Background Report Reference

AP-42 Section Number: 10.6.1

Background Report Section: 4

Reference Number: 81

Title: Report of Air Emissions and Inlet Loading Tests for Louisiana Pacific Corporation, Hanceville OSB Plant Hanceville, Alabama

Environmental Monitoring Laboratories, Inc.

May 1994

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4-81

REPORT OF AIR EMISSIONS AND INLET LOADING TESTS FOR LOUISIANA PACIFIC CORPORATION HANCEVILLE OSB PLANT

Hanceville, Alabama
March 31, 1994

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

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

ADD TO LIST

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#33194

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

Rept # 33194

ENVIRONMENTAL MONITORING LABORATORIES, INC.

O. Box 655 ○ 606 B Highway 51 North
Ridgeland, Mississippi 39158

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

May 3, 1994

Subject: Louisiana Pacific Corporation
Hanceville, Alabama OSB Plant

On March 31, 1994, Environmental Monitoring Laboratories conducted air emissions and inlet loading tests at Louisiana Pacific Corporation's OSB facility in Hanceville, Alabama. Testing was performed to determine emissions of particulate matter (PM), volatile organic compounds (VOC), nitrogen oxides (NOx), and carbon monoxide (CO) from the regenerative thermal oxidizer (RTO) system controlling emissions from five OSB dryers. Testing was also done at the RTO inlets to determine removal efficiency.

Results:

DRYERS RTO	PM		VOC		CO		NOx	
	gr/dscf	#/hr	ppm as C	#/hr	ppm	#/hr	ppm	#/hr
WEST RTO	.0036	2.78	12	1.98	61	23.89	24	15.26
EAST RTO	.0036	2.52	7	1.04	57	20.63	24	14.14
Dryer 4 Inlet	0.116	25.28	1656	78.52	71	7.84	17	3.08
Dryer 3 Inlet	0.163	38.18	1225	62.42	34	4.01	22	4.28
Projected Inlet total	0.140	158.7	1441	352.4	53	29.6	20	18.4
REMOVAL EFFICIENCY	96.7		99.1		- 50.3		- 59.8	

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.

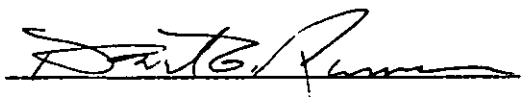
Following is a report of the test.

REPORT OF AIR EMISSIONS AND INLET LOADING TESTS
FOR LOUISIANA PACIFIC CORPORATION
HANCEVILLE OSB PLANT
HANCEVILLE, ALABAMA
MARCH 31, 1994

CONTENTS

REPORT CERTIFICATION

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

Signed 

Daniel G. Russell

1.0 TEST RESULTS: The following tables present the measured flow parameters and test results for emissions and inlet loading testing for Louisiana Pacific Corporation's Hanceville, Alabama OSB facility on March 31, 1994.

1.1 OSB Dryers RTO

RTO		WEST	EAST	TOTAL
Date		03-31-94	03-31-94	--------
Time Start		1612	1747	----
Time End		1713	1848	-----
PARTICULATE EMISSIONS	#/hr.	2.78	2.52	5.30
PARTICULATE EMISSIONS	gr/dscf	.0036	.0036	.0036
VOC EMISSIONS	#/hr	1.98	1.04	3.03
VOC EMISSIONS	ppm as C	11.92	6.76	9.44
NOx EMISSIONS	#/hr	15.26	14.14	29.40
NOx EMISSIONS	ppm	24	24	24
CO EMISSIONS	#/hr	24.5	22.3	46.8
CO EMISSIONS	ppm	63	62	63
VOLUMETRIC FLOWRATE	acfm	138170	128254	266424
VOLUMETRIC FLOWRATE	dscfm	89066	82493	171559
VELOCITY	ft./sec.	57.76	53.61	-----
STACK TEMPERATURE	° F	259	265	----
MOISTURE	%	11.9	11.3	-----
SAMPLE RATE	% isokinetic	95	98	

1.2 No. 4 Dryer Multiclone Inlet

Run No..... Date ..... Time Start ..... Time End		1 03-31-94 1106 1506	2 03-31-94 1627 1729	avg. —— —— ——
PARTICULATE EMISSIONS	#/hr.	25.88	24.68	25.28
PARTICULATE EMISSIONS	gr/dscf	0.119	0.113	0.116
VOC EMISSIONS	#/hr	78.79	78.26	78.53
VOC EMISSIONS	ppm	1669	1643	1656
NOx EMISSIONS	#/hr	3.07	3.09	3.08
NOx EMISSIONS	ppm	17	17	17
CO EMISSIONS	#/hr	8.15	8.22	8.19
CO EMISSIONS	ppm	7.80	7.87	7.84
VOLUMETRIC FLOWRATE	acfm	40201	40363	40282
VOLUMETRIC FLOWRATE	dscfm	25253	25475	25364
VELOCITY	ft./sec.	70.5	70.8	70.6
STACK TEMPERATURE	° F	157	163	160
MOISTURE	%	24.5	23.3	23.9
SAMPLE RATE	% isokinetic	93	98	96

1.3 No. 3 Dryer Multiclone Inlet

Run No..... Date ..... Time Start ..... Time End		1 03-31-94 1342 1417	2 03-31-94 1430 1506	avg. ------ ---- ----
PARTICULATE EMISSIONS	#/hr.	32.40	43.95	38.18
PARTICULATE EMISSIONS	gr/dscf	0.137	0.190	0.163
VOC EMISSIONS	#/hr	1210	1239	1225
VOC EMISSIONS	ppm	62.42	62.42	62.42
NOx EMISSIONS	#/hr	4.33	4.23	4.28
NOx EMISSIONS	ppm	22	22	22
CO EMISSIONS	#/hr	4.06	3.97	4.01
CO EMISSIONS	ppm	34	34	34
VOLUMETRIC FLOWRATE	acfm	41852	41966	41909
VOLUMETRIC FLOWRATE	dscfm	27586	26937	27262
VELOCITY —	ft./sec.	73.4	73.6	73.5
STACK TEMPERATURE	° F	167	169	168
MOISTURE	%	19.4	21.3	20.4
SAMPLE RATE	% isokinetic	95	90	92

1.4. Efficiency Summary: The following summary of system removal efficiency is based on mass emission rates. Emissions expressed in the tables are in pounds per hour. It should be noted that the inlet total used for calculating efficiency is the average measured values of the two dryer inlets multiplied by 5 dryers.

	PM	VOC	CO	NOx
RTO TOTAL	5.30	3.03	44.5	29.4
INLET TOTAL (projected)	158.6	352.4	29.6	18.4
REMOVAL %	96.7	99.1	-50.3	-59.8

2.0 SOURCE DESCRIPTION:

Process description here is limited to a brief description of the sources and their sampling locations. Detailed descriptions of the process and records of operating rates and conditions during testing may be supplied by Louisiana Pacific Corporation.

Five rotary dryers are used for drying wood flakes. Each dryer exhausts to a primary cyclone, then to high efficiency multicyclones. Exhausts from all five dryers join to a common header and enter the mixing chamber of the regenerative thermal oxidizer (RTO). The RTO consists of two mirrored sections. RTO inlet sampling was done at the inlets to the multiclones. The multiclone inlets are 41.75 inch diameter downflow ducts. Two sample ports at 90 degrees were installed at a location 8.6 diameters downstream of an elbow and 3.1 diameters upstream of a vertical to horizontal elbow. Two dryers were selected for testing -- Nos. 3 and 4. Two sample runs of 30 minutes duration were taken from each of those two dryers. The two RTO sides each exhaust to the atmosphere by way of a vertical 85.5 inch diameter stack. Two sample ports are provided at a location that is 3.7 diameters downstream of the inlet duct and 6.4 diameters below the stack exit.

3.0 TEST PROCEDURES:

Test procedures used are those described in 40 CFR, Part 60, Appendix A.

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 concentration was continuously monitored as described in Method 10. CO concentrations were monitored using a TECO Model 48H gas correlation filter NDIR in various ranges. 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. A TECO Model 10S analyzer was 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. 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_4) (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.

