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.

AP32 Section:	12.5.1
Background Chapter	3
Reference:	36
Title:	Air Emissions Test Report - Brandt Positive Pressure Baghouse - Newport Steel, Newport, KY. Prepared for: Newport Steel Corporation, Newport, KY. PN 050101.0013. Prepared by: Environmental Quality Management, Inc. November 2000.

JAMES E. BICKFORD
SECRETARY

PAUL E. PATTON
GOVERNOR

36

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION FOR AIR QUALITY
803 SCHENKEL LN
FRANKFORT KY 40601-1403

November 9, 2000

Ms. Jennifer A. McDaniel
Manager, Environmental and
Safety Compliance
Newport Steel
Ninth & Lowell Streets, P.O. Box 1670
Newport, Kentucky 41072

Dear Ms. McDaniel:

On October 3 and 4, 2000, carbon monoxide, NO_X, and SO_2 compliance tests were performed on the Electric Arc Furnace Brandt Baghouse at your Newport facility. Pacific Environmental Services, Inc performed the testing. John Allen and John Jayne observed testing for the Division for Air Quality. Proper test methods were followed, and the test report was checked for completeness and accuracy. The results are summarized below.

PARAMETER	TEST RESULTS	PERMIT LIMIT
Sulfur Dioxide	4.24 lb/hr, 0.07 lb/ton steel	
Nitrogen Oxides (as NO_2)	0.22 lb/ton of steel	0.51 lb/ton of steel
Carbon Monoxide	272.1 lb/hr, 4.0 lb/ton steel	

Therefore, this test report is accepted as proof of compliance for nitrogen oxide emissions. There is not a separate compliance limit for carbon monoxide and sulfur dioxide from the Brandt Baghouse. A copy of this letter is being sent to the Florence Regional Office for review. If you have any questions, please contact me at (502) 573-3382.

Sincerely,

Gerald H. Slucher

Gerald Slucher, Supervisor
Source Testing Section
Technical Services Branch

GHS

cc: Edd Frazier
W. A. Clements
Florence Regional Office
Pat Johnston

bcc: File: ID# 21-037-00006

EDUCATION PAYS

Printed on Recycled Paper
An Equal Opportunity Employer M

Newport Steel
Oil Country Tubular Goods
Line Pipe • Piling

November 3, 2000

Department for Environmental Protection
Division for Air Quality
803 Schenkel Lane
Frankfort, KY 40601-1403
Attn: Mr. Gerald Slucher

Re: Stack Test Results for EAF Exhaust/Brandt Baghouse
Air Quality Permit (F-98-014)

Dear Mr. Slucher,

Enclosed please find a copy of the, "Air Emissions Test Report – Brandt Positive Pressure Baghouse, Newport Steel Corporation, Newport, Kentucky." The test was conducted October 3 – October 4, 2000.

If you have any further questions, please feel free to contact me at 859/292-7236.

Sincerely,
Newport Steel Corporation

Jennifer A. McDaniel

Jennifer A. McDaniel
Manager, Environmental and
Safety Compliance

Cc: Thom Golatzki

NEWPORT STEEL CORPORATION
A Subsidiary of NS Group, Inc.

Ninth & Lowell Streets • P.O. Box 1670
Newport, Kentucky 41072
Phone (606) 292-6000, Fax (606) 292-0110

AIR EMISSION TEST REPORT
BRANDT POSITIVE PRESSURE BAGHOUSE
NEWPORT STEEL
NEWPORT, KENTUCKY

Prepared for

Newport Steel Corporation
P.O. Box 1670
Ninth & Lowell Streets
Newport, KY 41072

PN 050101.0013

Prepared by

Environmental Quality Management, Inc.
1310 Kemper Meadow Drive
Cincinnati, Ohio 45240
(513) 825-7500
Fax: (513) 825-7495

November 2000

TABLE OF CONTENTS

SECTION 1	INTRODUCTION	1-1
SECTION 2	SUMMARY OF TEST RESULTS	2-1
SECTION 3	SAMPLING AND ANALYTICAL PROCEDURES	3-1
	Location of Measurement Sites	3-1
	Stack Gas Volumetric Flow Rate	3-1
	Stack Gas Dry Molecular Weight	3-1
	Visible Emission Observation	3-2
	Stack Gas Moisture Content	3-2
	Nitrogen Oxides (NO_x)	3-2
	Carbon Monoxide	3-2
	Sulfur Dioxide (SO_2)	3-2
SECTION 4	PROCESS DESCRIPTIONS/SAMPLING LOCATIONS	4-1
SECTION 5	QUALITY ASSURANCE AND QUALITY CONTROL	5-1
	Calibration Procedures and Frequency	5-1
APPENDIX A	EXAMPLE CALCULATIONS	
APPENDIX B	FIELD DATA	
APPENDIX C	ANALYZER DATA	
APPENDIX D	PROCESS DATA	
APPENDIX E	CALIBRATION DATA	
APPENDIX F	VISIBLE EMISSION OBSERVATION FORMS	
APPENDIX G	CONTINUOUS EMISSION MONITORING DATA	

FIGURES

Number		Page
3-1	CEM Sample Flow and Calibration System Schematic	3-3
4-1	Brandt Baghouse Inlet Sampling Location Schmatic	4-2

TABLES

Number		Page
2-1	Summary of Stack Gas Conditions - Brandt Baghouse Inlet	2-2
2-2	Summary of NO_x and CO Emissions - Brandt Baghouse Inlet	2-3
2-3	Summary of SO_2 Emissions Brandt Baghouse Inlet	2-4
2-4	Data Comparison - CO (ppm)	2-5
2-5	Data Comparison - NO_x (ppm)	2-5
2-6	VE Readings and Rolling 6-Minute VE Averages for Newport Steel Brandt Baghouse	2-6
2-7	VE Readings and Rolling 6-Minute VE Averages for Newport Steel Melt Shop	2-25
5-1	Field Equipment Calibration Summary	5-2
5-2	Field Checks of Sampling Equipment	5-3
5-3	Field Checks of NO_x and CO Analyzers	5-3

SECTION 1

INTRODUCTION

Beginning on October 3, 2000 through October 4, 2000, Environmental Quality Management (EQ) and Pacific Environmental Services, Inc. (PES) personnel conducted an air emission evaluation at the Newport Steel Melt Shop in Newport, Kentucky. Sampling was conducted following the procedures of EPA reference methods. Nitrogen oxide, carbon monoxide and sulfur dioxide emissions were measured at the inlet of the Brandt fabric filter baghouse serving the electric arc furnace

EQ utilized EPA Reference Methods 1-4 to determine stack gas velocity and temperature, molecular weight, and moisture. Nitrogen oxide emissions were measured following the procedures of EPA Reference Method 7E. Carbon monoxide emissions were measured following the procedures of EPA Reference Method 10. Sulfur dioxide emissions were measured following the procedures of EPA Reference Method 6. Visible emission observations were conducted at the Brandt Baghouse exhaust and furnace roof monitor. The visible emission observations were conducted according to the procedures in EPA Method 9.

Ms. Jennifer McDaniel of Newport Steel coordinated process operations with the test team. Mr. Fred Hall and Mr. Tom Gerstle of EQ monitored process operations for the purposes of testing. Messrs. Ron Kolde, Gary Gay and Bryan Boggs of PES conducted all field efforts as the PES test team.

SECTION 2

SUMMARY OF TEST RESULTS

Sampling of Brandt Baghouse was conducted beginning on October 3, 2000. Test runs were at least 180 minutes in duration. Results from all three test runs are presented.

Table 2-1 summarizes the stack gas conditions measured at the baghouse inlet location. Moisture content was measured at the inlet and is applied in calculations for actual molecular weight calculations. The baghouse inlet had an average stack gas velocity of 72.0 feet per second at 177°F and 2.3 percent moisture content. Volumetric flow rates averaged 763,477 actual cubic feet per minute (acfm) or 608,262 dry standard cubic feet per minute (dscfm). Composition of the stack gas was essentially ambient in nature (0.1% carbon dioxide and 21.0% oxygen).

Table 2-2 summarizes the NO_x and CO emissions measured at the baghouse inlet. The overall average NO_x concentration was 3.4 parts per million (ppm), for a corresponding mass emission rate of14.6 pounds per hour (lb/hr). Based on steel production, the NO_x emission factor is 0.22 pound per ton of steel (lb/ton steel). The overall average CO concentration was 101.6 ppm, for a corresponding mass emission rate of 272.1 lb/hr, or 4.0 lb/ton steel.

Table 2-3 summarizes the SO_2 emissions for the three test runs. SO_2 concentrations averaged 0.79 ppm, for a corresponding mass emission rate of 4.82 lb/hr, or 0.07 lb/ton of steel produced.

Tables 2-4 and 2-5 present the test results comparing the NO_x and CO concentrations measured by the EPA Reference Methods (RM) 7E and 10, respectively, and the NO_x and CO concentrations concurrently measured by the CEMs.

EPA Reference Method 9, "Visible Determination of the Opacity of Emissions from Stationary Sources," was used to determine opacity from the baghouse exhaust as well as from the shop roof monitor. Observations were conducted simultaneously at each source in conjunction with the particulate sampling runs. The observations were recorded separately for the baghouse exhaust and melt shop roof monitor. The baghouse observation data is provided in Table 2-6. The melt shop observation data are provided

in Table 2-7. Both tables also present the rolling 6-minute averages. The visible emissions averaged 0% for the baghouse and furnace roof monitor.

