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

The file name refers to the reference number, the AP42 chapter and section. The file name "ref02_c01s02.pdf" would mean the reference is from AP42 chapter 1 section 2. The reference may be from a previous version of the section and no longer cited. The primary source should always be checked.

REPORT OF AIR EMISSIONS AND INLET LOADING TESTS FOR LOUISIANA PACIFIC CORPORATION URANIA MDF PLANT

Urania, Louisiana
January 18 through 21, 1994

Prepared for
Louisiana Pacific Corporation
Post Office Box 3107
Conroe, Texas 77305

ph: 409/760-5921
Contact: Dr. James T. Boswell

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

EMISSION TEST REPORT REVIEW SUMMARY

Source Category:

Filename: mdf2.xls
Ref. No.: 2(OECA)
Date: 14-Jul-97
Reviewer: DRL

Facility: Louisiana Pacific Corporation
Location: Urania, Louisiana
Source: Press Vent RTO Stack
Test date: 20-Jan-94 21-Jan-94

Test ID	Parameter	Units	Values reported			
			Run 1	Run 2	Run 3	AVERAGE
Total Inlet Emissions						
	Filterable PM	lb/hr	1.68	1.57	1.35	1.54
	Condensable inorg. PM	lb/hr	0.36	0.69	0.86	0.64
	Condensable org. PM	lb/hr	0.48	0.65	0.62	0.58
	Total condensable PM	lb/hr	0.84	1.34	1.48	1.22
	TOC as CARBON	lb/hr	2.88	2.63	3.10	2.87
	Formaldehyde	lb/hr	11.72	10.10	8.24	10.02
Total Outlet Emissions						
rto	Filterable PM	lb/hr	0.35	0.43	0.30	0.36
	Condensable inorg. PM	lb/hr	0.04	0.03	0.11	0.06
	Condensable org. PM	lb/hr	0.01	0.13	0.10	0.08
	Total condensable PM	lb/hr	0.05	0.16	0.21	0.14
	TOC as CARBON	lb/hr	0.17	0.26	0.20	0.21
	Formaldehyde	lb/hr	0.11	0.08	0.06	0.08
Control Efficiency						
	Filterable PM	%	79.0	72.8	77.9	76.6
	Condensable inorg. PM	%	88.6	95.9	86.7	90.4
	Condensable org. PM	%	97.2	80.1	84.0	87.1
	Total condensable PM	%	93.5	88.2	85.6	89.1
	TOC	%	94.2	90.2	93.4	92.6
	Formaldehyde	%	99.0	99.2	99.3	99.2

EMISSION TEST REPORT REVIEW SUMMARY

Source Category:

Filename: mdf2.xls
Ref. No.: 2(OECA)
Date: 11-Jul-97
Reviewer: DRL

Facility: Louisiana Pacific Corporation
Location: Urania, Louisiana
Source: Press Vent RTO Inlet
Test date: 21-Jan-94

Emission Data/Mass Flux Rates/Emission Factors

Test ID	Parameter	Units	Values reported			
			Run 1	Run 2	Run 3	AVERAGE
	Stack temperature	Deg F	81.3	83.3	95.5	86.7
	Pressure	in. Hg	30.1	30.1	30.1	30.1
	Moisture	%	1.3	0.9	1.2	1.1
	Oxygen	%	20.9	20.9	20.9	20.9
	Gas volume sampled	dscf	40.81	40.95	40.49	40.75
	Vol. flow, actual	acfm	66,946	68,931	69,475	68,451
	Vol. flow, standard*	dscfm	64,894	66,802	65,691	65,796
	Isokinetic variation	%	95.3	92.9	93.4	93.9
	Process rate	MSF 3/4/hr	9.0	9.0	9.0	9.0
Indicate basis for process rate:		thouthand square feet of 3/4 thick board per hour				
	Pollutant mass:					
	Filterable PM	grams	0.008	0.0073	0.0063	7.20E-03
	Condensable inorg. PM	grams	0.0017	0.0032	0.004	2.97E-03
	Condensable org. PM	grams	0.0023	0.003	0.0029	2.73E-03
	Total condensable PM	grams	0.004	0.0062	0.0069	5.70E-03
	Pollutant concentrations:					AVERAGE
	Filterable PM	gr/dscf	3.02E-03	2.75E-03	2.40E-03	2.73E-03
	Condensable inorg. PM	gr/dscf	6.43E-04	1.21E-03	1.52E-03	1.12E-03
	Condensable org. PM	gr/dscf	8.70E-04	1.13E-03	1.11E-03	1.04E-03
	Total condensable PM	gr/dscf	1.51E-03	2.34E-03	2.63E-03	2.16E-03
	CO2	% vol.	0.0	0.0	0.0	0.00E+00
	NOx	ppmdv	0.0	0.0	0.0	0.00E+00
	CO	ppmdv	0.0	0.0	0.0	0.00E+00
	Pollutant mass flux rates:					AVERAGE
	Filterable PM	lb/hr	1.68E+00	1.57E+00	1.35E+00	1.54E+00
	Condensable inorg. PM	lb/hr	3.58E-01	6.90E-01	8.58E-01	6.35E-01
	Condensable org. PM	lb/hr	4.84E-01	6.47E-01	6.22E-01	5.84E-01
	Total condensable PM	lb/hr	8.41E-01	1.34E+00	1.48E+00	1.22E+00
	CO2	lb/hr	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	NOx	lb/hr	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	CO	lb/hr	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Emission factors (ENGLISH UNITS):					AVERAGE
	Filterable PM	lb/unit	1.88E-01	1.76E-01	1.51E-01	1.71E-01
	Condensable inorg. PM	lb/unit	3.99E-02	7.71E-02	9.58E-02	7.09E-02
	Condensable org. PM	lb/unit	5.40E-02	7.22E-02	6.94E-02	6.52E-02
	Total condensable PM	lb/unit	9.39E-02	1.49E-01	1.65E-01	1.36E-01
	CO2	lb/unit	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	NOx	lb/unit	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	CO	lb/unit	0.00E+00	0.00E+00	0.00E+00	0.00E+00

*DSCFM BASED ON A STANDARD TEMPERATURE OF 68 DEGREES FAHRENHEIT

EMISSION TEST REPORT REVIEW SUMMARY

Source Category:

Filename: mdf2.xls
Ref. No.: 2(OECA)
Date: 11-Jul-97
Reviewer: DRL

Facility: Louisiana Pacific Corporation
Location: Urania, Louisiana
Source: Press Vent RTO Inlet
Test date: 20-Jan-94

Emission Data/Mass Flux Rates/Emission Factors

Test ID	Parameter	Units	Values reported			
			Run 1	Run 2	Run 3	AVERAGE
	Stack temperature	Deg F	101.6	97.6	97.9	99.0
	Pressure	in. Hg	30.1	30.1	30.1	30.1
	Moisture	%	0.8	1.1	1.0	0.9
	Oxygen	%	20.9	20.9	20.9	20.9
	Gas volume sampled	dscf	61.80	72.10	60.95	64.95
	Vol. flow, actual	acfm	70,878	80,996	69,798	73,891
	Vol. flow, standard*	dscfm	66,509	76,332	65,817	69,553
	Isokinetic variation	%	99.1	100.7	98.7	99.5
	Process rate	MSF 3/4/hr	9.1	9.1	9.1	9.1
Indicate basis for process rate:		thouthand square feet of 3/4 thick board per hour				
	Pollutant concentrations:					AVERAGE
	TOC as propane	ppmwv	6.28E+00	4.97E+00	6.80E+00	
	TOC as propane	ppmdv	6.3	5.0	6.9	6.07E+00
	CO2	% vol.	0.0	0.0	0.0	0.00E+00
	Formaldehyde	ppmdv	37.725	28.333	26.793	3.10E+01
	Pollutant mass flux rates:					AVERAGE
	TOC as propane	lb/hr	2.88E+00	2.63E+00	3.10E+00	2.87E+00
	CO2	lb/hr	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Formaldehyde	lb/hr	1.17E+01	1.01E+01	8.24E+00	1.00E+01
	Emission factors (ENGLISH UNITS):					AVERAGE
	TOC as propane	lb/unit	3.18E-01	2.89E-01	3.41E-01	3.16E-01
	CO2	lb/unit	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Formaldehyde	lb/unit	1.29E+00	1.11E+00	9.07E-01	1.10E+00

*DSCFM BASED ON A STANDARD TEMPERATURE OF 68 DEGREES FAHRENHEIT

TOC on Carbon = 0.24 lb/MSF 3/4

EMISSION TEST REPORT REVIEW SUMMARY

Source Category:

Filename: mdf2.xls
Ref. No.: 2(OECA)
Date: 11-Jul-97
Reviewer: DRL

Facility: Louisiana Pacific Corporation
Location: Urania, Louisiana
Source: Press Vent RTO Stack
Test date: 21-Jan-94

Emission Data/Mass Flux Rates/Emission Factors

Test ID	Parameter	Units	Values reported			
			Run 1	Run 2	Run 3	AVERAGE
	Stack temperature	Deg F	193.9	197.9	208	199.9
rto	Pressure	in. Hg	30.3	30.3	30.3	30.3
	Moisture	%	1.2	1.4	1.6	1.4
	Oxygen	%	20.9	20.9	20.9	20.9
	Gas volume sampled	dscf	69.20	68.19	68.20	68.53
	Vol. flow, actual	acfm	88,009	92,058	93,392	91,153
	Vol. flow, standard*	dscfm	71,025	73,699	73,465	72,730
	Isokinetic variation	%	98.5	93.5	93.8	95.3
	Process rate	MSF 3/4/hr	9.0	9.0	9.0	9.0
Indicate basis for process rate:		thouthand square feet of 3/4 thick board per hour				
	Pollutant mass:					
	Filterable PM	grams	0.0026	0.003	0.0021	2.57E-03
	Condensable inorg. PM	grams	0.0003	0.0002	0.0008	4.33E-04
	Condensable org. PM	grams	0.0001	0.0009	0.0007	5.67E-04
	Total condensable PM	grams	0.0004	0.0011	0.0015	1.00E-03
	Pollutant concentrations:					AVERAGE
	Filterable PM	gr/dscf	5.80E-04	6.79E-04	4.75E-04	5.78E-04
	Condensable inorg. PM	gr/dscf	6.69E-05	4.53E-05	1.81E-04	9.77E-05
	Condensable org. PM	gr/dscf	2.23E-05	2.04E-04	1.58E-04	1.28E-04
	Total condensable PM	gr/dscf	8.92E-05	2.49E-04	3.39E-04	2.26E-04
	CO2	% vol.	0.0	0.0	0.0	0.00E+00
	NOx	ppmdv	9.4	8.3	8.8	8.83E+00
	CO	ppmdv	3.1	2.0	2.1	2.40E+00
	Pollutant mass flux rates:					AVERAGE
	Filterable PM	lb/hr	3.53E-01	4.29E-01	2.99E-01	3.60E-01
	Condensable inorg. PM	lb/hr	4.07E-02	2.86E-02	1.14E-01	6.11E-02
	Condensable org. PM	lb/hr	1.36E-02	1.29E-01	9.97E-02	8.07E-02
	Total condensable PM	lb/hr	5.43E-02	1.57E-01	2.14E-01	1.42E-01
	CO2	lb/hr	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	NOx	lb/hr	4.78E+00	4.38E+00	4.63E+00	4.60E+00
	CO	lb/hr	9.60E-01	6.43E-01	6.73E-01	7.58E-01
	Emission factors (ENGLISH UNITS):					AVERAGE
	Filterable PM	lb/unit	3.94E-02	4.79E-02	3.34E-02	4.02E-02
	Condensable inorg. PM	lb/unit	4.54E-03	3.19E-03	1.27E-02	6.82E-03
	Condensable org. PM	lb/unit	1.51E-03	1.44E-02	1.11E-02	9.00E-03
	Total condensable PM	lb/unit	6.06E-03	1.75E-02	2.39E-02	1.58E-02
	CO2	lb/unit	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	NOx	lb/unit	5.34E-01	4.89E-01	5.17E-01	5.13E-01
	CO	lb/unit	1.07E-01	7.17E-02	7.51E-02	8.47E-02

*DSCFM BASED ON A STANDARD TEMPERATURE OF 68 DEGREES FAHRENHEIT

EMISSION TEST REPORT REVIEW SUMMARY

Source Category:

Filename: mdf2.xls
Ref. No.: 2(OECA)
Date: 11-Jul-97
Reviewer: DRL

Facility: Louisiana Pacific Corporation
Location: Urania, Louisiana
Source: Press Vent RTO Stack
Test date: 20-Jan-94

Emission Data/Mass Flux Rates/Emission Factors

Test ID	Parameter	Units	Values reported			
			Run 1	Run 2	Run 3	AVERAGE
	Stack temperature	Deg F	211.4	216	210.9	212.8
rto	Pressure	in. Hg	30.3	30.3	30.3	30.3
	Moisture	%	1.7	1.9	1.6	1.7
	Oxygen	%	20.9	20.9	20.9	20.9
	Gas volume sampled	dscf	45.05	53.81	45.04	47.97
	Vol. flow, actual	acfm	92,812	110,916	93,747	99,158
	Vol. flow, standard*	dscfm	72,667	86,075	73,491	77,411
	Isokinetic variation	%	93.4	94.2	92.4	93.3
	Process rate	MSF 3/4/hr	9.1	9.1	9.1	9.1
Indicate basis for process rate:		thouthand square feet of 3/4 thick board per hour				
	Pollutant concentrations:					AVERAGE
	TOC as propane	ppmwv	3.30E-01	4.30E-01	4.00E-01	
	TOC as propane	ppmdv	0.3	0.4	0.4	3.94E-01
	CO2	% vol.	0.0	0.0	0.0	0.00E+00
	Formaldehyde	ppmdv	0.335	0.191	0.169	2.32E-01
	Pollutant mass flux rates:					AVERAGE
	TOC as propane	lb/hr	1.67E-01	2.58E-01	2.05E-01	2.10E-01
	CO2	lb/hr	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Formaldehyde	lb/hr	1.14E-01	7.68E-02	5.80E-02	8.29E-02
	Emission factors (ENGLISH UNITS):					AVERAGE
	TOC as propane	lb/unit	1.84E-02	2.85E-02	2.26E-02	2.31E-02
	CO2	lb/unit	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Formaldehyde	lb/unit	1.25E-02	8.46E-03	6.39E-03	9.12E-03

*DSCFM BASED ON A STANDARD TEMPERATURE OF 68 DEGREES FAHRENHEIT

NOC as propane = 0.019 lb/MSF

DRYERS RTO CONTROL EFFICIENCY - PM

NORTH RTO	FILT PM, lb/hr	7.21
	COND. PM lb/hr	0.72
SOUTH RTO	FILT PM, lb/hr	8.29
	COND. PM, lb/hr	
RTO INLET	FILT PM, lb/hr	83.6
	COND PM, lb/hr	3.9

FILT PM = 81 %

COND. PM =

ENVIRONMENTAL MONITORING LABORATORIES, INC.

*P. O. Box 655 * 606 - B Highway 51 North*
Ridgeland, Mississippi 39158

phone: 601/856-3092
fax : 601/853-2151

February 17, 1994

Subject: Louisiana Pacific Corporation
Urania, Louisiana MDF Plant

During the period January 18 through 21, 1994, Environmental Monitoring Laboratories conducted air emissions and inlet loading tests at Louisiana Pacific Corporation's MDF facility in Urania, Louisiana. Testing was performed to determine emissions of particulate matter (PM), volatile organic compounds (VOC), formaldehyde (HCOH) nitrogen oxides (NOx), and carbon monoxide (CO) from the regenerative thermal oxidizer (RTO) system controlling emissions from two MDF dryers and from the RTO controlling emissions from the press vent. Testing was also simultaneously performed at the RTO inlets to determine removal efficiency.

Results:

DRYERS RTO	PM		VOC		HCOH		CO		NOx	
	gr/dscf	#/hr	ppm as C	#/hr	ppm	#/hr	ppm	#/hr	ppm	#/hr
NORTH RTO	0.012	7.93	5.36	0.22	1.19	0.41	3.4	1.10	27.3	14.6
SOUTH RTO	0.012	8.29	0.5	0.08	1.23	0.47	< 1	.11	27.2	15.2
RTO INLET	0.060	87.5	177	17.1	7.84	6.11	12.9	9.40	23.3	27.6
REMOVAL EFFICIENCY	81.46		98.25		85.60		88.30		-7.97	

does not match data on pg. 4

PRESS VENT RTO	PM		VOC		HCOH		CO		NOx	
	gr/dscf	#/hr	ppm as C	#/hr	ppm	#/hr	ppm	#/hr	ppm	#/hr
OUTLET	0.0006	0.35	1.18	0.056	0.23	0.08	2.4	0.76	8.8	4.58
RTO INLET	0.0049	2.78	18.2	0.776	30.95	10.03	ND*	ND*	ND*	ND*
REMOVAL EFFICIENCY	87.41		92.78		99.20		N/A		N/A	

* ND means non-detected

The testing project was coordinated by Dr. James T. Boswell of Louisiana Pacific Corporation. Danny Russell of Environmental Monitoring Laboratories coordinated sample collection and analysis and report preparation. Armstrong Environmental performed testing at the dryers South RTO outlet. All formaldehyde samples were shipped to Air Techniques in Marietta, Georgia for analysis and reagent QA/QC. Mr.Paul Laird of the Louisiana Department of Environmental Quality was present to witness portions of the testing. Mr. David Chiles, Mr. Russell Karon, and Mr. Jerry May representing Smith Engineering Company were also present.

Following is a report of the testing.

REPORT OF AIR EMISSIONS AND INLET LOADING TESTS
FOR LOUISIANA PACIFIC CORPORATION
URANIA MDF PLANT
URANIA, LOUISIANA
JANUARY 18 THROUGH 21, 1994

CONTENTS

1.0	Test Results	page	1
2.0	Source Description		12
3.0	Test Procedures		13
4.0	Data Reduction		14
5.0	Nomenclature		31
6.0	Calibration		32
7.0	Appendices:		33

A. Sampling and Analytical Data

B. Calibration Data

C. Instrument Recorder Traces/Data Log

D. HCOH Analysis Report (ATI)

E. Armstrong Environmental Report

F. Louisiana Pacific Production Summaries

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 emissions and inlet loading testing for Louisiana Pacific Corporation's Urania, Louisiana MDF facility during the period January 18 through 21, 1994.

1.1 MDF Dryers RTO

1.1.1 MDF Dryers North RTO

1.1.1.1 MDF Dryers North RTO - PM/NOx/CO Emissions Test on January 18, 1994

Run No.....		1	2	3	avg.
Date		1-18-94	1-18-94	1-18-94	———
Time Start		1115	1500	1657	———
Time End		1218	1602	1802	———
PARTICULATE EMISSIONS	#/hr.	7.04	10.02	6.73	7.93
PARTICULATE EMISSIONS	gr/dscf	0.011	0.016	0.010	0.012
NOx EMISSIONS	#/hr	16.28	15.24	12.19	14.57
NOx EMISSIONS	ppm	30.7	28.5	22.7	27.3
CO EMISSIONS	#/hr	1.65	1.21	0.43	1.10
CO EMISSIONS	ppm	5.1	3.7	1.3	3.4
VOLUMETRIC FLOWRATE	acfm	99602	101518	100968	100696
VOLUMETRIC FLOWRATE	dscfm	74261	74912	75189	74787
VELOCITY	ft./sec.	41.6	42.4	42.2	42.1
STACK TEMPERATURE	° F	215	217	210	214
MOISTURE	%	5.67	6.36	6.52	6.18
SAMPLE RATE	% isokinetic	97	95	94	95

1.1.1.2 MDF Dryers North RTO - VOC/HCOH Emissions Test January 19, 1994

Run No.....		1	2	3	avg.
Date		1-19-94	1-19-94	1-19-94	------
Time Start		1106	1627	1814	----
Time End		1506	1729	1915	----
VOC EMISSIONS	#/hr. as carbon	0.25	0.22	0.20	0.22
VOC EMISSIONS	ppm as carbon	5.8	5.5	4.8	5.4
HCOH EMISSIONS	#/hr	0.44	0.37	0.41	0.41
HCOH EMISSIONS	ppm	1.26	1.09	1.23	1.19
VOLUMETRIC FLOWRATE	acfm	101656	101619	101570	101615
VOLUMETRIC FLOWRATE	dscfm	74500	71772	71818	72697
VELOCITY	ft./sec.	42.5	42.5	42.5	42.5
STACK TEMPERATURE	° F	219	227	227	224
MOISTURE	%	6.80	9.10	9.04	8.32
SAMPLE RATE	% isokinetic	99	102	101	101

1.1.2 MDF DRYERS SOUTH RTO

1.1.2.1 MDF Dryers South RTO - PM/NOx/CO Emissions Test on January 18, 1994

Outlet sampling at the MDF Dryers South RTO was performed by Armstrong Environmental, Inc. of Dallas, Texas. A summary of results is presented in the following table. Details of the testing is provided in Armstrong Environmental's report which is reproduced in this report's Appendix E.

Run No.		1	2	3	avg.
Date		1-18-94	1-18-94	1-18-94	——
Time Start		1114	1458	1655	——
Time End		1218	1559	1755	——
PARTICULATE EMISSIONS	#/hr.	6.37	11.69	6.80	8.29
PARTICULATE EMISSIONS	gr/dscf	0.009	0.018	0.010	0.012
NOx EMISSIONS	#/hr	16.8	15.7	13.1	15.2
NOx EMISSIONS	ppm as carbon	29.2	28.7	23.7	27.2
CO EMISSIONS	#/hr	0.32	N/D*	N/D*	0.11
CO EMISSIONS	ppm	< 1	N/D*	N/D*	< 1
VOLUMETRIC FLOWRATE	acfm	108362	105251	105071	106228
VOLUMETRIC FLOWRATE	dscfm	80061	76576	76971	77869
VELOCITY	ft./sec.	46.4	45.0	45.0	45.5
STACK TEMPERATURE	° F	220	226	221	222
MOISTURE	%	6.02	6.96	6.64	6.54
SAMPLE RATE	% isokinetic	97	98	99	98

*ND means non detected. Where calculations were made with non-detected values, a value of zero was used.

1.1.2.2 MDF Dryers South RTO - VOC/HCOH Emissions Test January 19, 1994

Outlet sampling at the MDF Dryers South RTO was performed by Armstrong Environmental, Inc. of Dallas, Texas. A summary of results is presented in the following table. Details of the testing is provided in Armstrong Environmental's report which is reproduced in this report's Appendix E.

Run No.....		1	2	3	avg.
Date		1-19-94	1-19-94	1-19-94	------
Time Start		1106	1627	1810	----
Time End		1206	1727	1910	----
VOC EMISSIONS	#/hr. as carbon	0.25	N/D	N/D	0.08
VOC EMISSIONS	ppm as carbon	1.5	N/D	N/D	0.5
HCOH EMISSIONS	#/hr	2.47	2.96	4.40	3.28
HCOH EMISSIONS	ppm	0.95	1.15	1.60	1.23
VOLUMETRIC FLOWRATE	acfm	110535	110969	113749	111751
VOLUMETRIC FLOWRATE	dscfm	81581	80954	83207	81914
VELOCITY	ft./sec.	47.3	47.5	48.7	47.8
STACK TEMPERATURE	° F	219	226	225	217
MOISTURE	%	6.91	6.99	6.83	6.91
SAMPLE RATE	% isokinetic	98	98	102	99

1.1.3 MDF Dryers RTO Inlet

1.1.3.1 MDF Dryers RTO Inlet Loading Test for PM/CO/NOx on January 18, 1994.

Run No.....		1	2	3	avg.
Date		1-18-94	1-18-94	1-18-94	------
Time Start		1114	1459	1656	---
Time End		1223	1607	1809	---
PARTICULATE LOADING	#/hr.	41.33	170.45	50.63	87.47
PARTICULATE LOADING	gr/dscf	0.030	0.116	0.035	0.060
NOx LOADING	#/hr	22.68	23.42	36.71	27.60
NOx LOADING	ppm	19.8	19.2	30.8	23.3
CO LOADING	#/hr	7.91	11.18	9.10	9.40
CO LOADING	ppm	11.3	15.0	12.5	12.9
VOLUMETRIC FLOWRATE	acfm	185042	198324	193776	192381
VOLUMETRIC FLOWRATE	dscfm	160446	170814	166933	166065
VELOCITY	ft./sec.	32.8	35.2	34.4	34.1
STACK TEMPERATURE	° F	118	117	118	118
MOISTURE	%	5.83	6.47	6.42	6.24
SAMPLE RATE	% isokinetic	102	104	99	102

1.1.3.2 MDF Dryers RTO Inlet Loading Test for VOC and HCOH on January 19, 1994

Run No.		1	2	3	avg.
Date		1-19-94	1-19-94	1-19-94	——
Time Start		1105	1626	1812	——
Time End		1511	1737	1921	——
VOC LOADING	#/hr. as carbon	20.08	15.40	15.83	17.10
VOC LOADING	ppm as carbon	213.0	154.6	162.5	176.7
HCOH LOADING	#/hr	4.66	6.26	7.39	6.11
HCOH LOADING	ppm	6.22	7.84	9.47	7.84
VOLUMETRIC FLOWRATE	acfm	185042	198324	193776	192381
VOLUMETRIC FLOWRATE	dscfm	160446	170814	166933	166065
VELOCITY	ft./sec.	32.8	35.2	34.4	34.1
STACK TEMPERATURE	° F	118	117	118	118
MOISTURE	%	5.83	6.47	6.42	6.24
SAMPLE RATE	% isokinetic	102	104	99	102

1.2 Press Vent

1.2.1 Press Vent RTO Outlet

1.2.1.1 Press Vent RTO Outlet Emissions Test for PM/CO/NOx on January 21, 1994.

Run No.....		1	2	3	avg.
Date		1-21-94	1-21-94	1-21-94	------
Time Start		0818	1001	1226	---
Time End		0921	1102	1327	---
PARTICULATE EMISSIONS	#/hr.	0.41	0.20	0.44	0.35
PARTICULATE EMISSIONS	gr/dscf	0.0007	0.0003	0.0007	0.0006
NOx EMISSIONS	#/hr	4.77	4.37	4.62	4.58
NOx EMISSIONS	ppm	9.4	8.3	8.8	8.8
CO EMISSIONS	#/hr	0.96	0.64	0.67	0.76
CO EMISSIONS	ppm	3.1	2.0	2.1	2.4
VOLUMETRIC FLOWRATE	acfm	88009	92058	93392	91153
VOLUMETRIC FLOWRATE	dscfm	71036	73709	73477	72741
VELOCITY	ft./sec.	62.7	65.6	66.5	64.9
STACK TEMPERATURE	° F	194	198	208	200
MOISTURE	%	1.21	1.40	1.63	1.41
SAMPLE RATE	% isokinetic	98	93	94	95

1.2.1.2 Press Vent RTO Outlet Emissions Test for VOC/HCOH on January 20, 1994.

Run No.....		1	2	3	avg.
Date		1-20-94	1-20-94	1-20-94	------
Time Start		1141	1400	1600	----
Time End		1243	1501	1703	----
VOC EMISSIONS	#/hr. as carbon	0.045	0.069	0.055	0.056
VOC EMISSIONS	ppm as carbon	1.01	1.31	1.22	1.18
HCOH EMISSIONS	#/hr	0.114	0.077	0.058	0.083
HCOH EMISSIONS	ppm	0.34	0.19	0.17	0.13
VOLUMETRIC FLOWRATE	acfm	92812	110916	93747	99159
VOLUMETRIC FLOWRATE	dscfm	72553	85938	73372	77288
VELOCITY	ft./sec.	66.1	79.0	66.8	70.6
STACK TEMPERATURE	° F	211	216	211	213
MOISTURE	%	1.69	1.89	1.64	1.74
SAMPLE RATE	% isokinetic	93	94	92	93

1.2.2 Press Vent RTO Inlet

1.2.2.1 Press Vent RTO Inlet Loading Test for PM/CO/NOx on January 21, 1994

Run No.....		1	2	3	avg.
Date		1-21-94	1-21-94	1-21-94	------
Time Start		0817	1000	1225	——
Time End		0920	1101	1226	----
PARTICULATE LOADING	#/hr.	2.59	2.91	2.83	2.78
PARTICULATE LOADING	gr/dscf	0.005	0.005	0.005	0.005
NOx LOADING	#/hr	N/D	N/D	N/D	N/D
NOx LOADING	ppm	N/D	N/D	N/D	N/D
CO LOADING	#/hr	N/D	N/D	N/D	N/D
CO LOADING	ppm	N/D	N/D	N/D	N/D
VOLUMETRIC FLOWRATE	acfm	66946	68931	69475	68450
VOLUMETRIC FLOWRATE	dscfm	64908	66822	65706	65812
VELOCITY	ft./sec.	47.3	48.7	49.1	48.4
STACK TEMPERATURE	° F	81	83	96	87
MOISTURE	%	1.25	0.91	1.15	1.10
SAMPLE RATE	% isokinetic	95	93	93	94

1.2.2.2 Press Vent RTO Inlet Loading Test for VOC/HCOH on January 20, 1994

Run No.....		1	2	3	avg.
Date		1-20-94	1-20-94	1-20-94	------
Time Start		1140	1359	1559	----
Time End		1242	1500	1701	----
VOC LOADING	#/hr. as carbon	0.78	0.71	0.84	0.78
VOC LOADING	ppm as carbon	19.0	15.1	20.6	18.2
HCOH LOADING	#/hr	11.73	10.11	8.24	10.03
HCOH LOADING	ppm	37.73	28.33	26.79	30.95
VOLUMETRIC FLOWRATE	acfm	70878	80996	69798	73891
VOLUMETRIC FLOWRATE	dscfm	66501	76336	65819	69552
VELOCITY	ft./sec.	50.1	57.3	49.3	52.2
STACK TEMPERATURE	° F	102	98	98	99
MOISTURE	%	0.79	1.07	0.96	0.94
SAMPLE RATE	% isokinetic	99	101	99	99

1.3. Efficiency Summary: The following tabular summaries of system removal efficiencies are based on mass emission rates. Emissions expressed in the tables are in pounds per hour.

1.3.1. MDF Dryers RTO

	PM	VOC	HCOH	CO	NOx
NORTH RTO	7.93	0.22	0.41	1.10	14.6
SOUTH RTO	8.29	0.08	0.47	0.0	15.2
OUTLET TOTAL	16.22	0.30	0.88	1.10	29.8
INLET	87.5	17.1	6.11	9.4	27.6
REMOVAL %	81.46	98.3	85.6	88.30	-7.97

1.3.2. Press Vent RTO

	PM	VOC	HCOH	CO	NOx
OUTLET	0.35	0.056	0.08	0.76	4.58
INLET	2.78	0.776	10.03	ND*	ND*
REMOVAL %	87.41	92.78	99.20	N/A	N/A

* ND means non detected.

2.0 SOURCE DESCRIPTION: Louisiana Pacific Corporation operates a Medium Density Fiberboard (MDF) plant at its wood products complex in Urania, Louisiana. Two emissions producing processes associated with the manufacture of MDF are the drying of wood fiber and ventilation of the press. Process description here is limited to a brief description of the emissions sources and their sampling locations. Detailed descriptions of the processes, the pollution control equipment, and records of operating rates and conditions may be supplied by Louisiana Pacific Corporation.

L.P.'s MDF plant utilizes two direct heat wood fired dryers. The two dryers each have two exhausts and each exhaust is directed to primary cyclones. The exhausts from the four cyclones are combined to a common header preceding introduction to the emissions control equipment. Two Smith Engineering Company regenerative thermal oxidizers (RTO) have been installed for control of emissions from the dryers. The single header from the dryers enters a mixing box which acts as a settling chamber and air mixer. From the mixing box, the air is directed to and split equally between the twin RTO's designated as North RTO and South RTO. The selected inlet sampling location is in the header location immediately preceding the mixing box. This sampling location is not ideal but is the only location where air quality entering the RTO's can be determined. The ducts leaving the four cyclones combine into a common circular horizontal duct. The circular horizontal duct makes a 90° transition to a rectangular arch duct which enters the top of the mixing box. The rectangular arch is 144 inches wide by 94 inches deep and has an 11 foot center radius. As expected, most of the air was moving along the outside of the arch. Though the flow was not evenly distributed across the sampling traverses, air movement was laminar as verified by a null pitot technique. The RTO's exhaust to the atmosphere by way of 85.5 inch diameter vertical stacks. For each, two sample ports are provided at a location which is 44 inches (0.5 diameters) below the stack exit, and 229 inches (2.68 diameters) above the duct to stack transition. Sketches of the stacks and sampling locations are provided in Appendix A.

Emissions from the continuous press are also controlled by a Smith Engineering Company RTO. The press area is enclosed and ducted to the RTO in such a manner that any openings in the enclosure have inward velocities of greater than 200 feet per minute. The sampling location for the inlet to the press vent RTO is a vertical turned downward section of 65.75 inch diameter duct. Two sampling ports at 90° are provided at a location which is 148 inches (2.2 diameters) downstream of a horizontal to vertical elbow and 62 inches (0.9 diameters) above a vertical to horizontal elbow. The RTO exhausts to the atmosphere by way of a 65.50 inch vertical stack. Two sample ports at 90° are provided at a location which is 72 inches (1.1 diameters) below the stack exit and 204 inches (3.1 diameters) above the system inlet duct to stack transition. Sketches of the stacks and sampling locations are provided in Appendix A.

3.0 TEST PROCEDURES: Test procedures used are those described in 40 CFR, Part 60, Appendix A and in Part 266, Appendix IX..

Particulate sampling was done as described in Method 5. An exception was the inclusion of the condenser section particulate as described in Method 202. Reported particulate is based on three fractions: the front half, the back half organic (methylene chloride extraction), and the back half aqueous. The contribution of each fraction can be reviewed in Section 4.0.

Carbon monoxide concentrations were continuously monitored as described in Method 10. A Beckman Model 864 NDIR with a 0 to 1000 ppm range was used for inlet locations. Outlet concentrations were monitored using a TECO Model 48H gas correlation filter NDIR in various ranges. The exhausts of the CO instruments were captured in Tedlar bags in order to obtain an integrated gas sample. Oxygen content of the bag samples was measured using a calibrated Servomex paramagnetic oxygen analyzer. Carbon dioxide was measured using an Orsat analyzer. Instrument calibration was performed prior to and following each series of tests, and a mid range system bias check was made prior to and following each run by directing calibration to the gas sampling probe.

Nitrogen oxides were continuously monitored as described in Method 7E. Two TECO Model 10S analyzers were used. Instrument calibration was performed prior to and following each series of tests, and a mid range system bias check was made prior to and following each run by directing calibration to the gas sampling probe.

VOC concentrations were measured using Method 25A (continuous monitoring with a flame ionization detector). A TECO Model 51 was used at the outlet locations and a Ratfisch Model 55CA was used at the outlet locations. Both FIDs are equipped with multiple scales. The 0 to 100 ppm scale and the 0 to 1000 ppm scale were used for calibrations using zero air, and appropriate low, mid and high range concentrations of EPA protocol propane in nitrogen. Since calibrations are made with propane (C_3H_8), results as methane (CH_3) (or as carbon) are determined by increasing the measured concentration by a factor of three. A continuous trace of VOC as propane was recorded and manually integrated for each 60 minute test period. Instrument calibration was performed initially, and following each 60 minute test period. Any necessary adjustments were made after recording the response of the mid range calibration gas. which was introduced at the inlet to the VOC sampling probe. The gas samples were directed to the heated FID analyzers by way of heated teflon sample lines maintained at a minimum temperature of 275°F.

Formaldehyde was measured using the procedure described in CFR 40, Part 266, Appendix IX, Method 0011. Reagent preparation and sample analysis was performed by Air Techniques and Oxford Laboratories of Marietta, Georgia.

Inlet sampling was done simultaneously with outlet sampling in order to determine removal efficiency or additional pollutant contribution. For the dryers, this required the operation of three sample trains simultaneously at relatively far removed locations. Armstrong Engineering of Dallas, Texas, performed the outlet sampling at the South RTO outlet. A report of that testing is provided in Appendix E of this report.

4.0 DATA REDUCTION

LP - Urania
MDF Dryers North RTO
PM/CO/NOx Emissions Test - January 18, 1994

Collected Test Data:			RUN 1	RUN 2	RUN 3	
Date	:		1/18/94	1/18/94	1/18/94	
Time	:		1115	1500	1657	
Time end	:		1218	1602	1802	
1. As	:	sq ft	39.87123	39.87123	39.87123	
2. Dn	:	in.	0.242	0.305	0.305	
3. Cp	:	dimensionless	0.84	0.84	0.84	
4. Theta	:	minutes	60.00	60.00	60.00	
5. Y	:	dimensionless	1.01	1.01	1.01	
6. Pbar	:	in. Hg	30.25	30.25	30.25	
7. Pg	:	in. H2O	-0.36	-0.36	-0.36	
8. Vm	:	cf (dry gas)	35.361	56.451	56.426	
9. sqr(DP),avg	:	in.H2O^.5	0.6531	0.6636	0.6634	
10. DH	:	in. H2O	1.0400	2.8917	2.9646	
11. ts	:	degrees F	214.79	216.83	209.50	213.71
12. tm	:	degrees F	94.85	106.83	107.90	
13. Vlc	:	ml	44	78	80	
14. CO2	:	percent	1.00	0.90	0.90	
15. O2	:	percent	19.80	19.80	19.80	
16. CO	:	percent	0	0	0	
17. CO	:	ppm	5.1	3.7	1.3	3.4
18. M,PM	:	milligrams				
		front half	21.8	51.1	32.8	
		back half organic	0.1	1.5	1.6	
		back half aqueous	2.8	2.1	2.1	
20. NOx	:	ppm	30.7	28.5	22.7	27.3

LP - Urania
MDF Dryers North RTO
PM/CO/NOx Emissions Test - January 18, 1994

Calculations:		RUN 1	RUN 2	RUN 3	AVG.
1. Pm	: in.Hg (DH/13.6)+Pbar	30.3265	30.4626	30.4680	
2. Ps	: in. Hg (Pg/13.6)+Pbar	30.2235	30.2235	30.2235	
3. An	: sq ft ((Dn/24)^2)(3.1416)	3.19E-04	5.07E-04	5.07E-04	
4. Vmstd	: dscf Vm Y(Pm/Pstd)(Tstd/Tm)	34.448	54.073	53.957	47.493
5. Vwstd	: scf (.04707cf/ml)(Vlc)	2.071	3.671	3.766	
6. Bws	: dimensionless Vwstd/(Vwstd+Vmstd)	0.0567	0.0636	0.0652	0.0618
7. Md	: mol.wt. dry basis .44 CO2+.32 O2+.28(CO+N2)	28.952	28.936	28.936	
8. Ms	: mol.wt. wet basis Md(1-Bws)+18 Bws	28.33	28.24	28.22	
9. Vs	: ft/sec Kp Cp (sqrDP)sqr(Ts/(Ps Ms))	41.63	42.44	42.21	42.09
10. Q	: cfm Vs As(60 sec/min)	99602	101518	100968	100696
11. Qstw	: scfm Q(Ps/Pstd)(Tstd/Ts)	78726	79998	80436	79720
12. Qstd	: dscfm Qstw(1-Bws)	74261	74912	75189	74787
13. I	: percent [(100 Ts)(.002669 Vlc+(Vm Pm/Tm)]/(60 theta Vs Ps An)	96.51	94.54	93.99	95.01

Particulate Emissions

14. E,PM	: pounds/hr (M,PM/Vmstd)(Qstd)(60)/(453590)				
front half		6.216	9.364	6.046	7.209
back half organic		0.029	0.275	0.295	0.199
back half aqueous		0.798	0.385	0.387	0.523
Total		7.043	10.024	6.728	7.932
15. C,PM	: grains/dscf (M,PM/Vmstd)(.0154 grains/mg)				
front half		0.010	0.015	0.009	0.011
back half organic		0.000	0.000	0.000	0.000
back half aqueous		0.001	0.001	0.001	0.001
Total		0.011	0.016	0.010	0.012

Carbon Monoxide Emissions

16. E,CO	: pounds/hr. (C,CO)(7.27e-8)(Qstd)(60)	1.652	1.209	0.426	1.096

NOx Emissions

17. E,NOx	: pounds/hr. (C,NOx)(1.19e-7)(Qstd)(60)	16.278	15.244	12.186	14.569

LP - Urania
MDF Dryers RTO Inlet
PM/CO/NOx Loading Test - January 18, 1994

Collected Test Data:

			RUN 1	RUN 2	RUN 3	
Date	:		1/18/94	1/18/94	1/18/94	
Time	:		1114	1459	1656	
Time end	:		1223	1607	1809	
1. As	:	sq ft	94	94	94	
2. Dn	:	in.	0.272	0.272	0.272	
3. Cp	:	dimensionless	0.84	0.84	0.84	
4. Theta	:	minutes	62.50	62.50	62.50	
5. Y	:	dimensionless	1.00	1.00	1.00	
6. Pbar	:	in. Hg	30.25	30.25	30.25	
7. Pg	:	in. H2O	-1.6	-1.6	-1.6	
8. Vm	:	cf (dry gas)	46.052	49.943	46.843	
9. sqr(DP),avg	:	in.H2O^.5	0.5553	0.5945	0.5808	
10. DH	:	in. H2O	2.1603	2.3128	2.2436	
11. ts	:	degrees F	117.52	117.44	117.60	117.52
12. tm	:	degrees F	100.20	102.90	108.52	
13. Vlc	:	ml	58	70	64.5	
14. CO2	:	percent	1.00	1.00	1.00	
15. O2	:	percent	19.80	19.90	19.80	
16. CO	:	percent	0	0	0	
17. CO	:	ppm	11.3	15.0	12.5	12.9
18. M,PM	:	milligrams				
		front half	81.3	351.1	90.4	
		back half organic	2.7	5.2	5.5	
		back half aqueous	1.9	3	5.5	
19. NOx	:	ppm	19.8	19.2	30.8	23.3

LP - Urania
MDF Dryers RTO Inlet
PM/CO/NOx Loading Test - January 18, 1994

Calculations:		RUN 1	RUN 2	RUN 3	AVG.
1. Pm	: in.Hg (DH/13.6)+Pbar	30.4088	30.4201	30.4150	
2. Ps	: in. Hg (Pg/13.6)+Pbar	30.1324	30.1324	30.1324	
3. An	: sq ft ((Dn/24)^2)(3.1416)	4.04E-04	4.04E-04	4.04E-04	
4. Vmstd	: dscf Vm Y(Pm/Pstd)(Tstd/Tm)	44.114	47.629	44.224	45.323
5. Vwstd	: scf (.04707cf/ml)(Vlc)	2.730	3.295	3.036	
6. Bws	: dimensionless Vwstd/(Vwstd+Vmstd)	0.0583	0.0647	0.0642	0.0624
7. Md	: mol.wt. dry basis .44 CO2+.32 O2+.28(CO+N2)	28.952	28.956	28.952	
8. Ms	: mol.wt. wet basis Md(1-Bws)+18 Bws	28.31	28.25	28.25	
9. Vs	: ft/sec Kp Cp (sqrDP)sqr(Ts/(Ps Ms))	32.81	35.16	34.36	34.11
10. Q	: cfm Vs As(60 sec/min)	185042	198324	193776	192381
11. Qstw	: scfm Q(Ps/Pstd)(Tstd/Ts)	170376	182631	178393	177133
12. Qstd	: dscfm Qstw(1-Bws)	160446	170814	166933	166065
13. I	: percent [(100 Ts)(.002669 Vlc+(Vm Pm/Tm)]/(60 theta Vs Ps An)	102.48	103.93	98.75	101.72

Particulate Emissions

14. E,PM	: pounds/hr (M,PM/Vmstd)(Qstd)(60)/(453590)				
front half		39.114	166.558	45.138	83.603
back half organic		1.299	2.467	2.746	2.171
back half aqueous		0.914	1.423	2.746	1.694
Total		41.327	170.448	50.630	87.469
15. C,PM	: grains/dscf (M,PM/Vmstd)(.0154 grains/mg)				
front half		0.028	0.114	0.031	0.058
back half organic		0.001	0.002	0.002	0.002
back half aqueous		0.001	0.001	0.002	0.001
Total		0.030	0.116	0.035	0.060

Carbon Monoxide Emissions

22. E,CO	: pounds/hr. (C,CO)(7.27e-8)(Qstd)(60)	7.909	11.176	9.102	9.396

NOx Emissions

23. E,NOx	: pounds/hr. (C,NOx)(1.19e-7)(Qstd)(60)	22.683	23.417	36.711	27.603

LP - Urania
MDF Dryers North RTO
VOC/HCOH Emissions Test - January 19, 1994

Collected Test Data:

			RUN 1	RUN 2	RUN 3	
Date	:		1/19/94	1/19/94	1/19/94	
Time	:		1106	1627	1814	
Time end	:		1506	1729	1915	
1. As	:	sq ft	39.87123	39.87123	39.87123	
2. Dn	:	in.	0.277	0.277	0.277	
3. Cp	:	dimensionless	0.84	0.84	0.84	
4. Theta	:	minutes	60.00	60.00	60.00	
5. Y	:	dimensionless	1.01	1.01	1.01	
6. Pbar	:	in. Hg	30.28	30.28	30.28	
7. Pg	:	in. H2O	-0.36	-0.36	-0.36	
8. Vm	:	cf (dry gas)	46.64	48.062	47.705	
9. sqr(DP),avg	:	in.H2O^.5	0.6634	0.6561	0.6560	
10. DH	:	in. H2O	2.1396	2.0833	2.1021	
11. ts	:	degrees F	218.96	227.08	226.79	224.28
12. tm	:	degrees F	84.63	103.25	109.23	
13. Vlc	:	ml	72	98.5	96	
14. CO2	:	percent	1.00	0.90	0.90	
15. O2	:	percent	19.80	19.80	19.80	
16. CO	:	percent	0	0	0	
17. C,VOC	:	ppm as propane, wet basis	1.80	1.65	1.47	1.64
20. M,HCOH	:	micrograms	2070	1790	1970	

LP - Urania
MDF Dryers North RTO
VOC/HCOH Emissions Test - January 19, 1994

Calculations:		RUN 1	RUN 2	RUN 3	AVG.
1. Pm	: in.Hg (DH/13.6)+Pbar	30.4373	30.4332	30.4346	
2. Ps	: in. Hg (Pg/13.6)+Pbar	30.2535	30.2535	30.2535	
3. An	: sq ft ((Dn/24)^2)(3.1416)	4.18E-04	4.18E-04	4.18E-04	
4. Vmstd	: dscf Vm Y(Pm/Pstd)(Tstd/Tm)	46.458	46.285	45.461	46.068
5. Vwstd	: scf (.04707cf/ml)(Vlc)	3.389	4.636	4.519	
6. Bws	: dimensionless Vwstd/(Vwstd+Vmstd)	0.0680	0.0910	0.0904	0.0832
7. Md	: mol.wt. dry basis .44 CO2+.32 O2+.28(CO+N2)	28.952	28.936	28.936	
8. Ms	: mol.wt. wet basis Md(1-Bws)+18 Bws	28.21	27.94	27.95	
9. Vs	: ft/sec Kp Cp (sqrDP)sqr(Ts/(Ps Ms))	42.49	42.48	42.46	42.48
10. Q	: cfm Vs As(60 sec/min)	101656	101619	101570	101615
11. Qstw	: scfm Q(Ps/Pstd)(Tstd/Ts)	79935	78962	78957	79284
12. Qstd	: dscfm Qstw(1-Bws)	74500	71772	71818	72697
13. I	: percent [(100 Ts)(.002669 Vlc+(Vm Pm/Tm)]/(60 theta Vs Ps An)	99.02	102.41	100.52	100.65

VOC Emissions

14. C'VOC	: ppm as C,dry basis ((C,VOC)(3))/(1-bws)	5.79	5.45	4.84	5.36
15. E,VOC	: pounds/hr. (C'VOC)(3.12e-8)(Qstd)(60)	0.251	0.222	0.197	0.223

HCOH Emissions

16. C,HCOH	: ppm (M,HCOH/Vmstd)(.0283)	1.261	1.094	1.226	1.194
17. E,HCOH	: pounds/hr. (M,HCOH/Vmstd)(Qstd)(60)/(453590000)	0.439	0.367	0.412	0.406

LP - Urania
MDF Dryers RTO Inlet
VOC/HCOH Loading Test - January 19, 1994

Collected Test Data:

			RUN 1	RUN 2	RUN 3	
Date	:		1/19/94	1/19/94	1/19/94	
Time	:		1105	1626	1812	
Time end	:		1511	1737	1921	
1. As	:	sq ft	94	94	94	
2. Dn	:	in.	0.272	0.272	0.272	
3. Cp	:	dimensionless	0.84	0.84	0.84	
4. Theta	:	minutes	62.50	62.50	62.50	
5. Y	:	dimensionless	1.00	1.00	1.00	
6. Pbar	:	in. Hg	30.25	30.25	30.25	
7. Pg	:	in. H2O	-1.6	-1.6	-1.6	
8. Vm	:	cf (dry gas)	46.052	49.943	46.843	
9. sqr(DP),avg	:	in.H2O^.5	0.5553	0.5945	0.5808	
10. DH	:	in. H2O	2.1603	2.3128	2.2436	
11. ts	:	degrees F	117.52	117.44	117.60	117.52
12. tm	:	degrees F	100.20	102.90	108.52	
13. Vlc	:	ml	58	70	64.5	
14. CO2	:	percent	1.00	1.00	1.00	
15. O2	:	percent	19.80	19.90	19.80	
16. CO	:	percent	0	0	0	
17. C,VOC	:	ppm as propane, wet basis	66.86	48.19	50.68	55.24
18. M,HCOH	:	micrograms	9690	13200	14800	

LP - Urania
MDF Dryers RTO Inlet
VOC/HCOH Loading Test - January 19, 1994

Calculations:		RUN 1	RUN 2	RUN 3	AVG.
1. Pm	: in.Hg (DH/13.6)+Pbar	30.4088	30.4201	30.4150	
2. Ps	: in. Hg (Pg/13.6)+Pbar	30.1324	30.1324	30.1324	
3. An	: sq ft ((Dn/24)^2)(3.1416)	4.04E-04	4.04E-04	4.04E-04	
4. Vmstd	: dscf Vm Y(Pm/Pstd)(Tstd/Tm)	44.114	47.629	44.224	45.323
5. Vwstd	: scf (.04707cf/ml)(Vlc)	2.730	3.295	3.036	
6. Bws	: dimensionless Vwstd/(Vwstd+Vmstd)	0.0583	0.0647	0.0642	0.0624
7. Md	: mol.wt. dry basis .44 CO2+.32 O2+.28(CO+N2)	28.952	28.956	28.952	
8. Ms	: mol.wt. wet basis Md(1-Bws)+18 Bws	28.31	28.25	28.25	
9. Vs	: ft/sec Kp Cp (sqrDP)sqr(Ts/(Ps Ms))	32.81	35.16	34.36	34.11
10. Q	: cfm Vs As(60 sec/min)	185042	198324	193776	192381
11. Qstw	: scfm Q(Ps/Pstd)(Tstd/Ts)	170376	182631	178393	177133
12. Qstd	: dscfm Qstw(1-Bws)	160446	170814	166933	166065
13. I	: percent [(100 Ts)(.002669 Vlc+(Vm Pm/Tm)]/(60 theta Vs Ps An)	102.48	103.93	98.75	101.72

VOC Loading

14. C'VOC	: ppm as C,dry basis ((C,VOC)(3))/(1-bws)	212.99	154.57	162.48	176.68
15. E,VOC	: pounds/hr. (C'VOC)(3.12e-8)(Qstd)(60)	20.075	15.404	15.832	17.104

HCOH Loading

16. C,HCOH	: ppm (M,HCOH/Vmstd)(.0283)	6.216	7.843	9.471	7.843
17. E,HCOH	: pounds/hr. (M,HCOH/Vmstd)(Qstd)(60)/(453590000)	4.662	6.262	7.390	6.105

LP - Urania
MDF Press Vent RTO
PM/CO/NOx Emissions Test - January 21, 1994

Collected Test Data:			RUN 1	RUN 2	RUN 3	
Date	:		1/21/94	1/21/94	1/21/94	
Time	:		0818	1001	1226	
Time end	:		0921	1102	1327	
1. As	:	sq ft	23.39968	23.39968	23.39968	
2. Dn	:	in.	0.266	0.266	0.266	
3. Cp	:	dimensionless	0.84	0.84	0.84	
4. Theta	:	minutes	60.00	60.00	60.00	
5. Y	:	dimensionless	1.01	1.01	1.01	
6. Pbar	:	in. Hg	30.31	30.31	30.31	
7. Pg	:	in. H2O	-0.5	-0.5	-0.5	
8. Vm	:	cf (dry gas)	69.964	70.104	71.120	
9. sqr(DP),avg	:	in.H2O^.5	1.0063	1.0490	1.0557	
10. DH	:	in. H2O	4.8333	4.7250	4.8542	
11. ts	:	degrees F	193.88	197.92	207.96	199.92
12. tm	:	degrees F	92.58	101.79	110.00	
13. Vlc	:	ml	18	20.5	24	
14. CO2	:	percent	0.00	0.00	0.00	
15. O2	:	percent	20.90	20.90	20.90	
16. CO	:	percent	0	0	0	
17. CO	:	ppm	3.1	2.0	2.1	2.4
18. M,PM	:	milligrams				
		front half	2.6	0.3	1.6	
		back half organic	0.1	0.9	0.7	
		back half aqueous	0.3	0.2	0.8	
19. NOx	:	ppm	9.4	8.3	8.8	8.8

LP - Urania
MDF Press Vent RTO
PM/CO/NOx Emissions Test - January 21, 1994

Calculations:		RUN 1	RUN 2	RUN 3	AVG.
1. Pm	: in.Hg (DH/13.6)+Pbar	30.6654	30.6574	30.6669	
2. Ps	: in. Hg (Pg/13.6)+Pbar	30.2732	30.2732	30.2732	
3. An	: sq ft ((Dn/24)^2)(3.1416)	3.86E-04	3.86E-04	3.86E-04	
4. Vmstd	: dscf Vm Y(Pm/Pstd)(Tstd/Tm)	69.202	68.186	68.199	68.529
5. Vwstd	: scf (.04707cf/ml)(Vlc)	0.847	0.965	1.130	
6. Bws	: dimensionless Vwstd/(Vwstd+Vmstd)	0.0121	0.0140	0.0163	0.0141
7. Md	: mol.wt. dry basis .44 CO2+.32 O2+.28(CO+N2)	28.836	28.836	28.836	
8. Ms	: mol.wt. wet basis Md(1-Bws)+18 Bws	28.70	28.68	28.66	
9. Vs	: ft/sec Kp Cp (sqrDP)sqr(Ts/(Ps Ms))	62.69	65.57	66.52	64.92
10. Q	: cfm Vs As(60 sec/min)	88009	92058	93392	91153
11. Qstw	: scfm Q(Ps/Pstd)(Tstd/Ts)	71905	74752	74695	73784
12. Qstd	: dscfm Qstw(1-Bws)	71036	73709	73477	72741
13. I	: percent [(100 Ts)(.002669 Vlc+(Vm Pm/Tm)]/(60 theta Vs Ps An)	98.45	93.49	93.80	95.25

Particulate Emissions

14. E,PM	: pounds/hr (M,PM/Vmstd)(Qstd)(60)/(453590)				
front half		0.353	0.043	0.228	0.208
back half organic		0.014	0.129	0.100	0.081
back half aqueous		0.041	0.029	0.114	0.061
Total		0.407	0.200	0.442	0.350
15. C,PM	: grains/dscf (M,PM/Vmstd)(.0154 grains/mg)				
front half		0.0006	0.0001	0.0004	0.0003
back half organic		0.0000	0.0002	0.0002	0.0001
back half aqueous		0.0001	0.0000	0.0002	0.0001
Total		0.0007	0.0003	0.0007	0.0006

Carbon Monoxide Emissions

16. E,CO	: pounds/hr. (C,CO)(7.27e-8)(Qstd)(60)	0.961	0.643	0.673	0.759

NOx Emissions

17. E,NOx	: pounds/hr. (C,NOx)(1.19e-7)(Qstd)(60)	4.768	4.368	4.617	4.584

LP - Urania
MDF Press Vent RTO Inlet
PM/CO/NOx Loading Test - January 21, 1994

Collected Test Data:			RUN 1	RUN 2	RUN 3	
Date	:		1/21/94	1/21/94	1/21/94	
Time	:		0817	1000	1225	
Time end	:		0920	1101	1226	
1. As	:	sq ft	23.57865	23.57865	23.57865	
2. Dn	:	in.	0.218	0.218	0.218	
3. Cp	:	dimensionless	0.84	0.84	0.84	
4. Theta	:	minutes	60.00	60.00	60.00	
5. Y	:	dimensionless	1.00	1.00	1.00	
6. Pbar	:	in. Hg	30.31	30.31	30.31	
7. Pg	:	in. H2O	-2.6	-2.6	-2.6	
8. Vm	:	cf (dry gas)	40.999	42.375	42.307	
9. sqr(DP),avg	:	in.H2O^.5	0.8327	0.8564	0.8532	
10. DH	:	in. H2O	1.5563	1.6688	1.6417	
11. ts	:	degrees F	81.33	83.29	95.54	86.72
12. tm	:	degrees F	79.38	95.71	101.08	
13. Vlc	:	ml	11	8	10	
14. CO2	:	percent	0.00	0.00	0.00	
15. O2	:	percent	20.90	20.90	20.90	
16. CO	:	percent	0	0	0	
17. CO	:	ppm	0	0	0	0.00
18. M,PM	:	milligrams				
		front half	8.3	7.3	6.3	
		back half organic	2.3	3	2.9	
		back half aqueous	1.7	3.2	4	
19. NOx	:	ppm	0	0	0	0.00

LP - Urania
MDF Press Vent RTO Inlet
PM/CO/NOx Loading Test - January 21, 1994

Calculations:		RUN 1	RUN 2	RUN 3	AVG.
1. Pm	: in.Hg				
	(DH/13.6)+Pbar	30.4244	30.4327	30.4307	
2. Ps	: in. Hg				
	(Pg/13.6)+Pbar	30.1188	30.1188	30.1188	
3. An	: sq ft				
	((Dn/24)^2)(3.1416)	2.59E-04	2.59E-04	2.59E-04	
4. Vmstd	: dscf				
	Vm Y(Pm/Pstd)(Tstd/Tm)	40.811	40.952	40.492	40.752
5. Vwstd	: scf				
	(.04707cf/ml)(Vlc)	0.518	0.377	0.471	
6. Bws	: dimensionless				
	Vwstd/(Vwstd+Vmstd)	0.0125	0.0091	0.0115	0.0110
7. Md	: mol.wt. dry basis				
	.44 CO2+.32 O2+.28(CO+N2)	28.836	28.836	28.836	
8. Ms	: mol.wt. wet basis				
	Md(1-Bws)+18 Bws	28.70	28.74	28.71	
9. Vs	: ft/sec				
	Kp Cp (sqrDP)sqr(Ts/(Ps Ms))	47.32	48.72	49.11	48.38
10. Q	: cfm				
	Vs As(60 sec/min)	66946	68931	69475	68450
11. Qstw	: scfm				
	Q(Ps/Pstd)(Tstd/Ts)	65731	67436	66469	66546
12. Qstd	: dscfm				
	Qstw(1-Bws)	64908	66822	65706	65812
13. I	: percent				
	[(100 Ts)(.002669 Vlc+(Vm Pm/Tm)]/(60 theta Vs Ps An)	95.33	92.91	93.43	93.89