4.0 DATA REDUCTION

Louisiana Pacific Corporation - Hanceville, Alabama
No. 4 Dryer Multiclone Inlet
PM/VOC/NOx/CO Loading Test - March 31, 1994

Collected Test Data:

		RUN 1	RUN 2	
Date	:	3/31/94	3/31/94	
Time start	:	1033	1146	
Time end	:	1106	1220	
1. As	: sq ft	9.5069	9.5069	
2. Dn	: in.	0.234	0.234	
3. Cp	: dimensionless	0.84	0.84	
4. Theta	: minutes	30.00	30.00	
5. Y	: dimensionless	1.01	1.01	
6. Pbar	: in. Hg	29.8	29.8	
7. Pg	: in. H2O	-10	-10	
8. Vm	: cf (dry gas)	22.576	24.406	
9. sqr(DP),avg	: in.H2O^.5	1.0926	1.0938	
10. DH	: in. H2O	1.6667	2.0208	
11. ts	: degrees F	156.50	163.17	159.84
12. tm	: degrees F	82.42	91.88	
13. Vlc	: ml	153	152.5	
14. CO2	: percent	1.20	1.20	
15. O2	: percent	19.70	19.70	
16. CO	: ppm	71	71	
17. M,PM	: milligrams			
	front half	146.6	141.5	
	back half organic	17.4	20.2	
	back half aqueous	8	11.2	
18. VOC	: ppm, wet as propane	420	420	
19. NOx	: ppm	17	17	

No. 4 Dryer Multiclone Inlet
PM/VOC/NOx/CO Loading Test - March 31, 1994

Calculations:	RUN 1	RUN 2	AVG.
1. Pm : in.Hg (DH/13.6)+Pbar	29.9226	29.9486	
2. Ps : in. Hg (Pg/13.6)+Pbar	29.0647	29.0647	
3. An : sq ft ((Dn/24)^2)(3.1416)	2.99E-04	2.99E-04	
4. Vmstd : dscf Vm Y(Pm/Pstd)(Tstd/Tm)	22.197	23.606	22.902
5. Vwstd : scf (.04707cf/ml)(Vlc)	7.202	7.178	
6. Bws : dimensionless Vwstd/(Vwstd+Vmstd)	0.2450	0.2332	0.2391
7. Md : mol.wt. dry basis .44 CO2+.32 O2+.28(CO+N2)	28.98	28.98	
8. Ms : mol.wt. wet basis Md(1-Bws)+18 Bws	26.29	26.42	
9. Vs : ft/sec Kp Cp (sqrDP)sqr(Ts/(Ps Ms))	70.48	70.76	70.62
10. Q : cfm Vs As(60 sec/min)	40201	40363	40282
11. Qstw : scfm Q(Ps/Pstd)(Tstd/Ts)	33446	33221	33333
12. Qstd : dscfm Qstw(1-Bws)	25253	25475	25364
13. I : percent {(100 Ts)(.002669 Vlc+(Vm Pm/Tm)]/(60 theta Vs Ps An)	93.29	98.34	95.81
14. E,PM : pounds/hr (M,PM/Vmstd)(Qstd)(60)/(453590)			
front half	22.061	20.199	21.130
back half organic	2.618	2.884	2.7510
back half aqueous	1.204	1.599	1.401
Total --	25.883	24.681	25.282
15. C,PM : grains/dscf (M,PM/Vmstd)(.0154 grains/mg)			
front half	0.1017	0.0923	0.0970
back half organic	0.0121	0.0132	0.0126
back half aqueous	0.0056	0.0073	0.0064
Total	0.1193	0.1128	0.1161
16. E,CO : pounds/hr (C,CO)(7.27e-8)(Qstd)(60)	7.80	7.87	7.84
17. C'VOC : ppm as Carbon, dry ((C,VOC)*3)/(1-Bws)	1669	1643	1656
18. C,VOC : pounds/hr (C'VOC)(3.116e-8)(Qstd)(60)	78.79	78.26	78.52
19. E,NOx : pounds/hr C,NOx(1.19e-7)(Qstd)(60)	3.07	3.09	3.08

No. 3 Dryer Multiclone Inlet
PM/VOC/NOx/CO Loading Test - March 31, 1994

Collected Test Data:

		RUN 1	RUN 2	
	Date :	3/31/94	3/31/94	
	Time start :	1342	1430	
	Time end :	1417	1506	
1.	As : sq ft	9.5069	9.5069	
2.	Dn : in.	0.234	0.234	
3.	Cp : dimensionless	0.84	0.84	
4.	Theta : minutes	30.00	30.00	
5.	Y : dimensionless	1.01	1.01	
6.	Pbar : in. Hg	29.8	29.8	
7.	Pg : in. H2O	-10	-10	
8.	Vm : cf (dry gas)	25.494	23.997	
9.	sqr(DP),avg : in.H2O^.5	1.1399	1.1370	
10.	DH : in. H2O	2.2292	1.8792	
11.	ts : degrees F	166.83	168.58	167.71
12.	tm : degrees F	89.79	103.25	
13.	Vlc : ml	127	131	
14.	CO2 : percent	1.20	1.20	
15.	O2 : percent	19.70	19.70	
16.	CO : ppm	34	34	
17.	M,PM : milligrams			
	front half	196.8	228.1	
	back half organic	13	39	
	back half aqueous	10.1	13.3	
18.	VOC : ppm, wet as propane	325	325	
19.	NOx : ppm	22	22	

No. 3 Dryer Multiclone Inlet
PM/VOC/NOx/CO Loading Test - March 31, 1994

Calculations:	RUN 1	RUN 2	AVG.
1. Pm : in.Hg (DH/13.6)+Pbar	29.9639	29.9382	
2. Ps : in. Hg (Pg/13.6)+Pbar	29.0647	29.0647	
3. An : sq ft ((Dn/24)^2)(3.1416)	2.99E-04	2.99E-04	
4. Vmstd : dscf Vm Y(Pm/Pstd)(Tstd/Tm)	24.765	22.734	23.749
5. Vwstd : scf (.04707cf/ml)(Vlc)	5.978	6.166	
6. Bws : dimensionless Vwstd/(Vwstd+Vmstd)	0.1944	0.2134	0.2039
7. Md : mol.wt. dry basis .44 CO2+.32 O2+.28(CO+N2)	28.98	28.98	
8. Ms : mol.wt. wet basis Md(1-Bws)+18 Bws	26.84	26.64	
9. Vs : ft/sec Kp Cp (sqrDP)sqr(Ts/(Ps Ms))	73.37	73.57	73.47
10. Q : cfm Vs As(60 sec/min)	41852	41966	41909
11. Qstw : scfm Q(Ps/Pstd)(Tstd/Ts)	34245	34243	34244
12. Qstd : dscfm Qstw(1-Bws)	27586	26937	27262
13. I : percent [(100 Ts)(.002669 Vlc+(Vm Pm/Tm)]/(60 theta Vs Ps An)	95.27	89.57	92.42
14. E,PM : pounds/hr (M,PM/Vmstd)(Qstd)(60)/(453590)			
front half	28.998	35.751	32.375
back half organic	1.916	6.113	4.0141
back half aqueous	1.488	2.085	1.786
Total	32.402	43.948	38.175
15. C,PM : grains/dscf (M,PM/Vmstd)(.0154 grains/mg)			
front half	0.1224	0.1545	0.1384
back half organic	0.0081	0.0264	0.0173
back half aqueous	0.0063	0.0090	0.0076
Total	0.1367	0.1899	0.1633
16. E,CO : pounds/hr (C,CO)(7.27e-8)(Qstd)(60)	4.06	3.97	4.01
17. C'VOC : ppm as Carbon, dry ((C,VOC)*3)/(1-Bws)	1210	1239	1225
18. C,VOC : pounds/hr (C'VOC)(3.116e-8)(Qstd)(60)	62.42	62.42	62.42
19. E,NOx : pounds/hr C,NOx(1.19e-7)(Qstd)(60)	4.33	4.23	4.28