The data are presented as a comparison in relative concentration. The RM CO and NO_x data were collected at the Brandt baghouse inlet duct. The CEM CO and NO_x data were collected at the baghouse roof monitor, downstream of the bags.

Field data is presented in Appendix B and CEM data is presented in Appendix C.

TABLE 2-1

SUMMARY OF STACK GAS CONDITIONS
BRANDT BAGHOUSE INLET

Dates: October 3-4, 2000 **Plant: Newport Steel, Newport, Kentucky**

Run No./ Date	Time	Stack Gas Velocity, fps[a]	Volumetric Flow Rate		Stack Temp, °F	Moisture, %
			acfm[b]	dscfm[c]		
BI-1 10/3/00	1620	72.6	769,801	642,495	146	2.4
	1920	72.5	768,488	602,864	185	2.4
Average		72.6	769,145	622,680	166	2.4
BI-2 10/4/00	0730	70.1	743,496	589,107	183	1.9
	1115	72.6	770,057	597,374	197	1.9
Average		71.4	756,777	593,241	190	1.9
BI-3 10/4/00	1115	72.7	770,918	594,384	197	2.5
	1510	71.5	758,099	623,348	155	2.5
Average		72.1	764,509	608,866	176	2.5
Overall Average		72.0	763,477	608,262	177	2.3

[a]Feet per second.
[b]Actual cubic feet per minute.
[c]Dry standard cubic feet per minute.

TABLE 2-2
SUMMARY OF NO_x AND CO EMISSIONS
BRANDT BAGHOUSE INLET

Dates: October 3-4, 2000 Plant: Newport Steel, Newport, Kentucky

Run No./ Time	Nitrogen Oxides			Carbon Monoxide			Steel Production, tons/hr[d]
	Conc.,[a] ppm dry	Mass Rate lb/hr[b]	Mass Rate lb/ton Steel [c]	Conc., ppm dry[a]	Mass Rate lb/hr[b]	Mass Rate lb/ton Steel [c]	
October 3, 2000							
BI-1							87.5
1007 - 1051	3.6	15.94	0.25	125.2	340.0	5.43	83.6
1629 - 1928	2.9	12.74	0.20	75.3	204.6	3.27	40.5
Average	3.3	13.38[b]	0.23	100.3	272.3[b]	4.35	62.6
October 4, 2000							
BI-2							79.5
0800 - 0959	3.3	14.23	0.19	107.0	277.0	3.69	63.6
1045 - 1159	2.1	8.75	0.12	71.7	185.5	2.47	79.4
							80.1
Average	2.7	12.13[b]	0.15	89.4	231.3[b]	3.08	75.0
BI-3							80.1
1245 - 1405	4.7	20.91	0.30	101.3	275.4	4.01	79.3
1422 - 1622	3.7	16.61	0.24	128.8	350.3	5.11	66.4
							55.0
Average	4.2	18.33[b]	0.27	115.1	312.9[b]	4.56	68.6
Overall Average	3.4	14.61	0.22	101.6	272.1	4.00	68.7

[a]Part per million, dry basis.
[b]Pound per hour; the average mass rate is a time weighted average (calculations are provided in Appendix A).
[c]Pound per ton of steel produced (average steel production used in calculation).
[d]Rate of steel production, tons per hour.

TABLE 2-3
SUMMARY OF SULFUR DIOXIDE EMISSIONS
BRANDT BAGHOUSE INLET

Run No./ Time	Concentration	Mass Rate		Steel Production tons/hr[d]
	ppm dry[a]	lb/hr[b]	lb/ton steel[c]	
BI-2	0.68	4.24	0.07	62.6
BI-3	0.88	5.22	0.07	75.0
BI-4	0.80	5.00	0.07	68.6
Average	0.79	4.82	0.07	68.7

[a] Part per million, dry basis
[b] Pounds per hour
[c] Pounds per ton of steel
[d] Rate of steel production, tons per hour

TABLE 2-4. DATA COMPARISON - CO (ppm)

Run #	Date	Time	Values	
			RM	CEMS
1	10/03/00	1007-1051	100.3	85.4
2	10/04/00	0800-0959	89.4	83.7
3	10/04/00	1245-1405	115.1	98.9
Averages:			101.6	89.3

RM - Data collected at baghouse inlet using EPA Reference Method 10.
CEMS - Continuous emission monitoring data collected at the baghouse exhaust.

TABLE 2-5. DATA COMPARISON - NO_x (ppm)

Run #	Date	Time	Values	
			RM	CEMS
1	10/03/00	1629-1928	3.3	3.7
2	10/04/00	1045-1159	2.7	4.2
3	10/04/00	1422-1622	4.2	5.7
Averages:			3.4	4.5

RM - Data collected at baghouse inlet using EPA Reference Method 7E.
CEMS - Continuous emission monitoring data collected at the baghouse exhaust.

SECTION 3

SAMPLING AND ANALYTICAL PROCEDURES

The sampling and analytical procedures used in this test program conform to EPA Reference Methods 1-4, 6, 7E, 9 and 10, as published in the Federal Register.

LOCATION OF MEASUREMENT SITES

EPA Method 1, "Sample Velocity Traverses for Stationary Sources," was used to select representative measurement sites. Sample locations are shown in Section 4.

STACK GAS VOLUMETRIC FLOW RATE

EPA Method 2, "Determination of Stack Gas Velocity and Volumetric Flow Rates," was used at each location to determine stack gas volumetric flow rates. Standard and Type "S" pitot tubes, meeting the EPA specifications, and an inclined manometer were used to measure velocity pressures. A calibrated Type "K" thermocouple, attached directly to the pitot tube, was used to measure stack gas temperature. The stack gas velocity was calculated from the average square root of the stack gas velocity pressure, average stack gas temperature, stack gas molecular weight, and absolute static pressure. The volumetric flow rate is the product of velocity and stack cross-sectional area.

STACK GAS DRY MOLECULAR WEIGHT

EPA Reference Method 3, "Gas Analysis for the Determination of Dry Molecular Weight," was used to determine stack gas dry molecular weight. Fyrite® gas analyzers were used to measure direct concentrations of stack gas for percent concentrations of carbon dioxide and oxygen, along with integrated Tedlar® bag samples collected during each measurement run which were analyzed with an Orsat® analyzer.

STACK GAS MOISTURE CONTENT

EPA Reference Method 4, "Determination of Moisture Content in Stack Gases," was used to determine stack gas moisture content. This method was conducted during each NO_x measurement run. The initial and final contents of all impingers are determined gravimetrically.

VISIBLE EMISSION OBSERVATIONS

EPA Reference Method 9, "Visual Determination of the Opacity of Emissions from Stationary Sources" was used to determine the opacity from the baghouse exhaust as well as from the melt shop roof monitor. Observations were conducted simultaneously with the emission measurement runs.

NITROGEN OXIDES (NO_x)

EPA Reference Method 7E, "Determination of Nitrogen Oxide Emissions from Stationary Sources" (Instrumental Analyzer Procedure) was used to measure NO_x emissions at the Brandt baghouse inlet. The sampling system consisted of a Teflon sampling line connected to a stainless steel condenser and stainless steel probe with a three-way valve. Stack gas was routed to a chemiluminescent analyzer through this system. Data was collected on both a Yokogawa strip chart recorder and Strata data logging system. The analyzer was calibrated with a zero gas and two Protocol One nitrogen oxides-in-nitrogen calibration gases. Calibrations were performed at the start of each sample run and at 2.5-hour intervals during each test run. Each sampling run was approximately 3 - 4 hours in length. Figure 3-1 is a schematic of the sampling system.

CARBON MONOXIDE (CO)

EPA Reference Method 10, "Determination of Carbon Monoxide Emissions from Stationary Sources," was used to rescue CO emissions at the Brandt Baghouse inlet. The same sampling system for measuring NO_x emissions was used, with the exception of the CO instrument, which uses a non-dispersive infrared detection principle. The instrument was calibrated with a zero gas and three master gas certified calibration gases with concentrations of CO-in-nitrogen (balance). Figure 3-1 is a schematic of the sampling system.

SULFUR DIOXIDE (SO_2)

EPA Reference Method 6, "Determination of Sulfur Dioxide Emissions from Stationary Sources," was used to measure SO_2 emissions at the Brandt Baghouse inlet. A glass lined probe, filter assembly and series of four impingers containing 80% isopropanol (1st), 3% hydrogen peroxide (2nd and 3rd) and silica gel (4th) were used to collect SO_2 concentrations. The probe and filter assembly were maintained at

250°F, ± 25°F. Recovery of the sample trains consisted of a D.I. water rinse for impingers 2 and 3 after placing the contents in a sample recovery bottle. Impinger weights were recorded initially and at the end of each test run gravimetrically. Analysis of the samples was by barium perchlorate titratin using thorin indicator. Figure 3-2 is a schematic of the SO_2 sampling train.