Particulate Emissions

14. E,PM	: pounds/hr				
	(M,PM/Vmstd)(Qstd)(60)/(453590)				
front half		1.746	1.576	1.352	1.558
back half organic		0.484	0.648	0.622	0.585
back half aqueous		0.358	0.691	0.859	0.636
Total		2.588	2.914	2.833	2.778
15. C,PM	: grains/dscf				
	(M,PM/Vmstd)(.0154 grains/mg)				
front half		0.0031	0.0027	0.0024	0.0028
back half organic		0.0009	0.0011	0.0011	0.0010
back half aqueous		0.0006	0.0012	0.0015	0.0011
Total		0.0046	0.0051	0.0050	0.0049

Carbon Monoxide Emissions

22. E,CO	: pounds/hr.				
	(C,CO)(7.27e-8)(Qstd)(60)	0.000	0.000	0.000	0.000

NOx Emissions

23. E,NOx	: pounds/hr.				
	(C,NOx)(1.19e-7)(Qstd)(60)	0.000	0.000	0.000	0.000

LP - Urania
MDF Press Vent RTO
VOC/HCOH Emissions Test - January 20, 1994

Collected Test Data:

			RUN 1	RUN 2	RUN 3	
Date	:		1/20/94	1/20/94	1/20/94	
Time	:		1141	1400	1600	
Time end	:		1243	1501	1703	
1. As	:	sq ft	23.39968	23.39968	23.39968	
2. Dn	:	in.	0.218	0.218	0.218	
3. Cp	:	dimensionless	0.84	0.84	0.84	
4. Theta	:	minutes	60.00	60.00	60.00	
5. Y	:	dimensionless	1.01	1.01	1.01	
6. Pbar	:	in. Hg	30.29	30.29	30.29	
7. Pg	:	in. H2O	-0.5	-0.5	-0.5	
8. Vm	:	cf (dry gas)	45.377	54.897	47.099	
9. sqr(DP),avg	:	in.H2O^.5	1.0460	1.2456	1.0570	
10. DH	:	in. H2O	1.9583	2.8167	2.0271	
11. ts	:	degrees F	211.38	216.04	210.92	212.78
12. tm	:	degrees F	86.38	94.60	107.31	
13. Vlc	:	ml	16.5	22	16	
14. CO2	:	percent	0.00	0.10	0.00	
15. O2	:	percent	20.90	20.90	20.90	
16. CO	:	percent	0	0	0	
17. C,VOC	:	ppm as propane, wet basis	0.33	0.43	0.40	0.39
20. M,HCOH	:	micrograms	534	363	269	

LP - Urania
MDF Press Vent RTO
VOC/HCOH Emissions Test - January 20, 1994

Calculations:		RUN 1	RUN 2	RUN 3	AVG.
1. Pm	: in.Hg (DH/13.6)+Pbar	30.4340	30.4971	30.4391	
2. Ps	: in. Hg (Pg/13.6)+Pbar	30.2532	30.2532	30.2532	
3. An	: sq ft ((Dn/24)^2)(3.1416)	2.59E-04	2.59E-04	2.59E-04	
4. Vmstd	: dscf Vm Y(Pm/Pstd)(Tstd/Tm)	45.050	53.805	45.042	47.966
5. Vwstd	: scf (.04707cf/ml)(Vlc)	0.777	1.036	0.753	
6. Bws	: dimensionless Vwstd/(Vwstd+Vmstd)	0.0169	0.0189	0.0164	0.0174
7. Md	: mol.wt. dry basis .44 CO2+.32 O2+.28(CO+N2)	28.836	28.852	28.836	
8. Ms	: mol.wt. wet basis Md(1-Bws)+18 Bws	28.65	28.65	28.66	
9. Vs	: ft/sec Kp Cp (sqrDP)sqr(Ts/(Ps Ms))	66.11	79.00	66.77	70.63
10. Q	: cfm Vs As(60 sec/min)	92812	110916	93747	99159
11. Qstw	: scfm Q(Ps/Pstd)(Tstd/Ts)	73804	87592	74599	78665
12. Qstd	: dscfm Qstw(1-Bws)	72553	85938	73372	77288
13. I	: percent [(100 Ts)(.002669 Vlc+(Vm Pm/Tm)]/(60 theta Vs Ps An)	93.42	94.20	92.37	93.33

VOC Emissions

14. C'VOC	: ppm as C,dry basis ((C,VOC)(3))/(1-bws)	1.01	1.31	1.22	1.18
15. E,VOC	: pounds/hr. (C'VOC)(3.12e-8)(Qstd)(60)	0.045	0.069	0.055	0.056

HCOH Emissions

16. C,HCOH	: ppm (M,HCOH/Vmstd)(.0283)	0.335	0.191	0.169	0.232
17. E,HCOH	: pounds/hr. (M,HCOH/Vmstd)(Qstd)(60)/(453590000)	0.114	0.077	0.058	0.083

LP - Urania
MDF Press Vent RTO Inlet
VOC/HCOH Loading Test - January 20, 1994

Collected Test Data:			RUN 1	RUN 2	RUN 3	
Date	:		1/20/94	1/20/94	1/20/94	
Time	:		1140	1359	1559	
Time end	:		1242	1500	1701	
1. As	:	sq ft	23.57865	23.57865	23.57865	
2. Dn	:	in.	0.260	0.260	0.260	
3. Cp	:	dimensionless	0.84	0.84	0.84	
4. Theta	:	minutes	60.00	60.00	60.00	
5. Y	:	dimensionless	1.00	1.00	1.00	
6. Pbar	:	in. Hg	30.29	30.29	30.29	
7. Pg	:	in. H2O	-2.6	-2.6	-2.6	
8. Vm	:	cf (dry gas)	63.017	74.815	62.952	
9. sqr(DP),avg	:	in.H2O^.5	0.8660	0.9927	0.8554	
10. DH	:	in. H2O	3.6804	5.1417	3.6000	
11. ts	:	degrees F	101.63	97.58	97.88	99.03
12. tm	:	degrees F	89.81	101.46	96.96	
13. Vlc	:	ml	10.5	16.5	12.5	
14. CO2	:	percent	0.00	0.00	0.00	
15. O2	:	percent	20.90	20.90	20.90	
16. CO	:	percent	0	0	0	
17. C,VOC	:	ppm as propane, wet basis	6.28	4.97	6.80	6.02
18. M,HCOH	:	micrograms	82400	72200	57700	

LP - Urania
MDF Press Vent RTO Inlet
VOC/HCOH Loading Test - January 20, 1994

Calculations:		RUN 1	RUN 2	RUN 3	AVG.
1. Pm	: in.Hg (DH/13.6)+Pbar	30.5606	30.6681	30.5547	
2. Ps	: in. Hg (Pg/13.6)+Pbar	30.0988	30.0988	30.0988	
3. An	: sq ft ((Dn/24)^2)(3.1416)	3.69E-04	3.69E-04	3.69E-04	
4. Vmstd	: dscf Vm Y(Pm/Pstd)(Tstd/Tm)	61.813	72.115	60.945	64.958
5. Vwstd	: scf (.04707cf/ml)(Vlc)	0.494	0.777	0.588	
6. Bws	: dimensionless Vwstd/(Vwstd+Vmstd)	0.0079	0.0107	0.0096	0.0094
7. Md	: mol.wt. dry basis .44 CO2+.32 O2+.28(CO+N2)	28.836	28.836	28.836	
8. Ms	: mol.wt. wet basis Md(1-Bws)+18 Bws	28.75	28.72	28.73	
9. Vs	: ft/sec Kp Cp (sqrDP)sqr(Ts/(Ps Ms))	50.10	57.25	49.34	52.23
10. Q	: cfm Vs As(60 sec/min)	70878	80996	69798	73891
11. Qstw	: scfm Q(Ps/Pstd)(Tstd/Ts)	67032	77158	66455	70215
12. Qstd	: dscfm Qstw(1-Bws)	66501	76336	65819	69552
13. I	: percent [(100 Ts)(.002669 Vlc+(Vm Pm/Tm)]/(60 theta Vs Ps An)	99.07	100.69	98.69	99.49

VOC Loading

14. C'VOC	: ppm as C,dry basis ((C,VOC)(3))/(1-bws)	18.99	15.07	20.60	18.22
15. E,VOC	: pounds/hr. (C'VOC)(3.12e-8)(Qstd)(60)	0.782	0.710	0.838	0.776

HCOH Loading

16. C,HCOH	: ppm (M,HCOH/Vmstd)(.0283)	37.725	28.333	26.793	30.951
17. E,HCOH	: pounds/hr. (M,HCOH/Vmstd)(Qstd)(60)/(453590000)	11.726	10.109	8.243	10.026

5.0 NOMENCLATURE

SYMBOL	UNITS	DESCRIPTION
An	ft^2	Nozzle cross sectional area
As	ft^2	Stack cross sectional area
Bws	dimensionless	Wet gas fraction
CO2	percent	Carbon dioxide content by volume
CO	percent	Carbon monoxide content by volume
Cp	dimensionless	Pitot correction factor
C,X	as labeled	Concentration of pollutant X
DGF	dimensionless	Dry gas fraction
Dn	inches	Nozzle diameter
DH (delta H)	in. H_2O	Pressure drop across meter orifice
DP (delta P)	in. H_2O	Stack gas velocity pressure
E,X	#/hr	Emission rate of pollutant X
E'X	#/MM Btu	Emission rate of pollutant X
F	dscf	Volume of flue gas per MM Btu
I	percent	Nozzle velocity/stack gas velocity
Kp	consistent	Pitot tube constant
M,X	milligrams	Sample weight of pollutant X
Md	## mole	Dry molecular weight of stack gas
Ms	## mole	Wet molecular weight of stack gas
N2	percent	Nitrogen content by volume, dry basis
O2	percent	Oxygen content by volume, dry basis
Pbar	in. Hg	Barometric pressure
Pg	in. Hg	Stack static pressure
Pm	in. Hg	Total pressure at meter (Pbar+(DH/13.6)
Ps	in. Hg	Total stack pressure (Pbar+(Pg/13.6))
Pstd	in. Hg	Standard barometric pressure = 29.92
Q	acfm	Volumetric flow rate at stack conditions
Qstd	dscfm	Volumetric flow rate at standard conditions, dry basis
Qstdw	scfm	Volumetric flow rate at standard conditions, wet basis
q (theta)	minutes	Sample duration
tm	°F	Meter temperature (Tm denotes °R)
ts	°F	Stack temperature (Ts denotes °R)
Tstd	°R	Standard temperature = 528°R
Vlc	ml	volume of water collected
Vm	ft^3	Volume of dry gas sampled through meter
Vmstd	dscf	Sample volume at standard conditions
Vwstd	scf	Sample volume of water vapor
Y	dimensionless	Meter coefficient
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 850 ppm CO respectively. An intermediate check at 150 ppm CO is also performed. These calibrations and adjustments are repeated at the conclusion of each sampling period.

Chemiluminescent NOx Analyzer:
Nitrogen oxide concentrations measurements are made with a multi-range TECO Model 10-S NOx analyzer. Following a sufficient warm up period and prior to each sample run, the instrument's zero and span are checked and adjusted if necessary using a supply of zero air and 86 ppm protocol 1 nitrogen dioxide. These calibrations and adjustments are repeated at the conclusion of the sampling period.

7.0 APPENDICES

A. Sampling and Analytical Data

B. Recorder Traces/Data Log

C. Calibration Data

D. Formaldehyde Analysis (ATI)

E. Armstrong Environmental Report

F. Louisiana Pacific Production Summaries

7.0 APPENDICES

APPENDIX A.

SAMPLING AND ANALYTICAL DATA

MDF DRYERS

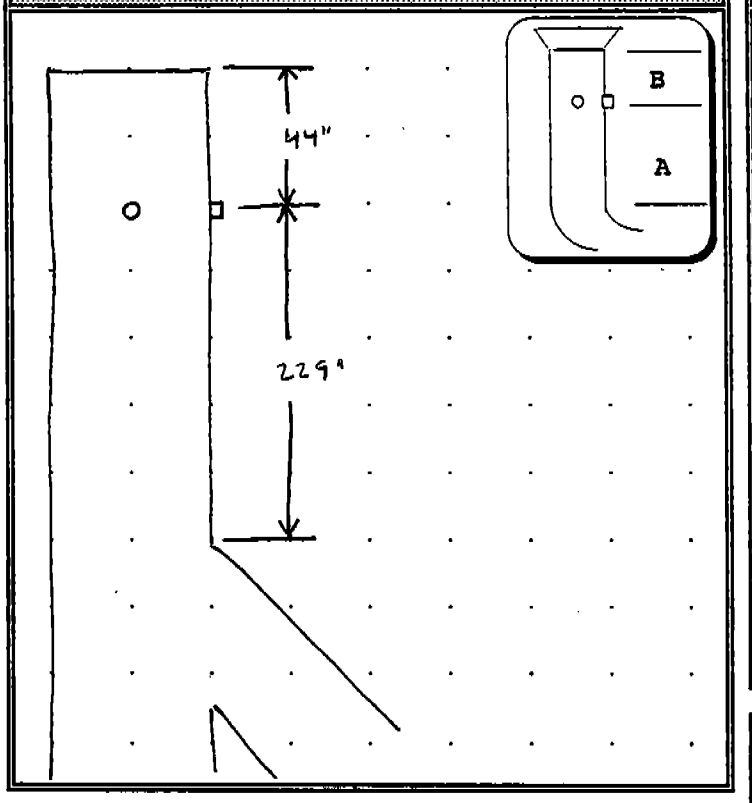
NORTH RTO

PM/CO/NOx EMISSIONS TEST

STACK CONFIGURATION AND SAMPLE POINT LAYOUT FOR CIRCULAR STACKS

PLANT:	Louisiana Pacific - Urania	Date:	
SOURCE:	MDF Dryer RTO Outlet - NORTH		
TEST FOR:	PM Setup		
TEST OPERATORS:	Russell		

SKETCH OF STACK



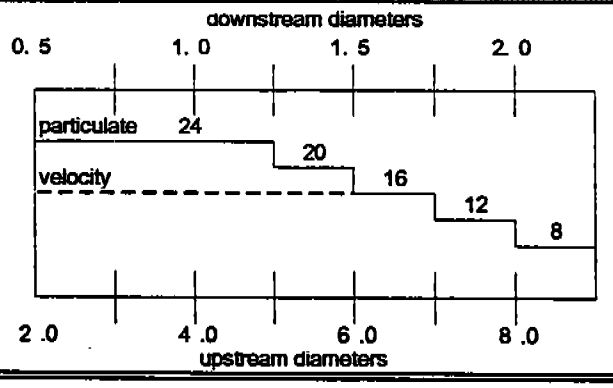
PERCENT OF DIAMETER

	points on a diameter							
point no.	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:	85.5
Distance from ports to disturbance:	
A. to upstream disturbance	229"
B. to downstream disturbance	44"
Upstream diameters:	2.68
Downstream diameters:	0.51
Minimum No. sample points required:	24
No. sample points selected:	12x2
Port Length:	4.0"
Port Type:	4" pipe nipple
Port Access:	platform / manrail

Point No.	Inches from wall	velocity head
1	1.8	
2	5.7	
3	10.1	
4	15.1	
5	21.4	
6	30.4	
7	55.1	
8	64.1	
9	70.4	
10	75.4	
11	79.8	
12	83.3	

MINIMUM NO. OF POINTS ON A DIAMETER



Pitot ID: _____ Pitot Cp: _____ Stack Temp: _____

Remarks:

Plant Louisiana Pacific - Urania Louisiana MDF Plant
Sampling Location Dryers North RTO
Test For PM / NOx / CO
Test Operators Russell / McKnight

RUN No. 1
Date 1-18-94
Time start 1115 end 1218

Meter Box	Anderson	No. Sample Pts.	12x2	Gas Analysis	int. BAG
Sample Box	No. 3	Minutes/Pt.	2.5	CO_2	orsat = 1.0
Probe/Pitot	8' Ef SS			O_2	Servomex = 19.8
Pitot Cp	.84	NOMOGRAPH		CO	TECO 48 = 5.1
Nozzle Dia.	.242	ΔH@	1.80	Time	
Filter No.		Meter Temp.	100		
		% H_2O	15	Condensate:	
Amb. Temp. °F	29	C-Factor	.85	tare 200	fin 241
Bar. Press. "Hg	30.25	Stack Temp.	230	Silica gel:	
Static Press. "H_2O	-.36	Ref. ΔP	.75	tare	fin 3.0 +

Remarks:
Nozzle Cd:
(1) .242
(2) .242 } .242
(3) .243

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	496.372	0.66	1.60	218	72	73	244	35	2
2	230	498.0	0.62	1.50	217	75	72	249	33	2
3	500	499.9	0.66	1.60	226	81	72	243	33	2
4	730	502.0	0.52	1.25	214	88	74	250	33	2
5	1000	503.5	0.52	1.25	221	89	75	251	33	2
6	1230	505.0	0.39	0.95	217	95	76	250	33	2
7	1500	506.5	0.31	0.75	220	95	76	250	33	2
8	1730	507.7	0.37	0.90	219	97	80	251	34	2
9	2000	509.2	0.42	1.00	216	100	82	248	35	2
10	2230	510.7	0.38	0.92	210	103	85	249	35	2
11	2500	512.0	0.40	0.96	206	104	87	247	36	2
12	2730	513.4	0.35	0.85	210	106	89	251	35	2
1	30/00	514.822	0.46	1.10	223	96	89	250	35	2
2	230	516.3	0.42	1.00	201	105	91	252	35	2
3	500	518.0	0.37	0.90	203	108	92	256	35	2
4	730	519.2	0.36	0.86	211	108	93	249	35	2
5	1000	520.6	0.35	0.85	218	110	94	250	35	2
6	1230	522.0	0.35	0.85	207	112	96	250	35	2
7	1500	523.2	0.39	0.95	226	113	97	250	35	2
8	1730	524.7	0.46	1.10	211	114	99	248	35	2
9	2000	525.9	0.32	0.77	221	116	101	250	35	2
10	2230	527.3	0.42	1.00	206	118	102	251	35	2
11	2500	528.6	0.48	1.15	214	122	103	250	35	2
12	2730	530.2	0.37	0.90	210	122	106	250	35	2
end	60	531.233								
		leak check:	.032	→ .039	= .007	cfm	11" Hg			
		pitot +ve	3.6							
		pitot -ve	3.2							
		35.361	.6531	1.0400	214.79		94.85			

Plant Louisiana Pacific -
Sampling Location Dryer RTO North Outlet
Test For PM/CO/NOx
Test Operators Russell/McKnight

RUN No. 2
Date 1-18-94
Time start 1500 end 1602

Meter Box	Anderson	No. Sample Pts.	12x2	Gas Analysis	int on pt
Sample Box	No 3	Minutes/Pt.	2.5	CO_2	0.9
Probe/Pitot	8' SS	NOMOGRAPH		O_2	Servomax = 19.8
Pitot Cp	.84	ΔH@	1.80	CO	3.7 ppm
Nozzle Dia.	.305	Meter Temp.	100	Time	
Filter No.		% H_2O	10	Condensate:	
Amb. Temp. °F	33	C-Factor	.95	tare 200	fin 275
Bar. Press. "Hg	30.25	Stack Temp.	230	Silica gel:	
Static Press. "H_2O	-.36	Ref. ΔP	.28	tare	fin +3

Remarks:
⊖ .305
⊘ .305 } .305
⊘ .306

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	532.180	0.54	3.55	218	77	74	242	37	3
2	230	534.4	0.52	3.40	225	87	74	242	37	3
3	500	536.9	0.45	2.95	215	98	75	231	37	2
4	730	539.6	0.39	2.50	223	105	77	230	37	2
5	1000	541.8	0.37	2.40	216	110	79	243	38	2
6	1230	544.0	0.34	2.20	223	114	81	237	37	2
7	1500	546.2	0.39	2.55	205	116	83	241	37	2
8	1730	548.1	0.44	2.85	227	120	85	235	37	2
9	2000	550.4	0.50	3.30	214	123	87	235	37	2
10	2230	552.5	0.50	3.30	213	126	89	240	37	2
11	2500	554.7	0.53	3.45	215	128	92	251	38	2
12	2730	557.4	0.48	3.20	206	130	95	244	37	2
1	30/00	560.003	0.72	4.70	212	117	97	253	38	2
2	230	562.9	0.74	4.80	229	127	98	246	38	2
3	500	566.2	0.64	4.20	213	131	99	251	38	2
4	730	568.8	0.47	3.20	223	132	100	250	38	2
5	1000	571.3	0.48	3.20	212	133	102	250	38	2
6	1230	573.8	0.40	2.60	231	134	103	250	38	2
7	1500	576.3	0.31	2.00	212	134	104	251	38	2
8	1730	579.0	0.30	2.00	225	133	105	248	38	2
9	2000	580.6	0.32	2.05	214	132	105	248	38	2
10	2230	582.7	0.30	1.95	217	132	106	237	37	2
11	2500	584.8	0.31	2.00	208	133	106	236	36	2
12	2730	586.8	0.32	2.05	208	133	107	237	36	2
end	60	588.631								

leak check: .049 → .062 = .013 cfm 8" Hg
pitot + ✓ e 4.4
pitot - ✓ e 3.9

56.451 .6636 2.8917 216.83 106.83

Plant: Louisiana Pacific
Sampling Location: MDF RTO North Outlet
Test For: PM/CO/NOx
Test Operators: Russell / McKnight

RUN No. 3
Date 1-18-94
Time start 1657 end 1802

Meter Box	Andersen	No. Sample Pts.	12 x 2	Gas Analysis	Bag		Remarks:
Sample Box	No. 3	Minutes/Pt.	2.5	CO_2	19.8	Direct	
Probe/Pitot	8' SS			O_2	19.9	Direct	
Pitot Cp	.84	NOMOGRAPH		CO			
Nozzle Dia.	.305	ΔH@	1.8	Time			
Filter No.		Meter Temp.					
		% H_2O		Condensate:			
Amb. Temp. °F	30	C-Factor		tare 200	fin 273		
Bar. Press. "Hg	29.25	Stack Temp.		Silica gel:			
Static Press. "H_2O	-.3	Ref. ΔP	.28	tare	fin +7		

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	00	589.957	0.79	5.40	219	87	83	235	35	4
2	230	592.4	0.76	5.00	212	93	83	235	35	4
3	500	595.3	0.67	4.40	215	101	83	247	34	4
4	730	598.1	0.57	3.70	209	108	85	251	35	4
5	1000	600.8	0.52	3.40	213	112	86	255	35	4
6	1230	603.6	0.39	2.55	208	116	86	255	35	4
7	1500	606.0	0.30	2.00	203	116	89	250	35	4
8	1730	608.3	0.29	1.90	208	117	92	250	35	4
9	2000	609.7	0.28	1.85	206	117	94	250	35	4
10	2230	611.5	0.30	2.00	210	118	95	235	35	4
11	2500	613.5	0.32	2.10	206	121	97	235	35	4
12	2730	616.2	0.32	2.10	207	123	99	236	35	4
1	3000	617.628	0.48	3.20	203	104	97	240	35	3
2	230	620.0	0.49	3.25	220	112	99	245	35	3
3	500	622.5	0.45	2.95	206	121	99	238	35	3
4	730	624.7	0.42	2.80	217	125	100	243	35	3
5	1000	627.3	0.38	2.45	212	127	101	238	35	3
6	1230	629.7	0.34	2.20	213	130	103	238	35	3
7	1500	631.6	0.40	2.60	205	129	104	240	35	3
8	1730	633.9	0.42	2.80	210	131	106	251	35	3
9	2000	636.6	0.46	3.00	205	134	107	253	35	3
10	2230	638.7	0.48	3.20	207	136	109	253	36	3
11	2500	640.8	0.50	3.30	213	138	110	254	36	3
12	2730	643.5	0.46	3.00	201	139	112	252	35	3
end	60	645.883								

leak check: .071 → .045 = .014 cfm 11" Hg
pitot + vc 5.0
pitot − vc 4.0
56.426 .6634 2.9646 209.50 107.90

PARTICULATE CATCH ANALYSIS

SAMPLES: L.P.-Uranium MDF / Dryers RTO North

DATE TAKEN: 1-18-94 DATE ANALYZED: 1-23-94

DELIVERED BY: DCR RECEIVED BY: DCR

ANALYZED BY: DCR

(Attach chain of custody if additional exchanges occur)

FILTERS:

RUN NO.	1	2	3	
FILTER NO.	532	533	535	
FILTER TARE, gms.	.5613	.5629	.5614	
	.5707	.6058	.5805	
	.5706	.6058	.5803	
FINAL WEIGHT, gms.	.5706	.6058	.5803	
NET GAIN, gms.	.0093	.0377	.0189	

PROBE WASH:

RUN NO.	1	2	3	
CONTAINER I.D.	N-RTO R1	N-RTO R2	N RTO R3	
VOLUME INTACT?	✓	✓	✓	
VOLUME, ml.	150	140	170	
TARE WEIGHT, gms.	(80) 107.9648	(81) 104.6001	(85) 109.1496	114.1933
	107.9772	104.6140	109.1639	114.1932
	107.9773	104.6135	109.1635	114.1932
FINAL WEIGHT, gms.	107.9773	104.6135	109.1635	114.1933
NET GAIN, gms.	.0125	.0134	.0139	-0-
LESS BLANK, gms.	-0-	-0-	-0-	

PARTICULATE SAMPLE WEIGHT:

RUN NO.	1	2	3	
filter + probe, mg.	21.8	51.1	32.8	

PARTICULATE CATCH ANALYSIS

(Back Half Methylene Chloride Extraction)

SAMPLES: L.P. - Dryers RTO North

DATE TAKEN: 1-18-94 DATE ANALYZED: 1-26-94

DELIVERED BY: [illegible] RECEIVED BY: [illegible]

ANALYZED BY: [illegible]

(Attach chain of custody if additional exchanges occur)

AQUEOUS FRACTION:

RUN NO.	1	2	3	
CONTAINER I.D.	NRTO R1 B AK	NRTOR2 BAK	NRTO R3 BAK	
VOLUME INTACT?	✓	✓	✓	
VOLUME, ml	300	300	300	
TARE WEIGHT, gms.	(9) 114.8140	(61) 113.9826	(67) 111.4659	
	114.8171	113.9845	111.4685	
	114.8168	113.9847	111.4680	
FINAL WEIGHT, gms.	114.8163	113.9847	111.4680	
NET GAIN, gms.	.0028	.0021	.0021	
LESS BLANK, gms.				

ORGANIC FRACTION 3 25ml extractions w/ methylene chloride

RUN NO.				
CONTAINER I.D.	same as above			
VOLUME INTACT?	✓	✓	✓	
VOLUME, ml				
TARE WEIGHT, gms.	(2) 104.7502	(84) 105.3498	(87) 107.2274	
	104.7507	105.3513	107.2293	
	104.7503	105.3513	107.2290	
FINAL WEIGHT, gms	104.7503	105.3513	107.2290	
NET GAIN, gms.	.0001	.0015	.0016	
LESS BLANK, gms.				

PARTICULATE SAMPLE WEIGHT:

RUN NO.	1	2	3	
Aqueous	2.8	2.1	2.1	
~~Aqueous~~ Organic fraction, mg	0.1	1.5	1.6	

mg

mg

MDF DRYERS

NORTH RTO

VOC/HCOH EMISSIONS TEST

Plant Louisiana Pacific - Urania MDF
Sampling Location North MDF RTO Outlet
Test For HCOH / VOC
Test Operators Rhymes / McKnight

RUN No. 1
Date 1-19-94
Time start 1106 end 1506

Meter Box	Anderson	No. Sample Pts.	12x2	Gas Analysis	int. ~~Grab~~ BAG
Sample Box	No. 3	Minutes/Pt.	2.5	CO_2	1.0
Probe/Pitot	8' Teflon	NOMOGRAPH		O_2	19.8
Pitot Cp	.84	ΔH@	1.80	CO	
Nozzle Dia.	.277 glas	Meter Temp.	100	Time	
Filter No.		% H_2O	10	Condensate:	
Amb. Temp. °F	38-48	C-Factor	.95	tare Remarks	fin
Bar. Press. "Hg	30.28	Stack Temp.	220	Silica gel:	
Static Press. "H_2O	-.36	Ref. Δ P	.39	tare Remarks	fin

Remarks:
Ø .277
Ø .277 } .277
Ø .277
begin leak @ 1136
up @ 1436

1) ONPA	576.5	625.5
2) ONPA	577.0	588.5
3) MT	477.5	478.5
4) SGel	780.5	791.0

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	646.523	0.50	2.40	211	67	67	N/A	38	2
2	2.30	648.2	0.51	2.40	235	73	66		38	2
3	5.00	650.2	0.47	2.25	213	78	66		38	2
4	7.30	651.6	0.43	2.10	219	82	67		38	2
5	10.00	654.4	0.41	1.95	212	89	69		38	3
6	12.30	656.4	0.38	1.80	228	94	69		39	3
7	15.00	658.0	0.37	1.75	212	96	72		39	3
8	17.30	659.9	0.45	2.20	226	100	74		39	3
9	20.00	661.8	0.47	2.20	237	102	75		40	2
10	22.30	663.8	0.49	2.35	216	107	78		40	2
11	25.00	665.7	0.50	2.40	233	109	81		40	2
12	27.30	668.0	0.46	2.20	219	113	84		40	2
1136										
14351	30.00	669.672	0.71	3.40	226	70	70		40	2
2	2.30	672.0	0.72	3.40	205	73	69		40	2
3	5.00	674.7	0.64	3.00	224	82	70		41	2
4	7.30	677.0	0.56	2.60	204	92	72		42	2
5	10.00	679.1	0.50	2.40	216	97	73		43	2
6	12.30	681.7	0.43	2.05	210	100	75		43	2
7	15.00	683.5	0.30	1.45	220	104	78		43	2
8	17.30	685.2	0.28	1.35	211	107	80		48	2
9	20.00	686.7	0.30	1.45	227	105	82		48	2
10	22.30	688.2	0.30	1.45	214	106	84		49	2
11	25.00	689.9	0.28	1.35	223	108	86		51	2
12	27.30	691.8	0.30	1.45	214	110	89		51	2
end	60	693.163								
		leak check	.055 → .062 =	.007 cfm @		8" Hg				
		pitot + ✓ @ 4.0								
		pitot − ✓ @ 3.3								
		46.640	.6634	2.1396	218.96	84.63				

Plant Louisiana Pacific - Urania MDF
Sampling Location MDF North RTO
Test For VOC/HCOH
Test Operators Rennie / McCright

RUN No. 2
Date 1-19-94
Time start 1627 end 1729

Meter Box	Anderson	No. Sample Pts.	12 x 2	Gas Analysis	inf. BAG	Remarks:	tare / Final
Sample Box	No. 3	Minutes/Pt.	2.5	CO_2	0.9	1 DNPH	579.5 / 650.0
Probe/Pitot	8' Teflon	NOMOGRAPH		O_2	19.8	2 DNPH	575.0 / 580.0
Pitot Cp	.84	ΔH@	1.8	CO		3 MT	477.5 / 478.5
Nozzle Dia.	.277	Meter Temp.		Time		45 Gel	725.5 / 747.5
Filter No.		% H_2O		Condensate:			
Amb. Temp. °F	40	C-Factor		tare Remark	fin		
Bar. Press. "Hg	30.28	Stack Temp.		Silica gel:			
Static Press. "H_2O	-.32	Ref. ΔP	.39	tare	fin		

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	694.673	0.50	2.40	228	76	76	N/A	40	2
2	230	696.6	0.52	2.45	224	81	77		42	2
3	500	699.2	0.48	2.30	226	87	77		44	2
4	730	701.1	0.40	1.80	234	94	78		44	2
5	1000	702.9	0.33	1.55	231	97	79		44	2
6	1230	704.8	0.32	1.50	225	101	81		44	2
7	1500	706.4	0.40	1.90	227	103	83		44	2
8	1730	708.2	0.44	2.10	222	105	84		45	2
9	2000	709.9	0.42	2.00	236	110	86		45	2
10	2230	712.4	0.46	2.20	224	115	90		46	2
11	2500	714.0	0.44	2.10	232	117	91		46	2
12	2730	716.1	0.44	2.10	217	120	94		46	2
1	3000	718.235	0.70	3.35	222	113	96		47	3
2	230	720.7	0.71	3.40	229	121	98		49	4
3	500	723.2	0.68	3.30	234	127	100		51	4
4	730	725.8	0.59	2.80	232	131	102		50	4
5	1000	728.2	0.46	2.15	222	131	104		50	4
6	1230	730.2	0.40	1.80	226	130	105		50	4
7	1500	732.1	0.35	1.70	229	128	106		51	4
8	1730	734.1	0.30	1.40	224	127	107		51	4
9	2000	735.6	0.29	1.40	235	125	107		52	4
10	2230	737.6	0.30	1.40	225	124	108		50	4
11	2500	739.1	0.30	1.45	232	124	108		50	4
12	2730	740.9	0.30	1.45	214	124	108		50	4
end	60	742.735								

leak check .047 → .052 ÷ .005 cfm 8" Hg
pitot +ve 3.9
pitot -ve 3.5

48.062 .6561 2.0833 227.08 103.25

Plant Louisiana Pacific - Urania MDF
Sampling Location MDF North RTO
Test For VOC/ HCOH
Test Operators Russell/McKnight

RUN No. 3
Date 1-19-94
Time start 1814 end 1915

Meter Box	Anderson	No. Sample Pts.	12 x 2	Gas Analysis	BAG-int.
Sample Box	No. 3	Minutes/Pt.	2.5	CO_2	0.9
Probe/Pitot	8' teflon			O_2	19.8
Pitot Cp	.84 ~~.277 gas~~	NOMOGRAPH		CO	
Nozzle Dia.	.277 gas	ΔH@	1.8	Time	
Filter No.		Meter Temp.			
		% H_2O		Condensate:	
Amb. Temp. °F	38	C-Factor		tare ~~2000~~	fin
Bar. Press. "Hg	30.28	Stack Temp.		Silica gel:	
Static Press. "H_2O	-.36	Ref. ΔP	.39	tare	fin

Remarks:

1) DNPH	575.0	652.0
2) DNPH	576.0	587.5
3) MT	477.5	478.5
4) S.Gel	747.5	757.0

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
1	000	743.111	0.74	3.65	222	85	85	N/A	38	4
2	230	745.6	0.73	3.50	233	100	86		40	4
3	500	748.1	0.65	3.10	226	108	86		42	4
4	730	750.6	0.60	2.85	226	114	87		44	4
5	1000	753.2	0.47	2.25	219	117	88		45	4
6	1230	755.4	0.44	2.15	226	120	89		45	4
7	1500	757.2	0.32	1.50	239	119	90		42	3
8	1730	759.0	0.30	1.40	226	119	91		43	3
9	2000	760.5	0.30	1.40	228	119	91		44	3
10	2230	762.2	0.30	1.40	219	121	92		43	3
11	2500	763.7	0.32	1.55	235	124	95		44	3
12	2730	765.5	0.30	1.40	222	126	96		44	3
1	30/00	767.177	0.49	2.35	225	114	98		44	3
2	230	769.3	0.50	2.40	233	124	99		44	3
3	500	771.4	0.44	2.15	221	128	100		44	3
4	730	773.5	0.37	1.75	236	129	101		44	3
5	1000	775.6	0.35	1.65	224	130	102		44	3
6	1230	777.4	0.30	1.45	233	129	103		44	3
7	1500	779.1	0.38	1.80	233	129	103		42	3
8	1730	780.8	0.39	1.85	231	130	105		42	3
9	2000	782.5	0.46	2.20	219	132	106		41	3
10	2230	785.1	0.43	2.10	232	134	106		41	3
11	2500	786.6	0.46	2.20	216	135	107		41	4
12	2730	788.6	0.50	2.40	219	136	108		40	4
end	60	790.816								

leak check: .012 → .014 = .002 cfm 10" Hg
pitot +ve 7.6
pitot -ve 3.5

47.705 .6560 2.1021 226.79 109.23

MDF DRYERS

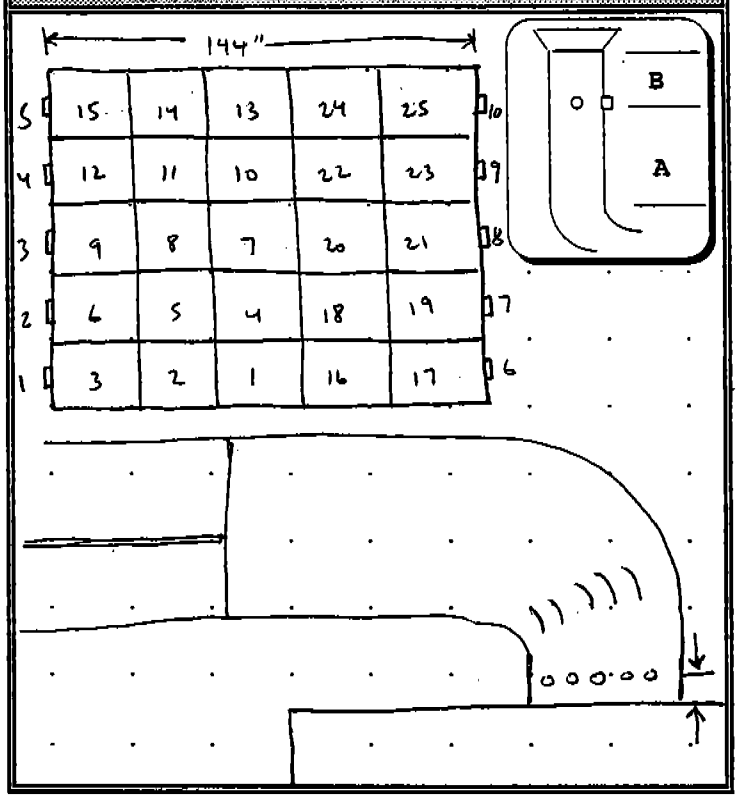
RTO INLET

PM/CO/NOx INLET LOADING TEST

STACK CONFIGURATION AND SAMPLE POINT LAYOUT FOR CIRCULAR STACKS

PLANT: Louisiana Pacific - Urania
Date:
SOURCE: Dryer RTO Inlet
TEST FOR: PM Setup
TEST OPERATORS: Russell

SKETCH OF STACK



PERCENT OF DIAMETER

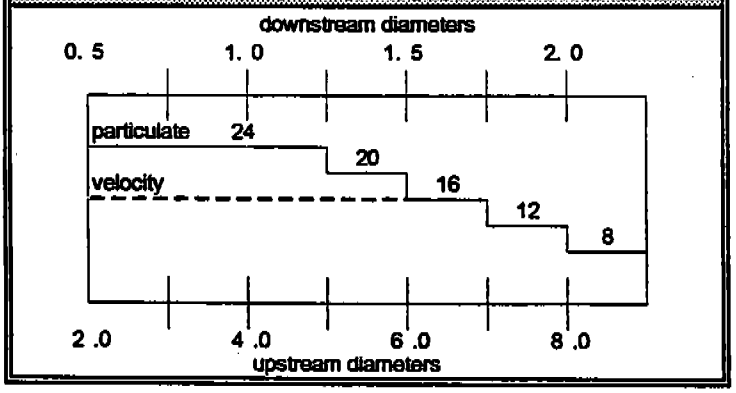
points on a diameter

point no.	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

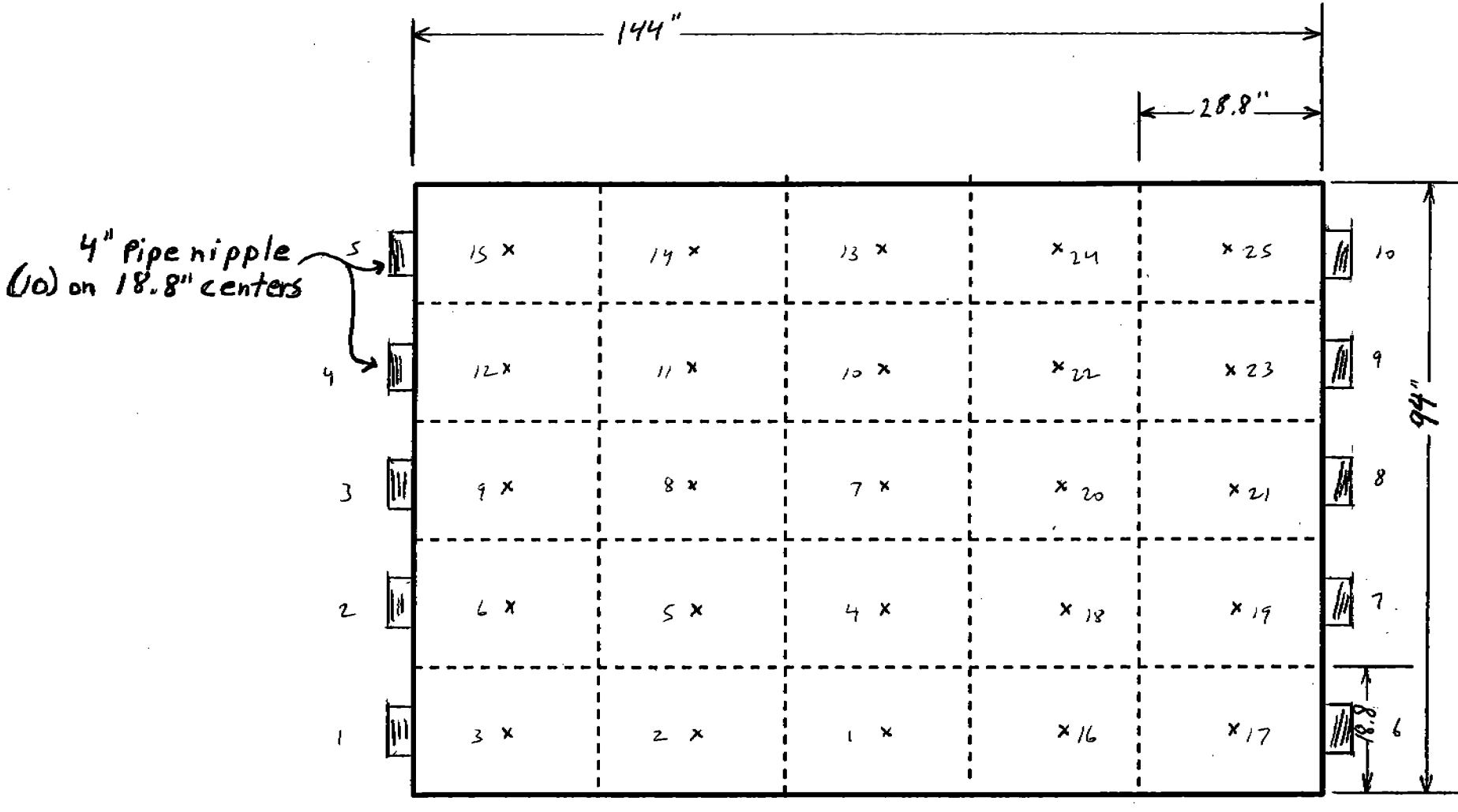
Point No.	Inches from wall	velocity head Δp				Δp	
1	72.0	.82	16	L	14	.05	0
2	43.2	.83	10	L	15	.05	0
3	14.4	1.30	10	L	16	1.35	5R
4		.57	5	L	17	1.40	3R
5		.45	4	L	18	.70	0
6		.38	0		19	.67	0
7		.30	0		20	.32	0
8		.23	0		21	.32	0
9		.28	0		22	.14	0
10		.05	0		23	.18	0
11		.18	0		24	.07	0
12		.18	0		25	.05	0
13		.05	0				

STACK DIAMETER: 144" x 94"
Distance from ports to disturbance:
A. to upstream disturbance
B. to downstream disturbance
Upstream diameters:
Downstream diameters:
Minimum No. sample points required:
No. sample points selected:
Port Length:
Port Type: 4" pipe nipple
Port Access: Platform / Boards

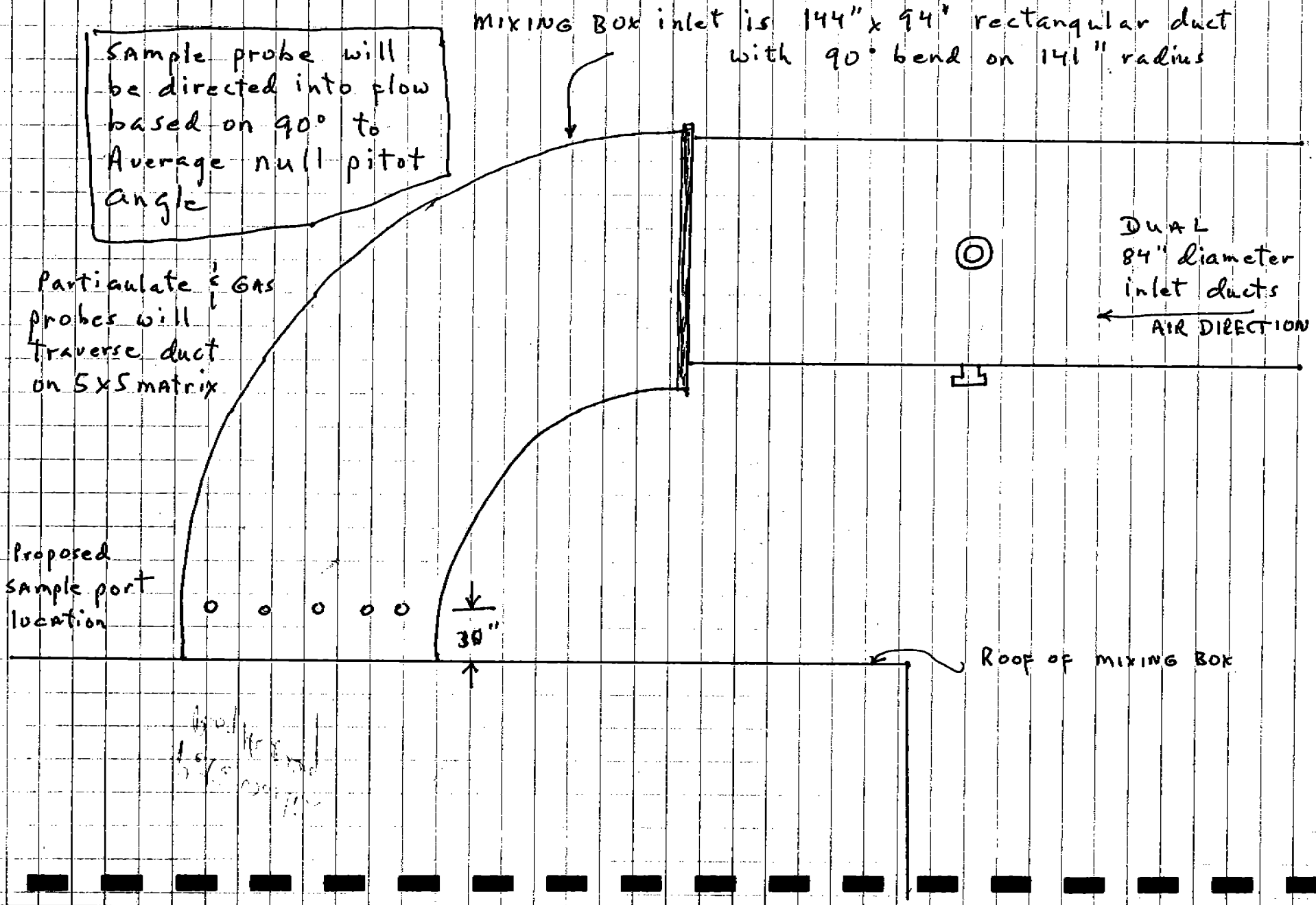
MINIMUM NO. OF POINTS ON A DIAMETER



Pitot ID :
Pitot Cp:
Stack Temp:
Remarks:


144"
28.8"
4" Pipe nipple
(10) on 18.8" centers
5
4
3
2
1
15
14
13
24
25
12
11
10
22
23
9
8
7
20
21
6
5
4
18
19
3
2
1
16
17
10
9
8
7
6
18.8
94"

LP. Urania, Louisiana
RTO inlet configuration
+ proposed sampling site



.272

Plant: Louisiana Pacific - Urania, Louisiana
Sampling Location: Dryers RTO Inlet
Test For: pm / NOx / CO
Test Operators: Russell

RUN No. 1
Date 1/18/94
Time start 1114 end 1222

Meter Box	RAC591349	No. Sample Pts.	25 (5x5)	Gas Analysis	~~Fyrite~~ Orsat
Sample Box	4	Minutes/Pt.	2.5	CO_2	1.0
Probe/Pitot	6' inc.	NOMOGRAPH		O_2	19.8
Pitot Cp	.84	ΔH@	1.85	CO	
Nozzle Dia.	.272	Meter Temp.	100	Time	
Filter No.		% H_2O	15	Condensate:	
Amb. Temp. °F	29	C-Factor	~~1.00~~ .91	tare 200	fin ~~30~~ 252
Bar. Press. "Hg	30.25	Stack Temp.	120	Silica gel:	
Static Press. "H_2O	-1.6	Ref. ΔP	.36	tare	fin +6

Remarks: Nozzle
① .272
② .272 } .272
③ .272
dryer down @ 1318

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	1	0.00	649.776	0.80	4.20	128	77	77	244	35	2
	2	2.30	652.4	0.83	4.30	125	81	76	251	34	3
	3	5.00	655.6	1.20	6.40	124	84	78	252	34	4
2	4	7.30	658.913	0.56	2.90	119	98	83	252	34	4
	5	10.00	662.1	0.38	1.95	121	101	86	251	34	4
	6	12.30	663.8	0.52	2.70	121	105	82	243	34	3
3	7	15.00	666.010	0.27	1.40	118	107	82	250	34	2
	8	17.30	667.3	0.23	1.20	118	110	84	250	35	2
	9	20.00	668.9	0.27	1.40	117	109	84	250	32	2
4	10	22.30	670.332	0.10	0.51	118	108	85	243	32	2
	11	25.00	671.3	0.08	0.41	115	108	86	252	34	2
	12	27.30	672.3	0.13	0.66	111	110	87	246	35	2
5	13	30.00	673.302	0.06	0.31	111	109	89	249	35	2
	14	32.30	674.2	0.06	0.31	112	112	94	241	35	2
	15	35.00	675.2	0.06	0.31	102	112	91	249	35	2
6	16	37.30	675.908	1.20	6.20	118	111	95	242	35	5
	17	40.00	679.2	1.20	6.30	119	113	95	248	35	5
7	18	42.30	682.424	0.65	3.40	120	123	96	252	35	5
	19	45.00	684.9	0.56	2.90	121	127	98	256	35	5
8	20	47.30	687.361	0.32	1.65	119	127	99	251	36	2
	21	50.00	689.1	0.30	1.55	122	129	100	250	36	3
9	22	52.30	690.681	0.18	0.96	118	124	100	250	36	3
	23	55.00	692.4	0.20	1.05	115	128	102	249	36	3
10	24	57.30	694.600	0.08	0.42	113	123	102	250	36	3
	25	60.00	694.9	0.10	0.51	113	125	98	250	36	3
end		62.30	695.828								
			46.052	.5553	2.1603	117.52		100.20			

leak check .033 → .040 = .007 cfm @ 11" Hg
pitot + ✓ @ 4.8
pitot − ✓ @ 4.5

Plant Louisiana Pacific - Urania, Louisiana
Sampling Location Dryer ~~OSB~~ RTO Inlet
Test For PM/CO/NOx
Test Operators Rhuce / Moore

RUN No. 2
Date 1-18-94
Time start 1759 end 1607

Meter Box	RAC 591349	No. Sample Pts.	5 x 5	Gas Analysis	~~Orsat~~		Remarks:
Sample Box	No 4	Minutes/Pt.	2.5	CO_2	1.0		
Probe/Pitot	6' SS			O_2	19.8		
Pitot Cp	.84	NOMOGRAPH		CO			
Nozzle Dia.	.272	ΔH@	1.85	Time			
Filter No.		Meter Temp.	100				
		% H_2O	10	Condensate:			
Amb. Temp. °F	23	C-Factor	.98	tare 200	fin 259		
Bar. Press. "Hg	30.25	Stack Temp.	125	Silica gel:			
Static Press. "H_2O	-.26	Ref. ΔP	.35	tare	fin +11		

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 1	000	696.164	0.71	3.90	121	83	82	234	38	3
2	230	699.0	0.90	4.90	121	85	84	245	36	3
3	500	701.7	1.25	6.80	120	89	82	245	36	3
2 4	730	705.535	0.41	2.20	119	102	83	245	36	3
5	1000	707.9	0.39	2.10	123	102	85	248	38	3
6	1230	709.9	0.58	3.20	121	109	85	248	38	3
3 7	1500	712.500	0.22	1.20	121	104	86	250	38	3
8	1730	714.5	0.22	1.20	120	106	87	249	38	3
9	2000	716.6	0.20	1.60	122	117	86	250	38	3
4 10	2230	718.415	0.13	0.70	119	113	87	251	38	3
11	2500	719.4	0.17	0.91	120	113	90	252	36	3
12	2730	721.0	0.16	0.85	115	114	92	249	37	2
5 13	3000	722.292	0.07	0.37	109	113	91	243	37	2
14	3230	723.3	0.07	0.37	119	114	92	248	37	2
15	3500	724.2	0.08	0.42	115	114	93	254	38	2
6 16	3730	725.052	1.20	6.50	120	117	93	250	34	4
17	4000	728.8	1.20	6.50	122	120	96	250	34	4
7 18	4230	732.000	0.77	4.20	121	125	98	245	39	4
19	4500	736.3	0.61	3.40	120	136	102	244	39	4
8 20	4730	737.5	0.33	1.75	117	127	95	245	39	2
21	5000	739.6	0.32	1.75	116	127	102	252	30	2
9 22	5230	741.229	0.15	0.80	117	130	101	252	37	2
23	5500	742.1	0.23	1.25	109	127	102	252	37	2
10 24	5730	743.963	0.10	0.53	108	135	101	250	38	2
25	6000	745.0	0.08	0.42	101	125	102	250	38	2
end	6230	746.107								

leak check .023 → .033 = .010 @ 8" Hg
pitot + ✓ @ 3.5
pitot - ✓ @ 3.7

49.943	.5945	2.3128	117.44		102.90	

Plant Louisiana Pacific
Sampling Location MDF RTO Inlet
Test For PM/NOx/Co
Test Operators Russell / Moore

RUN No. 2
Date 1-18-94
Time start 1656 end 1809

Meter Box	RAC 591349	No. Sample Pts.	5x5	Gas Analysis	~~[illegible]~~ ORSAT
Sample Box	No. 4	Minutes/Pt.	2.5	CO_2	1.0
Probe/Pitot	6' SS	NOMOGRAPH		O_2	19.8
Pitot Cp	.84	ΔH@	1.85	CO	
Nozzle Dia.	.272 SS	Meter Temp.		Time	
Filter No.		% H_2O		Condensate:	
Amb. Temp. °F	30	C-Factor		tare 200	fin 261
Bar. Press. "Hg	29.25	Stack Temp.		Silica gel:	
Static Press. "H_2O	-1.6	Ref. ΔP		tare	fin 3.5

Remarks:

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 1	000	746.453	0.75	4.10	117	92	90	248	35	3
2	230	749.6	0.89	5.00	118	101	94	244	35	3
3	500	752.5	1.15	6.20	121	106	93	245	35	3
2 4	730	755.789	0.60	3.25	117	112	96	251	35	3
5	1000	758.3	0.36	1.95	119	117	96	250	35	3
6	1230	760.2	0.57	3.20	119	118	95	253	36	3
3 7	1500	762.202	0.22	1.20	118	118	96	251	35	3
8	1730	763.6	0.19	1.05	120	119	96	247	35	3
9	2000	765.3	0.30	1.60	120	120	96	246	35	3
4 10	2230	766.309	0.08	0.43	119	117	97	251	35	3
11	2500	767.5	0.08	0.43	116	118	94	252	35	3
12	2730	768.9	0.25	1.35	113	115	99	252	35	3
5 13	3000	769.700	0.06	0.32	115	114	96	247	35	3
14	3230	770.6	0.06	0.32	114	114	98	244	35	3
15	3500	771.4	0.05	0.28	100	115	100	250	35	3
6 16	3730	772.214	1.00	5.50	113	116	96	250	35	3
17	4000	775.7	1.10	6.00	122	121	101	250	33	3
7 18	4230	778.802	0.74	4.00	121	126	99	248	35	3
19	4500	782.1	0.63	3.50	121	132	104	251	34	3
8 20	4730	784.607	0.30	1.60	119	131	104	251	34	3
21	5000	786.5	0.33	1.75	119	131	105	250	34	3
9 22	5230	788.343	0.13	0.70	118	132	102	250	34	3
23	5500	789.7	0.21	1.20	119	129	103	251	34	3
10 24	5730	790.999	0.10	0.53	118	127	103	250	35	2
25	6000	792.1	0.10	0.53	118	128	104	250	35	2
end	6230	793.296								

leak check: .074 → 0 29 = .005 cfm 9 "Hg
pitot + ve 51
pitot - ve 6.2

46.843 .5808 2.2436 117.60 108.52

PARTICULATE CATCH ANALYSIS

SAMPLES: L.P. - Uranium MDF / Dryers RTO Inlet

DATE TAKEN: 1-18-94 DATE ANALYZED: 1-23-94

DELIVERED BY: DGR RECEIVED BY: DGR

ANALYZED BY: DGR

(Attach chain of custody if additional exchanges occur)

FILTERS:

RUN NO.	1	2	3	
FILTER NO.	531	534	536	
FILTER TARE, gms.	.5628	.5599	.5623	
	.6342	.8157	.6340	
	.6343	.8156	.6344	
FINAL WEIGHT, gms.	.6343	.8156	.6344	
NET GAIN, gms.	.0715	.2557	.0721	

PROBE WASH:

RUN NO.	1	2	3	
CONTAINER I.D.	DRYN R1	DRYN R2	DRYN R3	
VOLUME INTACT?	✓	✓	✓	
VOLUME, ml	175	160	200	
TARE WEIGHT, gms.	(69) 112.5819	(71) 115.8177	(83) 105.1028	
	112.5920	115.9137	105.1212	
	112.5917	115.9130	105.1211	
		115.9131		
FINAL WEIGHT, gms	112.5917	115.9131	105.1211	
NET GAIN, gms.	.0098	.0954	.0183	
LESS BLANK, gms.				

PARTICULATE SAMPLE WEIGHT:

RUN NO.	1	2	3	
filter + probe, mg.	81.3	351.1	90.4	

PARTICULATE CATCH ANALYSIS

(Back Half Methylene Chloride Extraction)

SAMPLES: LP. - Dryers RTO Inlet

DATE TAKEN: 1-18-94 DATE ANALYZED: 1-26-94

DELIVERED BY: [illegible] RECEIVED BY: [illegible]

ANALYZED BY: [illegible]

(Attach chain of custody if additional exchanges occur)

AQUEOUS FRACTION:

RUN NO.	1	2	3	
CONTAINER I.D.	DRYN R1 BAK	DRYN R2BAK	DRYN R3BAK	
VOLUME INTACT?	✓	✓	✓	
VOLUME, ml	330	350	350	
TARE WEIGHT, gms.	(96) 98.6677	(68) 112.5339	(83) 105.1028	
	98.6690	112.5371	105.1076	
	98.6686	112.5369	105.1084	
			105.1083	
FINAL WEIGHT, gms	98.6686	112.5369	105.1083	
NET GAIN, gms.	.0019	.0030	.0055	0
LESS BLANK, gms.				

ORGANIC FRACTION

RUN NO.	1	2	3	
CONTAINER I.D.				
VOLUME INTACT?	✓	✓	✓	
VOLUME, ml				
TARE WEIGHT, gms.	(56) 105.8160	(62) 113.2209	(85) 109.1492	
	105.8186	113.2266	109.1548	
	105.8187	113.2261	109.1547	
FINAL WEIGHT, gms	105.8187	113.2261	109.1547	
NET GAIN, gms.	.0027	.0052	.0055	0
LESS BLANK, gms.				

