102	101	97	250	65	4
	5	274.8	0.34	2.90	100	108	98	250	65	4
	10	280.0	0.34	2.90	100	109	98	260	66	4
	15	284.7	0.34	2.90	106	113	99	260	67	4
	20	288.8	0.33	2.80	109	113	97	280	64	4
	25	293.7	0.33	2.80	99	120	101	250	67	4
	30	297.8	0.34	2.90	95	119	102	265	68	4
	25	302.5	0.35	3.00	95	121	102	260	67	4
38'50"		306.098								
		leak check: .053 → .065 = .012 cfm @ 10" Hg								
		pitot + to 5.0								
		pitot - to 5.0								
		35,674	.5820	2.8895	100.95	106.13				

Plant Kirby | RUN NO. 2
Source V-017 No.3 Pressure Vent | Date 5-23-91
Test For VOC | Time start 1909
Test Operators Russell/Moore | Time end 2009

FID Calibration:	time: ~1900	time:	time:
Range setting: 0-1000			
Zero gas 0	✓		
Span gas 1 21.2 ppm	✓		
Span gas 2 796 ppm	✓		

Data:

time	0-100 FID Scale ppm	FID Range ppm	Sample Pressure mBar	Fuel Pressure psi	Air Pressure psi	Oven Temp °C	Line Temp °F	Chart Speed cm/hr
0	-							
1	7							
2	3							
3	6							
4	33							
5	11							
6	5							
7	5							
8	26							
9	6							
10	4							
11	4							
12	32							
13	12							
14	5							
15	23							
16	15							
17	8							
18	5							
19	4							
20	22							
21	12							
22	5							
23	5							
24	15							
25	9							
26	5							
27	5							
28	11							
29	5							
30	4							
31	30							
32	10							
33	5							
~~34~~								
~~35~~								
~~36~~								
~~37~~								
~~38~~								

Remarks:

AVG = 10.64

Plant Kirby
Source V-017 No. 3 Pump Vent
Test For NOC
Test Operators Russell / Moore

RUN NO. 1
Date 5-23-91
Time start 1743
Time end 1843

FID Calibration:	time: 1740	time:	time:
Range setting: 0-1000			
Zero gas Air	✓		
Span gas 1 21.2 ppm	✓		
Span gas 2 796 ppm	✓		

Data:

time	FID Scale ppm	FID Range ppm	Sample Pressure mBar	Fuel Pressure psi	Air Pressure psi	Oven Temp °C	Line Temp °F	Chart Speed cm/hr
1	14	0-100	4.0	6.75	12.0	150	250	N/A
2	10							
3	5							
4	8							
5	43							
6	22							
7	10							
8	5							
9	42							
10	29							
11	7							
12	6							
13	53							
14	26							
15	11							
16	7							
17	40							
18	21							
19	10							
20	6							
21	33							
22	9							
23	7							
24	4							
25	24							
26	12							
27	6							
28	5							
29	15							
30	11							
31	5							
32	42							
33	14							
34	10							
35	5							
36								
37								
38								

Remarks:

Avg = 16.49 ppm

Plant Kirby	RUN NO. 3
Source V-017 Pan Vent No 3	Date 5-23-91
Test For VOC	Time start 2030
Test Operators Russell Moon	Time end 2130

FID Calibration:	time: 2015	time:	time:
Range setting: 0-1000			
Zero gas Air	✓		
Span gas 1 21.2 ppm	✓		
Span gas 2 796 ppm	✓		

Data:

time	FID Scale ppm	FID Range ppm	Sample Pressure mBar	Fuel Pressure psi	Air Pressure psi	Oven Temp °C	Line Temp °F	Chart Speed cm/hr
0								
1								
2	15 5	0-100	4.0	6.75	12.0	150	250	n/a
3	5							
4	27							
5	12							
6	5							
7	4							
8	29							
9	8							
10	5							
11	5							
12	29							
13	11							
14	4							
15	4							
16	29							
17	12							
18	4							
19	3							
20	6							
21	19							
22	12							
23	8							
24	8							
25								
26	28 8							
27	15							
28	10							
29	8							
30	8							
31	9							
32	8							
33	31							
34	15							
35	8							
36	8							
37	32							
38	19							
~~39~~								

Remarks:

PARTICULATE CATCH ANALYSIS:

SAMPLES: Kirby - V-017 No. 3 Precleaner

DATE TAKEN: 5-23-91 DATE ANALYZED: 5.25.91

SAMPLES DELIVERED BY: DCR RECEIVED BY: DCR

ANALYZED BY: DCR

Filter treatment: Filters oven dried 2 hours at 105° C, desiccated at least 24 hours, weighed to constant weight

FILTERS:

RUN NO.	1	2	3	
FILTER NO.	563	564	565	
FILTER TARE, gms	.4113	.4005	.4094	
1st weighing	.4137	.41097	.4164	
2nd weighing	.4138	.4099	.4160	
3rd weighing				
FINAL WEIGHT, gms.	.4138	.4099	.4160	
NET GAIN, gms.	.0025	.0094	.0066	

Probe wash treatment: Transferred to a tared beaker, acetone evaporated over low heat, desiccated at least 24 hours, weighed to constant weight.

PROBE WASH: Front Back Front Back Front Back

RUN NO.	1		2		3		
CONTAINER ID	PV3R1	PV3R18	PV3R2	PV3R28	PV3R3	PV3R38	
VOLUME INTACT?	✓	✓	✓	✓	✓	✓	
VOLUME, ml	100	250	125	250	200	250	
TARE WT., gms.	(26) 98.6840	(3) 104.6325	(44) 109.8937	(46) 105.8250	(47) 111.4726	(45) 114.7928	
1st weighing	98.6966	104.6388	109.9003	105.8789	111.4828	114.7933	
2nd weighing	98.6959	104.6383	109.9000	105.8277	111.4828	114.7930	
3rd weighing	98.6959			105.8279			
FINAL WEIGHT, gms.	98.6959	104.6383	109.9000	105.8279	111.4828	114.7930	
NET GAIN, gms.	.0119	.0058	.0070	.0029	.0102	.0022	
LESS BLANK, gms.							

PARTICULATE SAMPLE WEIGHT, mg.

RUN NO.	1F	1B	2F	2B	3F	3B		
filter + probe	14.4	5.8	16.4	2.9	16.8	2.2		

Plant Kirby
Sampling Location BV-B19 (Cooling Vent)
Test For PM/VOC/HCHO
Test Operators Rmed/Mmm

RUN No. 1
Date 5-24-91
Time start 0906 end 1018

Meter Box	RAC 591345	No. Sample Pts.	12x2	Gas Analysis	Air	Remarks:	
Sample Box	No.	Minutes/Pt.	2.5	CO_2			
Probe/Pitot	S'less	NOMOGRAPH		O_2			
Pitot Cp	.84	ΔH@	1.95	CO			
Nozzle Dia.	.301	Meter Temp.	95	Time			
Filter No.		% H_2O	<10	Condensate:		HCHO std. T413033	
Amb. Temp. °F	80	C-Factor	1.0	tare 200 fin 215		stop 424031	
Bar. Press. "Hg	29.94	Stack Temp.	100	Silica gel:			
Static Press. "H_2O	-.08	Ref. ΔP	.22	tare 619 fin 636.5		Line Down 1230	

Port Point	Elapsed Time, Min.	DGM Reading, Ft.³	Velocity Head ΔP, in. H_2O	Orifice ΔH in. H_2O	Stack Temp. °F	Meter Temp., °F In	Meter Temp., °F Out	Oven Temp. °F	Imp. Temp. °F	Vac. in. Hg	VOC ppm
1	0.00	307.686	0.40	3.20	107	81	80	225	66	7	7
2	2.30	310.1	0.43	3.65	106	87	78	235	62	8	10
3	5.00	312.6	0.41	3.45	106	94	80	240	61	8	8
4	7.30	315.0	0.38	3.20	104	100	82	250	64	8	6
5	10.00	318.4	0.38	3.20	104	107	84	255	66	8	5
6	12.30	320.1	0.35	2.95	107	105	86	260	68	8	6
7	15.00	322.8	0.34	2.85	103	99	87	250	67	7	6
8	17.30	325.2	0.39	3.30	102	104	88	275	68	7	10
9	20.00	327.3	0.40	3.40	100	108	90	260	67	8	12
10	22.30	329.8	0.25	2.10	104	113	90	250	70	8	10
11	26.00	331.8	0.25	2.10	103	114	91	250	67	5	10
12	27.30	334.0	0.22	1.85	102	117	93	250	66	5	10
1	30/00	335.709	0.40	3.40	106	117	91	260	67	8	10
2	2.30	338.2	0.48	4.05	106	119	93	250	65	8	6
3	5.00	341.2	0.51	4.30	107	123	96	255	67	8	6
4	7.30	343.6	0.46	4.00	104	127	97	260	66	8	4
5	10.00	346.3	0.37	3.10	106	130	100	250	68	9	6
6	12.30	349.1	0.33	2.80	108	130	101	266	63	7	7
7	15.00	351.3	0.32	2.70	111	131	100	250	62	7	5
8	17.30	354.0	0.40	3.40	108	126	100	254	60	8	6
9	20.00	356.0	0.41	3.50	111	125	99	255	60	9	5
10	22.30	358.9	0.27	2.30	111	124	99	260	61	6	5
11	25.00	361.2	0.22	1.85	109	121	100	250	62	5	5
12	27.30	362.8	0.20	1.70	109	119	102	250	64	4	5
end	60	364.574									7.08
		leak check .038		-.040	= .002 cfm @ 15" Hg						
		pitot + ΔP 4.0									
		pitot - ΔP 6.0									
		56.8880	.5932	3.014	105.88	103.60					

Environmental Monitoring Laboratories Ridgeland, Mississippi 601 856 0886

Plant Kiln
Sampling Location PV-019 Cooling Tower Vent
Test For PM/VOC/HCHO
Test Operators Russell/moore

RUN No. 2
Date 5-24-91
Time start 1049 end 1210

Meter Box	RAC591349	No. Sample Pts.	12 x 2	Gas Analysis	Air	Remarks: ~~104~~	
Sample Box	No. 3	Minutes/Pt.	2.5	CO_2			
Probe/Pitot	5' inc.	NOMOGRAPH		O_2			
Pitot Cp	.84	ΔH@	1.95	CO			
Nozzle Dia.	.301	Meter Temp.		Time		HCHO start 424 031	
Filter No.		% H_2O		Condensate:		stop 435 137	
Amb. Temp. °F	90	C-Factor		tare 200 fin 212			
Bar. Press. "Hg	29.94	Stack Temp.		Silica gel:			
Static Press. "H_2O	-.08	Ref. ΔP	.22	tare 625 fin 644			

Port Point	El. Time, Min.	DGM Reading, Ft.³	Velocity Head ΔP, in. H_2O	Orifice ΔH in. H_2O	Stack Temp. °F	Meter Temp., °F In	Meter Temp., °F Out	Oven Temp. °F	Imp. Temp. °F	Vac in. Hg	
1	000	364.817	0.45	3.80	120	93	91	230	69	5	10
2	230	366.9	0.39	3.25	122	97	91	240	67	5	7
3	500	369.3	0.39	3.25	120	101	91	270	70	5	3
4	730	371.6	0.39	3.25	122	106	91	260	68	5	3
5	1000	374.2	0.39	3.25	120	110	92	250	70	5	5
6	1230	376.7	0.38	3.20	118	112	93	265	67	5	7
7	1500	379.1	0.31	2.60	116	114	93	260	68	4	4
8	1730	381.5	0.38	3.20	114	115	94	250	67	5	5
9	2000	383.9	0.39	3.25	114	116	95	245	66	5	3
10	2230	386.2	0.30	2.55	114	118	96	240	64	4	2
11	2500	388.4	0.24	2.00	109	117	97	250	66	3	3
12	2730	390.5	0.26	2.20	109	116	96	260	67	3	2
1	30/0	392.493	0.36	3.00	108	99	94	275	68	4	6
2	230	395.0	0.40	3.40	105	102	93	260	67	5	4
3	500	397.4	0.47	4.00	109	105	93	250	60	6	3
4	730	400.3	0.46	3.90	109	110	94	260	62	6	5
5 pitot	1000	403.1	0.40	3.40	102	101	94	240	66	6	6
6	1230	405.2	0.30	2.50	108	103	95	250	65	6	4
7	1500	407.5	0.33	2.80	107	105	94	250	64	4	4
8	1730	410.1	0.41	3.50	108	111	96	220	66	5	5
9	2000	412.9	0.27	3.10	110	111	95	210	67	5	4
10	2230	414.5	0.34	2.90	112	113	95	200	66	5	4
11	2500	416.7	0.23	1.90	110	115	95	200	66	5	5
12	2730	419.1	0.18	1.50	110	114	92	190	67	2	4
end	60	420.746									4.54
			leak check: .012 → .021 = .009 cfm @ 8" Hg								
			pitot + ok								
			pitot - ok								
		55.9290	.5924	2.9825	112.33	101.17					

Plant Kirby
Sampling Location PV-019 Cooling Wheel Vent
Test For PM/VOC/HCHO
Test Operators Rumsey / Moore

RUN No. 3
Date 5-24-91
Time start 1238 end 1405

Meter Box	LAC591349	No. Sample Pts.	12x2	Gas Analysis	Air	Remarks:	
Sample Box	No. 1	Minutes/Pt.	2.5	CO_2			
Probe/Pitot	5' inc.	NOMOGRAPH		O_2			
Pitot Cp	.84	ΔH@	1.95	CO			
Nozzle Dia.	.301	Meter Temp.		Time			
Filter No.		% H_2O		Condensate:			
Amb. Temp. °F	91	C-Factor		tare 200 fin 222			
Bar. Press. "Hg	29.94	Stack Temp.		Silica gel:			
Static Press. "H_2O	-.08	Ref. ΔP	.22	tare 692 fin 693.5			

