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.

AP-42 Section 12.2
Reference
Report Sect. 4
Reference 71

Reviewed

# USS CLAIRTON WORKS
# CLAIRTON, PENNSYLVANIA

Report on
## COMPLIANCE DEMONSTRATION
## NO. 2 BATTERY COMBUSTION STACK
## USS CLAIRTON WORKS

OCTOBER 1993

Prepared By: Chester Environmental
3000 Tech Center Drive
Monroeville, Pennsylvania 15146

Project No.: 600725-01

57

U. S. Steel
Clairton Works
400 State Street
Clairton, PA 15025-1855

Orig → WUC
cy letter → EJT, WGG

October 25, 1993

AHF 10/26

Director
Bureau of Air Quality Control
Department of Environmental Resources
P.O. Box 2063
Harrisburg, PA 17120

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

U.S. Environmental Protection Agency
Region III
841 Chestnut Building
Philadelphia, PA 19017

Office of Chief Counsel
Western Region
Department of Environmental Resources
400 Waterfront Drive
Pittsburgh, PA 15222-4745

Gentlemen:

Subject: Compliance Demonstration
Clairton Battery Stack #2

I have enclosed with this letter the mass emission report on #2 Battery Combustion Stack. The compliance demonstration was conducted at USS Clairton Works, Clairton, PA, a division of USX Corporation, on August 25-26, 1993.

For questions regarding this report, please contact William C. Graeser at (412) 233-1467.

Very truly yours,

G T Weber Jr HWC

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

GTW/BAC
Enclosure



Steel the recycled material

U. S. Steel
Clairton Works
400 State Street
Clairton, PA 15025-1855

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Steel the recycled material

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## EXECUTIVE SUMMARY

On August 25 and 26, 1993, a compliance test program was conducted for USS Clairton Works, Clairton, PA, on the #2 Battery Combustion Stack. The purpose of the testing was to determine the (1) concentration and mass emission rate of particulate matter, and (2) presence and extent of visible emissions from the stack as required by the Amended Mon Valley Consent Decree, Paragraph V.A.(6) and Appendix 4.A.

The results of the testing showed an average particulate matter concentration and emission rate of 0.0175 grains per dry standard cubic feet (gr/dscf) and 5.3 pounds per hour (lb/hr), respectively. As promulgated by the Amended Mon Valley Consent Decree, Paragraph V.A.(6), the allowable particulate matter concentration for #2 Battery Combustion Stack is 0.030 gr/dscf. Thus, the average particulate matter concentration in the stack gas is less than the allowable concentration.

The opacity of the exhaust gas during any of the three tests was less than or equal to 10 percent. As promulgated by the Amended Mon Valley Consent Decree, Paragraph V.A.(6), the "visible emissions shall not equal or exceed 20 percent opacity for a period or periods aggregating in excess of 3 minutes in any 60-minute period and shall never equal or exceed 60 percent opacity."

## 1.0 INTRODUCTION

On August 25 and 26, 1993, a compliance test program was conducted for USS Clairton Works, Clairton, PA, on the #2 Battery Combustion Stack. The purpose of the testing was to determine the (1) concentration and mass emission rate of particulate matter, and (2) presence and extent of visible emissions from the stack as required by the Amended Mon Valley Consent Decree, Paragraph V.A.(6) and Appendix 4.A.

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

The test program required two days to complete the field work activities due to a delay in the operation of the Battery #2. Since no ovens in Battery #2 were pushed or charged from approximately 1200 to 1600 on August 25 1993, no emissions testing was completed during this time period. The third test run was conducted on the following day, August 26, 1993.

## 2.0 METHODOLOGIES

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

Particulate matter sampling was performed in accordance with EPA Stationary Source Sampling Methods 1 through 5. Three two-hour tests were executed during normal, maximum operation and production of the battery.

The process exhausts through a 114 inch inside diameter stack. A total of 24 traverse points, 12 per diameter, were sampled; the traverse points were calculated in accordance with EPA Method 1. Sampling was conducted through four equally spaced ports, with six traverse points sampled per port. Each traverse point was sampled for 5 minutes, thus bringing the total sampling time to 120 minutes for each test run.

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

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

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

As specified by EPA Method 5, each sample train was assembled as required by the method, leak-checked on site at the beginning and end of each test run, and operated such that isokinetic conditions were maintained. Clean up of the sampling train included an acetone rinse of the front-half components of the sample train. Front-half acetone rinses were evaporated to dryness, desiccated, and weighed to a constant weight. Sample train filters were desiccated for 24 hours, and particulate matter weight was determined gravimetrically. Rinse residue weights and filter weights were

measured to the nearest 0.1 mg. One acetone blank was prepared in the same manner as the test sample rinses. The blank residue weight was subtracted from the test sample residue weights. After blank correction, the acetone rinse residue weights and sample train filter weights were used to determine total particulate matter catch.

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

## 3.0 RESULTS

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

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

Copies of the field data sheets can be found in Appendix A. The gravimetric results and the emissions calculations for each test can be found in Appendix C.

The test results have been summarized in Table 1. The results of the testing showed an average particulate matter concentration and emission rate of 0.0175 grains per dry standard cubic feet (gr/dscf) and 5.3 pounds per hour (lb/hr), respectively. As promulgated by the Amended Mon Valley Consent Decree, Paragraph V.A.(6), the allowable particulate matter concentration for #2 Battery Combustion Stack is 0.030 gr/dscf. Thus, the average particulate matter concentration in the stack gas is less than the allowable concentration.

Table 1 also lists other pertinent stack and sampling parameters which include stack gas flow rate in units of actual cubic feet per minute (acfm) and standard cubic feet per minute (scfm), moisture content of the stack gas (percent by volume), stack gas temperature ($^{o}$F), gas volume sampled for each test in units of dry standard cubic feet (dscf), and the isokinetics value for each test. The gas volume sampled for each 120 minute test was greater than 50 dry standard cubic feet. The isokinetics value is equal to the ratio of the average linear gas velocity sampled through the probe nozzle to the average stack gas velocity. An isokinetics value between 90 percent and 110 percent is considered acceptable. Isokinetic values for the three test runs were 108.4 percent, 107.2 percent, and 107.1 percent; therefore, all values were within the acceptable range. Actual test sampling times have also been included in Table 1.

Copies of the field data sheets for the visible emissions readings can be found in Appendix A. As promulgated by the Amended Mon Valley Consent Decree,

Paragraph V.A.(6), the "visible emissions shall not equal or exceed 20 percent opacity for a period or periods aggregating in excess of 3 minutes in any 60-minute period and shall never equal or exceed 60 percent opacity." The opacity of the exhaust gas during any of the three tests was less than or equal to 10 percent.

TABLE 1

USS CLAIRTON WORKS
CLAIRTON, PA

#2 BATTERY COMBUSTION STACK
PARTICULATE MATTER EMISSIONS DATA

| | | Run 1 | Run 2 | Run 3 | Average |
|---|---|---|---|---|---|
| Test Number | | CLR-BS2-1 | CLR-BS2-2 | CLR-BS2-3 | |
| Test Date | | 8-25-93 | 8-25-93 | 8-26-93 | |
| Mass Emissions Rate and Concentration | | | | | |
| Particulate Matter | (lb/hr) | 7.0 | 3.0 | 5.9 | 5.3 |
| | (gr/dscf) | 0.0230 | 0.0103 | 0.0193 | 0.0175 |
| Stack Conditions | | | | | |
| Flow Rate | (acfm) | 78900 | 75300 | 78900 | 77700 |
| | (scfm) | 41500 | 39600 | 41500 | 40867 |
| | (dscfm) | 35400 | 33779 | 35524 | 34901 |
| Temperature | (°F) | 526 | 528 | 529 | 528 |
| Moisture Content | (%) | 14.7 | 14.7 | 14.4 | 14.6 |
| Sampling Conditions | | | | | |
| Test times | | 0925 to 0955 | 1607 to 1637 | 1109 to 1139 | |
| | | 1000 to 1030 | 1642 to 1712 | 1143 to 1213 | |
| | | 1035 to 1105 | 1718 to 1748 | 1218 to 1248 | |
| | | 1112 to 1142 | 1753 to 1823 | 1252 to 1322 | |
| Sampling Time | (minutes) | 120 | 120 | 120 | |
| Sample Volume | (dscf) | 64.978 | 61.197 | 64.280 | |
| Isokinetics | (%) | 108.4 | 107.2 | 107.1 | |

# COMPLIANCE DEMONSTRATION
# NO. 2 BATTERY COMBUSTION STACK
# USS CLAIRTON WORKS

## USS CLAIRTON WORKS
## CLAIRTON, PENNSYLVANIA

## APPENDIX A

## TEST PROTOCOL, FIELD DATA SHEETS, CALIBRATION RESULTS

CHESTER
ENVIRONMENTAL

# TEST PROTOCOL
# COMPLIANCE DEMONSTRATION OF
# #2 BATTERY COMBUSTION STACK

## USS CLAIRTON WORKS
## CLAIRTON, PA

Particulate matter sampling will be performed in accordance with EPA Stationary Source Sampling Methods 1 through 5 (40 CFR, Part 60, Appendix A) and Sections 139.11 and 139.12 of the Pennsylvania Department of Environmental Resources (PA DER) Source Testing Manual. Three two-hour tests will be executed during normal operating conditions. Greater than 50 dry standard cubic feet of sample gas will be collected during each test run.

The process exhausts through a 114 inch diameter stack. A total of 24 traverse points (12 per diameter) will be sampled; the traverse points will be calculated in accordance with EPA Method 1. Sampling will be conducted through four equally spaced ports, with six traverse points sampled per port. Each point will be sampled for 5 minutes, thus bringing the total sampling time to 120 minutes.

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

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

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

As specified by EPA Method 5, each sample train will be assembled as required by the method, leak-checked on site at the beginning and end of each test run, and operated such that isokinetic conditions are maintained. Clean up of the sampling train will include an acetone rinse of the front-half components of the sample train. Front-half acetone rinses will be evaporated to dryness, desiccated, and weighed to a constant weight. Sample train glass fiber filters will be desiccated for 24 hours, and particulate matter weight will be determined gravimetrically. Rinse residue weights and filter weights will be measured to the nearest 0.1 milligram. One acetone blank will be prepared in the same manner as the test sample rinses. The blank residue weight will be subtracted from the test sample residue weights. After blank correction, front-half acetone rinse residue weights and sample train filter weights will be used to determine total particulate matter catch. Clean up and analytical procedures will follow the methodology of EPA Method 5.

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

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

# STACK SAMPLING DATA SHEET

CLIENT USS Clairton Works
TEST UNIT #2 Battery Stack
PROJECT NO. 6007725-01
TEST CREW MC
BAROMETRIC PRESSURE 29.50

TEST DATE 8-25-93 (Wed)
TEST NO. CLR-#285-PM-1
NOZZLE (SIZE,#) 0.428
STATIC PRESSURE -1.0" $H_2O$
PORT DIRECTION #4 #3

ORIFICE CORRECTION (ΔH@) 1.802
METER CORRECTION (Y) 0.9619
CALIBRATION DATE 5-17-93
PITOT CORRECTION 0.84
CONTROL BOX NO. 7

HOT/COLD BOX NO. 2
PROBE NO. 10-2
FILTER NO. 1082
STACK DIA. 114"
PORT SIZE 4"

| Traverse Point (inches) | Time | Dry Gas Meter Reading (dcf) | Pitot ΔP (in. H2O) | Orifice ΔH Required (in. H2O) | Orifice ΔH Actual (in. H2O) | Meter Temperature In (°F) | Meter Temperature Out (°F) | Vacuum (in. Hg) | Stack Temp. (°F) | Probe Temp. (°F) | Impinger Temp. (°F) | Hot Box Temp. (°F) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | 5 min./point |
| 40.6 | 09:25 | 776.892 | .060 | 1.04 | 1.04 | 85 | 85 | 4.0 | 522 | 250 | <68 | 250 | |
| 28.5 | | | .070 | 1.22 | 1.22 | 102 | 85 | 4.5 | 540 | | | | |
| 20.2 | | | .070 | 1.22 | 1.22 | 105 | 85 | 4.5 | 546 | | | | |
| 13.5 | | | .050 | .87 | .87 | 110 | 86 | 4.0 | 550 | | | | |
| 7.6 | | | .040 | .70 | .70 | 110 | 86 | 4.0 | 529 | | | | |
| 2.4 | 09:55 | 815.638 | .050 | .87 | .87 | 115 | 88 | 4.0 | 504 | | | | |
| 40.6 | 10:00 | 815.638 | .050 | .87 | .87 | 100 | 88 | 4.0 | 558 | | | | |
| 28.5 | | | .060 | 1.04 | 1.04 | 120 | 92 | 4.0 | 569 | | | | |
| 20.2 | | | .060 | 1.04 | 1.04 | 120 | 92 | 4.0 | 529 | | | | |
| 13.5 | | | .060 | 1.04 | 1.04 | 122 | 95 | 4.5 | 521 | | | | |
| 7.6 | | | .050 | .87 | .87 | 122 | 95 | 4.0 | 528 | | | | |
| 2.4 | 10:30 | 833.935 | .050 | .87 | .87 | 122 | 95 | 4.0 | 500 | | | | |

Estimates:
MW= ~~28.0~~ 27.63
%H2O= 11

**SYSTEM LEAK CHECK**

| | Vacuum (in. Hg) | DGM Rate (cfm) |
|---|---|---|
| Before | 5.0 | 0.005 |
| After | 10.5 | <0.01 cfm |

**PITOT LEAK CHECK**

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

| GAS | 1 | 2 |
|---|---|---|
| CO2 | 5.0 | |
| O2 | 12.5 | |
| CO | 0 | |
| N2 | 82.5 | |

| Impinger No. | Impinger Contents | Final | Initial | Difference |
|---|---|---|---|---|
| 1. | 100mL DI. $H_2O$ | 663.1 | 479.3 | 183.8 |
| 2. | 100mL DI. $H_2O$ | 574.6 | 545.2 | 29.4 |
| 3. | Empty | 438.4 | 435.2 | 3.2 |
| 4. | Silica Gel | 545.5 | 525.0 | 20.5 |
| 5. | | | | |
| 6. | Actual | | | 236.9g total |
| 7. | Moisture = 14.8% | | | |
| 8. | | | | |