West and East RTO Outlet
PM/VOC/NOx/CO Emissions Test - March 31, 1994

Collected Test Data:

		West	East	
Date	:	3/31/94	3/31/94	
Time start	:	1612	1747	
Time end	:	1713	1848	
1. As	: sq ft	39.8712	39.8712	
2. Dn	: in.	0.27	0.27	
3. Cp	: dimensionless	0.84	0.84	
4. Theta	: minutes	60.00	60.00	
5. Y	: dimensionless	1.01	1.01	
6. Pbar	: in. Hg	29.8	29.8	
7. Pg	: in. H2O	0	0	
8. Vm	: cf (dry gas)	52.735	50.827	
9. sqr(DP),avg	: in.H2O^.5	0.8617	0.7972	
10. DH	: in. H2O	2.5250	2.3645	
11. ts	: degrees F	258.83	265.38	262.11
12. tm	: degrees F	99.06	99.90	
13. Vlc	: ml	144.5	131	
14. CO2	: percent	1.40	1.40	
15. O2	: percent	19.30	19.30	
16. CO	: ppm	61	57	
17. M,PM	: milligrams			
	front half	9.6	9.7	
	back half organic	1.9	1.1	
	back half aqueous	0.4	0.4	
18. VOC	: ppm, wet as propane	3.5	2	
19. NOx	: ppm	24	24	

West-and East RTO Outlet
PM/VOC/NOx/CO Emissions Test - March 31, 1994

Calculations:	WEST	EAST	Totals
1. Pm : in.Hg (DH/13.6)+Pbar	29.9857	29.9739	
2. Ps : in. Hg (Pg/13.6)+Pbar	29.8000	29.8000	
3. An : sq ft ((Dn/24)^2)(3.1416)	3.98E-04	3.98E-04	
4. Vmstd : dscf Vm Y(Pm/Pstd)(Tstd/Tm)	50.414	48.498	
5. Vwstd : scf (.04707cf/ml)(Vlc)	6.802	6.166	
6. Bws : dimensionless Vwstd/(Vwstd+Vmstd)	0.1189	0.1128	
7. Md : mol.wt. dry basis .44 CO2+.32 O2+.28(CO+N2)	28.996	28.996	
8. Ms : mol.wt. wet basis Md(1-Bws)+18 Bws	27.69	27.76	
9. Vs : ft/sec Kp Cp (sqrDP)sqr(Ts/(Ps Ms))	57.76	53.61	
10. Q : cfm Vs As(60 sec/min)	138170	128254	266424
11. Qstw : scfm Q(Ps/Pstd)(Tstd/Ts)	101083	92981	194064
12. Qstd : dscfm Qstw(1-Bws)	89066	82493	171559
13. I : percent [(100 Ts)(.002669 Vlc+(Vm Pm/Tm)]/(60 theta Vs Ps An)	94.61	98.26	
14. E,PM : pounds/hr (M,PM/Vmstd)(Qstd)(60)/(453590)			
front half	2.243	2.183	4.426
back half organic	0.444	0.248	0.692
back half aqueous	0.093	0.090	0.183
Total	2.781	2.520	5.301
15. C,PM : grains/dscf (M,PM/Vmstd)(.0154 grains/mg)			
front half	0.0029	0.0031	
back half organic	0.0006	0.0003	
back half aqueous	0.0001	0.0001	
Total	0.0036	0.0036	
16. E,CO : pounds/hr (C,CO)(7.27e-8)(Qstd)(60)	23.89	20.63	44.52
17. C'VOC : ppm as Carbon, dry ((C,VOC)*3)/(1-Bws)	11.92	6.76	
18. C,VOC : pounds/hr (C'VOC)(3.116e-8)(Qstd)(60)	1.98	1.04	3.03
19. E,NOx : pounds/hr C,NOx(1.19e-7)(Qstd)(60)	15.26	14.14	29.40

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
ΔH (delta H)	in. H_2O	Pressure drop across meter orifice
ΔP (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
θ (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

STACK CONFIGURATION AND SAMPLE POINT LAYOUT FOR CIRCULAR STACKS

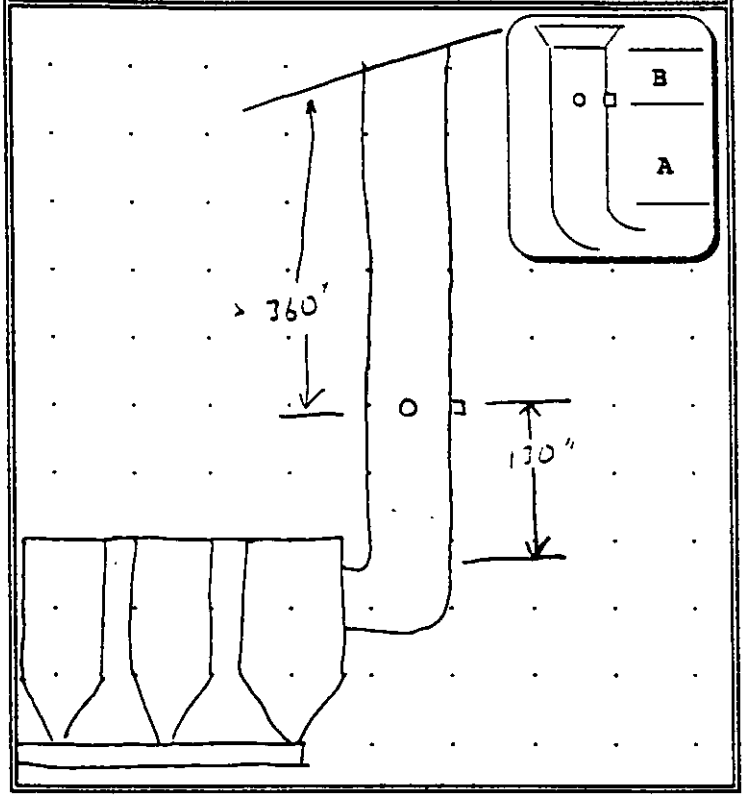
PLANT: L.P. - Hanceville Date:

SOURCE: Dryer Multiclone Inlet

TEST FOR: PM Setup

TEST OPERATORS: Russ

SKETCH OF STACK



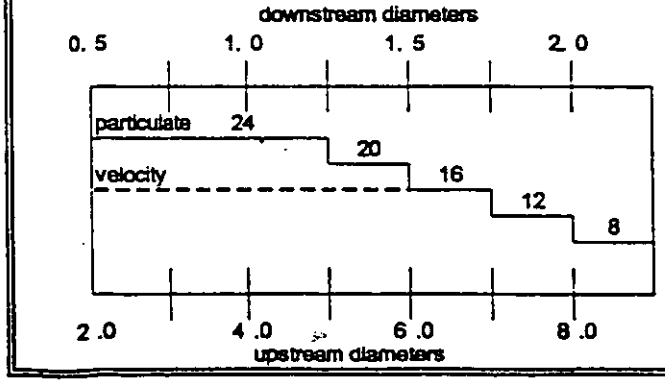
PERCENT OF DIAMETER

	points on a diameter: 2	4	6	8	10	12	14	16
point no.								
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	1.8	
2	6.1	
3	12.4	
4	29.4	
5	35.7	
6	39.9	

STACK DIAMETER:	41.75
Distance from ports to disturbance:	
A. to upstream disturbance	360"
B. to downstream disturbance	130"
Upstream diameters:	8.6
Downstream diameters:	3.1
Minimum No. sample points required:	12
No. sample points selected:	6 x 2
Port Length:	4.0"
Port Type:	7" pipe nipple
Port Access:	Manlift / Ground

MINIMUM NO. OF POINTS ON A DIAMETER



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

Remarks:

Plant L.P. Hansville, AL
Sampling Location [illegible] Dryer Inlet No. 3
Test For PM/NOx/
Test Operators [illegible] / G. [illegible]

