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.

22

Eling

USS
Clairton Works
400 State Street
Clairton, PA 15025

August 1, 1990

Director
Bureau of Air Quality Control
Department of Environmental Resources
Executive House-2nd & Chestnut
P.O. Box 2357
Harrisburg, PA 17105-2357

Deputy Director
Allegheny County Health Department
Bureau of Air Pollution Control
301 Thirty-ninth Street
Pittsburgh, PA 15201

U. S. Environmental Protection Agency
Region III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

Office of Chief Council
Western Region
Department of Environmental Resources
1303 Highland Building
121 South Highland Avenue
Pittsburgh, Pennsylvania 15206

Gentlemen:

Subject: Compliance Demonstration
B Battery Pushing Emission Control System

Please find enclosed with this letter the final report on B Battery Pushing Emission Control System (Baghouse-Shed) compliance demonstration, conducted at USS Clairton Works, Division of USX Corporation, during the period March 12 -13, 1990.

Please refer questions concerning this report to Paul S. Kiswardy at (412) 233-1046.

Very truly yours,

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

GTW/BAC-nt
Attachments

RECEIVED

AUG 0 8 1990

Enforcement
State Coordination Section

RECEIVED

AUG 0 7 1990

AIR ENFORCEMENT BRANCH
EPA Region III

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL
CHEMICAL WORKS

RESULTS OF THE
COMPLIANCE DEMONSTRATION
OF THE PUSHING EMISSIONS CONTROL
FOR B-BATTERY

Prepared for:

USS CLAIRTON WORKS
A DIVISION OF USX CORPORATION
CLAIRTON, PA

Prepared by:

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
3000 TECH CENTER DRIVE
MONROEVILLE, PA 15146

PROJECT NO. 601000-15

APRIL 1990

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

DCC#R667

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CLAIRTON COKE AND COAL
CHEMICAL WORKS

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APPENDIX B	Anticipated and Actual Pushing and Charging Schedule for B-Battery
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APPENDIX G	Field Data Sheets for Visible Emissions and Plume Opacity Measurements

ABSTRACT

A compliance demonstration of the baghouse which controls the pushing emissions from the B-Battery operated by United States Steel Corporation Clairton Coke and Coal Chemical Works was conducted on March 12 and 13, 1990. Particulate matter sampling was performed in accordance with EPA Stationary Source Sampling Methods 1 through 5, Sections 139.11 and 139.12 of the DER Source Testing Manual, and Chapter 6 of the Allegheny County Bureau of Air Pollution Control Source Testing Manual. In addition, the presence of visible emissions from the baghouse stacks was recorded. Measurements of the opacity of the plumes which resulted from the pushing of coke were also recorded. The results of the testing showed that the particulate matter emissions rate was 3.799 lbs particles per hour, while the allowable L.A.E.R. emissions rate is 3.877 lbs particles per hour based on the L.A.E.R. standard of 0.04 lbs/ton coke pushed. Thus, the emissions from the baghouse are in compliance. No visible emissions from the 12 baghouse stacks were observed during any of the tests. The maximum plume opacity at the shed containment structure associated with the pushing of coke was less than 20% in nearly all cases (81.25% of the cases). On average, a plume opacity greater than or equal to 20% was observed for 2.38 seconds.

1.0 INTRODUCTION

As required by the amended Mon Valley Consent Decree (Paragraph V.A. (5)(f)) in accordance with the requirements set forth in Chapter 6, Chapter 20, and Section F of Chapter 18 of the Allegheny County Bureau of Air Pollution Control Source Testing Manual, a compliance demonstration of the pushing emissions control for the B-Battery operated by United States Steel Corporation Clairton Coke and Coal Chemical Works was conducted on March 12 and 13, 1990. A baghouse controls the emissions which result from the pushing operations from the ovens of B-Battery. The purpose of this testing was to (1) measure the particulate matter emissions rate from the exhaust of the baghouse and (2) compare the measured emissions rate to the allowable emissions rate. In addition, the presence of visible emissions from the baghouse stacks was recorded. Measurements of the opacity of the plume from the shed containment structure which resulted from the pushing of the coke were also recorded.

The determination of the particulate matter emissions was performed by the Air Quality Engineering Division (AQE) of Keystone Environmental Resources, Inc. (Keystone). The test crew was comprised of Mark Grunebach, Manager of the Monitoring Services Department of AQE, Daniel Keller, Thomas Morgan, John Shimshock, and Patrick Stockton of Keystone, and Rich Casselberry of The Chester Engineers (Chester). Visible emission measurements of the baghouse exhaust were recorded by Lance Grumling and Ken Kuiros of Chester. Plume opacities associated with the pushing operations were recorded by Rich Casselberry of Chester. All test procedures were witnessed by John Logan of the Allegheny County Health Department. Plume opacities were also recorded by the Allegheny County Health Department.

2.0 METHODOLOGIES

Particulate matter sampling was performed in accordance with EPA Stationary Source Sampling Methods 1 through 5 (EPA Stationary Source Sampling Methods Notebook, 1984) and Sections 139.11 and 139.12 of the Department of Environmental Resources (DER) of the Commonwealth of Pennsylvania Source Testing Manual (Revision Number 1, January 1983). The total gas volume sampled during each 2 hour test was greater than 50 dry standard cubic feet. Testing was performed only during periods of normal plant operation.

The exhaust from the baghouse exits through 12 of the 14 stacks of the module pulse jet unit. The emissions from twelve of these 48" diameter stacks were tested. Each traverse for the stack included 12 traverse points as calculated from EPA Stationary Source Sampling Method 1. Sampling was conducted along a total of 2 traverses, or 24 traverse points, with the gas exhaust sampled for 5 minutes at each traverse point. Sampling was conducted through 2 sampling ports which were separated by 90°.

A single test run was performed for 12 of the 14 stacks of the baghouse as specified in Chapter 20 of the Allegheny County Bureau of Air Pollution Control Source Testing Manual. During each test, gas concentrations of CO_2, O_2, and N_2 (by difference) were determined with the use of a Fyrite apparatus as specified by EPA Stationary Source Sampling Method 3.

Clean up of the sampling train included a water and acetone rinse of both the front-half and back-half components. The water soluble and water insoluble portions of the front-half of the sampling train were determined as a total, while the water soluble and water insoluble portions of the back-half were determined separately. The back-half water and the water soluble rinses of the back-half components of the sampling train were treated in accordance with Section 139.12 of the DER Source Testing Manual and Chapter 6 of the Allegheny County Bureau of Air Pollution Control Source Testing Manual.

3.0 RESULTS

All testing was performed during periods of normal plant operation. To validate this, copies of the circular charts which were used to record the underfiring gas volume, gas pressure, and stack draft for the B-Battery and the B-Battery temperatures can be found in Appendix A. Copies of the anticipated and actual pushing and charging schedule for B-Battery can be found in Appendix B.

3.1 Particulate Matter Emissions Rate

The probes and sampling trains were operated in accordance with EPA Stationary Source Sampling Methods 1 through 5. Copies of the pre-test calibration results, the post-test calibration results, and the results of the audit of the control boxes conducted with a critical orifice provided by the Allegheny County Health Department can be found in Appendix C. It should be noted that while the audit was being performed, there were large temperature variations (about 20°F) within the laboratory.

Copies of the field data sheets for the particle sampling can be found in Appendix D. The emissions testing schedule is presented in Table 3-1. The emissions from modules 8, 9, 10, and 11 were tested simultaneously on March 12, 1990 (see Appendix D for a sketch of the module designation-number layout). There were several power outages during the first half of these tests. The total sampling time, however, was 2 hours. The emissions from modules 1, 3, 10, and 11 were tested simultaneously during the morning hours of March 13, 1990, while the emissions from modules 4, 5, 6, and 7 were tested simultaneously during the afternoon hours of March 13.

Copies of the emissions calculations for each test can be found in Appendix E. The results have been summarized in Tables 3-2, 3-3, and 3-4. The total particulate matter emissions rate was obtained by summing the emission rates from each module. These values are listed below:

TABLE 3-1

PARTICULATE MATTER EMISSIONS TESTING SCHEDULE

TEST #	MODULE #	DATE TESTED
CLR-M8-1	8	3-12-90
CLR-M9-1	9	3-12-90
CLR-M10-1	10	3-12-90
CLR-M11-1	11	3-12-90
CLR-M1-1	1	3-13-90
CLR-M3-1	3	3-13-90
CLR-M12-1	12	3-13-90
CLR-M14-1	14	3-13-90
CLR-M4-1	4	3-13-90
CLR-M5-1	5	3-13-90
CLR-M6-1	6	3-13-90
CLR-M7-1	7	3-13-90

TABLE 3-2

PARTICULATE MATTER EMISSIONS DATA
DAY 1: MARCH 12, 1990

EMISSIONS	MODULE #8	MODULE #9	MODULE #10	MODULE #11
gr/scfd	0.0012	0.0010	0.0012	0.0019
lb/hr	0.251	0.198	0.221	0.428
STACK CONDITIONS				
Flow (acfm)	27203	26054	24977	30901
Flow (scfm)	24132	23185	22256	27037
Moisture Content (%)	1.61	1.75	1.73	1.75
Stack Temp. (^{o}F)	125	123	122	133
SAMPLING CONDITIONS				
Sampling Time (min)	120	120	120	120
Sample Volume (scfd)	57.454	65.176	61.482	53.278
Isokinetics (%)	106.37	102.06	96.09	95.32

TABLE 3-3

PARTICULATE MATTER EMISSIONS DATA
DAY 2: MARCH 13, 1990

EMISSIONS	MODULE #1	MODULE #3	MODULE #12	MODULE #14
gr/scfd	0.0014	0.0012	0.0010	0.0018
lb/hr	0.336	0.302	0.220	0.379
STACK CONDITIONS				
Flow (acfm)	33091	34611	28306	28008
Flow (scfm)	28972	30792	25411	25047
Moisture Content (%)	2.07	1.87	2.17	2.37
Stack Temp. (^{o}F)	136	127	121	124
SAMPLING CONDITIONS				
Sampling Time (min)	120	120	120	120
Sample Volume (scfd)	61.230	83.279	77.514	54.528
Isokinetics (%)	94.86	98.31	106.59	105.97

TABLE 3-4

PARTICULATE MATTER EMISSIONS DATA
DAY 2: MARCH 13, 1990

EMISSIONS	MODULE #4	MODULE #5	MODULE #6	MODULE #7
gr/scfd	0.0013	0.0025	0.0013	0.0014
lb/hr	0.335	0.514	0.276	0.339
STACK CONDITIONS				
Flow (acfm)	34955	28121	30160	32167
Flow (scfm)	30075	24242	26041	28459
Moisture Content (%)	1.09	2.25	2.06	1.76
Stack Temp. (^{o}F)	147	145	144	130
SAMPLING CONDITIONS				
Sampling Time (min)	120	120	120	120
Sample Volume (scfd)	82.031	51.707	54.961	78.321
Isokinetics (%)	98.37	95.91	102.41	95.75

Module #	Particulate Matter Emissions Rate (lbs / hr)
1	0.336
3	0.302
4	0.335
5	0.514
6	0.276
7	0.339
8	0.251
9	0.198
10	0.221
11	0.428
12	0.220
14	0.379
Total	3.799

The particulate matter emission rate is 3.799 lbs per hour. The allowable particulate matter emissions rate is equal to 0.04 lbs particles per ton of coke pushed. Since there were on average 24.23 tons of coke per oven, and on average 4 ovens were pushed per hour, the particulate matter emissions rate is equal to (0.04 lbs particles/ton coke pushed) x (24.23 tons coke pushed/oven) x (4 ovens pushed/hour), or 3.877 lbs per hour. Thus, the particulate matter emissions from the baghouse are in compliance.

3.2 Analysis of the Filtered Back-Half Water and Water Soluble Rinses of the Back-Half Components

The analysis of the filtered back-half water solutions and the water soluble rinses of the back-half components of the sampling train was performed in accordance with the Allegheny County Bureau of Air Pollution Control Source Testing Manual, Chapter 6, Item 11. The sulfate ion concentration was determined by the Barium-Thornin method as outlined by EPA Method 6. The analytical results can be found in Appendix F. The weights of sulfate collected and the sulfate emission rates for each test performed are listed below:

Module #	Weight of $SO_4^{=}$ (g)	$SO_4^{=}$ Emission Rate (mg/dscm)
1	0.0030	1.73
3	0.0008	0.34
4	0.0029	1.25
5	0.0096	6.56
6	0.0005	0.32
7	0.0012	0.54
8	0.0015	0.92
9	0.0014	0.76
10	0.0009	0.52
11	0.0017	1.13
12	0.0009	0.41
14	0.0021	1.36

3.3 Opacity Measurements

The presence of visible emissions from the baghouse stacks and opacity measurements of the plumes from the pushing control shed associated with the pushing of coke were also recorded. Copies of the field data sheets can be found in Appendix G. This data has been summarized in Table 3-5. No visible emissions were observed from any of the baghouse stacks during any of the tests. A pushing performance of 100% was registered if the maximum plume opacity observed during the pushing operation was less than 20%. A pushing performance of 0% was registered if the maximum plume opacity was greater than or equal to 20%. The average pushing performance determined over both days of testing was 81.25%. During the pushing operation, the plume opacity was greater than or equal to 20% for an average of 2.38 seconds.

TABLE 3-5

PLUME OPACITY DATA

Date	Number of Observations	Number of Observations with Opacity <20%	Average Pushing Performance (%)	Average Time With Opacity >=20% (sec)
3-12-90	11	10	90.91	0.45
3-13-90	21	16	76.19	3.38
Average			81.25	2.38

4.0 CONCLUSIONS

The results of a compliance demonstration of the pushing emissions control for B-Battery operated by United States Steel Corporation Clairton Coke and Coal Chemical Works can be summarized as the following:

(1) The average particulate matter emissions rate was 3.799 lbs particles per hour. The allowable emissions rate is 3.877 lbs particles per hour. Thus, the emissions from the baghouse are in compliance.

(2) No visible emissions from the baghouse stacks were observed during any of the tests.

(3) The maximum plume opacity associated with the pushing of coke was less than 20% in nearly all cases (81.25% of the cases). On average, a plume opacity greater than or equal to 20% was observed for 2.38 seconds.

"B" BATTERY TEMPS.

PUSHER SIDE					COKE SIDE				
	Soot	Min.	Cal.	Horiz.		Soot	Min.	Cal.	Horiz.
A1	360		(500)		A1	440	115	(550)	
A3	260		400		A3	340		455	
A5	290		430		A5	360		475	
A7	290		430		A7	370		485	
A9	310		450		A9	380		495	
A11	300		440		A11	400		515	
A13	260		400		A13	360		475	
A15	290		430		A15	350	120	470	
A17	280	140	420		A17	340		460	
A19	300		435		A19	350		470	
A21	310		445		A21	360		460	
A23	270		405		A23				
A25	300		435		A25				
A27	310		445		A27				
A29	320		455		A29	360		480	
A31	310		445		A31	360		480	
A33	300		435		A33	340	125	465	
A35	320		455		A35	360		485	
A37	290	135	425		A37	340		465	
A's PS Avg.	2432				A's CS Avg.	2475			
B1	300		430		B1	370		495	
B3	270		400		B3	330		455	
B5	290		420		B5	330		455	
B7	300		430		B7	320	130	450	
B9	270		400		B9	340		470	
B11	300	130	430		B11	370		500	
B13	280		405		B13	350		480	
B15	300		425		B15	380		510	
B17	320		445		B17	370		500	
B19	310		435		B19	380		510	
B21	230		355		B21	340	135	475	
B23	250		375		B23	300		435	
B25	290		415		B25	340		475	
B27	270	125	395		B27	320		455	
B29	300		420		B29	350		485	
B31	260		380		B31	290		425	
B33	270		390		B33	290		425	
B35	290		410		B35	320		455	
B37	250		370		B37	290		425	
B38	260	120	(380)		B38	220		(550)	
B's PS Avg.	2408				B's CS Avg.	2467			

P.S.Flue Avg. 2420 C.S.Flue Avg. 2471 Flue Avg. 2445

P.S.Horiz. Avg. _____ C.S.Horiz. Avg. _____ Horiz.Avg. _____

DATE 3-11-90 TURN 12-8

432
18 | 7780
72
58
54
40

408
19 | 7750
76
15
475

15 | 7135
60
113
105
8

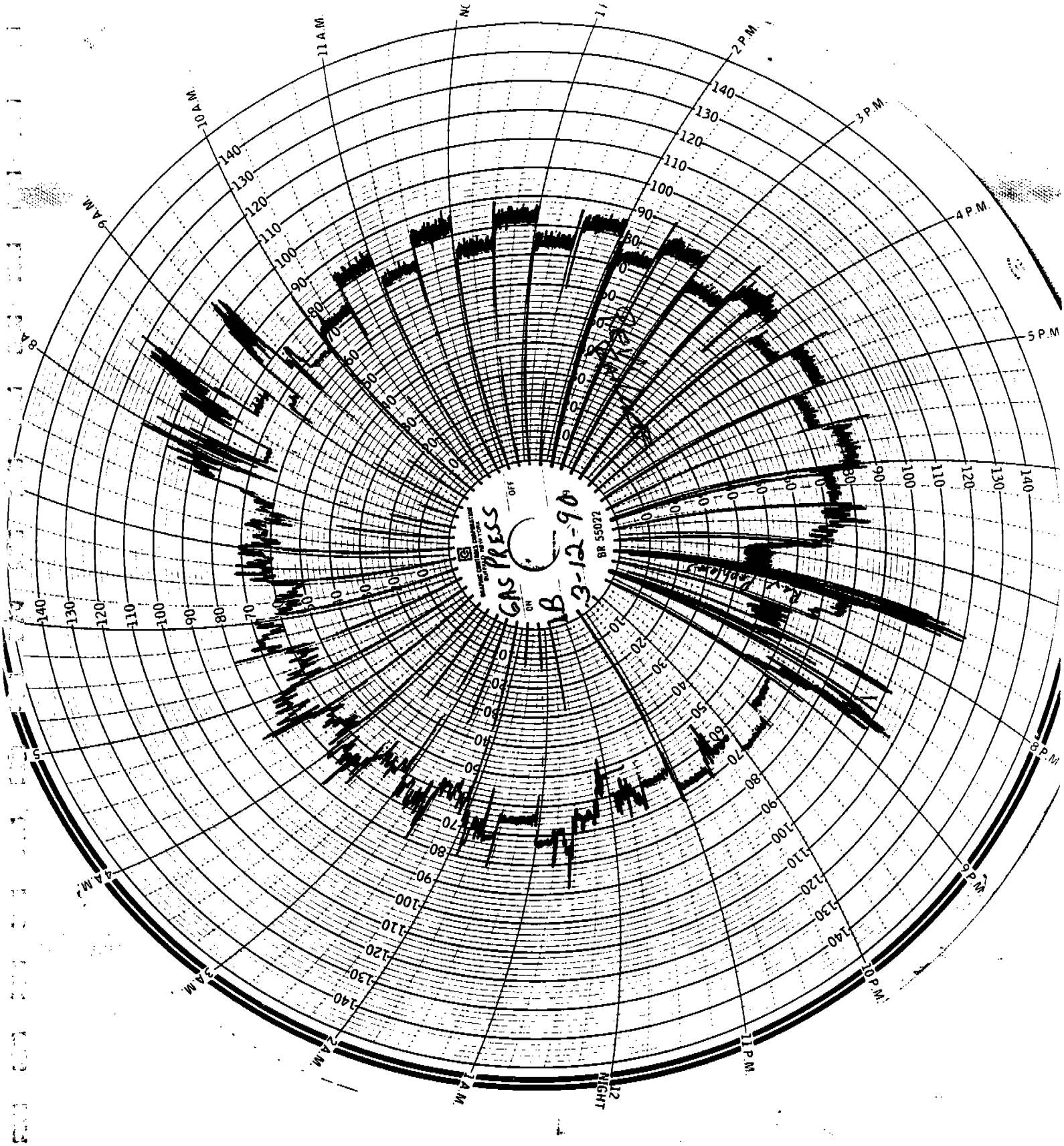
467
19 | 8880
76
125
114
11

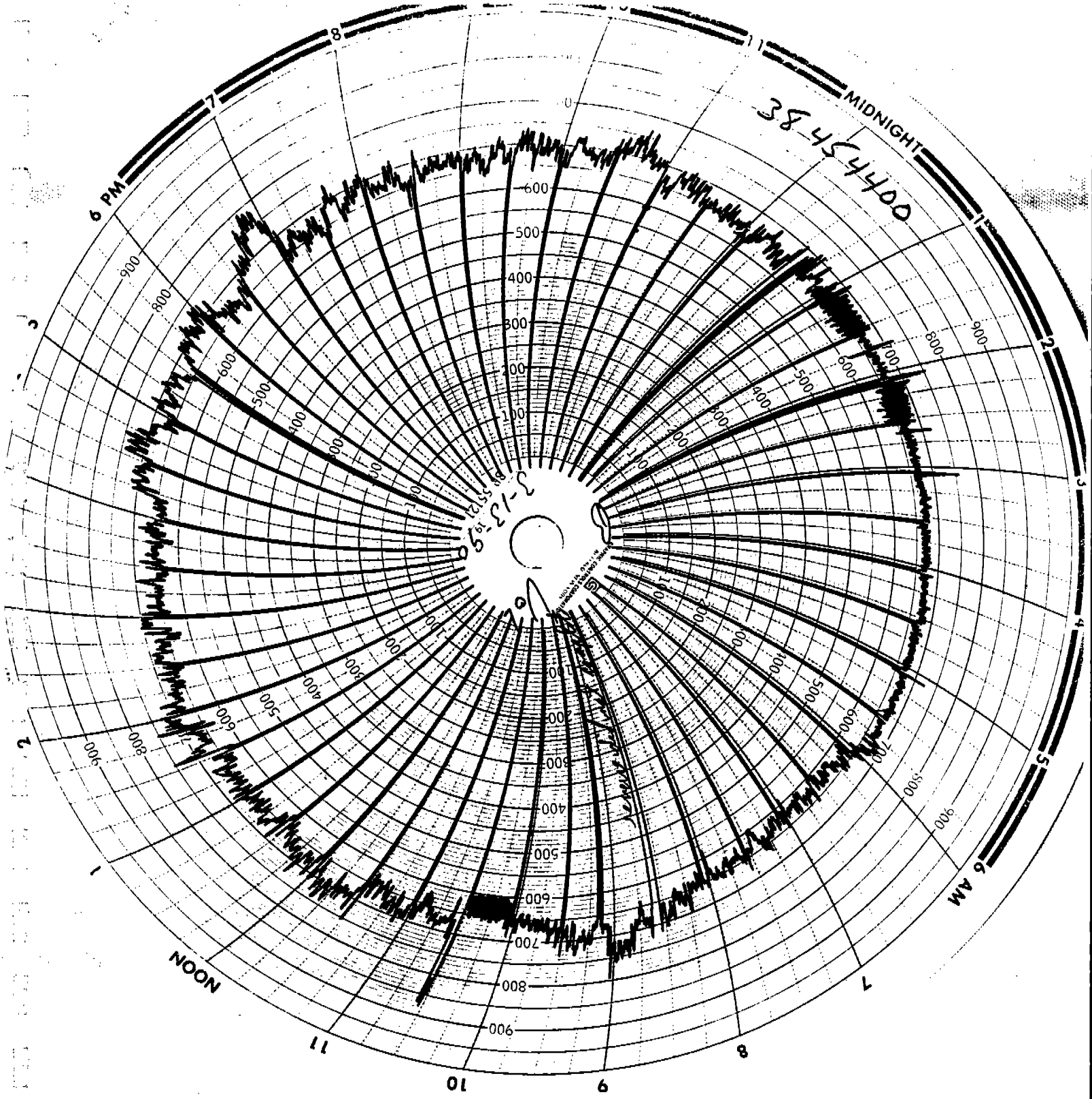
475
467
471
2 | 942

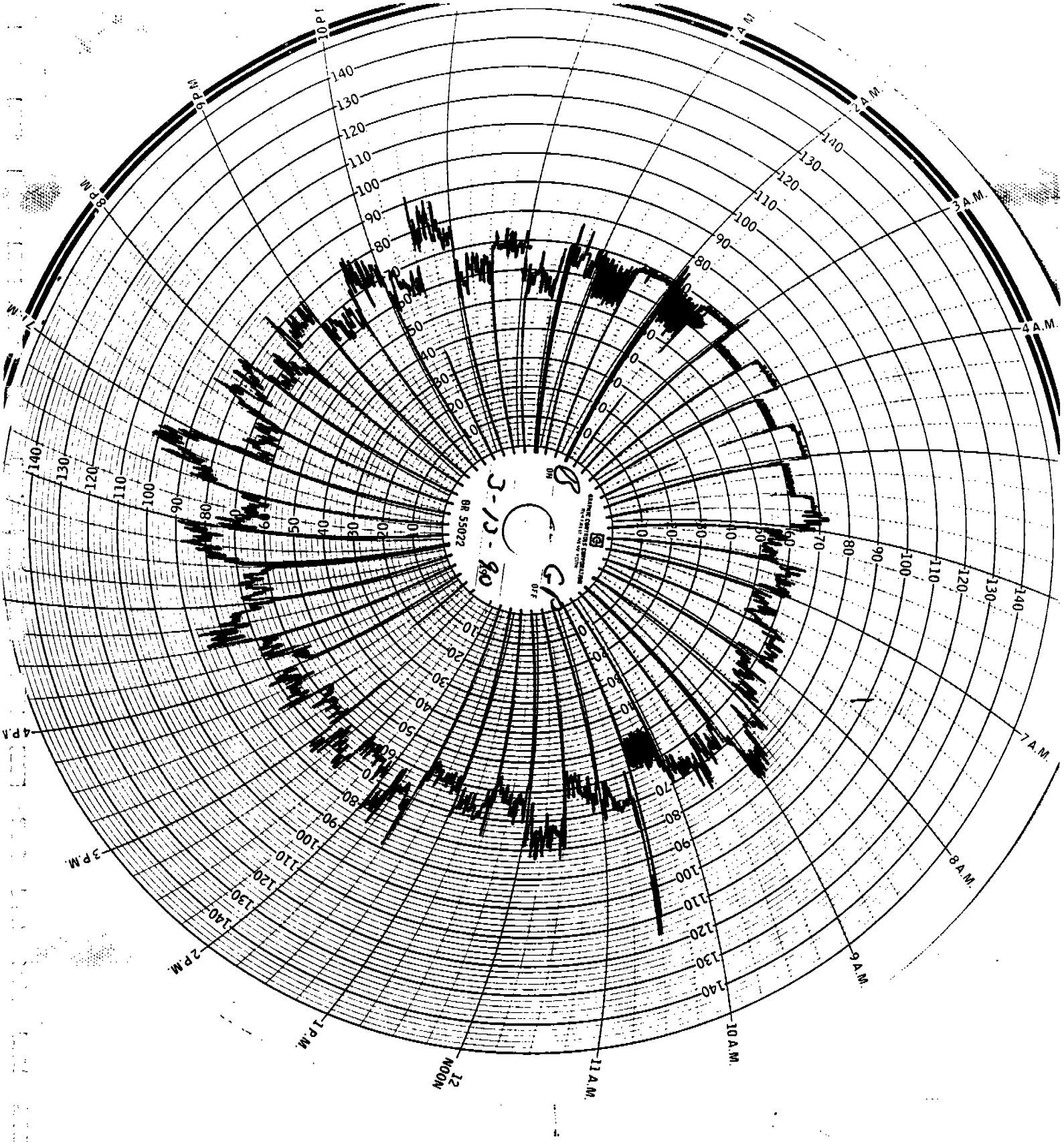
MAR 14 '90 11:15 PAGE.001

APPENDIX A

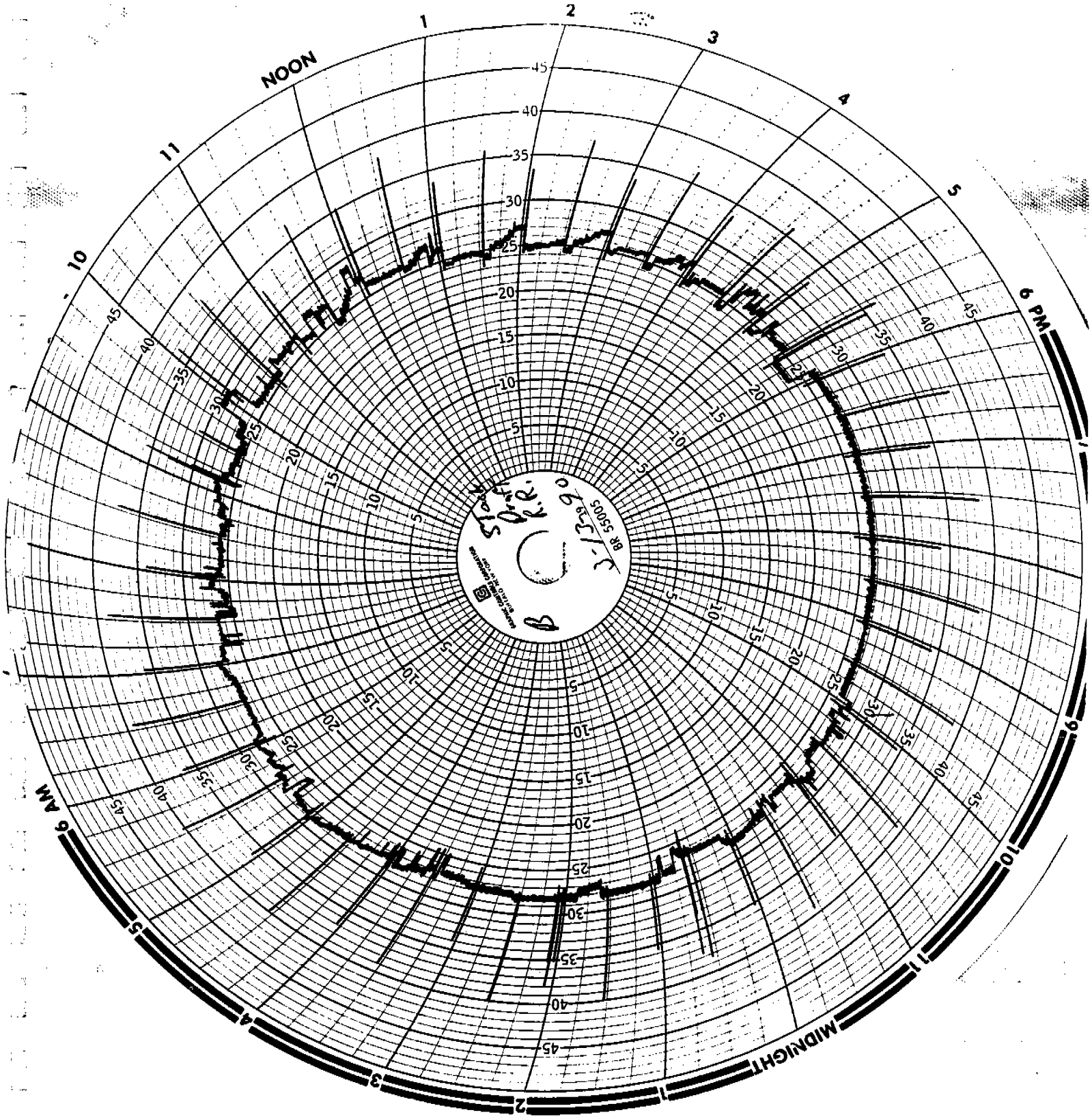
OPERATIONAL RECORDS FOR B-BATTERY


GAS PRESS
1B
3-12-90
BR 55022
2 P.M.
3 P.M.
4 P.M.
5 P.M.
8 P.M.
9 P.M.
10 P.M.
11 P.M.
12 NIGHT
1 A.M.
2 A.M.
3 A.M.
4 A.M.
5
8 A.
9 A.M.
10 A.M.
11 A.M.


MIDNIGHT
6 AM
NOON
6 PM
38-45-4400
3-13-5



3-13-80
BR 55022
ON
OFF
1 A.M.
2 A.M.
3 A.M.
4 A.M.
7 A.M.
8 A.M.
9 A.M.
10 A.M.
11 A.M.
12 NOON
1 P.M.
2 P.M.
3 P.M.
4 P.M.
6 P.M.
8 P.M.
10 P.M.


MIDNIGHT
1
2
3
4
5
6 AM
6
7
8
9
10
11
NOON
1
2
3
4
5
6 PM
7
8
9
10
11
BR 55005

"B" BATTERY TEMPS.

PUSHER SIDE				COKE SIDE			
	Spot	Min.	Cal.	Horiz.	Spot	Min.	Cal.	Horiz.
A1	360	130	490		410	120	530	
A3	320		450		350		470	
A5	330		460		390		510	
A7	320		450		400		520	
A9	310		440		360		480	
A11	310		440		410		530	
A13	310		440		410		530	
A15	300		430		370		490	
A17	300		430		350		470	
A19	280		410		360	125	485	
A21	330	135	465		360		485	
A23	300		435		400		525	
A25	300		435		350		475	
A27	310		445		400		525	
A29	300		435		370		495	
A31	330		465		380		505	
A33	310		445		390		515	
A35	320		455		400		525	
A37	300		435		360	130	490	
A's PS Avg. 2442					A's CS Avg. 2501			
B1	280		415		360		490	
B3	290		425		360		490	
B5	290		425		340		470	
B7	270	140	410		360		490	
B9	290		430		360		490	
B11	300		440		360		490	
B13	310		450		360		490	
B15	320		460		380	135	515	
B17	310		450		390		525	
B19	300		440		350		485	
B21	260		400		340		475	
B23	260		400		340		475	
B25	270	145	415		360		495	
B27	250		395		340		475	
B29	250		395		330		465	
B31	260		405		360		495	
B33	250		395		340		475	
B35	260		405		340		475	
B37	250		395		320		455	
B38	240		385		250		385	
B's PS Avg. 2418					B's CS Avg. 2485			

442
18)7965
72
76
72
45
418
19)7950
76
35
19
160

418
442
430
2)850

501
18)9025
90

485
19)9220
76
162
152
100

501
485
493
2)986

430
493
461
2)923

3/13/90

POST TEST

BOX NO. 1
DATE 4-5-90
BP 28.55
OPERATOR DRK

	TIME	WET TEST METER TEMP T_W	WET TEST METER VOLUME V_M	P_W	PRESSURE T_I	PRESSURE T_O	DRY TEST METER TEMP IN T_A	TEMP OUT P_D	TEMP AVG V_D	ORIFICE Y	ORIFICE $H_@$	VOLUME	METER CORRECT	ORIFICE COEIFFICE
START				0.000		28.55					1.00	261.800		
HALF			75.0				94.0	87.0	90.5					
STOP	8.60			5.000								266.980		
CALCULATION	8.60		535.0	5.057		28.55				550.5	28.62	5.180	1.0019	1.670
START				0.000		28.55					1.00	267.000		
HALF			75.0				96.0	88.0	92.0					
STOP	8.65			5.015								272.219		
CALCULATION	8.65		535.0	5.072		28.55				552.0	28.62	5.219	1.0001	1.675
START				0.000		28.55					1.00	272.300		
HALF			75.0				97.0	89.0	93.0					
STOP	8.63			5.000								277.520		
CALCULATION	8.63		535.0	5.057		28.55				553.0	28.62	5.220	0.9987	1.674
AVERAGE													1.0002	1.673
DIFFERENCE													3.48%	6.25%

CONTROL BOX CALIBRATION

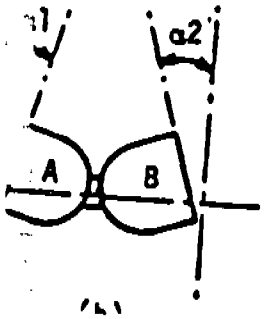
THREE POINT CALIBRATION

BOX NO. 1
DATE 12-27-89
BP 29.02
OPERATOR DRK

	TIME	WET TEST METER TEMP T_W	VOLUME V_M	PRESSURE P_W	T_I	T_O	DRY TEST METER TEMP IN T_A	TEMP OUT P_D	TEMP AVG V_D	Y	ORIFICE $H_@$	VOLUME	METER CORRECT	ORIFICE COEIFFICE
START				0.000		29.02					0.50	7.300		
HALF			74.0				82.0	74.0	78.0					
STOP	12.78			5.000								12.256		
CALCULATION	12.78		534.0	5.057		29.02				538.0	29.06	4.956	1.0266	1.849
START				0.000		29.02					1.00	12.700		
HALF			74.0				89.0	77.0	83.0					
STOP	8.90			5.000								17.675		
CALCULATION	8.90		534.0	5.057		29.02				543.0	29.09	4.975	1.0309	1.777
START				0.000		29.02					2.00	18.100		
HALF			74.0				92.0	79.0	85.5					
STOP	6.18			5.000								23.006		
CALCULATION	6.18		534.0	5.057		29.02				545.5	29.17	4.906	1.0476	1.706
AVERAGE													1.0350	1.777

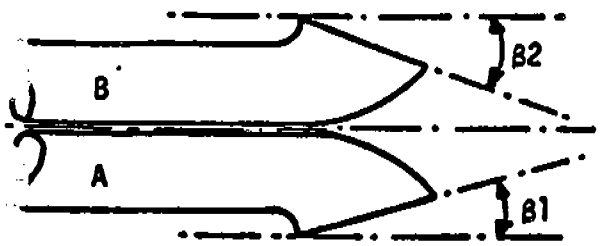
GEOMETRIC PITOT CALIBRATION

Probe No. 5-5
Date 4-3-90
Initials [illegible]
post CHECK

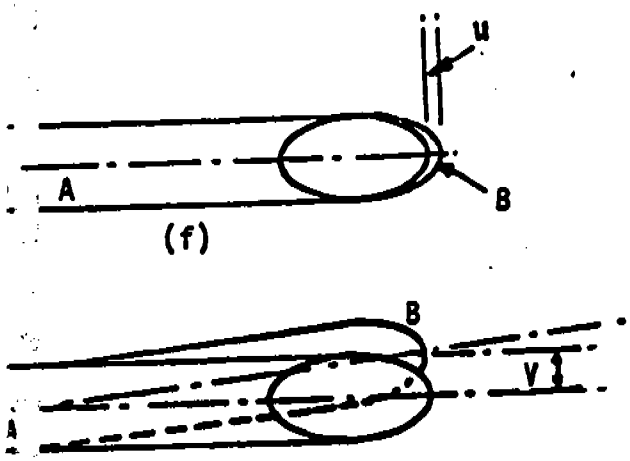


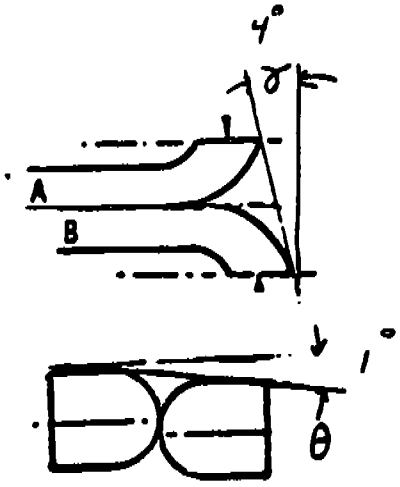
α1, α2 <10°

α1 = 1°
α2 = 1°
β1 = 1°
β2 = 1°
A = .874
μ = .061
V = .015
W = ≥0
X = 1.124
Y = .078
Z = .020
D_t = .372



β1, β2 <5

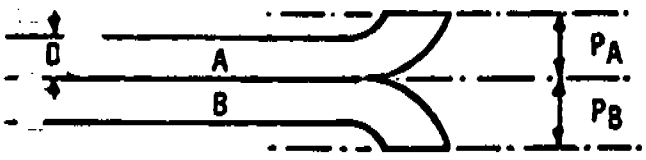




μ = A SIN γ

V = A SIN θ

A-SIDE PLANE



B-SIDE PLANE

1.05 D_t <P <1.50 D_t

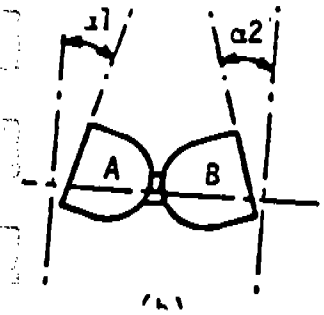
$P_A = P_B$

2.10 D_t <A <3.00 D_t

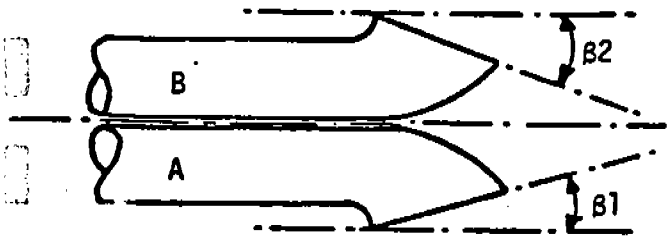
GEOMETRIC PITOT CALIBRATION

Probe No. 5-5
Date 2-26-90
Initials DRK Jr.
Pre-Test

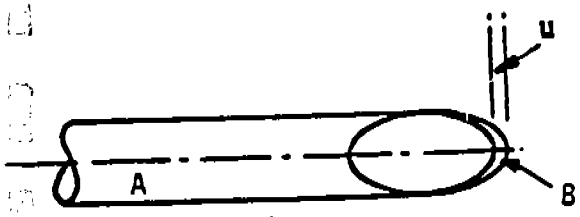
α1 = 1°
α2 = 1°
β1 = 2°
β2 = 1°
A = .865
μ = .075
V = .015
W = >0
X = 1.080
Y = 73"
Z = >2"
D_t = .375



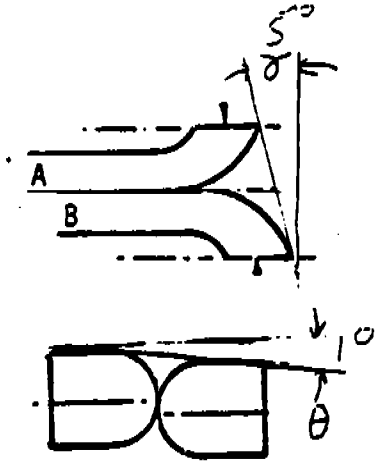
α1, α2 <10°



β1, β2 <5

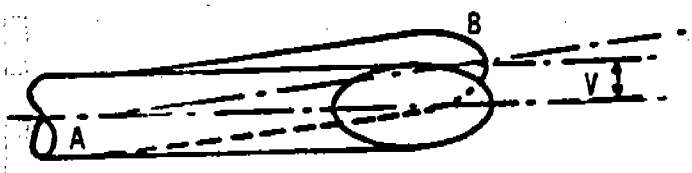


(f)

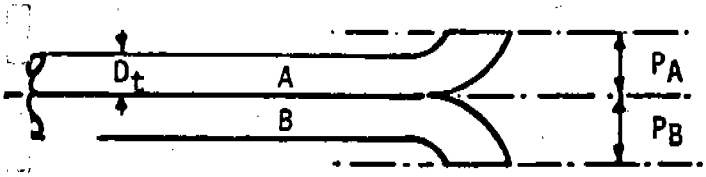


μ = A SIN δ

V = A SIN Θ



A-SIDE PLANE



B-SIDE PLANE

.394 .563

$1.05\ D_t < P < 1.50\ D_t$

$P_A = P_B$

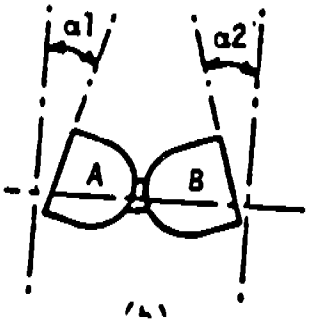
$2.10\ D_t < A < 3.00\ D_t$

.787 1.125

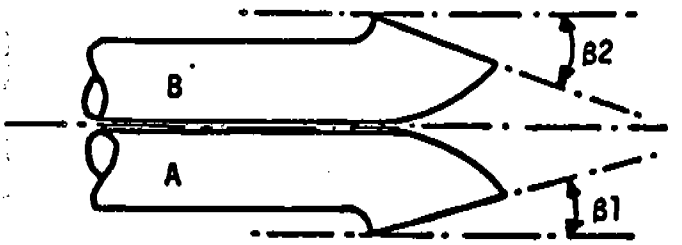
GEOMETRIC PITOT CALIBRATION

Probe No. 5-4
Date 4-3-90
Initials TJM
post check

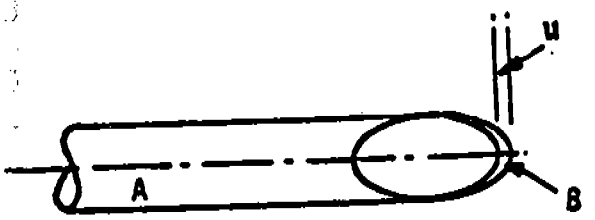
$\alpha 1$ = 1°
$\alpha 2$ = 3°
$\beta 1$ = 2°
$\beta 2$ = 1°
A = .877
μ = .015
V = .031
W = >0
X = .935
Y = >3"
Z = >2"
D_t = .372