Port Point	El. Time, Min.	DGM Reading, Ft.³	Velocity Head ΔP, in. H_2O	Orifice ΔH in. H_2O	Stack Temp. °F	Meter Temp., °F In	Meter Temp., °F Out	Oven Temp. °F	Imp. Temp. °F	Vac in. Hg	VOC PPM
1	0:00	421.050	0.42	3.55	115	91	89	200	71	7	4
2	230	423.4	0.42	3.55	113	93	89	200	68	8	3
3	500	426.3	0.39	3.20	112	102	90	215	67	7	7
4	730	428.5	0.39	3.20	109	105	90	230	66	8	2
5	1000	430.7	0.36	3.00	111	91	88	250	64	5	7
6	1230	432.4	0.32	2.65	112	98	89	225	60	6	5
7	1500	434.5	0.32	2.65	108	98	88	240	62	6	12
8	1730	436.7	0.40	3.40	105	103	89	250	64	8	5
9	2000	439.0	0.36	3.00	107	106	89	225	62	7	5
10	2230	441.5	0.27	2.30	107	109	90	195	65	8	6
11	2500	443.9	0.25	2.10	105	111	91	180	64	6	6
12	2730	446.0	0.23	1.90	105	111	92	200	62	5	6
1	30/00	447.771	0.42	3.55	112	95	92	260	68	8	8
2	230	450.1	0.48	3.90	110	99	94	250	67	9	7
3	500	452.6	0.48	3.90	107	100	91	260	66	10	10
4	730	455.5	0.45	3.75	112	109	92	240	62	10	10
5	1000	458.0	0.41	3.50	113	112	92	225	60	10	9
6	1230	460.8	0.27	2.30	114	113	94	230	60	6	8
7	1500	463.2	0.33	2.80	111	117	95	250	63	6	10
8	1730	465.4	0.43	3.70	111	117	95	260	64	8	8
9	2000	467.9	0.39	3.30	111	117	96	250	62	8	7
10	2230	470.3	0.36	3.00	110	119	96	265	65	8	8
11	2500	473.1	0.22	1.85	106	120	97	250	66	6	6
12	2730	475.1	0.18	1.50	106	119	97	240	67	4	6
end	60	476.903									6.75
			Leak check .057 → .065 = .008 cfm @ 15 "Hg								
		55.8530	.5925	2.9771	109.67	99	19				

PARTICULATE CATCH ANALYSIS:

SAMPLES: Kirby - V-018 Cooling Wheel Vent

DATE TAKEN: 5-24-91 DATE ANALYZED: 5-25-91

SAMPLES DELIVERED BY: DGR RECEIVED BY: DGR

ANALYZED BY: DGR

Filter treatment: Filters oven dried 2 hours at 105° C, desiccated at least 24 hours, weighed to constant weight

FILTERS:

RUN NO.	1	2	3	
FILTER NO.	566	567	568	
FILTER TARE, gms	.4116	.4076	.4099	
1st weighing	.4144	.4107	.4138	
2nd weighing	.4141	.4108	.4139	
3rd weighing				
FINAL WEIGHT, gms.	.4141	.4108	.4139	
NET GAIN, gms.	-.0025	.0032	.0040	

Probe wash treatment: Transferred to a tared beaker, acetone evaporated over low heat, desiccated at least 24 hours, weighed to constant weight.

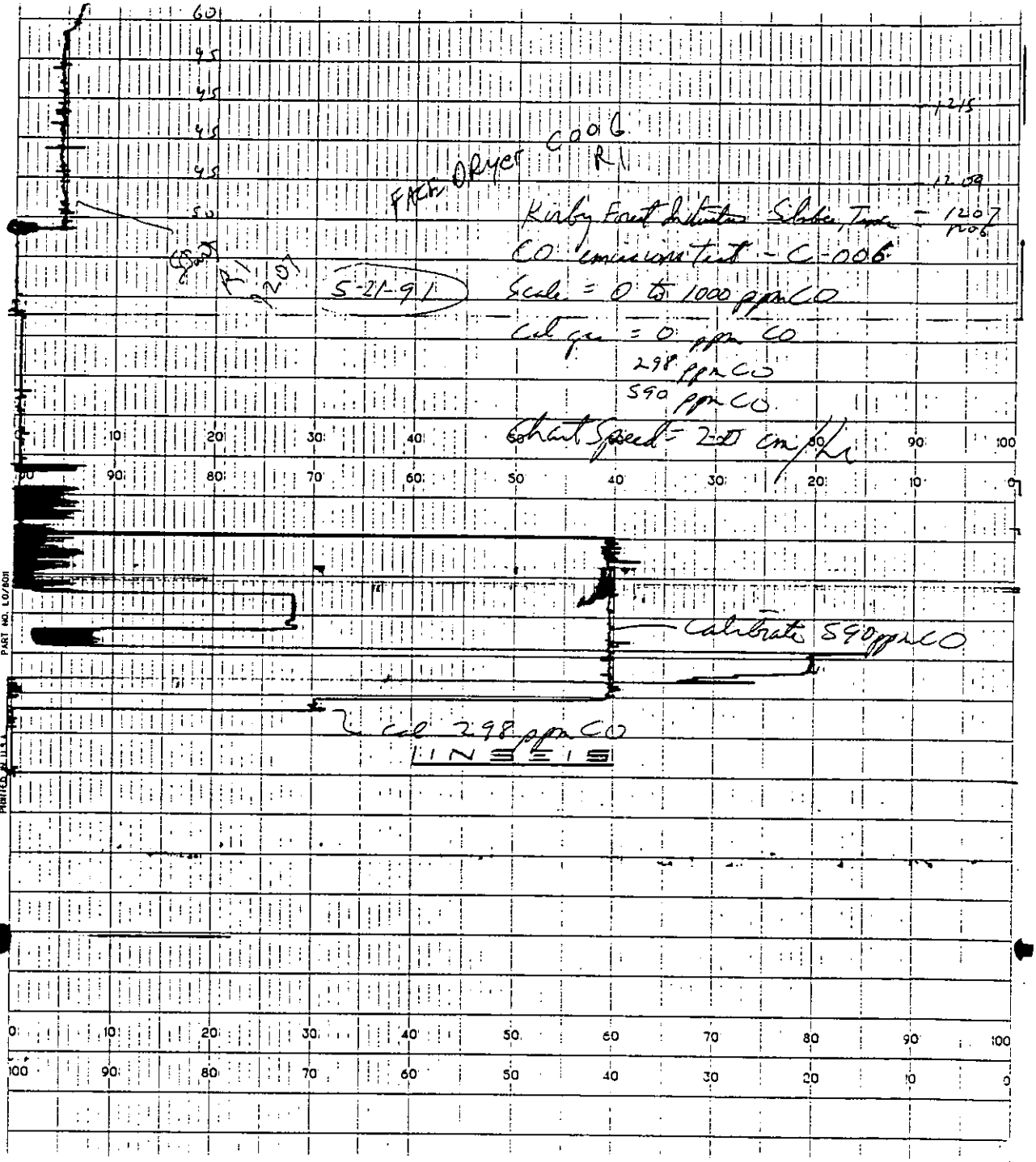
PROBE WASH:

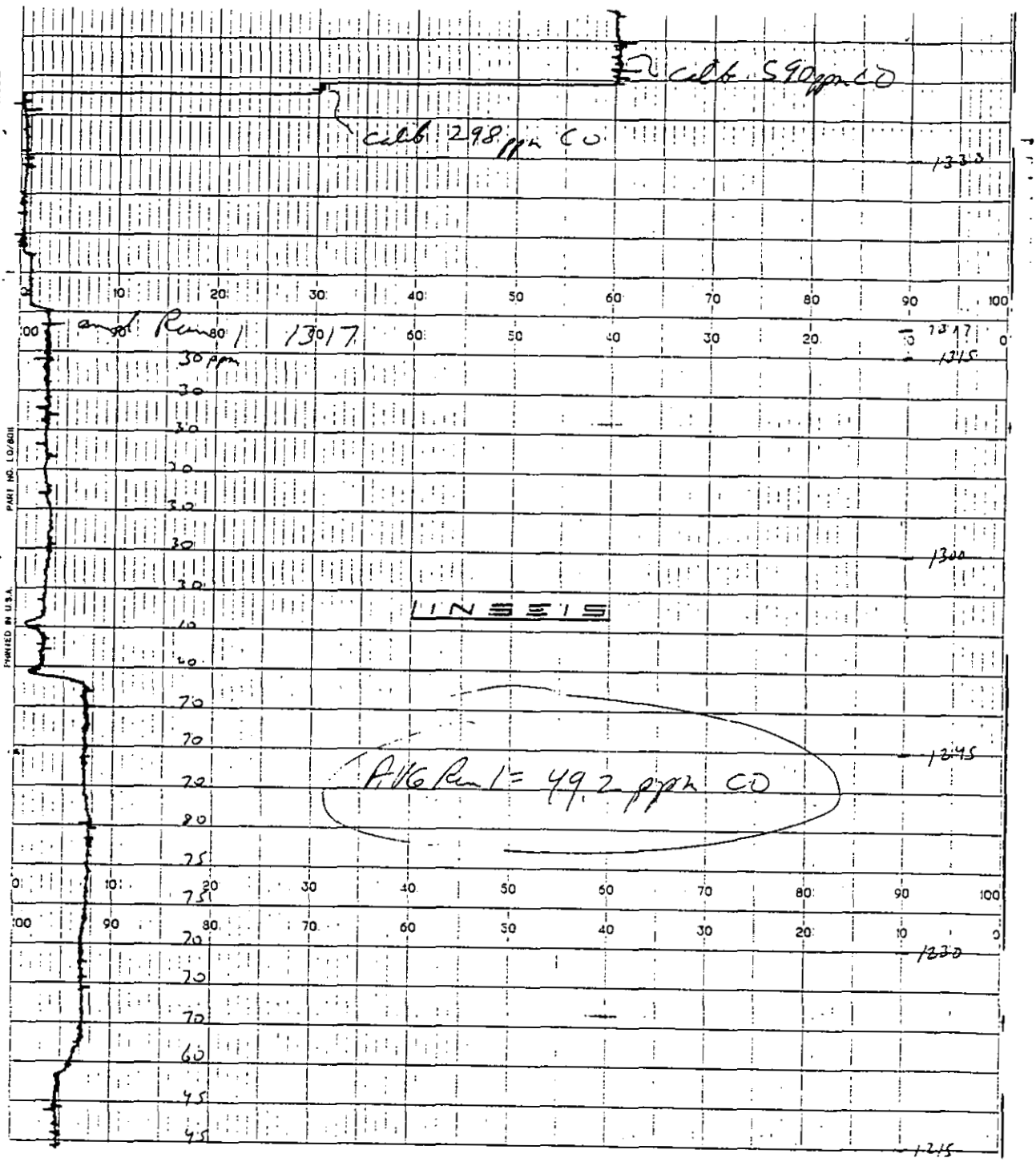
RUN NO.	F 1 B		F 2 B		F 3 B		
CONTAINER ID	PV4R1	PV4R1B	PV4R2	PV4R2B	PV4R3	PV4R3B	
VOLUME INTACT?	✓	✓	✓	✓	✓	✓	
VOLUME, ml	180	250	175	250	175	250	
TARE WT., gms.	(58) 98.6777	(7) 111.5506	(50) 103.8803	(61) 113.9867	(66) 109.8899	(4) 109.4414	
1st weighing	98.6919	111.5576	103.8935	113.9933	109.8925	109.4472	
2nd weighing	98.6918	111.5580	103.8933	113.9933	109.8926	109.4467	
3rd weighing							
FINAL WEIGHT, gms.	98.6918	111.5580	103.8933	113.9933	109.8926	109.4467	
NET GAIN, gms.	.0141	.0224	.0130	.0066	.0027	.0053	
LESS BLANK, gms.	-0-	-0-	-0-	-0-	-0-	-0-	

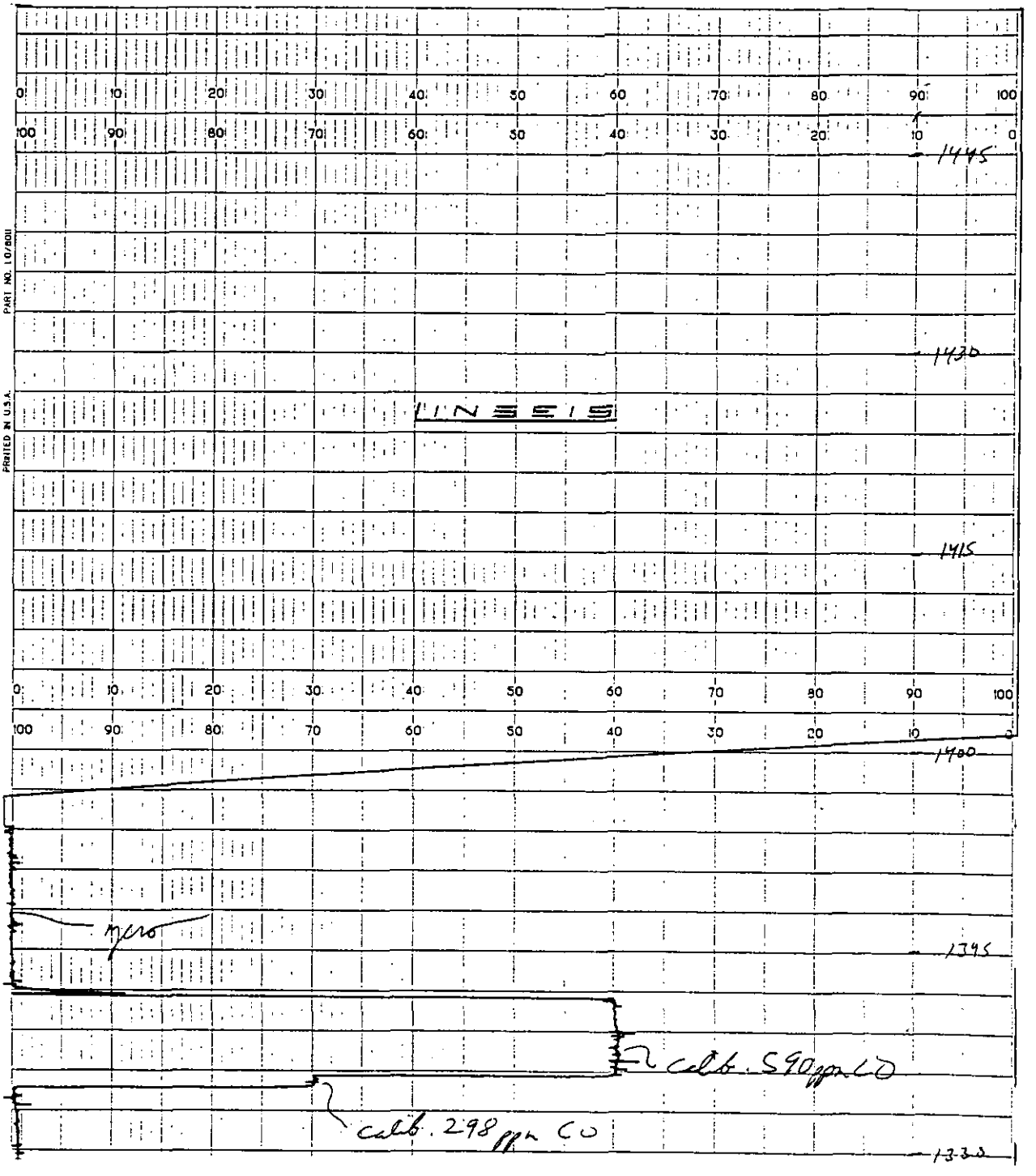
PARTICULATE SAMPLE WEIGHT, mg.

