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R. L. Heston
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AUG 30 1994

August 24, 1994

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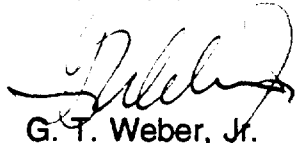
Gentlemen:

Subject: #13 Battery Stack Compliance Demonstration
USS Clairton Works

I am enclosing with this letter the mass emission report on #13 Battery Combustion Stack. The compliance demonstration was conducted at USS Clairton Works, a division of USX Corporation, on July 28-29, 1994.

For questions regarding these reports please call William C. Graeser at (412) 233-1467

Very truly yours,


G. T. Weber, Jr.
General Manager
USS Clairton Works

GTW/BAC
Enclosure



**USS CLAIRTON WORKS
A DIVISION OF USX CORPORATION
CLAIRTON, PENNSYLVANIA**

Report on

**COMPLIANCE DEMONSTRATION
NO. 13 BATTERY COMBUSTION STACK**

AUGUST 1994

**USS CLAIRTON WORKS
A DIVISION OF USX CORPORATION
CLAIRTON, PENNSYLVANIA**

Report on

**COMPLIANCE DEMONSTRATION
NO. 13 BATTERY COMBUSTION STACK**

AUGUST 1994

**Prepared By
Advanced Technology Systems, Inc.
3000 Tech Center Drive
Monroeville, Pennsylvania 15146**

Project No. IKM-0202

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EXECUTIVE SUMMARY

On July 28 and 29, 1994, a compliance test program was conducted for USS Clairton Works, Clairton, Pennsylvania, on the #13 Battery Combustion Stack. The purpose of the testing was to determine the (1) concentration and mass emission rate of particulate matter, and (2) presence and extent of visible emissions from the stack as required by the Second Consent Decree (Civil Action Nos. 79-709, 91-329), Chapter V (Compliance Requirements - Clairton Works), Section F (Combustion Stacks), Specific Items 2 through 4.

The results of the testing showed an average particulate matter concentration and emission rate of 0.0120 grains per dry standard cubic foot (gr/dscf) and 3.43 pounds per hour (lb/hr), respectively. As promulgated by the Second Consent Decree, Chapter V, Section F.2.a, the allowable particulate matter concentration for #13 Battery Combustion Stack is 0.015 gr/dscf (a Lowest Achievable Emission Rate [LAER] standard). Thus, the particulate matter emissions from the stack are less than the allowable concentration.

During the test periods, the greatest three-minute average opacity was less than 5 percent. The maximum opacity observed was 5 percent. As promulgated by the Second Consent Decree, Chapter V, Sections F.2.b and F.3, the visible emissions shall not equal or exceed 20 percent opacity for a period or periods aggregating in excess of 3 minutes in any 60-minute period and shall never equal or exceed 60 percent opacity. Thus, the observed opacities were less than the allowable values.

1.0 INTRODUCTION

On July 28 and 29, 1994, a compliance test program was conducted for USS Clairton Works, Clairton, Pennsylvania, on the #13 Battery Combustion Stack. The purpose of the testing was to determine the (1) concentration and mass emission rate of particulate matter, and (2) presence and extent of visible emissions from the stack as required by the Second Consent Decree (Civil Action Nos. 79-709, 91-329), Chapter V (Compliance Requirements - Clairton Works), Section F (Combustion Stacks), Specific Items 2 through 4.

Testing was performed by Messrs. Richard Casselberry and Thomas Morgan of Advanced Technology Systems, Inc. (previously the Monroeville, Pennsylvania-based Air Emissions Measurement Group of Chester Environmental) and Mr. Brian Fajtak of Environmental Technical Services under the direction of Mr. Bernie Clark of Chester Environmental. All test procedures were witnessed by Mr. Phil Lawrence of the Allegheny County Health Department - Department of Air Quality (DAQ).

The test program required two days to complete the field work activities due to a delay in the operation of the Battery #13. Since no ovens in Battery #13 were pushed or charged from approximately 1000 to 1245 on July 28, 1994, no emissions testing was completed during this time period. Once normal operations of the battery resumed (about 1245), emissions testing was resumed. Since there was an insufficient amount of daylight remaining after the completion of the second test run, the third test run was conducted on the following day, July 29, 1994.

2.0 METHODOLOGIES

The compliance test program was conducted in accordance with the emissions measurement test protocol, which can be found in Appendix A.

Particulate matter sampling was performed in accordance with EPA Stationary Source Sampling Methods 1 through 5, Sections 139.11 and 139.12 of the Pennsylvania Department of Environmental Resources (PA DER) Source Testing Manual, and Appendix A of the Amended Installation Permit for USS Clairton Works Nos. 13, 14, and 15 Batteries. Three two-hour tests were executed during normal operating conditions. Greater than 50 dry standard cubic feet of sample gas was collected during each test run.

The process exhausts through a 120 inch diameter stack. A total of 24 traverse points (12 per diameter) were sampled; the traverse points were calculated in accordance with EPA Method 1. Sampling was conducted through four equally spaced ports, with six traverse points sampled per port. Each point was sampled for 5 minutes, thus bringing the total sampling time to 120 minutes.

In accordance with EPA Method 2, velocities and volumetric flow rates of the exhaust gas were determined using a calibrated S type pitot tube. Positive and negative pitot lines were leak-checked at the beginning and end of each test run. Gas velocity differential pressures along with stack gas temperatures were recorded at each sampling point.

At the beginning and end of each test, gas concentrations of carbon dioxide (CO₂), oxygen (O₂), and nitrogen (N₂ - by difference) were determined with the use of Fyrite apparatus as specified by EPA Method 3. Gas concentrations were used to obtain dry molecular weight of the process gas.

Percent moisture content, by volume, of the exhaust gas was determined by measuring the weight gain of the four sample train impingers in accordance with EPA Method 4.

As specified by EPA Method 5, each sample train was assembled as required by the method, leak-checked on site at the beginning and end of each test run, and operated such that isokinetic conditions are maintained. Clean up of the sampling train will include a

water rinse followed by an acetone rinse of both the front-half and back-half components of the sample train, as per PA DER particulate matter test methods. The water soluble and water insoluble portions of the front-half of the sampling train were determined as a total; that is, the water rinse was not filtered to determine soluble and insoluble portions. Front-half acetone and water rinses were evaporated to dryness, desiccated, and weighed to a constant weight. The water soluble and water insoluble portions of the back-half were determined separately in accordance with Section 139.12 of the PA DER Source Testing Manual. The back-half water rinses and first three impinger solutions were combined and then filtered under suction through a preweighed 0.22 micrometer membrane filter. The filter used to capture the insoluble material was dried, desiccated, and weighed to a constant weight. After filtration, the soluble back-half water was extracted with chloroform and ethyl ether. The extracts were evaporated to dryness, desiccated, and weighed to a constant weight. The filtrate, or remaining water from the extraction process, was evaporated to dryness, desiccated, and weighed to a constant weight. Following the gravimetric analyses for the filtrate residue, the residue was resolubilized and the solution submitted for sulfate analysis via ion chromatography. Back-half acetone rinses were evaporated to dryness, desiccated, and weighed to a constant weight. Sample train filters were desiccated for 24 hours, and particulate matter weight was determined gravimetrically. Rinse residue weights and filter weights were measured to the nearest 0.1 mg. One acetone blank and one deionized distilled water blank were prepared in the same manner as the test sample rinses. The blank residue weights were subtracted from the test sample residue weights. After blank correction, front-half water and acetone rinse residue weights, sample train filter weights, and back-half water insoluble filter weights were used to determine total particulate matter catch.

All visible emissions determinations were performed in accordance with EPA Stationary Source Sampling Method 9. Visible emission readings were recorded for the duration of each particulate matter test.

TABLE 1-2. LOCATION OF TRAVERSE POINTS IN CIRCULAR STACKS
[Percent of stack diameter from inside wall to traverse point]

Traverse point number on a diameter	Number of traverse points on a diameter --											
	2	4	6	8	10	12	14	16	18	20	22	24
1	100	97	44	32	26	21	18	16	14	13	11	11
2	86.5	75.0	29.8	18.4	14.0	11.0	9.7	8.6	7.6	6.7	5.8	5.8
3	75.0	59.3	20.4	12.7	10.0	8.0	6.7	5.8	5.0	4.3	3.7	3.7
4	65.4	47.7	16.4	10.0	8.0	6.7	5.8	5.0	4.3	3.7	3.1	3.1
5	56.9	40.0	13.3	8.0	6.7	5.8	5.0	4.3	3.7	3.1	2.6	2.6
6	49.4	34.4	11.0	7.0	6.0	5.3	4.7	4.0	3.4	2.9	2.4	2.4
7	42.9	29.0	9.7	6.0	5.3	4.7	4.0	3.4	2.9	2.4	2.0	2.0
8	37.5	24.6	8.6	5.3	4.7	4.0	3.4	2.9	2.4	2.0	1.7	1.7
9	32.1	20.4	7.6	4.7	4.0	3.4	2.9	2.4	2.0	1.7	1.4	1.4
10	26.7	16.4	6.7	4.0	3.4	2.9	2.4	2.0	1.7	1.4	1.1	1.1
11	21.3	12.7	5.8	3.4	2.9	2.4	2.0	1.7	1.4	1.1	0.9	0.9
12	15.9	9.7	5.0	2.9	2.4	2.0	1.7	1.4	1.1	0.9	0.7	0.7
13	10.6	7.0	4.3	2.4	2.0	1.7	1.4	1.1	0.9	0.7	0.5	0.5
14	5.2	4.0	3.7	2.0	1.7	1.4	1.1	0.9	0.7	0.5	0.4	0.4
15	0.0	2.9	2.4	1.7	1.4	1.1	0.9	0.7	0.5	0.4	0.3	0.3
16	0.0	1.7	1.4	1.1	0.9	0.7	0.5	0.4	0.3	0.2	0.2	0.2
17	0.0	0.9	0.7	0.5	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 1-1. CROSS-SECTION LAYOUT FOR
RECTANGULAR STACKS

Number of traverse points	Stack layout
0	3x3
12	4x3
16	4x4
20	5x4
24	5x5
28	6x5
32	6x6
36	7x6
40	7x7

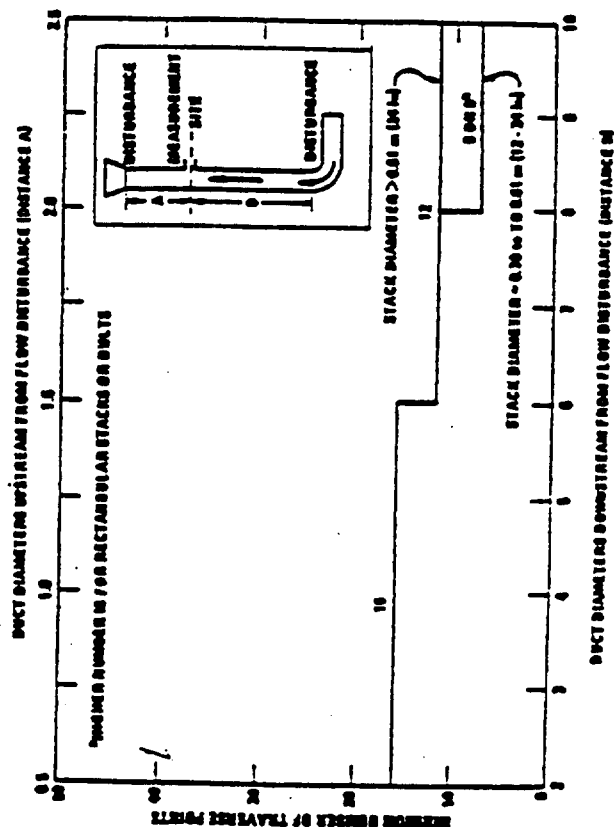
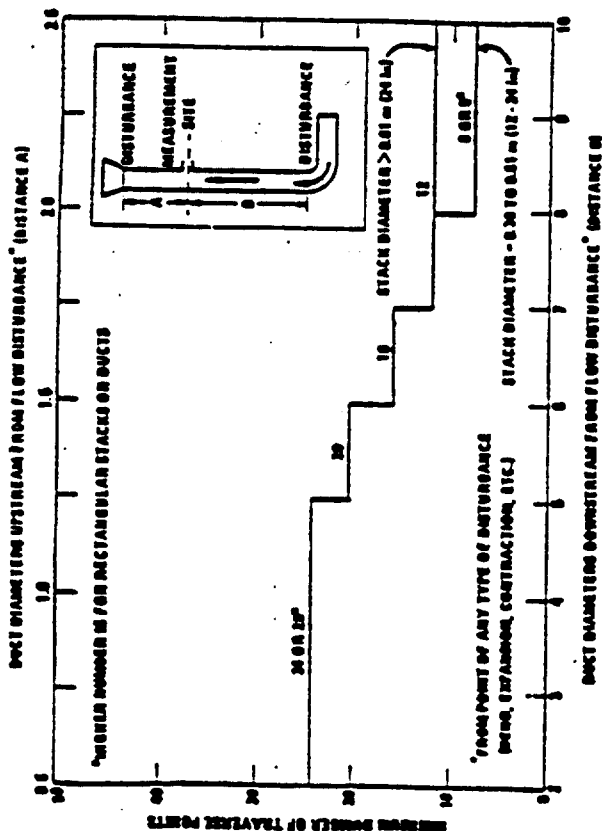
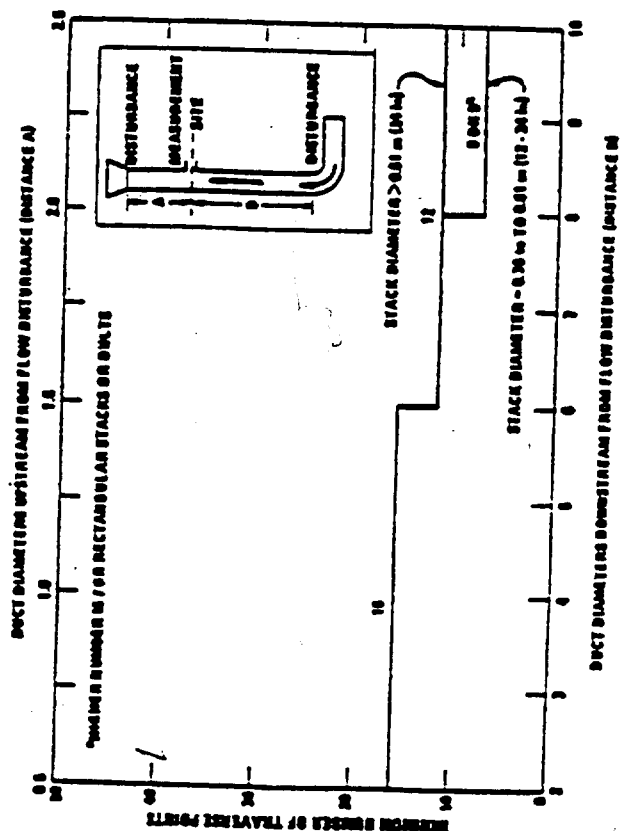
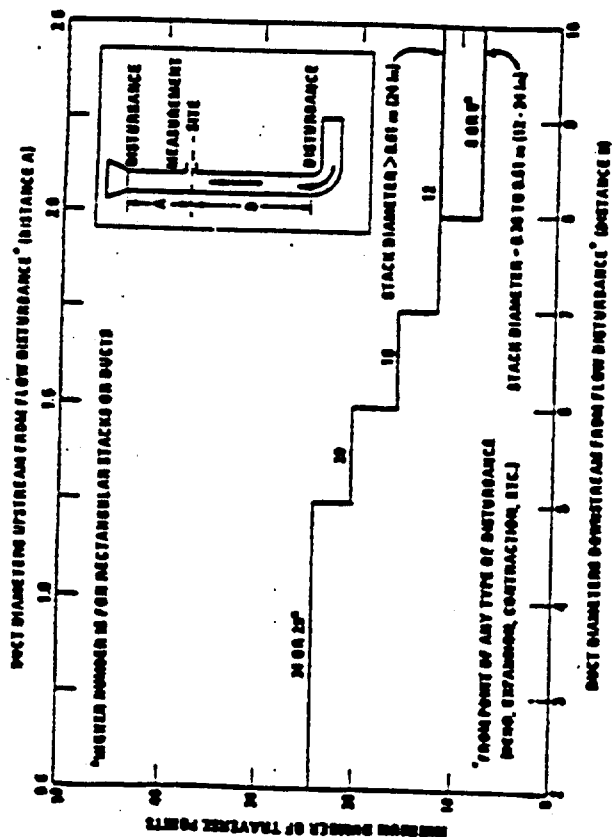


TABLE 1-2. LOCATION OF TRAVERSE POINTS IN CIRCULAR STACKS
(Percent of stack diameter from inside wall to traverse point)

Traverse point number (in a diameter)	Number of traverse points on a diameter--									
	2	4	6	8	10	12	14	16	18	20
1	100	87	44	32	26	21	18	16	14	12
2	84	70	36	24	19	15	13	11	10	9
3	70	56	30	20	16	13	11	10	9	8
4	56	42	24	16	13	11	10	9	8	7
5	42	28	16	10	8	7	6	5	4	3
6	28	16	8	5	4	3	2	2	1	1
7	16	8	4	2	2	1	1	1	1	1
8	8	4	2	1	1	1	1	1	1	1
9	4	2	1	1	1	1	1	1	1	1
10	2	1	1	1	1	1	1	1	1	1
11	1	1	1	1	1	1	1	1	1	1
12	1	1	1	1	1	1	1	1	1	1
13	1	1	1	1	1	1	1	1	1	1
14	1	1	1	1	1	1	1	1	1	1
15	1	1	1	1	1	1	1	1	1	1
16	1	1	1	1	1	1	1	1	1	1
17	1	1	1	1	1	1	1	1	1	1
18	1	1	1	1	1	1	1	1	1	1
19	1	1	1	1	1	1	1	1	1	1
20	1	1	1	1	1	1	1	1	1	1
21	1	1	1	1	1	1	1	1	1	1
22	1	1	1	1	1	1	1	1	1	1
23	1	1	1	1	1	1	1	1	1	1
24	1	1	1	1	1	1	1	1	1	1

TABLE 1-1. CROSS-SECTION LAYOUT FOR RECTANGULAR STACKS

Number of traverse points	Stack layout
2	3-3
4	4-4
6	6-6
8	8-8
10	10-10
12	12-12
14	14-14
16	16-16
18	18-18
20	20-20
22	22-22
24	24-24
26	26-26
28	28-28
30	30-30
32	32-32
34	34-34
36	36-36
38	38-38
40	40-40
42	42-42
44	44-44
46	46-46
48	48-48
50	50-50
52	52-52
54	54-54
56	56-56
58	58-58
60	60-60
62	62-62
64	64-64
66	66-66
68	68-68
70	70-70
72	72-72
74	74-74
76	76-76
78	78-78
80	80-80
82	82-82
84	84-84
86	86-86
88	88-88
90	90-90
92	92-92
94	94-94
96	96-96
98	98-98
100	100-100



STACK SAMPLING DATA SHEET

Page 1 of 2

CLIENT USS-CLARKSON WORKS TEST DATE 07-28-94 (THURS) ORIFICE CORRECTION (ΔH) 1.937 HOT/COLD BOX NO. 4
 TEST UNIT # 13 BATTERY STACK TEST NO. USS-CL-8513-2 METER CORRECTION (Y) 1.072 PROBE NO. 10.2
 PROJECT NO. TK-1 - 85242 NOZZLE (SIZE, #) 0.490" CALIBRATION DATE 66-20-94 FILTER NO. 1284
 TEST CREW 2PC, TM STATIC PRESSURE -1.0' H₂O PITOT CORRECTION 0.84 STACK DIA. 120"
 BAROMETRIC PRESSURE 29.38 PORT DIRECTION SOUTH WEST CONTROL BOX NO. 51 PORT SIZE 4.0" Messing

Traverse Point (inches)	Time	Dry Gas Meter Reading (deg)	Pilot A/P (in. H ₂ O)	Required (in. H ₂ O)	Actual (in. H ₂ O)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
42.7	13:40	890.730	0.05	1.44	1.44	88	88	5.0	509	~220	~68	~250	5 min./point
30.0			0.06	1.73	1.73	104	87	5.0	489				
21.3			0.06	1.73	1.73	105	88	5.0	499				
14.2			0.06	1.74	1.74	110	90	5.6	505				
9.0			0.04	1.16	1.16	112	92	3.5	498				
2.6	14:10	911.200	0.04	1.16	1.16	115	95	3.0	500				
42.7	14:14	911.200	0.04	1.16	1.16	110	95	3.0	509				
30.0			0.04	1.16	1.16	115	96	3.0	520				
21.3			0.04	1.16	1.16	118	97	3.0	519				
14.2			0.05	1.45	1.45	119	98	4.0	506				
8.0			0.05	1.45	1.45	120	98	4.0	520				
2.6	14:44	929.707	0.03	0.87	0.87	121	100	3.6	450				

Estimates:
 MW = 28.0
 %H₂O = 14.0

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGMT Rate (cfm)
Before	5.0	10.01 cfm
After	7.0	0.008 cfm

PITOT LEAK CHECK

	Positive (cfm)	Negative (cfm)
Before	0.153	0.153
After	0.145	0.151

GAS 1 2

	CO ₂	O ₂	CO	N ₂
Before	6.0	10.5	0	83.5
After	6.0	10.5	0	83.5

Impinger No. Impinger Contents Final Initial Difference

1.	100ml AT 40.0	748.5	532.8	215.7
2.	100ml AT 40.0	603.9	519.8	50.1
3.	EMPTY	759.8	452.2	9.6
4.	Stuen Gas	464.3	443.0	21.3
5.				
6.				
7.				
8.				

275.4g

ADVANCED TECHNOLOGY SYSTEMS, INC.