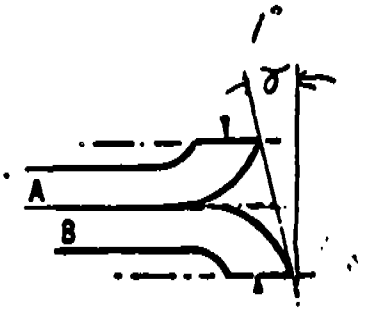
$\alpha 1, \alpha 2 < 10°$



$\beta 1, \beta 2 < 5$

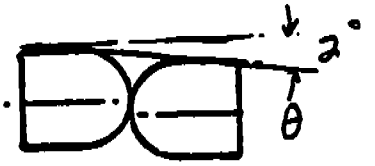


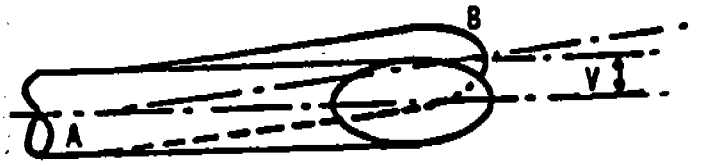
(f)



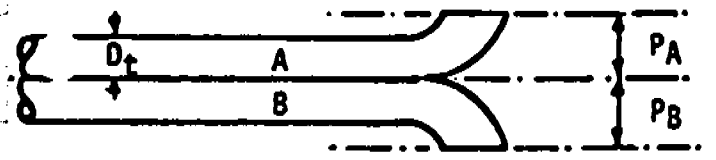
$\mu = A \sin \gamma$

$V = A \sin \theta$





A-SIDE PLANE



B-SIDE PLANE

.391 .559

$1.05\ D_t < P < 1.50\ D_t$

$P_A = P_B$

$2.10\ D_t < A < 3.00\ D_t$

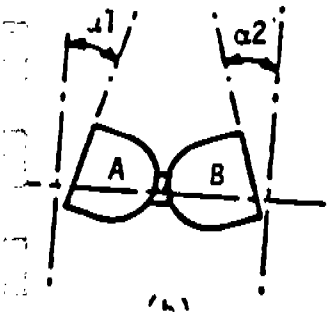
.781 1.116

GEOMETRIC PITOT CALIBRATION

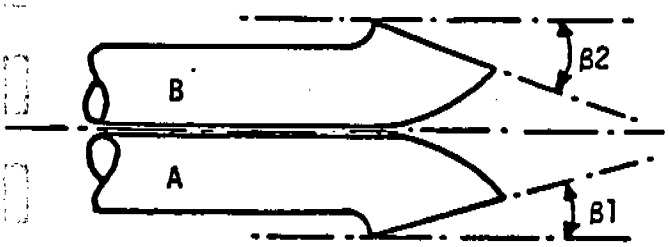
Probe No. S-4
Date 2-26-90
Initials [illegible]

Pre-Test

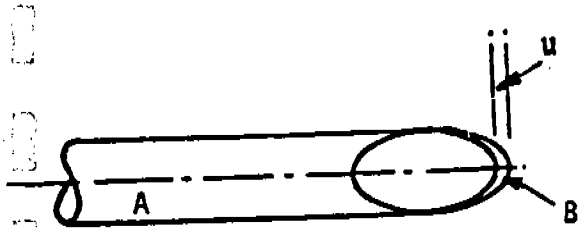
$\alpha 1$ = 1°
$\alpha 2$ = 0°
$\beta 1$ = 3°
$\beta 2$ = 1°
A = .870
μ = .015
V = .030
W = >0
X = .995
Y = >3"
Z = >2"
D_t = .372



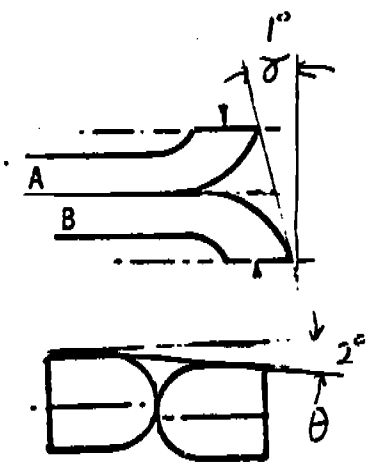
$\alpha 1, \alpha 2 < 10°$



$\beta 1, \beta 2 < 5$

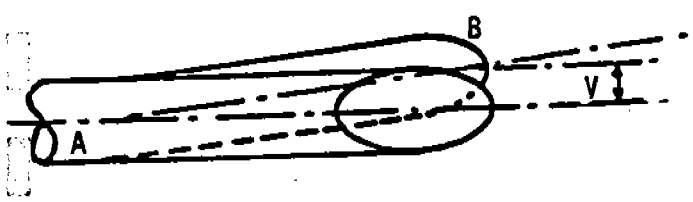


(f)

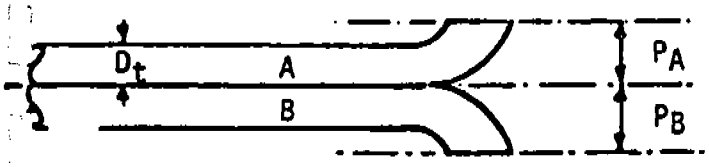


$\mu = A \sin \gamma$

$V = A \sin \theta$



A-SIDE PLANE



B-SIDE PLANE

.390 .560

$1.05\ D_t < P < 1.50\ D_t$

$P_A = P_B$

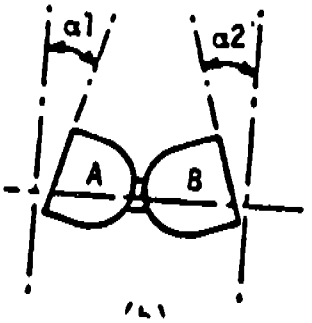
$2.10\ D_t < A < 3.00\ D_t$

.781 1.116

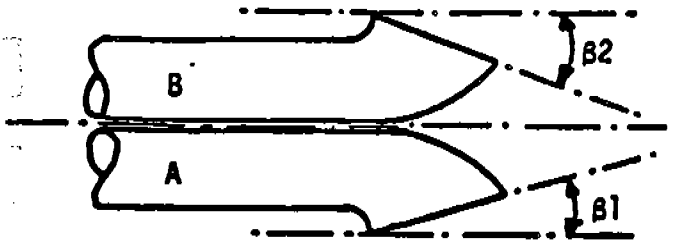
GEOMETRIC PITOT CALIBRATION

Probe No. 5-3
Date 1.3.90
Initials [illegible]
post check

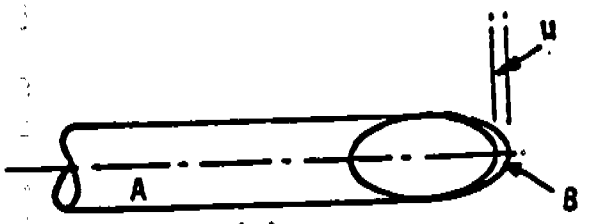
α1 = 5°
α2 = 4°
β1 = 1°
β2 = 2°
A = .850
μ = .030
V = .074
W = > 0
X = .939
Y = ≥ 3"
Z = ≥ 2'
D_t = .377



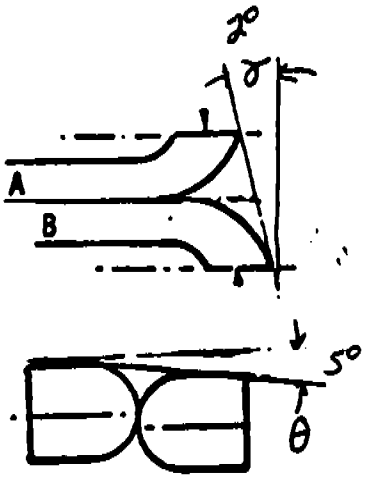
α1, α2 <10°



β1, β2 <5

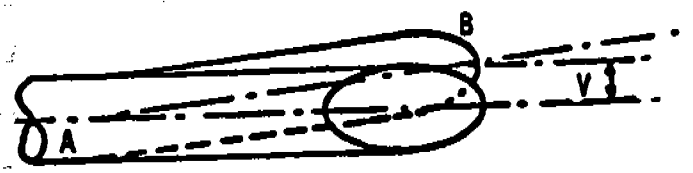


(f)

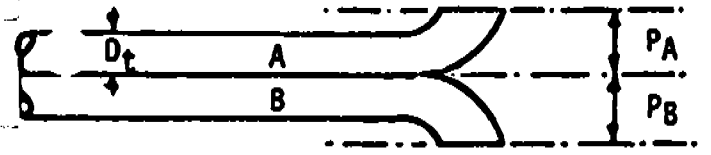


μ = A SIN γ

V = A SIN θ



A-SIDE PLANE



B-SIDE PLANE

.396 .566

1.05 D_t <P <1.50 D_t

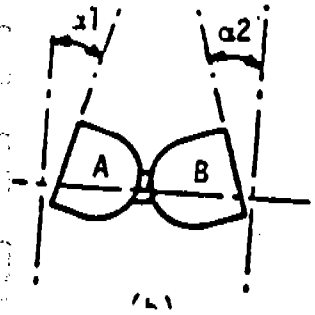
$P_A = P_B$

2.10 D_t <A <3.00 D_t

.792 1.131

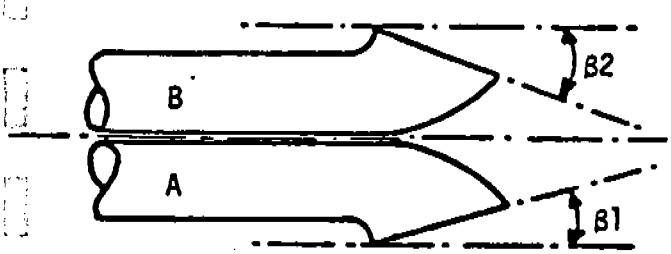
GEOMETRIC PITOT CALIBRATION

Probe No. 5-3
Date 2-26-90
Initials [illegible]
Pre-Test

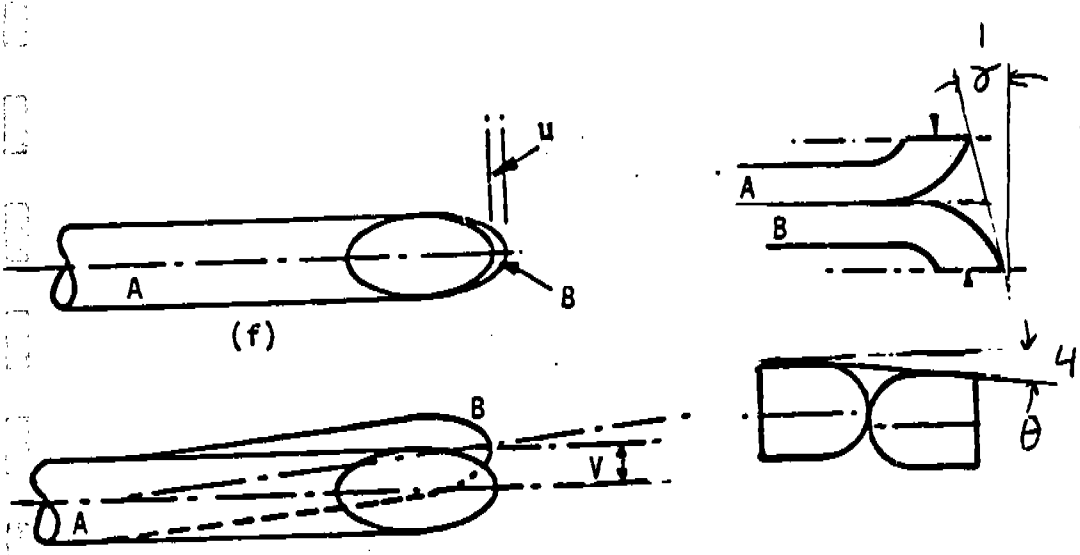


α1, α2 <10°

α1 = 1°
α2 = 3°
β1 = 3°
β2 = 0°
A = .855
μ = .015
V = .059
W = 70
X = .820
Y = 73"
Z = 72"
D_t = .1377



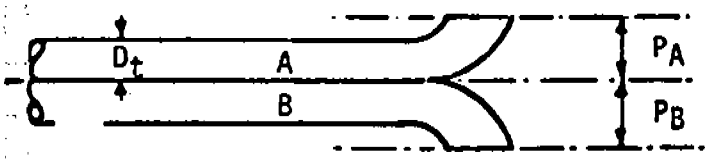
β1, β2 <5



μ = A SIN γ

V = A SIN θ

A-SIDE PLANE



B-SIDE PLANE

.396 .566
1.05 D_t <P <1.50 D_t

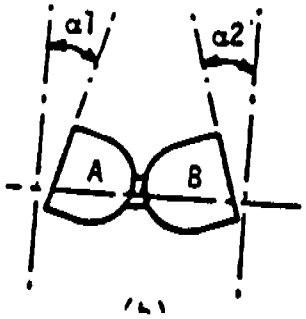
$P_A = P_B$

2.10 D_t <A <3.00 D_t
.792 1.131

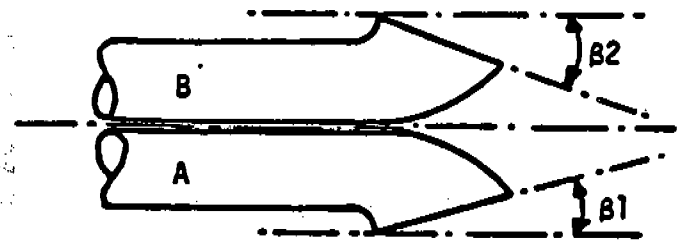
GEOMETRIC PITOT CALIBRATION

Probe No. 5-2
Date 4-3-90
Initials [illegible]
post check

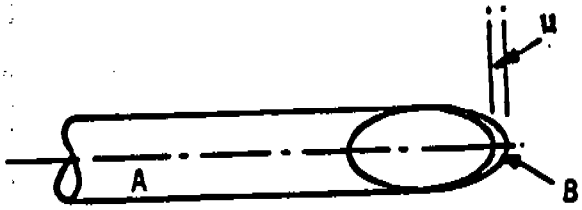
$\alpha 1$ = 3°
$\alpha 2$ = 1°
$\beta 1$ = 3°
$\beta 2$ = 0°
A = .970
μ = .050
V = .034
W = ≥0
X = 1.034
Y = ≥3"
Z = ≥2"
D_t = .377



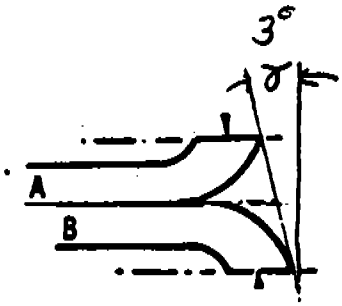
$\alpha 1, \alpha 2 < 10°$



$\beta 1, \beta 2 < 5$

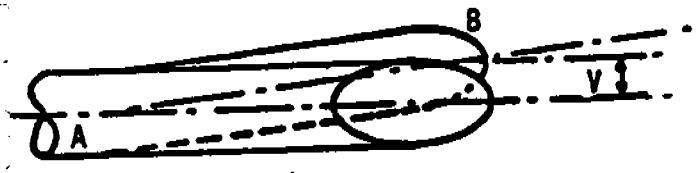


(f)

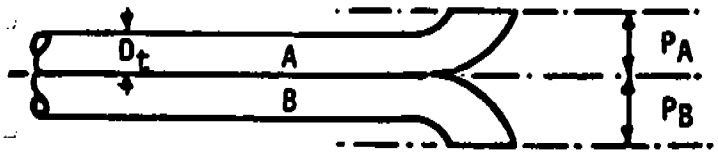


$\mu = A \sin \gamma$

$V = A \sin \Theta$



A-SIDE PLANE



B-SIDE PLANE

.395 .566

$1.05\ D_t < P < 1.50\ D_t$

$P_A = P_B$

$2.10\ D_t < A < 3.00\ D_t$

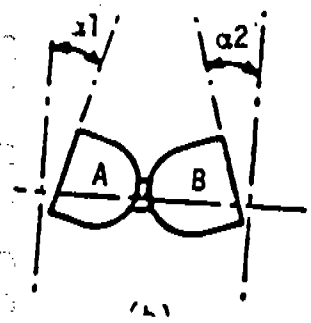
.792 1.131

GEOMETRIC PITOT CALIBRATION

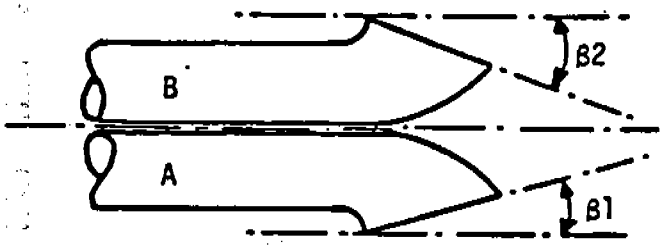
Probe No. 5-2
Date 2-26-90
Initials ERH

Pre-Test

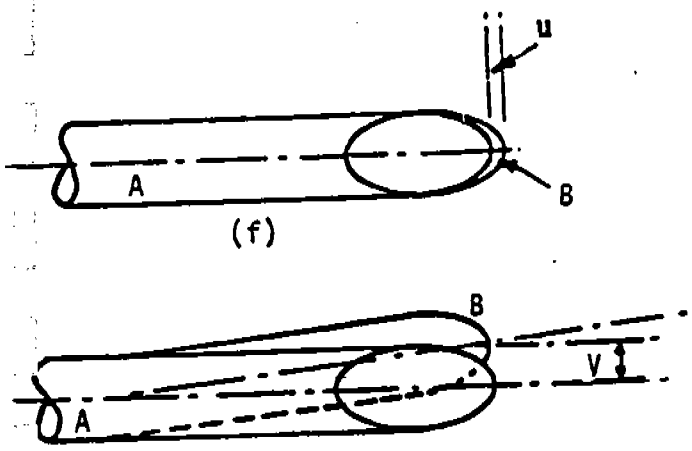
$\alpha 1$ = 3°
$\alpha 2$ = 1°
$\beta 1$ = 2°
$\beta 2$ = 1°
A = .987
μ = .086
V = .017
W = >0
X = 1.040
Y = >3"
Z = >2"
D_t = .377

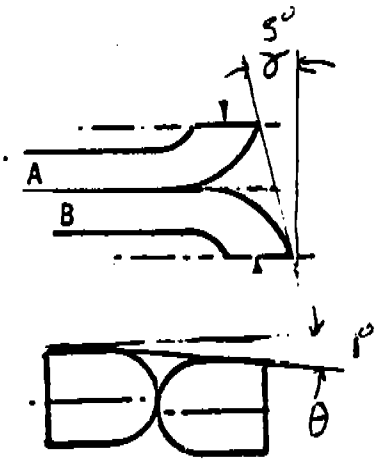


$\alpha 1$, $\alpha 2$ <10°



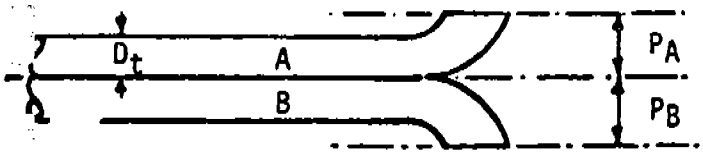
$\beta 1$, $\beta 2$ <5





$\mu = A \sin \gamma$

$V = A \sin \theta$



S-SIDE PLANE

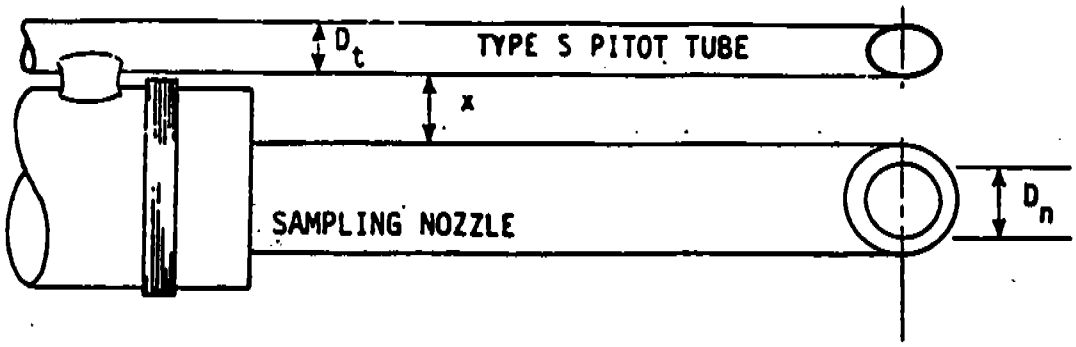
.396 .566

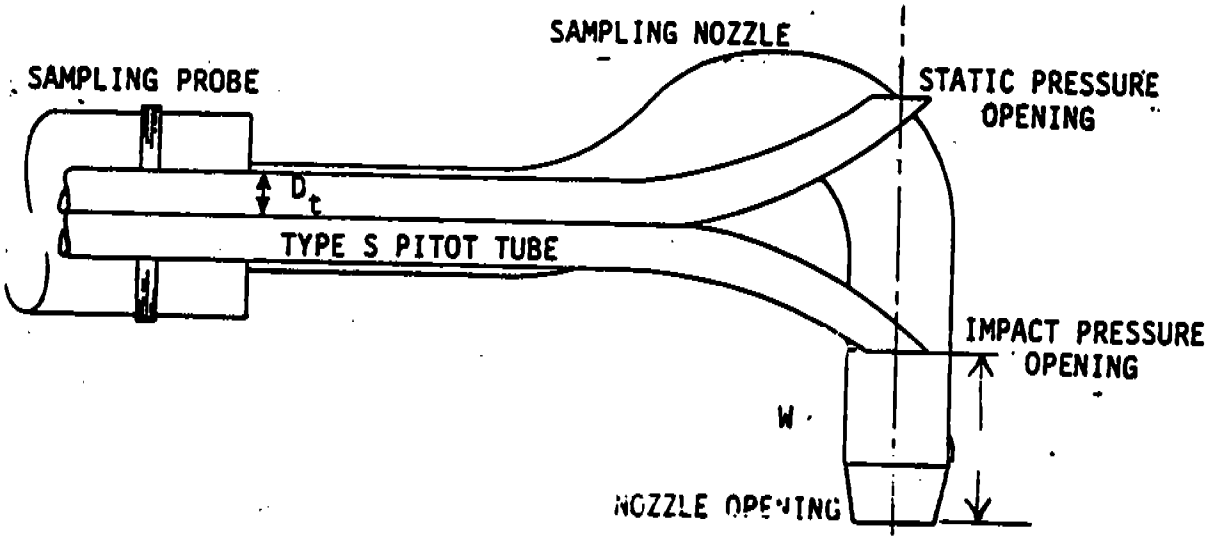
$1.05\ D_t < P < 1.50\ D_t$

$P_A = P_B$

$2.10\ D_t < A < 3.00\ D_t$

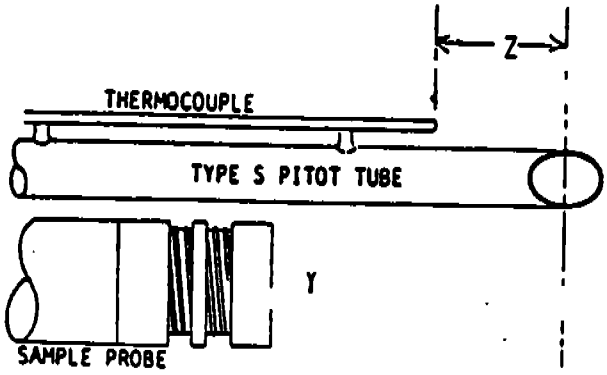
.792 1.31





D_n = Nozzle diameter

D_t = 3/16 to 3/8"



$W \geq 0$

$X \geq 3/4"$ for 1/2" Nozzle

$Y \geq 3"$

$Z \geq 2"$

APPENDIX C

PRE-TEST AND POST-TEST CALIBRATION AND AUDIT RESULTS

3.000.0000
/89

PUSHING AND CHARGING REPORT

"B" BATTERY

P.M.

DATE 3-13-90

PUSH		CHARGE		CLEAN CHUCK DOOR	COMMENTS	PUSH		CHARGE		CLEAN CHUCK DOOR	COMMENTS	TIME A.M.	P	C
A1		A34		A6		B1		B34		B6		12-1		
A6		A1		A11		B6		B1		B11		1-2		
A11		A6		A16		B11		B6		B16		2-3		
A16		A11		A21		B16		B11		B21		3-4		
A21		A16		A26		B21		B16		B26		4-5		
A26		A21		A31		B26		B21		B31		5-6		
A31		A26		A36		B31		B26		B36		6-7		
A36	12:13	A31	12:13	B3		B36	12:34	B31	12:32			7-8		
B3	12:42	A36	12:40	A8		B3	12:56	B36	1:08	B8		8-9		
A8	1:13	A3	1:14	A13		B8	1:26	B3	1:27	B13		9-10		
A13	1:36	A8	1:34	A18		B13	1:48	B8	1:52	B18		10-11		
A18	2:05	A13	2:03	A23		B18	2:20	B13	2:25	B23		11-12		
A23	2:35	A18	2:30	A28		B23	2:50	B18	2:46	B28				
A28	3:05	A23	3:00	A33		B28	3:20	B23	3:16	B33		TIME P.M.	P	C
A33	3:35	A28	3:30	A38		B33	4:10	B28	4:10			12-1	4	4
A38	4:25	A33	4:25	B5								1-2	4	4
A5	—	B33	4:52	A10		B5	4:40	A38	5:00	B10		2-3	4	4
A10	4:50	A5	—	A15		B10	5:05	B5	5:15	B15		3-4	3	3
A15	5:20	A10	5:22	A20		B15	5:45	B10	5:45	B20		4-5	4	3
A20	5:55	A15	5:56	A25		B20	6:00	B15	6:01	B25		5-6	4	5
A25	6:15	A20	6:15	A30		B25	6:27	B20	6:27	B30		6-7	5	4
A30	6:35	A25	6:37	A35		B30	6:53	B25	6:54	B35		7-8	4	4
A35	7:07	A30	7:10	B2		B35	7:31	B30	7:30			8-9	4	4
A2	7:35	A35	7:37	A7		B2	7:50	B35	7:49	B7		9-10	5	5
A7	8:09	A2	8:05	A12		B7	8:19	B2	8:19	B12		10-11	4	4
A12	8:32	A7	8:33	A17		B12	8:46	B7	8:47	B17		11-12	3	3
A17	9:00	A12	9:01	A22		B17	9:19	B12	9:15	B22		TOTALS		
A22	9:28	A17	9:29	A27		B22	9:42	B17	9:03	B27			P	C
A27	9:57	A22	9:58	A32		B27	10:11	B22	10:12	B32		12x8		
A32	10:25	A27	10:27	A37		B32	10:37	B27	10:40	B37		8x4	15	15
A37	10:53	A32	10:54	B4		B37	11:09	B32	11:10			4x12	33	3
B4	11:21	A37	11:22	B9		B4	11:35	B37	11:32	B9		Total	48	4
B9		B4		A14		B9		B4		B14				
A14		B9		A19		B14		B9		B19				
A19		A14		A24		B19		B14		B24		FOREMAN		
A24		A19		A29		B24		B19		B29		12x8 -		
A29		A24		A34		B29		B24		B34		8x4 -		
A34		A29		B1		B34		B29				4x12-		

LEAN A-1, A-2, A-3, A-4, A-5 CHUCK DOORS BEFORE REMOVING FOR PUSH

1.000.0068

PUSHING AND CHARGING REPORT

"B" BATTERY

A-01

DATE 3-13-90

PUSH		CHARGE		CLEAN CHUCK DOOR	COMMENTS	PUSH		CHARGE		CLEAN CHUCK DOOR	COMMENTS	TIME A.M.	P	C
A1	9:12	A34	8:53	A6		B1	9:25	B34	9:07	B6		12-1	5	5
A6	9:34	A1	9:42	A11		B6	9:53	B1	9:52	B11		1-2	4	4
A11	10:07	A6	10:15	A16		B11	10:20	B6	10:37	B16		2-3	5	5
A16	10:34	A11	10:37	A21		B16	10:44	B11	10:50	B21		3-4	4	4
A21	10:56	A16	10:59	A26		B21	11:09	B16	11:19	B26		4-5	4	4
A26	11:23	A21	11:29	A31		B26	11:35	B21	11:41	B31		5-6	5	5
A31	11:46	A26	11:48	A36		B31	11:58	B26	11:59	B36		6-7	4	4
A36		A31		B3		B36		B31				7-8	3	3
A3		A36		A8		B3		B36		B8		8-9	3	4
A8		A3		A13		B8		B3		B13		9-10	4	3
A13		A8		A18		B13		B8		B18		10-11	5	5
A18		A13		A23		B18		B13		B23		11-12	5	5
A23		A18		A28		B23		B18		B28				
A28		A23		A33		B28		B23		B33		TIME P.M.	P	C
A33		A28		A38		B33		B28				12-1		
A38		A33		B5								1-2		
A5		B33		A10		B5		A38		B10		2-3		
A10		A5		A15		B10		B5		B15		3-4		
A15		A10		A20		B15		B10		B20		4-5		
A20		A15		A25		B20	1207	B15	1209	B25		5-6		
A25	1217	A20	1217	A30		B25	1228	B20	1229	B30		6-7		
A30	1239	A25	1240	A35		B30	1250	B25	1254	B35		7-8		
A35	108	A30	110	B2		B35	120	B30	123			8-9		
A2	133	A35	137	A7		B2	147	B35	152	B7		9-10		
A7	200	A2	202	A12		B7	212	B2	214	B12		10-11		
A12	225	A7	235	A17		B12	239	B7	239	B17		11-12		
A17	253	A12	253	A22		B17	307	B12	307	B22		TOTALS		
A22	321	A17	322	A27		B22	335	B17	335	B27			P	
A27	350	A22	351	A32		B27	404	B22	404	B32		12x8	34	3
A32	418	A27	419	A37		B32	432	B27	432	B37		8x4	17	1
A37	446	A32	446	B4		B37	500	B32	500			4x12		
B4	514	A37	510	A9		B4	528	B37	524	B9		Total	51	5
A9	542	B4	542	A14		B9	557	B4	557	B14				
A14	611	A9	611	A19		B14	625	B9	625	B19				
A19	639	A14	639	A24		B19	653	B14	653	B24		FOREMAN		
A24	707	A19	707	A29		B24	721	B19	721	B29		12x8	Sowder	
A29	735	A24	735	A34		B29	808	B24	817	B34		8x4	Smith	
A34	823	A29	830	B1		B34	834	B29	837			4x12		
	25/25						26/26							

CLEAN A-1, A-2, A-3, A-4, A-5 CHUCK DOORS BEFORE REMOVING FOR PUSH

PUSHING SCHEDULE FOR BATTERY B

SEQ #	PUSH	CHARGE	EARLIEST TIME	DESIRED TIME	LATEST TIME	PM
1	B33	B28	3:50	4: 0	4:25	1
2	A38	A33	4: 4	4:14	4:39	1
3	A 5	B33	4:18	4:28	4:53	1
4	B 5	A38	4:32	4:42	5: 7	1
5	A10	A 5	4:46	4:56	5:21	1
6	B10	B 5	5: 0	5:10	5:35	1
7	A15	A10	5:14	5:24	5:49	1
8	B15	B10	5:28	5:38	6: 3	1
9	A20	A15	5:42	5:52	6:17	1
10	B20	B15	5:57	6: 7	6:32	1
11	A25	A20	6:11	6:21	6:46	1
12	B25	B20	6:25	6:35	7: 0	1
13	A30	A25	6:39	6:49	7:14	1
14	B30	B25	6:53	7: 3	7:28	1
15	A35	A30	7: 7	7:17	7:42	1
16	B35	B30	7:21	7:31	7:56	1
17	A 2	A35	7:35	7:45	8:10	1
18	B 2	B35	7:50	8: 0	8:25	1
19	A 7	A 2	8: 4	8:14	8:39	1
20	B 7	B 2	8:18	8:28	8:53	1
21	A12	A 7	8:32	8:42	9: 7	1
22	B12	B 7	8:46	8:56	9:21	1
23	A17	A12	9: 0	9:10	9:35	1
24	B17	B12	9:14	9:24	9:49	1
25	A22	A17	9:28	9:38	10: 3	1
26	B22	B17	9:42	9:52	10:17	1
27	A27	A22	9:57	10: 7	10:32	1
28	B27	B22	10:11	10:21	10:46	1
29	A32	A27	10:25	10:35	11: 0	1
30	B32	B27	10:39	10:49	11:14	1
31	A37	A32	10:53	11: 3	11:28	1
32	B37	B32	11: 7	11:17	11:42	1
33	A 4	A37	11:21	11:31	11:56	1
34	B 4	B37	11:35	11:45	12:10	1

TUE MAR 13 1990 4X12 TURN

PUSHING SCHEDULE FOR BATTERY B

SEQ #	PUSH	CHARGE	EARLIEST TIME	DESIRED TIME	LATEST TIME
1	B29	B24	7:50	8: 0	8:25
2	A34	A29	8: 5	8:15	8:40
3	B34	B29	8:20	8:30	8:55
4	A 1	A34	8:35	8:45	9:10
5	B 1	B34	8:50	9: 0	9:25
6	A 6	A 1	9: 5	9:15	9:40
7	B 6	B 1	9:20	9:30	9:55
8	A11	A 6	9:35	9:45	10:10
9	B11	B 6	9:50	10: 0	10:25
10	A16	A11	10: 5	10:15	10:40
11	B16	B11	10:20	10:30	10:55
12	A21	A16	10:35	10:45	11:10
13	B21	B16	10:50	11: 0	11:25
14	A26	A21	11: 5	11:15	11:40
15	B26	B21	11:20	11:30	11:55
16	A31	A26	11:35	11:45	12:10
17	B31	B26	11:50	12: 0	12:25
18	A36	A31	12: 5	12:15	12:40
19	B36	B31	12:20	12:30	12:55
20	A 3	A36	12:35	12:45	1:10
21	B 3	B36	12:50	1: 0	1:25
22	A 8	A 3	1: 5	1:15	1:40
23	B 8	B 3	1:20	1:30	1:55
24	A13	A 8	1:35	1:45	2:10
25	B13	B 8	1:50	2: 0	2:25
26	A18	A13	2: 5	2:15	2:40
27	B18	B13	2:20	2:30	2:55
28	A23	A18	2:35	2:45	3:10
29	B23	B18	2:50	3: 0	3:25
30	A28	A23	3: 5	3:15	3:40
31	B28	B23	3:20	3:30	3:55
32	A33	A28	3:35	3:45	4:10

TUE MAR 13 1990 8X 4 TURN

PUSHING SCHEDULE FOR BATTERY B

SEQ #	PUSH	CHARGE	EARLIEST TIME	DESIRED TIME	LATEST TIME	PM
1	B20	B15	11:50	12: 0	12:25	1
2	A25	A20	12: 4	12:14	12:39	1
3	B25	B20	12:18	12:28	12:53	1
4	A30	A25	12:32	12:42	1: 7	1
5	B30	B25	12:46	12:56	1:21	1
6	A35	A30	1: 0	1:10	1:35	1
7	B35	B30	1:14	1:24	1:49	1
8	A 2	A35	1:28	1:38	2: 3	1
9	B 2	B35	1:42	1:52	2:17	1
10	A 7	A 2	1:57	2: 7	2:32	1
11	B 7	B 2	2:11	2:21	2:46	1
12	A12	A 7	2:25	2:35	3: 0	1
13	B12	B 7	2:39	2:49	3:14	1
14	A17	A12	2:53	3: 3	3:28	1
15	B17	B12	3: 7	3:17	3:42	1
16	A22	A17	3:21	3:31	3:56	1
17	B22	B17	3:35	3:45	4:10	1
18	A27	A22	3:50	4: 0	4:25	1
19	B27	B22	4: 4	4:14	4:39	1
20	A32	A27	4:18	4:28	4:53	1
21	B32	B27	4:32	4:42	5: 7	1
22	A37	A32	4:46	4:56	5:21	1
23	B37	B32	5: 0	5:10	5:35	1
24	A 4	A37	5:14	5:24	5:49	1
25	B 4	B37	5:28	5:38	6: 3	1
26	A 9	A 4	5:42	5:52	6:17	1
27	B 9	B 4	5:57	6: 7	6:32	1
28	A14	A 9	6:11	6:21	6:46	1
29	B14	B 9	6:25	6:35	7: 0	1
30	A19	A14	6:39	6:49	7:14	1
31	B19	B14	6:53	7: 3	7:28	1
32	A24	A19	7: 7	7:17	7:42	1
33	B24	B19	7:21	7:31	7:56	1
34	A29	A24	7:35	7:45	8:10	1

TUE MAR 13 1990 12X 8 TURN

FINISHED 90 FISHING

PUSHING AND CHARGING REPORT

"B" BATTERY

P.M.

DATE 3-12-90

PUSH	25	CHARGE	25	CLEAN CHUCK DOOR	COMMENTS	PUSH	25	CHARGE	25	CLEAN CHUCK DOOR	COMMENTS
A1	2:55	A34	3:00	A6		B1	3:06	B34	3:15	B6	
A6	3:23	A1	3:25	A11		B6	3:36	B1	3:31	B11	
A11	4:12	A6	4:12	A16		B11	4:22	B6	4:22	B16	
A16	4:53	A11	4:57	A21		B16	4:43	B11	4:41	B21	
A21	4:53	A16	4:57	A26		B21	5:[illegible]	B16	5:25	B26	
A26	5:23	A21	5:21	A31		B26	5:33	B21	5:32	B31	
A31	5:45	A26	5:42	A36		B31	5:52	B26	6:02	B36	
A36	6:11	A31	6:15	B3		B36	6:25	B31	6:20		
B3	6:33	A36	6:43	B8		B3	6:53	B36	6:50	B8	
B8	7:07	A3	7:02	A13		B8	7:27	B3	7:12	B13	
B13	7:35	A8	7:32	A18		B13	7:55	B8	7:52	B18	
B18	8:04	A13	8:02	A23		B18	8:[illegible]	B13	8:16	B23	
B23	8:32	A18	8:30	A28		B23	8:[illegible]	B18	8:50	B28	
B28	9:00	A23	9:00	A33		B28	9:22	B23	9:22	B33	
B33	9:52	A28	9:30	A38		B33	10:03	B28	10:00		
B38	10:48	A33	10:50	B5							
B5	10:30	B33	10:30	A10		B5	10:58	A38	10:55	B10	
B10	10:59	A5	10:58	A15		B10	11:02	B5	11:07	B15	
B15	11:21	A10	11:31	A20		B15	11:35	B10	11:35	B20	
B20	11:45	A15	11:47	A25		B20		B15		B25	
B25		A20		A30		B25		B20		B30	
B30		A25		A35		B30		B25		B35	
B35		A30		B2		B35		B30			
B2		A35		A7		B2		B35		B7	
B7		A2		A12		B7		B2		B12	
B12		A7		A17		B12		B7		B17	
B17		A12		A22		B17		B12		B22	
B22		A17		A27		B22		B17		B27	
B27		A22		A32		B27		B22		B32	
B32		A27		A37		B32		B27		B37	
B37		A32		B4		B37		B32			
B4		A37		A9		B4		B37		B9	
B9	12:00	A4		A14		B9	12:15	B4	12:20	B14	
B14	12:34	A9	12:30	A19		B14	12:37	B9	12:43	B19	
B19	1:15	A14	1:07	A24		B19	1:17	B14	1:14	B24	
B24	1:39	A19	1:22	A29		B24	1:48	B19	1:46	B29	
B29	1:59	A24	2:00	A34		B29	2:20	B24	2:18	B34	
B34	2:30	A29	2:32	B1		B34	2:45	B29	2:44		

TIME A.M.	P	C
12-1		
1-2		
2-3		
3-4		
4-5		
5-6		
6-7		
7-8		
8-9		
9-10		
10-11		
11-12		

TIME P.M.	P	C
12-1	4	3
1-2	4	4
2-3	5	4
3-4	3	4
4-5	5	5
5-6	5	4
6-7	4	5
7-8	4	4
8-9	4	4
9-10	3	3
10-11	5	5
11-12	4	4

TOTALS	P	C
12x8		
8x4	16	15
4x12	34	34
Total	50	49

FOREMAN

12x8 -

8x4 -

4x12-

A-2, A-3, A-4, A-5 CHUCK DOORS BEFORE REMOVING FOR PUSH

MAR 14 '90 13:38 PAGE.001

.000.0000
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PUSHING AND CHARGING REPORT

"B" BATTERY

DATE 3-12-90

AM

PUSH		CHARGE		CLEAN CHUCK DOOR	COMMENTS	PUSH		CHARGE		CLEAN CHUCK DOOR	COMMENTS	TIME A.M.		C
1		A34		A6		B1		B34		B6		12-1	5	5
6		A1		A11		B6		B1		B11		1-2	5	5
11		A6		A16		B11		B6		B16		2-3	4	4
16		A11		A21		B16		B11		B21		3-4	4	4
21		A16		A26		B21		B16		B26		4-5	4	4
26		A21		A31		B26		B21		B31		5-6	5	5
A31		A26		A36		B31	12:08	B26	12:08	B36		6-7	4	4
A36	12:10	A31	12:20	B3		B36	12:32	B31	12:34			7-8	3	3
B3	12:42	A36	12:52	B8		B3	12:52	B36	12:52	B8		8-9	5	5
B8	1:10	A3	1:16	A13		B8	1:21	B3	1:32	B13		9-10	4	4
A13	1:34	A8	1:40	A18		B13	1:46	B8	1:51	B18		10-11	4	4
A18	1:57	A13	1:59	A23		B18	2:11	B13	2:12	B23		11-12	3	4
A23	2:25	A18	2:26	A28		B23	2:29	B18	2:42	B28				
A28	2:53	A23	2:56	A33	K	B28	3:02	B23	3:10	B33		TIME P.M.	P	C
A33	3:21	A28	3:32	A38	K	B33	3:33	B28	3:32			12-1		
A38	3:50	A33	3:51	B5								1-2		
B5	4:09	B33	4:00	A10	K	B5	4:10	A38	4:11	B10		2-3		
A10	4:32	B5	4:26	A15		B10	4:46	B5	4:32	B15		3-4		
A15	5:08	A10	5:00	A20		B15	5:16	B10	5:14	B20		4-5		
A20	5:28	A15	5:26	A25		B20	5:52	B15	5:46	B25		5-6		
A25	5:59	A20	5:59	A30		B25	6:15	B20	6:13	B30		6-7		
A30	6:25	A25	6:29	A35		B30	6:42	B25	6:39	B35		7-8		
A35	6:53	A30	6:55	B2		B35	7:02	B30	7:05			8-9		
B2	7:21	A35	7:12	A7		B2	7:35	B35	7:30	B7		9-10		
A7	8:07	A2	8:10	A12		B7	8:19	B2	8:23	B12		10-11		
A12	8:34	A7	8:39	A17		B12	8:48	B7	8:47	B17		11-12		
A17	8:58	A12	8:59	A22		B17	9:13	B12	9:12	B22		TOTALS		
A22	9:26	A17	9:25	A27		B22	9:42	B17	9:41	B27			P	C
A27	9:50	A22	9:53	A32		B27	10:05	B22	10:07	B32		12x8	34	34
A32	10:20	A27	10:21	A37		B32	10:35	B27	10:33	B37		8x4	16	17
A37	10:50	A32	10:46	B4		B37	11:05	B32	11:06			4x12		
A4	11:20	A37	11:15	B9		B4	11:26	B37	11:34	B9		Total	50	51
B9		A4	11:59	A14		B9		B4		B14				
A14		A9		A19		B14		B9		B19				
A19		A14		A24		B19		B14		B24		FOREMAN		
A24		A19		A29		B24		B19		B29		12x8 -		
A29		A24		A34		B29		B24		B34		8x4 -		
A34		A29		B1		B34		B29				4x12-		

LEAN A-1, A-2, A-3, A-4, A-5 CHUCK DOORS BEFORE REMOVING FOR PUSH.