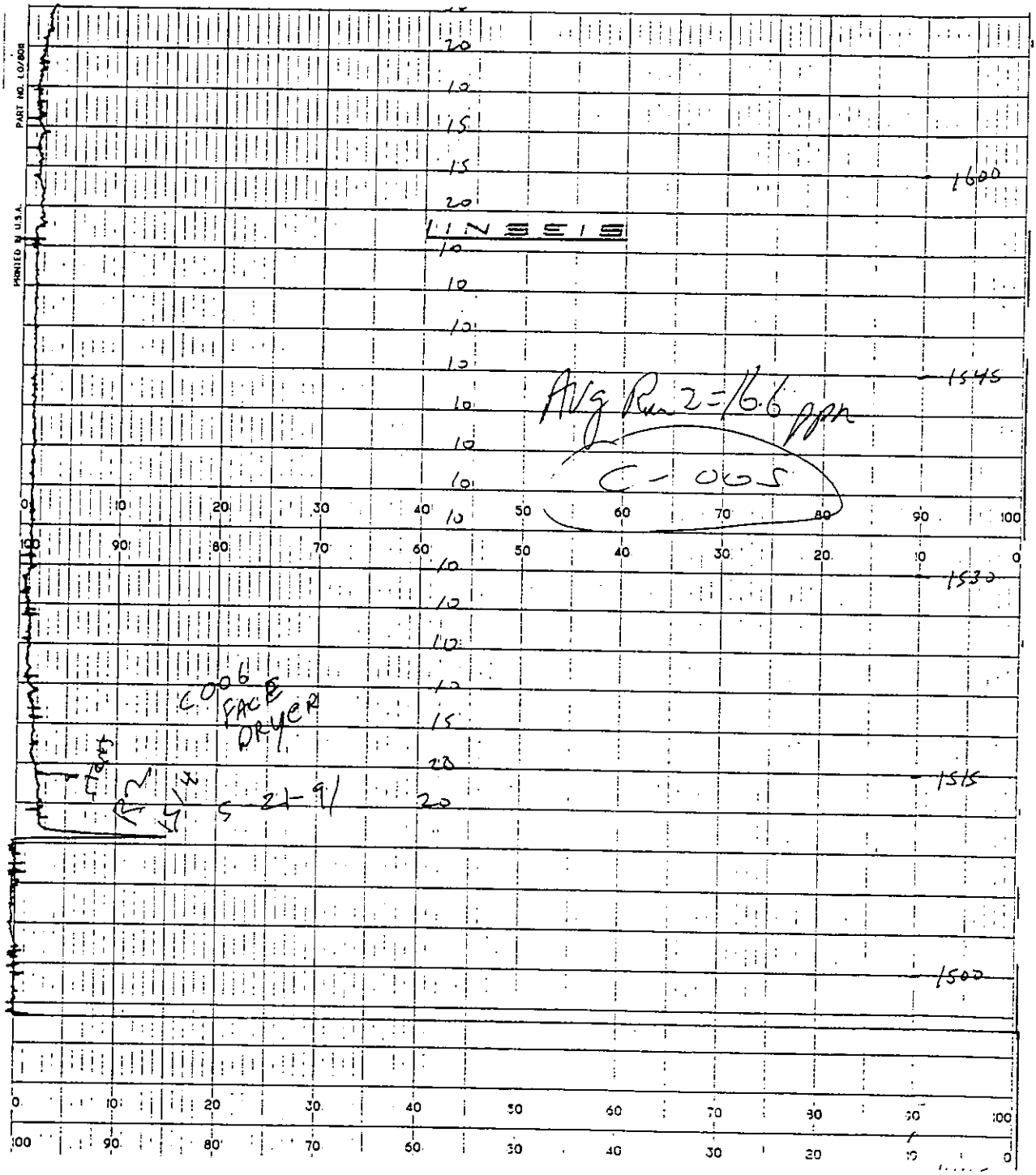
RUN NO.							
filter + probe	11.6	7.4	16.2	6.6	6.7	5.3	

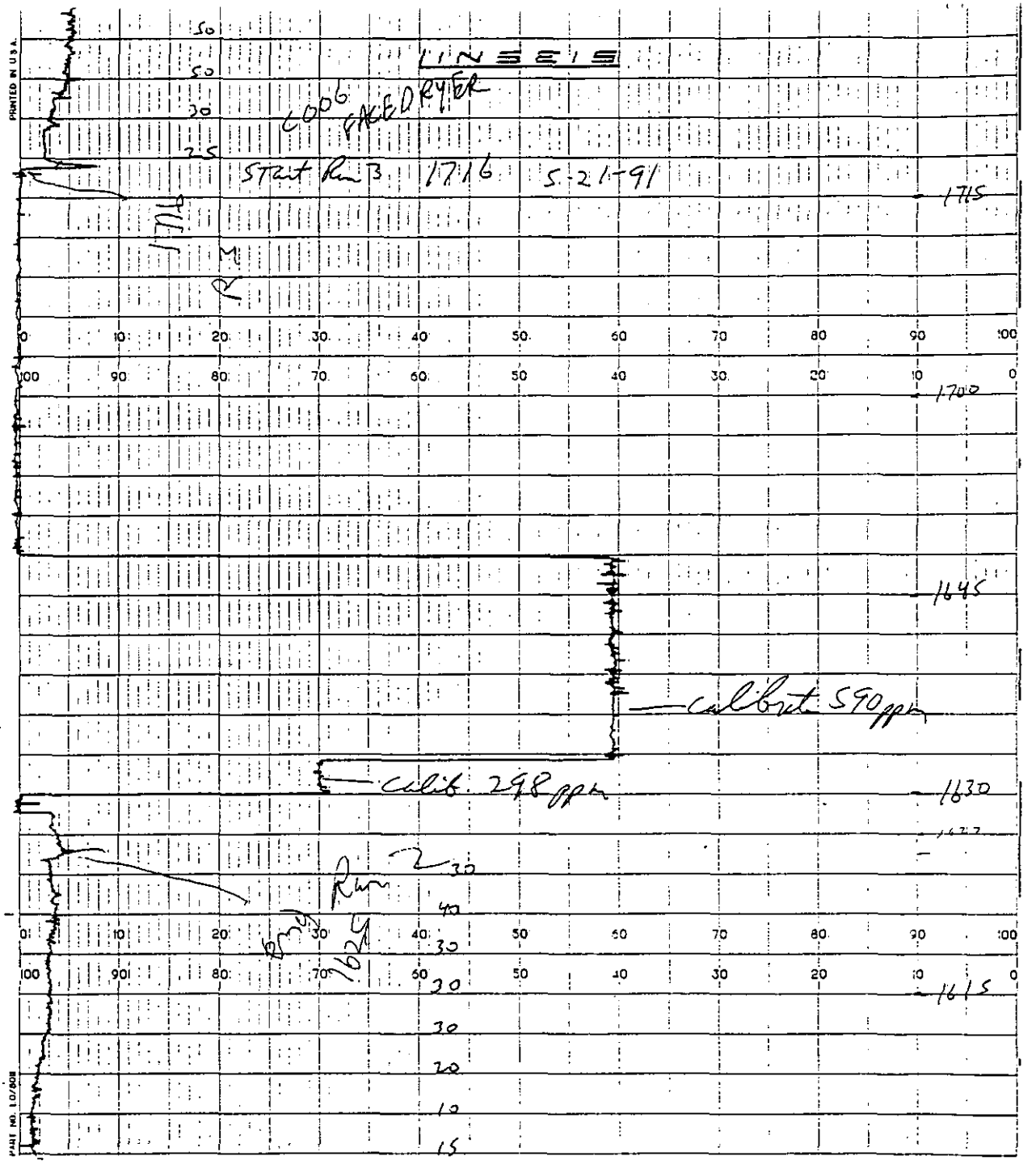
B. CO TRACE

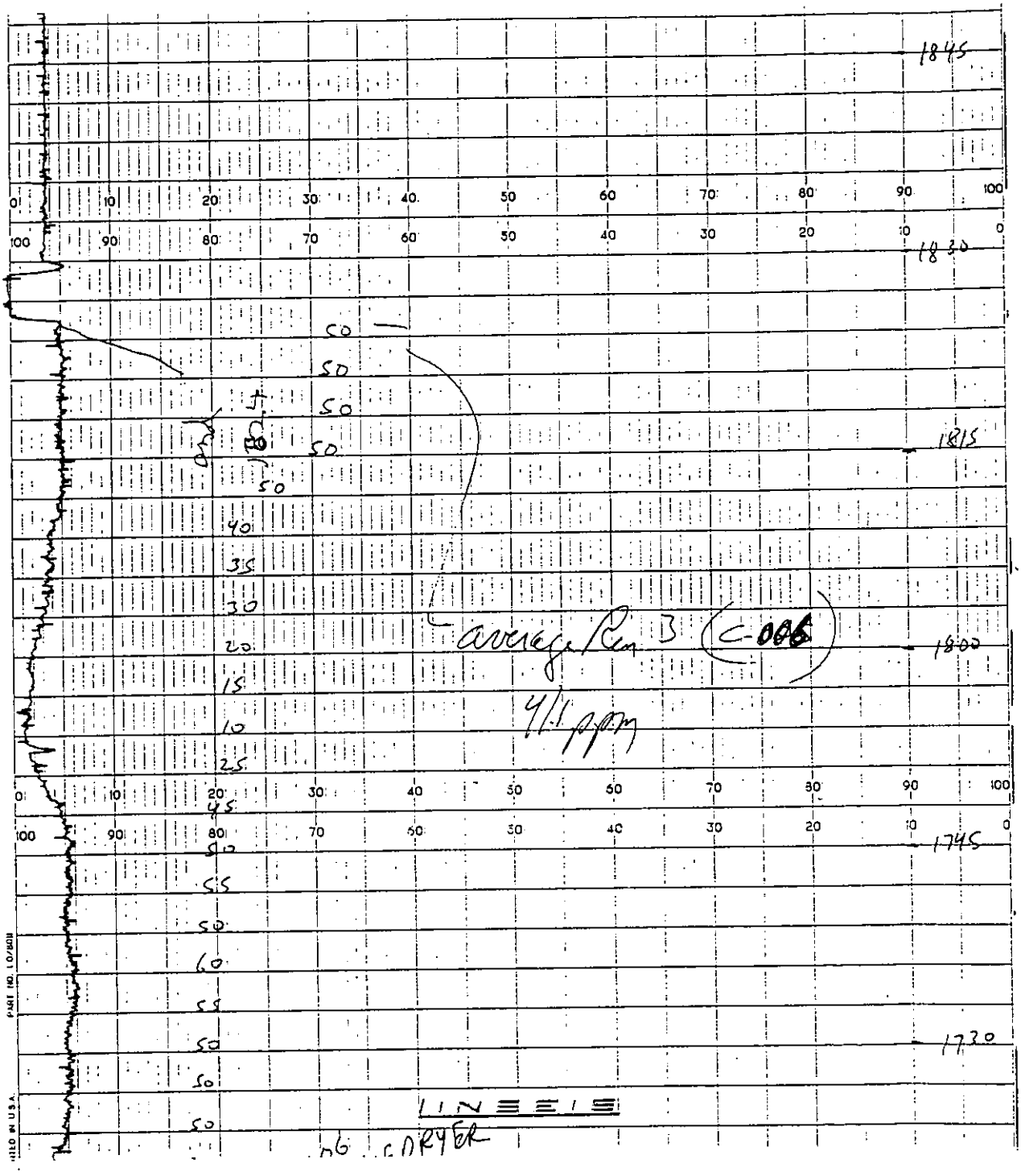

FACE DRYER COOL
Kirby Facet Institution Globe, Texas
CO emission test - C-006
5-21-91
Scale = 0 to 1000 ppm CO
Cal gas = 0 ppm CO
298 ppm CO
590 ppm CO
Chart Speed = 200 cm/hr
Calibrate 590 ppm CO
Cal 298 ppm CO
LINES

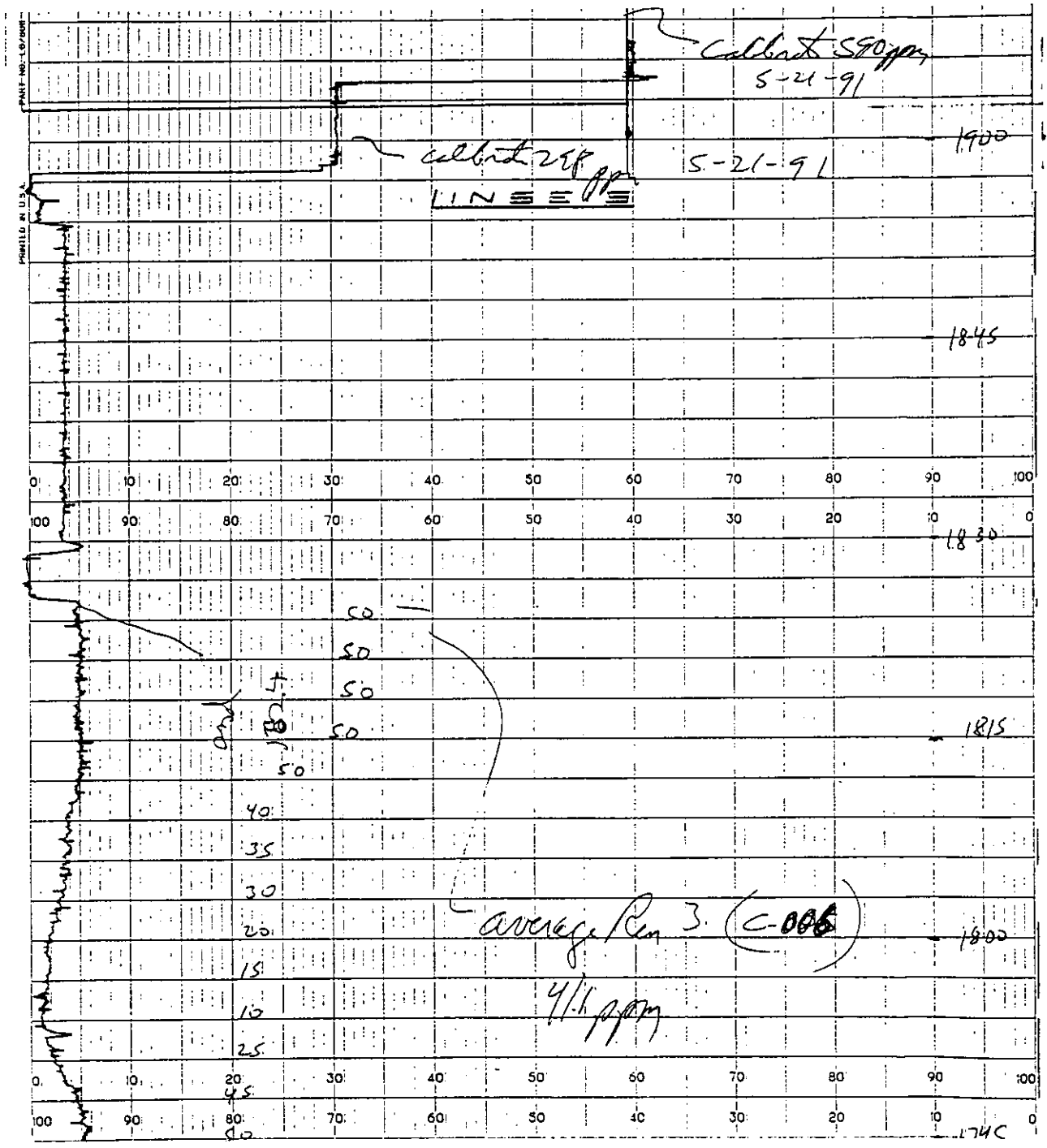

calib 590 ppm CO
calib 298 ppm CO
1330
and Run 1 1317
1317
1315
30 ppm
1300
LINES
1245
AVG Run 1 = 49.2 ppm CO
1230
1215