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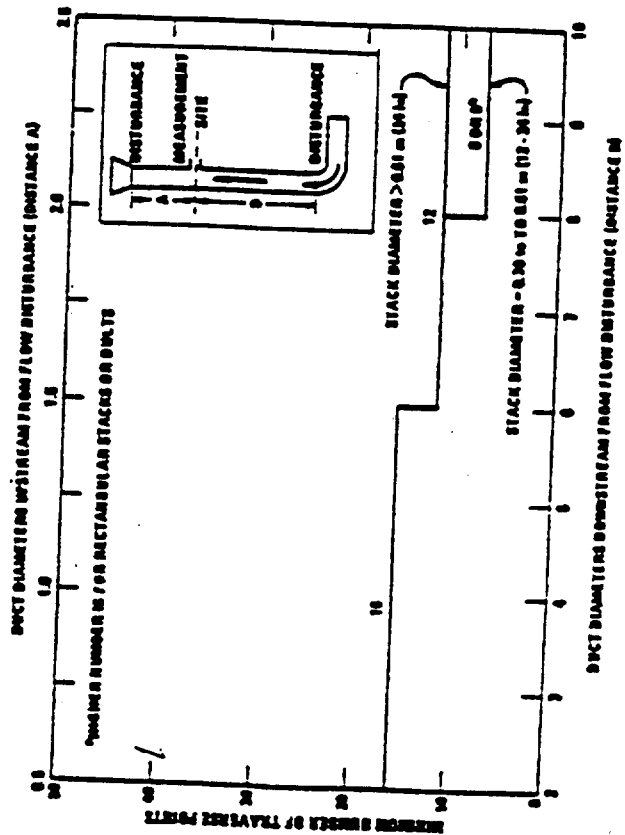
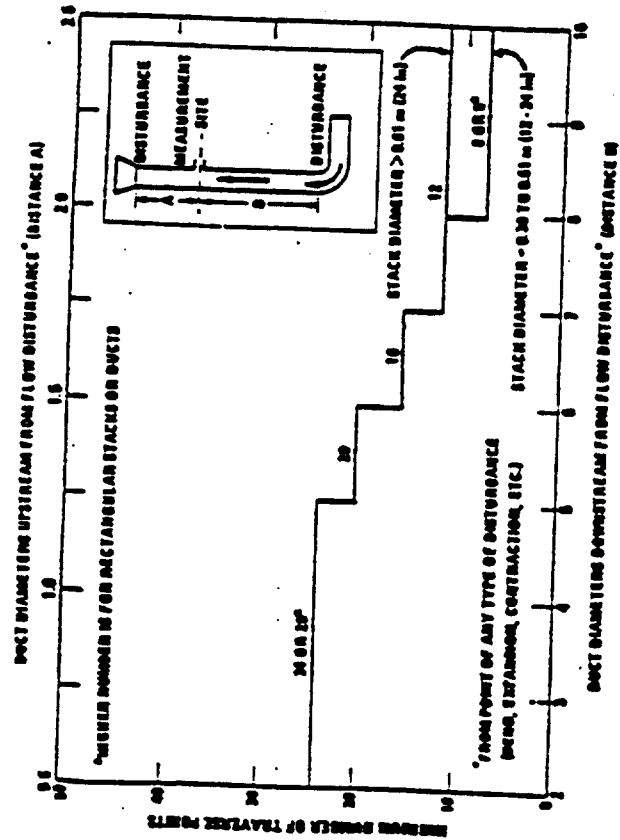


TABLE 1-2. LOCATION OF TRAVERSE POINTS IN CIRCULAR STACKS
(Percent of stack diameter from duct wall to traverse point)

Traverse point number on a diameter	Number of traverse points on a diameter--										
	2	4	6	8	10	12	14	16	18	20	24
1	100	87	74	62	50	38	26	14	14	12	11
2	86.5	75.6	64.6	53.6	42.6	31.6	20.6	9.6	9.6	8.6	8.6
3	75.6	64.6	53.6	42.6	31.6	20.6	9.6	9.6	8.6	8.6	8.6
4	64.6	53.6	42.6	31.6	20.6	9.6	9.6	8.6	8.6	8.6	8.6
5	53.6	42.6	31.6	20.6	9.6	9.6	8.6	8.6	8.6	8.6	8.6
6	42.6	31.6	20.6	9.6	9.6	8.6	8.6	8.6	8.6	8.6	8.6
7	31.6	20.6	9.6	9.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
8	20.6	9.6	9.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
9	9.6	9.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
10	9.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
11	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
12	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
13	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
14	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
15	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
16	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
17	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
18	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
19	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
20	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
21	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
22	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
23	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
24	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6

TABLE 1-1. CROSS-SECTION LAYOUT FOR
RECTANGULAR STACKS

Number of traverse points	Mobile layout
6	3x3
12	4x3
18	4x4
24	5x4
30	6x5
36	6x6
42	7x6
48	7x7

STACK SAMPLING DATA SHEET

Page 2 of 2

CLIENT USS-CLARENCE WORKS TEST DATE 07-28-94 (Grues) ORIFICE CORRECTION (ΔH) 1.837 HOT/COLD BOX NO. 1
 TEST UNIT Battery Stack #3 TEST NO. 155-CLE-65-13-1 METER CORRECTION (V) 1.012 PROBE NO. 10-2
 PROJECT NO. IR41-02462 NOZZLE (SIZE, #) 0.490 CALIBRATION DATE 06-20-94 FILTER NO. 1296
 TEST CREW RAC TM STATIC PRESSURE -1.0" H₂O PLOT CORRECTION 0.88 STACK DIA. 120"
 BAROMETRIC PRESSURE 29.30 PORT DIRECTION South, east CONTROL BOX NO. Sid PORT SIZE 40" Thru

Traverse Point (Inches)	Time	Dry Gas Meter Reading (dcl)	Pilot A/P (in. H ₂ O)	Orifice A/I Required (in. H ₂ O)	Actual (in. H ₂ O)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
42.7	09:38	853.225	0.05	1.40	1.40	100	83	4.5	499	2350	68	2350	5 min./point
30.0			0.05	1.40	1.40	100	83	4.5	498				
21.3			0.04	1.12	1.12	109	83	4.0	509				
14.2			0.03	0.84	0.84	109	83	3.5	506				
8.0			0.04	1.12	1.12	109	83	3.0	475				
2.6	10:04	870.827	0.03	0.84	0.84	109	84	3.0	480				
42.7	12:42	870.827	0.05	1.40	1.40	80	90	5.0	510				
30.0			0.05	1.40	1.40	94	80	5.0	516				
21.3			0.06	1.68	1.68	98	82	5.5	500				
14.2			0.05	1.40	1.40	100	85	5.0	495				
9.0			0.04	1.12	1.12	110	88	4.5	499				
2.6	13:13	890.520	0.03	0.84	0.84	110	89	3.5	465				
Test	14:12	1 = 120	1 = 73.885	1.21									
Test	14:11	14.6	0.04										

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (clm)
Before		
After		

PLOT LEAK CHECK

	Positive	Negative
Before		
After		

	QAS	1	2
CO2		60	6.0
O2		105	165
CO		0	0
N2		83.5	83.5

Impinger

No.	Impinger Contents	Final	Initial	Difference
1.	100ml AL H ₂ O			
2.	100ml AL H ₂ O			
3.	Empty			
4.	500ml AL H ₂ O			
5.				
6.				
7.				
8.				

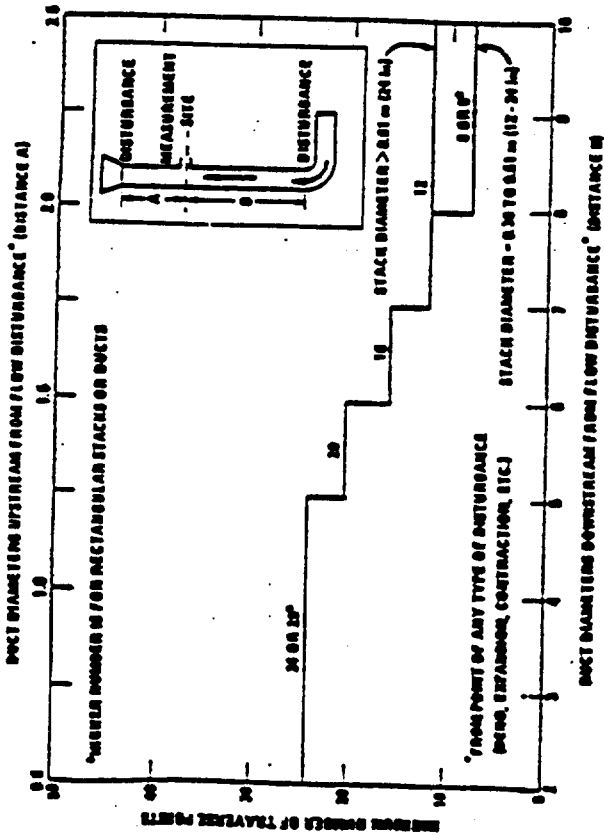
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 339 Haymaker Road Suite 201
 Monroeville, PA 15146
 412/856-0662
 FAX 412/856-0666

TABLE 1-2. LOCATION OF TRAVERSE POINTS IN CIRCULAR STACKS
[Percent of stack diameter from inside wall to traverse point]

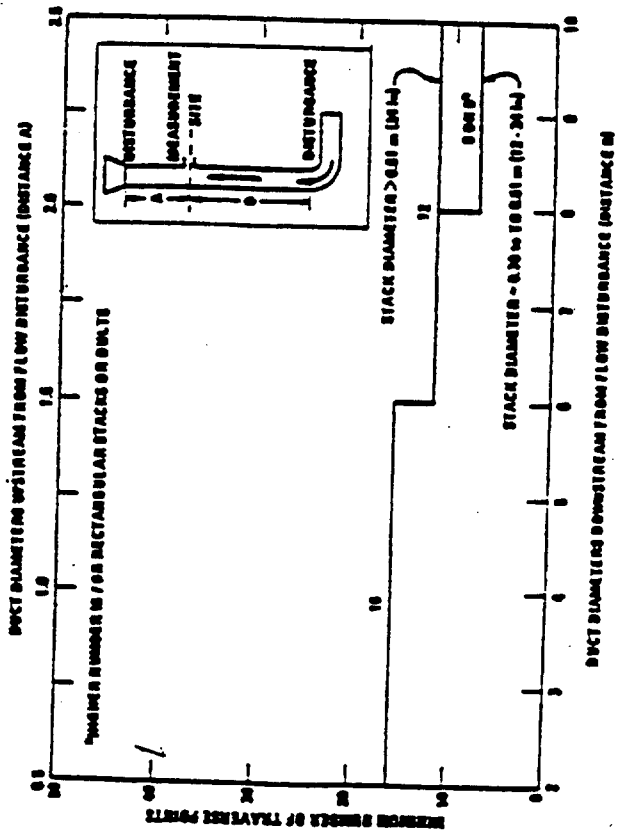
Traverse point number on a diameter	Number of traverse points on a diameter--									
	2	4	6	8	10	12	14	16	18	20
1	10.0	07.7	4.4	3.2	2.6	2.1	1.8	1.6	1.4	1.2
2	88.4	25.0	14.0	10.8	8.2	6.7	5.7	4.9	4.4	3.9
3	79.0	29.0	18.4	14.0	11.0	9.0	7.8	6.8	6.0	5.4
4	70.4	32.3	22.0	17.7	14.0	11.0	9.0	7.8	6.8	6.0
5	65.4	37.7	24.2	20.0	16.0	13.0	11.0	9.0	7.8	6.8
6	60.0	44.0	28.0	22.0	18.0	14.0	12.0	10.0	8.8	7.8
7	55.4	50.0	32.0	24.0	20.0	16.0	14.0	12.0	10.0	8.8
8	50.0	56.0	36.0	26.0	22.0	18.0	16.0	14.0	12.0	10.0
9	45.4	62.0	40.0	28.0	24.0	20.0	18.0	16.0	14.0	12.0
10	40.0	68.0	44.0	30.0	26.0	22.0	20.0	18.0	16.0	14.0
11	35.4	74.0	48.0	32.0	28.0	24.0	22.0	20.0	18.0	16.0
12	30.0	80.0	52.0	34.0	30.0	26.0	24.0	22.0	20.0	18.0
13	25.4	86.0	56.0	36.0	32.0	28.0	26.0	24.0	22.0	20.0
14	20.0	92.0	60.0	38.0	34.0	30.0	28.0	26.0	24.0	22.0
15	15.4	98.0	64.0	40.0	36.0	32.0	30.0	28.0	26.0	24.0
16	10.0	104.0	68.0	42.0	38.0	34.0	32.0	30.0	28.0	26.0
17	5.4	110.0	72.0	44.0	40.0	36.0	34.0	32.0	30.0	28.0
18	0.0	116.0	76.0	46.0	42.0	38.0	36.0	34.0	32.0	28.0
19	0.0	122.0	80.0	48.0	44.0	40.0	38.0	36.0	34.0	28.0
20	0.0	128.0	84.0	50.0	46.0	42.0	40.0	38.0	36.0	28.0
21	0.0	134.0	88.0	52.0	48.0	44.0	42.0	40.0	38.0	28.0
22	0.0	140.0	92.0	54.0	50.0	46.0	44.0	42.0	40.0	28.0
23	0.0	146.0	96.0	56.0	52.0	48.0	46.0	44.0	42.0	28.0
24	0.0	152.0	100.0	58.0	54.0	50.0	48.0	46.0	44.0	28.0

TABLE 1-1. CROSS-SECTION LAYOUT FOR RECTANGULAR STACKS

Number of traverse points	Stack layout
0	3-3
12	4-2
16	4-4
20	5-4
24	5-5
28	6-5
32	6-6
36	7-6
40	7-7



15.5



STACK SAMPLING DATA SHEET

Page 1 of 2

CLIENT USS - Clifton Works TEST DATE 07-28-94 (Thurs) ORIFICE CORRECTION (ΔH) 1.837 HOT/COLD BOX NO. 1
 TEST UNIT Battery Stack #13 TEST NO. USS-CLK-B5#13-#1 METER CORRECTION (V) 1.0172 PROBE NO. 10-2
 PROJECT NO. 1741-0202 NOZZLE (SIZE, #) 0.490" CALIBRATION DATE 06-20-94 FILTER NO. 1296
 TEST CREW STATIC PRESSURE -1.04 H₂O PITOT CORRECTION 0.84 STACK DIA. 120"
 BAROMETRIC PRESSURE 29.30 PORT DIRECTION North, East CONTROL BOX NO. 511 PORT SIZE 4/0 253.99

Traverse Point (inches)	Time	Dry Gas Meter Reading (scf)	Pitot ΔP (in. H ₂ O)	Orifice ΔH Required (in. H ₂ O)	Actual (in. H ₂ O)	Meter Temperature In (°F)	Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
42.7	08:30	816.635	0.05	1.40	1.40	71	71	4.5	521	~250°	~68°	~250°	5 min./point
30.0			0.06	1.68	1.68	86	71	5.0	536				
21.3			0.04	1.12	1.12	93	73	4.0	529				
14.2			0.05	1.40	1.40	100	75	4.5	480				
8.0			0.05	1.40	1.40	100	76	4.5	475				
2.6	09:00	835.180	0.03	0.84	0.84	100	76	3.5	450				
42.7	09:06	835.180	0.05	1.40	1.40	84	78	5.0	516				
30.0			0.04	1.12	1.12	100	78	4.5	509				
21.3			0.04	1.12	1.12	102	79	4.5	508				
14.2			0.05	1.40	1.40	105	80	5.0	495				
8.0			0.03	0.84	0.84	105	81	3.8	480				
2.6	09:36	853.225	0.03	0.84	0.84	104	81	3.5	450				

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	5.0	<0.01 cfm
After	8.0	0.01 cfm

PITOT LEAK CHECK

	Before	Positive	Negative
Before	05/15 sec	05/15 sec	05/15 sec
After	05/15 sec	05/15 sec	05/15 sec

	CO2	O2	CO	N2
Before	6.0	10.5	0	83.5
After	6.0	10.5	0	83.5

Impinger

No.	Impinger Contents	Final	Initial	Difference
1.	100ml DI H ₂ O	761.5	559.5	202.0
2.	100ml DI H ₂ O	596.4	553.3	43.1
3.	EMPTY	446.3	437.4	8.8
4.	512ml gas	671.5	649.4	22.1
5.				
6.				
7.				
8.				

Estimates:

MW = 28.0

%H₂O = 14.0

253.99

ADVANCED TECHNOLOGY SYSTEMS, INC.

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A report summarizing the compliance test program will be submitted within 60 days following completion of field work. The report will describe test methodologies utilized and present a textual and tabular summary of the emissions results and related sampling information. Copies of operational data will be included in the report to verify that all testing was performed during periods of normal plant operation. Also incorporated into the report will be copies of the pre-test calibration results, post-test calibration results, the results of an audit conducted with a critical orifice provided by the Allegheny County Health Department - Department of Air Quality, field data sheets for the particulate matter sampling and visible emissions determinations, emissions calculations sheets, and analytical results for each test.

water rinse followed by an acetone rinse of both the front-half and back-half components of the sample train, as per PA DER particulate matter test methods. The water soluble and water insoluble portions of the front-half of the sampling train will be determined as a total; that is, the water rinse will not be filtered to determine soluble and insoluble portions. Front-half acetone and water rinses will be evaporated to dryness, desiccated, and weighed to a constant weight. The water soluble and water insoluble portions of the back-half will be determined separately in accordance with Section 139.12 of the PA DER Source Testing Manual. The back-half water rinses and first three impinger solutions will be combined and then filtered under suction through a preweighed 0.22 micrometer membrane filter. The filter used to capture the insoluble material will be dried, desiccated, and weighed to a constant weight. After filtration, the soluble back-half water will be extracted with chloroform and ethyl ether. The extracts will be evaporated to dryness, desiccated, and weighed to a constant weight. The filtrate, or remaining water from the extraction process, will be evaporated to dryness, desiccated, and weighed to a constant weight. Following the gravimetric analyses for the filtrate residue, the residue will be resolubilized and the solution submitted for sulfate analysis via ion chromatography. Back-half acetone rinses will be evaporated to dryness, desiccated, and weighed to a constant weight. Sample train filters will be desiccated for 24 hours, and particulate matter weight will be determined gravimetrically. Rinse residue weights and filter weights will be measured to the nearest 0.1 mg. One acetone blank and one deionized distilled water blank will be prepared in the same manner as the test sample rinses. The blank residue weights will be subtracted from the test sample residue weights. After blank correction, front-half water and acetone rinse residue weights, sample train filter weights, and back-half water insoluble filter weights will be used to determine total particulate matter catch.

All visible emissions determinations will be performed in accordance with EPA Stationary Source Sampling Method 9. Visible emission readings will be recorded for the duration of each particulate matter test.

**TEST PROTOCOL
COMPLIANCE DEMONSTRATION
#13 BATTERY COMBUSTION STACK**

**USS CLAIRTON WORKS
CLAIRTON, PA**

Particulate matter sampling will be performed in accordance with EPA Stationary Source Sampling Methods 1 through 5, Sections 139.11 and 139.12 of the Pennsylvania Department of Environmental Resources (PA DER) Source Testing Manual, and Appendix A of the Amended Installation Permit for USS Clairton Works Nos. 13, 14, and 15 Batteries. Three two-hour tests will be executed during normal operating conditions. Greater than 50 dry standard cubic feet of sample gas will be collected during each test run.

The process exhausts through a 120 inch diameter stack. A total of 24 traverse points (12 per diameter) will be sampled; the traverse points will be calculated in accordance with EPA Method 1. Sampling will be conducted through four equally spaced ports, with six traverse points sampled per port. Each point will be sampled for 5 minutes, thus bringing the total sampling time to 120 minutes.

In accordance with EPA Method 2, velocities and volumetric flow rates of the exhaust gas will be determined using a calibrated S type pitot tube. Positive and negative pitot lines will be leak-checked at the beginning and end of each test run. Gas velocity differential pressures along with stack gas temperatures will be recorded at each sampling point.

At the beginning and end of each test, gas concentrations of CO₂, O₂, and N₂ (by difference) will be determined with the use of a Fyrite apparatus as specified by EPA Method 3. Gas concentrations will be used to obtain molecular weight of the process gas.

Percent moisture content, by volume, of the exhaust gas will be determined by measuring the weight gain of the four sample train impingers in accordance with EPA Method 4.

As specified by EPA Method 5, each sample train will be assembled as required by the method, leak-checked on site at the beginning and end of each test run, and operated such that isokinetic conditions are maintained. Clean up of the sampling train will include a

**COMPLIANCE DEMONSTRATION
NO. 13 BATTERY COMBUSTION STACK**

**USS CLAIRTON WORKS
A DIVISION OF USX CORPORATION
CLAIRTON, PENNSYLVANIA**

APPENDIX A

**TEST PROTOCOL, FIELD DATA SHEETS, CALIBRATION
RESULTS**



USS CLAIRTON WORKS
CLAIRTON, PA

TABLE 1

#13 BATTERY COMBUSTION STACK
PARTICULATE MATTER EMISSIONS DATA

		Run 1	Run 2	Run 3	Average
Test Number		CLR-BS#13-1	CLR-BS#13-2	CLR-BS#13-3	
Test Date		07-28-94	07-28-94	07-29-94	
<u>Mass Emissions Rate and Concentration</u>					
Particulate Matter	(lb/hr)	3.49	3.11	3.69	3.43
	(gr/dscf)	0.0121	0.0109	0.0129	0.0120
<u>Stack Conditions</u>					
Flow Rate	(acfm)	73700	73900	73500	73700
	(scfm)	39800	39800	39800	39800
	(dscfm)	33600	33200	33400	33400
Temperature	(°F)	496	498	495	496
Moisture Content	(%)	15.5	16.6	16.2	16.1
<u>Sampling Conditions</u>					
Test times		0830	1340	0740	
		to 0900	to 1410	to 0810	
		0906	1414	0813	
		to 0936	to 1444	to 0843	
		0939	1447	0846	
		to 1009	to 1517	to 0916	
		1242	1520	0919	
		to 1312	to 1550	to 0949	
Sampling Time	(minutes)	120	120	120	
Sample Volume	(dscf)	70.923	70.515	69.046	
Isokinetics	(%)	105.4	106.2	103.4	

All testing was performed during periods of normal plant operation. Copies of the plant operational data can be found in Appendix B.

The gravimetric and analytical results (including the results of the sulfate analyses of the back-half filtrate from the sample trains) and the emissions calculations for each test can be found in Appendix C.

3.0 RESULTS

The test results have been summarized in Table 1. The results of the testing showed an average particulate matter concentration and emission rate of 0.0120 grains per dry standard cubic foot (gr/dscf) and 3.43 pounds per hour (lb/hr), respectively. As promulgated by the Second Consent Decree, Chapter V, Section F.2.a, the allowable particulate matter concentration for #13 Battery Combustion Stack is 0.015 gr/dscf (a Lowest Achievable Emission Rate [LAER] standard). Thus, the particulate matter emissions from the stack are less than the allowable concentration.

Table 1 also lists other pertinent stack and sampling parameters which include stack gas flow rate in units of actual cubic feet per minute (acfm), standard cubic feet per minute (scfm), and dry standard cubic feet per minute (dscfm), stack gas temperature ($^{\circ}\text{F}$), moisture content of the stack gas (percent by volume), gas volume sampled for each test in units of dry standard cubic feet (dscf), and the isokinetics value for each test. The isokinetics value is equal to the ratio of the average linear gas velocity sampled through the probe nozzle to the average stack gas velocity. An isokinetics value between 90 percent and 110 percent is considered acceptable. All isokinetic values were within the acceptable range of values. The gas volume sampled for each 120 minute test was greater than 50 dry standard cubic feet. Actual test sampling times have also been included in Table 1.

Copies of all field data sheets, including the visible emissions readings, can be found in Appendix A. As promulgated by the Second Consent Decree, Chapter V, Sections F.2.b and F.3, the visible emissions shall not equal or exceed 20 percent opacity for a period or periods aggregating in excess of 3 minutes in any 60-minute period and shall never equal or exceed 60 percent opacity. During the test periods, the greatest three-minute average opacity was less than 5 percent. The maximum opacity observed was 5 percent. Thus, the observed opacities were less than the allowable values.

All sampling equipment was calibrated and operated in accordance with EPA Stationary Source Sampling Methods 1 through 5. Copies of the pre-test calibration results, post-test calibration results, and the results of an audit conducted with a critical orifice provided by the Allegheny County Health Department DAQ can be found in Appendix A.