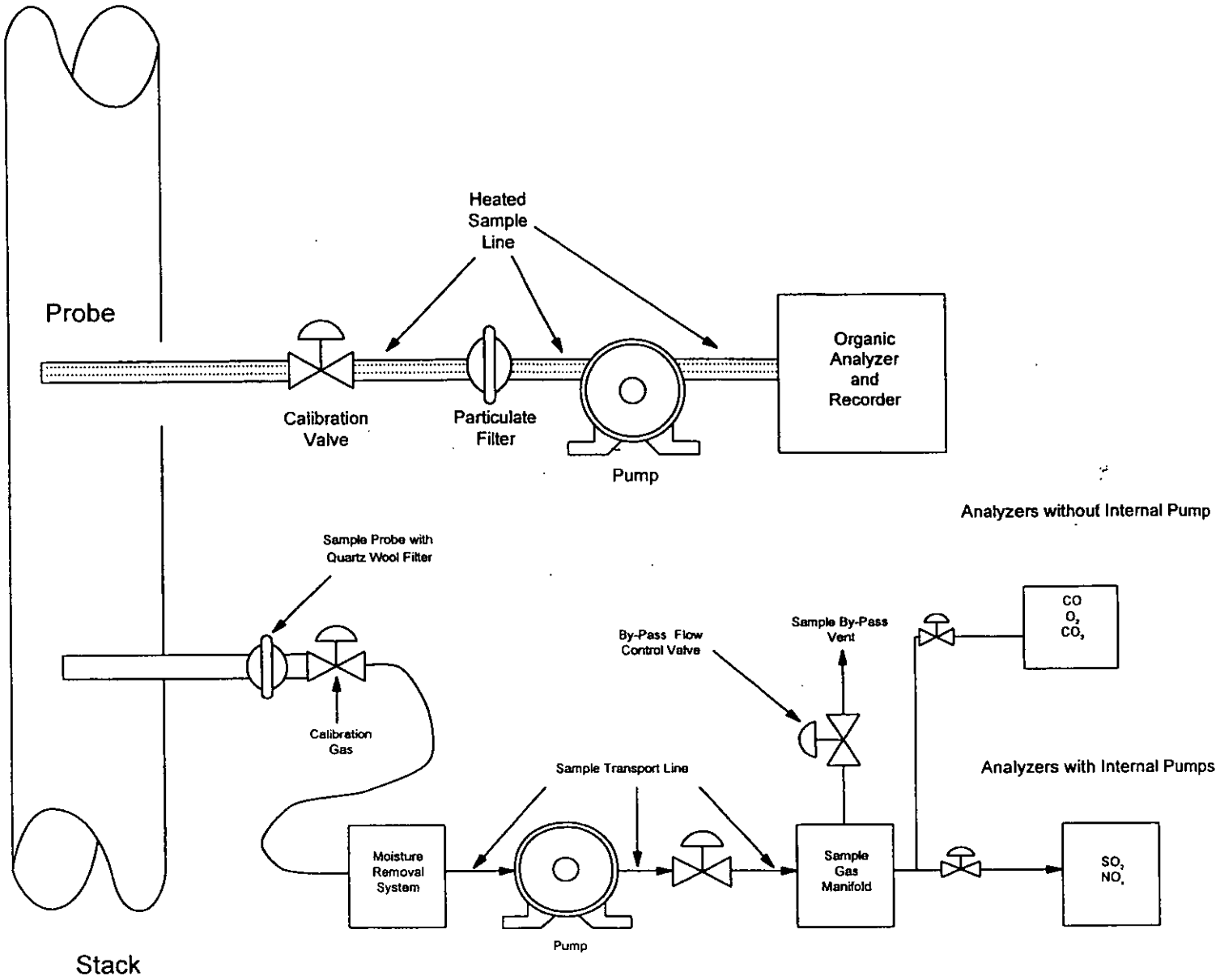


Figure 3-1. CEM Sample Flow and Calibration System Schematic (with THC analyzer)
Note: This study used the NO_x and CO analyzer.

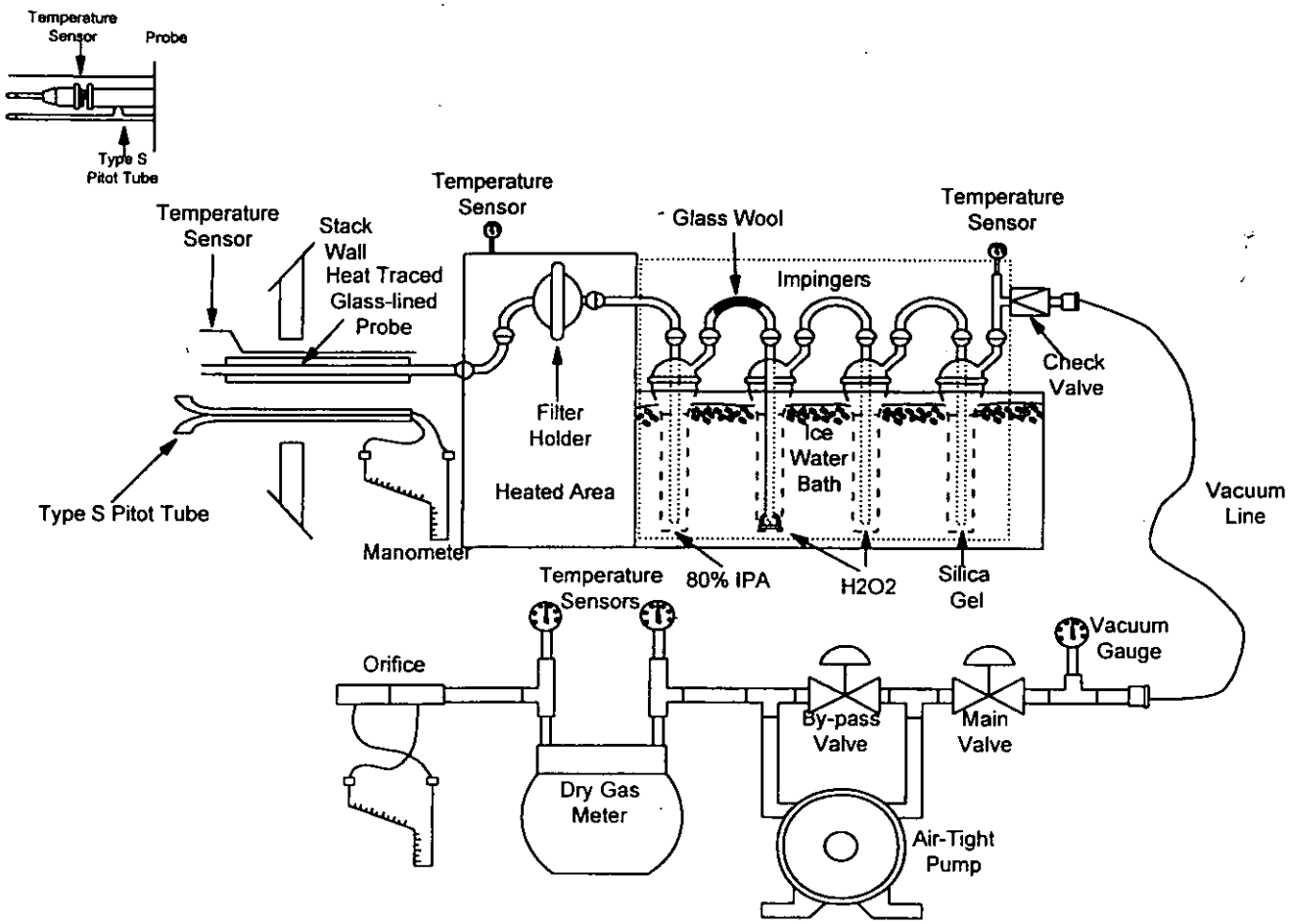


Figure 3-2 Schematic of SO_2 Sampling System

SECTION 4

PROCESS DESCRIPTIONS/SAMPLING LOCATIONS

The processes operating in the Newport Steel Corporation Melt Shop are the electric arc furnace (EAF), ladle metallurgy furnace (LMF), and continuous slab caster. The structure containing the EAF is referred to as the EAF building, and the structure containing LMF and the Caster is referred to as the Main Melt Shop Building. The Brandt baghouse vents emissions from the EAF and the EAF building.

Figure 4-1 shows the process flow for the Newport electric arc furnace (EAF). The EAF is a batch process. Each process cycle consists of four distinct phases: charging, melting, slagging, and tapping. After the furnace is charged with scrap and other additives, the meltdown phase comprises the period from charging to the complete meltdown of the solid material. Melting is accomplished by the heat supplied by direct radiation from the arcs formed between the electrodes and the scrap metal, by direct radiation from the furnace lining, and electric resistance of the metal between arc paths. The EAF also has oxy-fuel burners to provide additional heat input to enhance scrap meltdown and oxygen/carbon lances to enhance meltdown, refining, and foamy slag practice.

When the melting phase is complete, chemistry and temperature samples are taken. Based on these samples, the steel composition is adjusted and when the proper steel temperature has been reached, the foamy slag is poured off the furnace. For tapping, the power is shut off, the electrodes are raised to clear the molten steel bath, and the molten steel is tapped into a ladle and transferred to the LMF. After steel tapping is completed, the melting cycle begins again (i.e., the charging phase begins).