PAGE.006

MAR 14 '90 13:23

MAR 14 '90 13:19 PAGE.004

CC-1044 REV. 003

FOREMAN		12 M. - 8 A.M.	8 A.M. - 4 P.M.	4 P.M. - 12 M.
	Batteries ~~1-2-3~~ B	Sanders	Smith	Shelton
	Batteries 4-5-6			
	Relief 1 to 6			
	Batteries 7-8-9			
	Batteries 10-11-12			
	Relief 7 to 12			
	Batteries 13-14-15			
	Batteries 16-17-18			
	Relief 13 to 18			
	Batteries 19-20			
	Batteries 21-22			
	Relief 19 to 22			

UNITED STATES STEEL CORPORATION
CLAIRTON WORKS

FOREMEN ON DUTY

HOURLY OPERATION OF BATTERIES

DATE 3-12-90

	Batt. 1-2-3			Batt. 4-5-6			Batt. 7-8-9			Batt. 10-11-12			Batt. 13-14-15			Batt. 16-17-18			Batt. 19-20			Batt. 21-22			Batt. 12-A		
	P	C	S	P	C	S	P	C	S	P	C	S	P	C	S	P	C	S	P	C	S	P	C	S	P	C	S
12- 1 A.M.	5	5																									
1- 2 A.M.	5	5																									
2- 3 A.M.	4	4			34																						
3- 4 A.M.	4	4																									
4- 5 A.M.	4	4																									
5- 6 A.M.	5	5				34																					
6- 7 A.M.	4	4																									
7- 8 A.M.	3	3																									
8- 9 A.M.	5	5																									
9-10 A.M.	4	4																									
10-11 A.M.	4	4			32																						
11-12 A.M.	3	4																									
12- 1 P.M.	4	3																									
1- 2 P.M.	4	4				32																					
2- 3 P.M.	5	4																									
3- 4 P.M.	3	4																									
4- 5 P.M.	5	5																									
5- 6 P.M.	5	4																									
6- 7 P.M.	4	5			34																						
7- 8 P.M.	4	4																									
8- 9 P.M.	4	4																									
9-10 P.M.	3	3				34																					
10-11 P.M.	5	5																									
11-12 P.M.	4	4																									
TOTAL	100	100																									

REMARKS:

P 100 C 100

PUSHING SCHEDULE FOR BATTERY B

SEQ #	PUSH	CHARGE	EARLIEST TIME	DESIRED TIME	LATEST TIME	PM
1	A11	A 6	3:50	4: 0	4:25	1
2	B11	B 6	4: 4	4:14	4:39	1
3	A16	A11	4:18	4:28	4:53	1
4	B16	B11	4:32	4:42	5: 7	1
5	A21	A16	4:46	4:56	5:21	1
6	B21	B16	5: 0	5:10	5:35	1
7	A26	A21	5:14	5:24	5:49	1
8	B26	B21	5:28	5:38	6: 3	1
9	A31	A26	5:42	5:52	6:17	1
10	B31	B26	5:57	6: 7	6:32	1
11	A36	A31	6:11	6:21	6:46	1
12	B36	B31	6:25	6:35	7: 0	1
13	A 3	A36	6:39	6:49	7:14	1
14	B 3	B36	6:53	7: 3	7:28	1
15	A 8	A 3	7: 7	7:17	7:42	1
16	B 8	B 3	7:21	7:31	7:56	1
17	A13	A 8	7:35	7:45	8:10	1
18	B13	B 8	7:50	8: 0	8:25	1
19	A18	A13	8: 4	8:14	8:39	1
20	B18	B13	8:18	8:28	8:53	1
21	A23	A18	8:32	8:42	9: 7	1
22	B23	B18	8:46	8:56	9:21	1
23	A28	A23	9: 0	9:10	9:35	1
24	B28	B23	9:14	9:24	9:49	1
25	A33	A28	9:28	9:38	10: 3	1
26	B33	B28	9:42	9:52	10:17	1
27	A38	A33	9:57	10: 7	10:32	1
28	A 5	B33	10:11	10:21	10:46	1
29	B 5	A38	10:25	10:35	11: 0	1
30	A10	A 5	10:39	10:49	11:14	1
31	B10	B 5	10:53	11: 3	11:28	1
32	A15	A10	11: 7	11:17	11:42	1
33	B15	B10	11:21	11:31	11:56	1
34	A20	A15	11:35	11:45	12:10	1

MON MAR 12 1990 4X12 TURN

PUSHING SCHEDULE FOR BATTERY B

SEQ #	PUSH	CHARGE	EARLIEST TIME	DESIRED TIME	LATEST TIME	PM
1	A 7	A 2	7:50	8: 0	8:25	1
2	B 7	B 2	8: 5	8:15	8:40	1
3	A12	A 7	8:20	8:30	8:55	1
4	B12	B 7	8:35	8:45	9:10	1
5	A17	A12	8:50	9: 0	9:25	1
6	B17	B12	9: 5	9:15	9:40	1
7	A22	A17	9:20	9:30	9:55	1
8	B22	B17	9:35	9:45	10:10	1
9	A27	A22	9:50	10: 0	10:25	1
10	B27	B22	10: 5	10:15	10:40	1
11	A32	A27	10:20	10:30	10:55	1
12	B32	B27	10:35	10:45	11:10	1
13	A37	A32	10:50	11: 0	11:25	1
14	B37	B32	11: 5	11:15	11:40	1
15	A 4	A37	11:20	11:30	11:55	1
16	B 4	B37	11:35	11:45	12:10	1
17	A 9	A 4	11:50	12: 0	12:25	1
18	B 9	B 4	12: 5	12:15	12:40	1
19	A14	A 9	12:20	12:30	12:55	1
20	B14	B 9	12:35	12:45	1:10	1
21	A19	A14	12:50	1: 0	1:25	1
22	B19	B14	1: 5	1:15	1:40	1
23	A24	A19	1:20	1:30	1:55	1
24	B24	B19	1:35	1:45	2:10	1
25	A29	A24	1:50	2: 0	2:25	1
26	B29	B24	2: 5	2:15	2:40	1
27	A34	A29	2:20	2:30	2:55	1
28	B34	B29	2:35	2:45	3:10	1
29	A 1	A34	2:50	3: 0	3:25	1
30	B 1	B34	3: 5	3:15	3:40	1
31	A 6	A 1	3:20	3:30	3:55	1
32	B 6	B 1	3:35	3:45	4:10	1

MON MAR 12 1990 8X 4 TURN

PUSHING SCHEDULE FOR BATTERY B

SEQ #	PUSH	CHARGE	EARLIEST TIME	DESIRED TIME	LATEST TIME	PM
1	B31	B26	11:50	12: 0	12:25	1
2	A36	A31	12: 4	12:14	12:39	1
3	B36	B31	12:18	12:28	12:53	1
4	A 3	A36	12:32	12:42	1: 7	1
5	B 3	B36	12:46	12:56	1:21	1
6	A 8	A 3	1: 0	1:10	1:35	1
7	B 8	B 3	1:14	1:24	1:49	1
8	A13	A 8	1:28	1:38	2: 3	1
9	B13	B 8	1:42	1:52	2:17	1
10	A18	A13	1:57	2: 7	2:32	1
11	B18	B13	2:11	2:21	2:46	1
12	A23	A18	2:25	2:35	3: 0	1
13	B23	B18	2:39	2:49	3:14	1
14	A28	A23	2:53	3: 3	3:28	1
15	B28	B23	3: 7	3:17	3:42	1
16	A33	A28	3:21	3:31	3:56	1
17	B33	B28	3:35	3:45	4:10	1
18	A38	A33	3:50	4: 0	4:25	1
19	A 5	B33	4: 4	4:14	4:39	1
20	B 5	A38	4:18	4:28	4:53	1
21	A10	A 5	4:32	4:42	5: 7	1
22	B10	B 5	4:46	4:56	5:21	1
23	A15	A10	5: 0	5:10	5:35	1
24	B15	B10	5:14	5:24	5:49	1
25	A20	A15	5:28	5:38	6: 3	1
26	B20	B15	5:42	5:52	6:17	1
27	A25	A20	5:57	6: 7	6:32	1
28	B25	B20	6:11	6:21	6:46	1
29	A30	A25	6:25	6:35	7: 0	1
30	B30	B25	6:39	6:49	7:14	1
31	A35	A30	6:53	7: 3	7:28	1
32	B35	B30	7: 7	7:17	7:42	1
33	A 2	A35	7:21	7:31	7:56	1
34	B 2	B35	7:35	7:45	8:10	1

MON MAR 12 1990 12X 8 TURN

.000/0088
85

Car

Pusher

PUSHING AND CHARGING REPORT

"B" BATTERY

P.M

DATE 3-11-90

PUSH	26 CHARGE			CLEAN CHUCK DOOR	COMMENTS	PUSH	25 CHARGE			CLEAN CHUCK DOOR	COMMENTS	TIME A.M.	P	C
1	9:02	A34	8:55	A6	BY PASS	B1	9:15	B34	9:04	B6		12-1		
6	9:28	A1	9:25	A11	BY-PASS	B6	9:37	B1	9:31	B11	BY-PASS	1-2		
11	9:59	A6	9:55	A16		B11	10:09	B6	10:05	B16		2-3		
16	10:11	A11	10:13	A21	BY-PASS	B16	10:25	B11	10:25	B21		3-4		
21	10:39	A16	10:34	A26	BY-PASS	B21	10:53	B16	10:53	B26		4-5		
26	11:07	A21	11:07	A31		B26	11:21	B21	11:21	B31		5-6		
31	11:35	A26	11:35	A36		B31		B26		B36		6-7		
36		A31		B3		B36		B31				7-8		
3		A36		A8		B3		B36		B8		8-9		
8		A3		A13		B8		B3		B13		9-10		
13		A8		A18		B13		B8		B18		10-11		
18		A13		A23		B18		B13		B23		11-12		
23		A18		A28		B23		B18		B28				
28		A23		A33		B28		B23		B33		TIME P.M.	P	C
33		A28		A38		B33		B28				12-1	5	5
38		A33		B5								1-2	5	5
5		B33		A10		B5		A38		B10		2-3	4	4
10		A5		A15		B10		B5		B15		3-4	3	3
15		A10		A20		B15		B10		B20		4-5	4	3
20	12:06	A15	12:04	A25		B20	12:15	B15	12:14	B25		5-6	4	5
25	12:26	A20	12:22	A30		B25	12:33	B20	12:31	B30		6-7	5	5
30	12:40	A25	12:40	A35		B30	1:00	B25	1:03	B35		7-8	5	5
35	1:13	A30	1:14	B2		B35	1:30	B30	1:22			8-9	3	4
2	1:43	A35	1:38	A7		B2	1:57	B35	1:51	B7		9-10	5	4
7	2:06	A2	2:10	A12		B7	2:20	B2	2:21	B12		10-11	5	5
12	2:35	A7	2:32	A17		B12	2:50	B7	2:47	B17		11-12	3	3
17	3:05	A12	3:02	A22		B17	3:20	B12	3:14	B22		TOTALS		
22	3:36	A17	3:29	A27		B22	4:08	B17	4:11	B27			P	C
27	4:20	A22	4:20	A32		B27	4:29	B22	4:45	B32		12x8		
32	4:38	A27	5:09	A37		B32	5:03	B27	5:23	B37		8x4	17	17
37	5:15	A32	5:43	B4		B37	5:32	B32	5:28			4x12	34	34
4	5:52	A37	5:55	A9		B4	6:07	B37	6:29	B9		Total	51	51
9	6:24	A4	6:15	A14		B9	6:34	B4	6:32	B14				
14	6:46	A9	6:49	A19		B14	6:52	B9	6:55	B19				
19	7:08	A14	7:10	A24		B19	7:18	B14	7:20	B24		FOREMAN		
24	7:25	A19	7:30	A29		B24	7:30	B19	7:41	B29		12x8 - Saunders		
29	7:55	A24	7:53	A34		B29	8:10	B24	8:00	B34		8x4 - Smith		
34	8:55	A29	8:16	B1		B34	8:45	B29	8:40			4x12 - Shelton		

CLEAN A-1, A-2, A-3, A-4, A-6 CHUCK DOORS BEFORE REMOVING FOR PUSH

PAGE.008

MAR 14 '90 13:29

PUSHING AND CHARGING REPORT

"B" BATTERY

DATE 3-11-90

PUSH		CHARGE		CLEAN CHUCK DOOR	COMMENTS	PUSH		CHARGE		CLEAN CHUCK DOOR	COMMENTS	TIME A.M.	P	C
1	239	A34	251	A6		B1	253	B34	234	B6		12-1	5	5
6	307	A1	302	A11		B6	321	B1	316	B11		1-2	5	5
11	335	A6	330	A16		B11	350	B6	345	B16		2-3	4	4
16	407	A11	400	A21		B16	418	B11	415	B21		3-4	4	4
21	426	A16	428	A26		B21	448	B16	441	B26		4-5	4	4
26	500	A21	500	A31		B26	514	B21	510	B31		5-6	5	5
31	528	A26	523	A36		B31	542	B26	538	B36		6-7	4	4
36	557	A31	552	B3		B36	611	B31	605			7-8	3	3
3	625	A36	620	A8		B3	639	B36	634	B8		8-9	2	4
8	653	A3	648	A13		B8	707	B3	702	B13		9-10	5	3
13	721	A8	716	A18		B13	735	B8	730	B18		10-11	4	4
18	810	A13	815	A23		B18	825	B13	825	B23		11-12	4	4
23	915	A18	837	A28		B23	925	B18	850	B28				
28	935	A23	935	A33		B28	947	B23	947	B33		TIME P.M.	P	C
33	959	A28	959	A38		B33	10[illegible]	B28	1015			12-1		
38	1022	A33	1020	B5								1-2		
5	1042	B33	1044	A10		B5	1053	A38	1057	B10		2-3		
10	1103	A5	1105	A15		B10	1115	B5	1117	B15		3-4		
15	1130	A10	1132	A20		B15	1145	B10	1147	B20		4-5		
20		A15		A25		B20		B15		B25		5-6		
25		A20		A30		B25		B20		B30		6-7		
30		A25		A35		B30		B25		B35		7-8		
35		A30		B2		B35		B30				8-9		
2		A35		A7		B2		B35		B7		9-10		
7		A2		A12		B7		B2		B12		10-11		
12		A7		A17		B12		B7		B17		11-12		
17		A12		A22		B17		B12		B22		TOTALS		
22		A17		A27		B22		B17		B27			P	C
27		A22		A32		B27		B22		B32		12x8	34	34
32		A27		A37		B32		B27		B37		8x4	15	15
37		A32		B4		B37		B32				4x12		
4		A37		B9		B4	12[illegible]	B37	12[illegible]	B9		Total	49	49
9	1200	B4	1202	A14		B9	1216	B4	1216	B14				
14	1224	B9	1226	A19		B14	1236	B9	1239	B19				
19	1248	A14	1250	A24		B19	100	B14	103	B24		FOREMAN		
24	114	A19	116	A29		B24	128	B19	128	B29		12x8	Sandros	
29	142	A24	140	A34		B29	157	B24	154	B34		8x4	Smith	
34	204	A29	206	B1		B34	225	B29	220			4x12	Skelton	

CLEAN A-1, A-2, A-3, A-4, A-5 CHUCK DOORS BEFORE REMOVING FOR PUSH

UNITED STATES STEEL CORPORATION
CLAIRTON WORKS

FOREMEN ON DUTY

HOURLY OPERATION OF BATTERIES

DATE 3-11-90

FOREMAN		12 M. - 8 A.M.	8 A.M. - 4 P.M.	4 P.M. - 12 M.
	Batteries ~~1-2-3~~ B	Sanders	Smith	Skiffon
	Batteries 4-5-6			
	Relief 1 to 6			
	Batteries 7-8-9			
	Batteries 10-11-12			
	Relief 7 to 12			
	Batteries 13-14-15			
	Batteries 16-17-18			
	Relief 13 to 18			
	Batteries 19-20			
	Batteries 21-22			
	Relief 19 to 22			

	Batt. 1-2-3			Batt. 4-5-6			Batt. 7-8-9			Batt. 10-11-12			Batt. 13-14-15			Batt. 16-17-18			Batt. 19-20			Batt. 21-22			Batt. 22-A		
	P	C	S	P	C	S	P	C	S	P	C	S	P	C	S	P	C	S	P	C	S	P	C	S	P	C	S
12- 1 A.M.	5	5																									
1- 2 A.M.	5	5																									
2- 3 A.M.	4	4		34																							
3- 4 A.M.	4	4																									
4- 5 A.M.	4	4																									
5- 6 A.M.	5	5				34																					
6- 7 A.M.	4	4																									
7- 8 A.M.	3	3																									
8- 9 A.M.	2	4																									
9-10 A.M.	5	3																									
10-11 A.M.	4	4		32																							
11-12 A.M.	4	4																									
12- 1 P.M.	5	5																									
1- 2 P.M.	5	5				32																					
2- 3 P.M.	4	4																									
3- 4 P.M.	5	5																									
4- 5 P.M.	4	3																									
5- 6 P.M.	4	5																									
6- 7 P.M.	5	5		34																							
7- 8 P.M.	5	5																									
8- 9 P.M.	3	4																									
9-10 P.M.	5	4				34																					
10-11 P.M.	5	5																									
11-12 P.M.	3	3																									
TOTAL	100	100																									

REMARKS:

P 100 C 100

PUSHING SCHEDULE FOR BATTERY B

SEQ #	PUSH	CHARGE	EARLIEST TIME	DESIRED TIME	LATEST TIME	PM
1	B22	B17	3:50	4: 0	4:25	1
2	A27	A22	4: 4	4:14	4:39	1
3	B27	B22	4:18	4:28	4:53	1
4	A32	A27	4:32	4:42	5: 7	1
5	B32	B27	4:46	4:56	5:21	1
6	A37	A32	5: 0	5:10	5:35	1
7	B37	B32	5:14	5:24	5:49	1
8	A 4	A37	5:28	5:38	6: 3	1
9	B 4	B37	5:42	5:52	6:17	1
10	A 9	A 4	5:57	6: 7	6:32	1
11	B 9	B 4	6:11	6:21	6:46	1
12	A14	A 9	6:25	6:35	7: 0	1
13	B14	B 9	6:39	6:49	7:14	1
14	A19	A14	6:53	7: 3	7:28	1
15	B19	B14	7: 7	7:17	7:42	1
16	A24	A19	7:21	7:31	7:56	1
17	B24	B19	7:35	7:45	8:10	1
18	A29	A24	7:50	8: 0	8:25	1
19	B29	B24	8: 4	8:14	8:39	1
20	A34	A29	8:18	8:28	8:53	1
21	B34	B29	8:32	8:42	9: 7	1
22	A 1	A34	8:46	8:56	9:21	1
23	B 1	B34	9: 0	9:10	9:35	1
24	A 6	A 1	9:14	9:24	9:49	1
25	B 6	B 1	9:28	9:38	10: 3	1
26	A11	A 6	9:42	9:52	10:17	1
27	B11	B 6	9:57	10: 7	10:32	1
28	A16	A11	10:11	10:21	10:46	1
29	B16	B11	10:25	10:35	11: 0	1
30	A21	A16	10:39	10:49	11:14	1
31	B21	B16	10:53	11: 3	11:28	1
32	A26	A21	11: 7	11:17	11:42	1
33	B26	B21	11:21	11:31	11:56	1
34	A31	A26	11:35	11:45	12:10	1

SUN MAR 11 1990 4X12 TURN

PUSHING SCHEDULE FOR BATTERY B

SEQ #	PUSH	CHARGE	EARLIEST TIME	DESIRED TIME	LATEST TIME	PM
1	A18	A13	7:50	8: 0	8:25	1
2	B18	B13	8: 5	8:15	8:40	1
3	A23	A18	8:20	8:30	8:55	1
4	B23	B18	8:35	8:45	9:10	1
5	A28	A23	8:50	9: 0	9:25	1
6	B28	B23	9: 5	9:15	9:40	1
7	A33	A28	9:20	9:30	9:55	1
8	B33	B28	9:35	9:45	10:10	1
9	A38	A33	9:50	10: 0	10:25	1
10	A 5	B33	10: 5	10:15	10:40	1
11	B 5	A38	10:20	10:30	10:55	1
12	A10	A 5	10:35	10:45	11:10	1
13	B10	B 5	10:50	11: 0	11:25	1
14	A15	A10	11: 5	11:15	11:40	1
15	B15	B10	11:20	11:30	11:55	1
16	A20	A15	11:35	11:45	12:10	1
17	B20	B15	11:50	12: 0	12:25	1
18	A25	A20	12: 5	12:15	12:40	1
19	B25	B20	12:20	12:30	12:55	1
20	A30	A25	12:35	12:45	1:10	1
21	B30	B25	12:50	1: 0	1:25	1
22	A35	A30	1: 5	1:15	1:40	1
23	B35	B30	1:20	1:30	1:55	1
24	A 2	A35	1:35	1:45	2:10	1
25	B 2	B35	1:50	2: 0	2:25	1
26	A 7	A 2	2: 5	2:15	2:40	1
27	B 7	B 2	2:20	2:30	2:55	1
28	A12	A 7	2:35	2:45	3:10	1
29	B12	B 7	2:50	3: 0	3:25	1
30	A17	A12	3: 5	3:15	3:40	1
31	B17	B12	3:20	3:30	3:55	1
32	A22	A17	3:35	3:45	4:10	1

SUN MAR 11 1990 8X 4 TURN

PUSHING SCHEDULE FOR BATTERY B

SEQ #	PUSH	CHARGE	EARLIEST TIME	DESIRED TIME	LATEST TIME	PM
1	A 9	A 4	11:50	12: 0	12:25	1
2	B 9	B 4	12: 4	12:14	12:39	1
3	A14	A 9	12:18	12:28	12:53	1
4	B14	B 9	12:32	12:42	1: 7	1
5	A19	A14	12:46	12:56	1:21	1
6	B19	B14	1: 0	1:10	1:35	1
7	A24	A19	1:14	1:24	1:49	1
8	B24	B19	1:28	1:38	2: 3	1
9	A29	A24	1:42	1:52	2:17	1
10	B29	B24	1:57	2: 7	2:32	1
11	A34	A29	2:11	2:21	2:46	1
12	B34	B29	2:25	2:35	3: 0	1
13	A 1	A34	2:39	2:49	3:14	1
14	B 1	B34	2:53	3: 3	3:28	1
15	A 6	A 1	3: 7	3:17	3:42	1
16	B 6	B 1	3:21	3:31	3:56	1
17	A11	A 6	3:35	3:45	4:10	1
18	B11	B 6	3:50	4: 0	4:25	1
19	A16	A11	4: 4	4:14	4:39	1
20	B16	B11	4:18	4:28	4:53	1
21	A21	A16	4:32	4:42	5: 7	1
22	B21	B16	4:46	4:56	5:21	1
23	A26	A21	5: 0	5:10	5:35	1
24	B26	B21	5:14	5:24	5:49	1
25	A31	A26	5:28	5:38	6: 3	1
26	B31	B26	5:42	5:52	6:17	1
27	A36	A31	5:57	6: 7	6:32	1
28	B36	B31	6:11	6:21	6:46	1
29	A 3	A36	6:25	6:35	7: 0	1
30	B 3	B36	6:39	6:49	7:14	1
31	A 8	A 3	6:53	7: 3	7:28	1
32	B 8	B 3	7: 7	7:17	7:42	1
33	A13	A 8	7:21	7:31	7:56	1
34	B13	B 8	7:35	7:45	8:10	1

SUN MAR 11 1990 12X 8 TURN

APPENDIX B

ANTICIPATED AND ACTUAL PUSHING AND CHARGING SCHEDULE FOR B-BATTERY

MAGNAHELIC CALIBRAATION

DATE 4-5-90

OPERATOR DRK

P 0-10		P 0-.5		H	
MAGNEHILIC	MANOMETER	MAGNEHILIC	MANOMETER	MAGNEHILIC	MANOMETER
0.50	0.50	0.50	0.50	4.00	4.00
1.00	1.00	0.40	0.40	3.00	3.00
2.00	2.00	0.30	0.30	2.00	2.00
4.00	4.00	0.20	0.20	1.00	1.00
6.00	6.00	0.10	0.10	0.50	0.50
8.00	8.00				

LEAK CHECK

DATE 4-5-90

OPERATOR DRK

	START CF	STOP CF	VOL	TIME	LEAK RATE
DRY	730.915	731.115	0.200	10.000	-0.001
WET	0.000	0.192	0.192		

PYROMETER CALIBRATION

DATE 04-28-88

OPERATOR AGL

mV input	temp °F	temp rdg °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

PYROMETER CHECK

DATE 4-5-90

OPERATOR DRK

mV input °F	temp °F	temp rdg
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	301	300.0
8.31	400	400.0
10.57	500	500.0

CONTROL BOX CALIBRATION

THREE POINT CALIBRATION

BOX NO. 2
DATE 12-27-89
BP 29.02
OPERATOR DRK

	TIME	WET TEST METER TEMP T_W	WET TEST METER VOLUME V_M	WET TEST METER PRESSURE P_W	DRY TEST METER TEMP IN T_I	DRY TEST METER TEMP OUT T_O	DRY TEST METER TEMP AVG T_A	DRY TEST METER VOLUME V_D	DRY TEST METER Y	ORIFICE H_a	VOLUME	METER CORRECT	ORIFICE COEIFFICE
START				0.000		29.02				0.50	372.800		
HALF			74.0				85.0	78.0	81.5				
STOP	11.16			5.000							378.149		
CALCULATION	11.16		534.0	5.057	29.02				541.5	29.06	5.349	0.9574	1.401
START				0.000	29.02					1.00	378.700		
HALF			74.0				90.0	80.0	85.0				
STOP	8.33			5.000							384.054		
CALCULATION	8.33		534.0	5.057	29.02				545.0	29.09	5.354	0.9615	1.551
START				0.000	29.02					2.00	384.500		
HALF			74.0				93.0	81.0	87.0				
STOP	6.00			5.000							389.822		
CALCULATION	6.00		534.0	5.057	29.02				547.0	29.17	5.322	0.9683	1.604
AVERAGE												0.9624	1.519

POST TEST

BOX NO. 2
DATE 4-04-90
BP 28.75
OPERATOR DRK

	TIME	WET TEST METER TEMP T_W	WET TEST METER VOLUME V_M	WET TEST METER PRESSURE P_W	T_I	T_O	DRY TEST METER TEMP IN T_A	DRY TEST METER TEMP OUT P_D	DRY TEST METER TEMP AVG V_D	Y	ORIFICE $H_@$	VOLUME	METER CORRECT	ORIFICE COEIFFICE
START				0.000		28.75					1.00	160.900		
HALF			76.0				88.0	79.0	83.5					
STOP	8.25			5.000								166.192		
CALCULATION	8.25		536.0	5.057		28.75				543.5	28.82	5.292	0.9664	1.552
START				0.000		28.75					1.00	166.300		
HALF			76.0				90.0	80.0	85.0					
STOP	8.28			5.000								171.598		
CALCULATION	8.28		536.0	5.057		28.75				545.0	28.82	5.298	0.9680	1.559
START				0.000		28.75					1.00	171.700		
HALF			76.0				91.0	82.0	86.5					
STOP	8.28			5.000								177.012		
CALCULATION	8.28		536.0	5.057		28.75				546.5	28.82	5.312	0.9681	1.554
AVERAGE													0.9675	1.555
DIFFERENCE													-0.53%	-2.33%

MAGNAHELIC CALIBRATION
DATE 4-04-90
OPERATOR DRK

P 0-10		P 0-.5		H	
MAGNEHILIC	MANOMETER	MAGNEHILIC	MANOMETER	MAGNEHILIC	MANOMETER
0.5	0.5	0.5	0.5	0.5	0.5
1	1	0.4	0.4	1	1
2	2	0.3	0.3	2	2
4	4	0.2	0.2	3	3
6	6	0.1	0.1	4	4
8	8				

LEAK CHECK
DATE 4-04-90
OPERATOR DRK

	START CF	STOP CF	VOL	TIME	LEAK RATE
DRY	160.225	160.445	0.22	10.000	-0.001
WET	0	0.21	0.21		

PYROMETER CALIBRATION

DATE 7-19-89
OPERATOR PS/D

mV input	temp °F	temp rdg °F
0.18	40	40
0.40	50	50
0.84	70	70
1.29	90	90
1.74	110	110
2.66	150	150
3.82	200	200
6.09	300	300
8.31	400	400
10.57	500	500

PYROMETER CHECK

DATE 4-04-90
OPERATOR DRK

mV input °F	temp °F	temp rdg
0.18	40	40
0.40	50	50
0.84	70	70
1.29	90	90
1.74	110	110
2.66	150	150
3.82	200	200
6.09	300	300
8.31	400	400
10.57	500	500

CONTROL BOX CALIBRATION

THREE POINT CALIBRATION

BOX NO. 3
DATE 12-28-89
BP 28.98
OPERATOR DRK

	TIME	WET TEST METER TEMP T_W	WET TEST METER VOLUME V_M	P_W	PRESSURE T_I	PRESSURE T_O	DRY TEST METER TEMP IN T_A	TEMP OUT P_D	TEMP AVG V_D	Y	ORIFICE H_a	VOLUME	METER CORRECT	ORIFICE COEIFFICE
START				0.000		28.98					0.50	817.100		
HALF			76.0				90.0	76.0	83.0					
STOP	11.87			5.000								822.370		
CALCULATION	11.87		536.0	5.057		28.98				543.0	29.02	5.270	0.9708	1.579
START				0.000		28.98					1.00	822.600		
HALF			76.0				96.0	78.0	87.0					
STOP	8.62			5.000								827.874		
CALCULATION	8.62		536.0	5.057		28.98				547.0	29.05	5.274	0.9760	1.670
START				0.000		28.98					2.00	828.400		
HALF			76.0				101.0	79.0	90.0					
STOP	6.08			5.000								833.633		
CALCULATION	6.08		536.0	5.057		28.98				550.0	29.13	5.233	0.9865	1.652
AVERAGE													0.9778	1.634

POST TEST

BOX NO. 3
DATE 4-5-90
BP 28.55
OPERATOR DRK

	TIME	WET TEST METER TEMP T_W	VOLUME V_M	PRESSURE P_W	T_I	T_O	DRY TEST METER TEMP IN T_A	TEMP OUT P_D	TEMP AVG V_D	ORIFICE Y	$H_@$	VOLUME	METER CORRECT	ORIFICE COEIFFICE
START				0.000		28.55					1.00	634.400		
HALF			75.0				99.0		82.0	90.5				
STOP	8.73			5.000								639.705		
CALCULATION	8.73		535.0	5.057		28.55				550.5	28.62	5.305	0.9783	1.721
START				0.000		28.55					1.00	639.800		
HALF			75.0				101.0		83.0	92.0				
STOP	8.75			5.000								645.120		
CALCULATION	8.75		535.0	5.057		28.55				552.0	28.62	5.320	0.9782	1.724
START				0.000		28.55					1.00	645.200		
HALF			75.0				102.0		84.0	93.0				
STOP	8.75			5.000								650.525		
CALCULATION	8.75		535.0	5.057		28.55				553.0	28.62	5.325	0.9790	1.721
AVERAGE													0.9785	1.722
DIFFERENCE													-0.07%	-5.13%

MAGNAHELIC CALIBRAATION

DATE 4-5-90

OPERATOR DRK

P 0-10		P 0-.5		H	
MAGNEHILIC	MANOMETER	MAGNEHILIC	MANOMETER	MAGNEHILIC	MANOMETER
0.50	0.50	0.50	0.50	0.50	0.50
1.00	1.00	0.40	0.40	1.00	1.00
2.00	2.00	0.30	0.30	2.00	2.00
4.00	4.00	0.20	0.20	3.00	3.00
8.00	8.00	0.10	0.10	4.00	4.00

LEAK CHECK

DATE 4-5-90

OPERATOR DRK

	START CF	STOP CF	VOL	TIME	LEAK RATE
DRY	633.070	633.269	0.199	10.000	0.0001
WET	0.000	0.200	0.200		

PYROMETER CALIBRATION

DATE 7-20-89

OPERATOR PS/D

mV input	temp °F	temp rdg °F
0.18	40	40
0.40	50	50
0.84	70	70
1.29	90	90
1.74	110	110
2.66	150	150
3.82	200	200
6.09	300	300
8.31	400	400
10.57	500	500

PYROMETER CHECK

DATE 4-5-90

OPERATOR DRK

mV input °F	temp °F	temp rdg
0.18	40	40
0.40	50	50
0.84	70	70
1.29	90	90
1.74	110	110
2.66	150	150
3.82	200	200
6.09	300	301
8.31	400	400
10.57	500	500

CONTROL BOX CALIBRATION

THREE POINT

BOX NO. 4
DATE 12-28-89
BP 28.98
OPERATOR DRK

	TIME	WET TEST METER TEMP T_W	VOLUME V_M	PRESSURE P_W	T_I	T_O	DRY TEST METER TEMP IN T_A	TEMP OUT P_D	TEMP AVG V_D	Y	ORIFICE H_a	VOLUME	METER CORRECT	ORIFICE COEIFFICE
START				0.000		28.98					0.50	280.100		
HALF			76.0				76.0		75.0	75.5				
STOP	11.87			5.000								285.340		
CALCULATION	11.87		536.0	5.057		28.98				535.5	29.02	5.240	0.9629	1.617
START				0.000		28.98					1.00	285.900		
HALF			89.0				81.0		78.0	79.5				
STOP	8.63			5.000								291.190		
CALCULATION	8.63		549.0	5.057		28.98				539.5	29.05	5.290	0.9369	1.780
START				0.000		28.98					2.00	296.600		
HALF			76.0				76.0		76.0	76.0				
STOP	6.23			5.000								301.800		
CALCULATION	6.23		536.0	5.057		28.98				536.0	29.13	5.200	0.9675	1.780
AVERAGE													0.9558	1.726

POST TEST

BOX NO. 4
DATE 4-05-90
BP 28.55
OPERATOR TJM

	TIME	WET TEST METER TEMP T_W	VOLUME V_M	PRESSURE P_W	T_I	T_O	DRY TEST METER TEMP IN T_A	TEMP OUT P_D	V_D	TEMP AVG Y	ORIFICE H_a	VOLUME	METER CORRECT	ORIFICE COEIFFICE
START				0.000		28.55					1.20	121.495		
HALF			74.0				85.0	85.0		85.0				
STOP	8.25			5.000								126.681		
CALCULATION	8.25		534.0	5.057		28.55				545.0	28.64	5.186	0.9920	1.856
START				0.000		28.55					1.20	127.370		
HALF			74.0				87.0	86.0		86.5				
STOP	8.30			5.000								132.666		
CALCULATION	8.30		534.0	5.057		28.55				546.5	28.64	5.296	0.9741	1.873
START				0.000		28.55					1.20	133.710		
HALF			74.0				88.0	87.0		87.5				
STOP	8.30			5.000								139.000		
CALCULATION	8.30		534.0	5.057		28.55				547.5	28.64	5.290	0.9770	1.870
AVERAGE													0.9811	1.866
DIFFERENCE													-2.58%	-7.53%

MAGNAHELIC CALIBRAATION

DATE ~~2-27-90~~ 4-5-90

OPERATOR DRK

P 0-10		P 0-.5		H	
MAGNEHILIC	MANOMETER	MAGNEHILIC	MANOMETER	MAGNEHILIC	MANOMETER
0.50	0.50	0.50	0.50	4.00	4.05
1.00	1.00	0.40	0.40	3.00	3.00
2.00	2.00	0.30	0.30	2.00	2.00
4.00	4.00	0.20	0.20	1.00	1.00
6.00	6.00	0.10	0.10	0.50	0.50
8.00	8.00				

LEAK CHECK

DATE 4-05-90

OPERATOR TJM

	START CF	STOP CF	VOL	TIME	LEAK RATE
DRY	117.000	117.235	0.235	10.000	-0.001
WET	0.000	0.225	0.225		

PYROMETER CALIBRATION

DATE 7-20-89

OPERATOR PS/D

mV input	temp °F	temp rdg °F
0.18	40	40
0.40	50	50
0.84	70	70
1.29	90	90
1.74	110	110
2.66	150	150
3.82	200	200
6.09	300	300
8.31	400	400
10.57	500	500

PYROMETER CHECK

DATE 4-05-90

OPERATOR TJM

mV input	temp °F	temp rdg
0.18	40	40
0.40	50	50
0.84	70	70
1.29	90	90
1.74	110	110
2.66	150	150
3.82	200	200
6.09	300	301
8.31	400	400
10.57	500	501

Name: Keystone Env Res Phone: 825-9761

Date 4-3-90 Train ID Box 1 DGM Cal. Factor, Y 1.0350 Orifice No. BAPC-3

Type of Meter Box Napp 100 Type of Pump Diaphraghm

		Example	Run Number 1	2	3
DGM					
Final reading	ft^3	966.461	233,770	240.981	248.28
Initial reading	ft^3	946.602	236,600	233,800	241,100
Difference, V_m	ft^3	9.859	7.170	7.181	7.186
Percent Accuracy, %A					
Inlet/Outlet temperatures					
Initial	°F.	108/88	79 / 79	81 / 82	82 / 8
After 5 minutes		110/88	80 / 79	82 / 82	82 / 83
After 10 minutes		111/88	81 / 80	82 / 83	82 / 8
Final		112/89	81 / 80	82 / 83	82 / 83
Avg. temperature, t_d	°F/°R	99.3/559.3	79.9 / 539.1	82.1 / 542.1	82.5 / 542
Time, θ	min	15.0	15.0	15.0	15.0
Orifice man. rdg., delta H		1.35	.65	.65	.65
Bar. pressure, P_{bar}		29.75	28.75	28.75	28.95
Ambient temperature, t_i	°F/°C	74/23.3	75 / 23.9	75 / 23.9	75 / 23.
Pump vacuum	in. Hg	18.8	20.0	20.0	20.0
$V_{m(std)}$'	ft^3	9.2815			
DGM cal. factor, Y_c		1.0593			
*Vm(std)(M)	m^3	0.2629			

*If you calculate dry gas volume in English Units, use the conversion factor of 0.02832 m^3/ft^3 to obtain the volume in metric units.

Data Sheet

VOLUMETRIC FLOW DEVICE CALCULATION SHEET Box 1

Eq. 8-1 $$Vm(std) = VmY \left(\frac{Tstd}{Tm}\right) \left(\frac{Pbar + \frac{Delta\ H}{13.6}}{Pstd}\right)$$

Run #1 $$Vm(std)' = Vm \times Y \times \frac{528}{Tm} \times \left(\frac{Pbar + \frac{Delta\ H}{13.6}}{29.92}\right)$$

Vm(std)' = (7.170) (1.035) (.9779) (.9625)

Vm(std)' = 6.985 ft^3 (round to 3 decimals)

Run #2 Vm(std)' = (7.181) (1.035) (.9740) (.9625)

Vm(std)' = 6.968 ft^3

Run #3 Vm(std)' = (7.186) (1.035) (.9733) (.9625)

Vm(std)' = 6.967 ft^3

$$Vstd(M) = \frac{Vm(std)'\ Run\ \#1 + Vm(std)'\ Run\ \#2 + Vm(std)'\ Run\ \#3}{3}$$

Vstd(M) = 6.973 ft^3

(To Be Completed By Auditor)

$$\%\ A = \frac{Vstd(M) - Vstd(A)}{Vstd(A)} \times 100 \leq \pm 3\%$$

% A = _____ x 100

% A = _____ %

Name: Keystone Env. Resources Phone: 825-9761

Date 4-6-90 Train ID Box 2 DGM Cal. Factor, Y 0.9624 Orifice No. BAPC 3

Type of Meter Box Napp 100 Type of Pump Diaphragm

		Example	Run Number 1	2	3
DGM					
Final reading	ft^3	966.461	231.155	238.252	246.255
Initial reading	ft^3	946.602	224.000	231.500	239.000
Difference, V_m	ft^3	9.859	7.155	7.252	7.255
Percent Accuracy, ZA					
Inlet/Outlet temperatures					
Initial	°F.	108/88	78/77	78/77	79/78
After 5 minutes		110/88	78/77	78/77	79/78
After 10 minutes		111/88	78/77	79/77	79/78
Final		112/89	78/77	79/78	79/78
Avg. temperature, t_d	°F/°R	99.3/559.3	77.5/537.5	77.8/537.8	78.5/538.5
Time, θ	min	15.0	15.0	15.0	15.0
Orifice man. rdg., delta H		1.35	.65	.65	.65
Bar. pressure, P_{bar}		29.75	28.85	28.85	28.85
Ambient temperature, t_1	°F/°C	74/23.3	74/23.3	74/23.3	74/23.3
Pump vacuum	in. Hg	18.8	18.0	18.0	18.0
$V_{m(std)}$'	ft^3	9.2815			
DGM cal. factor, Y_c		1.0593			
*Vm(std)(M)	m^3	0.2629			

*If you calculate dry gas volume in English Units, use the conversion factor of 0.02832 m^3/ft^3 to obtain the volume in metric units.

Data Sheet

VOLUMETRIC FLOW DEVICE CALCULATION SHEET Box 2

Eq. 8-1 $$Vm(std) = VmY \left(\frac{Tstd}{Tm}\right) \left(\frac{Pbar + \frac{Delta\ H}{13.6}}{Pstd}\right)$$

Run #1 $$Vm(std)' = Vm \times Y \times \frac{528}{Tm} \times \left(\frac{Pbar + \frac{Delta\ H}{13.6}}{29.92}\right)$$

Vm(std)' = (7.155)(.9624)(.9823)(.9658)

Vm(std)' = 6.533 ft^3 (round to 3 decimals)

Run #2 Vm(std)' = (7.252)(.9624)(.9818)(.9658)

Vm(std)' = 6.618 ft^3

Run #3 Vm(std)' = (7.255)(.9624)(.9805)(.9658)

Vm(std)' = 6.612 ft^3

$$Vstd(M) = \frac{Vm(std)'\ Run\ \#1 + Vm(std)'\ Run\ \#2 + Vm(std)'\ Run\ \#3}{3}$$

Vstd(M) = 6.588 ft^3

(To Be Completed By Auditor)

$$\%\ A = \frac{Vstd(M) - Vstd(A)}{Vstd(A)} \times 100 \leq \pm 3\%$$

% A = _____ x 100

% A = _____ %

Name: Keystone Env. Resources Phone: 825-2266

Date 3-6-90 Train ID Box 3 DGM Cal. Factor, Y .9978 Orifice No BKPC 3

Type of Meter Box Napp 100 Type of Pump Diaphragm

			Run Number		
		Example	1	2	3
DGM					
Final reading	ft^3	966.461	662.287	670.056	678.20
Initial reading	ft^3	946.602	654.900	662.700	670.900
Difference, V_m	ft^3	9.859	7.387	7.356	7.308
Percent Accuracy, ZA					
Inlet/Outlet temperatures					
Initial	°F.	108/88	79/77	82/77	83/79
After 5 minutes		110/88	80/77	83/78	84/79
After 10 minutes		111/88	81/77	83/78	84/79
Final		112/89	82/77	83/78	84/79
Avg. temperature, t_d	°F/°R	99.3/559.3	78.7/538.7	80.2/540.2	81.3/54
Time, θ	min	15.0	15.0	15.0	15.0
Orifice man. rdg., delta H		1.35	.65	.65	.65
Bar. pressure, P_{bar}		29.75	28.85	28.85	28.85
Ambient temperature, t_i	°F/°C	74/23.3	74/23.3	74/23.3	74/23
Pump vacuum	in. Hg	18.8	19.0	19.0	19.0
$V_{m(std)}$'	ft^3	9.2815			
DGM cal. factor, Y_c		1.0593			
*Vm(std)(M)	m^3	0.2629			

*If you calculate dry gas volume in English Units, use the conversion factor of 0.02832 m^3/ft^3 to obtain the volume in metric units.

