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

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

USS CLAIRTON WORKS
CLAIRTON, PENNSYLVANIA

Report on

COMPLIANCE DEMONSTRATION
NO. 9 BATTERY COMBUSTION STACK

JUNE 1994

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Project No.: 3934-45-02

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EXECUTIVE SUMMARY

On May 11 and 12, 1994, a compliance test program was conducted for USS Clairton Works, Clairton, PA, on the #9 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 Amended Mon Valley Consent Decree, Paragraph V.A.(6) and Appendix 4.A.

The results of the testing showed an average particulate matter concentration and emission rate of 0.0152 grains per dry standard cubic feet (gr/dscf) and 4.72 pounds per hour (lb/hr), respectively. As promulgated by the Amended Mon Valley Consent Decree, Paragraph V.A.(6), the allowable particulate matter concentration for #9 Battery Combustion Stack is 0.030 gr/dscf. Thus, the average particulate matter concentration in the stack gas is less than the allowable concentration.

The opacity of the exhaust gas during any of the three tests was less than or equal to 10 percent. The average opacity of the exhaust gas in any 3 consecutive minute period was less than or equal to 5 percent. As promulgated by the Amended Mon Valley Consent Decree, Paragraph V.A.(6), 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."

1.0 INTRODUCTION

On May 11 and 12 1994, a compliance test program was conducted for USS Clairton Works, Clairton, PA, on the #9 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 Amended Mon Valley Consent Decree, Paragraph V.A.(6) and Appendix 4.A.

Testing was performed by Chester Environmental. All test procedures were witnessed by Phil Lawrence from the Allegheny County Health Department - Department of Air Quality (DAQ).

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. Three two-hour tests were executed during normal, maximum operation and production of the battery.

The process exhausts through a 114 inch inside 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 traverse point was sampled for 5 minutes, thus bringing the total sampling time to 120 minutes for each test run.

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 (CO_2), oxygen (O_2), and nitrogen (N_2, by difference) were determined with the use of Fyrite apparatus as specified by EPA Method 3. Gas concentrations were used to obtain molecular weight of the process gas on a dry basis.

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 were maintained. Clean up of the sampling train included an acetone rinse of the front-half components of the sample train. Front-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 was prepared in the same manner as the test sample rinses. The blank residue weight was subtracted from the test sample residue weights. After blank correction, the acetone rinse residue weights and sample train 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.

3.0 RESULTS

All testing was performed during periods of normal plant operation. The test results have been summarized in Table 1. The results of the testing showed an average particulate matter concentration and emission rate of 0.0152 grains per dry standard cubic feet (gr/dscf) and 4.72 pounds per hour (lb/hr), respectively. As promulgated by the Amended Mon Valley Consent Decree, Paragraph V.A.(6), the allowable particulate matter concentration for #9 Battery Combustion Stack is 0.030 gr/dscf. Thus, the average particulate matter concentration in the stack gas is 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 (^{O}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 gas volume sampled for each 120 minute test was greater than 50 dry standard cubic feet. 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. Isokinetic values for the three test runs were 95.1 percent, 98.7 percent, and 106.4 percent; therefore, all values were within the acceptable range. Actual test sampling times have also been included in Table 1.

Copies of the field data sheets for the visible emissions readings can be found in Appendix A. As promulgated by the Amended Mon Valley Consent Decree, Paragraph V.A.(6), 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." The opacity of the exhaust gas during any of the three tests was less than or equal to 10 percent. The average opacity of the exhaust gas in any 3 consecutive minute period was less than or equal to 5 percent.

Copies of the field data sheets can be found in Appendix A. 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.

Copies of the plant operational data can be found in Appendix B. The gravimetric results and the emissions calculations for each test can be found in Appendix C.

USS CLAIRTON WORKS
CLAIRTON, PA

TABLE 1

#9 BATTERY COMBUSTION STACK
PARTICULATE MATTER EMISSIONS DATA

		Run 1	Run 2	Run 3	Average
Test Number		CLR-BS#9-1	CLR-BS#9-2	CLR-BS#9-3	
Test Date		05-11-94	05-11-94	05-12-94	
Mass Emissions Rate and Concentration					
Particulate Matter	(lb/hr)	4.57	5.00	4.58	4.72
	(gr/dscf)	0.0142	0.0157	0.0157	0.0152
Stack Conditions					
Flow Rate	(acfm)	82700	82900	75800	80500
	(scfm)	43200	43100	39200	41800
	(dscfm)	37400	37200	33900	36200
Temperature	(°F)	533	537	540	537
Moisture Content	(%)	13.4	13.6	13.4	13.5
Sampling Conditions					
Test times		1040 to 1110	1320 to 1350	0818 to 0848	
		1114 to 1144	1353 to 1423	0852 to 0922	
		1147 to 1217	1426 to 1456	0925 to 0955	
		1220 to 1250	1500 to 1530	0958 to 1028	
Sampling Time	(minutes)	120	120	120	
Sample Volume	(dscf)	78.872	81.485	80.067	
Isokinetics	(%)	95.1	98.7	106.4	

CHESTER ENVIRONMENTAL

COMPLIANCE DEMONSTRATION
NO. 9 BATTERY COMBUSTION STACK

USS CLAIRTON WORKS
CLAIRTON, PENNSYLVANIA

APPENDIX A

TEST PROTOCOL, FIELD DATA SHEETS, CALIBRATION RESULTS

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TEST PROTOCOL
COMPLIANCE DEMONSTRATION
#9 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 (40 CFR, Part 60, Appendix A) and Sections 139.11 and 139.12 of the Pennsylvania Department of Environmental Resources (PA DER) Source Testing Manual. 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 114 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. Static pressure of the exhaust gas stream will be measured with the same pitot tube.

At the beginning and end of each test, gas concentrations of CO_2, O_2, and N_2 (by difference) will be determined with the use of Fyrite apparatus as specified by EPA Method 3. Gas concentrations will be used to obtain molecular weight of the process gas on a dry basis.

Percent moisture content, by volume, of the exhaust gas will 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 an acetone rinse of the front-half components of the sample train. Front-half acetone rinses will be evaporated to dryness, desiccated, and weighed to a constant weight. Sample train glass fiber 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 milligram. One acetone blank will be prepared in the same manner as the test sample rinses. The blank residue weight will be subtracted from the test sample residue weights. After blank correction, front-half acetone rinse residue weights and sample train filter weights will be used to determine total particulate matter catch. Clean up and analytical procedures will follow the methodology of EPA Method 5.

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.

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 Bureau of Air Quality, field data sheets for the particulate matter sampling and visible emissions determinations, computer-generated emissions calculations, and analytical results for each test.

STACK SAMPLING DATA SHEET

CLIENT USS- CLAIRTON WORKS
TEST UNIT BATTERY STACK #9
PROJECT NO. 3934-45-02
TEST CREW RPC, MV
BAROMETRIC PRESSURE 29.45

TEST DATE 05-11-94 (WED)
TEST NO. USS-CLR-BS9-#1
NOZZLE (SIZE,#) 0.490"
STATIC PRESSURE -.90" H_2O
PORT DIRECTION EAST, NORTH

ORIFICE CORRECTION (ΔH@) 1.814
METER CORRECTION (Y) 1.0128
CALIBRATION DATE 02-02-94
PITOT CORRECTION 0.84
CONTROL BOX NO. SIX

HOT/COLD BOX NO. 2
PROBE NO. 7-1
FILTER NO. 1228
STACK DIA. " 114
PORT SIZE 4" FLUSH

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H2O)	Orifice ΔH Actual (in. H2O)	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
40.6	10:40	488.250	.05	1.46	1.46	75	73	2.0	536	~250°F	<68°F	~250°F	5 min./point
28.5			.07	2.05	2.05	86	72	3.0	542				
20.2			.06	1.75	1.75	90	75	3.0	550				
13.5			.08	2.34	2.34	99	76	3.5	555				
7.6			.06	1.75	1.75	103	78	3.0	524				
2.4	11:10	509.254	.03	0.88	0.88	105	80	2.0	520				
40.6	11:14	509.254	.04	1.17	1.17	93	82	3.5	534				
28.5			.04	1.17	1.17	95	82	3.5	530				
20.2			.08	2.34	2.34	101	83	4.5	564				
13.5			.07	2.05	2.05	107	84	4.0	528				
7.6			.06	1.75	1.75	109	85	3.5	525				
2.4	11:44	529.300	.03	0.88	0.88	110	87	3.0	521				

Estimates:
MW= 28.
%H2O= 10.

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	5.0	<0.02CFM
After	7.0	<0.02CFM

PITOT LEAK CHECK

	Positive	Negative
Before	OK/15 SEC	OK/15 SEC
After	OK/15 SEC	OK/15 SEC

GAS	1	2
CO2	4.0	4.0
O2	12.5	12.5
CO	0	0
N2	83.5	83.5

12.55

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100 mL DI H_2O	728.4	532.2	196.2
2.	100 mL DI H_2O	594.3	559.1	35.2
3.	EMPTY	443.9	438.3	5.6
4.	SILICA GEL	677.3	655.8	21.5
5.				
6.				
7.				
8.			total=	258.5g

237.0g

CHESTER ENVIRONMENTAL

STACK SAMPLING DATA SHEET

CLIENT USS-CLAIRTON Works | TEST DATE 05-11-94 (WED) | ORIFICE CORRECTION (ΔH@) 1.814 | HOT/COLD BOX NO. 2

TEST UNIT BATTERY STACK #9 | TEST NO. USS-CLR-BS9-#1 | METER CORRECTION (Y) 1.028 | PROBE NO. 7-1

PROJECT NO. 3934-45-02 | NOZZLE (SIZE,#) 0.490" | CALIBRATION DATE 02-02-94 | FILTER NO. 1228

TEST CREW RPC MV | STATIC PRESSURE -0.90" H2O | PITOT CORRECTION 0.84 | STACK DIA. 114"

BAROMETRIC PRESSURE 29.45 | PORT DIRECTION WEST, SOUTH | CONTROL BOX NO. SIX | PORT SIZE 4" Flange

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H2O)	Orifice ΔH Actual (in. H2O)	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
40.6	1147	529.300	.09	2.63	2.63	95	87	3.5	523	~250°F	<68°F	~250°F	5 min./point
28.5			.07	2.05	2.05	107	86	3.0	557				
20.2			.07	2.05	2.05	108	87	3.0	520				
13.5			.06	1.75	1.75	110	87	3.0	534				
7.6			.05	1.46	1.46	111	87	2.5	541				
2.4	12:17	550.822	.03	.88	.88	110	88	2.0	520				
40.6	12:20	550.822	.08	2.34	2.34	101	89	3.5	538				
28.5			.06	1.75	1.75	109	88	3.0	529				
20.2			.06	1.75	1.75	110	88	3.0	520				
13.5			.04	1.17	1.17	110	89	2.0	525				
7.6			.05	1.46	1.46	109	89	2.5	532				
2.4	12:50	570.772	.03	.88	.88	110	89	2.0	537				
Test Totals	Δ=120 min	Δ=82.522 dcf	$(\Delta P)_{Avg}$ = .06	$(\Delta H)_{Avg}$ = 1.66		$(T_{meter})_{Avg}$ =	93		$(T_{stack})_{Avg}$ = 533				Estimates: MW= 28.8 %H2O= 10

SYSTEM LEAK CHECK

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

PITOT LEAK CHECK

	Positive	Negative
Before		
After		

GAS	1	2
CO2		
O2		
CO		
N2		

Impinger No.	Impinger Contents	Final	Initial	Difference
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				

CHESTER ENVIRONMENTAL

STACK SAMPLING DATA SHEET

CLIENT USS CLAIRTON WORKS
TEST UNIT BATTERY STACK #9
PROJECT NO. 3934-45-02
TEST CREW RPC, MV
BAROMETRIC PRESSURE 29.45

TEST DATE 05-11-94 (WED)
TEST NO. USS-CLR-BS9-#2
NOZZLE (SIZE,#) 0.490"
STATIC PRESSURE -0.90" H_2O
PORT DIRECTION SOUTH WEST

ORIFICE CORRECTION (ΔH@) 1.814
METER CORRECTION (Y) 1.0128
CALIBRATION DATE 02-02-94
PITOT CORRECTION 0.84
CONTROL BOX NO. SIX

HOT/COLD BOX NO. 3
PROBE NO. 7-1
FILTER NO. 1251
STACK DIA. 114
PORT SIZE 4" FLANGE

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H2O)	Orifice ΔH Actual (in. H2O)	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
406	13:20	571.050	.08	2.34	2.34	84	82	5.0	562	~250°F	<68°F	~250°F	5 min./point
285			.09	2.63	2.63	98	82	6.0	568				
202			.08	2.34	2.34	102	83	5.0	520				
135			.05	1.46	1.46	105	85	4.0	527				
76			.05	1.46	1.46	106	85	4.0	531				
24	13:50	593.595	.04	1.17	1.17	107	85	3.5	530				
406	13:53	593.595	.06	1.75	1.75	100	88	5.5	519				
285			.06	1.75	1.75	107	89	5.5	557				
202			.07	2.05	2.05	110	90	6.0	539				
135			.07	2.05	2.05	113	91	6.0	545				
76			.08	2.34	2.34	114	92	6.5	550				
24	14:23	615.500	.04	1.17	1.17	115	94	4.0	544				

Estimates:
MW= 28.8
%H2O= 12%

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	5.0	<0.02CFM
After	8.0	<0.02CFM

PITOT LEAK CHECK

	Positive	Negative
Before	0F/15SEC	0F/15SEC
After	0F/15SEC	0F/15SEC

GAS	1	2
CO2	4.0	4.0
O2	12.5	12.5
CO	0	0
N2	83.5	83.5

1440

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100 mL DI H_2O	693.2	539.5	153.7
2.	100 mL DI H_2O	634.5	571.2	63.3
3.	EMPTY	470.7	455.1	15.6
4.	SILICA GEL	668.5	630.8	37.7
5.				
6.				
7.			total =	270.3
8.				

232.0

CHESTER ENVIRONMENTAL

STACK SAMPLING DATA SHEET

CLIENT USS-CLAIRTON WORKS | TEST DATE 05-11-94 (USED) | ORIFICE CORRECTION (ΔH@) 1.814 | HOT/COLD BOX NO. 3
TEST UNIT BATTERY STACK #9 | TEST NO. USS-CLR-BS9-#2 | METER CORRECTION (Y) 1.0128 | PROBE NO. 7-1
PROJECT NO. 3934-AT-02 | NOZZLE (SIZE,#) 0.490" | CALIBRATION DATE 02-02-94 | FILTER NO. 1251
TEST CREW RPC, MV | STATIC PRESSURE -.90 "H2O | PITOT CORRECTION 0.84 | STACK DIA. 114"
BAROMETRIC PRESSURE 29.45 | PORT DIRECTION NORTH EAST | CONTROL BOX NO. 5,6 | PORT SIZE 4" flange

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H2O)	Orifice ΔH Actual (in. H2O)	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
40.6	14:26	615.500	.08	2.34	2.34	109	95	6.0	509	~250°F	<68°F	~250°F	5 min./point
28.5			.09	2.63	2.63	114	95	7.0	524				
20.2			.05	1.46	1.46	114	95	4.0	530				
13.5			.06	1.75	1.75	115	95	5.0	537				
7.6			.05	1.46	1.46	116	95	4.5	540				
2.4	14:56	636.612	.03	.88	.88	116	96	3.5	530				
40.6	15:00	636.612	.08	2.34	2.34	105	95	6.5	513				
28.6			.06	1.75	1.75	115	95	5.5	540				
20.2			.06	1.75	1.75	117	97	5.5	549				
13.5			.05	1.46	1.46	117	97	4.0	554				
7.6			.06	1.75	1.75	117	97	5.5	550				
2.4	15:30	657.511	.03	0.88	0.88	118	98	2.5	529				
Test Totals	Δ=120 min	Δ=86.461 dcf	$(\Delta P)_{Avg}$ = .06	$(\Delta H)_{Avg}$ = 1.79		$(T_{meter})_{Avg}$ = 101°F			$(T_{stack})_{Avg}$ = 537°F				Estimates: MW= 28.8 %H2O= 12%

SYSTEM LEAK CHECK

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

PITOT LEAK CHECK

	Positive	Negative
Before		
After		

GAS	1	2
CO2		
O2		
CO		
N2		

Impinger No.	Impinger Contents	Final	Initial	Difference
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				

CHESTER ENVIRONMENTAL

STACK SAMPLING DATA SHEET

CLIENT USS CLAIRTON WORKS | TEST DATE 05-12-94 (THUR.) | ORIFICE CORRECTION (ΔH@) 1.814 | HOT/COLD BOX NO. 2
TEST UNIT BATTERY STACK #9 | TEST NO. USS-CLR-B59-#3 | METER CORRECTION (Y) 1.0128 | PROBE NO. 7-1
PROJECT NO. 3934-45-02 | NOZZLE (SIZE,#) 0.490" | CALIBRATION DATE 02-02-94 | FILTER NO. 1248
TEST CREW RPC MV | STATIC PRESSURE -.90" H2O | PITOT CORRECTION 0.84 | STACK DIA. 114"
BAROMETRIC PRESSURE 29.38 | PORT DIRECTION EAST, NORTH | CONTROL BOX NO. six | PORT SIZE 4" Flange

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H2O)	Orifice ΔH Actual (in. H2O)	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
406	08:18	657.940	.06	1.68	1.68	64	63	2.0	545	~250°F	<68°F	~250°	5 min./point
285			.08	2.23	2.23	76	63	3.5	560				
202			.09	2.51	2.51	83	65	3.5	538				
135			.06	1.68	1.68	83	65	3.5	540				
76			.04	1.12	1.12	88	68	2.0	536				
24	0848	679.465	.04	1.12	1.12	89	69	2.0	542				
406	08:52	679.465	.07	1.96	1.96	78	69	3.5	522				
285			.09	2.51	2.51	88	70	4.0	563				
202			.06	1.68	1.68	89	70	2.5	538				
135			.06	1.68	1.68	88	71	2.5	541				
76			.03	0.84	0.84	88	70	1.0	557				
24	0922	699.635	.03	0.84	0.84	89	70	1.0	552				
													Estimates:
													MW= 28
													%H2O= 2

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	5.0	<0.02 cfm
After	6.0	<0.02 cfm

PITOT LEAK CHECK

	Positive	Negative
Before	OK/15 sec	OK/15 sec
After	OK/15 sec	OK/15 sec

GAS	1	2	
CO2	4.5	4.5	9/100
O2	12.0	12.0	
CO	0	0	
N2	83.5	83.5	

Impinger No.	Impinger Contents	Final	Initial	Difference	
1.	100 mL DI H2O	727.9	533.2	194.7	241.3g
2.	100 mL DI H2O	635.4	594.3	41.1	
3.	EMPTY	449.4	443.9	5.5	
4.	SILICA GEL	672.8	652.5	20.30	
5.					
6.					
7.					
8.			total =	261.6g	13.3%

CHESTER ENVIRONMENTAL

STACK SAMPLING DATA SHEET

CLIENT USS-CLAIRTON WORKS
TEST UNIT BATTERY STACK 9
PROJECT NO. 3934-45-02
TEST CREW RPC MV
BAROMETRIC PRESSURE 29.38

TEST DATE 05-12-94 (TUE)
TEST NO. US-CLR-BS9-3
NOZZLE (SIZE,#) 0.490"
STATIC PRESSURE -.90"
PORT DIRECTION WEST SOUTH

ORIFICE CORRECTION (ΔH@) 1.814
METER CORRECTION (Y) 1.0128
CALIBRATION DATE 02-02-94
PITOT CORRECTION 0.84
CONTROL BOX NO. 5-X

HOT/COLD BOX NO. 2
PROBE NO. 7-1
FILTER NO. 1248
STACK DIA. 114"
PORT SIZE 4" flange

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H2O)	Orifice ΔH Actual (in. H2O)	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
406	09:25	699.635	.07	1.96	1.96	76	68	3.0	536	~250°F	<68	~250°	5 min./point
285			.08	2.23	2.23	84	68	3.0	528				
202			.05	1.40	1.40	86	68	2.0	529				
135			.05	1.40	1.40	86	67	2.0	530				
76			.03	0.84	0.84	86	68	1.0	530				
24	09:55	719.848	.04	1.12	1.12	87	68	1.0	528				
406	09:58	719.848	.08	2.23	2.23	75	68	3.0	510				
285			.06	1.68	1.68	85	68	2.5	539				
202			.07	1.96	1.96	87	69	3.0	546				
135			.05	1.40	1.40	87	69	2.0	550				
76			.03	0.84	0.84	87	69	1.0	557				
24	10:28	739.348	.03	0.84	0.84	84	68	1.0	554				
Test Totals	Δθ=120 min.	ΔV=81.488 dcf	$(\Delta P)_{Avg}$=	$(\Delta H)_{Avg}$=		$T_{meter\,Avg}$=			$T_{stack\,Avg}$=				
			(.05)	(1.57)			(76°F)		(540°F)				

Estimates:
MW= 28.8
%H2O= 12

SYSTEM LEAK CHECK

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

PITOT LEAK CHECK

	Positive	Negative
Before		
After		

GAS	1	2
CO2		
O2		
CO		
N2		

Impinger No.	Contents	Final	Initial	Difference
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				

CHESTER ENVIRONMENTAL

VISIBLE EMISSIONS OBSERVATIONS FORM

OBSERVER: Mark Zaleski

DATE: 5-11-94

FACILITY: USX - Clairton

OBSERVATION: START TIME: 10:35

END TIME: 11:35

OBSERVATION POINT: Parking lot outside main gate Maple st.