216.4g

CHESTER ENVIRONMENTAL

# STACK SAMPLING DATA SHEET



| | | | | | |
|---|---|---|---|---|---|
| CLIENT | USS CLAIRTON WORKS | TEST DATE | 8-25-97 | ORIFICE CORRECTION (ΔH@) | 1.80" HOT/COLD BOX NO. 2 |
| TEST UNIT | #2 BATTERY STACK | TEST NO. | CLR-2BS-PM-1 | METER CORRECTION (Y) | 0.9619 PROBE NO. 10-2 |
| PROJECT NO. | 6(X)725-01 | NOZZLE (SIZE,#) | 0.428 | CALIBRATION DATE | 5-17-97 FILTER NO. 1082 |
| TEST CREW | RPC | STATIC PRESSURE | -1.0" $H_2O$ | PITOT CORRECTION | 0.84 STACK DIA. 114" |
| BAROMETRIC PRESSURE | 29.50 | PORT DIRECTION | #2, #1 | CONTROL BOX NO. | 7 PORT SIZE 4" |

| | Traverse Point (inches) | Time | Dry Gas Meter Reading (dcf) | Pitot ΔP (in. H2O) | Orifice ΔH Required (in. H2O) | Orifice ΔH Actual (in. H2O) | Meter Temperature In (°F) | Meter Temperature Out (°F) | Vacuum (in. Hg) | Stack Temp. (°F) | Probe Temp. (°F) | Impinger Temp. (°F) | Hot Box Temp. (°F) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ↑ | 40.6 | 10:35 | 833.935 | .050 | .87 | .87 | 111 | 100 | 4.0 | 521 | 250 | <68F | 250 | 5 min./point |
| | 28.5 | | | .060 | 1.04 | 1.04 | 123 | 102 | 4.0 | 520 | | | | |
| #2 | 20.2 | | | .060 | 1.04 | 1.021 | 124 | 103 | 4.0 | 519 | | | | |
| | 13.5 | | | .060 | 1.04 | 1.04 | 122 | 100 | 4.0 | 540 | | | | |
| | 7.6 | | | .050 | .87 | .87 | 122 | 100 | 4.0 | 507 | | | | |
| ↓ | 2.4 | 1105 | 851.329 | .040 | .69 | .69 | 122 | 101 | 3.5 | 500 | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| ↑ | 40.6 | 11:12 | 851.329 | .070 | 1.21 | 1.21 | 120 | 105 | 5.5 | 521 | | | | |
| | 28.5 | | | .070 | 1.21 | 1.21 | 120 | 105 | 5.5 | 520 | | | | |
| #1 | 20.2 | | | .050 | .86 | .86 | 128 | 105 | 4.0 | 545 | | | | |
| | 13.5 | | | .050 | .86 | .86 | 128 | 105 | 4.5 | 531 | | | | |
| | 7.6 | | | .050 | .86 | .86 | 128 | 103 | 4.5 | 505 | | | | |
| ↓ | 2.4 | 1142 | 869.750 | .040 | .69 | .69 | 126 | 102 | 4.0 | 500 | | | | |
| | | | | | | | | | | | | | | |
| | Test | Δ = | Δ = | $(\Delta P)_{AVG}$ = | $(\Delta H)_{AVG}$ = | | $(T_{meter})_{AVG}$ = 106°F | | | $(T_{stack})_{AVG}$ = 526°F | | | | Estimates: |
| | Totals | 120 | 72.858 | | | 1.05 | | | | | | | | MW= ~~28.02~~ 27.63 |
| | | min | dcf | 0.055 | | | velocity = [redacted] ft/sec | | | | | Iso. = 108.3% [redacted] | | %H2O= 11 |

**SYSTEM LEAK CHECK**

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

**PITOT LEAK CHECK**

| | Positive | Negative |
|---|---|---|
| Before | | |
| After | | |

| GAS | 1 | 2 |
|---|---|---|
| CO2 | | |
| O2 | | |
| CO | | |
| N2 | | |

18.5

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

CHESTER ENVIRONMENTAL

# STACK SAMPLING DATA SHEET

| | | | | | |
|---|---|---|---|---|---|
| CLIENT USS CLAIRTON WORKS | TEST DATE 8-25-93 (Wed.) | ORIFICE CORRECTION (ΔH@) 1.892 | HOT/COLD BOX NO. 4 |
| TEST UNIT #2 BATTERY STACK | TEST NO. CLR-2BS-PM-2 | METER CORRECTION (Y) 0.9619 | PROBE NO. 10-2 |
| PROJECT NO. 600725-01 | NOZZLE (SIZE,#) 0.428 | CALIBRATION DATE 5-12-93 | FILTER NO. 1081 |
| TEST CREW RPS | STATIC PRESSURE -1.0 "H2O | PITOT CORRECTION 0.84 | STACK DIA. 114" |
| BAROMETRIC PRESSURE 28.50 | PORT DIRECTION #1,4 | CONTROL BOX NO. 7 | PORT SIZE 4" |

| | Traverse Point (inches) | Time | Dry Gas Meter Reading (dcf) | Pitot ΔP (in. H2O) | Orifice ΔH Required (in. H2O) | Orifice ΔH Actual (in. H2O) | Meter Temperature In (°F) | Meter Temperature Out (°F) | Vacuum (in. Hg) | Stack Temp. (°F) | Probe Temp. (°F) | Impinger Temp. (°F) | Hot Box Temp. (°F) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ↑ | 40.6 | 16:07 | 870.681 | .06 | 1.04 | 1.04 | 100 | 100 | 2.0 | 516 | ~250° | <68° | ~250° | 5 min./point |
| | 28.5 | | | .06 | 1.04 | 1.04 | 112 | 99 | 2.0 | 509 | | | | |
| #1 | 20.2 | | | .06 | 1.04 | 1.04 | 118 | 99 | 2.0 | 531 | | | | |
| | 13.5 | | | .05 | .87 | .87 | 120 | 100 | 2.0 | 541 | | | | |
| | 7.6 | | | .05 | .87 | .87 | 120 | 100 | 2.0 | 541 | | | | |
| ↓ | 2.4 | 16:37 | 888.815 | .05 | .87 | .87 | 120 | 102 | 2.0 | 500 | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| ↑ | 40.6 | 16:42 | 888.815 | .07 | 1.21 | 1.21 | 116 | 100 | 3.0 | 531 | | | | |
| | 28.5 | | | .07 | 1.21 | 1.21 | 126 | 104 | 3.0 | 540 | | | | |
| #4 | 20.2 | | | .05 | .87 | .87 | 128 | 104 | 3.0 | 512 | | | | |
| | 13.5 | | | .06 | 1.04 | 1.04 | 130 | 105 | 3.0 | 519 | | | | |
| | 7.6 | | | .06 | 1.04 | 1.04 | 130 | 105 | 3.0 | 522 | | | | |
| ↓ | 2.4 | 17:12 | 908.311 | .06 | 1.04 | 1.04 | 130 | 105 | 3.0 | 539 | | | | |
| | | | | | | | | | | | | | | Estimates: |
| | | | | | | | | | | | | | | MW= ~~28.0~~ 27.64 |
| | | | | | | | | | | | | | | %H2O= 11 |

**SYSTEM LEAK CHECK**

| | Vacuum (in. Hg) | DGM Rate (cfm) |
|---|---|---|
| Before | 5.0 | <0.01cfm |
| After | 6.5 | <0.01cfm |

**PITOT LEAK CHECK**

| | Positive | Negative |
|---|---|---|
| Before | 0" H2O/15sec | 0" H2O/15sec |
| After | 0" H2O/15sec | 0" H2O/15sec |

| GAS | 1 | 2 |
|---|---|---|
| CO2 | 5.0 | 5.0 |
| O2 | 12.5 | 12.5 |
| CO | 0 | 0 |
| N2 | 82.5 | 82.5 |

| Impinger No. | Impinger Contents | Final | Initial | Difference |
|---|---|---|---|---|
| 1. | 100ml H2O | 738.2 | 557.4 | 180.8 |
| 2. | 100ml H2O | 500.7 | 476.4 | 24.3 |
| 3. | DRY | 458.1 | 455.9 | 2.2 |
| 4. | Si Gel | 681.4 | 665.6 | 15.8 |
| 5. | | | | |
| 6. | Actual | | | 223.1g total |
| 7. | Moisture = 14.7% | | | |
| 8. | | | | |

207.3g

CHESTER ENVIRONMENTAL

# STACK SAMPLING DATA SHEET



CLIENT USS - CLAIRTON WORKS
TEST UNIT #2 BATTERY STACK
PROJECT NO. 600725-01
TEST CREW RPC
BAROMETRIC PRESSURE 29.50

TEST DATE 8-25-93 (Wed.)
TEST NO. CLR-265-PM-2
NOZZLE (SIZE,#) 0-428
STATIC PRESSURE -1.0" H2O
PORT DIRECTION #3,2

ORIFICE CORRECTION (ΔH@) 1.802
METER CORRECTION (Y) 0.9619
CALIBRATION DATE 5-17-93
PITOT CORRECTION 0.84
CONTROL BOX NO. 7

HOT/COLD BOX NO. 4
PROBE NO. 10-2
FILTER NO. 1081
STACK DIA. 114"
PORT SIZE 4.0"

| | Traverse Point (inches) | Time | Dry Gas Meter Reading (dcf) | Pitot ΔP (in. H2O) | Orifice ΔH Required (in. H2O) | Orifice ΔH Actual (in. H2O) | Meter Temperature In (°F) | Meter Temperature Out (°F) | Vacuum (in. Hg) | Stack Temp. (°F) | Probe Temp. (°F) | Impinger Temp. (°F) | Hot Box Temp. (°F) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #3 | 40.6 | 17:18 | 908.311 | .06 | 1.04 | 1.04 | 118 | 106 | 2.5 | 516 | ~250°F | <68°F [illegible] | ~250°F | 5 min./point |
| | 28.5 | | | .06 | 1.04 | 1.04 | 140 | 111 | 3.0 | 530 | | | | |
| | 20.2 | | | .06 | 1.04 | 1.04 | 142 | 111 | 3.0 | 535 | | | | |
| | 13.5 | | | .05 | .87 | .87 | 147 | 115 | 2.5 | 541 | | | | |
| | 7.6 | | | .03 | .52 | .52 | 148 | 118 | 2.0 | 544 | | | | |
| | 2.4 | 17:48 | 925.289 | .03* | .52 | .52 | 150 | 120 | 2.0 | 496 | | | | |
| | | | | | | | | | | | | | | |
| #2 | 40.6 | 17:53 | 925.289 | .05 | .87 | .87 | 141 | 120 | 2.5 | 531 | | | | |
| | 28.5 | | | .05 | .87 | .87 | 152 | 124 | 2.5 | 533 | | | | |
| | 20.2 | | | .06 | 1.04 | 1.04 | 158 | 128 | 3.0 | 553 | | | | |
| | 13.5 | | | .04 | .69 | .69 | 160 | 129 | 2.0 | 569 | | | | |
| | 7.6 | | | .03 | .52 | .52 | 160 | 130 | 1.5 | 526 | | | | |
| | 2.4 | 18:23 | 941.760 | .03 | .52 | .52 | 160 | 130 | 1.5 | 497 | | | | |
| | Test Totals | Δ= 120 min | Δ= 71.079 dcf | $(\Delta P)_{AVG}$ = 0.050 | $(\Delta H)_{AVG}$ = 0.90 | | $(T_{meter})_{AVG}$ = 123°F | | | $(T_{stack})_{AVG}$ = 528°F | | | | Estimates: MW= ~~28.0~~ 27.64 |
| | | | | | | | Velocity = 17.7 ft/sec | | | ISO. = 107.2 % | | | | %H2O= 4 |

SYSTEM LEAK CHECK

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

PITOT LEAK CHECK

| | Positive | Negative |
|---|---|---|
| Before | | |
| After | | |

| GAS | 1 | 2 |
|---|---|---|
| CO2 | | |
| O2 | | |
| CO | | |
| N2 | | |

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

CHESTER ENVIRONMENTAL

# STACK SAMPLING DATA SHEET



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CLIENT | USS CLAIRTON WORKS | TEST DATE | 8-26-93 (8TH) | ORIFICE CORRECTION (ΔH@) | 1.802 | HOT/COLD BOX NO. | 2 |
| TEST UNIT | #2 BATTERY STACK | TEST NO. | CLR-2BS-PM#3 | METER CORRECTION (Y) | 0.9619 | PROBE NO. | 10-2 |
| PROJECT NO. | 600725-01 | NOZZLE (SIZE,#) | 0.4128 | CALIBRATION DATE | 05-17-93 | FILTER NO. | 1085 |
| TEST CREW | RPC | STATIC PRESSURE | -1.10 "H2O | PITOT CORRECTION | 0.84 | STACK DIA. | 114 |
| BAROMETRIC PRESSURE | 29.52 | PORT DIRECTION | #3,2 | CONTROL BOX NO. | Seven | PORT SIZE | 4 |

| | Traverse Point (inches) | Time | Dry Gas Meter Reading (dcf) | Pitot ΔP (in. H2O) | Orifice ΔH Required (in. H2O) | Orifice ΔH Actual (in. H2O) | Meter Temperature In (°F) | Meter Temperature Out (°F) | Vacuum (in. Hg) | Stack Temp. (°F) | Probe Temp. (°F) | Impinger Temp. (°F) | Hot Box Temp. (°F) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ↑ | 40.6 | 11:09 | 942.083 | .06 | 1.04 | 1.04 | 100 | 100 | 3.5 | 574 | ~250 | <68°F | ~250 | 5 min./point |
| #3 | 28.5 | | | .06 | 1.04 | 1.04 | 120 | 100 | 3.5 | 515 | | | | |
| | 20.3 | | | .06 | 1.04 | 1.04 | 130 | 108 | 3.5 | 521 | | | | |
| | 13.5 | | | .06 | 1.04 | 1.04 | 140 | 111 | 3.5 | 521 | | | | |
| | 7.6 | | | .06 | 1.04 | 1.04 | 142 | 111 | 3.5 | 506 | | | | |
| ↓ | 2.4 | 11:39 | 960.490 | .05 | .87 | .87 | 146 | 113 | 3.0 | 529 | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| ↑ | 40.6 | 11:43 | 960.490 | .06 | 1.04 | 1.04 | 140 | 112 | 4.0 | 527 | | | | |
| | 28.5 | | | .06 | 1.04 | 1.04 | 150 | 120 | 4.0 | 521 | | | | |
| #2 | 20.3 | | | .05 | .87 | .87 | 152 | 121 | 3.5 | 539 | | | | |
| | 13.5 | | | .06 | 1.04 | 1.04 | 156 | 123 | 4.0 | 546 | | | | |
| | 7.6 | | | .05 | .87 | .87 | 158 | 124 | 4.0 | 521 | | | | |
| ↓ | 2.4 | 12:13 | 978.860 | .05 | .87 | .87 | 158 | 123 | 4.0 | 501 | | | | |
| | | | | | | | | | | | | | | Estimates: |
| | | | | | | | | | | | | | | MW= ~~28.0~~ 27.94 |
| | | | | | | | | | | | | | | %H2O= 11 27.67 |

**SYSTEM LEAK CHECK**

| | Vacuum (in. Hg) | DGM Rate (cfm) |
|---|---|---|
| Before | 5.0 | <0.01 cfm |
| After | 6.5 | <0.01 cfm |

**PITOT LEAK CHECK**

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

| GAS | 1 | 2 |
|---|---|---|
| CO2 | 5.0 | 5.0 |
| O2 | 12.5 | 12.5 |
| CO | 0 | 0 |
| N2 | 82.5 | 82.5 |

FAIRITO CHECK 11:25
$O_2$ = 20.5

| Impinger No. | Impinger Contents | Final | Initial | Difference |
|---|---|---|---|---|
| 1. | 100 ml DI H2O | 664.4 | 483.6 | 180.8 |
| 2. | 100 ml DI H2O | 566.7 | 540.0 | 26.7 |
| 3. | Empty | 442.0 | 438.2 | 3.8 |
| 4. | Silica Gel | 597.2 | 579.0 | 18.2 |
| 5. | | | | |
| 6. | Actual | | | 229.5g |
| 7. | Moisture = 11.6% | | | total |
| 8. | 14.4 | | | |

211.3g

CHESTER ENVIRONMENTAL

# STACK SAMPLING DATA SHEET

CLIENT USS - CLAIRTON Works
TEST UNIT #2 BATTERY STACK
PROJECT NO. 609725-01
TEST CREW RPC
BAROMETRIC PRESSURE 29.52

TEST DATE 8-26-93 (THUR)
TEST NO. CLT-285-PA#-3
NOZZLE (SIZE,#) 0.428
STATIC PRESSURE -1.10 H2O
PORT DIRECTION #4, 1

ORIFICE CORRECTION (ΔH@) 1.802
METER CORRECTION (Y) .9619
CALIBRATION DATE 05-17-93
PITOT CORRECTION 0.84
CONTROL BOX NO. 5546