Data Sheet

VOLUMETRIC FLOW DEVICE CALCULATION SHEET Box 3

Eq. 8-1 $$Vm(std) = VmY \left(\frac{Tstd}{Tm}\right) \left(\frac{Pbar + \frac{Delta\ H}{13.6}}{Pstd}\right)$$

Run #1 $$Vm(std)' = Vm \times Y \times \frac{528}{Tm} \times \left(\frac{Pbar + \frac{Delta\ H}{13.6}}{29.92}\right)$$

Vm(std)' = (7.387) (.9778) (.9801) (.9658)

Vm(std)' = 6.837 ft³ (round to 3 decimals)

Run #2 Vm(std)' = (7.356) (.9778) (.9774) (.9658)

Vm(std)' = 6.790 ft³

Run #3 Vm(std)' = (7.308) (.9778) (.9754) (.9658)

Vm(std)' = 6.732 ft³

$$Vstd(M) = \frac{Vm(std)'\ Run\ \#1 + Vm(std)'\ Run\ \#2 + Vm(std)'\ Run\ \#3}{3}$$

Vstd(M) = 6.786 ft³

(To Be Completed By Auditor)

$$\%\ A = \frac{Vstd(M) - Vstd(A)}{Vstd(A)} \times 100 \leq \pm 3\%$$

% A = _____ x 100

% A = _____ %

VOLUMETRIC FLOW DEVICE CALCULATION SHEET Box 4

Eq. 8-1 $$Vm(std) = VmY \left(\frac{Tstd}{Tm}\right) \left(\frac{Pbar + \frac{Delta\ H}{13.6}}{Pstd}\right)$$

Run #1 $$Vm(std)' = Vm \times Y \times \frac{528}{Tm} \times \left(\frac{Pbar + \frac{Delta\ H}{13.6}}{29.92}\right)$$

Vm(std)' = (7.280)(.9558)(.9830)(.9658)

Vm(std)' = 6.606 ft^3 (round to 3 decimals)

Run #2 Vm(std)' = (7.335)(.9558)(.9735)(.9658)

Vm(std)' = 6.592 ft^3

Run #3 Vm(std)' = (7.385)(.9558)(.9685)(.9658)

Vm(std)' = 6.602 ft^3

$$Vstd(M) = \frac{Vm(std)'\ Run\ \#1 + Vm(std)'\ Run\ \#2 + Vm(std)'\ Run\ \#3}{3}$$

Vstd(M) = 6.600 ft^3

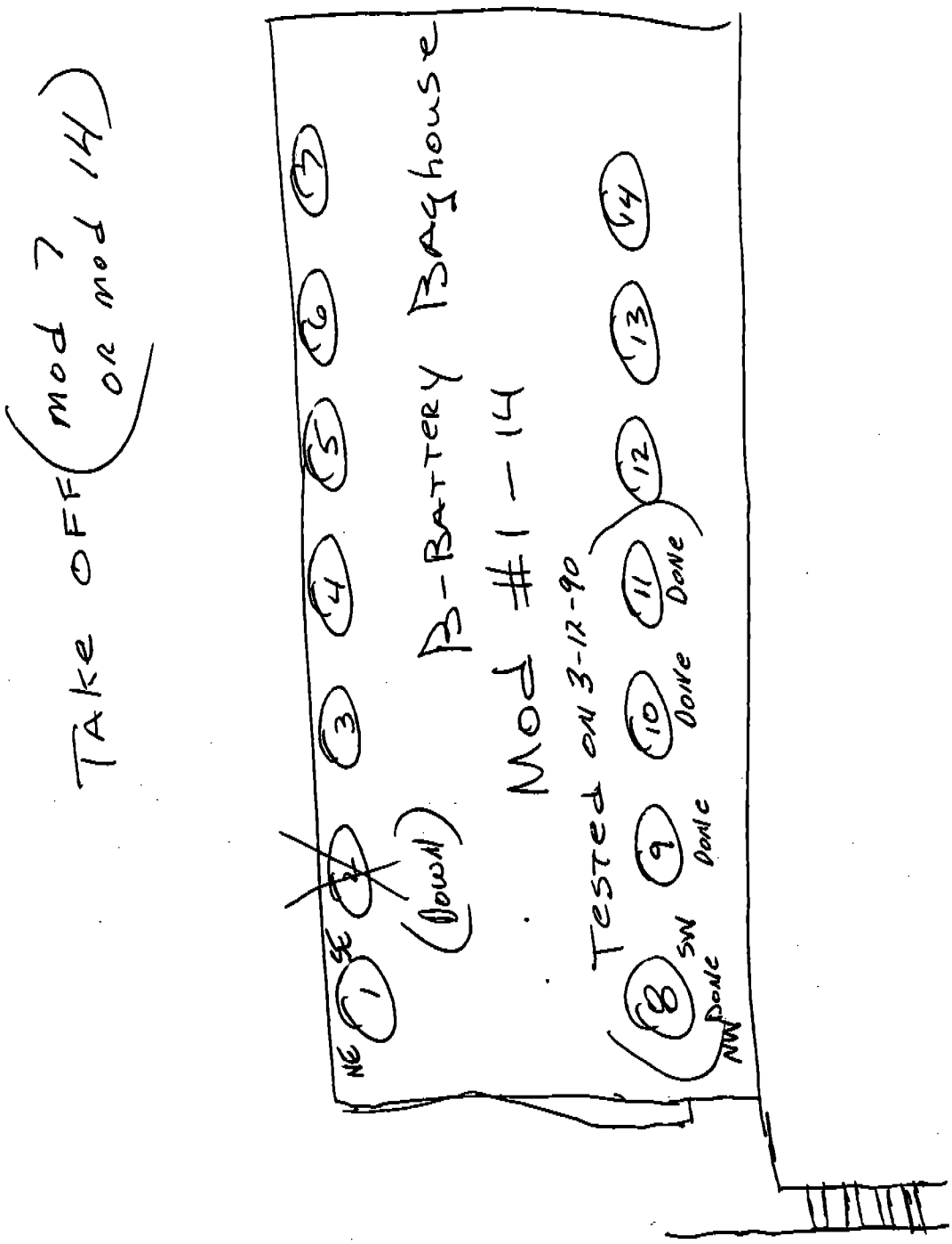
(To Be Completed By Auditor)

$$\%\ A = \frac{Vstd(M) - Vstd(A)}{Vstd(A)} \times 100 \leq \pm 3\%$$

% A = _____ x 100

% A = _____ %

USX Clairton
B-Battery Baghouse
3-12-90 & 3-13-90



APPENDIX D

FIELD DATA SHEETS FOR PARTICULATE MATTER EMISSIONS

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

Mod #8

STACK SAMPLING DATA SHEET

PLANT USX CLAIRTON
LOCATION: B-Battery Baghouse
ACTIVITY NO.: MOD. 8
CONTROL BOX OPERTOR:
PROBE HANDLER:
CLEAN UP:

DATE: 3-12-90
TEST NO.: CLR-M8-1
NOZZLE: #4 4 0.209
STATIC PRESSURE Ps: .40
PORT DIRECTION: SW, NW
BAROMETRIC PRESSURE: 29.37

ΔH@: 1.781 (12-27-89)
METER CORRECTION: 1.0372
PITOT CORRECTION: .84
CONTROL BOX NO.: 1
NOMOGRAPH SET POINT:
LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

HOT BOX NO.: 5
COLD BOX NO.: 5
PROBE NO.: 5-3
FILTER NO.: 351
STACK DIA.: 48

Point	Time	Meter Reading (dry) CF	Velocity HD in. H_2O	Orifice ΔH in. H_2O Reg.	Orifice ΔH in. H_2O Act.	Meter Temp °F In	Meter Temp °F Out	Vacuum in. Hg	Stack Temp °F	Probe Temp °F	Imp. Temp. °C/°F	Hot Box °F	Comments
47.0	11:25	854.664	.35	.56	.56	87	84	2.9	130	260°	68°	345°	5min/PT
44.8	11:30		.40	.74	.74	91	86	3.2	124				
42.3	11:35	859.868	.45	.80	.80	91	87	3.5	121				
39.5	11:40	859.868	.50	.92	.92	92	87	3.6	124		54°		
36.0	11:45		.45	.80	.80	94	88	3.2	124				
30.9	11:50		.45	.80	.80	98	91	3.2	124				
17.1	11:55		.40	.74	.74	101	93	3.1	124		55°		
12.0	12:00		.35	.56	.56	102	99	2.8	119				
8.5	12:05	874.258	.35	.56	.56	103	97	2.8	126				
5.7	12:10	874.258	.35	.56	.56	105	99	2.8	125				
3.2	12:15	878.000	.35	.44	.44	101	99	2.2	123		55°		
1.0	12:18		.20	.36	.36	104	100	2.0	123				

882.179

LEAK CHECK

	in. Hg.	Rate
Before		
After		

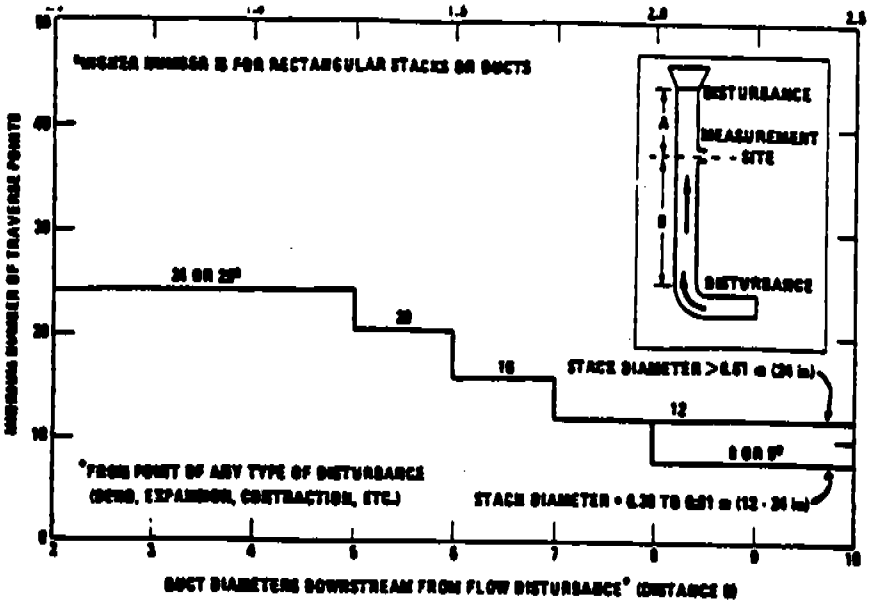
ORSAT

	1	2
CO_2	0.0	
O_2	20.5	
CO	0.0	
N	79.5	

PITOT LEAK CHECK

POS.	NEG.

Impinger No.	Final	Initial	Difference
1 100ml			
2 100ml			
3 Dry			
4 Silica			
5			



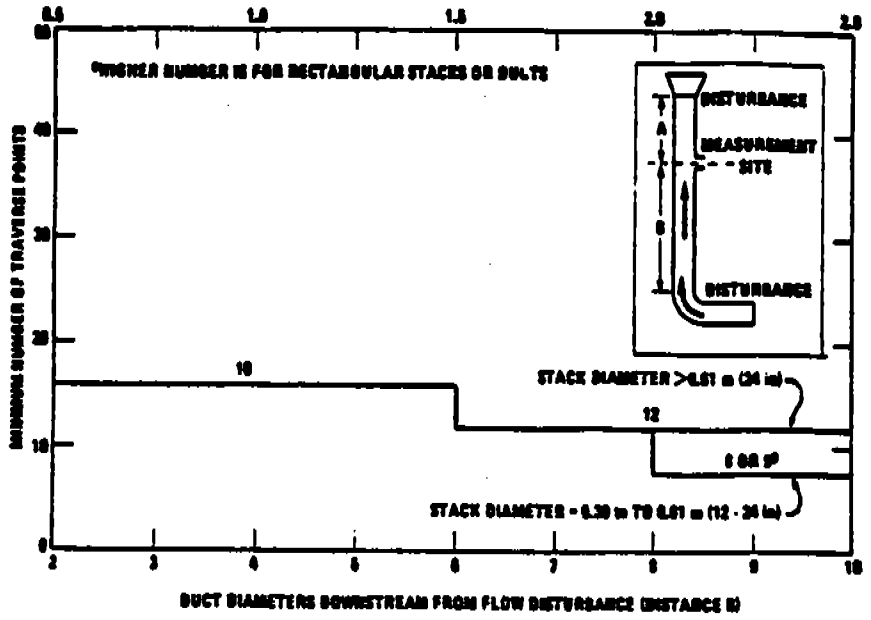


TABLE 1-2. LOCATION OF TRAVERSE POINTS IN CIRCULAR STACKS

(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	14.6	6.7	4.4	3.2	2.6	2.1	1.8	1.6	1.4	1.3	1.1	1.1
2	85.4	25.0	14.6	10.5	8.2	6.7	5.7	4.9	4.4	3.9	3.5	3.2
3		75.0	29.6	19.4	14.6	11.8	9.9	8.5	7.5	6.7	6.0	5.5
4		93.3	70.4	32.3	22.6	17.7	14.6	12.5	10.9	9.7	8.7	7.9
5			85.4	67.7	34.2	25.0	20.1	16.9	14.6	12.9	11.6	10.5
6			95.6	80.6	65.8	35.6	26.9	22.0	18.8	16.5	14.6	13.2
7				89.5	77.4	64.4	36.6	28.3	23.6	20.4	18.0	16.1
8				96.8	85.4	75.0	63.4	37.5	29.6	25.0	21.8	19.4
9					91.8	82.3	73.1	62.5	38.2	30.6	26.2	23.0
10					97.4	88.2	79.9	71.7	61.8	38.8	31.5	27.2
11						93.3	85.4	78.0	70.4	61.2	39.3	32.3
12						97.9	90.1	83.1	76.4	69.4	60.7	39.8
13							94.3	87.5	81.2	75.0	68.5	60.2
14							98.2	91.5	85.4	79.6	73.8	67.7
15								95.1	89.1	83.5	78.2	72.8
16								98.4	92.5	87.1	82.0	77.0
17									95.6	90.3	85.4	80.6
18									98.6	93.3	88.4	83.9
19										96.1	91.3	86.8
20										98.7	94.0	89.5
21											96.5	92.1
22											98.9	94.5
23												96.8
24												98.9

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

Number of traverse points	Matrix layout
9	3x3
12	4x3
16	4x4
20	5x4
25	5x5
30	6x5
36	6x6
42	7x6
49	7x7

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

STACK SAMPLING DATA SHEET

Mod #9

PLANT USX CLAIRTON DATE: 3-12-90 ΔH@: 1.519 (12-27-87) HOT BOX NO.: 1
LOCATION: B-BATTERY Baghouse TEST NO.: CLR-M9-15W METER CORRECTION: 0.9624 COLD BOX NO.: 1
ACTIVITY NO.: MOD. 9 NOZZLE: #37 (.232) PITOT CORRECTION: .84 PROBE NO.: 5-5
CONTROL BOX OPERTOR: STATIC PRESSURE Ps: .40 CONTROL BOX NO.: 2 FILTER NO.: 355
PROBE HANDLER: PORT DIRECTION: SW NOMOGRAPH SET POINT: STACK DIA.: 48.0
CLEAN UP: BAROMETRIC PRESSURE: 29.37 LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

Point	Time	Meter Reading (dry) CF	Velocity HD in. H_2O	Orifice ΔH in. H_2O Reg.	Orifice ΔH in. H_2O Act.	Meter Temp °F In	Meter Temp °F Out	Vacuum in. Hg	Stack Temp °F	Probe Temp °F	Imp. Temp. °C/°F	Hot Box °F	Comments
47.0	11:25	781.116	.30	0.72	0.72	88	83	2.0	124	260	68°F	250	5min/pt
44.8	11:30		.30	0.72	0.72	91	84	2.0	121				
42.3	11:35		.30	0.72	0.72	94	85	2.0	121				
39.5	11:40		.20	0.49	0.49	95	89	2.0	119				
36.0	~~11:45~~ 12:52		.20	0.49	0.49	98	91	2.0	125				
30.9	~~11:50~~ 12:57		.23	0.56	0.56	99	91	2.0	122				
17.1	~~11:55~~ 13:02		.25	0.62	0.62	101	91	2.0	119				
12.0	~~12:00~~ 13:07		.35	0.86	0.86	102	92	2.0	121				
8.5	~~12:05~~ 13:12		.40	0.99	0.99	101	96	3.0	126				
5.7	~~12:10~~ 13:17		.43	1.06	1.06	103	96	3.5	128				
3.2	~~12:15~~ 13:22	14:04	.40	0.99	0.99	104	96	3.0	123				
1.0	~~12:20~~ 13:27	14:09	.25	0.62	0.62	104	96	2.0	122				
	~~12:25~~ 13:32	14:14											

Final Meter Reading 814.770

LEAK CHECK

	in. Hg.	Rate
Before	5.0	L.02 CFM
After	7.0	.008 CFM L.02 CFM

ORSAT

	1	2
CO_2	0.0	
O_2	20.5	
CO	0.0	
N	79.5	

PITOT LEAK CHECK

POS.	NEG.

Impinger No.	Final	Initial	Difference
1 100ml			
2 100ml			
3 DRY			
4 Silica			
5			

D-5

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

Mod # 8

STACK SAMPLING DATA SHEET

PLANT: USX Clairton
DATE: 3-12-90
ΔH@: 1.781 (12-27-89)
HOT BOX NO.: 5
LOCATION: B. Battery Baghouse
TEST NO.: CLR-MS-1
METER CORRECTION: 1.0372
COLD BOX NO.: 5
ACTIVITY NO.: MOD. #8
NOZZLE: #4 0.209
PITOT CORRECTION: .84
PROBE NO.: 5-3
CONTROL BOX OPERTOR:
STATIC PRESSURE Ps: 140
CONTROL BOX NO.: 1
FILTER NO.: 351
PROBE HANDLER:
PORT DIRECTION: NW
NOMOGRAPH SET POINT:
STACK DIA.: 48
CLEAN UP:
BAROMETRIC PRESSURE: 29.37
LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

Point	Time	Meter Reading (dry) CF	Velocity HD in. H_2O	Orifice ΔH in. H_2O Reg.	Orifice ΔH in. H_2O Act.	Meter Temp °F In	Meter Temp °F Out	Vacuum in. Hg	Stack Temp °F	Probe Temp °F	Imp. Temp. °C/°F	Hot Box °F	Comments
47.0	14:45	882.177	.10	.20	.20	98	96	2.1	126	260°	≤68°F	245°	Sampling pt
44.8			.10	.20	.20	102	98	2.1	122				
42.3			.15	.28	.28	103	99	2.0	132		53°		
39.5			.15	.28	.28	103	98	1.9	131				
36.0			.25	.44	.44	104	99	2.3	125				
30.9			.30	.56	.56	104	100	2.9	128				
21.1			.50	.92	.92	106	100	3.8	124		54°		
12.0			.90	1.66	1.66	107	100	6.0	123				
8.5			.90	1.66	1.66	108	100	6.0	127				
5.7			.25	.44	.44	107	100	2.3	125		54°		
3.2			.90	1.66	1.66	109	101	6.0	125				
1.0			.50	.92	.92	108	101	4.0	121				

D-4 15:45 914.213

LEAK CHECK

	in. Hg.	Rate
Before	5.0	.006 CFM / 1.02 CFM
After	7.0	1.08 CFM

ORSAT

	1	2
CO_2	0.0	
O_2	20.5	
CO	0.0	
N	79.5	

PITOT LEAK CHECK

POS.	NEG.

Impinger No.	Final	Initial	Difference
1	586.8	581.6	5.2
2	562.5	558.6	3.9
3	412.8	411.8	1.0
4	664.9	655.0	9.9

Mod #10

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

STACK SAMPLING DATA SHEET

PLANT USX Clairton DATE: 3-12-90 ΔH@: 1.634 (12-28-89) HOT BOX NO.: 4
LOCATION: B-Battery/Baghouse TEST NO.: CLR-M10-1 METER CORRECTION: 0.9778 COLD BOX NO.: 4
ACTIVITY NO.: MOD. 10 NOZZLE: 37 .237 PITOT CORRECTION: .84 PROBE NO.: 5-2 (SS)
CONTROL BOX OPERTOR: STATIC PRESSURE Ps: .40 CONTROL BOX NO.: 3 FILTER NO.: 353
PROBE HANDLER: PORT DIRECTION: SW NOMOGRAPH SET POINT: STACK DIA.: 48.0
CLEAN UP: BAROMETRIC PRESSURE: 29.37 LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

Point	Time	Meter Reading (dry) CF	Velocity HD in. H_2O	Orifice ΔH in. H_2O Reg.	Orifice ΔH in. H_2O Act.	Meter Temp °F In	Meter Temp °F Out	Vacuum in. Hg	Stack Temp °F	Probe Temp °F	Imp. Temp. °C/°F	Hot Box °F	Comments
47.0	1125	299.019	.55	1.58	1.58	90	82	6.5	123	255	55	250	5m/IT
44.8	1134	305.843	.32	.90	.90	92	83	5.0	122				
42.3	1240	305.843	.60	1.68	1.68	100	88	7.0	126		58		12:40 New Start Time
39.5			.20	.56	.56	104	91	3.0	118				
36.0			.40	1.12	1.12	107	91	5.0	122		58		
30.9			.37	1.04	1.04	110	92	4.5	120				
17.1			.20	0.56	0.56	111	94	3.0	122		58		
12.0			.20	.56	.56	111	95	3.0	124				
8.5			.20	.56	.56	104	95	3.0	129		57		
5.7			.20	.56	.56	107	94	3.0	123				
3.2			.16	.46	.46	108	95	2.5	119		57		
1.0	~~1334~~	331.467	.16	.46	.46	109	95	2.5	115				

LEAK CHECK

	in. Hg.	Rate
Before	7.0	0.02
After	7.0	.013 1.02

ORSAT

	1	2
CO_2	0.0	
O_2	20.5	
CO	0.0	
N	79.5	

PITOT LEAK CHECK

POS.	NEG.
OK 15SEC	OK 15SEC

Impinger No.	Final	Initial	Difference
1 100ml	535.4	528.9	6.5
2 100ml	547.0	543.5	3.5
3 Dry	446.9	445.6	1.3
4 Silica	642.4	630.8	11.6
5			

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

Mod #9

STACK SAMPLING DATA SHEET

PLANT: USX-Clairton
DATE: 3-12-90
ΔH@: 1.519 (12-27-89)
HOT BOX NO.: 1
LOCATION: B-Battery Baghouse
TEST NO.: CLR-M9-1 NW
METER CORRECTION: .9624
COLD BOX NO.: 1
ACTIVITY NO.: MOD. 9
NOZZLE: #39 .232
PITOT CORRECTION: .84
PROBE NO.: 5-5
CONTROL BOX OPERTOR:
STATIC PRESSURE Ps: -.40
CONTROL BOX NO.: 2
FILTER NO.: 355
PROBE HANDLER:
PORT DIRECTION: NW
NOMOGRAPH SET POINT:
STACK DIA.: 48.0"
CLEAN UP:
BAROMETRIC PRESSURE: 29.37
LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

Point	Time	Meter Reading (dry) CF	Velocity HD in. H_2O	Orifice ΔH in. H_2O Reg.	Orifice ΔH in. H_2O Act.	Meter Temp °F In	Meter Temp °F Out	Vacuum In. Hg	Stack Temp °F	Probe Temp °F	Imp. Temp. °C/°F	Hot Box °F	Comments
47.0	14:45	814.770	.60	1.48	1.48	101	95	4.0	122	260	Iced Down <68°F	250	5 min/pt
44.8	14:50		.80	1.98	1.98	102	95	6.0	121				
42.3	14:55		.80	1.98	1.98	105	95	6.0	131				
39.5	15:00		.70	1.74	1.74	106	95	6.0	128				
36.0	15:05		.60	1.47	1.47	106	95	5.0	123				
30.9	15:10		.40	0.98	0.98	106	96	3.0	126				
17.1	15:15		.15	0.37	0.37	106	96	2.0	122				
12.0	15:20		.15	0.37	0.37	104	96	2.0	121				
8.5	15:25		.20	0.49	0.49	104	96	2.0	124				
5.7	15:30		.20	0.49	0.49	104	96	2.0	123				
3.2	15:35		.20	0.49	0.49	103	95	2.0	119				
1.0	15:40		.21	0.52	0.52	103	95	2.0	121				
	15:45	853.711											

LEAK CHECK

	in. Hg.	Rate
Before		
After		

ORSAT

	1	2
CO_2		
O_2		
CO		
N		

PITOT LEAK CHECK

POS.	NEG.

Impinger No.	Final	Initial	Difference
1	555.1	549.3	5.8
2	560.7	558.0	2.7
3	455.0	453.9	1.1
4	683.2	668.2	15.0
5			

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

Mod #11

STACK SAMPLING DATA SHEET

PLANT: ASX Clairton
DATE: 3-12-90
ΔH@: 1.762 (12-28-89)
HOT BOX NO.: 6
LOCATION: B-Battery/Baghouse
TEST NO.: CLR-M11-1
METER CORRECTION: 0.9558
COLD BOX NO.: 6
ACTIVITY NO.: MOD. 11
NOZZLE: [redacted] 45 .201
PITOT CORRECTION: .84
PROBE NO.: 5-4
CONTROL BOX OPERTOR:
STATIC PRESSURE Ps: .2
CONTROL BOX NO.: 4
FILTER NO.: 346
PROBE HANDLER:
PORT DIRECTION: SW
NOMOGRAPH SET POINT:
STACK DIA.: 48.0
CLEAN UP:
BAROMETRIC PRESSURE: 29.37
LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

Point	Time	Meter Reading (dry) CF	Velocity HD in. H_2O	Orifice ΔH in. H_2O Reg.	Orifice ΔH in. H_2O Act.	Meter Temp °F In	Meter Temp °F Out	Vacuum in. Hg	Stack Temp °F	Probe Temp °F	Imp. Temp. °C/°F	Hot Box °F	Comments.
47.0	1125	655.561	.40	.63	.63	91	89	5.0	130	260	Ice Down < 68°F	250	5m/PT
44.8	1135	660.607	.45	.71	.71	91	88	5.5	131				
42.3	1240	660.607	.60	.95	.95	92	91	6.5	136				
39.5	1245		.50	.79	.79	93	92	6.0	131				
36.0	1250		.45	.71	.71	94	93	5.5	136		58°F		
30.9	1255		.45	.71	.71	96	94	5.5	136				
17.1	1300		.45	.71	.71	98	96	5.5	133				
12.0	1305	675.644	.50	.79	.79	99	96	6.0	133		59°F		
8.5	1350	675.644	.50	.79	.79	101	102	6.0	133				
5.7	1355		.45	.71	.71	102	102	5.5	132				
3.2	1400		.40	.63	.63	102	102	5.0	132		58°F		
1.0	1405		.30	.47	.47	103	103	4.5	130				
	1410	685.913											

LEAK CHECK

	in. Hg.	Rate
Before	5.0	<.02 CFM
After	8.0	<.02 CFM

ORSAT

	1	2
CO_2		
O_2		
CO		
N		

PITOT LEAK CHECK

POS.	NEG.
OK 15 sec	OK 15 sec

Impinger No.		Final	Initial	Difference
1	100			
2	100			
3	Dry			
4	Silica			
5				

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

Mod #10

STACK SAMPLING DATA SHEET

PLANT USX CLAIRTON DATE: 3-12-90 ΔH@: 1.634 (12-28-89) HOT BOX NO.: 4
LOCATION: B-Battery Baghouse TEST NO.: CLR-M10-1 METER CORRECTION: 0.9778 COLD BOX NO.: 4
ACTIVITY NO.: MOD. 10 NOZZLE: #37 0.237 PITOT CORRECTION: 0.84 PROBE NO.: 5-2
CONTROL BOX OPERTOR: STATIC PRESSURE Ps: 0.40 CONTROL BOX NO.: 3 FILTER NO.: 353
PROBE HANDLER: PORT DIRECTION: NW NOMOGRAPH SET POINT: STACK DIA.: 48.0"
CLEAN UP: BAROMETRIC PRESSURE: 29.37 LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

Point	Time	Meter Reading (dry) CF	Velocity HD in. H_2O	Orifice ΔH in. H_2O Reg.	Orifice ΔH in. H_2O Act.	Meter Temp °F In	Meter Temp °F Out	Vacuum in. Hg	Stack Temp °F	Probe Temp °F	Imp. Temp. °C/°F	Hot Box °F	Comments
47.0	1445	331.467	.27	.78	.78	104	96	4.0	118	260	60	255	5 m/pt
44.8			.36	1.04	1.04	110	96	5.0	126				
42.3			.36	1.04	1.04	116	96	5.0	127		55		
39.5			.31	.89	.89	117	97	4.0	123				
36.0			.27	.78	.78	117	98	4.0	123		56		
30.9			.26	.75	.75	118	99	4.0	123				
17.1			.34	.98	.98	120	99	4.5 ~~4.0~~ 5	123				
12.0			.40	1.15	1.15	122	100	5.5 5.0	123		54		
8.5			.43	1.24	1.24	121	101	5.5	121				
5.7			.38	1.10	1.10	120	101	5.0	125		54		
3.2			.30	.87	.87	119	101	4.0	121				
1.0	1545	367.104	.42	1.21	1.21	121	101	5.5	118		56		

D-8

LEAK CHECK

	in. Hg.	Rate
Before		
After		

ORSAT

	1	2
CO_2		
O_2		
CO		
N		

PITOT LEAK CHECK

POS.	NEG.

Impinger No.	Final	Initial	Difference
1			
2			
3			
4			
5			

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

STACK SAMPLING DATA SHEET

PLANT: USX Clairton
DATE: 3-13-90
ΔH@: 1.762 (12-28-89)
HOT BOX NO.: 2
LOCATION: B-Battery Baghouse
TEST NO.: CLR-M1-1
METER CORRECTION: 0.9558
COLD BOX NO.: 2
ACTIVITY NO.: MOD. 1
NOZZLE: #44 0.209
PITOT CORRECTION: 0.84
PROBE NO.: 5-3
CONTROL BOX OPERTOR:
STATIC PRESSURE Ps: 0.40
CONTROL BOX NO.: 4
FILTER NO.: 354
PROBE HANDLER:
PORT DIRECTION: NE
NOMOGRAPH SET POINT:
STACK DIA.: 48"
CLEAN UP:
BAROMETRIC PRESSURE: 29.55
LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

Point	Time	Meter Reading (dry) CF	Velocity HD in. H_2O	Orifice ΔH in. H_2O Reg.	Orifice ΔH in. H_2O Act.	Meter Temp °F In	Meter Temp °F Out	Vacuum in. Hg	Stack Temp °F	Probe Temp °F	Imp. Temp. °C/°F	Hot Box °F	Comments
47.0	955	715.650	.40	.72	.72	79	78	4.5	130	260	Iced Down 268°F	250	5min/PT
44.8			.50	.90	.90	80	79	5.0	125				
42.3			.60	1.08	1.08	82	80	6.0	122		58°		
39.5			.60	1.08	1.08	83	81	6.0	131				
36.0			.50	.90	.90	85	83	5.0	134				
30.9			.50	.90	.90	87	86	5.0	136		57°		
17.1			.50	.90	.90	89	87	5.0	136				
12.0			.60	1.08	1.08	90	89	6.0	134				
8.5			.40	.72	.72	93	91	4.5	137		59°		
5.7			.60	1.09	1.09	94	93	6.0	136				
3.2			.60	1.09	1.09	95	94	6.0	138				
1.0	1055	748.490	.40	.72	.72	96	95	6.0	136		59°		

D-11

LEAK CHECK

	in. Hg.	Rate
Before	5.0	<0.02 cfm
After	8.0	.010 cfm

ORSAT

	1	2
CO_2	0.0	
O_2	20.5	
CO	0.0	
N	79.5	

PITOT LEAK CHECK

POS.	NEG.
OK 15sec	OK 15sec

Impinger No.	Final	Initial	Difference
1 100ml	550.7	541.8	9.9
2 100ml	581.6	577.2	4.4
3 DRY	373.5	372.0	1.5
4 200gm 5.16ml	601.9	590.3	11.6

Mod #11

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

STACK SAMPLING DATA SHEET

PLANT: USX Clairton
DATE: 3-12-90
ΔH@: 1.762 (12-28-89)
HOT BOX NO.: 6
LOCATION: B-Battery Baghouse
TEST NO.: CLR-M11-1
METER CORRECTION: .9558
COLD BOX NO.: 6
ACTIVITY NO.: MOD. 11
NOZZLE: #45 .201
PITOT CORRECTION: .84
PROBE NO.: 5-4
CONTROL BOX OPERTOR:
STATIC PRESSURE Ps: .12
CONTROL BOX NO.: 4
FILTER NO.: 346
PROBE HANDLER:
PORT DIRECTION: NW
NOMOGRAPH SET POINT:
STACK DIA.: 48.0
CLEAN UP:
BAROMETRIC PRESSURE:
LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

Point	Time	Meter Reading (dry) CF	Velocity HD in. H_2O	Orifice ΔH in. H_2O Reg.	Orifice ΔH in. H_2O Act.	Meter Temp °F In	Meter Temp °F Out	Vacuum in. Hg	Stack Temp °F	Probe Temp °F	Imp. Temp. °C/°F	Hot Box °F	Comments
47.0	1445	685.914	.40	.63	.63	100	102	5.0	132	260	Ice down < 68°F	250	
44.8	1450		.20	.32	.32	100	101	4.0	127				
42.3	1455		.25	.39	.39	100	101	4.0	134				
39.5	1500		.25	.39	.39	100	101	4.0	137		58°		
36.0	1505		.30	.47	.47	103	102	4.5	133				
30.9	1510		.30	.47	.47	103	102	4.5	133				
17.1	1515		.60	.95	.95	105	104	6.0	128		57°		
12.0	1520		.80	1.26	1.26	106	106	8.0	127				
8.5	1525		.80	1.26	1.26	106	107	8.0	135				
5.7	1530		.80	1.26	1.26	107	108	8.0	134		59°		
3.2	1533		.80	1.26	1.26	107	108	8.0	138				
1.0	1540	715.645	.60	.95	.95	108	108	6.0	135				
	1545												

D-10

LEAK CHECK

	in. Hg.	Rate
Before		
After		

ORSAT

	1	2
CO_2		
O_2		
CO		
N		

PITOT LEAK CHECK

POS.	NEG.

Impinger No.	Final	Initial	Difference
1	563.9	559.7	4.2
2	545.1	543.1	2.0
3	440.5	440.0	.50
4	683.6	670.2	13.4
5			

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

STACK SAMPLING DATA SHEET

PLANT: USX Clairton
DATE: 3-13-90
ΔH@: 1.762 (12-28-89)
HOT BOX NO.: 2
LOCATION: B-Battery Baghouse
TEST NO.: CLR-M1-1
METER CORRECTION: 0.9558
COLD BOX NO.: 2
ACTIVITY NO.: MOD. 1
NOZZLE: #44 0.209
PITOT CORRECTION: 0.84
PROBE NO.: 5-3
CONTROL BOX OPERTOR:
STATIC PRESSURE Ps: 0.40
CONTROL BOX NO.: 4
FILTER NO.: 354
PROBE HANDLER:
PORT DIRECTION: SE
NOMOGRAPH SET POINT:
STACK DIA.: 48"
CLEAN UP:
BAROMETRIC PRESSURE: 29.55
LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

Point	Time	Meter Reading (dry) CF	Velocity HD in. H_2O	Orifice ΔH in. H_2O Reg.	Orifice ΔH in. H_2O Act.	Meter Temp °F In	Meter Temp °F Out	Vacuum in. Hg	Stack Temp °F	Probe Temp °F	Imp. Temp. °C/°F	Hot Box °F	Comments
47.0	1125	748.490	.40	.72	.72	93	94	4.5	140	260	Iced down <68°F	250	5min/PT
44.8			.40	.72	.72	94	95	4.5	140				
42.3			.40	.72	.72	95	95	4.5	138		59°		
39.5			.40	.72	.72	95	95	4.5	138				
36.0			.40	.72	.72	96	96	4.5	140				
30.9			.40	.72	.72	97	97	4.5	140		59°		
17.1			.60	1.08	1.08	98	97	6.0	140				
12.0			.60	1.08	1.08	98	98	6.0	142				
8.5			.80	1.45	1.45	100	99	7.5	142		59°		
5.7			.80	1.45	1.45	100	100	7.5	138				
3.2			.80	1.45	1.45	101	100	7.5	138				
1.0	1225	783.470	.80	1.45	1.45	101	100	7.5	138		59°		

D-12

LEAK CHECK

	in. Hg.	Rate
:fore		
ter		

ORSAT

	1	2
CO_2	0.0	
O_2	20.5	
CO	0.0	
N	79.5	

PITOT LEAK CHECK

POS.	NEG.

Impinger No.	Final	Initial	Difference
1 100ml			
2 100ml			
3 DRY			
4 200gm 5.16cl			

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

STACK SAMPLING DATA SHEET

PLANT: USX Clairton | DATE: 3-13-90 | ΔH@: 1.579 (12-27-89) | HOT BOX NO.: 7
LOCATION: B-Battery Exhaust | TEST NO.: CLR-M3-1 | METER CORRECTION: 0.9624 | COLD BOX NO.: 7
ACTIVITY NO.: MOD. 3 | NOZZLE: #39 0.232 | PITOT CORRECTION: 0.84 | PROBE NO.: 5-5
CONTROL BOX OPERTOR: | STATIC PRESSURE Ps: 0.30 | CONTROL BOX NO.: 2 | FILTER NO.: 352
PROBE HANDLER: | PORT DIRECTION: NE | NOMOGRAPH SET POINT: | STACK DIA.: 48"
CLEAN UP: | BAROMETRIC PRESSURE: 29.55 | LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

Point	Time	Meter Reading (dry) CF	Velocity HD in. H_2O	Orifice ΔH in. H_2O Reg.	Orifice ΔH in. H_2O Act.	Meter Temp °F In	Meter Temp °F Out	Vacuum in. Hg	Stack Temp °F	Probe Temp °F	Imp. Temp. °C/°F	Hot Box °F	Comments
47.0	0955	855.392	0.6	1.46	1.46	84	79	10.0	122	260	Iced Down 468°F	250	5min/pt
44.8			0.6	1.46	1.46	89	81	10.0	117				
42.3			0.7	1.70	1.70	91	82	13.0	115				
39.5			0.6	1.46	1.46	92	84	11.0	125		63°F		
36.0			0.6	1.46	1.46	93	85	11.0	120				
30.9			0.5	1.22	1.22	95	86	8.2	126				
17.1			0.5	1.22	1.22	96	87	8.8	123				
12.0			0.6	1.46	1.46	97	87	10.4	119				
8.5			0.7	1.70	1.70	98	88	12.3	129		59°F		
5.7			0.7	1.70	1.70	97	89	12.3	124				
3.2			0.7	1.70	1.70	97	89	12.3	123				
1.0			0.6	1.46	1.46	98	90	10.8	121				
	1055	901.468											

D-13

LEAK CHECK

	in. Hg.	Rate
efore	5.0	<0.02 cfm
ilter	17.0	0.019 cfm

ORSAT

	1	2
CO_2	0.0	
O_2	20.5	
CO	0.0	
N	79.5	

PITOT LEAK CHECK

POS.	NEG.
15sec OK	15sec OK

Impinger No.	Final	Initial	Difference
1 100ml	552.3	545.3	7.0
2 100ml	547.9	539.8	8.1
3 DRY	456.6	453.9	2.7
4 400gm 5.16cl	670.4	654.6	15.8

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

STACK SAMPLING DATA SHEET

PLANT: USX Clairton | DATE: 3-13-90 | ΔH@: 1.519 (12-27-89) | HOT BOX NO.: 7
LOCATION: B-Battery/Baghouse | TEST NO.: CLR-M3 - 1 | METER CORRECTION: 0.9624 | COLD BOX NO.: 7
ACTIVITY NO.: MOD. 3 | NOZZLE: #39 0.232 | PITOT CORRECTION: 0.84 | PROBE NO.: 5-5
CONTROL BOX OPERTOR: | STATIC PRESSURE Ps: 0.30 | CONTROL BOX NO.: 2 | FILTER NO.: 352
PROBE HANDLER: | PORT DIRECTION: SE | NOMOGRAPH SET POINT: | STACK DIA.: 48"
CLEAN UP: | BAROMETRIC PRESSURE: 29.55 | LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

Point	Time	Meter Reading (dry) CF	Velocity HD in. H_2O	Orifice ΔH in. H_2O Reg.	Orifice ΔH in. H_2O Act.	Meter Temp °F In	Meter Temp °F Out	Vacuum in. Hg	Stack Temp °F	Probe Temp °F	Imp. Temp. °C/°F	Hot Box °F	Comments
47.0	1125	901.468	0.4	0.97	0.97	94	91	7.0	133	260	Iced Down <68°F	250	5 min/pt
44.8			0.4	0.97	0.97	98	92	7.0	126				
42.3			0.4	0.97	0.97	100	92	7.0	139				
39.5			0.2	0.49	0.49	100	92	4.0	127				
36.0			0.3	0.73	0.73	101	92	5.3	133		65°F		
30.9			0.4	0.97	0.97	101	93	7.0	138				
17.1			0.6	1.46	1.46	102	93	10.3	126				
12.0			0.8	1.95	1.95	101	93	14.0	134				
8.5			1.0	2.44	2.44	104	93	15.0	130				
5.7			1.2	2.92	2.92	106	94	16.0	127				
3.2			0.9	2.19	2.19	106	95	14.5	132		63°F		
1.0			0.7	1.70	1.70	105	94	12.0	129				
	1225	946.832											

D-14

LEAK CHECK

	in. Hg.	Rate
fore		
er		

ORSAT

	1	2
CO_2	0.0	
O_2	20.5	
CO	0.0	
N		

PITOT LEAK CHECK

POS.	NEG.

Impinger No.	Final	Initial	Difference
1 100 ml			
2 100 ml			
3 DRY			
4 Silica			

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

STACK SAMPLING DATA SHEET

PLANT: USX Clairton | DATE: 3-13-90 | ΔH@: 1.519 (12-27-89) | HOT BOX NO.: #6
LOCATION: B-Battery Baghouse | TEST NO.: CLR-M4-1 | METER CORRECTION: 0.9624 | COLD BOX NO.: #6
ACTIVITY NO.: MOD. 4 | NOZZLE: #39 0.232 | PITOT CORRECTION: 0.84 | PROBE NO.: 5-5
CONTROL BOX OPERTOR: | STATIC PRESSURE Ps: 0.3 | CONTROL BOX NO.: 2 | FILTER NO.: 377
PROBE HANDLER: | PORT DIRECTION: NE | NOMOGRAPH SET POINT: | STACK DIA.: 48"
CLEAN UP: | BAROMETRIC PRESSURE: 29.55 | LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

Point	Time	Meter Reading (dry) CF	Velocity HD in. H_2O	Orifice ΔH in. H_2O Reg.	Orifice ΔH in. H_2O Act.	Meter Temp °F In	Meter Temp °F Out	Vacuum in. Hg	Stack Temp °F	Probe Temp °F	Imp. Temp. °C/°F	Hot Box °F	Comments
47.0	1425	947.127	0.3	0.71	0.71	96	93	4.1	148	260	Iced Down <68°F	250	5 min/pt
44.8			0.3	0.71	0.71	101	94	4.1	146				
42.3			0.3	0.71	0.71	102	95	4.1	149				
39.5			0.4	0.95	0.95	102	94	5.3	156		65°F		
36.0			0.4	0.95	0.95	103	95	5.3	147				
30.9			0.5	1.19	1.19	104	96	7.0	151		62°F		
17.1			0.6	1.43	1.43	104	96	8.2	147				
12.0			0.8	1.90	1.90	103	96	11.9	146		58°F		
8.5			0.9	2.14	2.14	101	95	14.7	158				
5.7			1.0	2.34	2.34	99	94	15.6	151		57°F		
3.2			1.0	2.34	2.34	97	93	15.6	148				
1.0			0.2	0.47	0.47	97	92	3.0	143				
	1525	990.405											

D-15

LEAK CHECK

	in. Hg.	Rate
Before	5.0	<0.02 cfm
After	10.0	0.010

ORSAT

	1	2
CO_2	0.0	
O_2	20.5	
CO	0.0	
N	[illegible]	

PITOT LEAK CHECK

POS.	NEG.
15 sec OK	15 sec OK

Impinger No.	Final	Initial	Difference
1 100 ml	556.5	554.4	2.1
2 100 ml	554.8	544.6	0.2
3 Dry	464.0	462.0	2.0
4 Silica	698.7	683.9	14.8

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

STACK SAMPLING DATA SHEET

PLANT: USX Clairton
DATE: 3-13-90
ΔH@: 1.519 (12-27-89)
HOT BOX NO.: #6
LOCATION: B-Battery/Baghouse
TEST NO.: CLR-M4-1
METER CORRECTION: 0.9624
COLD BOX NO.: #6
ACTIVITY NO.: MOD. 4
NOZZLE: #39 0.232
PITOT CORRECTION: 0.84
PROBE NO.: 5-5
CONTROL BOX OPERTOR:
STATIC PRESSURE Ps: 0.3
CONTROL BOX NO.: 2
FILTER NO.: 377
PROBE HANDLER:
PORT DIRECTION: SE
NOMOGRAPH SET POINT:
STACK DIA.: 48"
CLEAN UP:
BAROMETRIC PRESSURE: 29.55
LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

Point	Time	Meter Reading (dry) CF	Velocity HD in. H_2O	Orifice ΔH in. H_2O Reg.	Orifice ΔH in. H_2O Act.	Meter Temp °F In	Meter Temp °F Out	Vacuum in. Hg	Stack Temp °F	Probe Temp °F	Imp. Temp. °C/°F	Hot Box °F	Comments
47.0	1545	990.405	0.8	1.87	187	99	95	11.3	147	260	Ice/Dry <68°F	250	5 min/pt
44.8			0.8	1.87	1.87	102	96	11.3	144				
42.3			0.7	1.64	1.64	103	96	10.0	142		61°F		
39.5			0.7	1.64	1.64	105	96	10.0	140				
36.0			0.5	1.17	1.17	106	97	7.0	140		63°F		
30.9			0.5	1.17	1.17	107	98	7.0	138				
17.1			0.6	1.40	1.40	108	99	7.8	150		60°F		
12.0			0.8	1.87	1.87	107	98	11.2	145				
8.5			0.2	0.47	0.47	106	99	2.9	152		61°F		
5.7			1.0	2.34	2.34	108	99	15.3	146				
3.2			1.0	2.34	2.34	105	99	15.3	150		58°F		
1.0			0.5	1.17	1.17	104	99	7.0	133				
	1645	038.179											

D-16

LEAK CHECK

	in. Hg.	Rate
efore		
fter		

ORSAT

	1	2
CO_2	0.0	
O_2	20.5	
CO	0.0	
N	79.5	

PITOT LEAK CHECK

POS.	NEG.