The Brandt baghouse exhausts the electric arc furnace (EAF) and the EAF building by an exhaust system consisting of (1) a direct evacuation control (DEC), and (2) a roof canopy hood. The DEC - also called a "fourth hole" system or direct shell evacuation (DSE) - captures emissions generated during scrap meltdown while the EAF roof is in place directly from the furnace vessel. The DEC is comprised of water-cooled ductwork to cool the hot EAF exhaust gases. Prior to the water-cooled section, a gap in the duct allows the entrainment of shop ambient air to assist in the combustion of carbon monoxide (CO) off-gases to carbon dioxide (CO_2). After passing sufficient distance to cool the exhaust, the DEC duct then merges with shop roof ductwork from the roof canopy hood. The overhead roof canopy hood collects fumes and gases that escape the furnace shell. The combined gas stream including EAF exhausts and melt shop ambient air is ducted to the Brandt baghouse.

Process information was collected during the course of the sampling program and included:

A) Charge weights and materials, and tap weights and materials

B) Heat times, including start and stop times, log of process operation including periods of no operation during testing

C) Pressure drop across the baghouse, visual inspection of bagsand control system fan amperes

D) Fan/duct damper positions

E) Fan amperes

Data was recorded at 15-minute intervals during testing. These data are provided in Appendix D.

EPA Reference Method 1 was used to determine representative measurement sites for stack gas velocity determinations on the baghouse inlet duct. The inlet of the baghouse consisted of a circular horizontal duct, 15 feet in diameter. Two sampling ports were located approximately 150 feet (10 duct diameters) downstream of a 45° elbow and 19 feet (1.3 dd) upstream of the nearest disturbance. Eight points per port for a total of 16 points were used for the velocity traverse. A schematic of the baghouse inlet site is shown in Figure 4-2.

The NO_x, CO and SO_2 sampling system collected data from this location.

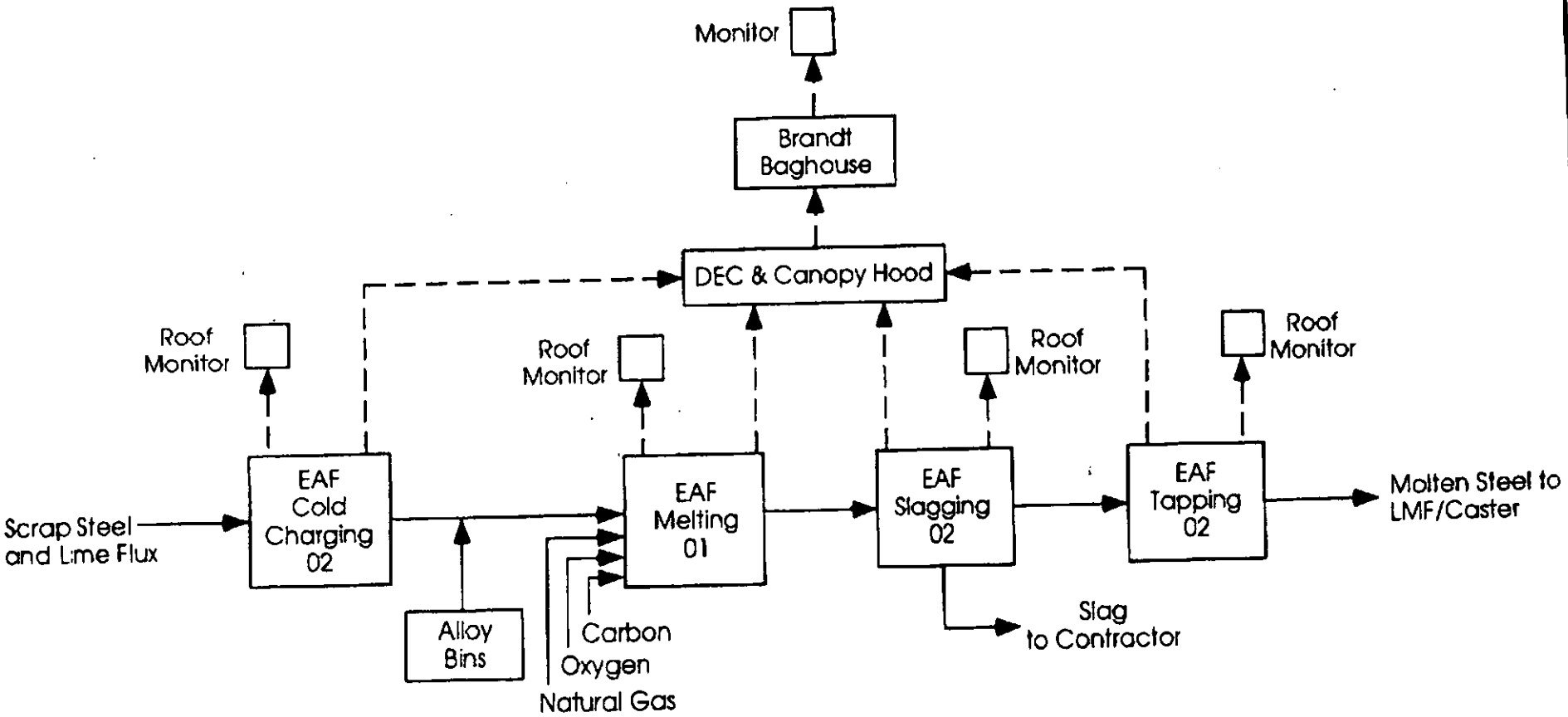


Figure 4-1 Schematic of Process Flow

Melt Shop - Electric Arc Furnace (EAF)

→ Material/Fuel Flow

- - → Emission Stream

Newport Steel, Inc.	EQ
Process Flow Diagram: Melt Shop - Electric Arc Furnace (EAF)	
Drawing No.:	
Scale: Not to Scale	
Drawn by: RJH	Revision: 0
Checked by: FDH	Date: 2/9/98

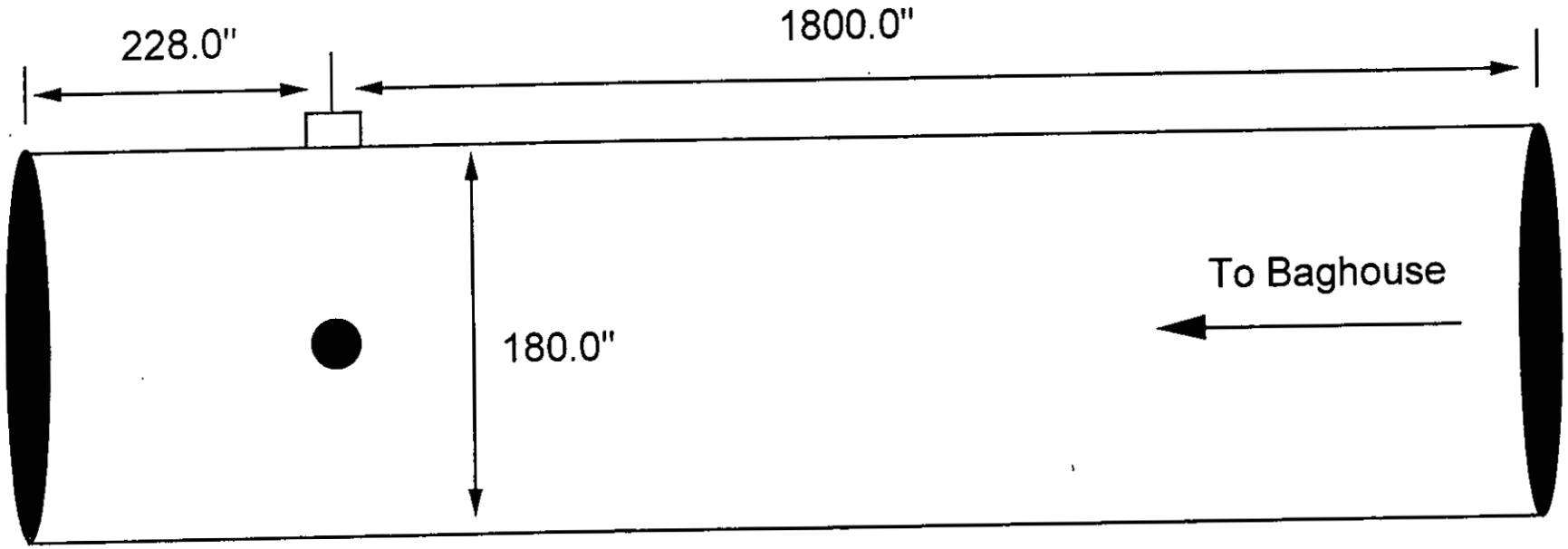


Figure 4-2 Schematic of Brandt Baghouse Inlet Sampling Location

SECTION 5

QUALITY ASSURANCE AND QUALITY CONTROL

The field sampling quality assurance for this project included the use of: calibrated source sampling equipment; reference test methods; and traceability protocols for the recording and calculation of data. The analytical quality assurance includes use of validated analytical procedures; calibration of analytical instruments; and analysis of control samples and blanks. The calibration and quality control procedures used for this test program are described in the following subsection:

CALIBRATION PROCEDURES AND FREQUENCY

All manual stack gas sampling equipment was calibrated before the test program in accordance with the procedures outlined in the *Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III*, EPA-600/4-72-027B. Summarized in Table 5-1 are the stack gas sampling equipment calibrations which were performed in preparation for this project. The meter boxes were re-calibrated after the test.