PARTICULATE SAMPLE WEIGHT:

RUN NO.	1	2	3	
AQ P.Q.	1.9	3.0	3.5	
OR ORG. fraction, mg	2.7	5.2	5.5	

MDF DRYERS

RTO INLET

VOC/HCOH INLET LOADING TEST

Plant: Louisiana Pacific - Urania NDF
Sampling Location: Dryer 6 RTO Inlet
Test For: P/COH/VOC
Test Operators: Russell / Mann

RUN No. 1
Date 1-19-94
Time start 1105 end 1511

Meter Box	RAC 551349	No. Sample Pts.	5x5	Gas Analysis	Eq. 7		
Sample Box	No. 4	Minutes/Pt.	2.5	CO_2	1.0	1.0	1.0
Probe/Pitot	6' teflon			O_2	Smax	19.8	
Pitot Cp	.84	NOMOGRAPH		CO			
Nozzle Dia.	.200 glass	ΔH@	1.85	Time			
Filter No.	N/A	Meter Temp.	100				
		% H_2O	10	Condensate:			
Amb. Temp. °F	36	C-Factor	1.0	tare Run	fin		
Bar. Press. "Hg	30.28	Stack Temp.	120	Silica gel:			
Static Press. "H_2O	-1.6	Ref. ΔP	.42	tare	fin		

Remarks:

1) DNPH	562.5	601.5
2) DNPH	570.0	579.5
3) MT	482.0	482.5
4) S.Gel	780.5	786.0

Dryer lost at mid point 1236 mean
① .260
② .260 } .260 g/M
③ .260

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 1	0.00	793.664	0.70	3.10	132	70	69	N/A	36	2
2	230	796.5	0.98	4.40	129	74	67		35	2
3	500	798.7	1.15	5.20	128	75	71		35	2
2 4	730	801.855	0.45	1.95	134	81	69		35	2
5	1000	803.7	0.40	1.75	136	89	70		38	2
6	1230	805.7	0.55	2.40	131	93	72		39	2
3 7	1500	807.6	0.18	0.80	138	103	74		39	2
8	1730	809.3	0.17	0.75	135	98	74		39	2
9	2000	810.6	0.35	1.55	129	99	78		40	2
4 10	2230	812.125	0.68	0.33	133	98	77		40	2
11	2500	812.9	0.10	0.45	135	102	79		40	2
12	2730	813.8	0.22	0.90	134	101	80		40	2
5 13	3000	814.152	0.10	0.44	131	75	73		39	2
14	3230	815.0	0.08	0.33	128	76	74		39	2
15	3500	815.9	0.06	0.26	128	77	74		40	2
6 16	3730	816.532	1.25	5.50	137	80	77		42	2
17	4000	819.6	1.25	5.50	140	86	78		42	2
7 18	4230	823.000	0.83	3.76	136	95	80		43	2
19	4500	825.6	0.64	2.80	138	98	84		43	2
8 20	4730	827.910	0.37	1.65	140	104	81		47	2
21	5000	829.7	0.36	1.60	138	107	83		50	2
9 22	5230	831.431	0.25	1.10	143	107	83		50	2
23	5500	833.0	0.24	1.05	136	107	84		50	2
10 24	5730	834.411	0.14	0.60	137	111	85		50	2
25	6000	835.7	0.18	0.84	129	109	85		51	2
end	6230	837.258								
		43.594	.6089	1.9580	133.20		84.80			

leak check: .056 → .056 = 0.000 cfm @ 11 "Hg
pitot + vc 4.9
pitot − vc 6.0

Plant Louisiana Pacific - Urania Louisiana MDF
Sampling Location MDF RTO Inlet
Test For ~~PM~~ HCOH / VOC
Test Operators Russell

RUN No. 2
Date 1-19-94
Time start 1626 end 1737

Meter Box	RAL591349	No. Sample Pts.	5x5	Gas Analysis	Fyrite
Sample Box	No. 4	Minutes/Pt.	2.5	CO_2	1.0
Probe/Pitot	6' teflon	NOMOGRAPH		O_2	19.9
Pitot Cp		ΔH@	1.85	CO	
Nozzle Dia.	.277 glas	Meter Temp.	100	Time	
Filter No.		% H_2O	100%	Condensate:	
Amb. Temp. °F	40	C-Factor	10.0	tare Rem fin	
Bar. Press. "Hg	30.28	Stack Temp.	125	Silica gel:	
Static Press. "H_2O	-1.6	Ref. ΔP	.33	tare fin	

Remarks:

impingers	Tare	Final
1) DNPH	566.5	627.0
2) DNPH	575.5	593
3) MT	482.5	483.5
4) SGel	758.5	779.0

① .277
⊖ .277
⊖ .277

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 1	000	837.685	0.65	3.60	134	88	86	N/A	40	2
2	230	840.3	0.83	4.70	138	90	87		43	2
3	500	843.3	1.15	6.60	136	93	87		45	2
2 4	730	846.557	0.58	2.30	139	100	88		45	2
5	1000	849.1	0.36	2.00	138	107	89		45	2
6	1230	851.1	0.45	2.45	139	108	90		44	2
3 7	1500	853.120	0.29	1.60	137	111	93		45	2
8	1730	855.0	0.22	1.20	140	112	92		45	2
9	2000	856.7	0.27	1.50	138	113	92		45	2
4 10	2230	858.298	0.13	0.72	136	113	94		45	2
11	2500	859.6	0.08	0.44	135	114	91		45	2
12	2730	860.7	0.17	0.90	127	116	96		45	2
5 13	3000	861.916	0.07	0.38	125	116	95		45	2
14	3230	863.0	0.07	0.38	131	116	96		48	2
15	3500	864.0	0.06	0.33	113	117	98		50	2
6 16	3730	864.899	1.25	7.00	134	115	103		53	5
17	4000	868.3	1.25	7.00	138	118	100		55	5
7 18	4230	872.182	1.00	5.60	137	127	100		55	5
19	4500	875.6	0.61	3.40	138	132	101		55	5
8 20	4730	878.094	0.33	1.85	135	133	102		52	3
21	5000	880.2	0.31	1.70	136	135	106		52	3
9 22	5230	881.806	0.11	0.65	140	133	104		52	3
23	5500	883.0	0.18	1.05	138	129	104		52	3
10 24	5730	884.500	0.12	0.65	125	125	108		50	2
25	6000	885.8	0.12	0.65	138	128	104		50	2
end	6230	886.942								

leak check: .085 → .088 = .003 cfm @ "Hg
pitot + ve 7.4
pitot - ve 7.0

49.257 .5910 2.3460 134.60 105.60

Plant L.P. - Urania MDF
Sampling Location MDF RTO Inlet
Test For HCOH / VOC
Test Operators Russell / Moore

RUN No. 3
Date 1-19-94
Time start 1812 end 1921

Meter Box	RAC591349	No. Sample Pts.	~~12~~ 25x5	Gas Analysis	Fyrite
Sample Box	No. 4	Minutes/Pt.	2.5	CO_2	1.0
Probe/Pitot	6' Glass	NOMOGRAPH		O_2	19.8
Pitot Cp	.84	ΔH@	1.85	CO	
Nozzle Dia.	.277 glass	Meter Temp.		Time	
Filter No.		% H_2O		Condensate:	
Amb. Temp. °F	38	C-Factor		tare Remarks	fin
Bar. Press. "Hg	30.28	Stack Temp.		Silica gel:	
Static Press. "H_2O	-1.6	Ref. ΔP	.33	tare Remarks	fin

Remarks:

	Tare	Final
1) DNPH	562.0	625.0
2) DNPH	577.0	596.5
3) MT	482.5	483.5
4) S. Gel	779.0	787

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 1	000	887.216	0.96	5.50	132	98	97	N/A	40	5
2	230	890.4	1.05	5.90	133	102	97		37	5
3	500	893.8	1.10	6.20	133	106	96		46	6
2 4	730	897.062	0.54	3.00	135	109	97		45	3
5	1000	899.7	0.33	1.80	131	120	97		45	3
6	1230	901.6	0.54	3.00	131	121	97		43	3
3 7	1500	903.743	0.25	1.35	133	124	100		43	3
8	1730	905.7	0.21	1.15	133	123	98		44	3
9	2000	906.9	0.24	1.30	129	121	98		40	2
4 10	2230	908.370	0.12	0.65	127	122	98		40	2
11	2500	909.6	0.13	0.71	133	123	100		41	2
12	2730	910.8	0.15	0.84	118	125	99		40	2
5 13	3000	912.001	0.08	0.46	125	121	100		41	2
14	3230	913.1	0.09	0.50	129	122	99		41	2
15	3500	914.2	0.08	0.46	128	122	101		41	2
6 16	3730	915.039	1.10	6.20	140	117	100		40	6
17	4000	918.3	1.10	6.20	142	123	101		40	6
7 18	4230	921.783	0.69	3.90	138	128	101		39	6
19	4500	925.1	0.63	3.50	142	135	103		40	6
8 20	4730	927.169	0.38	2.10	137	132	103		39	3
21	5000	929.7	0.31	1.70	141	137	107		46	3
9 22	5230	931.172	0.20	1.10	129	132	106		46	3
23	5500	932.7	0.27	1.50	127	132	109		42	3
10 24	5730	934.3	0.09	0.50	126	129	107		39	2
25	6000	935.6	0.10	0.66	133	130	107		38	2
end	6230	936.651								

leak check: .013 → .013 = 0.000 cfm 12" Hg
pitot + ve 3.2
pitot - ve 4.1

49.435 .5994 2.3916 132.20 111.44

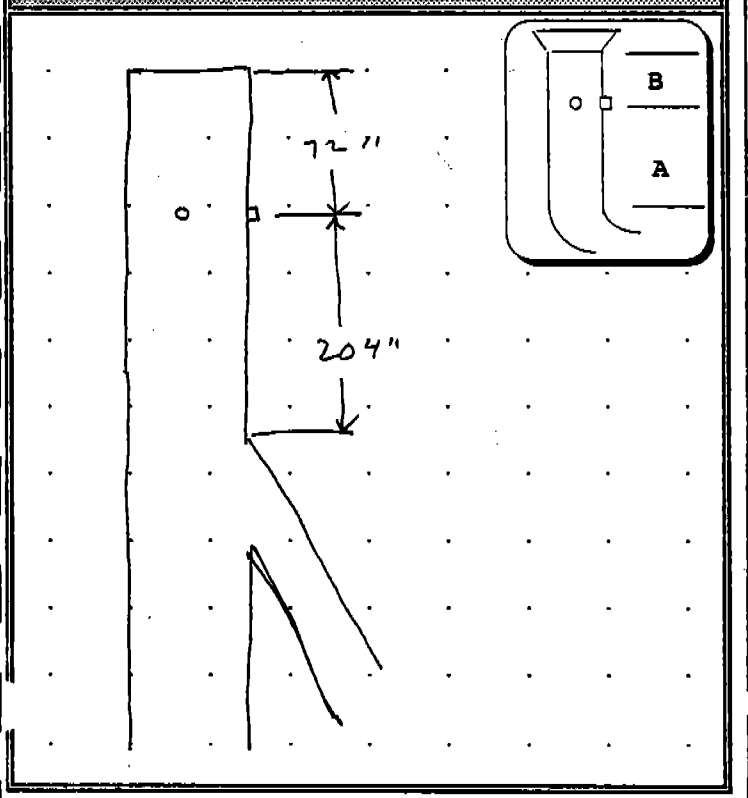
PRESS VENT RTO

PM/CO/NOx EMISSIONS TEST

STACK CONFIGURATION AND SAMPLE POINT LAYOUT FOR CIRCULAR STACKS

PLANT: L.P. - Marion MDF Date: 1-19-94
SOURCE: Press Vent RTO Outlet
TEST FOR: PM set up
TEST OPERATORS: Russell

SKETCH OF STACK



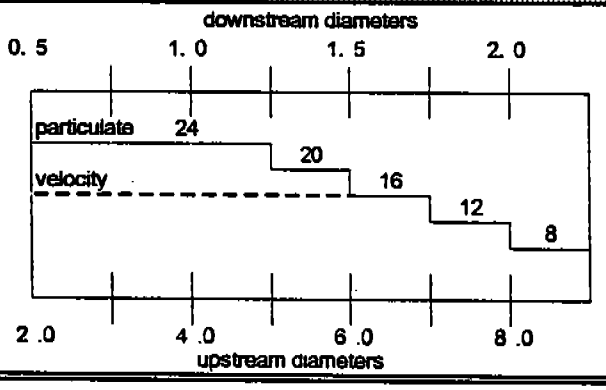
PERCENT OF DIAMETER

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:	65.50"
Distance from ports to disturbance:	
A. to upstream disturbance	204"
B. to downstream disturbance	72"
Upstream diameters:	3.1
Downstream diameters:	1.1
Minimum No. sample points required:	24
No. sample points selected:	12 x 2
Port Length:	3.5"
Port Type:	4" pipe nipple
Port Access:	platform

Point No.	Inches from wall	velocity head
1	1.4	
2	4.4	
3	7.7	
4	11.6	
5	16.4	
6	23.3	
7	42.2	
8	49.1	
9	53.9	
10	57.8	
11	61.1	
12	63.8	

MINIMUM NO. OF POINTS ON A DIAMETER



Pitot ID: Pitot Cp: Stack Temp:

Remarks:

Plant Louisiana Pacific - Urania MDF
Sampling Location MDF Press RTO outlet
Test For ~~HCOH/VOC~~ PM/CO/NOx
Test Operators Russell/McKnight

RUN No. 1
Date 1-21-94
Time start 0818 end 0921

Meter Box	Anderson	No. Sample Pts.	12x2	Gas Analysis	int. BAG
Sample Box	3	Minutes/Pt.	2.5	CO_2	0
Probe/Pitot	6' teflon			O_2	20.9 - Smax
Pitot Cp	.84	NOMOGRAPH		CO	
Nozzle Dia.	.266 glass	ΔH@	1.80	Time	
Filter No.		Meter Temp.	100		
		% H_2O	10	Condensate:	
Amb. Temp. °F	86	C-Factor	.96	tare 200	fin 209
Bar. Press. "Hg	30.31	Stack Temp.	230	Silica gel:	
Static Press. "H_2O	-.50	Ref. ΔP	.45	tare	fin +9

Remarks:
Nozzle (glass)
Ø .266
⊖ .266
⊕ .266

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	941.310	1.30	5.50	214	57	57	244	40	5
2	2.30	944.5	1.30	5.50	192	70	58	245	40	5
3	5.00	947.0	1.30	5.50	193	78	58	254	41	5
4	7.30	949.9	1.35	5.70	182	87	60	253	41	5
5	10.00	953.1	1.30	5.50	185	95	62	251	40	5
6	12.30	956.4	1.40	6.00	181	101	64	252	38	5
7	15.00	959.0	0.86	3.60	181	104	66	255	38	5
8	17.30	962.0	0.77	3.20	185	105	68	245	40	5
9	20.00	964.2	0.79	3.30	174	106	71	250	40	5
10	22.30	966.7	0.79	3.30	187	108	73	245	40	5
11	25.00	969.6	0.74	3.10	196	110	75	247	39	4
12	27.30	972.0	0.75	3.20	208	111	78	251	38	4
1	30.00	974.210	1.40	5.90	195	106	79	253	40	5
2	2.30	977.4	1.40	6.00	194	116	81	249	40	5
3	5.00	980.3	1.50	6.30	192	119	82	251	40	5
4	7.30	983.8	1.60	6.60	203	123	84	250	40	5
5	10.00	987.7	1.50	6.40	205	126	86	254	40	6
6	12.30	990.7	1.50	6.40	209	127	88	245	40	6
7	15.00	994.5	1.05	4.30	197	129	90	253	40	6
8	17.30	997.9	1.00	4.20	183	125	91	254	40	5
9	20.00	000.5	0.94	3.90	187	127	91	255	40	5
10	22.30	002.7	1.00	4.20	210	124	92	248	40	5
11	25.00	005.8	0.95	4.00	204	124	93	242	41	5
12	27.30	008.7	1.05	4.40	192	126	93	246	42	5
end	60	011.274								

leak check: .099 → .105 = .006 cfm @ 14" Hg
pitot + ve 4.0
pitot - ve 4.0

69.964 1.0631 4.8333 193.88 92.58

Plant Louisiana Pacific - Urania MDF
Sampling Location MDF Press Vent RTO ~~[illegible]~~ Outlet
Test For PM/CO/NOX
Test Operators [illegible] / ~~[illegible]~~ McKnight

RUN No. 2
Date 1-21-94
Time start 1001 end 1102

Meter Box	Anderson	No. Sample Pts.	12x2	Gas Analysis	int. BAG
Sample Box	No. 3	Minutes/Pt.	2.5	CO_2	0
Probe/Pitot	6' Tiffin			O_2	Smax = 20.9
Pitot Cp	.84	NOMOGRAPH		CO	
Nozzle Dia.	.266	ΔH@	1.8	Time	
Filter No.		Meter Temp.			
		% H_2O		Condensate:	
Amb. Temp. °F	40	C-Factor		tare 200	fin 214
Bar. Press. "Hg	30.31	Stack Temp.		Silica gel:	
Static Press. "H_2O	-.50	Ref. ΔP	.45	tare	fin +6.5

Remarks:

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	011.953	1.30	5.50	211	71	71	252	40	5
2	230	014.6	1.20	5.00	202	79	72	250	40	5
3	500	018.6	1.40	6.00	182	93	71	250	41	6
4	730	021.2	1.30	5.50	181	100	72	251	41	6
5	1000	024.3	1.30	5.50	207	104	73	253	41	6
6	1230	027.0	1.30	5.50	188	110	75	257	40	6
7	1500	030.3	0.86	3.60	185	114	77	256	40	6
8	1730	032.9	0.82	3.45	191	114	80	256	40	4
9	2000	035.7	0.72	3.00	186	115	82	256	40	4
10	2230	038.2	0.72	3.00	194	115	84	250	40	4
11	2500	040.3	0.70	2.95	212	117	87	250	40	4
12	2730	042.3	0.72	3.00	189	117	88	248	41	4
1	3000	044.638	1.50	6.30	196	111	89	245	40	6
2	230	048.7	1.50	6.30	192	123	90	256	40	6
3	500	051.5	1.60	6.60	208	128	91	257	40	6
4	730	054.9	1.60	6.60	202	132	93	251	40	6
5	1000	058.4	1.50	6.30	196	133	95	251	40	6
6	1230	062.0	1.45	6.20	199	134	96	250	40	6
7	1500	065.3	1.05	4.40	216	135	98	250	40	6
8	1730	068.4	0.93	3.95	224	133	98	253	40	6
9	2000	071.6	0.99	4.15	191	131	101	246	40	6
10	2230	073.8	0.94	4.00	206	131	101	254	40	6
11	2500	077.3	0.80	3.40	196	131	101	247	40	6
12	2730	079.5	0.75	3.20	196	129	101	251	40	6
end	60	082.057								

leak check: .043 → .043 = 0.000 cfm 10" Hg
pitot + ve 5.0
pitot - ve 5.0

70.104 1.0490 4.7250 197.92 101.79

Plant Louisiana Pacific
Sampling Location DDEP Lum VENT RTO Outlet
Test For ~~Hcl~~ / PM / CO / NOx
Test Operators Rowan / McKnight

RUN No. 3
Date 1-21-94
Time start 1226 end 1227

Meter Box	Anderson	No. Sample Pts.	12x2	Gas Analysis	integ	Remarks:	
Sample Box	No. 2	Minutes/Pt.	2.5	CO_2	0		
Probe/Pitot	6' teflon			O_2	snox = 20.9		
Pitot Cp	.84	NOMOGRAPH		CO			
Nozzle Dia.	.266 glass	ΔH@	1.8	Time			
Filter No.		Meter Temp.					
		% H_2O		Condensate:			
Amb. Temp. °F	45	C-Factor		tare 200	fin 215		
Bar. Press. "Hg	30.31	Stack Temp.		Silica gel:			
Static Press. "H_2O	-.50	Ref. ΔP	.45	tare	fin +9.0		

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
1	0.00	082.531	1.40	6.00	207	89	80	252	39	7
2	230	085.6	1.50	6.20	207	98	85	251	40	7
3	500	088.0	1.55	6.60	215	106	85	250	37	7
4	730	091.3	1.50	6.20	219	113	85	250	40	7
5	1000	095.2	1.50	6.20	215	119	87	250	40	7
6	1230	098.6	1.40	6.00	199	123	87	252	41	7
7	1500	102.3	0.83	3.50	209	125	89	250	41	7
8	1730	105.3	0.78	3.30	194	124	90	247	40	5
9	2000	107.5	0.77	3.20	199	125	92	250	40	5
10	2230	110.0	0.73	3.05	201	124	93	265	41	5
11	2500	112.4	0.75	3.10	205	124	94	260	40	5
12	2730	114.9	0.75	3.15	190	123	94	260	40	5
13										
1	3000	117.386	1.45	6.20	198	118	95	244	41	8
2	230	120.4	1.60	6.80	230	127	96	257	42	8
3	500	124.2	1.50	6.20	197	134	97	250	42	8
4	730	127.8	1.55	6.50	203	136	98	255	40	6
5	1000	130.9	1.60	6.80	198	138	99	251	40	8
6	1230	134.7	1.40	6.00	221	138	101	252	40	8
7	1500	137.7	1.00	4.20	202	137	100	256	41	8
8	1730	140.4	0.96	4.00	215	136	104	255	41	8
9	2000	143.6	1.00	4.20	221	136	105	255	40	7
10	2230	146.6	0.77	3.20	224	136	105	256	41	5
11	2500	148.7	0.78	3.25	220	135	105	251	40	5
12	2730	151.4	0.75	2.70	202	135	105	247	40	5
	60	153.651								

leak check: .042 — .044 = .002 @ 11" Hg
pitot + vc 6.2
pitot - vc 5.0

71.120 1.0557 4.8542 207.94 110.00

PARTICULATE CATCH ANALYSIS

SAMPLES: L.P. - Urania MDF / Pure Vent RTO outlet

DATE TAKEN: 1-21-94 DATE ANALYZED: 1-23-94

DELIVERED BY: [illegible] RECEIVED BY: [illegible]

ANALYZED BY: [illegible]

(Attach chain of custody if additional exchanges occur)

FILTERS:

RUN NO.	1	2	3	
FILTER NO.	537	539	501	
FILTER TARE, gms.	.5638	.5595	.5650	
	.5633	.5597	.5647	
	.5632	.5597	.5647	
FINAL WEIGHT, gms.	.5632	.5597	.5647	
NET GAIN, gms.	-.0006	0.0002	-.0003	

PROBE WASH:

RUN NO.	1	2	3	
CONTAINER I.D.	PV R1	PV R2	PV R3	
VOLUME INTACT?	✓	✓	✓	
VOLUME, ml	140	150	150	
TARE WEIGHT, gms.	(3) 104.6267	(7) 111.5432	(90) 107.9579	
	104.6298	111.5437	107.9601	
	104.6299	111.5433	107.9598	
FINAL WEIGHT, gms.	104.6299	111.5433	107.9598	
NET GAIN, gms.	.0032	.0001	.0019	
LESS BLANK, gms.	-0-	-0-	-0-	

PARTICULATE SAMPLE WEIGHT:

RUN NO.	1	2	3	
filter + probe, mg.	2.6	0.3	1.6	

PARTICULATE CATCH ANALYSIS

(Back Half Methylene Chloride Extraction)

SAMPLES: L.P. Pum Vent RTO (Outlet)

DATE TAKEN: 1-21-94 DATE ANALYZED: 1-26-94

DELIVERED BY: DCR RECEIVED BY: DCR

ANALYZED BY: DCR

(Attach chain of custody if additional exchanges occur)

AQUEOUS FRACTION:

RUN NO.	1	2	3	
CONTAINER I.D.	PUR1 BAK	PUR2 BAK	PUR3 BAK	
VOLUME INTACT?	✓	✓	✓	
VOLUME, ml	300	300	300	
TARE WEIGHT, gms.	(25) 97.0868	(29) 98.3928	108.5425 (88)	
	97.0871	98.3932	108.5429	
	97.0871	98.3930	108.5433	
FINAL WEIGHT, gms.	97.0871	98.3930	108.5433	
NET GAIN, gms.	.0003	.0002	.0008	
LESS BLANK, gms.				

ORGANIC FRACTION

RUN NO.	1	2	3	
CONTAINER I.D.	Same			
VOLUME INTACT?	Same			
VOLUME, ml	Same			
TARE WEIGHT, gms.	(7) 111.5410	(81) 104.6007	(89) 106.4080	
	111.5410	104.6014	106.4085	
	111.5411	104.6010	106.4087	
FINAL WEIGHT, gms.	111.5411	104.6010	106.4087	
NET GAIN, gms.	.0001	.0009	.0007	
LESS BLANK, gms.				

PARTICULATE SAMPLE WEIGHT:

RUN NO.	1	2	3	
Aqueous	0.3	0.2	0.8	
Aqueous fraction, mg	0.1	0.9	0.7	

Organic

PRESS VENT RTO

VOC/HCOH EMISSIONS TEST

Plant Louisiana Pacific - Urania Louisiana MDF
Sampling Location MDF Press RTO Outlet
Test For HCOH/VOC
Test Operators Russell/Moore

RUN No. 1
Date 1-20-94
Time start 1141 end 1243

Meter Box	Anderson	No. Sample Pts.	12x2	Gas Analysis	int. BAG
Sample Box	No 3	Minutes/Pt.	2.5	CO_2	0
Probe/Pitot	6' teflon	NOMOGRAPH		O_2	Servomex = 20.9
Pitot Cp	.84	ΔH@	1.85	CO	
Nozzle Dia.	.218 glas	Meter Temp.	100	Time	
Filter No.		% H_2O	10	Condensate:	
Amb. Temp. °F	47	C-Factor	.96	tare Remarks	fin 16.5
Bar. Press. "Hg	30.29	Stack Temp.	200	Silica gel:	
Static Press. "H_2O	-.50	Ref. ΔP	1.05	tare	fin

Remarks:

impinger	tare	final
1) NPH	577.0	585.0
2) NPH	577.0	580.0
3) MT	478.0	478.5
4) S.Gel	731.5	736.5

⊘ .218
⊘ .218 } .218 glass
⊘ .218

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	791.977	1.25	2.20	221	63	61	N/A	42	2
2	230	793.8	1.25	2.20	217	66	61		42	2
3	500	795.6	1.35	2.40	199	68	62		40	2
4	730	797.4	1.30	2.15	203	78	63		40	2
5	1000	799.5	1.40	2.50	199	83	64		40	2
6	1230	801.5	1.20	2.30	213	88	65		43	2
7	1500	803.8	0.85	1.50	207	94	67		44	2
8	1730	805.3	0.71	1.30	207	93	68		45	2
9	2000	807.1	0.77	1.35	205	93	70		46	2
10	2230	808.5	0.72	1.25	199	94	71		46	2
11	2500	809.9	0.70	1.20	206	95	73		46	2
12	2730	811.8	0.56	1.00	202	97	75		46	2
1	30/00	813.200	1.40	2.50	222	95	76		46	2
2	230	815.5	1.60	2.80	210	104	78		46	2
3	500	817.7	1.60	2.80	217	109	80		46	2
4	730	820.1	1.60	2.80	226	112	81		46	2
5	1000	822.2	1.50	2.60	216	114	82		46	2
6	1230	824.6	1.50	2.60	221	115	82		44	2
7	1500	826.8	1.10	2.00	205	117	86		44	2
8	1730	828.8	0.94	1.70	202	114	87		45	2
9	2000	830.8	0.95	1.75	220	112	89		45	2
10	2230	833.0	0.73	1.30	242	111	90		45	2
11	2600	834.3	0.77	1.25	211	110	90		46	2
12	2730	835.6	0.82	1.45	203	110	90		45	2
wd	40/00	837.354								

leak check: .063 → .068 = .005 cfm @ 8" Hg

pitot + ✓ @ 3.3
pitot - ✓ @ 3.7

45.377 1.0460 1.9583 211.38 86.38

Plant: Louisiana Pacific - Ukiah MDF
Sampling Location: MDF ~~RT~~ Press RTO Outlet
Test For: HCOA / VOC
Test Operators: Russell / Moore

RUN No. 2
Date 1-20-94
Time start 1400 end 1501

Meter Box	Andersen	No. Sample Pts.	12x2	Gas Analysis	Int Bag
Sample Box	No 3	Minutes/Pt.	2.5	CO_2	0.1 Direct
Probe/Pitot	6' Teflon	NOMOGRAPH		O_2	20.9
Pitot Cp	.84	ΔH@	1.80	CO	
Nozzle Dia.	.218	Meter Temp.		Time	
Filter No.		% H_2O		Condensate:	
Amb. Temp. °F	47	C-Factor		tare Remote	fin
Bar. Press. "Hg	30.29	Stack Temp.		Silica gel:	
Static Press. "H_2O	-.50	Ref. ΔP	1.05	tare	fin

Remarks:

	Tare	Final
1) DNPH	578.5	588.0
2) DNPH	576.5	577.5
3) MT	478.5	478.5
4) S.Gel	736.7	748.0

22

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	837.763	1.70	3.00	216	69	68	N/A	47	3
2	230	840.4	1.35	2.40	207	76	67		49	3
3	500	842.3	1.40	2.50	232	81	68		50	3
4	730	844.6	1.50	2.65	216	87	69		50	3
5	1000	846.8	1.85	3.25	215	94	70		53	3
6	1230	848.8	1.80	3.20	238	99	71		53	3
7	1500	851.4	1.60	2.80	206	104	73		53	3
8	1730	853.5	1.70	3.00	203	107	75		52	3
9	2000	856.0	1.35	2.40	209	109	77		50	3
10	2230	858.1	1.10	2.00	201	109	79		50	3
11	2500	860.1	1.30	2.30	212	109	80		49	3
12	2730	862.2	1.35	2.40	210	111	82		49	3
1	30/00	864.406	2.00	3.60	199	104	83		51	3
2	230	866.9	2.20	4.00	205	115	84		50	3
3	500	869.9	2.10	3.90	238	119	85		50	3
4	730	872.3	2.10	3.90	208	121	87		50	3
5	1000	875.0	1.90	3.40	219	123	89		50	3
6	1230	877.7	2.00	3.60	226	123	90		49	3
7	1500	880.4	1.90	3.40	210	125	92		49	3
8	1730	883.1	1.30	2.30	224	124	93		49	3
9	2000	885.1	1.10	1.95	243	120	94		48	3
10	2230	886.9	1.15	2.10	212	118	94		50	3
11	2500	888.9	0.97	1.70	230	118	95		50	3
12	2730	890.6	1.05	1.85	206	116	95		50	3
Avg	60/00	892.660								
		leak check: .070		→ .075	=	.005 cfm @	9"	Hg		
		pitot+ @ 4.2								
		pitot- @ 3.4								
		54.897	1.2456	2.8167	216.04		94.60			

Plant Louisiana Pacific - Urania MDF
Sampling Location MDF Press RTO Outlet
Test For HCOH/VOC
Test Operators Russell/Moore

RUN No. 3
Date 1-20-94
Time start 1600 end 1703

Meter Box	Anderson	No. Sample Pts.	12x2	Gas Analysis	int. Bag
Sample Box	No. 3	Minutes/Pt.	2.5	CO_2	0
Probe/Pitot	6' t flow	NOMOGRAPH		O_2	20.9
Pitot Cp	.84	ΔH@	1.80	CO	
Nozzle Dia.	.218 gas	Meter Temp.		Time	
Filter No.		% H_2O		Condensate:	
Amb. Temp. °F	45	C-Factor		tare Remarks fin	
Bar. Press. "Hg	30.29	Stack Temp.		Silica gel:	
Static Press. "H_2O	-.50	Ref. ΔP	1.05	tare fin	

Remarks:

1) DNPH	577.0	584.5
2) DNPH	579.0	581.0
3) MT	478.5	479.0
4) S. Gel	744.0	750.0

16.0

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
1	000	893.642	1.40	2.50	193	76	68	N/A	45	3
2	230	895.8	1.40	2.50	197	77	68		45	3
3	500	897.9	1.35	2.40	231	81	69		45	3
4	730	900.1	1.40	2.50	193	87	69		45	3
5	1000	902.3	1.40	2.50	199	93	71		44	3
6	1230	904.5	1.35	2.40	198	97	72		44	3
7	1500	906.6	0.90	1.60	206	99	73		45	3
8	1730	908.4	0.69	1.20	200	99	74		45	3
9	2000	910.1	0.69	1.20	204	97	76		45	3
10	2230	911.3	0.67	1.20	195	97	76		46	3
11	2500	912.9	0.64	1.15	204	98	78		46	3
12	2730	914.6	0.64	1.15	204	100	79		46	3
1	30/00	915.861	0.45	2.55	212	92	80		47	3
2	230	918.1	1.50	2.60	210	107	82		46	3
3	500	920.2	1.55	2.80	211	107	82		46	3
4	730	922.5	1.50	2.65	237	112	83		46	3
5	1000	924.8	1.50	2.60	204	115	85		46	3
6	1230	926.9	1.60	2.80	210	115	86		45	3
7	1500	929.5	1.10	1.95	218	116	88		45	3
8	1730	931.6	0.95	1.70	235	115	88		46	3
9	2000	932.8	1.05	1.90	242	113	89		46	3
10	2230	935.4	0.95	1.70	242	114	90		46	3
11	2500	937.3	0.85	1.50	211	114	90		46	3
12	2730	938.8	0.90	1.60	206	113	91		46	3
end	60	940.741								

Leak check: .065 - .069 = .004 cfm @ 8" Hg
pitot +ve 4.6
pitot -ve 5.0

47.099 1.0570 2.0271 210.92 107.31

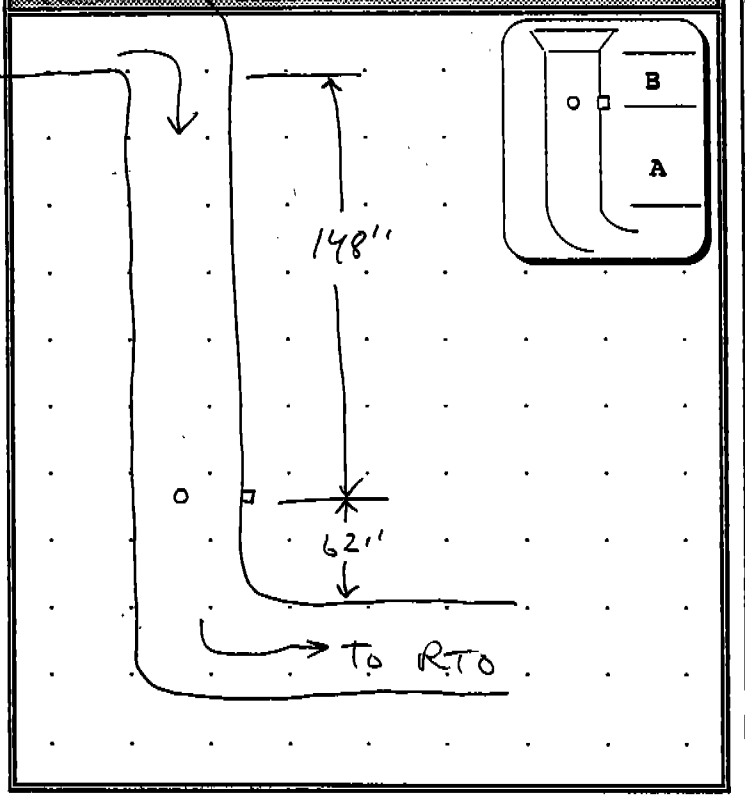
PRESS VENT RTO INLET

PM/CO/NOx INLET LOADING TEST

STACK CONFIGURATION AND SAMPLE POINT LAYOUT FOR CIRCULAR STACKS

PLANT: L.P. – Urania MOF **Date:** 1-19-94
SOURCE: PRESS VENT RTO INLET
TEST FOR: PM set up
TEST OPERATORS: Rumm

SKETCH OF STACK



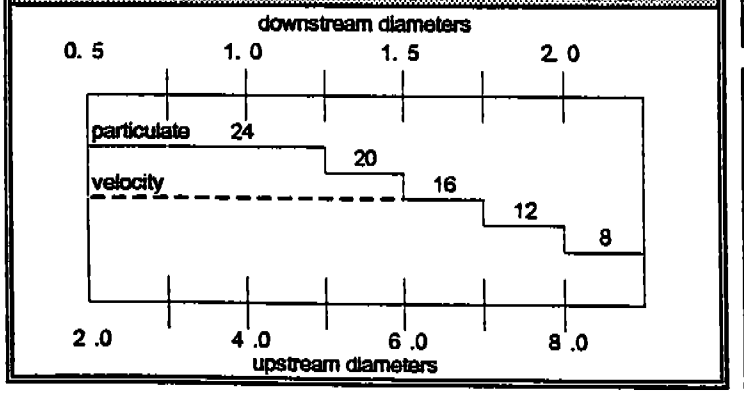
PERCENT OF DIAMETER

point no.	2 points on a diameter	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

Point No.	Inches from wall	velocity head
1	1.4	
2	4.4	
3	7.8	
4	11.6	
5	16.4	
6	23.4	
7	42.3	
8	49.3	
9	54.1	
10	58.0	
11	61.3	
12	64.0	

STACK DIAMETER: 65.75"
Distance from ports to disturbance:
A. to upstream disturbance: 148"
B. to downstream disturbance: 62"
Upstream diameters: 2.2
Downstream diameters: .94
Minimum No. sample points required: 24
No. sample points selected: 12x2
Port Length: 3.25
Port Type: 4" p. Nipple
Port Access: platform

MINIMUM NO. OF POINTS ON A DIAMETER



Pitot ID: Pitot Cp: Stack Temp:
Remarks:

Plant Louisiana Pacific - Urania MDF
Sampling Location MDF Press RTO Inlet
Test For: ~~HCOH/VOC~~ PM/CO/NOx
Test Operators Russell/Moore

RUN No. 1
Date 1-21-94
Time start 0817 end 0920

Meter Box	RAC	No. Sample Pts.	12x2	Gas Analysis	AIR
Sample Box	4	Minutes/Pt.	2.5	CO_2	
Probe/Pitot	8' teflon	NOMOGRAPH		O_2	
Pitot Cp	.84	ΔH@	1.85	CO	
Nozzle Dia.	.218	Meter Temp.	100	Time	
Filter No.		% H_2O	<10	Condensate:	
Amb. Temp. °F	~~40~~ 36	C-Factor	.99	tare 200	fin 207
Bar. Press. "Hg	30.31	Stack Temp.	100	Silica gel:	
Static Press. "H_2O	-2.6	Ref. ΔP	.81	tare	fin +3.5

Remarks:
Φ .218
Θ .218 } .218 gfm
Φ .218

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	140.005	0.60	1.35	77	57	57	249	40	2
2	230	141.6	0.58	1.20	78	66	58	237	40	2
3	500	143.2	0.59	1.35	77	62	58	232	40	2
4	730	144.9	0.58	1.35	78	66	58	238	40	2
5	1000	146.3	0.59	1.35	89	78	62	244	38	2
6	1230	147.9	0.57	1.30	79	78	61	250	38	2
7	1500	149.3	0.76	1.70	80	78	62	253	38	2
8	1730	151.2	0.81	1.75	80	79	60	251	40	2
9	2000	152.9	0.94	2.10	81	83	62	247	40	2
10	2230	154.6	0.78	1.70	84	91	65	247	40	2
11	2500	156.7	0.88	2.00	84	91	66	247	40	2
12	2730	158.1	0.85	1.90	84	93	66	250	40	2
1	30/00	159.916	0.80	1.80	83	93	69	242	40	2
2	230	162.3	0.84	2.15	85	100	71	250	40	2
3	500	164.1	0.84	1.90	78	99	72	251	40	2
4	730	166.1	0.80	1.80	85	102	77	242	39	2
5	1000	167.9	0.70	1.40	83	105	73	246	39	2
6	1230	169.8	0.56	1.25	81	107	76	246	39	2
7	1500	171.4	0.58	1.30	81	105	77	242	39	2
8	1730	173.1	0.63	1.40	83	106	76	246	39	2
9	2000	174.5	0.64	1.35	80	109	80	250	39	2
10	2230	176.3	0.63	1.30	80	110	79	247	39	2
11	2500	177.7	0.62	1.30	80	107	78	250	40	2
12	2730	179.4	0.59	1.25	82	108	78	242	42	2
end	60	181.004								

leak check: .011 → .020 = .009 1/m @ 8" Hg
pitot +ve 5.2
pitot -ve 4.0

40.999 .8327 1.5563 81.33 79.38

Plant Louisiana Pacific - Urania MDF
Sampling Location MDF Press ~~Exit~~ RTO Inlet
Test For PM/CO/NOx
Test Operators Russell/Moore

RUN No. 2
Date 1-21-97
Time start 1000 end 1100

Meter Box	Anderson	No. Sample Pts.	12x2	Gas Analysis	AIR	Remarks:	
Sample Box	No. 4	Minutes/Pt.	2.5	CO_2			
Probe/Pitot	8' Teflon	NOMOGRAPH		O_2			
Pitot Cp	.84	ΔH@	1.85	CO			
Nozzle Dia.	.218	Meter Temp.	100	Time			
Filter No.		% H_2O	210	Condensate:			
Amb. Temp. °F	40	C-Factor	1.0	tare 200	fin 210		
Bar. Press. "Hg	30.31	Stack Temp.	100	Silica gel:			
Static Press. "H_2O	-2.6	Ref. Δ P	.21	tare	fin +6.5		

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	185.967	0.57	1.30	75	87	81	247	40	2
2	2.30	187.6	0.61	1.40	75	92	76	248	39	2
3	5.00	188.9	0.60	1.35	80	92	77	250	39	2
4	7.30	191.0	0.60	1.35	80	93	77	240	38	2
5	10.00	192.3	0.58	1.30	80	95	78	241	38	2
6	12.30	193.7	0.58	1.30	82	94	84	240	38	2
7	15.00	195.5	0.85	1.90	83	98	80	251	39	2
8	17.30	197.4	0.99	2.25	84	103	81	250	40	2
9	20.00	199.3	0.94	2.15	79	105	81	250	40	2
10	22.30	201.7	0.95	2.15	80	107	82	250	41	2
11	25.00	203.5	0.97	2.20	85	109	82	252	41	2
12	27.30	205.1	0.96	2.20	85	114	84	250	42	2
1	30.00	207.278	0.82	1.85	86	111	85	243	42	2
2	2.30	209.2	0.94	2.10	~~88~~	110	86	252	42	2
3	5.00	211.2	0.89	1.95	85	112	85	252	42	2
4	7.30	213.4	0.75	1.70	85	117	86	252	42	2
5	10.00	215.0	0.67	1.50	85	113	88	252	42	2
6	12.30	216.5	0.62	1.40	85	113	88	248	41	2
7	15.00	218.3	0.58	1.30	85	115	89	252	40	2
8	17.30	220.2	0.63	1.40	85	114	87	251	40	2
9	20.00	221.6	0.72	1.60	86	120	94	251	40	2
10	22.30	223.1	0.67	1.50	87	116	9	252	40	2
11	25.00	225.2	0.67	1.50	88	115	89	250	40	2
12	27.30	226.5	0.62	1.40	86	122	95	250	40	2
end	60	228.342								

leak check: .031 → .035 = .004 @ 11" Hg
pitot + ✓ @ 4.4
pitot − ✓ @ 3.6

42.375	.8564	1.6688	83.29		95.71

Plant Louisiana Pacific - Urania MDF
Sampling Location MDF Press RTO Inlet
Test For Pb/CO/NO
Test Operators Russell / Moore

RUN No. 3
Date 1-21-94
Time start 1225 end 1226

Meter Box	RAC	No. Sample Pts.	12x2	Gas Analysis	AIR
Sample Box	No. 1	Minutes/Pt.	2.5	CO_2	
Probe/Pitot	8' Teflon			O_2	
Pitot Cp	.84	NOMOGRAPH		CO	
Nozzle Dia.	.218	ΔH@	1.85	Time	
Filter No.		Meter Temp.			
		% H_2O		Condensate:	
Amb. Temp. °F	45	C-Factor		tare 200	fin 209
Bar. Press. "Hg	30.31	Stack Temp.		Silica gel:	
Static Press. "H_2O	-2.6	Ref. ΔP	.81	tare	fin +3.5

Remarks:

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	228.611	0.62	1.40	94	93	89	247	44	3
2	230	230.5	0.59	1.20	95	94	87	250	40	2
3	500	231.9	0.60	1.35	95	90	86	250	40	2
4	730	233.5	0.59	1.30	95	97	86	239	41	2
5	1000	235.2	0.57	1.25	95	99	90	246	41	2
6	1230	236.9	0.55	1.25	95	102	95	254	40	2
7	1500	238.7	0.84	1.90	95	101	96	250	40	2
8	1730	240.4	0.86	1.95	95	114	87	250	40	2
9	2000	242.1	0.98	2.20	99	111	91	250	40	2
10	2230	243.9	0.90	2.00	95	112	89	250	41	2
11	2500	245.8	0.89	2.00	94	113	88	250	40	2
12	2730	247.7	0.82	1.75	94	113	89	250	40	2
1	30/00	249.592	0.84	1.90	96	114	92	260	42	2
2	230	251.5	0.85	1.90	96	115	91	260	42	2
3	500	253.4	0.82	1.85	96	115	91	253	40	2
4	730	255.5	0.76	1.70	97	114	91	250	40	2
5	1000	257.2	0.67	1.50	97	118	91	250	40	2
6	1230	258.6	0.58	1.30	93	118	96	259	41	2
7	1500	260.5	0.74	1.70	96	118	93	261	40	2
8	1730	262.7	0.67	1.50	97	124	95	250	40	2
9	2000	264.1	0.66	1.50	97	121	96	252	40	2
10	2230	265.7	0.68	1.50	96	119	94	247	40	3
11	2500	267.6	0.74	1.70	96	122	96	250	40	3
12	2730	269.1	0.74	1.70	95	121	95	250	40	3
end	60	270.918								

leak check: .050 → .050 = 0.000 cfm 9"Hg
pitot + ✓ e 36
pitot - ✓ e 4.5

42.307 .8532 1.6417 95.54 101.08

PARTICULATE CATCH ANALYSIS

SAMPLES: L.P. - Urania MDF / Press Vent RTO Inlet

DATE TAKEN: 1-21-94 DATE ANALYZED: 1-23-94

DELIVERED BY: [signature] RECEIVED BY: [signature]

ANALYZED BY: [signature]

(Attach chain of custody if additional exchanges occur)

FILTERS:

RUN NO.	1	2	3	
FILTER NO.	538	540	514	
FILTER TARE, gms.	.5593	.5610	.5627	
	.5605	.5649	.5633	
	.5607	.5648	.5635	
FINAL WEIGHT, gms.	.5607	.5648	.5635	
NET GAIN, gms.	.0014	.0038	.0008	

PROBE WASH:

RUN NO.	1	2	3	
CONTAINER I.D.	PVN R1	PVN R2	PVN R3	
VOLUME INTACT?	✓	✓	—	
VOLUME, ml	120	170	140	
TARE WEIGHT, gms.	(2) 104.7530	(62) 113.2218	(91) 102.7996	
	104.7601	113.2258	102.8051	
	104.7599	113.2253	102.8051	
FINAL WEIGHT, gms	104.7599	113.2253	102.8051	
NET GAIN, gms.	.0069	.0035	.0055	
LESS BLANK, gms.				

PARTICULATE SAMPLE WEIGHT:

RUN NO.	1	2	3	
filter + probe, mg.	8.3	7.3	6.3	

PARTICULATE CATCH ANALYSIS

(Back Half Methylene Chloride Extraction)

SAMPLES: L.P. Press Vent RTO Inlet

DATE TAKEN: 1-21-94 DATE ANALYZED: 1-26-94

DELIVERED BY: DSR RECEIVED BY: DSR

ANALYZED BY: DER

(Attach chain of custody if additional exchanges occur)

AQUEOUS FRACTION:

RUN NO.	1	2	3	
CONTAINER I.D.	PVNR1 BAK	PVNR2 BAK	PVNR3BAK	
VOLUME INTACT?	✓	✓	✓	
VOLUME, ml	300	300	300	
TARE WEIGHT, gms.	(3) 104.6240	(15) 107.2502	(80) 107.9644	
	104.6257	107.2538	107.9683	
	104.6257	107.2534	107.9684	
FINAL WEIGHT, gms.	104.6257	107.2534	107.9684	
NET GAIN, gms.	.0017	.0032	.0040	
LESS BLANK, gms.				

ORGANIC FRACTION

RUN NO.	1	2	3	
CONTAINER I.D.	Same			
VOLUME INTACT?	Same			
VOLUME, ml	Same			
TARE WEIGHT, gms.	(69) 112.5820	(90) 107.9573	(91) 102.7999	
	112.5850	107.9609	102.8039	
	112.5841	107.9603	102.8030	
	112.5843	107.9603	102.8028	
FINAL WEIGHT, gms.	112.5843	107.9603	102.8028	
NET GAIN, gms.	.0023	.0030	.0029	
LESS BLANK, gms.				

PARTICULATE SAMPLE WEIGHT:

RUN NO.	1	2		
AQ	1.7	3.2	4.0	
ORG Aqueous fraction, mg	2.3	3.0	2.9	

PRESS VENT RTO INLET

VOC/HCOH INLET LOADING TEST

Plant Louisiana Pacific - Urania MDF
Sampling Location MDF Press RTO Inlet
Test For HCOH / VOC
Test Operators Russell / McKnight

RUN No. 1
Date 1-20-94
Time start 1140 end 1242

Meter Box	AK	No. Sample Pts.	12 x 2	Gas Analysis	Fyrite
Sample Box	No. 4	Minutes/Pt.	2.5	CO_2	0
Probe/Pitot	8' teflon			O_2	20.7
Pitot Cp		NOMOGRAPH		CO	
Nozzle Dia.	~~.277~~ .260	ΔH@	1.85	Time	
Filter No.		Meter Temp.	100		
		% H_2O	<10	Condensate:	
Amb. Temp. °F	47	C-Factor	1.0	tare Rm	fin 0.5
Bar. Press. "Hg	30.29	Stack Temp.	<100	Silica gel:	
Static Press. "H_2O	-26	Ref. ΔP	.38	tare Rm	fin

Remarks:

	Tare	final
1) DNPH	562.5	566.5
2) DNPH	571.5	572.5
3) DNPH	482.0	482.5
4) SGPH	758.0	763.0

Paul Laird LDEQ

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	937.481	0.50	2.40	100	65	64	N/A	43	3
2	230	939.5	0.60	2.90	99	65	63		40	3
3	500	942.5	0.57	2.70	97	79	66		40	3
4	730	944.2	0.58	2.80	100	75	64		40	3
5	1000	946.2	0.61	3.00	100	79	66		43	3
6	1230	948.7	0.61	3.00	100	87	66		44	3
7	1500	950.6	0.79	3.60	101	91	62		44	3
8	1730	953.5	0.85	4.10	100	94	68		45	4
9	2000	956.3	0.95	4.60	97	97	69		46	4
10	2230	959.0	0.99	4.80	102	101	70		46	4
11	2500	961.9	1.05	5.10	102	108	72		46	4
12	2730	965.2	0.98	4.80	102	111	75		46	4
1	30/00	968.209	0.81	4.00	102	111	77		46	4
2	230	971.0	0.97	4.70	103	114	80		46	4
3	500	973.9	0.90	4.40	103	116	81		46	4
4	730	977.0	0.78	3.80	103	117	80		46	4
5	1000	979.6	0.74	3.60	103	120	83		46	5
6	1230	982.5	0.60	2.90	104	122	85		46	5
7	1500	984.8	0.71	3.45	103	121	86		46	3
8	1730	987.3	0.65	3.20	104	123	87		45	3
9	2000	989.9	0.72	3.50	104	124	88		45	3
10	2230	992.5	0.70	3.40	103	119	89		48	3
11	2500	995.0	0.72	3.50	103	126	89		48	3
12	2730	997.6	0.80	3.80	104	125	91		48	3
1	40/00	000.498								

leak check → .035 → .035 = 0.000 cfm @ 11" Hg
pitot + ~ 4.0
pitot - ~ 4.4

63.017 .8660 3.6804 101.63 89.81

Plant Louisiana Pacific - Urania MDF
Sampling Location MDF Phase RTO Inlet
Test For HCOH / VOC
Test Operators Russell / McKnight

RUN No. 2
Date 1-20-94
Time start 1359 end 1500

Meter Box	RAC 591349	No. Sample Pts.	12 x 2	Gas Analysis	AIR
Sample Box	No. 4	Minutes/Pt.	2.5	CO_2	
Probe/Pitot	8' teflon	NOMOGRAPH		O_2	
Pitot Cp	.84	ΔH@	1.85	CO	
Nozzle Dia.	.260	Meter Temp.		Time	
Filter No.		% H_2O		Condensate:	
Amb. Temp. °F	47	C-Factor		tare Remarks fin	
Bar. Press. "Hg		Stack Temp.		Silica gel:	
Static Press. "H_2O	~~[illegible]~~ 2.6	Ref. ΔP	.38	tare fin	

Remarks:

1) DNPH	564.0	570.0
2) DNPH	572.0	576.5
3) MT	482.0	482.5
4) S.Gel	763.0	769.0

16.5

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
1	000	000.995	0.76	3.70	96	78	76	N/A	~~N/A~~	4
2	230	004.0	0.81	4.00	96	79	76		48	5
3	500	007.0	0.81	4.00	97	87	76		48	5
4	730	009.1	0.82	4.00	98	88	76		48	5
5	1000	011.7	0.81	4.00	97	95	77		51	5
6	1230	015.0	0.75	3.60	97	99	78		50	5
7	1500	017.1	1.00	4.80	100	106	80		52	5
8	1730	020.1	1.35	6.60	98	107	80		50	5
9	2000	023.5	1.40	6.70	98	114	82		47	5
10	2230	027.0	1.40	6.70	97	119	82		46	5
11	2500	030.5	1.45	7.00	98	123	86		46	5
12	2730	034.3	1.45	7.00	97	125	84		46	5
1	30/00	038.028	1.35	6.60	100	126	90		47	6
2	230	041.7	1.35	6.60	98	125	91		46	6
3	500	044.8	1.30	6.40	98	128	91		46	6
4	730	048.5	1.15	5.50	98	130	95		47	6
5	1000	051.8	0.98	4.70	100	131	92		45	5
6	1230	054.8	0.87	4.30	97	131	93		46	5
7	1500	057.7	0.92	4.50	97	132	95		46	5
8	1736	060.9	0.90	4.40	98	134	95		46	5
9	2000	063.9	0.98	4.90	97	131	96		46	6
10	2230	067.3	0.93	4.60	96	132	96		47	6
11	2500	070.1	0.91	4.40	97	133	98		47	6
12	2730	072.9	0.91	4.40	97	134	98		47	6
	60/00	075.810								

Leak check: .031 → .031 = 0.000 cfm @ 10" Hg
pitot + ve 6.0
pitot − ve 5.0

74.815 5.1417 97.58 101.46

.9927

Plant Louisiana Pacific - Urania MDF
Sampling Location MDF Press RTO Inlet
Test For HCOH/VOC
Test Operators Russell/McKnight

RUN No. 3
Date 1-20-94
Time start 1559 end 1701

Meter Box	RAC	No. Sample Pts.	12x2	Gas Analysis	AIR	Remarks:	
Sample Box	No. 4	Minutes/Pt.	2.5	CO_2		impingers	Tare / Final
Probe/Pitot	8' Teflon			O_2		1) DI H	563.0 / 569.5
Pitot Cp	.84	NOMOGRAPH		CO		2) DI H	570.5 / 571.0
Nozzle Dia.	.266	ΔH@	1.85	Time		3) MT	482.0 / 482.5
Filter No.		Meter Temp.				4) S.Gel	769.0 / 774.0
		% H_2O		Condensate:			
Amb. Temp. °F	45	C-Factor		tare	fin	12.5	
Bar. Press. "Hg		Stack Temp.		Silica gel:			
Static Press. "H_2O	-2.6	Ref. ΔP	.38	tare	fin		

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	1000	076.114	0.52	2.45	89	75	75	N/A	44	3
2	230	078.7	0.63	3.00	92	79	76		45	3
3	500	080.7	0.63	3.00	94	83	77		43	3
4	730	082.9	0.60	2.90	94	83	78		44	3
5	1000	085.1	0.61	3.00	97	89	78		44	3
6	1230	087.4	0.55	2.70	95	96	77		44	3
7	1500	089.7	0.72	3.50	96	100	79		45	3
8	1730	092.5	0.94	4.60	100	103	78		45	3
9	2000	095.9	0.97	4.70	100	108	80		45	3
10	2230	098.2	0.94	4.60	98	111	79		45	3
11	2500	101.7	0.91	4.50	98	116	83		45	3
12	2730	104.6	0.88	4.30	98	120	83		45	3
1	30/00	107.164	0.83	4.10	97	119	83		45	3
2	230	110.2	0.90	4.60	99	119	84		45	3
3	500	113.4	0.93	4.70	99	120	83		45	3
4	730	116.5	0.74	3.65	100	122	88		45	3
5	1000	119.3	0.70	3.40	99	124	89		45	3
6	1230	121.7	0.58	2.80	100	125	91		45	3
7	1500	124.3	0.65	3.10	100	125	91		45	3
8	1730	127.0	0.71	3.45	102	123	91		44	3
9	2000	129.0	0.72	3.45	101	124	91		45	3
10	2230	131.6	0.72	3.45	100	124	92		45	3
11	2500	134.3	0.66	3.20	100	126	94		46	3
12	2730	136.8	0.67	3.25	100	126	94		45	3
end	60	139.066								

leak check: .068 → .070 = .002 cfm @ 9" Hg
pitot ✓ @ 5.6
pitot ✓ @ 3.1

62.952 | .8554 | 3.6000 | 97.88 | 96.96

APPENDIX B.