RUN No. 1
Date 2-31-94
Time start 1342 end 1417

Meter Box	[illegible]	No. Sample Pts.	6x2	Gas Analysis	
Sample Box	No. 4	Minutes/Pt.	2.5	CO_2	
Probe/Pitot	5' in			O_2	
Pitot Cp	.84	NOMOGRAPH		CO	
Nozzle Dia.	~~.246~~ .210	ΔH@	1.80	Time	
Filter No.		Meter Temp.	100		
		% H_2O	12	Condensate:	321
Amb. Temp. °F	65	C-Factor	.92	tare 200	fin ~~249~~
Bar. Press. "Hg	29.60	Stack Temp.	170	Silica gel:	
Static Press. "H_2O		Ref. ΔP	1.10	tare	fin +6

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	0.0	010.757	1.30	2.20	173	78	75	240	55	4
2	2.30	012.8	1.50	2.60	170	83	75	257	52	4
3	5.0	014.9	1.50	2.60	170	87	76	257	50	4
4	7.30	017.2	1.40	2.40	176	95	76	258	48	4
5	10.0	019.4	1.10	1.85	168	99	77	260	48	4
6	12.30	021.2	1.10	1.85	167	101	78	261	50	4
1	15.00	023.403	1.40	2.40	170	~~98~~ 94	82	262	45	4
2	2.30	025.7	1.40	2.40	166	103	82	261	46	4
3	5.00	027.8	1.45	2.45	167	107	83	262	46	4
4	7.30	030.0	1.10	1.85	162	111	85	263	47	4
5	10.00	032.0	1.50	2.60	160	113	87	265	49	4
6	12.30	034.2	0.93	1.55	159	117	89	266	52	4
	end 30.0	036.251								
		Leak chk: .010	⟶	.019	= .009	15 [illegible]		8 [illegible]		
		25.494	1.1399	2.2292	166.83		89.79			

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

Plant L.P. Kensville, AL

Sampling Location Dryer Inlet No. 3

Test For PM / NOx

Test Operators [illegible] / G. McKnight

RUN No. 2

Date 3-31-94

Time start 1430 end 1506

Meter Box	Andersen	No. Sample Pts.	6x2	Gas Analysis	
Sample Box	No. 3	Minutes/Pt.	2.5	CO_2	
Probe/Pitot	5' [illegible]			O_2	
Pitot Cp	.84	NOMOGRAPH		CO	
Nozzle Dia.	.210	ΔH@	1.80	Time	
Filter No.		Meter Temp.	100°		
		% H_2O	12 / 20	Condensate:	
Amb. Temp. °F	65	C-Factor	.92 / .79	tare 200	fin 320
Bar. Press. "Hg	29.60	Stack Temp.	170 / 170	Silica gel:	
Static Press. "H_2O		Ref. ΔP	1.3 / 1.3	tare	fin #11

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	0.00	037.003	1.30	1.90	162	101	90	259	58	4
2	2.30	039.1	1.30	1.90	170	107	90	264	58	4
3	5.00	041.0	1.35	1.95	170	110	91	265	55	4
4	7.30	043.0	1.10	1.60	168	112	92	266	50	4
5	10.00	044.8	1.10	1.60	165	113	92	259	51	4
6	12.30	046.6	1.40	2.00	170	115	94	266	52	4
1	15.00	048.799	1.40	2.00	171	105	95	247	52	4
2	2.30	051.0	1.50	2.20	170	113	96	269	50	4
3	5.00	053.1	1.40	2.00	171	116	96	270	50	4
4	7.30	055.0	1.10	1.60	170	118	97	257	51	4
5	10.00	056.8	1.30	1.90	169	118	98	257	55	4
6	12.30	058.9	1.30	1.90	167	120	99	262	55	4
end	30.00	061.000								
		Leak: .058 →		.063	= .005	cfm @ 8 "Hg				
		23.997	1.1370	1.8792	168.58	103.25				

Plant L.P. Hanceville, AL

Sampling Location #4 Dryer Inlet

Test For PM/ NOx/

Test Operators [illegible] / G. McKnight

RUN No. 1

Date 3-31-94

Time start 1033 end 1106

Meter Box	Ambient
Sample Box	M.4
Probe/Pitot	5' [illegible]
Pitot Cp	.84
Nozzle Dia.	.210
Filter No.	
Amb. Temp. °F	65
Bar. Press. "Hg	29.80
Static Press. "H_2O	

No. Sample Pts.	6×2
Minutes/Pt.	2.5
NOMOGRAPH	
ΔH@	1.80
Meter Temp.	100
% H_2O	19
C-Factor	.80
Stack Temp.	170
Ref. ΔP	1.3

Gas Analysis: Air

CO_2 ___ ___ ___

O_2 ___ ___ ___

CO ___ ___ ___

Time ___ ___ ___

Condensate: tare 200 fin 245

Silica gel: 18

tare ___ fin ___

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	0.00	963.150	1.20	1.75	157	70	69	259	55	4
2	2.30	965.0	1.30	1.85	157	74	68	260	52	4
3	5.00	966.9	1.40	2.00	156	79	69	261	48	4
4	7.30	968.9	1.10	1.60	155	85	70	264	48	4
5	10.00	970.6	1.10	~~1.~~ 1.60	155	88	71	262	60	4
6	12.30	972.3	1.05	1.50	156	92	72	256	60	4
1	15/0.0	974.219	1.20	1.75	158	98	75	259	60	4
2	2.30	976.2	1.30	1.85	157	96	76	260	60	4
3	5.00	978.2	1.30	1.85	156	100	77	261	58	4
4	7.30	980.1	1.30	1.85	156	103	79	260	58	4
5	10.00	982.0	1.10	1.60	155	106	80	258	50	4
6	12.30	983.8	1.10	1.60	160	107	82	250	51	4
	end 15/0.0	985.726								
		Leak: .08	———	.086	= .004	cfm @ 8 "Hg				
		22.576	1.0926	~~1.6~~ 1.667	156.5	82.92				

Plant L.P. Hanville, AL
Sampling Location #4 Boiler Inlet
Test For PM / HCl
Test Operators

RUN No. 2
Date 3-31-94
Time start 1146 end 1220

Meter Box	Reverse	No. Sample Pts.	6 x 2	Gas Analysis	air
Sample Box	No. 3	Minutes/Pt.	2.5	CO_2	
Probe/Pitot	5' Glass	NOMOGRAPH		O_2	
Pitot Cp	.84	ΔH@	1.90	CO	
Nozzle Dia.	.210	Meter Temp.	100	Time	
Filter No.		% H_2O	13	Condensate:	347
Amb. Temp. °F	65	C-Factor	0a.92	tare 200	fin 547
Bar. Press. "Hg	29.87	Stack Temp.	170	Silica gel:	+5.5
Static Press. "H_2O		Ref. ΔP	1.10	tare	fin

Remarks: 600 ml ectra of dist. water

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	985.977	1.10	1.85	161	81	80	260	60	4
2	230	987.9	1.30	2.20	163	85	80	258	58	4
3	500	989.9	1.30	2.20	165	90	80	261	55	4
4	730	992.0	1.10	1.85	164	95	80	257	55	4
5	1000	993.9	1.60	2.70	164	99	81	262	55	5
6	1230	996.1	1.10	1.85	162	105	82	260	55	5
1	1300	998.410	1.20	2.00	163	99	84	265	55	4
2	230	001.2	1.30	2.20	164	106	85	262	52	4
3	500	002.6	1.20	2.00	164	108	86	260	50	4
4	730	004.6	1.10	1.85	163	110	87	258	50	4
5	1000	006.4	.92	1.55	163	112	88	259	50	4
6	1230	008.3	1.20	2.00	162	113	89	260	51	4
	1300	010.383								
		Leak: 951	———	.057 = .096		time	8	Hg		
		24.406	1.0938	2.0208	163.17		91.88			

PARTICULATE CATCH ANALYSIS

SAMPLES: L.P. Hanaville - RTO Inlets

DATE TAKEN: _____ DATE ANALYZED: _____

DELIVERED BY: _____ RECEIVED BY: _____

ANALYZED BY: _____

(Attach chain of custody if additional exchanges occur)

FILTERS: _____

RUN NO.	D3 R1	D3 R2	D4R1	D4R2
FILTER NO.	701	816	702	832
FILTER TARE, gms.	.5414	.5450	.5478	.5470
	.7319	.7650	.6794	.6764
FINAL WEIGHT, gms.	.7319	.7650	.6894	.6764
NET GAIN, gms.				