STACK SAMPLING DATA SHEET

Page 1 of 2

CLIENT USS-CLARKTON WORKS TEST DATE 07-29-94 (Fri) ORIFICE CORRECTION (ΔH) 0.837 HOT/COLD BOX NO. 4
 TEST UNIT # 13 BATTERY STACK TEST NO. USS-CL-85-13-3 METER CORRECTION (Y) 0.172 PROBE NO. 10-2
 PROJECT NO. 2001-8242 NOZZLE (SIZE, #) 0.490 CALIBRATION DATE 06-20-94 FILTER NO. 1305
 TEST CREW RPC TM STATIC PRESSURE -1.1" H₂O PITOT CORRECTION 0.84 STACK DIA. 120"
 BAROMETRIC PRESSURE 29.40 PORT DIRECTION NORTH, EAST CONTROL BOX NO. SIX PORT SIZE 40" THREADED MALE

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcl)	Pilot ΔP (in. H ₂ O)	Orifice ΔH		Meter Temperature		Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
				Required (in. H ₂ O)	Actual (in. H ₂ O)	In (°F)	Out (°F)						
42.7	67 ⁰⁰ AM	966.761	0.05	1.39	1.39	68	68	35	533	~250°F	<68°F	~250°F	5 min./point
30.0			0.05	1.39	1.39	82	68	35	509				
21.3			0.04	1.11	1.11	91	70	30	500				
14.2			0.04	1.11	1.11	97	73	30	489				
8.0			0.03	0.83	0.83	100	75	25	479				
2.6	08 ¹⁰ AM	984.654	0.03	0.83	0.83	99	75	25	484				
42.7	08 ¹³ AM	984.654	0.04	1.11	1.11	95	80	35	511				
30.0			0.05	1.39	1.39	105	81	40	509				
21.3			0.04	1.11	1.11	107	82	35	511				
14.2			0.03	0.83	0.83	107	82	30	494				
8.0			0.03	0.83	0.83	108	82	25	500				
2.6	08 ⁴³ AM	1001.677	0.03	0.83	0.83	107	83	25	450				
													Estimates:
													MW = 28.0
													%H ₂ O = 14.0

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DCM Rate (cfm)
Before	5.0	0.0120 Fm
After	5.0	0.0101 Fm

PITOT LEAK CHECK

	Before	After	Positive	Negative
GAS	0.5/15.50	0.5/15.50	0.5/15.50	0.5/15.50
CO ₂	0.5/15.50	0.5/15.50	0.5/15.50	0.5/15.50
O ₂	0.5/15.50	0.5/15.50	0.5/15.50	0.5/15.50
CO	0.5/15.50	0.5/15.50	0.5/15.50	0.5/15.50
N ₂	0.5/15.50	0.5/15.50	0.5/15.50	0.5/15.50

	1	2
CO ₂	6.5	6.5
O ₂	10.5	10.5
CO	0	0
N ₂	83.0	83.0

Impinger Contents

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100 ml DI H ₂ O	743.7	534.1	209.6
2.	100 ml DI H ₂ O	603.8	555.8	48.0
3.	50 ml DI H ₂ O	457.3	451.2	6.1
4.	50 ml DI H ₂ O	600.8	642.2	18.2
5.				
6.				
7.				
8.				

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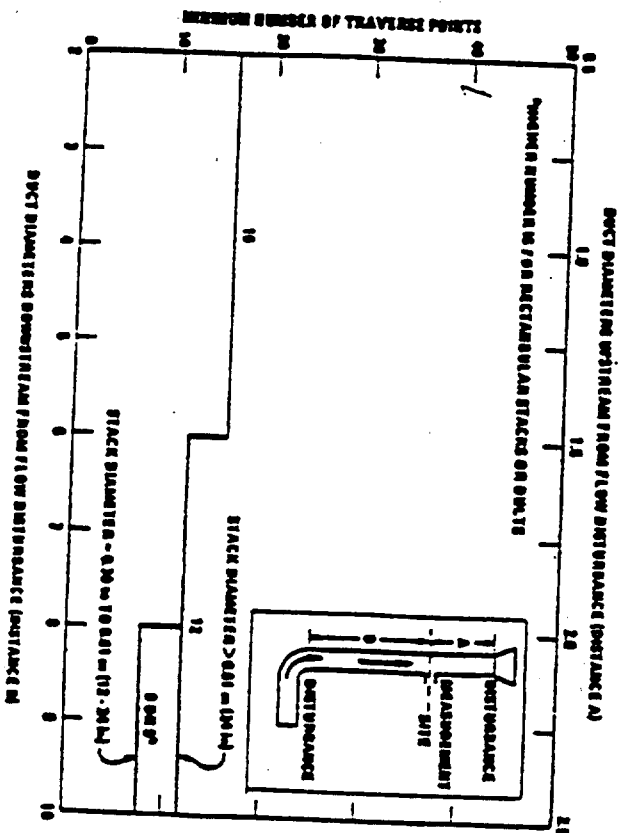
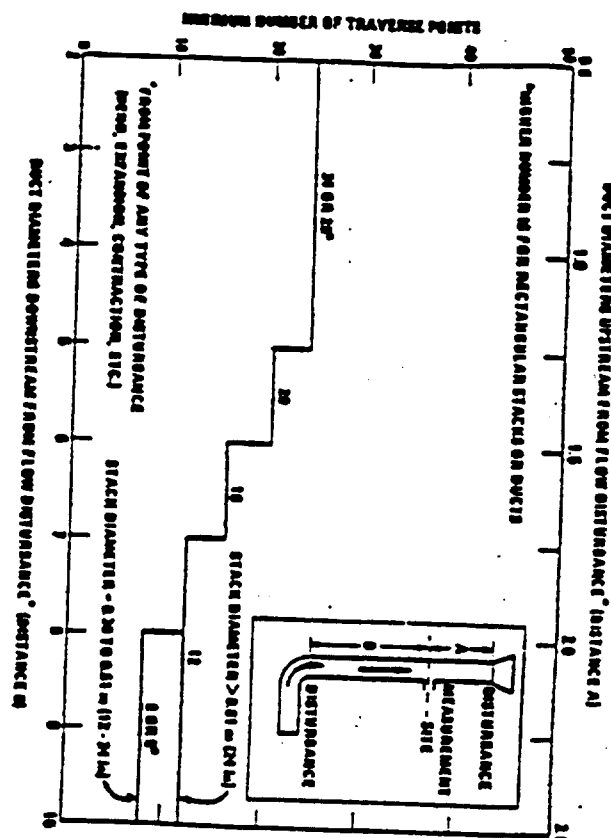


TABLE 1-2. LOCATION OF TRAVERSE POINTS IN CIRCULAR STACKS
(Percent of stack diameter from heads used to traverse point)

Invoice point number on a diameter		Number of barrow points on a diameter —											
		2	4	6	8	10	12	14	16	18	20	22	24
1	108	0.7	4.6	3.2	2.6	2.1	1.8	1.6	1.4	1.3	1.1	1.0	0.9
2	264	25.0	14.0	10.6	8.2	6.7	5.7	4.9	4.4	3.9	3.5	3.3	3.0
3	360	32.0	18.0	13.4	10.4	8.6	7.4	6.4	5.6	5.0	4.5	4.3	4.0
4	456	38.0	22.0	16.8	12.8	10.8	9.4	8.2	7.2	6.4	5.8	5.5	5.0
5	552	44.0	26.0	19.8	14.8	12.4	10.8	9.6	8.4	7.6	6.8	6.5	6.0
6	648	50.0	30.0	22.8	17.2	14.4	12.4	11.2	10.0	9.2	8.4	8.0	7.5
7	744	56.0	34.0	25.8	19.2	16.0	13.6	12.4	11.2	10.4	9.6	9.2	8.5
8	840	62.0	38.0	28.8	21.2	17.6	15.2	13.6	12.4	11.6	10.8	10.4	9.5
9	936	68.0	42.0	31.8	23.2	19.6	16.8	15.2	14.0	13.2	12.4	12.0	11.0
10	1032	74.0	46.0	34.8	25.2	21.6	18.4	16.8	15.6	14.8	14.0	13.6	12.5
11	1128	80.0	50.0	37.8	27.2	23.6	20.0	18.4	17.2	16.4	15.6	15.2	14.0
12	1224	86.0	54.0	40.8	29.2	25.6	21.6	20.0	18.8	18.0	17.2	16.8	15.5
13	1320	92.0	58.0	43.8	31.2	27.6	23.2	21.6	20.4	19.6	18.8	18.4	17.0
14	1416	98.0	62.0	46.8	33.2	29.6	24.8	23.2	22.0	21.2	20.4	20.0	18.5
15	1512	104.0	66.0	49.8	35.2	31.6	26.4	24.8	23.6	22.8	22.0	21.6	20.0
16	1608	110.0	70.0	52.8	37.2	33.6	28.0	26.4	25.2	24.4	23.6	23.2	21.5
17	1704	116.0	74.0	55.8	39.2	35.6	29.6	28.0	26.8	26.0	25.2	24.8	23.0
18	1800	122.0	78.0	58.8	41.2	37.6	31.2	30.0	28.4	27.6	26.8	26.4	24.5
19	1896	128.0	82.0	61.8	43.2	39.6	32.8	31.6	30.8	29.2	28.4	28.0	26.0
20	1992	134.0	86.0	64.8	45.2	41.6	34.4	33.2	32.4	30.8	30.0	29.6	27.5
21	2088	140.0	90.0	67.8	47.2	43.6	36.0	34.8	33.6	32.4	31.6	31.2	29.0
22	2184	146.0	94.0	70.8	49.2	45.6	37.6	36.4	35.2	34.0	33.2	32.8	30.5
23	2280	152.0	98.0	73.8	51.2	47.6	39.2	38.0	36.8	35.6	34.8	34.4	32.0
24	2376	158.0	102.0	76.8	53.2	49.6	40.8	39.6	38.4	37.2	36.4	36.0	33.5

TABLE 1-1. CROSS-SECTION LAYOUT FOR RECTANGULAR STACKS

[illegible]

STACK SAMPLING DATA SHEET

CLIENT USS-CLARKTON WOKES TEST DATE 07-29-94 (FRI) ORIFICE CORRECTION ($\Delta H/O$) 1.837 HOT/COLD BOX NO. 4
 TEST UNIT Boiler Smoke #13 TEST NO. 135-1385-13 METER CORRECTION (Y) 1.0173 PROBE NO. 10-2
 PROJECT NO. 244-0242 NOZZLE (SIZE, H/O) 490" CALIBRATION DATE 06-20-94 FILTER NO. 1365
 TEST CREW RPC TH STATIC PRESSURE -1.1" H₂O PITOT CORRECTION 0.84 STACK DIA. 120"
 BAROMETRIC PRESSURE 29.40 PORT DIRECTION SOUTH, WEST CONTROL BOX NO. 511 PORT SIZE 40" NPT

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcl)	Pitot ΔP (in. H ₂ O)	Orifice ΔH	Actual (in. H ₂ O)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
42.7	08:46	1001.677	0.05	1.41	1.41	95	86	3.0	525	2250F	485	2250F	5 min./point
30.0			0.06	1.70	1.70	99	86	4.0	493				
21.3			0.06	1.76	1.70	110	86	4.0	495				
14.2			0.04	1.41	1.41	112	87	3.0	501				
8.0			0.03	0.85	0.85	112	88	2.0	481				
2.6	09:14	1020.960	0.03	0.85	0.85	112	89	2.0	449				
42.7	09:19	1020.960	0.05	1.41	1.41	97	89	3.5	511				
30.0			0.05	1.41	1.41	105	90	3.5	515				
21.3			0.05	1.41	1.41	116	92	3.5	516				
14.2			0.03	0.85	0.85	116	93	2.5	500				
8.0			0.03	0.85	0.85	116	93	2.5	465				
2.6	09:49	1038.903	0.03	0.85	0.85	116	93	2.5	460				
Test 1=120 min		1=72.42 dcl	ADP _{avg} = 0.04	ADH _{avg} = 1.14		Temperature = 92.98 °F			Est. Stack Temp = 495 °F				Estimates: MW = 28.0 %H ₂ O = 14.0

SYSTEM LEAK CHECK				PITOT LEAK CHECK				Impinger				Impinger			
Vacuum (in. Hg)	DGM Rate (cfm)	Before	After	Before	After	Positive	Negative	No.	Contents	Final	Initial	Difference	1.	2.	3.

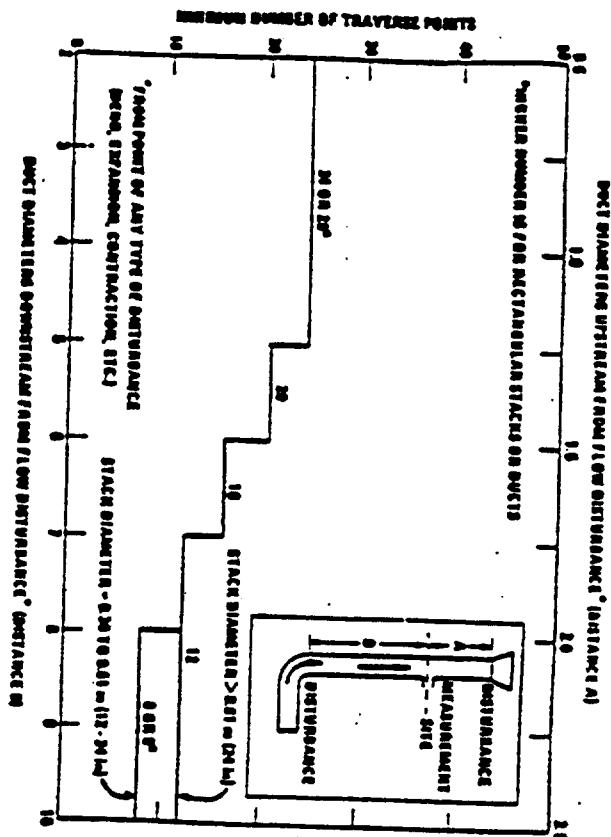


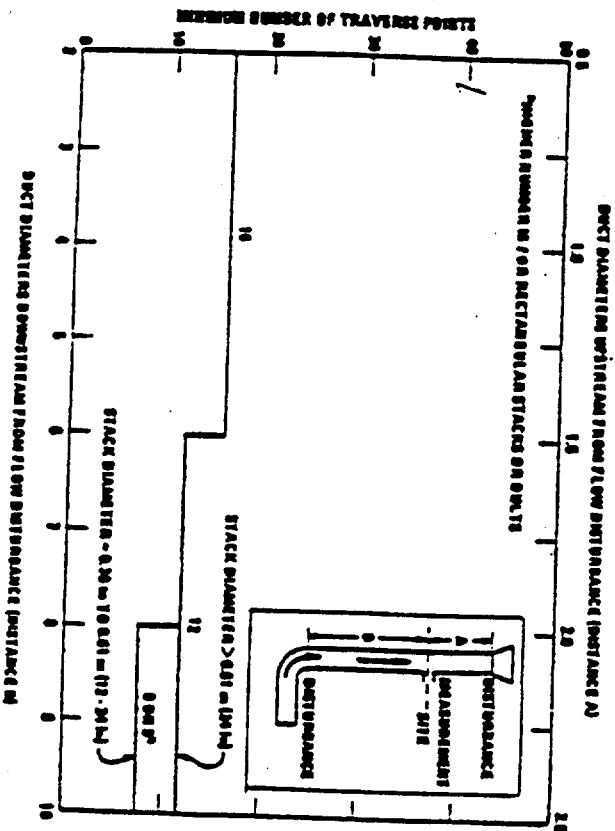
TABLE 1-2. LOCATION OF TRAVERSE POINTS IN CIRCULAR STACKS

(Percent of stack diameter from inside wall to traverse point)

Traverse point number on a diameter	Number of traverse points on a diameter—															
	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32
1	14.0	0.7	4.4	3.2	2.0	2.1	1.0	1.0	1.4	1.2	1.1	1.1	1.3	1.4	1.5	1.6
2	25.0	14.0	10.6	8.2	6.7	5.7	4.0	4.4	3.0	3.5	3.2	3.2	3.8	4.0	4.2	4.4
3	66.4	35.0	29.0	18.4	11.0	8.0	6.0	7.5	6.7	6.0	6.0	6.0	6.7	6.7	6.7	6.7
4	78.0	39.0	20.4	12.3	7.7	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
5	80.3	39.4	20.4	12.3	7.7	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
6	80.3	39.4	20.4	12.3	7.7	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
7	80.3	39.4	20.4	12.3	7.7	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
8	80.3	39.4	20.4	12.3	7.7	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
9	80.3	39.4	20.4	12.3	7.7	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
10	80.3	39.4	20.4	12.3	7.7	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
11	80.3	39.4	20.4	12.3	7.7	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
12	80.3	39.4	20.4	12.3	7.7	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
13	80.3	39.4	20.4	12.3	7.7	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
14	80.3	39.4	20.4	12.3	7.7	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
15	80.3	39.4	20.4	12.3	7.7	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
16	80.3	39.4	20.4	12.3	7.7	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
17	80.3	39.4	20.4	12.3	7.7	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
18	80.3	39.4	20.4	12.3	7.7	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
19	80.3	39.4	20.4	12.3	7.7	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
20	80.3	39.4	20.4	12.3	7.7	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
21	80.3	39.4	20.4	12.3	7.7	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
22	80.3	39.4	20.4	12.3	7.7	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
23	80.3	39.4	20.4	12.3	7.7	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
24	80.3	39.4	20.4	12.3	7.7	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0

TABLE 1-1. CROSS-SECTION LAYOUT FOR RECTANGULAR STACKS

Number of traverse points	Stack layout
8	3x3
12	4x3
16	4x4
20	5x3
24	5x4
28	6x3
32	6x4
36	7x3
40	7x4
44	7x5
48	7x6
52	7x7



CONTROL BOX CALIBRATION

THREE POINT CALIBRATION

BOX # 6 BP 28.95 In. Hg
DATE 06-20-94 OPERATOR RPC

	WET TEST METER				DRY TEST METER						METER COEFFICIENT Y	ORIFICE COEFFICIENT Δ H@
	TIME (min)	TEMP TW	VOLUME VM	PRESSURE PW	TEMP IN TI	TEMP OUT TO	TEMP AVG TA	ORIFICE PD	VOLUME VD			
START HALF STOP	12.75	81.0	0.000 5.000	28.95	98.0	89.0	93.5	0.50	350.100 355.151			
CALCULATION	12.75	541.0	5.013	28.95			553.5	28.99	5.051	1.0140	1.873	
START HALF STOP	8.95	81.0	0.000 5.000	28.95	105.0	90.0	97.5	1.00	355.600 360.700			
CALCULATION	8.95	541.0	5.013	28.95			557.5	29.02	5.100	1.0103	1.833	
START HALF STOP	6.30	81.0	0.000 5.000	28.95	110.0	92.0	101.0	2.00	361.200 366.234			
CALCULATION	6.30	541.0	5.013	28.95			561.0	29.10	5.034	1.0273	1.805	
AVERAGE										1.0172	1.837	

POST TEST

BOX # 6 BP 29.00 In. Hg
DATE 08-03-94 OPERATOR RPC

	WET TEST METER				DRY TEST METER						METER COEFFICIENT Y	ORIFICE COEFFICIENT Δ H@
	TIME (min)	TEMP TW	VOLUME VM	PRESSURE PW	TEMP IN TI	TEMP OUT TO	TEMP AVG TA	ORIFICE PD	VOLUME VD			
START HALF STOP		72.0	0.000	29.00	98.0	82.0	90.0	1.25	63.000			
	7.90		5.000						68.309			
CALCULATION	7.90	532.0	5.013	29.00			550.0	29.09	5.309	0.9730	1.747	
START HALF STOP		72.0	0.000	29.00	105.0	84.0	94.5	1.25	68.500			
	7.95		5.000						73.541			
CALCULATION	7.95	532.0	5.013	29.00			554.5	29.09	5.041	1.0331	1.754	
START HALF STOP		72.0	0.000	29.00	111.0	87.0	99.0	1.25	74.000			
	7.98		5.000						79.073			
CALCULATION	7.98	532.0	5.013	29.00			559.0	29.09	5.073	1.0349	1.753	
AVERAGE										1.0137	1.751	
DIFFERENCE										0.3%	4.9%	

PRE-TEST MAGNEHELIC CALIBRATION

BOX# 6

DATE 06-09-94

OPERATOR RPC

0 to 3.0" H2O RANGE

MAGNEHELIC

ΔP MANOMETER

0.50 0.50
1.00 1.00
2.00 2.00
3.00 3.00

0 to 0.50" H2O RANGE

SLANT TUBE

PRIMARY STANDARD

MAGNEHELIC

ΔH MANOMETER

4.00 4.00
3.00 3.00
2.00 2.00
1.00 1.00
0.50 0.50

PRE-TEST LEAK CHECK

DATE 06-20-94

OPERATOR RPC

	START CF	STOP CF	VOLUME CF	TIME (min)	LEAK RATE
DRY	394.400	394.619	0.219	10.000	0.000
WET	0.000	0.222	0.222		

PYROMETER CALIBRATION

DATE 04-28-88

OPERATOR AGL

PRE-TEST PYROMETER CHECK

DATE 06-09-94

OPERATOR RPC

VOLTAGE INPUT (mV)	ARGE TEMP (°F)	TEMP READING (°F)	VOLTAGE INPUT (mV)	TARGET TEMP (°F)	TEMP READING (°F)
0.18	40	40.0	0.18	40	40.0
0.40	50	50.0	0.40	50	50.0
0.84	70	70.0	0.84	70	70.0
1.29	90	90.0	1.29	90	90.0
1.74	110	110.0	1.74	110	110.0
2.66	150	150.0	2.66	150	150.0
3.82	200	200.0	3.82	200	200.0
6.09	300	301.0	6.09	300	301.0
8.31	400	400.0	8.31	400	402.0
10.57	500	500.0	10.57	500	502.0

POST-TEST MAGNEHELIC CALIBRATION

BOX# 6

DATE 08-03-94

OPERATOR RPC

0 to 3.0" H2O RANGE

MAGNEHELIC

Δ P MANOMETER

0.50 0.50
1.00 1.00
2.00 2.00
3.00 3.00

0 to 0.50" H2O RANGE

SLANT TUBE

PRIMARY STANDARD

MAGNEHELIC

Δ H MANOMETER

4.00 4.00
3.00 3.00
2.00 2.00
1.00 1.00
0.50 0.50

POST-TEST LEAK CHECK

DATE 08-03-94

OPERATOR RPC

	START CF	STOP CF	VOLUME CF	TIME (min)	LEAK RATE
DRY	62.400	62.590	0.190	10.000	0.0000
WET	0.000	0.190	0.190		

PYROMETER CALIBRATION

DATE 04-28-88

OPERATOR AGL

POST-TEST PYROMETER CHECK

DATE 08-03-94

OPERATOR RPC

VOLTAGE INPUT (mV)	ARGE TEMP (°F)	TEMP READING (°F)	VOLTAGE INPUT (mV)	TARGET TEMP (°F)	TEMP READING (°F)
0.18	40	40.0	0.18	40	40.0
0.40	50	50.0	0.40	50	50.0
0.84	70	70.0	0.84	70	70.0
1.29	90	90.0	1.29	90	90.0
1.74	110	110.0	1.74	110	110.0
2.66	150	150.0	2.66	150	150.0
3.82	200	200.0	3.82	200	200.0
6.09	300	301.0	6.09	300	302.0
8.31	400	400.0	8.31	400	402.0
10.57	500	500.0	10.57	500	502.0