SOURCE:

DISTANCE: 950'

DIRECTION FROM: S

HEIGHT: 200'

MIND:

SPEED: 17 mph

DIRECTION: SW

TEMPERATURE: 60°

SKY CONDITION: 25% Cloud Cover

BACKGROUND: Sky

READING CONDITIONS: fair

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 240

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 0

CREW: ____ FOREMAN: ____

COMMENTS: ____

9 STACK

0	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0

30	0	0	0	0
31	0	0	0	0
32	0	0	0	0
33	0	0	0	0
34	0	0	0	0
35	0	0	0	0
36	0	0	0	0
37	0	0	0	0
38	0	0	0	0
39	0	0	0	0
40	0	0	0	0
41	0	0	0	0
42	0	0	0	0
43	0	0	0	0
44	0	0	0	0
45	0	0	0	0
46	0	0	0	0
47	0	0	0	0
48	0	0	0	0
49	0	0	0	0
50	0	0	0	0
51	0	0	0	0
52	0	0	0	0
53	0	0	0	0
54	0	0	0	0
55	0	0	0	0
56	0	0	0	0
57	0	0	0	0
58	0	0	0	0
59	0	0	0	0

VISIBLE EMISSIONS OBSERVATIONS FORM

9 STACK

OBSERVER: Mark Zaleski

DATE: 5-11-94

FACILITY: USX-Clairton

OBSERVATION: START TIME: 11:35

END TIME: 12:35

OBSERVATION POINT:

Parking lot at Maple St gate

SOURCE: Batt. 9. Stack

DISTANCE: 950'

DIRECTION FROM: S

HEIGHT: 200'

WIND:

SPEED: 17

DIRECTION: SW

TEMPERATURE: 61

SKY CONDITION: 50% clouds

BACKGROUND: Sky

READING CONDITIONS: Fair

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 240

No. READINGS >= 20%: 0

No. READINGS >= 60%: 0

GREATEST OPACITY: 0

CREW: ____ FOREMAN: ____

COMMENTS: ____

0	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0

30	0	0	0	0
31	0	0	0	0
32	0	0	0	0
33	0	0	0	0
34	0	0	0	0
35	0	0	0	0
36	0	0	0	0
37	0	0	0	0
38	0	0	0	0
39	0	0	0	0
40	0	0	0	0
41	0	0	0	0
42	0	0	0	0
43	0	0	0	0
44	0	0	0	0
45	0	0	0	0
46	0	0	0	0
47	0	0	0	0
48	0	0	0	0
49	0	0	0	0
50	0	0	0	0
51	0	0	0	0
52	0	0	0	0
53	0	0	0	0
54	0	0	0	0
55	0	0	0	0
56	0	0	0	0
57	0	0	0	0
58	0	0	0	0
59	0	0	0	0

VISIBLE EMISSIONS OBSERVATIONS FORM

9 STACK

OBSERVER: Mark Zaleski

DATE: 5-11-94

FACILITY: USX-Clairton

OBSERVATION: START TIME: 12:35

END TIME: 1:35

OBSERVATION POINT: Parking Lot of Maplest gate

SOURCE: Batt. 9 stack

DISTANCE: 950'

DIRECTION FROM: SE

HEIGHT: 200'

WIND:

SPEED: 17mph

DIRECTION: SW

TEMPERATURE: 48

SKY CONDITION: Mostly Cloudy

BACKGROUND: sky

READING CONDITIONS: fair

COLOR OF EMISSION:

TOTAL No. OF READINGS: 240

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 0

CREW: FOREMAN:

COMMENTS:

0	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0

30	0	0	0	0
31	0	0	0	0
32	0	0	0	0
33	0	0	0	0
34	0	0	0	0
35	0	0	0	0
36	0	0	0	0
37	0	0	0	0
38	0	0	0	0
39	0	0	0	0
40	0	0	0	0
41	0	0	0	0
42	0	0	0	0
43	0	0	0	0
44	0	0	0	0
45	0	0	0	0
46	0	0	0	0
47	0	0	0	0
48	0	0	0	0
49	0	0	0	0
50	0	0	0	0
51	0	0	0	0
52	0	0	0	0
53	0	0	0	0
54	0	0	0	0
55	0	0	0	0
56	0	0	0	0
57	0	0	0	0
58	0	0	0	0
59	0	0	0	0

VISIBLE EMISSIONS OBSERVATIONS FORM

OBSERVER: Mark Zaleski

DATE: 5-11-94

FACILITY: USX-Clairton

OBSERVATION: START TIME: 1:35

END TIME: 2:35

OBSERVATION POINT: Maple St gate parking lot

SOURCE: Batt. 9 Stack

DISTANCE: 950'

DIRECTION FROM: S

HEIGHT: 200'

WIND:

SPEED: 10mph

DIRECTION: SW

TEMPERATURE: 69

SKY CONDITION: Mostly Cloudy

BACKGROUND: Sky

READING CONDITIONS: fair

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 240

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 0

CREW: ____ FOREMAN: ____

COMMENTS: ____

9 STACK

0	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0

30	0	0	0	0
31	0	0	0	0
32	0	0	0	0
33	0	0	0	0
34	0	0	0	0
35	0	0	0	0
36	0	0	0	0
37	0	0	0	0
38	0	0	0	0
39	0	0	0	0
40	0	0	0	0
41	0	0	0	0
42	0	0	0	0
43	0	0	0	0
44	0	0	0	0
45	0	0	0	0
46	0	0	0	0
47	0	0	0	0
48	0	0	0	0
49	0	0	0	0
50	0	0	0	0
51	0	0	0	0
52	0	0	0	0
53	0	0	0	0
54	0	0	0	0
55	0	0	0	0
56	0	0	0	0
57	0	0	0	0
58	0	0	0	0
59	0	0	0	0

VISIBLE EMISSIONS OBSERVATIONS FORM

OBSERVER: Mark Zaleski

DATE: 5-11-94

FACILITY: USX - Clairton

OBSERVATION: START TIME: 2:35

END TIME: 3:35

OBSERVATION POINT:
Maple St gate Parking Lot

SOURCE:

DISTANCE: 950'

DIRECTION FROM: S

HEIGHT: 200'

WIND:

SPEED: 17mph

DIRECTION: SW

TEMPERATURE: 74

SKY CONDITION: Mostly Cloudy

BACKGROUND: Sky

READING CONDITIONS: Fair

COLOR OF EMISSION: Black

TOTAL No. OF READINGS: 236

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 10

CREW: ____ FOREMAN: ____

COMMENTS: ____

9 STACK

0	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	5
15	5	10	10	10
16	5	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0

30	0	0	0	0
31	0	0	0	0
32	0	0	0	0
33	0	0	0	0
34	0	0	0	0
35	0	0	0	0
36	0	0	0	0
37	0	0	0	0
38	0	0	0	0
39	0	0	0	0
40	0	0	0	0
41	0	0	0	0
42	0	0	0	0
43	0	0	0	0
44	0	0	0	0
45	0	0	0	0
46	0	0	0	0
47	0	0	0	0
48	0	0	0	0
49	0	0	0	0
50	0	0	0	0
51	0	0	0	0
52	0	0	0	0
53	0	0	0	0
54	0	0	0	0
55	0	0	0	0
56				
57				
58				
59				

VISIBLE EMISSIONS OBSERVATIONS FORM

OBSERVER: Mark Zaleski

DATE: 5-12-94

FACILITY: USX - Clairton

OBSERVATION: START TIME: 8:00

END TIME: 9.00

OBSERVATION POINT:

Maple St gate parkinglot

SOURCE: Batt. 9 Stack

DISTANCE: 950'

DIRECTION FROM: S

HEIGHT: 200'

WIND:

SPEED: 14 mph

DIRECTION: NW

TEMPERATURE: 53°F

SKY CONDITION: Mostly Cloudy

BACKGROUND: Sky

READING CONDITIONS: fair

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 240

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 0

CREW: ____ FOREMAN: ____

COMMENTS: ____

9 STACK

0	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0

30	0	0	0	0
31	0	0	0	0
32	0	0	0	0
33	0	0	0	0
34	0	0	0	0
35	0	0	0	0
36	0	0	0	0
37	0	0	0	0
38	0	0	0	0
39	0	0	0	0
40	0	0	0	0
41	0	0	0	0
42	0	0	0	0
43	0	0	0	0
44	0	0	0	0
45	0	0	0	0
46	0	0	0	0
47	0	0	0	0
48	0	0	0	0
49	0	0	0	0
50	0	0	0	0
51	0	0	0	0
52	0	0	0	0
53	0	0	0	0
54	0	0	0	0
55	0	0	0	0
56	0	0	0	0
57	0	0	0	0
58	0	0	0	0
59	0	0	0	0

VISIBLE EMISSIONS OBSERVATIONS FORM

OBSERVER: Mark Zaleski

DATE: 5-12-94

FACILITY: USX - Clairton

OBSERVATION: START TIME: 9:00

END TIME: 10:00

OBSERVATION POINT:

Maple St gate parking lot

SOURCE: Batt. 9 Stack

DISTANCE: 950'

DIRECTION FROM: S

HEIGHT: 200'

WIND:

SPEED: 14 mph

DIRECTION: NW

TEMPERATURE: 50

SKY CONDITION: Overcast

BACKGROUND: Sky

READING CONDITIONS: fair

COLOR OF EMISSION: -

TOTAL No. OF READINGS: 240

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 0

CREW: ____ FOREMAN: ____

COMMENTS: ____

9 STACK

0	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0

30	0	0	0	0
31	0	0	0	0
32	0	0	0	0
33	0	0	0	0
34	0	0	0	0
35	0	0	0	0
36	0	0	0	0
37	0	0	0	0
38	0	0	0	0
39	0	0	0	0
40	0	0	0	0
41	0	0	0	0
42	0	0	0	0
43	0	0	0	0
44	0	0	0	0
45	0	0	0	0
46	0	0	0	0
47	0	0	0	0
48	0	0	0	0
49	0	0	0	0
50	0	0	0	0
51	0	0	0	0
52	0	0	0	0
53	0	0	0	0
54	0	0	0	0
55	0	0	0	0
56	0	0	0	0
57	0	0	0	0
58	0	0	0	0
59	0	0	0	0

VISIBLE EMISSIONS OBSERVATIONS FORM

OBSERVER: Mark Zaleski

9 STACK

DATE: 5-12-94

FACILITY: USX - Clairton

OBSERVATION: START TIME: 10:00

END TIME: 11:00

OBSERVATION POINT: Maplest. gate parking lot

SOURCE: Batt. 9 Stack

DISTANCE: 950'

DIRECTION FROM: S

HEIGHT: 200'

WIND:

SPEED: 14 mph

DIRECTION: N

TEMPERATURE: 49

SKY CONDITION: Overcast

BACKGROUND: Sky

READING CONDITIONS: fair

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 240

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 0

CREW: ____ FOREMAN: ____

COMMENTS: ____

0	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0

30	0	0	0	0
31	0	0	0	0
32	0	0	0	0
33	0	0	0	0
34	0	0	0	0
35	0	0	0	0
36	0	0	0	0
37	0	0	0	0
38	0	0	0	0
39	0	0	0	0
40	0	0	0	0
41	0	0	0	0
42	0	0	0	0
43	0	0	0	0
44	0	0	0	0
45	0	0	0	0
46	0	0	0	0
47	0	0	0	0
48	0	0	0	0
49	0	0	0	0
50	0	0	0	0
51	0	0	0	0
52	0	0	0	0
53	0	0	0	0
54	0	0	0	0
55	0	0	0	0
56	0	0	0	0
57	0	0	0	0
58	0	0	0	0
59	0	0	0	0

VISIBLE EMISSIONS OBSERVATIONS FORM

OBSERVER: Mark Zaleski

DATE: 5-12-94

FACILITY: USX Clairton

OBSERVATION: START TIME: 11:00

END TIME: 1130

OBSERVATION POINT:
Maple St. gate parking lot

SOURCE: Batt. 9 Stack

DISTANCE: 950'

DIRECTION FROM: S

HEIGHT: 200'

WIND:

SPEED: 14mph

DIRECTION: N

TEMPERATURE: 50

SKY CONDITION: Overcast

BACKGROUND: Sky

READING CONDITIONS: fair

COLOR OF EMISSION: Black

TOTAL No. OF READINGS: 120

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 10

CREW: ____ FOREMAN: ____

COMMENTS: ____

9 STACK

0	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	5	5	5
24	5	5	5	10
25	10	10	5	5
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0

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CONTROL BOX CALIBRATION

THREE POINT CALIBRATION

BOX # 6 BP 29 In. Hg
DATE 02-02-94 OPERATOR RPC

	WET TEST METER				DRY TEST METER						
	TIME (min)	TEMP TW	VOLUME VM	PRESSURE PW	TEMP IN TI	TEMP OUT TO	TEMP AVG TA	ORIFICE PD	VOLUME VD	METER COEFFICIENT Y	ORIFICE COEFFICIENT ΔH@
START			0.000	29.00					265.100		
HALF		69.0			90.0	76.0	83.0	0.50			
STOP	12.90		5.000						270.200		
CALCULATION	12.90	529.0	5.013	29.00							
START			0.000	29.00			543.0	29.04	5.100	1.0076	1.866
HALF		69.0			96.0	82.0		1.00	270.500		
STOP	9.00		5.000				89.0				
CALCULATION	9.00	529.0	5.013	29.00					275.602		
START			0.000	29.00			549.0	29.07	5.102	1.0170	1.796
HALF		69.0			96.0	81.0		2.00	276.100		
STOP	6.33		5.000				88.5				
CALCULATION	6.33	529.0	5.013	29.00					281.200		
AVERAGE							548.5	29.15	5.100	1.0139	1.779
										1.0128	1.814

POST TEST

BOX # 6 BP 29.00 in. Hg
DATE 06-09-94 OPERATOR RPC

	WET TEST METER				DRY TEST METER					METER COEFFICIENT Y	ORIFICE COEFFICIENT ΔH@
	TIME (min)	TEMP TW	VOLUME VM	PRESSURE PW	TEMP IN TI	TEMP OUT TO	TEMP AVG TA	ORIFICE PD	VOLUME VD		
START			0.000	29.00				1.70	135.300		
HALF		78.0			112.0	96.0	104.0				
STOP	6.95		5.000						140.394		
CALCULATION	6.95	538.0	5.013	29.00			564.0	29.13	5.094	1.0271	1.833
START			0.000	29.00				1.70	140.900		
HALF		78.0			116.0	97.0	106.5				
STOP	7.00		5.000						146.000		
CALCULATION	7.00	538.0	5.013	29.00			566.5	29.13	5.100	1.0305	1.852
START			0.000	29.00				1.70	146.700		
HALF		78.0			117.0	97.0	107.0				
STOP	7.00		5.000						151.809		
CALCULATION	7.00	538.0	5.013	29.00			567.0	29.13	5.109	1.0296	1.850
AVERAGE										1.0291	1.845
DIFFERENCE										-1.6%	-1.7%

PRE-TEST MAGNEHELIC CALIBRATION
BOX# 6
DATE 02-02-94
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

0 to 5" H2O RANGE

MAGNEHELIC

Δ H	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 02-02-94
OPERATOR RPC

	START CF	STOP CF	VOLUME CF	TIME (min)	LEAK RATE
DRY	264.400	264.560	0.160	10.000	-0.001
WET	0.000	0.150	0.150		

PYROMETER CALIBRATION
DATE 04-28-88
OPERATOR AGL

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

PRE-TEST PYROMETER CHECK
DATE 02-02-94
OPERATOR RPC

VOLTAGE INPUT (mV)	TARGET TEMP (°F)	TEMP READING (°F)
0.18	40	40.0
0.40	50	50.0
0.84	70	70.0
1.29	90	90.0
1.74	110	110.0
2.66	150	150.0
3.82	200	200.0
6.09	300	300.0
8.31	400	400.0
10.57	500	500.0

POST-TEST MAGNEHELIC CALIBRATION
BOX# 6
DATE 06-09-94
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

0 to 5" H2O RANGE

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 06-09-94
OPERATOR RPC

	START CF	STOP CF	VOLUME CF	TIME (min)	LEAK RATE
DRY	134.261	134.471	0.210	10.000	-0.0000
WET	0.000	0.210	0.210		

PYROMETER CALIBRATION
DATE 04-28-88
OPERATOR AGL

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

POST-TEST PYROMETER CHECK
DATE 06-09-94
OPERATOR RPC

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

QA ORIFICE AUDIT

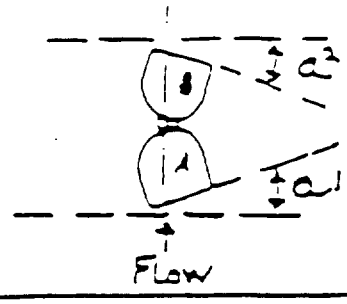
ORIFICE BAPC-3 DATE 06-09-94 B.P. 29.00
OPERATOR RPC BOX # 6

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	
	IN	OUT	IN	OUT	IN	OUT
TEMP INITIAL	105	100	102	98	102	97
TEMP 5 MIN	102	99	101	97	102	97
TEMP 10 MIN	102	98	102	97	103	98
TEMP 15 MIN	102	98	102	97	103	98
		TEMP R		TEMP R		TEMP R
TEMP AVG	100.75	560.75	99.5	559.5	100	560
TIME (MIN.)	15.00		15.00		15.00	
	N WATE	IN HG	IN WATER	IN HG	IN WATER	IN HG
ORIFICE	0.75	0.06	0.75	0.06	0.75	0.06
METER PRESSURE		29.06		29.06		29.06
	°F	°C	°F	°C	°F	°C
AMBIENT TEMP.	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 # XCF-59
Precheck
Post Check

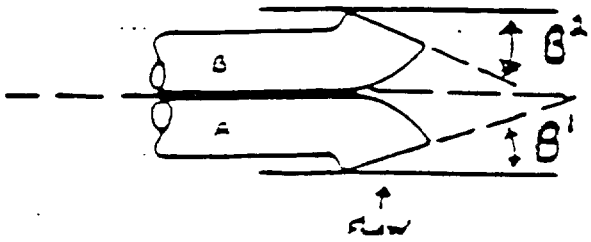
Probe #: 7-1
Date: 1-24-94
Initials: JM

① 

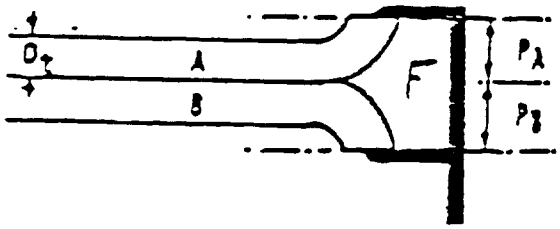
a^1 = 1.0°
a^2 = 4.0°
$a^1, a^2 = <10°$

B^1 = 1.0°
B^2 = 1.0°
$B^1, B^2 = <5°$

F = 1.042"