Impinger No.	Final	Initial	Difference
1 100ml			
2 100ml			
3 Dry			
4 Silica			

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

STACK SAMPLING DATA SHEET

PLANT: USX Clairton
DATE: 3-13-90
ΔH@: 1.762 (12-28-89)
HOT BOX NO.: 5
LOCATION: B-Battery Baghouse
TEST NO.: CLP-M5-1
METER CORRECTION: 0.9558
COLD BOX NO.: 5
ACTIVITY NO.: MOD 5
NOZZLE: #44 0.209
PITOT CORRECTION: 0.84
PROBE NO.: 5-3
CONTROL BOX OPERTOR:
STATIC PRESSURE Ps: 0.3
CONTROL BOX NO.: 4
FILTER NO.: 347
PROBE HANDLER:
PORT DIRECTION: NE
NOMOGRAPH SET POINT:
STACK DIA.: 48"
CLEAN UP:
BAROMETRIC PRESSURE: 29.55
LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

Point	Time	Meter Reading (dry) CF	Velocity HD in. H_2O	Orifice ΔH in. H_2O Reg.	Orifice ΔH in. H_2O Act.	Meter Temp °F In	Meter Temp °F Out	Vacuum in. Hg	Stack Temp °F	Probe Temp °F	Imp. Temp. °C/°F	Hot Box °F	Comments
47.0	1425	783.600	.30	.54	.54	95	96	5.0	146	260	Iced Down <68°F	250	5 min/pt
44.8			.30	.54	.54	97	96	5.0	149				
42.3			.30	.54	.54	98	97	5.0	148		59°		
39.5			.30	.54	.54	98	97	5.0	142				
36.0			.35	.64	.64	101	99	5.0	139				
30.9			.40	.73	.73	102	101	5.0	149		58°		
17.1			.50	.91	.91	104	103	6.0	147				
12.0			.50	.91	.91	104	104	6.0	145				
8.5			.50	.91	.91	104	104	6.0	150		59°		
5.7			.40	.73	.73	104	104	6.0	149				
3.2			.40	.73	.73	104	104	6.0	144				
1.0	1525	812.564	.40	.73	.73	104	104	6.0	144		59°		

D-17

LEAK CHECK

	in. Hg.	Rate
efore	5.0	<0.02 cfm
fter	1.0	0.010 cfm

ORSAT

	1	2
CO_2	0.0	
O_2	20.5	
CO	0.0	
N	[illegible]	

PITOT LEAK CHECK

POS.	NEG.
15 sec OK	15 sec OK

Impinger No.	Final	Initial	Difference
1 100ml			
2 100ml			
3 0ml			
4 silica			

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

STACK SAMPLING DATA SHEET

PLANT: USX Clairton
DATE: 3-13-90
ΔH@: 1.762 (12-28-89)
HOT BOX NO.: 5
LOCATION: B-Battery/Baghouse
TEST NO.: CLR-M5-1
METER CORRECTION: 0.9558
COLD BOX NO.: 5
ACTIVITY NO.: MOD. 5
NOZZLE: #44 0.209
PITOT CORRECTION: 0.84
PROBE NO.: 5-3
CONTROL BOX OPERTOR:
STATIC PRESSURE Ps: 0.3
CONTROL BOX NO.: 4
FILTER NO.: 347
PROBE HANDLER:
PORT DIRECTION: SE
NOMOGRAPH SET POINT:
STACK DIA.: 48"
CLEAN UP:
BAROMETRIC PRESSURE: 29.55
LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

Point	Time	Meter Reading (dry) CF	Velocity HD in. H_2O	Orifice ΔH in. H_2O Reg.	Orifice ΔH in. H_2O Act.	Meter Temp °F In	Meter Temp °F Out	Vacuum in. Hg	Stack Temp °F	Probe Temp °F	Imp. Temp. °C/°F	Hot Box °F	Comments
47.0	1545	812.564	.30	.54	.54	105	107	5.0	145	260	Ice down 68°F	250	5 min/pt
44.8			.30	.54	.54	105	107	5.0	146				
42.3			.40	.73	.73	107	107	5.0	143		59°		
39.5			.40	.73	.73	107	107	5.0	145				
36.0			.40	.73	.73	107	107	5.0	146				
30.9			.40	.73	.73	107	108	5.0	141		58°		
17.1			.40	.73	.73	107	108	5.0	140				
12.0			.40	.73	.73	108	108	5.0	144				
8.5			.40	.73	.73	108	108	5.0	148		59°		
5.7			.40	.73	.73	108	108	5.0	146				
3.2			.40	.73	.73	108	108	5.0	145				
1.0	1645	842.990	.30	.54	.54	108	109	5.0	148		58°		

D-18

LEAK CHECK

	in. Hg.	Rate
Before		
After		

ORSAT

	1	2
CO_2	0.0	
O_2	20.5	
CO	0.0	
N	≈	

PITOT LEAK CHECK

POS.	NEG.

Impinger No.	Final	Initial 513.7	Difference
1 100ml	518.7	~~516~~	5.0
2 100ml	559.7	556.4	3.3
3 Dry	483.6	481.9	1.7
4 Silica	664.1	648.9	15.2

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

STACK SAMPLING DATA SHEET

PLANT USX Clairton DATE: 3-13-90 ΔH@: 1.634 (12-28-89) HOT BOX NO.: 1
LOCATION: B-Battery Baghouse TEST NO.: CL-M6-1 METER CORRECTION: 0.9778 COLD BOX NO.: 1
ACTIVITY NO.: MOD. 6 NOZZLE: #45 0.201 PITOT CORRECTION: 0.84 PROBE NO.: 5-4
CONTROL BOX OPERTOR: STATIC PRESSURE Ps: 0.3 CONTROL BOX NO.: 3 FILTER NO.: 338
PROBE HANDLER: PORT DIRECTION: NE NOMOGRAPH SET POINT: STACK DIA.: 48"
CLEAN UP: BAROMETRIC PRESSURE: 29.55 LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

Point	Time	Meter Reading (dry) CF	Velocity HD in. H_2O	Orifice ΔH in. H_2O Reg.	Orifice ΔH in. H_2O Act.	Meter Temp °F In	Meter Temp °F Out	Vacuum in. Hg	Stack Temp °F	Probe Temp °F	Imp. Temp. °C/°F	Hot Box °F	Comments
47.0	14:25	426.372	0.25	0.35	0.35	98	91	2.0	150	260	Iced Down <68°F	250	5 min/pt
44.8	14:30		0.25	0.35	0.35	103	93	2.0	150				
42.3	14:35		0.27	0.38	0.38	106	94	2.0	147				
39.5	14:40		0.27	0.38	0.38	107	94	2.0	145				
36.0	14:45		0.27	0.38	0.38	109	94	2.0	147				
30.9	14:50		0.30	0.43	0.43	109	95	2.5	150				
17.1	14:55		0.50	0.72	0.72	110	95	3.0	147				
12.0	15:00		0.60	0.86	0.86	110	94	3.5	146				
8.5	15:05		0.60	0.86	0.86	110	94	3.5	152				
5.7	15:10		0.70	1.00	1.00	110	93	4.0	147				
3.2	15:15		0.60	0.86	0.86	110	93	3.5	143				
1.0	15:20		0.40	0.57	0.57	110	93	2.5	139				

15:25 456.480

D-19

LEAK CHECK

	in. Hg.	Rate
efore	5.0	<0.02 cfm
fter	6.0	0.005

ORSAT

	1	2
CO_2	0.0	
O_2	20.5	
CO	0.0	
N	[illegible]	

PITOT LEAK CHECK

POS.	NEG.
15 sec OK	15 sec OK

Impinger No.	Final	Initial	Difference
1 100ml	561.0	554.2	6.8
2 100ml	562.0	560.4	1.6
3 dry	453.0	451.1	1.9
4 silica	690.8	675.8	14.2

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

STACK SAMPLING DATA SHEET

PLANT: USX Clairton
DATE: 3-13-90
ΔH@: 1.634 (12-28-89)
HOT BOX NO.: 1
LOCATION: B-Battery Baghouse
TEST NO.: CLP-M6-1
METER CORRECTION: 0.9778
COLD BOX NO.: 1
ACTIVITY NO.: MOD. 6
NOZZLE: #45 0.201
PITOT CORRECTION: 0.84
PROBE NO.: 5-4
CONTROL BOX OPERTOR:
STATIC PRESSURE Ps: 0.3
CONTROL BOX NO.: 3
FILTER NO.: 338
PROBE HANDLER:
PORT DIRECTION: SE
NOMOGRAPH SET POINT:
STACK DIA.: 48"
CLEAN UP:
BAROMETRIC PRESSURE: 29.55
LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

Point	Time	Meter Reading (dry) CF	Velocity HD in. H_2O	Orifice ΔH in. H_2O Reg.	Orifice ΔH in. H_2O Act.	Meter Temp °F In	Meter Temp °F Out	Vacuum in. Hg	Stack Temp °F	Probe Temp °F	Imp. Temp. °C/°F	Hot Box °F	Comments
47.0	15:44	456.480	.40	0.57	0.57	101	92	2.0	145	260	Iced Down <68°F	250	5 min/pt
44.8	15:49		.40	0.57	0.57	107	93	2.5	143				
42.3	15:54		.50	0.71	0.71	109	95	3.0	141				
39.5	15:59		.50	0.71	0.71	111	95	3.0	140				
36.0	16:04		.50	0.72	0.72	112	96	3.0	138				
30.9	16:09		.50	0.72	0.72	113	96	3.0	136				
17.1	16:14		.40	0.58	0.58	113	97	2.5	146				
12.0	16:19		.50	0.72	0.72	114	97	3.0	143				
8.5	16:24		.50	0.72	0.72	114	97	3.0	148				
5.7	16:29		.60	0.87	0.87	115	98	3.5	142				
3.2	16:34		.50	0.72	0.72	115	98	3.0	141				
1.0	16:39		.40	0.58	0.58	115	99	2.5	140				
	16:44	486.838											

D-20

LEAK CHECK

	in. Hg.	Rate
efore		
fter		

ORSAT

	1	2
CO_2	0.0	
O_2	20.5	
CO	0.0	
N		

PITOT LEAK CHECK

POS.	NEG.

Impinger No.	Final	Initial	Difference
1 100ml			
2 100ml			
3 DRY			
4 Silica			

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

STACK SAMPLING DATA SHEET

PLANT: USX Clairton
DATE: 3-13-90
ΔH@: 1.781 (12-27-89)
HOT BOX NO.: 1
LOCATION: B-Battery/Baghouse
TEST NO.: CLR-M7-1
METER CORRECTION: 1.0372
COLD BOX NO.: 1
ACTIVITY NO.: MOD. 7
NOZZLE: ~~[illegible]~~57 0.237
PITOT CORRECTION: 0.84
PROBE NO.: 5-2 5-2
CONTROL BOX OPERTOR:
STATIC PRESSURE Ps: .40
CONTROL BOX NO.: 1
FILTER NO.: 371 371
PROBE HANDLER:
PORT DIRECTION: NE
NOMOGRAPH SET POINT:
STACK DIA.: 48"
CLEAN UP:
BAROMETRIC PRESSURE: 29.55
LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

Point	Time	Meter Reading (dry) CF	Velocity HD in. H_2O	Orifice ΔH in. H_2O Reg.	Orifice ΔH in. H_2O Act.	Meter Temp °F In	Meter Temp °F Out	Vacuum in. Hg	Stack Temp °F	Probe Temp °F	Imp. Temp. °C/°F	Hot Box °F	Comments
47.0	[illegible]	[illegible]	[illegible]	.63	.63	98	97	3.0	138	260	Iced Down <68°F	250	5 min/pt
44.8	[illegible]		[illegible]	1.39	1.39	104	[illegible]	5.5	140				
42.3	[illegible]		[illegible]	2.02	2.02	107	100	8.1	137		60°		
39.5	[illegible]		[illegible]	1.89	1.89	109	100	7.5	131				
36.0	[illegible]:45		.80	2.02	2.02	111	103	8.0	134				
30.9	[illegible]:50		.60	1.51	1.51	111	104	6.6	135				
17.1	[illegible]:55		.45	1.14	1.14	111	105	5.0	135		59°		
12.0	15:00		.45	1.14	1.14	110	105	5.0	135				
8.5	15:05		.35	.88	.88	108	105	4.0	134				
5.7	15:10		.30	.76	.76	108	105	3.5	130				
3.2	15:15		.30	.76	.76	108	105	3.5	130		60°		
1.0	15:20		.25	.63	.63	110	104	3.2	120				
	15:25	034.071											

D-21

LEAK CHECK

	in. Hg.	Rate
fore	5.0	<0.02 cfm
ter	11.0	0.01

ORSAT

	1	2
CO_2	0.0	
O_2	20.5	
CO	0.0	
N	[illegible]	

PITOT LEAK CHECK

POS.	NEG.
OK 15 sec	OK 15 sec

Impinger No.	Final	Initial	Difference
1 100 ml	544.8	538.7	6.1
2 100 ml	552.8	544.1	8.7
3 DRY	432.3	431.1	1.2
4 Silica	656.0	642.3	13.7

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

STACK SAMPLING DATA SHEET

PLANT: USX Clairton
DATE: 3-13-90
ΔH@: 1.781 (12-27-89)
HOT BOX NO.: 4
LOCATION: B-Battery/Baghouse
TEST NO.: CLR-M7 - 1
METER CORRECTION: 1.0372
COLD BOX NO.: 4
ACTIVITY NO.: MOD. 7
NOZZLE: #37 0.237
PITOT CORRECTION: 0.84
PROBE NO.: 5-2
CONTROL BOX OPERTOR:
STATIC PRESSURE Ps: .40
CONTROL BOX NO.: 1
FILTER NO.: 371
PROBE HANDLER:
PORT DIRECTION: SE
NOMOGRAPH SET POINT:
STACK DIA.: 48"
CLEAN UP:
BAROMETRIC PRESSURE: 29.55
LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

Point	Time	Meter Reading (dry) CF	Velocity HD in. H_2O	Orifice ΔH in. H_2O Reg.	Orifice ΔH in. H_2O Act.	Meter Temp °F In	Meter Temp °F Out	Vacuum in. Hg	Stack Temp °F	Probe Temp °F	Imp. Temp. °C/°F	Hot Box °F	Comments
47.0	15:45	034.071	.25	.63	.63	104	104	3.0	135	260	Ice Down <68°F	250	5 min/pt
44.8	15:50		.25	.63	.63	109	105	3.0	132				
42.3	15:55		.25	.63	.63	110	105	3.0	131		59°		
39.5	16:00		.25	.63	.63	109	104	3.0	130				
36.0	16:05		.30	.76	.76	110	104	3.2	127				
30.9	16:10		.30	.76	.76	110	104	3.2	125				
17.1	16:15		.80	2.02	2.02	112	105	7.5	132		60°		
12.0	16:20		.95	2.40	2.40	113	105	9.0	130				
8.5	16:25		1.00	2.52	2.52	113	104	9.5	136				
5.7	16:30		1.00	2.52	2.52	113	104	9.6	134				
3.2	16:35		1.00	2.52	2.52	113	104	9.8	119		58°		
1.0	16:40		.95	2.40	2.40	113	104	8.9	90				
	16:45	076.200											

D-22

LEAK CHECK

	in. Hg.	Rate
fore		
er		

ORSAT

	1	2
CO_2	0.0	
O_2	20.5	
CO	0.0	
N		

PITOT LEAK CHECK

POS.	NEG.

Impinger No.	Final	Initial	Difference
1 100 ml			
2 100 ml			
3 dry			
4 Silica			

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

STACK SAMPLING DATA SHEET

PLANT: USX Clairton
DATE: 3-13-90
ΔH@: 1.781 (12-27-89)
HOT BOX NO.: 1
LOCATION: B-Battery Exhaust
TEST NO.: CLR-M12-1
METER CORRECTION: 1.0372
COLD BOX NO.: 1
ACTIVITY NO.: Mod #12
NOZZLE: #37 0.237
PITOT CORRECTION: 0.84
PROBE NO.: 5-2
CONTROL BOX OPERTOR:
STATIC PRESSURE Ps: .30
CONTROL BOX NO.: 1
FILTER NO.: 361
PROBE HANDLER:
PORT DIRECTION: SW
NOMOGRAPH SET POINT:
STACK DIA.: 48"
CLEAN UP:
BAROMETRIC PRESSURE: 29.55
LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

Point	Time	Meter Reading (dry) CF	Velocity HD in. H_2O	Orifice ΔH in. H_2O Reg.	Orifice ΔH in. H_2O Act.	Meter Temp °F In	Meter Temp °F Out	Vacuum in. Hg	Stack Temp °F	Probe Temp °F	Imp. Temp. °C/°F	Hot Box °F	Comments
47.0	9.55	914.921	.25	.74	.74	78	75	5.0	119	260	Cool Down <68°F	250	5min/PT
44.8	10:00		.25	.74	.74	84	78	6.0	119				
42.3	10:05		.30	.89	.89	87	80	6.1	117				
39.5	10:10		.30	.89	.89	90	82	6.5	124		59°		
36.0	10:15		.30	.89	.89	92	84	6.5	123				
30.9	10:20		.30	.89	.89	93	85	6.5	124				
17.1	10:25		.45	1.35	1.35	95	87	9.4	120		57°		
12.0	10:30		.60	1.79	1.79	97	87	[redacted] 12.0	118				
8.5	10:35		.65	1.94	1.94	97	87	14.0	126				
5.7	10:40		.60	1.79	1.79	96	89	13.8	124		56°		
3.2	10:45		.60	1.79	1.79	97	90	13.6	119				
1.0	10:50		.40	1.19	1.19	97	90	9.0	110				
	10:55	953.249											

D-23

LEAK CHECK

	in. Hg.	Rate
Before	5.0	<0.02 cfm
After	16.0	.01 CFM

ORSAT

	1	2
CO_2	0.0	
O_2	20.5	
CO	0.0	
N	79.5	

PITOT LEAK CHECK

POS.	NEG.
OK 15sec	OK 15sec

Impinger No.	Final	Initial	Difference
1 100ml	562.4	553.2	9.2
2 100ml	567.5	559.7	7.8
3 DRY	452.9	450.0	2.9
4 200gms 5.16ml	702.1	685.5	16.6

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

STACK SAMPLING DATA SHEET

PLANT: USX Clairton
DATE: 3-13-90
ΔH@: 1.781 (12-27-89)
HOT BOX NO.: 1
LOCATION: B-Battery/Baghouse
TEST NO.: CLR-M12-1
METER CORRECTION: 1.0372
COLD BOX NO.: 1
ACTIVITY NO.: MOD #12
NOZZLE: #37 0.237
PITOT CORRECTION: 0.84
PROBE NO.: 5-2
CONTROL BOX OPERTOR:
STATIC PRESSURE Ps: .30
CONTROL BOX NO.: 1
FILTER NO.: 361
PROBE HANDLER:
PORT DIRECTION: NW
NOMOGRAPH SET POINT:
STACK DIA.: 48"
CLEAN UP:
BAROMETRIC PRESSURE: 29.55
LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

Point	Time	Meter Reading (dry) CF	Velocity HD in. H_2O	Orifice ΔH in. H_2O Reg.	Orifice ΔH in. H_2O Act.	Meter Temp °F In	Meter Temp °F Out	Vacuum in. Hg	Stack Temp °F	Probe Temp °F	Imp. Temp. °C/°F	Hot Box °F	Comments
47.0	11:28	953.249	.25	.74	.74	91	88	6.0	127	260	Tred Down <68°F	250	5min/pt
44.8	11:32		.25	.74	.74	95	90	6.0	124				
42.3	11:37		.25	.74	.74	97	91	6.1	133		57°		
39.5	11:42		.25	.74	.74	98	91	6.0	127				
36.0	11:47		.25	.74	.74	99	92	6.0	129				
30.9	11:52		.25	.74	.74	100	93	6.0	131				
17.1	11:57		.45	1.34	1.34	102	94	9.0	125		55°		
12.0	12:02		.50	1.49	1.49	102	95	10.0	131				
8.5	12:07		.55	1.64	1.64	103	96	11.0	128				
5.7	12:12		.70	2.09	2.09	103	96	14.5	100				
3.2	12:17		.80	2.38	2.38	106	99	5.5	121		56°		
1.0	12:22		.50	1.49	1.49	105	95	4.0	93				
	12:27	953.800											

D-24

LEAK CHECK

	in. Hg.	Rate
fore		
ter		

ORSAT

	1	2
CO_2	0.0	
O_2	20.5	
CO	0.0	
N	79.5	

PITOT LEAK CHECK

POS.	NEG.

Impinger No.	Final	Initial	Difference
1 100 ml			
2 100 ml			
3 Dry			
4 Silica			

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

STACK SAMPLING DATA SHEET

PLANT USX Clairton DATE: 3-13-90 ΔH@: 1.634 (12-28-89) HOT BOX NO.: 5
LOCATION: B-Battery Baghouse TEST NO.: CLP-M14-1 METER CORRECTION: 0.9778 COLD BOX NO.: 5
ACTIVITY NO.: MOD. 14 NOZZLE: #45 0.201 PITOT CORRECTION: 0.84 PROBE NO.: 5-4
CONTROL BOX OPERTOR: STATIC PRESSURE Ps: .40 CONTROL BOX NO.: 3 FILTER NO.: 378
PROBE HANDLER: PORT DIRECTION: SW NOMOGRAPH SET POINT: STACK DIA.: 48"
CLEAN UP: BAROMETRIC PRESSURE: 29.55 LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

Point	Time	Meter Reading (dry) CF	Velocity HD in. H_2O	Orifice ΔH in. H_2O Reg.	Orifice ΔH in. H_2O Act.	Meter Temp °F In	Meter Temp °F Out	Vacuum in. Hg	Stack Temp °F	Probe Temp °F	Imp. Temp. °C/°F	Hot Box °F	Comments
47.0	09:55	367.470	0.25	0.36	0.36	77	72	2.0	120	260	Ice Drum <68°F	250	5 min/pt
44.8	10:00		0.25	0.36	0.36	83	73	2.0	119				
42.3	10:05		0.25	0.36	0.36	88	76	2.0	119				
39.5	10:10		0.28	0.40	0.40	91	77	2.0	123				
36.0	10:15		0.30	0.43	0.43	94	80	2.0	121				
30.9	10:20		0.35	0.50	0.50	96	80	3.0	122				
17.1	10:25		0.60	0.86	0.86	99	81	4.0	123				
12.0	10:30		0.60	0.88	0.88	102	82	4.0	121				
8.5	10:35		0.70	1.03	1.03	102	84	4.0	121				
5.7	10:40		0.70	1.03	1.03	102	84	4.0	122				
3.2	10:45		0.60	0.88	0.88	102	84	3.5	123				
1.0	10:50		0.50	0.73	0.73	102	85	3.0	122				
	10:55	398.662											

D-25

LEAK CHECK

	in. Hg.	Rate
efore	5.0	<0.02 cfm
fter	6.0	0.025 CFM

ORSAT

	1	2
CO_2	0.0	
O_2	20.5	
CO	0.0	
N	79.5	

PITOT LEAK CHECK

POS.	NEG.
red OK 15sec	OK 15sec

Impinger No.	Final	Initial	Difference
1 100ml	520.5	510.6	9.9
2 100ml	564.6	559.0	5.6
3 DRY	485.0	483.4	1.6
4 silica	675.9	664.9	11.0

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

STACK SAMPLING DATA SHEET

PLANT: USX Clairton
LOCATION: B-Battery/Baghouse
ACTIVITY NO.: MOD. 14
CONTROL BOX OPERTOR:
PROBE HANDLER:
CLEAN UP:

DATE: 3-13-90
TEST NO.: CLR-M14-1
NOZZLE: #45 0.201
STATIC PRESSURE Ps: 0.40
PORT DIRECTION: NW
BAROMETRIC PRESSURE: 29.55

ΔH@: 1.634 (12-28-89)
METER CORRECTION: 0.9778
PITOT CORRECTION: 0.84
CONTROL BOX NO.: 3
NOMOGRAPH SET POINT:
LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

HOT BOX NO.: 5
COLD BOX NO.: 5
PROBE NO.: 5-4
FILTER NO.: 378
STACK DIA.: 48"

Point	Time	Meter Reading (dry) CF	Velocity HD in. H_2O	Orifice ΔH in. H_2O Reg.	Orifice ΔH in. H_2O Act.	Meter Temp °F In	Meter Temp °F Out	Vacuum in. Hg	Stack Temp °F	Probe Temp °F	Imp. Temp. °C/°F	Hot Box °F	Comments
47.0	11:27	398.662	.30	0.43	0.43	82	83	2.0	121	260	Iced Down 68°F	250	5 min/pt
44.8	11:32		.25	0.36	0.36	96	83	2.0	124				
42.3	11:37		.38	0.55	0.55	98	84	2.0	131				
39.5	11:42		.35	0.51	0.51	100	85	2.0	127				
36.0	11:47		.42	0.61	0.61	102	86	2.5	129				
30.9	11:52		.42	0.61	0.61	103	87	2.5	131				
17.1	11:57		.40	0.58	0.58	104	88	2.5	125				
12.0	12:02		.40	0.58	0.58	104	89	2.5	127				
8.5	12:07		.40	0.58	0.58	104	89	2.5	127				
5.7	12:12		.43	0.63	0.63	104	89	2.5	126				
3.2	12:17		.25	0.37	0.37	105	90	2.0	124				
1.0	12:22		.25	0.37	0.37	105	90	2.0	121				
	12:27	426.220											

D-26

LEAK CHECK

	in. Hg.	Rate
efore		
fter		

ORSAT

	1	2
CO_2	0.0	
O_2	20.5	
CO	0.0	
N	79.5	

PITOT LEAK CHECK

POS.	NEG.

Impinger No.	Final	Initial	Difference
1 100ml			
2 100ml			
3 DRY			
4 SILICA			

APPENDIX E

PARTICULATE MATTER EMISSIONS CALCULATIONS

Plant: Clairton Coke Works (U.S. Steel) **Date:** 3/20/90

Activity No. 601000-15

PARTICULATE REPORTING FORM

Test Number	Component	Molecular Weight	Cyclone Weight	Filter Weight (Particulate)	Insol. Part. in Front Half	Insol. Part. in Back Half (Millipore After)	Soluble Part. in Back Half (Impingers 1 & 2 (Acetone + H_2O) Total Rinses)	Soluble Part. in Front Half (Probe 1 & 2 Acetone + H_2O)
CLR-M1-1	Particulate			0.0015		0.0027	0.0105	0.0013
CLR-M3-1	Particulate			0.0001		0.0029	0.0050	0.0033
CLR-M4-1	Particulate			0.0022		0.0020	0.0201	0.0028
CLR-M5-1	Particulate			0.0020		0.0036	0.0173	0.0029
CLR-M6-1	Particulate			0.0009		0.0029	0.0085	0.0007
CLR-M7-1	Particulate			0.0014		0.0054	0.0049	0.0004
CLR-M8-1	Particulate			0.0012		0.0030	0.0041	0.0004
CLR-M9-1	Particulate			0.0009		0.0029	0.0037	0.0005
CLR-M10-1	Particulate			0.0001		0.0028	0.0032	0.0018
CLR-M11-1	Particulate			0.0017		0.0020	0.0082	~~0.0078~~ 0.002 ~~0.0135~~
CLR-M12-1	Particulate			0.0003		0.0034	0.0044	0.0015
CLR-M14-1	Particulate			0.0016		0.0032	0.0073	0.0016
BLK-ACETONE		Total Weight (g) 0.0000						
BLK-H_2O		0.0000						

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE
MODULE 8

DATE: 3-12-90
CHARGE #: ...150-601000
TEST #: CLR-M8-1

1. EMISSION RESULTS

PARAMETER	GR/SCFD	LB/HR
PARTICULATE	.00123	.25092

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2. STACK CONDITIONS

FLOW (ACFM)	27203.
(SCFM)	24132.
MOISTURE CONTENT (%)	1.61
STACK TEMPERATURE (F)	124.8

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3. SAMPLING CONDITIONS

SAMPLE TIME (MIN.)	120.0
SCFD GAS SAMPLED	57.454
PERCENT ISOKINETIC	106.37

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 8
CLR-M8-1 3-12-90

FIELD DATA AND VELOCITY CALCULATIONS

POINT	TIME	METER READING (DRY) CF	DELTA P IN.H2O	ORIFICE DELTA H REQ	ORIFICE DELTA H ACT	METER TEMP DEG F IN	METER TEMP DEG F OUT	VACUUM IN.HG.	STACK TEMP DEG F	CORRECTED VELOCITY FT/SEC
47.0SW	1125.0	854.664	.350	.56	.56	87.	84.	2.9	130.	35.5
44.8SW			.400	.74	.74	91.	86.	3.2	124.	37.7
42.3SW			.450	.80	.80	91.	87.	3.5	121.	39.9
39.5SW			.500	.92	.92	92.	87.	3.6	124.	42.2
36.0SW			.450	.80	.80	94.	88.	3.2	124.	40.0
30.9SW			.450	.80	.80	98.	91.	3.2	124.	40.0
17.1SW			.400	.74	.74	101.	93.	3.1	124.	37.7
12.0SW			.350	.56	.56	102.	99.	2.8	119.	35.1
8.5SW			.350	.56	.56	103.	97.	2.8	126.	35.3
5.7SW			.350	.56	.56	105.	99.	2.8	125.	35.3
3.2SW			.250	.44	.44	101.	99.	2.2	123.	29.8
1.0SW	1225.0	882.179	.200	.38	.38	104.	100.	2.0	123.	26.6
47.0NW	1445.0	882.179	.100	.20	.20	98.	96.	2.1	126.	18.9
44.8NW			.100	.20	.20	102.	98.	2.1	122.	18.8
42.3NW			.150	.28	.28	103.	99.	2.0	132.	23.3
39.5NW			.150	.28	.28	103.	98.	1.9	131.	23.2
36.0NW			.250	.44	.44	104.	99.	2.3	125.	29.8
30.9NW			.300	.56	.56	104.	100.	2.9	128.	32.8
17.1NW			.500	.92	.92	106.	100.	3.8	124.	42.2
12.0NW			.900	1.66	1.66	107.	100.	6.0	123.	56.5
8.5NW			.900	1.66	1.66	108.	100.	6.0	127.	56.7
5.7NW			.250	.44	.44	107.	100.	2.3	125.	29.8
3.2NW			.900	1.66	1.66	109.	101.	6.0	125.	56.6
1.0NW	1545.0	914.213	.500	.92	.92	108.	101.	4.0	121.	42.1

O R S A T	
CO2	.0
O2	20.5
CO	.0
N	79.5

IMPINGER NO.	1	5.2
	2	3.9
	3	1.0
	4	.0
ABSORBED H2O		9.9

CONTROL BOX CALIBRATIONS

	FACTOR	DATE
ORIFICE	1.781	12-27-89
METER	1.0372	12-27-89
PITOT	0.84	2-26-90

LEAK CHECK

	RATE	IN.HG
INITIAL	LT 0.02CFM	5.0
FINAL	LT 0.02CFM	7.0

CONTROL BOX NO. 1 PROBE NO. 5-3 NOZZLE NO. 44

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 8
CLR-M8-1 3-12-90

STACK SAMPLING CALCULATIONS

A.	BAROMETRIC PRESSURE IN. HG.....	29.37
B.	AVG. DELTA H (IN H2O).....	.71
C.	METER PRESSURE (IN. HG.).....	29.42
D.	STATIC PRESSURE (IN. H2O).....	.40
E.	STATIC PRESSURE (IN. HG.).....	.029
F.	STACK PRESSURE (IN. HG.) (A+E).....	29.40
G.	STACK DIAMETER (IN.).....	48.00
H.	STACK AREA (SQ. FT.).....	12.57
	NOZZLE DIAMETER.....	.2090
I.	NOZZLE AREA (SQ. FT.).....	.000238
J.	AVG. STACK TEMP (DEG. R.).....	584.8
K.	AVG. METER TEMP (DEG. R.).....	558.5
L.	CONDENSATE VOL. (ML).....	10.1
M.	ABSORBED H2O (ML).....	9.9
N.	TOTAL H2O (ML).....	20.0
O.	METERED GAS (CF).....	59.549
P.	GAS METER CORRECTION.....	1.0372
Q.	CORRECTED METERED GAS (CF).....	61.764
R.	H2O GAS VOLUME (CF) (0.00267N(K/C).....	1.014
S.	TOTAL SAMPLED VOLUME (CF) (Q+R).....	62.778
T.	PERCENT H2O (100R/S).....	1.61
	THEORETICAL MAXIMUM.....	13.46
	PERCENT WATER USED.....	1.61
U.	SCFD GAS SAMPLED (528*Q*C/(29.9*K)).....	57.454

V. MOLECULAR WEIGHT OF STACK GAS

COMPONENT	ORSAT-DRY VOL.PCT./100	X	MOISTURE CORRECTION (1-T/100)	X	MOLECULAR WEIGHT	=	WEIGHT PER MOLE
CO2	.000	X	.9839	X	44.0	=	.00
CO	.000	X	.9839	X	28.0	=	.00
O2	.205	X	.9839	X	32.0	=	6.45
N2	.795	X	.9839	X	28.2	=	22.06
H2O		X	T/100= .0161	X	18.0	=	.29
					MOLECULAR WEIGHT OF STACK GAS	=	28.80

W.	PITOT CORRECTION.....	.840
X.	AVERAGE CORRECTED VELOCITY (FPS).....	36.08
	[85.49*W*SQRT{(J*DELTA P)/(V*F)}]	
Y.	AVG. FLOW RATE (CFM) (X*H*60).....	27203.
Z.	STACK FLOW RATE (SCFM) (528*Y/J*F/29.92).....	24132.
	STACK FLOW RATE (DRY).....	23742.
AA.	SAMPLE TIME (SEC).....	7200.
BB.	PERCENT ISOKINETIC.....	106.37
	(J*100*U*29.92)/(528*X*AA*I*F*(1-T/100))	

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 8
CLR-M8-1 3-12-90

PARAMETER	CYCLONE WT. (G)	MATL.ON FILTER(G)	INSOL.MATL. IN PROBE(G)	SOL.MATL. IN PROBE(G)
PARTICULATE	.00000	.00120	.00000	.00040

PARAMETER	INSOL.MATL. IN IMP.(G)	SOLUBLE MATL. IN IMP.(G)
PARTICULATE	.00300	.00410

PARTICULATE	.00870
ALL MATLS.	.00870

PARAMETER	GR/SCFD	LB/HR
PARTICULATE	.00123	.25092

Emission rates are based on the PA method.
The soluble impinger weight is excluded from the calculations

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE
MODULE 9

DATE: 3-12-90
CHARGE #: ...150-601000
TEST #: CLR-M9-1

1. EMISSION RESULTS

PARAMETER	GR/SCFD	LB/HR
PARTICULATE	.00102	.19839

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2. STACK CONDITIONS

FLOW (ACFM)	26054.
(SCFM)	23185.
MOISTURE CONTENT (%)	1.75
STACK TEMPERATURE (F)	123.0

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3. SAMPLING CONDITIONS

SAMPLE TIME (MIN.)	120.0
SCFD GAS SAMPLED	65.176
PERCENT ISOKINETIC	102.06

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 9
CLR-M9-1 3-12-90

FIELD DATA AND VELOCITY CALCULATIONS

POINT	TIME	METER READING (DRY) CF	DELTA P IN.H2O	ORIFICE DELTA H REQ	ORIFICE DELTA H ACT	METER TEMP DEG F IN	METER TEMP DEG F OUT	VACUUM IN.HG.	STACK TEMP DEG F	CORRECTED VELOCITY FT/SEC
47.0SW	1125.0	781.116	.300	.72	.72	88.	83.	2.0	124.	32.7
44.8SW			.300	.72	.72	91.	84.	2.0	121.	32.6
42.3SW			.300	.72	.72	94.	85.	2.0	121.	32.6
39.5SW			.200	.49	.49	95.	89.	2.0	119.	26.6
36.0SW			.200	.49	.49	98.	91.	2.0	125.	26.7
30.9SW			.230	.56	.56	99.	91.	2.0	122.	28.6
17.1SW			.250	.62	.62	101.	91.	2.0	119.	29.7
12.0SW			.350	.86	.86	102.	92.	2.0	121.	35.2
8.5SW			.400	.99	.99	101.	96.	3.0	126.	37.8
5.7SW			.430	1.06	1.06	103.	96.	3.5	128.	39.2
3.2SW			.400	.99	.99	104.	96.	3.0	123.	37.7
1.0SW	1225.0	814.770	.250	.62	.62	104.	96.	2.0	122.	29.8
47.0NW	1445.0	814.770	.600	1.48	1.48	101.	95.	4.0	122.	46.1
44.8NW			.800	1.98	1.98	102.	95.	6.0	121.	53.2
42.3NW			.800	1.98	1.98	105.	95.	6.0	131.	53.7
39.5NW			.700	1.74	1.74	106.	95.	6.0	128.	50.1
36.0NW			.600	1.47	1.47	106.	95.	5.0	123.	46.2
30.9NW			.400	.98	.98	106.	96.	3.0	126.	37.8
17.1NW			.150	.37	.37	106.	96.	2.0	122.	23.1
12.0NW			.150	.37	.37	104.	96.	2.0	121.	23.0
8.5NW			.200	.49	.49	104.	96.	2.0	124.	26.7
5.7NW			.200	.49	.49	104.	96.	2.0	123.	26.7
3.2NW			.200	.49	.49	103.	95.	2.0	119.	26.6
1.0NW	1545.0	853.711	.210	.52	.52	103.	95.	2.0	121.	27.3

O R S A T

CO2	.0
O2	20.5
CO	.0
N	79.5

IMPINGER NO.	1	5.8
	2	2.7
	3	1.1
	4	.0
ABSORBED H2O		15.0

CONTROL BOX CALIBRATIONS

	FACTOR	DATE
ORIFICE	1.519	12-27-89
METER	0.9624	12-27-89
PITOT	0.84	2-26-90

LEAK CHECK

	RATE	IN.HG
INITIAL	LT 0.02CFM	5.0
FINAL	0.008 CFM	7.0

CONTROL BOX NO. 2 PROBE NO. 5-5 NOZZLE NO. 39

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 9
CLR-M9-1 3-12-90

STACK SAMPLING CALCULATIONS

A.	BAROMETRIC PRESSURE IN. HG.....	29.37
B.	AVG. DELTA H (IN H2O).....	.88
C.	METER PRESSURE (IN. HG.).....	29.43
D.	STATIC PRESSURE (IN. H2O).....	.40
E.	STATIC PRESSURE (IN. HG.).....	.029
F.	STACK PRESSURE (IN. HG.) (A+E).....	29.40
G.	STACK DIAMETER (IN.).....	48.00
H.	STACK AREA (SQ. FT.).....	12.57
	NOZZLE DIAMETER.....	.2320
I.	NOZZLE AREA (SQ. FT.).....	.000294
J.	AVG. STACK TEMP (DEG. R.).....	583.0
K.	AVG. METER TEMP (DEG. R.).....	557.2
L.	CONDENSATE VOL. (ML).....	9.6
M.	ABSORBED H2O (ML).....	15.0
N.	TOTAL H2O (ML).....	24.6
O.	METERED GAS (CF).....	72.595
P.	GAS METER CORRECTION.....	.9624
Q.	CORRECTED METERED GAS (CF).....	69.865
R.	H2O GAS VOLUME (CF) (0.00267N(K/C).....	1.243
S.	TOTAL SAMPLED VOLUME (CF) (Q+R).....	71.109
T.	PERCENT H2O (100R/S).....	1.75
	THEORETICAL MAXIMUM.....	12.75
	PERCENT WATER USED.....	1.75
U.	SCFD GAS SAMPLED (528*Q*C/(29.9*K)).....	65.176

V. MOLECULAR WEIGHT OF STACK GAS

COMPONENT	ORSAT-DRY VOL.PCT./100	X	MOISTURE CORRECTION (1-T/100)	X	MOLECULAR WEIGHT	=	WEIGHT PER MOLE
CO2	.000	X	.9825	X	44.0	=	.00
CO	.000	X	.9825	X	28.0	=	.00
O2	.205	X	.9825	X	32.0	=	6.45
N2	.795	X	.9825	X	28.2	=	22.03
H2O		X	T/100= .0175	X	18.0	=	.31
					MOLECULAR WEIGHT OF STACK GAS	=	28.79

W.	PITOT CORRECTION.....	.840
X.	AVERAGE CORRECTED VELOCITY (FPS).....	34.56
	[85.49*W*SQRT{(J*DELTA P)/(V*F)}]	
Y.	AVG. FLOW RATE (CFM) (X*H*60).....	26054.
Z.	STACK FLOW RATE (SCFM) (528*Y/J*F/29.92).....	23185.
	STACK FLOW RATE (DRY).....	22780.
AA.	SAMPLE TIME (SEC).....	7200.
BB.	PERCENT ISOKINETIC.....	102.06
	(J*100*U*29.92)/(528*X*AA*I*F*(1-T/100))	

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 9
CLR-M9-1 3-12-90

PARAMETER	CYCLONE WT. (G)	MATL.ON FILTER(G)	INSOL.MATL. IN PROBE(G)	SOL.MATL. IN PROBE(G)
PARTICULATE	.00000	.00090	.00000	.00050

PARAMETER	INSOL.MATL. IN IMP.(G)	SOLUBLE MATL. IN IMP.(G)
PARTICULATE	.00290	.00370
PARTICULATE	.00800	
ALL MATLS.	.00800	

PARAMETER	GR/SCFD	LB/HR
PARTICULATE	.00102	.19839

Emission rates are based on the PA method.
The soluble impinger weight is excluded from the calculations

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE
MODULE 10

DATE: 3-12-90
CHARGE #: ...150-601000
TEST #: CLR-M10-1

1. EMISSION RESULTS

PARAMETER	GR/SCFD	LB/HR
PARTICULATE	.00118	.22070

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2. STACK CONDITIONS

FLOW (ACFM)	24977.
(SCFM)	22256.
MOISTURE CONTENT (%)	1.73
STACK TEMPERATURE (F)	122.3

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3. SAMPLING CONDITIONS

SAMPLE TIME (MIN.)	120.0
SCFD GAS SAMPLED	61.482
PERCENT ISOKINETIC	96.09

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 10
CLR-M10-1 3-12-90

FIELD DATA AND VELOCITY CALCULATIONS

POINT	TIME	METER READING (DRY) CF	DELTA P IN.H2O	ORIFICE DELTA H REQ	ORIFICE DELTA H ACT	METER TEMP DEG F IN	METER TEMP DEG F OUT	VACUUM IN.HG.	STACK TEMP DEG F	CORRECTED VELOCITY FT/SEC
47.0SW	1125.0	299.019	.550	1.58	1.58	90.	82.	6.5	123.	44.2
44.8SW			.320	.90	.90	92.	83.	5.0	122.	33.7
42.3SW			.600	1.68	1.68	100.	88.	7.0	126.	46.3
39.5SW			.200	.56	.56	104.	91.	3.0	118.	26.5
36.0SW			.400	1.12	1.12	107.	91.	5.0	122.	37.7
30.9SW			.370	1.04	1.04	110.	92.	4.5	120.	36.2
17.1SW			.200	.56	.56	111.	94.	3.0	122.	26.6
12.0SW			.200	.56	.56	111.	95.	3.0	124.	26.7
8.5SW			.200	.56	.56	104.	95.	3.0	129.	26.8
5.7SW			.200	.56	.56	107.	94.	3.0	123.	26.7
3.2SW			.160	.46	.46	108.	95.	2.5	119.	23.8
1.0SW	1225.0	331.467	.160	.46	.46	109.	95.	2.5	115.	23.7
47.0NW	1445.0	331.467	.270	.78	.78	104.	96.	4.0	118.	30.8
44.8NW			.360	1.04	1.04	110.	96.	5.0	126.	35.8
42.3NW			.360	1.04	1.04	116.	96.	5.0	127.	35.9
39.5NW			.310	.89	.89	117.	97.	4.0	123.	33.2
36.0NW			.270	.78	.78	117.	98.	4.0	123.	31.0
30.9NW			.260	.75	.75	118.	99.	4.0	123.	30.4
17.1NW			.340	.98	.98	120.	99.	4.5	123.	34.7
12.0NW			.400	1.15	1.15	122.	100.	5.5	123.	37.7
8.5NW			.430	1.24	1.24	121.	101.	5.5	121.	39.0
5.7NW			.380	1.10	1.10	120.	101.	5.0	125.	36.8
3.2NW			.300	.87	.87	119.	101.	4.0	121.	32.6
1.0NW	1545.0	367.104	.420	1.21	1.21	121.	101.	5.5	118.	38.5

O R S A T

CO2	.0
O2	20.5
CO	.0
N	79.5

IMPINGER NO.	1	6.5
	2	3.5
	3	1.3
	4	.0
ABSORBED H2O		11.6

CONTROL BOX CALIBRATIONS

	FACTOR	DATE
ORIFICE	1.634	12-28-89
METER	0.9778	12-28-89
PITOT	0.84	2-26-90

LEAK CHECK

	RATE	IN.HG
INITIAL	LT 0.02CFM	7.0
FINAL	0.013 CFM	7.0

CONTROL BOX NO. 3 PROBE NO. 5-2 NOZZLE NO. 37

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 10
CLR-M10-1 3-12-90

STACK SAMPLING CALCULATIONS

A.	BAROMETRIC PRESSURE IN. HG.....	29.37
B.	AVG. DELTA H (IN H2O).....	.91
C.	METER PRESSURE (IN. HG.).....	29.44
D.	STATIC PRESSURE (IN. H2O).....	.40
E.	STATIC PRESSURE (IN. HG.).....	.029
F.	STACK PRESSURE (IN. HG.) (A+E).....	29.40
G.	STACK DIAMETER (IN.).....	48.00
H.	STACK AREA (SQ. FT.).....	12.57
	NOZZLE DIAMETER.....	.2370
I.	NOZZLE AREA (SQ. FT.).....	.000306
J.	AVG. STACK TEMP (DEG. R.).....	582.3
K.	AVG. METER TEMP (DEG. R.).....	562.9
L.	CONDENSATE VOL. (ML).....	11.3
M.	ABSORBED H2O (ML).....	11.6
N.	TOTAL H2O (ML).....	22.9
O.	METERED GAS (CF).....	68.085
P.	GAS METER CORRECTION.....	.9778
Q.	CORRECTED METERED GAS (CF).....	66.574
R.	H2O GAS VOLUME (CF) (0.00267N(K/C).....	1.169
S.	TOTAL SAMPLED VOLUME (CF) (Q+R).....	67.743
T.	PERCENT H2O (100R/S).....	1.73
	THEORETICAL MAXIMUM.....	12.40
	PERCENT WATER USED.....	1.73
U.	SCFD GAS SAMPLED (528*Q*C/(29.9*K)).....	61.482

V. MOLECULAR WEIGHT OF STACK GAS

COMPONENT	ORSAT-DRY VOL.PCT./100	X	MOISTURE CORRECTION (1-T/100)	X	MOLECULAR WEIGHT	=	WEIGHT PER MOLE
CO2	.000	X	.9827	X	44.0	=	.00
CO	.000	X	.9827	X	28.0	=	.00
O2	.205	X	.9827	X	32.0	=	6.45
N2	.795	X	.9827	X	28.2	=	22.03
H2O		X	T/100= .0173	X	18.0	=	.31
					MOLECULAR WEIGHT OF STACK GAS	=	28.79

W.	PITOT CORRECTION.....	.840
X.	AVERAGE CORRECTED VELOCITY (FPS).....	33.13
	[85.49*W*SQRT{(J*DELTA P)/(V*F)}]	
Y.	AVG. FLOW RATE (CFM) (X*H*60).....	24977.
Z.	STACK FLOW RATE (SCFM) (528*Y/J*F/29.92).....	22256.
	STACK FLOW RATE (DRY).....	21872.
AA.	SAMPLE TIME (SEC).....	7200.
BB.	PERCENT ISOKINETIC.....	96.09
	(J*100*U*29.92)/(528*X*AA*I*F*(1-T/100))	