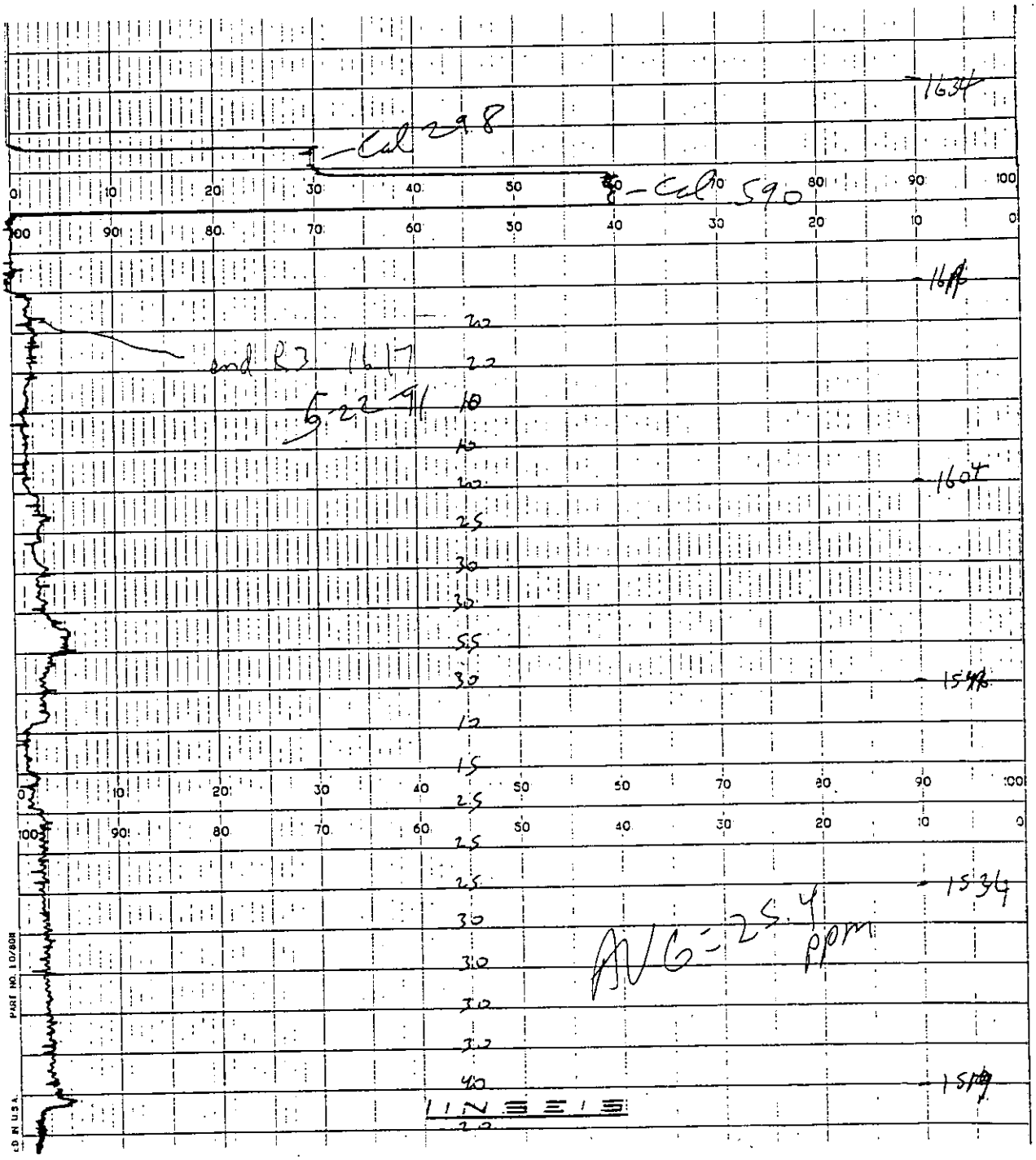

0 10 20 30 40 50 60 70 80 90 100
100 90 80 70 60 50 40 30 20 10 0
1445
1430
1415
1400
1385
1330
PART NO. 10/5011
PRINTED IN U.S.A.
UNISIS
zero
calb. 590 ppm CO
calb. 298 ppm CO

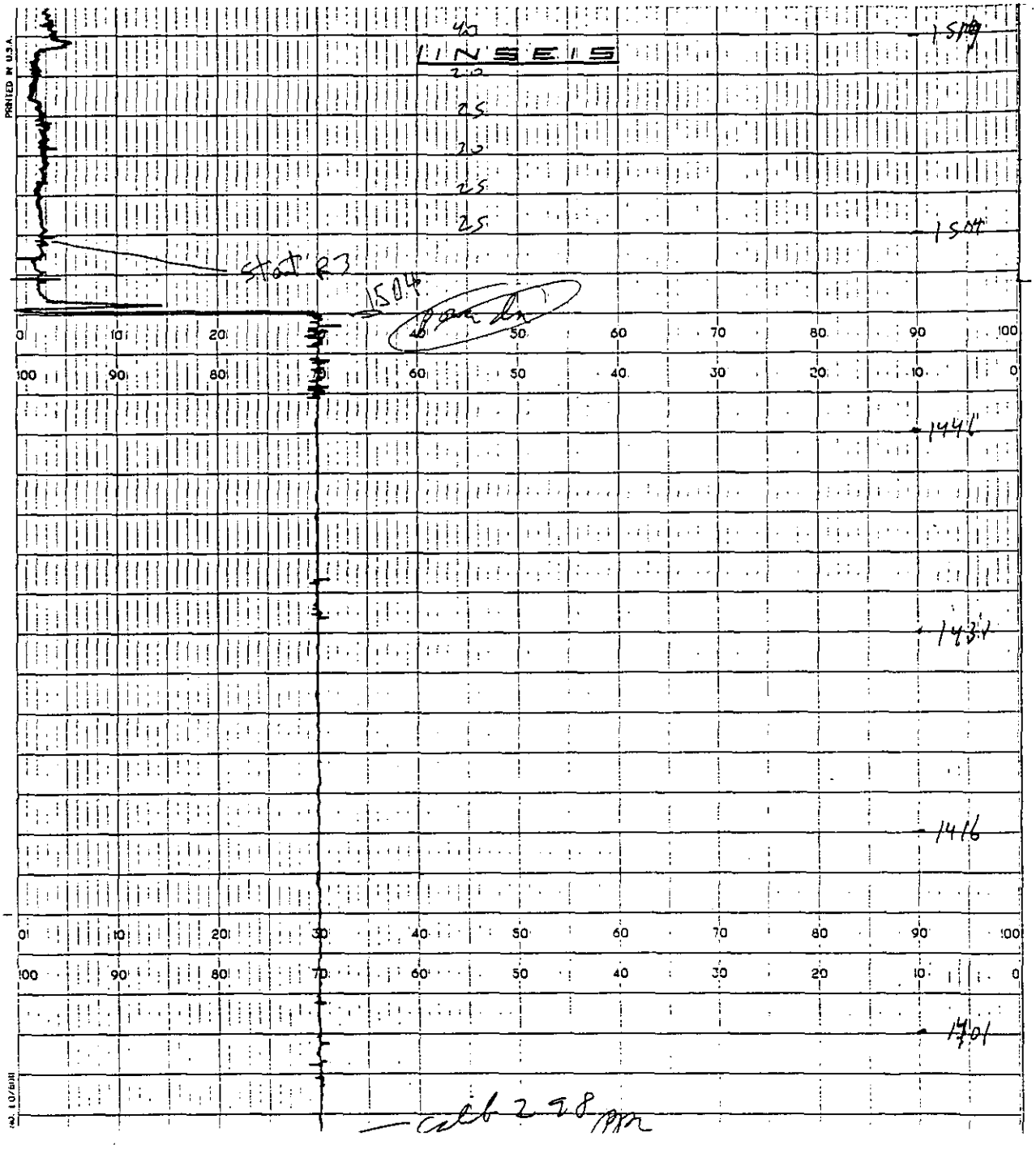

PART NO. LO/808
PRINTED IN U.S.A.
LINSIS
1600
1545
1530
1515
1500
Avg Run 2 = 16.6 ppm
C-005
C006 FACE DRYER
Run 4 5 21-9
0 10 20 30 40 50 60 70 80 90 100

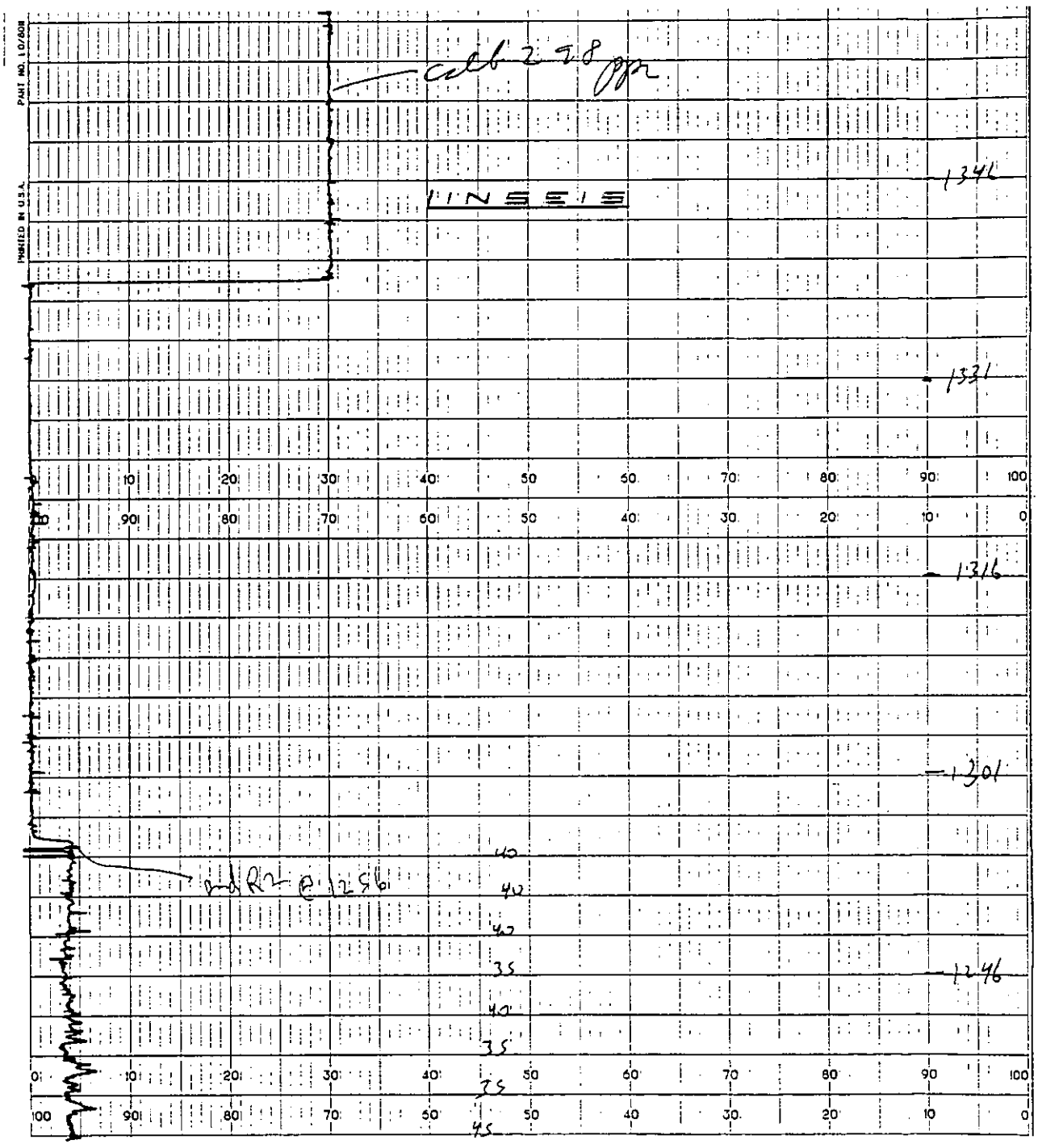

LINSIS
6006 PAKED RYER
START Run 3 1716 5-21-91
1715
1700
1645
calibrate 590 ppm
calibrate 298 ppm
1630
1615
Run 2
PRINTED IN U.S.A.
PART NO. 10/908