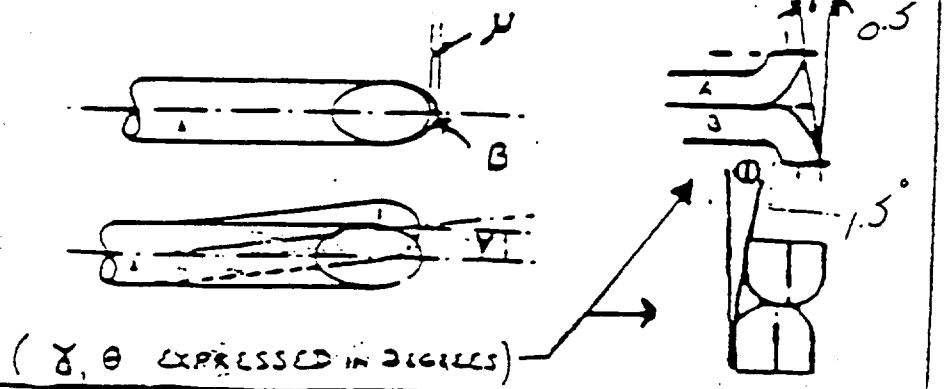
② 

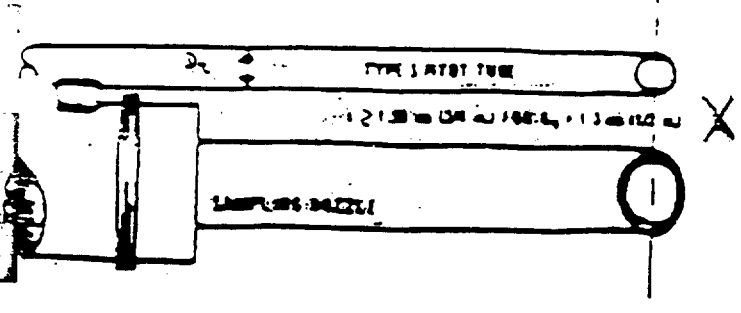
μ = .0008 — $\mu = \leq 0.1250"$ ($\mu = F \tan\gamma$)
V = 0.0262 — $V = \leq 0.03125"$ ($V = F \tan\theta$)
W = 1.160 — $W \geq 0"$

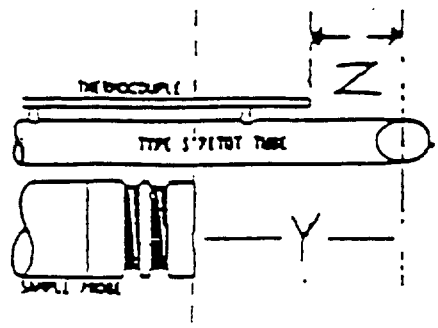
③ 

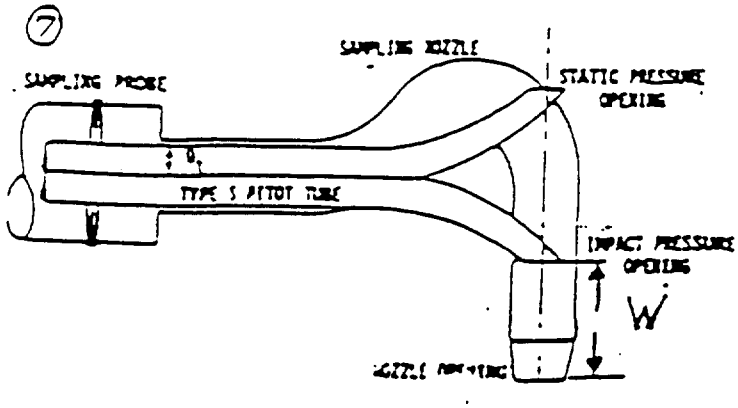
$1.05\ D_t < A < 1.50\ D_t$
$P_A = P_B$
$2.10\ D_t < A < 3.00\ D_t$

X = 1.491 — $X \geq 0.750"$ (3/4" using 1/2" nozzle)
Y = 6.000 — $Y \geq 3.0"$
Z = 2.551 — $Z > 2.0"$
D_t = .374 — $D_t > .1875"$

④ 

⑤ 

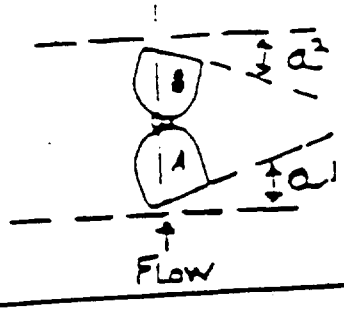
⑥ 

⑦ 

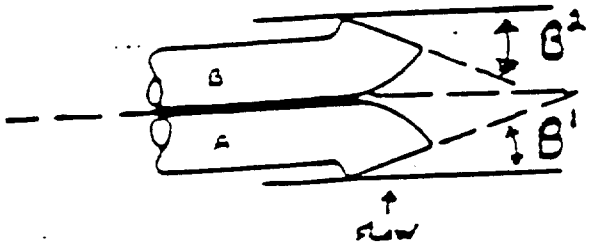
GEOMETRIC PITOT CALIBRATION

Caliper # XEF-59
Precheck
Post Check

Probe #: 7-1
Date: 06-10-94
Initials: RFC

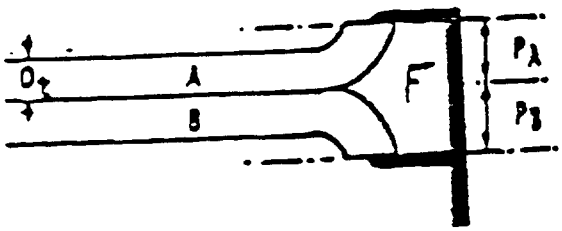


a^1 = 1°
a^2 = 2°
$a^1, a^2 = <10°$



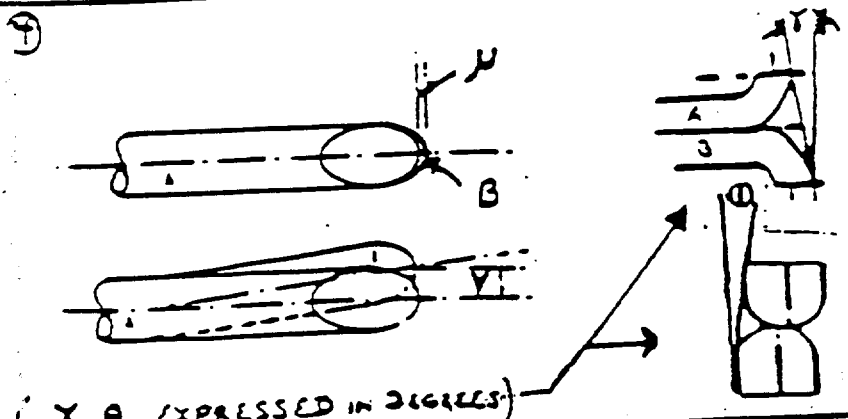
B^1 = 1°
B^2 = 1°
$B^1, B^2 = <5°$

F = 1.50"

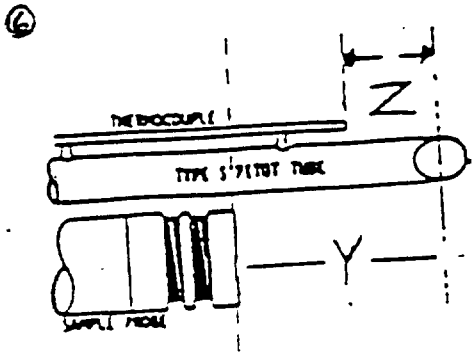


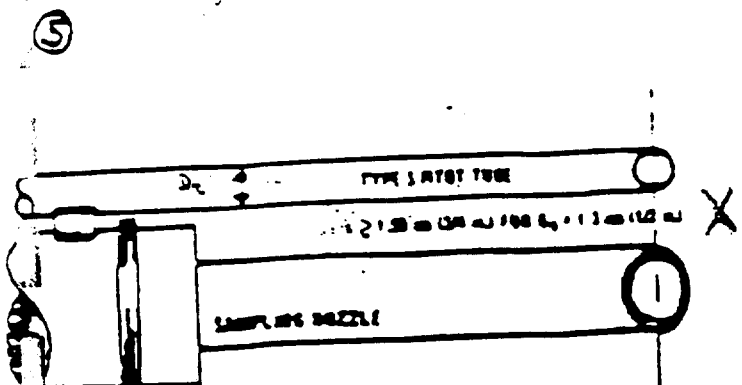
$1.05\ D_t < A < 1.50\ D_t$
$P_A = P_B$
$2.10\ D_t < B < 3.00\ D_t$

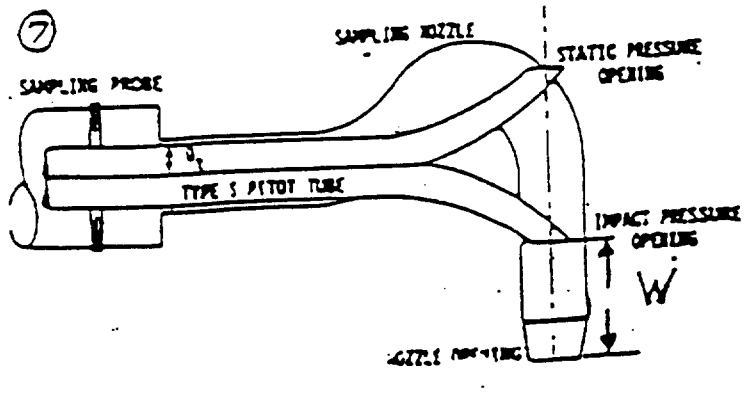
μ = 0 — μ = ≤ 0.1250" ($\mu = F \tan \gamma$)
V = 0 — V = ≤0.03125" ($V = F \tan \theta$)
W = .25 — W ≥ 0"
X = .850 — X ≥ 0.750" (3/4" using 1/2" nozzle)
Y = 6.10 — Y ≥ 3.0"
Z = 2.6 — Z > 2.0"
D_t = .390 — D_t > .1875"



(γ, θ EXPRESSED IN DEGREES)







COMPLIANCE DEMONSTRATION
NO. 9 BATTERY COMBUSTION STACK

USS CLAIRTON WORKS
CLAIRTON, PENNSYLVANIA

APPENDIX B

PLANT OPERATIONAL DATA

CHESTER
ENVIRONMENTAL

Batteries: 7-9_2

Oven	Last Pushed	Earliest	Desired	Latest
A20/8	18:39	11:49pm	12:00am	12:11am
B21/7	18:44	11:55pm	12:05am	12:15am
B20/7	18:44	12:00am	12:11am	12:22am
A22/8	18:44	12:05am	12:17am	12:28am
B22/7	18:44	12:11am	12:22am	12:34am
A24/8	18:44	12:17am	12:28am	12:40am
B24/7	18:44	12:22am	12:34am	12:46am
A26/8	18:44	12:28am	12:40am	12:51am
B26/7	18:44	12:34am	12:46am	12:57am
A28/8	18:44	12:40am	12:52am	1:03am
B28/7	18:44	12:46am	12:58am	1:09am
A30/8	18:44	12:51am	1:04am	1:15am
B30/7	18:44	12:57am	1:10am	1:21am
A1 /9	18:44	1:03am	1:16am	1:27am
B1 /8	18:43	1:05am	1:16am	1:27am
A3 /9	18:44	1:10am	1:21am	1:33am
B3 /8	18:44	1:16am	1:27am	1:38am
A5 /9	18:44	1:22am	1:33am	1:44am
B5 /8	18:44	1:28am	1:39am	1:50am
A7 /9	18:44	1:34am	1:45am	1:56am
B7 /8	18:44	1:40am	1:51am	2:02am
A9 /9	19:42	1:46am	1:57am	2:06am
B9 /8	18:44	1:51am	2:02am	2:13am
A11/9	18:44	1:57am	2:08am	2:19am
B11/8	18:44	2:03am	2:14am	2:25am
A13/9	18:44	2:09am	2:20am	2:31am
B13/8	18:44	2:15am	2:26am	2:37am
A15/9	18:44	2:21am	2:32am	2:43am
B15/8	18:44	2:27am	2:38am	2:49am
A17/9	18:43	2:33am	2:43am	2:54am
B17/8	18:43	2:38am	2:49am	3:00am
A19/9	18:43	2:44am	2:55am	3:06am
B19/8	18:43	2:50am	3:01am	3:12am
A21/9	18:43	2:56am	3:07am	3:18am
B21/8	18:43	3:02am	3:13am	3:24am
A23/9	18:43	3:08am	3:19am	3:30am
B23/8	18:43	3:14am	3:24am	3:35am
A25/9	18:43	3:19am	3:30am	3:41am
B25/8	18:42	3:25am	3:36am	3:47am
A27/9	18:42	3:31am	3:42am	3:53am
B27/8	18:42	3:37am	3:48am	3:59am
A29/9	18:42	3:43am	3:54am	4:05am
B29/8	18:41	3:48am	3:59am	4:10am
A31/9	18:41	3:54am	4:05am	4:16am
B31/8	18:41	4:00am	4:11am	4:22am
B1 /8	18:41	4:06am	4:17am	4:28am
A3 /9	18:41	4:12am	4:23am	4:34am
B3 /8	18:41	4:18am	4:29am	4:40am
A5 /9	18:40	4:24am	4:35am	4:45am
B5 /8	18:40	4:29am	4:40am	4:51am
A7 /9	18:40	4:35am	4:46am	4:57am
B7 /8	18:40	4:41am	4:52am	5:03am
A9 /9	18:40	4:47am	4:58am	5:09am
B9 /8	18:40	4:53am	5:04am	5:15am
A11/9	18:40	4:59am	5:10am	5:21am
B11/8	18:40	5:05am	5:16am	5:27am
A13/9	18:40	5:10am	5:21am	5:32am
B13/8	18:40	5:16am	5:27am	5:38am
A15/9	18:39	5:22am	5:33am	5:44am
B15/8	18:39	5:28am	5:39am	5:50am
A17/9	18:39	5:34am	5:45am	5:56am
B17/8	18:39	5:40am	5:51am	6:02am
A19/9	18:39	5:46am	5:57am	6:08am
B19/8	18:39	5:51am	6:02am	6:13am
A21/9	18:39	5:57am	6:08am	6:19am
B21/8	18:39	6:03am	6:14am	6:25am
A23/9	18:39	6:09am	6:20am	6:31am
B23/8	18:39	6:15am	6:26am	6:37am
A25/9	18:39	6:21am	6:32am	6:43am
B25/8	18:39	6:27am	6:38am	6:49am
A27/9	18:39	6:33am	6:43am	6:54am
B27/8	18:39	6:39am	6:49am	7:00am
A29/9	18:39	6:44am	6:55am	7:06am
B29/8	18:39	6:50am	7:01am	7:12am
A31/9	18:39	6:56am	7:07am	7:18am
B31/8	18:39	7:02am	7:13am	7:24am
B1 /8	18:39	7:08am	7:19am	7:30am
A3 /9	18:39	7:14am	7:24am	7:35am
B3 /8	18:39	7:19am	7:30am	7:41am
A5 /9	18:39	7:25am	7:36am	7:47am
B5 /8	18:39	7:31am	7:42am	7:53am

PUSHING SCHEDULE

Wednesday, May 11, 1994 Turn 1
Batteries: 7-9_2

Oven	Last Pushed	Earliest	Desired	Latest
[illegible]	[illegible]	7:37am	7:48am	7:59am
B7 /8	18:38	7:43am	7:54am	8:05am