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 10
CLR-M10-1 3-12-90

PARAMETER	CYCLONE WT. (G)	MATL.ON FILTER(G)	INSOL.MATL. IN PROBE(G)	SOL.MATL. IN PROBE(G)
PARTICULATE	.00000	.00010	.00000	.00180

PARAMETER	INSOL.MATL. IN IMP.(G)	SOLUBLE MATL. IN IMP.(G)
PARTICULATE	.00280	.00320
PARTICULATE	.00790	
ALL MATLS.	.00790	

PARAMETER	GR/SCFD	LB/HR
PARTICULATE	.00118	.22070

Emission rates are based on the PA method.
The soluble impinger weight is excluded from the calculations

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE
MODULE 11

DATE: 3-12-90
CHARGE #: ...150-601000
TEST #: CLR-M11-1

1. EMISSION RESULTS

PARAMETER	GR/SCFD	LB/HR
PARTICULATE	.00188	.42779

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2. STACK CONDITIONS

FLOW (ACFM)	30901.
(SCFM)	27037.
MOISTURE CONTENT (%)	1.75
STACK TEMPERATURE (F)	132.7

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3. SAMPLING CONDITIONS

SAMPLE TIME (MIN.)	120.0
SCFD GAS SAMPLED	53.278
PERCENT ISOKINETIC	95.32

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 11
CLR-M11-1 3-12-90

FIELD DATA AND VELOCITY CALCULATIONS

POINT	TIME	METER READING (DRY) CF	DELTA P IN.H2O	ORIFICE DELTA H REQ	ORIFICE DELTA H ACT	METER TEMP DEG F IN	METER TEMP DEG F OUT	VACUUM IN.HG.	STACK TEMP DEG F	CORRECTED VELOCITY FT/SEC
47.0SW	1125.0	655.561	.400	.63	.63	91.	89.	5.0	130.	37.9
44.8SW			.450	.71	.71	91.	88.	5.5	131.	40.3
42.3SW			.600	.95	.95	92.	91.	6.5	136.	46.7
39.5SW			.500	.79	.79	93.	92.	6.0	131.	42.4
36.0SW			.450	.71	.71	94.	93.	5.5	136.	40.4
30.9SW			.450	.71	.71	96.	94.	5.5	136.	40.4
17.1SW			.450	.71	.71	98.	96.	5.5	133.	40.3
12.0SW			.500	.79	.79	99.	96.	6.0	133.	42.5
8.5SW			.500	.79	.79	101.	102.	6.0	133.	42.5
5.7SW			.450	.71	.71	102.	102.	5.5	132.	40.3
3.2SW			.400	.63	.63	102.	102.	5.0	132.	38.0
1.0SW	1225.0	685.913	.300	.47	.47	103.	103.	4.5	130.	32.8
47.0NW	1445.0	685.913	.400	.63	.63	100.	102.	5.0	132.	38.0
44.8NW			.200	.32	.32	100.	101.	4.0	127.	26.7
42.3NW			.250	.39	.39	100.	101.	4.0	134.	30.1
39.5NW			.250	.39	.39	100.	101.	4.0	137.	30.2
36.0NW			.300	.47	.47	103.	102.	4.5	133.	32.9
30.9NW			.300	.47	.47	103.	102.	4.5	133.	32.9
17.1NW			.600	.95	.95	105.	104.	6.0	128.	46.4
12.0NW			.800	1.26	1.26	106.	106.	8.0	127.	53.5
8.5NW			.800	1.26	1.26	106.	107.	8.0	133.	53.8
5.7NW			.800	1.26	1.26	107.	108.	8.0	134.	53.8
3.2NW			.800	1.26	1.26	107.	108.	8.0	138.	54.0
1.0NW	1545.0	715.645	.600	.95	.95	108.	108.	6.0	135.	46.6

O R S A T

CO2	.0
O2	20.5
CO	.0
N	79.5

IMPINGER NO. 1	4.2
2	2.0
3	.5
4	.0
ABSORBED H2O	13.4

CONTROL BOX CALIBRATIONS

	FACTOR	DATE
ORIFICE	1.762	12-28-89
METER	0.9558	12-28-89
PITOT	0.84	2-26-90

LEAK CHECK

	RATE	IN.HG
INITIAL	LT 0.02CFM	5.0
FINAL	LT 0.02CFM	8.0

CONTROL BOX NO. 4 PROBE NO. 5-4 NOZZLE NO. 45

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 11
CLR-M11-1 3-12-90

STACK SAMPLING CALCULATIONS

A.	BAROMETRIC PRESSURE IN. HG.....	29.37
B.	AVG. DELTA H (IN H2O).....	.76
C.	METER PRESSURE (IN. HG.).....	29.43
D.	STATIC PRESSURE (IN. H2O).....	.20
E.	STATIC PRESSURE (IN. HG.).....	.015
F.	STACK PRESSURE (IN. HG.) (A+E).....	29.38
G.	STACK DIAMETER (IN.).....	48.00
H.	STACK AREA (SQ. FT.).....	12.57
	NOZZLE DIAMETER.....	.2010
I.	NOZZLE AREA (SQ. FT.).....	.000220
J.	AVG. STACK TEMP (DEG. R.).....	592.7
K.	AVG. METER TEMP (DEG. R.).....	560.1
L.	CONDENSATE VOL. (ML).....	6.7
M.	ABSORBED H2O (ML).....	13.4
N.	TOTAL H2O (ML).....	20.1
O.	METERED GAS (CF).....	60.084
P.	GAS METER CORRECTION.....	.9558
Q.	CORRECTED METERED GAS (CF).....	57.428
R.	H2O GAS VOLUME (CF) (0.00267N(K/C).....	1.022
S.	TOTAL SAMPLED VOLUME (CF) (Q+R).....	58.450
T.	PERCENT H2O (100R/S).....	1.75
	THEORETICAL MAXIMUM.....	16.70
	PERCENT WATER USED.....	1.75
U.	SCFD GAS SAMPLED (528*Q*C/(29.9*K)).....	53.278

V. MOLECULAR WEIGHT OF STACK GAS

COMPONENT	ORSAT-DRY VOL.PCT./100	X	MOISTURE CORRECTION (1-T/100)	X	MOLECULAR WEIGHT	=	WEIGHT PER MOLE
CO2	.000	X	.9825	X	44.0	=	.00
CO	.000	X	.9825	X	28.0	=	.00
O2	.205	X	.9825	X	32.0	=	6.45
N2	.795	X	.9825	X	28.2	=	22.03
H2O		X	T/100= .0175	X	18.0	=	.31
					MOLECULAR WEIGHT OF STACK GAS	=	28.79

W.	PITOT CORRECTION.....	.840
X.	AVERAGE CORRECTED VELOCITY (FPS).....	40.98
	[85.49*W*SQRT{(J*DELTA P)/(V*F)}]	
Y.	AVG. FLOW RATE (CFM) (X*H*60).....	30901.
Z.	STACK FLOW RATE (SCFM) (528*Y/J*F/29.92).....	27037.
	STACK FLOW RATE (DRY).....	26564.
AA.	SAMPLE TIME (SEC).....	7200.
BB.	PERCENT ISOKINETIC.....	95.32
	(J*100*U*29.92)/(528*X*AA*I*F*(1-T/100))	

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 11
CLR-M11-1 3-12-90

PARAMETER	CYCLONE WT. (G)	MATL.ON FILTER(G)	INSOL.MATL. IN PROBE(G)	SOL.MATL. IN PROBE(G)
PARTICULATE	.00000	.00170	.00000	.00280

PARAMETER	INSOL.MATL. IN IMP.(G)	SOLUBLE MATL. IN IMP.(G)
PARTICULATE	.00200	.00820

PARTICULATE	.01470
ALL MATLS.	.01470

PARAMETER	GR/SCFD	LB/HR
PARTICULATE	.00188	.42779

Emission rates are based on the PA method.
The soluble impinger weight is excluded from the calculations

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE
MODULE 1

DATE: 3-13-90
CHARGE #: ...150-601000
TEST #: CLR-M1-1

1. EMISSION RESULTS

PARAMETER	GR/SCFD	LB/HR
PARTICULATE	.00138	.33642

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2. STACK CONDITIONS

FLOW (ACFM)	33091.
(SCFM)	28972.
MOISTURE CONTENT (%)	2.07
STACK TEMPERATURE (F)	136.2

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3. SAMPLING CONDITIONS

SAMPLE TIME (MIN.)	120.0
SCFD GAS SAMPLED	61.230
PERCENT ISOKINETIC	94.86

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 1
CLR-M1-1 3-13-90

FIELD DATA AND VELOCITY CALCULATIONS

POINT	TIME	METER READING (DRY) CF	DELTA P IN.H2O	ORIFICE DELTA H REQ	ORIFICE DELTA H ACT	METER TEMP DEG F IN	METER TEMP DEG F OUT	VACUUM IN.HG.	STACK TEMP DEG F	CORRECTED VELOCITY FT/SEC
47.0NE	955.0	715.850	.400	.72	.72	79.	78.	4.5	130.	37.8
44.8NE			.500	.90	.90	80.	79.	5.0	125.	42.1
42.3NE			.600	1.08	1.08	82.	80.	6.0	122.	46.0
39.5NE			.600	1.08	1.08	83.	81.	6.0	131.	46.4
36.0NE			.500	.90	.90	85.	83.	5.0	134.	42.4
30.9NE			.500	.90	.90	87.	86.	5.0	136.	42.5
17.1NE			.500	.90	.90	89.	87.	5.0	136.	42.5
12.0NE			.600	1.08	1.08	90.	89.	6.0	134.	46.5
8.5NE			.400	.72	.72	93.	91.	4.5	137.	38.0
5.7NE			.600	1.09	1.09	94.	93.	6.0	136.	46.6
3.2NE			.600	1.09	1.09	95.	94.	6.0	138.	46.6
1.0NE	1055.0	748.490	.400	.72	.72	96.	95.	6.0	136.	38.0
47.0SE	1125.0	748.490	.400	.72	.72	93.	94.	4.5	140.	38.1
44.8SE			.400	.72	.72	94.	95.	4.5	140.	38.1
42.3SE			.400	.72	.72	95.	95.	4.5	138.	38.1
39.5SE			.400	.72	.72	95.	95.	4.5	138.	38.1
36.0SE			.400	.72	.72	96.	96.	4.5	140.	38.1
30.9SE			.400	.72	.72	97.	97.	4.5	140.	38.1
17.1SE			.600	1.08	1.08	98.	97.	6.0	140.	46.7
12.0SE			.600	1.08	1.08	98.	98.	6.0	142.	46.8
8.5SE			.800	1.45	1.45	100.	99.	7.5	142.	54.0
5.7SE			.800	1.45	1.45	100.	100.	7.5	138.	53.9
3.2SE			.800	1.45	1.45	101.	100.	7.5	138.	53.9
1.0SE	1225.0	783.470	.800	1.45	1.45	101.	100.	7.5	138.	53.9

O R S A T

CO2	.0
O2	20.5
CO	.0
N	79.5

IMPINGER NO.	1	9.9
	2	4.4
	3	1.5
	4	.0
ABSORBED H2O		11.6

CONTROL BOX CALIBRATIONS

	FACTOR	DATE
ORIFICE	1.762	12-28-89
METER	0.9558	12-28-89
PITOT	0.84	2-26-90

LEAK CHECK

	RATE	IN.HG
INITIAL	LT 0.02CFM	5.0
FINAL	0.010 CFM	8.0

CONTROL BOX NO. 4 PROBE NO. 5-3 NOZZLE NO. 44

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 1
CLR-M1-1 3-13-90

STACK SAMPLING CALCULATIONS

A.	BAROMETRIC PRESSURE IN. HG.....	29.55
B.	AVG. DELTA H (IN H2O).....	.98
C.	METER PRESSURE (IN. HG.).....	29.62
D.	STATIC PRESSURE (IN. H2O).....	.40
E.	STATIC PRESSURE (IN. HG.).....	.029
F.	STACK PRESSURE (IN. HG.) (A+E).....	29.58
G.	STACK DIAMETER (IN.).....	48.00
H.	STACK AREA (SQ. FT.).....	12.57
	NOZZLE DIAMETER.....	.2090
I.	NOZZLE AREA (SQ. FT.).....	.000238
J.	AVG. STACK TEMP (DEG. R.).....	596.2
K.	AVG. METER TEMP (DEG. R.).....	552.1
L.	CONDENSATE VOL. (ML).....	15.8
M.	ABSORBED H2O (ML).....	11.6
N.	TOTAL H2O (ML).....	27.4
O.	METERED GAS (CF).....	67.620
P.	GAS METER CORRECTION.....	.9558
Q.	CORRECTED METERED GAS (CF).....	64.631
R.	H2O GAS VOLUME (CF) (0.00267N(K/C).....	1.364
S.	TOTAL SAMPLED VOLUME (CF) (Q+R).....	65.995
T.	PERCENT H2O (100R/S).....	2.07
	THEORETICAL MAXIMUM.....	17.94
	PERCENT WATER USED.....	2.07
U.	SCFD GAS SAMPLED (528*Q*C/(29.9*K)).....	61.230

V. MOLECULAR WEIGHT OF STACK GAS

COMPONENT	ORSAT-DRY VOL.PCT./100	X	MOISTURE CORRECTION (1-T/100)	X	MOLECULAR WEIGHT	=	WEIGHT PER MOLE
CO2	.000	X	.9793	X	44.0	=	.00
CO	.000	X	.9793	X	28.0	=	.00
O2	.205	X	.9793	X	32.0	=	6.42
N2	.795	X	.9793	X	28.2	=	21.96
H2O		X	T/100= .0207	X	18.0	=	.37
					MOLECULAR WEIGHT OF STACK GAS	=	28.75

W.	PITOT CORRECTION.....	.840
X.	AVERAGE CORRECTED VELOCITY (FPS).....	43.89
	[85.49*W*SQRT{(J*DELTA P)/(V*F)}]	
Y.	AVG. FLOW RATE (CFM) (X*H*60).....	33091.
Z.	STACK FLOW RATE (SCFM) (528*Y/J*F/29.92).....	28972.
	STACK FLOW RATE (DRY).....	28373.
AA.	SAMPLE TIME (SEC).....	7200.
BB.	PERCENT ISOKINETIC.....	94.86
	(J*100*U*29.92)/(528*X*AA*I*F*(1-T/100))	

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 1
CLR-M1-1 3-13-90

PARAMETER	CYCLONE WT. (G)	MATL.ON FILTER(G)	INSOL.MATL. IN PROBE(G)	SOL.MATL. IN PROBE(G)
PARTICULATE	.00000	.00150	.00000	.00130

PARAMETER	INSOL.MATL. IN IMP.(G)	SOLUBLE MATL. IN IMP.(G)
PARTICULATE	.00270	.01050

PARTICULATE	.01600
ALL MATLS.	.01600

PARAMETER	GR/SCFD	LB/HR
PARTICULATE	.00138	.33642

Emission rates are based on the PA method.
The soluble impinger weight is excluded from the calculations

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE
MODULE 3

DATE: 3-13-90
CHARGE #: ...150-601000
TEST #: CLR-M3-1

1. EMISSION RESULTS

PARAMETER	GR/SCFD	LB/HR
PARTICULATE	.00117	.30174

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2. STACK CONDITIONS

FLOW (ACFM)	34611.
(SCFM)	30792.
MOISTURE CONTENT (%)	1.87
STACK TEMPERATURE (F)	126.6

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3. SAMPLING CONDITIONS

SAMPLE TIME (MIN.)	120.0
SCFD GAS SAMPLED	83.279
PERCENT ISOKINETIC	98.31

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 3
CLR-M3-1 3-13-90

FIELD DATA AND VELOCITY CALCULATIONS

POINT	TIME	METER READING (DRY) CF	DELTA P IN.H2O	ORIFICE DELTA H REQ	ORIFICE DELTA H ACT	METER TEMP DEG F IN	METER TEMP DEG F OUT	VACUUM IN.HG.	STACK TEMP DEG F	CORRECTED VELOCITY FT/SEC
47.0NE	955.0	855.392	.600	1.46	1.46	84.	79.	10.0	122.	46.0
44.8NE			.600	1.46	1.46	89.	81.	10.0	117.	45.8
42.3NE			.700	1.70	1.70	91.	82.	13.0	115.	49.4
39.5NE			.600	1.46	1.46	92.	84.	11.0	125.	46.1
36.0NE			.600	1.46	1.46	93.	85.	11.0	120.	45.9
30.9NE			.500	1.22	1.22	95.	86.	8.2	126.	42.1
17.1NE			.500	1.22	1.22	96.	87.	8.8	123.	42.0
12.0NE			.600	1.46	1.46	97.	87.	10.4	119.	45.9
8.5NE			.700	1.70	1.70	98.	88.	12.3	129.	50.0
5.7NE			.700	1.70	1.70	97.	89.	12.3	124.	49.8
3.2NE			.700	1.70	1.70	97.	89.	12.3	123.	49.7
1.0NE	1055.0	901.468	.600	1.46	1.46	98.	90.	10.8	121.	46.0
47.0SE	1125.0	901.468	.400	.97	.97	94.	91.	7.0	133.	37.9
44.8SE			.400	.97	.97	98.	92.	7.0	126.	37.7
42.3SE			.400	.97	.97	100.	92.	7.0	139.	38.1
39.5SE			.200	.49	.49	100.	92.	4.0	127.	26.7
36.0SE			.300	.73	.73	101.	92.	5.3	133.	32.8
30.9SE			.400	.97	.97	101.	93.	7.0	138.	38.1
17.1SE			.600	1.46	1.46	102.	93.	10.3	126.	46.2
12.0SE			.800	1.95	1.95	101.	93.	14.0	134.	53.7
8.5SE			1.000	2.44	2.44	104.	93.	15.0	130.	59.8
5.7SE			1.200	2.92	2.92	106.	94.	16.0	127.	65.3
3.2SE			.900	2.19	2.19	106.	95.	14.5	132.	56.8
1.0SE	1225.0	946.832	.700	1.70	1.70	105.	94.	12.0	129.	50.0

O R S A T	
CO2	.0
O2	20.5
CO	.0
N	79.5

IMPINGER NO.	
1	7.0
2	8.1
3	2.7
4	.0
ABSORBED H2O	15.8

CONTROL BOX CALIBRATIONS

	FACTOR	DATE
ORIFICE	1.519	12-27-89
METER	0.9624	12-27-89
PITOT	0.84	2-26-90

LEAK CHECK

	RATE	IN.HG
INITIAL	LT 0.02CFM	5.0
FINAL	0.010 CFM	15.0

CONTROL BOX NO. 2 PROBE NO. 5-5 NOZZLE NO. 39

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 3
CLR-M3-1 3-13-90

STACK SAMPLING CALCULATIONS

A.	BAROMETRIC PRESSURE IN. HG	29.55
B.	AVG. DELTA H (IN H2O)	1.49
C.	METER PRESSURE (IN. HG.)	29.66
D.	STATIC PRESSURE (IN. H2O)	.30
E.	STATIC PRESSURE (IN. HG.)	.022
F.	STACK PRESSURE (IN. HG.) (A+E)	29.57
G.	STACK DIAMETER (IN.)	48.00
H.	STACK AREA (SQ. FT.)	12.57
	NOZZLE DIAMETER	.2320
I.	NOZZLE AREA (SQ. FT.)	.000294
J.	AVG. STACK TEMP (DEG. R.)	586.6
K.	AVG. METER TEMP (DEG. R.)	553.5
L.	CONDENSATE VOL. (ML)	17.8
M.	ABSORBED H2O (ML)	15.8
N.	TOTAL H2O (ML)	33.6
O.	METERED GAS (CF)	91.440
P.	GAS METER CORRECTION	.9624
Q.	CORRECTED METERED GAS (CF)	88.002
R.	H2O GAS VOLUME (CF) (0.00267N(K/C)	1.674
S.	TOTAL SAMPLED VOLUME (CF) (Q+R)	89.676
T.	PERCENT H2O (100R/S)	1.87
	THEORETICAL MAXIMUM	14.13
	PERCENT WATER USED	1.87
U.	SCFD GAS SAMPLED (528*Q*C/(29.9*K))	83.279

V. MOLECULAR WEIGHT OF STACK GAS

COMPONENT	ORSAT-DRY VOL.PCT./100	X	MOISTURE CORRECTION (1-T/100)	X	MOLECULAR WEIGHT	=	WEIGHT PER MOLE
CO2	.000	X	.9813	X	44.0	=	.00
CO	.000	X	.9813	X	28.0	=	.00
O2	.205	X	.9813	X	32.0	=	6.44
N2	.795	X	.9813	X	28.2	=	22.00
H2O		X	T/100= .0187	X	18.0	=	.34
					MOLECULAR WEIGHT OF STACK GAS	=	28.77

W.	PITOT CORRECTION	.840
X.	AVERAGE CORRECTED VELOCITY (FPS)	45.90
	[85.49*W*SQRT{(J*DELTA P)/(V*F)}]	
Y.	AVG. FLOW RATE (CFM) (X*H*60)	34611.
Z.	STACK FLOW RATE (SCFM) (528*Y/J*F/29.92)	30792.
	STACK FLOW RATE (DRY)	30217.
AA.	SAMPLE TIME (SEC)	7200.
BB.	PERCENT ISOKINETIC	98.31
	(J*100*U*29.92)/(528*X*AA*I*F*(1-T/100))	

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 3
CLR-M3-1 3-13-90

PARAMETER	CYCLONE WT. (G)	MATL.ON FILTER(G)	INSOL.MATL. IN PROBE(G)	SOL.MATL. IN PROBE(G)
PARTICULATE	.00000	.00010	.00000	.00330

PARAMETER	INSOL.MATL. IN IMP.(G)	SOLUBLE MATL. IN IMP.(G)
PARTICULATE	.00290	.00500
PARTICULATE	.01130	
ALL MATLS.	.01130	

PARAMETER	GR/SCFD	LB/HR
PARTICULATE	.00117	.30174

Emission rates are based on the PA method.
The soluble impinger weight is excluded from the calculations

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE
MODULE 4

DATE: 3-13-90
CHARGE #: ...150-601000
TEST #: CLR-M4-1

1. EMISSION RESULTS

PARAMETER	GR/SCFD	LB/HR
PARTICULATE	.00131	.33508

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2. STACK CONDITIONS

FLOW (ACFM)	34955.
(SCFM)	30075.
MOISTURE CONTENT (%)	1.09
STACK TEMPERATURE (F)	146.5

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3. SAMPLING CONDITIONS

SAMPLE TIME (MIN.)	120.0
SCFD GAS SAMPLED	82.031
PERCENT ISOKINETIC	98.37

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 4
CLR-M4-1 3-13-90

FIELD DATA AND VELOCITY CALCULATIONS

POINT	TIME	METER READING (DRY) CF	DELTA P IN.H2O	ORIFICE DELTA H REQ	ORIFICE DELTA H ACT	METER TEMP DEG F IN	METER TEMP DEG F OUT	VACUUM IN.HG.	STACK TEMP DEG F	CORRECTED VELOCITY FFT/SEC
47.0NE	1425.0	947.127	.300	.71	.71	96.	93.	4.1	148.	33.2
44.8NE			.300	.71	.71	101.	94.	4.1	146.	33.1
42.3NE			.300	.71	.71	102.	95.	4.1	149.	33.2
39.5NE			.400	.95	.95	102.	94.	5.3	156.	38.6
36.0NE			.400	.95	.95	103.	95.	5.3	147.	38.3
30.9NE			.500	1.19	1.19	104.	96.	7.0	151.	43.0
17.1NE			.600	1.43	1.43	104.	96.	8.2	147.	46.9
12.0NE			.800	1.90	1.90	103.	96.	11.9	146.	54.1
8.5NE			.900	2.14	2.14	101.	95.	14.7	158.	58.0
5.7NE			1.000	2.34	2.34	99.	94.	15.6	151.	60.8
3.2NE			1.000	2.34	2.34	97.	93.	15.6	148.	60.6
1.0NE	1525.0	990.405	.200	.47	.47	97.	92.	3.0	143.	27.0
47.0SE	1545.0	990.405	.800	1.87	1.87	99.	95.	11.3	147.	54.2
44.8SE			.800	1.87	1.87	102.	96.	11.3	144.	54.0
42.3SE			.700	1.64	1.64	103.	96.	10.0	142.	50.5
39.5SE			.700	1.64	1.64	105.	96.	10.0	140.	50.4
36.0SE			.500	1.17	1.17	106.	97.	7.0	140.	42.6
30.9SE			.500	1.17	1.17	107.	98.	7.0	138.	42.5
17.1SE			.600	1.40	1.40	108.	99.	7.8	150.	47.0
12.0SE			.800	1.87	1.87	107.	98.	11.2	145.	54.1
8.5SE			.200	.47	.47	106.	99.	2.9	152.	27.2
5.7SE			1.000	2.34	2.34	108.	99.	15.3	146.	60.5
3.2SE			1.000	2.34	2.34	105.	99.	15.3	150.	60.7
1.0SE	1645.0	1038.179	.500	1.17	1.17	104.	99.	7.0	133.	42.3

O R S A T

CO2	.0
O2	20.5
CO	.0
N	79.5

IMPINGER NO.	1	2.1
	2	.2
	3	2.0
	4	.0
ABSORBED H2O		14.8

CONTROL BOX CALIBRATIONS

	FACTOR	DATE
ORIFICE	1.519	12-27-89
METER	0.9624	12-27-89
PITOT	0.84	2-26-90

LEAK CHECK

	RATE	IN.HG
INITIAL	LT 0.02CFM	5.0
FINAL	0.010 CFM	15.0

CONTROL BOX NO. 2 PROBE NO. 5-5 NOZZLE NO. 39

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 4
CLR-M4-1 3-13-90

STACK SAMPLING CALCULATIONS

A.	BAROMETRIC PRESSURE IN. HG.....	29.55
B.	AVG. DELTA H (IN H2O).....	1.45
C.	METER PRESSURE (IN. HG.).....	29.66
D.	STATIC PRESSURE (IN. H2O).....	.30
E.	STATIC PRESSURE (IN. HG.).....	.022
F.	STACK PRESSURE (IN. HG.) (A+E).....	29.57
G.	STACK DIAMETER (IN.).....	48.00
H.	STACK AREA (SQ. FT.).....	12.57
	NOZZLE DIAMETER.....	.2320
I.	NOZZLE AREA (SQ. FT.).....	.000294
J.	AVG. STACK TEMP (DEG. R.).....	606.5
K.	AVG. METER TEMP (DEG. R.).....	559.4
L.	CONDENSATE VOL. (ML).....	4.3
M.	ABSORBED H2O (ML).....	14.8
N.	TOTAL H2O (ML).....	19.1
O.	METERED GAS (CF).....	91.052
P.	GAS METER CORRECTION.....	.9624
Q.	CORRECTED METERED GAS (CF).....	87.628
R.	H2O GAS VOLUME (CF) (0.00267N(K/C).....	.962
S.	TOTAL SAMPLED VOLUME (CF) (Q+R).....	88.590
T.	PERCENT H2O (100R/S).....	1.09
	THEORETICAL MAXIMUM.....	23.78
	PERCENT WATER USED.....	1.09
U.	SCFD GAS SAMPLED (528*Q*C/(29.9*K)).....	82.031

V. MOLECULAR WEIGHT OF STACK GAS

COMPONENT	ORSAT-DRY VOL.PCT./100	X	MOISTURE CORRECTION (1-T/100)	X	MOLECULAR WEIGHT	=	WEIGHT PER MOLE
CO2	.000	X	.9891	X	44.0	=	.00
CO	.000	X	.9891	X	28.0	=	.00
O2	.205	X	.9891	X	32.0	=	6.49
N2	.795	X	.9891	X	28.2	=	22.18
H2O		X	T/100= .0109	X	18.0	=	.20
					MOLECULAR WEIGHT OF STACK GAS	=	28.86

W.	PITOT CORRECTION.....	.840
X.	AVERAGE CORRECTED VELOCITY (FPS).....	46.36
	[85.49*W*SQRT{(J*DELTA P)/(V*F)}]	
Y.	AVG. FLOW RATE (CFM) (X*H*60).....	34955.
Z.	STACK FLOW RATE (SCFM) (528*Y/J*F/29.92).....	30075.
	STACK FLOW RATE (DRY).....	29748.
AA.	SAMPLE TIME (SEC).....	7200.
BB.	PERCENT ISOKINETIC.....	98.37
	(J*100*U*29.92)/(528*X*AA*I*F*(1-T/100))	

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 4
CLR-M4-1 3-13-90

PARAMETER	CYCLONE WT. (G)	MATL.ON FILTER(G)	INSOL.MATL. IN PROBE(G)	SOL.MATL. IN PROBE(G)
PARTICULATE	.00000	.00220	.00000	.00280

PARAMETER	INSOL.MATL. IN IMP.(G)	SOLUBLE MATL. IN IMP.(G)
PARTICULATE	.00200	.02010
PARTICULATE	.02710	
ALL MATLS.	.02710	

PARAMETER	GR/SCFD	LB/HR
PARTICULATE	.00131	.33508

Emission rates are based on the PA method.
The soluble impinger weight is excluded from the calculations

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE
MODULE 5

DATE: 3-13-90
CHARGE #: ...150-601000
TEST #: CLR-M5-1

1. EMISSION RESULTS

PARAMETER	GR/SCFD	LB/HR
PARTICULATE	.00253	.51420

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2. STACK CONDITIONS

FLOW (ACFM)	28121.
(SCFM)	24242.
MOISTURE CONTENT (%)	2.25
STACK TEMPERATURE (F)	145.4

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3. SAMPLING CONDITIONS

SAMPLE TIME (MIN.)	120.0
SCFD GAS SAMPLED	51.707
PERCENT ISOKINETIC	95.91

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 5
CLR-M5-1 3-13-90

FIELD DATA AND VELOCITY CALCULATIONS

POINT	TIME	METER READING (DRY) CF	DELTA P IN.H2O	ORIFICE DELTA H REQ	ORIFICE DELTA H ACT	METER TEMP DEG F IN	METER TEMP DEG F OUT	VACUUM IN.HG.	STACK TEMP DEG F	CORRECTED VELOCITY FT/SEC
47.0NE	1425.0	783.600	.300	.54	.54	95.	96.	5.0	146.	33.2
44.8NE			.300	.54	.54	97.	96.	5.0	149.	33.3
42.3NE			.300	.54	.54	98.	97.	5.0	148.	33.3
39.5NE			.300	.54	.54	98.	97.	5.0	142.	33.1
36.0NE			.350	.64	.64	101.	99.	5.0	139.	35.7
30.9NE			.400	.73	.73	102.	101.	5.0	149.	38.4
17.1NE			.500	.91	.91	104.	103.	6.0	147.	42.9
12.0NE			.500	.91	.91	104.	104.	6.0	145.	42.8
8.5NE			.500	.91	.91	104.	104.	6.0	150.	43.0
5.7NE			.400	.73	.73	104.	104.	6.0	149.	38.4
3.2NE			.400	.73	.73	104.	104.	6.0	144.	38.3
1.0NE	1525.0	812.564	.400	.73	.73	104.	104.	6.0	144.	38.3
47.0SE	1545.0	812.564	.300	.54	.54	105.	107.	5.0	145.	33.2
44.8SE			.300	.54	.54	105.	107.	5.0	146.	33.2
42.3SE			.400	.73	.73	107.	107.	5.0	143.	38.3
39.5SE			.400	.73	.73	107.	107.	5.0	145.	38.3
36.0SE			.400	.73	.73	107.	107.	5.0	146.	38.4
30.9SE			.400	.73	.73	107.	108.	5.0	141.	38.2
17.1SE			.400	.73	.73	107.	108.	5.0	140.	38.2
12.0SE			.400	.73	.73	108.	108.	5.0	144.	38.3
8.5SE			.400	.73	.73	108.	108.	5.0	148.	38.4
5.7SE			.400	.73	.73	108.	108.	5.0	146.	38.4
3.2SE			.400	.73	.73	108.	108.	5.0	145.	38.3
1.0SE	1645.0	841.990	.300	.54	.54	108.	109.	5.0	148.	33.3

O R S A T

CO2	.0
O2	20.5
CO	.0
N	79.5

IMPINGER NO.	1	5.0
	2	3.3
	3	1.7
	4	.0
ABSORBED H2O		15.2

CONTROL BOX CALIBRATIONS

	FACTOR	DATE
ORIFICE	1.762	12-28-89
METER	0.9558	12-28-89
PITOT	0.84	2-26-90

LEAK CHECK

	RATE	IN.HG
INITIAL	LT 0.02CFM	5.0
FINAL	0.010 CFM	6.0

CONTROL BOX NO. 4 PROBE NO. 5-3 NOZZLE NO. 44

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 5
CLR-M5-1 3-13-90

STACK SAMPLING CALCULATIONS

A.	BAROMETRIC PRESSURE IN. HG.....	29.55
B.	AVG. DELTA H (IN H2O).....	.69
C.	METER PRESSURE (IN. HG.).....	29.60
D.	STATIC PRESSURE (IN. H2O).....	.30
E.	STATIC PRESSURE (IN. HG.).....	.022
F.	STACK PRESSURE (IN. HG.) (A+E).....	29.57
G.	STACK DIAMETER (IN.).....	48.00
H.	STACK AREA (SQ. FT.).....	12.57
	NOZZLE DIAMETER.....	.2090
I.	NOZZLE AREA (SQ. FT.).....	.000238
J.	AVG. STACK TEMP (DEG. R.).....	605.4
K.	AVG. METER TEMP (DEG. R.).....	564.2
L.	CONDENSATE VOL. (ML).....	10.0
M.	ABSORBED H2O (ML).....	15.2
N.	TOTAL H2O (ML).....	25.2
O.	METERED GAS (CF).....	58.390
P.	GAS METER CORRECTION.....	.9558
Q.	CORRECTED METERED GAS (CF).....	55.809
R.	H2O GAS VOLUME (CF) (0.00267N(K/C).....	1.282
S.	TOTAL SAMPLED VOLUME (CF) (Q+R).....	57.092
T.	PERCENT H2O (100R/S).....	2.25
	THEORETICAL MAXIMUM.....	22.61
	PERCENT WATER USED.....	2.25
U.	SCFD GAS SAMPLED (528*Q*C/(29.9*K)).....	51.707

V. MOLECULAR WEIGHT OF STACK GAS

COMPONENT	ORSAT-DRY VOL.PCT./100	X	MOISTURE CORRECTION (1-T/100)	X	MOLECULAR WEIGHT	=	WEIGHT PER MOLE
CO2	.000	X	.9775	X	44.0	=	.00
CO	.000	X	.9775	X	28.0	=	.00
O2	.205	X	.9775	X	32.0	=	6.41
N2	.795	X	.9775	X	28.2	=	21.92
H2O		X	T/100= .0225	X	18.0	=	.40
					MOLECULAR WEIGHT OF STACK GAS	=	28.73

W.	PITOT CORRECTION.....	.840
X.	AVERAGE CORRECTED VELOCITY (FPS).....	37.30
	[85.49*W*SQRT{(J*DELTA P)/(V*F)}]	
Y.	AVG. FLOW RATE (CFM) (X*H*60).....	28121.
Z.	STACK FLOW RATE (SCFM) (528*Y/J*F/29.92).....	24242.
	STACK FLOW RATE (DRY).....	23697.
AA.	SAMPLE TIME (SEC).....	7200.
BB.	PERCENT ISOKINETIC.....	95.91
	(J*100*U*29.92)/(528*X*AA*I*F*(1-T/100))	

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 5
CLR-M5-1 3-13-90

PARAMETER	CYCLONE WT. (G)	MATL.ON FILTER(G)	INSOL.MATL. IN PROBE(G)	SOL.MATL. IN PROBE(G)
PARTICULATE	.00000	.00200	.00000	.00290

PARAMETER	INSOL.MATL. IN IMP.(G)	SOLUBLE MATL. IN IMP.(G)
PARTICULATE	.00360	.01730
PARTICULATE	.02580	
ALL MATLS.	.02580	

PARAMETER	GR/SCFD	LB/HR
PARTICULATE	.00253	.51420

Emission rates are based on the PA method.
The soluble impinger weight is excluded from the calculations

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE
MODULE 6

DATE: 3-13-90
CHARGE #: ...150-601000
TEST #: CLR-M6-1

1. EMISSION RESULTS

PARAMETER	GR/SCFD	LB/HR
PARTICULATE	.00126	.27564

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2. STACK CONDITIONS

FLOW (ACFM)	30160.
(SCFM)	26041.
MOISTURE CONTENT (%)	2.06
STACK TEMPERATURE (F)	144.4

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3. SAMPLING CONDITIONS

SAMPLE TIME (MIN.)	120.0
SCFD GAS SAMPLED	54.961
PERCENT ISOKINETIC	102.41

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 6
CLR-M6-1 3-13-90

FIELD DATA AND VELOCITY CALCULATIONS

POINT	TIME	METER READING (DRY) CF	DELTA P IN.H2O	ORIFICE DELTA H REQ	ORIFICE DELTA H ACT	METER TEMP DEG F IN	METER TEMP DEG F OUT	VACUUM IN.HG.	STACK TEMP DEG F	CORRECTED VELOCITY FT/SEC
47.0NE	1425.0	426.372	.250	.35	.35	98.	91.	2.0	150.	30.4
44.8NE			.250	.35	.35	103.	93.	2.0	150.	30.4
42.3NE			.270	.38	.38	106.	94.	2.0	147.	31.5
39.5NE			.270	.38	.38	107.	94.	2.0	145.	31.5
36.0NE			.270	.39	.39	109.	94.	2.0	147.	31.5
30.9NE			.300	.43	.43	109.	95.	2.5	150.	33.3
17.1NE			.500	.72	.72	110.	95.	3.0	147.	42.9
12.0NE			.600	.86	.86	110.	94.	3.5	146.	47.0
8.5NE			.600	.86	.86	110.	94.	3.5	152.	47.2
5.7NE			.700	1.00	1.00	110.	93.	4.0	147.	50.8
3.2NE			.600	.86	.86	110.	93.	3.5	143.	46.8
1.0NE	1525.0	456.480	.400	.57	.57	110.	93.	2.5	139.	38.1
47.0SE	1545.0	456.480	.400	.57	.57	101.	92.	2.0	145.	38.3
44.8SE			.400	.57	.57	107.	93.	2.5	143.	38.2
42.3SE			.500	.71	.71	109.	95.	3.0	141.	42.7
39.5SE			.500	.71	.71	111.	95.	3.0	140.	42.7
36.0SE			.500	.72	.72	112.	96.	3.0	138.	42.6
30.9SE			.500	.72	.72	113.	96.	3.0	136.	42.5
17.1SE			.400	.58	.58	113.	97.	2.5	146.	38.3
12.0SE			.500	.72	.72	114.	97.	3.0	143.	42.8
8.5SE			.500	.72	.72	114.	97.	3.0	148.	42.9
5.7SE			.600	.87	.87	115.	98.	3.5	142.	46.8
3.2SE			.500	.72	.72	115.	98.	3.0	141.	42.7
1.0SE	1645.0	486.838	.400	.58	.58	115.	99.	2.5	140.	38.1

O R S A T	
CO2	.0
O2	20.5
CO	.0
N	79.5

IMPINGER NO.	1	6.8
	2	1.6
	3	1.9
	4	.0
ABSORBED H2O		14.2

CONTROL BOX CALIBRATIONS

	FACTOR	DATE
ORIFICE	1.634	12-28-89
METER	0.9778	12-28-89
PITOT	0.84	2-26-90

LEAK CHECK

	RATE	IN.HG
INITIAL	LT 0.02CFM	5.0
FINAL	0.005 CFM	6.0

CONTROL BOX NO. 3 PROBE NO. 5-4 NOZZLE NO. 45

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 6
CLR-M6-1 3-13-90

STACK SAMPLING CALCULATIONS

A.	BAROMETRIC PRESSURE IN. HG.....	29.55
B.	AVG. DELTA H (IN H2O).....	.64
C.	METER PRESSURE (IN. HG.).....	29.60
D.	STATIC PRESSURE (IN. H2O).....	.30
E.	STATIC PRESSURE (IN. HG.).....	.022
F.	STACK PRESSURE (IN. HG.) (A+E).....	29.57
G.	STACK DIAMETER (IN.).....	48.00
H.	STACK AREA (SQ. FT.).....	12.57
	NOZZLE DIAMETER.....	.2010
I.	NOZZLE AREA (SQ. FT.).....	.000220
J.	AVG. STACK TEMP (DEG. R.).....	604.4
K.	AVG. METER TEMP (DEG. R.).....	562.2
L.	CONDENSATE VOL. (ML).....	10.3
M.	ABSORBED H2O (ML).....	14.2
N.	TOTAL H2O (ML).....	24.5
O.	METERED GAS (CF).....	60.466
P.	GAS METER CORRECTION.....	.9778
Q.	CORRECTED METERED GAS (CF).....	59.124
R.	H2O GAS VOLUME (CF) (0.00267N(K/C).....	1.243
S.	TOTAL SAMPLED VOLUME (CF) (Q+R).....	60.366
T.	PERCENT H2O (100R/S).....	2.06
	THEORETICAL MAXIMUM.....	22.05
	PERCENT WATER USED.....	2.06
U.	SCFD GAS SAMPLED (528*Q*C/(29.9*K)).....	54.961

V. MOLECULAR WEIGHT OF STACK GAS

COMPONENT	ORSAT-DRY VOL.PCT./100	X	MOISTURE CORRECTION (1-T/100)	X	MOLECULAR WEIGHT	=	WEIGHT PER MOLE
CO2	.000	X	.9794	X	44.0	=	.00
CO	.000	X	.9794	X	28.0	=	.00
O2	.205	X	.9794	X	32.0	=	6.42
N2	.795	X	.9794	X	28.2	=	21.96
H2O		X	T/100= .0206	X	18.0	=	.37
					MOLECULAR WEIGHT OF STACK GAS	=	28.75

W.	PITOT CORRECTION.....	.840
X.	AVERAGE CORRECTED VELOCITY (FPS).....	40.00
	[85.49*W*SQRT{(J*DELTA P)/(V*F)}]	
Y.	AVG. FLOW RATE (CFM) (X*H*60).....	30160.
Z.	STACK FLOW RATE (SCFM) (528*Y/J*F/29.92).....	26041.
	STACK FLOW RATE (DRY).....	25505.
AA.	SAMPLE TIME (SEC).....	7200.
BB.	PERCENT ISOKINETIC.....	102.41
	(J*100*U*29.92)/(528*X*AA*I*F*(1-T/100))	

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 6
CLR-M6-1 3-13-90

PARAMETER	CYCLONE WT. (G)	MATL.ON FILTER(G)	INSOL.MATL. IN PROBE(G)	SOL.MATL. IN PROBE(G)
PARTICULATE	.00000	.00090	.00000	.00070

PARAMETER	INSOL.MATL. IN IMP.(G)	SOLUBLE MATL. IN IMP.(G)
PARTICULATE	.00290	.00850
PARTICULATE	.01300	
ALL MATLS.	.01300	

PARAMETER	GR/SCFD	LB/HR
PARTICULATE	.00126	.27564

Emission rates are based on the PA method.
The soluble impinger weight is excluded from the calculations

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE
MODULE 7

DATE: 3-13-90
CHARGE #: ...150-601000
TEST #: CLR-M7-1

1. EMISSION RESULTS

PARAMETER	GR/SCFD	LB/HR
PARTICULATE	.00142	.33928

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2. STACK CONDITIONS

FLOW (ACFM)	32167.
(SCFM)	28459.
MOISTURE CONTENT (%)	1.76
STACK TEMPERATURE (F)	130.0

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3. SAMPLING CONDITIONS

SAMPLE TIME (MIN.)	120.0
SCFD GAS SAMPLED	78.321
PERCENT ISOKINETIC	95.75

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 7
CLR-M7-1 3-13-90

FIELD DATA AND VELOCITY CALCULATIONS

POINT	TIME	METER READING (DRY) CF	DELTA P IN.H2O	ORIFICE DELTA H REQ	ORIFICE DELTA H ACT	METER TEMP DEG F IN	METER TEMP DEG F OUT	VACUUM IN.HG.	STACK TEMP DEG F	CORRECTED VELOCITY FT/SEC
47.0NE	1425.0	994.528	.250	.63	.63	98.	93.	3.0	138.	30.1
44.8NE			.550	1.39	1.39	104.	99.	5.5	140.	44.7
42.3NE			.800	2.02	2.02	107.	100.	8.1	137.	53.8
39.5NE			.750	1.89	1.89	109.	100.	7.5	131.	51.8
36.0NE			.800	2.02	2.02	111.	103.	8.0	134.	53.6
30.9NE			.600	1.51	1.51	111.	104.	6.6	135.	46.5
17.1NE			.450	1.14	1.14	111.	105.	5.0	135.	40.3
12.0NE			.450	1.14	1.14	110.	105.	5.0	135.	40.3
8.5NE			.350	.88	.88	108.	105.	4.0	134.	35.5
5.7NE			.300	.76	.76	108.	105.	3.5	130.	32.7
3.2NE			.300	.76	.76	108.	105.	3.5	130.	32.7
1.0NE	1525.0	1034.071	.250	.63	.63	110.	104.	3.2	120.	29.6
47.0SE	1545.0	34.071	.250	.63	.63	104.	104.	3.0	135.	30.0
44.8SE			.250	.63	.63	109.	105.	3.0	132.	29.9
42.3SE			.250	.63	.63	110.	105.	3.0	131.	29.9
39.5SE			.250	.63	.63	109.	104.	3.0	130.	29.9
36.0SE			.300	.76	.76	110.	104.	3.2	127.	32.7
30.9SE			.300	.76	.76	110.	104.	3.2	125.	32.6
17.1SE			.800	2.02	2.02	112.	105.	7.5	132.	53.6
12.0SE			.950	2.40	2.40	113.	105.	9.0	130.	58.3
8.5SE			1.000	2.52	2.52	113.	104.	9.5	136.	60.1
5.7SE			1.000	2.52	2.52	113.	104.	9.6	134.	60.0
3.2SE			1.000	2.52	2.52	113.	104.	9.8	119.	59.2
1.0SE	1645.0	76.200	.950	2.40	2.40	113.	104.	8.9	90.	56.2