HOT/COLD BOX NO. 2
PROBE NO. 10-2
FILTER NO. 1083
STACK DIA. 114"
PORT SIZE 4

| Traverse Point (inches) | Time | Dry Gas Meter Reading (dcf) | Pitot ΔP (in. H2O) | Orifice ΔH Required (in. H2O) | Orifice ΔH Actual (in. H2O) | Meter Temperature In (°F) | Meter Temperature Out (°F) | Vacuum (in. Hg) | Stack Temp. (°F) | Probe Temp. (°F) | Impinger Temp. (°F) | Hot Box Temp. (°F) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #4 | | | | | | | | | | | | | 5 min./point |
| 40.6 | 12:18 | 978.860 | .07 | 1.21 | 1.21 | 138 | 120 | 5.0 | 561 | ~250° | 66°F | ~250° | |
| 28.5 | | | .07 | 1.21 | 1.21 | 152 | 126 | 5.0 | 549 | | | | |
| 20.2 | | | .07 | 1.21 | 1.21 | 156 | 126 | 5.0 | 561 | | | | |
| 13.5 | | | .05 | .87 | .87 | 152 | 126 | 3.5 | 520 | | | | |
| 7.6 | | | .05 | .87 | .87 | 155 | 124 | 3.5 | 519 | | | | |
| 2.4 | 12:48 | 998.805 | .05 | .87 | .87 | 155 | 122 | 3.5 | 610 | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| #1 | | | | | | | | | | | | | |
| 40.6 | 12:52 | 998.805 | .07 | 1.23 | 1.23 | 130 | 110 | 5.0 | 555 | | | | |
| 28.5 | | | .07 | 1.23 | 1.23 | 131 | 111 | 5.0 | 543 | | | | |
| 20.2 | | | .05 | .88 | .88 | 131 | 111 | 4.0 | 516 | | | | |
| 13.5 | | | .05 | .88 | .88 | 130 | 110 | 4.0 | 525 | | | | |
| 7.6 | | | .05 | .88 | .88 | 132 | 109 | 4.0 | 511 | | | | |
| 2.4 | 13:22 | 1017.333 | .05 | .88 | .88 | 132 | 109 | 4.0 | 506 | | | | |
| Total | Δ = | Δ = | $(\Delta P)_{AVG}$ = | $(\Delta H)_{AVG}$ = | | $(T_{meter})_{AVG}$ = 128°F | | | $(T_{stack})_{AVG}$ = 529°F | | | | Estimates: 27.67 |
| Totals | 120 min | 75.250 dcf | 0.055 | | 1.00 | velocity = 18.5 ft/sec | | | | Tsc. = | 10 7/8 % | | MW = ~~28.0~~ ~~27.99~~ |
| | | | | | | | | | | | | | %H2O = N |

SYSTEM LEAK CHECK

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

PITOT LEAK CHECK

| | Positive | Negative |
|---|---|---|
| Before | | |
| After | | |

| GAS | 1 | 2 |
|---|---|---|
| CO2 | | |
| O2 | | |
| CO | | |
| N2 | | |

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

CHESTER ENVIRONMENTAL

VISIBLE EMISSIONS OBSERVATIONS FORM

#2 STACK TEST

OBSERVER: DENNIS

DATE: F-25-97

FACILITY: USX CLAIRTON

OBSERVATION: START TIME: 10:15

END TIME: 11:15

OBSERVATION POINT: ETS TRAILER AREA

SOURCE: #2 STACK

DISTANCE: 500'

DIRECTION FROM: NW

HEIGHT: 200'

WIND:

SPEED: 6 MPH

DIRECTION: NORTH

TEMPERATURE: 82°F

SKY CONDITION: PTLY CLDY

BACKGROUND: SKY

READING CONDITIONS: FAIR

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 240

No. READINGS >= 20% —

No. READINGS >= 60% —

GREATEST OPACITY: —

CREW: C FOREMAN: HARRIS

COMMENTS: — 30 %

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

RUN #1 2ND HR.

VISIBLE EMISSIONS OBSERVATIONS FORM

#2 STACK TEST

OBSERVER: [illegible]

DATE: 8-25-93

FACILITY: USX CLAIRTON

OBSERVATION: START TIME: 16:05

END TIME: 17:05

OBSERVATION POINT:

E-5 TRAILER AREA

SOURCE: #2 STACK

DISTANCE: 800'

DIRECTION FROM: N.W.

HEIGHT: 200'

WIND:

SPEED: 7 MPH

DIRECTION: → WEST

TEMPERATURE: 94°F

SKY CONDITION: PTLY CLOUDY

BACKGROUND: SKY

READING CONDITIONS: FAIR

COLOR OF EMISSION: BLACK

TOTAL No. OF READINGS: 240

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 10%

CREW: D FOREMAN: WARGO

COMMENTS: - : 0%

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

RUN #2 1ST HR.

START TEST 16:05 2ND RUN

VISIBLE EMISSIONS OBSERVATIONS FORM

#2 STACK TEST

OBSERVER: Donna

DATE: 2-26-93

FACILITY: USX CLAIRTON

OBSERVATION: START TIME: 11:05

END TIME: 12:05

OBSERVATION POINT:

EPC TRAILER AREA

SOURCE: #2 STACK

DISTANCE: 500'

DIRECTION FROM: NW

HEIGHT: 200'

WIND:

SPEED: 5 MPH

DIRECTION: SE

TEMPERATURE: 57 °F

SKY CONDITION: PTLY CLDY

BACKGROUND: SKY

READING CONDITIONS: FAIR

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 240

No. READINGS >= 20% —

No. READINGS >= 60% —

GREATEST OPACITY: —

CREW: C FOREMAN: HARRIS

COMMENTS: - : 8 2

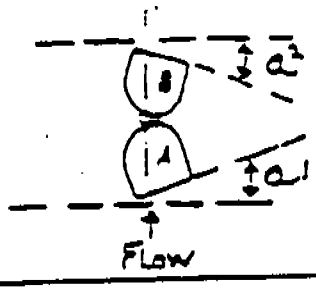
START 3RD RUN

| | | |

# GEOMETRIC PITOT CALIBRATION

Caliper # XEF-59 | Probe #: 10-2
Precheck: | Date: 07-13-93
Post Check: | Initials: LPC

①

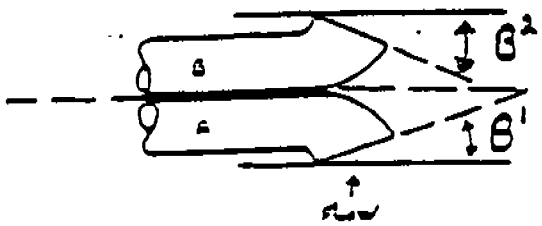



a¹ = 3.0
a² = 0
a¹, a² = <10°

B¹ = 0
B² = 1.0
B¹, B², = <5°

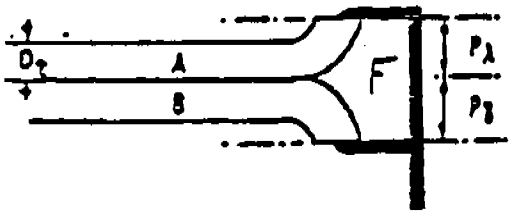
F = .930"

②



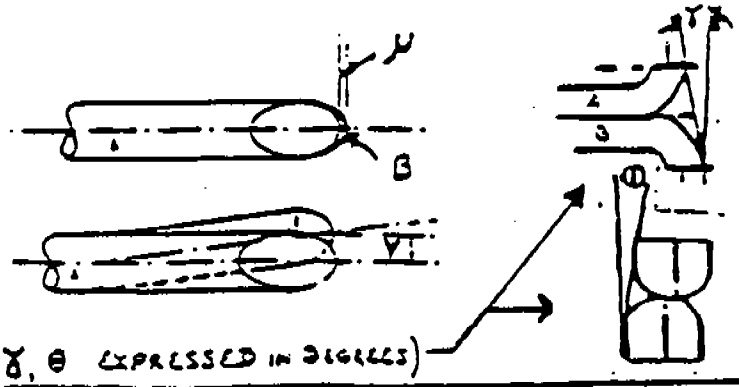

μ = .16 — μ = ≤ 0.1250" (μ = F TAN γ)
V = 0 — V = ≤0.03125" (V = F TAN θ)
W = .194 — W ≥ 0"
X = .97 — X ≥ 0.750" (3/4" using 1/2" nozzle)
Y = 5.600 — Y ≥ 3.0"
Z = 3.6 — Z > 2.0"
$D_t$ = .375 — $D_t$ > .1875"

③



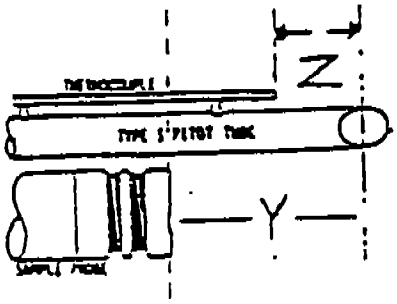

1.05 $D_t$ < A < 1.50 $D_t$
$P_A$ = $P_B$
2.10 $D_t$ < A < 3.00 $D_t$

④

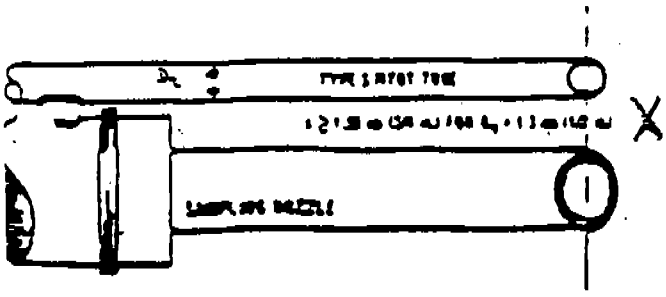



(γ, θ EXPRESSED IN DEGREES)

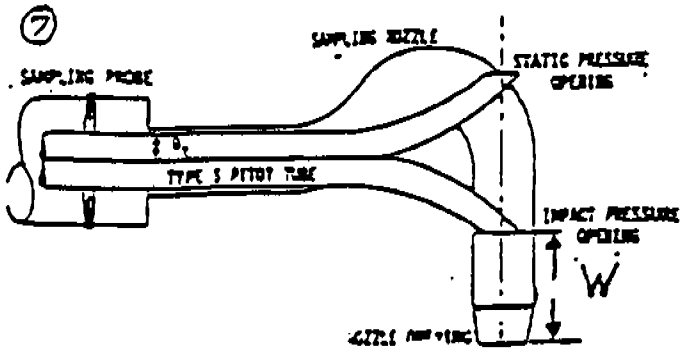
⑥




⑤




⑦

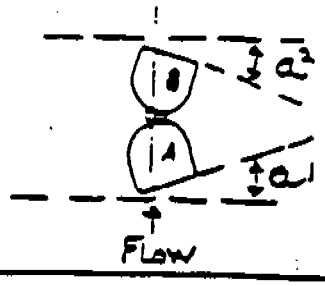


# GEOMETRIC PITOT CALIBRATION

Caliper # XEF-59
Precheck
Post Check

Probe #: 10-2
Date: 10-11-93
Initials: TJM

①

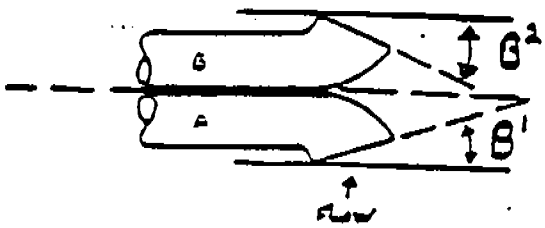



a¹ = 5.0°
a² = 1.0°
a¹, a² = <10°

B¹ = 2.0°
B² = 2.0°
B¹, B², = <5°

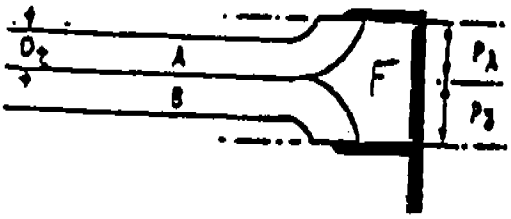
F = 0.880"

②




μ = 0.0153 — μ = ≤ 0.1250" (μ = F TAN γ)
V = 0 — V = ≤0.03125" (V = F TAN θ)
W = 0.267 — W ≥ 0"

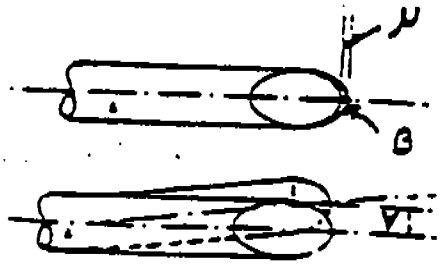
③

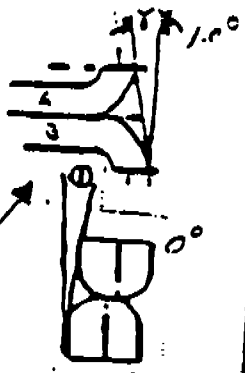



1.05 D_t < d < 1.50 D_t
P_A = P_B
2.10 D_t < l < 3.00 D_t

X = 1.030 — X ≥ 0.750" (3/4" using 1/2" nozzle)
Y = 5.665 — Y ≥ 3.0"
Z = 4.872 — Z > 2.0"
D_t = .373 — D_t > .1875"

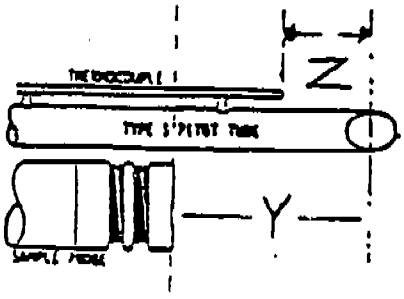
④



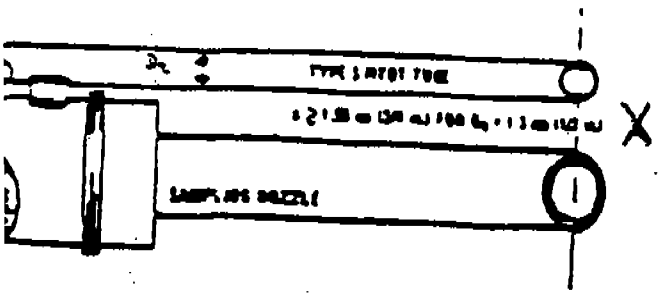




(γ, θ EXPRESSED IN DEGREES)

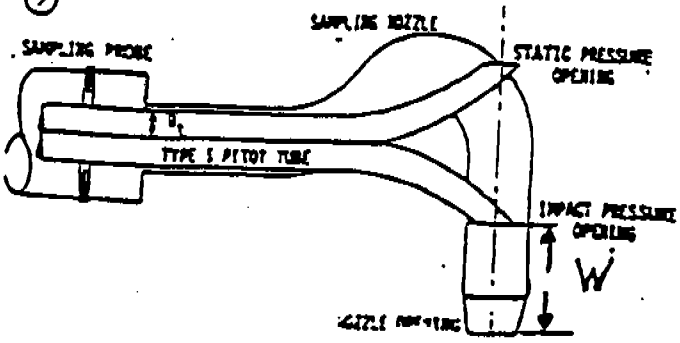
⑥




⑤




⑦



# COMPLIANCE DEMONSTRATION
# NO. 2 BATTERY COMBUSTION STACK
# USS CLAIRTON WORKS

## USS CLAIRTON WORKS
## CLAIRTON, PENNSYLVANIA

## APPENDIX B

## PLANT OPERATIONAL DATA

CHESTER
ENVIRONMENTAL

CC-10295 REV. 1161
03.081.0020

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

# PUSHING AND CHARGING REPORT

UNIT NO. 1

12 Hrs. Beginning 12:00 AM

Date 8-25-93

**BATTERY NO. A-3**

| OVEN NO. | TIME PUSHED | | TIME CHARGED | | NOTES |
|---|---|---|---|---|---|
| 1 | 9 | 06 | 9 | 03 | |
| 3 | 9 | 18 | 9 | [illegible] | |
| 5 | 9 | 30 | 9 | 35 | |
| 7 | 9 | 38 | 9 | 42 | |
| 9 | 9 | 45 | 9 | 55 | |
| 11 | 9 | 52 | 10 | 05 | |
| 13 | 10 | 25 | 10 | 28 | |
| 15 | 10 | 35 | 10 | 35 | |
| 17 | 10 | 46 | 10 | 48 | |
| 19 | 11 | 00 | 11 | 04 | |
| 21 | 11 | 10 | 11 | 12 | HR PB |
| 23 | 11 | 20 | 11 | 22 | |
| 25 | 11 | 27 | 11 | 29 | |
| 27 | 11 | 35 | 11 | [illegible] | |
| 29 | 11 | 50 | 11 | 50 | |
| 31 | 11 | 59 | | | |
| 2 | | | | | |
| 4 | | | | | |
| 6 | | | 12 | 17 | |
| 8 | 12 | 07 | 12 | 25 | |
| 10 | 12 | 16 | 12 | 20 | |
| 12 | 12 | 26 | 12 | 55 | |
| 14 | 12 | 37 | 1 | 20 | |
| 16 | 12 | 46 | 1 | 27 | |
| 18 | 1 | 05 | 1 | 27 | |
| 20 | 1 | 22 | 1 | 46 | PB |
| 22 | 1 | 33 | 1 | 44 | HR PB |
| 24 | 1 | 43 | 2 | 00 | |
| 26 | 1 | 53 | 2 | 10 | |
| 28 | 2 | 04 | 2 | 31 | PB |
| 30 | 2 | 17 | 2 | 37 | PB |
| 1 | | | | | |
| 2 | | | | | |