RECORDER TRACES/DATA LOG

Louisiana Pacific Corporation - Urania MDF Plant
MDF Dryers - RTO North Outlet and RTO Inlet
NOx/CO CEM Data Acquisition - 10 Minute Data Log

Run 1

Log Time		Ch 1 Volts	NOx ppm Outlet	Ch 2 Volts	CO ppm Outlet	Ch 3 Volts	NOx ppm Inlet	Ch 4 volts	CO ppm Inlet
1108	1118	12.5	31.3	1.0	5.0	7.9	19.8	1.2	12.0
1118	1128	12.2	30.5	1.1	5.5	7.5	18.8	1.0	10.0
1128	1138	12.2	30.5	0.9	4.5	7.9	19.8	1.2	12.0
1138	1148	12.5	31.3	1.1	5.5	8.1	20.3	1.1	11.0
1148	1158	12.2	30.5	1.1	5.5	8.1	20.3	1.2	12.0
1158	1208	12.1	30.3	0.9	4.5	8.1	20.3	1.1	11.0
AVERAGES:			**30.7**		**5.1**		**19.8**		**11.3**

Run 2

Log Time		Ch 1 Volts	NOx ppm Outlet	Ch 2 Volts	CO ppm Outlet	Ch 3 Volts	NOx ppm Inlet	Ch 4 volts	CO ppm Inlet
1459	1509	12.0	30.0	0.8	4.0	8.8	22.0	1.0	10.0
1509	1519	11.3	28.3	0.7	3.5	8.2	20.5	1.1	11.0
1519	1529	11.8	29.5	0.7	3.5	8.1	20.3	1.6	16.0
1529	1539	11.5	28.8	0.8	4.0	7.6	19.0	1.8	18.0
1539	1549	11.0	27.5	0.7	3.5	7.8	19.5	1.8	18.0
1549	1559	10.9	27.3	0.7	3.5	5.5	13.8	1.7	17.0
AVERAGES:			**28.5**		**3.7**		**19.2**		**15.0**

Run 3

Log Time		Ch 1 Volts	NOx ppm Outlet	Ch 2 Volts	CO ppm Outlet	Ch 3 Volts	NOx ppm Inlet	Ch 4 volts	CO ppm Inlet
1656	1706	6.8	17.0	0.4	2.0	2.2	5.5	1.0	10.0
1706	1716	7.9	19.8	0.3	1.5	9.0	22.5	2.2	22.0
1716	1726	9.2	23.0	0.2	1.0	17.0	42.5	1.1	11.0
1726	1736	9.9	24.8	0.3	1.5	17.5	43.8	1.0	10.0
1736	1746	10.4	26.0	0.2	1.0	15.5	38.8	1.0	10.0
1746	1756	10.2	25.5	0.2	1.0	12.8	32.0	1.2	12.0
AVERAGES:			**22.7**		**1.3**		**30.8**		**12.5**

Louisiana Pacific Corporation - Urania MDF Plant
MDF Press Vent Rto Inlet/Outlet Test 1-21-94
NOx/CO CEM Data Acquisition - 10 Minute Data Log

Run 1

Log Time		Ch 1 Volts	NOx ppm Outlet	Ch 2 Volts	CO ppm Outlet	Ch 3 Volts	NOx ppm Inlet	Ch 4 volts	CO ppm Inlet
0816	0826	8.9	8.9	1.5	3.0	0.0	0.0	0.0	0.0
0826	0836	9.1	9.1	1.6	3.2	0.0	0.0	0.0	0.0
0836	0846	9.0	9.0	1.5	3.0	0.0	0.0	0.0	0.0
0846	0856	9.6	9.6	1.6	3.2	0.0	0.0	0.0	0.0
0856	0906	9.8	9.8	1.7	3.4	0.0	0.0	0.0	0.0
0906	0916	9.8	9.8	1.5	3.0	0.0	0.0	0.0	0.0
AVERAGES:			9.4		3.1		0.0		0.0

Run 2

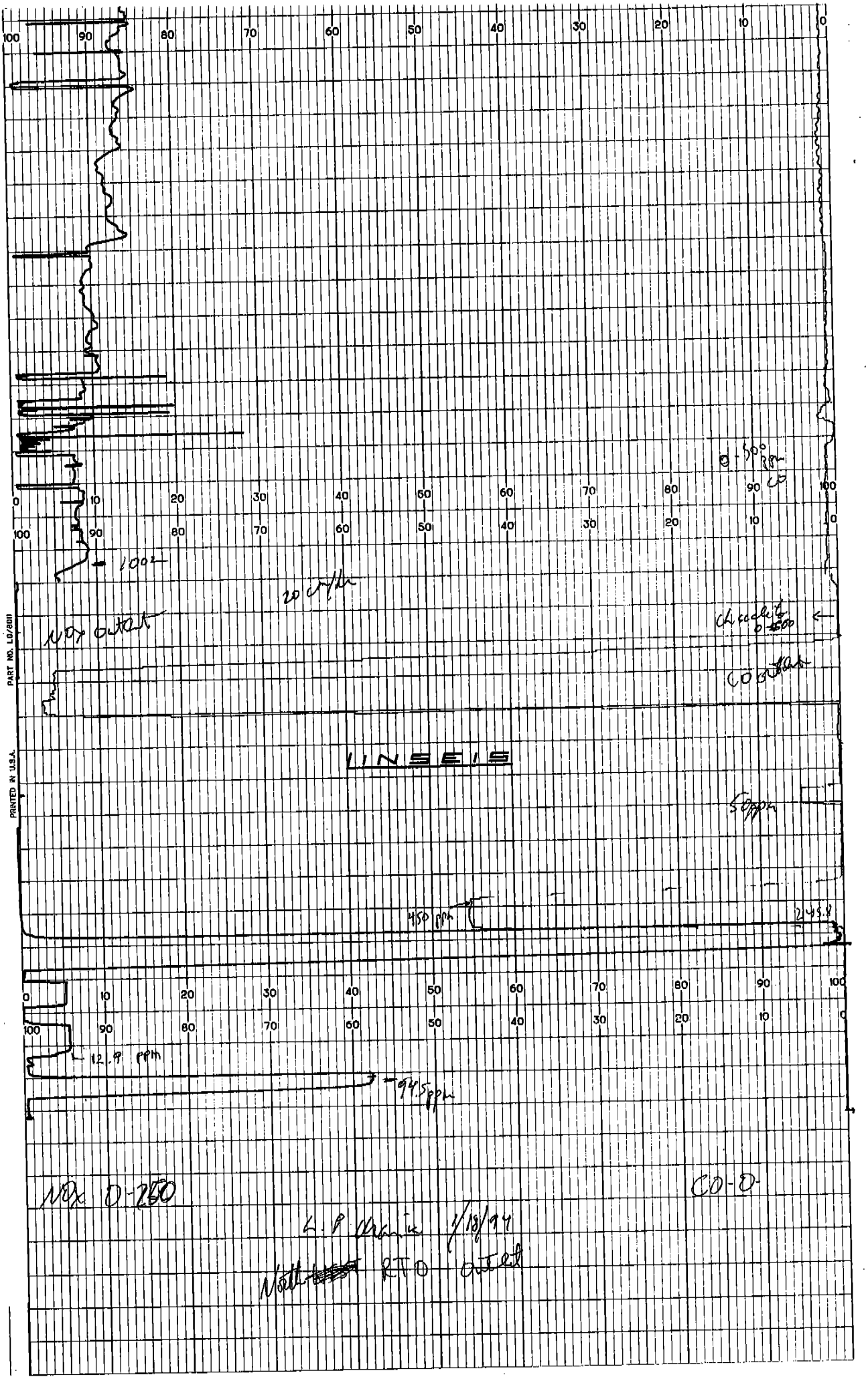
Log Time		Ch 1 Volts	NOx ppm Outlet	Ch 2 Volts	CO ppm Outlet	Ch 3 Volts	NOx ppm Inlet	Ch 4 volts	CO ppm Inlet
1001	1012	8.7	8.7	1.1	2.2	0.0	0.0	0.0	0.0
1012	1022	7.7	7.7	0.9	1.8	0.0	0.0	0.0	0.0
1022	1032	7.9	7.9	1.0	2.0	0.0	0.0	0.0	0.0
1032	1042	8.2	8.2	1.0	2.0	0.0	0.0	0.0	0.0
1042	1052	8.5	8.5	0.9	1.8	0.0	0.0	0.0	0.0
1052	1102	8.6	8.6	1.0	2.0	0.0	0.0	0.0	0.0
AVERAGES:			8.3		2.0		0.0		0.0

Run 3

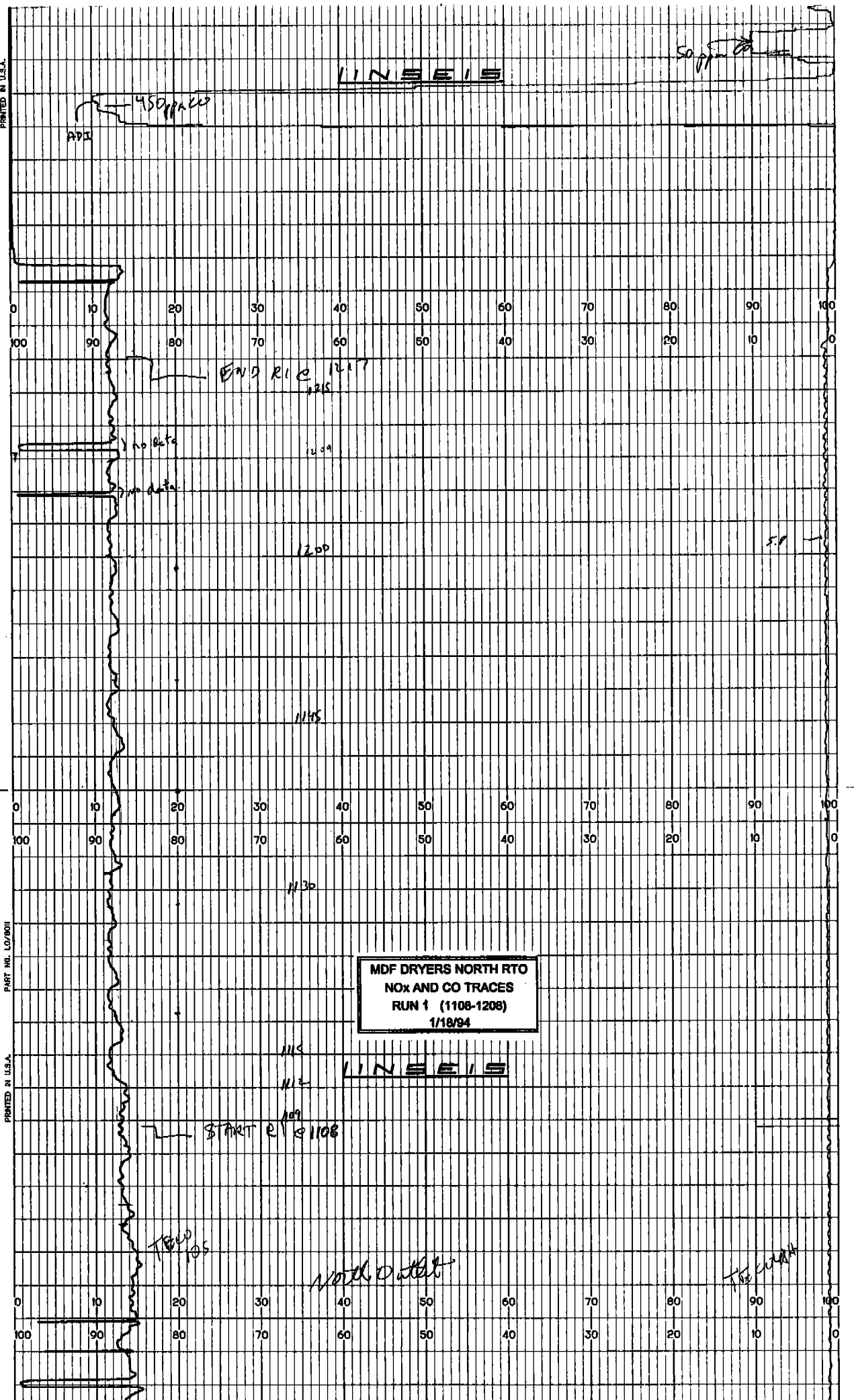
Log Time		Ch 1 Volts	NOx ppm Outlet	Ch 2 Volts	CO ppm Outlet	Ch 3 Volts	NOx ppm Inlet	Ch 4 volts	CO ppm Inlet
1226	1236	8.4	8.4	1.3	2.6	0.0	0.0	0.0	0.0
1236	1246	8.7	8.7	1.1	2.2	0.0	0.0	0.0	0.0
1246	1256	9.0	9.0	0.9	1.8	0.0	0.0	0.0	0.0
1256	1306	8.9	8.9	1.0	2.0	0.0	0.0	0.0	0.0
1306	1316	8.8	8.8	1.1	2.2	0.0	0.0	0.0	0.0
1316	1326	8.9	8.9	1.0	2.0	0.0	0.0	0.0	0.0
AVERAGES:			8.8		2.1		0.0		0.0

MDF DRYERS NORTH RTO

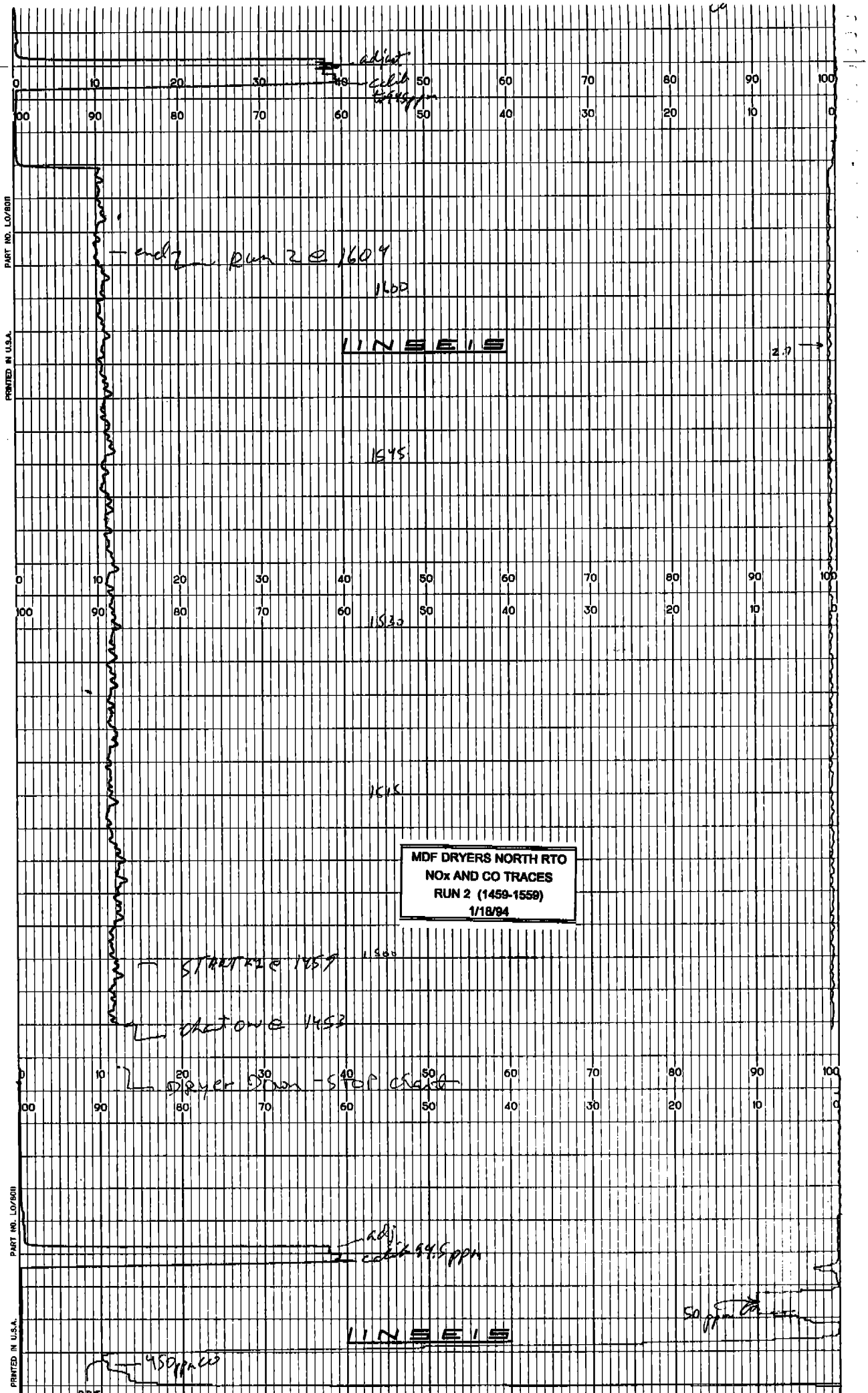
CO/NOX TRACES



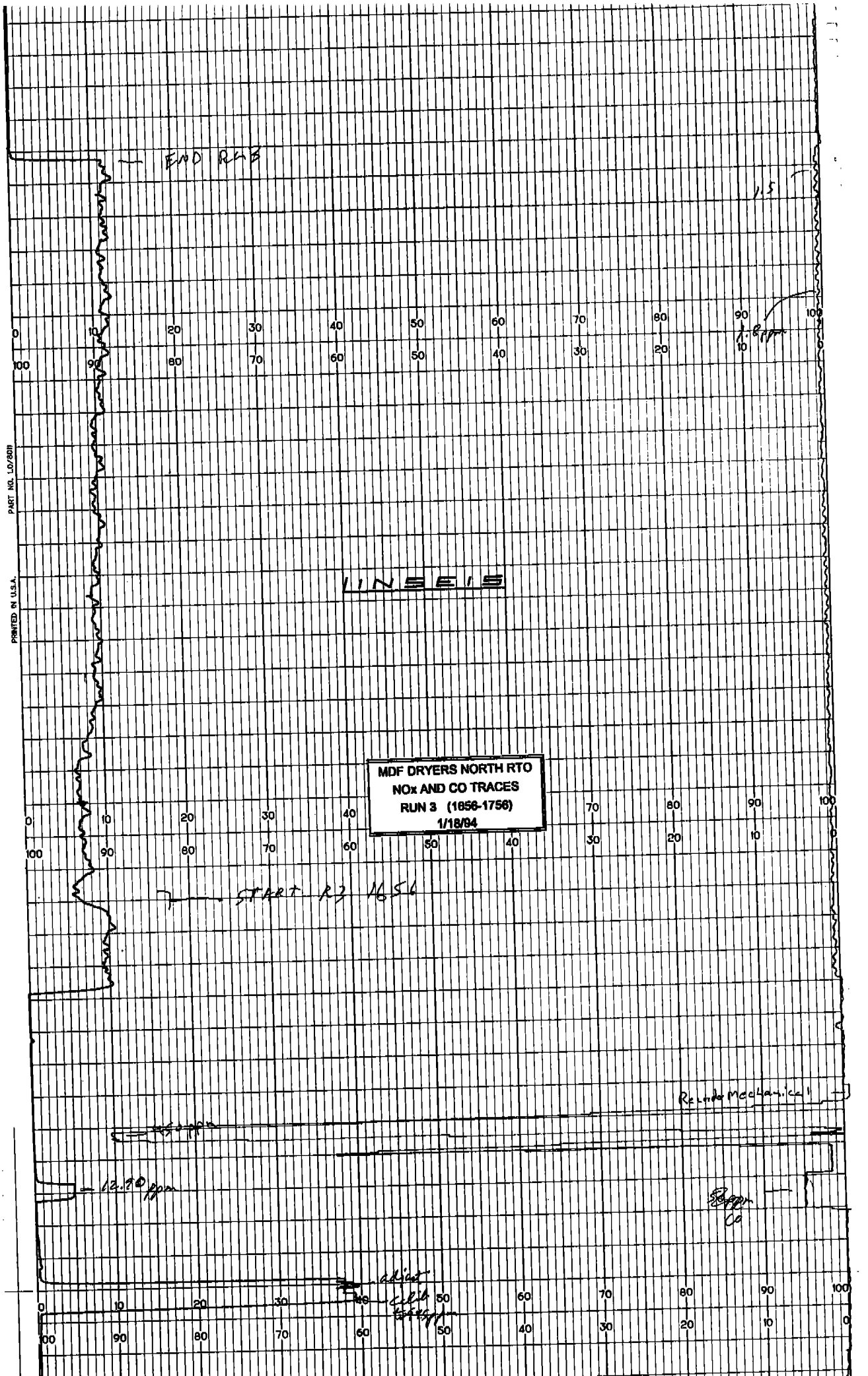
100 90 80 70 60 50 40 30 20 10 0
0 10 20 30 40 50 60 70 80 90 100
100 90 80 70 60 50 40 30 20 10 0
0-500 ppm CO
100%
20 cm/hr
NOx outlet
Chocolate 0-500
CO outlet
LINSEIS
50ppm
450 ppm
245.8
0 10 20 30 40 50 60 70 80 90 100
100 90 80 70 60 50 40 30 20 10 0
12.9 ppm
94.5ppm
NOx 0-250
CO-0-
L.P. Chanie 1/18/94
North RTO outlet
PART NO. LC/8011
PRINTED IN U.S.A.



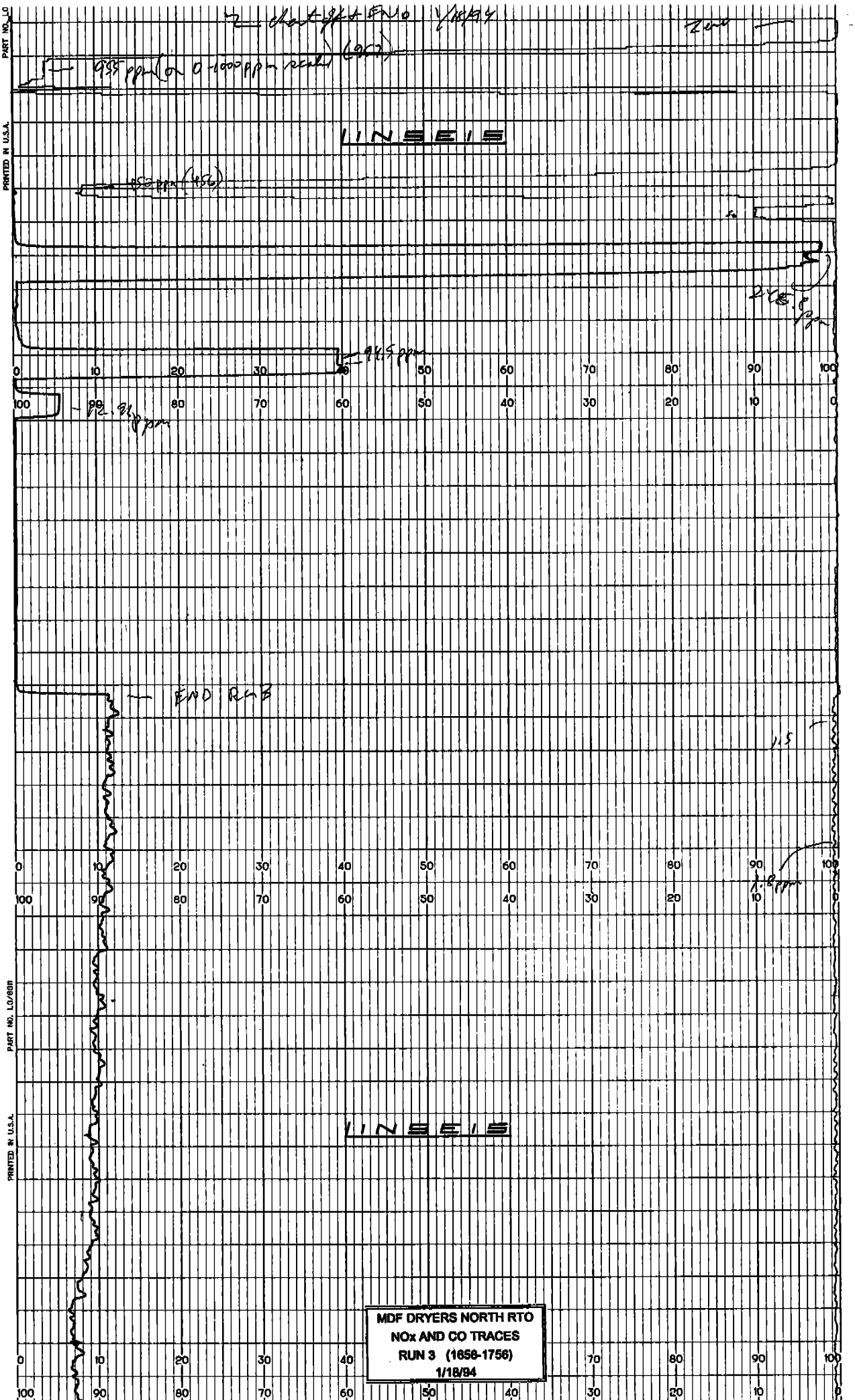
LINSEIS
450 ppm CO
ADI
50 ppm CO
END R1 @ 1217
1215
no data
1209
no data
1200
S.P
1145
1130
MDF DRYERS NORTH RTO
NOx AND CO TRACES
RUN 1 (1108-1208)
1/18/94
LINSEIS
1115
1112
1109
START R1 @ 1108
TECO 105
North Outlet
TECO 105
PRINTED IN U.S.A.
PART NO. LO/8011



adjust
calib
end
Run 2 @ 1604
1600
LINSEIS
2.7
1545
1530
1515
MDF DRYERS NORTH RTO
NOx AND CO TRACES
RUN 2 (1459-1559)
1/18/94
START #2 @ 1459
1500
chart on @ 1453
Dryer Down - Stop Chart
adj
calib 94.5 ppm
50 ppm
LINSEIS
450 ppm CO
PART NO. LO/8011
PRINTED IN U.S.A.



END RUB
1.5
1.8 ppm
LINSEIS
MDF DRYERS NORTH RTO
NOx AND CO TRACES
RUN 3 (1656-1756)
1/18/94
START R3 1656
Recorder Mechanical
12.90 ppm
Co
adjust
PART NO. LO/8011
PRINTED IN U.S.A.


PART NO. LO
PRINTED IN U.S.A.
LINSEIS
PART NO. LO/8011
PRINTED IN U.S.A.
LINSEIS
END RUN
MDF DRYERS NORTH RTO
NOx AND CO TRACES
RUN 3 (1658-1756)
1/18/94

MDF DRYERS RTO INLET

CO/NOX TRACES

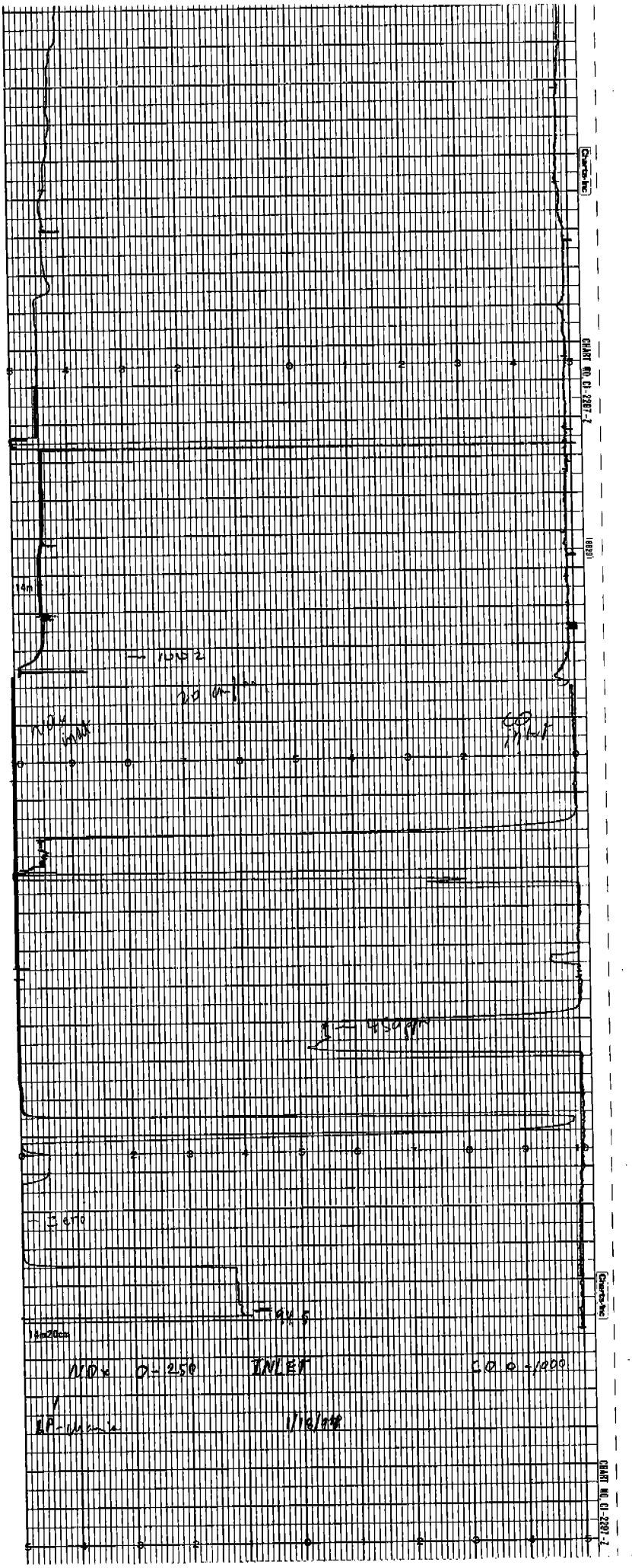
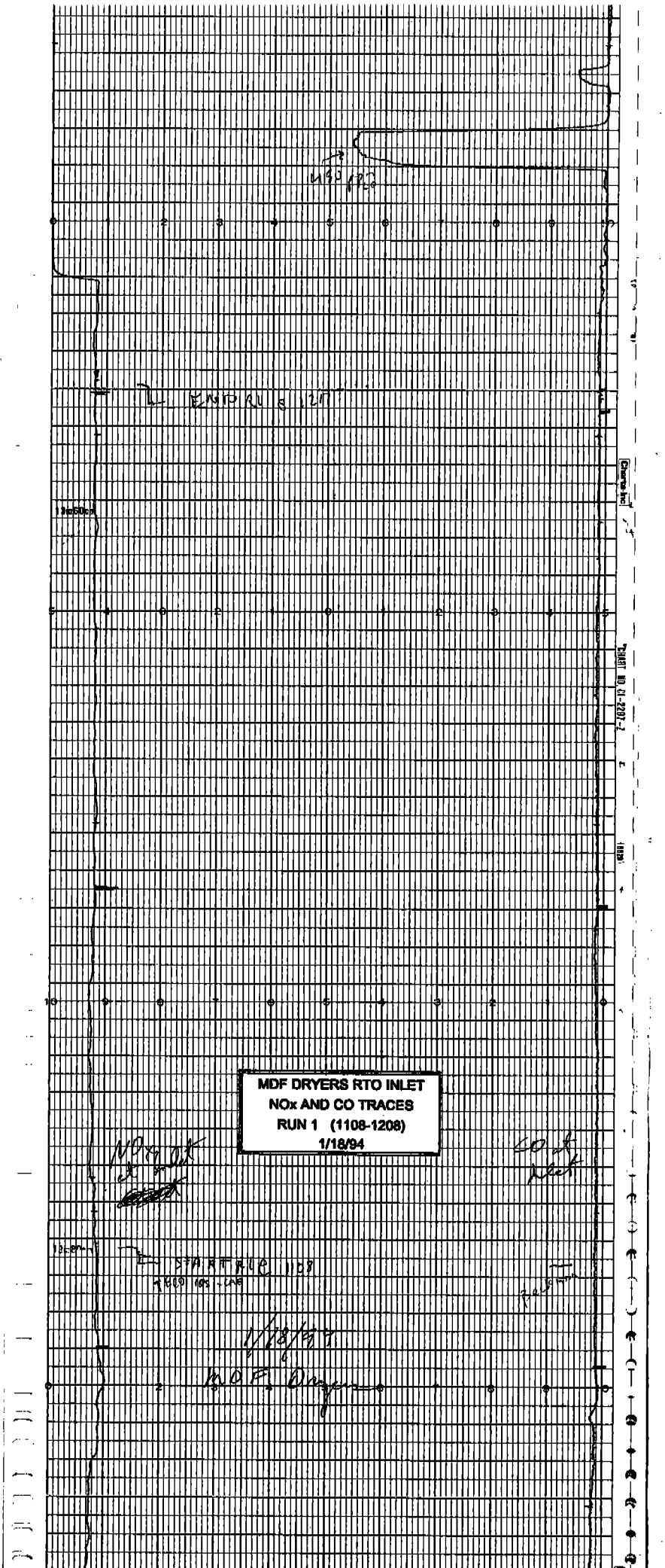
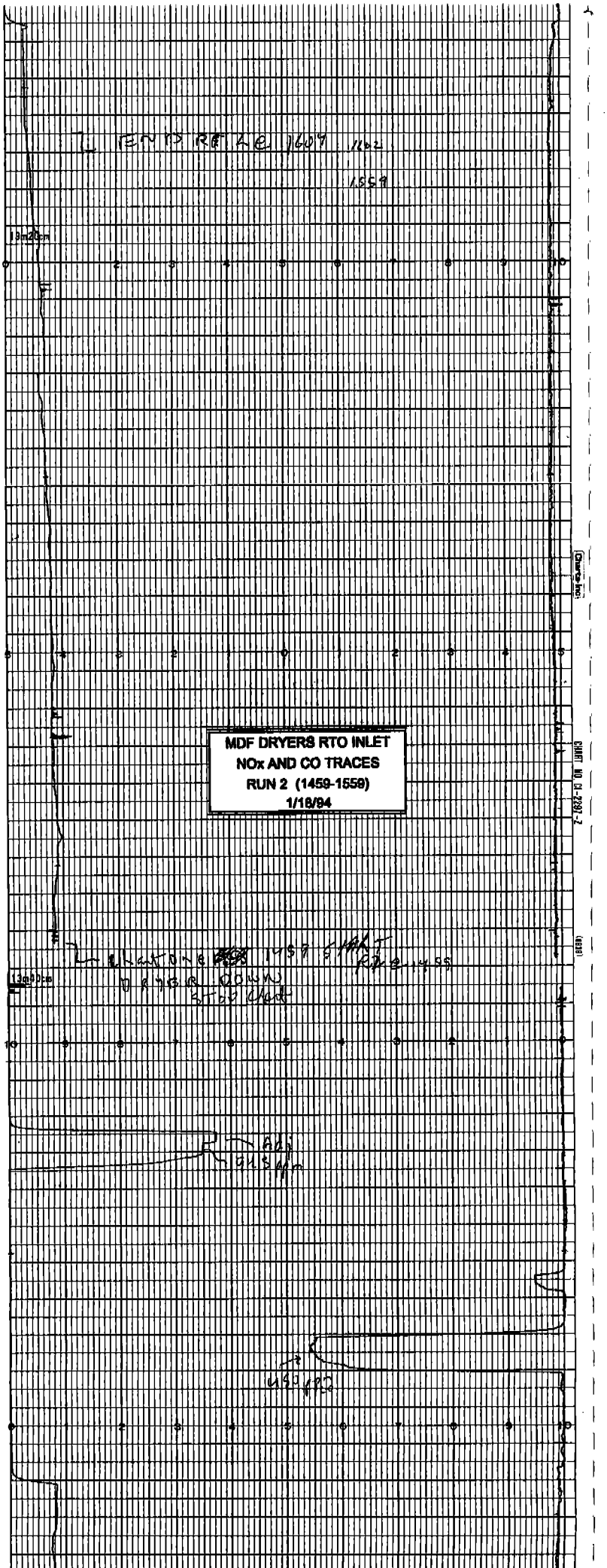
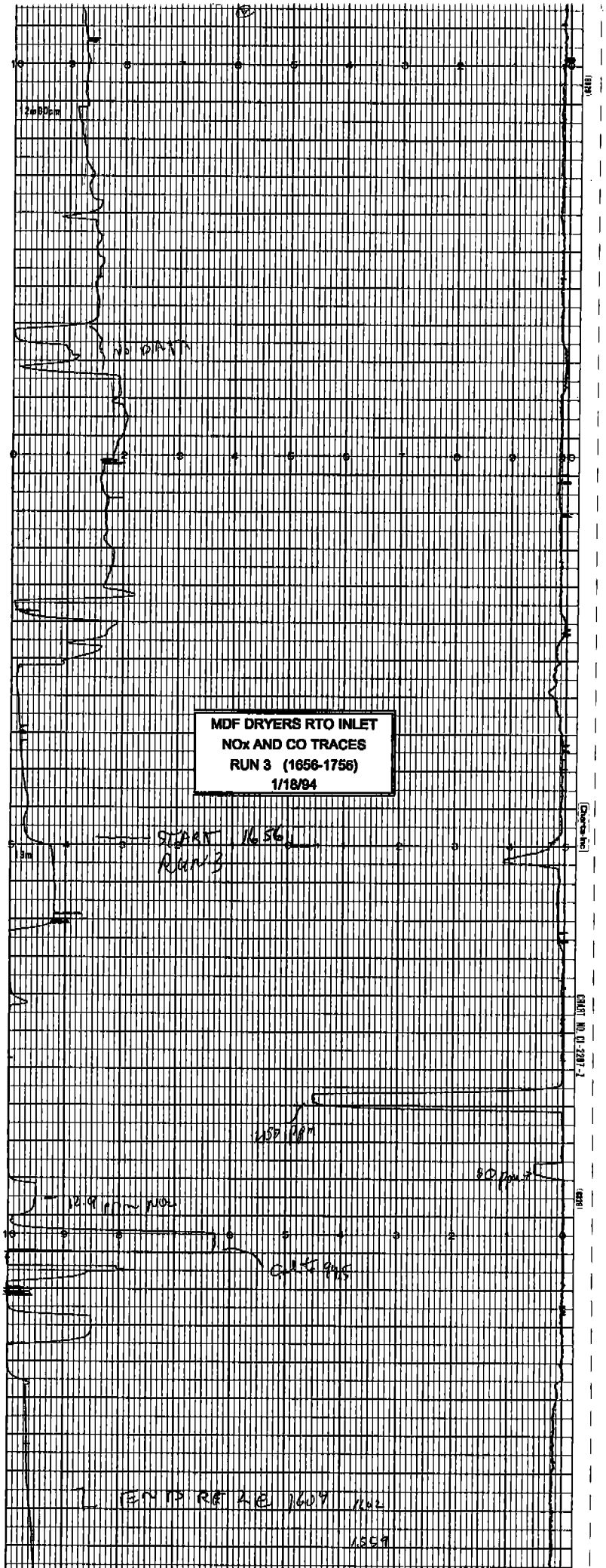
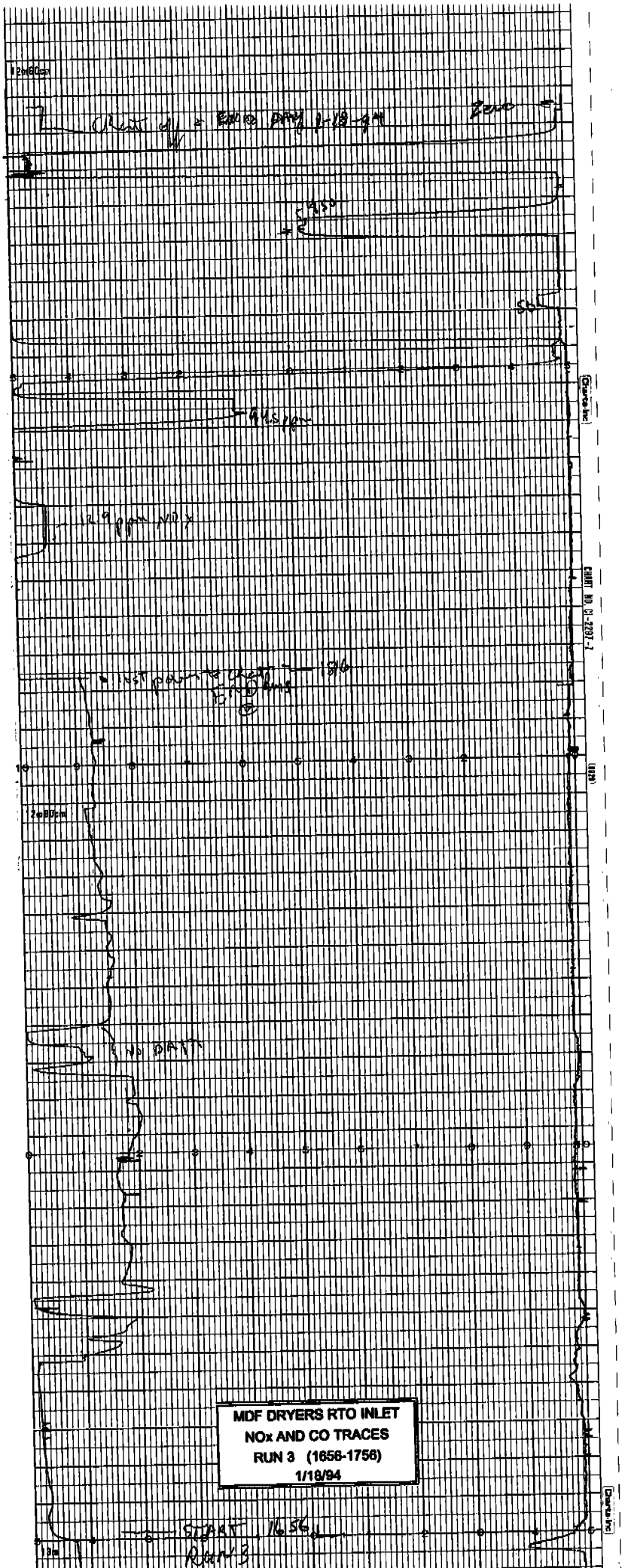


CHART NO. C1-2287-Z
14m
NOx 0-250 INLET
CO 0-1000


MDF DRYERS RTO INLET
NOx AND CO TRACES
RUN 1 (1108-1208)
1/18/94
START RUN 1108
1/18/94
MDF Dryers


MDF DRYERS RTO INLET
NOx AND CO TRACES
RUN 2 (1459-1559)
1/18/94
13m20cm
13m40cm
Adj
Charts Inc.


MDF DRYERS RTO INLET
NOx AND CO TRACES
RUN 3 (1656-1756)
1/18/94
START 1656
RUN 3
12.9 ppm NOx
ENDRE 1609
1602
1559
CHART NO. CI-2287-2

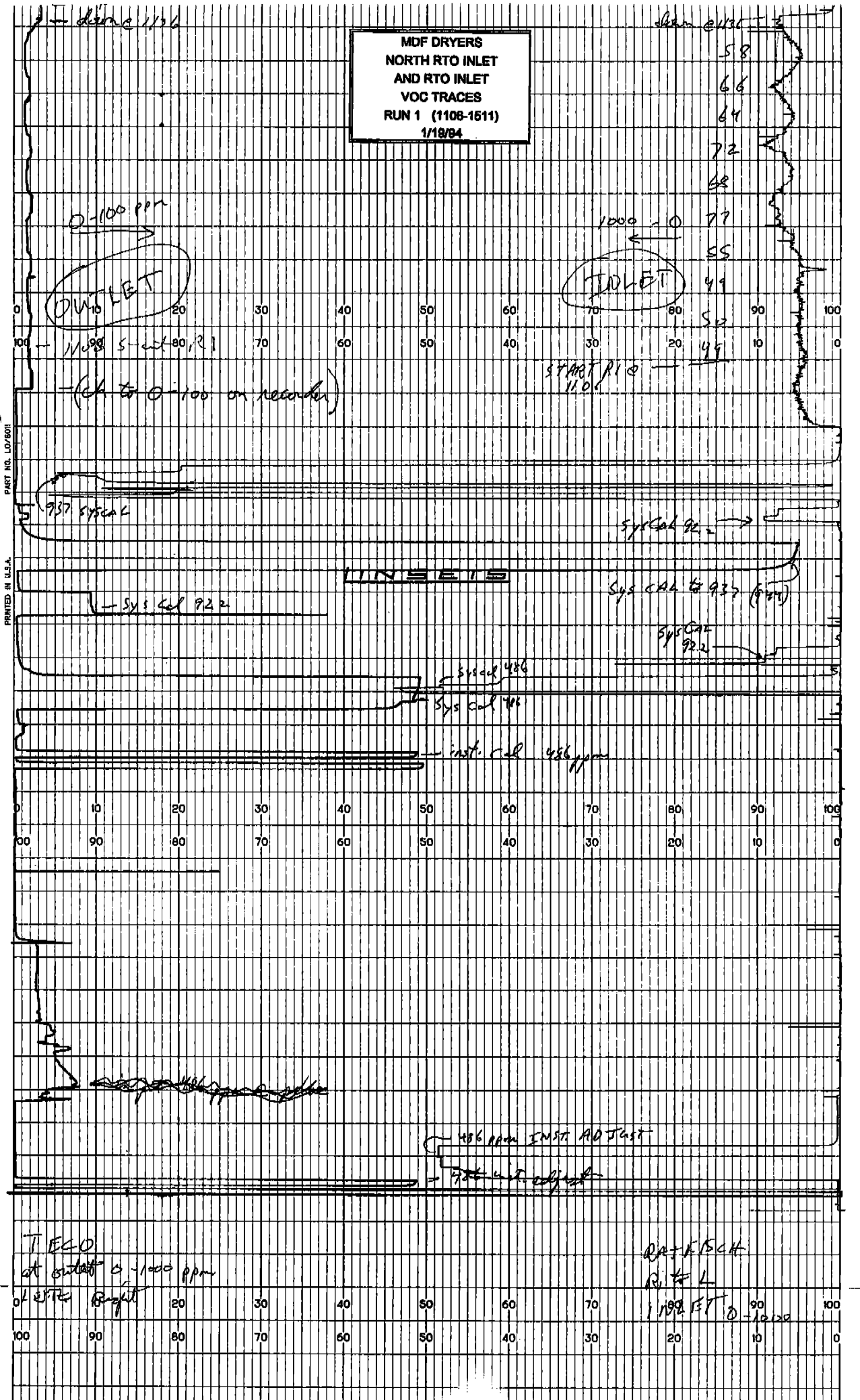


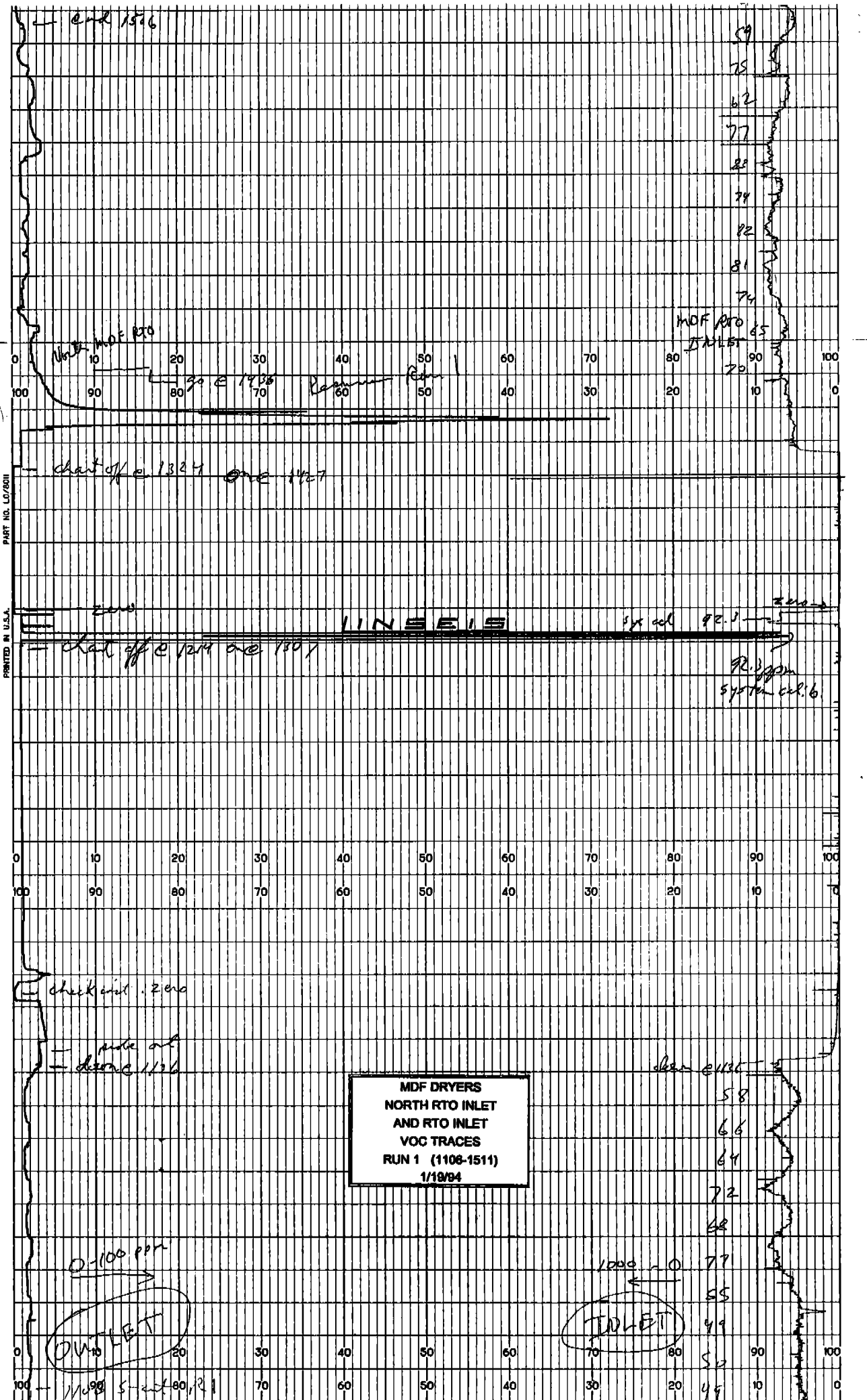
MDF DRYERS RTO INLET
NOx AND CO TRACES
RUN 3 (1656-1756)
1/18/94

MDF DRYERS

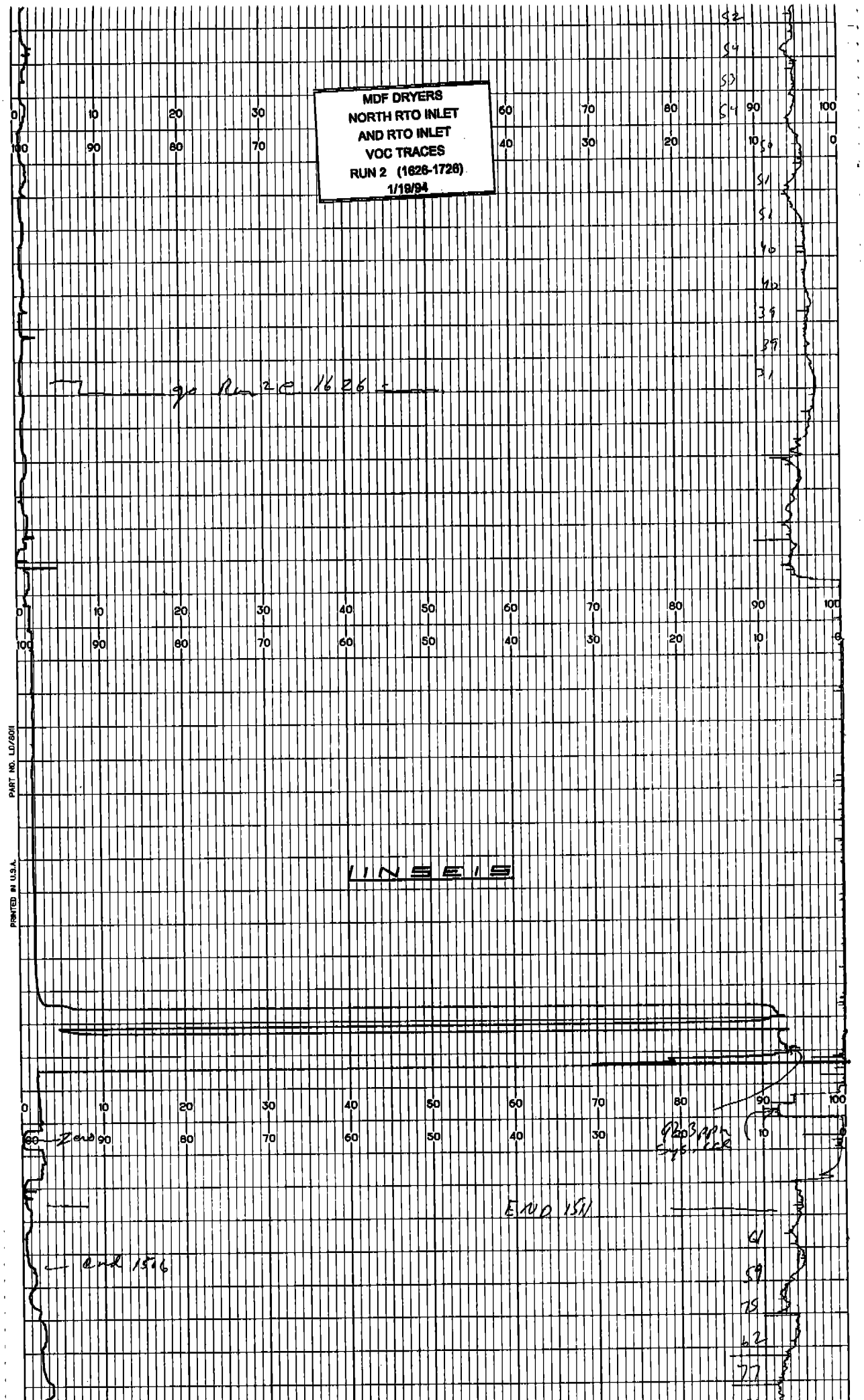
NORTH RTO AND RTO INLET

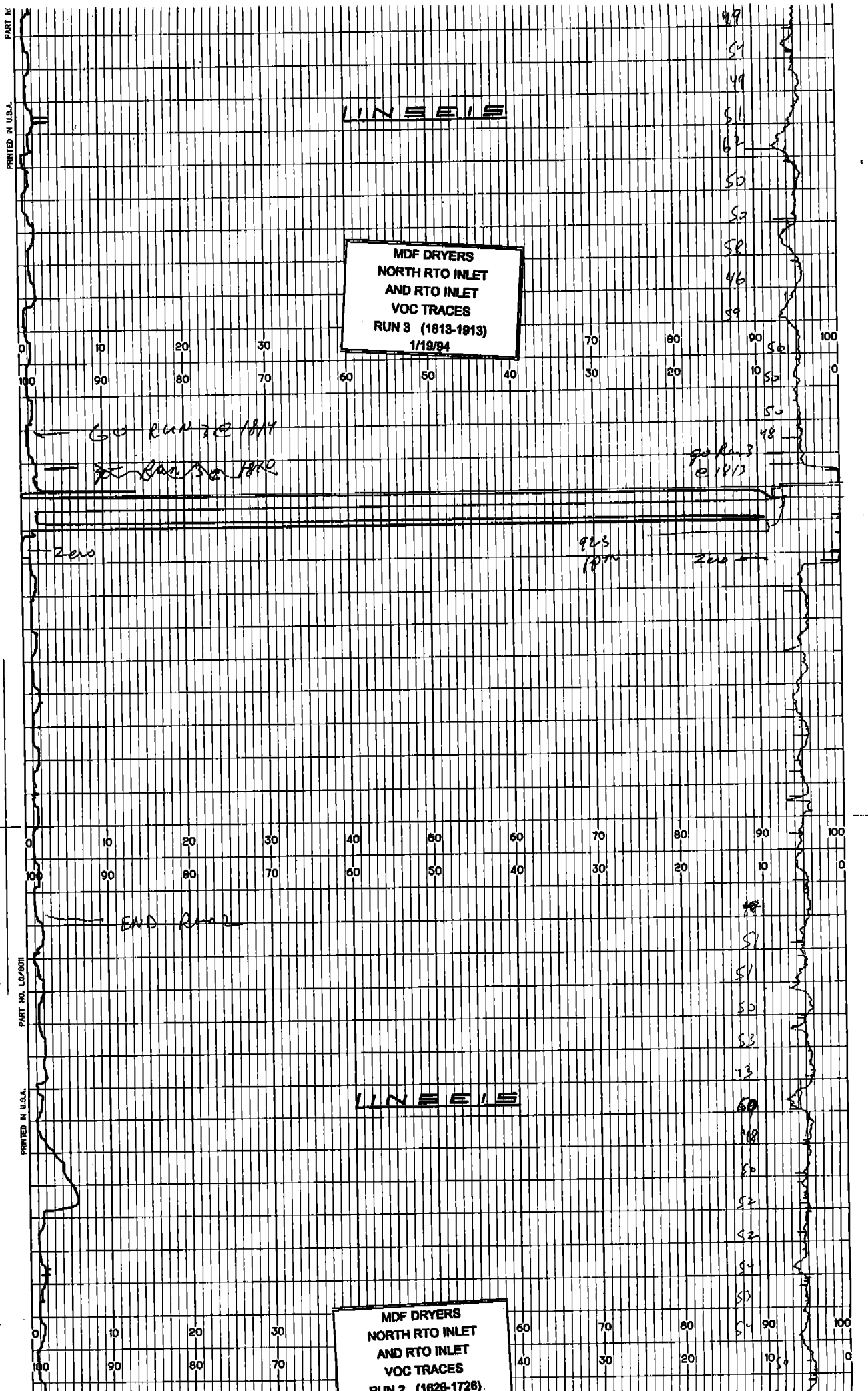
VOC TRACES

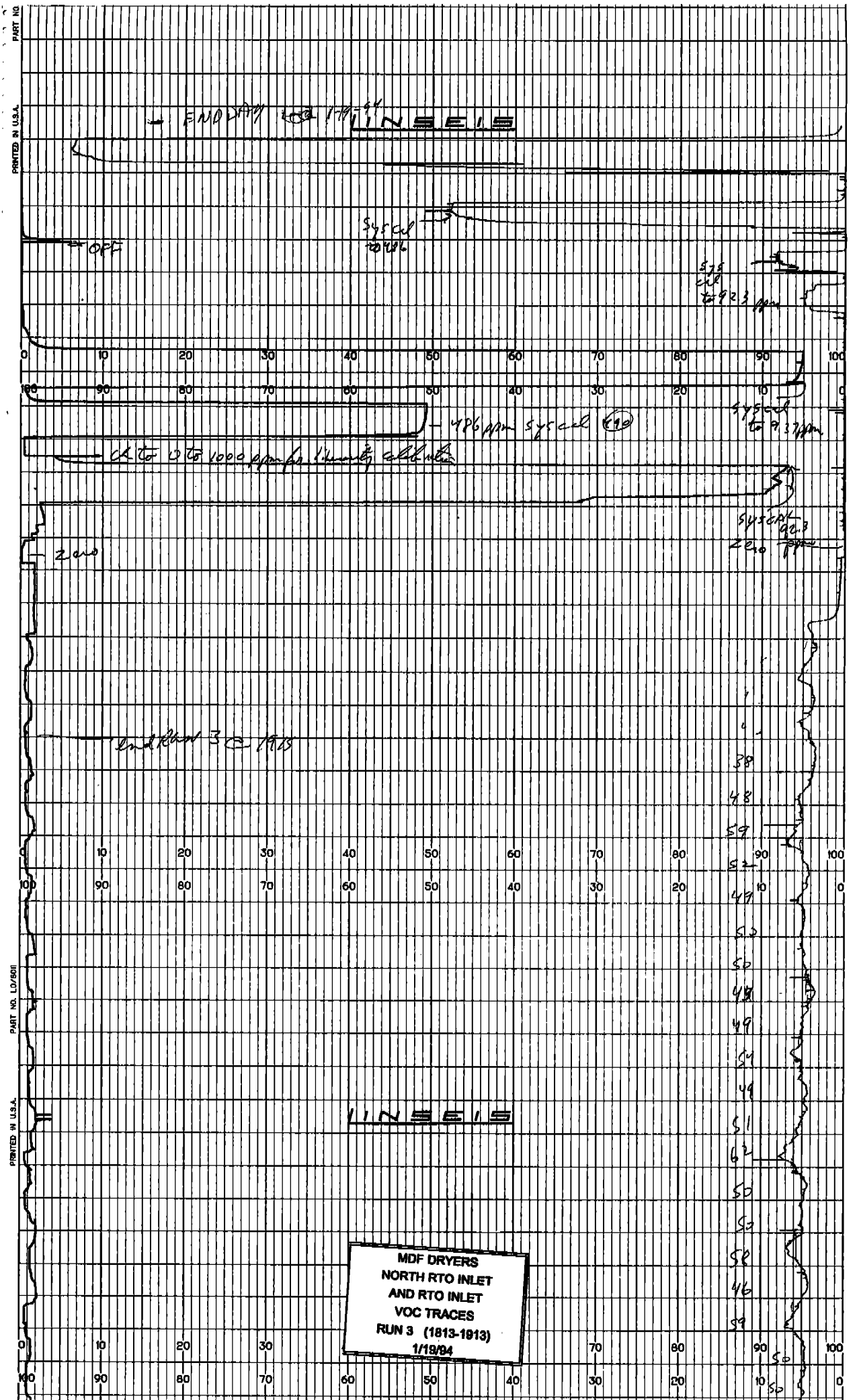

MDF DRYERS
NORTH RTO INLET
AND RTO INLET
VOC TRACES
RUN 1 (1108-1511)
1/19/94
0-100 ppm
OUTLET
1000 - 0
INLET
58
66
64
72
68
77
55
49
50
49
START R1 @ 1106
937 SysCAL
SysCAL 92.2
INSETS
Sys CAL to 937
Sys Cal 92.2
Sys Cal 486
Sys Cal 486
inst. cal 486 ppm
486 ppm INST. ADJUST
TECO
at outlet 0-1000 ppm
RATFISCH
R1 to L
INLET 0-10000
PART NO. LO/8011
PRINTED IN U.S.A.



end 1506
North MDF RTO
go @ 1436
Resume Run 1
MDF RTO INLET
59
75
62
77
74
82
81
74
65
70
chart off @ 1324 on @ 1427
zero
LINSEIS
sys cal 92.3
zero
chart off @ 1214 on @ 1301
92.3 ppm
system cal. 6
check inst. zero
pulse out
down @ 1136
down @ 1135
58
66
64
72
68
77
55
49
50
49
0-100 ppm
1000 - 0
OUTLET
INLET
MDF DRYERS
NORTH RTO INLET
AND RTO INLET
VOC TRACES
RUN 1 (1106-1511)
1/19/94
PART NO. LO/8011
PRINTED IN U.S.A.