PROBE WASH: _____

RUN NO.	D3 R1	D3 R2	D4R1	D4R2
CONTAINER I.D.	D3 R1	D3 R2	D4R1	D4R2
VOLUME INTACT?	✓	✓	✓	✓
VOLUME, ml	140	200	200	200
TARE WEIGHT, gms.	(9) 114.8182	(26) 98.6682	(68) 112.5364	(85) 109.1512
	114.8245	98.6763	112.5414	109.1633
FINAL WEIGHT, gms	114.8245	98.6763	112.5414	109.1633
NET GAIN, gms.	.0063	.0081	.0050	.0121
LESS BLANK, gms.				

PARTICULATE SAMPLE WEIGHT: D3 D4

RUN NO.	1	2	1	2
filter + probe, mg.	196.8	229.1	146.6	141.5

STACK CONFIGURATION AND SAMPLE POINT LAYOUT FOR CIRCULAR STACKS

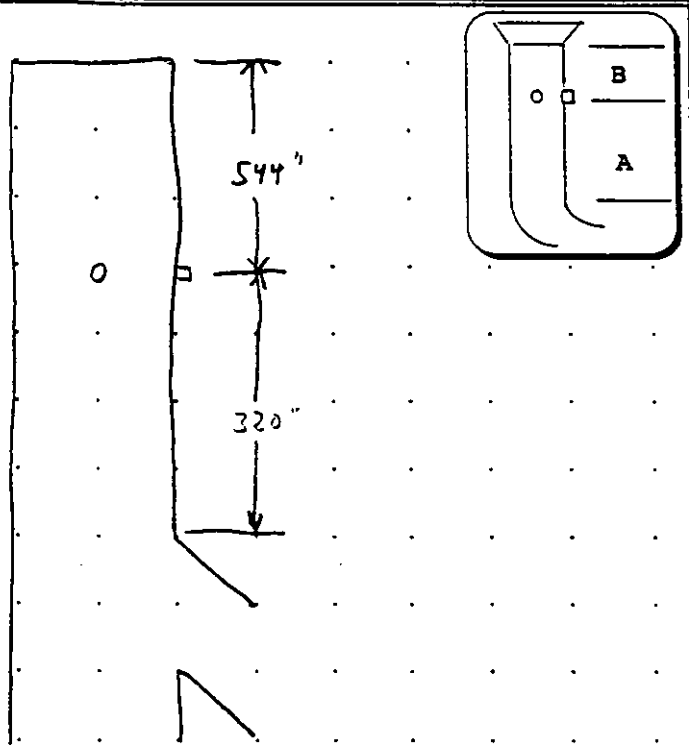
PLANT: L.P. Hancevill Date:

SOURCE: West/East RTO

TEST FOR: PM Setup

TEST OPERATORS: Rumsey

SKETCH OF STACK



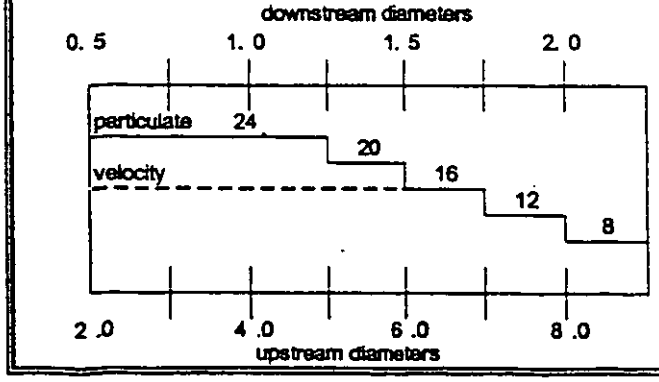
PERCENT OF DIAMETER

	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	320"
B. to downstream disturbance	544"
Upstream diameters:	3.7
Downstream diameters:	6.4
Minimum No. sample points required:	24
No. sample points selected:	12x2
Port Length:	4.25"
Port Type:	4" pipe nipple
Port Access:	Platform

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 L.P. Hanesville, AL

Sampling Location West ATO Outlet

Test For PM / NOx

Test Operators Moore / B. McKnight

RUN No. 1

Date 3-31-94

Time start 1612 end 1713

Meter Box	Auburn	No. Sample Pts.	12 x 2	Gas Analysis	
Sample Box	No. 4	Minutes/Pt.	2.5	CO_2	
Probe/Pitot	8' SS	NOMOGRAPH		O_2	
Pitot Cp	.84	ΔH@	1.80	CO	
Nozzle Dia.	.270	Meter Temp.	100	Time	
Filter No.		% H_2O	20	Condensate:	
Amb. Temp. °F	59	C-Factor	.79	tare 200 fin 330	
Bar. Press. "Hg	29.80	Stack Temp.	275	Silica gel:	
Static Press. "H_2O		Ref. ΔP	.56	tare fin 714.5	

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	0:00	061.429	0.98	3.25	260	79	81	257	50	4
2	2:30	063.8	0.88	2.90	262	85	80	260	48	4
3	5:00	066.2	0.96	3.20	259	91	79	258	48	4
4	7:30	068.7	0.85	2.85	261	97	79	264	45	4
5	10:00	071.1	0.95	3.20	260	101	79	258	45	4
6	12:30	073.5	0.92	3.05	262	103	80	256	42	4
7	15:00	076.0	0.71	2.40	259	109	81	262	45	4
8	17:30	078.3	0.52	1.70	260	110	83	264	45	4
9	20:00	080.1	0.47	1.55	259	108	84	270	45	4
10	22:30	081.9	0.41	1.35	256	107	85	264	48	3
11	25:00	083.5	0.39	1.30	249	105	86	262	48	3
12	27:30	085.1	0.35	1.15	249	106	86	264	49	3
1	30:00	086.685	1.10	3.50	251	96	86	262	51	4
2	32:30	089.1	1.10	3.50	258	115	85	262	51	4
3	35:00	091.7	1.10	3.50	261	120	89	263	50	4
4	37:30	094.4	1.05	3.50	259	124	91	264	55	4
5	40:00	096.9	1.05	3.50	261	126	93	259	58	4
6	42:30	099.6	0.90	3.00	263	127	95	257	60	4
7	45:00	102.0	0.81	2.70	261	126	96	253	61	4
8	47:30	104.2	0.67	2.25	258	126	96	260	62	4
9	50:00	106.4	0.60	2.00	262	123	97	257	55	3
10	52:30	108.4	0.53	1.75	256	121	97	267	54	3
11	55:00	110.3	0.60	2.00	263	120	98	270	55	3
12	57:30	112.3	0.45	1.50	263	121	98	266	56	3
end	60/ave	114.159								
		Leak check .006 @ 15 = .035 cfm @ 8 "Hg								
		52.735	.867	2.8250	258.83		99.06			

Plant L.P. Fayetteville, AL
Sampling Location East RTO Outlet
Test For PM / HCl
Test Operators Jones / B Mackaleh

RUN No. 1
Date 3-31-94
Time start 1747 end 1848

Meter Box	Andersen	No. Sample Pts.	12x2	Gas Analysis	
Sample Box	No. 3	Minutes/Pt.	2.5	CO_2	
Probe/Pitot	8' SS	NOMOGRAPH		O_2	
Pitot Cp	.84	ΔH@	1.90	CO	
Nozzle Dia.	.270	Meter Temp.	100	Time	
Filter No.		% H_2O	14	Condensate:	
Amb. Temp. °F	55	C-Factor	.89	tare 206 fin 318	
Bar. Press. "Hg	29.80	Stack Temp.	275	Silica gel:	
Static Press. "H_2O		Ref. ΔP	.50	tare fin 412	