Listed in Tables 5-2 and 5-3 are the additional calibration checks which were performed on the sampling equipment on-site, just prior to the testing, to ensure that equipment was not damaged during transport. Analyzer checks were conducted directly on the instrument initially and then through the sampling system. Calibration checks were conducted before and after each test run. Protocol One calibration gases were used for calibrating the NO_x analyzer and master gas certified calibration gases for the CO analyzer.

TABLE 5-1

FIELD EQUIPMENT CALIBRATION SUMMARY*

Equipment	Calibrated against	Allowable error
Method 5 meter box	Reference test meter	Y ±0.02 Y ▲H@ ±0.20 ▲H@ post-test Y ±0.05 Y
Orsat®	Certified cylinder gas	±0.5%
Pitot tube	Geometric specifications	See EPA Method 2
Thermocouple	ASTM-3F thermometer	±1.5%
Impinger (or condenser thermometer)	ASTM-3F	±2°F
Dry gas meter thermometer	ASTM-3F	±5°F
Barometer	NBS traceable barometer	±0.1 in.Hg

*As recommended in the *Quality Assurance Handbook for Air PollutionMeasurement Systems: Volume III. Stationary Source-Specific Methods*. EPA-600/4-77-027b, August 1977.

TABLE 5-2

FIELD CHECKS OF SAMPLING EQUIPMENT

Equipment	Checked against	Allowable difference
Pitot tube	Inspection	No visible damage
Thermocouples	ASTM 2F or 3F	±1.5%
Probe nozzles	Caliper	High-low 0.004 in.

TABLE 5-3

FIELD CHECKS OF NO_x ANALYZER

	Instrument Check	Acceptable Limit
Initial Calibration	CO & NO_x Calibration Error, % Span	± 2%
	Sampling System Bias	< 5% of Span
Daily Calibration	CO & NO_x Calibration Error, % Spane	± 2%
	CO & NO_x Drift, % Span	< 3% of Span

Appendix A

Example Calculations

Example Calculations for Pollutant Emissions

1. **Volume of dry gas sampled corrected to standard conditions, ft3.**
   Note: Vm must be corrected for leakage if any leakage rates exceed La.

$$Vmstd = 17.647 * Vm * \gamma * \frac{Pbar + \frac{\Delta H}{13.6}}{Tm, \ ^{\circ}R}$$

2. **Volume of water vapor at standard conditions, ft^3.**

$$Vwstd = 0.04707 * Vlc + 0.04715 * Vsg$$

3. **Moisture content in stack gas, dimension less.**

$$Bws = \frac{Vwstd}{Vwstd + Vmstd}$$

4. **Dry molecular weight of stack gas, lb/lb -mole.**

$$Md = 0.44 * \%CO_2 + 0.32 * \%O_2 + 0.28 * (\%N_2 + \%CO)$$

5. **Molecular weight of stack gas, lb/lb-mole.**

$$Ms = Md\ (1\text{-}Bws) + 18 * Bws$$

6. **Stack velocity at stack conditions, f/s.**

$$Vs = 85.49 * Cp * ave\sqrt{\Delta P} * \sqrt{\frac{Ts, \ ^{\circ}R}{Ps * Ms}}$$

7. **Stack gas volumetric flow rate at stack conditions, cfm.**

$$Qs = 60 * Vs * As$$

8. **Dry stack gas volumetric flow rate at standard conditions, cfm.**

$$Qsstd = 17.647 * Qs * \frac{Ps}{Ts, \ ^{\circ}R} * (1 - Bws)$$

Example Calculations for Pollutant Emissions

1. **Volume of dry gas sampled corrected to standard conditions, ft3.**
   Note: Vm must be corrected for leakage if any leakage rates exceed La.

$$Vmstd = 17.647 * Vm * \gamma * \frac{Pbar + \frac{\Delta H}{13.6}}{Tm,\ ^{\circ}R}$$

2. **Volume of water vapor at standard conditions, ft^3.**

$$Vwstd = 0.04707 * Vlc + 0.04715 * Vsg$$

3. **Moisture content in stack gas, dimension less.**

$$Bws = \frac{Vwstd}{Vwstd + Vmstd}$$

4. **Dry molecular weight of stack gas, lb/lb -mole.**

$$Md = 0.44 * \%CO_2 + 0.32 * \%O_2 + 0.28 * (\%N_2 + \%CO)$$

5. **Molecular weight of stack gas, lb/lb-mole.**

$$Ms = Md\ (1\text{-}Bws) + 18 * Bws$$

6. **Stack velocity at stack conditions, f/s.**

$$Vs = 85.49 * Cp * ave\sqrt{\Delta P} * \sqrt{\frac{Ts,\ ^{\circ}R}{Ps * Ms}}$$

7. **Stack gas volumetric flow rate at stack conditions, cfm.**

$$Qs = 60 * Vs * As$$

8. **Dry stack gas volumetric flow rate at standard conditions, cfm.**

$$Qsstd = 17.647 * Qs * \frac{Ps}{Ts,\ ^{\circ}R} * (1 - Bws)$$

9. **Concentration in gr/dscf.**

$$Cs = 0.01543 * \frac{Mn}{Vmstd}$$

10. **Concentration in lb/dscf.**

$$Cs,\ lb/dscf = \frac{gr/dscf}{7000}$$

11. **Pollutant mass emission rate, lb/hr.**

$$Pmr,\ lb/hr = lb/dscf * Qsstd * 60$$

12. **Pollutant mass emission rate, lb/MMBtu.**

$$pmr,\ lb/MMBtu = \frac{pmr,\ lb/hr}{MMBtu/hr}$$

13. **F-factor, Fd.**

$$Fd = \frac{10^6 * (3.64 * \%H) + (1.53 * \%C) + (0.57 * \%S) + (0.14 * \%N) - (0.46 * \%O_2)}{GCV\ (Btu/lb)}$$

14. **F-factor, pollutant mass emission rate, lb/MMBtu.**

$$= \frac{lb/dscf * Fd * 20.9}{(20.9 - \%O_2)}$$

15. **Heat imput, MMBtu/hr fuel.**

$$= \frac{GVC\ (Btu/lb) * Feed\ Rate\ (lb/hr)}{10^6}$$

16. **Heat input, MMBtu/hr, F-factor.**

$$= \frac{Qsstd}{Fd} * ((20.9 - \%O_2) + 20.9) * 60$$

17. Volume of dry gas sampled corrected to standard conditions, m^3.

$$Vmstd\ (m^3) = Vmstd\ (ft^3) * 0.02831$$

18. Concentration in ug/dscm.

$$ug/dscm = Target\ Catch,\ micrograms\ /\ Vmstd\ (m^3)$$

19. Concentration corrected to 7% oxygen.

$$ug/dscm\ @\ 7\%\ O_2 = ug/dscm * (20.9-7)\ /\ (20.9-measured\ O_2)$$

20. Concentration, part per million, dry basis.

$$ppm,\ dry = ppm,\ wet\ basis \div \left(1 - \frac{BWS,\ \%}{Fd} \right)$$

21. Pollutant Mass Emission Rate, pound per hour.

$$PMR,\ lb/hr = \frac{ppm,\ dry * Compound\ Molecular\ Weight}{(385.3 \times 10^6)} * dscfm * 60$$

Common Molecular Weights (MW)

Total Gaseous Organic Compound (TGOC)	**=**	**44.09**
Sulfur Dioxide (SO_2)	**=**	**64.05**
Nitrogen Oxides (NO_x)	**=**	**46.00**
Carbon Monoxide (CO)	**=**	**28.01**
Oxygen (O_2)	**=**	**32.00**
Carbon Dioxide (CO_2)	**=**	**44.01**

22. Removal Efficiency (RE), percent.

$$RE = (Inlet\ lb/hr - Outlet\ lb/hr\ /\ Inlet\ lb/hr) * 100$$

Nomenclature and Dimensions

An	=	Cross-sectional area of sampling nozzle, ft^2
As	=	Cross-sectional area of stack, ft^2
Bws	=	Proportion by volume of water vapor in the gas stream, dimensionless
Cp	=	Pitot tube coefficient, dimensionless
Cs	=	Concentration of pollutant matter in stack gas-dry basis, grains per dry standard cubic foot (gr/dscf)
%CO	=	Percent of carbon monoxide by volume, dry basis
$\%CO_2$	=	Percent of carbon dioxide by volume, dry basis
ΔH	=	Average pressure drop across the sampling meter flow ofifice, inches of water (in. H_2O)
GCV	=	Gross calorific value, Btu/lb
I	=	Percent of isokinetic sampling
La	=	Maximum acceptable leakage rate for either a pretest leak check or for a leak check following a component change/ equal to 0.020 cubic foot per minute or 4% of the average sampling rate, whichever is less
Md	=	Dry molecular weight, lb/lb-mole
Mn	=	Total amount of pollutant matter collected, milligrams (mg)
Ms	=	Molecular weight of stack gas (wet basis), lb/lb-mole
$\%N_2$	=	Percent of nitrogen by volume, dry basis
$\%O_2$	=	Percent of oxygen by volume, dry basis
ΔP	=	Velocity head of stack gas, inches of water (in. H_2O)
Pbar	=	Barometric pressure, inches of mercury (in. Hg)
Ps	=	Absolute stack gas pressure, inches of mercury (in. Hg)
Pstd	=	Gas pressure at standard conditions, inches of mercury (29.92 in. Hg)

pmr	=	Pollutant matter emission rate, pounds per hour (lb/hr)
Qs	=	Volumetric flow rate - wet basis at stack conditions, actual cubic feet per minute (acfm)
Qsstd	=	Volumetric flow rate - dry basis at stack conditions, actual cubic feet per minute (dscfm)
Tm	=	Average temperature of dry gas meter, °R
Ts	=	Average temperature of stack gas, °R
Tstd	=	Temperature at standard conditions, 528°R
Vlc	=	Total volume of liquid collected in impingers, ml
Vsg	=	Weight of moisture collected in silica gel, grams
Vm	=	Volume of dry gas sampled at meter conditions, ft^3
Vmstd	=	Volume of dry gas sampled at standard conditions, ft^3
Vs	=	Average stack gas velocity at stack conditions, ft/s
Vwstd	=	Volume of water vapor at standard conditions, scf
γ	=	Dry gas meter calibration factor, dimensionless
Θ	=	Total sampling time, minutes