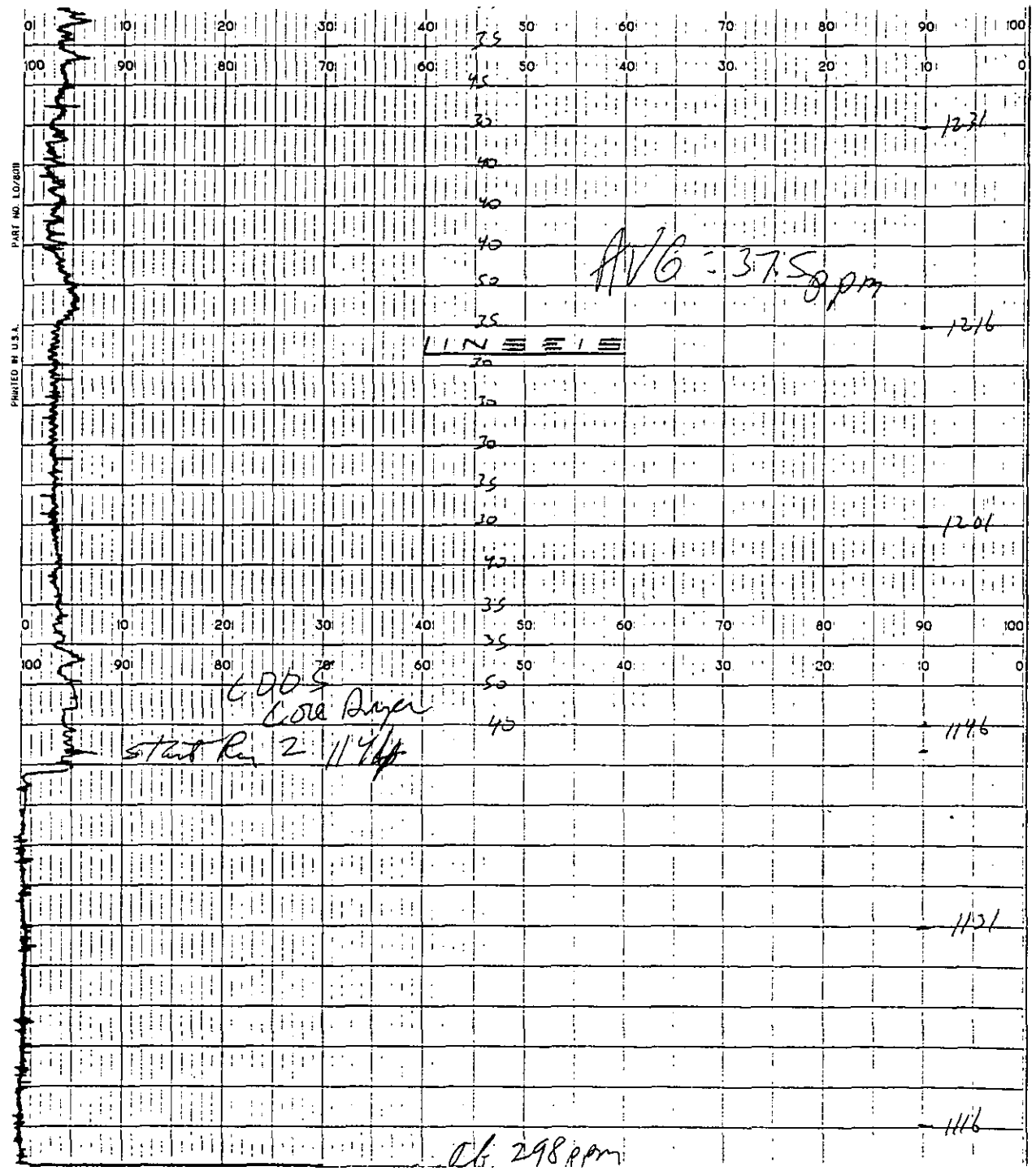

1845
1830
1815
1800
1745
1730
Average Run 3 (C-006)
4.1 ppm
LINES
no DRYER

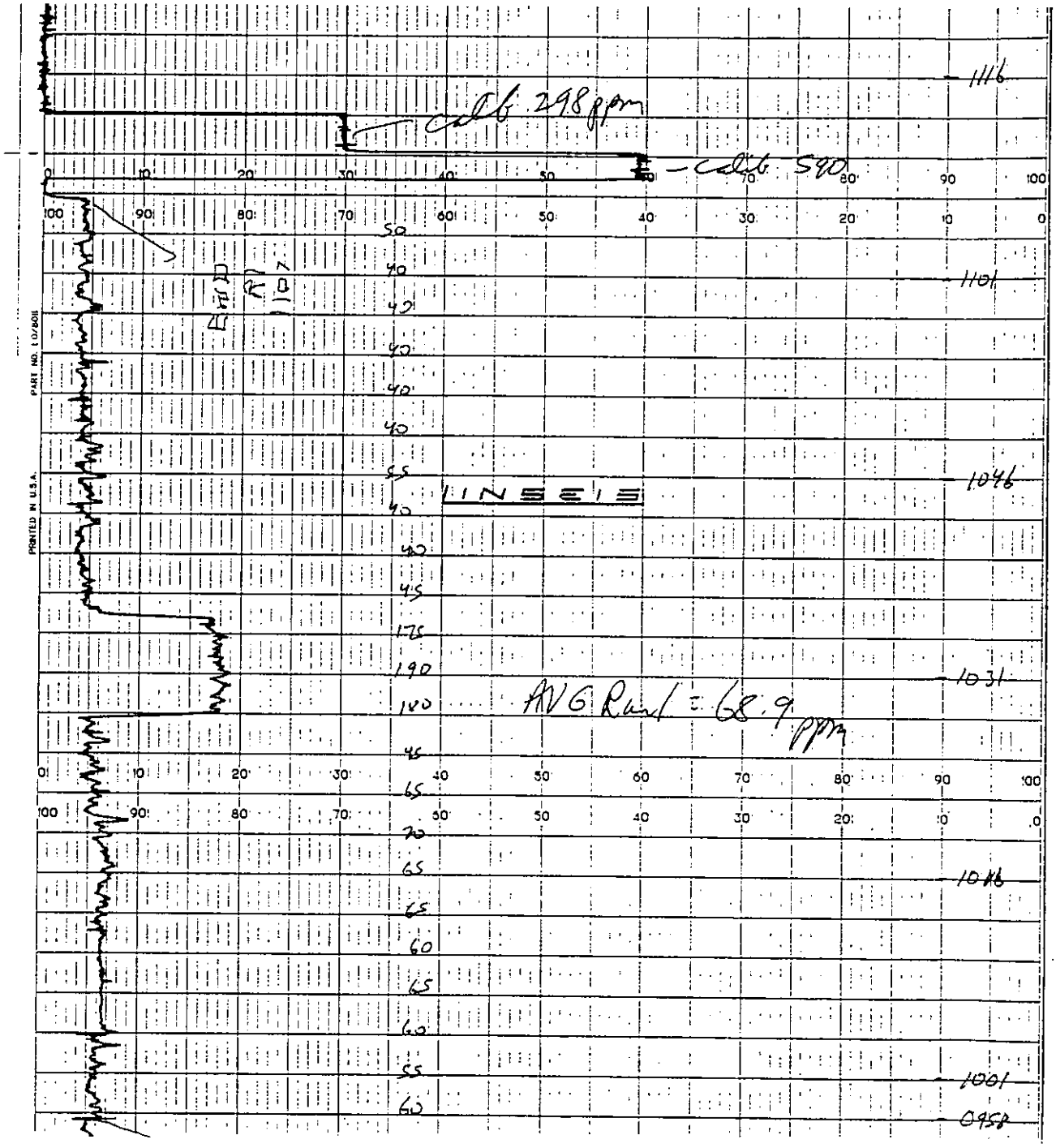

Calibrate 580 ppm
5-21-91
1900
calibrate 248 ppm
5-21-91
LINES
1845
1830
50
50
50
50
50
40
35
30
20
15
10
25
45
40
1815
average Rm 3 (C-006
4.1 ppm
1800
1745

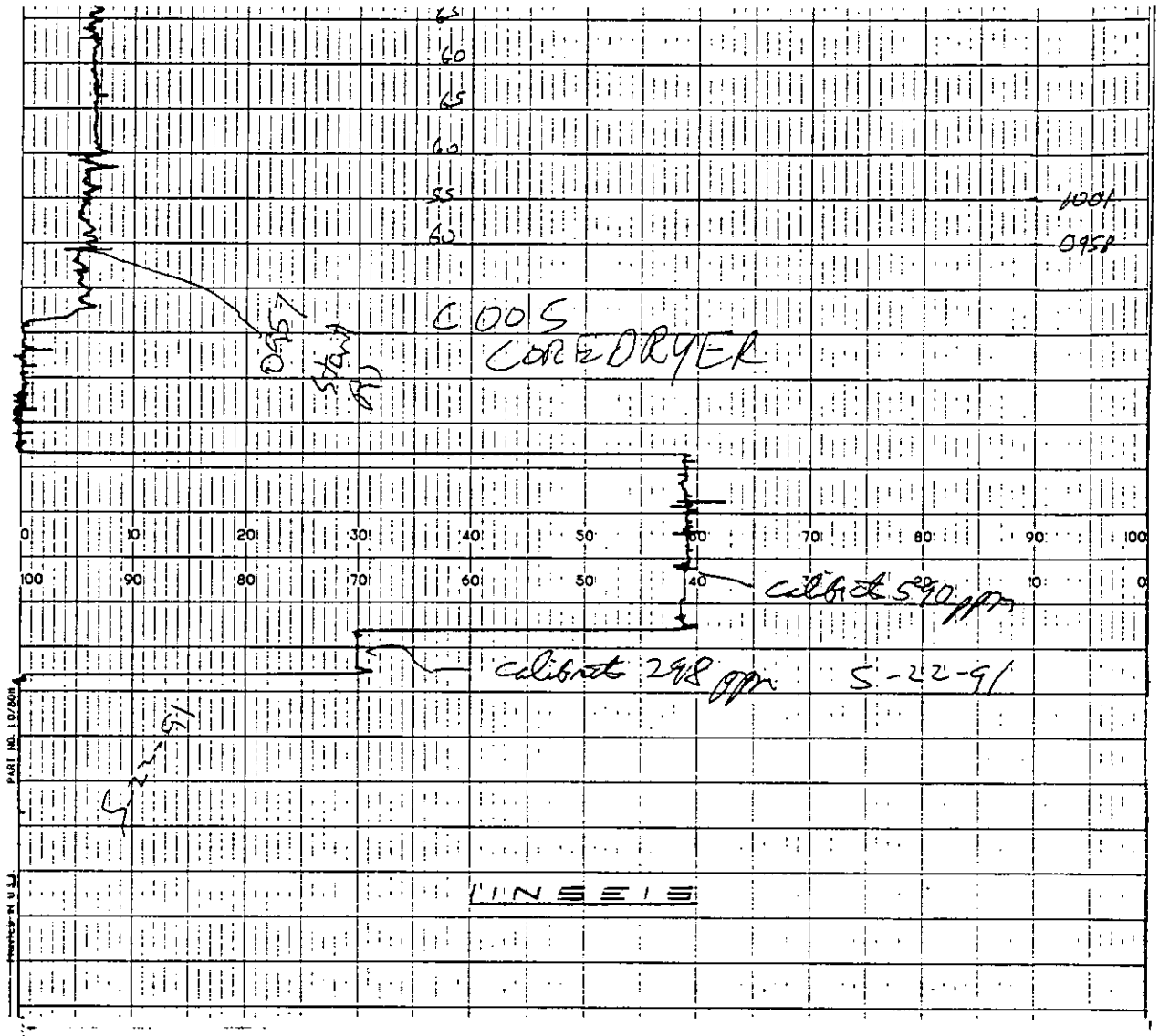

1634
Cal 298
Cal 590
1644
end R3 1617
5-22-91
1604
1554
1534
AVG - 25.4 ppm
1514
LINEAR


LINSEIS
Start R3
1504
1504
1444
1431
1416
1401
Calib 298 ppm


PRINTED IN U.S.A.
PART NO. 110/600R
calib 2 to 8 psi
LINEAR
1346
1331
1316
1301
1246
0 10 20 30 40 50 60 70 80 90 100
100 90 80 70 60 50 40 30 20 10 0
end RT @ 1256
40
40
40
35
40
35
35
45


PRINTED IN U.S.A.
PART NO. LO/8011
LINES
AVG = 375 RPM
12:31
12:16
12:01
11:46
11:31
11:16
600 Core Dryer
Start Run 2 11:46
OL 298 RPM


Calb 298 ppm
Calb 590
1116
1101
1046
1031
1016
1001
0952
INSEIS
AVG Run = 68.9 ppm
PART NO. 1.0/8011
PRINTED IN U.S.A.


C005
CORE DRYER
calibrate 590 ppm
calibrate 298 ppm
5-22-91
LINSEIS

C. AMBIENT MONITOR DATA

Downwind #1

Plant Kirby Forest Industries Date 5-22-91

Source G.L. V ≈ 200 yards SW of main Bldg.

Test Operators _____

Sampling Data:

	Urea	HCHO	Phenol
Sampler I.D.	MSA 9903	SKC 823 (A)	SKC 823 (B)
Date/Method Calibrated	5-19-91	Bubble meter	
Avg. calibrated flow rate, lpm	.909	.0984	.0952

Sample type	Urea	HCHO	Phenol
Configuration	1.0 nominal lpm	SKC treated	SKC XAD-7
~~Sampler position~~	2 midget impingers	XAD-2 resin	resin Tube
~~Position I.D.~~	W/.1N NaOH	tube	

Time start 1425

Time stop 1829

Filter No. _____

Filter Tare weight _____

Filter Final weight _____

Remarks: Wind: light NE

Ambient Temp ≈ 88

B.bar = 29.92

Calculations and Results:

Total sample time, minutes: 244

Sample volume, m3: [(sample rate, ml)*(time, min.)/1000] _____

Sample weight, mg: [(final wt.- tare wt.)*1000] _____

Concentration, mg/m3 : [weight/volume] _____

Downwind R 2

Plant	Kirby Forest Industries
Date	5-23-9
Source	G.L. ~ 200 yards SW of Press line Bldg
Test Operators	Russell

Sampling Data:

	Urea	HCHO	Phenol
Sampler I.D.	MSA 9903	SKC 823 (A)	SKC 823 (B)
Date/Method Calibrated	5-19-91	5-19-91	5-15-91
Avg.calibrated flow rate, lpm	.909	.0984	.0952

Sample type	Urea	HCHO	Phenol
Configuration	2 midget	SKC treated	SKC XAD-7
Sampler position	impingers	XAD-2 resin	resin tube
Position I.D.	w/ .1N NaOH	tube	

Time start	0835	Remarks: Wind = near calm NE
Time stop	1255	Ambient Temp ≈ 87
Filter No.		Pbar = 29.92
Filter Tare weight		
Filter Final weight		

Calculations and Results:

Total sample time, minutes:	260
Sample volume, m3: [(sample rate, ml)*(time, min.)/1000]	
Sample weight, mg: [(final wt.- tare wt.)*1000]	
Concentration, mg/m3 : [weight/volume]	

Down Wind R3

Plant Kirby Forest Industries Date 5-23-91

Source G.L. ~ 200 yards

Test Operators Russell

Sampling Data:	Urea	HCHO	Phenol
Sampler I.D.	MSA9903	SKC 823 (A)	SKC 823 (B)
Date/Method Calibrated	5-19-91 Bubble meter		
Avg. calibrated flow rate, lpm	.909	.0984	.0952
Sample type	Urea	HCHO	Phenol
Configuration	2 midget	SKC treated	SKC
Sampler position	impingers	XAD-2 resin tubes	XAD-7 tubes
Position I.D.	w/1N NaOH		

Time start 1207

Time stop 1703

Filter No.