QA ORIFICE AUDIT

ORIFICE OPERATOR BAPC-3 RPC DATE 06-09-94 BOX # 6 B.P. 29.00

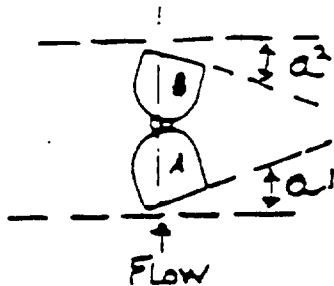
RUN	1		2		3	
INITIAL CF	110.300		118.300		126.300	
FINAL CF	117.825		125.828		133.810	
DIFFERENCE	7.525		7.528		7.510	
TEMP INITIAL	IN	OUT	IN	OUT	IN	OUT
TEMP 5 MIN	105	100	102	98	102	97
TEMP 10 MIN	102	99	101	97	102	97
TEMP 15 MIN	102	98	102	97	103	98
	102	98	102	97	103	98
TEMP AVG	TEMP R 100.75 560.75		TEMP R 99.5 559.5		TEMP R 100 560	
TIME (MIN.)	15.00		15.00		15.00	
ORIFICE	IN WATER	IN HG	IN WATER	IN HG	IN WATER	IN HG
	0.75	0.06	0.75	0.06	0.75	0.06
METER PRESSURE	29.06		29.06		29.06	
AMBIENT TEMP.	°F	°C	°F	°C	°F	°C
	78.0	25.6	78.0	25.6	78.0	25.6
VACUUM IN HG	21.0		21.0		21.0	
DGM CAL Y	1.0128		1.0128		1.0128	
STD CF	6.995		7.014		6.991	
STD CUBIC METERS	0.1981		0.1986		0.1980	

GEOMETRIC PITOT CALIBRATION

Caliper # X6F-59
 Precheck _____
 Post Check _____

Probe #: 10.2
 Date: 6-10-94
 Initials: RPC

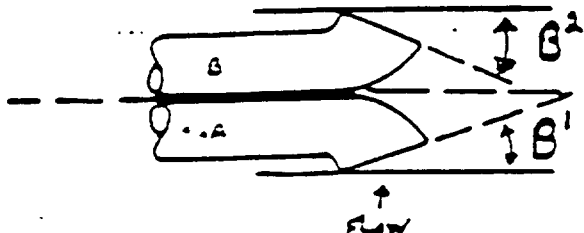
①



$a^1 = 3"$
 $a^2 = 0"$
 $B^1 = 0"$
 $B^2 = 1"$
 $F = 93"$

$a^1, a^2 = < 10^\circ$
 $B^1, B^2 = < 5^\circ$

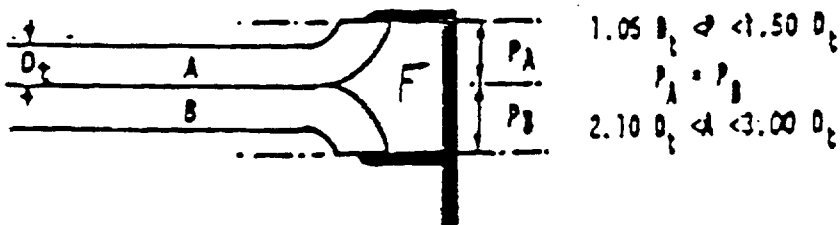
②



$\mu = 16$
 $V = 0$
 $W = 194$

$\mu \leq 0.1250^\circ (\mu = F \tan \delta)$
 $V \leq 0.03125^\circ (V = F \tan \theta)$
 $W \geq 0"$

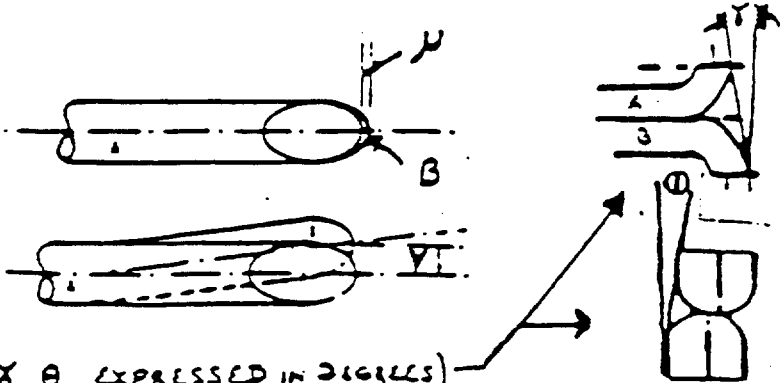
③



$Y = 5.6$
 $Z = 3.6$
 $D_1 = 375$

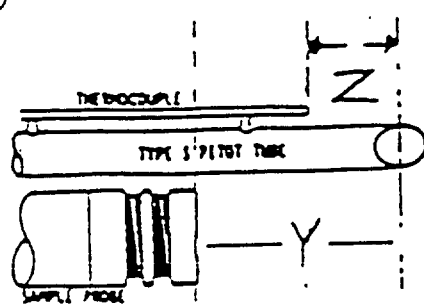
$Y \geq 3.0"$
 $Z \geq 2.0"$
 $D_1 > .1875"$

④

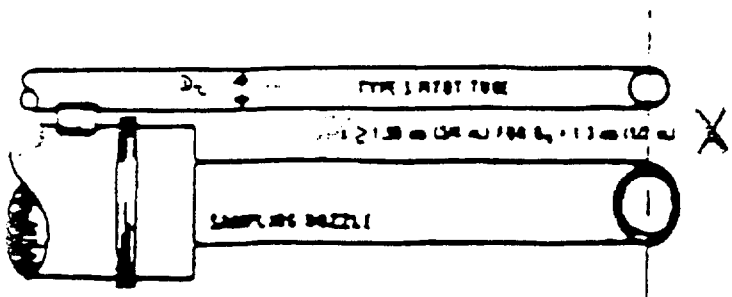


(δ, θ EXPRESSED IN DEGREES)

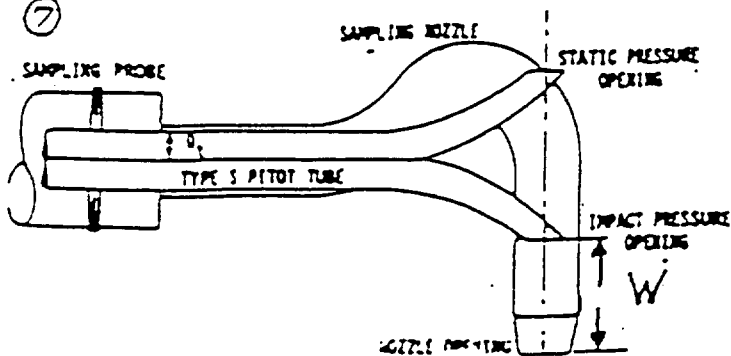
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⑥



⑦

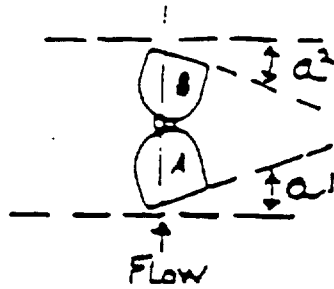


GEOMETRIC PITOT CALIBRATION

Caliper # Y62-59
 Precheck _____
 Post Check _____

Probe #: 10-2
 Date: 08-03-84
 Initials: KR

①

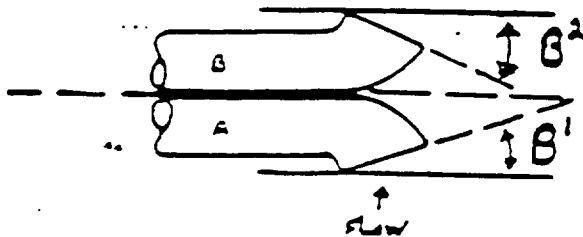


$a^1 = 3^\circ$
 $a^2 = 0^\circ$
 $B^1 = 0^\circ$
 $B^2 = 1^\circ$
 $F = .94$

$a^1, a^2 = < 10^\circ$

$B^1, B^2 = < 5^\circ$

②



$\mu = .16$
 $V = 0$
 $W = .194$

$\mu \leq 0.1250^\circ (\mu = F \cdot T)$

$V \leq 0.03125^\circ (V = F \cdot T)$

$W \geq 0^\circ$

$X = 0.97$

$X \geq 0.750^\circ$
 (3/4" using 1/2" nozzle)

$Y = 5.6$

$Y \geq 3.0^\circ$

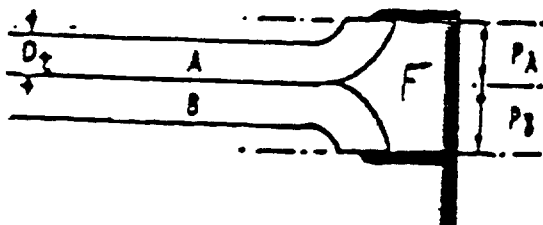
$Z = 3.8$

$Z \geq 2.0^\circ$

$D_t = .376$

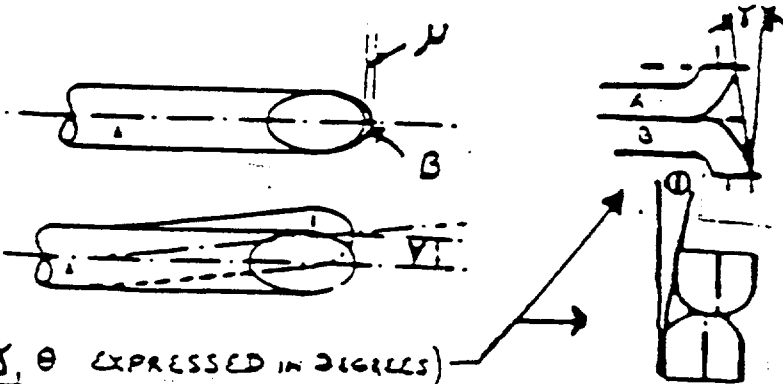
$D_t \geq .1875^\circ$

③

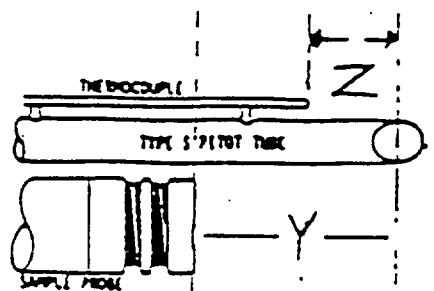


$1.05 D_1 \leq D_2 \leq 1.50 D_1$
 $P_A = P_B$
 $2.10 D_1 \leq D_3 \leq 3.00 D_1$

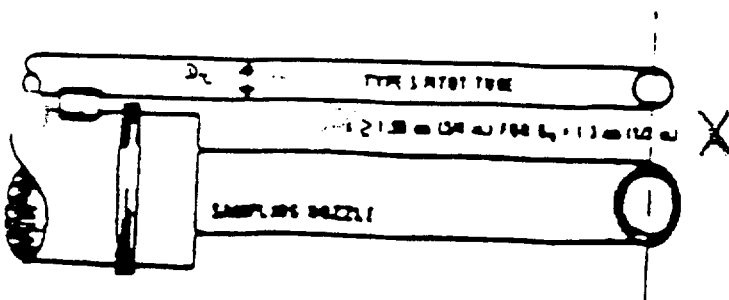
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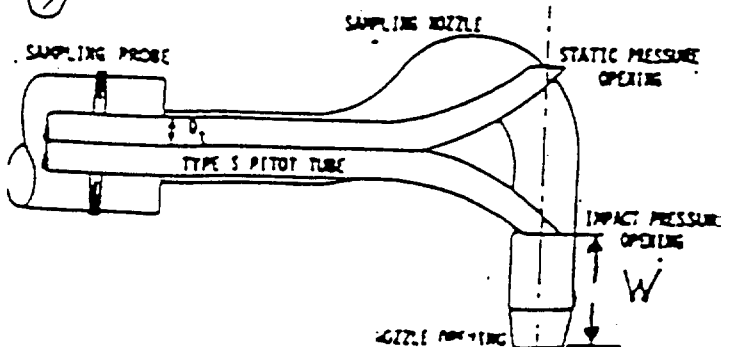
⑤



⑥



⑦



VISIBLE EMISSIONS OBSERVATION FORM

①

13 STACK

OBSERVER: R. BRIAN FAYTAK

DATE: 7/28/94

FACILITY: USX/CLAIRTON

OBSERVATION START TIME: 0830

END TIME: 0930

OBSERVATION POINT:

100' south of #19 Batt.

SOURCE:

DISTANCE: ≈ 300'

DIRECTION FROM: S-W

HEIGHT: ≈ 150'

WIND:

SPEED: < 5 mph

DIRECTION: South

TEMPERATURE: 66°F

SKY CONDITION: OVERCAST

BACKGROUND: SKY

READING CONDITIONS: GOOD

COLOR OF EMISSIONS: -

TOTAL # OF READINGS: 240

NO. READINGS 0 - 15%: 240

NO. READINGS 15 - 20%: -

NO. READINGS 25 - 50%: -

NO. READINGS 50 - 100%: -

NO. READINGS > 200%: -

GREATEST OPACITY: 0

COMMENTS:

	:00	:15	:30	:45
00	☐	☐	☐	☐
01	☐	☐	☐	☐
02	☐	☐	☐	☐
03	☐	☐	☐	☐
04	☐	☐	☐	☐
05	☐	☐	☐	☐
06	☐	☐	☐	☐
07	☐	☐	☐	☐
08	☐	☐	☐	☐
09	☐	☐	☐	☐
10	☐	☐	☐	☐
11	☐	☐	☐	☐
12	☐	☐	☐	☐
13	☐	☐	☐	☐
14	☐	☐	☐	☐
15	☐	☐	☐	☐
16	☐	☐	☐	☐
17	☐	☐	☐	☐
18	☐	☐	☐	☐
19	☐	☐	☐	☐
20	☐	☐	☐	☐
21	☐	☐	☐	☐
22	☐	☐	☐	☐
23	☐	☐	☐	☐
24	☐	☐	☐	☐
25	☐	☐	☐	☐
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VISIBLE EMISSIONS OBSERVATION FORM

#13 STACK

②

OBSERVER: R. BRIAN FAYTAK

DATE: 7/28/94

FACILITY: USX/CLAIRTON

OBSERVATION START TIME: 0930

END TIME: 1010

OBSERVATION POINT:

100' south of #19 Batt.

SOURCE:

DISTANCE: ~300'

DIRECTION FROM: S-W

HEIGHT: ~150'

WIND:

SPEED: < 5 mph

DIRECTION: South

TEMPERATURE: 68°F

SKY CONDITION: OVERCAST

BACKGROUND: SKY

READING CONDITIONS: GOOD

COLOR OF EMISSIONS: -

TOTAL # OF READINGS: 162

NO. READINGS 0 - 15% 1

0. READINGS 20% 1

NO. READINGS 25 - 50% 1

NO. READINGS 60 - 100% 1

NO. READINGS > 20% 1

GREATEST OPACITY: 0

COMMENTS:

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VISIBLE EMISSIONS OBSERVATION FORM

③

#13 STACK

OBSERVER: R. BRIAN FAYTAK

DATE: 7/28/94

FACILITY: USX/CLAIRTON

OBSERVATION START TIME: 1242 hrs

END TIME: 1342 hrs

OBSERVATION POINT:

1/2 mi South of #19 BATT.

SOURCE:

DISTANCE: ≈ 300'

DIRECTION FROM: S-W

HEIGHT: ≈ 150'

WIND:

SPEED: ≈ 5-10 mph

DIRECTION: S

TEMPERATURE: 76°

SKY CONDITION: 80% Cloudy

BACKGROUND: SKY

LOADING CONDITIONS: Good

COLOR OF EMISSIONS: —

TOTAL # OF READINGS: 240

NO. READINGS 0 - 15%: 240

NO. READINGS 20%: —

NO. READINGS 25 - 55%: —

NO. READINGS 60 - 100%: —

NO. READINGS > 20%: —

GREATEST OPACITY: 0

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VISIBLE EMISSIONS OBSERVATION FORM

④

#13 STACK

OBSERVER: R. BRIAN FAJAK

DATE: 7-28-94

ACTIVITY: USX / CLAIRTON

OBSERVATION START TIME: 1342 hrs.

END TIME: 1442 hrs

OBSERVATION POINT:

≈ 100' south of #19 BATT.

SOURCE:

DISTANCE: ≈ 300'

DIRECTION FROM: S-W

HEIGHT: ≈ 100'

WIND:

SPEED: ≈ 5 → 10 mph

DIRECTION: South

TEMPERATURE: 78°

SKY CONDITION: 90% Clouds

BACKGROUND: SKY

LOADING CONDITIONS: GOOD

COLOR OF EMISSIONS: —

TOTAL # OF READINGS: 240

NO. READINGS 0 - 15%: 240

NO. READINGS 20%: —

NO. READINGS 25 - 55%: —

NO. READINGS 60 - 100%: —

NO. READINGS > 20%: —

GREATEST OPACITY: 0

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VISIBLE EMISSIONS OBSERVATION FORM

5

#13 STACK

OBSERVER: R. BRIAN FAYTAK

DATE: 7-28-94

ACTIVITY: USX/CLAIRTON

OBSERVATION START TIME: 1442 hrs.

END TIME: 1542 hrs

OBSERVATION POINT:

≈ 100' south of 19 Batt.

SOURCE:

DISTANCE: ≈ 300'

DIRECTION FROM: S-W

HEIGHT: ≈ 150'

WIND:

SPEED: ≈ 5-10 mph

DIRECTION: S

TEMPERATURE: 77°

SKY CONDITION: 80% Clouds

BACKGROUND: SKY

WEATHER CONDITIONS: GOOD

COLOR OF EMISSIONS: -

TOTAL # OF READINGS: 240

NO. READINGS 0 - 15%: 240

NO. READINGS 16 - 20%: -

NO. READINGS 21 - 35%: -

NO. READINGS 36 - 50%: -

NO. READINGS 51 - 65%: -

NO. READINGS 66 - 80%: -

GREATEST OPACITY: 0

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VISIBLE EMISSIONS OBSERVATION FORM

6

#13 ~~5~~ STACK

OBSERVER: R. BRIAN FAYTAK

DATE: 7-28-94

FACILITY: USX/CLARKTON

OBSERVATION START TIME: 1542 hrs.

END TIME: 1552 hrs

OBSERVATION POINT:

"100' SOUTH OF "19 BATT.

SOURCE:

DISTANCE: "300'

DIRECTION FROM: S-W

HEIGHT: "100'

WIND:

SPEED: "5-10 mph

DIRECTION: S

TEMPERATURE: 79°

SKY CONDITION: 80% Clouds

BACKGROUND: SKY

WEATHER CONDITIONS: GOOD

COLOR OF EMISSIONS: _____

TOTAL # OF READINGS: 42

NO. READINGS 0 - 15% 42

NO. READINGS 15 - 20% -

NO. READINGS 25 - 50% -

NO. READINGS 50 - 100% -

NO. READINGS > 20% -

GREATEST OPACITY: 0

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VISIBLE EMISSIONS OBSERVATION FORM

①

OBSERVER: R. BRIAN FAJTAH

DATE: 7/29/94

FACILITY: USX/CLAIRTON

OBSERVATION START TIME: 0740 hrs.

END TIME: 0840 hrs.

OBSERVATION POINT:

~100' south of #19 BATT.

SOURCE:

DISTANCE: ~300'

DIRECTION FROM: S-W

HEIGHT: ~150'

WIND:

SPEED: ~5-10 mph

DIRECTION: N-E

TEMPERATURE: 65°

SKY CONDITION: 10% clouds

BACKGROUND: SKY

READING CONDITIONS: GOOD

COLOR OF EMISSIONS: -

TOTAL # OF READINGS: 240

NO. READINGS 0 - 15%: 240

NO. READINGS 20%: -

NO. READINGS 25 - 50%: -

NO. READINGS 60 - 100%: -

NO. READINGS > 20%: -

GREATEST OPACITY: 0

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VISIBLE EMISSIONS OBSERVATION FORM

②

OBSERVER: R. BRIAN FAYHAK

DATE: 7/29/94

FACILITY: USX/CARTON

OBSERVATION START TIME: 0840 hrs

END TIME: ~~0845~~ 0940 hrs

OBSERVATION POINT:

≈ 100' south of #19 BATT.

SOURCE:

DISTANCE: ≈ 300'

DIRECTION FROM: S-W

HEIGHT: ≈ 150'

WIND:

SPEED: ≈ 5-10 mph

DIRECTION: N-E

TEMPERATURE: 68°

SKY CONDITION: 25% clouds

BACKGROUND: SKY

READING CONDITIONS: GOOD

COLOR OF EMISSIONS: Gray/Black

TOTAL # OF READINGS: 240

NO. READINGS 0 - 15%: 240

NO. READINGS 16 - 20%: —

NO. READINGS 21 - 50%: —

NO. READINGS 51 - 100%: —

NO. READINGS > 20%: —

GREATEST OPACITY: 5%

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57	☐	☐	☐	☐
58	☐	☐	☐	☐
59	☐	☐	☐	☐

VISIBLE EMISSIONS OBSERVATION FORM

3

OBSERVER: R. BRIAN FAYTAK

DATE: 7/29/94

FACILITY: USX/CLARKTON

OBSERVATION START TIME: 0940

END TIME: 0951

OBSERVATION POINT:

~100' south of #19 BATT.