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	114.414	0.71	2.60	269	91	89	259	60	3
2	230	116.6	0.72	2.65	261	96	88	258	55	3
3	500	118.8	0.66	2.45	273	99	87	262	52	3
4	730	121.1	0.68	2.60	271	103	86	260	50	3
5	1000	123.3	0.70	2.60	270	106	86	262	51	3
6	1230	125.5	0.69	2.60	269	108	87	262	51	3
7	1500	127.7	0.64	2.40	269	110	87	260	52	3
8	1730	129.8	0.56	2.10	267	111	88	258	50	3
9	2000	131.9	0.47	1.75	265	111	88	260	45	3
10	2230	133.7	0.48	1.80	265	109	88	259	42	3
11	2500	135.6	0.34	1.30	269	108	88	261	42	3
12	2730	137.1	0.36	1.35	269	105	89	263	45	3
13										
1	2000	138.699	0.98	3.35	275	94	86	260	45	3
2	230	141.0	0.98	3.35	276	112	89	263	48	3
3	500	143.9	0.95	3.60	275	118	90	265	48	3
4	730	146.6	0.96	3.60	266	121	90	265	49	3
5	1000	149.0	0.92	3.50	272	123	92	266	49	3
6	1230	151.7	0.79	2.95	267	123	92	258	50	3
7	1500	153.9	0.63	2.30	275	121	92	260	51	3
8	1730	156.0	0.54	2.00	266	118	93	260	51	3
9	2000	158.0	0.51	1.90	272	116	93	259	52	3
10	2230	160.0	0.48	1.80	269	115	93	260	52	3
11	2500	161.8	0.46	1.70	270	115	94	261	52	3
12	2730	163.6	0.40	1.50	265	113	94	270	50	3
	stop 60/60	165.241								
		Leak chk .012		.616	= .004		8			
		50.827	.7972	2.3645	265.38		95.90			

PARTICULATE CATCH ANALYSIS

SAMPLES: L.P. Hancock - RTO outlet

DATE TAKEN: _____ DATE ANALYZED: _____

DELIVERED BY: DCR RECEIVED BY: DCR

ANALYZED BY: DCR

(Attach chain of custody if additional exchanges occur)

FILTERS: _____

RUN NO.	EAST	WEST		
FILTER NO.	818	817		
FILTER TARE, gms.	.5467	.5468		
	.5525	.5531		
FINAL WEIGHT, gms.	.5525	5531		
NET GAIN, gms.	.0058	.0063		

PROBE WASH: _____

RUN NO.	EAST	WEST		
CONTAINER I.D.	EAST R1	EAST R1		
VOLUME INTACT?	✓	✓		
VOLUME, ml	120	150		
TARE WEIGHT, gms.	(45) 107.2512	(87) 107.2300		
	107.2550	107.2334		
FINAL WEIGHT, gms	107.2550	107.2334		
NET GAIN, gms.	.0038	.0034		
LESS BLANK, gms.				

PARTICULATE SAMPLE WEIGHT:

RUN NO.	EAST	WEST		
filter + probe, mg.	9.6	9.7		

DRY GAS METER CALIBRATION

Meter ID	Andersen		
Calibration Method	DGM/DGM	By	DGR
Calibration Meter ID	651729	Pbar	29.80
Date	4/11/94		

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		Temp out					
								init.	final	init.	final				
1	4.00	10.00	346.87	358.001	82	93.507	104.898	100	117	102	103	1.010	1.14	0.71	1.815
1	3.00	11.00	358.001	368.729	84	104.898	115.935	113	129	103	107	1.016	1.01	0.72	1.774
1	2.00	13.00	368.729	379.137	84	115.935	126.714	118	133	107	111	1.020	0.83	0.73	1.738
1	1.00	18.00	379.137	389.442	84	126.714	137.456	118	127	111	115	1.016	0.6	0.74	1.683
1	0.75	20.00	389.442	399.506	84	137.456	148.024	112	125	113	118	1.008	0.53	0.75	1.626
Averages:												1.01			1.73

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

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

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

$DH@ = 0.921/K^2$

Where:

Y = Meter correction factor, dimensionless

Vcal = Volume of gas through calibrating meter, cubic feet

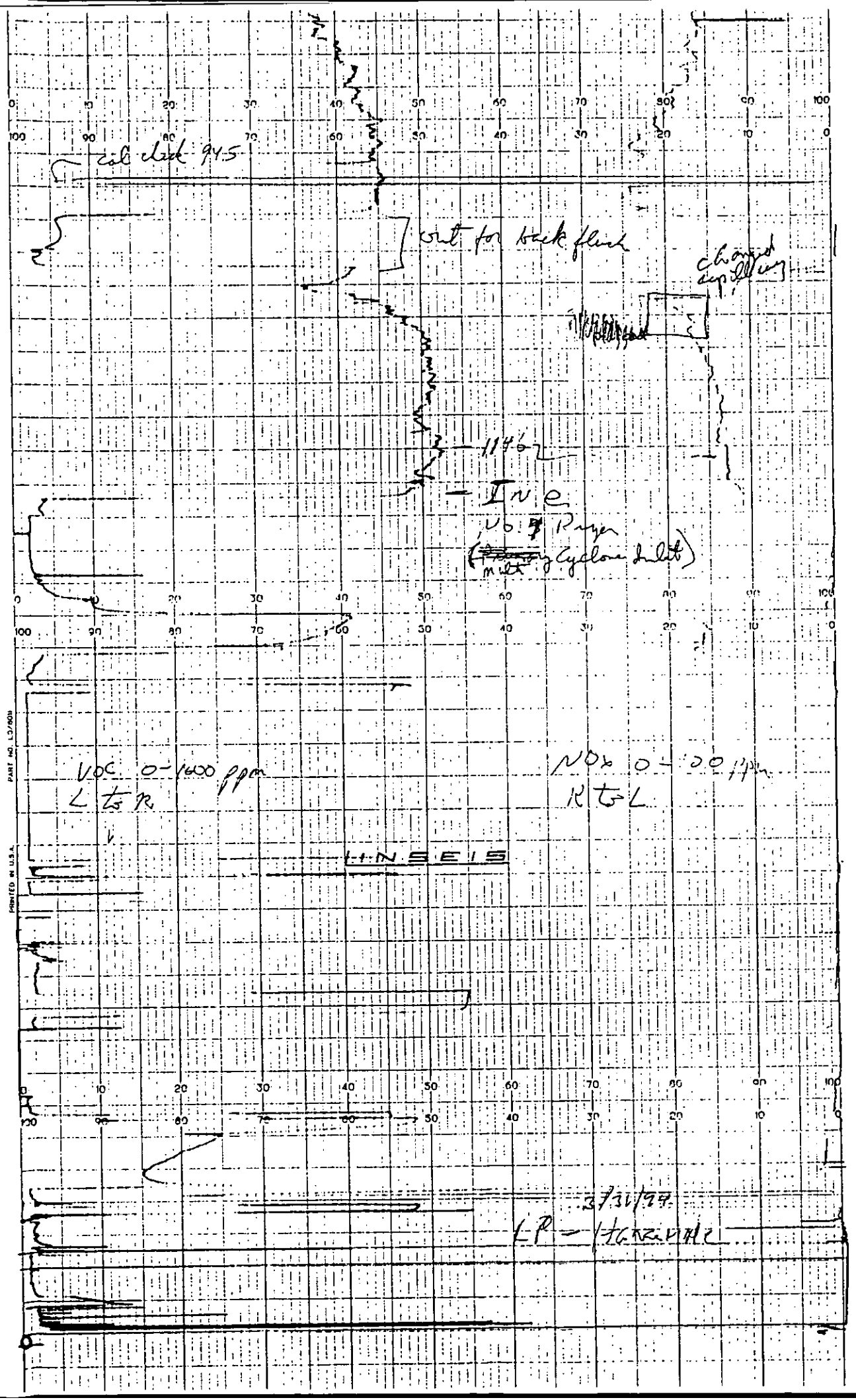
Vdgm = Volume of gas through field dry gas meter, cubic feet