Batteries: 7-8 2

Oven	Last Pushed	Earliest	Desired	Latest
B15/7		9:45aa	9:23aa	9:15aa
A17/8		9:45aa	9:26aa	9:21aa
B17/7		9:51aa	9:30aa	9:21aa
A19/6		9:57aa	9:42aa	9:33aa
B19/7		9:57aa	9:45aa	9:39aa
A21/6		10:03aa	9:54aa	9:45aa
B21/7		10:09aa	10:00aa	9:51aa
A23/6		10:15aa	10:06aa	9:57aa
B23/7		10:21aa	10:12aa	10:03aa
A25/6		10:27aa	10:18aa	10:09aa
B25/7		10:33aa	10:24aa	10:15aa
A27/6		10:39aa	10:30aa	10:21aa
B27/7		10:45aa	10:36aa	10:27aa
A29/6		10:51aa	10:42aa	10:33aa
B29/7		10:57aa	10:48aa	10:39aa
A31/6		11:03aa	10:54aa	10:45aa
A2 /9		11:09aa	11:00aa	10:51aa
B2 /8		11:15aa	11:06aa	10:57aa
A4 /9		11:21aa	11:12aa	11:03aa
B4 /8		11:27aa	11:18aa	11:09aa
A6 /9		11:33aa	11:24aa	11:15aa
B6 /8		11:39aa	11:30aa	11:21aa
A8 /9		11:45aa	11:36aa	11:27aa
B8 /8		11:51aa	11:42aa	11:33aa
A10/9		11:57aa	11:48aa	11:39aa
B10/8		12:03pp	11:54aa	11:45aa
A12/9		12:09pp	12:00pp	11:51aa
B12/8		12:15pp	12:06pp	11:57aa
A14/9		12:21pp	12:12pp	12:03pp
B14/8		12:27pp	12:18pp	12:09pp
A16/9		12:33pp	12:24pp	12:15pp
B16/8		12:39pp	12:30pp	12:21pp
A18/9		12:45pp	12:36pp	12:27pp
B18/8		12:51pp	12:42pp	12:33pp
A20/9		12:57pp	12:48pp	12:39pp
B20/8		1:03pp	12:54pp	12:45pp
A22/9		1:09pp	1:00pp	12:51pp
B22/8		1:15pp	1:06pp	12:57pp
A24/9		1:21pp	1:12pp	1:03pp
B24/8		1:27pp	1:18pp	1:09pp
A26/9		1:33pp	1:24pp	1:15pp
B26/8		1:39pp	1:30pp	1:21pp
A28/9		1:45pp	1:36pp	1:27pp
B28/8		1:51pp	1:42pp	1:33pp
A30/9		1:57pp	1:48pp	1:39pp
B30/8		2:03pp	1:54pp	1:45pp
A1 /7		2:09pp	2:00pp	1:51pp
B1 /6		2:15pp	2:06pp	1:57pp
A3 /7		2:21pp	2:12pp	2:03pp
B3 /6		2:27pp	2:18pp	2:09pp
A5 /7		2:33pp	2:24pp	2:15pp
B5 /6		2:39pp	2:30pp	2:21pp
A7 /7		2:45pp	2:36pp	2:27pp
B7 /6		2:51pp	2:42pp	2:33pp
A9 /7		2:57pp	2:48pp	2:39pp
B9 /6		3:03pp	2:54pp	2:45pp
A11/7		3:09pp	3:00pp	2:51pp
B11/6		3:15pp	3:06pp	2:57pp
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B13/6		3:27pp	3:18pp	3:09pp
A15/7		3:33pp	3:24pp	3:15pp
B15/6		3:39pp	3:30pp	3:21pp
A17/7		3:45pp	3:36pp	3:27pp
B17/6		3:51pp	3:42pp	3:33pp
A19/7		3:57pp	3:48pp	3:39pp
B19/6		4:03pp	3:54pp	3:45pp
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A29/7		4:57pp	4:48pp	4:39pp
B29/6		5:03pp	4:54pp	4:45pp
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B31/6		5:15pp	5:06pp	4:57pp
A2 /8		5:21pp	5:12pp	5:03pp
B2 /7		5:27pp	5:18pp	5:09pp
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B4 /7		5:39pp	5:30pp	5:21pp
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B8 /7		6:03pp	5:54pp	5:45pp
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B18/7		7:03pp	6:54pp	6:45pp
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B26/7		7:51pp	7:42pp	7:33pp
A28/8		7:57pp	7:48pp	7:39pp
B28/7		8:03pp	7:54pp	7:45pp
A30/8		8:09pp	8:00pp	7:51pp
B30/7		8:15pp	8:06pp	7:57pp
A1 /9		8:21pp	8:12pp	8:03pp
B1 /8		8:27pp	8:18pp	8:09pp
A3 /9		8:33pp	8:24pp	8:15pp
B3 /8		8:39pp	8:30pp	8:21pp
A5 /9		8:45pp	8:36pp	8:27pp
B5 /8		8:51pp	8:42pp	8:33pp
A7 /9		8:57pp	8:48pp	8:39pp
B7 /8		9:03pp	8:54pp	8:45pp
A9 /9		9:09pp	9:00pp	8:51pp
B9 /8		9:15pp	9:06pp	8:57pp
A11/9		9:21pp	9:12pp	9:03pp
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B8 /6		12:15aa	12:06aa	11:57pp
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B8 /7		12:33pp	12:24pp	12:15pp
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B10/7		12:45pp	12:36pp	12:27pp
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B28/7		2:33pp	2:24pp	2:15pp
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B30/7		2:45pp	2:36pp	2:27pp
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B2 /6		6:09pp	6:00pp	5:51pp
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B4 /6		6:21pp	6:12pp	6:03pp
A6 /7		6:27pp	6:18pp	6:09pp
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A8 /7		6:39pp	6:30pp	6:21pp
B8 /6		6:45pp	6:36pp	6:27pp
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B10/6		6:57pp	6:48pp	6:39pp
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B12/6		7:09pp	7:00pp	6:51pp
A14/7		7:15pp	7:06pp	6:57pp
B14/6		7:21pp	7:12pp	7:03pp
A16/7		7:27pp	7:18pp	7:09pp
B16/6		7:33pp	7:24pp	7:15pp
A18/7		7:39pp	7:30pp	7:21pp
B18/6		7:45pp	7:36pp	7:27pp
A20/7		7:51pp	7:42pp	7:33pp
B20/6		7:57pp	7:48pp	7:39pp
A22/7		8:03pp	7:54pp	7:45pp
B22/6		8:09pp	8:00pp	7:51pp
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B24/6		8:21pp	8:12pp	8:03pp
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B30/6		8:57pp	8:48pp	8:39pp
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A13/8		10:15pp	10:06pp	9:57pp
B13/7		10:21pp	10:12pp	10:03pp
A15/8		10:27pp	10:18pp	10:09pp
B15/7		10:33pp	10:24pp	10:15pp
A17/8		10:39pp	10:30pp	10:21pp
B17/7		10:45pp	10:36pp	10:27pp
A19/8		10:51pp	10:42pp	10:33pp
B19/7		10:57pp	10:48pp	10:39pp
A21/8		11:03pp	10:54pp	10:45pp
B21/7		11:09pp	11:00pp	10:51pp
A23/8		11:15pp	11:06pp	10:57pp
B23/7		11:21pp	11:12pp	11:03pp
A25/8		11:27pp	11:18pp	11:09pp
B25/7		11:33pp	11:24pp	11:15pp
A27/8		11:39pp	11:30pp	11:21pp
B27/7		11:45pp	11:36pp	11:27pp
A29/8		11:51pp	11:42pp	11:33pp
B29/7		11:57pp	11:48pp	11:39pp
A31/8		12:03aa	11:54pp	11:45pp
A2 /9		12:09aa	12:00aa	11:51pp
B2 /8		12:15aa	12:06aa	11:57pp
A4 /9		12:21aa	12:12aa	12:03aa
B4 /8		12:27aa	12:18aa	12:09aa
A6 /9		12:33aa	12:24aa	12:15aa
B6 /8		12:39aa	12:30aa	12:21aa
A8 /9		12:45aa	12:36aa	12:27aa
B8 /8		12:51aa	12:42aa	12:33aa
A10/9		12:57aa	12:48aa	12:39aa
B10/8		1:03aa	12:54aa	12:45aa
A12/9		1:09aa	1:00aa	12:51aa
B12/8		1:15aa	1:06aa	12:57aa
A14/9		1:21aa	1:12aa	1:03aa
B14/8		1:27aa	1:18aa	1:09aa
A16/9		1:33aa	1:24aa	1:15aa
B16/8		1:39aa	1:30aa	1:21aa
A18/9		1:45aa	1:36aa	1:27aa
B18/8		1:51aa	1:42aa	1:33aa
A20/9		1:57aa	1:48aa	1:39aa
B20/8		2:03aa	1:54aa	1:45aa
A22/9		2:09aa	2:00aa	1:51aa
B22/8		2:15aa	2:06aa	1:57aa
A24/9		2:21aa	2:12aa	2:03aa
B24/8		2:27aa	2:18aa	2:09aa
A26/9		2:33aa	2:24aa	2:15aa
B26/8		2:39aa	2:30aa	2:21aa
A28/9		2:45aa	2:36aa	2:27aa
B28/8		2:51aa	2:42aa	2:33aa
A30/9		2:57aa	2:48aa	2:39aa
B30/8		3:03aa	2:54aa	2:45aa
A1 /7		3:09aa	3:00aa	2:51aa
B1 /6		3:15aa	3:06aa	2:57aa
A3 /7		3:21aa	3:12aa	3:03aa
B3 /6		3:27aa	3:18aa	3:09aa
A5 /7		3:33aa	3:24aa	3:15aa
B5 /6		3:39aa	3:30aa	3:21aa
A7 /7		3:45aa	3:36aa	3:27aa
B7 /6		3:51aa	3:42aa	3:33aa
A9 /7		3:57aa	3:48aa	3:39aa
B9 /6		4:03aa	3:54aa	3:45aa
A11/7		4:09aa	4:00aa	3:51aa
B11/6		4:15aa	4:06aa	3:57aa
A13/7		4:21aa	4:12aa	4:03aa
B13/6		4:27aa	4:18aa	4:09aa
A15/7		4:33aa	4:24aa	4:15aa
B15/6		4:39aa	4:30aa	4:21aa
A17/7		4:45aa	4:36aa	4:27aa
B17/6		4:51aa	4:42aa	4:33aa
A19/7		4:57aa	4:48aa	4:39aa
B19/6		5:03aa	4:54aa	4:45aa
A21/7		5:09aa	5:00aa	4:51aa
B21/6		5:15aa	5:06aa	4:57aa
A23/7		5:21aa	5:12aa	5:03aa
B23/6		5:27aa	5:18aa	5:09aa
A25/7		5:33aa	5:24aa	5:15aa
B25/6		5:39aa	5:30aa	5:21aa
A27/7		5:45aa	5:36aa	5:27aa
B27/6		5:51aa	5:42aa	5:33aa
A29/7		5:57aa	5:48aa	5:39aa
B29/6		6:03aa	5:54aa	5:45aa
A31/7		6:09aa	6:00aa	5:51aa
B31/6		6:15aa	6:06aa	5:57aa
A2 /8		6:21aa	6:12aa	6:03aa
B2 /7		6:27aa	6:18aa	6:09aa
A4 /8		6:33aa	6:24aa	6:15aa
B4 /7		6:39aa	6:30aa	6:21aa
A6 /8		6:45aa	6:36aa	6:27aa
B6 /7		6:51aa	6:42aa	6:33aa
A8 /8		6:57aa	6:48aa	6:39aa
B8 /7		7:03aa	6:54aa	6:45aa
A10/8		7:09aa	7:00aa	6:51aa
B10/7		7:15aa	7:06aa	6:57aa
A12/8		7:21aa	7:12aa	7:03aa
B12/7		7:27aa	7:18aa	7:09aa
A14/8		7:33aa	7:24aa	7:15aa
B14/7		7:39aa	7:30aa	7:21aa
A16/8		7:45aa	7:36aa	7:27aa
B16/7		7:51aa	7:42aa	7:33aa
A18/8		7:57aa	7:48aa	7:39aa
B18/7		8:03aa	7:54aa	7:45aa
A20/8		8:09aa	8:00aa	7:51aa
B20/7		8:15aa	8:06aa	7:57aa
A22/8		8:21aa	8:12aa	8:03aa
B22/7		8:27aa	8:18aa	8:09aa
A24/8		8:33aa	8:24aa	8:15aa
B24/7		8:39aa	8:30aa	8:21aa
A26/8		8:45aa	8:36aa	8:27aa
B26/7		8:51aa	8:42aa	8:33aa
A28/8		8:57aa	8:48aa	8:39aa
B28/7		9:03aa	8:54aa	8:45aa
A30/8		9:09aa	9:00aa	8:51aa
B30/7		9:15aa	9:06aa	8:57aa
A1 /9		9:21aa	9:12aa	9:03aa
B1 /8		9:27aa	9:18aa	9:09aa
A3 /9		9:33aa	9:24aa	9:15aa
B3 /8		9:39aa	9:30aa	9:21aa
A5 /9		9:45aa	9:36aa	9:27aa
B5 /8		9:51aa	9:42aa	9:33aa
A7 /9		9:57aa	9:48aa	9:39aa
B7 /8		10:03aa	9:54aa	9:45aa
A9 /9		10:09aa	10:00aa	9:51aa
B9 /8		10:15aa	10:06aa	9:57aa
A11/9		10:21aa	10:12aa	10:03aa
B11/8		10:27aa	10:18aa	10:09aa
A13/9		10:33aa	10:24aa	10:15aa
B13/8		10:39aa	10:30aa	10:21aa
A15/9		10:45aa	10:36aa	10:27aa
B15/8		10:51aa	10:42aa	10:33aa
A17/9		10:57aa	10:48aa	10:39aa
B17/8		11:03aa	10:54aa	10:45aa
A19/9		11:09aa	11:00aa	10:51aa
B19/8		11:15aa	11:06aa	10:57aa
A21/9		11:21aa	11:12aa	11:03aa
B21/8		11:27aa	11:18aa	11:09aa
A23/9		11:33aa	11:24aa	11:15aa
B23/8		11:39aa	11:30aa	11:21aa
A25/9		11:45aa	11:36aa	11:27aa
B25/8		11:51aa	11:42aa	11:33aa
A27/9		11:57aa	11:48aa	11:39aa
B27/8		12:03pp	11:54aa	11:45aa
A29/9		12:09pp	12:00pp	11:51aa
B29/8		12:15pp	12:06pp	11:57aa
A31/9		12:21pp	12:12pp	12:03pp
B31/8		12:27pp	12:18pp	12:09pp
A2 /7		12:33pp	12:24pp	12:15pp
B2 /6		12:39pp	12:30pp	12:21pp
A4 /7		12:45pp	12:36pp	12:27pp
B4 /6		12:51pp	12:42pp	12:33pp
A6 /7		12:57pp	12:48pp	12:39pp
B6 /6		1:03pp	12:54pp	12:45pp
A8 /7		1:09pp	1:00pp	12:51pp
B8 /6		1:15pp	1:06pp	12:57pp
A10/7		1:21pp	1:12pp	1:03pp
B10/6		1:27pp	1:18pp	1:09pp
A12/7		1:33pp	1:24pp	1:15pp
B12/6		1:39pp	1:30pp	1:21pp
A14/7		1:45pp	1:36pp	1:27pp
B14/6		1:51pp	1:42pp	1:33pp
A16/7		1:57pp	1:48pp	1:39pp
B16/6		2:03pp	1:54pp	1:45pp
A18/7

Batteries: 7-9_2

Oven	Last Pushed	Earliest	Desired	Latest
A25/7	18:44	3:49	4:00	4:11
B25/8	18:44	3:55	4:05	4:16
A27/7	18:44	4:00	4:11	4:22
B27/8	18:44	4:06	4:17	4:28
A29/7	18:44	4:12	4:23	4:34
B31/8	16:44	4:18	4:29	4:40
A32/7	18:42	4:24	4:35	4:46
C2 /9	16:44	4:29	4:40	4:51
A2 /8	16:44	4:35	4:46	4:57
B2 /7	16:44	4:41	4:52	5:03
A4 /8	16:44	4:47	4:58	5:09
B4 /7	16:44	4:53	5:04	5:15
A6 /8	16:44	4:59	5:10	5:21
B6 /7	16:43	5:05	5:16	5:27
A8 /8	19:44	5:10	5:21	5:32
B8 /7	16:44	5:16	5:27	5:38
A10/8	19:44	5:22	5:33	5:44
B10/7	18:44	5:28	5:39	5:50
A12/8	16:44	5:34	5:45	5:56
B12/7	18:44	5:40	5:51	6:02
A14/8	18:43	5:46	5:57	6:08
B14/7	18:44	5:51	6:02	6:13
A16/8	18:44	5:57	6:08	6:19
B16/7	16:44	6:03	6:14	6:25
A18/8	16:44	6:09	6:20	6:31
B18/7	18:44	6:15	6:26	6:37
A20/8	18:44	6:21	6:32	6:43
B20/7	18:43	6:27	6:38	6:49
A22/8	18:36	6:32	6:43	6:54
B22/7	18:36	6:38	6:49	7:00
A24/8	16:36	6:44	6:55	7:06
B24/7	16:36	6:50	7:01	7:12
A26/8	16:36	6:56	7:07	7:18
B26/7	18:39	7:02	7:13	7:24
A28/8	16:38	7:08	7:19	7:30
B28/7	16:38	7:13	7:24	7:35
A30/8	18:38	7:19	7:30	7:41
B30/7	18:36	7:25	7:36	7:47
A1 /9	18:38	7:31	7:42	7:53
B1 /8	16:38	7:37	7:48	7:59
A3 /9	16:38	7:43	7:54	8:05
B3 /8	16:38	7:48	7:59	8:10
A5 /9	16:38	7:54	8:05	8:16
B5 /8	16:36	8:00	8:11	8:22
A7 /9	16:36	8:06	8:17	8:28
B7 /8	16:36	8:12	8:23	8:34
A9 /9	16:36	8:18	8:29	8:40
B9 /8	16:36	8:24	8:35	8:46
A11/9	16:36	8:29	8:40	8:51
B11/8	16:36	8:35	8:46	8:57
A13/9	16:36	8:41	8:52	9:03
B13/8	16:36	8:47	8:58	9:09
A15/9	16:36	8:53	9:04	9:15
B15/8	16:36	8:59	9:10	9:21
A17/9	16:36	9:05	9:16	9:27
B17/8	16:36	9:10	9:21	9:32
A19/9	16:36	9:16	9:27	9:38
B19/8	16:36	9:22	9:33	9:44
A21/9	16:36	9:28	9:39	9:50
B21/8	16:36	9:34	9:45	9:56
A23/9	16:36	9:40	9:51	10:02
B23/8	16:36	7:46	9:57	10:02
A25/9	16:36	9:51	10:02	10:08
B25/8	16:36	9:57	10:08	10:14
A27/9	16:36	10:03	10:14	10:20
B27/8	16:36	10:09	10:20	10:26
A29/9	16:36	10:15	10:26	10:32
B29/8	16:36	10:21	10:32	10:37
A31/9	16:36	10:27	10:38	10:43
B31/8	16:36	10:32	10:43	10:49
A32/9	16:36	10:38	10:49	10:54
C2 /9	16:36	10:44	10:55	11:00
A2 /8	16:36	10:50	11:01	11:06
B2 /7	16:36	10:56	11:07	11:12
A4 /8	16:36	11:02	11:13	11:18
B4 /7	16:36	11:08	11:19	11:24
A6 /8	16:36	11:13	11:24	11:29
B6 /7	16:36	11:19	11:30	11:35
A8 /8	16:36	11:25	11:36	11:41
B8 /7	16:36	11:31	11:42	11:47
A10/8	16:36	11:37	11:48	11:53
B10/7	16:36	11:43	11:54	11:59

PUSHING SCHEDULE

Wednesday, May 11, 1994 Turn 3

Batteries: 7-9_2

Last Pushed	Earliest	Desired	Latest
16:36	11:37	11:48	11:59
16:36	11:43	11:54	12:05