**BATTERY NO. B-3**

| OVEN NO. | TIME PUSHED | | TIME CHARGED | | NOTES |
|---|---|---|---|---|---|
| 1 | 2 | 34 | 2 | 51 | HR-PB |
| 3 | 2 | 45 | 3 | 09 | |
| 5 | 3 | 07 | 3 | 18 | |
| 7 | 3 | 29 | 3 | 32 | |
| 9 | 3 | 35 | 3 | 41 | |
| 11 | 3 | 45 | 3 | 51 | |
| 13 | 3 | 56 | 4 | 33 | |
| 15 | 4 | 31 | 4 | 44 | |
| 17 | 4 | 42 | 4 | 55 | |
| 19 | 4 | 53 | 5 | 05 | |
| 21 | 5 | 03 | 5 | 16 | |
| 23 | 5 | 14 | 5 | 29 | |
| 25 | 5 | 25 | 5 | 38 | |
| 27 | 5 | 36 | 5 | 48 | |
| 29 | 5 | 46 | 5 | 59 | |
| 31 | 5 | 57 | 6 | 05 | |
| 2 | | | | | |
| 4 | | | | | |
| 6 | | | | | |
| 8 | | | | | |
| 10 | | | | | |
| 12 | | | | | |
| 14 | | | | | |
| 16 | | | | | |
| 18 | | | | | |
| 20 | | | | | |
| 22 | | | | | |
| 24 | | | | | |
| 26 | | | | | |
| 28 | | | | | |
| 30 | | | | | |
| 1 | | | | | |
| 2 | 6 | 07 | 6 | 16 | |

**BATTERY NO. A-2**

| OVEN NO. | TIME PUSHED | | TIME CHARGED | | NOTES |
|---|---|---|---|---|---|
| 1 | | | | | |
| 3 | | | | | |
| 5 | | | | | |
| 7 | | | | | |
| 9 | | | | | |
| 11 | | | | | |
| 13 | | | | | |
| 15 | | | | | |
| 17 | | | | | |
| 19 | | | | | |
| 21 | | | | | |
| 23 | | | | | |
| 25 | | | | | |
| 27 | | | | | |
| 29 | | | | | |
| 31 | | | | | |
| 2 | 6 | 14 | 6 | 23 | |
| 4 | 6 | 25 | 6 | 34 | |
| 6 | 6 | 34 | 6 | 42 | |
| 8 | 6 | 40 | 6 | 53 | |
| 10 | 6 | 57 | 7 | 03 | |
| 12 | 7 | 07 | 7 | 13 | |
| 14 | 7 | 17 | 7 | 23 | |
| 16 | 7 | 29 | 7 | 36 | |
| 18 | 7 | 39 | 7 | 47 | |
| 20 | 7 | 57 | 8 | 06 | |
| 22 | 8 | 10 | 8 | 08 | |
| 24 | 8 | 20 | 8 | 18 | |
| 26 | 8 | 30 | 8 | 28 | |
| 28 | 8 | 40 | 8 | 42 | |
| 30 | 8 | 50 | 8 | 52 | |
| 1 | | | | | |
| 2 | | | | | |

REMARKS: 28/ 28 17/ 17 15/ 15 6 C 6 C

Condition of Signals

Condition of Pusher

## HOURLY REPORT OF OPERATION

| TIME | OVENS PUSHED | OVENS CHARGED | OVENS SCHEDULED | TIME | OVENS PUSHED | OVENS CHARGED | OVENS SCHEDULED |
|---|---|---|---|---|---|---|---|
| 12-1 | 5 | 4 | | 6-7 | 6 | 6 | |
| 1-2 | 5 | 5 | | 7-8 | 5 | 5 | |
| 2-3 | 4 | 5 | | 8-9 | 5 | 6 | |
| 3-4 | 5 | 5 | | 9-10 | 6 | 5 | |
| 4-5 | 3 | 3 | | 10-11 | 3 | 4 | |
| 5-6 | 6 | 6 | | 11-12 | 7 | 6 | |
| | 28 | 28 | | | 32 | 32 | |

Total Ovens Pushed 60

Total Ovens Charged 60

Pusherman

Battery Foreman

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1-2 | 5 | 5 | | 7-8 | 5 | 5 | |
| 2-3 | 4 | 5 | | 8-9 | 5 | 6 | |
| 3-4 | 5 | 5 | | 9-10 | 6 | 5 | |
| 4-5 | 3 | 4 | | 10-11 | | 4 | |
| 5-6 | 6 | 4 | | 11-12 | | 4 | |

Total Ovens Pushed 60

Total Ovens Charged 60

Pusherman

Battery Foreman

| OVEN NO. | TIME PUSHED | | TIME CHARGED | | NOTES |
|---|---|---|---|---|---|
| B1 | 9 | 15 | 9 | 29 | |
| 3 | 9 | 27 | 9 | 57 | |
| 5 | 9 | 59 | 10 | 04 | |
| 7 | 10 | 06 | 10 | 12 | |
| 9 | 10 | 14 | 10 | 18 | |
| 11 | 10 | 20 | 10 | 29 | |
| 13 | 10 | 31 | 10 | 40 | |
| 15 | 10 | 42 | 10 | 53 | |
| 17 | 10 | 55 | 11 | 04 | |
| 19 | 11 | 06 | 11 | 15 | |
| 21 | 11 | 17 | 11 | 53 | |
| ~~23~~ | | | | | Make-up |
| 25 | 11 | 35 | 11 | 43 | |
| 27 | 11 | 45 | 11 | 53 | |
| 29 | 11 | 55 | 11 | 59 | |
| 31 | | | | | |
| B2 | | 17 | | | |
| 4 | | 18 | | | |
| 6 | | | 2 | 06 | |
| 8 | 12 | 08 | 12 | 18 | |
| 10 | 12 | 20 | 12 | 30 | |
| 12 | 12 | 32 | 12 | 41 | |
| 14 | 12 | 43 | 1 | — | |
| 16 | 1 | 02 | 1 | 12 | |
| 18 | 1 | 14 | 1 | 24 | |
| 20 | 1 | 26 | 1 | 35 | |
| 22 | 1 | 37 | 1 | 47 | |
| 24 | 1 | 49 | 2 | 02 | |
| 26 | 2 | 04 | 2 | 12 | |
| 28 | 2 | 14 | 2 | 22 | |
| 30 | 2 | 24 | 2 | 28 | |
| C/1 | 2 | 30 | 2 | 40 | |
| C/2 | | | | | |

| OVEN NO. | TIME PUSHED | | TIME CHARGED | | NOTES |
|---|---|---|---|---|---|
| A1 | 2 | 42 | 3 | 15 | |
| 3 | 3 | — | 3 | 27 | |
| 5 | 3 | 17 | 3 | 39 | RB |
| 7 | 3 | 25 | 3 | 57 | |
| 9 | 3 | 41 | 3 | 57 | |
| 11 | 3 | 53 | 4 | 32 | |
| 13 | | | | | |
| 15 | 4 | 34 | 4 | 43 | |
| 17 | 4 | 45 | 4 | 55 | |
| 19 | 4 | 57 | 5 | 04 | |
| 21 | 5 | 06 | 5 | 16 | KO RB |
| 23 | 5 | 18 | 5 | 28 | |
| 25 | 5 | 30 | 5 | 40 | |
| 27 | 5 | 42 | 5 | 52 | |
| 29 | 5 | 54 | 6 | 03 | |
| 31 | 6 | 05 | 6 | 18 | |
| B2 | | | | | |
| 4 | | | | | |
| 6 | | | 16 | | |
| 8 | | | 16 | | |
| 10 | | | | | |
| 12 | | | | | |
| 14 | | | | | |
| 16 | | | | | |
| 18 | | | | | |
| 20 | 12 | 49 | 2 | 36 | |
| 22 | | | | | |
| 24 | | | | | |
| 26 | | | | | |
| 28 | | | | | |
| 30 | | | | | |

| OVEN NO. | TIME PUSHED | | TIME CHARGED | | NOTES |
|---|---|---|---|---|---|
| B1 | | | | | |
| 3 | | | | | |
| 5 | | | | | |
| 7 | | | | | |
| 9 | | | | | |
| 11 | | | | | |
| 13 | | | | | |
| 15 | | | | | |
| 17 | | | | | |
| 19 | | | | | |
| 21 | | | | | |
| 23 | | | | | |
| 25 | | | 16 | | |
| 27 | | | 16 | | 59 P / 60 C |
| 29 | | | | | |
| 31 | | | | | |
| B2 | 6 | 20 | 6 | 25 | |
| 4 | 6 | 30 | 6 | 35 | |
| 6 | 6 | 40 | 6 | 47 | |
| 8 | 6 | 50 | 7 | — | |
| 10 | 7 | 02 | 7 | 10 | |
| 12 | 7 | 12 | 7 | 22 | PB |
| 14 | 7 | 24 | 7 | 33 | KO RB |
| 16 | 7 | 35 | 7 | 45 | |
| 18 | 7 | 50 | 8 | 04 | |
| 20 | 8 | 06 | 8 | 15 | PB |
| 22 | 8 | 17 | 8 | 25 | |
| 24 | 8 | 27 | 8 | 35 | |
| 26 | 8 | 37 | 8 | 46 | |
| 28 | 8 | 48 | 8 | 56 | RB |
| 30 | 8 | 58 | 9 | 02 | |
| C/1 | 9 | 04 | 9 | 19 | |
| C/2 | | | | | |

REMARKS:

~~12-8~~ { 50-11 PB-IIII } 84 { KO- PB-II }

Condition of Signals

Condition of Pusher

HOURLY REPORT OF OPERATION

| TIME | OVENS PUSHED | OVENS CHARGED | OVENS SCHEDULED | TIME | OVENS PUSHED | OVENS CHARGED | OVENS SCHEDULED |
|---|---|---|---|---|---|---|---|
| 12-1 | 5 | 4 | | 6-7 | 5 | 5 | |
| 1-2 | 5 | 5 | | 7-8 | 5 | 5 | |
| 2-3 | 5 | 6 | | 8-9 | 6 | 6 | |
| 3-4 | 5 | 5 | | 9-10 | 4 | 4 | |
| 4-5 | 3 | 3 | | 10-11 | 6 | 6 | |
| 5-6 | 5 | 5 | | 11-12 | 5 | 6 | |
| | 28 | 28 | | | 31 | 32 | |

Total Ovens Pushed 59

Total Ovens Charged 60

Pusherman

Battery Foreman

CC-10295 REV. 1161
03.001.0020

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

# PUSHING AND CHARGING REPORT

UNIT NO. 1
12 Hrs. Beginning 12:00 PM
Date 8-25-93

| BATTERY NO. B-2 | | | | | |
|---|---|---|---|---|---|
| OVEN NO. | TIME PUSHED | | TIME CHARGED | | NOTES |
| 1 | | | | | |
| 3 | | | | | |
| 5 | | | | | |
| 7 | | | | | |
| 9 | | | | | |
| 11 | | | | | |
| 13 | | | | | |
| 15 | | | | | |
| 17 | | | | | |
| 19 | | | | | |
| 21 | | | | | |
| 23 | 10 | 02 | | | |
| 25 | | | | | |
| 27 | | | | | |
| 29 | | | | | |
| 31 | 12 | 38 | 12 | 52 | — |
| 2 | 7 | 02 | 7 | 16 | — |
| 4 | 7 | 10 | 7 | 16 | — |
| 6 | 7 | 24 | 7 | 26 | — |
| 8 | 7 | 31 | 7 | 38 | — |
| 10 | 7 | 44 | 7 | 46 | — |
| 12 | 7 | 51 | 7 | 58 | — |
| 14 | 8 | 42 | 8 | 49 | — |
| 16 | 8 | 45 | 8 | 48 | — |
| 18 | 8 | 56 | 8 | 56 | — |
| 20 | 9 | 10 | 9 | 21 | — |
| 22 | 9 | 20 | 9 | 29 | — |
| 24 | 9 | 30 | 9 | 39 | — |
| 26 | 9 | 40 | 9 | 49 | — |
| 28 | 9 | 50 | 9 | 59 | — |
| 30 | 9 | 50 | 10 | 02 | — |
| R/1 | 10 | 08 | 10 | 12 | — |
| R/2 | 12 | 44 | 1 | 58 | — |

| BATTERY NO. A-1 | | | | | |
|---|---|---|---|---|---|
| OVEN NO. | TIME PUSHED | | TIME CHARGED | | NOTES |
| 1 | 10 | 18 | 10 | 22 | — |
| 3 | 10 | 28 | 10 | 32 | — |
| 5 | 10 | 38 | 10 | 42 | — |
| 7 | 10 | 48 | 10 | 52 | — |
| 9 | 10 | 58 | 11 | 02 | — |
| 11 | 11 | 08 | 11 | 12 | — |
| 13 | 11 | 20 | 11 | 24 | — |
| 15 | 11 | 32 | 11 | 36 | — |
| 17 | 11 | 44 | 11 | 48 | — |
| 19 | | | | | |
| 21 | | | | | |
| 23 | | | | | |
| 25 | | | | | |
| 27 | | | | | |
| 29 | | | | | |
| 31 | | | | | |
| 2 | 12 | 54 | 1 | 03 | — |
| 4 | 1 | 05 | 1 | 14 | — |
| 6 | 1 | 16 | 1 | 25 | — |
| 8 | 1 | 27 | 1 | 35 | — |
| 10 | 1 | 37 | 1 | 46 | — |
| 12 | 1 | 48 | 1 | 56 | — |
| 14 | 1 | 58 | 2 | 06 | — PB |
| 16 | 2 | 08 | 2 | 17 | — |
| 18 | 2 | 19 | 2 | 34 | — |
| (20) | | | | | PASS-UP |
| 22 | 2 | 36 | 2 | 45 | PB — |
| 24 | 2 | 47 | 2 | 56 | PB — |
| 26 | 2 | 58 | 3 | 08 | — |
| 28 | 3 | 10 | 3 | 26 | — |
| 30 | 3 | 28 | 3 | 36 | — |
| R/1 | | | | | |
| R/2 | | | | | |

| BATTERY NO. B-1 | | | | | |
|---|---|---|---|---|---|
| OVEN NO. | TIME PUSHED | | TIME CHARGED | | NOTES |
| 1 | 3 | 38 | 3 | 46 | — |
| 3 | 3 | 48 | 3 | 52 | — |
| 5 | 4 | 10 | 4 | 12 | — |
| 7 | 4 | 22 | 4 | 24 | — |
| 9 | 4 | 34 | 4 | 36 | PB, KO |
| 11 | 4 | 46 | 4 | 48 | PB, KO |
| 13 | 4 | 58 | 5 | 02 | PB — |
| 15 | 5 | 12 | 5 | 16 | — |
| 17 | 5 | 22 | 5 | 26 | — |
| 19 | 5 | 32 | 5 | 39 | — |
| 21 | 5 | 42 | 5 | 48 | — |
| 23 | 5 | 58 | 6 | 02 | — |
| 25 | 6 | 08 | 6 | 12 | — |
| 27 | 6 | 20 | 6 | 24 | — |
| 29 | 6 | 32 | 6 | 36 | — |
| 31 | 6 | 44 | 6 | 48 | — |
| 2 | | | | | |
| 4 | | | | | |
| 6 | | | | | |
| 8 | | | | | |
| 10 | | | | | |
| 12 | | | | | |
| 14 | | | | | |
| 16 | | | | | |
| 18 | | | | | |
| 20 | | | | | |
| 22 | | | | | |
| 24 | | | | | |
| 26 | | | | | |
| 28 | | | | | |
| 30 | | | | | |
| R/1 | | | | | |
| R/2 | 6 | 50 | 6 | 54 | — |