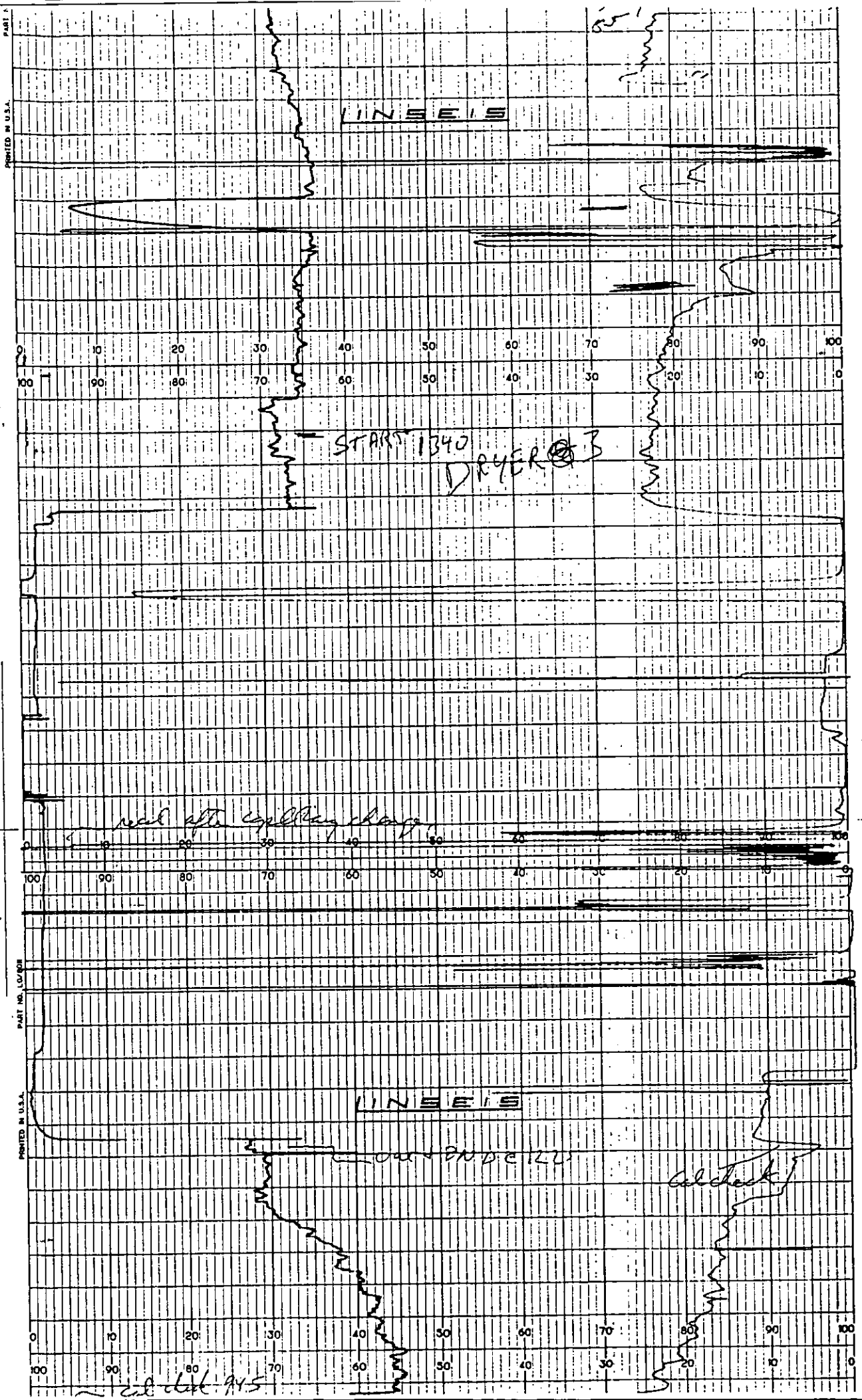
Pbar = Barometric pressure, in. Hg

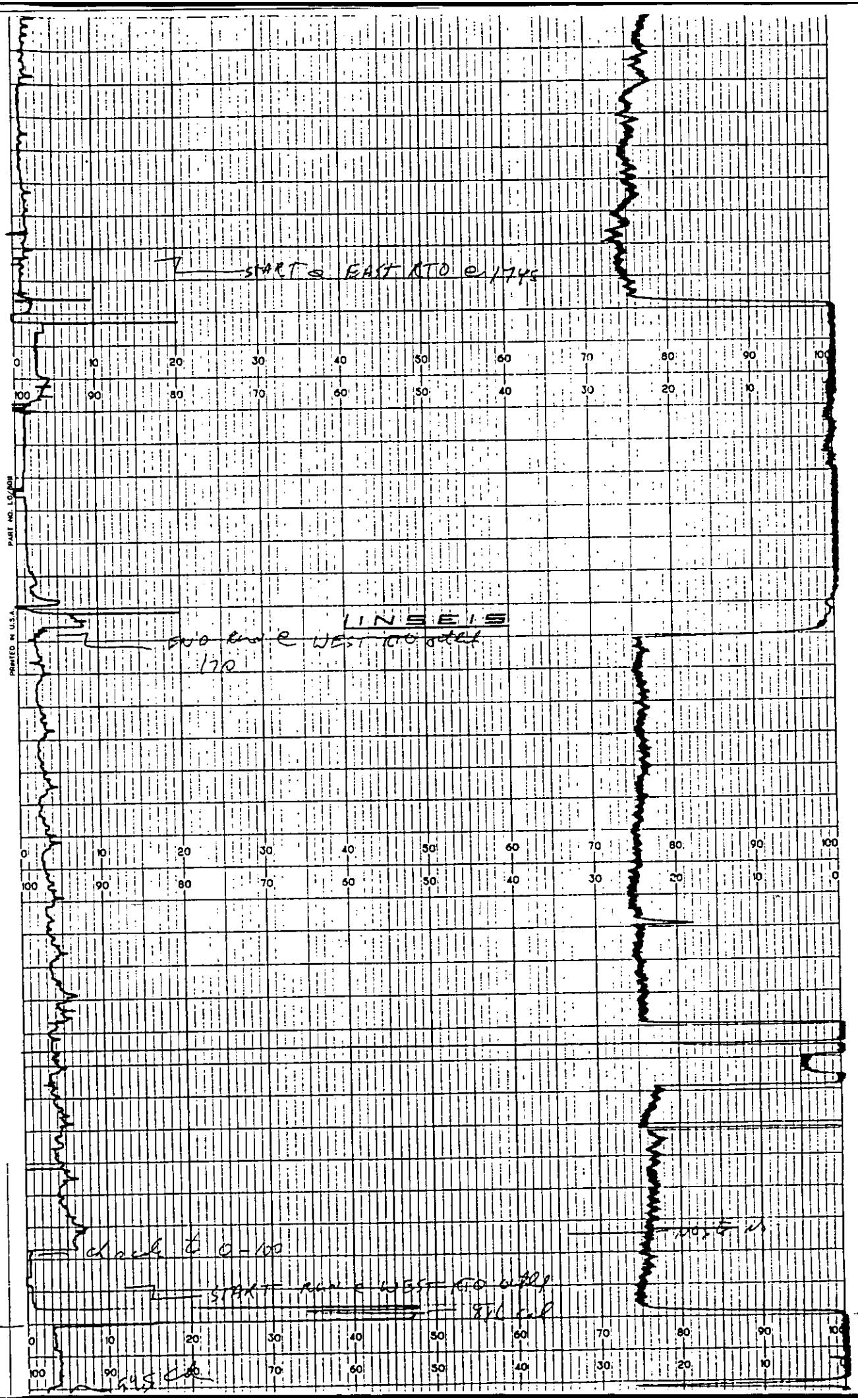
Pm = Meter pressure, (Pbar = DH/13.6)