NOTE: Standard conditions = 68°F and 29.92 in. Hg

Example Calculations for Pollutant Emissions

NIOSH/OSHA and EPA Method 18

1. Sample Volume Standard Liters (Evacuated Tank).

$$Liters_{std} = 17.647 * Total\ Tank\ Volume,\ L * \left(\frac{Pf}{Tf} - \frac{Pin}{Tin}\right)$$

Pf	**=**	**Final tank pressure, in. Hg**
Pin	**=**	**Initial tank pressure, in. Hg**
Tf	**=**	**Final tank temperature, °R**
Tin	**=**	**Initial tank temperature, °R**

2. Sample Volume, Standard Liters (VOST Meter).

$$Volume,\ Liters_{std} = 17.647 * Total\ Volume,\ L * Y * \left(\frac{Barometric,\ in.\ Hg}{Meter\ Temp.,\ Rankin}\right)$$

3. Concentration, micrograms per liter.

$$\mu g/l = Total\ \mu g/sample \div Vmstd,\ liters$$

4. Concentration, part per million, wet basis.

$$ppm,\ wet = \left(\frac{\mu/\ell * 24.04\ \ell/mole}{Molecular\ Weight\ of\ Analyte}\right)$$

5. **Concentration, part per million, dry basis.**

$$ppm,\ dry = ppm,\ wet \div \left(1 - \frac{H_2O,\ \%}{100} \right)$$

6. **Mass Emission Rate, pound per hour.**

$$MR,\ lb/hr = \left(\frac{ppm,\ dry * MW,\ analyte}{385.3 \ x \ 10^6} \right) * dscfm * 60$$

MW	=	**Molecular weight of target analyte**
ppm	=	**Part per million**
dscfm	=	**Volumetric flow rate, dry standard cubic feet per minute**
MR, lb/hr	=	**Mass emission rate, pound per hour**
Molar Volume	=	**385.3 ft^3 / lb mole**
ppm by volume	=	**ft^3 / 10^6 ft^3, volume ratio**

PACIFIC ENVIRONMENTAL SERVICES, INC.

Project No.	Page of
5620.001	1 1

Client: EQM- Newport Steel

Location: Newport, Kentucky

Prepared By	Date	Checked By	Date	Sheet Title
R Holder	10/30/00	[illegible]	10/31	NOx / CO Mass Emission Rates

10/3/00 1007-1051 = 0.75 hrs — Time-weighted averages

Run No. 1 1629-1928 = 3.00 hrs

NOx Mass Rate, lb/hr = $\frac{(15.94\ lb/hr \times 0.75\ hrs) + (12.74\ lb/hr \times 3.00\ hrs)}{3.75\ hrs.}$ = 13.38 lb/hr

CO Mass Rate lb/hr = $\frac{(340.0\ lb/hr \times 0.75\ hrs) + (204.64\ lb/hr \times 3.00\ hrs)}{3.75\ hrs.}$ = 231.7 lb/hr.

10/4/00 0800-0959 = 1.98 hrs

Run No. 2 1045-1159 = 1.23 hrs

NOx Mass Rate, lb/hr = $\frac{(14.23\ lb/hr \times 1.98\ hrs) + (8.75\ lb/hr \times 1.23\ hrs)}{3.21\ hrs.}$ = 12.13 lb/hr

CO Mass Rate, lb/hr = $\frac{(277.0\ lb/hr \times 1.98\ hrs) + (185.5\ lb/hr \times 1.23\ hrs)}{3.21\ hrs.}$ = 241.9 lb/hr.

Run No. 3 1245-1405 = 1.33 hrs

1422-1622 = 2.00 hrs

NOx Mass Rate, lb/hr = $\frac{(20.91 \times 1.33\ hrs) + (16.61 \times 2.00\ hrs)}{3.33\ hrs.}$ = 18.33 lb/hr

CO Mass Rate, lb/hr = $\frac{(275.4\ lb/hr \times 1.33\ hrs) + (350.3\ lb/hr \times 2.00\ hrs)}{3.33\ hrs.}$ = 320.4 lb/hr

Summary of Stack Gas Parameters and Test Results
Project
Plant Name & Location
US EPA Test Method 2 - Velocity
Baghouse Inlet
Page 1 of 1

	RUN NUMBER	*Velocity #2*		*Velocity #3*		*Velocity #4*		*Average*
	RUN DATE	*10/03/2000*		*10/03/2000*		*10/04/2000*		
	RUN TIME	*1620*		*1920*		*730*		
	MEASURED DATA							
P_{static}	Stack Static Pressure, inches H_2O	-3.80		-3.60		-3.40		-3.60
P_{bar}	Barometric Pressure, inches Hg	29.66		29.66		29.68		29.67
CO_2	Carbon Dioxide content, % by volum	0.1		0.1		0.1		0.1
O_2	Oxygen content, % by volume	20.6		20.6		20.6		20.6
N_2	Nitrogen content, % by volume	79.4		79.4		79.3		79.3
C_p	Pitot Tube Coefficient	0.84		0.84		0.84		0.84
	Circular Stack? 1=Y,0=N:	1		1		1		1
As	Diameter or Dimensions, inches:	180.00		180.00		180.00		180.00
A	Stack Area, ft^2	176.7		176.7		176.7		176.71
	Temp. °F, WET							0.0
	Temp. °F, DRY							0.0
	Vapor Pressure Value, in. Hg. (Chart)							0.0000
B_{ws}	Moisture, % by volume	2.40		2.40		1.90		2.23
	Travers Point Number	Delta P	Temp, °F	Delta P	Temp, °F	Delta P	Temp, °F	
		1.20	136.0	1.60	214.0	1.10	166.0	
		1.20	137.0	1.60	203.0	1.00	173.0	
		1.20	136.0	1.50	193.0	1.20	181.0	
		1.20	140.0	1.60	203.0	1.10	183.0	
		1.30	147.0	1.30	199.0	1.20	196.0	
		1.30	150.0	1.30	195.0	1.20	208.0	
		1.40	154.0	1.40	194.0	1.10	212.0	
		1.30	154.0	1.30	185.0	1.00	210.0	
		1.70	153.0	1.20	194.0	1.60	197.0	
		1.90	154.0	1.30	186.0	1.50	206.0	
		1.70	155.0	1.30	176.0	1.50	191.0	
		1.50	154.0	1.20	175.0	1.30	175.0	
		1.50	152.0	1.20	165.0	1.40	165.0	
		1.50	145.0	1.10	167.0	1.40	156.0	
		1.50	137.0	1.10	161.0	1.30	151.0	
		1.40	133.0	1.30	152.0	1.20	154.0	
	Average	1.4250	146.1	1.3313	185.1	1.2563	182.8	
	Square Root Average	1.1900		1.1517		1.1181		
	CALCULATED DATA							
P_s	Stack Pressure, inches Hg	29.38		29.40		29.43		29.40
M_d	Molecular Weight (d.b.), lb/lb•mole	28.84		28.84		28.84		28.84
M_s	Molecular Weight (w.b.), lb/lb•mole	28.58		28.58		28.63		28.60
V_s	Stack Gas Velocity, ft/s	72.6		72.5		70.1		71.7
Q_a	Stack Gas Volumetric flow, acfm	769,801		768,488		743,496		760,595
Q_s	Stack Gas Volumetric flow, dscfm	642,495		602,864		589,107		611,489
Q_s	Stack Gas Volumetric flow, dscmm	18,193		17,071		16,682		17,315

DA
10/31/00

Summary of Stack Gas Parameters and Test Results
Project
Plant Name & Location
US EPA Test Method 2 - Velocity
Baghouse Inlet
Page 1 of 1