REMARKS:

ITO - 17 / 23 / 17 / 59
PB - 111 / 18 / 23 / 17 / 58

Condition of Signals

Condition of Pusher

## HOURLY REPORT OF OPERATION

| TIME | OVENS PUSHED | OVENS CHARGED | OVENS SCHEDULED | TIME | OVENS PUSHED | OVENS CHARGED | OVENS SCHEDULED |
|---|---|---|---|---|---|---|---|
| 12-1 | 3 | 1 | | 6-7 | 5 | 6 | |
| 1-2 | 6 | 7 | | 7-8 | 6 | 6 | |
| 2-3 | 5 | 5 | | 9-9 | 3 | 3 | |
| 3-4 | 4 | 5 | | 9-10 | 6 | 5 | |
| 4-5 | 5 | 4 | | 10-11 | 7 | 6 | |
| 5-6 | 5 | 5 | | 11-12 | 4 | 5 | |
| | 28 | 30 | | | 31 | 31 | |

Total Ovens Pushed 59
Total Ovens Charged 58

Pusherman

Battery Foreman

CC-10295 REV. 1161
03.001.0020

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

# PUSHING AND CHARGING REPORT

UNIT NO. 1
12 Hrs. Beginning 12:00 P M
Date 8-25-93

BATTERY NO. A-3

| OVEN NO. | TIME PUSHED | | TIME CHARGED | | NOTES |
|---|---|---|---|---|---|
| 1 | | | | | |
| 3 | | | | | |
| 5 | | | | | |
| 7 | | | | | |
| 9 | | | | | |
| 11 | | | | | |
| 13 | | | | | |
| 15 | | | | | |
| 17 | | | | | |
| 19 | | | | | |
| 21 | | | | | |
| 23 | | | | | |
| 25 | | | | | |
| 27 | | | | | |
| 29 | | | | | |
| 31 | | | 12 | 05 | |
| 2 | 6 | 53 | 7 | 03 | |
| 4 | 7 | 06 | 7 | 15 | |
| 6 | 7 | 17 | 7 | 26 | D.A |
| 8 | 7 | 28 | 7 | 36 | P.A |
| 10 | 7 | 38 | 7 | 46 | |
| 12 | 7 | 48 | 7 | 56 | |
| 14 | 7 | 58 | 8 | — | |
| 16 | 8 | 41 | 8 | 51 | |
| 18 | 8 | 53 | 9 | 01 | P.B |
| 20 | 9 | 03 | 9 | 11 | |
| 22 | 9 | 13 | 9 | 21 | |
| 24 | 9 | 23 | 9 | 31 | |
| 26 | 9 | 33 | 9 | 41 | |
| 28 | 9 | 43 | 9 | 51 | P.B |
| 30 | 9 | 53 | 10 | 02 | |
| 1 | | | | | |
| 2 | | | | | |

BATTERY NO. B-3

| OVEN NO. | TIME PUSHED | | TIME CHARGED | | NOTES |
|---|---|---|---|---|---|
| 1 | 10 | 13 | 10 | 21 | |
| 3 | 10 | 23 | 10 | 31 | |
| 5 | 10 | 33 | 10 | 41 | |
| 7 | 10 | 43 | 10 | 51 | |
| 9 | 10 | 53 | 11 | — | |
| 11 | 11 | 02 | 11 | 10 | P.B |
| 13 | 11 | 12 | 11 | 20 | |
| 15 | 11 | 22 | 11 | 30 | |
| 17 | 11 | 32 | 11 | 40 | |
| 19 | | | | | |
| 21 | | | | | |
| 23 | | | | | |
| 25 | | | | | |
| 27 | | | | | |
| 29 | | | | | |
| 31 | | | | | |
| 2 | 12 | 47 | 12 | 49 | |
| 4 | 12 | 58 | 12 | 58 | |
| 6 | 1 | 10 | 1 | 12 | |
| 8 | 1 | 20 | 1 | 22 | |
| 10 | 1 | 30 | 1 | 32 | |
| 12 | 1 | 40 | 1 | 42 | |
| 14 | 1 | 50 | 1 | 52 | |
| 16 | 2 | 00 | 2 | 02 | |
| 18 | 2 | 10 | 2 | 12 | |
| 20 | 2 | 22 | 2 | 24 | |
| 22 | 2 | 28 | 2 | 30 | |
| 24 | 2 | 40 | 2 | 42 | |
| 26 | 2 | 50 | 2 | 52 | |
| 28 | 3 | 00 | 3 | 02 | |
| 30 | 3 | 12 | 3 | 14 | |
| 1 | 3 | 20 | 3 | 22 | |
| 2 | | | | | |

BATTERY NO. A-2

| OVEN NO. | TIME PUSHED | | TIME CHARGED | | NOTES |
|---|---|---|---|---|---|
| 1 | 3 | 30 | 3 | 32 | |
| 3 | 3 | 40 | 3 | 42 | |
| 5 | 4 | 05 | 4 | 13 | |
| 7 | 4 | 15 | 4 | 22 | |
| 9 | 4 | 26 | 4 | 32 | |
| 11 | 4 | 36 | 4 | 50 | K.O.P.B |
| 13 | 4 | 52 | 5 | 02 | |
| 15 | 5 | 04 | 5 | 13 | |
| 17 | 5 | 15 | 5 | 23 | |
| 19 | 5 | 25 | 5 | 33 | |
| 21 | 5 | 35 | 5 | 58 | |
| 23 | 5 | 48 | 6 | 04 | |
| 25 | 6 | 02 | 6 | 11 | |
| 27 | 6 | 13 | 6 | 23 | |
| 29 | 6 | 26 | 6 | 33 | |
| 31 | 6 | 35 | 6 | 44 | |
| 2 | | | | | |
| 4 | | | | | |
| 6 | | | | | |
| 8 | | | | | |
| 10 | | | | | |
| 12 | | | | | |
| 14 | | | | | |
| 16 | | | | | |
| 18 | | | | | |
| 20 | | | | | |
| 22 | | | | | |
| 24 | | | | | |
| 26 | | | | | |
| 28 | | | | | |
| 30 | | | | | |
| 1 | | | | | |
| 2 | | | | | |

REMARKS: 151/16 — 251/25 — 161/16 — 56 — 57

Condition of Signals

Condition of Pusher

HOURLY REPORT OF OPERATION

| TIME | OVENS PUSHED | OVENS CHARGED | OVENS SCHEDULED | TIME | OVENS PUSHED | OVENS CHARGED | OVENS SCHEDULED |
|---|---|---|---|---|---|---|---|
| 12-1 | 2 | 3 | | 6-7 | 5 | 5 | |
| 1-2 | 5 | 5 | | 7-8 | 6 | 7 | |
| 2-3 | 6 | 6 | | 8-9 | 2 | 1 | |
| 3-4 | 5 | 5 | | 9-10 | 6 | 6 | |
| 4-5 | 5 | 4 | | 10-11 | 5 | 5 | |
| 5-6 | 5 | 5 | | 11-12 | 4 | 5 | |
| | 28 | 28 | | | 28 | 29 | |

Total Ovens Pushed 56
Total Ovens Charged 57

Pusherman

Battery Foreman [signature]

CC-102B5 REV. 1161
93.001.1080

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

# PUSHING AND CHARGING REPORT

UNIT NO. 1
12 Hrs. Beginning 12:00 AM
Date 8-26-93

**BATTERY NO. A-3**

| OVEN NO. | TIME PUSHED | | TIME CHARGED | | NOTES |
|---|---|---|---|---|---|
| 1 | 4 | 44 | 4 | 48 | |
| 3 | 4 | 56 | 4 | 59 | |
| 5 | 5 | 08 | 5 | 12 | |
| 7 | 5 | 19 | 5 | 23 | |
| 9 | 5 | 30 | 5 | 34 | |
| 11 | 5 | 42 | 5 | 45 | PB |
| 13 | 5 | 56 | 5 | 59 | |
| 15 | 6 | 08 | 6 | 12 | |
| 17 | 6 | 19 | 6 | 23 | |
| 19 | 6 | 29 | 6 | 33 | |
| 21 | 6 | 40 | 6 | 43 | PB |
| 23 | 6 | 51 | 6 | 54 | PB |
| 25 | 6 | 58 | 7 | 02 | |
| 27 | 7 | 09 | 7 | 13 | PB |
| 29 | 7 | 20 | 7 | 24 | |
| 31 | 7 | 31 | 7 | 35 | |
| 2 | | | | | |
| 4 | | | | | |
| 6 | | | | | |
| 8 | | | | | |
| 10 | | | | | |
| 12 | | | | | |
| 14 | | | | | |
| 16 | | | | | |
| 18 | | | | | |
| 20 | | | | | |
| 22 | | | | | |
| 24 | | | | | |
| 26 | | | | | |
| 28 | | | | | |
| 30 | | | | | |
| 1 | | | | | |
| 2 | | | | | |

**BATTERY NO. B-3**

| OVEN NO. | TIME PUSHED | | TIME CHARGED | | NOTES |
|---|---|---|---|---|---|
| 1 | | | | | |
| 3 | | | | | |
| 5 | | | | | |
| 7 | | | | | |
| 9 | | | | | |
| 11 | | | | | |
| 13 | | | | | |
| 15 | | | | | |
| 17 | | | | | |
| 19 | 12 | 05 | 12 | 07 | |
| 21 | 12 | 17 | 12 | 19 | |
| 23 | 12 | 29 | 12 | 32 | |
| 25 | 12 | 40 | 12 | 43 | |
| 27 | 12 | 51 | 12 | 53 | |
| 29 | 1 | 02 | 1 | 05 | |
| 31 | 1 | 13 | 1 | 17 | |
| 2 | 8 | 05 | 8 | 07 | |
| 4 | 8 | 15 | 8 | 17 | |
| 6 | 8 | 25 | 8 | 27 | P.B. |
| 8 | 8 | 35 | 8 | 37 | |
| 10 | 8 | 45 | 8 | 47 | PB |
| 12 | 9 | 05 | 9 | 07 | PB |
| 14 | 9 | 15 | 9 | 17 | |
| 16 | 9 | 28 | 9 | 30 | |
| 18 | 9 | 40 | 9 | 42 | |
| 20 | 9 | 50 | 9 | 52 | |
| 22 | 10 | 00 | 10 | 02 | HPPB |
| 24 | 10 | 10 | 10 | 12 | HP PB |
| 26 | 10 | 24 | 10 | 26 | H.P.PB |
| 28 | 10 | 35 | 10 | 37 | |
| 30 | 10 | 45 | 10 | 47 | |
| E1 | 10 | 55 | 10 | 57 | |
| E2 | 1 | 23 | 1 | 26 | |

**BATTERY NO. A-2**

| OVEN NO. | TIME PUSHED | | TIME CHARGED | | NOTES |
|---|---|---|---|---|---|
| 1 | 11 | 10 | 11 | 08 | |
| 3 | 11 | 48 | 11 | 50 | |
| 5 | 11 | 54 | 11 | 56 | |
| 7 | 11 | 59 | | | |
| 9 | | | | | |
| 11 | | | | | |
| 13 | | | | | |
| 15 | | | | | |
| 17 | | | | | |
| 19 | | | | | |
| 21 | | | | | |
| 23 | | | | | |
| 25 | | | | | |
| 27 | | | | | |
| 29 | | | | | |
| 31 | | | | | |
| 2 | 1 | 28 | 1 | 31 | |
| 4 | 1 | 39 | 1 | 42 | |
| 6 | 1 | 49 | 1 | 53 | |
| 8 | 2 | — | 2 | 05 | |
| 10 | 2 | 16 | 2 | 20 | |
| 12 | 2 | 27 | 2 | 30 | |
| 14 | 2 | 38 | 2 | 42 | PB |
| 16 | 2 | 49 | 2 | 53 | |
| 18 | 3 | 00 | 3 | 04 | |
| 20 | 3 | 10 | 3 | 15 | |
| 22 | 3 | 20 | 3 | 25 | |
| 24 | 3 | 30 | 3 | 35 | |
| 26 | 3 | 41 | 3 | 46 | |
| 28 | 3 | 51 | 3 | 56 | |
| 30 | 4 | 35 | 4 | 40 | |
| 1 | | | | | |
| 2 | | | | | |

REMARKS:

16/16 24/24 19/18

Condition of Signals

Condition of Pusher

## HOURLY REPORT OF OPERATION

| TIME | OVENS PUSHED | OVENS CHARGED | OVENS SCHEDULED | TIME | OVENS PUSHED | OVENS CHARGED | OVENS SCHEDULED |
|---|---|---|---|---|---|---|---|
| 12-1 | 5 | 5 | | 6-7 | 6 | 5 | |
| 1-2 | 6 | 6 | | 7-8 | 3 | 4 | |
| 2-3 | 5 | 5 | | 8-9 | 5 | 5 | |
| 3-4 | 6 | 6 | | 9-10 | 5 | 5 | |
| 4-5 | 3 | 3 | | 10-11 | 6 | 6 | |
| 5-6 | 5 | 5 | | 11-12 | 4 | 3 | |
| | 30 | 30 | | | 29 | 28 | |

Total Ovens Pushed 59

Total Ovens Charged 58

Pusherman

Battery Foreman

CC-10295 REV. 1161
03.001.0030

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

# PUSHING AND CHARGING REPORT

UNIT NO. 1
12 Hrs. Beginning 12:00 AM
Date 9-26-93

BATTERY NO. [illegible]

| OVEN NO. | TIME PUSHED | TIME CHARGED | NOTES |
|---|---|---|---|
| 1 | 4 52 | 4 54 | |
| 3 | 5 03 | 5 05 | |
| 5 | 5 13 | 5 15 | |
| 7 | 5 23 | 5 25 | |
| 9 | 5 33 | 5 35 | |
| 11 | 5 43 | 5 45 | |
| 13 | 5 53 | 5 55 | |
| 15 | 6 04 | 6 06 | |
| 17 | 6 16 | 6 18 | |
| 19 | 6 28 | 6 30 | |
| 21 | 6 40 | 6 42 | |
| 23 | | 2 53 | |
| 25 | 7 05 | 7 07 | |
| 27 | 7 17 | 7 19 | |
| 29 | 7 29 | 7 31 | |
| 31 | 7 41 | 7 43 | |
| 2 | | | |
| 4 | | | |
| 6 | | | |
| 8 | | | |
| 10 | | 6 | |
| 12 | | 7 | |
| 14 | | | |
| 16 | | | |
| 18 | | | |
| 20 | | | |
| 22 | | | |
| 24 | | | |
| 26 | | | |
| 28 | | | |
| 30 | | | |
| C/1 | | | |
| C/2 | 7 50 | 7 52 | |