MDF DRYERS
NORTH RTO INLET
AND RTO INLET
VOC TRACES
RUN 2 (1626-1726)
1/19/94
go Run 2 @ 1626
LINSEIS
END 1511
end 1516
PART NO. LD/8011
PRINTED IN U.S.A.

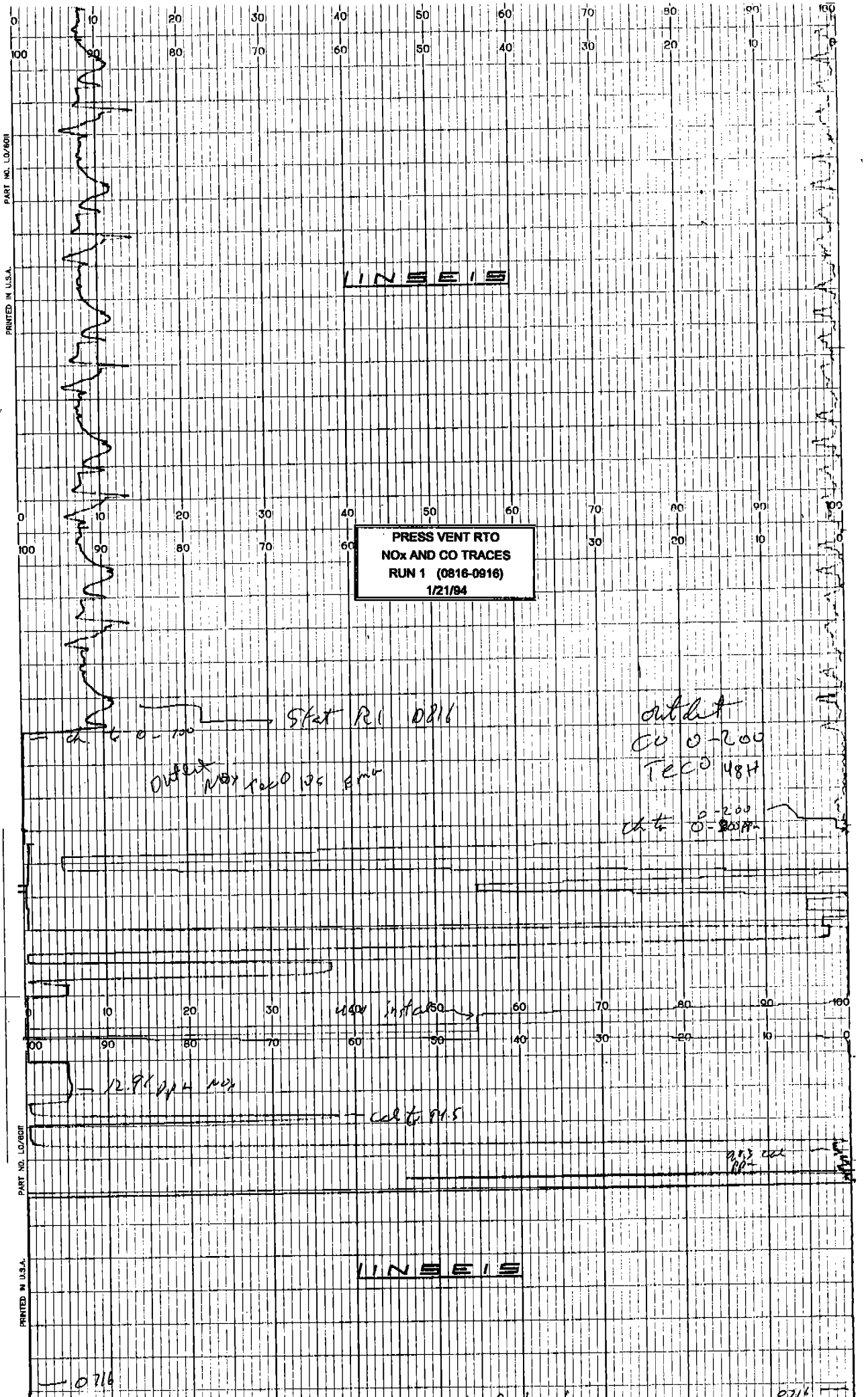

LINSEIS
MDF DRYERS
NORTH RTO INLET
AND RTO INLET
VOC TRACES
RUN 3 (1813-1913)
1/19/94
Go Run 2 @ 1814
Go Run 3 @ 1870
Go Run 3 @ 1913
Zero
Zero
END Run 2
LINSEIS
MDF DRYERS
NORTH RTO INLET
AND RTO INLET
VOC TRACES
RUN 2 (1626-1726)
PRINTED IN U.S.A.
PART NO. L0/9011

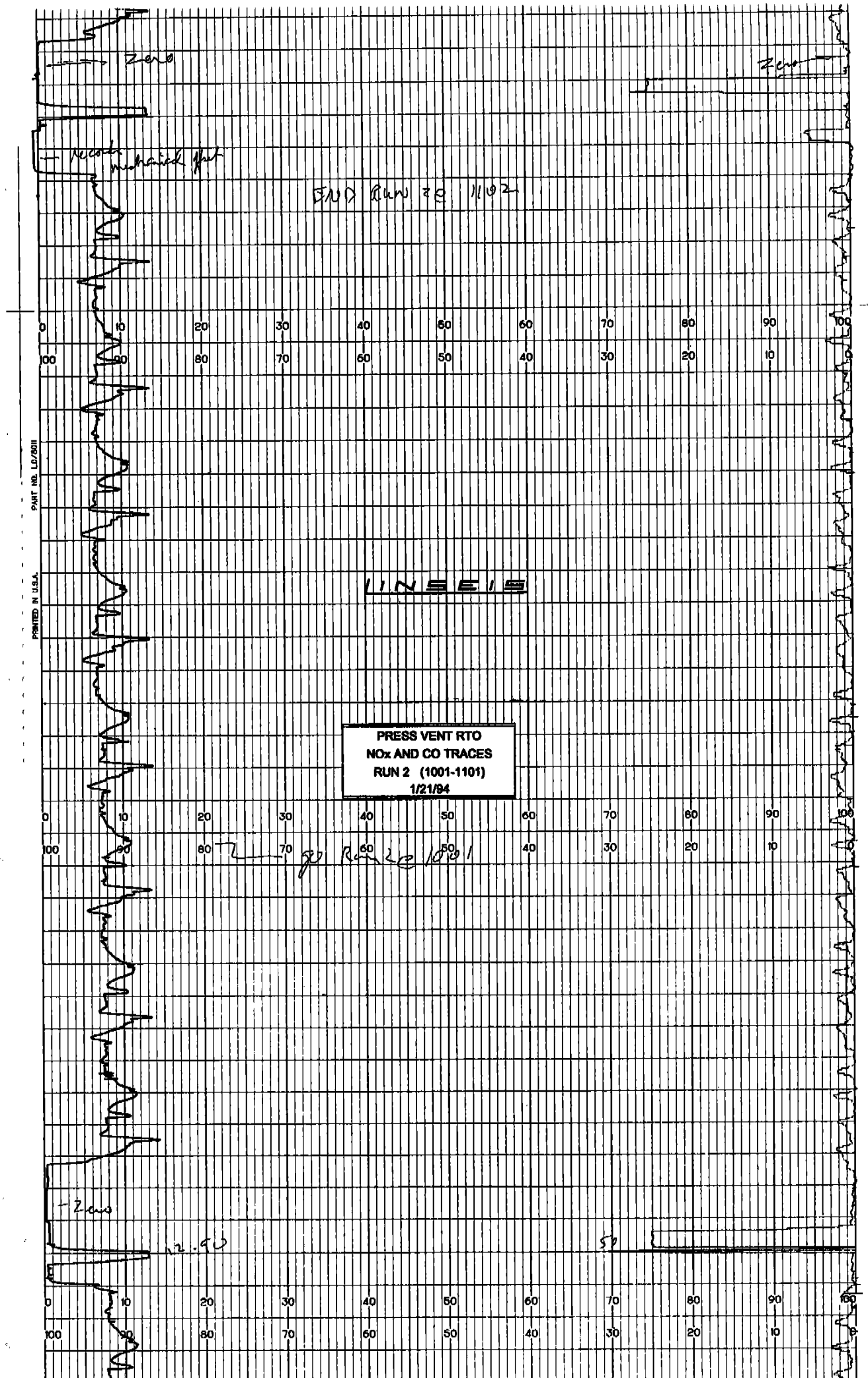


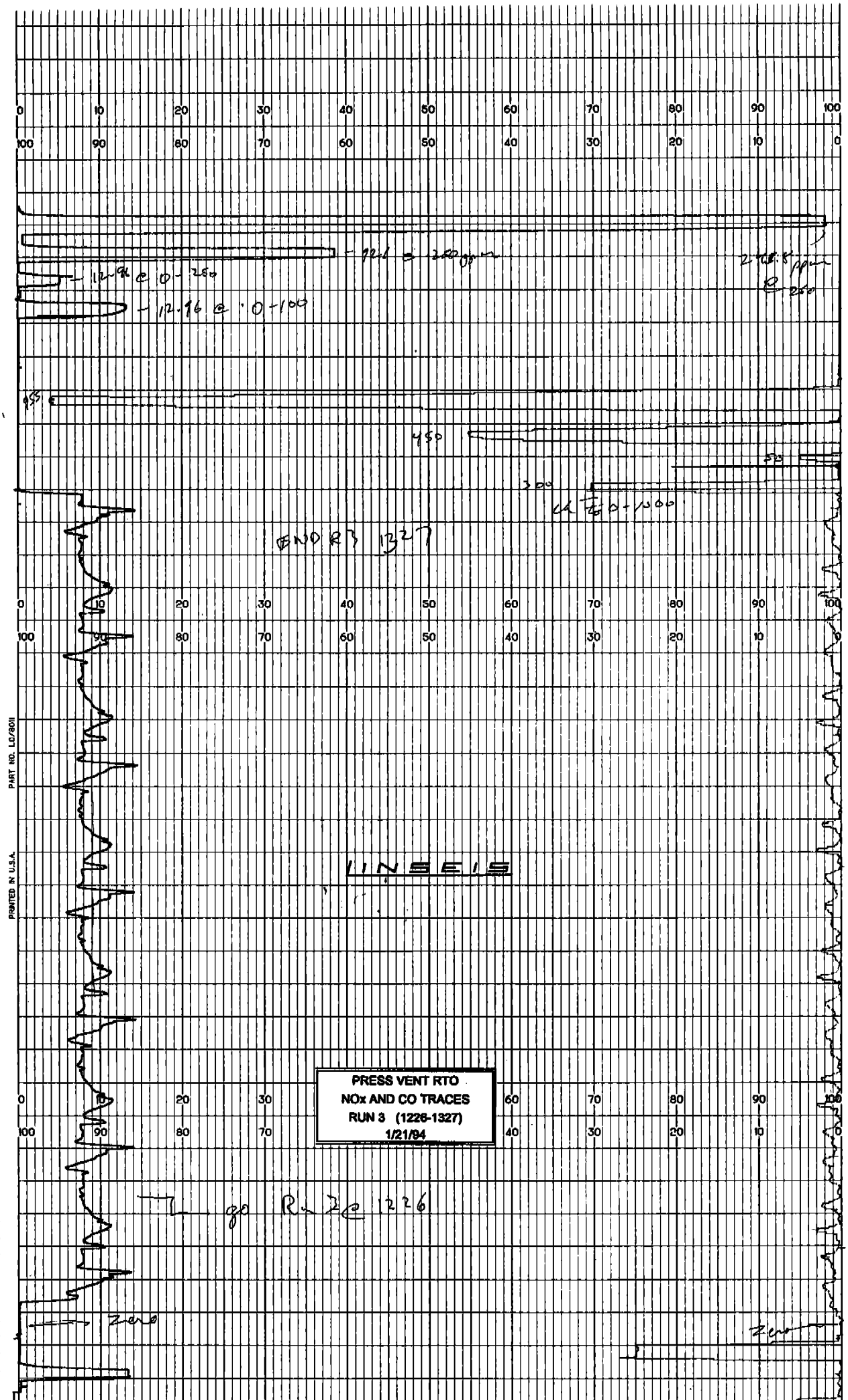
PART NO.
PRINTED IN U.S.A.
LINSEIS
OFF
Sys cal to 486
Sys cal to 923 ppm
Sys cal to 937 ppm
486 ppm sys cal
ck to 0 to 1000 ppm for linearity calibration
Zero
SYS CAL 92.3 ppm
end Run 3 @ 1915
38
48
59
52
49
50
50
48
49
54
49
51
62
50
50
58
46
59
50
50
PART NO. LO/5011
PRINTED IN U.S.A.
LINSEIS
MDF DRYERS
NORTH RTO INLET
AND RTO INLET
VOC TRACES
RUN 3 (1813-1913)
1/19/94

PRESS VENT RTO

CO/NOx TRACES

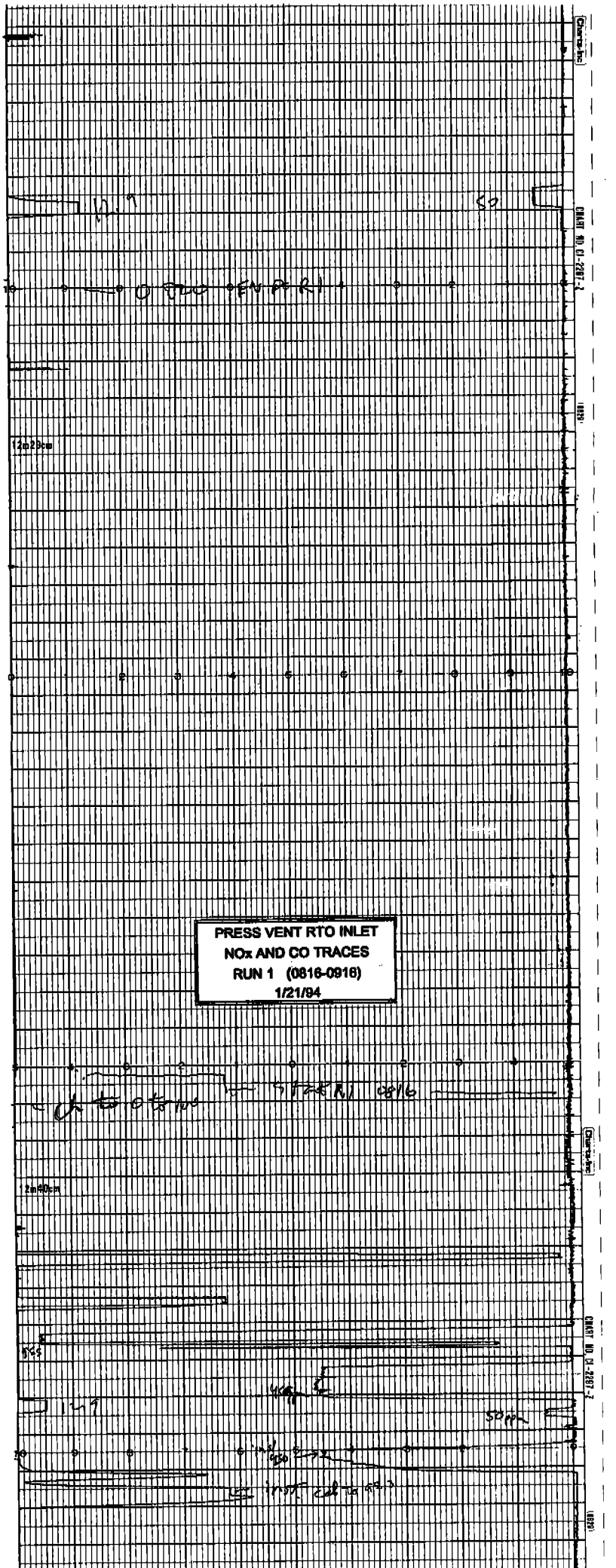

PRESS VENT RTO
NOx AND CO TRACES
RUN 1 (0816-0916)
1/21/94
LINSEIS
Stat R1 0816
outlet
CO 0-200
TECO 48H
12.96 ppm NOx
cal to 94.5
0716
PART NO. LO/8011
PRINTED IN U.S.A.

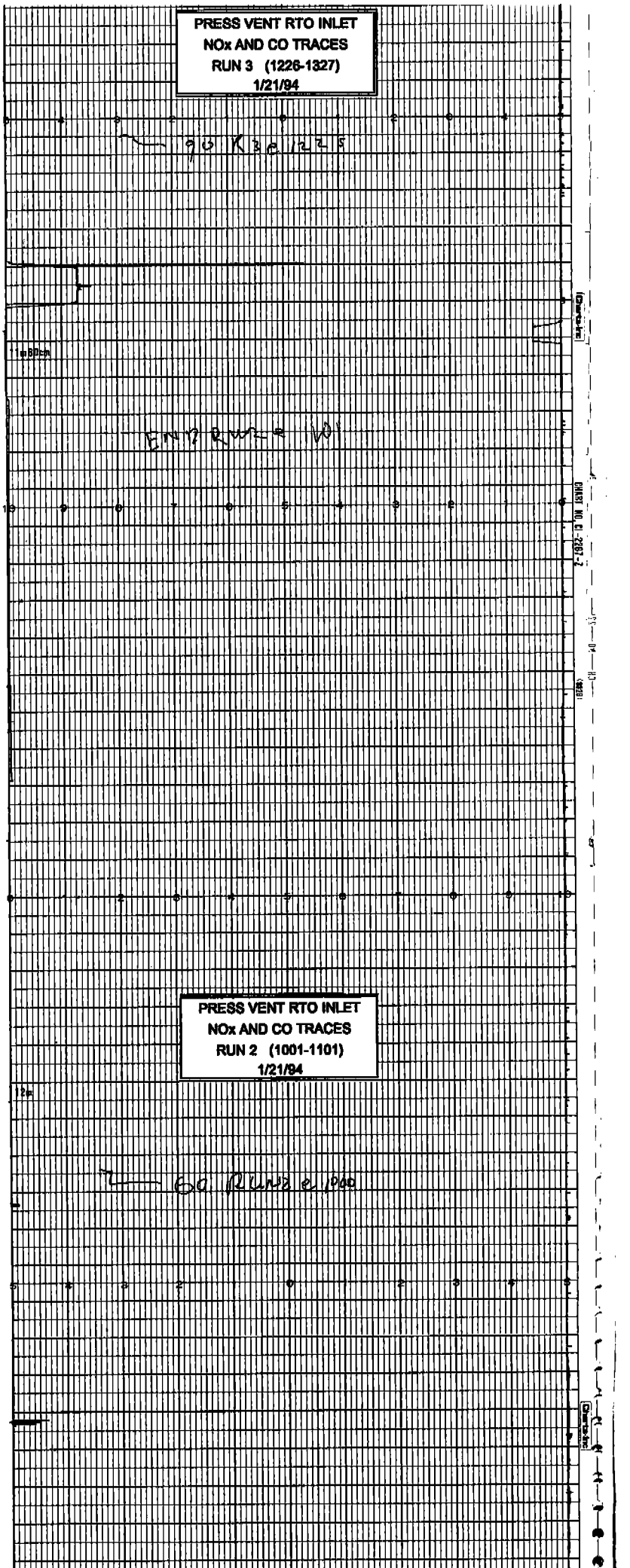

Zero
Zero
Recorder mechanical fault
END RUN 2 @ 1102
LINSEIS
PRESS VENT RTO
NOx AND CO TRACES
RUN 2 (1001-1101)
1/21/94
go Run 2 @ 1001
Zero
12.90
50
PRINTED IN U.S.A.
PART NO. LD/5011

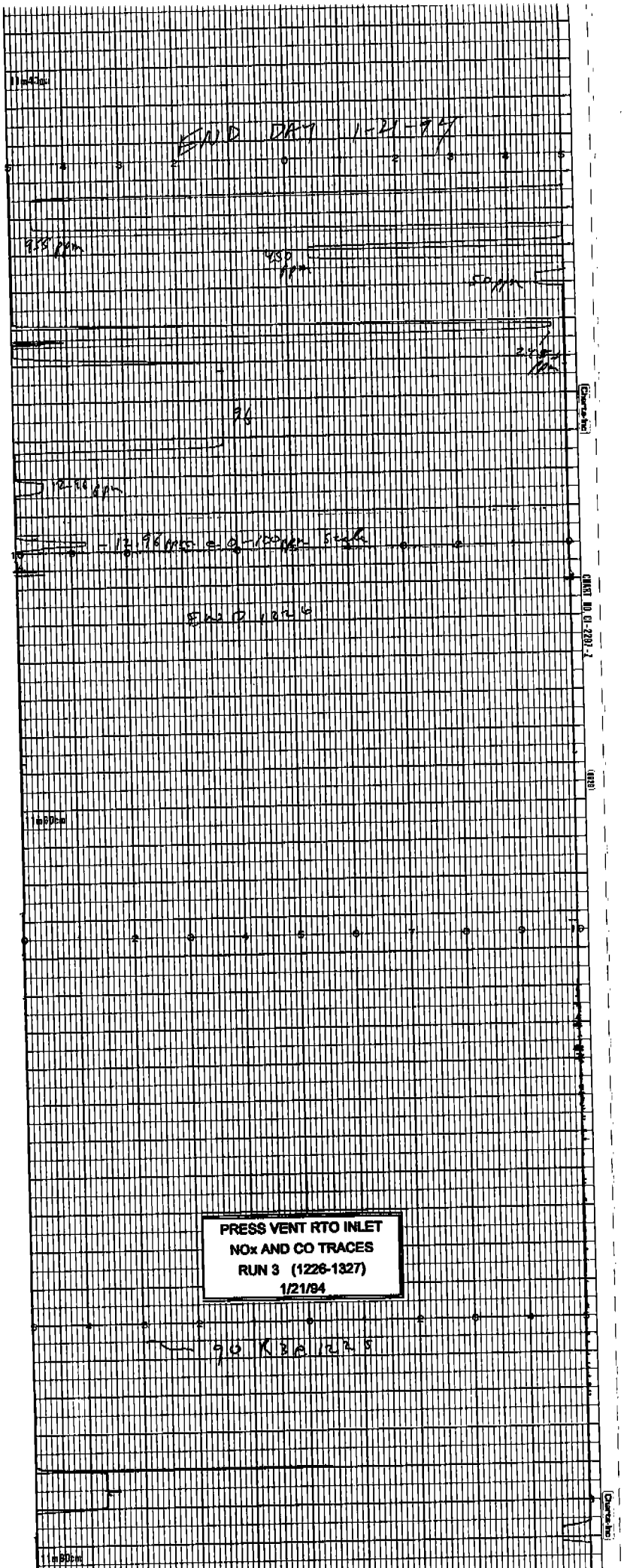

0 10 20 30 40 50 60 70 80 90 100
100 90 80 70 60 50 40 30 20 10 0
12.96 @ 0-250
12.96 @ 0-100
450
300
END R3 1327
LINSEIS
PRESS VENT RTO
NOx AND CO TRACES
RUN 3 (1226-1327)
1/21/94
Zero
Zero
PART NO. LD/8011
PRINTED IN U.S.A.

PRESS VENT RTO INLET

CO/NOX TRACES


PRESS VENT RTO INLET
NOx AND CO TRACES
RUN 1 (0816-0916)
1/21/94
12m23cm
12m40cm
CHART NO. C1-2287-2

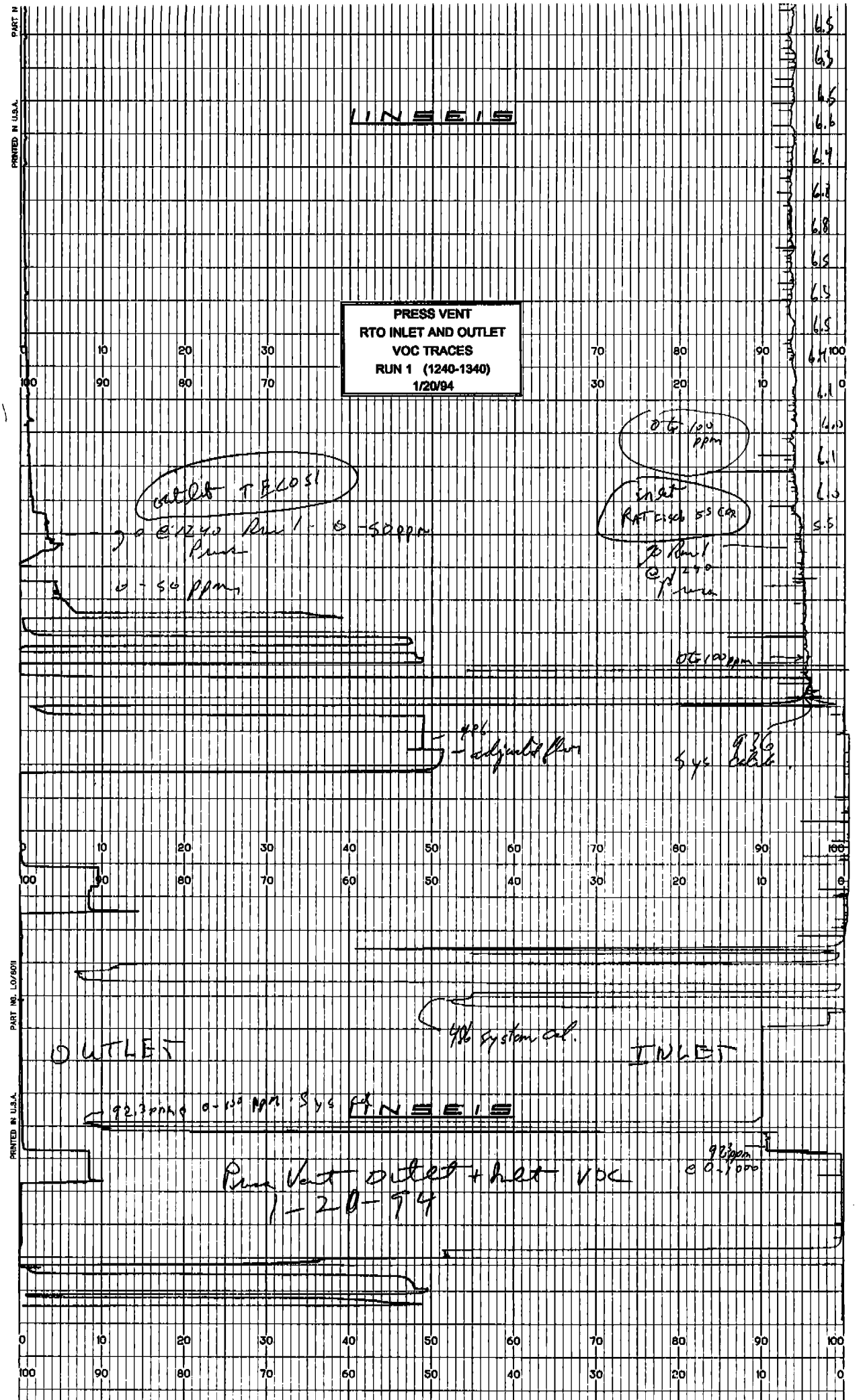

PRESS VENT RTO INLET
NOx AND CO TRACES
RUN 3 (1226-1327)
1/21/94
90 K3e 1225
END RUN 2 10
PRESS VENT RTO INLET
NOx AND CO TRACES
RUN 2 (1001-1101)
1/21/94
60 RUN 2 e 1000


END DAY 1-21-94
955 ppm
950 ppm
50 ppm
96
12.96 ppm
12.96 ppm = 0-100 ppm scale
END 1226
90 KBP 1225
PRESS VENT RTO INLET
NOx AND CO TRACES
RUN 3 (1226-1327)
1/21/94

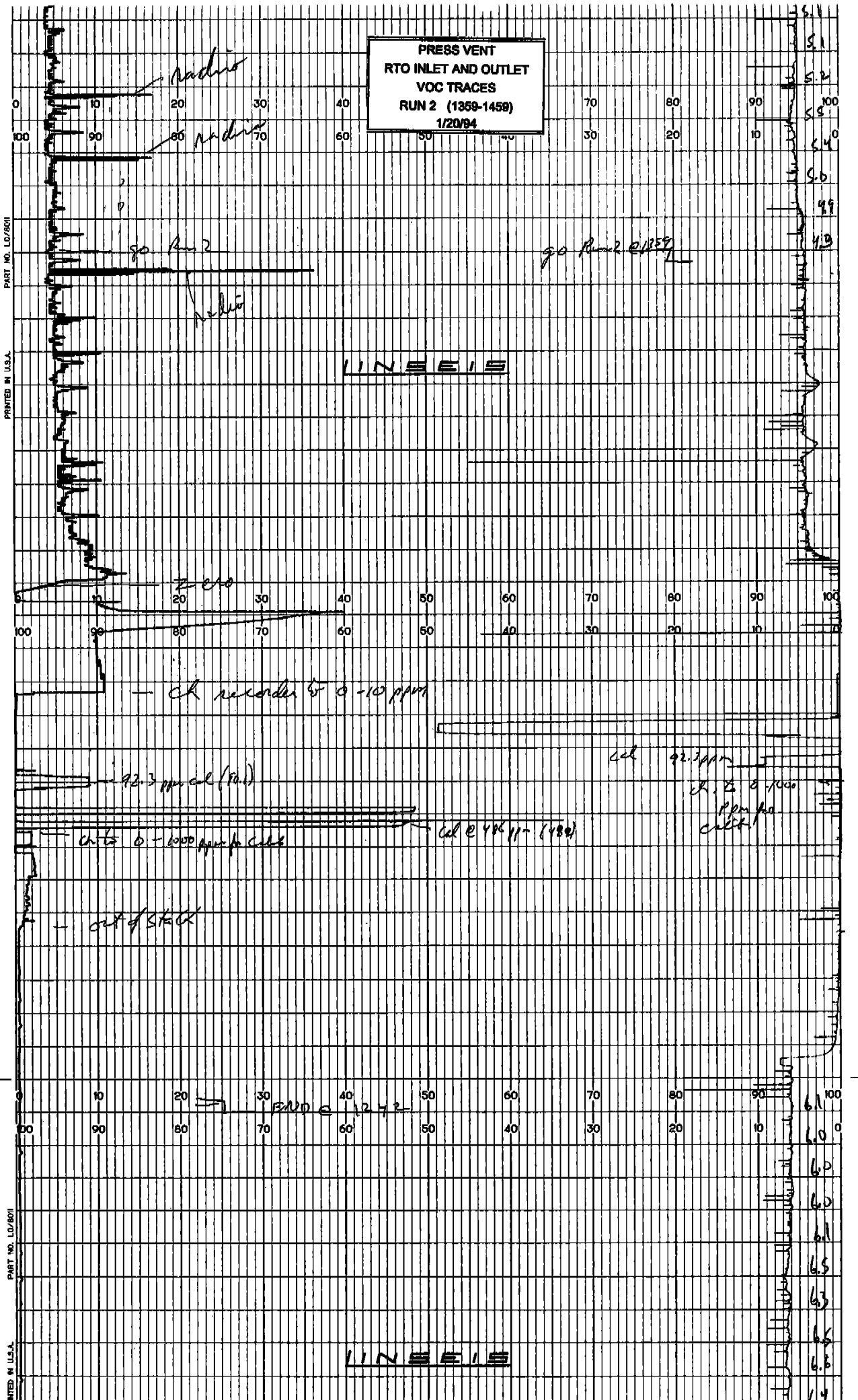
PRESS VENT RTO

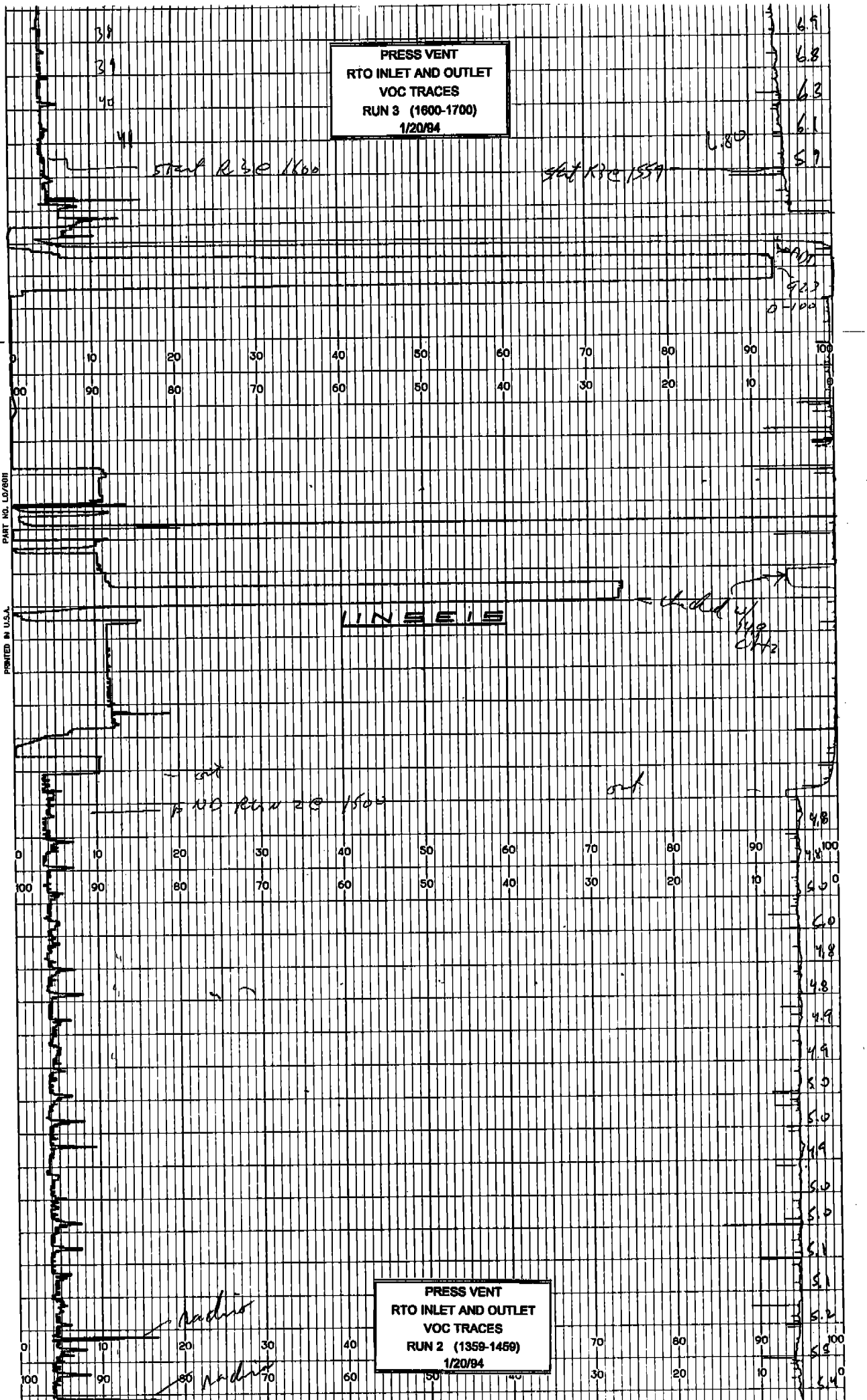
AND RTO INLET

VOC TRACES

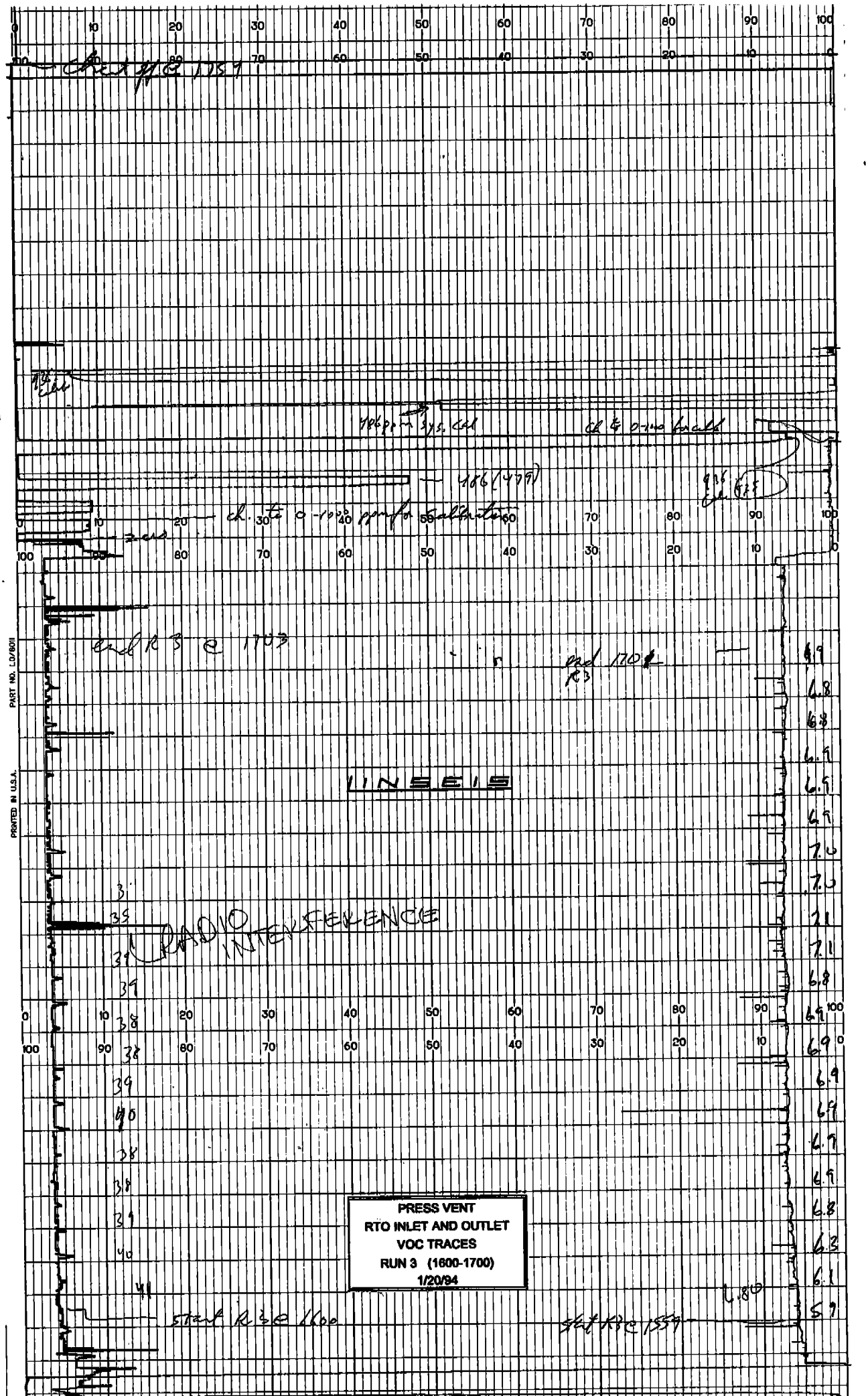

PRESS VENT
RTO INLET AND OUTLET
VOC TRACES
RUN 1 (1240-1340)
1/20/94
LINSEIS
OUTLET
INLET
LINSEIS
Press Vent outlet + Inlet VOC
1-20-94

PRESS VENT
RTO INLET AND OUTLET
VOC TRACES
RUN 2 (1359-1459)
1/20/94





PRINTED IN U.S.A. PART NO. LD/8011


PRESS VENT
RTO INLET AND OUTLET
VOC TRACES
RUN 3 (1600-1700)
1/20/94
RADIO INTERFERENCE
LINSEIS
PART NO. LD/8011
PRINTED IN U.S.A.

APPENDIX C.

CALIBRATION DATA

DRY GAS METER CALIBRATION

Meter ID	Andersen		
Calibration Method	DGM/DGM	**By**	DGR
Calibration Meter ID	651729	**Pbar**	29.95
Date	11/22/93		

Vac. in. Hg	DH in. H2O	Time min	Calibrating Meter Vi cf	Calibrating Meter Vf cf	Calibrating Meter Temp F	Field Meter Vi cf	Field Meter Vf cf	Field Meter Temp. in inlet	Field Meter Temp. in final	Field Meter Temp. out inlet	Field Meter Temp. out final	Y	Q	K	DH@
1	5.00	8.33	887.293	897.494	69	574.007	584.124	68	90	68	70	1.005	1.21	0.7	1.8932
1	4.00	9.50	897.494	907.956	69	584.124	594.686	87	108	70	77	1.011	1.1	0.71	1.8525
1	3.00	10.00	907.956	917.643	72	594.686	604.589	106	118	78	87	1.017	0.98	0.72	1.7816
1	2.00	12.50	917.643	927.274	69	604.589	614.675	110	118	88	96	1.011	0.8	0.71	1.82
1	1.00	16.50	927.274	936.795	70	614.675	624.8	112	118	95	102	1.003	0.61	0.76	1.6057
Averages:												1.011			1.7906

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

K = Q(sqrt((Pm Mm)/((Tm out)(DH))

Q = ((Vmi-Vmf)/min.)(TM,out/Tm,avg)(Y)

DH@ = 0.921/K^2

Where:

Y = Meter correction factor, dimensionless

Vcal = Volume of gas through calibrating meter, cubic feet

Vdgm = Volume of gas through field dry gas meter, cubic feet

Pbar = Barometric pressure, in. Hg

Pm = Meter pressure, (Pbar = DH/13.6)

Tdgm = Average dry gas meter temp, degrees R

Tcal = Temperature of gas at calibrating meter, degrees R

DRY GAS METER CALIBRATION

Meter ID	Andersen		
Calibration Method	DGM/DGM	**By**	BMcK
Calibration Meter ID	651729	**Pbar**	29.87
Date	1/23/94		

Vac. in. Hg	DH in. H2O	Time min	Calibrating Meter Vi cf	Calibrating Meter Vf cf	Calibrating Meter Temp F	Field Meter Vi cf	Field Meter Vf cf	Field Meter Temp. in init.	Field Meter Temp. in final	Field Meter Temp out init.	Field Meter Temp out final	Y	Q	K	DH@
1	2.50	15.00	57.375	70.220	66	156.742	169.410	50	85	59	64	1.005	0.84	0.69	1.935
1	2.50	15.00	70.220	83.395	68	169.410	182.686	86	108	62	72	1.012	0.87	0.71	1.834
1	2.50	15.00	83.395	96.311	66	182.686	195.961	102	115	70	81	1.015	0.87	0.7	1.864
Averages:												1.01			1.88

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

K = Q(sqrt((Pm Mm)/((Tm out)(DH))

Q = ((Vmi-Vmf)/min.)(TM,out/Tm,avg)(Y)

DH@ = 0.921/K^2

Where:

Y = Meter correction factor, dimensionless

Vcal = Volume of gas through calibrating meter, cubic feet

Vdgm = Volume of gas through field dry gas meter, cubic feet

Pbar = Barometric pressure, in. Hg

Pm = Meter pressure, (Pbar = DH/13.6)

Tdgm = Average dry gas meter temp, degrees R

Tcal = Temperature of gas at calibrating meter, degrees R

DRY GAS METER CALIBRATION

Meter ID	RAC 591349		
Calibration Method	DGM/DGM	By	DGR
Calibration Meter ID	651729	Pbar	29.7
Date	12/5/93		

Vac.	DH	Time	Calibrating Meter			Field Meter						Y	Q	K	DH@
in. Hg	in. H2O	min	Vi cf	Vf cf	Temp F	Vi cf	Vf cf	Temp. in init.	Temp. in final	Temp out init.	Temp out final				
1	5.00	8.50	936.797	947.036	67	227.177	237.657	75	103	72	71	0.989	1.2	0.69	1.949
1	3.00	12.50	947.036	958.747	67	237.657	249.842	92	104	71	75	0.988	0.94	0.69	1.919
1	2.00	16.50	958.747	970.912	67	249.842	262.643	103	105	76	79	0.988	0.75	0.67	2.043
1	1.25	17.00	970.912	980.787	67	262.643	273.079	92	105	77	75	0.980	0.59	0.67	2.059
1	0.85	20.00	980.787	990.762	67	273.079	283.657	98	102	80	82	0.983	0.51	0.7	1.880
Averages:												0.99			1.97

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

K = Q(sqrt((Pm Mm)/((Tm out)(DH))

Q = ((Vmi-Vmf)/min.)(TM,out/Tm,avg)(Y)

DH@ = 0.921/K^2

Where:

Y = Meter correction factor, dimensionless

Vcal = Volume of gas through calibrating meter, cubic feet

Vdgm = Volume of gas through field dry gas meter, cubic feet

Pbar = Barometric pressure, in. Hg

Pm = Meter pressure, (Pbar = DH/13.6)

Tdgm = Average dry gas meter temp, degrees R

Tcal = Temperature of gas at calibrating meter, degrees R

DRY GAS METER CALIBRATION

Meter ID	RAC		
Calibration Method	DGM/DGM	**By**	BMcK
Calibration Meter ID	651729	**Pbar**	29.87
Date	1/23/94		

Vac. in. Hg	DH in. H2O	Time min	Calibrating Meter Vi cf	Vf cf	Temp F	Field Meter Vi cf	Vf cf	Temp. in init.	Temp. in final	Temp out init.	Temp out final	Y	Q	K	DH@
1	2.70	66.00	96.412	154.944	68	274.546	334.993	68	129	68	91	1.000	0.9	0.7	1.899
1	2.70	20.15	154.944	172.577	67	334.993	354.062	125	132	92	97	0.996	0.91	0.7	1.890
1	2.70	22.00	172.577	191.882	67	354.062	374.883	128	135	98	100	1.005	0.92	0.7	1.865
Averages:												1.00			1.88

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

K = Q(sqrt((Pm Mm)/((Tm out)(DH))

Q = ((Vmi-Vmf)/min.)(TM,out/Tm,avg)(Y)

DH@ = 0.921/K^2

Where:

Y = Meter correction factor, dimensionless

Vcal = Volume of gas through calibrating meter, cubic feet

Vdgm = Volume of gas through field dry gas meter, cubic feet

Pbar = Barometric pressure, in. Hg

Pm = Meter pressure, (Pbar = DH/13.6)

Tdgm = Average dry gas meter temp, degrees R

Tcal = Temperature of gas at calibrating meter, degrees R

APPENDIX D.

FORMALDEHYDE ANALYLSIS

(AIR TECHNIQUES/OXFORD LABORATORIES)

OL # 19W-7788

TIME RECEIVED _____
DATE EXTRACTED _____

SAMPLE SUBMISSION FORM
Oxford Laboratory

Submitted By | Date Submitted 1-27-94 | Date Requested

Company Name Air Techniques | Attention Russell Barton

Address | State | Zip Code

Telephone | Received By

No. of Samples & Identification: Purchase Order# 4462

1. LP MDF North	R 1	(7) LP MDF INR 1		(13) LP PV INR 1	
2.	2	(8)	2	(14)	2
3.	3	(9)	3	(15)	3
4. South	1	(10) LP PV out R 1		(16) Blank	
5.	2	(11)	2		
6.	3	(12)	3		

Analyses Requested and Special Instructions: MOOII

TYPE OF SAMPLE: WW ___ MW ___ DW ___ SLUDGE ___ SOIL ___ OTHER ✓

TYPE OF FORM(S): SPOES ___ CUSTODY ✓ STATE ___ P. TREAT ___ OTHER: _____

CALL: ___ FAX: ___ # _____ DATE: _____ COPY: _____ OTHER: _____

Results:	(1)	(2)	(3)	(4)	(5)	(6)
Formaldehyde, total ug	2070	1790	1970	2470	2960	4400
	(7)	(8)	(9)	(10)	(11)	(12)
HCHO	9690	13200	14800	534	363	269
	(13)	(14)	(15)	(16)		
HCHO	82400	72200	57700	16.8		

1994 02 07 12:01 PAGE - 01

APPENDIX E.

(ARMSTRONG ENVIRONMENTAL REPORT)

Compliance Emissions Sampling
Louisiana Pacific
Urania, LA
January 18-19, 1994
Armstrong Environmental Inc.
Project W-1479-94

Report Prepared For:
Mr. Dan Russell
PO Box 655
Ridgeland, MS 39158

Report Prepared January 19, 1994 by:
Armstrong Environmental, Inc.
7715 Sovereign Row
Dallas, Texas 75247
(214) 631-0021

TABLE OF CONTENTS

		Page
1.	INTRODUCTION	1
2.	SUMMARY	2 - 4
3.	PROCEDURES	5 - 6
4	APPENDICES	
	A - CALCULATION SUMMARIES	7 - 18
	B - ANALYTICAL SUMMARIES	19 - 23
	C - FIELD DATA SHEETS	24 - 29
	D - STRIP CHART SUMMARIES	30 - 53
	E - EQUIPMENT CALIBRATIONS	54 - 62
	F - GAS CERTIFICATIONS	63 - 73

I. INTRODUCTION

A series of tests were performed on the South RTO Exhaust at the Louisiana Pacific facility located in Urania, Louisiana on January 18-19, 1994.

The purpose of this test series was to determine emission rates of Particulate, CO, NOx, VOC and Formaldehyde in terms of lbs/hr.

Testing was performed following procedures detailed in Title 40:Code of Federal Regulations (40:CFR).

Sampling was performed by Cody Jefferson, Scott Craig, Jerry Salinas, Larry Whicher and Tom Armstrong of Armstrong Environmental, Inc. using an Apex Method 5 sampling train, a Beckman 400A Continuous FID Hydrocarbon analyzer, a Fuji Continuous NDIR CO Analyzer and a TECO Model 10 Continuous NOX Analyzer.

Testing was performed over a two day period, commencing on January 18 at 11:14 am and ending at 5:55 pm and commencing at 11:06 am and ending at 7:10 pm, January 19, 1994.

Submitted by:
Armstrong Environmental Inc.

Jill Smith

Jill Smith
Environmental Specialist

Tom Armstrong

Tom Armstrong
President

II. SUMMARY

A series of tests were performed on the Louisiana Pacific South RTO Exhaust at the facility in Urania, LA on January 18-19, 1994.

Testing was performed following procedures detailed in Title 40: Code of Federal Regulations.

The results of this test series are summarized in Table 1-2.

Results indicate the following emission rates:

Run #	1	2	3	Average
Particulate, lbs/hr	6.372	11.69	6.795	8.286
NOX as NO2, lbs/hr	16.74	15.73	13.06	15.18
CO, lbs/hr	0.315	ND	ND	0.105
Formaldehyde, lbs/hr	0.3633	0.4372	0.6224	0.4743
VOC as C3H8, lbs/hr	0.255	ND	ND	0.085

Formaldehyde results reported by telephone via Dan Russell on February 8, 1994.

SUMMARY OF EMISSIONS TEST DATA

Table : 1
Plant : Louisiana Pacific, Urania, LA
Location : South RTO Exhaust - Particulate Train
Operator : C.Jefferson, S.Craig, J.Salinas, L.Whicher, T.Armstrong
Test Date : 18-Jan-94

Repetition :	1	2	3
STACK GAS			
Temperature, F	220.4	225.5	220.8
Velocity, fps	46.37	45.04	44.97
Volume Flow, acfm	108361.7	105251.1	105070.9
scfm	80061.0	76576.4	76971.4
scfh	4803662	4594581	4618286
Moisture, %	6.02%	6.76%	6.64%
CO2, %	0.00	0.00	0.00
O2, %	21.00	21.00	20.00
SAMPLE			
Start Time, hrs:min	11:14 AM	2:58 PM	4:55 PM
Finish Time, hrs:min	12:18 PM	3:59 PM	5:55 PM
Sample Volume, scf	39.399	38.106	38.514
Isokinetic Ratio, %	97.36243	98.45317	98.99711
PARTICULATE			
Sample Weight, mg	23.70	43.97	25.70
Concentration, gr/scf	0.009282	0.017804	0.010296
Emissions, lbs/hr	6.371541	11.69001	6.795145
CARBON MONOXIDE			
Concentration, ppm	0.9045	ND	ND
Emissions, lbs/hr	0.31583	ND	ND
NITROGEN OXIDE AS NO2			
Concentration, ppm	29.245	28.662	23.69
Emissions, lbs/hr	16.77628	15.72621	13.06524

SUMMARY OF EMISSIONS TEST DATA

Table : 2
Plant : Louisiana Pacific, Urania, LA
Location : South RTO Exhaust - Formaldehyde Train
Operator : C.Jefferson, S.Craig, J.Salinas
Test Date : 19-Jan-94

Repetition :	1	2	3
STACK GAS			
Temperature, F	218.3	225.7	224.9
Velocity, fps	47.31	47.49	48.68
Volume Flow, acfm	110535.5	110968.9	113743.9
scfm	81580.8	80953.7	83207.0
scfh	4894848	4857224	4992419
Moisture, %	6.91%	6.99%	6.83%
CO2, %	0.00	0.00	0.00
O2, %	21.00	21.00	21.00
SAMPLE			
Start Time, hrs:min	11:06 AM	4:27 PM	6:10 PM
Finish Time, hrs:min	12:06 PM	5:27 PM	7:10 PM
Sample Volume, scf	73.386	72.510	77.817
Isokinetic Ratio, %	98.16559	97.74506	102.0585
VOC AS C3H8			
Concentration, ppm	0.456	ND	ND
Emissions, lbs/hr	0.254959	ND	ND
FORMALDEHYDE			
Sample Weight, mg	2.47	2.96	4.40
Concentration, ppm	0.95197	1.154605	1.599253
Emissions, lbs/hr	0.363272	0.437211	0.62244

III. PROCEDURES

The procedure for emissions sampling followed USEPA test methods as detailed in Title 40: Code of Federal Regulations. The following methods were used:

Method	Title
1	Sample and Velocity Traverses from Stationary Sources
2	Determination of Stack Gas Velocity and Volumetric Flow (Type S Pitot)
3	Gas Analysis for CO_2, O_2, Excess Air and Dry Molecular Weight
4	Determination of Moisture Content in Stack Gases
5	Determination of Particulate Emissions from Stationary Sources
7E	Determination of Nitrogen Oxides Emissions from Stationary Sources (Instrument Analyzer Procedure)
10	Determination of Carbon Monoxide Emissions from Stationary Sources
25A	Determination of Total Gaseous Organic Concentration using a Flame Ionization Analyzer

Particulate sampling was performed at 24 points, 2.5 minutes per point, making a total run duration of 60.0 minutes. A 9 foot stainless steel probe was used with a 0.24533 inch ID stainless steel sampling nozzle. Sampling was performed using a "Type S" pitot tube.

Formaldehyde sampling was performed using an Apex Method 5 sampling train with a glass lined probe and a 0.33033 glass nozzle. Sampling was performed isokinetically at 24 points for 60 minutes. Formaldehyde train contained 100 mls of DNPH reagent in each of the first and second impingers, third empty and fourth containing Silica Gel.

CO_2 and O_2 were determined using fyrite analyzers.

Volume flow, moisture and particulates were determined using an Apex Method 5 sampling train with 100mls of distilled water in the first and second impingers, third empty, and 200 grams of silica gel in the fourth impinger.

Carbon monoxide was determined using a Fuji Continuous NDIR CO Analyzer spanned with 402 ppm, 106.7 ppm and 50 ppm EPA Protocol 1 CO gas standards balanced with N_2, +/- 2% Certified.

Nitrogen oxides were determined using a TECO Model 10 Continuous NOX Analyzer spanned with 402.4 ppm, 98.2 ppm and 30.6 ppm EPA Protocol 1 NOX gas standards balanced with N2.

VOC was determined using a Beckman 400A FID analyzer spanned with 203 ppm, 30.4 ppm and 5.5 ppm EPA Protocol 1 Propane gas standards balanced with N2.

Formaldehyde analysis was provided by Mr. Dan Russell, to whom Formaldehyde samples were delivered onsite.