SOURCE:

DISTANCE: ~300'

DIRECTION FROM: S-W

HEIGHT: ~150'

WIND:

SPEED: ~5-10 mph

DIRECTION: N-E

TEMPERATURE: 69°

SKY CONDITION: 10% clouds

BACKGROUND: SKY

READING CONDITIONS: GOOD

COLOR OF EMISSIONS: _____

TOTAL # OF READINGS: 46

NO. READINGS 0 - 15% 46

0. READINGS 20% -

NO. READINGS 25 - 50% -

10. READINGS 60 - 100% -

NO. READINGS > 20% -

GREATEST OPACITY: _____

COMMENTS:

	:00	:15	:30	:45
00	○	○	○	○
01	○	○	○	○
02	○	○	○	○
03	○	○	○	○
04	○	○	○	○
05	○	○	○	○
06	○	○	○	○
07	○	○	○	○
08	○	○	○	○
09	○	○	○	○
10	○	○	○	○
11	○	○		
12				
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	:00	:15	:30	:45
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57				
58				
59				

**COMPLIANCE DEMONSTRATION
NO. 13 BATTERY COMBUSTION STACK**

**USS CLAIRTON WORKS
A DIVISION OF USX CORPORATION
CLAIRTON, PENNSYLVANIA**

APPENDIX B

PLANT OPERATIONAL DATA



CC-10285 REV. 1181
03.001.0020

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

PUSHING AND CHARGING REPORT

UNIT NO. 5

12 Hrs. Beginning ~~12:00 AM~~ 11 PM 7/27/94

Date 7-28-94

BATTERY NO. <u>13-A</u>				BATTERY NO. <u>13-B</u>				BATTERY NO. <u>14-A</u>			
OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES	OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES	OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES
1				1	7 25	7 33		1	10 00	10 03	
3				3	7 35	7 43		3	10 12	10 15	✓
5				5	7 45	7 53		5	10 20	10 24	
7				7	7 55	8 03		7	10 30	10 38	
9				9	8 05	8 13		9	10 40		
11				11	8 15	8 23		11	10 50		
13				13	8 25	8 28		13			
15				15	8 40	8 48	✓	15	8 30		
17				17	8 50	8 58	✓	17			
19				19	9 00	9 08	✓	19			
21				21	9 10	9 18	✓	21			
23				23	9 20	9 28	✓	23			
25				25	9 30	9 38		25			
27				27	9 40	9 48	✓	27			
29				29	9 50	9 58	✓	29			
31				31				31			
2	3 55	4 22		2		11 14		2	1 17	1 45	
4	4 04	4 32		4		11 24		4	1 27	1 56	
6	4 14	4 42		6	11 06	11 34		6	1 37	2 06	
8	4 24	4 52		8	11 16	11 44		8	1 47	2 16	
10	4 34	5 03		10	11 26	11 54		10	1 58	2 25	
12	4 44	5 14		12	11 36	12 04		12	2 08	2 36	
14	4 54	5 28		14	11 46	12 14		14	2 18	2 46	
16	5 05	5 40		16	11 56	12 24		16	2 28	2 56	
18	5 16	5 52		18	12 06	12 34		18	2 38	3 07	
20	5 30	6 04		20	12 16	12 44		20	2 48	3 17	
22	5 42	6 10		22	12 26	12 54		22	2 58	3 27	
24	5 54	6 15		24	12 36	1 05		24	3 07	3 37	
26	6 06	6 20		26	12 46	1 15		26	3 19	3 48	
28	7 05	7 13		28	12 56	1 25		28	3 29	4 02	
30	7 15	7 23		30	1 07	1 35		30	3 39	4 12	
1				1				1			
2				2				2			

REMARKS:

15/16 28/30 22/19

Condition of Signals

Condition of Pusher

HOURLY REPORT OF OPERATION

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED	TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED	
12/1	6	6	12/13	5	5	6	10/10	
12/2	6	6	12/12	6	1	2	1/2	Total Ovens Pushed 65
3/3	6	6	12/12	7	6	5	12/11	Total Ovens Charged 65
3/4	6	6	12/12	8	6	6	11/11	
3/5	5	5	11/12	9	6	6	12/12	Pusherman
5/4	6	7	12/12	10	6	4	11/9	Battery Foreman
	35	35			30	50		

CC-10295 REV. 1181
03.001.0020

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

PUSHING AND CHARGING REPORT

UNIT NO. 5

12 Hrs. Beginning ~~10:00 PM~~ 11 AM 7/22/94

Date 7-28-94

BATTERY NO. <u>13-A</u>				BATTERY NO. <u>13-B</u>				BATTERY NO. <u>14-A</u>			
OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES	OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES	OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES
1	1 08	1 39		1				1			
3	1 19	1 50	✓	3				3			
5	1 30	2 01	✓	5				5			
7	1 41	2 13		7				7			
9	1 52	2 18	✓	9				9		11 24	
11	2 03	2 24	✓	11				11		11 43	
13	2 15	2 38	✓	13				13	11 31	11 54	
15	3 00	3 19		15				15	-	12 05	PASS-UP
17	3 11	3 29		17				17	11 45	12 16	
19	3 21	3 39	✓	19				19	11 56	12 27	
21	3 31	3 49	✓	21				21	12 07	12 37	
23	3 41	4 00		23				23	12 18	12 47	✓#1
25	3 51	4 11		25				25	12 29	12 55	✓#1
27	4 02	4 21		27				27	12 40	1 06	✓#1
29	4 13	4 32		29				29	12 51	1 17	
31	4 23	4 43		31				31	12 57	1 28	
2	10 04			2	4 34	5 04		2	7 13	7 44	
4	10 16			4	4 45	5 14		4	7 24	7 55	
6				6	4 56	5 24		6	7 35	8 05	
8				8	5 06	5 34		8	7 46	8 17	
10				10	5 16	5 44		10	7 57	8 29	
12				12	5 26	5 56		12	8 07	8 41	
14				14	5 36	6 06		14	8 18	8 52	
16				16	5 46	6 17		16	8 31	9 03	
18				18	5 58	6 28		18	8 43	9 15	
20				20	6 08	6 39		20	8 54	9 27	
22				22	6 19	6 50		22	9 05	9 39	
24				24	6 30	7 00		24	9 17	9 51	
26				26	6 41	7 11		26	9 29	10 02	
28				28	6 52	7 22		28	9 41	10 14	
30				30	7 02	7 33		30	9 53		
1				1				1			
2				2				2			

REMARKS:

18 / 16 15 / 15 24 / 26

Condition of Signals

Condition of Pusher

HOURLY REPORT OF OPERATION

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED	TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED	
1-12	3	3	8 8	5-6	6	6	12 12	
1-1	6	6	11 11	6-7	5	5	11 11	Total Ovens Pushed <u>57</u>
1-2	5	5	10 10	7-8	6	6	11 11	Total Ovens Charged <u>57</u>
1-9	2	5	5 8	8-9	5	5	10 10	
3-4	6	4	12 10	9-10	5	5	10 10	Pusherman
4-8	6	5	12 11	10-11	2	2	4 4	Battery Foreman <u>J. J. [Signature]</u>
	28	28			29	29		

CC-10295 REV. 1161
03.001.0020

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

PUSHING AND CHARGING REPORT

UNIT NO. #5

12 Hrs. Beginning 12:00 AM

Date 7-29-94

11 pm 7/29/94

BATTERY NO. <u>13-A</u>				BATTERY NO. <u>13-B</u>				BATTERY NO. <u>14-H</u>			
OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES	OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES	OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES
1	7 25	7 53	✓	1	1 08	1 30		1	3 36	3 58	
3	7 35	8 03	✓	3	1 18	1 39		3	3 46	4 09	
5	7 45	8 13	✓	5	1 28	1 48		5	3 56	4 19	
7	7 55	8 23	✓	7	1 37	1 58		7	4 07	4 29	
9	8 05	8 33	✓	9	1 46	2 08		9	4 17	4 37	
11	8 15	8 43	✓	11	1 56	2 17		11	4 27	4 47	
13	8 25	8 53	✓	13	2 06	2 27		13	4 37	5 00	
15	8 35	9 03	✓	15	2 15	2 37		15	4 47	5 10	S.M.T.
17	8 45	9 13	✓	17	2 25	2 47		17	4 57	5 35	
19	8 55	9 23	✓	19	2 35	2 57		19	5 10	6 03	
21	9 05	9 33	✓	21	2 45	3 07		21	5 30	7 11	
23	9 15	9 43	✓	23	2 55	3 17		23	5 47	7 01	
25	9 25	9 53		25	3 05	3 27		25	6 10	7 13	
27	9 35	10 03		27	3 15	3 38		27	7 00	7 23	
29	9 45	10 13		29	3 25	3 48		29	7 10	7 54	
31	9 55	10 23		31				31	7 15	7 43	✓
2		11 10		2	10 05	10 33		2			
4		11 19		4	10 15	10 38		4			
6	11 00	11 26		6	10 25	10 43		6			
8	11 08	11 36		8	10 35	10 48		8			
10	11 17	11 42		10	10 45	10 53		10			
12	11 28	11 50		12	10 55	10 58		12			
14	11 38	12 00		14				14			
16	11 48	12 10		16				16			
18	11 58	12 20		18				18			
20	12 08	12 30		20				20			
22	12 18	12 40		22				22			
24	12 28	12 50		24				24			
26	12 38	1 00		26				26			
28	12 48	1 10		28				28			
30	12 58	1 20		30				30		11 02	
1				1				1			
2				2				2			

REMARKS: A15/13 CHUCK DOOR NEEDS OILED OR SOMEHOW VERY TIGHT?

29/31

21/21

16/17

Condition of Signals

Condition of Pusher

HOURLY REPORT OF OPERATION

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED	TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED	
11	7	7		8 5	3	2		
12	6	6		9 6	1	1		Total Ovens Pushed <u>66</u>
13	6	7		8 7	7	7		Total Ovens Charged <u>69</u>
14	6	6		9 8	6	7		
15	6	6		10 9	6	6		Pusherman
16	6	5		11 10	6	9		Battery Foreman <u>4/1/10</u>
	37	37			29	32		

CC-10295 REV. 1161
03.001.0020

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

PUSHING AND CHARGING REPORT

UNIT NO. #5

12 Hrs. Beginning 12:00 P.M.

Date 7-29-94

11 am 7/29/94

BATTERY NO. <u>13-A's</u>				BATTERY NO. <u>13-B's</u>				BATTERY NO. <u>14-A's</u>			
OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES	OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES	OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES
1				1	7 05	7 34		1	9 52		
3				3	7 16	7 44		3	10 04		
5				5	7 26	7 54		5	10 16		
7				7	7 36	8 04		7			
9				9	7 46	8 15		9			
11				11	7 56	8 25		11			
13				13	8 06	8 36		13			
15				15	8 17	8 48		15			
17				17	8 27	9 02		17			
19				19	8 38	9 14		19			
21				21	8 50	9 26		21			
23				23	9 04	9 38		23			
25				25	9 16	9 50		25			
27				27	9 28	10 02		27			
29				29	9 40	10 14		29			
31				X	X	X		31			
2	4 28	4 46		2				2	1 16	1 57	
4	4 38	5 05		4				4	1 27	1 57	
6	4 48	5 15		6				6	1 38	2 01	
8	4 58	5 25		8				8	1 49	2 20	
10	5 07	5 36		10				10	1 59	3 03	
12	5 17	5 37		12				12	2 11	3 13	
14	5 27	5 43		14	11 39	12 08		14	2 22	3 23	
16	5 34	6 13		16	11 49	12 19		16	3 05	3 33	
18	5 39	6 18		18	11 59	12 30		18	3 15	3 43	
20	5 45	6 33		20	12 10	12 41		20	3 25	3 53	
22	6 15	6 43		22	12 21	12 52		22	3 35	4 04	
24	6 20	6 53		24	12 32	1 03		24	3 45	4 14	
26	6 35	7 03		26	12 43	1 14		26	3 55	4 20	
28	6 45	7 14		28	12 54	1 25		28	4 06	4 26	
30	6 55	7 24		30	1 05	1 36		30	4 16	4 36	
X	X	X		X	X	X		X	X	X	
X	X	X		X	X	X		X	X	X	

REMARKS:

15/15 24/24 18/15

Condition of Signals

Condition of Pusher

HOURLY REPORT OF OPERATION

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED	TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED	
11-12	3	0	9 6	5-6	6	6	11 11	
12-1	5	5	9 9	6-7	5	5	11 11	Total Ovens Pushed <u>57</u>
1-2	6	6	11 11	7-8	6	6	12 12	Total Ovens Charged <u>54</u>
2-3	2	2	4 4	8-9	5	5	10 10	
3-4	6	6	12 12	9-10	5	5	10 10	Pusherman
4-5	6	6	12 12	10-11	2	2	4 4	Battery Foreman
	<u>28</u>	<u>25</u>			<u>29</u>	<u>29</u>		

PUSHING SCHEDULE

Thursday, July 28, 1994 Turn 1

Batteries: 13-15_2

#	Oven	Last Pushed	Earliest	Desired	Latest
—	A5 /15		10:49am	11:00am	11:11am
—	B6 /13		10:55am	11:05am	11:16am
—	A7 /15		11:00am	11:11am	11:22am
—	B8 /13		11:06am	11:17am	11:28am
—	A9 /15		11:12am	11:23am	11:34am
—	B10/13		11:18am	11:29am	11:40am
—	A11/15		11:24am	11:35am	11:46am
—	B12/13		11:29am	11:40am	11:51am
—	A13/15		11:35am	11:46am	11:57am
—	B14/13		11:41am	11:52am	12:03am
—	A15/15		11:47am	11:58am	12:09am
—	B16/13		11:53am	12:04am	12:15am
—	A17/15		11:59am	12:10am	12:21am
—	B18/13		12:05am	12:16am	12:27am
—	A19/15		12:10am	12:21am	12:32am
—	B20/13		12:16am	12:27am	12:38am
—	A21/15		12:22am	12:33am	12:44am
—	B22/13		12:28am	12:39am	12:50am
—	A23/15		12:34am	12:45am	12:56am
—	B24/13		12:40am	12:51am	1:02am
—	A25/15		12:46am	12:57am	1:08am
—	B26/13		12:51am	1:02am	1:13am
—	A27/15		12:57am	1:08am	1:19am
—	B28/13		1:03am	1:14am	1:25am
—	A29/15		1:09am	1:20am	1:31am
—	B30/13		1:15am	1:26am	1:37am
—	A31/15		1:21am	1:32am	1:43am
—	B2 /14		1:27am	1:38am	1:49am
—	B2 /15		1:32am	1:43am	1:54am
—	A4 /14		1:38am	1:49am	2:00am
—	B4 /15		1:44am	1:55am	2:06am
—	A6 /14		1:50am	2:01am	2:12am
—	B6 /15		1:56am	2:07am	2:18am
—	A8 /14		2:02am	2:13am	2:24am
—	B8 /15		2:08am	2:19am	2:30am
—	A10/14		2:13am	2:24am	2:35am
—	B10/15		2:19am	2:30am	2:41am
—	A12/14		2:25am	2:36am	2:47am
—	B12/15		2:31am	2:42am	2:53am
—	A14/14		2:37am	2:48am	2:59am
—	B14/15		2:43am	2:54am	3:05am
—	A15/14		2:48am	2:59am	3:10am
—	B15/15		2:54am	3:05am	3:16am
—	A18/14		3:00am	3:11am	3:22am
—	B18/15		3:06am	3:17am	3:28am
—	A20/14		3:12am	3:23am	3:34am
—	B20/15		3:18am	3:29am	3:40am
—	A22/14		3:24am	3:35am	3:46am
—	B22/15		3:29am	3:40am	3:51am
—	A24/14		3:35am	3:46am	3:57am
—	B24/15		3:41am	3:52am	4:03am
—	A25/14		3:47am	3:58am	4:09am
—	B25/15		3:53am	4:04am	4:15am
—	A28/14		3:59am	4:10am	4:21am
—	B28/15		4:05am	4:16am	4:27am
—	A30/14		4:10am	4:21am	4:32am
—	B30/15		4:16am	4:27am	4:38am
—	A2 /13		4:22am	4:33am	4:44am
—	B1 /14		4:28am	4:39am	4:50am
—	A4 /13		4:34am	4:45am	4:56am
—	B3 /14		4:40am	4:51am	5:02am
—	A6 /13		4:46am	4:57am	5:08am
—	B5 /14		4:51am	5:02am	5:13am
—	A8 /13		4:57am	5:08am	5:19am
—	B7 /14		5:03am	5:14am	5:25am
—	A10/13		5:09am	5:20am	5:31am
—	B9 /14		5:15am	5:26am	5:37am
—	A12/13		5:21am	5:32am	5:43am
—	B11/14		5:27am	5:38am	5:49am
—	A14/13		5:32am	5:43am	5:54am
—	B13/14		5:38am	5:49am	6:00am
—	A16/12		5:44am	5:55am	6:06am
—	B15/14		5:50am	6:01am	6:12am
—	A18/13		5:56am	6:07am	6:18am
—	B17/14		6:02am	6:13am	6:24am
—	A20/13		6:08am	6:19am	6:30am
—	B19/14		6:13am	6:24am	6:35am
—	A22/13		6:19am	6:30am	6:41am
—	B21/14		6:25am	6:36am	6:47am
—	A24/13		6:31am	6:42am	6:53am

PUSHING SCHEDULE

Thursday, July 28, 1994 Turn 1

Batteries: 13-15_2

#	Oven	Last Pushed	Earliest	Desired	Latest
—	B23/14		6:37am	6:48am	6:59am
—	A26/13		6:43am	6:54am	7:05am

PUSHING SCHEDULE

Thursday, July 28, 1994 Turn 2

Batteries: 13-15_2

#	Oven	Last Pushed	Earliest	Desired	Latest
---	B25/14	17:48	6:45am	7:00am	7:15am
---	A28/13	17:48	6:51am	7:06am	7:21am
---	B27/14	17:48	6:57am	7:12am	7:27am
---	A38/13	17:48	7:03am	7:18am	7:33am
---	B29/14	17:48	7:09am	7:24am	7:39am
---	B1 /13	17:48	7:15am	7:30am	7:45am
---	A2 /15	17:48	7:21am	7:36am	7:51am
---	B3 /13	17:48	7:27am	7:42am	7:57am
---	A4 /15	17:48	7:33am	7:48am	8:03am
---	B5 /13	17:48	7:39am	7:54am	8:09am
---	A6 /15	17:48	7:45am	8:00am	8:15am
---	B7 /13	17:48	7:51am	8:06am	8:21am
---	A8 /15	17:48	7:57am	8:12am	8:27am
---	B9 /13	17:48	8:03am	8:18am	8:33am
---	A10/15	17:48	8:09am	8:24am	8:39am
---	B11/13	17:48	8:15am	8:30am	8:45am
---	A12/15	17:48	8:21am	8:36am	8:51am
---	B13/13	17:48	8:27am	8:42am	8:57am
---	A15/14	17:54	8:33am	8:48am	9:03am
---	B14/15	17:54	8:39am	8:54am	9:09am
---	B15/13	17:55	8:45am	9:00am	9:15am
---	A16/15	17:55	8:51am	9:06am	9:21am
---	B17/13	17:55	8:57am	9:12am	9:27am
---	A18/15	17:55	9:03am	9:18am	9:33am
---	B19/13	17:55	9:09am	9:24am	9:39am
---	A20/15	17:55	9:15am	9:30am	9:45am
---	B21/13	17:56	9:21am	9:36am	9:51am
---	A22/15	17:56	9:27am	9:42am	9:57am
---	B23/13	17:56	9:33am	9:48am	10:03am
---	A24/15	17:56	9:39am	9:54am	10:09am
---	B25/13	17:56	9:45am	10:00am	10:15am
---	A26/15	17:56	9:51am	10:06am	10:21am
---	B27/13	17:56	9:57am	10:12am	10:27am
---	A28/15	17:57	10:03am	10:18am	10:33am
---	B29/13	17:57	10:09am	10:24am	10:39am
---	A30/15	17:57	10:15am	10:30am	10:45am
---	B1 /14	17:57	10:21am	10:36am	10:51am
---	B1 /15	17:57	10:27am	10:42am	10:57am
---	A3 /14	17:57	10:33am	10:48am	11:03am
---	B3 /15	17:57	10:39am	10:54am	11:09am
---	A5 /14	17:58	10:45am	11:00am	11:15am
---	B5 /15	17:58	10:51am	11:06am	11:21am
---	A7 /14	17:58	10:57am	11:12am	11:27am
---	B7 /15	17:58	11:03am	11:18am	11:33am
---	A9 /14	17:58	11:09am	11:24am	11:39am
---	B9 /15	17:58	11:15am	11:30am	11:45am
---	A11/14	17:58	11:21am	11:36am	11:51am
---	B11/15	17:59	11:27am	11:42am	11:57am
---	A13/14	17:59	11:33am	11:48am	12:03pm
---	B13/15	17:59	11:39am	11:54am	12:09pm
---	B15/15	17:59	11:45am	12:00pm	12:15pm
---	A17/14	17:59	11:51am	12:06pm	12:21pm
---	B17/15	17:59	11:57am	12:12pm	12:27pm
---	A19/14	17:59	12:03pm	12:18pm	12:33pm
---	B19/15	18:00	12:09pm	12:24pm	12:39pm
---	A21/14	18:00	12:15pm	12:30pm	12:45pm
---	B21/15	18:00	12:21pm	12:36pm	12:51pm
---	A23/14	18:00	12:27pm	12:42pm	12:57pm
---	B23/15	18:00	12:33pm	12:48pm	1:03pm
---	A25/14	18:00	12:39pm	12:54pm	1:09pm
---	B25/15	18:01	12:45pm	1:00pm	1:15pm
---	A27/14	18:01	12:51pm	1:06pm	1:21pm
---	B27/15	18:01	12:57pm	1:12pm	1:27pm
---	A29/14	18:01	1:03pm	1:18pm	1:33pm
---	B29/15	18:01	1:09pm	1:24pm	1:39pm
---	A31/14	18:01	1:15pm	1:30pm	1:45pm
---	B1 /13	18:01	1:21pm	1:36pm	1:51pm
---	B2 /14	18:02	1:27pm	1:42pm	1:57pm
---	A3 /13	18:02	1:33pm	1:48pm	2:03pm
---	B4 /14	18:02	1:39pm	1:54pm	2:09pm
---	A5 /13	18:02	1:45pm	2:00pm	2:15pm
---	B6 /14	18:02	1:51pm	2:06pm	2:21pm
---	A7 /13	18:02	1:57pm	2:12pm	2:27pm
---	B8 /14	18:02	2:03pm	2:18pm	2:33pm
---	A9 /13	18:03	2:09pm	2:24pm	2:39pm
---	B10/14	18:03	2:15pm	2:30pm	2:45pm
---	A11/13	18:03	2:21pm	2:36pm	2:51pm
---	B12/14	18:03	2:27pm	2:42pm	2:57pm
---	A13/13	18:03	2:33pm	2:48pm	3:03pm
---	B14/14	18:03	2:39pm	2:54pm	3:09pm