Filter Tare weight

Filter Final weight

Remarks:

Wind ≈ light NE (changed to east)

Ambient Temp = 89

Pba = 29.90

Calculations and Results:

Total sample time, minutes: 236

Sample volume, m3: [(sample rate, ml)*(time, min.)/1000]

Sample weight, mg: [(final wt.- tare wt.)*1000]

Concentration, mg/m3 : [weight/volume]

Up Wind R1

Plant Kirby Forest Industries Date 5-22-91

Source G.b. ~ 100 yards east SE of press line

Test Operators Russell

Sampling Data:	Urea	HCHO	Phenol
Sampler I.D.	MSA 9178	SKC 910(A)	SKC 910(B)
Date/Method Calibrated	5-19-91	Bubble Tube	
Avg. calibrated flow rate, lpm	.896	.0945	.0952
Sample type	Urea	HCHO	Phenol
Configuration	2 impingers	SKC treated	SKC XAD-7
Sampler position	w/ .1N NaOH	XAD-2 tube	resin Tubes
Position I.D.			

Time start 1409

Time stop 1754

Filter No.

Filter Tare weight

Filter Final weight

Remarks:

Wind = NE light

Amb. Temperature = 88

P. bar = 29.92

Calculations and Results:

Total sample time, minutes: 226

Sample volume, m3: [(sample rate, ml)*(time, min.)/1000]

Sample weight, mg: [(final wt.- tare wt.)*1000]

Concentration, mg/m3 : [weight/volume]

Upwind R2

Plant Kirby Forest Industries Date 5-23-91

Source G.L. ~ 100 yards ESE of Press Line Bldg.

Test Operators Russ

Sampling Data:	Urea	HCHO	Phenol
Sampler I.D.	MSA9178	SKC 910 A	SKC 910 B
Date/Method Calibrated	5-19-91	Bubble Tube	
Avg. calibrated flow rate, lpm	.896	.0945	.0952
Sample type	Urea	HCHO	Phenol
Configuration	2 impingers	SKC treated	SKC XAD-7
Sampler position	w/ 1N NaOH	XAD-2 tubes	tubes
Position I.D.			

Time start 0925

Time stop 1249

Filter No.

Filter Tare weight

Filter Final weight

Remarks:

Wind = near calm NE

Ambient Temp = 87°

P. Bar = 29.92

Calculations and Results:

Total sample time, minutes: 266

Sample volume, m3: [(sample rate, ml)*(time, min.)/1000]

Sample weight, mg: [(final wt.- tare wt.)*1000]

Concentration, mg/m3 : [weight/volume]

Upwind Run 3

Plant Kirby Date 5-23-91

Source ~100 yards ESE of Pressline Bldg

Test Operators Rinaca

Sampling Data:

Sampler I.D.	MSA9178	SKC 910 A	SKC 910 B
Date/Method Calibrated	5-19-91	Bubble	Meter
Avg.calibrated flow rate, lpm	.896	.0945	.0952

Sample type	Urea	HCHO	Phenol
Configuration	2 midget impingers	SKC treated XAD-2 tubes	SKC XAD-7 twin Tubes
Sampler position			
Position I.D.	w/.1 N NaOH		

Time start	1257	Remarks:	
Time stop	1653		
Filter No.			
Filter Tare weight			
Filter Final weight			

Calculations and Results:

Total sample time, minutes:	236
Sample volume, m3: [(sample rate, ml)*(time, min.)/1000]	
Sample weight, mg: [(final wt.- tare wt.)*1000]	
Concentration, mg/m3 : [weight/volume]	

D. CALIBRATION DATA

PITOT TUBE GEOMETRY CALIBRATION

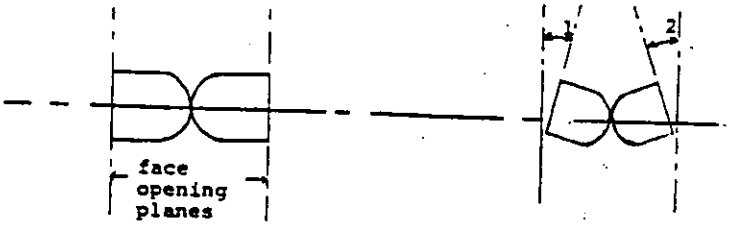
Pitot tube/probe identification: 3' Date Checked: 5-21-91 By: DGA

. Pitot tubes having the following geometric characteristics are assigned a pitot tube coefficient of 0.84.

1. Face openings perpendicular to transverse axis: ($\alpha 1$ and $\alpha 2 < 10^0$)

$\alpha 1$ = 0

$\alpha 2$ = 0

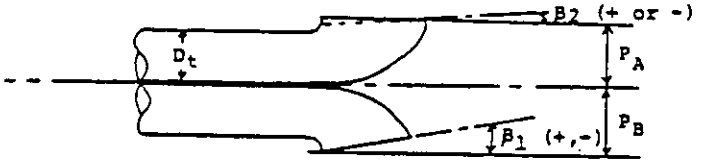


2. Face openings parallel to longitudinal axis: (β_1 and β_2 5°; P = 1.05 D_t to 1.50 D_t; $P_A = P_B$)

D_t = .375 β_1 = 0

P_A = .45 β_2 = 6

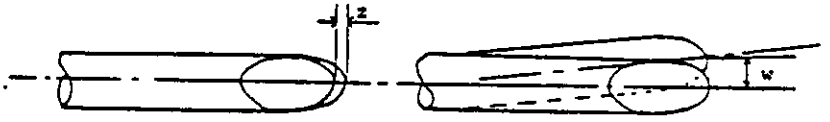
P_B = .45



3. Both legs equal length and centerline coincident (z < .125 inch; w < .031 inch)

z = 0

w = 0



PITOT/PROBE CLEARANCE CHECK:

Nozzle ID: .270 / .301 Nozzle dia: .270 / .301 Date: 5-21-91

II. Pitot/probe/nozzle assemblies have the same Cp as the isolated Pitot tube when the following conditions exist.

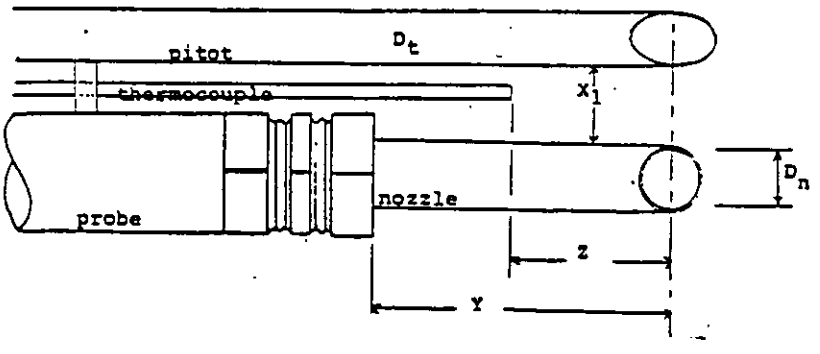
1. D_t > .188 & < .375 inch D_t = .375

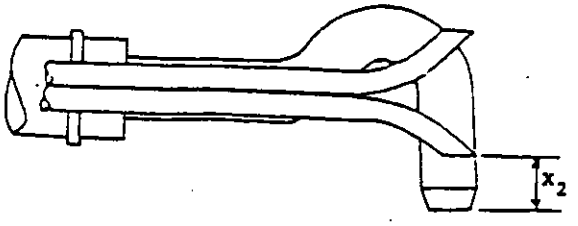
2. $X_1 \geq$ .75 inch X_1 = 1.0 / 1.0

3. $X_2 \geq$ 0 inch X_2 = .50 / .25

4. Y ≥ 3.0 inch Y = 6.25 / 6.25

5. z ≥ 2.0 inch z = 2.25 / 2.25





THERMOMETER/THERMOCOUPLE CALIBRATION

Date: 5-21-91 By: DER

Reference Thermometer ASTM Hg/glass 20°-760°F

Last Service

Field Thermometer	Temp. Source	Reference Temperature	Field Therm. Temperature	% error, absolute
3' T'couple Omega 650	Good Stack	105	107	<1
Meter In Omega 650	Ambient	82	82	—
Meter Out Omega 650	Ambient	82	82	—
Impinger out Bimetal-dial	Ambient	82	82	—
Sample Box Bimetal-dial	Box No. 1	246	245	<1

DRY GAS METER CALIBRATION

ERROR

Meter I.D. RAC Date 6-21-91

Calibration Method DGM/DGM Bell Prove By DGR

Calibration Meter I.D. 651729

Barometric Pressure 29.65

Vac in. H2O	DH in. H2O	Time min.	Calibrating Meter Vi cf	Vf cf	Temp F	Field Meter Vi cf	Vf cf	Temp F initial	Temp F final	Y	Q	X	DH@
6	1.9	15	532.261	542.941	68	612.263	623.328	75 75	99 77	.985	.719	.663	2.10
6	1.9	15.3	542.941	553.669	68	623.328	634.56	97 77	114 87	.997	.719	.658	2.13
6	1.9	17	553.669	565.467	68	634.56	647.076	111 87	123 97	1.00	.722	.655	2.14
										.995			2.12

$$Y = [(Vcal)(Pbar)(Tdgm)]/[(Vdgm)(Pm)(Tcal)]$$

Where:

Y = Meter Correction Factor

Vcal = Volume of gas through calibrating meter, ft.3

Vdgm = Volume of gas through field dry gas meter, ft.3

Pbar = Barometric pressure, in. Hg

Pm = Meter pressure, (Pbar-DH/13.6), in. Hg

Tdgm = Average dry gas meter temp., degrees R

Tcal = Temperature of gas through calibrating meter, degrees R

DRY GAS METER CALIBRATION

Meter I.D. RAC 591349 Date: February 2, 1991

Calibration Method: DGM/DGM Bell Prove By: DGR

Calibration Meter I.D: 651729

Barometric Pressure: 30.16

Vac in. H2O	DP in. H2O	Time min.	Calibrating Meter Vi cf	Vf cf	Temp F	Field Meter Vi cf	Vf cf	Temp F initial		Temp F final		Y
2	.50	26	13.493	23.476	68	36.81	47.369	82	82	99	88	.980
2	1.00	23.5	23.436	36.126	68	47.369	60.812	99	88	118	99	1.00
2	2.00	13.5	36.126	45.675	69	60.812	70.997	118	97	117	105	1.00
2	3.00	11	45.675	55.474	70	70.997	81.326	118	99	112	98	1.01
2	4.00	10.5	55.474	66.396	70	81.326	92.748	111	96	119	100	1.01
												1.00

$$Y = [(Vcal)(Pbar)(Tdgm)]/[(Vdgm)(Pm)(Tcal)]$$

Where:

Y = Meter Correction Factor

Vcal = Volume of gas through calibrating meter, ft.3

Vdgm = Volume of gas through field dry gas meter, ft.3

Pbar = Barometric pressure, in. Hg

Pm = Meter pressure, (Pbar=DH/13.6), in. Hg

Tdgm = Average dry gas meter temp., degrees R

Tcal = Temperature of gas through calibrating meter, degrees R

Personal Pump Calibration 5-19-91

	1	2	3	4	5	6
	Pump I.D.	ml	elapsed Time Seconds		calibrated Flow	
1						
2	SKC 910 A	100	63			
3	SKC 910 A	100	64		.0945	
4	SKC 910 A	100	64			
5						
6	SKC 910 B	100	63			
7	SKC 910 B	100	63		.0952	
8	SKC 910 B	100	63			
9						
10						
11	SKC 823 A	100	61			
12	SKC 823 A	100	61		.0984	
13	SKC 823 A	100	61			
14						
15	SKC 823 B	100	64			
16	SKC 823 B	100	64			
17	SKC 823 B	100	64		.0937	
18						
19						
20	MSA 9903	1000	66			
21	MSA 9903	1000	66		.909	
22	MSA 9903	1000	66			
23						
24						
25	MSA 9178	1000	67		.896	
26	MSA 9178	1000	67			
27	MSA 9178	1000	67			
28						
29						
30						
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40						

E. ANALYTICAL REPORT FOR HCHO, PHENOL, AND UREA

BONNER ANALYTICAL TESTING COMPANY
658 Weathersby Road
Hattiesburg, MS 39402
(601) 264-2854

Client: Environmental Monitoring Laboratory

File Number: EM0529-69-75
Collected By: Client

Sample Date/Time: unknown
Date/Time Rec'd: 5-29-91 @ 1740
Date/Time Begun: 5-29-91 @ 1740

Sample I.D.	UREA* ug	MDL	Date/Time/Analyst
Upwind Run #1	0.533	0.01	6-03-91/1100/KAD
Upwind Run #2	0.596		
Upwind Run #3	0.564		
Downwind Run #1	0.346		
Downwind Run #2	0.446		
Downwind Run #3	0.771		
NAOH Blank	0.109		

All analyses performed in accordance with 40 CFR 136 and amendments.

MDL = Method Detection Limit.

*Note: Standards of Urea at concentrations of 1.0 and 5.0 yielded percent recoveries of 137.6 and 96.1, respectively.