Oven	Last Pushed	Earliest	Desired	Latest
A22/7	18:39	1:49am	2:22am	2:55am
A23/7	18:44	1:22am	1:55am	2:28am
A24/7	18:44	1:00am	1:33am	2:06am
A25/7	18:44	12:36am	1:09am	1:42am
A26/7	18:44	12:41am	1:14am	1:47am
A27/7	18:44	12:58am	1:31am	2:04am
A28/7	18:45	1:04am	1:37am	2:10am
A29/7	18:45	1:08am	1:41am	2:14am
A30/7	18:45	1:11am	1:44am	2:17am
A31/7	18:45	1:13am	1:46am	2:19am
A32/7	18:45	1:15am	1:48am	2:21am
A33/7	18:45	1:17am	1:50am	2:23am
A34/7	18:45	1:19am	1:52am	2:25am
A35/7	18:45	1:21am	1:54am	2:27am
A36/7	18:45	1:23am	1:56am	2:29am
A37/7	18:45	1:25am	1:58am	2:31am
A38/7	18:45	1:27am	2:00am	2:33am
A39/7	18:45	1:29am	2:02am	2:35am
A40/7	18:45	1:31am	2:04am	2:37am
A41/7	18:45	1:33am	2:06am	2:39am
A42/7	18:45	1:35am	2:08am	2:41am
A43/7	18:45	1:37am	2:10am	2:43am
A44/7	18:45	1:39am	2:12am	2:45am
A45/7	18:45	1:41am	2:14am	2:47am
A46/7	18:45	1:43am	2:16am	2:49am
A47/7	18:45	1:45am	2:18am	2:51am
A48/7	18:45	1:47am	2:20am	2:53am
A49/7	18:45	1:49am	2:22am	2:55am
A50/7	18:45	1:51am	2:24am	2:57am
A51/7	18:45	1:53am	2:26am	2:59am
A52/7	18:45	1:55am	2:28am	3:01am
A53/7	18:45	1:57am	2:30am	3:03am
A54/7	18:45	1:59am	2:32am	3:05am
A55/7	18:45	2:01am	2:34am	3:07am
A56/7	18:45	2:03am	2:36am	3:09am
A57/7	18:45	2:05am	2:38am	3:11am
A58/7	18:45	2:07am	2:40am	3:13am
A59/7	18:45	2:09am	2:42am	3:15am
A60/7	18:45	2:11am	2:44am	3:17am
A61/7	18:45	2:13am	2:46am	3:19am
A62/7	18:45	2:15am	2:48am	3:21am
A63/7	18:45	2:17am	2:50am	3:23am
A64/7	18:45	2:19am	2:52am	3:25am
A65/7	18:45	2:21am	2:54am	3:27am
A66/7	18:45	2:23am	2:56am	3:29am
A67/7	18:45	2:25am	2:58am	3:31am
A68/7	18:45	2:27am	3:00am	3:33am
A69/7	18:45	2:29am	3:02am	3:35am
A70/7	18:45	2:31am	3:04am	3:37am
A71/7	18:45	2:33am	3:06am	3:39am
A72/7	18:45	2:35am	3:08am	3:41am
A73/7	18:45	2:37am	3:10am	3:43am
A74/7	18:45	2:39am	3:12am	3:45am
A75/7	18:45	2:41am	3:14am	3:47am
A76/7	18:45	2:43am	3:16am	3:49am
A77/7	18:45	2:45am	3:18am	3:51am
A78/7	18:45	2:47am	3:20am	3:53am
A79/7	18:45	2:49am	3:22am	3:55am
A80/7	18:45	2:51am	3:24am	3:57am
A81/7	18:45	2:53am	3:26am	3:59am
A82/7	18:45	2:55am	3:28am	4:01am
A83/7	18:45	2:57am	3:30am	4:03am
A84/7	18:45	2:59am	3:32am	4:05am
A85/7	18:45	3:01am	3:34am	4:07am
A86/7	18:45	3:03am	3:36am	4:09am
A87/7	18:45	3:05am	3:38am	4:11am
A88/7	18:45	3:07am	3:40am	4:13am
A89/7	18:45	3:09am	3:42am	4:15am
A90/7	18:45	3:11am	3:44am	4:17am
A91/7	18:45	3:13am	3:46am	4:19am
A92/7	18:45	3:15am	3:48am	4:21am
A93/7	18:45	3:17am	3:50am	4:23am
A94/7	18:45	3:19am	3:52am	4:25am
A95/7	18:45	3:21am	3:54am	4:27am
A96/7	18:45	3:23am	3:56am	4:29am
A97/7	18:45	3:25am	3:58am	4:31am
A98/7	18:45	3:27am	4:00am	4:33am
A99/7	18:45	3:29am	4:02am	4:35am
A100/7	18:45	3:31am	4:04am	4:37am
A101/7	18:45	3:33am	4:06am	4:39am
A102/7	18:45	3:35am	4:08am	4:41am
A103/7	18:45	3:37am	4:10am	4:43am
A104/7	18:45	3:39am	4:12am	4:45am
A105/7	18:45	3:41am	4:14am	4:47am
A106/7	18:45	3:43am	4:16am	4:49am
A107/7	18:45	3:45am	4:18am	4:51am
A108/7	18:45	3:47am	4:20am	4:53am
A109/7	18:45	3:49am	4:22am	4:55am
A110/7	18:45	3:51am	4:24am	4:57am
A111/7	18:45	3:53am	4:26am	4:59am
A112/7	18:45	3:55am	4:28am	5:01am
A113/7	18:45	3:57am	4:30am	5:03am
A114/7	18:45	3:59am	4:32am	5:05am
A115/7	18:45	4:01am	4:34am	5:07am
A116/7	18:45	4:03am	4:36am	5:09am
A117/7	18:45	4:05am	4:38am	5:11am
A118/7	18:45	4:07am	4:40am	5:13am
A119/7	18:45	4:09am	4:42am	5:15am
A120/7	18:45	4:11am	4:44am	5:17am
A121/7	18:45	4:13am	4:46am	5:19am
A122/7	18:45	4:15am	4:48am	5:21am
A123/7	18:45	4:17am	4:50am	5:23am
A124/7	18:45	4:19am	4:52am	5:25am
A125/7	18:45	4:21am	4:54am	5:27am
A126/7	18:45	4:23am	4:56am	5:29am
A127/7	18:45	4:25am	4:58am	5:31am
A128/7	18:45	4:27am	5:00am	5:33am
A129/7	18:45	4:29am	5:02am	5:35am
A130/7	18:45	4:31am	5:04am	5:37am
A131/7	18:45	4:33am	5:06am	5:39am
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A455/7	18:45	3:21pm	3:54pm	4:27pm
A456/7	18:45	3:23pm	3:56pm	4:29pm
A457/7	18:45	3:25pm	3:58pm	4:31pm
A458/7	18:45	3:27pm	4:00pm	4:33pm
A459/7	18:45	3:29pm	4:02pm	4:35pm
A460/7	18:45	3:31pm	4:04pm	4:37pm
A461/7	18:45	3:33pm	4:06pm	4:39pm
A462/7	18:45	3:35pm	4:08pm	4:41pm
A463/7	18:45	3:37pm	4:10pm	4:43pm
A464/7	18:45	3:39pm	4:12pm	4:45pm
A465/7	18:45	3:41pm	4:14pm	4:47pm
A466/7	18:45	3:43pm	4:16pm	4:49pm
A467/7	18:45	3:45pm	4:18pm	4:51pm
A468/7	18:45	3:47pm	4:20pm	4:53pm
A469/7	18:45	3:49pm	4:22pm	4:55pm
A470/7	18:45	3:51pm	4:24pm	4:57pm
A471/7	18:45	3:53pm	4:26pm	4:59pm
A472/7	18:45	3:55pm	4:28pm	5:01pm
A473/7	18:45	3:57pm	4:30pm	5:03pm
A474/7	18:45	3:59pm	4:32pm	5:05pm
A475/7	18:45	4:01pm	4:34pm	5:07pm
A476/7	18:45	4:03pm	4:36pm	5:09pm
A477/7	18:45	4:05pm	4:38pm	5:11pm
A478/7	18:45	4:07pm	4:40pm	5:13pm
A479/7	18:45	4:09pm	4:42pm	5:15pm
A480/7	18:45	4:11pm	4:44pm	5:17pm
A481/7	18:45	4:13pm	4:46pm	5:19pm
A482/7	18:45	4:15pm	4:48pm	5:21pm
A483/7	18:45	4:17pm	4:50pm	5:23pm
A484/7	18:45	4:19pm	4:52pm	5:25pm
A485/7	18:45	4:21pm	4:54pm	5:27pm
A486/7	18:45	4:23pm	4:56pm	5:29pm
A487/7	18:45	4:25pm	4:58pm	5:31pm
A488/7	18:45	4:27pm	5:00pm	5:33pm
A489/7	18:45	4:29pm	5:02pm	5:35pm
A490/7	18:45	4:31pm	5:04pm	5:37pm
A491/7	18:45	4:33pm	5:06pm	5:39pm
A492/7	18:45	4:35pm	5:08pm	5:41pm
A493/7	18:45	4:37pm	5:10pm	5:43pm
A494/7	18:45	4:39pm	5:12pm	5:45pm
A495/7	18:45	4:41pm	5:14pm	5:47pm
A496/7	18:45	4:43pm	5:16pm	5:49pm
A497/7	18:45	4:45pm	5:18pm	5:51pm
A498/7	18:45	4:47pm	5:20pm	5:53pm
A499/7	18:45	4:49pm	5:22pm	5:55pm
A500/7	18:45	4:51pm	5:24pm	5:57pm
A501/7	18:45	4:53pm	5:26pm	5:59pm
A502/7	18:45	4:55pm	5:28pm	6:01pm
A503/7	18:45	4:57pm	5:30pm	6:03pm
A504/7	18:45	4:59pm	5:32pm	6

Oven	Last Pushed	Earliest	Desired	Latest
A30/9	16:36	7:45am	8:00am	8:15am
B30/9	16:36	7:51am	8:06am	8:21am
C1 /8	16:36	7:57am	8:12am	8:27am
B1 /9	16:36	8:03am	8:18am	8:33am
A1 /7	16:36	8:09am	8:24am	8:39am
B3 /9	16:36	8:15am	8:30am	8:45am
A3 /7	16:36	8:21am	8:36am	8:51am
B5 /9	16:36	8:27am	8:42am	8:57am
A5 /7	16:36	8:33am	8:48am	9:03am
B7 /9	16:36	8:39am	8:54am	9:09am
A7 /7	16:36	8:45am	9:00am	9:15am
B9 /9	16:36	8:51am	9:06am	9:21am
A9 /7	16:36	8:57am	9:12am	9:27am
B11/9	16:36	9:03am	9:18am	9:33am
A11/7	16:36	9:09am	9:24am	9:39am
B13/9	16:36	9:15am	9:30am	9:45am
A13/7	16:36	9:21am	9:36am	9:51am
B15/9	16:36	9:27am	9:42am	9:57am
A15/7	16:36	9:33am	9:48am	10:03am
B17/9	16:36	9:39am	9:54am	10:09am
A17/7	16:36	9:45am	10:00am	10:15am
B19/9	16:36	9:51am	10:06am	10:21am
A19/7	16:36	9:57am	10:12am	10:27am
B21/9	16:36	10:03am	10:18am	10:33am
A21/7	16:36	10:09am	10:24am	10:39am
B23/9	16:36	10:15am	10:30am	10:45am
A23/7	16:36	10:21am	10:36am	10:51am
B25/9	16:36	10:27am	10:42am	10:57am
A25/7	16:37	10:33am	10:48am	11:03am
B27/9	16:37	10:39am	10:54am	11:09am
A27/7	16:37	10:45am	11:00am	11:15am
B29/9	16:37	10:51am	11:06am	11:21am
A29/7	16:37	10:57am	11:12am	11:27am
B31/9	16:37	11:03am	11:18am	11:33am
A31/7	16:38	11:09am	11:24am	11:39am
C2 /9	16:38	11:15am	11:30am	11:45am
A2 /8	16:38	11:21am	11:36am	11:51am
B2 /7	16:38	11:27am	11:42am	11:57am
B4 /9	16:38	11:33am	11:48am	12:03pm
A4 /7	16:38	11:39am	11:54am	12:09pm
B6 /9	16:39	11:45am	12:00pm	12:15pm
A6 /7	16:39	11:51am	12:06pm	12:21pm
B8 /9	16:39	11:57am	12:12pm	12:27pm
A8 /7	16:39	12:03pm	12:18pm	12:33pm
B10/9	16:39	12:09pm	12:24pm	12:39pm
A10/7	16:39	12:15pm	12:30pm	12:45pm
C12/9	16:40	12:21pm	12:36pm	12:51pm
B12/7	16:40	12:27pm	12:42pm	12:57pm
A12/8	16:40	12:33pm	12:48pm	1:03pm
B14/9	16:40	12:39pm	12:54pm	1:09pm
A14/7	16:40	12:45pm	1:00pm	1:15pm
B16/9	16:40	12:51pm	1:06pm	1:21pm
A16/8	16:40	12:57pm	1:12pm	1:27pm
B18/7	16:40	1:03pm	1:18pm	1:33pm
A18/9	16:41	1:09pm	1:24pm	1:39pm
B20/9	16:41	1:15pm	1:30pm	1:45pm
A20/7	16:41	1:21pm	1:36pm	1:51pm
B22/9	16:41	1:27pm	1:42pm	1:57pm
A22/7	16:41	1:33pm	1:48pm	2:03pm
B24/9	16:41	1:39pm	1:54pm	2:09pm
A24/7	16:41	1:45pm	2:00pm	2:15pm
B26/9	16:41	1:51pm	2:06pm	2:21pm
A26/8	16:41	1:57pm	2:12pm	2:27pm
B28/9	16:41	2:03pm	2:18pm	2:33pm
A28/7	16:42	2:09pm	2:24pm	2:39pm
B30/9	16:42	2:15pm	2:30pm	2:45pm
A30/7	16:42	2:21pm	2:36pm	2:51pm
C1 /8	16:42	2:27pm	2:42pm	2:57pm
B1 /9	16:42	2:33pm	2:48pm	3:03pm
A1 /7	16:42	2:39pm	2:54pm	3:09pm
B3 /9	16:42	2:45pm	3:00pm	3:15pm
A3 /7	16:42	2:51pm	3:06pm	3:21pm
B5 /9	16:42	2:57pm	3:12pm	3:27pm
A5 /7	16:42	3:03pm	3:18pm	3:33pm
B7 /9	16:42	3:09pm	3:24pm	3:39pm
A7 /7	16:42	3:15pm	3:30pm	3:45pm
B9 /9	16:42	3:21pm	3:36pm	3:51pm
A9 /7	16:42	3:27pm	3:42pm	3:57pm
B11/9	16:42	3:33pm	3:48pm	4:03pm
A11/7	16:42	3:39pm	3:54pm	4:09pm

Batteries: 7-9_2

Oven	Last Pushed	Earliest	Desired	Latest
B15/9	18:44	3:49pm	4:00pm	4:11pm
B15/8	18:44	3:55pm	4:05pm	4:15pm
B17/9	18:44	4:00pm	4:11pm	4:22pm
B17/8	18:44	4:05pm	4:17pm	4:28pm
B19/8	19:44	4:11pm	4:23pm	4:34pm
B15/8	18:44	4:18pm	4:29pm	4:40pm
B21/9	18:44	4:24pm	4:35pm	4:46pm
B21/8	18:43	4:29pm	4:42pm	4:51pm
A27/9	18:44	4:35pm	4:46pm	4:57pm
B23/8	18:44	4:41pm	4:52pm	5:03pm
B25/9	18:44	4:47pm	4:58pm	5:09pm
B25/8	18:44	4:52pm	5:04pm	5:15pm
B27/9	18:44	4:59pm	5:10pm	5:21pm
B27/8	18:44	5:05pm	5:16pm	5:27pm
A29/9	18:47	5:10pm	5:21pm	5:32pm
B29/8	18:44	5:15pm	5:27pm	5:38pm
B31/9	18:44	5:21pm	5:33pm	5:44pm
B31/8	18:44	5:26pm	5:39pm	5:50pm
[illegible]	18:44	5:34pm	5:45pm	5:56pm
[illegible]	18:44	5:42pm	5:51pm	6:02pm
[illegible]	18:44	5:46pm	5:57pm	6:06pm
[illegible]	18:44	5:51pm	6:02pm	6:13pm
[illegible]	18:44	5:57pm	6:03pm	6:19pm
[illegible]	18:44	6:03pm	6:14pm	6:25pm
[illegible]	18:44	6:09pm	6:20pm	6:31pm
[illegible]	18:44	6:15pm	6:26pm	6:37pm
A8 /7	18:44	6:21pm	6:32pm	6:43pm
B10/9	18:44	6:27pm	6:38pm	6:49pm
A10/7	18:47	6:32pm	6:43pm	6:54pm
B12/9	18:44	6:38pm	6:49pm	7:00pm
B12/7	18:44	6:44pm	6:55pm	7:06pm
[illegible]	18:44	6:50pm	7:01pm	7:12pm
[illegible]	18:44	6:56pm	7:07pm	7:18pm
B16/9	18:44	7:02pm	7:13pm	7:24pm
[illegible]	18:44	7:08pm	7:19pm	7:30pm
[illegible]	18:44	7:13pm	7:24pm	7:35pm
[illegible]	18:44	7:19pm	7:30pm	7:41pm
[illegible]	18:44	7:25pm	7:36pm	7:47pm
[illegible]	18:44	7:31pm	7:42pm	7:53pm
[illegible]	18:44	7:37pm	7:48pm	7:59pm
[illegible]	18:44	7:43pm	7:54pm	8:05pm
[illegible]	18:44	7:49pm	7:59pm	8:10pm
[illegible]	18:44	7:54pm	8:05pm	8:16pm
[illegible]	18:44	8:00pm	8:11pm	8:22pm
[illegible]	18:44	8:06pm	8:17pm	8:28pm
[illegible]	18:44	8:12pm	8:23pm	8:34pm
[illegible]	18:44	8:18pm	8:29pm	8:40pm
[illegible]	18:44	8:24pm	8:35pm	8:46pm
[illegible]	18:44	8:29pm	8:40pm	8:51pm
[illegible]	18:44	8:35pm	8:46pm	8:57pm
[illegible]	18:44	8:41pm	8:52pm	9:03pm
[illegible]	18:44	8:47pm	8:58pm	9:09pm
[illegible]	18:44	8:53pm	9:04pm	9:15pm
[illegible]	18:44	8:59pm	9:10pm	9:21pm
[illegible]	18:44	9:05pm	9:15pm	9:26pm
[illegible]	18:44	9:10pm	9:21pm	9:32pm
[illegible]	18:44	9:16pm	9:27pm	9:38pm
[illegible]	18:44	9:22pm	9:33pm	9:44pm
[illegible]	18:44	9:28pm	9:39pm	9:50pm
[illegible]	18:44	9:34pm	9:45pm	9:56pm
[illegible]	18:44	9:40pm	9:51pm	10:02pm
[illegible]	18:44	9:46pm	9:57pm	10:08pm
[illegible]	18:44	9:51pm	10:02pm	10:13pm
[illegible]	18:44	9:57pm	10:08pm	10:19pm
[illegible]	18:44	10:03pm	10:14pm	10:25pm
[illegible]	18:44	10:09pm	10:20pm	10:31pm
[illegible]	18:44	10:15pm	10:26pm	10:37pm
[illegible]	18:44	10:21pm	10:32pm	10:43pm
[illegible]	18:44	10:27pm	10:38pm	10:49pm
[illegible]	18:44	10:32pm	10:43pm	10:54pm
[illegible]	18:44	10:38pm	10:49pm	11:00pm
[illegible]	18:44	10:44pm	10:55pm	11:06pm
[illegible]	18:44	10:50pm	11:01pm	11:12pm
[illegible]	18:44	10:56pm	11:07pm	11:18pm
[illegible]	18:44	11:02pm	11:13pm	11:24pm
[illegible]	18:44	11:08pm	11:19pm	11:30pm
[illegible]	18:44	11:14pm	11:25pm	11:36pm
[illegible]	18:44	11:20pm	11:31pm	11:42pm
[illegible]	18:44	11:26pm	11:36pm	11:47pm
[illegible]	18:44	11:31pm	11:42pm	11:53pm

7/-B31

PUSHING SCHEDULE

Thursday, May 12, 1994 Turn 3
Batteries: 7-9_2

Oven	Last Pushed	Earliest	Desired	Latest
31/8	18:34	11:37pm	11:48pm	11:59pm
[illegible] /9	18:42	11:43pm	11:54pm	12:05am

CC-10295 REV. 1161
93.003-0020

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

PUSHING AND CHARGING REPORT

UNIT NO. 5

12 Hrs. Beginning 12:00 AM

Date 5-11-94

BATTERY NO. 9As

OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES
1	1 13	1 35	
3	1 27	1 46	
5	1 37	1 57	
7	1 48	2 08	
9	1 59	2 19	
11	2 10	2 28	
13	2 21	2 40	
15	2 30	2 52	
17	2 42	3 04	
19	2 54	3 16	
21	3 06	3 28	
23	3 18	3 40	
25	3 30	3 52	
27	3 42	4 04	
29	3 54	4 22	
31	4 06	4 34	
2	10 41	11 07	
4	10 52	11 20	
6	11 09	11 33	
8	11 22	11 43	
10	11 35	11 54	PB
12	11 45		
14	11 56		
16			
18			
20			
22			
24			
26			
28			
30			
1			
2			

BATTERY NO. 9Bs

OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES
1			
3			
5			
7			
9			
11			
13			
15			
17			
19			
21			
23			
25			
27			
29			
31			
2	4 24	4 46	
4	4 36	4 58	
6	4 48	5 10	
8	5 —	5 22	
10	5 12	5 34	
12	5 24	5 46	
14	5 36	5 58	
16	5 48	6 10	
18	6 —	6 22	
20	6 12	6 34	PB
22	6 24	6 46	
24	6 36	6 58	
26	6 48	7 10	
28	7 —	7 16	
30	7 12	7 28	
C1	7 18	7 40	
2			

BATTERY NO. 8As

OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES
1	2 30	2 52	
3	2 42	8 16	
5	7 54	8 27	
7	8 18	8 38	
9	8 29	8 49	
11	8 40	9 01	
13	8 51	9 11	
15	9 03	9 22	
17	9 13	9 32	
19	9 24	9 43	
21	9 34	9 53	
23	9 45	10 04	
25	9 55	10 18	
27	10 06	10 28	
29	10 20	10 39	
31	10 30	10 50	
2			
4			
6			
8			
10			
12			
14			
16		12 09	
18		12 19	
20	12 11	12 29	
22	12 21	12 39	
24	12 31	12 49	
26	12 41	1 —	
28	12 51	1 11	
30	1 02	1 25	
1			
2			

REMARKS: 23 / 21 / 16 / 10 / 22 / 24

Condition of Signals

Condition of Pusher

HOURLY REPORT OF OPERATION

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
12-1	5	5	
1-2	6	6	
2-3	5	5	
3-4	5	5	
4-5	4	5	
5-6	5	5	
6-7	5	5	
7-8	6	5	
8-9	4	4	
9-10	6	6	
10-11	5	5	
11-12	5	5	
	31	30	

Total Ovens Pushed 61

Total Ovens Charged 61

Pusherman

Battery Foreman

CC-10295 REV. 1161
03.001.0020

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

PUSHING AND CHARGING REPORT

UNIT NO. 3
12 Hrs. Beginning 12:00 P. M.
Date 05-11-94

BATTERY NO. A-9

OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES
1	7 26	7 34	
3	7 37	7 45	
5	7 48	7 56	
7	7 59	8 08	
9	8 11	8 18	
11	8 22	8 29	
13	8 35	8 42	
15	8 45	8 52	
17	8 56	9 03	
19	9 10	9 18	
21	9 22	9 30	
23	9 34	9 41	
25	9 45	9 52	
27	9 55	9 59	
29	10 02	10 06	
31	10 08	10 14	
2			
4			
6			
8			
10			
12		12 05	
14		12 16	
16	12 07	12 29	
18	12 18	12 37	
20	12 29	12 49	
22	12 39	12 58	
24	12 49	1 08	
26	1 00	1 18	
28	1 10	1 28	
30	1 20	1 39	
1			
2			

REMARKS: 24/26

BATTERY NO. B-9

OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES
1	1 37	1 57	
3	1 48	2 07	
5	1 59	2 18	
7	2 09	2 28	
9	2 20	2 37	
11	2 30	2 49	
13	2 41	2 59	
15	2 51	3 09	
17	3 02	3 19	
19	3 12	3 28	
21	3 21	3 38	
23	3 31	3 48	
25	4 08	4 17	
27	4 20	4 27	
29	4 30	4 38	
31	4 42	4 49	
2	10 40	10 47	
4	10 50	10 57	
6	11 02	11 10	
8	11 13	11 21	
10	11 25	11 32	
12			
14			
16			
18			
20			
22			
24			
26			
28			
30			
1			
2	4 52	4 59	