BATTERY NO. A-1

| OVEN NO. | TIME PUSHED | TIME CHARGED | NOTES |
|---|---|---|---|
| 1 | | | |
| 3 | | | |
| 5 | | | |
| 7 | | | |
| 9 | | 2 | |
| 11 | | 12 | |
| 13 | | 7 | |
| 15 | | | |
| 17 | | | |
| 19 | 12 07 | 12 10 | |
| 21 | 12 20 | 12 22 | |
| 23 | 12 32 | 12 34 | |
| 25 | 12 44 | 12 46 | |
| 27 | 12 56 | 12 58 | |
| 29 | 1 07 | 1 09 | |
| 31 | 1 19 | 1 17 | |
| 2 | 8 13 | 8 21 | |
| 4 | 8 23 | 8 32 | |
| 6 | 8 34 | 8 43 | |
| 8 | 8 45 | 9 — | |
| 10 | 8 02 | 9 10 | |
| 12 | 9 17 | 9 23 | PB |
| 14 | 9 25 | 9 34 | PB |
| 16 | 9 36 | 9 46 | PB |
| 18 | 9 48 | 10 06 | |
| 20 | 2 15 | 2 18 | |
| 22 | 10 08 | 10 16 | PB |
| 24 | 10 18 | 10 20 | PB |
| 26 | 10 29 | 10 40 | PB |
| 28 | 10 42 | 11 — | PB |
| 30 | 11 02 | 11 14 | PB |

BATTERY NO. B-1

| OVEN NO. | TIME PUSHED | TIME CHARGED | NOTES |
|---|---|---|---|
| 1 | 11 16 | 11 21 | |
| 3 | 11 23 | 11 31 | |
| 5 | 11 29 | 11 35 | PB |
| 7 | 11 35 | 11 41 | KO |
| 9 | | | |
| 11 | | | |
| 13 | | | |
| 15 | | | |
| 17 | | | |
| 19 | | | |
| 21 | | 90 | |
| 23 | | 88 | 58 |
| 25 | | 84 | 59 |
| 27 | | | |
| 29 | | | |
| 31 | | | |
| 2 | 1 31 | 1 33 | |
| 4 | 1 43 | 1 45 | |
| 6 | 1 55 | 1 57 | |
| 8 | 2 06 | 2 08 | |
| 10 | 2 24 | 2 26 | PB |
| 12 | 2 36 | 2 38 | |
| 14 | 2 47 | 2 49 | KO PB |
| 16 | 2 56 | 2 58 | PB |
| 18 | 3 05 | 3 07 | |
| 20 | 3 15 | 3 17 | PB |
| 22 | 3 25 | 3 27 | |
| 24 | 3 35 | 3 37 | |
| 26 | 3 45 | 3 47 | |
| 28 | 3 55 | 3 57 | |
| 30 | 4 32 | 4 34 | |
| C/1 | 4 42 | 4 44 | |
| C/2 | | | |

REMARKS:

12-8 { KO-1 / PB-1111 }

8-4 { KO-1 / PB-1111 }

KO 2/4001 B/1

Condition of Signals

Condition of Pusher

## HOURLY REPORT OF OPERATION

| TIME | OVENS PUSHED | OVENS CHARGED | OVENS SCHEDULED | TIME | OVENS PUSHED | OVENS CHARGED | OVENS SCHEDULED |
|---|---|---|---|---|---|---|---|
| 12-1 | 5 | 5 | | 6-7 | 4 | 4 | |
| 1-2 | 5 | 5 | | 7-8 | 5 | 5 | |
| 2-3 | 5 | 5 | | 8-9 | 4 | 3 | |
| 3-4 | 6 | 6 | | 9-10 | 5 | 5 | |
| 4-5 | 3 | 3 | | 10-11 | 4 | 4 | |
| 5-6 | 6 | 6 | | 11-12 | 5 | 6 | |
| | 30 | 32 | | | 27 | 27 | |

Total Ovens Pushed 58
Total Ovens Charged 59

Pusherman

Battery Foreman

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

Unit No. _____
12 Hrs. Beginning 12:00 PM
Date 8-26-93

| BATTERY NO. B-2 | | | | BATTERY NO. A-1 | | | | BATTERY NO. B-1 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OVEN NO. | TIME PUSHED | TIME CHARGED | NOTES | OVEN NO. | TIME PUSHED | TIME CHARGED | NOTES | OVEN NO. | TIME PUSHED | TIME CHARGED | NOTES |
| 1 | | | | 1 | 6 48 | 7 16 | | 1 | | | |
| 3 | | | | 3 | 6 49 | 7 28 | | 3 | | | |
| 5 | | | | 5 | 7 04 | 7 40 | | 5 | | | |
| 7 | | | | 7 | 7 19 | 7 54 | | 7 | | | |
| 9 | | | | 9 | 7 30 | 8 33 | | 9 | 12 41 | 1 11 | KO-PB |
| 11 | | | | 11 | 7 32 | 8 49 | | 11 | 12 51 | 1 21 | PB |
| 13 | | | | 13 | 7 56 | 9 02 | | 13 | 1 02 | 1 31 | KO-PB |
| 15 | | | | 15 | 8 35 | 9 14 | | 15 | 1 13 | 1 41 | PB |
| 17 | | | | 17 | 8 50 | 9 26 | | 17 | 1 23 | 1 51 | |
| 19 | | | | 19 | 9 04 | 9 36 | | 19 | 1 33 | 2 02 | PB |
| 21 | | | | 21 | 9 16 | 9 50 | | 21 | 1 43 | 2 13 | |
| 23 | | | | 23 | 9 28 | 10 03 | | 23 | 1 53 | 2 23 | PB |
| 25 | | | | 25 | 9 38 | 10 16 | | 25 | 2 04 | 2 34 | |
| 27 | | | | 27 | 9 52 | 10 32 | | 27 | 2 15 | 2 40 | |
| 29 | | | | 29 | 10 05 | 10 42 | | 29 | 2 25 | 2 57 | |
| 31 | | | | 31 | 10 14 | 10 52 | | 31 | 2 36 | 3 08 | |
| 2 | 2 53 | 3 22 | | 2 | | | | 2 | 10 34 | 11 02 | |
| 4 | 3 04 | 3 32 | | 4 | | | | 4 | 10 44 | 11 14 | |
| 6 | 3 14 | 3 42 | | 6 | | | | 6 | 10 54 | 11 24 | |
| 8 | 3 24 | 3 53 | | 8 | | | | 8 | 11 04 | 11 34 | |
| 10 | 3 34 | 4 06 | | 10 | | | | 10 | 11 16 | 11 44 | |
| 12 | 3 44 | 4 18 | | 12 | | | | 12 | 11 26 | | |
| 14 | 3 55 | 4 32 | | 14 | | | | 14 | 11 36 | | |
| 16 | 4 08 | 4 44 | | 16 | | | | 16 | 11 46 | | |
| 18 | 4 20 | 4 56 | | 18 | | | | 18 | | | |
| 20 | 4 24 | [illegible] | | 20 | | | | 20 | | | |
| 22 | 4 46 | 5 [illegible] | | 22 | | | | 22 | | | |
| 24 | 4 58 | 5 [illegible] | | 24 | | | | 24 | | | |
| 26 | 5 10 | 5 26 | | 26 | | | | 26 | | | |
| 28 | 5 22 | 5 54 | | 28 | | | | 28 | | | |
| 30 | 5 34 | 5 59 | | 30 | | | | 30 | | | |
| C 1 | 5 38 | 6 05 | | 1 | | | | 1 | | | |
| 2 | | | | 2 | | | | C/2 | 2 42 | 3 18 | |

REMARKS: KO-11

16/16 PB-HT 1 16/16 21/18

Condition of Signals | Condition of Pusher

HOURLY REPORT OF OPERATION

| TIME | OVENS PUSHED | OVENS CHARGED | OVENS SCHEDULED | TIME | OVENS PUSHED | OVENS CHARGED | OVENS SCHEDULED | |
|---|---|---|---|---|---|---|---|---|
| 12-1 | 2 | — | | 6-7 | 2 | 4 | | |
| 1-2 | 6 | 5 | | 7-8 | 5 | 4 | | Total Ovens Pushed 53 |
| 2-3 | 6 | 6 | | 8-9 | 2 | 2 | | Total Ovens Charged 50 |
| 3-4 | 6 | 6 | | 9-10 | 5 | 5 | | |
| 4-5 | 5 | 5 | | 10-11 | 5 | 5 | | Pusherman |
| 5-6 | 4 | 6 | | 11-12 | 5 | 5 | | Battery Foreman [illegible] |
| | 29 | 28 | | | 24 | 22 | | |

CC-10295 REV. 1181
03.981.0020

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

# PUSHING AND CHARGING REPORT

UNIT NO. 1

12 Hrs. Beginning 12:00 P M

Date 8-26-93

| BATTERY NO. A-3 | | | | | |
|---|---|---|---|---|---|
| OVEN NO. | TIME PUSHED | | TIME CHARGED | | NOTES |
| 1 | | | | | |
| 3 | | | | | |
| 5 | | | | | |
| 7 | | | | | |
| 9 | | | | | |
| 11 | | | | | |
| 13 | | | | | |
| 15 | | | | | |
| 17 | | | | | |
| 19 | | | | | |
| 21 | | | | | |
| 23 | | | | | |
| 25 | | | | | |
| 27 | | | | | |
| 29 | | | | | |
| 31 | | | | | |
| 2 | 2 | 45 | 3 | 20 | PB KO |
| 4 | 2 | 55 | 3 | 29 | |
| 6 | 3 | 07 | 3 | 37 | |
| 8 | 3 | 15 | 3 | 52 | |
| 10 | 3 | 27 | 3 | 58 | |
| 12 | 3 | 35 | 4 | 10 | PB |
| 14 | 3 | 50 | 4 | 28 | PB |
| 16 | 3 | 56 | 4 | 38 | PB KO |
| 18 | 4 | 19 | 4 | 48 | K.O.P.B |
| 20 | 4 | 30 | 5 | — | K.O.PB |
| 22 | 4 | 41 | 5 | 13 | K.O.P.B |
| 24 | 4 | 51 | 5 | 23 | K.O PB |
| 26 | 5 | 02 | 5 | 37 | KO |
| 28 | 5 | 15 | 5 | 47 | |
| 30 | 5 | 25 | 5 | 57 | |
| 1 | | | | | |
| 2 | | | | | |

| BATTERY NO. B-3 | | | | | |
|---|---|---|---|---|---|
| OVEN NO. | TIME PUSHED | | TIME CHARGED | | NOTES |
| 1 | 5 | 42 | 6 | 07 | |
| 3 | 6 | 53 | 7 | 30 | |
| 5 | 7 | 04 | 7 | 40 | |
| 7 | 7 | 23 | 7 | 50 | |
| 9 | 7 | 33 | 8 | 37 | |
| 11 | 7 | 43 | 8 | 45 | |
| 13 | 7 | 53 | 9 | 05 | |
| 15 | 8 | 35 | 9 | 15 | P.B |
| 17 | 8 | 47 | 9 | 25 | |
| 19 | 9 | 03 | 9 | 35 | |
| 21 | 9 | 13 | 9 | 45 | |
| 23 | 9 | 23 | 9 | 55 | |
| 25 | 9 | 33 | 10 | 09 | |
| 27 | 9 | 43 | 10 | 22 | |
| 29 | 9 | 53 | 10 | 30 | |
| 31 | 10 | 07 | 10 | 39 | |
| 2 | | | | | |
| 4 | | | | | |
| 6 | | | | | |
| 8 | | | | | |
| 10 | | | | | |
| 12 | | | | | |
| 14 | | | | | |
| 16 | | | | | |
| 18 | | | | | |
| 20 | | | | | |
| 22 | | | | | |
| 24 | | | | | |
| 26 | | | | | |
| 28 | | | | | |
| 30 | | | | | |
| 1 | | | | | |
| 2 | C-2 | 10 | 20 | 10 | 49 |

| BATTERY NO. A-2 | | | | | |
|---|---|---|---|---|---|
| OVEN NO. | TIME PUSHED | | TIME CHARGED | | NOTES |
| 1 | | | | | |
| 3 | | | | | |
| 5 | | | | | |
| 7 | | | 12 | 01 | |
| 9 | 12 | 32 | 12 | 24 | |
| 11 | 12 | 45 | 12 | 47 | |
| 13 | 12 | 55 | 12 | 57 | |
| 15 | 1 | 05 | 1 | 07 | |
| 17 | 1 | 15 | 1 | 17 | |
| 19 | 1 | 25 | 1 | 27 | |
| 21 | 1 | 35 | 1 | 38 | |
| 23 | 1 | 45 | 2 | 12 | HP. PB |
| 25 | 2 | 00 | 2 | 32 | |
| 27 | 2 | 07 | 2 | 47 | |
| 29 | 2 | 18 | 2 | 57 | |
| 31 | 2 | 30 | 3 | 09 | |
| 2 | 10 | 27 | 10 | 59 | |
| 4 | 10 | 37 | 11 | 06 | |
| 6 | 10 | 47 | 11 | 16 | |
| 8 | 10 | 57 | 11 | 26 | |
| 10 | 11 | 08 | 11 | 36 | |
| 12 | 11 | 18 | 11 | 46 | |
| 14 | 11 | 28 | | | |
| 16 | 11 | 38 | | | |
| 18 | 11 | 48 | | | |
| 20 | | | | | |
| 22 | | | | | |
| 24 | | | | | |
| 26 | | | | | |
| 28 | | | | | |
| 30 | | | | | |
| 1 | | | | | |
| 2 | | | | | |

REMARKS:

Condition of Signals

Condition of Pusher

## HOURLY REPORT OF OPERATION

| TIME | OVENS PUSHED | OVENS CHARGED | OVENS SCHEDULED | TIME | OVENS PUSHED | OVENS CHARGED | OVENS SCHEDULED |
|---|---|---|---|---|---|---|---|
| 12-1 | 3 | 4 | | 6-7 | 1 | 1 | |
| 1-2 | 5 | 4 | | 7-8 | 5 | 3 | |
| 2-3 | 6 | 4 | | 8-9 | 2 | 2 | |
| 3-4 | 6 | 6 | | 9-10 | 6 | 6 | |
| 4-5 | 4 | 4 | | 10-11 | 6 | 6 | |
| 5-6 | 4 | 6 | | 11-12 | 5 | 5 | |
| | 28 | 27 | | | 25 | 22 | |

Total Ovens Pushed 53

Total Ovens Charged 51

Pusherman

Battery Foreman

Wednesday, August 23, 1995 Turn 2
Batteries: 1-3_2

| Seq # | Oven | Last Pushed | Earliest | Desired | Latest |
|---|---|---|---|---|---|
| 1 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 2 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 3 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 4 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 5 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 6 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 7 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 8 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 9 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 10 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 11 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 12 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 13 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 14 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 15 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 16 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 17 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 18 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 19 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 20 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 21 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 22 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 23 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 24 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 25 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 26 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 27 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 28 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 29 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 30 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 31 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 32 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 33 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 34 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 35 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 36 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 37 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 38 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 39 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 40 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 41 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 42 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 43 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 44 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 45 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 46 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 47 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 48 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 49 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 50 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 51 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 52 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 53 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 54 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 55 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 56 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 57 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 58 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 59 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 60 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 61 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 62 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 63 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 64 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 65 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 66 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 67 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 68 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 69 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 70 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 71 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 72 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 73 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 74 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 75 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 76 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 77 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 78 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

— B 23 - 2
— A 20 - 1

Thursday, August 26 1993 Turn 2
Batteries: 1-3_2

| Seq # | Over | Last Pushed | Earliest | Desired | Latest |
|---|---|---|---|---|---|
| [illegible] | [illegible] | [illegible] | 5:50pm | 6:00pm | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible]