APPENDIX A

PARTICULATE EMISSION TEST SUMMARY

PLANT : Louisiana Pacific, Urania, LA
DATE : 18-Jan-94
PLACE : South RTO Exhaust - Particulate Train
RUN# : 1

TEST DURATION (MINUTES) :	60	LIQUID COLLECTED (mls) :	53.6
NOZZLE DIAMETER (INCH.) :	0.24533	PARTICULATE WEIGHT (Front half mg	23.7
METER COEFFICIENT (Y) :	0.97853	PARTICULATE WEIGHT (Back half mg)	0
PITOT COEFFICIENT (Cp) :	0.84	STATIC PRESSURE (in. H2O) :	-0.28
GAS METER VOL.(Cu.Ft.) :	38.563	PERCENT CO2 :	0
BAROMETRIC PRESSURE :	30.33	PERCENT O2 :	21
		PERCENT CO :	0

MOLECULAR WEIGHTS

CARBON MONOXIDE :	28	FLUORIDES :	19
VOC AS C3H8 :	44	CHLORIDES :	35.5
NOX AS NO2 :	46		

FOR CIRCULAR STACK		FOR RECTANGULAR STACK	
STACK DIAMETER (inch):	84.5	STACK LENGTH(inches) :	
STACK AREA (Sq.Ft.) :	38.944	STACK WIDTH(inches) :	
NOZZLE AREA (feet):	0.00033	STACK AREA (Sq.Ft.) :	0

ENTER THE STACK AREA SHOWN ABOVE: 38.944

FLOWS

SAMPLED VOLUME (STD. CU.FT.):	39.3990
VOLUME OF WATER VAPOR (STD. CU.FT.):	2.5230
FRACTIONAL MOISTURE CONTENT (%):	0.0602
DRY BASE:	79.0000
MOLECULAR WT. OF STACK GAS (DRY BASE):	28.8400
MOLECULAR WT. OF STACK GAS (WET BASE):	28.1876
STACK PRESSURE (inch Hg):	30.3094
STACK GAS VELOCITY (ft/sec.):	46.3750
ACTUAL STACK GAS FLOW RATE (ACFM):	108361.744
STANDARD STACK GAS FLOW RATE (SCFH):	4803661.69

PARTICULATE

FRONT HALF

PARTICULATE CONCENTRATION (GR./SCF):	0.0093
PARTICULATE CONCENTRATION (LBS/SCF):	1.33E-06
PARTICULATE EMISSION (LBS/HR):	6.3715

BACK HALF

PARTICULATE CONCENTRATION (GR./SCF):	0.0000
PARTICULATE CONCENTRATION (LBS/SCF):	0.00E+00
PARTICULATE EMISSION (LBS/HR):	0.0000

ISOKINETIC RATIO (%): 97.3624

POINTS	STACK T. deg F	DELTA P	SQ DP	DELTA H	METER T. INLET	METER T. OUTLET	METER T. AVERAGE
1	216	0.66	0.8124	1.58	50	51	50.5
2	220	0.68	0.82462	1.62	46	46	46
3	225	0.64	0.8	1.52	50	47	48.5
4	220	0.62	0.7874	1.48	53	44	48.5
5	219	0.58	0.76158	1.38	54	45	49.5
6	220	0.58	0.76158	1.38	54	46	50
7	223	0.49	0.7	1.17	55	45	50
8	223	0.46	0.67823	1.09	59	46	52.5
9	224	0.55	0.74162	1.31	58	46	52
10	221	0.55	0.74162	1.31	58	46	52
11	219	0.64	0.8	1.52	60	48	54
12	221	0.59	0.76811	1.41	62	49	55.5
13	226	0.73	0.8544	1.74	57	54	55.5
14	218	0.67	0.81854	1.60	60	54	57
15	217	0.68	0.82462	1.62	60	54	57
16	225	0.62	0.7874	1.48	61	53	57
17	218	0.52	0.72111	1.24	62	52	57
18	223	0.45	0.67082	1.07	62	51	56.5
19	216	0.35	0.59161	0.83	62	53	57.5
20	222	0.32	0.56569	0.76	63	51	57
21	226	0.35	0.59161	0.83	64	52	58
22	214	0.38	0.61644	0.90	63	53	58
23	215	0.35	0.59161	0.83	64	53	58.5
24	218	0.31	0.55678	0.74	64	52	58
	220.375		0.7237	1.2671	58.3750	49.6250	54.0000

PARTICULATE EMISSION TEST SUMMARY

PLANT : Louisiana Pacific, Urania, LA
DATE : 18-Jan-94
PLACE : South RTO Exhaust - Particulate Train
RUN# : 2

TEST DURATION (MINUTES) :	60	LIQUID COLLECTED (mls) :	58.7
NOZZLE DIAMETER (INCH.) :	0.24533	PARTICULATE WEIGHT (Front half mg	43.97
METER COEFFICIENT (Y) :	0.97853	PARTICULATE WEIGHT (Back half mg)	0
PITOT COEFFICIENT (Cp) :	0.84	STATIC PRESSURE (in. H2O) :	-0.28
GAS METER VOL.(Cu.Ft.) :	37.266	PERCENT CO2 :	0
BAROMETRIC PRESSURE :	30.33	PERCENT O2 :	21
		PERCENT CO :	0

MOLECULAR WEIGHTS

CARBON MONOXIDE :	28	FLUORIDES :	19
VOC AS C3H8 :	44	CHLORIDES :	35.5
NOX AS NO2 :	46		

FOR CIRCULAR STACK		FOR RECTANGULAR STACK	
STACK DIAMETER (inch):	84.5	STACK LENGTH(inches) :	
STACK AREA (Sq.Ft.) :	38.944	STACK WIDTH(inches) :	
NOZZLE AREA (feet):	0.00033	STACK AREA (Sq.Ft.) :	0

ENTER THE STACK AREA SHOWN ABOVE: 38.944

FLOWS

SAMPLED VOLUME (STD. CU.FT.):	38.1062
VOLUME OF WATER VAPOR (STD. CU.FT.):	2.7630
FRACTIONAL MOISTURE CONTENT (%):	0.0676
DRY BASE:	79.0000
MOLECULAR WT. OF STACK GAS (DRY BASE):	28.8400
MOLECULAR WT. OF STACK GAS (WET BASE):	28.1072
STACK PRESSURE (inch Hg):	30.3094
STACK GAS VELOCITY (ft/sec.):	45.0437
ACTUAL STACK GAS FLOW RATE (ACFM):	105251.056
STANDARD STACK GAS FLOW RATE (SCFH):	4594581.11

PARTICULATE

FRONT HALF

PARTICULATE CONCENTRATION (GR./SCF):	0.0178
PARTICULATE CONCENTRATION (LBS/SCF):	2.54E-06
PARTICULATE EMISSION (LBS/HR):	11.6900

BACK HALF

PARTICULATE CONCENTRATION (GR./SCF):	0.0000
PARTICULATE CONCENTRATION (LBS/SCF):	0.00E+00
PARTICULATE EMISSION (LBS/HR):	0.0000

ISOKINETIC RATIO (%): 98.4532

POINTS	STACK T. deg F	DELTA P	SQUAR D.P	DELTA H	METER T. INLET	METER T. OUTLET	METER T. AVERAGE
1	215	0.59	0.76811	1.41	49	48	48.5
2	224	0.58	0.76158	1.38	49	46	47.5
3	221	0.59	0.76811	1.41	52	45	48.5
4	223	0.56	0.74833	1.33	54	46	50
5	223	0.46	0.67823	1.09	57	44	50.5
6	232	0.52	0.72111	1.24	58	44	51
7	228	0.39	0.6245	0.93	59	43	51
8	225	0.41	0.64031	0.97	60	44	52
9	234	0.52	0.72111	1.24	62	44	53
10	232	0.55	0.74162	1.31	64	45	54.5
11	230	0.64	0.8	1.52	64	46	55
12	221	0.60	0.7746	1.43	63	48	55.5
13	230	0.72	0.84853	1.72	59	50	54.5
14	234	0.67	0.81854	1.60	61	51	56
15	224	0.67	0.81854	1.60	61	49	55
16	223	0.55	0.74162	1.31	62	50	56
17	227	0.46	0.67823	1.09	62	49	55.5
18	230	0.39	0.6245	0.93	62	49	55.5
19	228	0.33	0.57446	0.78	62	50	56
20	227	0.31	0.55678	0.74	63	50	56.5
21	223	0.32	0.56569	0.76	62	49	55.5
22	221	0.35	0.59161	0.83	61	49	55
23	219	0.38	0.61644	0.90	63	48	55.5
24	217	0.36	0.6	0.86	62	48	55
	225.4583		0.6993	1.1825	59.6250	47.2917	53.4583

PARTICULATE EMISSION TEST SUMMARY

PLANT : Louisiana Pacific, Urania, LA
DATE : 18-Jan-94
PLACE : South RTO Exhaust - Particulate Train
RUN# : 3

TEST DURATION (MINUTES) :	60	LIQUID COLLECTED (mls) :	58.2
NOZZLE DIAMETER (INCH.) :	0.24533	PARTICULATE WEIGHT (Front half mg	25.7
METER COEFFICIENT (Y) :	0.97853	PARTICULATE WEIGHT (Back half mg)	0
PITOT COEFFICIENT (Cp) :	0.84	STATIC PRESSURE (in. H2O) :	-0.28
GAS METER VOL.(Cu.Ft.) :	37.289	PERCENT CO2 :	0
BAROMETRIC PRESSURE :	30.29	PERCENT O2 :	20
		PERCENT CO :	0

MOLECULAR WEIGHTS

CARBON MONOXIDE :	28	FLUORIDES :	19
VOC AS C3H8 :	44	CHLORIDES :	35.5
NOX AS NO2 :	46		

FOR CIRCULAR STACK		FOR RECTANGULAR STACK	
STACK DIAMETER (inch):	84.5	STACK LENGTH(inchs) :	
STACK AREA (Sq.Ft.) :	38.944	STACK WIDTH(inchs) :	
NOZZLE AREA (feet):	0.00033	STACK AREA (Sq.Ft.) :	0

ENTER THE STACK AREA SHOWN ABOVE: 38.944

FLOWS

SAMPLED VOLUME (STD. CU.FT.):	38.5145
VOLUME OF WATER VAPOR (STD. CU.FT.):	2.7395
FRACTIONAL MOISTURE CONTENT (%):	0.0664
DRY BASE:	80.0000
MOLECULAR WT. OF STACK GAS (DRY BASE):	28.8000
MOLECULAR WT. OF STACK GAS (WET BASE):	28.0828
STACK PRESSURE (inch Hg):	30.2694
STACK GAS VELOCITY (ft/sec.):	44.9666
ACTUAL STACK GAS FLOW RATE (ACFM):	105070.902
STANDARD STACK GAS FLOW RATE (SCFH):	4618285.92

PARTICULATE

FRONT HALF

PARTICULATE CONCENTRATION (GR./SCF):	0.0103
PARTICULATE CONCENTRATION (LBS/SCF):	1.47E-06
PARTICULATE EMISSION (LBS/HR):	6.7951

BACK HALF

PARTICULATE CONCENTRATION (GR./SCF):	0.0000
PARTICULATE CONCENTRATION (LBS/SCF):	0.00E+00
PARTICULATE EMISSION (LBS/HR):	0.0000

ISOKINETIC RATIO (%): 98.9971

POINTS	STACK T. deg F	DELTA P	SQUAR D.P	DELTA H	METER T. INLET	METER T. OUTLET	METER T. AVERAGE
1	217	0.57	0.75498	1.36	51	50	50.5
2	222	0.59	0.76811	1.41	43	45	44
3	225	0.55	0.74162	1.31	44	43	43.5
4	219	0.54	0.73485	1.29	48	40	44
5	220	0.49	0.7	1.17	50	41	45.5
6	222	0.45	0.67082	1.07	53	38	45.5
7	221	0.38	0.61644	0.90	52	38	45
8	218	0.43	0.65574	1.02	54	38	46
9	217	0.52	0.72111	1.24	54	39	46.5
10	222	0.65	0.80623	1.55	55	39	47
11	220	0.62	0.7874	1.48	55	39	47
12	225	0.60	0.7746	1.43	56	39	47.5
13	222	0.79	0.88882	1.88	50	43	46.5
14	220	0.74	0.86023	1.76	54	43	48.5
15	221	0.65	0.80623	1.55	56	45	50.5
16	220	0.52	0.72111	1.24	58	44	51
17	220	0.38	0.61644	0.90	57	44	50.5
18	223	0.40	0.63246	0.95	57	42	49.5
19	221	0.34	0.5831	0.81	56	42	49
20	218	0.31	0.55678	0.74	57	42	49.5
21	222	0.31	0.55678	0.74	56	42	49
22	219	0.37	0.60828	0.88	56	41	48.5
23	221	0.42	0.64807	1.00	57	43	50
24	223	0.34	0.5831	0.81	57	42	49.5
	220.75		0.6997	1.1871	53.5833	41.7500	47.6667

PARTICULATE EMISSION TEST SUMMARY

PLANT : Louisiana Pacific, Urania, LA
DATE : 19-Jan-94
PLACE : South RTO Exhaust - Formaldehyde Train
RUN# : 1

TEST DURATION (MINUTES) :	60	LIQUID COLLECTED (mls) :	115.7
NOZZLE DIAMETER (INCH.) :	0.33033	PARTICULATE WEIGHT (Front half mg	0
METER COEFFICIENT (Y) :	0.97853	PARTICULATE WEIGHT (Back half mg)	0
PITOT COEFFICIENT (Cp) :	0.84	STATIC PRESSURE (in. H2O) :	-0.33
GAS METER VOL.(Cu.Ft.) :	72.13	PERCENT CO2 :	0
BAROMETRIC PRESSURE :	30.5	PERCENT O2 :	21
		PERCENT CO :	0

MOLECULAR WEIGHTS

CARBON MONOXIDE :	28	FLUORIDES :	19
VOC AS C3H8 :	44	CHLORIDES :	35.5
NOX AS NO2 :	46		

FOR CIRCULAR STACK		FOR RECTANGULAR STACK	
STACK DIAMETER (inch):	84.5	STACK LENGTH(inches) :	
STACK AREA (Sq.Ft.) :	38.944	STACK WIDTH(inches) :	
NOZZLE AREA (feet):	0.0006	STACK AREA (Sq.Ft.) :	0

ENTER THE STACK AREA SHOWN ABOVE: 38.944

FLOWS

SAMPLED VOLUME (STD. CU.FT.):	73.3860
VOLUME OF WATER VAPOR (STD. CU.FT.):	5.4460
FRACTIONAL MOISTURE CONTENT (%):	0.0691
DRY BASE:	79.0000
MOLECULAR WT. OF STACK GAS (DRY BASE):	28.8400
MOLECULAR WT. OF STACK GAS (WET BASE):	28.0911
STACK PRESSURE (inch Hg):	30.4757
STACK GAS VELOCITY (ft/sec.):	47.3053
ACTUAL STACK GAS FLOW RATE (ACFM):	110535.539
STANDARD STACK GAS FLOW RATE (SCFH):	4894848.36
ISOKINETIC RATIO (%):	98.1656

POINTS	STACK T. deg F	DELTA P	SQ DP	DELTA H	METER T. INLET	METER T. OUTLET	METER T. AVERAGE
1	215	0.72	0.84853	5.50	62	63	62.5
2	218	0.70	0.83666	5.40	63	62	62.5
3	220	0.65	0.80623	5.04	65	63	64
4	220	0.61	0.78102	4.73	66	63	64.5
5	222.3	0.62	0.7874	4.80	68	63	65.5
6	223	0.52	0.72111	5.10	69	64	66.5
7	221	0.43	0.65574	4.22	69	64	66.5
8	219	0.48	0.69282	3.72	69	65	67
9	220	0.50	0.70711	3.87	69	65	67
10	206	0.61	0.78102	4.73	55	57	56
11	206	0.64	0.8	4.96	57	59	58
12	208	0.57	0.75498	4.42	58	59	58.5
13	228	0.91	0.95394	7.05	58	58	58
14	221	0.82	0.90554	6.35	62	59	60.5
15	217	0.74	0.86023	5.73	63	59	61
16	220	0.65	0.80623	5.04	64	59	61.5
17	221	0.60	0.7746	4.65	65	59	62
18	218	0.55	0.74162	4.26	66	60	63
19	219	0.41	0.64031	3.17	67	60	63.5
20	223	0.32	0.56569	2.48	67	60	63.5
21	221	0.33	0.57446	2.55	68	61	64.5
22	220	0.37	0.60828	2.86	68	61	64.5
23	223	0.35	0.59161	2.71	69	61	65
24	211	0.32	0.56569	2.48	69	62	65.5
	218.3458		0.7400	4.4092	64.8333	61.0833	62.9583

PARTICULATE EMISSION TEST SUMMARY

PLANT : Louisiana Pacific, Urania, LA
DATE : 19-Jan-94
PLACE : South RTO Exhaust - Formaldehyde Train
RUN# : 2

TEST DURATION (MINUTES) :	60	LIQUID COLLECTED (mls) :	115.7
NOZZLE DIAMETER (INCH.) :	0.33033	PARTICULATE WEIGHT (Front half mg	0
METER COEFFICIENT (Y) :	0.97853	PARTICULATE WEIGHT (Back half mg)	0
PITOT COEFFICIENT (Cp) :	0.84	STATIC PRESSURE (in. H2O) :	-0.33
GAS METER VOL.(Cu.Ft.) :	72.13	PERCENT CO2 :	0
BAROMETRIC PRESSURE :	30.5	PERCENT O2 :	21
		PERCENT CO :	0

MOLECULAR WEIGHTS

CARBON MONOXIDE :	28	FLUORIDES :	19
VOC AS C3H8 :	44	CHLORIDES :	35.5
NOX AS NO2 :	46		

FOR CIRCULAR STACK		FOR RECTANGULAR STACK	
STACK DIAMETER (inch):	84.5	STACK LENGTH(inches) :	
STACK AREA (Sq.Ft.) :	38.944	STACK WIDTH(inches) :	
NOZZLE AREA (feet):	0.0006	STACK AREA (Sq.Ft.) :	0

ENTER THE STACK AREA SHOWN ABOVE: 38.944

FLOWS

SAMPLED VOLUME (STD. CU.FT.):	72.5100
VOLUME OF WATER VAPOR (STD. CU.FT.):	5.4460
FRACTIONAL MOISTURE CONTENT (%):	0.0699
DRY BASE:	79.0000
MOLECULAR WT. OF STACK GAS (DRY BASE):	28.8400
MOLECULAR WT. OF STACK GAS (WET BASE):	28.0827
STACK PRESSURE (inch Hg):	30.4757
STACK GAS VELOCITY (ft/sec.):	47.4908
ACTUAL STACK GAS FLOW RATE (ACFM):	110968.931
STANDARD STACK GAS FLOW RATE (SCFH):	4857223.65
ISOKINETIC RATIO (%):	97.7451

POINTS	STACK T. deg F	DELTA P	SQUAR D.P	DELTA H	METER T. INLET	METER T. OUTLET	METER T. AVERAGE
1	225	0.71	0.84261	5.50	59	58	58.5
2	230	0.75	0.86603	5.80	59	59	59
3	220	0.68	0.82462	5.20	64	59	61.5
4	222	0.66	0.8124	5.10	68	59	63.5
5	220	0.64	0.8	4.90	71	59	65
6	229	0.65	0.80623	5.00	73	60	66.5
7	222	0.43	0.65574	3.30	75	60	67.5
8	225	0.43	0.65574	3.30	76	60	68
9	227	0.51	0.71414	3.90	77	61	69
10	222	0.54	0.73485	4.10	77	61	69
11	232	0.57	0.75498	4.40	79	62	70.5
12	231	0.56	0.74833	4.60	80	62	71
13	226	0.84	0.91652	7.00	71	61	66
14	223	0.84	0.91652	7.00	76	63	69.5
15	231	0.74	0.86023	6.10	79	64	71.5
16	230	0.67	0.81854	5.50	81	65	73
17	228	0.58	0.76158	4.70	82	65	73.5
18	227	0.47	0.68557	3.80	83	66	74.5
19	226	0.44	0.66332	3.60	83	66	74.5
20	228	0.34	0.5831	2.80	83	67	75
21	220	0.35	0.59161	2.80	81	67	74
22	229	0.38	0.61644	3.10	82	67	74.5
23	223	0.34	0.5831	2.80	81	67	74
24	221	0.27	0.51962	2.20	81	68	74.5
	225.7083		0.7388	4.4375	75.8750	62.7500	69.3125

PARTICULATE EMISSION TEST SUMMARY

PLANT : Louisiana Pacific, Urania, LA
DATE : 19-Jan-94
PLACE : South RTO Exhaust - Formaldehyde Train
RUN# : 3

TEST DURATION (MINUTES) :	60	LIQUID COLLECTED (mls) :	121.2
NOZZLE DIAMETER (INCH.) :	0.33033	PARTICULATE WEIGHT (Front half mg	0
METER COEFFICIENT (Y) :	0.97853	PARTICULATE WEIGHT (Back half mg)	0
PITOT COEFFICIENT (Cp) :	0.84	STATIC PRESSURE (in. H2O) :	-0.36
GAS METER VOL.(Cu.Ft.) :	75.035	PERCENT CO2 :	0
BAROMETRIC PRESSURE :	30.5	PERCENT O2 :	21
		PERCENT CO :	0

MOLECULAR WEIGHTS

CARBON MONOXIDE :	28	FLUORIDES :	19
VOC AS C3H8 :	44	CHLORIDES :	35.5
NOX AS NO2 :	46		

FOR CIRCULAR STACK		FOR RECTANGULAR STACK	
STACK DIAMETER (inch):	84.5	STACK LENGTH(inchs) :	
STACK AREA (Sq.Ft.) :	38.944	STACK WIDTH(inchs) :	
NOZZLE AREA (feet):	0.0006	STACK AREA (Sq.Ft.) :	0

ENTER THE STACK AREA SHOWN ABOVE: 38.944

FLOWS

SAMPLED VOLUME (STD. CU.FT.):	77.8171
VOLUME OF WATER VAPOR (STD. CU.FT.):	5.7049
FRACTIONAL MOISTURE CONTENT (%):	0.0683
DRY BASE:	79.0000
MOLECULAR WT. OF STACK GAS (DRY BASE):	28.8400
MOLECULAR WT. OF STACK GAS (WET BASE):	28.0996
STACK PRESSURE (inch Hg):	30.4735
STACK GAS VELOCITY (ft/sec.):	48.6784
ACTUAL STACK GAS FLOW RATE (ACFM):	113743.92
STANDARD STACK GAS FLOW RATE (SCFH):	4992419.15
ISOKINETIC RATIO (%):	102.0585

POINTS	STACK T. deg F	DELTA P	SQUAR D.P	DELTA H	METER T. INLET	METER T. OUTLET	METER T. AVERAGE
1	227	0.74	0.86023	6.10	59	59	59
2	223	0.71	0.84261	5.80	54	56	55
3	227	0.71	0.84261	5.80	55	56	55.5
4	218	0.73	0.8544	6.00	55	55	55
5	222	0.62	0.7874	5.10	55	55	55
6	220	0.65	0.80623	5.30	55	55	55
7	224	0.46	0.67823	3.70	54	54	54
8	228	0.49	0.7	4.00	54	54	54
9	224	0.55	0.74162	4.50	53	53	53
10	223	0.62	0.7874	5.10	58	53	55.5
11	225	0.64	0.8	5.20	58	53	55.5
12	226	0.57	0.75498	4.70	58	53	55.5
13	228	0.92	0.95917	7.50	52	50	51
14	232	0.95	0.97468	7.80	59	50	54.5
15	224	0.81	0.9	6.60	50	50	50
16	230	0.68	0.82462	5.60	50	50	50
17	230	0.56	0.74833	4.60	50	50	50
18	221	0.52	0.72111	4.20	51	49	50
19	222	0.38	0.61644	3.10	54	49	51.5
20	224	0.39	0.6245	3.20	55	49	52
21	225	0.37	0.60828	3.00	57	49	53
22	223	0.35	0.59161	2.80	58	49	53.5
23	225	0.33	0.57446	2.70	58	49	53.5
24	227	0.35	0.59161	2.80	58	49	53.5
	224.9167		0.7579	4.8000	55.0000	52.0417	53.5208

APPENDIX B

PARTICULATE ANALYTICAL DATA FORM

Company: Smith Uvania La Run Number: R, PW

Location: RTO S. EX Density(Pa.)

Date: 1-18-94

Liquid Level Marked? ✓

Blank Concentation(Ca)

Rinse Volume(Vaw) 205 ml Acetone

Residue in Rinse(Wa)=Ca*Vaw*Pa

Date of Weighing 1-21-94 Gross Wt. 107.9296

Date of Weighing Gross Wt. 107.9296

Average Gross Wt. 107.9296

Less Blank Residue(Wa)

Tare Wt. 107.9168

Weight of Particulate in Rinse 0.0128 = 12.8 mg

Date of Weighing 1-21-94 Gross Filter Wt. 0.46865

Date of Weighing Gross Filter Wt. 0.46867

Average Gross Wt. 0.46866

Filter Tare Wt. 0.45942

Weight of Particulate on Filter 0.00924 9.24 mg

~~Total~~ Weight of Particulate 1.66 mg

Petri Dish

23.7 mg.

PARTICULATE ANALYTICAL DATA FORM

Company: Smith, Urania La Run Number: R2 PW

Location: RTO S. Ex Density(Pa.)

Date: 1-19-94

Liquid Level Marked? ✓

Blank Concentation(Ca)

Rinse Volume(Vaw) 130 ml Acetone

Residue in Rinse(Wa)=Ca*Vaw*Pa

Date of Weighing 1-21-94 Gross Wt. 104.2847

Date of Weighing Gross Wt. 104.2845

Average Gross Wt. 104.2846

Less Blank Residue(Wa)

Tare Wt. 104.2536

Weight of Particulate in Rinse 0.0310 31.0 mg

Date of Weighing 1-21-94 Gross Filter Wt. 0.47500

Date of Weighing Gross Filter Wt. 0.47500

Average Gross Wt. 0.47500

Filter Tare Wt. 0.46564

Weight of Particulate on Filter 0.0100 10.0 mg

Total Weight of Particulate 2.97 mg

43.97 mg

PARTICULATE ANALYTICAL DATA FORM

Company: Smith Urania La Run Number: R3 PW

Location: RTO S, Ex. Density(Pa.)

Date: 1-18-94

Liquid Level Marked? ✓

Blank Concentation(Ca)

Rinse Volume(Vaw) 230 ml Acetone

Residue in Rinse(Wa)=Ca*Vaw*Pa

Date of Weighing 1-21-94 Gross Wt. 106.5590

Date of Weighing Gross Wt. 106.5591

Average Gross Wt. 106.5590

Less Blank Residue(Wa)

Tare Wt. 106.5491

Weight of Particulate in Rinse 0.0099 g 9.9 mg

Date of Weighing 1-21-94 Gross Filter Wt. 0.47250

Date of Weighing Gross Filter Wt. 0.47250

Average Gross Wt. 0.47250

Filter Tare Wt. 0.45922

Weight of Particulate on Filter 0.01328 13.28 mg

Total Weight of Particulate 2.59 mg

25.7 mg

ACETONE BLANK ANALYTICAL DATA FORM

PLANT: Smith La.
SAMPLE LOCATION: Blank RTO S. Rx
LIQUID LEVEL MARKED? ✓
BLANK VOLUME (Pa): 75ml

DATE OF WEIGHING 1-21-94 GROSS WEIGHT 99.9579
DATE OF WEIGHING _____ GROSS WEIGHT 99.9581
AVERAGE GROSS WEIGHT 99.9580
TARE WEIGHT 99.9584
WEIGHT OF BLANK (ma) 0.0000

$$Ca = \frac{ma}{Va\ Pa} = \_\_\_\_\_ \text{ mg/g}$$

Note: In no case should a blank residue greater than 0.01 mg/g or 0.001% of the blank weight be subtracted from the sample weight.

Smith RTO Ex 1-18-94

Petri Dish wtch

	Tare	wt	wt	
R_1	.16992 g	.17251 g	0.00259 g	= 2.59 mg
R_2	.15531 g	0.15697 g	0.00166 g	= 1.66 mg
R_3	.15713 g	0.16010 g	0.00297 g	= 2.97 mg

APPENDIX C

PARTICULATE FIELD DATA

Tm = 40
Ts = 220

Vmstd = 39.681 2.2495
Vwstd = 2.633
Bws = .06223
Vel = 45.29
I = 100.14 %

STD 0 = .885
STD 1 = 3.0
STD 2 = 2.5

PLANT: LP Uvania
DATE: 1-18-94
REPETITION: 1

LOCATION: South RTO EX - Part. Train
OPERATOR: G. SG. JS. LW. ITA
STACK #: EX
SAMPLE BOX #: 9
METER BOX #: 7
AMBIENT TEMPERATURE: 35°
BAROMETRIC PRESSURE: 30.33
ASSUMED MOISTURE: 7 %
PROBE LENGHT: 9' 8 ft. STAINLESS
NOZZLE DIAMETER: .245 .245 .246 = .2453 = .00033 ft²
STACK DIAMETER: ~~84.5"~~ 84.5" = 38.94 ft²
METER H: 1.67822
C FACTOR: .84
METER CO-EFFICIENT: .97853

IMPINGERS

	Initial	Final
#1: 100mL	H2O	136
#2: 100mL		112
#3: —		205.6
#4: 200g SG		53.6
#5:		56

COMMENTS:

CO_2	O_2	
0.0 %	21.0 %	2.633
		39.681

FILTER TARE: .45942 g

Temp 210-220
Static -.32

PRE-TEST LEAK CHECK
Meter: .013 Cu. ft. 15 in. HG
Pitots: ✓ in. H20

POST-TEST LEAK CHECK
Meter: 1016 Cu. ft. 7 in. HG
Pitots in. H20

	#	θ	STATIC PRES.	Ts °F	ΔP	√ΔP	ΔH	Vm FT.³	Tm INLET	Tm OUTLET	OVEN TEMP	IMP OUTLET TEMP	VACUUM (IN HG)
.52	A 1	11:14		216	.66		1.58	189.950	50	51	250	30	3.0
.52	2		-.32	220	.68		1.62	191.753	46	46	253	30	3.0
.50	3			225	.64		1.52	193.585	50	47	250	31	3.0
.48	4			220	.62		1.48	195.360	53	44	247	30	3.0
.45	5			219	.58		1.38	197.109	54	45	250	30	3.0
.37	6			220	.58		1.38	198.801	54	46	251	31	3.0
.36	7			223	.49		1.17	200.492	55	45	253	30	3.0
.38	8			223	.46		1.09	202.046	59	46	247	31	3.0
.44	9			224	.55		1.31	203.552	58	46	243	31	3.0
.52	10			221	.55		1.31	205.108	58	46	245	31	3.0
.56	11			219	.64		1.52	206.945	60	48	247	31	3.0
.55	12			221	.59		1.41	208.622	62	49	251	31	3.0
.65	B 1	11:55		226	.73		1.74	210.327	57	54	254	31	3.0
.68	2			218	.67		1.60	212.224	60	54	253	30	3.0
.65	3			217	.68		1.62	214.042	60	54	253	32	3.0
.63	4			225	.62		1.481	15.873	61	53	250	31	3.0
.51	5			218	.52		1.24	217.621	62	52	247	31	3.0
.42	6			223	.45		1.07	219.222	62	51	248	31	3.0
.38	7			211	.35		.83	220.711	62	53	248	31	3.0
.35	8			222	.32		.76	22.025	63	51	249	31	3.0
.35	9			226	.35		.83	23.281	64	52	251	32	3.0
.37	10			214	.38		.96	24.595	63	53	251	32	3.0
.37	11			215	.35		.83	25.963	64	53	253	32	3.0
.31	12			218	.31		.74	27.271	64	52	250	33	3.0
								227.513					
	AV			220.4	.53208	.7227		38.563					

PARTICULATE FIELD DATA

PLANT: LP
DATE: 1-8-94
REPETITION: 2

LOCATION: South RTO Ex. - PART. TRAIN
OPERATOR:
STACK #: Ex
SAMPLE BOX #: 8
METER BOX #: 7
AMBIENT TEMPERATURE: 35
BAROMETRIC PRESSURE: 30.33
ASSUMED MOISTURE: 7%
PROBE LENGHT: 9'
NOZZLE DIAMETER: .24533"
STACK DIAMETER: 84.5"
METER H : 1.67822
C FACTOR: .84
METER CO-EFFICIENT: .97853

FILTER TARE: .46564 g

PRE-TEST LEAK CHECK
Meter: 0.005 Cu. ft. 15 in. HG
Pitots: ✓ in. H20

IMPINGERS

	Initial	Final
#1: 100 mls H_2O		146
#2: 100 mls		106
#3: —		206.7
#4: 200 g SG		58.7
#5:		

COMMENTS:

CO_2 0% O_2 21%

POST-TEST LEAK CHECK
Meter: 0.00 ✓ Cu. ft. 5 in. HG
Pitots ✓ in. H20

÷	θ	STATIC PRES.	Ts °F	ΔP	√ΔP	ΔH	Vm FT.³	Tm INLET	Tm OUTLET	OVEN TEMP.	IMP OUTLET TEMP.	VACUUM (IN HG)
A1	2:58		215	.59		1.41	229.091	49	48	250	34	2
2			224	.58		1.38	230.796	49	46	259	35	2
3			221	.59		1.41	232.497	52	45	258	34	2
4			223	.56		1.33	234.193	54	46	261	36	2
5			223	.46		1.09	235.855	57	44	258	34	2
6		-.28	232	.52		1.24	237.361	58	44	257	35	2
7			228	.39		.93	238.962	59	43	257	34	2
8			225	.41		.97	240.348	60	44	253	33	2
9			234	.52		1.24	241.770	62	44	257	33	2
10			232	.55		1.31	243.372	64	45	249	35	2
11			230	.64		1.52	245.018	64	46	253	34	3
12			221	.60		1.43	246.795	63	48	251	33	3
B1			230	.72		1.72	248.515	59	50	250	33	4
2			234	.67		1.60	250.399	61	51	257	33	4
3			224	.67		1.60	252.217	61	49	258	32	4
4			223	.55		1.31	254.034	62	50	257	33	3
5			227	.46		1.09	255.681	62	49	252	31	3
6			230	.39		.93	257.187	62	49	251	31	3
7			228	.33		.78	258.574	62	50	258	31	2
8			227	.31		.74	259.849	63	50	254	31	2
9			223	.32		.76	261.086	62	49	253	31	2
10			221	.35		.83	262.342	61	49	250	30	2
11			219	.38		.90	263.655	63	48	251	30	2
12			217	.36		.86	265.624	62	48	250	29	2
							266.357					
ΔV		-.28	225.5	.49667	.69927	1.183	37.2661	53.51				

PARTICULATE FIELD DATA

PLANT: LP
DATE: 1-18-94
REPETITION: 3

LOCATION: RTO South Ex. - PAINT. TRAIN
OPERATOR: JS/SC
STACK #: RTO South Ex.
SAMPLE BOX #: 7
METER BOX #: 7
AMBIENT TEMPERATURE: 35
BAROMETRIC PRESSURE: 30.29
ASSUMED MOISTURE: 7%
PROBE LENGHT: 9'
NOZZLE DIAMETER: .24533"
STACK DIAMETER: 84.5"
METER H : 1.87822
C FACTOR: .84
METER CO-EFFICIENT: .97853

IMPINGERS

	Initial	Final
#1:	100 mls	132 mls
#2:	100 mls	120 mls
#3:	—	
#4:	200 gr SiO	206.2
#5:		58.2

H_2O

COMMENTS:

CO_2	O_2
0%	20%

FILTER TARE: .45922

PRE-TEST LEAK CHECK
Meter: 0.00 Cu. ft. 15 in. HG
Pitots: ✓ in. H20

POST-TEST LEAK CHECK
Meter: ✓ Cu. ft. 5 in. HG
Pitots ✓ in. H20

#	θ	STATIC PRES.	Ts °F	ΔP	√ΔP	ΔH	Vm FT.³	Tm INLET	Tm OUTLET	OVEN TEMP.	IMP OUTLET TEMP.	VACUUM (IN HG)
A 1	4:59		217	.57		1.36	266.505	51	50	257	29	1.5
2			222	.59		1.41	269.185	47	45	254	29	2
3	5:04	-.28	225	.55		1.31	269.870	44	43	249	29	2
4			219	.54		1.29	271.610	48	40	250	29	2
5	5:09		220	.49		1.17	273.135	50	41	247	29	2
6			222	.45		1.07	274.772	53	38	248	28	2
7	5:14		221	.38		.90	276.378	52	38	246	28	2
8			218	.43		1.02	277.845	54	38	245	28	2
9	5:19		217	.52		1.24	279.250	54	39	246	28	2
10			222	.65		1.55	280.710	55	39	242	28	2
11	5:24		220	.62		1.48	282.325	55	39	244	28	2
12			225	.60		1.43	283.970	56	39	242	28	2
B 1	5:31		222	.79		1.88	285.697	50	43	254	28	2
2			220	.74		1.76	287.380	54	43	257	28	2
3	5:36		221	.65		1.55	289.475	56	45	258	28	2
4			220	.52		1.24	291.395	58	44	259	28	2
5	5:41		220	.38		.90	293.165	57	44	255	28	2.5
6			223	.40		.95	294.690	57	42	255	28	2
7	5:46		221	.34		.81	296.060	56	42	260	28	2
8			218	.31		.74	297.335	57	42	256	28	2
9	5:51		222	.31		.74	298.535	56	42	255	28	7.5
10			219	.37		.88	299.730	56	41	252	28	1.5
11	5:56		221	.42		1.0	301.012	57	43	256	28	1
12	5:58:30		223	.34		.81	302.513	57	42	257	28	1
							303.794					
ΔV							37.2891					

PARTICULATE FIELD DATA

STO 0 = 1.160
STO 1 = 3.029
STO 2 = 2.5

PLANT: LP
DATE: 1-19-94
REPETITION: 1

STO 0 1.64184

LOCATION: RTO South Ex Formaldehyde TRAIN
OPERATOR: JS, CJ, SC
STACK #: EX
SAMPLE BOX #: 9
METER BOX #: 7
AMBIENT TEMPERATURE: 25°
BAROMETRIC PRESSURE: 30.5
ASSUMED MOISTURE: 6%
PROBE LENGHT: 11' — 11 FT. GLASS
NOZZLE DIAMETER: .330, .330, .331 (.33033)
STACK DIAMETER: 84.5" (38.944 ft²) (.00060)
METER H : 1.67822
C FACTOR: .84
METER CO-EFFICIENT: .97853

IMPINGERS

	Initial	Final
#1: 100 mls	DNPH	176
#2: 100 mls		115
#3: —		1
#4: 200 gr SG		217.1
#5:		109.10

COMMENTS:

CO_2	O_2
0%	21%

FILTER TARE: N/A

PRE-TEST LEAK CHECK
Meter: .005 Cu. ft. .15 in. HG
Pitots: ✓ .85 .75 in. H20

POST-TEST LEAK CHECK
Meter: 0.00 ✓ Cu. ft. 18 in. HG
Pitots in. H20

#	θ	STATIC PRES.	Ts °F	ΔP	√ΔP	ΔH	Vm FT.³	Tm INLET	Tm OUTLET	OVEN TEMP.	IMP OUTLET TEMP.	VACUUM (IN H)
A1	11:06		215	.72		5.5	306.719	62	63	258	30	15
2			218	.70		5.4	310.113	63	62	257	30	15
3			220	.65		5.04	313.459	65	63	262	30	15
4		-.38	220	.61		4.73	316.684	66	63	261	30	15
5			222.3	.62		4.80	319.808	68	63	258	30	15
6			223	.52		5.10	322.958	69	64	257	30	15
7			221	.43		4.22	326.203	69	64	259	30	15
8			219	.48		3.72	329.154	69	65	263	30	15
9	11:33 / [illegible]		220	.50		3.87	331.925	69	65	265	30	15
10			206	.61		4.73	334.753	55	57	264	30	16
11			206	.64		4.96	337.878	57	59	261	30	15
12			208	.57		4.42	341.078	58	59	258	30	15
B1			228	.91		7.05	344.097	58	58	258	30	15
2			221	.82		6.35	347.913	62	59	256	30	16
3			217	.74		5.73	351.535	63	59	258	30	16
4			220	.65		5.04	354.976	64	59	262	30	16
5			221	.60		4.65	358.201	65	59	261	30	16
6		-.36	218	.55		4.26	361.300	66	60	263	30	16
7			219	.41		3.17	364.266	67	60	260	30	16
8			223	.32		2.48	366.827	67	60	269	30	16
9			221	.33		2.55	369.090	68	61	268	30	16
10			220	.37		2.86	371.388	68	61	261	30	16
11			223	.35		2.71	373.821	69	61	263	30	16
12			211	.32		2.48	376.187	69	62	260	30	16
							378.450					
ΔV		-.37	218.3	.55917		4.409	71.731	63.01				

Vel = 47.76 x107 mls 6.5% moisture 1-Bws = .935 Vmstd = 72.974 Ts = 678 Tm = 523 Md = 28.84 Ms = 28.13 [illegible] = 30.47 ISO = 95.41 msps = 857.199

PARTICULATE FIELD DATA

.75 .85

PLANT: LP
DATE: 1-19-94
REPETITION: 2

LOCATION: RTO South Ex FORM. MAIN
OPERATOR:
STACK #: Exhaust
SAMPLE BOX #: 9
METER BOX #: 7
AMBIENT TEMPERATURE: 45
BAROMETRIC PRESSURE: 30.5
ASSUMED MOISTURE: 6%
PROBE LENGHT: 11'
NOZZLE DIAMETER: .330, .330, .331
STACK DIAMETER: 84.5"
METER H : 1.67822
C FACTOR: .84
METER CO-EFFICIENT: .97853

IMPINGERS

	Initial	Final
#1: 100 mls > DNPH		128
#2: 100 mls		151
#3: —		18
#4: 200 gr SG		218.7
#5:		
		115.7

COMMENTS:

CO_2	O_2
0%	21%

FILTER TARE: N/A

PRE-TEST LEAK CHECK
Meter: 0.00 Cu. ft. 15 in. HG
Pitots: in. H20

POST-TEST LEAK CHECK
Meter: 0.040 Cu. ft. 5 in. HG
Pitots ✓ in. H20

#	θ	STATIC PRES.	Ts °F	ΔP	√ΔP	ΔH	Vm FT.3	Tm INLET	Tm OUTLET	OVEN TEMP.	IMP OUTLET TEMP.	VACUUM (IN HG)
A1	4.27		225	.71		5.5	379.144	59	58	258	29	2
2			230	.75		5.8	82.5	59	59	262	29	3
3			220	.68		5.2	85.9	64	59	261	29	2
4			222	.66		5.1	89.2	68	59	259	30	2
5			220	.64		4.9	92.5	71	59	260	31	2
6			229	.65		5.0	95.7	73	60	258	30	2
7		.33	222	.43		3.3	98.9	75	60	259	29	2
8			225	.43		3.3	401.5	76	60	255	30	2
9			227	.51		3.9	404.1	77	61	258	31	2
10			222	.54		4.1	407.0	77	61	258	30	2
11			232	.57		4.4	409.9	79	62	258	30	2
12			231	.56		4.6	413.0	80	62	255	30	2
B1			226	.85		7.0	416.100	71	61	258	29	4
2			223	.85		7.0	19.9	76	63	257	30	4
3			231	.74		6.1	23.7	79	64	257	31	3.5
4			230	.67		5.5	27.2	81	65	256	31	2
5			228	.58		4.7	30.6	82	65	257	30	2
6			227	.47		3.8	33.7	83	66	255	31	2
7			226	.44		3.6	36.6	83	66	258	31	2
8			228	.34		2.8	39.3	83	67	257	31	2
9			220	.35		2.8	41.7	81	67	256	31	2
10			229	.38		3.1	44.1	82	67	254	30	2
11			223	.34		2.8	46.7	81	67	253	31	2
12			221	.27		2.2	49.1	81	68	254	30	2
							451.274					
ΔV							72.130					

PARTICULATE FIELD DATA

PLANT: LP
DATE: 1-19-94
REPETITION: 3

LOCATION: RTO South Ex - FORM. TRAIN
OPERATOR:
STACK #: Ex
SAMPLE BOX #: 9
METER BOX #: 7
AMBIENT TEMPERATURE: 40°
BAROMETRIC PRESSURE: 30.5
ASSUMED MOISTURE: 6%
PROBE LENGHT: 11'
NOZZLE DIAMETER: .33033
STACK DIAMETER: 84.5"
METER H : 1.6782
C FACTOR: .84
METER CO-EFFICIENT: .97853

IMPINGERS

	Initial	Final
#1: 100 ml > DNPH		146
#2: 100 ml		141
#3: —		14
#4: 200 gr SG		220.2
#5:		
		121.20

COMMENTS:

CO_2 0% O_2 21%

FILTER TARE: N/A

PRE-TEST LEAK CHECK
Meter: 0.00 Cu. ft. 15 in. HG
Pitots: .86 .75 in. H20

POST-TEST LEAK CHECK
Meter: 0.018 Cu. ft. 9 in. HG
Pitots ✓ in. H20

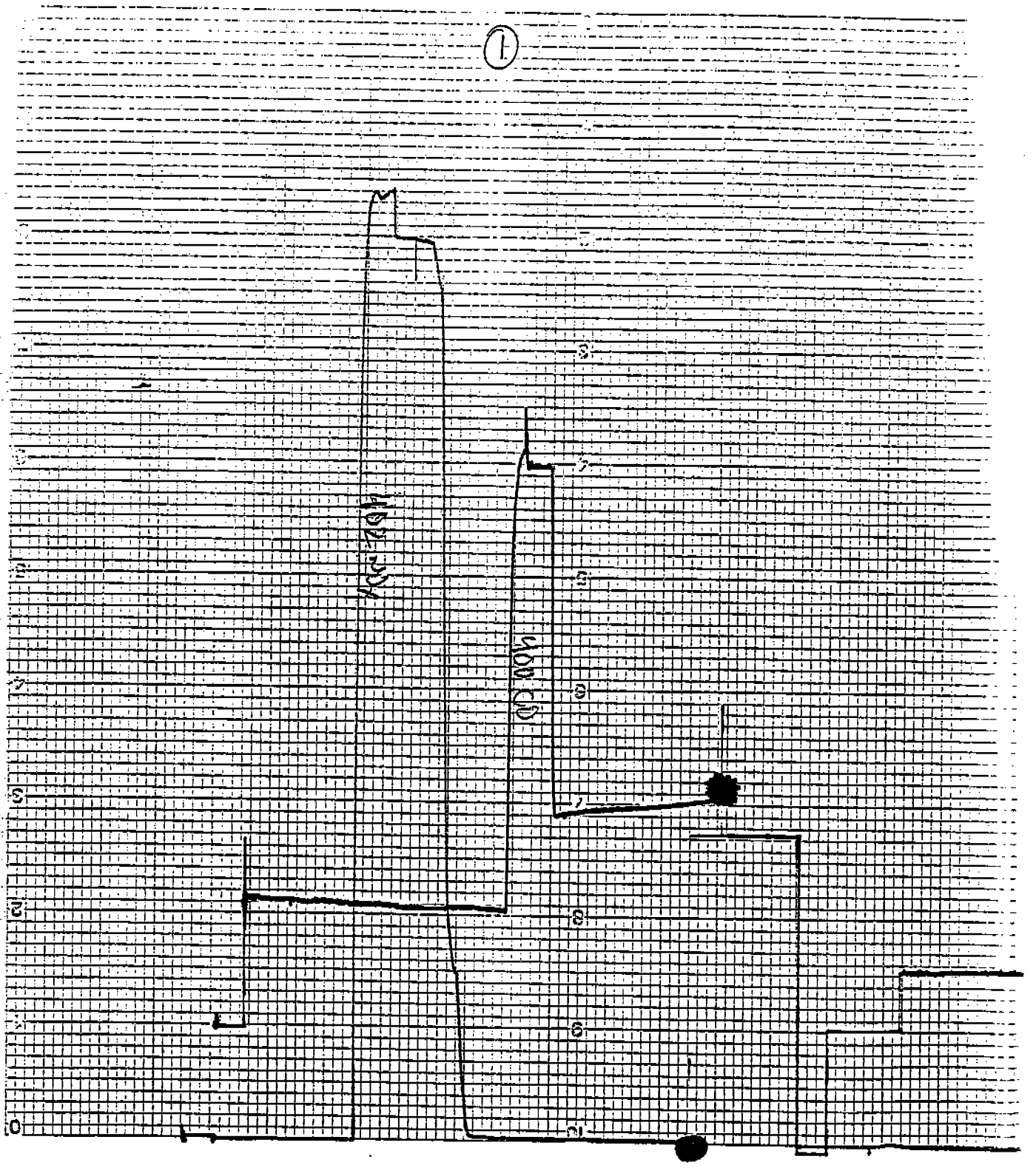
#	θ	STATIC PRES.	Ts °F	ΔP	√ΔP	ΔH	Vm FT.³	Tm INLET	Tm OUTLET	OVEN TEMP.	IMP OUTLET TEMP.	VACUUM (IN Hg)
A1	6:10		227	.74		6.1	451.721	59	59	258	29	4
2			223	.71		5.8	55.2	54	56	257	29	4
3			227	.71		5.8	58.7	55	56	255	29	4
4			218	.73		6.0	62.2	55	55	256	29	4
5		7.36	222	.62		5.1	65.7	55	55	253	29	4
6			220	.65		5.3	68.9	55	55	254	29	4
7			224	.46		3.7	72.3	54	54	254	30	4
8			228	.49		4.0	75.1	54	54	257	30	4
9			224	.55		4.5	78.0	53	53	258	30	4
10			223	.62		5.1	81.0	58	53	259	29	5
11			225	.64		5.2	84.3	58	53	256	29	5
12			226	.57		4.7	87.6	58	53	259	29	5
B1			228	.92		7.5	490.728	52	50	258	29	8
2			232	.95		7.8	94.6	59	50	260	27	9
3			224	.81		6.6	98.7	50	50	259	27	8
4			230	.68		5.6	502.4	50	50	260	27	7
5			230	.56		4.6	505.8	50	50	258	29	5
6			221	.52		4.2	508.9	54	49	257	28	5
7			222	.38		3.1	511.8	54	49	258	28	5
8			224	.39		3.2	514.4	55	49	260	29	5
9			225	.37		3.0	516.9	57	49	258	29	5
10			223	.35		2.8	519.5	58	49	257	30	5
11			225	.33		2.7	524.9	58	49	258	30	5
12			227	.35		2.8	524.3	58	49	257	30	5
	7:10						526.756					
AV							75.0351					

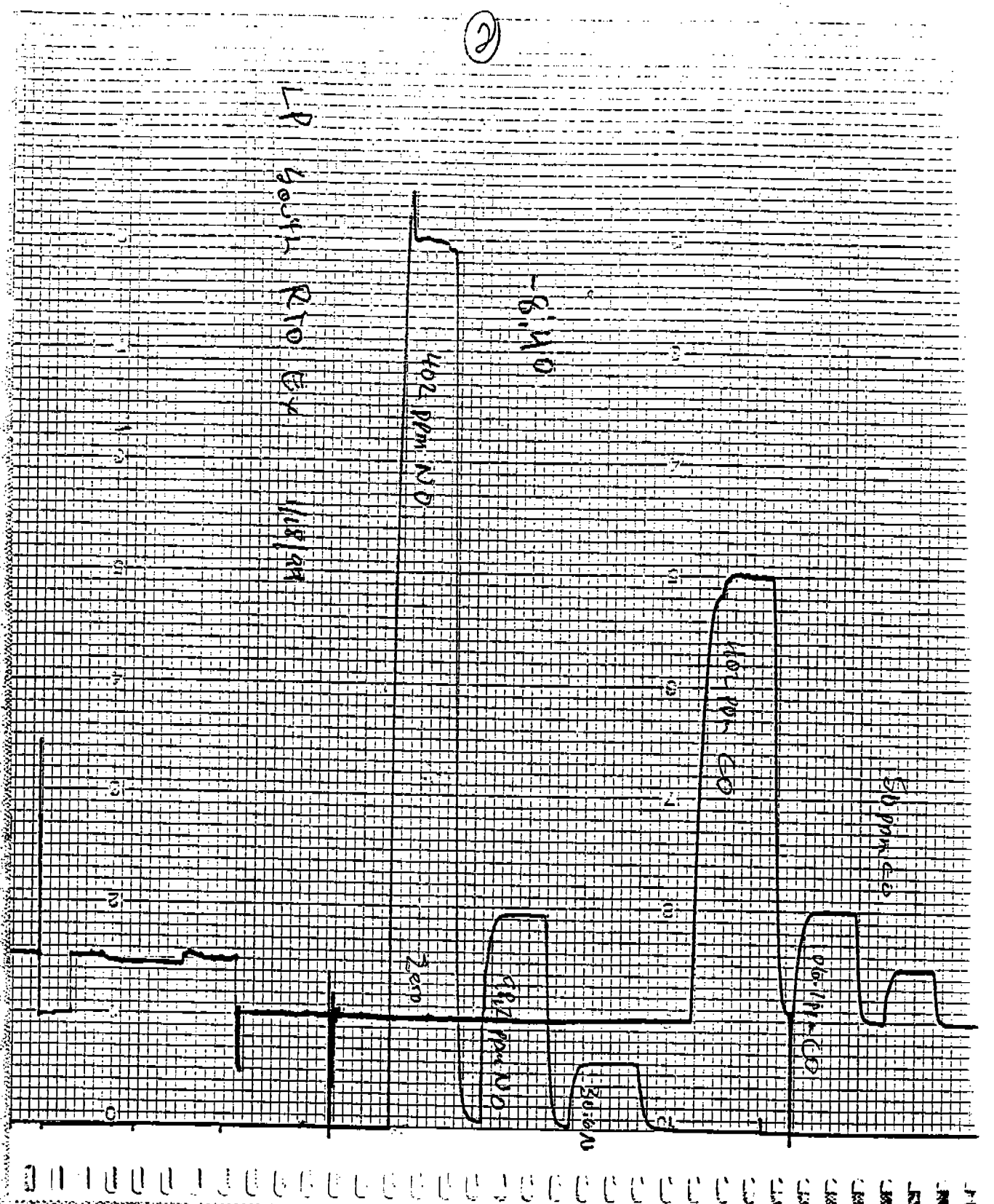
APPENDIX D

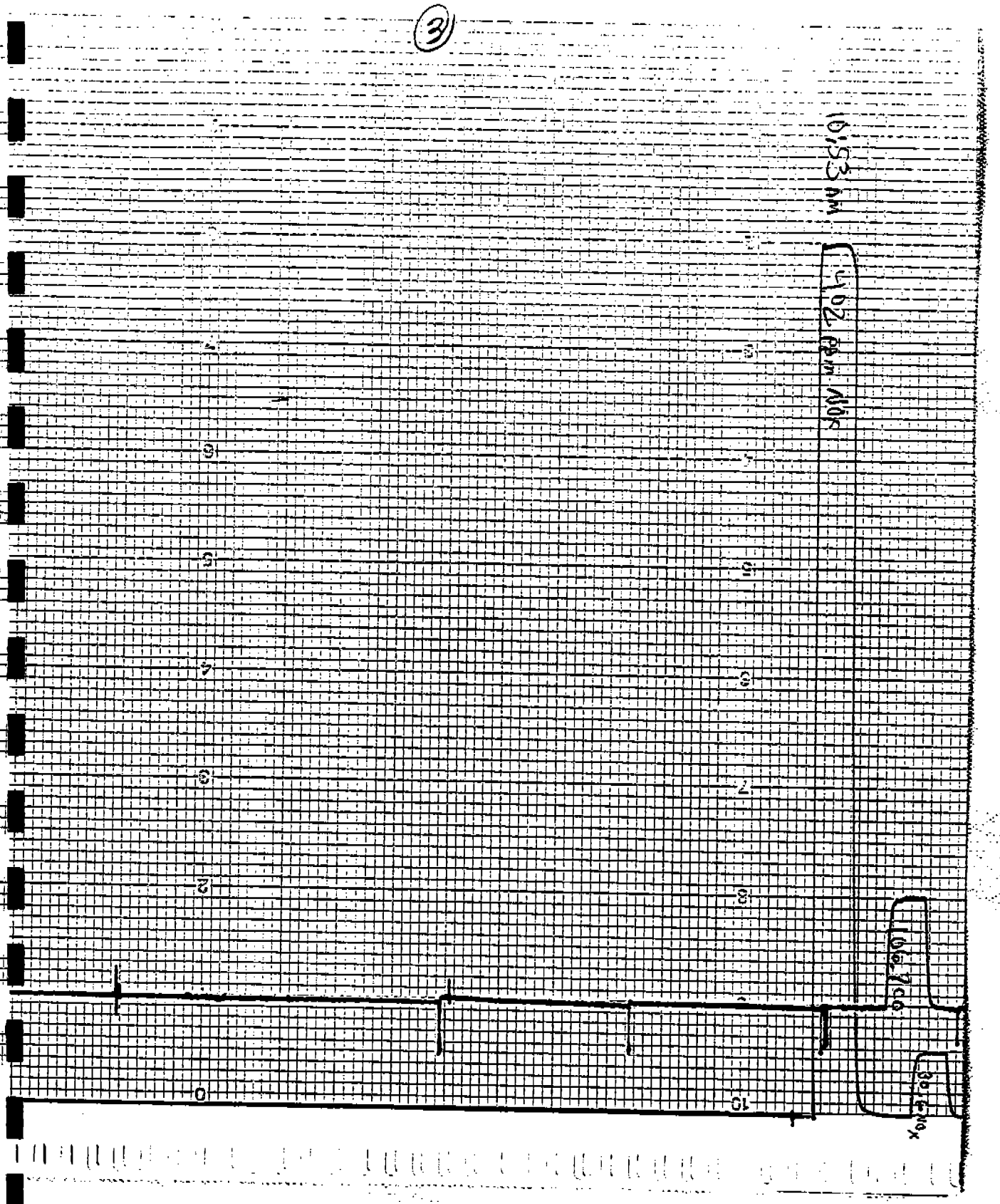
LP 1-18-94

SOUTH RTO EXHAUST

	Run 1 (11:15-12:18)		Run 2 (2:58-3:59)		Run 3 (4:55-5:55)	
	NOx	CO	NOx	CO	NOx	CO
	5	0	6	0	3	0
	5.5	0	6		3.5	
	5	.2	6.5		4	
	5	.2	6		3.5	
	5.5	0	6		3.5	
	5	.2	6		3.5	
	6	.2	5.5		3.5	
	6	0	5.5		4.5	
	5.5	0	5.5		4.5	
10	6	.2	6		5	
	6	.2	6		5	
	6	.2	5.5		5	
	6	.2	6		5	
	6	0	6		5	
	6	.2	6		5	
	6	.2	6		5	
	6	.2	5.5		5	
	6	.2	5.5		5	
	6	.2	6		5	
20	6	0	5.5		5	
	6	0	5.5		5	
	6	.2	5		5	
	6	0	5.5		5	
	6	0	5		5.5	
	6	0	5		5	
	6	0	5		5.5	
	6	0	5		5	
	6	0	5		5	
	6	0	5.5		5.5	
30	6	0	5		5.5	
	6	0	5.62	0	5.5	0
	5.82	0.09			4.71	
PPM/UNIT	5.025	10.05	5.1		5.03	
PPM	29.245	0.9045	28.662	ND	23.69	ND