22/22

BATTERY NO. A-8

OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES
1			
3			
5			
7			
9			
11			
13			
15			
17			
19			
21			
23			
25			
27			
29			
31			
2	4 57	5 03	
4	5 06	5 13	
6	5 16	5 24	
8	5 27	5 34	
10	5 37	5 45	
12	5 47	5 53	
14	5 56	5 59	
16	6 05	6 10	
18	6 15	6 21	
20	6 25	6 32	
22	6 35	6 42	
24	6 45	6 53	
26	6 55	7 02	
28	7 05	7 13	
30	7 16	7 23	
1			
2			

15/15

Condition of Signals

Condition of Pusher

HOURLY REPORT OF OPERATION

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
12-1	5	6	
1-2	6	5	
2-3	5	6	
3-4	4	5	
4-5	6	5	
5-6	6	7	
	32	34	

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
6-7	6	5	
7-8	6	6	
8-9	5	5	
9-10	5	6	
10-11	4	4	
11-12	3	3	
	29	29	

Total Ovens Pushed

Total Ovens Charged

Pusherman

Battery Foreman

CC-1025 REV. 1161
03.001.0020

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

PUSHING AND CHARGING REPORT

UNIT NO. 3
12 Hrs. Beginning 12:00 AM
Date 5-12-94

BATTERY NO. AS-9

OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES
1			
3			
5			
7			
9			
11			
13			
15			
17			
19			
21			
23			
25			
27			
29			
31			
2	5 22	5 38	
4	5 35	5 49	
6	5 40	5 59	
8	5 51	6 10	
10	6 01	6 20	
12	6 12	6 28	
14	6 22	6 35	
16	6 32	6 46	
18	6 43	6 57	
20	6 54	7 09	
22	7 06	7 21	
24	7 18	7 33	
26	7 30	7 39	
28	7 42	7 45	PB
30	8 16	8 25	
1			
2			

REMARKS: 15/15

BATTERY NO. BS-9

OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES
1	8 33	8 45	
3	8 48	8 55	
5	8 59	9 15	
7	9 10	9 30	
9	9 21	9 40	
11	9 33	9 53	
13	9 51	10 05	
15	9 56	10 17	
17	10 03	10 28	
19	10 19	10 42	
21	10 30	10 52	
23	10 44	11 05	
25	10 54	11 15	
27	11 10	11 22	
29	11 20	11 32	
31	11 30	11 39	
2			
4			
6			
8			
10			
12	12 10	12 19	
14	12 15	12 25	
16	12 21	12 31	
18	12 27	12 37	
20	12 33	12 52	
22	12 39	1 02	
24	1 20	1 28	
26	1 25	1 36	
28	1 31	1 47	
30	1 47	1 54	
C1	2 27	2 46	
C3	11 41	11 45	

28/28

BATTERY NO. AS-8

OVEN NO	TIME PUSHED	TIME CHARGED	NOTES
1	2 37	2 56	
3	2 48	3 06	
5	2 58	3 16	
7	3 08	3 24	
9	3 18	3 36	
11	3 28	3 48	
13	3 38	3 59	
15	3 50	4 11	
17	4 01	4 21	
19	4 13	4 31	
21	4 23	4 41	
23	4 33	4 52	
25	4 43	4 57	
27	4 54	5 07	
29	4 57	5 20	
31	5 09	5 33	
2	11 47	11 56	
4	11 58		
6			
8			
10			
12			
14			
16			
18			
20			
22			
24			
26			
28			
30			
1			
2			

18/17

Need 2 New Chair

Condition of Signals OK

Condition of Pusher ok

HOURLY REPORT OF OPERATION

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
12-1	6	5	
1-2	4	5	
2-3	4	2	
3-4	5	6	
4-5	7	6	
5-6	5	6	
	31	30	

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
6-7	6	6	
7-8	4	5	
8-9	4	3	
9-10	5	4	
10-11	5	5	
11-12	6	7	
	30	30	

Total Ovens Pushed 61
Total Ovens Charged 60

Pusherman 20481
Battery Foreman

CC-10295 REV. 1161
03.031.0020

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

PUSHING AND CHARGING REPORT

UNIT NO. 3

12 Hrs. Beginning 12:00 N/MN

Date 5-12-44

BATTERY NO. 9 A's

OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES
1	2 43	2 52	
3	2 54	3 05	
5	3 07	3 15	
7	3 17	3 25	
9	3 27	3 35	
11	3 37	3 45	
13	3 47	3 50	
15	4 05	4 12	
17	4 17	4 24	
19	4 27	4 35	
21	4 40	4 48	
23	4 51	4 59	
25	5 03	5 11	
27	5 09	5 18	
29	5 27	5 34	
31	5 38	5 45	
2			
4			
6			
8			
10			
12			
14			
16			
18			
20			
22			
24			
26			
28			
30			
1			
2			

REMARKS: 16/16

BATTERY NO. 9 B's

OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES
1			
3			
5			
7			
9			
11			
13			
15			
17			
19			
21			
23			
25			
27			
29			
31			
2	5 53	5 59	
4	6 04	6 12	
6	6 18	6 24	
8	6 28	6 36	
10	6 38	6 45	
12	6 48	6 54	
14	6 58	7 05	
16	7 07	7 14	
18	7 17	7 24	
20	7 27	7 33	
22	7 37	7 43	
24	7 48	7 54	
26	7 59	8 05	
28	8 09	8 16	
30	8 20	8 24	
C1	8 27	8 32	
2			

16/16

BATTERY NO. 8 A's

OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES
1	8 40	8 46	
3	8 51	8 58	
5	9 02	9 08	
7	9 12	9 15	
9	9 17	9 24	
11	9 27	9 34	
13	9 37	9 44	
15	9 50	9 56	
17	10 00	10 12	
19	10 10	10 27	
21	10 20	10 37	
23	10 30	10 47	
25	10 40	11 06	
27	10 50	11 17	
29	11 10		
31	11 20		
2			
4		12 09	
6	12 11	12 21	
8	12 23	12 33	
10	12 35	12 45	
12	12 47	12 57	
14	12 59	1 10	
16	1 12	1 21	
18	1 23	1 33	
20	1 35	1 46	
22	1 46	1 55	
24	1 57	2 11	
26	2 09	2 18	
28	2 20	2 28	
30	2 30	2 41	
1			
2			

29/28

Condition of Signals

Condition of Pusher

HOURLY REPORT OF OPERATION

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
12-1	5	5	
1-2	5	5	
2-3	5	5	
3-4	5	6	
4-5	5	5	
5-6	5	5	--
	30	31	

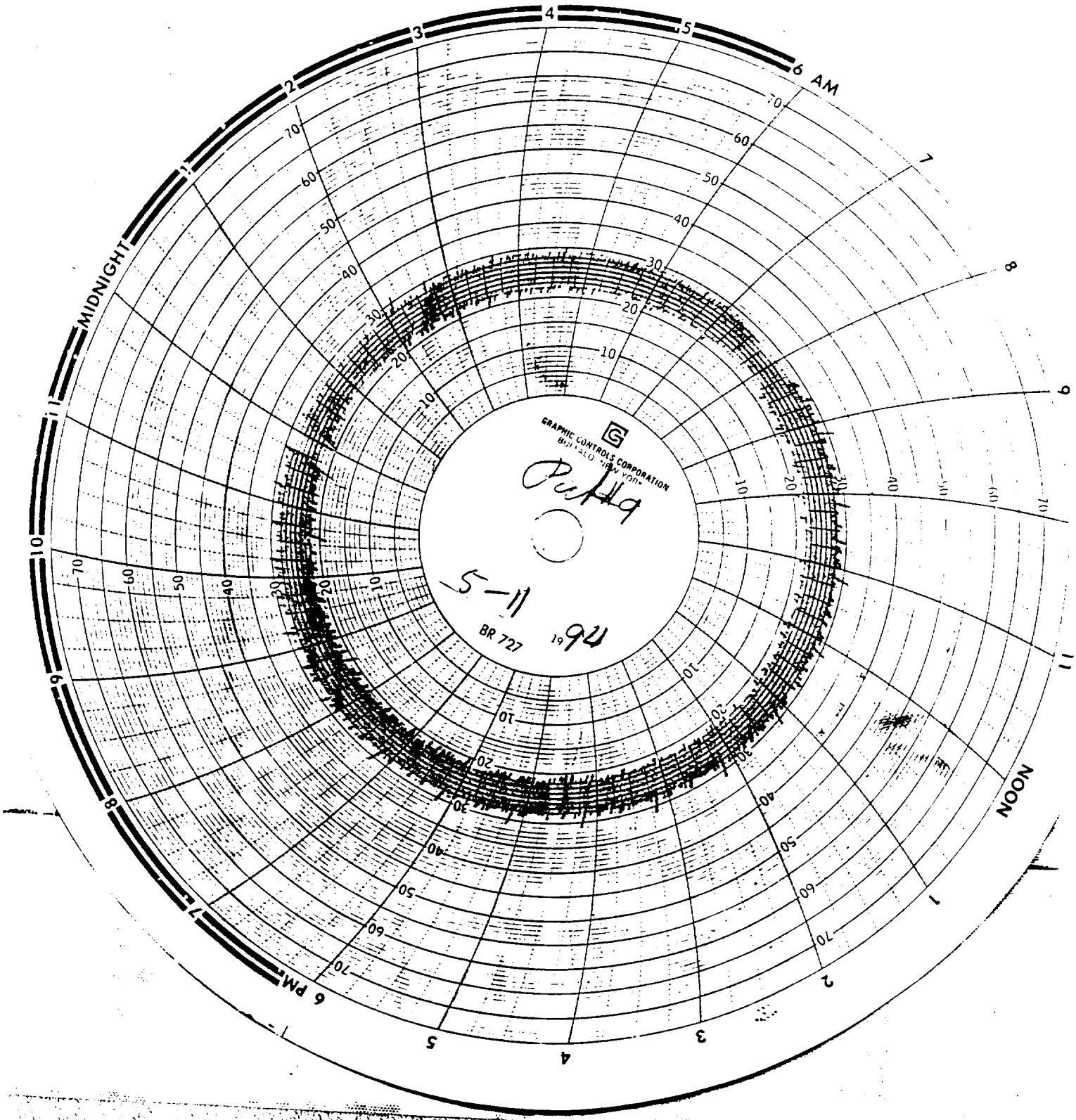
TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
6-7	6	5	
7-8	6	6	
8-9	5	6	
9-10	6	6	
10-11	6	4	
11-12	2	2	
	31	29	