Wednesday, August 25, 1993 Turn 1
Batteries: 1-3_2

| Seq # | Oven | Last Pushed | Earliest | Desired | Latest |
|---|---|---|---|---|---|
| [illegible] | [illegible] | [illegible] | [illegible] | 12:00am | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible]

Thursday, August 26, 1993 Turn 2
Batteries: 1-3_2

| Seq # | Oven | Last Pushed | Earliest | Desired | Latest |
|---|---|---|---|---|---|
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

Friday, August 27, 1993 Turn 3

Batteries: 1-3_2

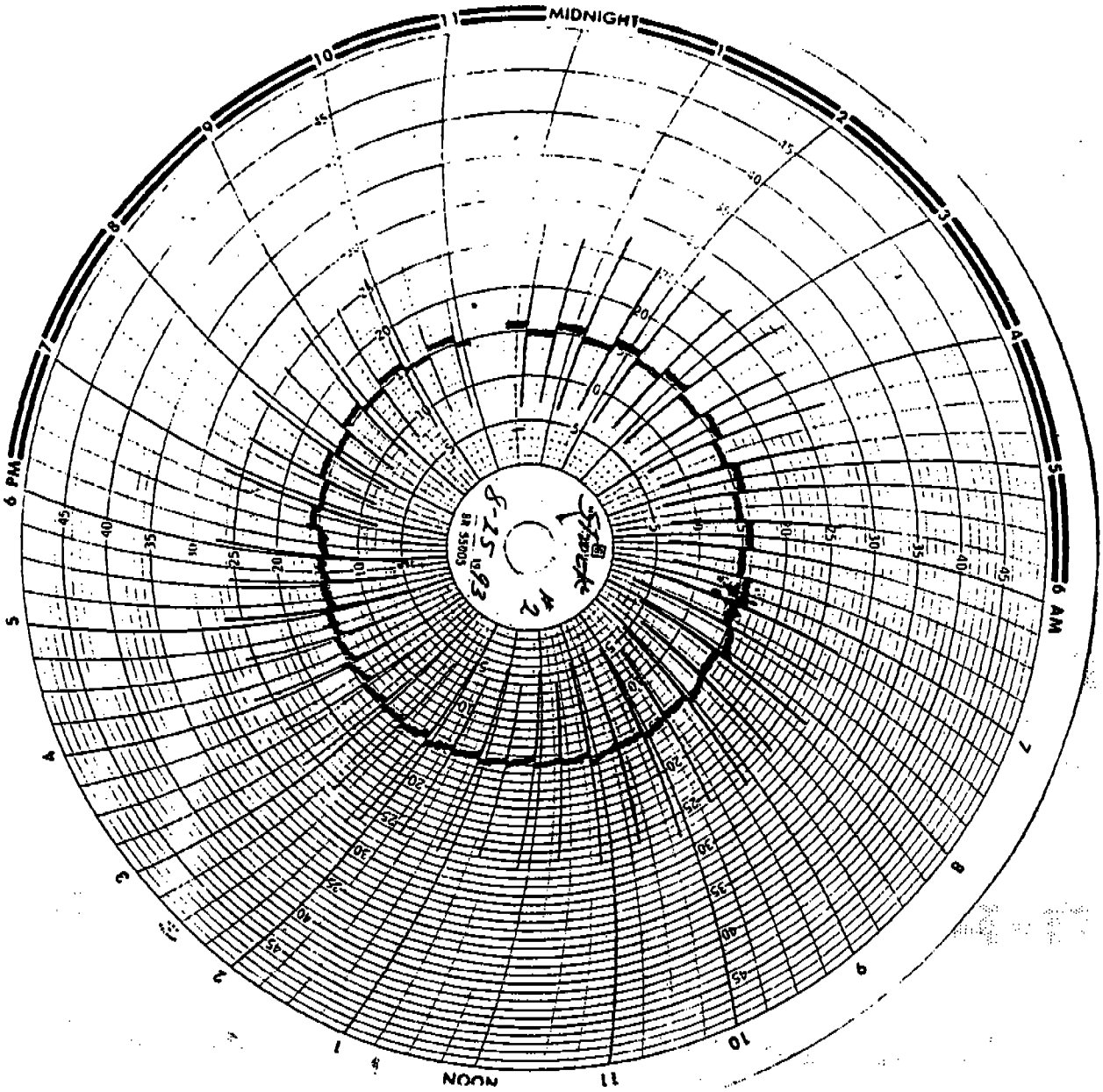
| Seq # | Oven | Last Pushed | Earliest | Desired | Latest |
|---|---|---|---|---|---|
| 1 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 2 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 3 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 4 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 5 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 6 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 7 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 8 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 9 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 10 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 11 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 12 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 13 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 14 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 15 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 16 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 17 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 18 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 19 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 20 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 21 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 22 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 23 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 24 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 25 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 26 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 27 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 28 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 29 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 30 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 31 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 32 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 33 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 34 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 35 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 36 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 37 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 38 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 39 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 40 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 41 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 42 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 43 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 44 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 45 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 46 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 47 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 48 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 49 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 50 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 51 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 52 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 53 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 54 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 55 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 56 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 57 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 58 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 59 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 60 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 61 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 62 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 63 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 64 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 65 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 66 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 67 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 68 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 69 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 70 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 71 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 72 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 73 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 74 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 75 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 76 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 77 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 78 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 79 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

Thursday, August 26, 1993 Turn 1
Batteries: 1-3_2

| Seq # | Oven | Last Pushed | Earliest | Desired | Latest |
|---|---|---|---|---|---|
| 1 | [illegible] | [illegible] | [illegible] | 12:00am | [illegible] |
| 2 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 3 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 4 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 5 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 6 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 7 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 8 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 9 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 10 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 11 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 12 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 13 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 14 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 15 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 16 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 17 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 18 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 19 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 20 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 21 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 22 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 23 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 24 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 25 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 26 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 27 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 28 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 29 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 30 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 31 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 32 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 33 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 34 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 35 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 36 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 37 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 38 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 39 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 40 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 41 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 42 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 43 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 44 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 45 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 46 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 47 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 48 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 49 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 50 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 51 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 52 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 53 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 54 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 55 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 56 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 57 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 58 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 59 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 60 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 61 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 62 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 63 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 64 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 65 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 66 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 67 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 68 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 69 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 70 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 71 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 72 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 73 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 74 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 75 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 76 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 77 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 78 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 79 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 1 | A18/2 | 19:44 | 2:15am | 2:25am | 2:35am |
| 2 | B18/1 | 19:44 | 2:21am | 2:31am | 2:41am |
| 3 | A12/2 | 19:44 | 2:27am | 2:37am | 2:47am |
| 4 | B12/1 | 19:45 | 2:34am | 2:44am | 2:54am |
| 5 | A14/2 | 19:45 | 2:40am | 2:50am | 3:00am |
| 6 | B14/1 | 19:45 | 2:46am | 2:56am | 3:06am |
| 7 | A16/2 | 19:45 | 2:52am | 3:02am | 3:12am |
| 8 | B16/1 | 19:45 | 2:58am | 3:08am | 3:18am |
| 9 | A18/2 | 19:45 | 3:04am | 3:14am | 3:24am |
| 10 | B18/1 | 19:45 | 3:10am | 3:20am | 3:30am |
| 11 | A20/2 | 19:45 | 3:16am | 3:26am | 3:36am |
| 12 | B20/1 | 19:32 | 3:22am | 3:32am | 3:42am |
| 13 | A22/2 | 19:32 | 3:28am | 3:38am | 3:48am |
| 14 | B22/1 | 19:32 | 3:34am | 3:44am | 3:54am |
| 15 | A24/2 | 19:32 | 3:40am | 3:50am | 4:00am |
| 16 | B24/1 | 19:32 | 3:46am | 3:56am | 4:06am |
| 17 | A26/2 | 19:33 | 3:53am | 4:03am | 4:13am |
| 18 | B26/1 | 19:33 | 3:59am | 4:09am | 4:19am |
| 19 | A28/2 | 19:32 | 4:05am | 4:15am | 4:25am |
| 20 | B28/1 | 19:32 | 4:11am | 4:21am | 4:31am |
| 21 | A30/2 | 19:32 | 4:17am | 4:27am | 4:37am |
| 22 | B30/1 | 19:32 | 4:23am | 4:33am | 4:43am |
| 23 | C1 /1 | 19:32 | 4:29am | 4:39am | 4:49am |
| 24 | A1 /3 | 19:32 | 4:35am | 4:45am | 4:55am |
| 25 | B1 /2 | 19:31 | 4:41am | 4:51am | 5:01am |
| 26 | A3 /3 | 19:31 | 4:47am | 4:57am | 5:07am |
| 27 | B3 /2 | 19:31 | 4:53am | 5:03am | 5:13am |
| 28 | A5 /3 | 19:31 | 4:59am | 5:09am | 5:19am |
| 29 | B5 /2 | 19:31 | 5:05am | 5:15am | 5:25am |
| 30 | A7 /3 | 19:32 | 5:12am | 5:22am | 5:32am |
| 31 | B7 /2 | 19:32 | 5:18am | 5:28am | 5:38am |
| 32 | A9 /3 | 19:31 | 5:24am | 5:34am | 5:44am |
| 33 | B9 /2 | 19:31 | 5:30am | 5:40am | 5:50am |
| 34 | A11/3 | 19:31 | 5:36am | 5:46am | 5:56am |
| 35 | B11/2 | 19:31 | 5:42am | 5:52am | 6:02am |
| 36 | A13/3 | 19:31 | 5:48am | 5:58am | 6:08am |
| 37 | B13/2 | 19:31 | 5:54am | 6:04am | 6:14am |
| 38 | A15/3 | 19:30 | 6:00am | 6:10am | 6:20am |
| 39 | B15/2 | 19:30 | 6:06am | 6:16am | 6:26am |
| 40 | A17/3 | 19:30 | 6:12am | 6:22am | 6:32am |
| 41 | B17/2 | 19:30 | 6:18am | 6:28am | 6:38am |
| 42 | A19/3 | 19:30 | 6:24am | 6:34am | 6:44am |
| 43 | B19/2 | 19:31 | 6:31am | 6:41am | 6:51am |
| 44 | A21/3 | 19:31 | 6:37am | 6:47am | 6:57am |
| 45 | B21/2 | 19:30 | 6:43am | 6:53am | 7:03am |
| 46 | A23/3 | 19:30 | 6:49am | 6:59am | 7:09am |
| 47 | A25/3 | 19:30 | 6:55am | 7:05am | 7:15am |
| 48 | B25/2 | 19:30 | 7:01am | 7:11am | 7:21am |
| 49 | A27/3 | 19:30 | 7:07am | 7:17am | 7:27am |
| 50 | B27/2 | 19:30 | 7:13am | 7:23am | 7:33am |
| 51 | A29/3 | 19:29 | 7:19am | 7:29am | 7:39am |
| 52 | B29/2 | 19:29 | 7:25am | 7:35am | 7:45am |
| 53 | A31/3 | 19:29 | 7:31am | 7:41am | 7:51am |
| 54 | B31/2 | 19:29 | 7:37am | 7:47am | 7:57am |
| 55 | C2 /2 | 19:29 | 7:43am | 7:53am | 8:03am |