Method 351.3

Certified by: _____
Michael S. Bonner, Ph.D.
BONNER ANALYTICAL TESTING COMPANY

ldb

BONNER ANALYTICAL TESTING COMPANY
658 Weathersby Road
Hattiesburg, MS 39402
(601) 264-2854

Client: Environmental Monitoring Laboratories

File Number: EML0529-32-60
Collected By: Client

Sample Date/Time: unknown
Date/Time Rec'd: 5-29-91
Date/Time Begun: 6/12/91

Sample Name	Lab Name	Formaldehyde (T, mg)
	9-32	0.0045
	9-33	0.0038
	9-34	0.0080
	9-35	0.0051
LP-C006-R1	EM0529-36	0.0110
LP-C006-R2	EM0529-37	0.0120
LP-C006-R3	EM0529-38	0.0049
LP-C005-R1	EM0529-39	0.0066
LP-C005-R2	EM0529-40	0.002
LP-C005-R3	EM0529-41	0.005
-016 ~~PV-17~~-R1-R2	EM0529-45	0.015
-016 ~~PV-17-R3~~	EM0529-46	0.0044
-017 PV-18-R1	EM0529-47	0.0096
-017 PV-18-R2	EM0529-48	0.014
-018 PV-18-R3	EM0529-49	0.0045
-018 PV-19-R1	EM0529-50	0.008
-018 PV-19-R2	EM0529-51	0.005
-018 PV-19-R3	EM0529-52	0.0146
Upwind R-1	EM0529-53	0.009
Upwind R-2	EM0529-54	0.002
Upwind R-3	EM0529-55	0.0115
Downwind R-1	EM0529-56	0.008
Downwind R-2	EM0529-57	0.001
Downwind R-3	EM0529-58	0.0142
Field Blank	EM0529-59	0.003
Media Blank	EM0529-60	0.006

MDL - 5ug

Data reported in mg/l unless otherwise noted. All analyses performed in accordance with 40 CFR 136 and amendments.

MDL = Method Detection Limit.

Certified by: _____
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BONNER ANALYTICAL TESTING COMPANY

BONNER ANALYTICAL TESTING COMPANY

QUANTITATIVE RESULTS AND QUALITY ASSURANCE DATA
BASE NEUTRALS AND ACIDS - GC/MS ANALYSIS DATA

Chain of Custody Data Required for BATCO Data Management Summary Reports
Analysis Method - CLP Statement of Work for Organic Analysis

EM0611-40 BATCO File # | ENVIRONMENTAL MONITORING LAB COMPANY | XAD-7 TUBES SAMPLE TYPE | PHENOL MEDIA BLANK SAMPLE POINT | Collected: Analyzed: 06/27/91 DATE | 1311 TIME

Compound	MDL ug	SAMPLE			100 PPM STD.			20 PPM STD.			MATRIX			DUPLICATE MATRIX		
		Detected Concen. ug	Spike		Detected Concen. mg/L (ppm)	Spike		Detected Concen. mg/L (ppm)	Spike		Detected Concen. ng/ul in the extract	Spike		Detected Concen. ng/ul in the extract	Spike	
			Amt. ug	% Recov		Amt. mg	% Recov		Amt. mg	% Recov		Amt. ug	% Recov		Amt. ug	% Recov
Phenol	5	ND			139.3	100	139.3	19.5	20	97.5	-----	-----	----	------	-----	----
SURROGATES:																
Fluorophenol			200	72.1		200	94.1		200	74.9		200	-----		200	-----
Phenol-d6			200	71.6		200	74.2		200	79.5		200	-----		200	----
Nitrobenzene-d5			100	117.6		100	107.2		100	108.3		100	-----		100	----
Fluorobiphenyl			100	117.3		100	105.0		100	107.0		100	-----		100	----
2,4,6-Tribromophenol			200	81.6		200	66.5		200	49.0		200	-----		200	----
Terphenyl-d14			100	70.0		100	137.4		100	100.6		100	-----		100	-----

LAB FILE # >A0602

Certified by:

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BONNER ANALYTICAL TESTING COMPANY

BONNER ANALYTICAL TESTING COMPANY

QUANTITATIVE RESULTS AND QUALITY ASSURANCE DATA
BASE NEUTRALS AND ACIDS - GC/MS ANALYSIS DATA

Chain of Custody Data Required for BATCO Data Management Summary Reports
Analysis Method - CLP Statement of Work for Organic Analysis

EM0529-61 — BATCO File #
ENVIRONMENTAL MONITORING LAB — COMPANY
XAD-7 TUBES — SAMPLE TYPE
PHENOL — UPWIND R-1 — SAMPLE POINT
Collected:
Analyzed: 06/26/91 — DATE
1452 — TIME

Compound	MDL ug	SAMPLE Detected Concen. ug	SAMPLE Spike Amt. ug	SAMPLE Spike % Recov	100 PPM STD. Detected Concen. mg/L (ppm)	100 PPM STD. Spike Amt. mg	100 PPM STD. Spike % Recov	20 PPM STD. Detected Concen. mg/L (ppm)	20 PPM STD. Spike Amt. mg	20 PPM STD. Spike % Recov	MATRIX Detected Concen. ng/ul in the extract	MATRIX Spike Amt. ug	MATRIX Spike % Recov	DUPLICATE MATRIX Detected Concen. ng/ul in the extract	DUPLICATE MATRIX Spike Amt. ug	DUPLICATE MATRIX Spike % Recov
Phenol	5	ND			139.3	100	139.3	19.5	20	97.5	-----	-----	----	-------	-----	----
SURROGATES:																
Fluorophenol			200	88.7		200	94.1		200	74.9		200	-----		200	-----
Phenol-d6			200	97.6		200	74.2		200	79.5		200	-----		200	----
Nitrobenzene-d5			100	101.1		100	107.2		100	108.3		100	-----		100	----
Fluorobiphenyl			100	100.2		100	105.0		100	107.0		100	-----		100	----
2,4,6-Tribromophenol			200	102.5		200	66.5		200	49.0		200	-----		200	----
Terphenyl-d14			100	95.0		100	137.4		100	108.6		100	-----		100	-----

LAB FILE # >A0659

Certified by:

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BONNER ANALYTICAL TESTING COMPANY

BONNER ANALYTICAL TESTING COMPANY

QUANTITATIVE RESULTS AND QUALITY ASSURANCE DATA
BASE NEUTRALS AND ACIDS - GC/MS ANALYSIS DATA

Chain of Custody Data Required for BATCO Data Management Summary Reports
Analysis Method - CLP Statement of Work for Organic Analysis

EM0529-62 (BATCO File #) | ENVIRONMENTAL MONITORING LAB (COMPANY) | XAD-7 TUBES (SAMPLE TYPE) | PHENOL | UPWIND R-2 (SAMPLE POINT) | Collected: | Analyzed: 06/26/91 (DATE) 1553 (TIME)

Compound	MDL ug	SAMPLE			100 PPM STD.			20 PPM STD.			MATRIX			DUPLICATE MATRIX		
		Detected Concen. ug	Spike		Detected Concen. mg/L (ppm)	Spike		Detected Concen. mg/L (ppm)	Spike		Detected Concen. ng/ul in the extract	Spike		Detected Concen. ng/ul in the extract	Spike	
			Amt. ug	% Recov		Amt. mg	% Recov		Amt. mg	% Recov		Amt. ug	% Recov		Amt. ug	% Recov
Phenol	5	ND			139.3	100	139.3	19.5	20	97.5	-----	-----	----	------	-----	----
SURROGATES:																
Fluorophenol			200	86.7		200	94.1		200	74.9		200	-----		200	-----
Phenol-d6			200	97.6		200	74.2		200	79.5		200	-----		200	----
Nitrobenzene-d5			100	101.1		100	107.2		100	100.3		100	-----		100	----
Fluorobiphenyl			100	100.2		100	105.0		100	107.8		100	-----		100	----
2,4,6-Tribromophenol			200	102.5		200	66.5		200	49.0		200	-----		200	----
Terphenyl-d14			100	95.8		100	137.4		100	100.6		100	-----		100	-----

LAB FILE # >A8668

Certified by:

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BONNER ANALYTICAL TESTING COMPANY

BONNER ANALYTICAL TESTING COMPANY

QUANTITATIVE RESULTS AND QUALITY ASSURANCE DATA
BASE NEUTRALS AND ACIDS - GC/MS ANALYSIS DATA

Chain of Custody Data Required for BATCO Data Management Summary Reports
Analysis Method - CLP Statement of Work for Organic Analysis

EM8529-63 (BATCO File #) | ENVIRONMENTAL MONITORING LAB (COMPANY) | XAD-7 TUBES (SAMPLE TYPE) | PHENOL UPWIND R-3 (SAMPLE POINT) | Collected: Analyzed: 06/26/91 (DATE) 1654 (TIME)

Compound	MDL ug	SAMPLE			100 PPM STD.			20 PPM STD.			MATRIX			DUPLICATE MATRIX		
		Detected Concen. ug	Spike		Detected Concen. mg/L (ppm)	Spike		Detected Concen. mg/L (ppm)	Spike		Detected Concen. ng/ul in the extract	Spike		Detected Concen. ng/ul in the extract	Spike	
			Amt. ug	% Recov		Amt. mg	% Recov		Amt. mg	% Recov		Amt. ug	% Recov		Amt. ug	% Recov
Phenol	5	ND			139.3	100	139.3	19.5	20	97.5	-----	-----	----	------	-----	----
SURROGATES:																
Fluorophenol			200	89.8		200	94.1		200	74.9		200	-----		200	-----
Phenol-d6			200	61.9		200	74.2		200	79.5		200	-----		200	----
Nitrobenzene-d5			100	95.4		100	107.2		100	108.3		100	-----		100	----
Fluorobiphenyl			100	110.0		100	105.0		100	107.8		100	-----		100	----
2,4,6-Tribromophenol			200	109.3		200	66.5		200	49.8		200	-----		200	----
Terphenyl-d14			100	103.5		100	137.4		100	100.6		100	-----		100	-----

LAB FILE # >AB661

Certified by:

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BONNER ANALYTICAL TESTING COMPANY

BONNER ANALYTICAL TESTING COMPANY

QUANTITATIVE RESULTS AND QUALITY ASSURANCE DATA
BASE NEUTRALS AND ACIDS - GC/MS ANALYSIS DATA

Chain of Custody Data Required for BATCO Data Management Summary Reports
Analysis Method - CLP Statement of Work for Organic Analysis

EM#529-64 — BATCO File #
ENVIRONMENTAL MONITORING LAB — COMPANY
XAD-7 TUBES — SAMPLE TYPE
PHENOL — DOWNWIND R-1 — SAMPLE POINT
Collected: Analyzed: 06/26/91 — DATE
1754 — TIME

Compound	MDL ug	SAMPLE			100 PPM STD.			20 PPM STD.			MATRIX			DUPLICATE MATRIX		
		Detected Concen. ug	Spike Amt. ug	Spike % Recov	Detected Concen. mg/L (ppm)	Spike Amt. mg	Spike % Recov	Detected Concen. mg/L (ppm)	Spike Amt. mg	Spike % Recov	Detected Concen. ng/ul in the extract	Spike Amt. ug	Spike % Recov	Detected Concen. ng/ul in the extract	Spike Amt. ug	Spike % Recov
Phenol	5	ND			139.3	100	139.3	19.5	20	97.5	-----	-----	----	------	-----	----
SURROGATES:																
Fluorophenol			200	91.2		200	94.1		200	74.9		200	-----		200	-----
Phenol-d6			200	71.6		200	74.2		200	79.5		200	-----		200	----
Nitrobenzene-d5			100	99.1		100	107.2		100	108.3		100	-----		100	----
Fluorobiphenyl			100	106.3		100	105.8		100	107.8		100	-----		100	----
2,4,6-Tribromophenol			200	97.2		200	66.5		200	49.0		200	-----		200	----
Terphenyl-d14			100	84.5		100	137.4		100	108.6		100	-----		100	-----

LAB FILE # >A8662

Certified by: _____
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BONNER ANALYTICAL TESTING COMPANY

QUANTITATIVE RESULTS AND QUALITY ASSURANCE DATA
BASE NEUTRALS AND ACIDS - GC/MS ANALYSIS DATA

Chain of Custody Data Required for BATCO Data Management Summary Reports
Analysis Method - CLP Statement of Work for Organic Analysis

EM0529-65 — BATCO File # | ENVIRONMENTAL MOMITORING LAB — COMPANY | XAD-7 TUBES — SAMPLE TYPE | PHENOL — DOWNWIND R-2 — SAMPLE POINT | Collected: Analyzed: 06/26/91 (DATE) 1855 (TIME)

Compound	MDL ug	SAMPLE			100 PPM STD.			20 PPM STD.			MATRIX			DUPLICATE MATRIX		
		Detected Concen. ug	Spike Amt. ug	Spike % Recov	Detected Concen. mg/L (ppm)	Spike Amt. mg	Spike % Recov	Detected Concen. mg/L (ppm)	Spike Amt. mg	Spike % Recov	Detected Concen. ng/ul in the extract	Spike Amt. ug	Spike % Recov	Detected Concen. ng/ul in the extract	Spike Amt. ug	Spike % Recov
Phenol	5	ND			139.3	100	139.3	19.5	20	97.5	-----	-----	----	------	-----	----
SURROGATES:																
Fluorophenol			200	87.4		200	94.1		200	74.9		200	-----		200	-----
Phenol-d6			200	62.3		200	74.2		200	79.5		200	-----		200	----
Nitrobenzene-d5			100	87.3		100	107.2		100	108.3		100	-----		100	----
Fluorobiphenyl			100	88.8		100	105.8		100	107.8		100	-----		100	----
2,4,6-Tribromophenol			200	72.8		200	66.5		200	49.0		200	-----		200	----
Terphenyl-d14			100	80.4		100	137.4		100	100.6		100	-----		100	-----

LAB FILE # >A0663

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BONNER ANALYTICAL TESTING COMPANY

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QUANTITATIVE RESULTS AND QUALITY ASSURANCE DATA
BASE NEUTRALS AND ACIDS - GC/MS ANALYSIS DATA

Chain of Custody Data Required for BATCO Data Management Summary Reports
Analysis Method - CLP Statement of Work for Organic Analysis

EH0529-66 — BATCO File #
ENVIRONMENTAL MONITORING LAB — COMPANY
XAD-7 TUBES — SAMPLE TYPE
PHENOL — DOWNWIND R-3 — SAMPLE POINT
Collected:
Analyzed: 06/26/91 — DATE
1955 — TIME

Compound	MDL ug	SAMPLE			100 PPM STD.			20 PPM STD.			MATRIX			DUPLICATE MATRIX		
		Detected Concen. ug	Spike		Detected Concen. mg/L (ppm)	Spike		Detected Concen. mg/L (ppm)	Spike		Detected Concen. ng/ul in the extract	Spike		Detected Concen. ng/ul in the extract	Spike	
			Amt. ug	% Recov		Amt. mg	% Recov		Amt. mg	% Recov		Amt. ug	% Recov		Amt. ug	% Recov
Phenol	5	ND			139.3	100	139.3	19.5	20	97.5	-----	-----	----	------	-----	----
SURROGATES:																
Fluorophenol			200	90.9		200	94.1		200	74.9		200	-----		200	-----
Phenol-d6			200	91.9		200	74.2		200	79.5		200	-----		200	----
Nitrobenzene-d5			100	99.3		100	107.2		100	100.3		100	-----		100	----
Fluorobiphenyl			100	94.4		100	105.0		100	107.0		100	-----		100	----
2,4,6-Tribromophenol			200	93.7		200	66.5		200	49.0		200	-----		200	----
Terphenyl-d14			100	107.4		100	137.4		100	100.6		100	-----		100	-----