	RUN NUMBER	***Velocity #5***		***Velocity #5B/6A***		***Velocity #6B***		***Average***
	RUN DATE	***10/04/2000***		***10/04/2000***		***10/04/2000***		
	RUN TIME	***1115***		***1115***		***1510***		
	MEASURED DATA							
P_{static}	Stack Static Pressure, inches H_2O	-3.40		-3.40		-3.70		-3.50
P_{bar}	Barometric Pressure, inches Hg	29.68		29.68		29.68		29.68
CO_2	Carbon Dioxide content, % by volum	0.1		0.1		0.1		0.1
O_2	Oxygen content, % by volume	20.6		20.6		20.6		20.6
N_2	Nitrogen content, % by volume	79.4		79.4		79.3		79.3
C_p	Pitot Tube Coefficient	0.84		0.84		0.84		0.84
	Circular Stack? 1=Y,0=N:	1		1		1		1
As	Diameter or Dimensions, inches:	180.00		180.00		180.00		180.00
A	Stack Area, ft^2	176.7		176.7		176.7		176.71
	Temp. °F, WET							0.0
	Temp. °F, DRY							0.0
	Vapor Pressure Value, in. Hg. (Chart)							0.0000
B_{ws}	Moisture, % by volume	1.90		2.50		2.50		2.30
	Travers Point Number	Delta P	Temp, °F	Delta P	Temp, °F	Delta P	Temp, °F	
		1.70	186.0	1.70	186.0	1.40	190.0	
		1.60	205.0	1.60	205.0	1.50	186.0	
		1.60	206.0	1.60	206.0	1.40	182.0	
		1.50	186.0	1.50	186.0	1.60	178.0	
		1.30	178.0	1.30	178.0	1.40	169.0	
		1.30	169.0	1.30	169.0	1.50	164.0	
		1.40	157.0	1.40	157.0	1.40	159.0	
		1.30	154.0	1.30	154.0	1.30	156.0	
		1.20	202.0	1.20	202.0	1.20	141.0	
		1.20	207.0	1.20	207.0	1.30	141.0	
		1.10	220.0	1.10	220.0	1.30	140.0	
		1.20	224.0	1.20	224.0	1.40	139.0	
		1.20	221.0	1.20	221.0	1.30	138.0	
		1.10	213.0	1.10	213.0	1.20	136.0	
		1.20	209.0	1.20	209.0	1.20	132.0	
		1.20	207.0	1.20	207.0	1.30	131.0	
	Average	1.3188	196.5	1.3188	196.5	1.3563	155.1	
	Square Root Average	1.1458		1.1458		1.1636		
	CALCULATED DATA							
P_s	Stack Pressure, inches Hg	29.43		29.43		29.41		29.42
M_d	Molecular Weight (d.b.), lb/lb•mole	28.84		28.84		28.84		28.84
M_s	Molecular Weight (w.b.), lb/lb•mole	28.63		28.57		28.57		28.59
V_s	Stack Gas Velocity, ft/s	72.6		72.7		71.5		72.3
Q_a	Stack Gas Volumetric flow, acfm	770,057		770,918		758,099		766,358
Q_s	Stack Gas Volumetric flow, dscfm	597,374		594,384		623,348		605,035
Q_s	Stack Gas Volumetric flow, dscmm	16,916		16,831		17,651		17,133

DD 10/31/10

Summary of Stack Gas Parameters and Test Results
5620.001
Newport Steel-Kentucky
US EPA Test Method 6 or 8 Sulfric Acid and Acid Mists
Brandt Baghouse Inlet

	RUN NUMBER	*BI-2*	*BI-3*	*BI-4*	
	RUN DATE	*10/03/2000*	*10/04/2000*	*10/04/2000*	*Average*
	RUN TIME	*1645-1945*	*0800-1100*	*1143-1443*	
	MEASURED DATA				
P_{static}	Stack Static Pressure, inches H_2O	-3.80	-3.40	-3.40	-3.53
y	Meter Box Correction Factor	1.001	1.001	1.001	1.001
P_{bar}	Barometric Pressure, inches Hg	29.20	29.68	29.68	29.52
V_m	Sample Volume, ft^3	121.805	120.239	120.635	120.893
$Dp^{1/2}$	Average Square Root Dp, (in. $H_2O)^{1/2}$	1.1900	1.1180	1.1458	1.1513
DH	Avg Meter Orifice Pressure, in. H_2O	1.40	1.40	1.40	1.40
T_m	Average Meter Temperature, °F	96	81	89	89
T_s	Average Stack Temperature, °F	167	190	197	185
V_{lc}	Condensate Collected, ml	60.3	47.2	63.4	57.0
CO_2	Carbon Dioxide content, % by volume	0.1	0.1	0.1	0.1
O_2	Oxygen content, % by volume	20.6	20.7	20.6	20.6
N_2	Nitrogen content, % by volume	79.4	79.2	79.3	79.3
C_p	Pitot Tube Coefficient	0.84	0.84	0.84	0.84
	Circular Stack? 1=Y,0=N:	1	1	1	
As	Diameter or Dimensions, inches:	180.00	180.00	180.00	180.00
Q	Sample Run Duration, minutes	180	180	180	180
D_n	Nozzle Diameter, inches	0.000	0.000	0.000	0.000
	CALCULATED DATA				
A_n	Nozzle Area, ft^2	0.000000	0.000000	0.000000	0.000000
$V_{m(std)}$	Standard Meter Volume, ft^3	113.353	116.882	115.558	115.265
$V_{m(std)}$	Standard Meter Volume, m^3	3.210	3.310	3.272	3.264
Q_m	Average Sampling Rate, dscfm	0.630	0.649	0.642	0.640
P_s	Stack Pressure, inches Hg	28.92	29.43	29.43	29.26
B_{ws}	Moisture, % by volume	2.4	1.9	2.5	2.3
$B_{ws(sat)}$	Moisture (at saturation), % by volume	39.3	64.5	74.8	59.5
V_{wstd}	Standard Water Vapor Volume, ft^3	2.838	2.222	2.984	2.681
$1-B_{ws}$	Dry Mole Fraction	0.976	0.981	0.975	0.977
M_d	Molecular Weight (d.b.), lb/lb•mole	28.84	28.84	28.84	28.84
M_s	Molecular Weight (w.b.), lb/lb•mole	28.57	28.64	28.57	28.59
V_s	Stack Gas Velocity, ft/s	72.6	71.4	72.1	72.0
A	Stack Area, ft^2	176.7	176.7	176.7	176.71
Q_a	Stack Gas Volumetric flow, acfm	769,145	756,777	764,509	763,477
Q_s	Stack Gas Volumetric flow, dscfm	622,680	593,241	623,348	613,090
Q_s	Stack Gas Volumetric flow, dscmm	17,632	16,799	17,651	17,361
I	Isokinetic Sampling Ratio, %	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Summary of Stack Gas Parameters and Test Results
5620.001
Newport Steel-Kentucky
US EPA Test Method 6 or 8 Sulfric Acid and Acid Mists
Brandt Baghouse Inlet

	RUN NUMBER	***BI-2***	***BI-3***	***BI-4***	
	RUN DATE	***10/03/2000***	***10/04/2000***	***10/04/2000***	***Average***
	RUN TIME	***1645-1945***	***0800-1100***	***1143-1443***	
	EMISSIONS DATA				
	Sulfur Dioxide				
	Titrant Normality, N	0.00973	0.00973	0.00973	**0.00973**
	Titrant Volume, ml	0.8	1.1	1.0	**0.9**
ppmdv	**Parts Per Million, Dry Basis**	**6.83E-01**	**8.83E-01**	**8.04E-01**	**7.90E-01**
E_{SO2}	**Emission Rate, lb/hr**	**4.24E+00**	**5.22E+00**	**5.00E+00**	**4.82E+00**

CEM Data Correction Data Sheet

Plant Name:	Newport Steel
Sampling Location:	Baghouse Inlet
Date:	10/3-10/4/00
Project Number:	5620.001
CEM Operator:	G. Gay
Pollutant:	N0x
Molecular Weight:	46.01

Run No.	Start-Stop Time	Raw Data (% or ppm)	Calibration Data			Source Information			Calibration Corrected Data (% or ppm)	Mass Emission Rate (lb/hr)	Steel Production, tons per hour	Mass Emission Rate lbs/ton steel
			Cma	Co	Cm	Stack Flow (dscfm)	Fd Factor (dscf/ MMBtu)	Stack O2 Conc. (%)				
1	1007-1051	4.1	49.5	0.4	51.4	622,680			3.6	15.94		
2	1629-1928	3.2	49.5	0.2	52.2	622,680			2.9	12.74		
3	0800-0959	3.5	49.5	0.1	50.1	593,241			3.3	14.23		
4	1045-1159	2.2	49.5	0.2	49.2	593,241			2.1	8.75		
5	1245-1405	4.8	49.5	0.2	49.2	623,348			4.7	20.91		
6	1422-1622	3.8	49.5	0.2	48.6	623,348			3.7	16.61		
7												
8												
9												
10												
11												
12												
								Average	3.4	14.86		

Pollutant	MWgas
CO	28.01
Propane	44.10
NOx	46.01
SO2	64.06

Calibration Error Correction

Cgas=(Cobs-Co)*(Cma/(Cm-Co))

Oxygen Corrected Data

C=Cgas*((20.9-O2 fact)/(20.9-O2 obs))

Mass Emission Rate (lb/hr)

E(lb/hr)=Cgas*MWgas*Qs(dscfm)*60/385300000

Mass Emission Rate (lb/MMBtu)