14/-A15

A15/14 after B13/13

PUSHING SCHEDULE

Thursday, July 28, 1994 Turn 3

Batteries: 13-15_2

#	Oven	Last Pushed	Earliest	Desired	Latest
	A15/13	18:03	2:49pm	3:00pm	3:11pm
	B16/14	18:03	2:55pm	3:05pm	3:16pm
	A17/13	18:03	3:00pm	3:11pm	3:22pm
	B18/14	18:03	3:06pm	3:17pm	3:28pm
	A19/13	18:03	3:12pm	3:23pm	3:34pm
	B20/14	18:03	3:18pm	3:29pm	3:40pm
	A21/13	18:03	3:24pm	3:35pm	3:46pm
	B22/14	18:02	3:29pm	3:40pm	3:51pm
	A23/13	18:03	3:35pm	3:46pm	3:57pm
	B24/14	18:03	3:41pm	3:52pm	4:03pm
	A25/13	18:03	3:47pm	3:58pm	4:09pm
	B26/14	18:03	3:53pm	4:04pm	4:15pm
	A27/13	18:03	3:59pm	4:10pm	4:21pm
	B28/14	18:03	4:05pm	4:16pm	4:27pm
	A29/13	18:02	4:10pm	4:21pm	4:32pm
	B30/14	18:03	4:16pm	4:27pm	4:38pm
	A31/13	18:03	4:22pm	4:33pm	4:44pm
	A1 /13	18:03	4:28pm	4:39pm	4:50pm
	B2 /13	18:03	4:34pm	4:45pm	4:56pm
	A3 /13	18:03	4:40pm	4:51pm	5:02pm
	B4 /13	18:03	4:46pm	4:57pm	5:08pm
	A5 /13	36:05	4:51pm	5:02pm	5:13pm
	B6 /13	36:06	4:57pm	5:08pm	5:19pm
	A7 /13	36:06	5:03pm	5:14pm	5:25pm
	B8 /13	36:06	5:09pm	5:20pm	5:31pm
	A9 /13	36:06	5:15pm	5:26pm	5:37pm
	B10/13	36:06	5:21pm	5:32pm	5:43pm
	A11/13	36:06	5:27pm	5:38pm	5:49pm
	B12/13	36:06	5:32pm	5:43pm	5:54pm
	A13/13	36:06	5:38pm	5:49pm	6:00pm
	B14/13	36:06	5:44pm	5:55pm	6:06pm
	A15/13	36:06	5:50pm	6:01pm	6:12pm
	B16/13	36:06	5:56pm	6:07pm	6:18pm
	A17/13	36:06	6:02pm	6:13pm	6:24pm
	B18/13	36:06	6:08pm	6:19pm	6:30pm
	A19/13	36:05	6:13pm	6:24pm	6:35pm
	B20/13	36:06	6:19pm	6:30pm	6:41pm
	A21/13	36:06	6:25pm	6:36pm	6:47pm
	B22/13	36:06	6:31pm	6:42pm	6:53pm
	A23/13	36:06	6:37pm	6:48pm	6:59pm
	B24/13	36:06	6:43pm	6:54pm	7:05pm
	A25/13	36:05	6:48pm	6:59pm	7:10pm
	B26/13	36:05	6:54pm	7:05pm	7:16pm
	A27/13	36:05	7:00pm	7:11pm	7:22pm
	B28/13	36:05	7:06pm	7:17pm	7:28pm
	A29/13	36:05	7:12pm	7:23pm	7:34pm
	B30/13	36:05	7:18pm	7:29pm	7:40pm
	A31/13	36:05	7:24pm	7:35pm	7:46pm
	A2 /14	36:04	7:29pm	7:40pm	7:51pm
	B2 /13	36:04	7:35pm	7:46pm	7:57pm
	A4 /14	36:04	7:41pm	7:52pm	8:03pm
	B4 /13	36:04	7:47pm	7:58pm	8:09pm
	A6 /14	36:04	7:53pm	8:04pm	8:15pm
	B6 /13	36:04	7:59pm	8:10pm	8:21pm
	A8 /14	36:04	8:05pm	8:16pm	8:27pm
	B8 /13	36:03	8:10pm	8:21pm	8:32pm
	A10/14	36:03	8:16pm	8:27pm	8:38pm
	B10/13	36:03	8:22pm	8:33pm	8:44pm
	A12/14	36:03	8:28pm	8:39pm	8:50pm
	B12/13	36:03	8:34pm	8:45pm	8:56pm
	A14/14	36:03	8:40pm	8:51pm	9:02pm
	B14/13	36:03	8:46pm	8:57pm	9:08pm
	A16/14	36:02	8:51pm	9:02pm	9:13pm
	B16/13	36:02	8:57pm	9:08pm	9:19pm
	A18/14	36:02	9:03pm	9:14pm	9:25pm
	B18/13	36:02	9:09pm	9:20pm	9:31pm
	A20/14	36:02	9:15pm	9:26pm	9:37pm
	B20/13	36:02	9:21pm	9:32pm	9:43pm
	A22/14	36:02	9:27pm	9:38pm	9:49pm
	B22/13	36:01	9:32pm	9:43pm	9:54pm
	A24/14	36:01	9:38pm	9:49pm	10:00pm
	B24/13	36:01	9:44pm	9:55pm	10:06pm
	A26/14	36:01	9:50pm	10:01pm	10:12pm
	B26/13	36:01	9:56pm	10:07pm	10:18pm
	A28/14	36:01	10:02pm	10:13pm	10:24pm
	B28/13	36:01	10:08pm	10:19pm	10:30pm
	A30/14	36:00	10:13pm	10:24pm	10:35pm
	B30/13	35:54	10:19pm	10:30pm	10:41pm
	A2 /13	35:54	10:25pm	10:36pm	10:47pm
	B1 /14	35:54	10:31pm	10:42pm	10:53pm

PUSHING SCHEDULE

Thursday, July 28, 1994 Turn 3

Batteries: 13-15_2

Oven	Last Pushed	Earliest	Desired	Latest
A4 /13	35:54	10:37pm	10:48pm	10:59pm
B3 /14	35:54	10:43pm	10:54pm	11:05pm

PUSHING SCHEDULE

Friday, July 29, 1994 Turn 1
Batteries: 13-15_2

Oven	Last Pushed	Earliest	Desired	Latest
A6 /13	35:54	10:49am	11:00am	11:11am
B5 /14	35:53	10:55am	11:05am	11:16am
A8 /13	35:53	11:00am	11:11am	11:22am
B7 /14	35:53	11:06am	11:17am	11:28am
A10/13	35:53	11:12am	11:23am	11:34am
B9 /14	35:53	11:18am	11:29am	11:40am
A12/13	35:53	11:24am	11:35am	11:46am
B11/14	35:52	11:29am	11:40am	11:51am
A14/13	35:52	11:35am	11:46am	11:57am
B13/14	35:52	11:41am	11:52am	12:03am
A16/13	35:52	11:47am	11:58am	12:09am
B15/14	35:52	11:53am	12:04am	12:15am
A18/13	35:52	11:59am	12:10am	12:21am
B17/14	35:52	12:05am	12:16am	12:27am
A20/13	35:51	12:10am	12:21am	12:32am
B19/14	35:51	12:16am	12:27am	12:38am
A22/13	35:51	12:22am	12:33am	12:44am
B21/14	35:51	12:28am	12:39am	12:50am
A24/13	35:51	12:34am	12:45am	12:56am
B23/14	35:51	12:40am	12:51am	1:02am
A26/13	35:51	12:46am	12:57am	1:08am
B25/14	18:02	12:51am	1:02am	1:13am
A28/13	18:02	12:57am	1:08am	1:19am
B27/14	18:02	1:03am	1:14am	1:25am
A30/13	18:02	1:09am	1:20am	1:31am
B29/14	18:02	1:15am	1:26am	1:37am
B1 /13	18:02	1:21am	1:32am	1:43am
A2 /15	18:02	1:27am	1:38am	1:49am
B3 /13	18:01	1:32am	1:43am	1:54am
A4 /15	18:01	1:38am	1:49am	2:00am
B5 /13	18:01	1:44am	1:55am	2:06am
A6 /15	18:01	1:50am	2:01am	2:12am
B7 /13	18:01	1:56am	2:07am	2:18am
A8 /15	18:01	2:02am	2:13am	2:24am
B9 /13	18:01	2:08am	2:19am	2:30am
A10/15	18:00	2:13am	2:24am	2:35am
B11/13	18:00	2:19am	2:30am	2:41am
A12/15	18:00	2:25am	2:36am	2:47am
B13/13	18:00	2:31am	2:42am	2:53am
A14/15	17:54	2:37am	2:48am	2:59am
B15/13	17:54	2:43am	2:54am	3:05am
A16/15	17:53	2:48am	2:59am	3:10am
B17/13	17:53	2:54am	3:05am	3:16am
A18/15	17:53	3:00am	3:11am	3:22am
B19/13	17:53	3:06am	3:17am	3:28am
A20/15	17:53	3:12am	3:23am	3:34am
B21/13	17:53	3:18am	3:29am	3:40am
A22/15	17:53	3:24am	3:35am	3:46am
B23/13	17:52	3:29am	3:40am	3:51am
A24/15	17:52	3:35am	3:46am	3:57am
B25/13	17:52	3:41am	3:52am	4:03am
A26/15	17:52	3:47am	3:58am	4:09am
B27/13	17:52	3:53am	4:04am	4:15am
A28/15	17:52	3:59am	4:10am	4:21am
B29/13	17:52	4:05am	4:16am	4:27am
A30/15	17:51	4:10am	4:21am	4:32am
B1 /14	17:51	4:16am	4:27am	4:38am
A1 /15	17:51	4:22am	4:33am	4:44am
B3 /14	17:51	4:28am	4:39am	4:50am
A3 /15	17:51	4:34am	4:45am	4:56am
B5 /14	17:51	4:40am	4:51am	5:02am
A5 /15	17:51	4:46am	4:57am	5:08am
B7 /14	17:50	4:51am	5:02am	5:13am
A7 /15	17:50	4:57am	5:08am	5:19am
B9 /15	17:50	5:03am	5:14am	5:25am
A11/14	17:50	5:09am	5:20am	5:31am
B11/15	17:50	5:15am	5:26am	5:37am
A13/14	17:50	5:21am	5:32am	5:43am
B13/15	17:49	5:27am	5:38am	5:49am
A15/14	21:01	5:32am	5:43am	5:54am
B15/15	17:53	5:38am	5:49am	6:00am
A17/14	17:53	5:44am	5:55am	6:06am
B17/15	17:53	5:50am	6:01am	6:12am
A19/14	17:53	5:56am	6:07am	6:18am
B19/15	17:53	6:02am	6:13am	6:24am
A21/14	17:54	6:08am	6:19am	6:30am
B21/15	17:54	6:13am	6:24am	6:35am
A23/14	17:54	6:19am	6:30am	6:41am
B23/15	17:54	6:25am	6:36am	6:47am
B23/15	17:54	6:31am	6:42am	6:53am

PUSHING SCHEDULE

Friday, July 29, 1994 Turn 1
Batteries: 13-15_2

#	Oven	Last Pushed	Earliest	Desired	Latest
---	A25/14	17:54	6:37am	6:48am	6:59am
---	B25/15	17:54	6:43am	6:54am	7:05am

PUSHING SCHEDULE

Friday, July 29, 1994 Turn 2
Batteries: 13-15_2

Oven	Last Pushed	Earliest	Desired	Latest
A27/14	17:54	6:45am	7:00am	7:15am
B27/15	17:54	6:51am	7:06am	7:21am
A29/14	17:54	6:57am	7:12am	7:27am
B29/15	17:54	7:03am	7:18am	7:33am
A31/14	17:54	7:09am	7:24am	7:39am
A1 /13	17:54	7:15am	7:30am	7:45am
B2 /14	17:54	7:21am	7:36am	7:51am
A3 /13	17:54	7:27am	7:42am	7:57am
B4 /14	17:54	7:33am	7:48am	8:03am
A5 /13	17:54	7:39am	7:54am	8:09am
B6 /14	17:54	7:45am	8:00am	8:15am
A7 /13	17:54	7:51am	8:06am	8:21am
B8 /14	17:54	7:57am	8:12am	8:27am
A9 /13	17:54	8:03am	8:18am	8:33am
B10/14	17:54	8:09am	8:24am	8:39am
A11/13	17:54	8:15am	8:30am	8:45am
B12/14	17:54	8:21am	8:36am	8:51am
A13/13	17:54	8:27am	8:42am	8:57am
B14/14	17:54	8:33am	8:48am	9:03am
A15/13	17:54	8:39am	8:54am	9:09am
B16/14	17:55	8:45am	9:00am	9:15am
A17/13	17:55	8:51am	9:06am	9:21am
B18/14	17:55	8:57am	9:12am	9:27am
A19/13	17:55	9:03am	9:18am	9:33am
B20/14	17:55	9:09am	9:24am	9:39am
A21/13	17:55	9:15am	9:30am	9:45am
B22/14	17:56	9:21am	9:36am	9:51am
A23/13	17:56	9:27am	9:42am	9:57am
B24/14	17:56	9:33am	9:48am	10:03am
A25/13	17:56	9:39am	9:54am	10:09am
B26/14	17:56	9:45am	10:00am	10:15am
A27/13	17:56	9:51am	10:06am	10:21am
B28/14	17:56	9:57am	10:12am	10:27am
A29/13	17:57	10:03am	10:18am	10:33am
B30/14	17:57	10:09am	10:24am	10:39am
A31/13	17:57	10:15am	10:30am	10:45am
A1 /15	17:57	10:21am	10:36am	10:51am
B2 /13	17:57	10:27am	10:42am	10:57am
A3 /15	17:57	10:33am	10:48am	11:03am
B4 /13	17:57	10:39am	10:54am	11:09am
A5 /15	17:58	10:45am	11:00am	11:15am
B6 /13	17:58	10:51am	11:06am	11:21am
A7 /15	17:58	10:57am	11:12am	11:27am
B8 /13	17:58	11:03am	11:18am	11:33am
A9 /15	17:58	11:09am	11:24am	11:39am
B10/13	17:58	11:15am	11:30am	11:45am
A11/15	17:58	11:21am	11:36am	11:51am
B12/13	17:59	11:27am	11:42am	11:57am
A13/15	17:59	11:33am	11:48am	12:03pm
B14/13	17:59	11:39am	11:54am	12:09pm
A15/15	17:59	11:45am	12:00pm	12:15pm
B16/13	17:59	11:51am	12:06pm	12:21pm
A17/15	17:59	11:57am	12:12pm	12:27pm
B18/13	17:59	12:03pm	12:18pm	12:33pm
A19/15	18:00	12:09pm	12:24pm	12:39pm
B20/13	18:00	12:15pm	12:30pm	12:45pm
A21/15	18:00	12:21pm	12:36pm	12:51pm
B22/13	18:00	12:27pm	12:42pm	12:57pm
A23/15	18:00	12:33pm	12:48pm	1:03pm
B24/13	18:00	12:39pm	12:54pm	1:09pm
A25/15	18:01	12:45pm	1:00pm	1:15pm
B26/13	18:01	12:51pm	1:06pm	1:21pm
A27/15	18:01	12:57pm	1:12pm	1:27pm
B28/13	18:01	1:03pm	1:18pm	1:33pm
A29/15	18:01	1:09pm	1:24pm	1:39pm
B30/13	18:01	1:15pm	1:30pm	1:45pm
A31/15	18:01	1:21pm	1:36pm	1:51pm
A2 /14	18:02	1:27pm	1:42pm	1:57pm
B2 /15	18:02	1:33pm	1:48pm	2:03pm
A4 /14	18:02	1:39pm	1:54pm	2:09pm
B4 /15	18:02	1:45pm	2:00pm	2:15pm
A6 /14	18:02	1:51pm	2:06pm	2:21pm
B6 /15	18:02	1:57pm	2:12pm	2:27pm
A8 /14	18:02	2:03pm	2:18pm	2:33pm
B8 /15	18:03	2:09pm	2:24pm	2:39pm
A10/14	18:03	2:15pm	2:30pm	2:45pm
B10/15	18:03	2:21pm	2:36pm	2:51pm
A12/14	18:03	2:27pm	2:42pm	2:57pm
B12/15	18:03	2:33pm	2:48pm	3:03pm
A14/14	18:03	2:39pm	2:54pm	3:09pm

PUSHING SCHEDULE

Friday, July 29, 1994 Turn 3

Batteries: 13-15_2

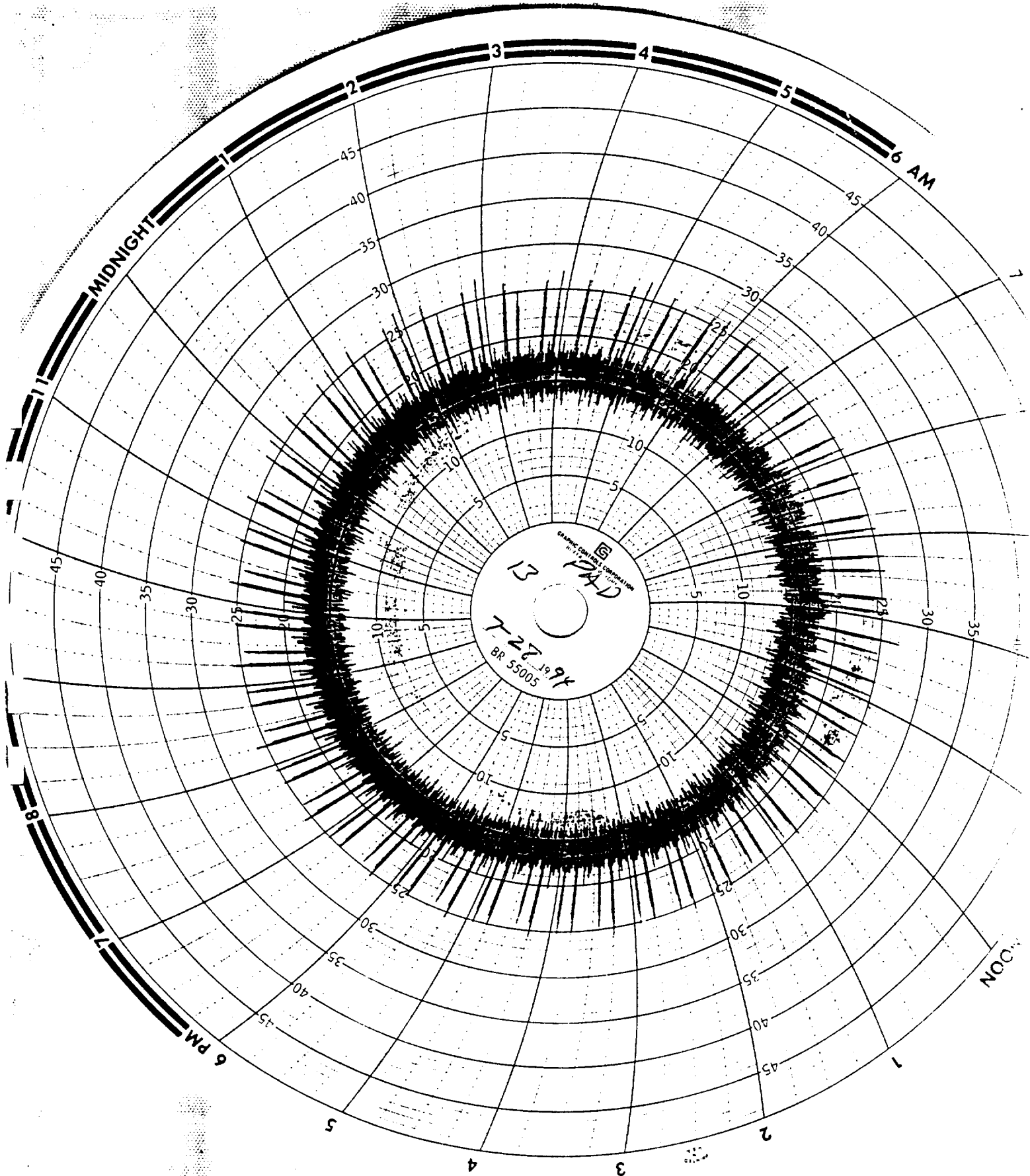
Oven	Last Pushed	Earliest	Desired	Latest
B14/15	18:03	2:49pm	3:00pm	3:11pm
A16/14	18:03	2:55pm	3:05pm	3:16pm
B16/15	18:03	3:00pm	3:11pm	3:22pm
A18/14	18:03	3:06pm	3:17pm	3:28pm
B18/15	18:03	3:12pm	3:23pm	3:34pm
A20/14	18:03	3:18pm	3:29pm	3:40pm
B20/15	18:03	3:24pm	3:35pm	3:46pm
A22/14	18:02	3:29pm	3:40pm	3:51pm
B22/15	18:03	3:35pm	3:46pm	3:57pm
A24/14	18:03	3:41pm	3:52pm	4:03pm
B24/15	18:03	3:47pm	3:58pm	4:09pm
A26/14	18:03	3:53pm	4:04pm	4:15pm
B26/15	18:03	3:59pm	4:10pm	4:21pm
A28/14	18:03	4:05pm	4:16pm	4:27pm
B28/15	18:02	4:10pm	4:21pm	4:32pm
A30/14	18:03	4:16pm	4:27pm	4:38pm
B30/15	18:03	4:22pm	4:33pm	4:44pm
A2 /13	18:03	4:28pm	4:39pm	4:50pm
B1 /14	18:03	4:34pm	4:45pm	4:56pm
A4 /13	18:03	4:40pm	4:51pm	5:02pm
B3 /14	18:03	4:46pm	4:57pm	5:08pm
A6 /13	18:02	4:51pm	5:02pm	5:13pm
B5 /14	18:03	4:57pm	5:08pm	5:19pm
A8 /13	18:03	5:03pm	5:14pm	5:25pm
B7 /14	18:03	5:09pm	5:20pm	5:31pm
A10/13	18:03	5:15pm	5:26pm	5:37pm
B9 /14	18:03	5:21pm	5:32pm	5:43pm
A12/13	18:03	5:27pm	5:38pm	5:49pm
B11/14	18:03	5:32pm	5:43pm	5:54pm
A14/13	18:03	5:38pm	5:49pm	6:00pm
B13/14	18:03	5:44pm	5:55pm	6:05pm
A16/13	18:03	5:50pm	6:01pm	6:12pm
B15/14	18:03	5:56pm	6:07pm	6:18pm
A18/13	18:03	6:02pm	6:13pm	6:24pm
B17/14	18:03	6:08pm	6:19pm	6:30pm
A20/13	18:03	6:13pm	6:24pm	6:35pm
B19/14	18:03	6:19pm	6:30pm	6:41pm
A22/13	18:03	6:25pm	6:36pm	6:47pm
B21/14	18:03	6:31pm	6:42pm	6:53pm
A24/13	18:03	6:37pm	6:48pm	6:59pm
B23/14	18:03	6:43pm	6:54pm	7:05pm
A26/13	18:02	6:48pm	6:59pm	7:10pm
B25/14	18:03	6:54pm	7:05pm	7:16pm
A28/13	18:03	7:00pm	7:11pm	7:22pm
B27/14	18:03	7:06pm	7:17pm	7:28pm
A30/13	18:03	7:12pm	7:23pm	7:34pm
B29/14	18:03	7:18pm	7:29pm	7:40pm
A1 /13	18:03	7:24pm	7:35pm	7:46pm
B1 /15	18:02	7:29pm	7:40pm	7:51pm
A3 /13	18:03	7:35pm	7:46pm	7:57pm
B4 /14	18:03	7:41pm	7:52pm	8:03pm
A5 /13	18:03	7:47pm	7:58pm	8:09pm
B5 /15	18:03	7:53pm	8:04pm	8:15pm
A6 /13	18:03	7:59pm	8:10pm	8:21pm
B7 /13	18:03	8:05pm	8:16pm	8:27pm
A8 /15	18:02	8:10pm	8:21pm	8:32pm
B9 /13	18:03	8:16pm	8:27pm	8:38pm
A10/13	18:03	8:22pm	8:33pm	8:44pm
B11/13	18:03	8:28pm	8:39pm	8:50pm
A12/15	18:03	8:34pm	8:45pm	8:56pm
B13/13	18:03	8:40pm	8:51pm	9:02pm
A14/15	18:03	8:46pm	8:57pm	9:08pm
B15/13	18:03	8:51pm	9:02pm	9:13pm
A16/15	18:03	8:57pm	9:08pm	9:19pm
B17/13	18:03	9:03pm	9:14pm	9:25pm
A18/15	18:03	9:09pm	9:20pm	9:31pm
B19/13	18:03	9:15pm	9:26pm	9:37pm
A20/15	18:03	9:21pm	9:32pm	9:43pm
B21/13	18:03	9:27pm	9:38pm	9:49pm
A22/15	18:03	9:32pm	9:43pm	9:54pm
B23/13	18:03	9:38pm	9:49pm	10:00pm
A24/15	18:03	9:44pm	9:55pm	10:06pm
B25/13	18:03	9:50pm	10:01pm	10:12pm
A26/15	18:03	9:56pm	10:07pm	10:18pm
B27/13	18:03	10:02pm	10:13pm	10:24pm
A28/15	18:03	10:08pm	10:19pm	10:30pm
B29/13	18:03	10:13pm	10:24pm	10:35pm
A30/15	18:03	10:19pm	10:30pm	10:41pm
B1 /14	18:03	10:25pm	10:36pm	10:47pm
A3 /15	18:03	10:31pm	10:42pm	10:53pm