LAB FILE # >AS664

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BONNER ANALYTICAL TESTING COMPANY

QUANTITATIVE RESULTS AND QUALITY ASSURANCE DATA
BASE NEUTRALS AND ACIDS - GC/MS ANALYSIS DATA

Chain of Custody Data Required for BATCO Data Management Summary Reports
Analysis Method - CLP Statement of Work for Organic Analysis

EM0529-67 — BATCO File #
ENVIRONMENTAL MONITORING LAB — COMPANY
XAD-7 TUBES — SAMPLE TYPE
PHENOL — FIELD BLANK — SAMPLE POINT
Collected:
Analyzed: 06/26/91 — DATE
1111 — TIME

Compound	MDL ug	SAMPLE			100 PPM STD.			20 PPM STD.			MATRIX			DUPLICATE MATRIX		
		Detected Concen. ug	Spike		Detected Concen. mg/L (ppm)	Spike		Detected Concen. mg/L (ppm)	Spike		Detected Concen. ng/ul in the extract	Spike		Detected Concen. ng/ul in the extract	Spike	
			Amt. ug	% Recov		Amt. mg	% Recov		Amt. mg	% Recov		Amt. ug	% Recov		Amt. ug	% Recov
Phenol	5	ND			139.3	100	139.3	19.5	20	97.5	-----	-----	----	------	-----	----
SURROGATES:																
Fluorophenol			200	99.0		200	94.1		200	74.9		200	-----		200	-----
Phenol-d6			200	76.2		200	74.2		200	79.5		200	-----		200	----
Nitrobenzene-d5			100	103.1		100	107.2		100	108.3		100	-----		100	----
Fluorobiphenyl			100	99.7		100	105.8		100	107.8		100	-----		100	----
2,4,6-Tribromophenol			200	41.4		200	66.5		200	49.8		200	-----		200	----
Terphenyl-d14			100	99.9		100	137.4		100	108.6		100	-----		100	-----

LAB FILE # >A8657

Certified by:

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BONNER ANALYTICAL TESTING COMPANY

QUANTITATIVE RESULTS AND QUALITY ASSURANCE DATA
BASE NEUTRALS AND ACIDS - GC/MS ANALYSIS DATA

Chain of Custody Data Required for BATCO Data Management Summary Reports
Analysis Method - CLP Statement of Work for Organic Analysis

EM0529-60 | ENVIRONMENTAL MONITORING LAB | XAD-7 TUBES | PHENOL | Collected: | |
BATCO File # | COMPANY | SAMPLE TYPE | SAMPLE POINT | Analyzed: 06/26/91 | 2054
| | | | | DATE | TIME

Compound	MDL ug	SAMPLE			100 PPM STD.			20 PPM STD.			MATRIX			DUPLICATE MATRIX		
		Detected Concen. ug	Spike		Detected Concen. mg/L (ppm)	Spike		Detected Concen. mg/L (ppm)	Spike		Detected Concen. ng/ul in the extract	Spike		Detected Concen. ng/ul in the extract	Spike	
			Amt. ug	% Recov		Amt. mg	% Recov		Amt. mg	% Recov		Amt. ug	% Recov		Amt. ug	% Recov
Phenol	5	ND			139.3	100	139.3	19.5	20	97.5	-----	-----	----	------	-----	----
SURROGATES:																
Fluorophenol			200	98.6		200	94.1		200	74.9		200	-----		200	-----
Phenol-d6			200	75.7		200	74.2		200	79.5		200	-----		200	-----
Nitrobenzene-d5			100	103.0		100	107.2		100	108.3		100	-----		100	-----
Fluorobiphenyl			100	105.6		100	105.8		100	107.0		100	-----		100	-----
2,4,6-Tribromophenol			200	93.0		200	66.5		200	49.0		200	-----		200	-----
Terphenyl-d14			100	72.3		100	137.4		100	100.6		100	-----		100	-----

LAB FILE # >A0665

Certified by:

MICHAEL S. BONNER, Ph. D.
BONNER ANALYTICAL TESTING COMPANY

F. MISCELLANEOUS

AIR CONTAMINANT DATA						EMISSION POINT DISCHARGE PARAMETERS									
EMISSION POINT		CHEMICAL COMPOSITION OF TOTAL STREAM		AIR CONTAMINANT EMISSION RATE		UTM COORDINATES OF EMISSION PT.			STACK SOURCES					AREA SOURCES	
									HEIGHT ABOVE GROUND (ft)	HEIGHT ABOVE STRUCT. (ft)	EXIT DATA				
NUMBER	NAME	AIR CONTAMINANT NAME	CONC.(%)	#/HR	TONS/YR	ZONE	EAST (METERS)	NORTH (METERS)			DIA. (ft)	VEL (fps)	TEMP. (degF)	LENGTH (ft)	WIDTH (ft)
V-017	Press Vent 3	TSP		2.93	12.31	15	387511	3360292	59.1	0	4.88	36.5	140		
		PM10		0.0293	0.1231										
		HCHO		0.07	0.29										
		VOC		3.21	13.38										
V-018	Cooling Wheel Vent	PM10		1.55	6.51	15	387511	3360316	43.3	0	4.88	22.0	90		
		HCHO		0.04	0.17										
		VOC		1.80	7.49										
F-019	Finishing Area Fugitives	VOC		1.68	0.57	15	387556	3360291						160	160
F-020	Blending Room Futitives	UF Resin		0.09	1.02	15	387511	3360164							
		Paraffin		>0.01	0.01										
T-021	Urea Storage Tank	Urea		>0.01	0.01	15	387519	3360137	20		3	0.001	80		
T-022	UF Resin Tank	UF Resin		0.02	0.43	15	387528	3360137	20		3	0.001	80		

Permit No. R-1104

TABL (a)
EMISSION SOURCES

Date December 31, 1990

AIR CONTAMINANT DATA						EMISSION POINT DISCHARGE PARAMETERS									
EMISSION POINT		CHEMICAL COMPOSITION OF TOTAL STREAM		AIR CONTAMINANT EMISSION RATE		UTM COORDINATES OF EMISSION PT.			STACK SOURCES					AREA SOURCES	
									HEIGHT ABOVE GROUND	HEIGHT ABOVE STRUCT.	EXIT DATA				
NUMBER	NAME	AIR CONTAMINANT NAME	CONC.(%)	#/HR	TONS/YR	ZONE	EAST (METERS)	NORTH (METERS)	(ft)	(ft)	DIA. (ft)	VEL (fps)	TEMP. (degF)	LENGTH (ft)	WIDTH (ft)
F-001	Truck Dump	PM10		0.21	0.44	15	387694	3359992						46	30
F-002	Raw Material Storage	PM10		0.22	0.45	15	387706	3360038						400	100
B-003	Refiners/Flakers	PM10		0.41	1.72	15	387517	3360105	39	2	1.50	90.6	83		
C-004	Face Dryer Inlet	PM10		0.80	3.36	15	387517	3360112	40	3	2.73	63.0	90		
C-005	Core Dryer Outlet	PM10		0.67	2.81	15	387525	3360155	54	7	4.82	37.7	100		
		HCHO		0.29	1.23										
		VOC		21.97	92.26										
		NOx		2.98	12.52										
		CO		4.26	17.89										
		SO2		0.16	0.67										

TABLE (a)
EMISSION SOURCES

Date December 31, 1990

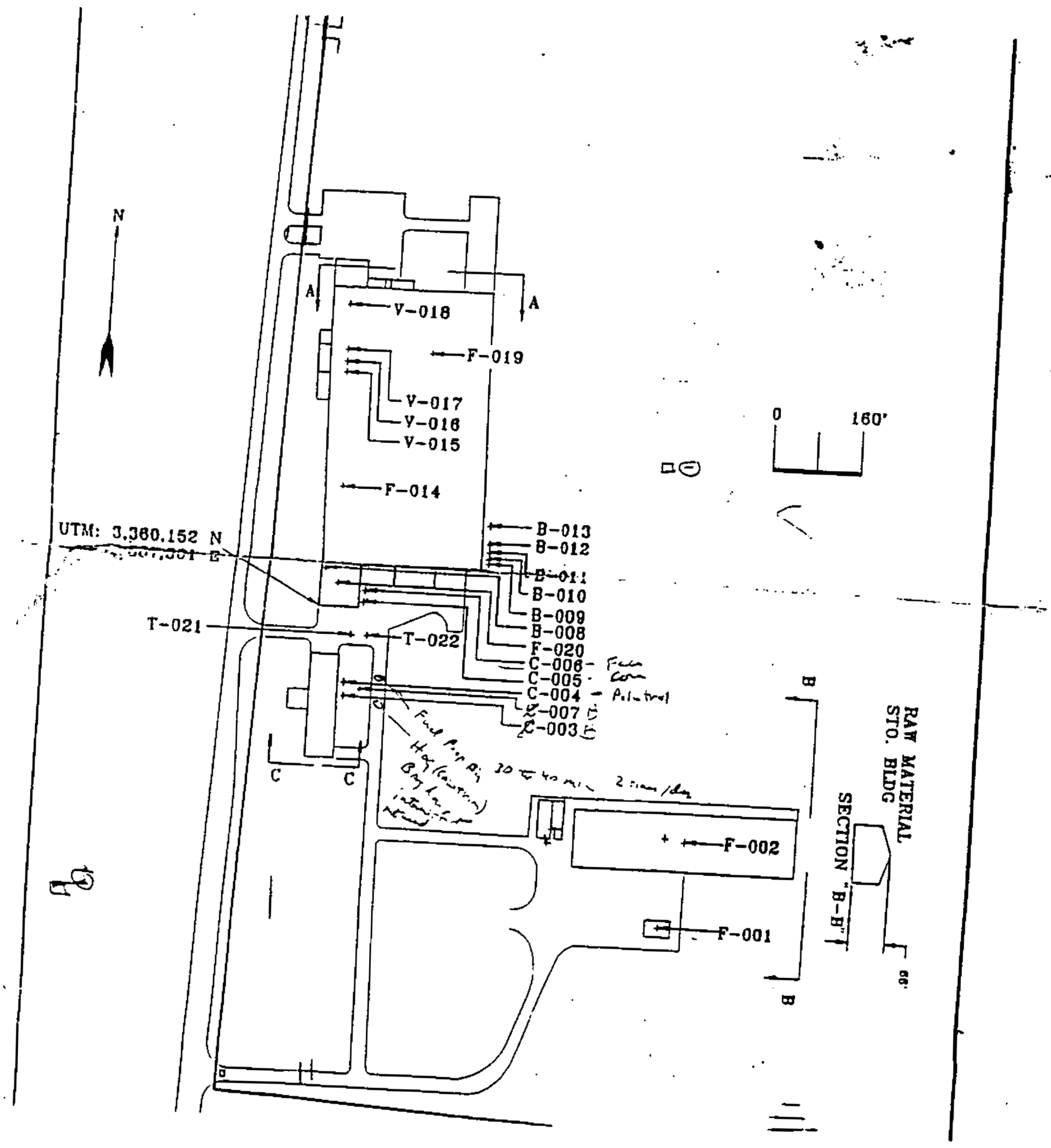
AIR CONTAMINANT DATA						EMISSION POINT DISCHARGE PARAMETERS									
EMISSION POINT		CHEMICAL COMPOSITION OF TOTAL STREAM		AIR CONTAMINANT EMISSION RATE		UTM COORDINATES OF EMISSION PT.			STACK SOURCES					AREA SOURCES	
									HEIGHT ABOVE GROUND (ft)	HEIGHT ABOVE STRUCT. (ft)	EXIT DATA				
NUMBER	NAME	AIR CONTAMINANT NAME	CONC.(%)	#/HR	TONS/YR	ZONE	EAST (METERS)	NORTH (METERS)			DIA. (ft)	VEL (fps)	TEMP. (degF)	LENGTH (ft)	WIDTH (ft)
C-006	Face Dryer Outlet	PM10		0.67	2.81	15	387525	3360162	54	7	4.82	36.1	100		
		HCHO		0.29	1.23										
		VOC		21.97	92.26										
		NOx		2.98	12.52										
		CO		4.26	17.89										
		SO2		0.16	0.67										
B-007	TOH Burner Fuel Silo	PM10		0.10	0.42	15	387525	3360109							
B-008 *	Recycle For Blenders					15	387503	3360173							
B-009	Sawline	PM10		0.44	1.87	15	387591	3360180	39.0	15	2.66	30.0	90		
B-010	Material Reject	PM10		0.44	0.11	15	387591	3360182	41.0	17	1.33	12.0	90		
B-011	Breaker & Conveyor	PM10		1.30	5.46	15	387591	3360186	39.0	15	3.42	65.3	85		

inside

* Emissions are listed under F-014.

TABI (a)
EMISSION SOURCES

AIR CONTAMINANT DATA						EMISSION POINT DISCHARGE PARAMETERS									
EMISSION POINT		CHEMICAL COMPOSITION OF TOTAL STREAM		AIR CONTAMINANT EMISSION RATE		UTM COORDINATES OF EMISSION PT.			STACK SOURCES					AREA SOURCES	
									HEIGHT ABOVE GROUND (ft)	HEIGHT ABOVE STRUCT. (ft)	EXIT DATA				
NUMBER	NAME	AIR CONTAMINANT NAME	CONC.(%)	#/HR	TONS/YR	ZONE	EAST (METERS)	NORTH (METERS)			DIA. (ft)	VEL (fps)	TEMP. (degF)	LENGTH (ft)	WIDTH (ft)
B-012	Upper Sander	PM10		0.89	3.73	15	387591	3360191	42.3	18.3	2.66	60.0	90		
B-013	Lower Sander	PM10		0.89	3.73	15	387591	3360201	42.3	18.3	2.66	60.0	90		
F-014 *	Forming Line Vent	PM10		0.71	3.00	15	387511	3360218	49.1	0			80	372	3
V-015	Press Vent 1	TSP		2.93	12.31	15	387511	3360279	59.1	0	4.88	36.5	140		
		PM10		0.0293	0.1231										
		HCHO		0.07	0.29										
		VOC		3.21	13.38										
V-016	Press Vent 2	TSP		5.43	22.81	15	387511	3360286	59.1		4.88	36.5	140		
		PM10		0.0543	0.2281										
		HCHO		0.10	0.42										
		VOC		4.62	19.26										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C-007
C-003
T-021
T-022
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F-001
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RAW MATERIAL
STO. BLDG
SECTION "B-B"