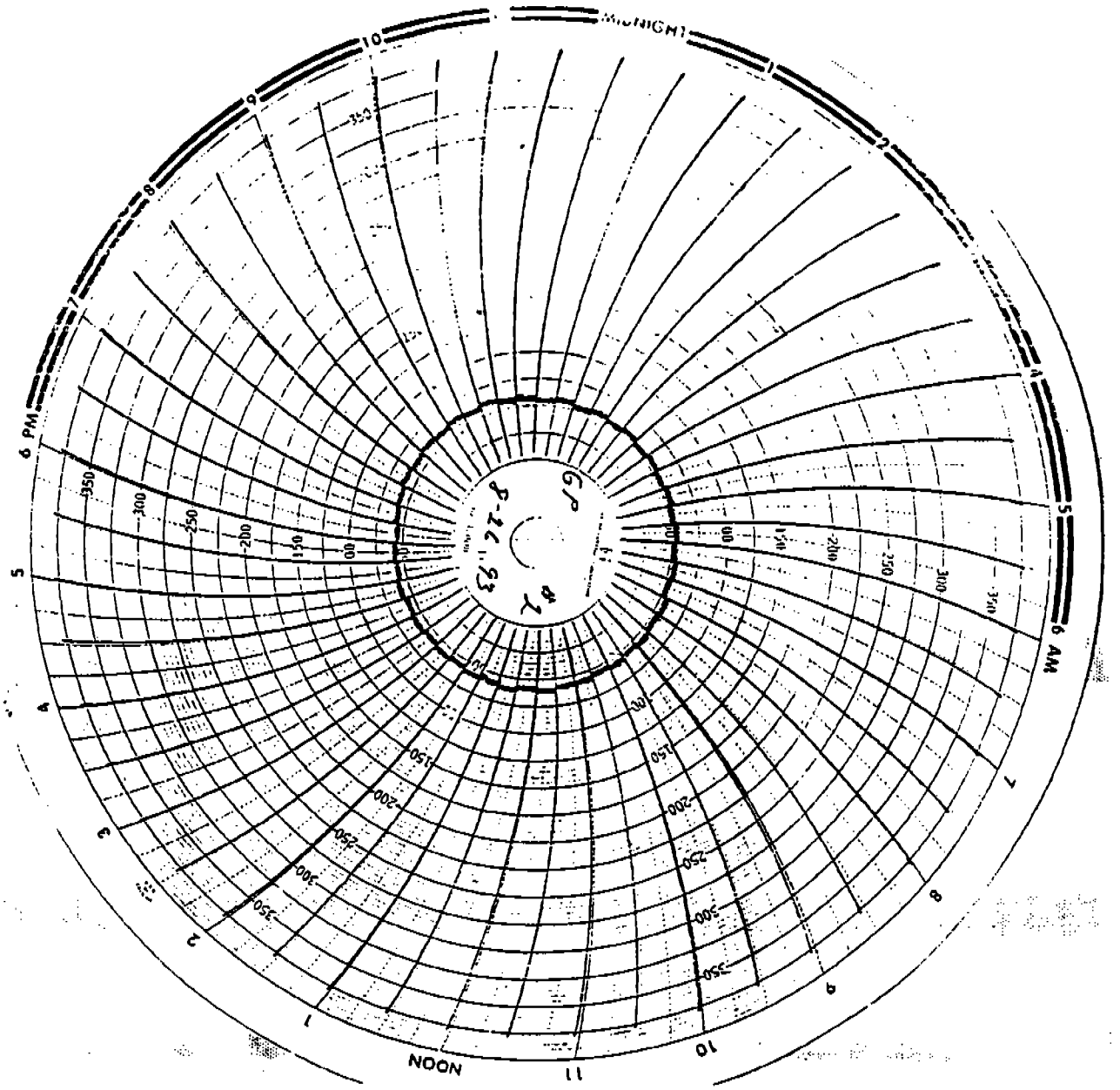
+A20-1 w B8-1

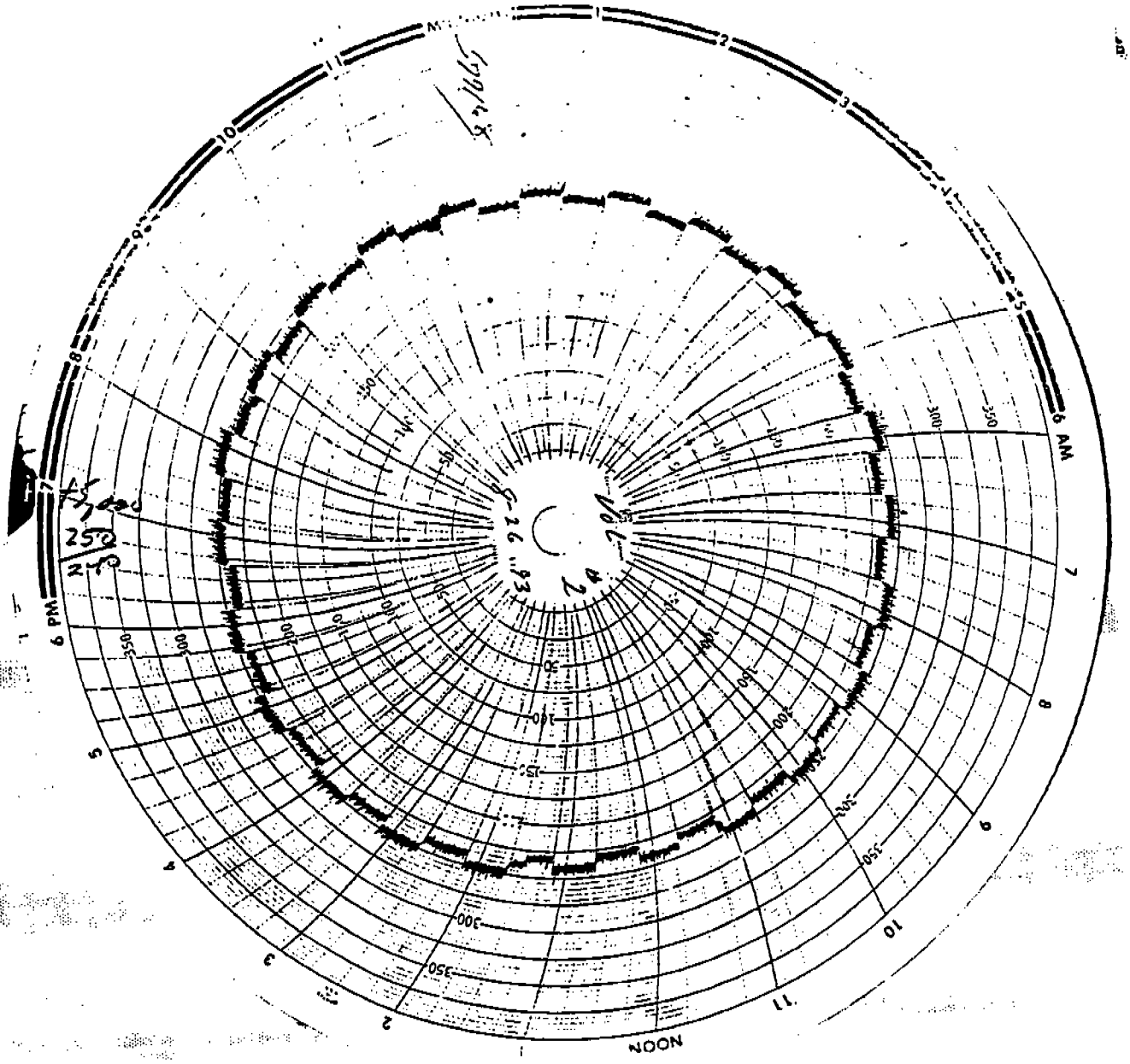
-B23-2


MIDNIGHT
6 AM
NOON
6 PM
8-25-93
BR 55005
#2

MIDNIGHT
NOON
6 PM
GP #2
8-25 1993

6 AM
NOON
6 PM
MIDNIGHT
Stock
C #2
8-26 1993


MIDNIGHT
6 AM
NOON
6 PM


6 AM
6 PM
NOON
Vol
2
8-26-93
250
240

# COMPLIANCE DEMONSTRATION
# NO. 2 BATTERY COMBUSTION STACK
# USS CLAIRTON WORKS

## USS CLAIRTON WORKS
## CLAIRTON, PENNSYLVANIA

## APPENDIX C

## GRAVIMETRIC RESULTS, EMISSIONS CALCULATIONS

CHESTER
ENVIRONMENTAL

# STACK SAMPLING CALCULATIONS

CLIENT USS Clairton Works TEST DATE 8-25-93
TEST SITE #2 Battery Combustion Stack TEST NUMBER CLR-235-PM-1

| | | | | |
|---|---|---|---|---|
| A. | Barometric Pressure | 29.50 | in. Hg | |
| B. | Static Pressure | -1.0 | in. H2O | |
| C. | Stack Pressure | 29.43 | in. Hg | [A+(B/13.6)] |
| D. | Average ΔH | 1.05 | in. H2O | |
| E. | Meter Pressure | 29.58 | in. Hg | [A+(D/13.6)] |
| F. | Average ΔP | 0.055 | in. H2O | |
| G. | Pitot Coefficient | 0.84 | | |
| H. | Gas Meter Coefficient | 0.9619 | | |
| I. | Stack Diameter | 114 | in. | |
| J. | Stack Area | 70.88 | $ft^2$ | $(0.00545*I^2)$ |
| K. | Nozzle Diameter | 0.428 | in. | |
| L. | Nozzle Area | $9.99 \times 10^{-4}$ | $ft^2$ | $(0.00545*K^2)$ |
| M. | Average Stack Temperature | 526 | °F | |
| N. | Average Stack Temperature | 986 | °R | (460+M) |
| O. | Average Meter Temperature | 106 | °F | |
| P. | Average Meter Temperature | 563 | °R | (460+O) |
| Q. | Condensate Volume | 216.4 | mL | |
| R. | Absorbed H2O | 20.5 | mL | |
| S. | Total H2O | 236.9 | mL | (Q+R) |
| T. | Filter Weight | 0.0281 | g | |
| U. | Probe Weight | 0.0688 | g | |
| V. | Impinger Weight | — | g | |
| W. | Total Weight | 0.0969 | g | (T+U+V) |
| X. | Metered Gas Volume | 72.858 | dcf | |
| Y. | Corrected Metered Gas Volume | 70.082 | dcf | (X*H) |
| Z. | H2O Gas Volume | 12.072 | cf | (0.00267*S*P/A) |
| AA. | Total Sample Volume | 82.154 | cf | (Y+Z) |
| BB. | Percent H2O | 14.7 | % | (100*Z/AA) |
| CC. | Gas Volume Sampled | 64.978 | dscf | [Y*(528/P)*(E/29.92)] |
| DD | Grain Loading | 0.0230 | gr/dscf | (15.43*W/CC) |

EE. Average Molecular Weight:

| Component | % Volume ÷100 | * (1-BB/100) | * Molecular Weight | = Weight/Mol |
|---|---|---|---|---|
| H2O | 0.147 | | 18 | 2.646 |
| CO2 | 0.050 | 0.853 | 44 | 1.877 |
| CO | ∅ | | 28 | ∅ |
| O2 | 0.125 | | 32 | 3.412 |
| N2 | 0.825 | | 28 | 19.704 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Average Molecular Weight 27.64 lb./lb. mol

| | | | | |
|---|---|---|---|---|
| FF. | Average Stack Velocity | 18.5 | fps | {85.49*G*[(F*N)/(C*EE)]^0.5} |
| GG. | Averge Flow Rate | 78900 | acfm | (60*FF*J) |
| HH | Standard Flow Rate | 41500 | scfm | [GG*(528/N)*(C/29.92)] |
| II. | Sample Time | 7200 | sec | |
| JJ. | Percent Isokinetic | 108.4 | % | {[100*CC*60*J] / [HH*L*II*(1-BB/100)]} |
| KK. | Mass Flow Rate | 7.0 | lb/hr | [DD*HH*(1-BB/100)*60/7000] |

CHESTER ENVIRONMENTAL

# STACK SAMPLING CALCULATIONS

CLIENT USS Clairton Works TEST DATE 8-25-93
TEST SITE #2 Battery Combustion Stack TEST NUMBER CLR-2BS-PM-2

| | | | | |
|---|---|---|---|---|
| A. | Barometric Pressure | 29.50 | in. Hg | |
| B. | Static Pressure | -1.0 | in. H2O | |
| C. | Stack Pressure | 29.43 | in. Hg | [A+(B/13.6)] |
| D. | Average ΔH | 0.90 | in. H2O | |
| E. | Meter Pressure | 29.57 | in. Hg | [A+(D/13.6)] |
| F. | Average ΔP | 0.050 | in. H2O | |
| G. | Pitot Coefficient | 0.84 | | |
| H. | Gas Meter Coefficient | 0.9619 | | |
| I. | Stack Diameter | 114 | in. | |
| J. | Stack Area | 70.88 | $ft^2$ | $(0.00545*I^2)$ |
| K. | Nozzle Diameter | 0.428 | in. | |
| L. | Nozzle Area | $9.99 \times 10^{-4}$ | $ft^2$ | $(0.00545*K^2)$ |
| M. | Average Stack Temperature | 528 | °F | |
| N. | Average Stack Temperature | 988 | °R | (460+M) |
| O. | Average Meter Temperature | 123 | °F | |
| P. | Average Meter Temperature | 583 | °R | (460+O) |
| Q. | Condensate Volume | 207.3 | mL | |
| R. | Absorbed H2O | 15.8 | mL | |
| S. | Total H2O | 223.1 | mL | (Q+R) |
| T. | Filter Weight | 0.0165 | g | |
| U. | Probe Weight | 0.0243 | g | |
| V. | Impinger Weight | — | g | |
| W. | Total Weight | 0.0408 | g | (T+U+V) |
| X. | Metered Gas Volume | 71.079 | dcf | |
| Y. | Corrected Metered Gas Volume | 68.371 | dcf | (X*H) |
| Z. | H2O Gas Volume | 11.772 | cf | (0.00267*S*P/A) |
| AA. | Total Sample Volume | 80.143 | cf | (Y+Z) |
| BB. | Percent H2O | 14.7 | % | (100*Z/AA) |
| CC. | Gas Volume Sampled | 61.197 | dscf | [Y*(528/P)*(E/29.92)] |
| DD | Grain Loading | 0.0103 | gr/dscf | (15.43*W/CC) |

EE. Average Molecular Weight:

| Component | % Volume ÷100 | * (1-BB/100) | * Molecular Weight | = Weight/Mol |
|---|---|---|---|---|
| H2O | 0.147 | | 18 | 2.646 |
| CO2 | 0.050 | 0.853 | 44 | 1.877 |
| CO | Ø | ↓ | 28 | Ø |
| O2 | 0.125 | ↓ | 32 | 3.412 |
| N2 | 0.825 | ↓ | 28 | 19.704 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Average Molecular Weight 27.64 lb./lb. mol

| | | | | |
|---|---|---|---|---|
| FF. | Average Stack Velocity | 17.7 | fps | {85.49*G*[(F*N)/(C*EE)]^0.5} |
| GG. | Averge Flow Rate | 75300 | acfm | (60*FF*J) |
| HH | Standard Flow Rate | 39600 | scfm | [GG*(528/N)*(C/29.92)] |
| II. | Sample Time | 7200 | sec | |
| JJ. | Percent Isokinetic | 107.2 | % | {[100*CC*60*J] / [HH*L*II*(1-BB/100)]} |
| KK. | Mass Flow Rate | 3.0 | lb/hr | [DD*HH*(1-BB/100)*60/7000] |

CHESTER ENVIRONMENTAL

# STACK SAMPLING CALCULATIONS

CLIENT USS Clairton Works TEST DATE 8-26-93
TEST SITE #2 Battery Combustion Stack TEST NUMBER CLR-2BS-PM-3

| | | | | |
|---|---|---|---|---|
| A. | Barometric Pressure | 29.52 | in. Hg | |
| B. | Static Pressure | -1.1 | in. H2O | |
| C. | Stack Pressure | 29.44 | in. Hg | [A+(B/13.6)] |
| D. | Average ΔH | 1.00 | in. H2O | |
| E. | Meter Pressure | 29.59 | in. Hg | [A+(D/13.6)] |
| F. | Average ΔP | 0.055 | in. H2O | |
| G. | Pitot Coefficient | 0.84 | | |
| H. | Gas Meter Coefficient | 0.9619 | | |
| I. | Stack Diameter | 114 | in. | |
| J. | Stack Area | 70.88 | ft² | (0.00545*I²) |
| K. | Nozzle Diameter | 0.428 | in. | |
| L. | Nozzle Area | $9.99 \times 10^{-4}$ | ft² | (0.00545*K²) |
| M. | Average Stack Temperature | 529 | °F | |
| N. | Average Stack Temperature | 989 | °R | (460+M) |
| O. | Average Meter Temperature | 128 | °F | |
| P. | Average Meter Temperature | 588 | °R | (460+O) |
| Q. | Condensate Volume | 211.3 | mL | |
| R. | Absorbed H2O | 18.2 | mL | |
| S. | Total H2O | 229.5 | mL | (Q+R) |
| T. | Filter Weight | 0.0364 | g | |
| U. | Probe Weight | 0.0442 | g | |
| V. | Impinger Weight | — | g | |
| W. | Total Weight | 0.0806 | g | (T+U+V) |
| X. | Metered Gas Volume | 75.750 | dcf | |
| Y. | Corrected Metered Gas Volume | 72.383 | dcf | (X*H) |
| Z. | H2O Gas Volume | 12.205 | cf | (0.00267*S*P/A) |
| AA. | Total Sample Volume | 84.588 | cf | (Y+Z) |
| BB. | Percent H2O | 14.4 | % | (100*Z/AA) |
| CC. | Gas Volume Sampled | 64.280 | dscf | [Y*(528/P)*(E/29.92)] |
| DD | Grain Loading | 0.093 | gr/dscf | (15.43*W/CC) |

EE. Average Molecular Weight:

| Component | % Volume ÷100 | * (1-BB/100) | * Molecular Weight | = Weight/Mol |
|---|---|---|---|---|
| H2O | 0.144 | | 18 | 2.592 |
| CO2 | 0.056 | 0.856 | 44 | 1.883 |
| CO | Ø | | 28 | Ø |
| O2 | 0.125 | | 32 | 3.424 |
| N2 | 0.825 | | 28 | 19.774 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Average Molecular Weight 27.67 lb./lb. mol

| | | | | |
|---|---|---|---|---|
| FF. | Average Stack Velocity | 186 | fps | {85.49*G*[(F*N)/(C*EE)]^0.5} |
| GG. | Averge Flow Rate | 78900 | acfm | (60*FF*J) |
| HH | Standard Flow Rate | 41500 | scfm | [GG*(528/N)*(C/29.92)] |
| II. | Sample Time | 7200 | sec | |
| JJ. | Percent Isokinetic | 107.1 | % | {[100*CC*60*J] / [HH*L*II*(1-BB/100)]} |
| KK. | Mass Flow Rate | 5.9 | lb/hr | [DD*HH*(1-BB/100)*60/7000] |

CHESTER ENVIRONMENTAL

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
AIR QUALITY ENGINEERING



## ANALYTICAL REPORTING FORM

CLIENT USS Clairton Works
PLANT LOCATION #2 Battery Combustion Stack
PROJECT NUMBER 600725 J01
UNIT TESTED

TEST DATE 8/25/93 & 8/26/93
DATE RECEIVED 8/26/93
DATE ANALYZED 9/7/93
ANALYTICAL METHOD EPA Method 5

| Test Number | Component | Cyclone Weight Units ( ) | Filter Weight Units ( g ) | Insoluble Portion of Front Half Units ( ) | 0.22μ Filter Insoluble Portion of Back Half Units ( ) | Soluble Portion of Back Half Units ( ) | Soluble Portion of Front Half Units ( g ) | Chloroform/ Ethyl Ether Extract Units ( ) |
|---|---|---|---|---|---|---|---|---|
| CLR-2BS-PM-1 | Particulate | | 0.0281 | | | | 0.0699 | |
| CLR-2BS-PM-2 | " | | 0.0165 | | | | 0.0254 | |
| CLR-2BS-PM-3 | " | | 0.0364 | | | | 0.0453 | |
| CLR-2BS-PM-BLK | " | | | | | | 0.0011 | |

Extraction Method
Solvent

Analyst's Signature John P. Shimshock
Date 9/9/93

Comments

AQE 3/92