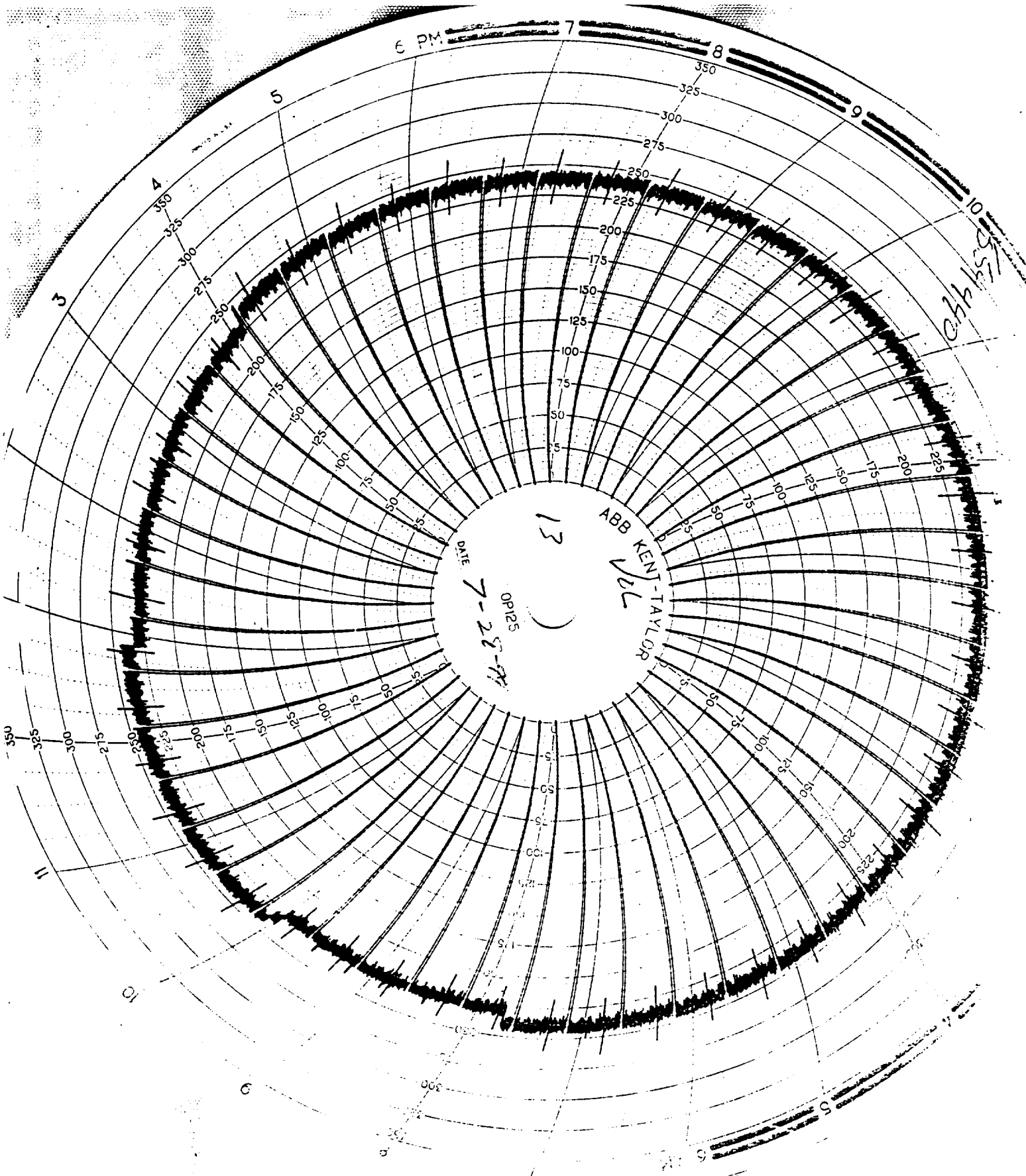
PUSHING SCHEDULE

Friday, July 29, 1994 Turn 3

Batteries: 13-15_2

Oven	Last Pushed	Earliest	Desired	Latest
B3 /15	18:03	10:37pm	10:48pm	10:59pm
A5 /14	18:03	10:43pm	10:54pm	11:05pm





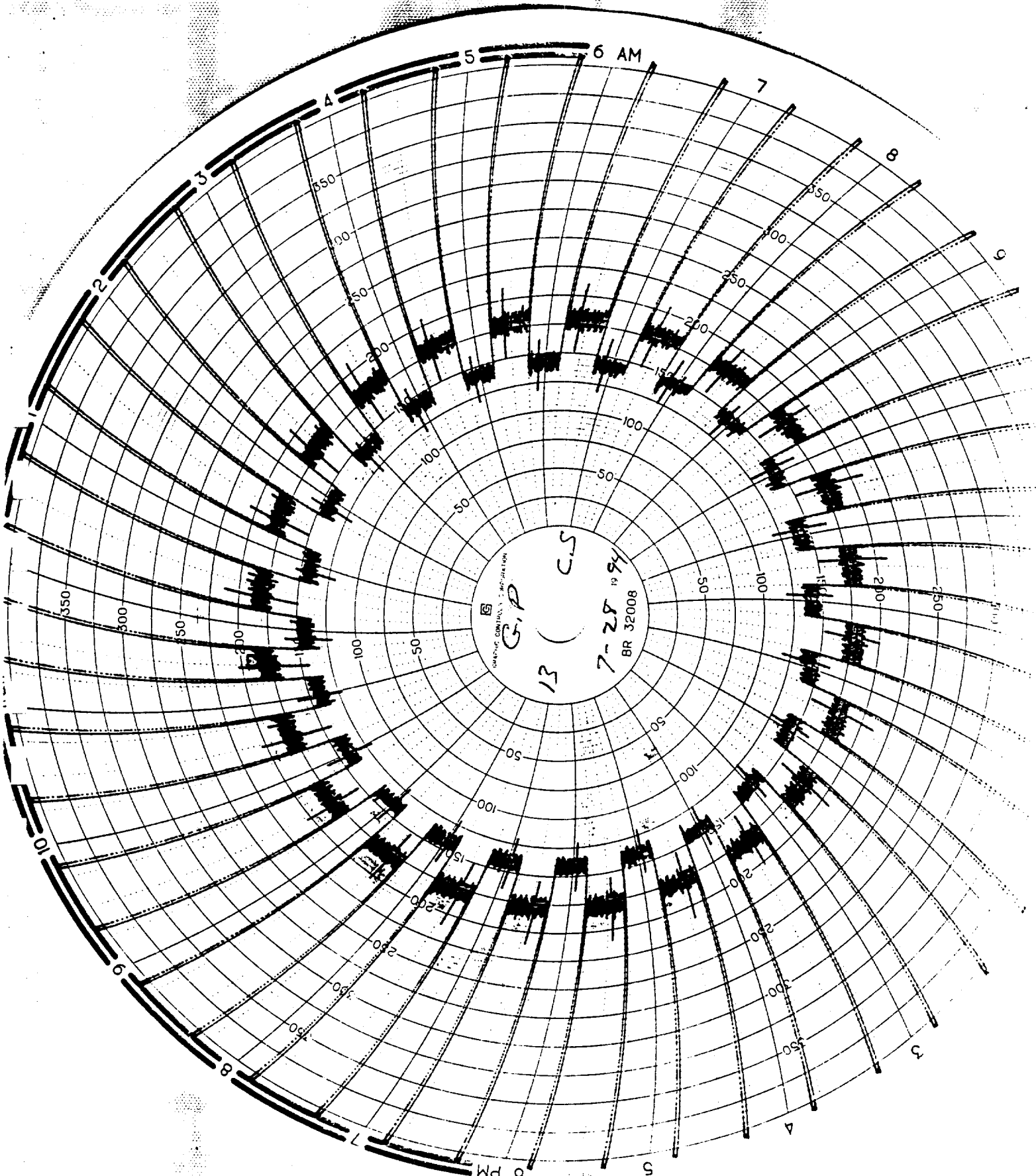
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13

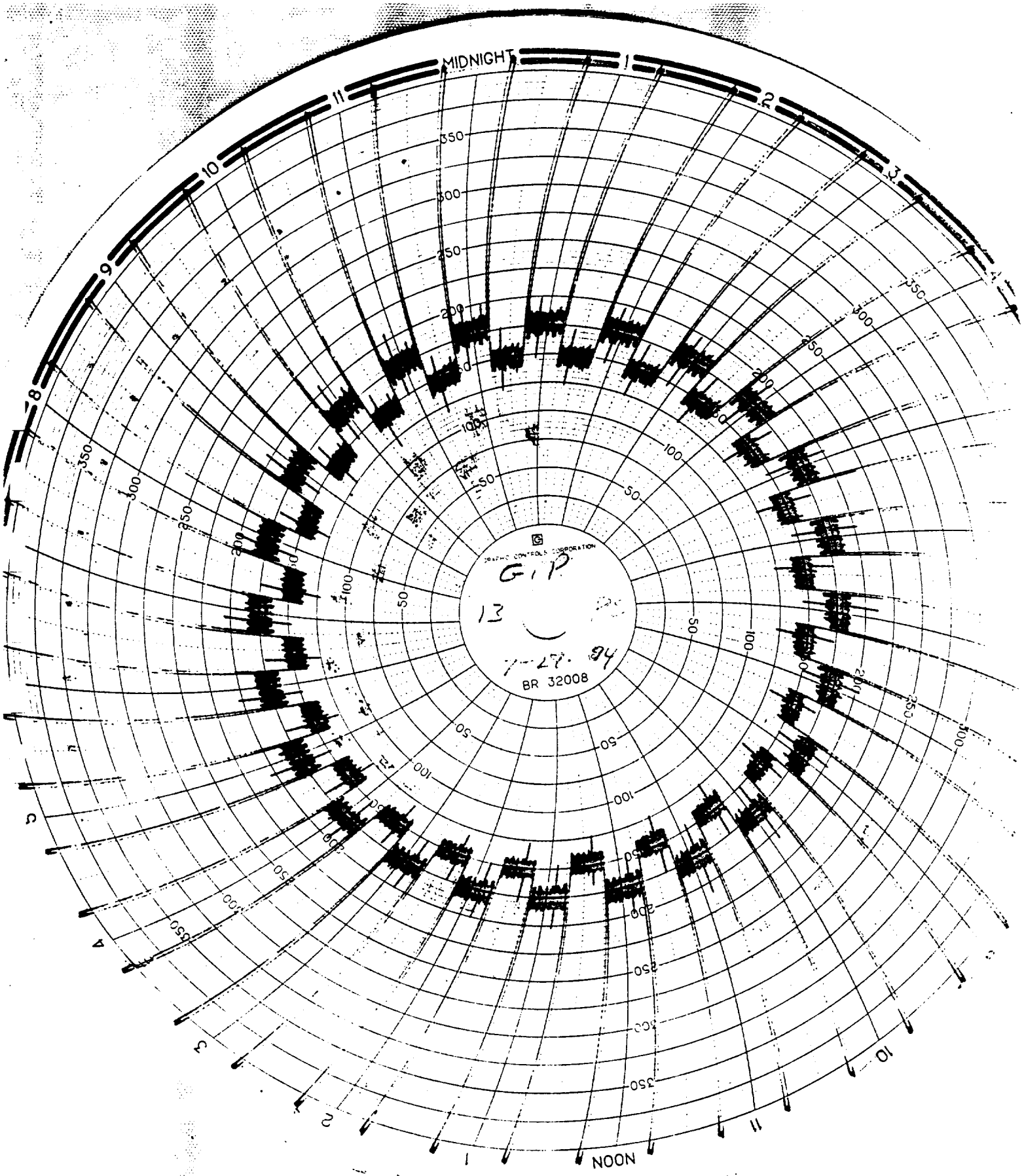
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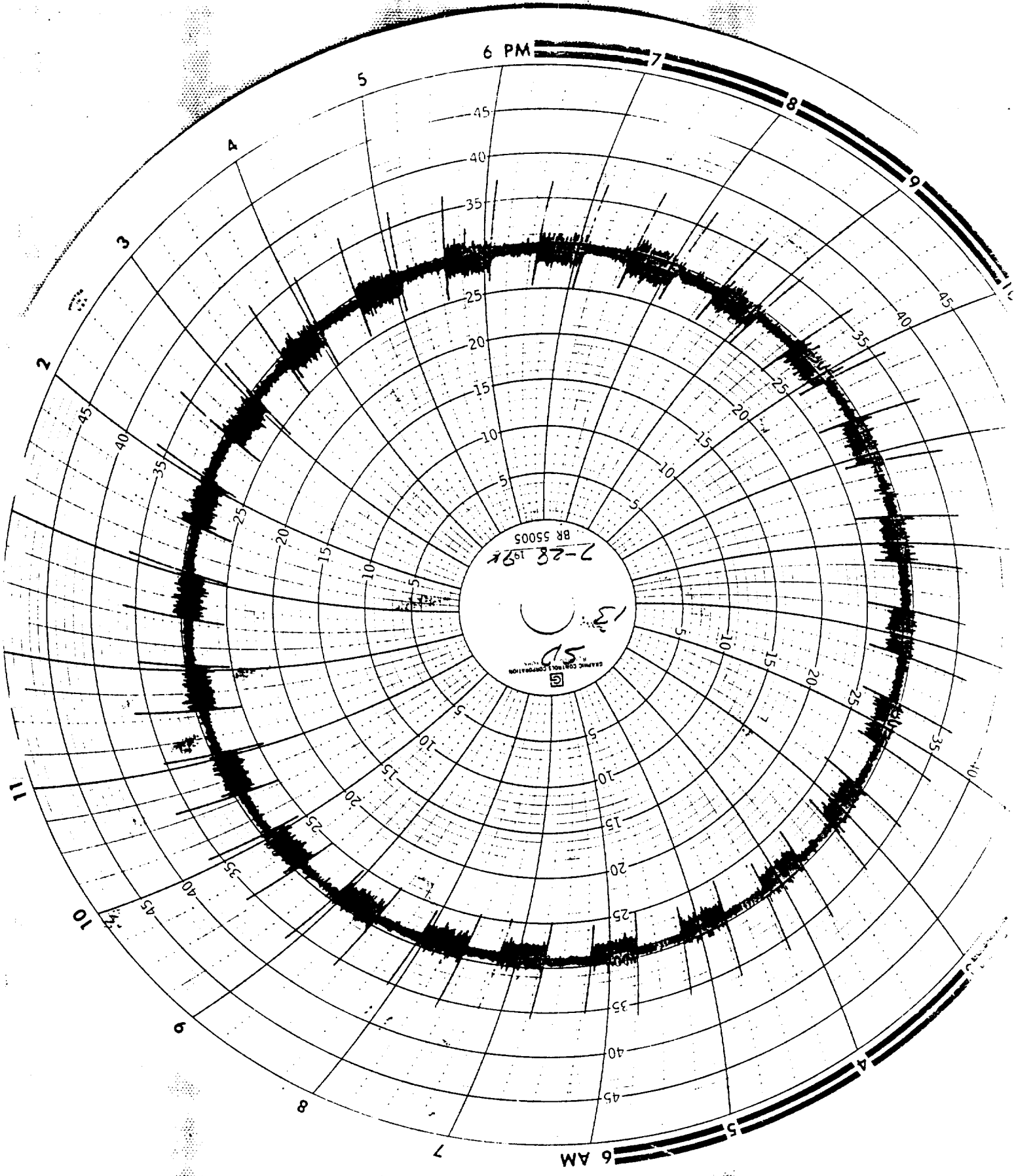
DATE 7-28-71
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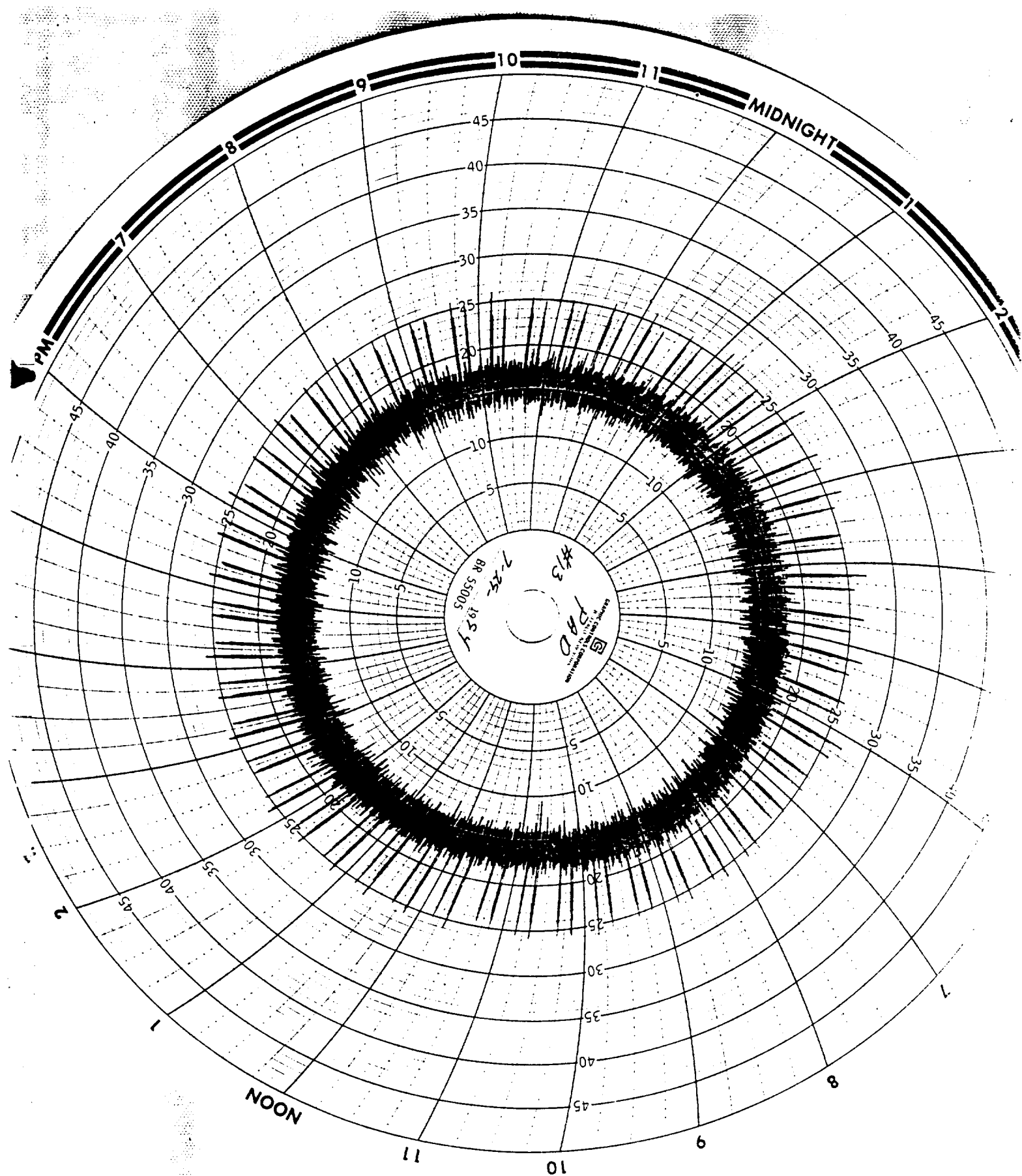
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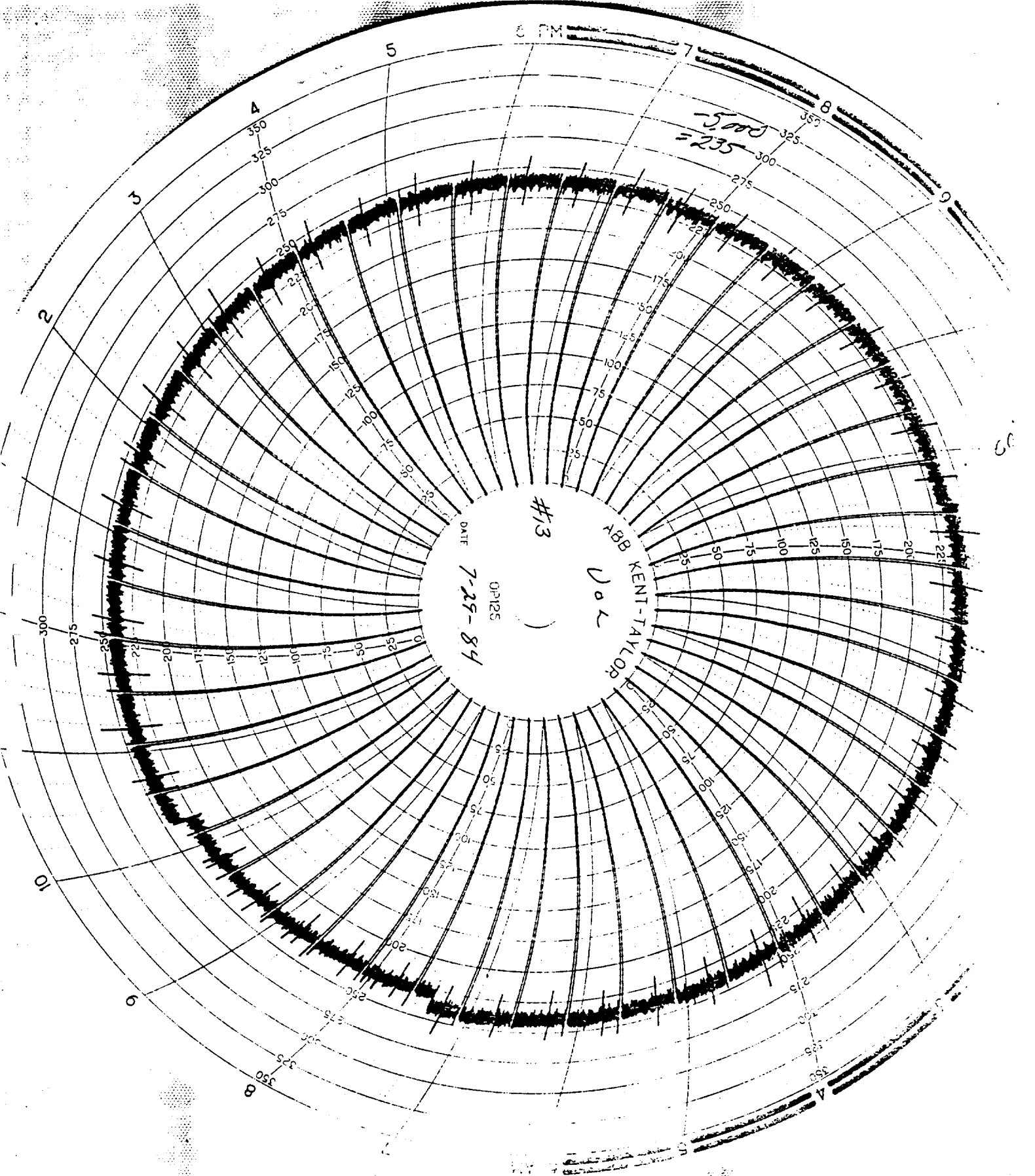