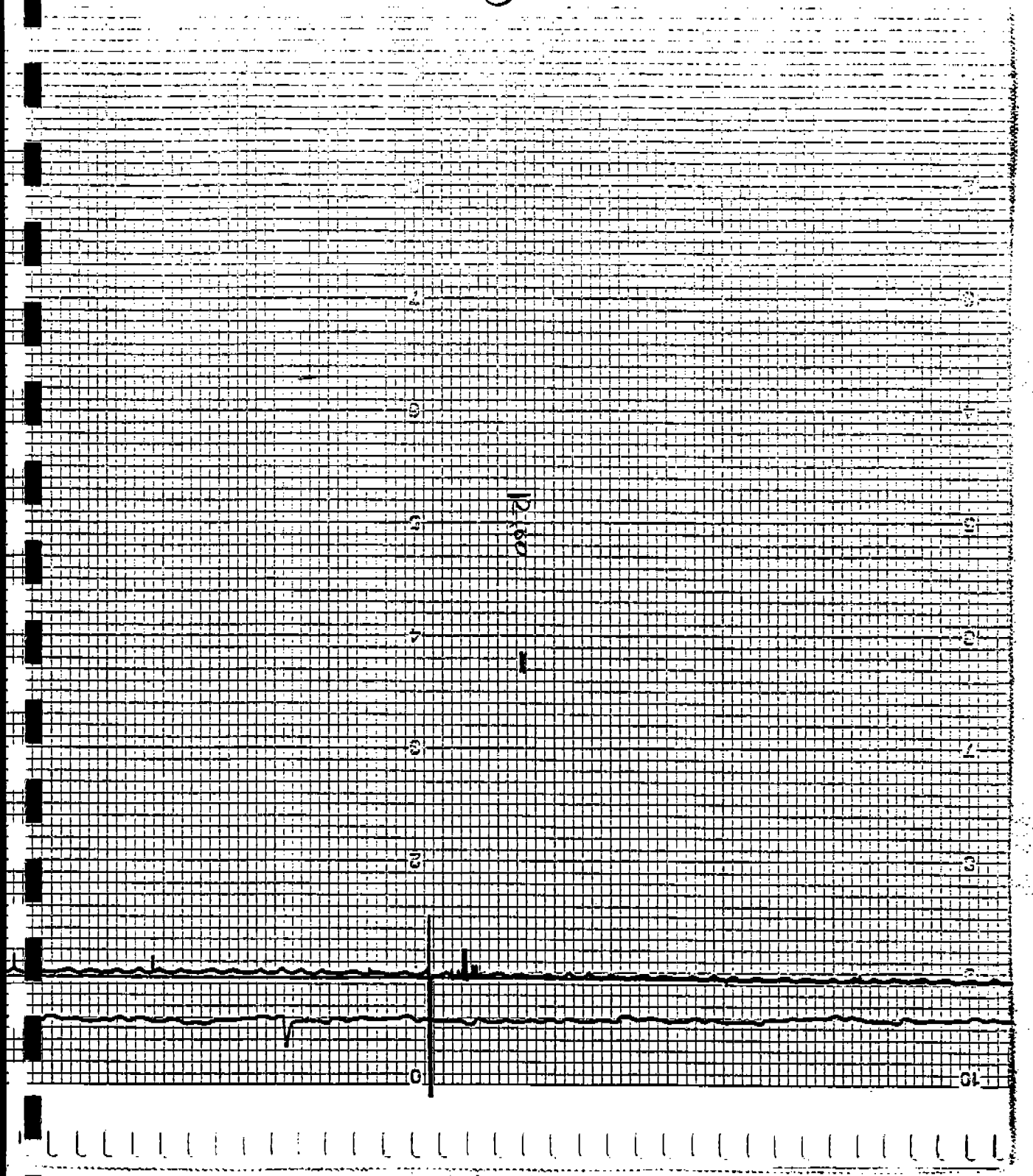


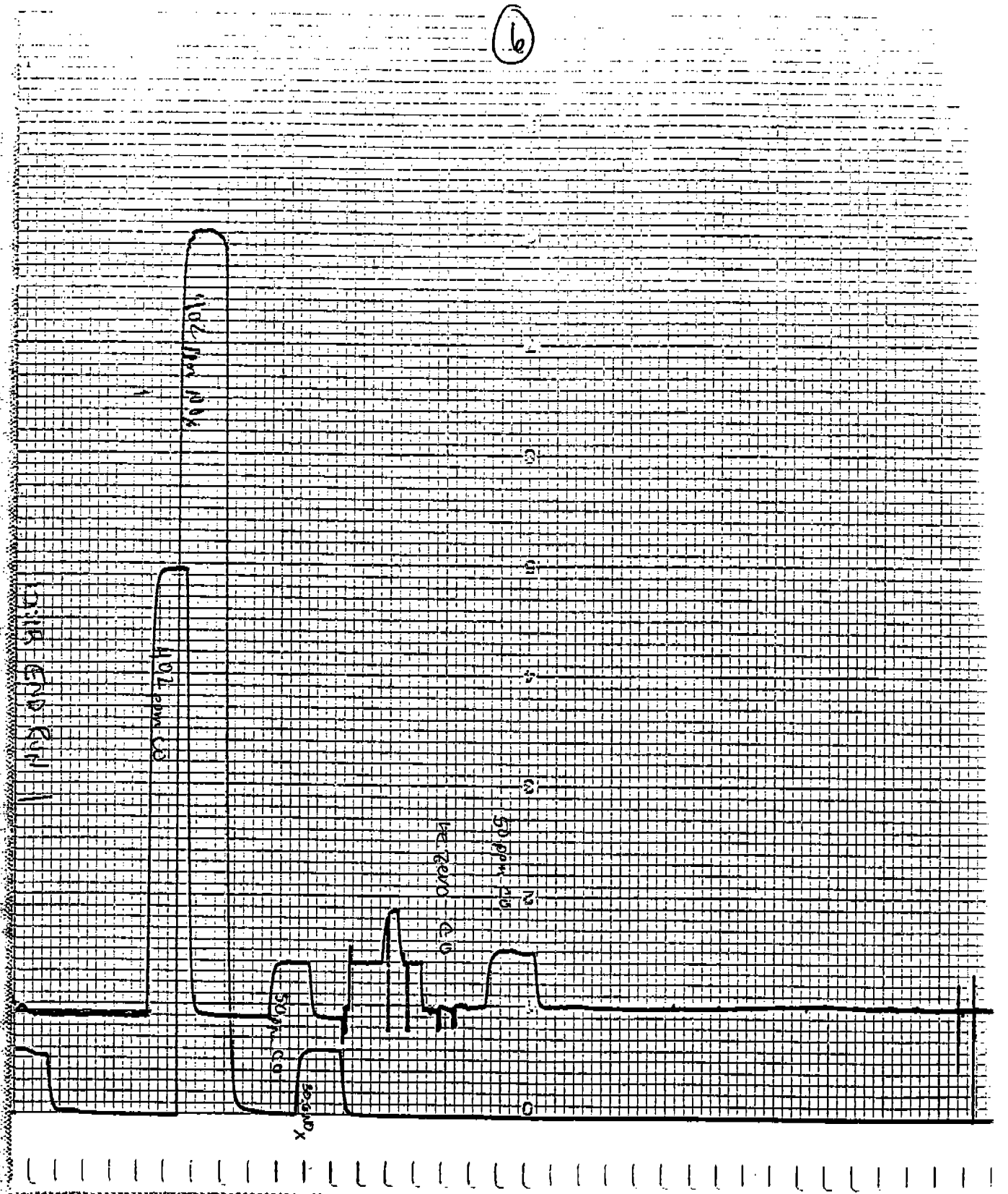

LP South RTO Ex
1/18/94
402 ppm NO
402 ppm CO
50 ppm CO
Zero

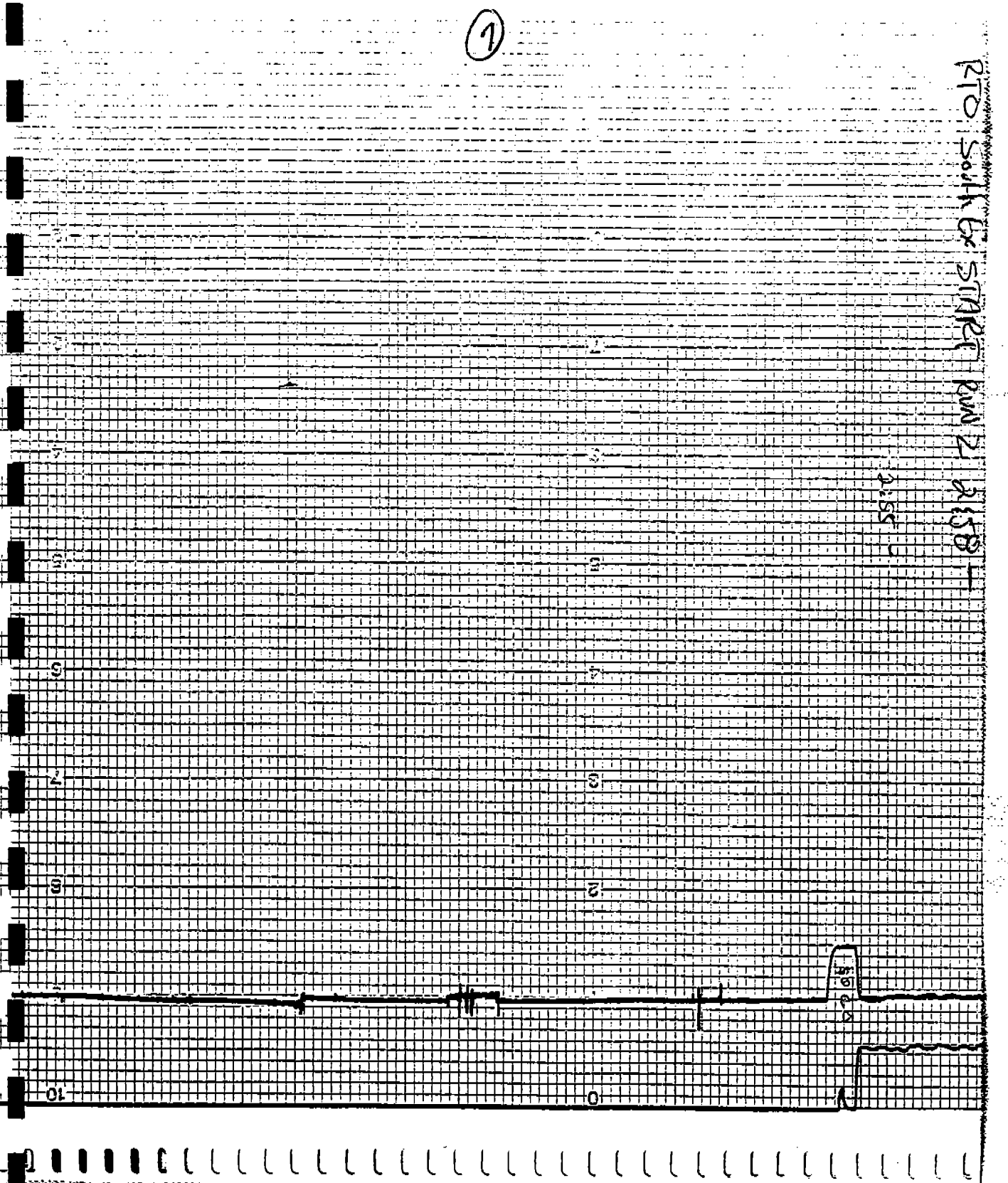

3
10:53 AM
402 ppm NOx
106.700
30.6 NOx

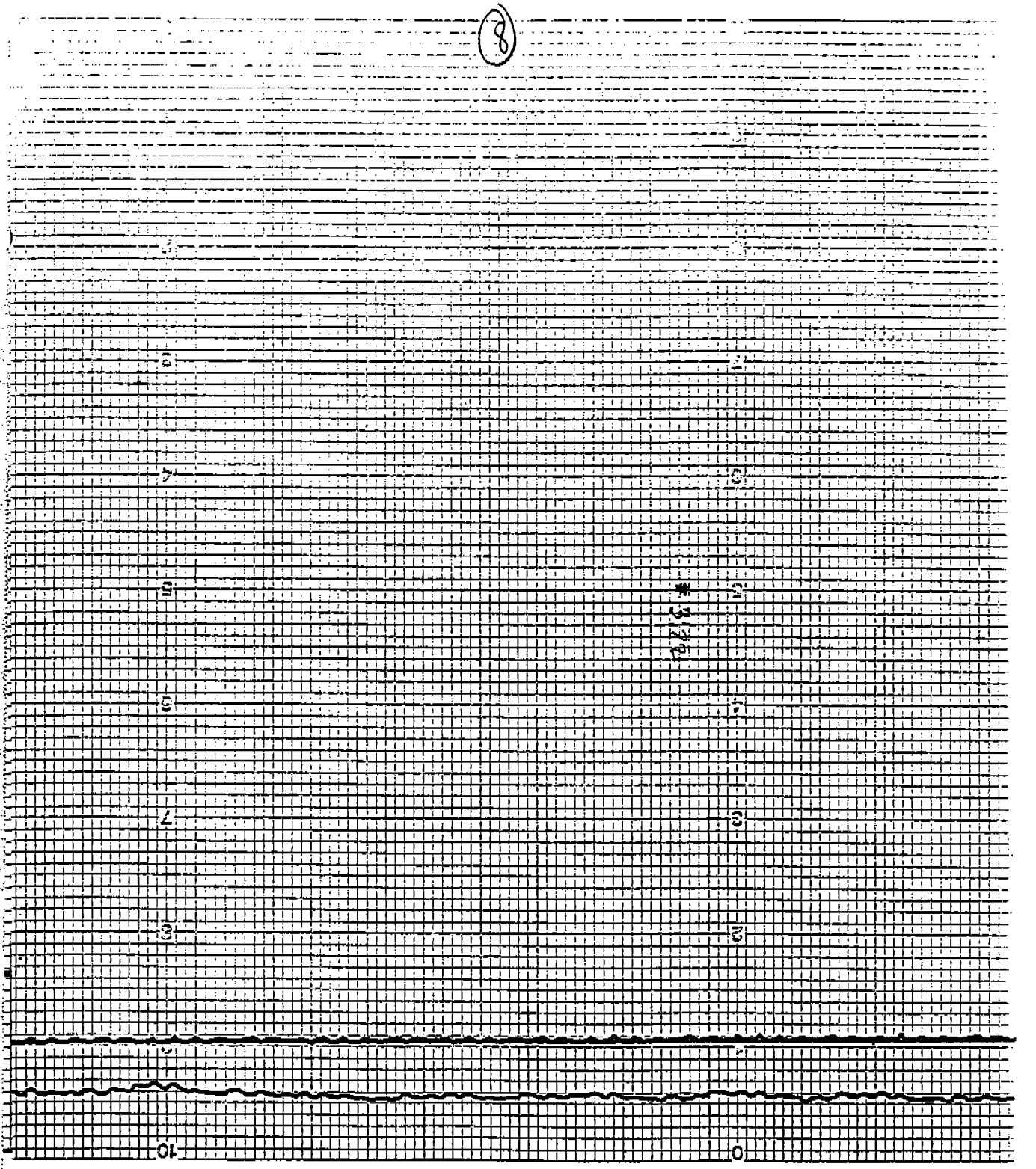
(4)

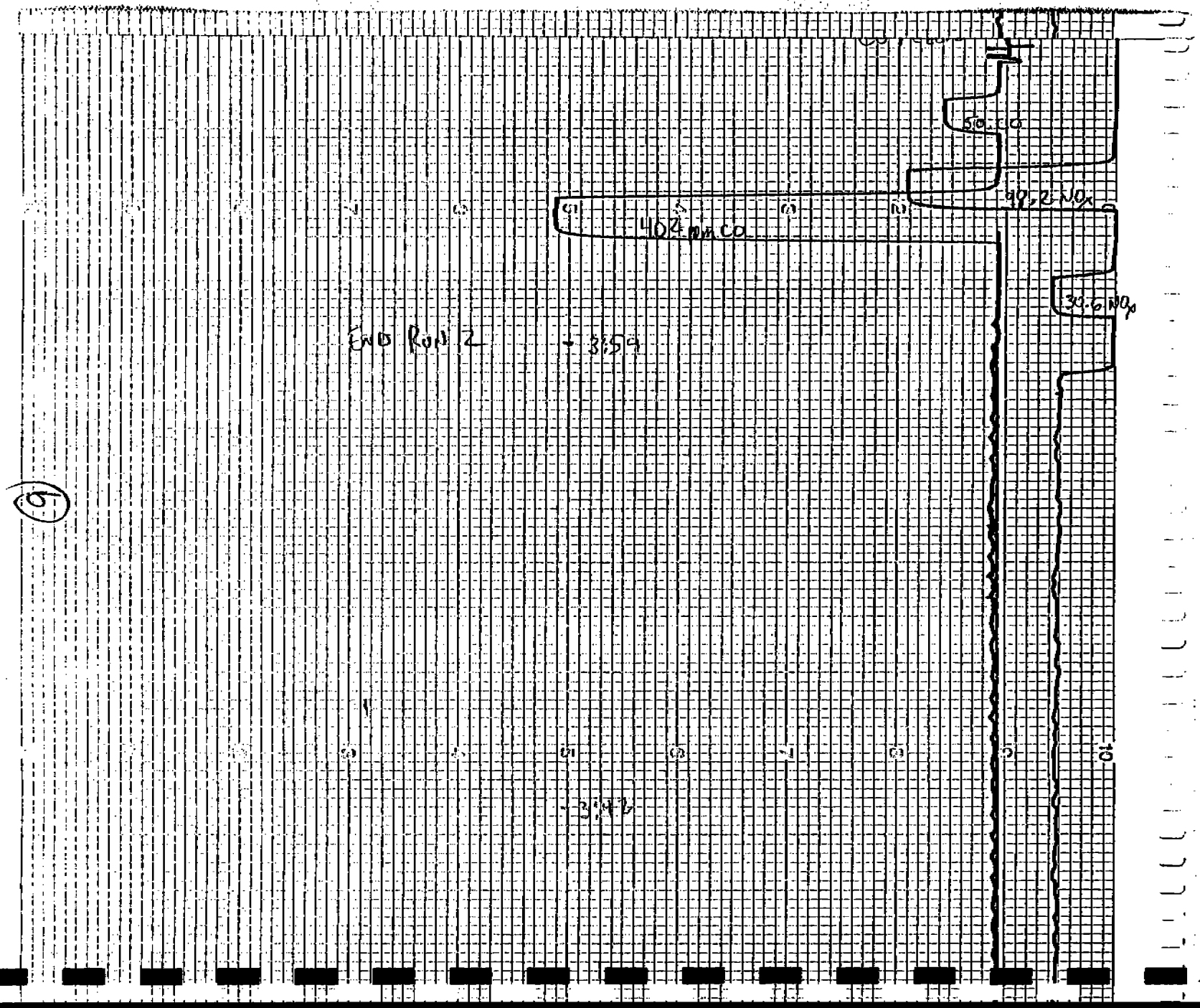
5



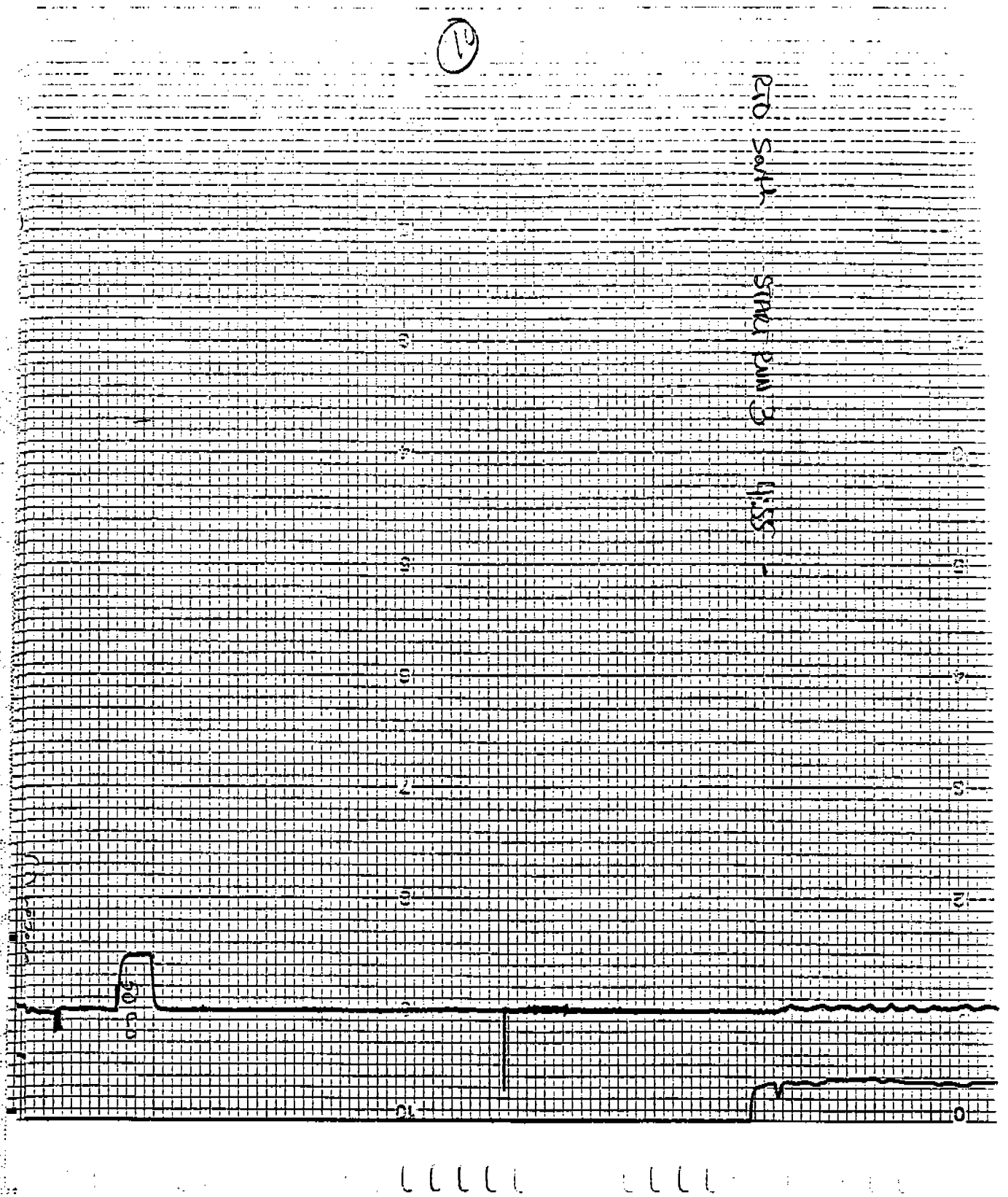

6
402 ppm NOx
402 ppm CO
50 ppm CO
50 ppm CO
0

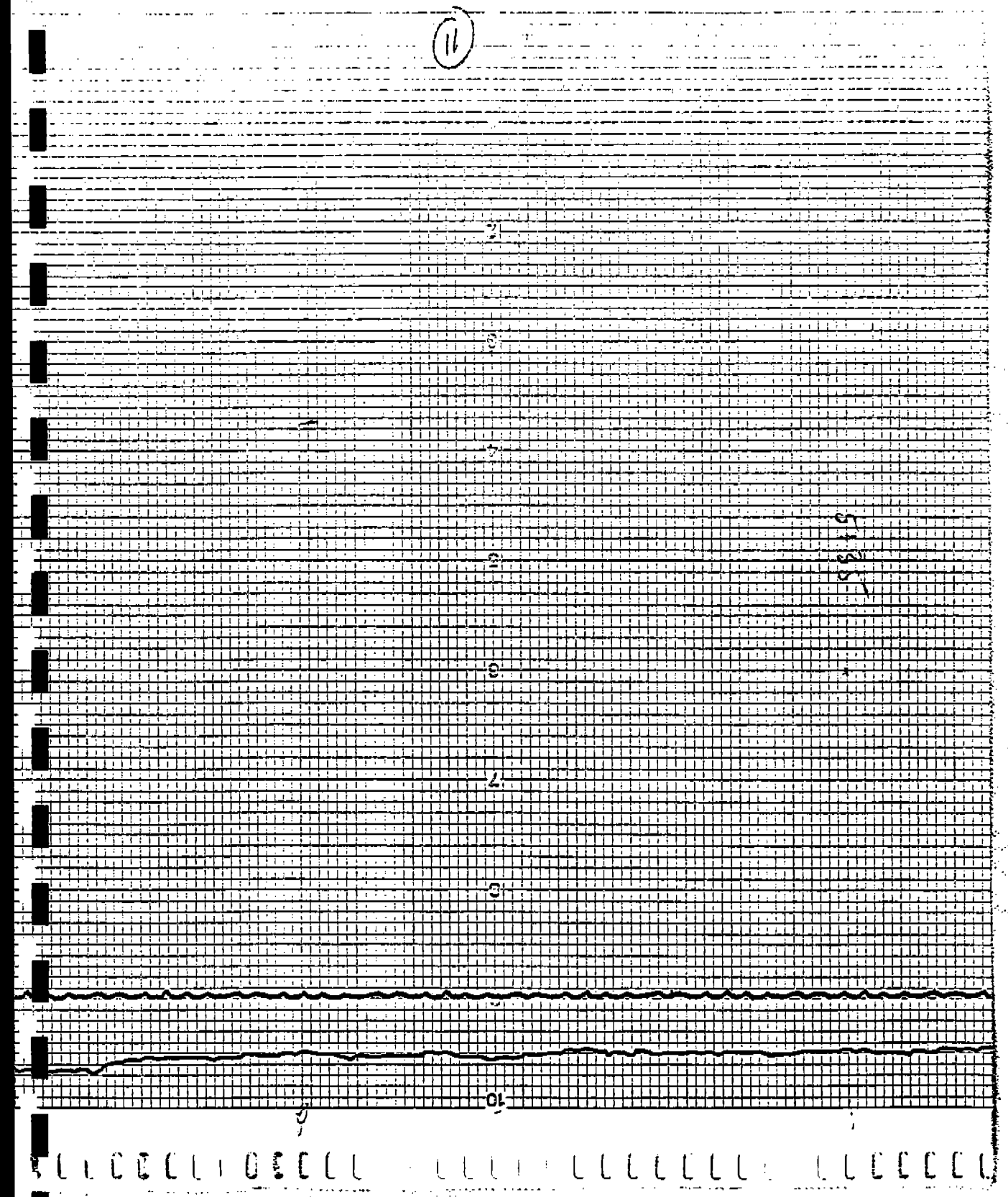

1
RTO South Ex START Run 2 2158
2:55

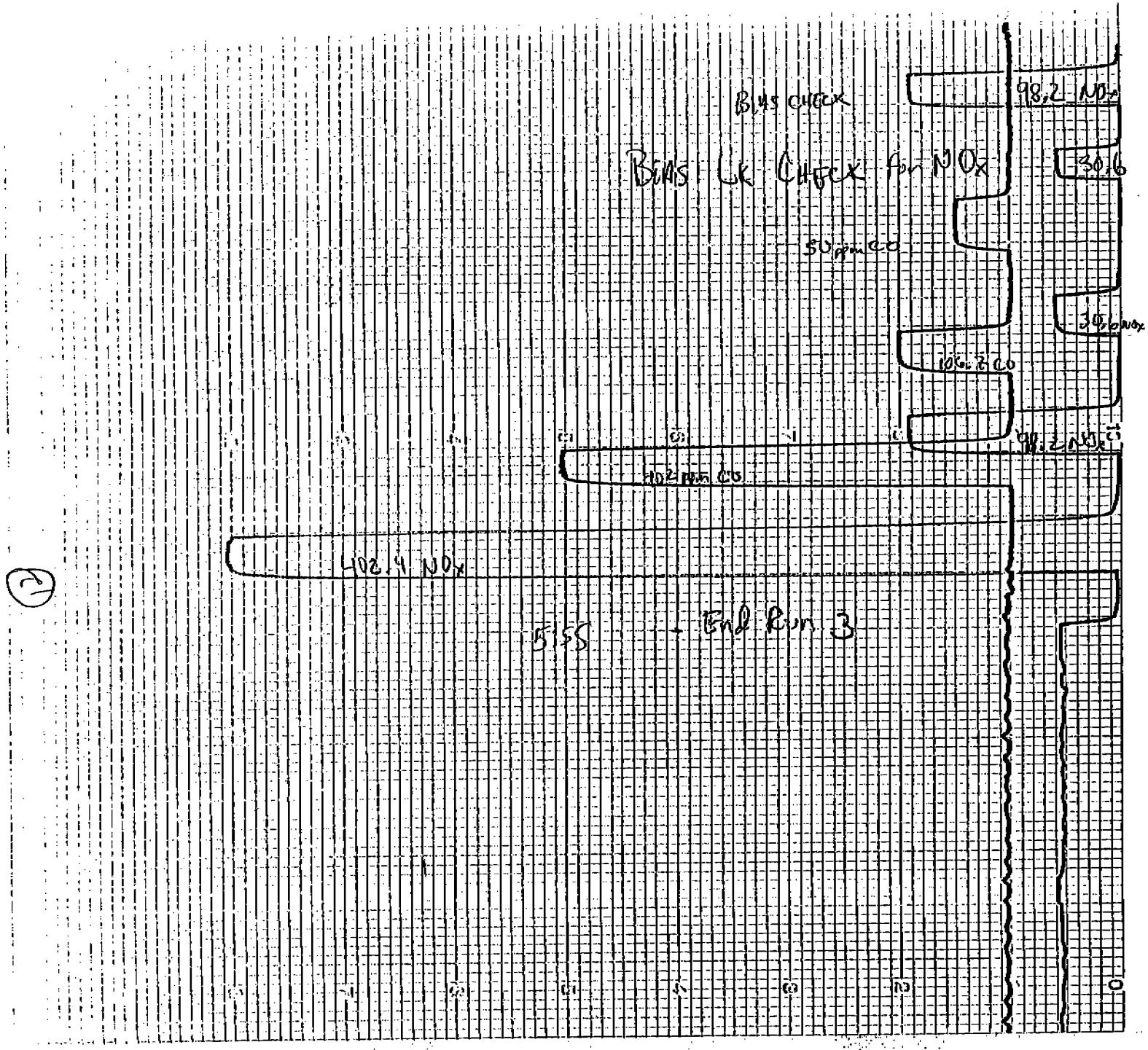




9


RTO South
START RUN 3
4:55

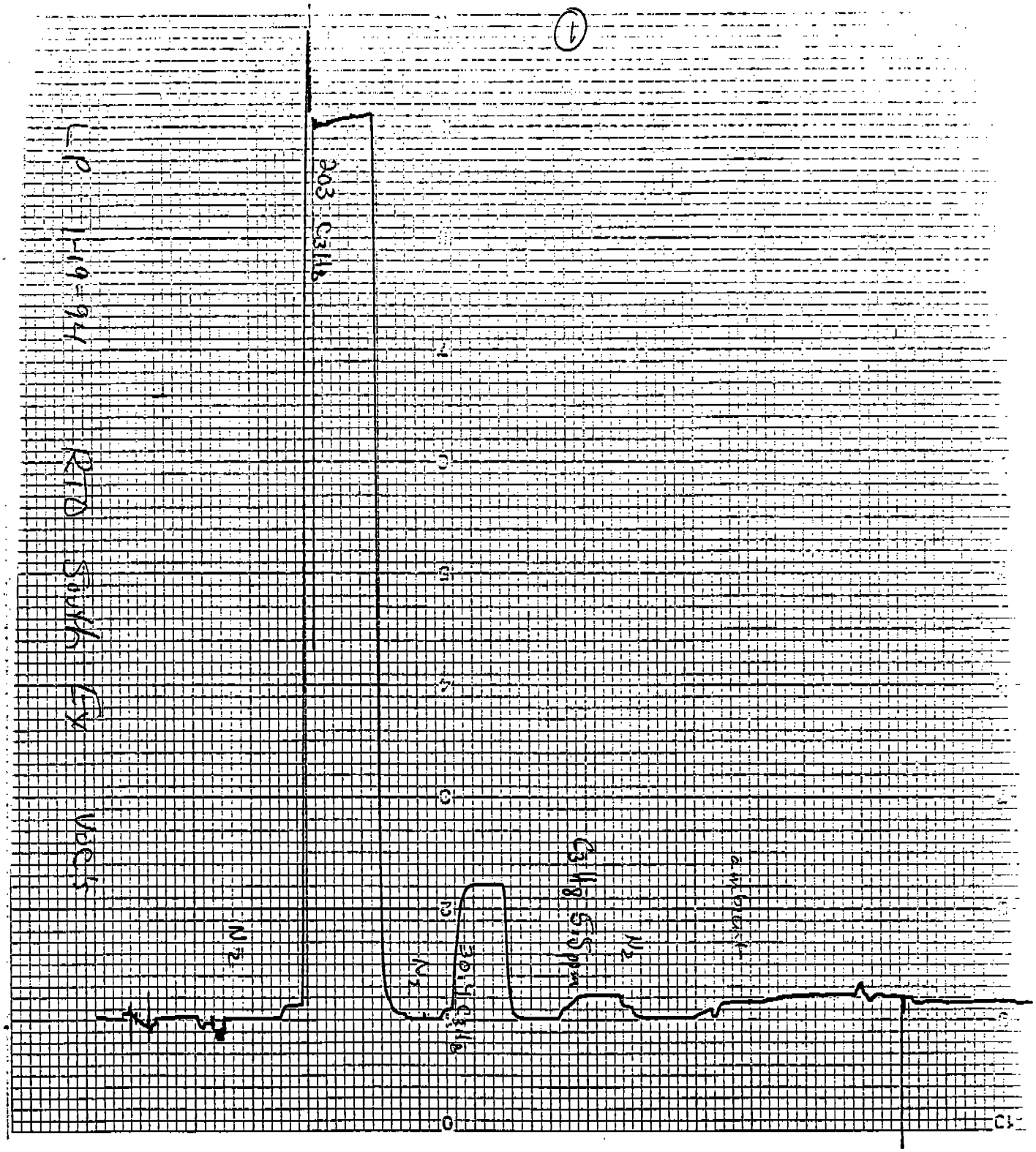

11
2
3
4
5
6
7
8
9
10


Bias check
Bias Ck Check for NOx
98.2 NOx
30.6
50 ppm CO
30 ppm NOx
106.2 CO
98.2 NOx
402 ppm CO
402.4 NOx
1555 - End Run 3

LP 1-19-94

RTO SOUTH EXHAUST - VOC'S

	Run 1 11:05-11:27 / 2:34-3:14	Run 2 4:27-5:31	Run 3 6:10-7:10
11:05	.2	0	0
	.2		
	.2		
	.2		
	.1		
	.1		
	.1		
	.1		
	.2		
10	.2		
11:27	.2		
	.1		
	.2		
	.1		
	.2		
	.2		
	.2		
	.2		
	.2		
20	.2		
	.2		
	.2		
	.2		
	.2		
	.2		
	.2		
	.2		
	.2		
	.2		
	.2		
30	.2		
	0.18	0	0
PPM/UNIT	2.533		
PPM	0.456	ND	ND


LP 1-19-94 RTO South Ex VOCs
203 C3H8
N2
N2
30.4 C3H8
C3H8 5.5 ppm
N2
ambient
0

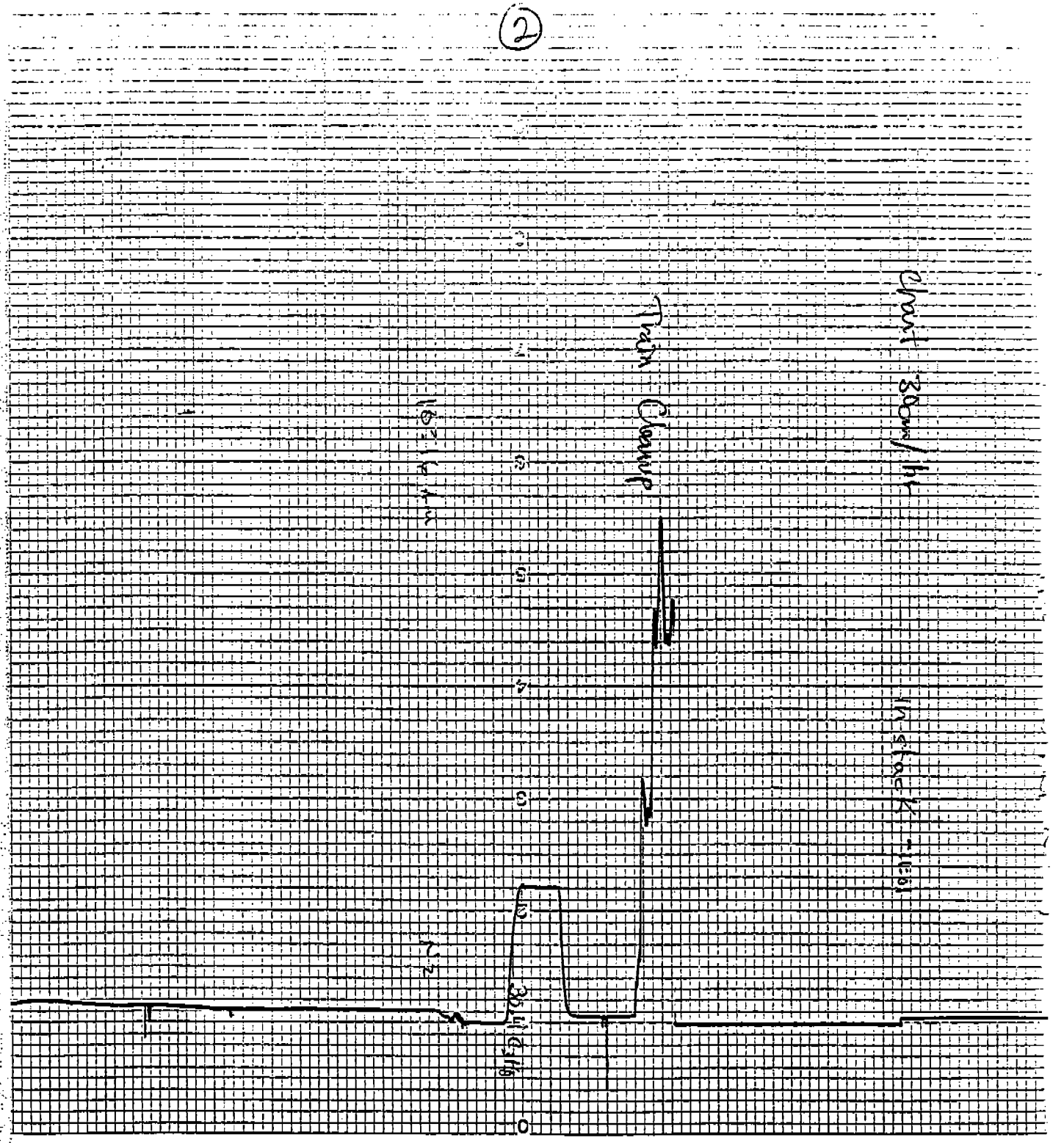


Chart 30cm/hr
Train Clamp
Instack

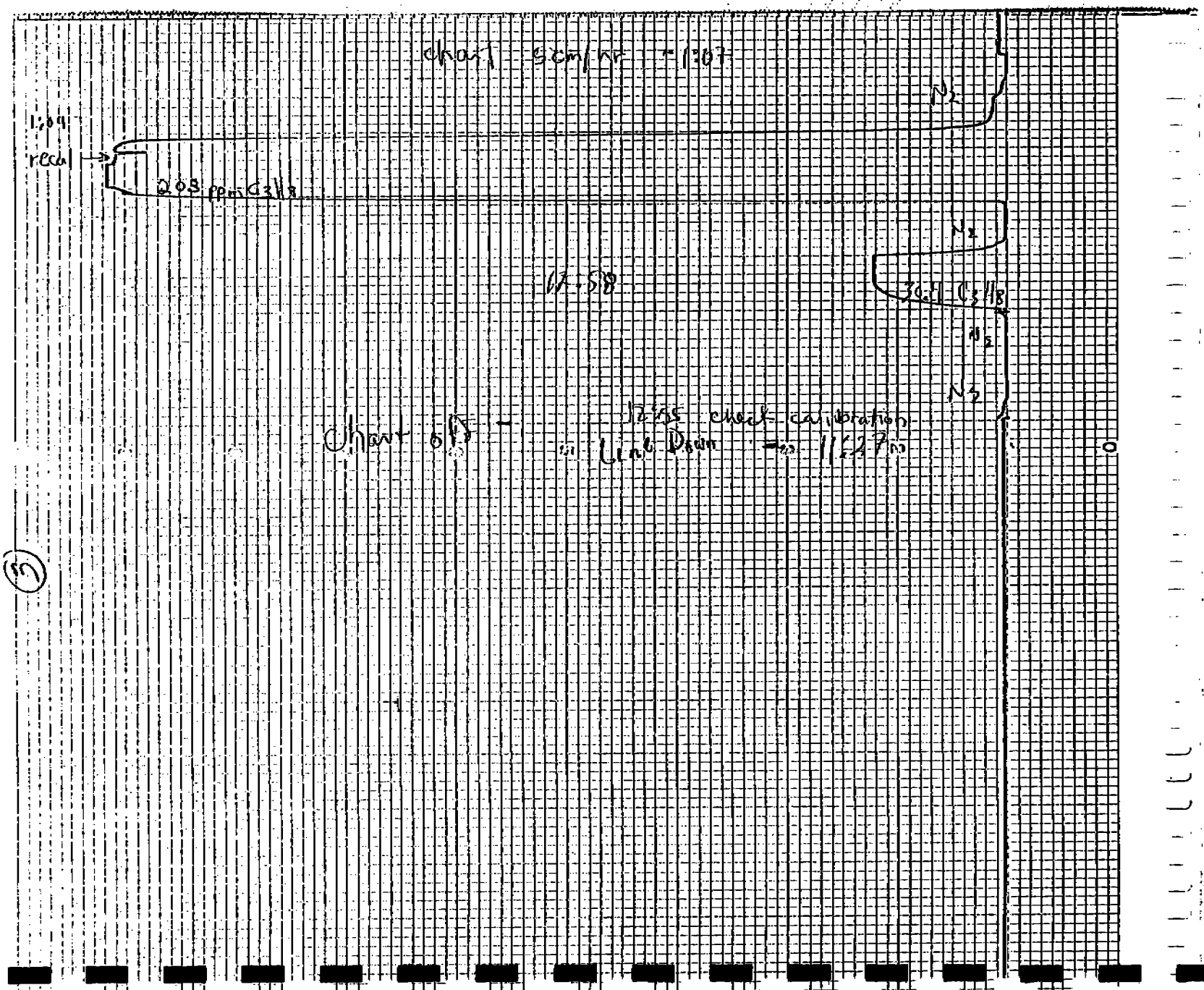
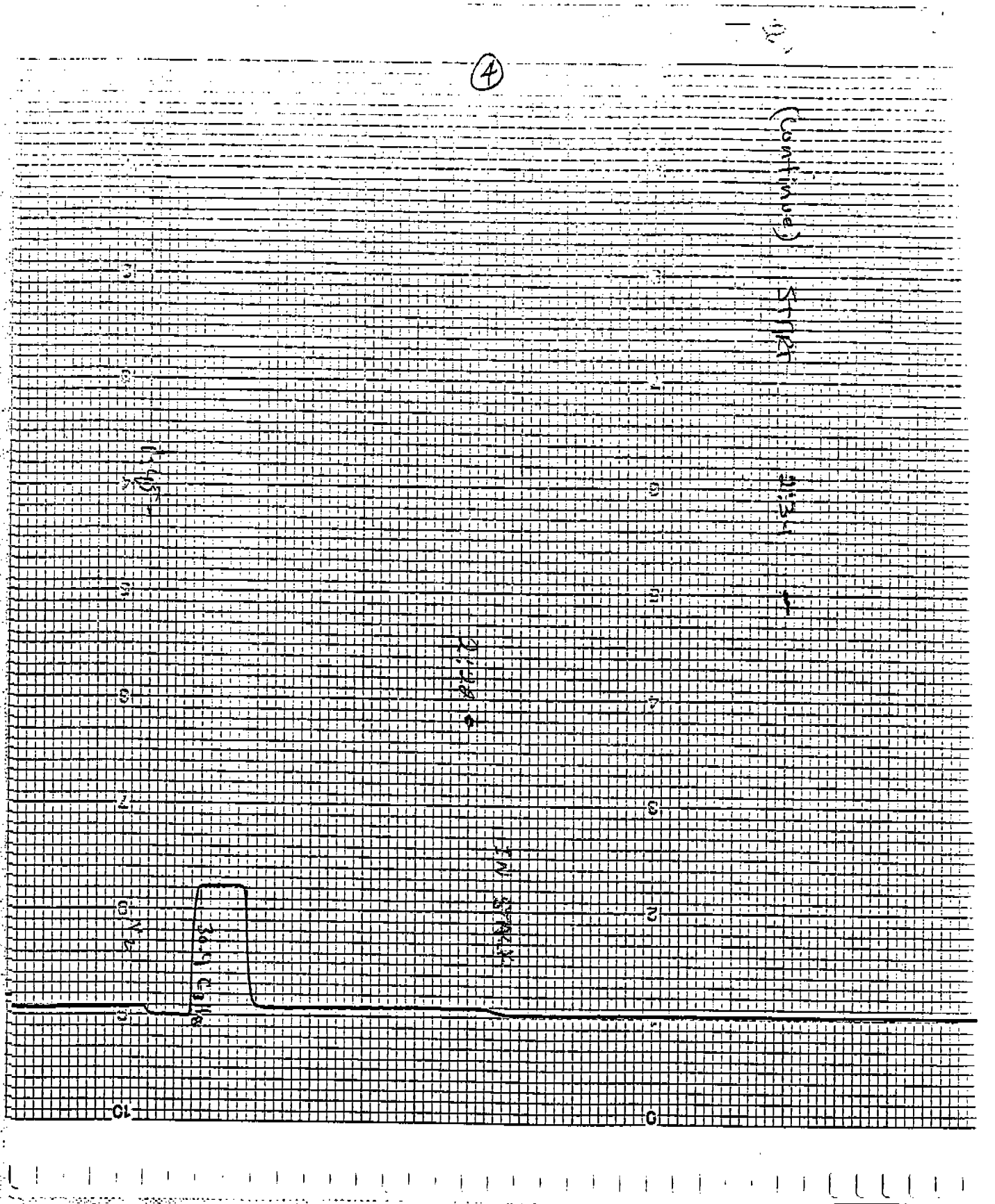
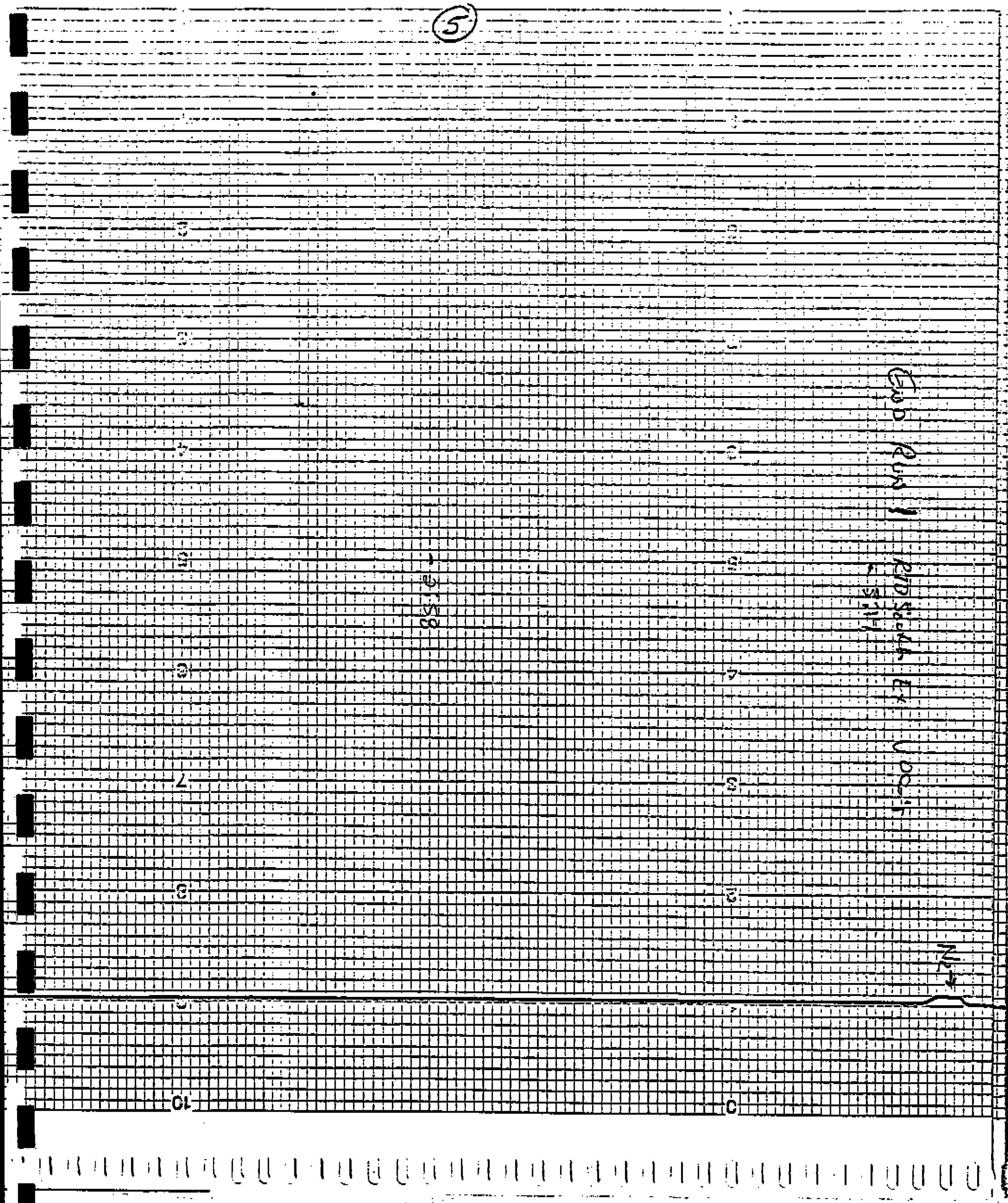
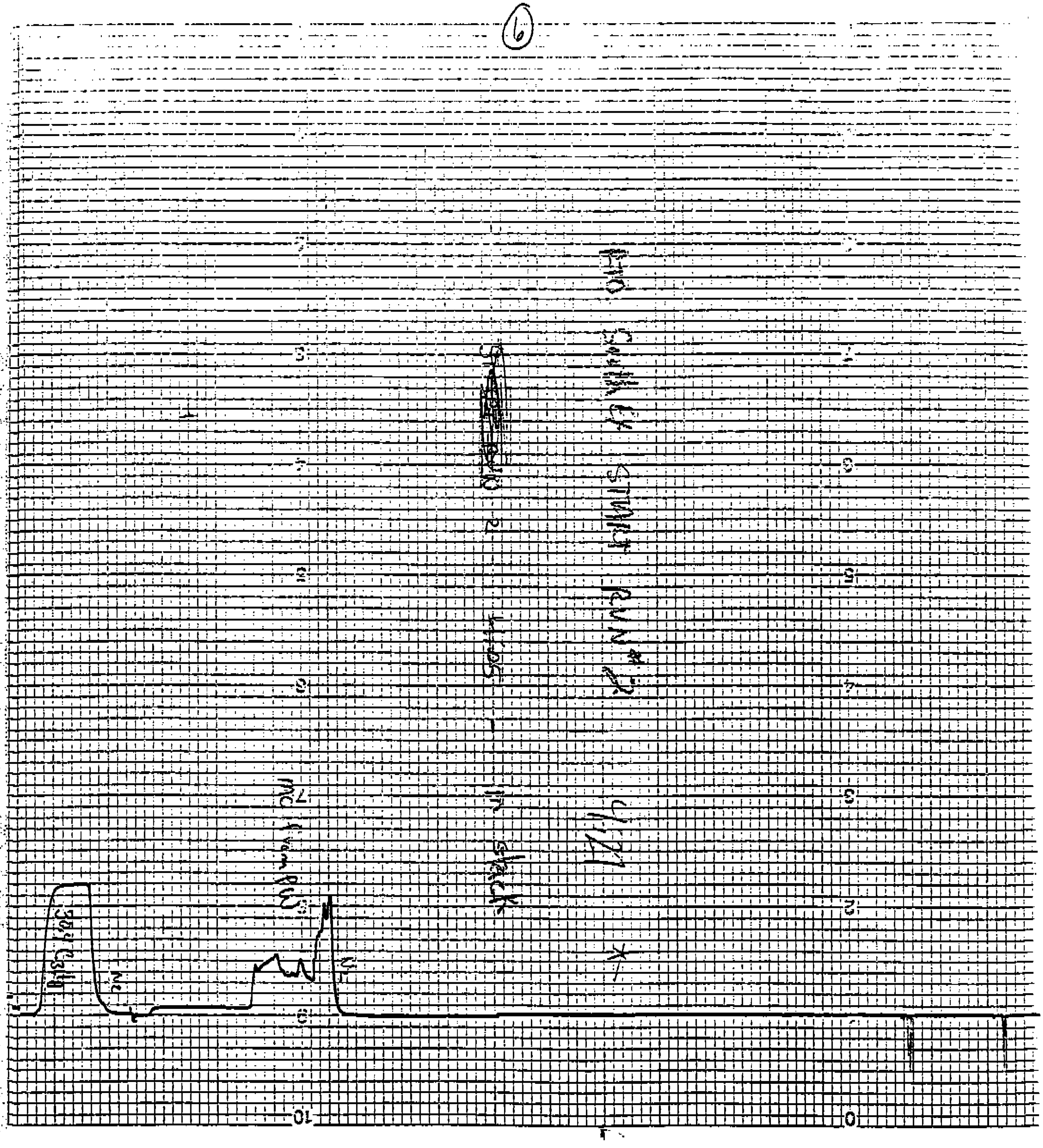


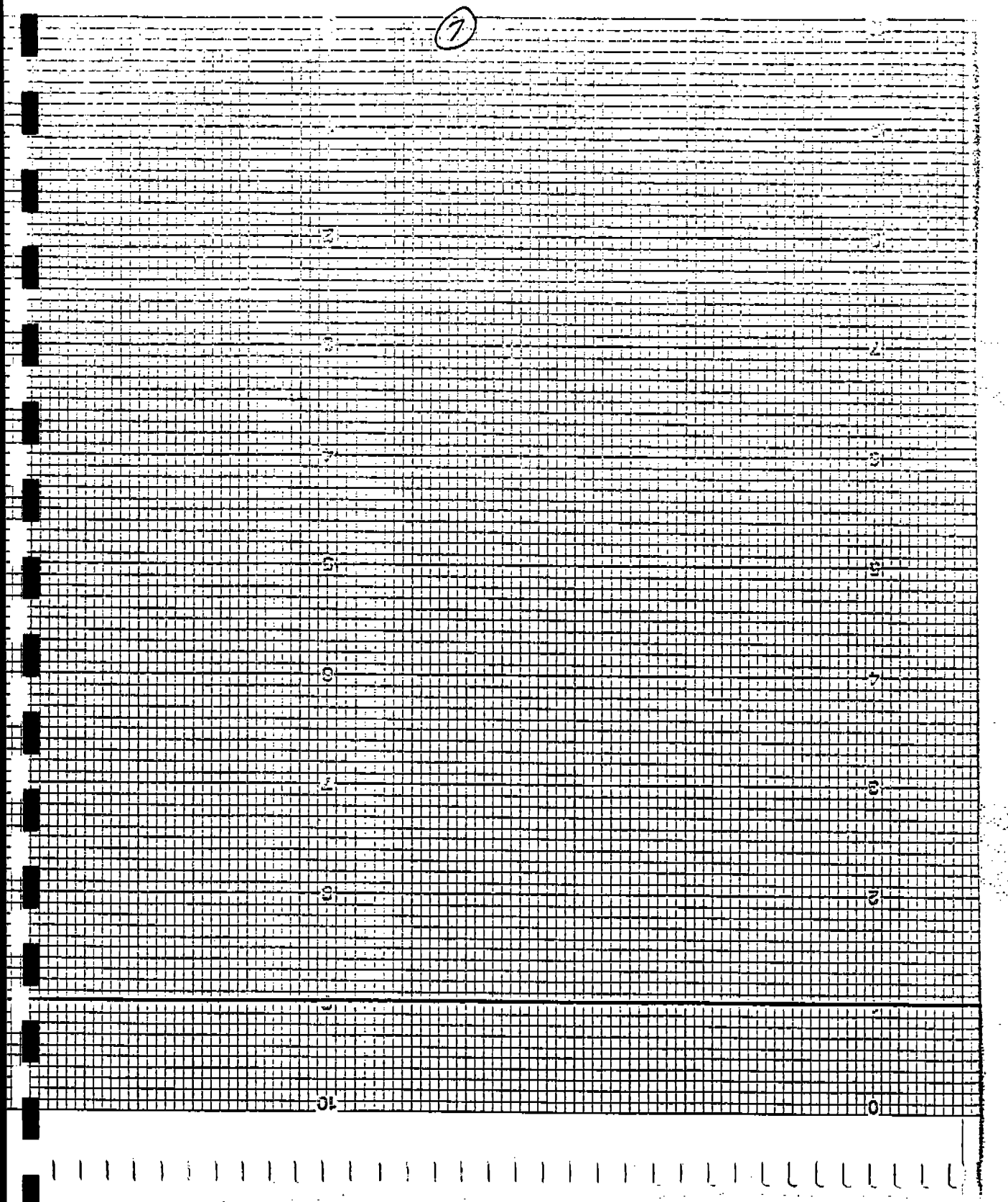
chart 5cm/hr - 1:07
N2
1:04
recal
203 ppm C3H8
N2
12:58
30.4 C3H8
N2
N2
Chart off - 12:55 check calibration
Line Down - 11:27 m
0


(4)
(Continue)
START
2:34
2:28
IN STACK
30.4 C3H8
N2

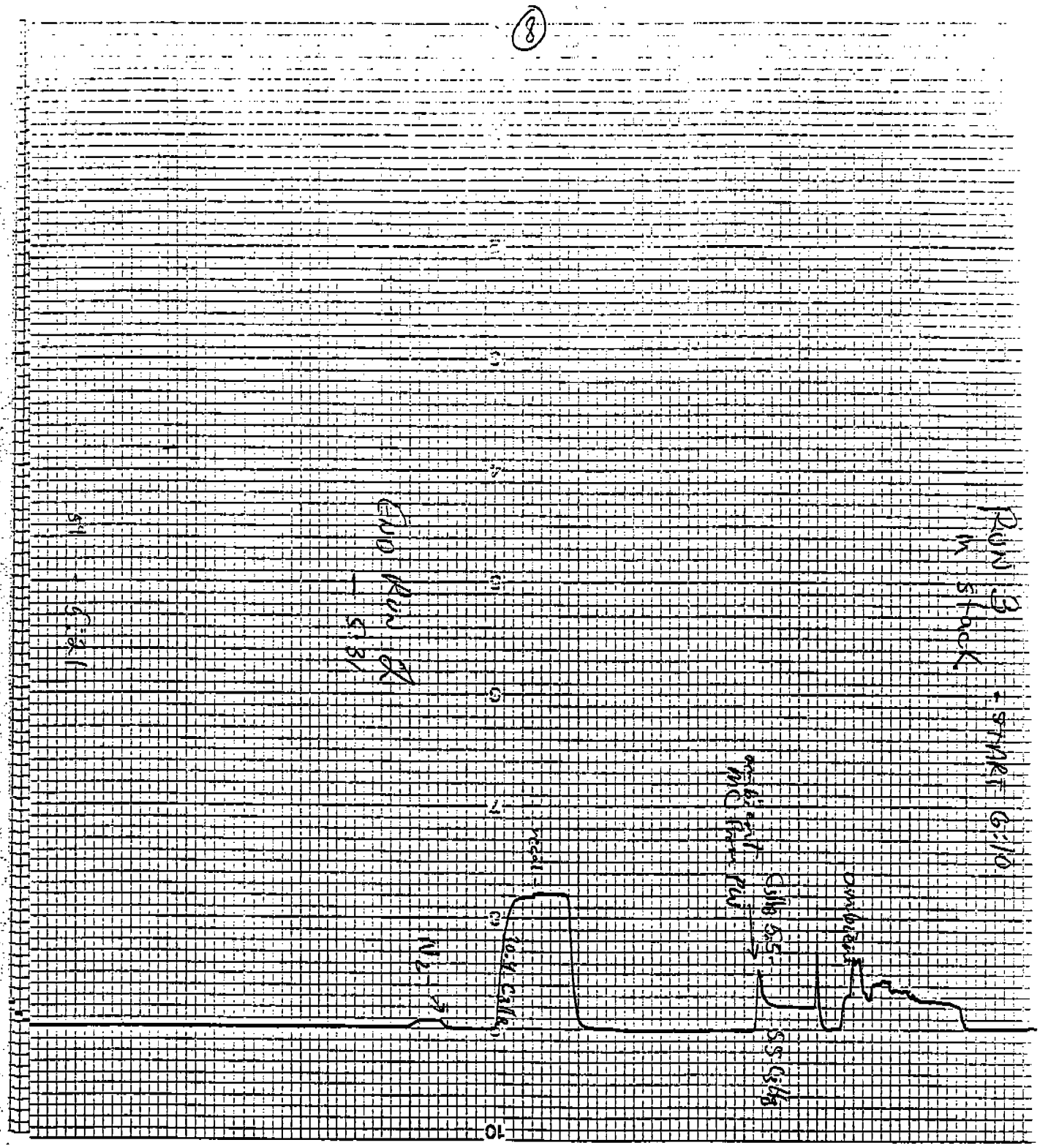

5
End Run 1
N2

(6)