Total Ovens Pushed 61

Total Ovens Charged 60

Pusherman

Battery Foreman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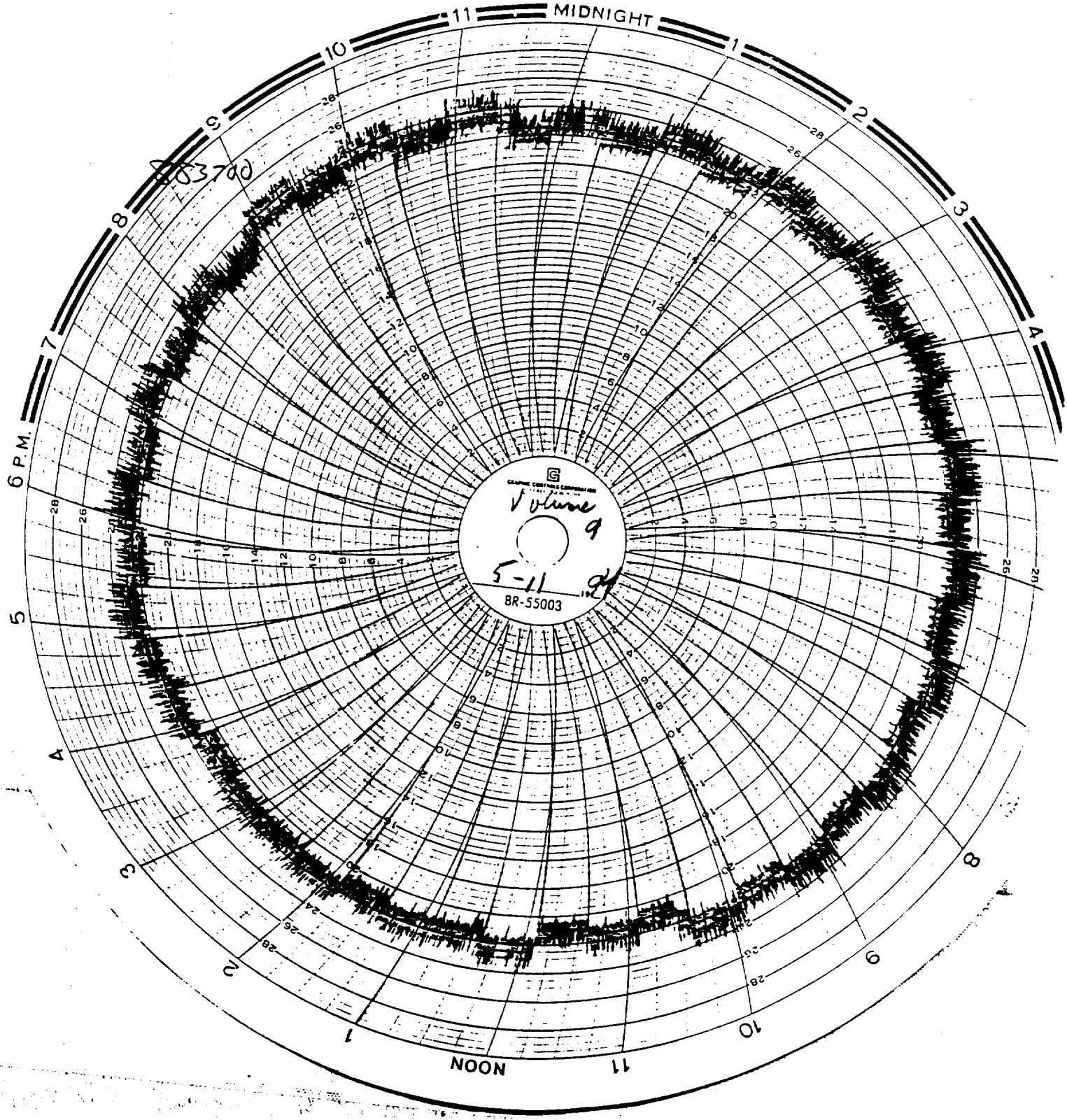
6 AM
NOON
6 PM
GRAPHIC CONTROLS CORPORATION
BUFFALO, NEW YORK
Pulls
5-11
BR 727
1994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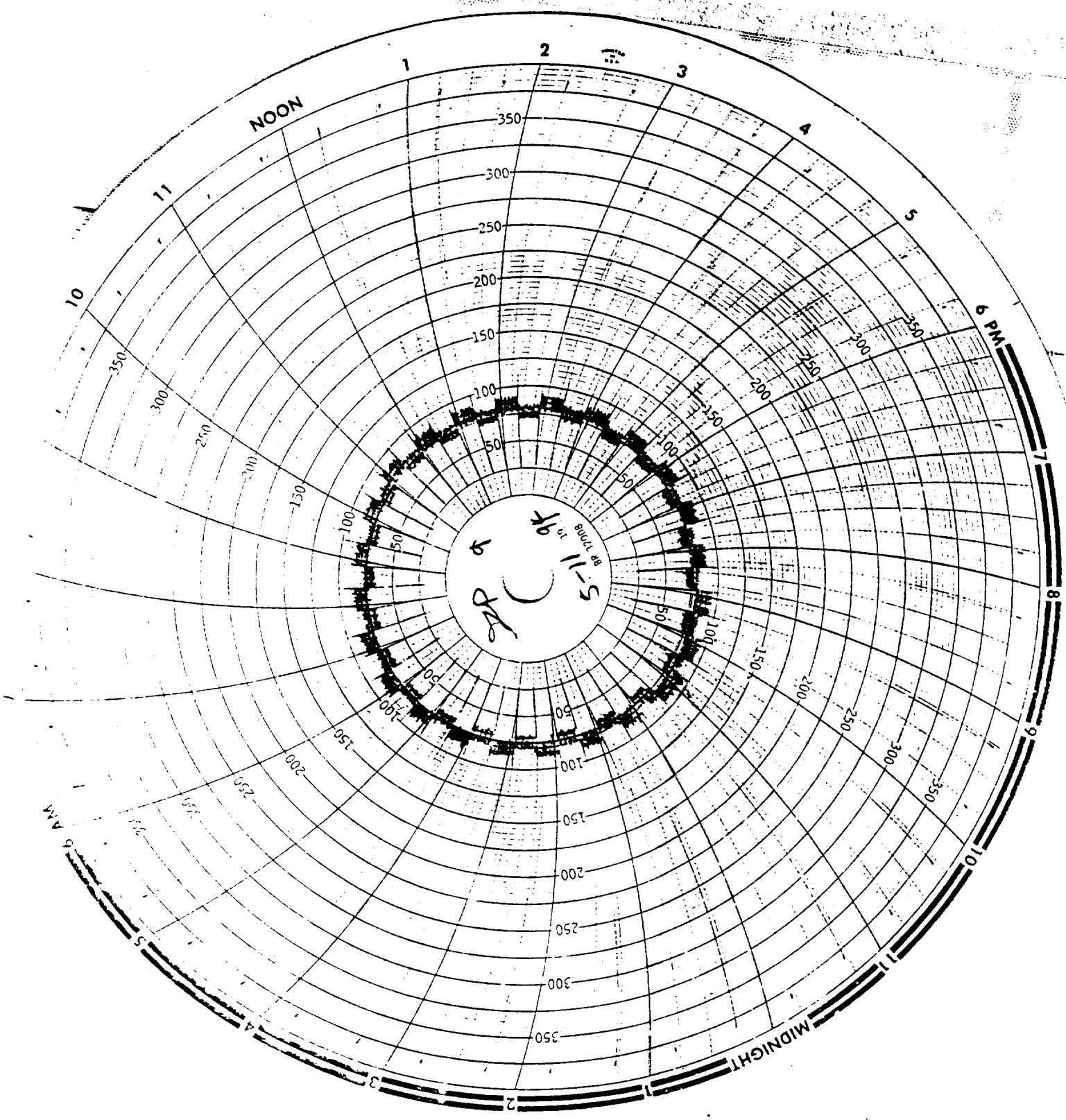
6 P.M.
Volume 9
5-11
BR-55003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1
2
3
4
5
6 PM
7
8
9
10
11
MIDNIGHT
1
2
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4
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6 AM
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8
9
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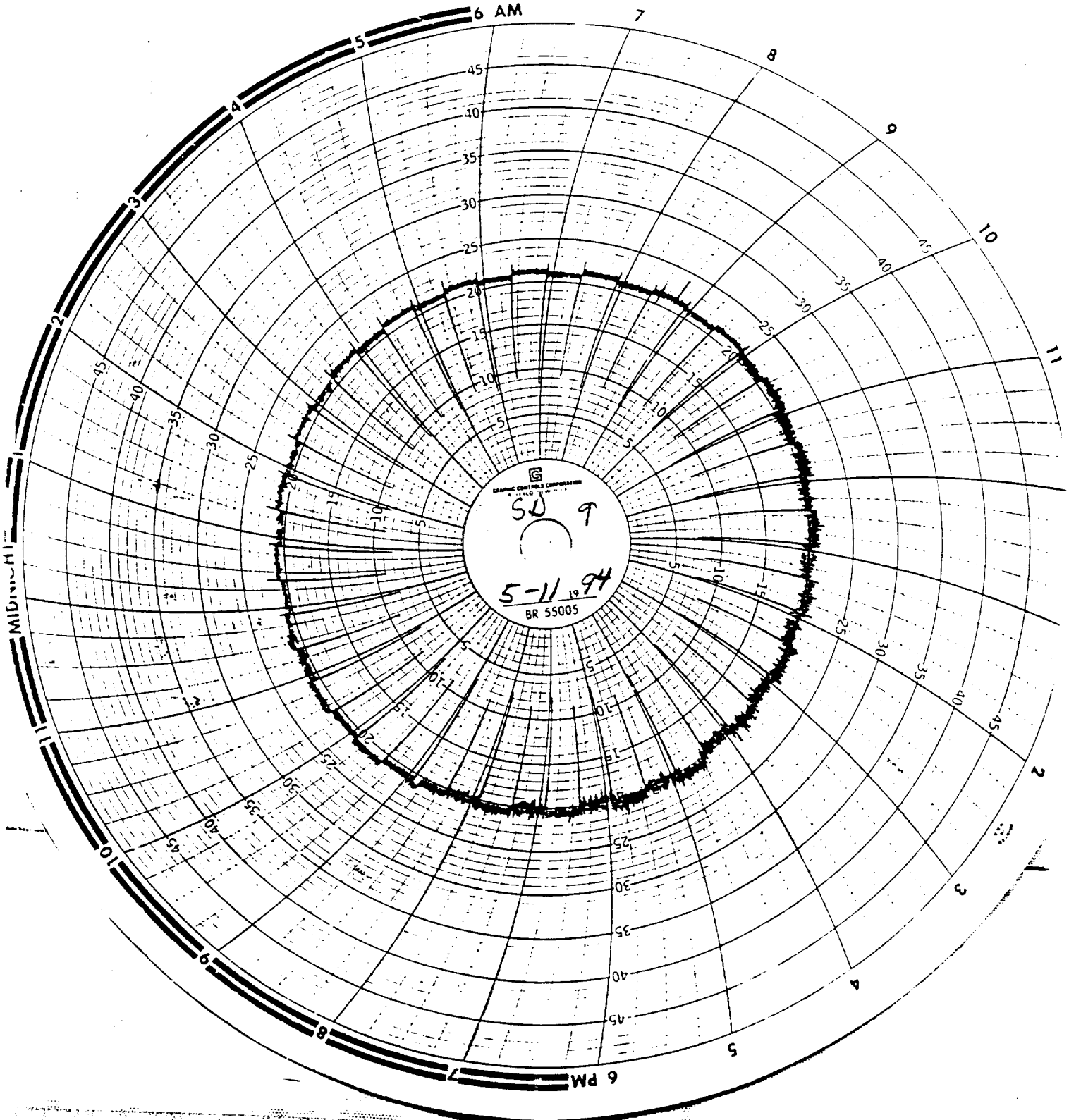
11
50
100
150
200
250
300
350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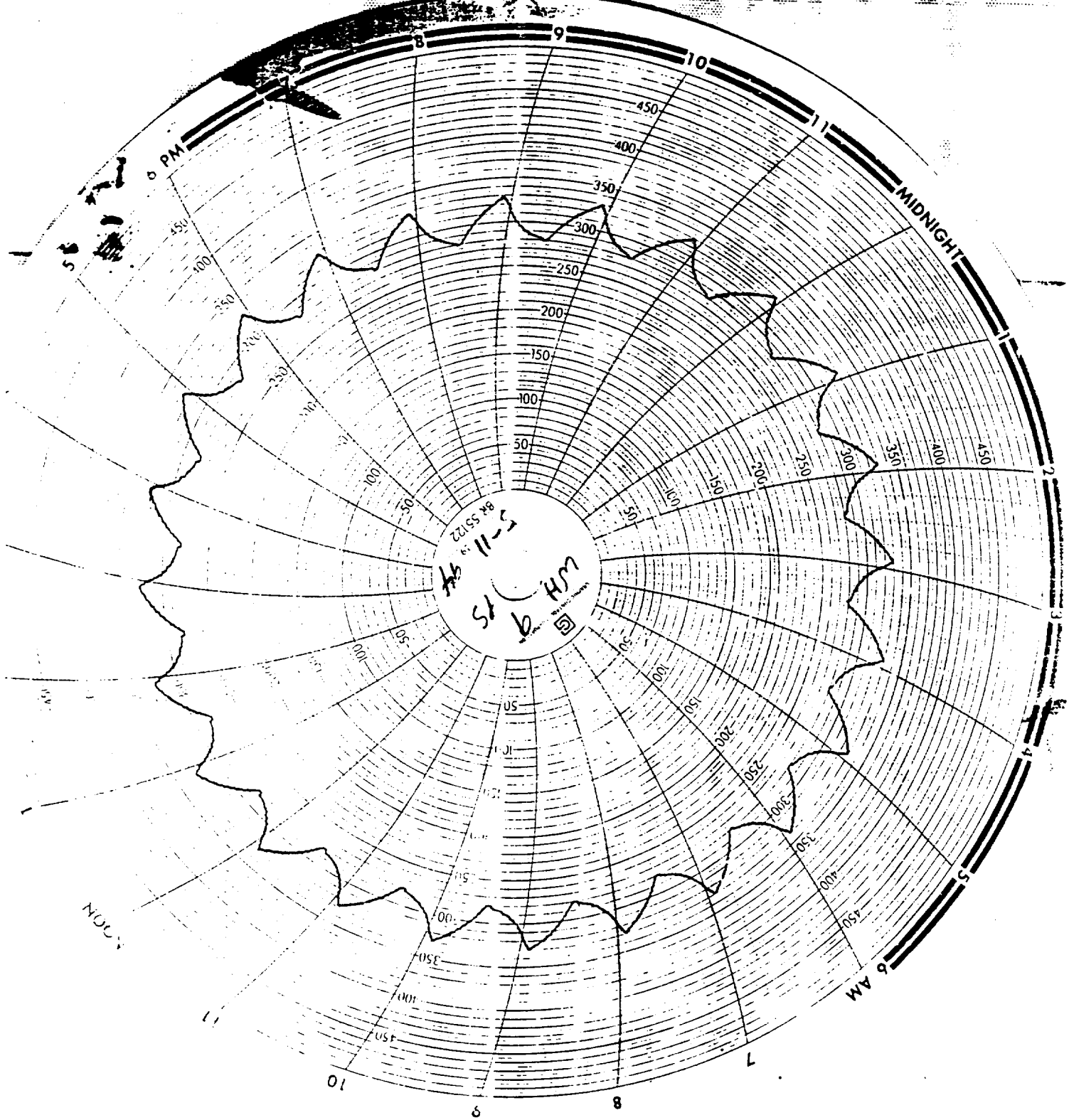
6 PM
SD 9
5-11 94
BR 55005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6 PM
1
2
3
4
5
7
8
9
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11
50
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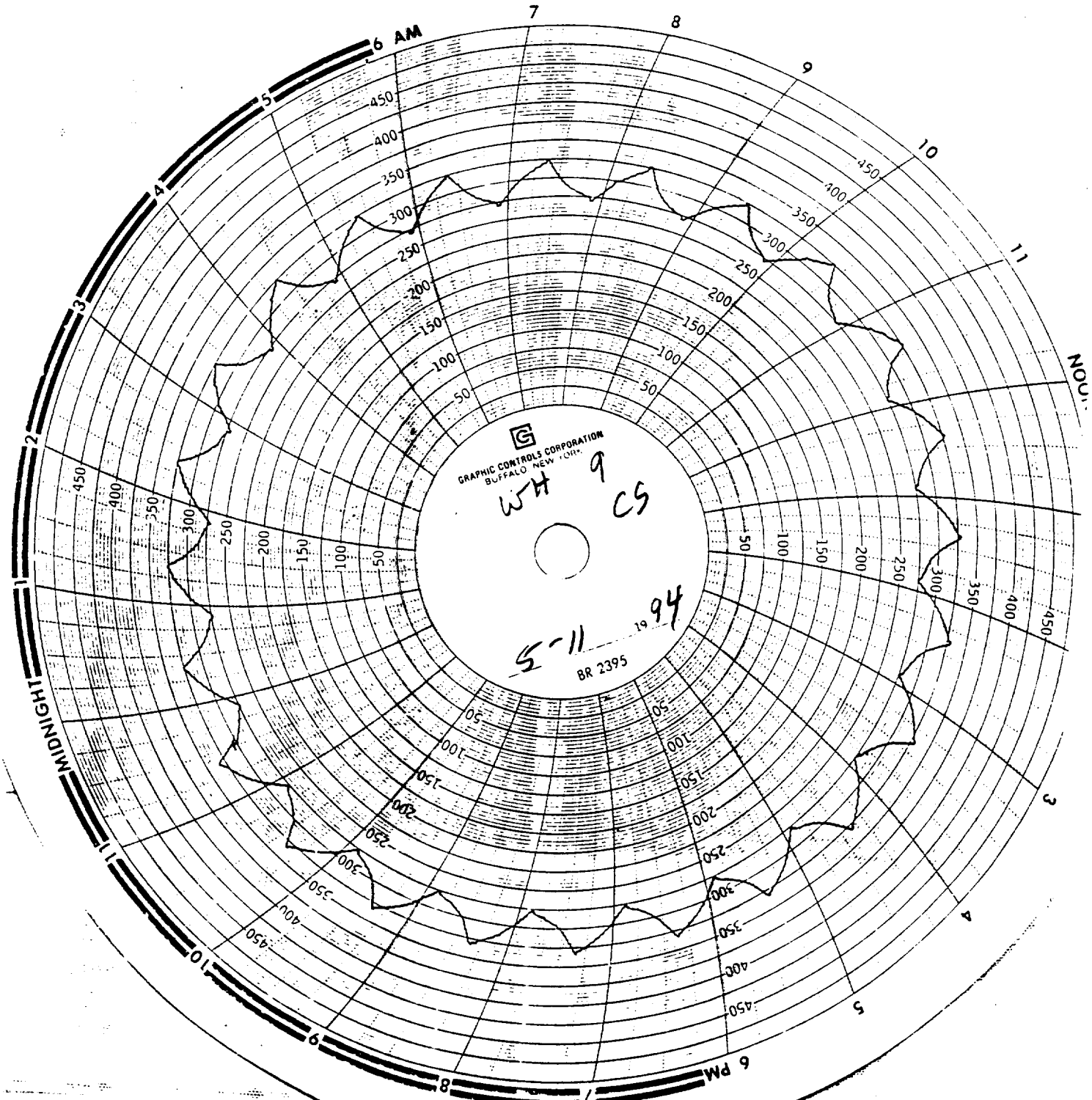
300
350
400
450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MIDNIGHT
6 PM
NOON
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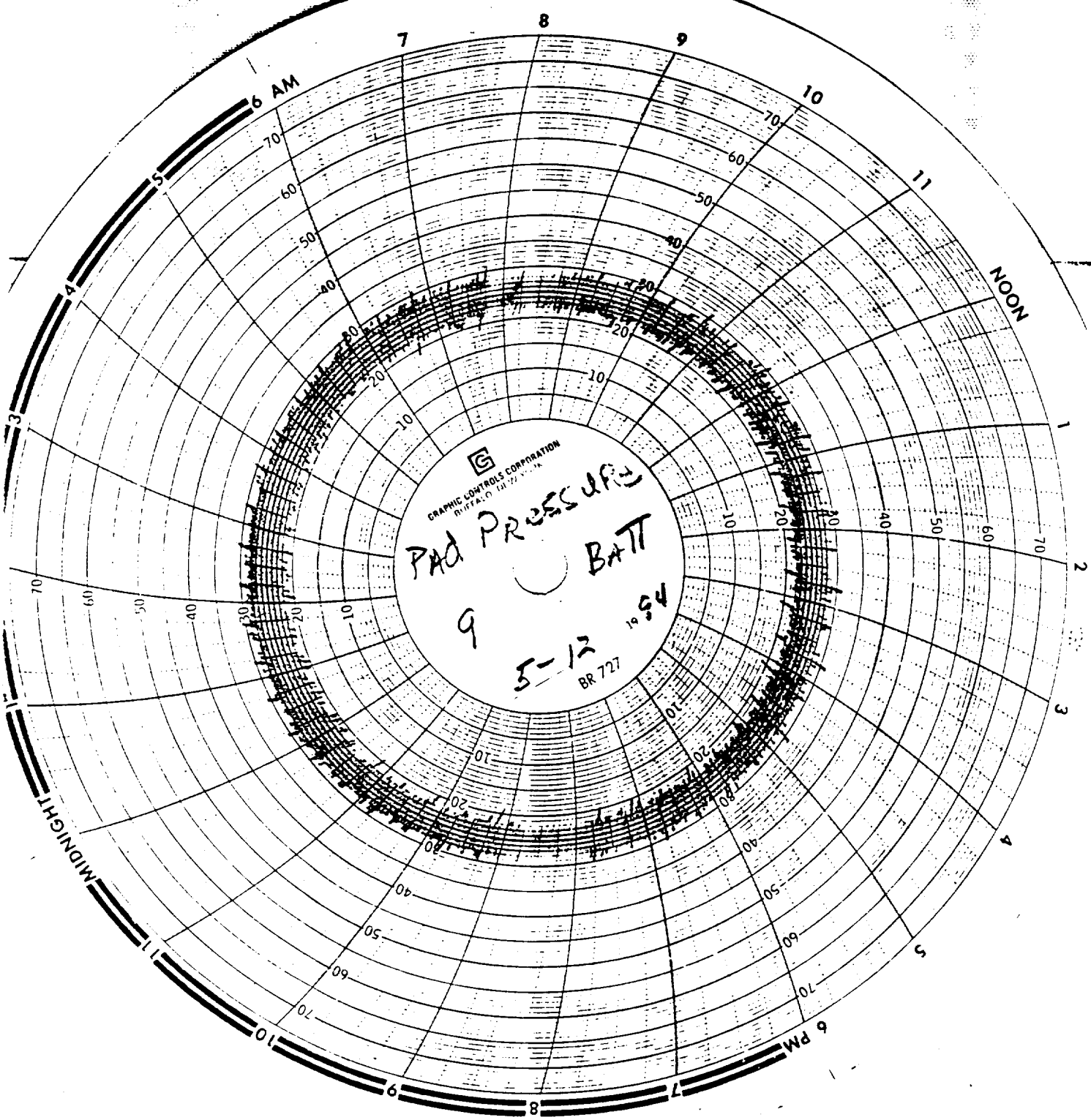
BUFFALO NEW YORK
WH 9 CS
5-11 19 94
BR 2395


6 AM
NOON
MIDNIGHT
6 PM
GRAPHIC CONTROLS CORPORATION
BUFFALO NEW YORK
PAD PRESSURE
BATT
9
5-12
1994
BR 727

NOON
1
2
3
4
5
6 PM
7
8
9
10
11
MIDNIGHT
1
2
3
4
5
6 AM
7
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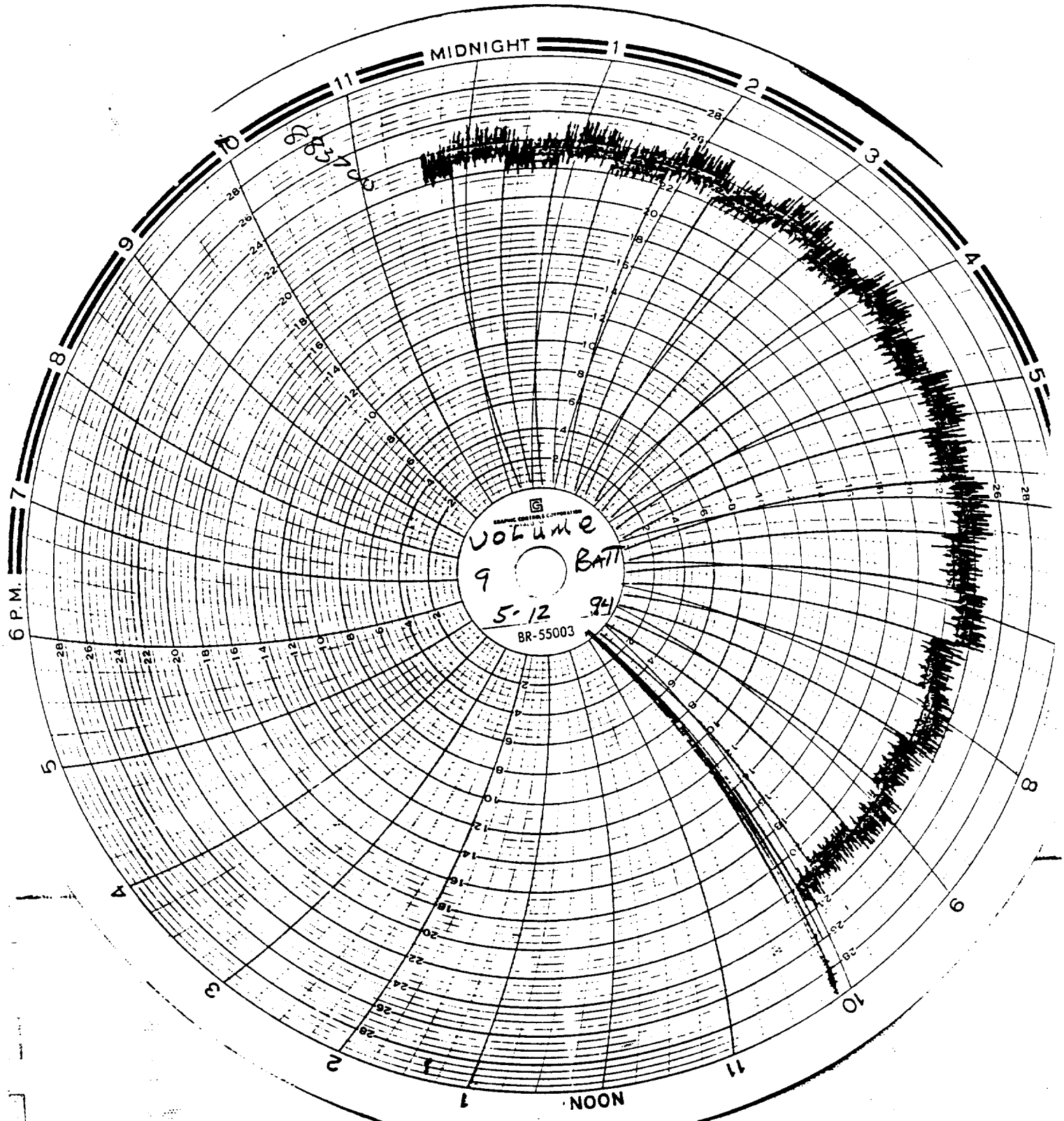
11
50
100
150
200
250
300
350
Volume
Batt
CAL
0-400K
ERR CAL
CHART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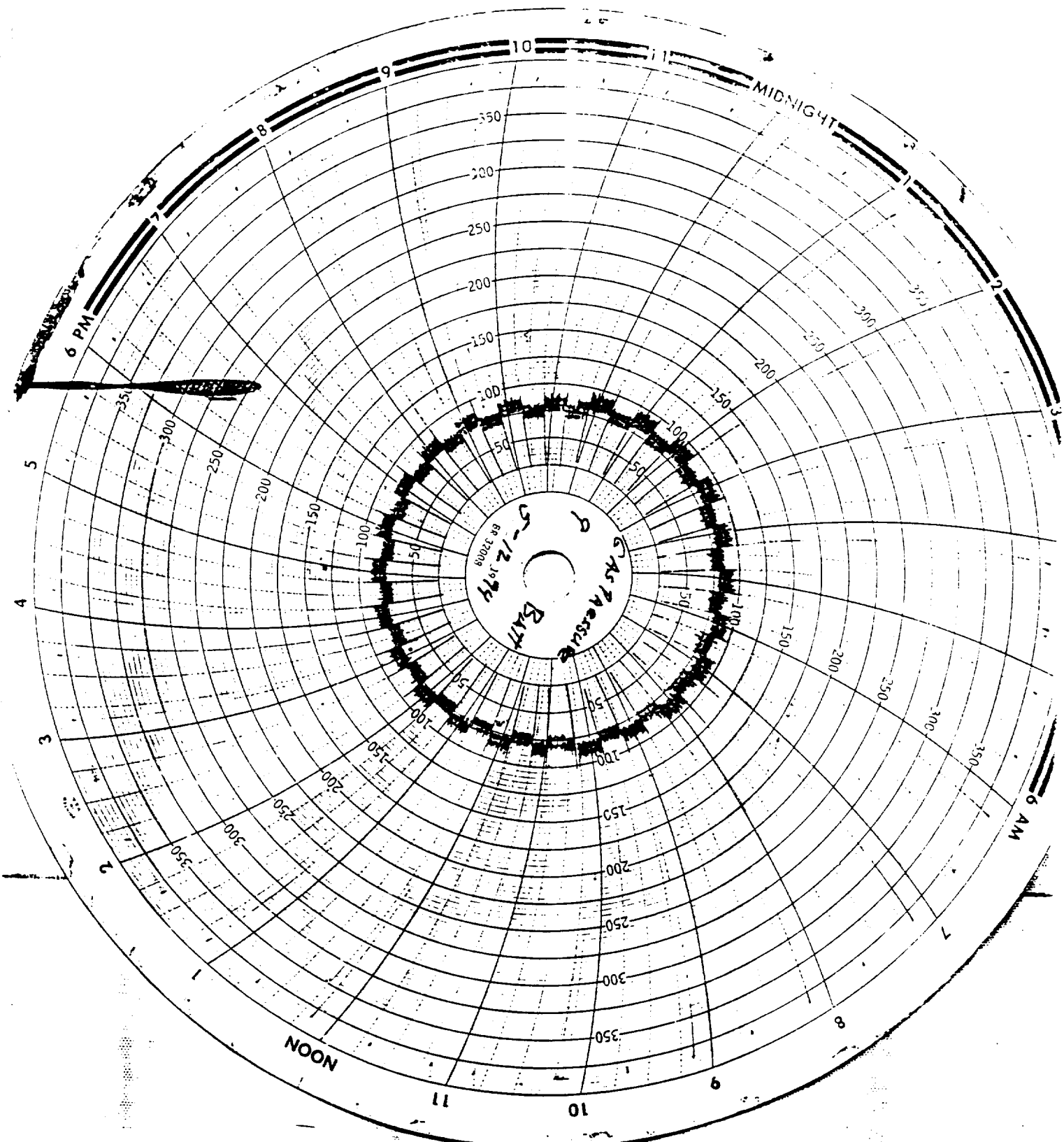
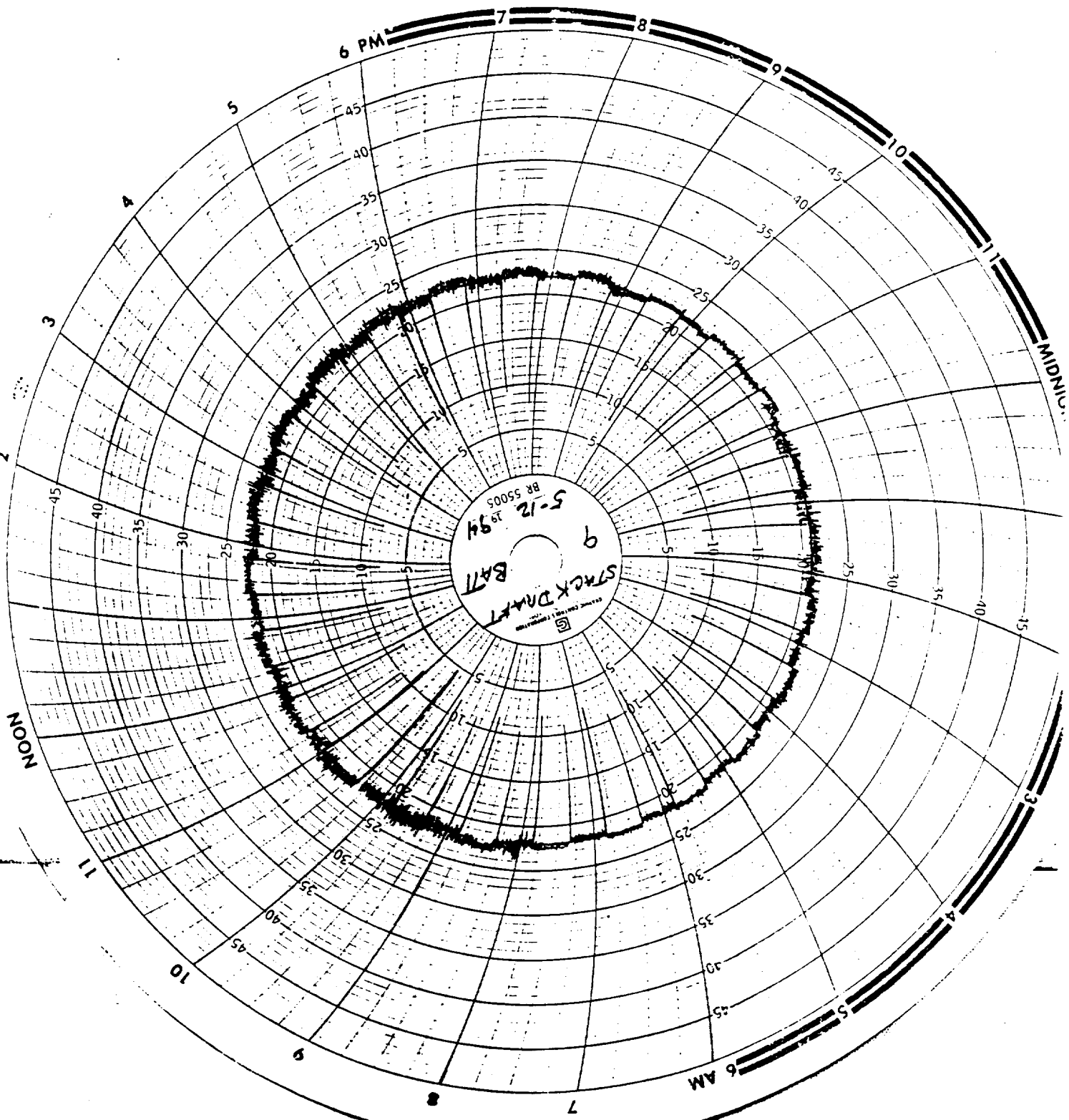
NOON
6 P.M.
Volume
BATT
5-12
94
BR-55003