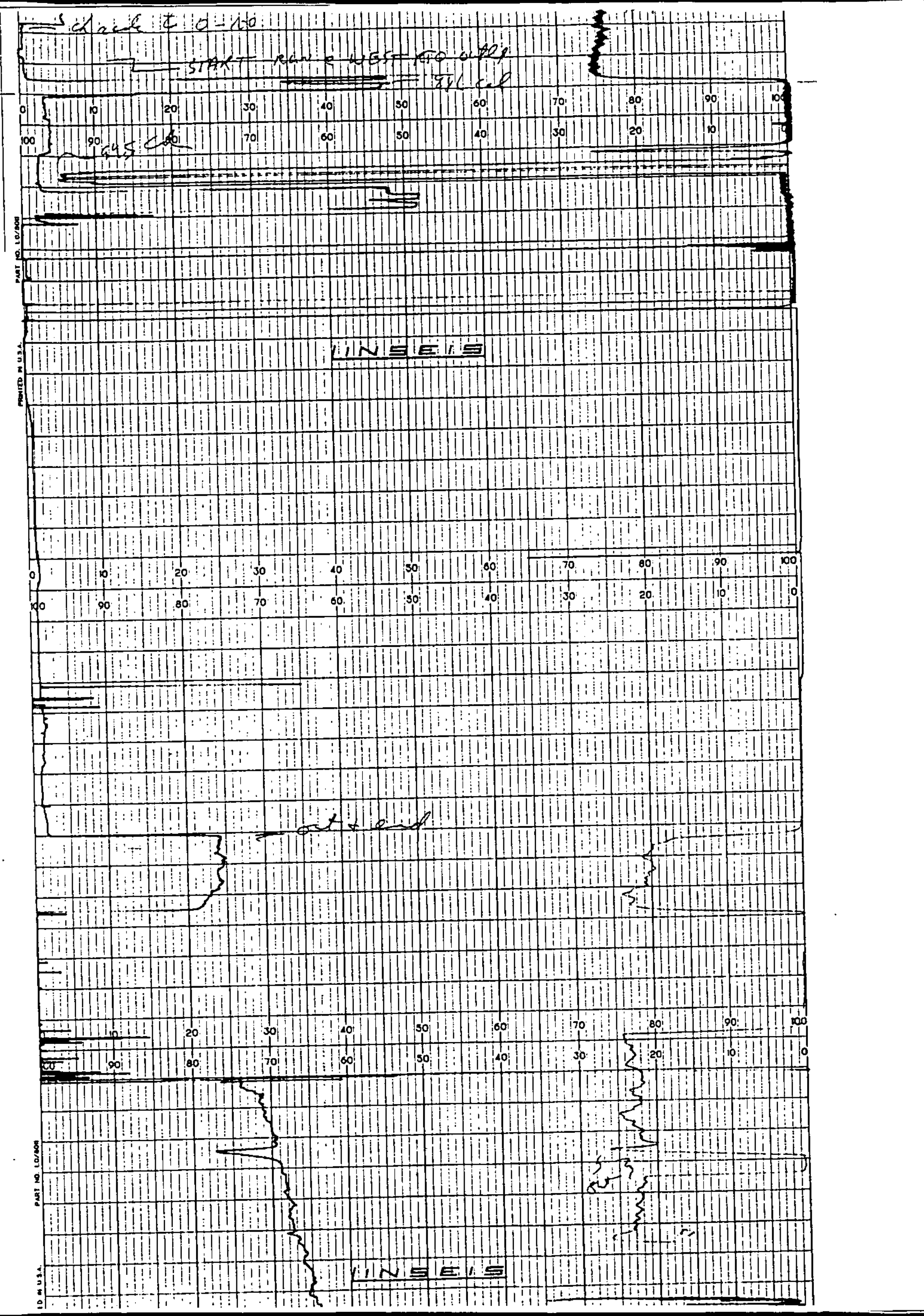
Tdgm = Average dry gas meter temp, degrees R

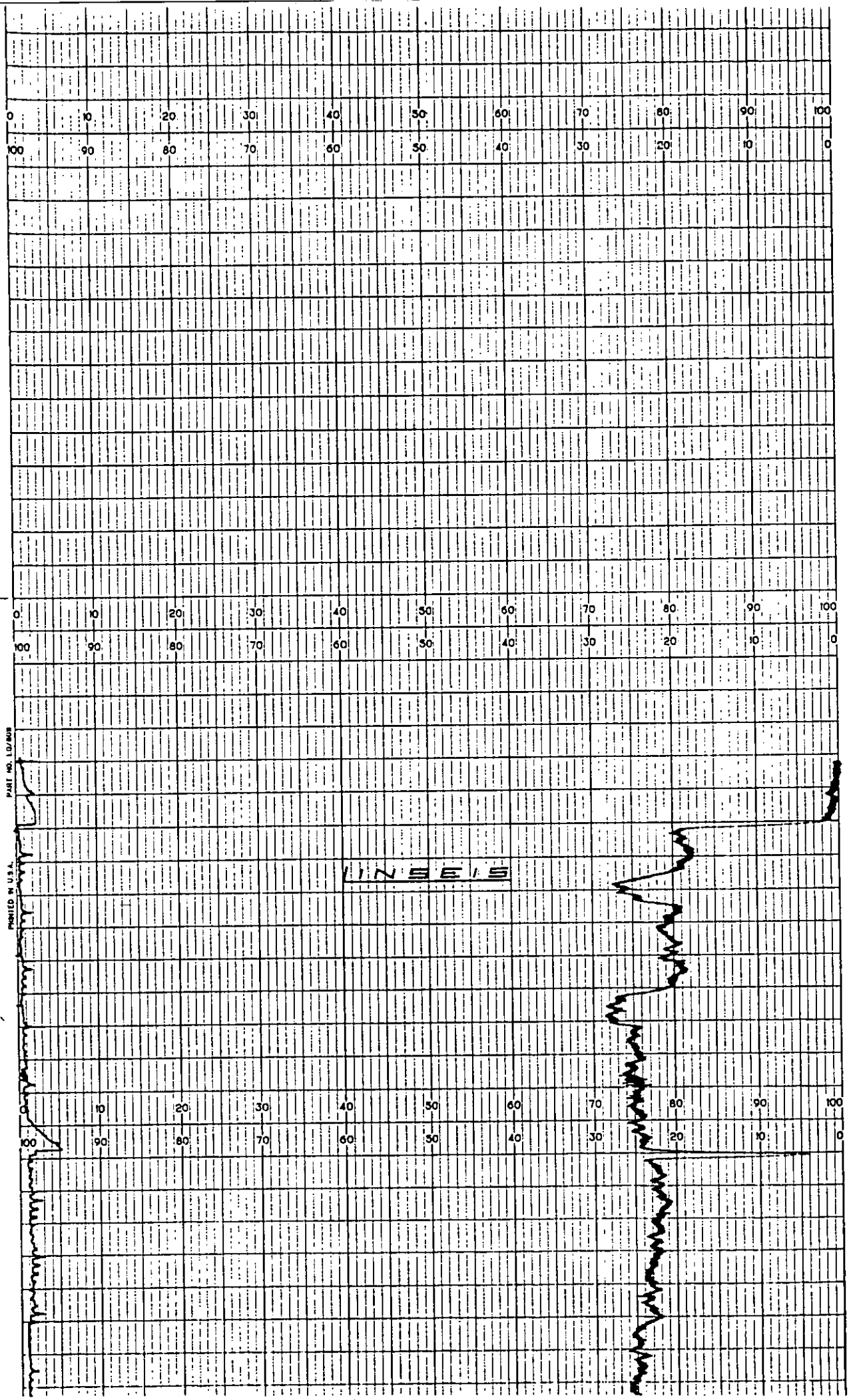
Tcal = Temperature of gas at calibrating meter, degrees R


cold start 94.5
cut for back flush
changed impellers
1146
Inc
No 7 Paper
(multi cyclone inlet)
VOC 0-1600 ppm
L to R
NOx 0-100 ppm
R to L
INSEIS
3/31/99
LP - HORIZONTAL


LINSEIS
START 1340
DRYER @ 3
real after cycling change
LINSEIS
cal check


START @ EAST RTO @ 1745
LINSEIS
END @ WEST RTO @ 1750
START @ WEST RTO @ 1751


START
LINSEIS
PART NO. LO/808
PRINTED IN U.S.A.
LINSEIS


0 10 20 30 40 50 60 70 80 90 100
100 90 80 70 60 50 40 30 20 10 0
PART NO. LD/808
PRINTED IN U.S.A.