O R S A T	
CO2	.0
O2	20.5
CO	.0
N	79.5

IMPINGER NO.	1	6.1
	2	8.7
	3	1.2
	4	.0
ABSORBED H2O		13.7

CONTROL BOX CALIBRATIONS

	FACTOR	DATE
ORIFICE	1.781	12-27-89
METER	1.0372	12-27-89
PITOT	0.84	2-26-90

LEAK CHECK

	RATE	IN.HG
INITIAL	LT 0.02CFM	5.0
FINAL	0.010 CFM	11.0

CONTROL BOX NO. 1 PROBE NO. 5-2 NOZZLE NO. 37

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 7
CLR-M7-1 3-13-90

STACK SAMPLING CALCULATIONS

A.	BAROMETRIC PRESSURE IN. HG.....	29.55
B.	AVG. DELTA H (IN H2O).....	1.38
C.	METER PRESSURE (IN. HG.).....	29.65
D.	STATIC PRESSURE (IN. H2O).....	.40
E.	STATIC PRESSURE (IN. HG.).....	.029
F.	STACK PRESSURE (IN. HG.) (A+E).....	29.58
G.	STACK DIAMETER (IN.).....	48.00
H.	STACK AREA (SQ. FT.).....	12.57
	NOZZLE DIAMETER.....	.2370
I.	NOZZLE AREA (SQ. FT.).....	.000306
J.	AVG. STACK TEMP (DEG. R.).....	590.0
K.	AVG. METER TEMP (DEG. R.).....	566.3
L.	CONDENSATE VOL. (ML).....	16.0
M.	ABSORBED H2O (ML).....	13.7
N.	TOTAL H2O (ML).....	29.7
O.	METERED GAS (CF).....	81.672
P.	GAS METER CORRECTION.....	1.0372
Q.	CORRECTED METERED GAS (CF).....	84.710
R.	H2O GAS VOLUME (CF) (0.00267N(K/C).....	1.515
S.	TOTAL SAMPLED VOLUME (CF) (Q+R).....	86.225
T.	PERCENT H2O (100R/S).....	1.76
	THEORETICAL MAXIMUM.....	15.31
	PERCENT WATER USED.....	1.76
U.	SCFD GAS SAMPLED (528*Q*C/(29.9*K)).....	78.321

V. MOLECULAR WEIGHT OF STACK GAS

COMPONENT	ORSAT-DRY VOL.PCT./100	X	MOISTURE CORRECTION (1-T/100)	X	MOLECULAR WEIGHT	=	WEIGHT PER MOLE
CO2	.000	X	.9824	X	44.0	=	.00
CO	.000	X	.9824	X	28.0	=	.00
O2	.205	X	.9824	X	32.0	=	6.44
N2	.795	X	.9824	X	28.2	=	22.03
H2O		X	T/100= .0176	X	18.0	=	.32
					MOLECULAR WEIGHT OF STACK GAS	=	28.79

W.	PITOT CORRECTION.....	.840
X.	AVERAGE CORRECTED VELOCITY (FPS).....	42.66
	[85.49*W*SQRT{(J*DELTA P)/(V*F)}]	
Y.	AVG. FLOW RATE (CFM) (X*H*60).....	32167.
Z.	STACK FLOW RATE (SCFM) (528*Y/J*F/29.92).....	28459.
	STACK FLOW RATE (DRY).....	27960.
AA.	SAMPLE TIME (SEC).....	7200.
BB.	PERCENT ISOKINETIC.....	95.75
	(J*100*U*29.92)/(528*X*AA*I*F*(1-T/100))	

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 7
CLR-M7-1 3-13-90

PARAMETER	CYCLONE WT. (G)	MATL.ON FILTER(G)	INSOL.MATL. IN PROBE(G)	SOL.MATL. IN PROBE(G)
PARTICULATE	.00000	.00140	.00000	.00040

PARAMETER	INSOL.MATL. IN IMP.(G)	SOLUBLE MATL. IN IMP.(G)
PARTICULATE	.00540	.00490
PARTICULATE	.01210	
ALL MATLS.	.01210	

PARAMETER	GR/SCFD	LB/HR
PARTICULATE	.00142	.33928

Emission rates are based on the PA method.
The soluble impinger weight is excluded from the calculations

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 12
CLR-M12-1 3-13-90

FIELD DATA AND VELOCITY CALCULATIONS

POINT	TIME	METER READING (DRY) CF	DELTA P IN.H2O	ORIFICE DELTA H REQ	ORIFICE DELTA H ACT	METER TEMP DEG F IN	METER TEMP DEG F OUT	VACUUM IN.HG.	STACK TEMP DEG F	CORRECTED VELOCITY FFT/SEC
47.0SW	955.0	914.921	.250	.74	.74	78.	75.	5.0	119.	29.6
44.8SW			.250	.74	.74	84.	78.	6.0	119.	29.6
42.3SW			.300	.89	.89	87.	80.	6.1	117.	32.4
39.5SW			.300	.89	.89	90.	82.	6.5	124.	32.6
36.0SW			.300	.89	.89	92.	84.	6.5	123.	32.6
30.9SW			.300	.89	.89	93.	85.	6.5	124.	32.6
17.1SW			.450	1.35	1.35	95.	87.	9.4	120.	39.8
12.0SW			.600	1.79	1.79	97.	87.	12.0	118.	45.9
8.5SW			.650	1.94	1.94	97.	87.	14.0	126.	48.1
5.7SW			.600	1.79	1.79	96.	89.	13.8	124.	46.1
3.2SW			.600	1.79	1.79	97.	90.	13.6	119.	45.9
1.0SW	1055.0	953.249	.400	1.19	1.19	97.	90.	9.0	110.	37.2
47.0NW	1125.0	953.249	.250	.74	.74	91.	88.	6.0	127.	29.8
44.8NW			.250	.74	.74	95.	90.	6.0	124.	29.8
42.3NW			.250	.74	.74	97.	91.	6.1	133.	30.0
39.5NW			.250	.74	.74	98.	91.	6.0	127.	29.8
36.0NW			.250	.74	.74	99.	92.	6.0	129.	29.9
30.9NW			.250	.74	.74	100.	93.	6.0	131.	29.9
17.1NW			.450	1.34	1.34	102.	94.	9.0	125.	40.0
12.0NW			.500	1.49	1.49	102.	95.	10.0	131.	42.3
8.5NW			.550	1.64	1.64	103.	96.	11.0	128.	44.3
5.7NW			.700	2.09	2.09	103.	96.	14.8	100.	48.8
3.2NW			.800	2.38	2.38	106.	99.	5.5	121.	53.1
1.0NW	1225.0	993.800	.500	1.49	1.49	105.	95.	4.0	93.	41.0

O R S A T

CO2	.0
O2	20.5
CO	.0
N	79.5

IMPINGER NO.	1	9.2
	2	7.8
	3	2.9
	4	.0
ABSORBED H2O		16.6

CONTROL BOX CALIBRATIONS

	FACTOR	DATE
ORIFICE	1.781	12-27-89
METER	1.0372	12-27-89
PITOT	0.84	2-26-90

LEAK CHECK

	RATE	IN.HG
INITIAL	LT 0.02CFM	5.0
FINAL	0.010 CFM	15.0

CONTROL BOX NO. 1 PROBE NO. 5-2 NOZZLE NO. 37

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 12
CLR-M12-1 3-13-90

STACK SAMPLING CALCULATIONS

A.	BAROMETRIC PRESSURE IN. HG.....	29.55
B.	AVG. DELTA H (IN H2O).....	1.24
C.	METER PRESSURE (IN. HG.).....	29.64
D.	STATIC PRESSURE (IN. H2O).....	.30
E.	STATIC PRESSURE (IN. HG.).....	.022
F.	STACK PRESSURE (IN. HG.) (A+E).....	29.57
G.	STACK DIAMETER (IN.).....	48.00
H.	STACK AREA (SQ. FT.).....	12.57
	NOZZLE DIAMETER.....	.2370
I.	NOZZLE AREA (SQ. FT.).....	.000306
J.	AVG. STACK TEMP (DEG. R.).....	581.3
K.	AVG. METER TEMP (DEG. R.).....	552.5
L.	CONDENSATE VOL. (ML).....	19.9
M.	ABSORBED H2O (ML).....	16.6
N.	TOTAL H2O (ML).....	36.5
O.	METERED GAS (CF).....	78.879
P.	GAS METER CORRECTION.....	1.0372
Q.	CORRECTED METERED GAS (CF).....	81.813
R.	H2O GAS VOLUME (CF) (0.00267N(K/C).....	1.816
S.	TOTAL SAMPLED VOLUME (CF) (Q+R).....	83.630
T.	PERCENT H2O (100R/S).....	2.17
	THEORETICAL MAXIMUM.....	11.99
	PERCENT WATER USED.....	2.17
U.	SCFD GAS SAMPLED (528*Q*C/(29.9*K)).....	77.514

V. MOLECULAR WEIGHT OF STACK GAS

COMPONENT	ORSAT-DRY VOL.PCT./100	X	MOISTURE CORRECTION (1-T/100)	X	MOLECULAR WEIGHT	=	WEIGHT PER MOLE
CO2	.000	X	.9783	X	44.0	=	.00
CO	.000	X	.9783	X	28.0	=	.00
O2	.205	X	.9783	X	32.0	=	6.42
N2	.795	X	.9783	X	28.2	=	21.93
H2O		X	T/100= .0217	X	18.0	=	.39
					MOLECULAR WEIGHT OF STACK GAS	=	28.74

W.	PITOT CORRECTION.....	.840
X.	AVERAGE CORRECTED VELOCITY (FPS).....	37.54
	[85.49*W*SQRT{(J*DELTA P)/(V*F)}]	
Y.	AVG. FLOW RATE (CFM) (X*H*60).....	28306.
Z.	STACK FLOW RATE (SCFM) (528*Y/J*F/29.92).....	25411.
	STACK FLOW RATE (DRY).....	24859.
AA.	SAMPLE TIME (SEC).....	7200.
BB.	PERCENT ISOKINETIC.....	106.59
	(J*100*U*29.92)/(528*X*AA*I*F*(1-T/100))	

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 12
CLR-M12-1 3-13-90

PARAMETER	CYCLONE WT. (G)	MATL.ON FILTER(G)	INSOL.MATL. IN PROBE(G)	SOL.MATL. IN PROBE(G)
PARTICULATE	.00000	.00030	.00000	.00150

PARAMETER	INSOL.MATL. IN IMP.(G)	SOLUBLE MATL. IN IMP.(G)
PARTICULATE	.00340	.00440
PARTICULATE	.00960	
ALL MATLS.	.00960	

PARAMETER	GR/SCFD	LB/HR
PARTICULATE	.00103	.22013

Emission rates are based on the PA method.
The soluble impinger weight is excluded from the calculations

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE
MODULE 14

DATE: 3-13-90
CHARGE #: ...150-601000
TEST #: CLR-M14-1

1. EMISSION RESULTS

PARAMETER	GR/SCFD	LB/HR
PARTICULATE	.00181	.37884

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2. STACK CONDITIONS

FLOW (ACFM)	28008.
(SCFM)	25047.
MOISTURE CONTENT (%)	2.37
STACK TEMPERATURE (F)	123.7

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3. SAMPLING CONDITIONS

SAMPLE TIME (MIN.)	120.0
SCFD GAS SAMPLED	54.528
PERCENT ISOKINETIC	105.97

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 14
CLR-M14-1 3-13-90

FIELD DATA AND VELOCITY CALCULATIONS

POINT	TIME	METER READING (DRY) CF	DELTA P IN.H2O	ORIFICE DELTA H REQ	ORIFICE DELTA H ACT	METER TEMP DEG F IN	METER TEMP DEG F OUT	VACUUM IN.HG.	STACK TEMP DEG F	CORRECTED VELOCITY FT/SEC
47.0SW	955.0	367.470	.250	.36	.36	77.	72.	2.0	120.	29.7
44.8SW			.250	.36	.36	83.	73.	2.0	119.	29.6
42.3SW			.250	.36	.36	88.	76.	2.0	119.	29.6
39.5SW			.280	.40	.40	91.	77.	2.0	123.	31.5
36.0SW			.300	.43	.43	94.	80.	2.0	121.	32.5
30.9SW			.350	.50	.50	96.	80.	3.0	122.	35.2
17.1SW			.600	.86	.86	99.	81.	4.0	123.	46.1
12.0SW			.600	.88	.88	102.	82.	4.0	121.	46.0
8.5SW			.700	1.03	1.03	102.	84.	4.0	121.	49.7
5.7SW			.700	1.03	1.03	102.	84.	4.0	122.	49.7
3.2SW			.600	.88	.88	102.	84.	3.5	123.	46.1
1.0SW	1055.0	398.662	.500	.73	.73	102.	85.	3.0	122.	42.0
47.0NW	1125.0	398.662	.300	.43	.43	82.	83.	2.0	121.	32.5
44.8NW			.250	.36	.36	96.	83.	2.0	124.	29.8
42.3NW			.380	.55	.55	98.	84.	2.0	131.	36.9
39.5NW			.350	.51	.51	100.	85.	2.0	127.	35.3
36.0NW			.420	.61	.61	102.	86.	2.5	129.	38.7
30.9NW			.420	.61	.61	103.	87.	2.5	131.	38.8
17.1NW			.400	.58	.58	104.	88.	2.5	125.	37.7
12.0NW			.400	.58	.58	104.	89.	2.5	127.	37.7
8.5NW			.400	.58	.58	104.	89.	2.5	127.	37.7
5.7NW			.430	.63	.63	104.	89.	2.5	126.	39.1
3.2NW			.250	.37	.37	105.	90.	2.0	124.	29.8
1.0NW	1225.0	426.220	.250	.37	.37	105.	90.	2.0	121.	29.7

O R S A T

CO2	.0
O2	20.5
CO	.0
N	79.5

IMPINGER NO.	1	9.9
	2	5.6
	3	1.6
	4	.0
ABSORBED H2O		11.0

CONTROL BOX CALIBRATIONS

	FACTOR	DATE
ORIFICE	1.634	12-28-89
METER	0.9778	12-28-89
PITOT	0.84	2-26-90

LEAK CHECK

	RATE	IN.HG
INITIAL	LT 0.02CFM	5.0
FINAL	0.005 CFM	6.0

CONTROL BOX NO. 3 PROBE NO. 5-4 NOZZLE NO. 45

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 14
CLR-M14-1 3-13-90

STACK SAMPLING CALCULATIONS

A.	BAROMETRIC PRESSURE IN. HG.....	29.55
B.	AVG. DELTA H (IN H2O).....	.58
C.	METER PRESSURE (IN. HG.).....	29.59
D.	STATIC PRESSURE (IN. H2O).....	.40
E.	STATIC PRESSURE (IN. HG.).....	.029
F.	STACK PRESSURE (IN. HG.) (A+E).....	29.58
G.	STACK DIAMETER (IN.).....	48.00
H.	STACK AREA (SQ. FT.).....	12.57
	NOZZLE DIAMETER.....	.2010
I.	NOZZLE AREA (SQ. FT.).....	.000220
J.	AVG. STACK TEMP (DEG. R.).....	583.7
K.	AVG. METER TEMP (DEG. R.).....	550.5
L.	CONDENSATE VOL. (ML).....	17.1
M.	ABSORBED H2O (ML).....	11.0
N.	TOTAL H2O (ML).....	28.1
O.	METERED GAS (CF).....	58.750
P.	GAS METER CORRECTION.....	.9778
Q.	CORRECTED METERED GAS (CF).....	57.446
R.	H2O GAS VOLUME (CF) (0.00267N(K/C).....	1.396
S.	TOTAL SAMPLED VOLUME (CF) (Q+R).....	58.842
T.	PERCENT H2O (100R/S).....	2.37
	THEORETICAL MAXIMUM.....	13.02
	PERCENT WATER USED.....	2.37
U.	SCFD GAS SAMPLED (528*Q*C/(29.9*K)).....	54.528

V. MOLECULAR WEIGHT OF STACK GAS

COMPONENT	ORSAT-DRY VOL.PCT./100	X	MOISTURE CORRECTION (1-T/100)	X	MOLECULAR WEIGHT	=	WEIGHT PER MOLE
CO2	.000	X	.9763	X	44.0	=	.00
CO	.000	X	.9763	X	28.0	=	.00
O2	.205	X	.9763	X	32.0	=	6.40
N2	.795	X	.9763	X	28.2	=	21.89
H2O		X	T/100= .0237	X	18.0	=	.43
					MOLECULAR WEIGHT OF STACK GAS	=	28.72

W.	PITOT CORRECTION.....	.840
X.	AVERAGE CORRECTED VELOCITY (FPS).....	37.15
	[85.49*W*SQRT{(J*DELTA P)/(V*F)}]	
Y.	AVG. FLOW RATE (CFM) (X*H*60).....	28008.
Z.	STACK FLOW RATE (SCFM) (528*Y/J*F/29.92).....	25047.
	STACK FLOW RATE (DRY).....	24453.
AA.	SAMPLE TIME (SEC).....	7200.
BB.	PERCENT ISOKINETIC.....	105.97
	(J*100*U*29.92)/(528*X*AA*I*F*(1-T/100))	

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 14
CLR-M14-1 3-13-90

PARAMETER	CYCLONE WT. (G)	MATL.ON FILTER(G)	INSOL.MATL. IN PROBE(G)	SOL.MATL. IN PROBE(G)
PARTICULATE	.00000	.00160	.00000	.00160

PARAMETER	INSOL.MATL. IN IMP.(G)	SOLUBLE MATL. IN IMP.(G)
PARTICULATE	.00320	.00730

PARTICULATE	.01370
ALL MATLS.	.01370

PARAMETER	GR/SCFD	LB/HR
PARTICULATE	.00181	.37884

Emission rates are based on the PA method.
The soluble impinger weight is excluded from the calculations

APPENDIX F

ANALYTICAL RESULTS FOR SULFATE DETERMINATION

Sample I.D.	Weight of Residue After Filtration (g)	Weight of Water Blank (g)	Amount of 0.1 N NaOH Needed to Neutralize Sample (mL)	Weight of Na^+ (g)	Weight of Residue After Neutralization (g)	Weight of $SO_4^=$ (g)	$SO_4^=$ Emission Rate (mg/dscm)
CLR-M1-1	0.0067	0.0000	0.30	0.0007	0.0060	0.0030	1.7301
CLR-M3-1	0.0018	0.0000	0.10	0.0002	0.0022	0.0008	0.3393
CLR-M4-1	0.0115	0.0000	0.30	0.0007	0.0106	0.0029	1.2484
CLR-M5-1	0.0157	0.0000	1.08	0.0025	0.0143	0.0096	6.5574
CLR-M6-1	0.0011	0.0000	0.10	0.0002	0.0018	0.0005	0.3213
CLR-M7-1	0.0010	0.0000	0.17	0.0004	0.0020	0.0012	0.5410
CLR-M8-1	0.0028	0.0000	0.19	0.0004	0.0033	0.0015	0.9219
CLR-M9-1	0.0022	0.0000	0.16	0.0004	0.0034	0.0014	0.7584
CLR-M10-1	0.0011	0.0000	0.10	0.0002	0.0018	0.0009	0.5169
CLR-M11-1	0.0055	0.0000	0.20	0.0005	0.0049	0.0017	1.1266
CLR-M12-1	0.0013	0.0000	0.10	0.0002	0.0019	0.0009	0.4100
CLR-M14-1	0.0050	0.0000	0.30	0.0007	0.0047	0.0021	1.3601

Performed in accordance with the Allegheny County Bureau of Air Pollution Control Source Testing Manual, Chapter 6, Item 11.

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

115X Clairton Works - B - Battery

Date	Test #	SCFD GAS SAMPLED	SCMD GAS SAMPLED
2-90	CLR-M8-1	57.454	1.627
12-90	CLR-M9-1	65.176	1.846
2-90	CLR-M10-1	61.482	1.741
12-90	CLR-M11-1	53.278	1.509
-13-90	CLR-M1-1	61.230	1.734
13-90	CLR-M3-1	83.279	2.358
-13-90	CLR-M4-1	82.031	2.323
13-90	CLR-M5-1	51.707	1.464
13-90	CLR-M6-1	54.961	1.556
-13-90	CLR-M7-1	78.321	2.218
3-90	CLR-M12-1	77.514	2.195
-13-90	CLR-M14-1	54.528	1.544

$$1\ ft^3 = 0.0283\ m^3$$

$$\frac{1\ ft^3}{1} \times \frac{(12\ in)^3}{1\ ft^3} \times \frac{(2.54\ cm)^3}{(1\ in)^3} \times \frac{1\ m^3}{(100\ cm)^3} = 0.028316847$$

$$\doteq 0.0283$$

APPENDIX G

FIELD DATA SHEETS FOR VISIBLE EMISSIONS AND PLUME OPACITY MEASUREMENTS

USX CORPORATION USS CLAIRTON WORKS

EMISSION CONTROL REPORT - "B" BATTERY SHED OBSERVATIONS

BATTERY B

DATE	Oven Observ.	Sec. >=20%	Max. Opacity	Pushing Performance
03/12/90	B-14	0	0%	100%
03/12/90	A-19	0	0%	100%
03/12/90	B-24	0	0%	100%
03/12/90	A-29	0	0%	100%
03/12/90	B-29	0	0%	100%
03/12/90	A-34	0	0%	100%
03/12/90	B-34	0	0%	100%
03/12/90	A-1	5	25%	0%
03/12/90	B-1	0	0%	100%
03/12/90	A-6	0	0%	100%
03/12/90	B-6	0	0%	100%
03/13/90	A-11	0	0%	100%
03/13/90	B-11	0	0%	100%
03/13/90	A-16	0	0%	100%
03/13/90	B-16	0	0%	100%
03/13/90	A-21	0	0%	100%
03/13/90	B-21	6	25%	0%
03/13/90	A-26	0	0%	100%
03/13/90	B-26	25	25%	0%
03/13/90	A-31	0	0%	100%
03/13/90	B-31	0	0%	100%
03/13/90	A-36	0	0%	100%
03/13/90	B-36	15	25%	0%
03/13/90	A-23	0	0%	100%
03/13/90	B-23	15	25%	0%
03/13/90	A-28	0	0%	100%
03/13/90	B-28	10	30%	0%
03/13/90	A-33	0	0%	100%
03/13/90	B-33	0	0%	100%
03/13/90	A-38	0	0%	100%
03/13/90	B-5	0	0%	100%
03/13/90	A-5	0	0%	100%
Total:	32	76		81.25%
Average:		2.38		

"B" Battery Pushing

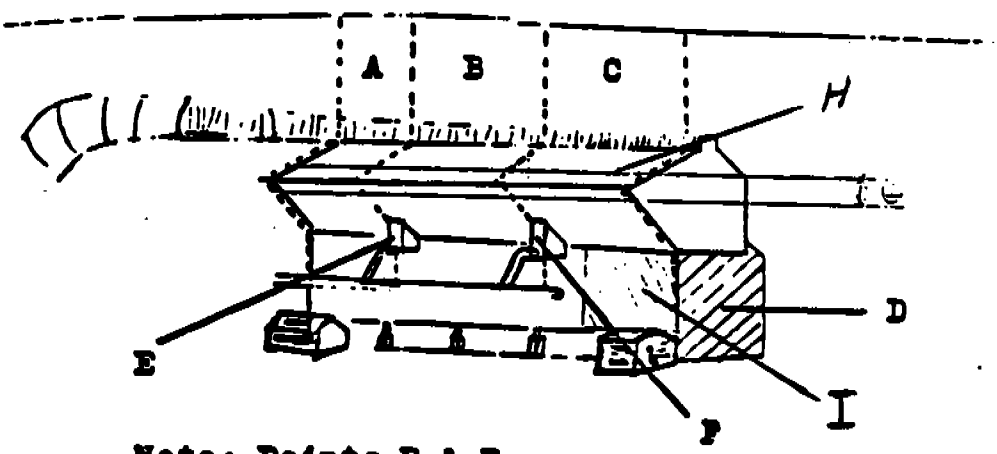
Name: RICH CASSELBERRY

Date: 03/12/90

Foreman: HALL Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
B-14	12:40	:00	0%	NO VISIBLE EMISSIONS FROM PUSH
				WINDS FROM SW APPROX 10-20 MPH.

Points of Emission



Note: Points E & F
Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte
During Push and Travel.

"B" Battery Pushing

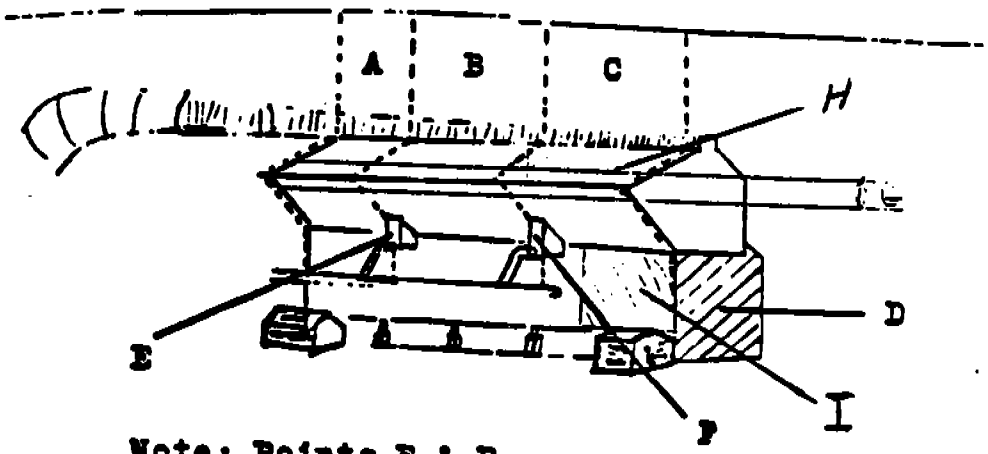
Name: RICH CASSELBERRY

Date: 03/12/90

Foreman: HALL Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
A-A	1:01	:00	0%	NO VISIBLE EMISSIONS FROM PUSH.
				WINDS FROM THE SW. APPROX 15 MPH

Points of Emission



Note: Points E & P
Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte-
During Push and Travel.

"B" Battery Pushing

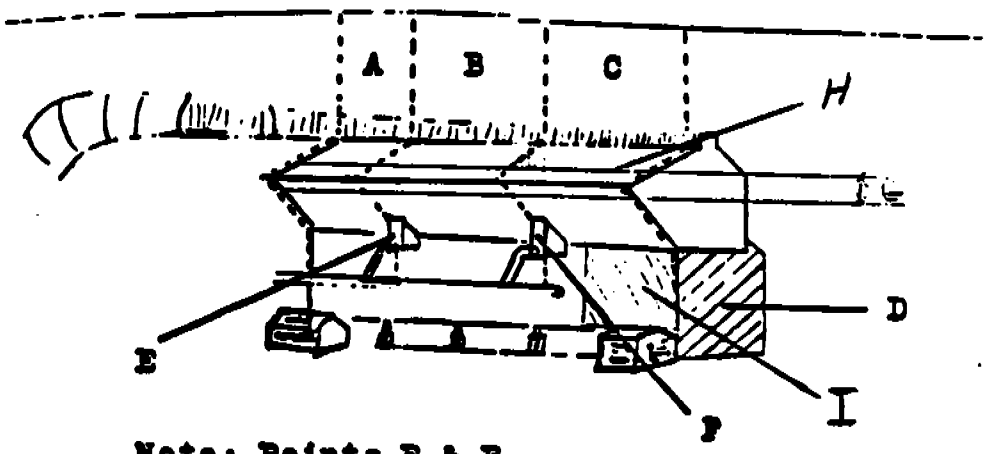
Name: Rich Casselberry

Date: 03/12/90

Foreman: HALL Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
B-24	1:47	:00	0%	NO VISIBLE EMISSIONS FROM PUSH.
				WINDS FROM SW. APPROX 15 MPH.

Points of Emission



Note: Points E & F
Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte
During Push and Travel.

"B" Battery Pushing

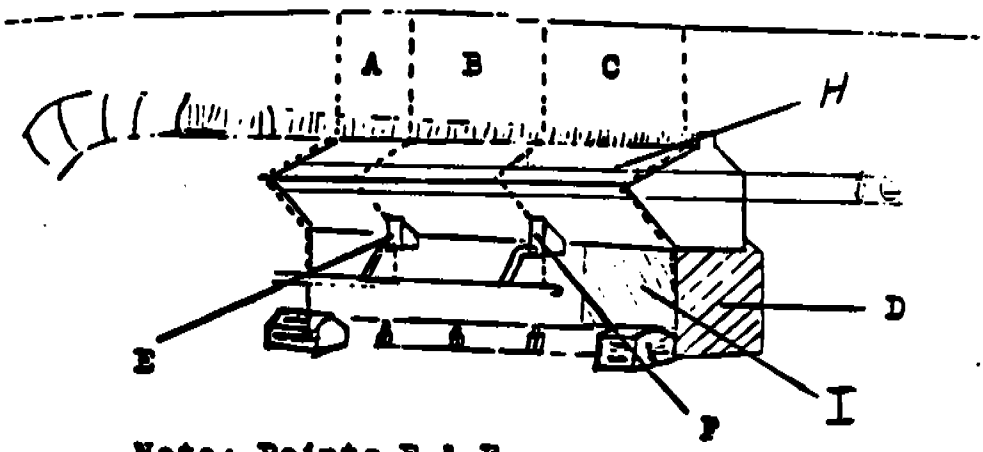
Name: Rick Casselberry

Date: 03/12/90

Foreman: HALL Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
A-29	2:08	:00	0%	NO VISIBLE EMISSIONS FROM PUSH.
				WINDS FROM S.W. APPROX 15 MPH.

Points of Emission



Note: Points E & F
Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte
During Push and Travel.

"B" Battery Pushing

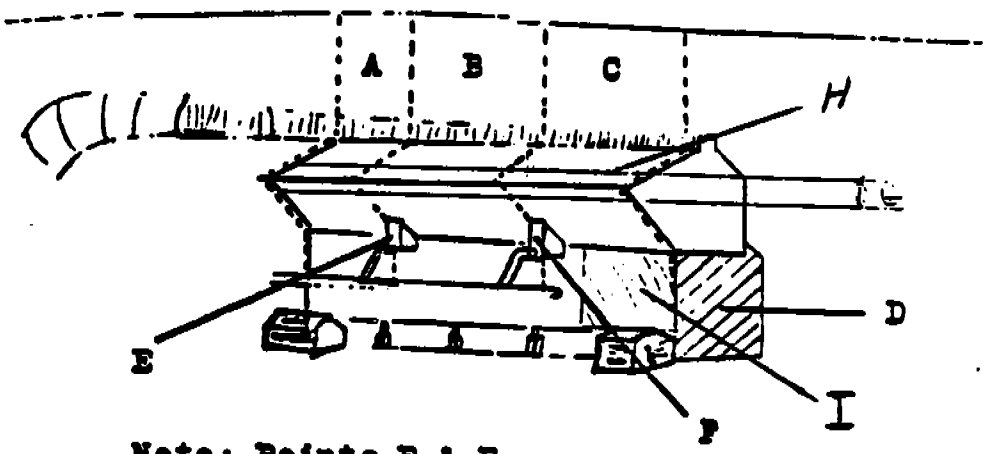
Name: RICH CASSELBERRY

Date: 03/12/90

Foreman: HALL Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
A-34	2:27	100	0%	NO VISIBLE EMISSIONS FROM PUSH.
				WINDS FROM SW. AT APPROX 20 MPH.

Points of Emission



Note: Points E & F
Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte
During Push and Travel.

"B" Battery Pushing

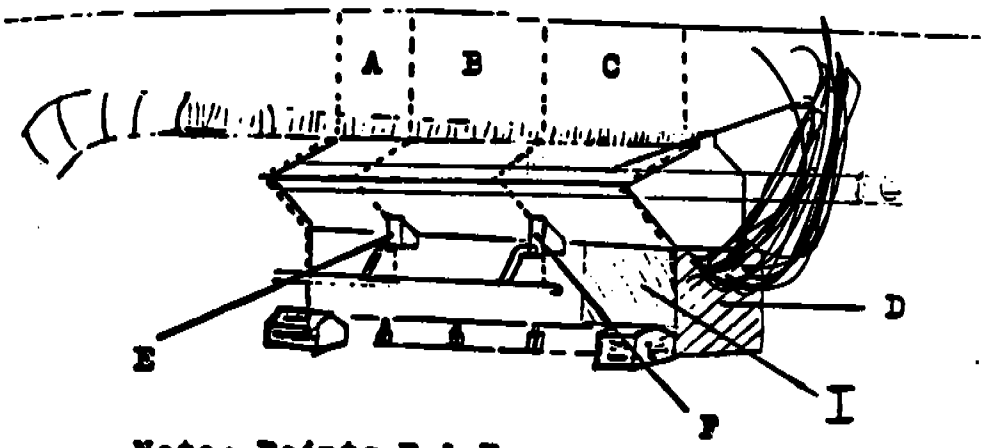
Name: RICH CASSELBERRY

Date: 03/12/90

Foreman: HALL Crew: B

OVEN	TIME	1. PUSH Seconds Max.	≥ 20% Opac.	Areas of Emission &/or Comments
A-1	2:50	105	25%	ALL EMISSIONS WERE FROM THE SOUTH END OF
				THE SHED, AREA "D"
				WINDS FROM S.W. AT APROX 20mph

Points of Emission



Note: Points E & F
Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte
During Push and Travel.

"B" Battery Pushing

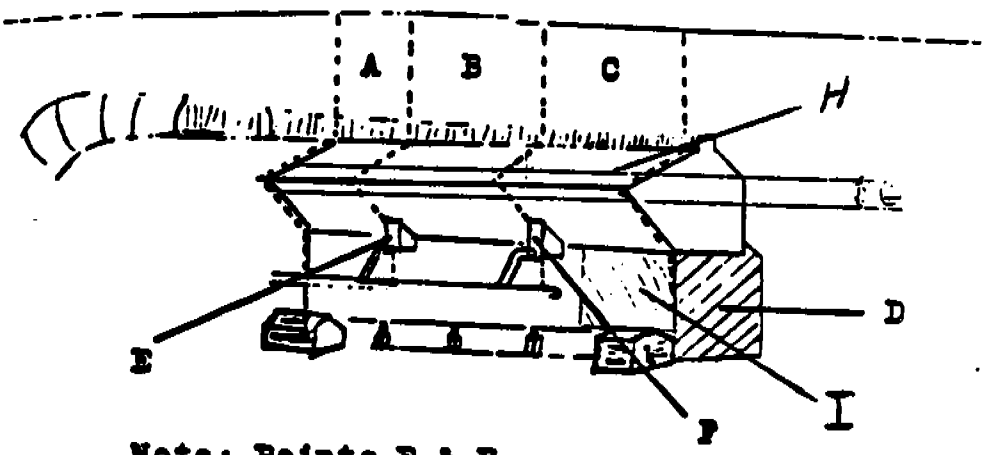
Name: RICH CASSELBERRY

Date: 03/12/90

Foreman: HALL Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
A-6	3:18	:00	0%	NO VISIBLE EMISSIONS FROM PUSH
				WINDS FROM THE WEST AT APPROX 20 MPH.

Points of Emission



Note: Points E & F
Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte
During Push and Travel.

COUNTY – HUGHES

"B" Battery Pushing

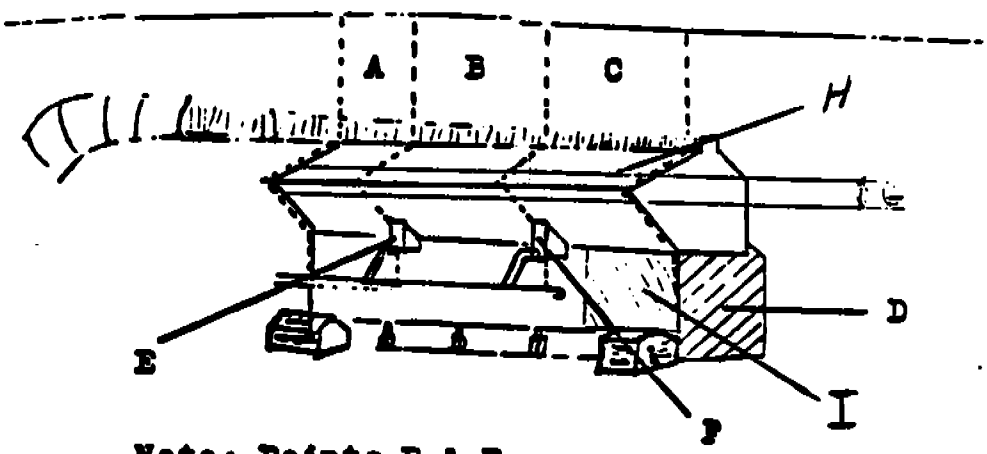
Name: RICH CASSELBERRY

Date: 03/13/80

Foreman: HALL Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
A-16	10:32	100	0%	NO VISIBLE EMISSIONS FROM PUSH.
				WINDS FROM S.W. AT APPROX 15 mPH.

Points of Emission



Note: Points E & F Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte During Push and Travel.

"B" Battery Pushing

COUNTY - HUGHES

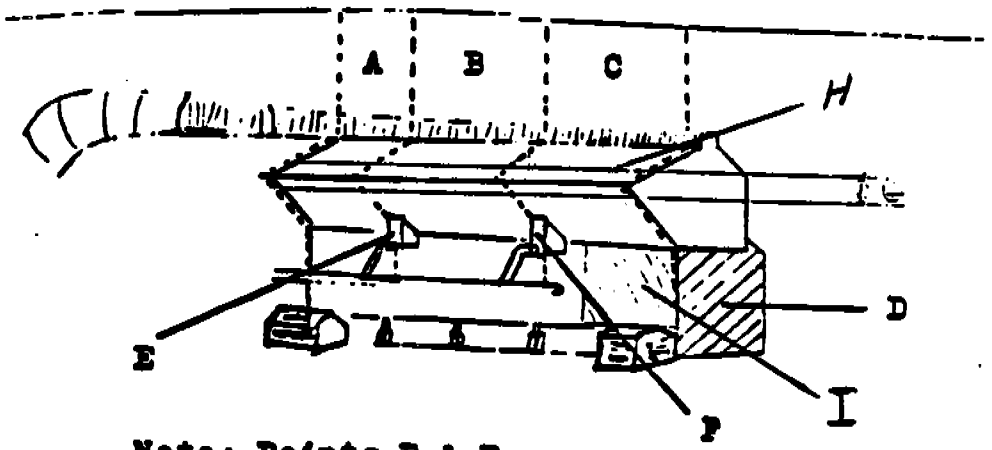
Name: RICH CASSELBERRY

Date: 03/13/90

Foreman: HALL Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
B-16	10.43	100	0%	NO VISIBLE EMISSIONS FROM PUSH.
				WINDS FROM THE S.W. AT APPROX 10 mph.

Points of Emission



Note: Points E & F
Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte-
During Push and Travel.

"B" Battery Pushing

COUNTY HUGHES

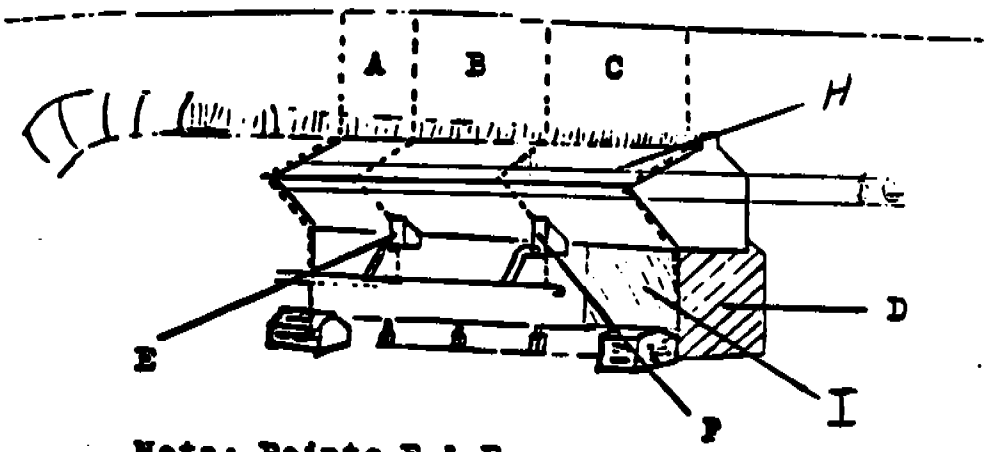
Name: RICH CASSEMERRY

Date: 03/13/90

Foreman: HALL Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
A-21	10:54	:00	0%	NO VISIBLE EMISSIONS FROM PUSH.
				WINDS FROM S.W. APPROX. 15 MPH.

Points of Emission



Note: Points E & F
Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte
During Push and Travel.

"B" Battery Pushing

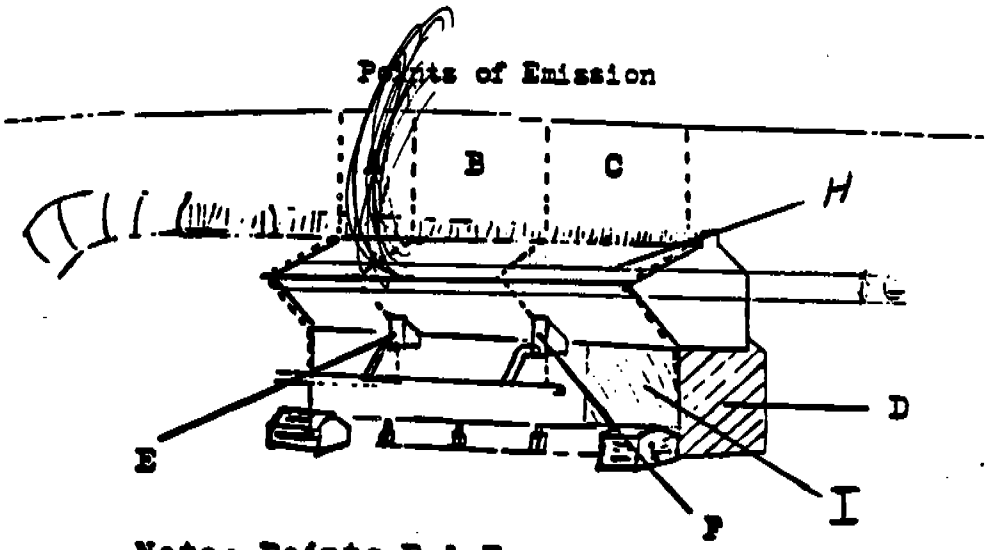
COUNTY - HUGHES

Name: RICH CASSEBERRY

Date: 03/13/90

Foreman: HALL Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
B-21	11:07	10.6	25%	ALL EMISSIONS FROM ROOF OF SHED AREA "A"
				WINDS FROM THE WEST AT APPROX 15 mph



Note: Points E & F
Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte
During Push and Travel.

"B" Battery Pushing

COUNTY - HUGHES

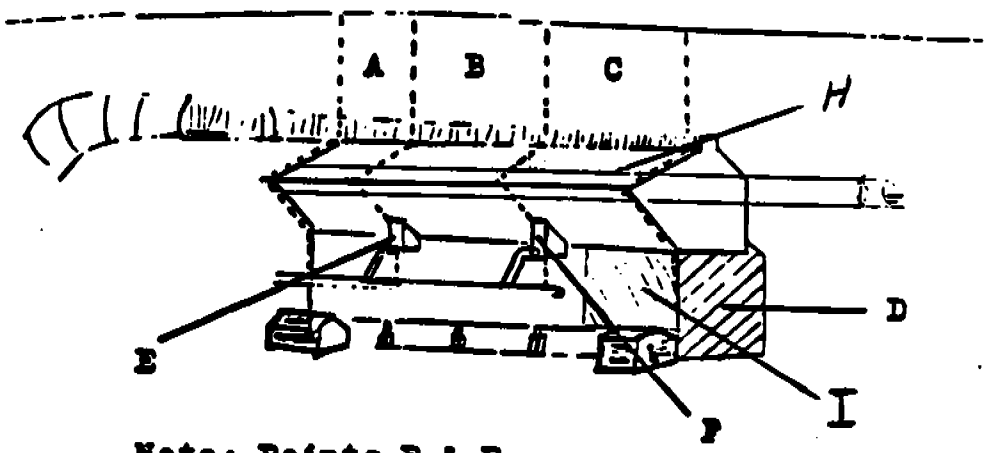
Name: RICH CASSELBERRY

Date: 03/13/70

Foreman: HALL Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
A-26	11:22	:00	0%	NO VISIBLE EMISSION OVER 20% FROM PUSH
				00 SECONDS OF 15% FROM AREA "B"
				WINDS FROM THE WEST AT APPROX 15 MPH.

Points of Emission



Note: Points E & F
Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte
During Push and Travel.