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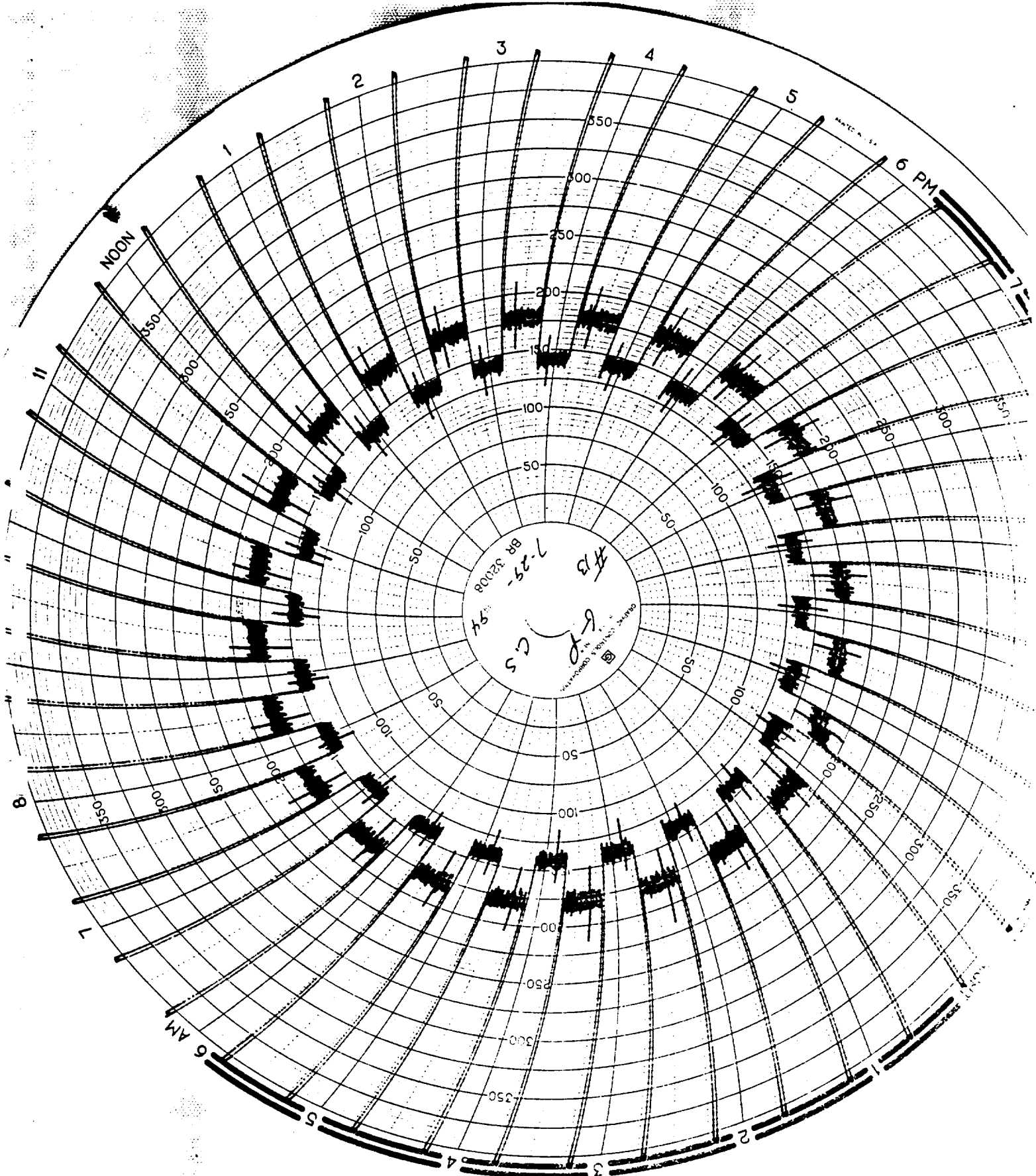
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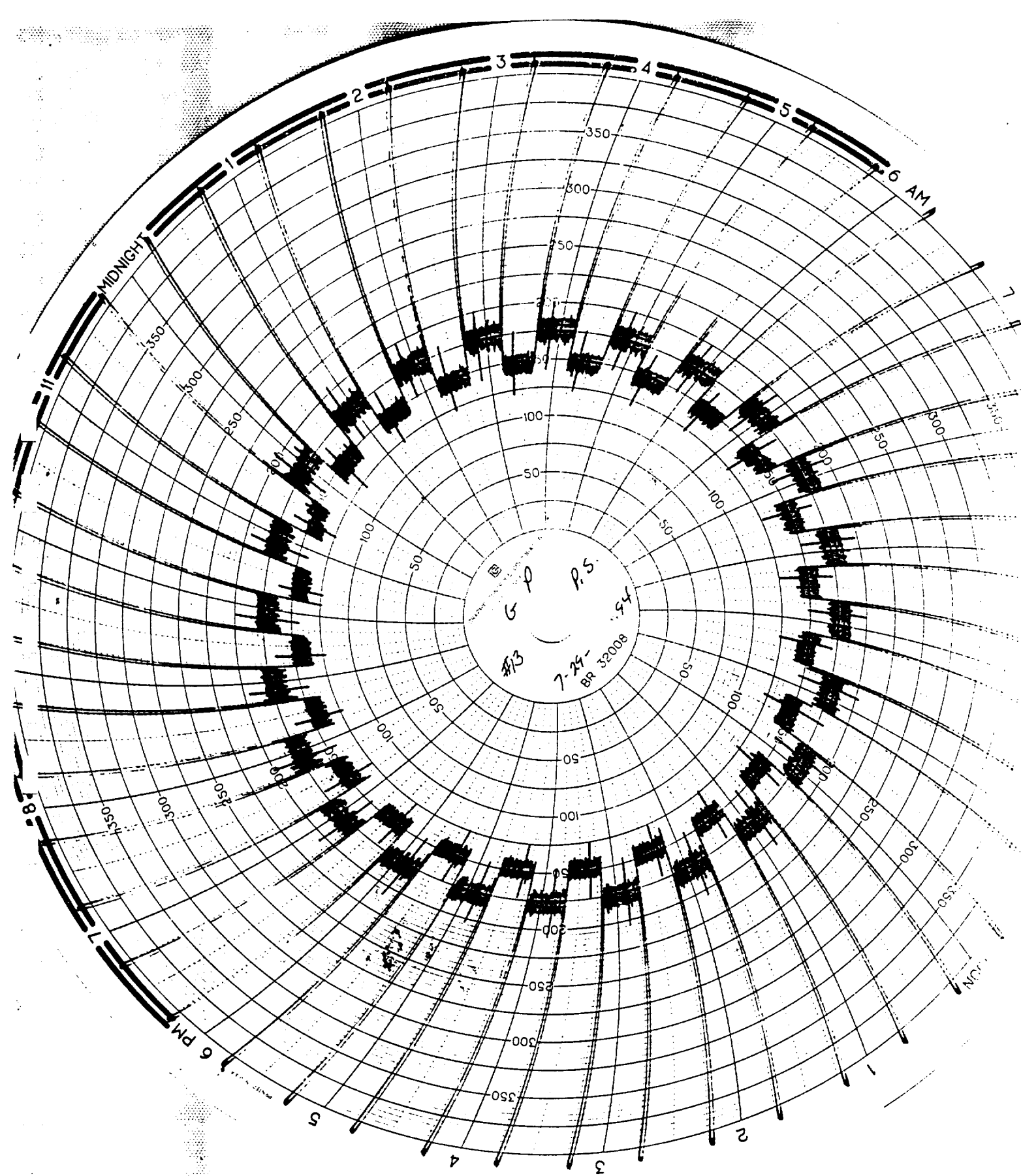
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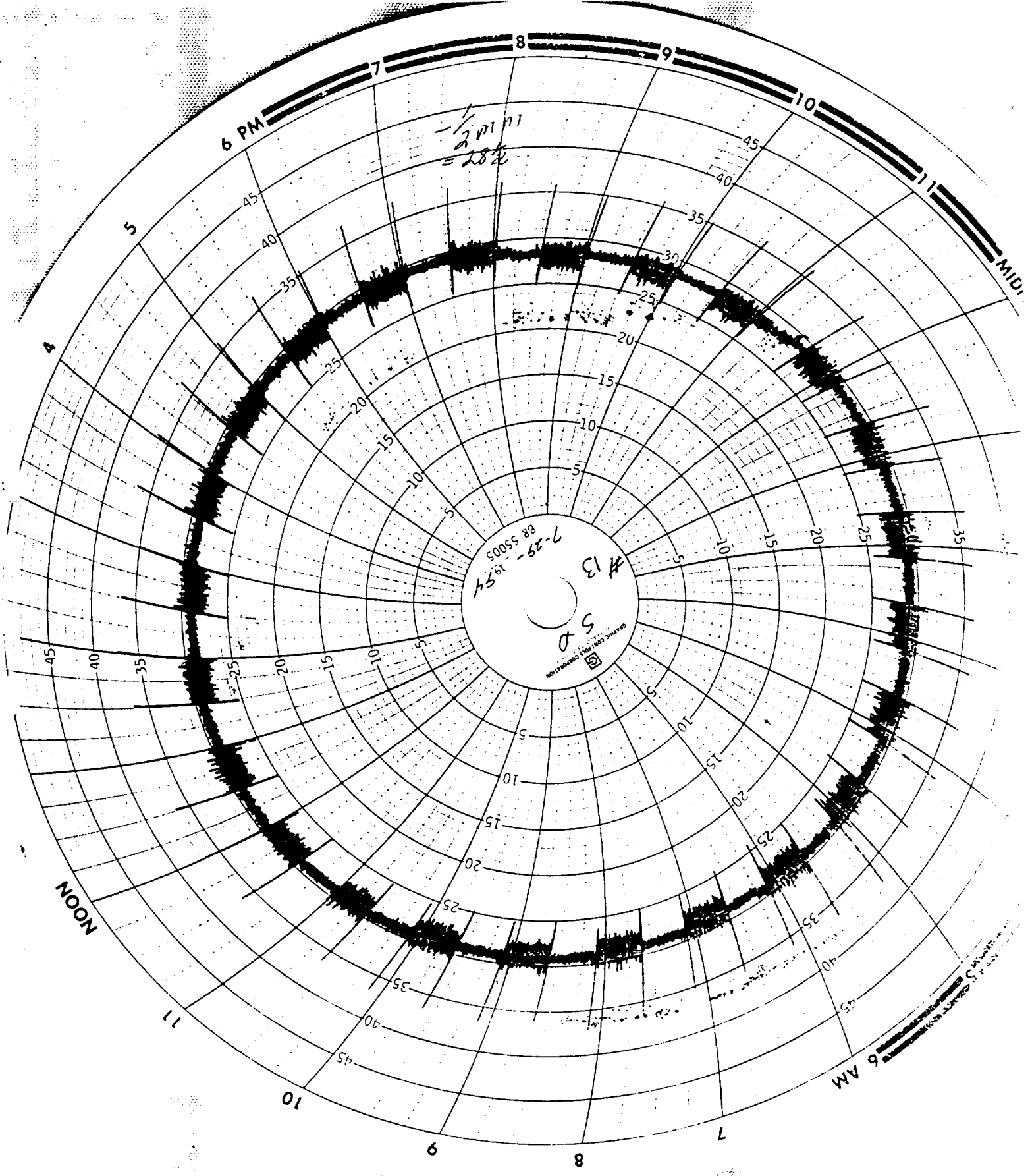
BB

Vol

KENT-TAYLOR







7-25-10 54
50
#13
RR 55005

20171
282

6 PM

MID.

6 AM

NOON

**COMPLIANCE DEMONSTRATION
NO. 13 BATTERY COMBUSTION STACK**

**USS CLAIRTON WORKS
A DIVISION OF USX CORPORATION
CLAIRTON, PENNSYLVANIA**

**APPENDIX C
GRAVIMETRIC AND ANALYTICAL RESULTS, EMISSIONS
CALCULATIONS**



TEST DATE

DATE RECEIVED :

DATE ANALYZED

ANALYTICAL METHOD

Analyst's Signature
Date

26/01 2022

STACK SAMPLING CALCULATIONS

CLIENT: USS CLAIRTON WORKS

TEST DATE: 07-28-94

TEST SITE #13 BATTERY COMBUSTION STACK

TEST NUMBER: CLR-BS#13-1

A.	Barometric Pressure	29.30	in. Hg	
B.	Static Pressure	-1.0	in. H2O	
C.	Stack Pressure	29.23	in. Hg	[A+(B/13.6)]
D.	Average Δ H	1.21	in. H2O	
E.	Meter Pressure	29.39	in. Hg	[A+(D/13.6)]
F.	Average Δ P	0.04	in. H2O	
G.	Pitot Coefficient	0.84		
H.	Gas Meter Coefficient	1.0172		
I.	Stack Diameter	120	in.	
J.	Stack Area	78.54	ft ²	(0.00545*I ²)
K.	Nozzle Diameter	0.490	in.	
L.	Nozzle Area	1.31E-03	ft ²	(0.00545*K ²)
M.	Average Stack Temperature	496	°F	
N.	Average Stack Temperature	956	°R	(460+M)
O.	Average Meter Temperature	90	°F	
P.	Average Meter Temperature	550	°R	(460+O)
Q.	Condensate Volume	253.9	mL	
R.	Absorbed H2O	22.1	mL	
S.	Total H2O	276.0	mL	(Q+R)
T.	Filter Weight	0.0203	g	
U.	Probe Weight	0.0341	g	
V.	Impinger Weight	0.0013	g	
W.	Total Weight	0.0557	g	(T+U+V)
X.	Metered Gas Volume	73.885	dcf	
Y.	Corrected Metered Gas Volume	75.156	dcf	(X*H)
Z.	H2O Gas Volume	13.822	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	88.978	cf	(Y+Z)
BB.	Percent H2O	15.5	%	(100*Z/AA)
CC.	Gas Volume Sampled	70.923	dscf	[Y*(528/P)*(E/29.92)]
DD.	Grain Loading	0.0121	gr/dscf	(15.43*W/CC)
EE.	Average Molecular Weight:			

Component	% Volume ÷100	*(1-BB/100)	* Mol. Weight	= Weight/Mol
H2O	0.155		18	2.796
CO2	0.060	0.845	44	2.230
CO	0.000	0.845	28	0.000
O2	0.105	0.845	32	2.838
N2	0.835	0.845	28	19.748

Average Molecular Weight

27.61 lb./lb. mol

FF.	Average Stack Velocity	15.6	fps	{85.49*G*[(F*N)/(C*EE)]^0.5}
GG.	Average Flow Rate	73700	acfm	(60*FF*J)
HH.	Standard Flow Rate	39800	scfm	[GG*(528/N)*(C/29.92)]
II.	Sample Time	7200	sec	
JJ.	Percent Isokinetic	105.4	%	{[100*CC*60*J]/[HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	3.49	lb/hr	[DD*HH*(1-BB/100)*60/7000]

STACK SAMPLING CALCULATIONS

CLIENT: USS CLAIRTON WORKS

TEST DATE: 07-28-94

TEST SITE #13 BATTERY COMBUSTION STACK

TEST NUMBER: CLR-BS#13-2

A.	Barometric Pressure	29.30	in. Hg	
B.	Static Pressure	-1.0	in. H2O	
C.	Stack Pressure	29.23	in. Hg	[A+(B/13.6)]
D.	Average Δ H	1.27	in. H2O	
E.	Meter Pressure	29.39	in. Hg	[A+(D/13.6)]
F.	Average Δ P	0.04	in. H2O	
G.	Pitot Coefficient	0.84		
H.	Gas Meter Coefficient	1.0172		
I.	Stack Diameter	120	in.	
J.	Stack Area	78.54	ft ²	(0.00545*I ²)
K.	Nozzle Diameter	0.490	in.	
L.	Nozzle Area	1.31E-03	ft ²	(0.00545*K ²)
M.	Average Stack Temperature	498	°F	
N.	Average Stack Temperature	958	°R	(460+M)
O.	Average Meter Temperature	106	°F	
P.	Average Meter Temperature	566	°R	(460+O)
Q.	Condensate Volume	275.4	mL	
R.	Absorbed H2O	21.3	mL	
S.	Total H2O	296.7	mL	(Q+R)
T.	Filter Weight	0.0178	g	
U.	Probe Weight	0.0310	g	
V.	Impinger Weight	0.0011	g	
W.	Total Weight	0.0499	g	(T+U+V)
X.	Metered Gas Volume	75.690	dcf	
Y.	Corrected Metered Gas Volume	76.992	dcf	(X*H)
Z.	H2O Gas Volume	15.312	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	92.304	cf	(Y+Z)
BB.	Percent H2O	16.6	%	(100*Z/AA)
CC.	Gas Volume Sampled	70.515	dscf	[Y*(528/P)*(E/29.92)]
DD.	Grain Loading	0.0109	gr/dscf	(15.43*W/CC)
EE.	Average Molecular Weight:			

Component	% Volume +100	*(1-BB/100)	* Mol. Weight	= Weight/Mol
H2O	0.166		18	2.986
CO2	0.060	0.834	44	2.202
CO	0.000	0.834	28	0.000
O2	0.105	0.834	32	2.803
N2	0.835	0.834	28	19.501

Average Molecular Weight

27.49 lb./lb. mol

FF.	Average Stack Velocity	15.7	fps	{85.49*G*[(F*N)/(C*EE)]*0.5}
GG.	Average Flow Rate	73900	acfm	(60*FF*J)
HH.	Standard Flow Rate	39800	scfm	[GG*(528/N)*(C/29.92)]
II.	Sample Time	7200	sec	
JJ.	Percent Isokinetic	106.2	%	{[100*CC*60*J]/[HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	3.11	lb/hr	[DD*HH*(1-BB/100)*60/7000]

STACK SAMPLING CALCULATIONS

CLIENT: USS CLAIRTON WORKS
TEST SITE #13 BATTERY COMBUSTION STACK

TEST DATE: 07-29-94
TEST NUMBER: CLR-BS#13-3

A.	Barometric Pressure	29.40	in. Hg	
B.	Static Pressure	-1.1	in. H2O	
C.	Stack Pressure	29.32	in. Hg	[A+(B/13.6)]
D.	Average Δ H	1.14	in. H2O	
E.	Meter Pressure	29.48	in. Hg	[A+(D/13.6)]
F.	Average Δ P	0.04	in. H2O	
G.	Pitot Coefficient	0.84		
H.	Gas Meter Coefficient	1.0172		
I.	Stack Diameter	120	in.	
J.	Stack Area	78.54	ft ²	(0.00545*I ²)
K.	Nozzle Diameter	0.490	in.	
L.	Nozzle Area	1.31E-03	ft ²	(0.00545*K ²)
M.	Average Stack Temperature	495	°F	
N.	Average Stack Temperature	955	°R	(460+M)
O.	Average Meter Temperature	93	°F	
P.	Average Meter Temperature	553	°R	(460+O)
Q.	Condensate Volume	263.7	mL	
R.	Absorbed H2O	18.2	mL	
S.	Total H2O	281.9	mL	(Q+R)
T.	Filter Weight	0.0150	g	
U.	Probe Weight	0.0415	g	
V.	Impinger Weight	0.0013	g	
W.	Total Weight	0.0578	g	(T+U+V)
X.	Metered Gas Volume	72.142	dcf	
Y.	Corrected Metered Gas Volume	73.383	dcf	(X*H)
Z.	H2O Gas Volume	14.157	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	87.540	cf	(Y+Z)
BB.	Percent H2O	16.2	%	(100*Z/AA)
CC.	Gas Volume Sampled	69.046	dscf	[Y*(528/P)*(E/29.92)]
DD.	Grain Loading	0.0129	gr/dscf	(15.43*W/CC)
EE.	Average Molecular Weight:			

Component	% Volume ÷100	*(1-BB/100)	* Mol. Weight	= Weight/Mol
H2O	0.162		18	2.911
CO2	0.065	0.838	44	2.397
CO	0.000	0.838	28	0.000
O2	0.105	0.838	32	2.817
N2	0.830	0.838	28	19.482

Average Molecular Weight

27.61

lb./lb. mol

FF.	Average Stack Velocity	15.6	fps	{85.49*G*[(F*N)/(C*EE)]^0.5}
GG.	Average Flow Rate	73500	acfm	(60*FF*I)
HH.	Standard Flow Rate	39800	scfm	[GG*(528/N)*(C/29.92)]
II.	Sample Time	7200	sec	
JJ.	Percent Isokinetic	103.4	%	{[100*CC*60*J]/[HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	3.69	lb/hr	[DD*HH*(1-BB/100)*60/7000]

RJ Lee Group, Inc.

350 Hochberg Road Monroeville, PA 15146
Phone (412) 325-1776 Fax (412) 733-1799

LABORATORY REPORT

Advanced Technology Systems, Inc.

339 Haymaker Road, Suite 201

Monroeville, PA 15146

Attention: Patrick Stockton

(412) 856-0662

Analysis: Determination of Sulfate in Solution

Method: Ion Chromatography

RJ Lee Group Job No.: INH408743

Samples Received: 10-Aug-94

Report Date: 12-Aug-94

Client Project: NA

Purchase Order No.: 29182

RECEIVED

AL

AMS

Sample Identification		Sulfate	Volume	Total mg
Client	RJ Lee Group	PPM	ml	
CLR-BS#13-1	0134074	204	50	10.2
CLR-BS#13-2	0134075	190	50	9.50
CLR-BS#13-3	0134076	426	50	21.3
CLR-BS#13-SO4-BLK	0134077	< 1.0	50	< 0.050

These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which the results are used or interpreted. Unless notified in writing to return the samples covered by this report, RJ Lee Group will store the samples for a period of thirty (30) days before discarding. A shipping and handling fee will be assessed for the return of any samples.

Analyst

Date

Monroeville, PA - Berkeley, CA - Washington, DC - Houston, TX

Chopra-Lee, Inc., Grand Island, NY

Monroeville AB1A Accreditation #460

Analyst PH
Date 8-12-94

CHAIN OF CUSTODY RECORD

PLANT CODE **IKM0202** PROJECT NAME **CLR** NUMBER OF CONTAINERS

SAMPLERS (Signature)

STA. NO.	DATE	TIME	W	O	C	STATION LOCATION
	7/28/94		✓			CLR-B5#13-1
	7/28/94		✓			CLR-B5#13-2
	7/29/94		✓			CLR-B5#13-3
	8/9/94		✓			CLR-B5#13-504-B/K. 1

CONDUCTIVITY

REMARKS OR OBSERVATIONS

TOTAL Vol. 50ml
↓ ↑

SO4 by Ion Chromatograph

Relinquished by: (Signature)

Date

Received by: (Signature)

Time

Relinquished by: (Signature)

Date

Received for Laboratory by: (Signature)

Time

Relinquished by: (Signature)

Date

Received by: (Signature)

Time

Relinquished by: (Signature)

Date

Received for Laboratory by: (Signature)

Time

Relinquished by: (Signature)

Date

Received by: (Signature)

Time

Relinquished by: (Signature)

Date

Received for Laboratory by: (Signature)

Time

Ice Chest Temp °C

Ice Chest #

Chain of Custody Tag #

*DISTRIBUTION: Original accompanies shipment; Copy to Coordinator Field Files.