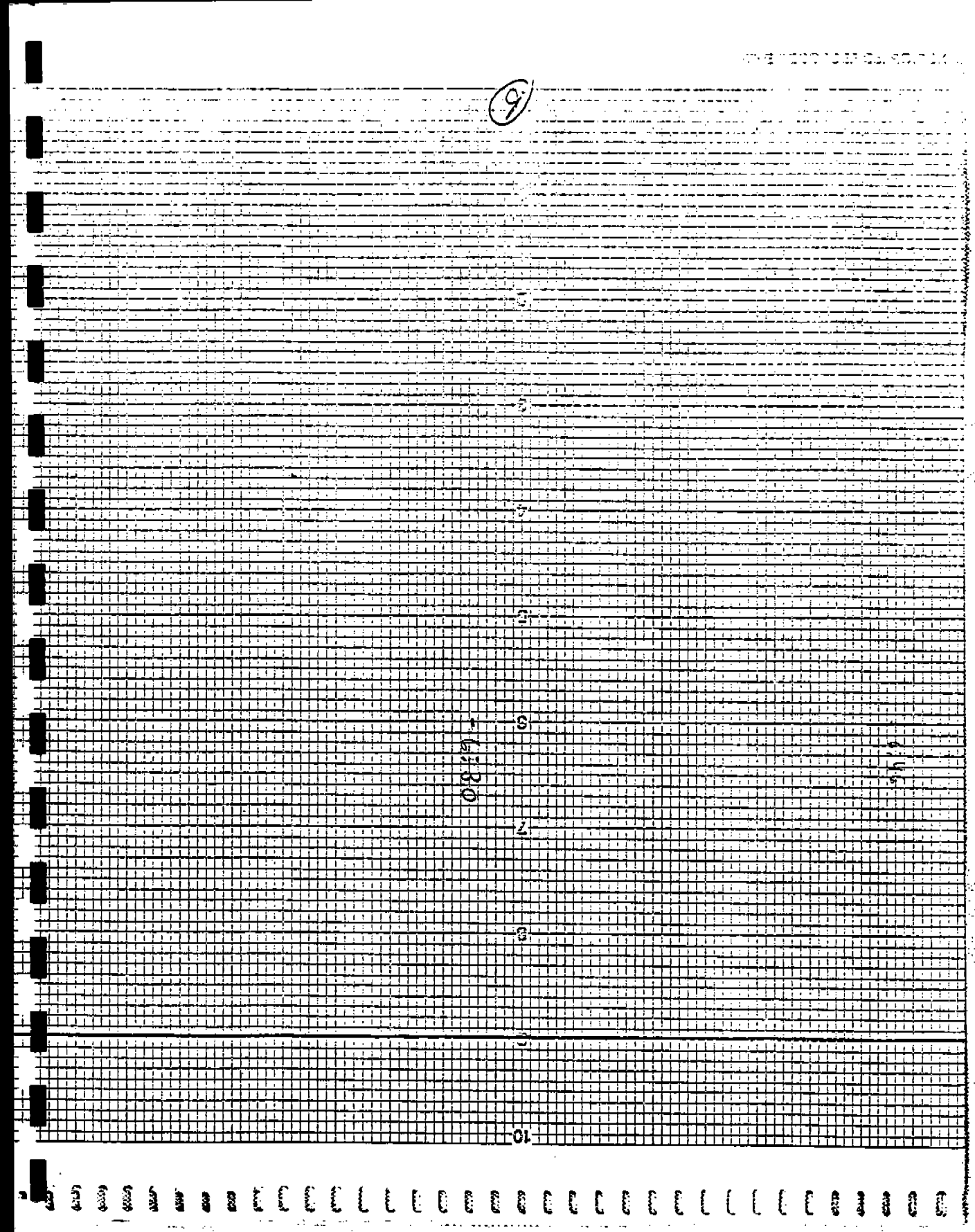




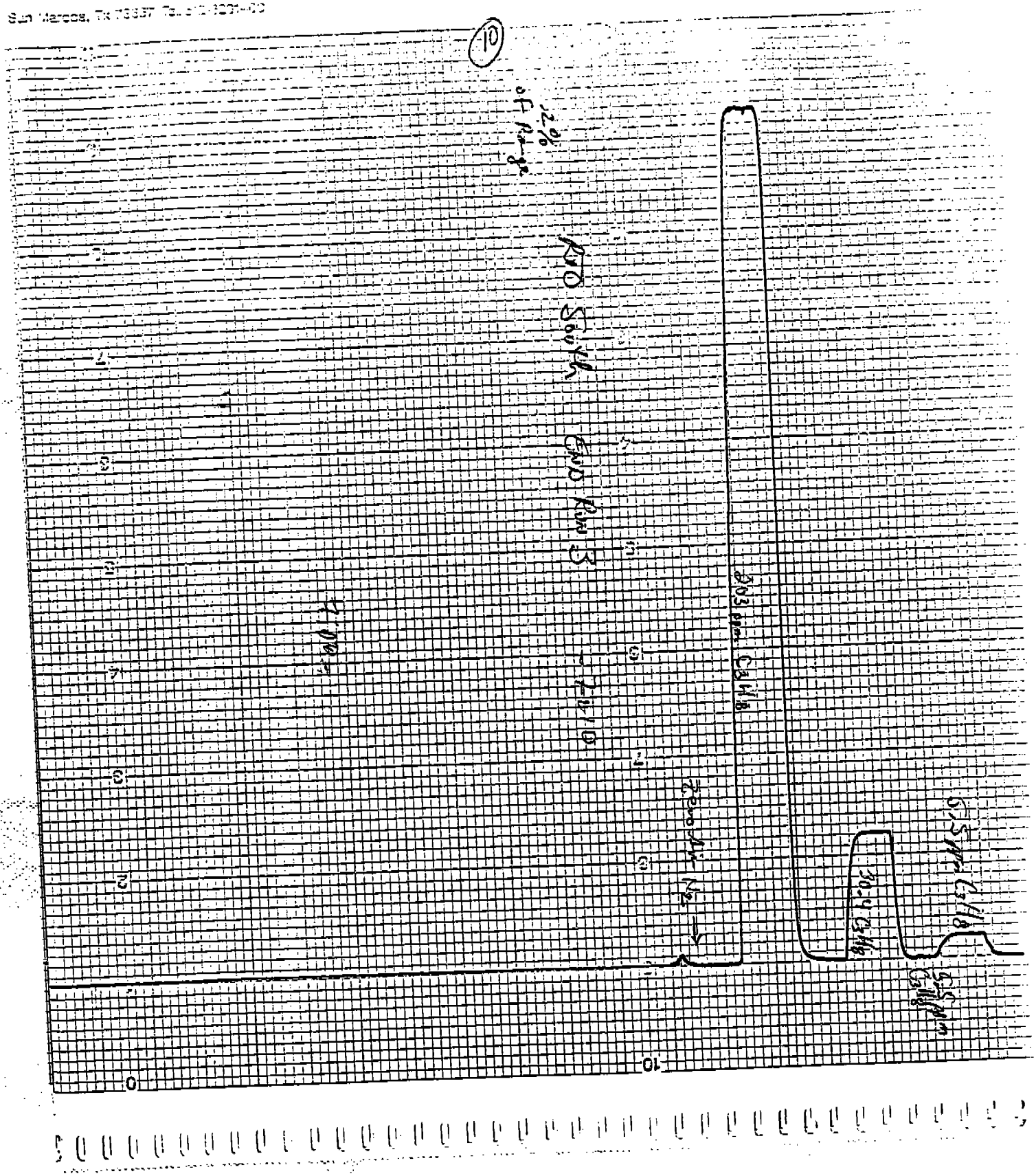
7



8
Run 3 - START 6:10
in stack
End Run 2
- 5:31
recal
ambient
ambient
MC from PW
10


10
5
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100
105
110
115
120
125
130
135
140
145
150
155
160
165
170
175
180
185
190
195
200
205
210
215
220
225
230
235
240
245
250
255
260
265
270
275
280
285
290
295
300
305
310
315
320
325
330
335
340
345
350
355
360
365
370
375
380
385
390
395
400
405
410
415
420
425
430
435
440
445
450
455
460
465
470
475
480
485
490
495
500
505
510
515
520
525
530
535
540
545
550
555
560
565
570
575
580
585
590
595
600
605
610
615
620
625
630
635
640
645
650
655
660
665
670
675
680
685
690
695
700
705
710
715
720
725
730
735
740
745
750
755
760
765
770
775
780
785
790
795
800
805
810
815
820
825
830
835
840
845
850
855
860
865
870
875
880
885
890
895
900
905
910
915
920
925
930
935
940
945
950
955
960
965
970
975
980
985
990
995
1000
1005
1010
1015
1020
1025
1030
1035
1040
1045
1050
1055
1060
1065
1070
1075
1080
1085
1090
1095
1100
1105
1110
1115
1120
1125
1130
1135
1140
1145
1150
1155
1160
1165
1170
1175
1180
1185
1190
1195
1200
1205
1210
1215
1220
1225
1230
1235
1240
1245
1250
1255
1260
1265
1270
1275
1280
1285
1290
1295
1300
1305
1310
1315
1320
1325
1330
1335
1340
1345
1350
1355
1360
1365
1370
1375
1380
1385
1390
1395
1400
1405
1410
1415
1420
1425
1430
1435
1440
1445
1450
1455
1460
1465
1470
1475
1480
1485
1490
1495
1500
1505
1510
1515
1520
1525
1530
1535
1540
1545
1550
1555
1560
1565
1570
1575
1580
1585
1590
1595
1600
1605
1610
1615
1620
1625
1630
1635
1640
1645
1650
1655
1660
1665
1670
1675
1680
1685
1690
1695
1700
1705
1710
1715
1720
1725
1730
1735
1740
1745
1750
1755
1760
1765
1770
1775
1780
1785
1790
1795
1800
1805
1810
1815
1820
1825
1830
1835
1840
1845
1850
1855
1860
1865
1870
1875
1880
1885
1890
1895
1900
1905
1910
1915
1920
1925
1930
1935
1940
1945
1950
1955
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
2055
2060
2065
2070
2075
2080
2085
2090
2095
2100
2105
2110
2115
2120
2125
2130
2135
2140
2145
2150
2155
2160
2165
2170
2175
2180
2185
2190
2195
2200
2205
2210
2215
2220
2225
2230
2235
2240
2245
2250
2255
2260
2265
2270
2275
2280
2285
2290
2295
2300
2305
2310
2315
2320
2325
2330
2335
2340
2345
2350
2355
2360
2365
2370
2375
2380
2385
2390
2395
2400
2405
2410
2415
2420
2425
2430
2435
2440
2445
2450
2455
2460
2465
2470
2475
2480
2485
2490
2495
2500
2505
2510
2515
2520
2525
2530
2535
2540
2545
2550
2555
2560
2565
2570
2575
2580
2585
2590
2595
2600
2605
2610
2615
2620
2625
2630
2635
2640
2645
2650
2655
2660
2665
2670
2675
2680
2685
2690
2695
2700
2705
2710
2715
2720
2725
2730
2735
2740
2745
2750
2755
2760
2765
2770
2775
2780
2785
2790
2795
2800
2805
2810
2815
2820
2825
2830
2835
2840
2845
2850
2855
2860
2865
2870
2875
2880
2885
2890
2895
2900
2905
2910
2915
2920
2925
2930
2935
2940
2945
2950
2955
2960
2965
2970
2975
2980
2985
2990
2995
3000
3005
3010
3015
3020
3025
3030
3035
3040
3045
3050
3055
3060
3065
3070
3075
3080
3085
3090
3095
3100
3105
3110
3115
3120
3125
3130
3135
3140
3145
3150
3155
3160
3165
3170
3175
3180
3185
3190
3195
3200
3205
3210
3215
3220
3225
3230
3235
3240
3245
3250
3255
3260
3265
3270
3275
3280
3285
3290
3295
3300
3305
3310
3315
3320
3325
3330
3335
3340
3345
3350
3355
3360
3365
3370
3375
3380
3385
3390
3395
3400
3405
3410
3415
3420
3425
3430
3435
3440
3445
3450
3455
3460
3465
3470
3475
3480
3485
3490
3495
3500
3505
3510
3515
3520
3525
3530
3535
3540
3545
3550
3555
3560
3565
3570
3575
3580
3585
3590
3595
3600
3605
3610
3615
3620
3625
3630
3635
3640
3645
3650
3655
3660
3665
3670
3675
3680
3685
3690
3695
3700
3705
3710
3715
3720
3725
3730
3735
3740
3745
3750
3755
3760
3765
3770
3775
3780
3785
3790
3795
3800
3805
3810
3815
3820
3825
3830
3835
3840
3845
3850
3855
3860
3865
3870
3875
3880
3885
3890
3895
3900
3905
3910
3915
3920
3925
3930
3935
3940
3945
3950
3955
3960
3965
3970
3975
3980
3985
3990
3995
4000
4005
4010
4015
4020
4025
4030
4035
4040
4045
4050
4055
4060
4065
4070
4075
4080
4085
4090
4095
4100
4105
4110
4115
4120
4125
4130
4135
4140
4145
4150
4155
4160
4165
4170
4175
4180
4185
4190
4195
4200
4205
4210
4215
4220
4225
4230
4235
4240
4245
4250
4255
4260
4265
4270
4275
4280
4285
4290
4295
4300
4305
4310
4315
4320
4325
4330
4335
4340
4345
4350
4355
4360
4365
4370
4375
4380
4385
4390
4395
4400
4405
4410
4415
4420
4425
4430
4435
4440
4445
4450
4455
4460
4465
4470
4475
4480
4485
4490
4495
4500
4505
4510
4515
4520
4525
4530
4535
4540
4545
4550
4555
4560
4565
4570
4575
4580
4585
4590
4595
4600
4605
4610
4615
4620
4625
4630
4635
4640
4645
4650
4655
4660
4665
4670
4675
4680
4685
4690
4695
4700
4705
4710
4715
4720
4725
4730
4735
4740
4745
4750
4755
4760
4765
4770
4775
4780
4785
4790
4795
4800
4805
4810
4815
4820
4825
4830
4835
4840
4845
4850
4855
4860
4865
4870
4875
4880
4885
4890
4895
4900
4905
4910
4915
4920
4925
4930
4935
4940
4945
4950
4955
4960
4965
4970
4975
4980
4985
4990
4995
5000
5005
5010
5015
5020
5025
5030
5035
5040
5045
5050
5055
5060
5065
5070
5075
5080
5085
5090
5095
5100
5105
5110
5115
5120
5125
5130
5135
5140
5145
5150
5155
5160
5165
5170
5175
5180
5185
5190
5195
5200
5205
5210
5215
5220
5225
5230
5235
5240
5245
5250
5255
5260
5265
5270
5275
5280
5285
5290
5295
5300
5305
5310
5315
5320
5325
5330
5335
5340
5345
5350
5355
5360
5365
5370
5375
5380
5385
5390
5395
5400
5405
5410
5415
5420
5425
5430
5435
5440
5445
5450
5455
5460
5465
5470
5475
5480
5485
5490
5495
5500
5505
5510
5515
5520
5525
5530
5535
5540
5545
5550
5555
5560
5565
5570
5575
5580
5585
5590
5595
5600
5605
5610
5615
5620
5625
5630
5635
5640
5645
5650
5655
5660
5665
5670
5675
5680
5685
5690
5695
5700
5705
5710
5715
5720
5725
5730
5735
5740
5745
5750
5755
5760
5765
5770
5775
5780
5785
5790
5795
5800
5805
5810
5815
5820
5825
5830
5835
5840
5845
5850
5855
5860
5865
5870
5875
5880
5885
5890
5895
5900
5905
5910
5915
5920
5925
5930
5935
5940
5945
5950
5955
5960
5965
5970
5975
5980
5985
5990
5995
6000
6005
6010
6015
6020
6025
6030
6035
6040
6045
6050
6055
6060
6065
6070
6075
6080
6085
6090
6095
6100
6105
6110
6115
6120
6125
6130
6135
6140
6145
6150
6155
6160
6165
6170
6175
6180
6185
6190
6195
6200
6205
6210
6215
6220
6225
6230
6235
6240
6245
6250
6255
6260
6265
6270
6275
6280
6285
6290
6295
6300
6305
6310
6315
6320
6325
6330
6335
6340
6345
6350
6355
6360
6365
6370
6375
6380
6385
6390
6395
6400
6405
6410
6415
6420
6425
6430
6435
6440
6445
6450
6455
6460
6465
6470
6475
6480
6485
6490
6495
6500
6505
6510
6515
6520
6525
6530
6535
6540
6545
6550
6555
6560
6565
6570
6575
6580
6585
6590
6595
6600
6605
6610
6615
6620
6625
6630
6635
6640
6645
6650
6655
6660
6665
6670
6675
6680
6685
6690
6695
6700
6705
6710
6715
6720
6725
6730
6735
6740
6745
6750
6755
6760
6765
6770
6775
6780
6785
6790
6795
6800
6805
6810
6815
6820
6825
6830
6835
6840
6845
6850
6855
6860
6865
6870
6875
6880
6885
6890
6895
6900
6905
6910
6915
6920
6925
6930
6935
6940
6945
6950
6955
6960
6965
6970
6975
6980
6985
6990
6995
7000
7005
7010
7015
7020
7025
7030
7035
7040
7045
7050
7055
7060
7065
7070
7075
7080
7085
7090
7095
7100
7105
7110
7115
7120
7125
7130
7135
7140
7145
7150
7155
7160
7165
7170
7175
7180
7185
7190
7195
7200
7205
7210
7215
7220
7225
7230
7235
7240
7245
7250
7255
7260
7265
7270
7275
7280
7285
7290
7295
7300
7305
7310
7315
7320
7325
7330
7335
7340
7345
7350
7355
7360
7365
7370
7375
7380
7385
7390
7395
7400
7405
7410
7415
7420
7425
7430
7435
7440
7445
7450
7455
7460
7465
7470
7475
7480
7485
7490
7495
7500
7505
7510
7515
7520
7525
7530
7535
7540
7545
7550
7555
7560
7565
7570
7575
7580
7585
7590
7595
7600
7605
7610
7615
7620
7625
7630
7635
7640
7645
7650
7655
7660
7665
7670
7675
7680
7685
7690
7695
7700
7705
7710
7715
7720
7725
7730
7735
7740
7745
7750
7755
7760
7765
7770
7775
7780
7785
7790
7795
7800
7805
7810
7815
7820
7825
7830
7835
7840
7845
7850
7855
7860
7865
7870
7875
7880
7885
7890
7895
7900
7905
7910
7915
7920
7925
7930
7935
7940
7945
7950
7955
7960
7965
7970
7975
7980
7985
7990
7995
8000
8005
8010
8015
8020
8025
8030
8035
8040
8045
8050
8055
8060
8065
8070
8075
8080
8085
8090
8095
8100
8105
8110
8115
8120
8125
8130
8135
8140
8145
8150
8155
8160
8165
8170
8175
8180
8185
8190
8195
8200
8205
8210
8215
8220
8225
8230
8235
8240
8245
8250
8255
8260
8265
8270
8275
8280
8285
8290
8295
8300
8305
8310
8315
8320
8325
8330
8335
8340
8345
8350
8355
8360
8365
8370
8375
8380
8385
8390
8395
8400
8405
8410
8415
8420
8425
8430
8435
8440
8445
8450
8455
8460
8465
8470
8475
8480
8485
8490
8495
8500
8505
8510
8515
8520
8525
8530
8535
8540
8545
8550
8555
8560
8565
8570
8575
8580
8585
8590
8595
8600
8605
8610
8615
8620
8625
8630
8635
8640
8645
8650
8655
8660
8665
8670
8675
8680
8685
8690
8695
8700
8705
8710
8715
8720
8725
8730
8735
8740
8745
8750
8755
8760
8765
8770
8775
8780
8785
8790
8795
8800
8805
8810
8815
8820
8825
8830
8835
8840
8845
8850
8855
8860
8865
8870
8875
8880
8885
8890
8895
8900
8905
8910
8915
8920
8925
8930
8935
8940
8945
8950
8955
8960
8965
8970
8975
8980
8985
8990
8995
9000
9005
9010
9015
9020
9025
9030
9035
9040
9045
9050
9055
9060
9065
9070
9075
9080
9085
9090
9095
9100
9105
9110
9115
9120
9125
9130
9135
9140
9145
9150
9155
9160
9165
9170
9175
9180
9185
9190
9195
9200
9205
9210
9215
9220
9225
9230
9235
9240
9245
9250
9255
9260
9265
9270
9275
9280
9285
9290
9295
9300
9305
9310
9315
9320
9325
9330
9335
9340
9345
9350
9355
9360
9365
9370
9375
9380
9385
9390
9395
9400
9405
9410
9415
9420
9425
9430
9435
9440
9445
9450
9455
9460
9465
9470
9475
9480
9485
9490
9495
9500
9505
9510
9515
9520
9525
9530
9535
9540
9545
9550
9555
9560
9565
9570
9575
9580
9585
9590
9595
9600
9605
9610
9615
9620
9625
9630
9635
9640
9645
9650
9655
9660
9665
9670
9675
9680
9685
9690
9695
9700
9705
9710
9715
9720
9725
9730
9735
9740
9745
9750
9755
9760
9765
9770
9775
9780
9785
9790
9795
9800
9805
9810
9815
9820
9825
9830
9835
9840
9845
9850
9855
9860
9865
9870
9875
9880
9885
9890
9895
9900
9905
9910
9915
9920
9925
9930
9935
9940
9945
9950
9955
9960
9965
9970
9975
9980
9985
9990
9995
10000

San Marcos, Tx 78667 Tel. 512-[illegible]



APPENDIX E

SUMMARY OF PRE METER BOX CALIBRATION

METER BOX NUMBER: 7
CALIBRATION DATE:1/14/94
CALIBRATED BY:Larry Whicher
BAROMETRIC PRESSURE: 29.83

```
*********************************************************
*                                                       *
*      DELTA H = ORFICE PRESSURE                        *
*      VW = VOLUME OF WET GAS METER                     *
*      TW = AVERAGED TEMPERATURE OF WET METER           *
*      VD = VOLUME OF DRY GAS METER                     *
*      TD = AVERAGED TEMPERATURE OF DRY GAS METER       *
*      TIME = DURATION OF EACH POINT RUN                *
*                                                       *
*********************************************************
```

POINT 1
DELTA H = .5 VW = 5 TW = 68
VD = 5.017 TD = 64.8 TIME = 12.02 TEST METER Y = .9804
METER BOX Y = .9699607
METER BOX H = 1.631244

POINT 2
DELTA H = 1 VW = 5 TW = 68
VD = 5.017 TD = 68 TIME = 8.55 TEST METER Y = .9804
METER BOX Y = .9746754
METER BOX H = 1.640711

POINT 3
DELTA H = 1.5 VW = 10 TW = 68
VD = 10.05 TD = 71.8 TIME = 14.41 TEST METER Y = .9804
METER BOX Y = .9789236
METER BOX H = 1.735181

POINT 4
DELTA H = 2 VW = 10 TW = 68
VD = 10.075 TD = 74.5 TIME = 12.29 TEST METER Y = .9804
METER BOX Y = .9802488
METER BOX H = 1.674403

POINT 5
DELTA H = 3 VW = 10 TW = 68
VD = 10.05 TD = 76.5 TIME = 10.09 TEST METER Y = .9804
METER BOX Y = .9839505
METER BOX H = 1.686583

POINT 6
DELTA H = 4 VW = 10 TW = 68
VD = 10.04 TD = 77 TIME = 8.78 TEST METER Y = .9804
METER BOX Y = .9834422
METER BOX H = 1.701173

AVERAGE Y = .9785335
AVERAGE H = 1.678216

Meter Box Calibration

Dry Gas Meter #: 7
Calibrated by: Larry Whichlo
Date: 1-14-97
Barometric Pressure: 29.83

Orifice ΔH	Test Meter Volume V_w	Dry Gas Meter Volume V_d	Temperature: Test Meter T_w	Temperature: Dry Gas Meter Inlet T_{di}	Temperature: Dry Gas Meter Outlet T_{do}	Temperature: Dry Gas Meter Ave T_d	Time θ	γ	ΔH@
.5	5.000	5.017	68.0	63 / 72	63 / 61	64.8	12.02	.9804	
1.0	5.000	5.017	68.0	64 / 79	63 / 64	68.0	8.55	.9804	
1.5	10.000	10.050	68.0	70 / 84	65 / 68	71.8	14.41	.9804	
2.0	10.000	10.075	68.0	75 / 85	68 / 70	74.5	12.29	.9804	
3.0	10.000	10.050	68.0	77 / 86	71 / 72	76.5	10.09	.9804	
4.0	10.000	10.040	68.0	77 / 87	72 / 72	77.0	8.78	.9804	

$$\gamma = \frac{V_w P_{bar} (T_d + 460)}{V_d \left(P_{bar} + \frac{\Delta H}{13.6}\right) (T_w + 460)}$$

$$\Delta H@ = \frac{0.0317\ \Delta H}{P_{bar}(T_d + 460)} \left[\frac{(T_w + 460)\ \theta}{V_w} \right]^2$$

P_{bar} = Barometric Pressure

DATE: 1-14-94 Pom 29.83

ΔH	VW	TW	VD	TDI	TDO	ΔTD	S
5 (5 ft³)	986.000	68	141.508	63	63		
	981.000	68	136.491	72	61		
	5.000	68	5.017		64.8		12.02
.0 (5 ft³)	991.000	68	146.525	66	63		
	986.000	68	141.508	79	64		
	5.000	68	5.017		68.0		8.55
5 (10 ft³)	1001.000	68	156.575	70	65		
	991.000	68	146.525	84	68		
	10.000	68	10.050		71.8		14.41
2.0 (10 ft³)	11.000	68	166.650	75	68		
	1.000	68	156.575	85	70		
	10.000	68	10.075		74.5		12.29
.0 (10 ft³)	21.000	68	176.700	77	71		
	11.000	68	166.650	86	72		
	10.000	68	10.050		76.5		10.09
0 (10 ft³)	31.000	68	186.740	77	72		
	21.000	68	176.700	87	72		
	10.000	68	10.040		77.0		8.76

SUMMARY OF POST METER BOX CALIBRATION

METER BOX NUMBER : 7
CALIBRATION DATE: 01/20/94
CALIBRATED BY: Dan Barrera
BAROMETRIC PRESSURE (inch Hg): 30.15

```
*************************************************************
*                                                           *
*      DELTA H = ORFICE PRESSURE                            *
*      VW = VOLUME OF WET GAS METER                         *
*      TW = AVERAGED TEEMPERATURE OF WET METER              *
*      VD = VOLUME OF DRY GAS METER                         *
*      TD = AVERAGED TEMPERATURE OF DRY GAS METER           *
*      TIME = DURATION OF EACH POINT RUN                    *
*                                                           *
*************************************************************
```

POINT 1
DELTA H = 1 VW = 10 TW = 64.5
VD = 9.738 TD = 47.75 TIME = 16.74 TEST METER Y = .9804
METER BOX Y = .9722549
METER BOX H = 1.596335

POINT 2
DELTA H = 1 VW = 10 TW = 65
VD = 9.844 TD = 57 TIME = 16.99 TEST METER Y = .9804
METER BOX Y = .9783744
METER BOX H = 1.618031

POINT 3
DELTA H = 1 VW = 10 TW = 65.5
VD = 9.929 TD = 63.25 TIME = 17.06 TEST METER Y = .9804
METER BOX Y = .980791
METER BOX H = 1.614976

AVERAGE Y = .9771401
AVERAGE H = 1.609781

Post-Test
Meter Box Calibration

Dry Gas Meter #: 7
Calibrated by: DAN BARRERA
Date: 1-20-94
Barometric Pressure: 30.15

Orifice ΔH	Test Meter Volume V_w	Dry Gas Meter Volume V_d	Temperature: Test Meter T_w	Dry Gas Meter Inlet T_{di}	Dry Gas Meter Outlet T_{do}	Dry Gas Meter Ave T_d	Time θ	Y	ΔH@
1.0	10	9.738	64.5	41/66	40/44	47.75	16:74	.9804	
1.0	10	9.844	65	55/74	46/53	57	16:99	.9804	
1.0	10	9.929	65.5	62/78	54/59	63.25	17:06	.9804	

$$Y = \frac{V_w P_{bar} (T_d + 460)}{V_d (P_{bar} + \frac{\Delta H}{13.6}) (T_w + 460)}$$

$$\Delta H@ = \frac{0.0317 \Delta H}{P_{bar}(T_d + 460)} \left[\frac{(T_w + 460) \theta}{V_w}\right]^2$$

P_{bar} = Barometric Pressure

ARMSTRONG ENVIRONMENTAL, INC.

DRY GAS METER #: 7

DATE: 1-20-94

ΔH	VW	TW	VD	TDT	TDO	ΔTD	θ
1.0 (10FT^3)	191.0	64/64	536.804	41	40		
	181.0	65/65	527.066	66	44		
	10	64.5	9.738		→	47.75	16:74
1.0 (10FT^3)	201.0	65/65	546.648	55	46		
	191.0	65/65	536.804	74	53		
	10	65	9.844		→	57	16:99
1.0 (10FT^3)	211.0	65/65	556.577	62	54		
	201.0	66/66	546.648	78	59		
	10	65.5	9.929		→	63.25	17:06

ATMOSPHERIC CALIBRATIONS

NATIONAL 42-383

WATCH CHECKED AGAINST PRINCO INSTRUMENTS Hg BAROMETER
MODEL #453 SERIAL # 10030

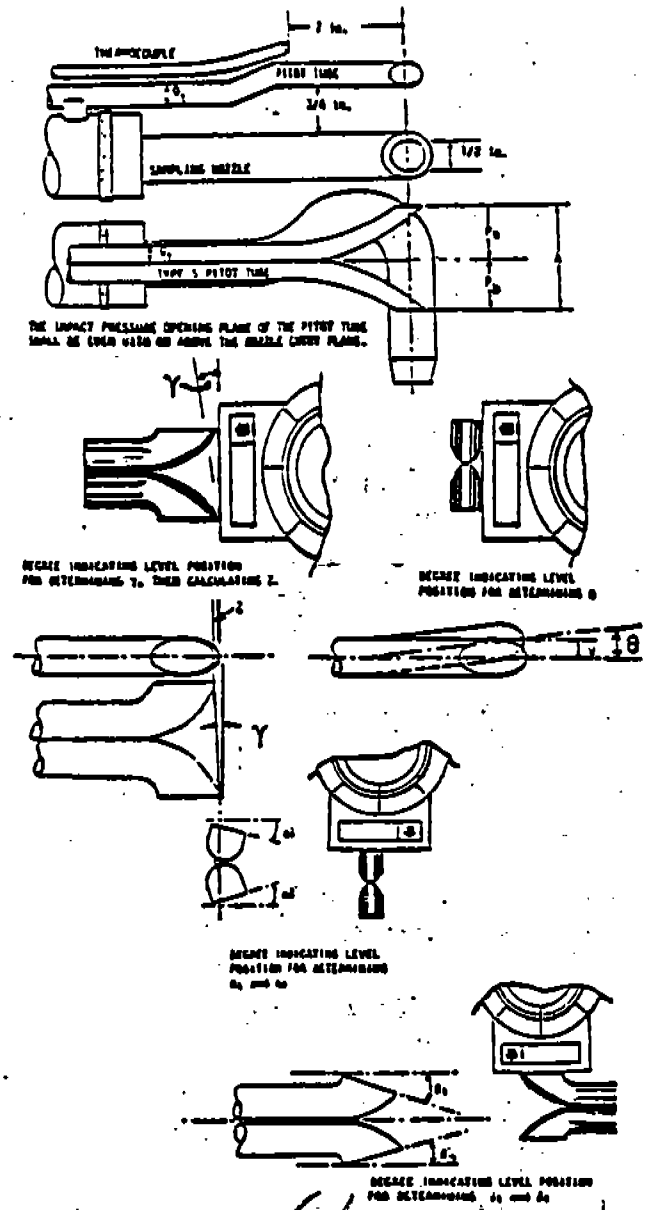
DATE	TIME	TEMP °F	WATCH READING	ACTUAL	% difference	Watch
10-8-93	9:14	78	29.59	29.66	99.76	Larry Whicher
10/11/93	9:08	75	29.94	29.88	.2	Joe Barrera
10/11/93	9:13	75	29.85	29.80	0.1	Richard Taylor
10/11/93	9:20	75.0	29.82	29.88	0.15	John Dahlem
10/11/93	9:30	75°	29.85	29.85	0.1	Jerry Salinas
10/18/93	9:04	75	29.59	29.6	.03	?
10/18/93	10:30	75°	29.73	29.71	.02	J. Barrera
10/18/93	10:29	75°	29.67	29.71	.04	J. Salinas
10/25/93	9:50	70°	29.78	29.85		Larry Whicher
10/31/93	8:50	50°	30.09	30.09	0	JOHN DAHLEM
11/15/93	9:30	74°	30.00	30.06	.06	Larry Whicher
11/15/93	9:30	74°	30.09	30.06	.02	Jerry Salinas
11/15/93	9:32	74°	30.18	30.06	.12	JOE BARRERA
11/15/93	10:30	75	30.06	30.06	0	JOHN Dahlem
11/23/93	12:48	71°	29.76	29.8	.11	DAN BARRERA
11/23/93	12:50	71°	30.03	29.8	1.00	SCOTT GRAIG
12/27/93	11:00	52°	29.85	29.88	.1	JOHN Dahlem
1/20/93	8:00	64°	29.648	29.65	.002	JOE BARRERA
2/27/93	8:08	71°	29.85	29.78	.07	SCOTT CRAIG
10/30/93	10:30	74	30.21	30.21	0	Richard Taylor
2/30/93	12:00	70°	30.19	30.21	.1	John Dahlem
Dec 28/94	2:25	69°	29.94	29.93	.01	[illegible]
31-94	9:26	55°	30.1	30.4	.03	[illegible]
2-2-94	11:00	75.0	30.07	30.1	.02	John Dahlem

PITOT TUBE INSPECTION DATA SHEET

Company Name: _____

Pre-sample Date 1-11-94

Post Sample Date _____



Yes	level?	
NO	obstructions?	
NO	damaged?	
4°	$-10° < \alpha_1 < +10°$	
4°	$-10° < \alpha_2 < +10°$	
4°	$-5° < \beta_1 < +5°$	
3°	$-5° < \beta_2 < +5°$	
2°	γ	
1°	θ	
.559	A	
.281	$1.05\ D_t < P_a < 1.5\ D_t$	
.278	$1.05\ D_t < P_b < 1.5\ D_t$	
Yes	$3/16" \leq D_t \leq 3/8"$	
.0195	$A \tan \gamma < 0.125"$	
.0097	$A \tan \theta < 0.03125"$	
.003	$P_a = P_b \pm 0.063"$	

Comments: Glass Lined

Pitot tube/probe number 11-G meets or exceeds all specifications criteria and/or applicable design features* and is hereby assigned a pitot tube calibration factor of 0.84.

Signature [signature]

Date 1-11-94

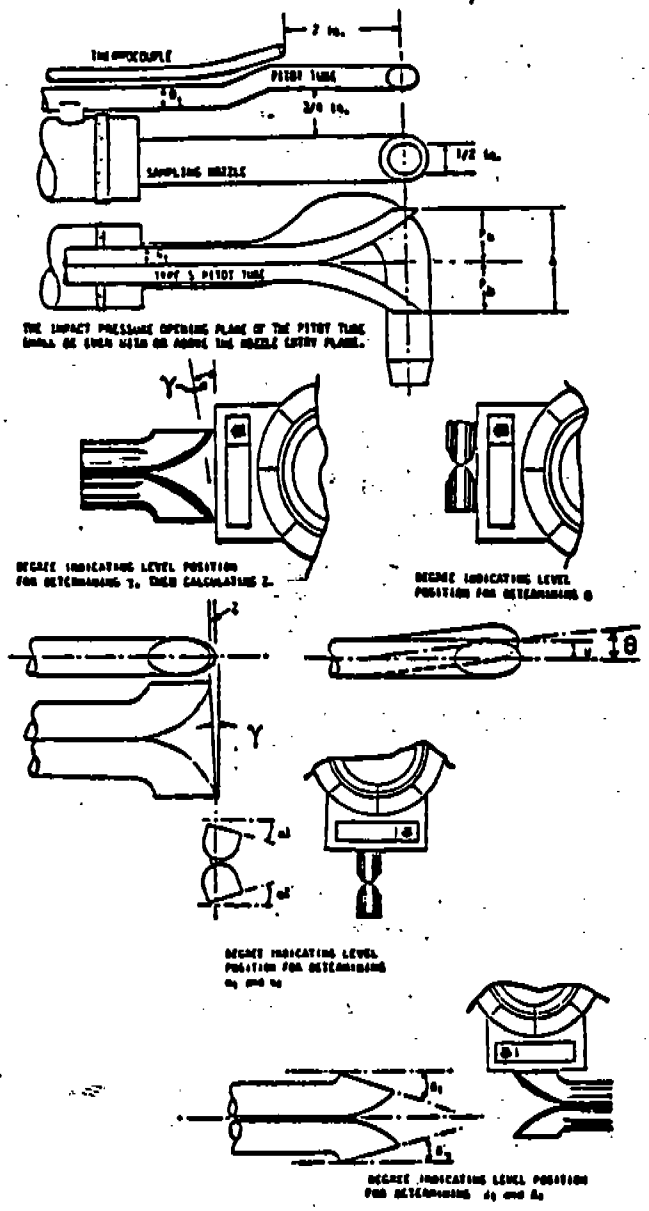
*See 40 CFR 60, Vol. 42, No. 160, Method 2. Verify the minimum 2 inch setback of the thermocouple and the minimum 3/4 inch separation between the pitot tube and the nozzle as shown at the top of this page.

PITOT TUBE INSPECTION DATA SHEET

Company Name: Armstrong

Pre-sample Date 2-1-94

Post Sample Date _____



✓	level?	
NO	obstructions?	
NO	damaged?	
3	$-10° < \alpha_1 < +10°$	
3	$-10° < \alpha_2 < +10°$	
1	$-5° < \beta_1 < +5°$	
1	$-5° < \beta_2 < +5°$	
2	γ	
0	θ	
.621	A	
.309	$1.05\ D_t < P_a < 1.5\ D_t$	
.312	$1.05\ D_t < P_b < 1.5\ D_t$	
✓	$3/16" \leq D_t \leq 3/8"$	
.0216	$A \tan \gamma < 0.125"$	
0.0	$A \tan \theta < 0.03125"$	
.003	$P_a = P_b \pm 0.063"$	

Comments: _____

Pitot tube/probe number [illegible] meets or exceeds all specifications criteria and/or applicable design features* and is hereby assigned a pitot tube calibration factor of 0.84.

Signature [signature]

Date 2-1-94

*See 40 CFR 60, Vol. 42, No. 160, Method 2. Verify the minimum 2 inch setback of the thermocouple and the minimum 3/4 inch separation between the pitot tube and the nozzle as shown at the top of this page.

APPENDIX F

AIR PRODUCTS AND CHEMICALS, INC.
3415 BANNING STREET
DALLAS, TX 75233
FT. WORTH CUSTOMERS CALL
1-800-453-APCI
TELEPHONE (214) 929-8835

DATE: 05/10/93
TIME: 15:49
PAGE: 1

****
* CERTIFICATE OF ANALYSIS *
****

ARMSTRONG ENVIRONMENTAL
4747 IRVING BLVD. #204
DALLAS TX 75247

CUSTOMER ACCOUNT : R7818
CUSTOMER ORDER NO : TA93-1233
ORDER NO : 36A-000243
ORDER DETAIL SEQ : 3
SHIPPER NUMBER : 36G-S-22164

REMARKS : GAS MIXTURE(S) LISTED BELOW ARE TRACEABLE TO NIST CLASS S WEIGHTS AND/OR NIST GAS MIXTURE STANDARD REFERENCE MATERIALS (SRM's) - REFERENCE APCI SOP FIELD DIRECTIVE BOOK I PART A-3.

CERTIFIED GAS MIXTURE: CARBON MONOXIDE IN NITROGEN

BATCH NO	ANALYSIS DATE	BAR CODE	CYLINDER NO	COMPONENT REQUESTED	CONCENTRATION REQUESTED	ANALYTICAL RESULT	UNIT MEASU
04500	04/08/93	BUY706	SG91147738AL	CARBON MONOXIDE	400	402.0	MOLAR
				Nitrogen		BALANCE	

CERTIFICATION

THIS ANALYSIS HAS BEEN PERFORMED UTILIZING APPROVED ANALYTICAL METHOD(S) AND IS CORRECT TO WITHIN THE ANALYTICAL ACCURACIES OF THIS (THESE) METHOD(S).

Lisa Overman
AUTHORIZED SIGNATURE

Air Products And Chemicals, Inc.
Specialty Gases
10202 Strang Road
LaPorte, Texas 77571
(713) 476-3100

AIR PRODUCTS

ANALYTICAL REPORT

SAMPLE OF: Carbon Monoxide in Nitrogen DATE: 1/11/93 PAGE: 1 of 1

SHIPPER NO.: 865-s-91341 CUSTOMER ORDER NO.: ---

SAMPLE DATE: 1/11/93 REQUESTED BY: Armstrong

REMARKS:

ANALYSIS

LAB NO.	CYL NO.	COMPONENT REQUESTED	CONCENTRATION REQUESTED	ANALYTICAL RESULT	UNIT OF MEASURE
865-04028	SG9114521BAL	Nitrogen	99.9900		Percent
		Carbon Monoxide	100.00	106.7	Molar PP

CERTIFICATION

This analysis has been performed utilizing the analytical method(s) stated and is correct to within the analytical accuracies of this (these) method(s).

Joseph Garriga (KW)
Authorized Signature

FORM 8030

AIR PRODUCTS AND CHEMICALS, INC.
3415 BANNING STREET
DALLAS, TX 75233
FT. WORTH CUSTOMERS CALL
1-800-453-APCI
TELEPHONE (214) 929-8825

DATE: 05/12/93
TIME: 15:48
PAGE: 1

****
* CERTIFICATE OF ANALYSIS *
****

ARMSTRONG ENVIRONMENTAL
4747 IRVING BLVD. #204
DALLAS TX 75247

CUSTOMER ACCOUNT : R7818
CUSTOMER ORDER NO : TA93-1233
ORDER NO : 36A-000243
ORDER DETAIL SEQ : 1
SHIPPER NUMBER : 360-S-22144

REMARKS : GAS MIXTURE(S) LISTED BELOW ARE TRACEABLE TO NIST CLASS S WEIGHTS AND/OR NIST GAS MIXTURE STANDARD REFERENCE MATERIALS (SRM's) - REFERENCE APCI SOD FIELD DIRECTIVE BOOK I PART A-3.

PRIMARY GAS MIXTURE : CARBON MONOXIDE IN NITROGEN

BATCH NO	ANALYSIS DATE	BAR CODE	CYLINDER NO	COMPONENT REQUESTED	CONCENTRATION REQUESTED	ANALYTICAL RESULT	UNIT MEASU
04495	04/08/93	8GP203	SG1094N8	CARBON MONOXIDE	50	50.0	MOLAR
				Nitrogen		BALANCE	

CERTIFICATION

THIS ANALYSIS HAS BEEN PERFORMED UTILIZING APPROVED ANALYTICAL METHOD(S) AND IS CORRECT TO WITHIN THE ANALYTICAL ACCURACIES OF THIS (THESE) METHOD(S).

Lisa Overman
AUTHORIZED SIGNATURE

Scott Specialty Gases, Inc.

1290 COMBERMERE STREET, TROY, MI 48083 (313) 589-2950 FAX: (313) 589-2134

CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

Customer
ARMSTRONG ENVIROMENTAL
7715 SOVEREIGN ROW
DALLAS TX 75247-9004

Assay Laboratory
Scott Specialty Gases, Inc.
1290 Combermere
Troy, MI 48083

Purchase Order 1317
Scott Project # 556803

ANALYTICAL INFORMATION

Certified to exceed the minimum specifications of EPA Protocol 1 Procedure # G1, Section Number 3.0.4

Cylinder Number ALM037096
Cylinder Pressure 1900 psig

Certification Date 10-11-93
Previous Certification Dates None

General Exp. Date 10-11-95
Acid Rain Exp. Date 10-11-95

ANALYZED CYLINDER

Components	Certified Concentration	Analytical Uncertainty*
Nitric Oxide	402.4 ppm	±1% NIST Directly Traceable
Total Oxides of Nitrogen	402.9 ppm	Reference Value Only

Balance Gas: Nitrogen

*Analytical uncertainty is inclusive of usual known error sources which at least includes reference standard error & precision of the measurement processes.

REFERENCE STANDARD

Type	Expiration Date	Cylinder Number	Concentration
NTRM 1687	7-23-95	ALM-022382	951 PPM NO IN NITROGEN

INSTRUMENTATION

Instrument/Model/Serial #	Last Date Calibrated	Analytical Principle
NO: Beckman/951A/270-082899B	9-8-93	Chemiluminescence

ANALYZER READINGS (Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

Components	First Triad Analysis	Second Triad Analysis	Calibration Curve
Nitric Oxide	Date: 10-4-95 Response Units: mv Z1=0.00 R1=95.10 T1=40.30 R2=95.10 Z2=0.00 T2=40.30 Z3=0.00 T3=40.30 R3=95.10 Avg. Conc. of Cust. Cyl. 402.9 ppm	Date: 10-11-95 Response Units: mv Z1=0.00 R1=95.10 T1=40.20 R2=95.10 Z2=0.00 T2=40.20 Z3=0.00 T3=40.20 R3=95.10 Avg. Conc. of Cust. Cyl. 401.9 ppm	Concentration=$A+Bx+Cx^2+Dx^3+Ex^4$ r=0.99999 NTRM1687 Constants: A=-0.1577292 B=10.00145 C=0 D=0 E=0
			Concentration=$A+Bx+Cx^2+Dx^3+Ex^4$
			Concentration=$A+Bx+Cx^2+Dx^3+Ex^4$

Special Notes
If this product is used for Acid Rain Rule Compliance, the *Acid Rain Expiration Date* noted above applies per 40 CFR Part 75, Appendix H. Otherwise, the *General Expiration Date* applies.

Analyst Frank P. Doran

Air Products and Chemicals, Inc.
SPECIALTY GAS DEPARTMENT
12722 S. WENTWORTH AVENUE
CHICAGO, IL 60628

Certificate of Analysis - EPA Protocol #1 Gases

PERFORMED ACCORDING TO SECTION 3.0.4 (Procedure #G1)
Certified Accuracy 1% NIST Traceable

Customer:
APCI
3415 BANNING ST
DALLAS,TX. TX 75233

Notes:

Order No: 855-016677-01
Batch No: 861-11964

Cylinder No: SG9113468BAL
Cylinder Pressure: 2000 psig
Certification Date: 04/26/93
Expiration Date: 04/26/95

PO: Rel:

*** Certified Concentration ***		********* Reference Standards *********			********** Analytical Instrumentation **********			
Component	Certified Concentration	Cylinder #	Standard Number	Concentration	Instrument Make/Model	Serial Number	Last Calibration	Measurement Principal
Nitric Oxide	98.2 PPM	SG9103337BAL	GMIS	94.0000 PPM	Rosemount 951a	0101877	04/08/93	CHEMILUMINESCENCE

Balance Gas: Nitrogen

Analytical Data*

Component: Nitric Oxide

First Analysis Date: 04/15/93

Zero	*** Test Gas ***		*** Ref. Gas ***	
mV	mV	PPM	mV	PPM
-.030	39.9	98.3	38.2	94.0
-.020	39.9	98.2	38.2	94.0
-.020	39.9	98.4	38.2	94.0
Average:		98.3		

Second Analysis Date: 04/26/93

Zero	*** Test Gas ***		*** Ref. Gas ***	
mV	mV	PPM	mV	PPM
.040	39.7	98.2	38.0	94.0
.040	39.7	98.2	38.0	94.0
.060	39.7	98.2	38.0	94.0
Average:		98.2		

*** Calculations performed per Section 3.0.4 subsection 4.1.7

Analyst: Richard VanDyke
Richard VanDyke

Approved By: Robert McNear
Robert McNear

Scott Specialty Gases, Inc.
1290 COMBERMERE STREET, TROY, MI 48083 (313) 589-2950 FAX: (313) 589-2134

CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

Customer
ARMSTRONG ENVIROMENTAL
7715 SOVEREIGN ROW
DALLAS TX 75247-9004

Assay Laboratory
Scott Specialty Gases, Inc.
1290 Combermere
Troy, MI 48083

Purchase Order 1317
Scott Project # 556803

ANALYTICAL INFORMATION

Certified to exceed the minimum specifications of EPA Protocol 1 Procedure # G1, Section Number 3.0.4

Cylinder Number AAL18218
Cylinder Pressure 1900 psig

Certification Date 10-11-93
Previous Certification Dates None

General Exp. Date 10-11-95
Acid Rain Exp. Date 10-11-95

ANALYZED CYLINDER

Components	Certified Concentration	Analytical Uncertainty*
Nitric Oxide	30.60 ppm	±1% NIST Directly Traceable
Total Oxides of Nitrogen	31.00 ppm	Reference Value Only
Balance Gas: Nitrogen		

*Analytical uncertainty is inclusive of usual known error sources which at least includes reference standard error & precision of the measurement processes.

REFERENCE STANDARD

Type	Expiration Date	Cylinder Number	Concentration
CRM 1684	9-17-94	ALM-024698	95.6 PPM NO IN N_2

INSTRUMENTATION

Instrument/Model/Serial #	Last Date Calibrated	Analytical Principle
NO: Horiba/OPE-235/483814	9-13-93	Chemiluminescence

ANALYZER READINGS (Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

Components	First Triad Analysis	Second Triad Analysis	Calibration Curve
Nitric Oxide	Date: 10-4-93 Response Units: mv Z1=0.00 R1=95.60 T1=30.60 R2=95.60 Z2=0.00 T2=30.60 Z3=0.00 T3=30.60 R3=95.60 Avg. Conc. of Cust. Cyl. 30.60 ppm	Date: 10-11-93 Response Units: mv Z1=0.00 R1=95.60 T1=30.60 R2=95.60 Z2=0.00 T2=30.60 Z3=0.00 T3=30.60 R3=95.60 Avg. Conc. of Cust. Cyl. 30.60 ppm	Concentration=$A+Bx+Cx^2+Dx^3+Ex^4$ r=0.99999 SRM 1684B Constants: A=-0.000967584 B=1.000115 C=0 D=0 E=0
			Concentration=$A+Bx+Cx^2+Dx^3+Ex^4$
			Concentration=$A+Bx+Cx^2+Dx^3+Ex^4$

Special Notes
If this product is used for Acid Rain Rule Compliance, the *Acid Rain Expiration Date* noted above applies per 40 CFR Part 75, Appendix H. Otherwise, the *General Expiration Date* applies.

Analyst Frank P. Doran

AIR PRODUCTS
4822 INDUSTRY LANE
DURHAM, NC 27713

CERTIFICATE OF ANALYSIS-EPA PROTOCOL MIXTURES

REFERENCE #: 88-23473 CYLINDER #:SG9113690 CYL. PRESSURE: 2000PSIG

EXPIRATION DATE:4-7-96 LAST ANALYSIS DATE: 4-7-93
BATCH# 05867
CUSTOMER: AIR PRODUCTS P.O.#
DALLAS, TX 75233 METHOD: EPA PROTOCOL # 1 3.0.4. G-1

STANDARD:

SRM #: 2644

CYL #: FF39583

CONC.: 244.5 PPM
VALID DATE:7-13-90
EXPIR. DATE:7-18-94

INSTRUMENT:

COMPONENT: BECKMAN THC

MODEL #: 400

SERIAL #: 1003052

LAST CAL.: 4-2-93

COMP: C3H8
MEAN CONC: 203 PPM

REPLICATE CONC.
DATE: 4-7-93 DATE:
203 PPM
203 PPM
204 PPM

COMP:
MEAN CONC:

REPLICATE CONC.
DATE: DATE:

COMP:
MEAN CONC:

REPLICATE CONC.
DATE: DATE:

BALANCE GAS: NITROGEN

REPLICATE DATA | COMPONENT: C3H8

DATE: 4-7-93 | DATE:

Z	0	R	425	C	352.9	Z	R	C
R	426	Z	0	C	353.7	R	Z	C
Z	0	C	354.6	R	425	Z	C	R

REPLICATE DATA | COMPONENT:

DATE: | DATE:

Z	R	C	Z	R	C
R	Z	C	R	Z	C
Z	C	R	Z	C	R

REPLICATE DATA | COMPONENT:

DATE: | DATE:

Z	R	C	Z	R	C
R	Z	C	R	Z	C
Z	C	R	Z	C	R

Z=ZERO C=CANDIDATE R=REFERENCE

ANALYST: APPROVED BY:

"THIS REPORT STATED ACCURATELY THE RESULTS OF THE INVESTIGATION MADE UPON THE MATERIAL SUBMITTED TO THE ANALYTICAL LABORATORY. EVERY EFFORT HAS BEEN MADE TO DETERMINE OBJECTIVELY, THE INFORMATION REQUESTED; HOWEVER, IN CONNECTION WITH ITS RENDERING OF THIS REPORT, AIR PRODUCTS SHALL HAVE NO LIABILITY IN EXCESS OF ITS ESTABLISHED CHARGE FOR THE SERVICE. ANY USE OF THIS REPORT OR THE INFORMATION CONTAINED HEREIN SHALL BE AT THE SOLE RISK OF THE USER."

AIR PRODUCTS
4822 INDUSTRY LANE
DURHAM, NC 27713

CERTIFICATE OF ANALYSIS-EPA PROTOCOL MIXTURES

REFERENCE #: 88-23475 CYLINDER #:SG9113687 CYL. PRESSURE: 2000PSIG

EXPIRATION DATE:10-7-94 LAST ANALYSIS DATE: 4-7-93

BATCH# 05866
CUSTOMER: AIR PRODUCTS
DALLAS TX. 75233

P.O.#
METHOD: EPA PROTOCOL # 1 3.0.4. G-1

STANDARD:

SRM #: 2643

CYL #: FF39574

CONC.: 101 PPM
VALID DATE:1-26-93
EXPIR. DATE:1-26-97

INSTRUMENT:

COMPONENT: BECKMAN THC

MODEL #: 400

SERIAL #: 1003052

LAST CAL.: 4-2-93

COMP: C3H8
MEAN CONC: 30.4 PPM

REPLICATE CONC.
DATE: 4-7-93 DATE:
30.4 PPM
30.5 PPM
30.4 PPM

COMP:
MEAN CONC:

REPLICATE CONC.
DATE: DATE:

COMP:
MEAN CONC:

REPLICATE CONC.
DATE: DATE:

BALANCE GAS: NITROGEN

REPLICATE DATA | COMPONENT: C3H8

DATE: 4-7-93 | DATE:

Z	0	R	547	C	164.6	Z	R	C
R	548	Z	0	C	165.5	R	Z	C
Z	0	C	164.9	R	548	Z	C	R

REPLICATE DATA | COMPONENT:

DATE: | DATE:

Z	R	C	Z	R	C
R	Z	C	R	Z	C
Z	C	R	Z	C	R

REPLICATE DATA | COMPONENT:

DATE: | DATE:

Z	R	C	Z	R	C
R	Z	C	R	Z	C
Z	C	R	Z	C	R

Z=ZERO C=CANDIDATE R=REFERENCE

ANALYST: APPROVED BY:

"THIS REPORT STATED ACCURATELY THE RESULTS OF THE INVESTIGATION MADE UPON THE MATERIAL SUBMITTED TO THE ANALYTICAL LABORATORY. EVERY EFFORT HAS BEEN MADE TO DETERMINE OBJECTIVELY, THE INFORMATION REQUESTED; HOWEVER, IN CONNECTION WITH ITS RENDERING OF THIS REPORT, AIR PRODUCTS SHALL HAVE NO LIABILITY IN EXCESS OF ITS ESTABLISHED CHARGE FOR THE SERVICE. ANY USE OF THIS REPORT OR THE INFORMATION CONTAINED HEREIN SHALL BE AT THE SOLE RISK OF THE USER."

AIR PRODUCTS AND CHEMICALS, INC.
SPECIALTY GAS DEPARTMENT
10202 STRANG ROAD
LA PORTE, TX 77571
TELEPHONE (713) 478-3100
FAX (713) 478-3112

DATE: 01/25/93
TIME: 12:17
PAGE: 1

****
* CERTIFICATE OF ANALYSIS *
****

ARMSTRONG ENVIRONMENTAL
4747 IRVING BLVD. #204
DALLAS TX 75247

CUSTOMER ACCOUNT : R7818
CUSTOMER ORDER NO : TA93-1233
ORDER NO : 360-037684
ORDER DETAIL SEQ : 1

REMARKS : GAS MIXTURE(S) LISTED BELOW ARE TRACEABLE TO NIST CLASS S WEIGHTS AND/OR NIST GAS MIXTURE STANDARD REFERENCE MATERIALS (SRM's) - REFERENCE APCI SGD FIELD DIRECTIVE BOOK I PART A-3.

** ANALYSIS **

CERTIFIED GAS MIXTURE: PROPANE IN NITROGEN

BATCH NO	ANALYSIS DATE	BAR CODE	CYLINDER NO	COMPONENT REQUESTED	CONCENTRATION REQUESTED	ANALYTICAL RESULT	UNIT OF MEASURE
04133	01/25/93	BMB383	SG040625AS	PROPANE	5	5.5	MOLAR PPM
				Nitrogen		BALANCE	

CERTIFICATION

THIS ANALYSIS HAS BEEN PERFORMED UTILIZING APPROVED ANALYTICAL METHOD(S) AND IS CORRECT TO WITHIN THE ANALYTICAL ACCURACIES OF THIS (THESE) METHOD(S).

AUTHORIZED SIGNATURE

FORM 3806-1 (REV. 8/88)

APPENDIX F.

PRODUCTION SUMMARY

(LOUISIANA PACIFIC)

lb/MSF 3/4

URANIA MDF STACK TEST OPERATIONAL SUMMARY

01/18/94

	DRYER 1	DRYER 2
Dry Furnish Moisture	9.3 - 11.2%	10.2 - 12.8%
Inlet Temperature	171- 221^{0}F	174 - 196^{0}F
Outlet Temperature	115 - 130^{0}F	115 - 131^{0}F

CONTINUOUS PRESS

Resin Usage (U-F)	10.4 gal/min.
Wax Usage (Emulsion)	0.5 gal/min.
Line Speed	39.5 ft/min.
Press Temperature	387 - 396^{0}F
Thickness	0.307 in*
Density	55.8 lbs/cu.ft.
PRODUCTION	**30,133 lbs/hr.**

*Nominal thickness = 0.25 inch (¼)

$$\frac{lb}{hr} \times \frac{ft^3}{lb} = \frac{ft^3}{hr} \times \frac{1}{ft} = \frac{ft^2}{hr} \times \frac{1}{1000} = \frac{MSF}{hr}(0.307)$$

$$\frac{MSF}{hr}(0.307) \times \frac{0.307}{0.75} = 0.409$$

$$\frac{30133}{55.8} \times \frac{12}{0.307} \times 0.409 = 8.63 \frac{MSF}{hr} \quad 3/4$$

URANIA MDF STACK TEST OPERATIONAL SUMMARY

01/19/94

	DRYER 1	DRYER 2
Dry Furnish Moisture	8.6 - 12.3%	10.6 - 13.2%
Inlet Temperature	144- 215^{0}F	174 - 206^{0}F
Outlet Temperature	114 - 129^{0}F	116 - 130^{0}F

CONTINUOUS PRESS

Resin Usage (U-F)	9.0 - 10.5 gal/min.
Wax Usage (Emulsion)	0.5 gal/min.
Line Speed	38.0 - 44.1 ft/min.
Press Temperature	378 - 398^{0}F
Thickness	0.272 - 0.306 in.* 0.289
Density	52.9 - 55.8 lbs/cu.ft. 54.35
PRODUCTION	25,671 - 31,768 lbs/hr. 28719.5

*Nominal thickness = 0.25 inch (¼)

$$\frac{\frac{28719.5}{54.35} \times \frac{12}{0.289} \times \frac{0.289}{0.75}}{1000} = 8.454 \frac{\text{hst}}{\text{hr}} \; 3/4$$

URANIA MDF STACK TEST OPERATIONAL SUMMARY

01/20/94

	DRYER 1	DRYER 2
Dry Furnish Moisture	8.8 - 10.5%	8.3 - 11.7%
Inlet Temperature	169 - 215^{0}F	169 - 185^{0}F
Outlet Temperature	120 - 136^{0}F	114 - 140^{0}F

CONTINUOUS PRESS

Resin Usage (U-F)	11.4 - 11.9 gal/min.
Wax Usage (Emulsion)	0.5 gal/min.
Line Speed	29.0 - 30.0 ft/min.
Press Temperature	387 - 405^{0}F
Thickness	0.430 - 0.434 in* 0.432
Density	50.4 - 51.5 lbs/cu.ft. 51.0
PRODUCTION	**28,234 - 29,620 lbs/hr.** 28927

*Nominal thickness = 0.375 inch (3/8)

$$\frac{28927}{51} \times \frac{12}{.432} \times \frac{.432}{0.75} = 9.08 \text{ msf/hr } 3/4$$

URANIA MDF STACK TEST OPERATIONAL SUMMARY

01/21/94

	DRYER 1	DRYER 2
Dry Furnish Moisture	9.0 - 11.0%	9.1 - 11.6%
Inlet Temperature	182 - 215^{0}F	179 - 204^{0}F
Outlet Temperature	118 - 133^{0}F	116 - 133^{0}F

CONTINUOUS PRESS

Resin Usage (U-F)	10.4 - 11.2 gal/min.
Wax Usage (Emulsion)	0.5 gal/min.
Line Speed	44.0 - 43.5 ft/min.
Press Temperature	375 - 407^{0}F
Thickness	0.283 - 0.293 in* 0.288
Density	53.4 - 54.1 lbs/cu.ft. 53.8
PRODUCTION	30,001 - 30,267 lbs/hr. 30134

*Nominal thickness = 0.25 inch (¼)

$$\frac{30134}{53.8} \times \frac{12}{0.75} = 8.96 \text{ msf/hr} \quad 3/4$$