COUNTY - HUGHES

"B" Battery Pushing

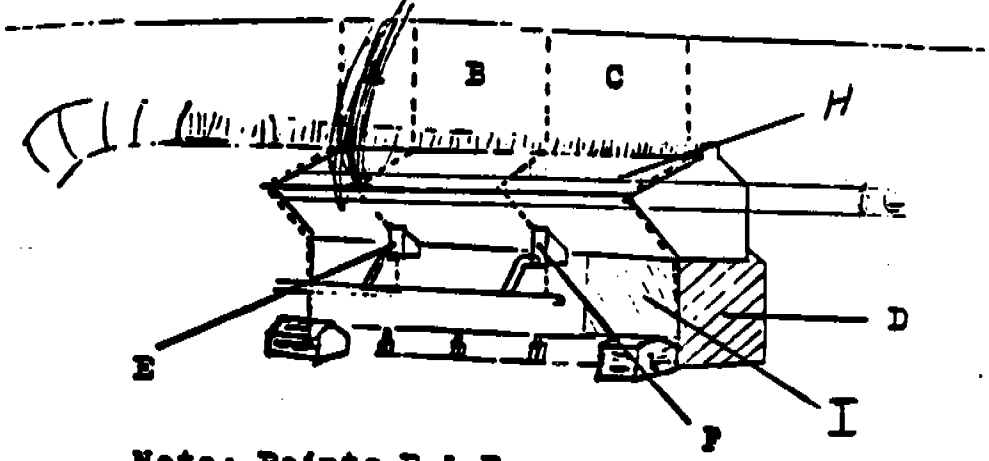
Name: RICH CASSELBERRY

Date: 03/13/90

Foreman: HALL Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
B-26	11:33	:25	25%	ALL EMISSIONS WERE FROM ROOF AREA "A"
				WINDS FROM THE WEST AT APPROX 15MPH.

Points of Emission



Note: Points E & F Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte During Push and Travel.

COUNTY - HUGHES

"B" Battery Pushing

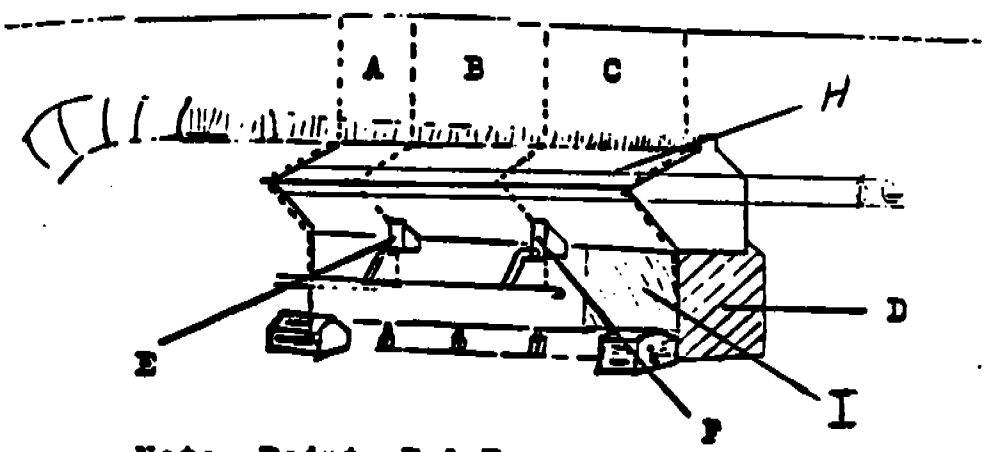
Name: RICH CASSELBERRY

Date: 03/13/90

Foreman: HALL Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
A-31	11:44	:00	0%	NO VISIBLE EMISSIONS FROM PUSH
				WINDS FROM THE WEST AT APPROX. 15MPH.

Points of Emission



Note: Points E & F
Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte
During Push and Travel.

"B" Battery Pushing

COUNTY HUGHES

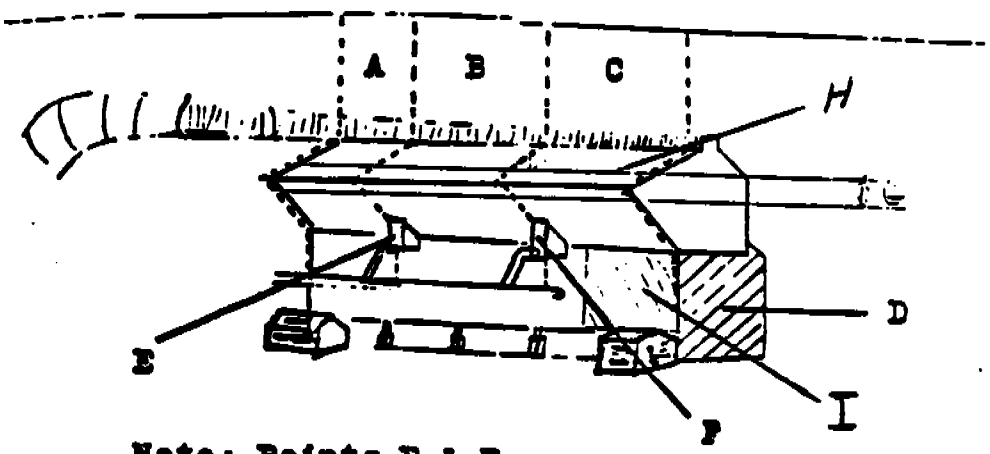
Name: RICH CASSELBERRY

Date: 03/13/90

Foreman: HALL Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
B-31	1156	:00	0%	NO VISIBLE EMISSIONS OVER 20%,
				:06 SECONDS OF 15% FROM AREA "A"
				WINDS FROM THE WEST AT APPROX 20 MPH

Points of Emission



Note: Points E & F
Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte-
During Push and Travel.

County - Hughes

"B" Battery Pushing

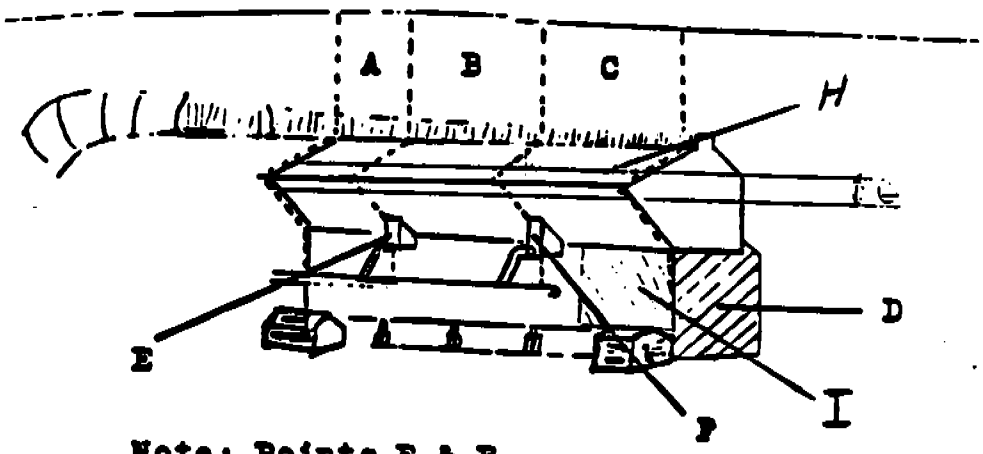
Name: Rich Casselberry

Date: 03/13/90

Foreman: Hall Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
A-36	1215	:00	0%	NO VISIBLE EMISSIONS FROM PUSH.
				WINDS FROM THE WEST AT APPROX 15 mph.

Points of Emission



Note: Points E & F Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte During Push and Travel.

COUNTY – HUGHES

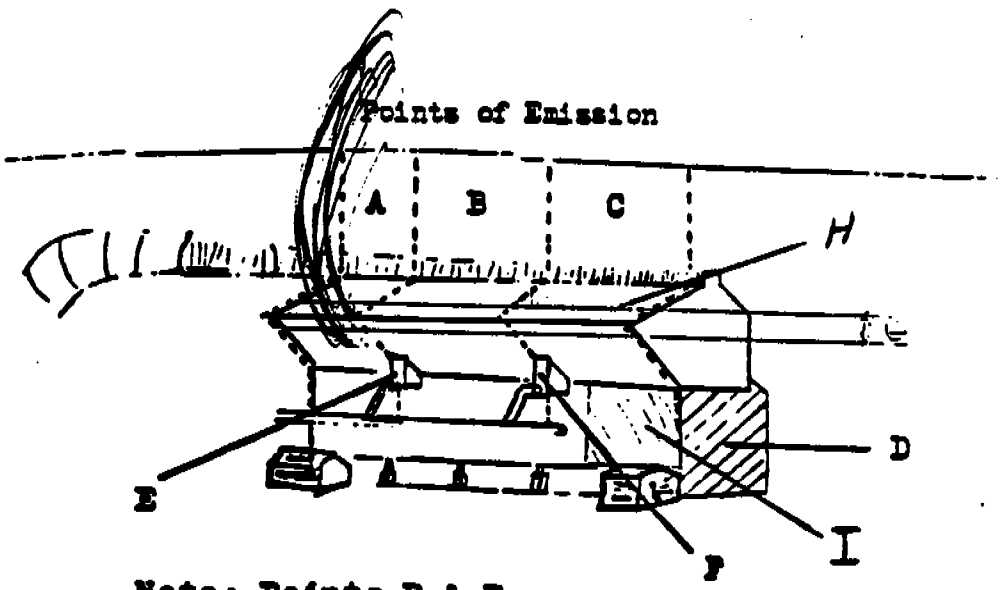
"B" Battery Pushing

Name: RICH CASSELBERRY

Date: 03/13/90

Foreman: HALL Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
B-36	12:27	:15	25%	ALL EMISSIONS FROM ROOF AREA "A"
				WINDS FROM THE SW AT APPROX 15 M.P.H.



Note: Points E & F
Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte
During Push and Travel.

"B" Battery Pushing

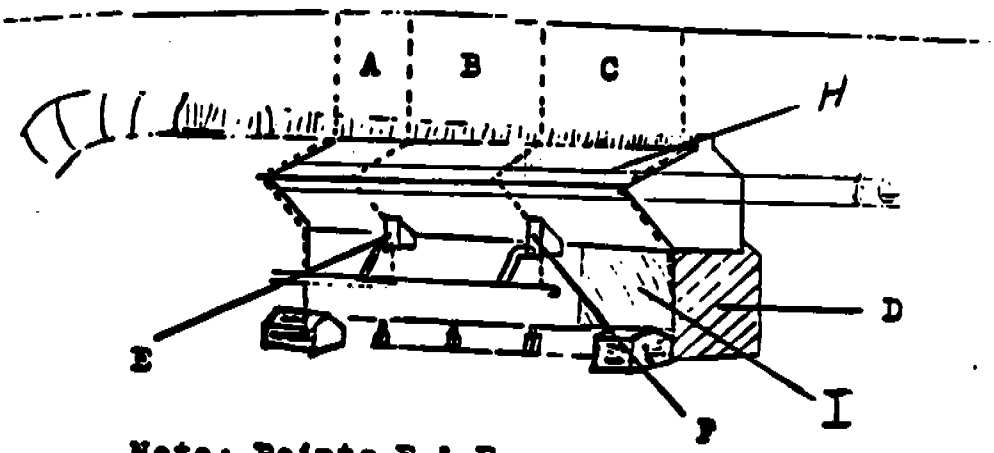
Name: RICH CASSELBERRY

Date: 03/13/90

Foreman: HALL Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
A-22	2:25	:00	0%	NO VISIBLE EMISSIONS FROM PUSH.
				WINDS FROM THE WEST AT APPROX. 10 MPH

Points of Emission



Note: Points E & F
Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte
During Push and Travel.

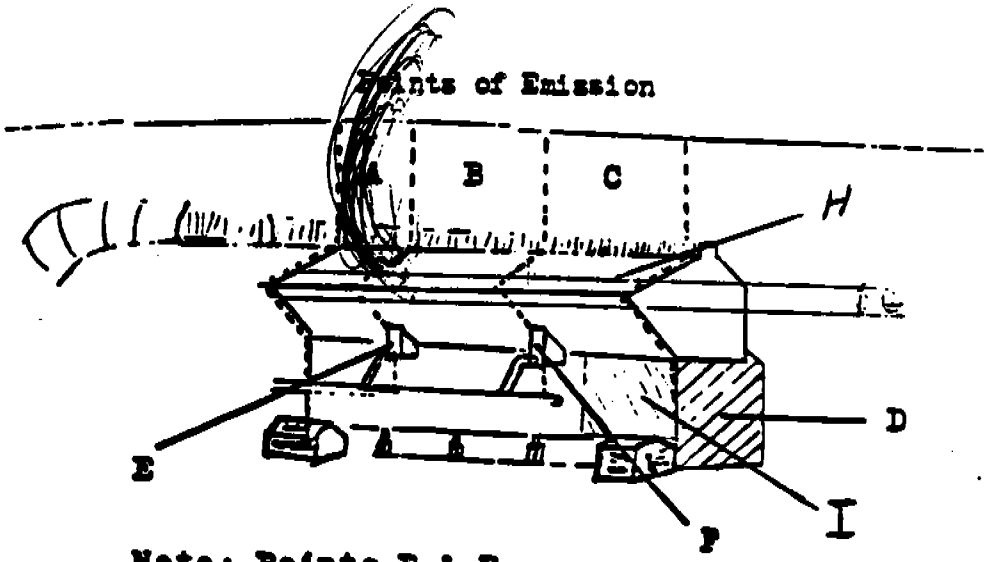
"B" Battery Pushing

Name: RICH CASSELBERRY

Date: 03/13/90

Foreman: HALL Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
B-23	2:44	:15	25%	ALL EMISSIONS WERE FROM ROOF AREA "A"
				WINDS FROM THE WEST AT 10 MPH.



Note: Points E & P
Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte
During Push and Travel.

"B" Battery Pushing

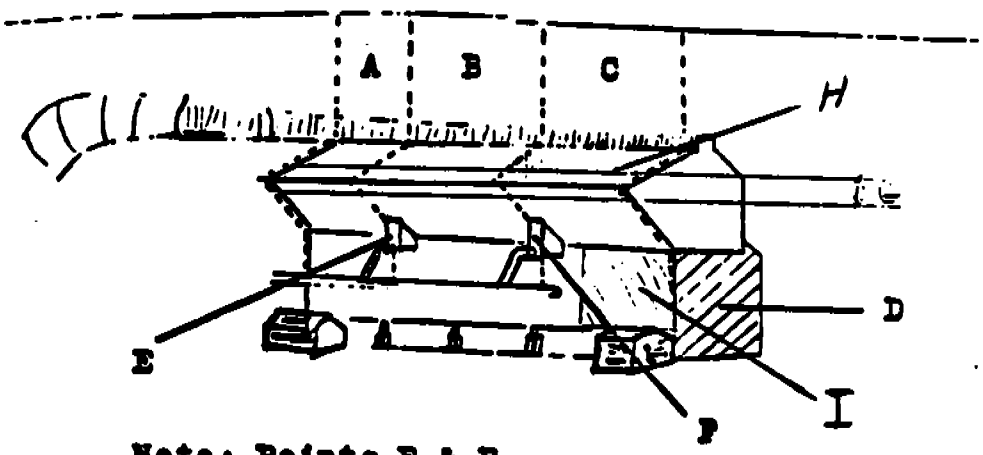
Name: RICH CASSELBERRY

Date: 05/13/90

Foreman: HALL Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
A-28	303	:00	0%	NO VISIBLE EMISSIONS FROM PUSH.
				WINDS FROM THE WEST AT 10 MPH

Points of Emission



Note: Points E & F Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte During Push and Travel.

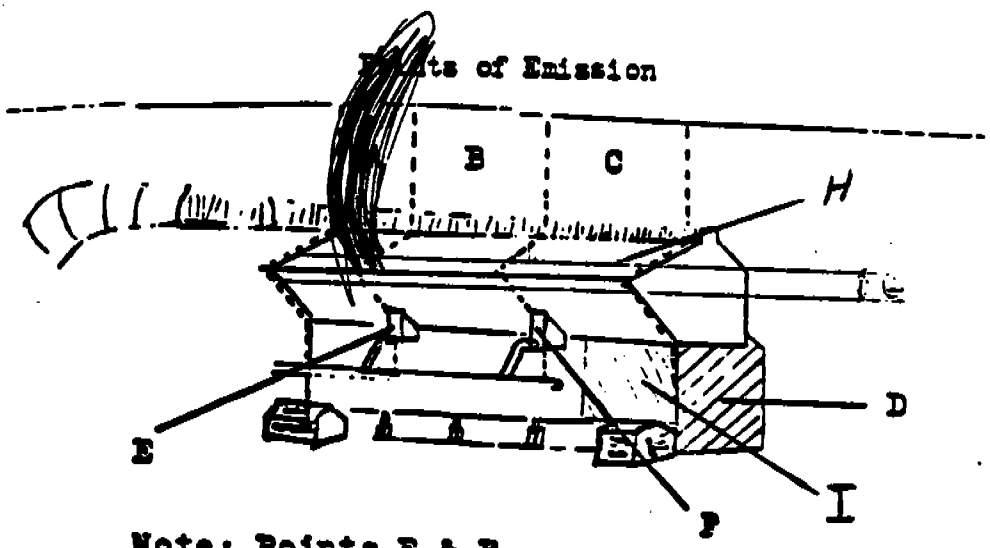
"B" Battery Pushing

Name: RICH CASSELBERRY

Date: 03/13/90

Foreman: HALL Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
B-28	3:16	10	30%	ALL EMISSION FROM ROOF AREA "A"
				WINDS FROM THE WEST AT 10 MPH.



Note: Points E & P
Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte-
During Push and Travel.

"B" Battery Pushing

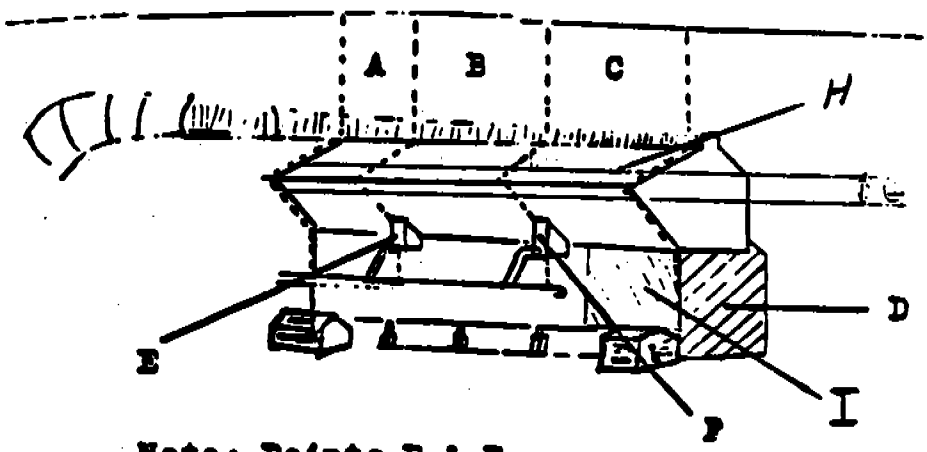
Name: RICH CASSELBERRY

Date: 03/13/90

Foreman: HALL Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
A-33	3:37	:00	0%	NO VISIBLE EMISSIONS FROM PUSH.
				WIND FROM THE WEST AT APPROX. 10 MPH

Points of Emission



Note: Points E & F
Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte
During Push and Travel.

"B" Battery Pushing

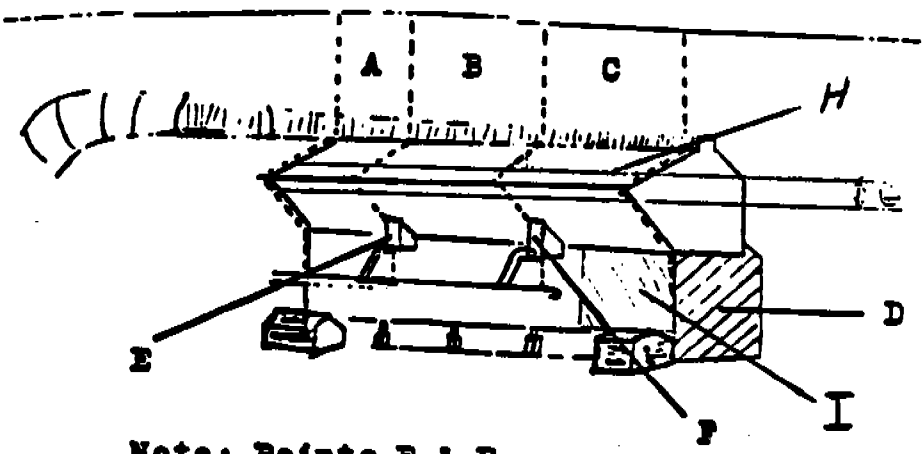
Name: RICH CASSELBERRY

Date: 03/13/90

Foreman: HALL Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
B-33	4:08	:00	0%	NO EMISSIONS READINGS OF 20%
				:12 SECONDS OF 10%
				WINDS FROM THE WEST AT APPROX. 10 MPH

Points of Emission



Note: Points E & F
Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte
During Push and Travel.

"B" Battery Pushing

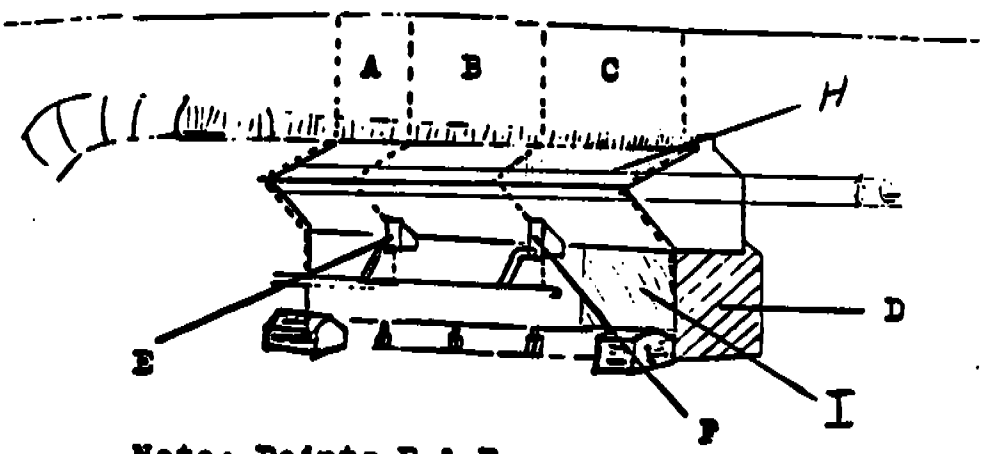
Name: RICH CASSELBERRY

Date: 03/13/90

Foreman: HALL Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
A-38	4.20	:00	0%	NO VISIBLE EMISSIONS FROM PUSH.
				WINDS FROM THE WEST AT APPROX 10 M.P.H.

Points of Emission



Note: Points E & F
Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte
During Push and Travel.

"B" Battery Pushing

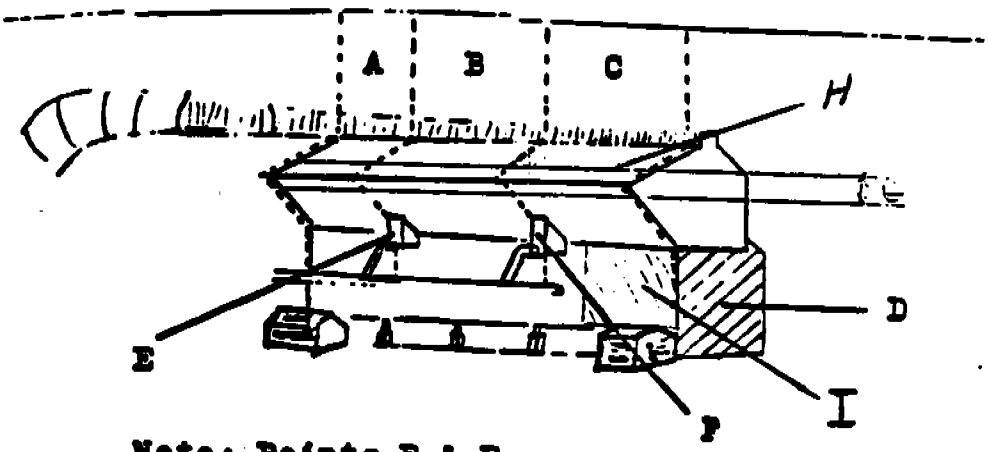
Name: RICH CASSELBERRY

Date: 03/13/90

Foreman: HALL Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
B-5	4:31	:00	0%	NO VISIBLE EMISSIONS FROM PUSH
				WINDS FROM THE WEST AT APPROX 10 MPH.

Points of Emission



Note: Points E & F
Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte
During Push and Travel.

"B" Battery Pushing

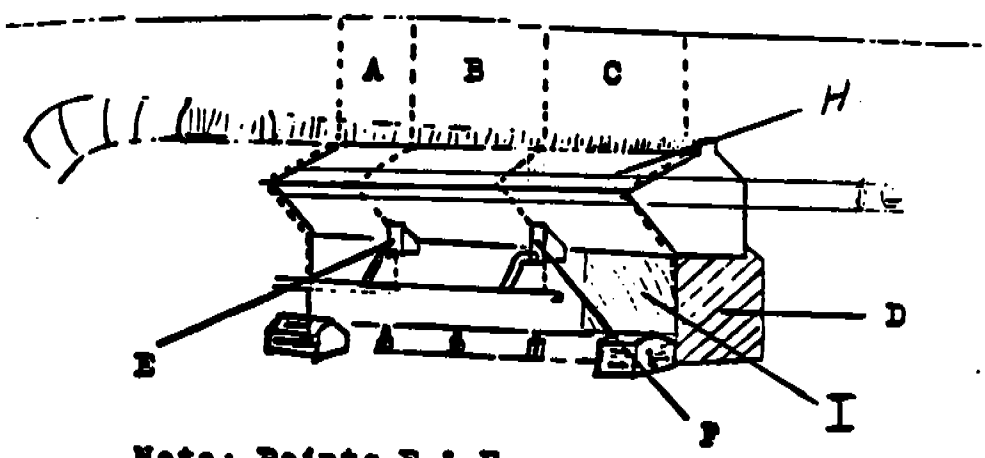
Name: Rich Casselberry

Date: 03/13/00

Foreman: Hall Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
A-5	4:43	:00	0%	NO VISIBLE EMISSIONS FROM PUSH.
				WINDS ARE FROM THE WEST AT APPROX. 10 MPH.

Points of Emission



Note: Points E & F Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte During Push and Travel.

(1)

VISIBLE EMISSIONS OBSERVATIONS FORM

"B"-BATTERY - BAG-HSE

OBSERVER: K. KUIROS

DATE: 3/12/90

FACILITY: USK-CLAIRTON

OBSERVATION: START TIME: 11 25 A

END TIME: 12 25 P

OBSERVATION POINT:

South of #3 Feeder RM off Roadway

SOURCE: Bag House

DISTANCE: 150'

DIRECTION FROM: S/E

HEIGHT: 75'

WIND:

SPEED: 25 MPH

DIRECTION: S/W

TEMPERATURE: 71

SKY CONDITION: Pt. Cloudy

BACKGROUND: Pipe + 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: Lost Power AT 11 36 A - Restored AT 12 40 P

11 25	0	0	0	0	0	55	30	0	0	0	0
	1	0	0	0	0		31	0	0	0	0
	2	0	0	0	0		32	0	0	0	0
	3	0	0	0	0		33	0	0	0	0
	4	0	0	0	0		34	0	0	0	0
30	5	0	0	0	0	12N	35	0	0	0	0
	6	0	0	0	0		36	0	0	0	0
	7	0	0	0	0		37	0	0	0	0
	8	0	0	0	0		38	0	0	0	0
	9	0	0	0	0		39	0	0	0	0
35	10	0	0	0	0	5	40	0	0	0	0
✓	11	0	0	0	0		41	0	0	0	0
	12	0	0	0	0		42	0	0	0	0
	13	0	0	0	0		43	0	0	0	0
	14	0	0	0	0		44	0	0	0	0
40	15	0	0	0	0	10	45	0	0	0	0
	16	0	0	0	0		46	0	0	0	0
	17	0	0	0	0		47	0	0	0	0
	18	0	0	0	0		48	0	0	0	0
	19	0	0	0	0		49	0	0	0	0
45	20	0	0	0	0	15	50	0	0	0	0
	21	0	0	0	0		51	0	0	0	0
	22	0	0	0	0		52	0	0	0	0
	23	0	0	0	0		53	0	0	0	0
	24	0	0	0	0		54	0	0	0	0
50	25	0	0	0	0	20	55	0	0	0	0
	26	0	0	0	0		56	0	0	0	0
	27	0	0	0	0		57	0	0	0	0
	28	0	0	0	0		58	0	0	0	0
	29	0	0	0	0		59	0	0	0	0

(2)

VISIBLE EMISSIONS OBSERVATIONS FORM

"B" - BATTERY BAG-HSE

OBSERVER: K. Kuikos

DATE: 3/12/90

FACILITY: USX-CLAIRTON

OBSERVATION: START TIME: 12 25 P

END TIME: 1 25 P

OBSERVATION POINT: South of #3 Feeder Room off Roadway

SOURCE: Bag-House

DISTANCE: 150'

DIRECTION FROM: S/E

HEIGHT: 75'

WIND:

SPEED: 25 MPH

DIRECTION: S/W

TEMPERATURE: 72

SKY CONDITION: Pt. Cloudy

BACKGROUND: Pt. Blue Sky

READING CONDITIONS: Good Air

COLOR OF EMISSION:

TOTAL No. OF READINGS: 240

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 0

CREW: FOREMAN:

COMMENTS: Resumed at 12 40 P from Page (1)

Lost Power at 1 PM Again - Resumed at 1 40 P

25 / 120	0	0	0	0	0	55	30	0	0	0	0
	1	0	0	0	0		31	0	0	0	0
	2	0	0	0	0		32	0	0	0	0
	3	0	0	0	0		33	0	0	0	0
	4	0	0	0	0		34	0	0	0	0
30	5	0	0	0	0	10	35	0	0	0	0
	6	0	0	0	0		36	0	0	0	0
	7	0	0	0	0		37	0	0	0	0
	8	0	0	0	0		38	0	0	0	0
	9	0	0	0	0		39	0	0	0	0
35	10	0	0	0	0	5	40	0	0	0	0
	11	0	0	0	0		41	0	0	0	0
	12	0	0	0	0		42	0	0	0	0
	13	0	0	0	0		43	0	0	0	0
	14	0	0	0	0		44	0	0	0	0
✓ 40	15	0	0	0	0	10	45	0	0	0	0
	16	0	0	0	0	✓	46	0	0	0	0
	17	0	0	0	0		47	0	0	0	0
	18	0	0	0	0		48	0	0	0	0
	19	0	0	0	0		49	0	0	0	0
45	20	0	0	0	0	15	50	0	0	0	0
	21	0	0	0	0		51	0	0	0	0
	22	0	0	0	0		52	0	0	0	0
	23	0	0	0	0		53	0	0	0	0
	24	0	0	0	0		54	0	0	0	0
50	25	0	0	0	0	20	55	0	0	0	0
	26	0	0	0	0		56	0	0	0	0
	27	0	0	0	0		57	0	0	0	0
	28	0	0	0	0		58	0	0	0	0
	29	0	0	0	0		59	0	0	0	0

5

VISIBLE EMISSIONS OBSERVATIONS FORM

"B" BATTERY Bag-Hse

OBSERVER: ~~K. Kutros~~ Grumline

DATE: 3/12/90

FACILITY: USX-CLAIRTON

OBSERVATION: START TIME: 3:25 0

END TIME: _____

OBSERVATION POINT: South of #3 Feeder Room OFF Roadside

SOURCE: Bag-House

DISTANCE: 150'

DIRECTION FROM: S/E

HEIGHT: 75'

WIND:

SPEED: 21 MPH

DIRECTION: W

TEMPERATURE: 76°

SKY CONDITION: Pt. Cloudy

BACKGROUND: Pt. Pe & Sky

READING CONDITIONS: FAIR

COLOR OF EMISSION: _____

TOTAL No. OF READINGS: 104

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 0

CREW: ____ FOREMAN: _____

COMMENTS: _____

3:25	0	0	0	0	0	30				
	1	0	0	0	0	31				
	2	0	0	0	0	32				
	3	0	0	0	0	33				
	4	0	0	0	0	34				
30	5	0	0	0	0	35				
	6	0	0	0	0	36				
	7	0	0	0	0	37				
	8	0	0	0	0	38				
	9	0	0	0	0	39				
35	10	0	0	0	0	40				
	11	0	0	0	0	41				
	12	0	0	0	0	42				
	13	0	0	0	0	43				
	14	0	0	0	0	44				
40	15	0	0	0	0	45				
	16	0	0	0	0	46				
	17	0	0	0	0	47				
	18	0	0	0	0	48				
	19	0	0	0	0	49				
45	20	0	0	0	0	50				
	21					51				
	22					52				
	23					53				
	24					54				
	25					55				
	26					56				
	27					57				
	28					58				
	29					59				

(1)

VISIBLE EMISSIONS OBSERVATIONS FORM

"B" - BATTERY Bag-House

OBSERVER: K. KULROS

DATE: 3/13/90

FACILITY: USX-CLAIRTON

OBSERVATION: START TIME: 9:35 A

END TIME: 10:35 A

OBSERVATION POINT:

South of #3 Feeder Room Alongside Roadway

SOURCE: Bag-House

DISTANCE: 150'

DIRECTION FROM: S/W

HEIGHT: 75'

WIND:

SPEED: 14 MPH

DIRECTION: S/W

TEMPERATURE: 67°

SKY CONDITION: Pt. Cloudy

BACKGROUND: Pipe + 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:

9:35	0	0	0	0	0	25	30	0	0	0	0
	1	0	0	0	0		31	0	0	0	0
	2	0	0	0	0		32	0	0	0	0
	3	0	0	0	0		33	0	0	0	0
	4	0	0	0	0		34	0	0	0	0
10	5	0	0	0	0	30	35	0	0	0	0
	6	0	0	0	0		36	0	0	0	0
	7	0	0	0	0		37	0	0	0	0
	8	0	0	0	0		38	0	0	0	0
	9	0	0	0	0		39	0	0	0	0
5	10	0	0	0	0	35	40	0	0	0	0
	11	0	0	0	0		41	0	0	0	0
	12	0	0	0	0		42	0	0	0	0
	13	0	0	0	0		43	0	0	0	0
	14	0	0	0	0		44	0	0	0	0
10	15	0	0	0	0	40	45	0	0	0	0
	16	0	0	0	0		46	0	0	0	0
	17	0	0	0	0		47	0	0	0	0
	18	0	0	0	0		48	0	0	0	0
	19	0	0	0	0		49	0	0	0	0
15	20	0	0	0	0	45	50	0	0	0	0
	21	0	0	0	0		51	0	0	0	0
	22	0	0	0	0		52	0	0	0	0
	23	0	0	0	0		53	0	0	0	0
	24	0	0	0	0		54	0	0	0	0
20	25	0	0	0	0	50	55	0	0	0	0
	26	0	0	0	0		56	0	0	0	0
	27	0	0	0	0		57	0	0	0	0
	28	0	0	0	0		58	0	0	0	0
	29	0	0	0	0		59	0	0	0	0

(2)

VISIBLE EMISSIONS OBSERVATIONS FORM

"B"-BATTERY -Bag-Hse

OBSERVER: K. Kulpos

DATE: 3/13/90

FACILITY: USX-CLAIRTON

OBSERVATION: START TIME: 10:55 A

END TIME: 11:55 A

OBSERVATION POINT:

South of #2 Feeder Room

Alongside Roadway

SOURCE: Bag-House

DISTANCE: 150'

DIRECTION FROM: S/W

HEIGHT: 75'

WIND:

SPEED: 16 MPH

DIRECTION: W

TEMPERATURE: 68°

SKY CONDITION: PT. Cloudy

BACKGROUND: Pipe + 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:

10:55 A	0	0	0	0	0	25	30	0	0	0	0
	1	0	0	0	0		31	0	0	0	0
	2	0	0	0	0		32	0	0	0	0
	3	0	0	0	0		33	0	0	0	0
	4	0	0	0	0		34	0	0	0	0
11:00 A	5	0	0	0	0	30	35	0	0	0	0
	6	0	0	0	0		36	0	0	0	0
	7	0	0	0	0		37	0	0	0	0
	8	0	0	0	0		38	0	0	0	0
	9	0	0	0	0		39	0	0	0	0
5	10	0	0	0	0	35	40	0	0	0	0
	11	0	0	0	0		41	0	0	0	0
	12	0	0	0	0		42	0	0	0	0
	13	0	0	0	0		43	0	0	0	0
	14	0	0	0	0		44	0	0	0	0
10	15	0	0	0	0	40	45	0	0	0	0
	16	0	0	0	0		46	0	0	0	0
	17	0	0	0	0		47	0	0	0	0
	18	0	0	0	0		48	0	0	0	0
	19	0	0	0	0		49	0	0	0	0
15	20	0	0	0	0	45	50	0	0	0	0
	21	0	0	0	0		51	0	0	0	0
	22	0	0	0	0		52	0	0	0	0
	23	0	0	0	0		53	0	0	0	0
	24	0	0	0	0		54	0	0	0	0
20	25	0	0	0	0	50	55	0	0	0	0
	26	0	0	0	0		56	0	0	0	0
	27	0	0	0	0		57	0	0	0	0
	28	0	0	0	0		58	0	0	0	0
	29	0	0	0	0		59	0	0	0	0

(3)

VISIBLE EMISSIONS OBSERVATIONS FORM

"B" - Battery - Bag-Hse

OBSERVER: K. Kuiros

DATE: 3/13/90

FACILITY: USX - Clairton

OBSERVATION: START TIME: 11 55 A

END TIME: 12 28 P

OBSERVATION POINT:

South of #3 Feeder Room Alongside Roadway

SOURCE: Bag-House

DISTANCE: 150'

DIRECTION FROM: S/W

HEIGHT: 75'

WIND:

SPEED: 12 MPH

DIRECTION: S/W

TEMPERATURE: 72°

SKY CONDITION: Pt. Cloudy

BACKGROUND: Pile + Sky

READING CONDITIONS: Fair

COLOR OF EMISSION:

TOTAL No. OF READINGS: 136

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 0

CREW: FOREMAN:

COMMENTS:

11 55	0	0	0	0	0	25	30	0	0	0	0
	1	0	0	0	0		31	0	0	0	0
	2	0	0	0	0		32	0	0	0	0
	3	0	0	0	0		33	0	0	0	0
	4	0	0	0	0		34				
12 00	5	0	0	0	0	30	35				
	6	0	0	0	0		36				
	7	0	0	0	0		37				
	8	0	0	0	0		38				
	9	0	0	0	0		39				
5	10	0	0	0	0	35	40				
	11	0	0	0	0		41				
	12	0	0	0	0		42				
	13	0	0	0	0		43				
	14	0	0	0	0		44				
10	15	0	0	0	0	40	45				
	16	0	0	0	0		46				
	17	0	0	0	0		47				
	18	0	0	0	0		48				
	19	0	0	0	0		49				
15	20	0	0	0	0	45	50				
	21	0	0	0	0		51				
	22	0	0	0	0		52				
	23	0	0	0	0		53				
	24	0	0	0	0		54				
20	25	0	0	0	0	50	55				
	26	0	0	0	0		56				
	27	0	0	0	0		57				
	28	0	0	0	0		58				
	29	0	0	0	0		59				

(4)

VISIBLE EMISSIONS OBSERVATIONS FORM

"B" - BATTERY - BAG - HSE

OBSERVER: K. Kulros + Grumling

DATE: 3/13/90

FACILITY: USX-Clairton

OBSERVATION: START TIME: 2:22 P

END TIME: 3:22 P

OBSERVATION POINT:
South of #3 Feeder Room
Alongside Roadway

SOURCE: Bag-House

DISTANCE: 150'

DIRECTION FROM: S/W

HEIGHT: 75'

WIND:

SPEED: 10 MPH

DIRECTION: W

TEMPERATURE: 75

SKY CONDITION: PT Cloudy

BACKGROUND: Piled Sky

READING CONDITIONS: Good

COLOR OF EMISSION: \

TOTAL No. OF READINGS: 240

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 0

CREW: ____ FOREMAN: ____

COMMENTS: ____

2:22 P	0	0	0	0	0		30	0	0	0	0
	1	0	0	0	0		31	0	0	0	0
	2	0	0	0	0		32	0	0	0	0
25	3	0	0	0	0	55	33	0	0	0	0
	4	0	0	0	0		34	0	0	0	0
	5	0	0	0	0		35	0	0	0	0
	6	0	0	0	0		36	0	0	0	0
	7	0	0	0	0		37	0	0	0	0
30	8	0	0	0	0	3:00 P	38	0	0	0	0
	9	0	0	0	0		39	0	0	0	0
	10	0	0	0	0		40	0	0	0	0
	11	0	0	0	0		41	0	0	0	0
	12	0	0	0	0		42	0	0	0	0
35	13	0	0	0	0	5	43	0	0	0	0
	14	0	0	0	0		44	0	0	0	0
	15	0	0	0	0		45	0	0	0	0
	16	0	0	0	0		46	0	0	0	0
	17	0	0	0	0		47	0	0	0	0
40	18	0	0	0	0	10	48	0	0	0	0
	19	0	0	0	0		49	0	0	0	0
	20	0	0	0	0		50	0	0	0	0
	21	0	0	0	0		51	0	0	0	0
	22	0	0	0	0	15	52	0	0	0	0
45	23	0	0	0	0		53	0	0	0	0
	24	0	0	0	0		54	0	0	0	0
	25	0	0	0	0		55	0	0	0	0
	26	0	0	0	0		56	0	0	0	0
	27	0	0	0	0		57	0	0	0	0
50	28	0	0	0	0	20	58	0	0	0	0
	29	0	0	0	0		59	0	0	0	0

Grumling starts here

(5)

VISIBLE EMISSIONS OBSERVATIONS FORM

"B - BATTERY BAG HOUSE

OBSERVER: Grumling

DATE: 3-13-90

FACILITY: USX Clairton

OBSERVATION: START TIME: 3:23

END TIME: 4:23

OBSERVATION POINT:

South of #3 Feeder Room Along Side Roadway

SOURCE:

DISTANCE: 150'

DIRECTION FROM: S.W

HEIGHT: 75'

WIND:

SPEED: 9 MPH

DIRECTION: WEST

TEMPERATURE: 76°

SKY CONDITION: Partly cloudy

BACKGROUND: Sky

READING CONDITIONS: Good

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		30	0	0	0	0
	1	0	0	0	0		31	0	0	0	0
3:25	2	0	0	0	0		32	0	0	0	0
	3	0	0	0	0	55	33	0	0	0	0
	4	0	0	0	0		34	0	0	0	0
	5	0	0	0	0		35	0	0	0	0
	6	0	0	0	0		36	0	0	0	0
	7	0	0	0	0		37	0	0	0	0
	8	0	0	0	0	4:00	38	0	0	0	0
30	9	0	0	0	0		39	0	0	0	0
	10	0	0	0	0		40	0	0	0	0
	11	0	0	0	0		41	0	0	0	0
	12	0	0	0	0		42	0	0	0	0
35	13	0	0	0	0	05	43	0	0	0	0
	14	0	0	0	0		44	0	0	0	0
	15	0	0	0	0		45	0	0	0	0
	16	0	0	0	0		46	0	0	0	0
	17	0	0	0	0		47	0	0	0	0
40	18	0	0	0	0	10	48	0	0	0	0
	19	0	0	0	0		49	0	0	0	0
	20	0	0	0	0		50	0	0	0	0
	21	0	0	0	0		51	0	0	0	0
	22	0	0	0	0		52	0	0	0	0
45	23	0	0	0	0	15	53	0	0	0	0
	24	0	0	0	0		54	0	0	0	0
	25	0	0	0	0		55	0	0	0	0
	26	0	0	0	0		56	0	0	0	0
	27	0	0	0	0		57	0	0	0	0
50	28	0	0	0	0	20	58	0	0	0	0
	29	0	0	0	0		59	0	0	0	0

(6)

VISIBLE EMISSIONS OBSERVATIONS FORM

"B" BATTERY BAG HOUSE

OBSERVER: GRUMLING

DATE: 3-13-90

FACILITY: USX CLAIRTON

OBSERVATION: START TIME: 433

END TIME: 444

OBSERVATION POINT:

SOUTH of #3 FEEDER ROOM ALONG SIDE ROADWAY

SOURCE:

DISTANCE: 150'

DIRECTION FROM: S.W

HEIGHT: 75'

WIND:

SPEED: 9 MPH

DIRECTION: WEST

TEMPERATURE: 76

SKY CONDITION: PARTLY CLOUDY

BACKGROUND: SKY

READING CONDITIONS: FAIR

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 92

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 0

CREW: ____ FOREMAN: ____

COMMENTS:

0	0	0	0	0	30					
1	0	0	0	0	31					
2	0	0	0	0	32					
3	0	0	0	0	33					
4	0	0	0	0	34					
5	0	0	0	0	35					
6	0	0	0	0	36					
7	0	0	0	0	37					
8	0	0	0	0	38					
9	0	0	0	0	39					
10	0	0	0	0	40					
11	0	0	0	0	41					
12	0	0	0	0	42					
13	0	0	0	0	43					
14	0	0	0	0	44					
15	0	0	0	0	45					
16	0	0	0	0	46					
17	0	0	0	0	47					
18	0	0	0	0	48					
19	0	0	0	0	49					
20	0	0	0	0	50					
21	0	0	0	0	51					
22	0	0	0	0	52					
23					53					
24					54					
25					55					
26					56					
27					57					
28					58					
29					59					