MIDNIGHT
6 PM
6 AM
NOON
Gas Pressure
Batt
5-12 1974


6 PM
7
8
9
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11
MIDNIGHT
3
4
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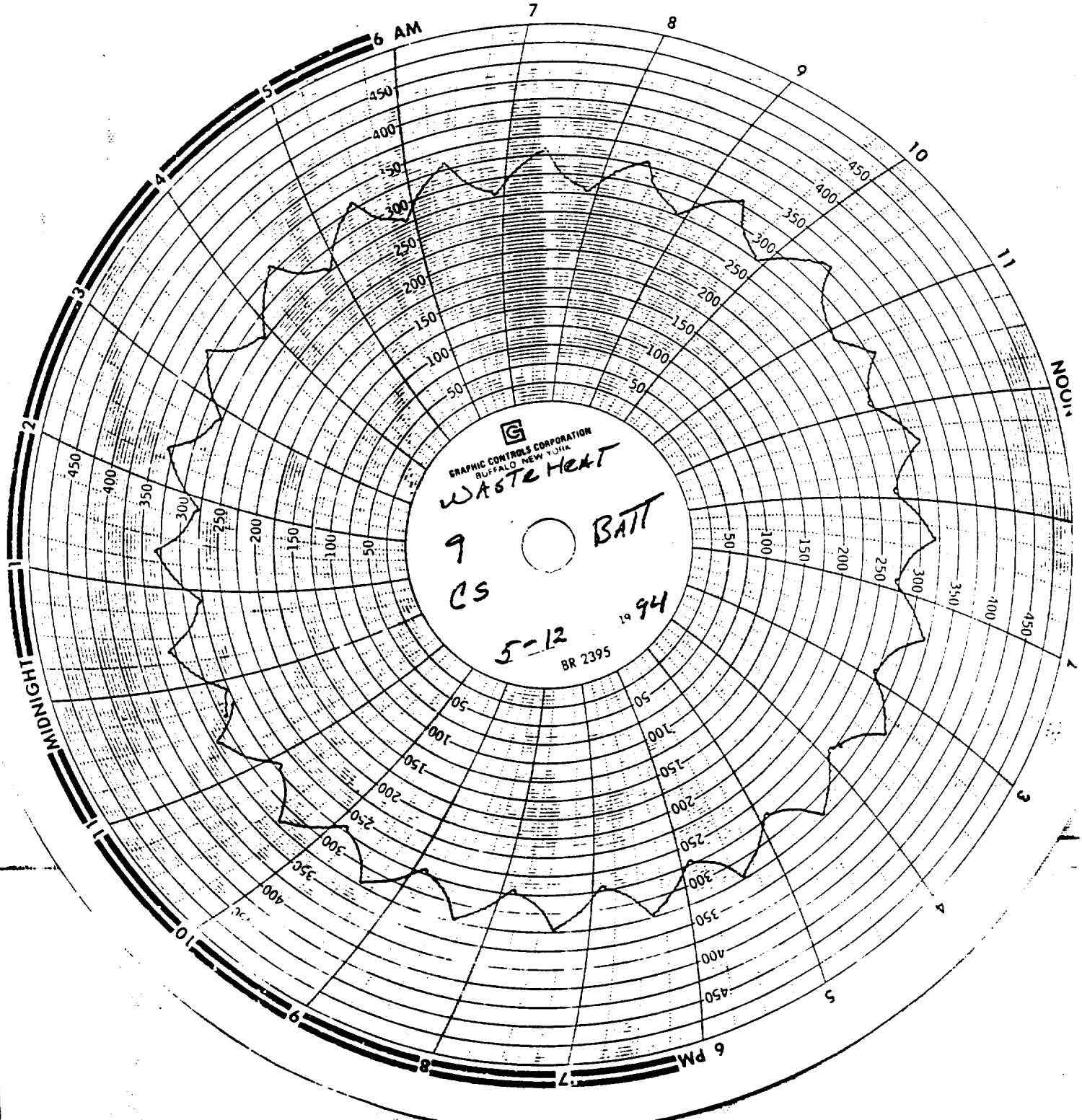
6 AM
7
8
9
10
11
NOON
1
2
3
4
5
STACK DRAFT
BATT
9
5-12 1994
BR 55005

MIDNIGHT
NOON
6 PM
WASTE HEAT
BATT
BR SS122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NOON
MIDNIGHT
6 PM
GRAPHIC CONTROLS CORPORATION
BUFFALO NEW YORK
WASTE HEAT
9
BATT
CS
5-12
19 94
BR 2395

COMPLIANCE DEMONSTRATION
NO. 9 BATTERY COMBUSTION STACK

USS CLAIRTON WORKS
CLAIRTON, PENNSYLVANIA

APPENDIX C

GRAVIMETRIC RESULTS, EMISSIONS CALCULATIONS

CHESTER
ENVIRONMENTAL

CHESTER ENVIRONMENTAL RESOURCES
AIR QUALITY ENGINEERING

ANALYTICAL REPORTING FORM

CLIENT: USS - Clairton Works
PLANT LOCATION: Clairton, PA
PROJECT NUMBER: 393445-02
UNIT TESTED: Battery Stack #9

TEST DATE: 5/11 + 5/12/94
DATE RECEIVED: 5/11 + 5/12/94
DATE ANALYZED: 5/20/94
ANALYTICAL METHOD:

Test Number	Filter ID Number	Component	Cyclone Weight Units ( )	Filter Weight Units (grams)	Soluble Portion of Front Half H2O Rinse Units ( )	Soluble Portion of Front Half Acetone Rinse Units (grams)	Soluble Portion of Back Half H2O Rinse Units ( )	Soluble Portion of Back Half Acetone Rinse Units ( )	0.22μm Filter Insoluble Portion of Back Half H2O Rinse Units ( )
CLR-BS9-1	1228	Particulate		0.0403		0.0325			
CLR-BS9-2	1251	Particulate		0.0350		0.0477			
CLR-BS9-3	1248	Particulate		0.0349		0.0467			

Analyst's Signature: Patricia A. Stockton
Date: 5/23/94

Comments:

AQE 10/92

STACK SAMPLING CALCULATIONS

CLIENT: USS CLAIRTON WORKS — TEST DATE: 05-11-94

TEST SITE #9 BATTERY COMBUSTION STACK — TEST NUMBER: CLR-BS#9-1

A.	Barometric Pressure	29.45	in. Hg	
B.	Static Pressure	-0.90	in. H2O	
C.	Stack Pressure	29.38	in. Hg	[A+(B/13.6)]
D.	Average ΔH	1.66	in. H2O	
E.	Meter Pressure	29.57	in. Hg	[A+(D/13.6)]
F.	Average ΔP	0.06	in. H2O	
G.	Pitot Coefficient	0.84		
H.	Gas Meter Coefficient	1.0128		
I.	Stack Diameter	114	in.	
J.	Stack Area	70.88	ft²	(0.00545*I²)
K.	Nozzle Diameter	0.490	in.	
L.	Nozzle Area	1.31E-03	ft²	(0.00545*K²)
M.	Average Stack Temperature	533	°F	
N.	Average Stack Temperature	993	°R	(460+M)
O.	Average Meter Temperature	93	°F	
P.	Average Meter Temperature	553	°R	(460+O)
Q.	Condensate Volume	237.0	mL	
R.	Absorbed H2O	21.5	mL	
S.	Total H2O	258.5	mL	(Q+R)
T.	Filter Weight	0.0403	g	
U.	Probe Weight	0.0325	g	
V.	Impinger Weight		g	
W.	Total Weight	0.0728	g	(T+U+V)
X.	Metered Gas Volume	82.522	dcf	
Y.	Corrected Metered Gas Volume	83.578	dcf	(X*H)
Z.	H2O Gas Volume	12.960	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	96.538	cf	(Y+Z)
BB.	Percent H2O	13.4	%	(100*Z/AA)
CC.	Gas Volume Sampled	78.872	dscf	[Y*(528/P)*(E/29.92)]
DD.	Grain Loading	0.0142	gr/dscf	(15.43*W/CC)

EE. Average Molecular Weight:

Component	% Volume ÷100	*(1-BB/100)	* Mol. Weight	= Weight/Mol
H2O	0.134	[illegible]	18	2.416
CO2	0.040	0.866	44	1.524
CO	0.000	0.866	28	0.000
O2	0.125	0.866	32	3.463
N2	0.835	0.866	28	20.241

Average Molecular Weight: 27.64 lb./lb. mol

FF.	Average Stack Velocity	19.4	fps	{85.49*G*[(F*N)/(C*EE)]^0.5}
GG.	Averge Flow Rate	82700	acfm	(60*FF*J)
HH.	Standard Flow Rate	43200	scfm	[GG*(528/N)*(C/29.92)]
II.	Sample Time	7200	sec	
JJ.	Percent Isokinetic	95.1	%	{[100*CC*60*J]/[HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	4.57	lb/hr	[DD*HH*(1-BB/100)*60/7000]

STACK SAMPLING CALCULATIONS

CLIENT: USS CLAIRTON WORKS
TEST SITE #9 BATTERY COMBUSTION STACK

TEST DATE: 05-11-94
TEST NUMBER: CLR-BS#9-2

A.	Barometric Pressure	29.45	in. Hg	
B.	Static Pressure	-0.90	in. H2O	
C.	Stack Pressure	29.38	in. Hg	[A+(B/13.6)]
D.	Average ΔH	1.79	in. H2O	
E.	Meter Pressure	29.58	in. Hg	[A+(D/13.6)]
F.	Average ΔP	0.06	in. H2O	
G.	Pitot Coefficient	0.84		
H.	Gas Meter Coefficient	1.0128		
I.	Stack Diameter	114	in.	
J.	Stack Area	70.88	ft²	(0.00545*I²)
K.	Nozzle Diameter	0.490	in.	
L.	Nozzle Area	1.31E-03	ft²	(0.00545*K²)
M.	Average Stack Temperature	537	°F	
N.	Average Stack Temperature	997	°R	(460+M)
O.	Average Meter Temperature	101	°F	
P.	Average Meter Temperature	561	°R	(460+O)
Q.	Condensate Volume	232.6	mL	
R.	Absorbed H2O	37.7	mL	
S.	Total H2O	270.3	mL	(Q+R)
T.	Filter Weight	0.0350	g	
U.	Probe Weight	0.0477	g	
V.	Impinger Weight		g	
W.	Total Weight	0.0827	g	(T+U+V)
X.	Metered Gas Volume	86.461	dcf	
Y.	Corrected Metered Gas Volume	87.568	dcf	(X*H)
Z.	H2O Gas Volume	13.748	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	101.316	cf	(Y+Z)
BB.	Percent H2O	13.6	%	(100*Z/AA)
CC.	Gas Volume Sampled	81.485	dscf	[Y*(528/P)*(E/29.92)]
DD.	Grain Loading	0.0157	gr/dscf	(15.43*W/CC)

EE. Average Molecular Weight:

Component	% Volume ÷100	*(1-BB/100)	* Mol. Weight	= Weight/Mol
H2O	0.136	0.864	18	2.442
CO2	0.040	0.864	44	1.521
CO	0.000	0.864	28	0.000
O2	0.125	0.864	32	3.457
N2	0.835	0.864	28	20.207
Average Molecular Weight				27.63 lb./lb. mol

FF.	Average Stack Velocity	19.5	fps	{85.49*G*[(F*N)/(C*EE)]^0.5}
GG.	Averge Flow Rate	82900	acfm	(60*FF*J)
HH.	Standard Flow Rate	43100	scfm	[GG*(528/N)*(C/29.92)]
II.	Sample Time	7200	sec	
JJ.	Percent Isokinetic	98.7	%	{[100*CC*60*J]/[HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	5.00	lb/hr	[DD*HH*(1-BB/100)*60/7000]

STACK SAMPLING CALCULATIONS

CLIENT: USS CLAIRTON WORKS

TEST SITE #9 BATTERY COMBUSTION STACK

TEST DATE: 05-12-94

TEST NUMBER: CLR-BS#9-3

A.	Barometric Pressure	29.38	in. Hg	
B.	Static Pressure	-0.90	in. H2O	
C.	Stack Pressure	29.31	in. Hg	[A+(B/13.6)]
D.	Average ΔH	1.57	in. H2O	
E.	Meter Pressure	29.50	in. Hg	[A+(D/13.6)]
F.	Average ΔP	0.05	in. H2O	
G.	Pitot Coefficient	0.84		
H.	Gas Meter Coefficient	1.0128		
I.	Stack Diameter	114	in.	
J.	Stack Area	70.88	ft²	(0.00545*I²)
K.	Nozzle Diameter	0.490	in.	
L.	Nozzle Area	1.31E-03	ft²	(0.00545*K²)
M.	Average Stack Temperature	540	°F	
N.	Average Stack Temperature	1000	°R	(460+M)
O.	Average Meter Temperature	76	°F	
P.	Average Meter Temperature	536	°R	(460+O)
Q.	Condensate Volume	241.3	mL	
R.	Absorbed H2O	20.3	mL	
S.	Total H2O	261.6	mL	(Q+R)
T.	Filter Weight	0.0349	g	
U.	Probe Weight	0.0467	g	
V.	Impinger Weight		g	
W.	Total Weight	0.0816	g	(T+U+V)
X.	Metered Gas Volume	81.408	dcf	
Y.	Corrected Metered Gas Volume	82.450	dcf	(X*H)
Z.	H2O Gas Volume	12.743	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	95.193	cf	(Y+Z)
BB.	Percent H2O	13.4	%	(100*Z/AA)
CC.	Gas Volume Sampled	80.067	dscf	[Y*(528/P)*(E/29.92)]
DD.	Grain Loading	0.0157	gr/dscf	(15.43*W/CC)

EE. Average Molecular Weight:

Component	% Volume ÷100	*(1-BB/100)	* Mol. Weight	= Weight/Mol
H2O	0.134	[illegible]	18	2.410
CO2	0.045	0.866	44	1.715
CO	0.000	0.866	28	0.000
O2	0.120	0.866	32	3.326
N2	0.835	0.866	28	20.250
Average Molecular Weight				27.70 lb./lb. mol

FF.	Average Stack Velocity	17.8	fps	{85.49*G*[(F*N)/(C*EE)]^0.5}
GG.	Averge Flow Rate	75800	acfm	(60*FF*J)
HH.	Standard Flow Rate	39200	scfm	[GG*(528/N)*(C/29.92)]
II.	Sample Time	7200	sec	
JJ.	Percent Isokinetic	106.4	%	{[100*CC*60*J]/[HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	4.58	lb/hr	[DD*HH*(1-BB/100)*60/7000]