E(lb/MMBtu)=Cgas*MWgas*Fd*(20.9/(20.9-O2 obs))/385300000

CEM Data Correction Data Sheet

Plant Name:	Newport Steel
Sampling Location:	Baghouse Inlet
Date:	10/3-10/4/00
Project Number:	5620.001
CEM Operator:	G. Gay
Pollutant:	CO
Molecular Weight:	28.01

Run No.	Start-Stop Time	Raw Data (ppm)	Calibration Data			Source Information			Calibration Corrected Data (% or ppm)	Mass Emission Rate (lb/hr)	Steel Production tons per hour	Mass Emission Rate lbs/ton steel
			Cma	Co	Cm	Stack Flow (dscfm)	Fd Factor (dscf/ MMBtu)	Stack O2 Conc. (%)				
1	1007-1051	130.7	600.6	4.5	610.0	622,680			125.2	340.01		
1	1629-1928	77.5	600.6	1.0	610.8	622,680			75.3	204.64		
2	0800-0959	109.2	600.6	1.1	607.9	593,241			107.0	276.99		
2	1045-1159	74.1	600.6	1.1	613.0	593,241			71.7	185.52		
3	1245-1405	104.1	600.6	1.1	612.0	623,348			101.3	275.44		
3	1422-1622	132.4	600.6	0.5	615.4	623,348			128.8	350.27		
7												
8												
9												
10												
11												
12												
								Average	101.6	#REF!	272.15	

Pollutant	MWgas
CO	28.01
Propane	44.10
NOx	46.01
SO2	64.06

Calibration Error Correction

Cgas=(Cobs-Co)*(Cma/(Cm-Co))

Oxygen Corrected Data

C=Cgas*((20.9-O2 fact)/(20.9-O2 obs))

Mass Emission Rate (lb/hr)

E(lb/hr)=Cgas*MWgas*Qs(dscfm)*60/385300000

Mass Emission Rate (lb/MMBtu)

E(lb/MMBtu)=Cgas*MWgas*Fd*(20.9/(20.9-O2 obs))/385300000

Appendix B

Field Data

TRAVERSE POINT LOCATION FOR CIRCULAR DUCTS

Plant: Newport Steel

Date: 10/2/00

Sampling Location: Brandt Baghouse Inlet

Inside of Far Wall to Outside of Nipple:

Inside of Near Wall to Outside of Nipple (Nipple Length): *

Stack I.D.: 15' or 180"

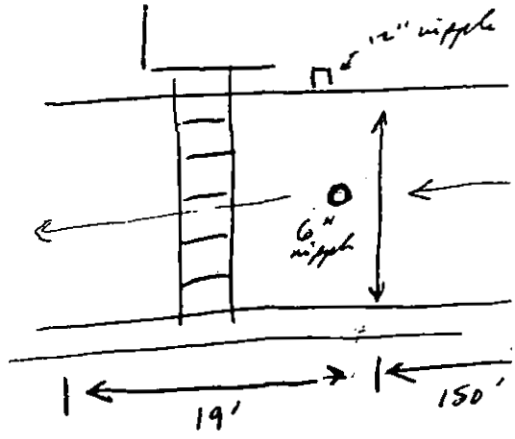
Distance Downstream from Flow Disturbance (Distance B):

150" inches / Stack I.D. = 10.0 dd

Distance Upstream from Flow Disturbance (Distance A):

19' inches / Stack I.D. = 1.3 dd

Calculated By: [illegible]



Schematic of Sampling Location

* marked for inside of port

Traverse Point Number	Fraction of Length	Length (inches)	Product of Columns 2 & 3 (To nearest 1/8")	Nipple Length (inches)	Traverse Point Location (Sum of Col. 4 & 5)
1	0.032	180"	5.76"	N/A	5.76"
2	0.105		18.9"		18.9"
3	0.194		34.92"		34.92"
4	0.323		58.14"		58.14"
5	0.677		121.86"		121.86"
6	0.806		145.08"		145.04"
7	0.895		161.11"		161.11"
8	0.968		174.24"		174.24"

GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant: Newport Steel Date: 10/3/00
Sampling Location: Bundle Reheating Furnace Clock Time: 1620
Run #: Velocity #2 Operators: RK/PB/TG
Barometric Pressure, in. Hg: 29.66 Static Pressure, in. H_2O: -3.8
Moisture, %: 2.4 Molecular wt., Dry: 28.84 Pitot Tube, Cp: 0.84
Stack Dimension, in. Diameter or Side 1: 180" Side 2: —
Wet Bulb, °F: — Dry Bulb, °F: — PITOT LEAK CHECK GOOD

	Traverse Point Number	Velocity Head in. H_2O	Stack Temp. °F
SIDE	1	1.2	136
	2	1.2	137
	3	1.2	136
	4	1.2	140
	5	1.3	147
	6	1.3	150
	7	1.4	154
	8	1.3	154
TOP	1	1.7	153
	2	1.9	154
	3	1.7	155
	4	1.5	154
	5	1.5	152
	6	1.5	145
	7	1.5	137
	8	1.4	133
		$\overline{\sqrt{\Delta P}}$ = 1.19	$\overline{T_s}$ = 146

$$M_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times \%N_2)$$

0.1 20.7

$$M_d = (0.44 \times \quad) + (0.32 \times \quad) + (0.28 \times \quad)$$

$$M_d = 28.84$$

$$M_s = M_d \times (1 - \frac{\%H_2O}{100}) + 18 (\frac{\%H_2O}{100})$$

$$M_s = (\quad) \times (1 - \frac{\quad}{100}) + 18 (\frac{\quad}{100})$$

M_s = ~~28.67~~ 28.58

T_s = 146 °F = 606 °R (°F + 460)

$$P_s = P_b + \frac{S.P.}{13.6} = (29.66) + \frac{-3.8}{13.6}$$

P_s = ~~28.92~~ in. Hg 29.38

$\overline{\sqrt{\Delta P}}$ = 1.19

$$V_s = 85.49 \times C_p \times \overline{\sqrt{\Delta P}} \times \sqrt{\frac{T_s (°R)}{P_s \times M_s}}$$

$$V_s = 85.49 \times (.84) \times (1.19) \times \sqrt{\frac{606}{(\cancel{28.92})(\cancel{28.67})}}$$

29.38 28.58

V_s = ~~73.06~~ ft/s ~~72.59~~ 73.865

A_s = 176.71 ft²

$Q_s = V_s \times A_s \times 60$ s/m

Q_s = ~~73.06~~ 73.865 × 176.71 × 60

Q_s = ~~774,646~~ acfm ~~769,683~~ 783,161.05

$$Q_{s_{std}} = Q_s \times 17.647 \times \frac{P_s}{T_s} \times (1 - \frac{\%H_2O}{100})$$

$$Q_{s_{std}} = \cancel{774,646} \; 783,161.05 \times 17.647 \times \frac{\cancel{28.92} \; 29.38}{606} \times (1 - \frac{2.4}{100})$$

$Q_{s_{std}}$ = ~~639,351~~ dscfm ~~642,718~~ ~~653,959.65~~

642,760 ✓ DI

FIELD DATA SHEET

Plant: Newport Steel
Sampling Location: Brandt Baghouse Inlet
Run Number: BI-2 Date: 10/3/00
Pretest Leak Rate: 0.004 cfm @ 15 in. Hg.
Pretest Leak Check: Pitot: ✓ Orsat: ✓

Sample Type: SO2 Operator: BB
Pbar: 29.20 Ps:
CO2: 0 O2: 20
Probe Length/Type: 7' Glass Pitot #:
Stack Diameter: 180" As:

Nozzle ID: — Thermocouple #:
Assumed Bws: — Filter #: —
Meter Box #: -1 Y: 1.001 ΔH@: 1.995
Post-Test Leak Rate: 0.004 cfm @ ~~15~~ 10 in. Hg.
Post-Test Leak Check: Pitot: — Orsat: —

Traverse Point Number	Sampling Time (min)	Clock Time (24-hour clock)	Gas Meter Reading (Vm) ft³	Velocity Head (Δp) in H2O	Orifice Pressure Differential (ΔH) in H2O Desired	Orifice Pressure Differential (ΔH) in H2O Actual	Stack Temp. (Ts)	Temperature °F Probe	Temperature °F Filter	Impinger Temp. °F	Dry Gas Meter Temp. Inlet (Tm in °F)	Dry Gas Meter Temp. Outlet (Tm out °F)	Pump Vacuum (in. Hg)
			137.243										
	0	1645	137.243		1.4	1.4	~~66~~	256	256	58	94	93	3½
	10	1655	143.94		1.4	1.4	~~60~~	253	257	52	94	93	4
	20	1705	150.71		1.4	1.4		253	258	50	97	93	4
	30	1715	157.49		1.4	1.4		257	258	52	98	94	4
	40	1725	164.26		1.4	1.4		255	259	52	99	94	4
	50	1735	171.035		1.4	1.4		254	259	53	99	94	4
	60	1745	177.83		1.4	1.4		255	259	54	99	94	4
	70	1755	184.6		1.4	1.4		255	257	55	98	94	4.2
	80	1805	191.38		1.4	1.4		254	255	55	98	94	4.2
	90	1815	198.24		1.4	1.4		255	256	57	98	94	4.3
	100	1825	205.1		1.4	1.4		257	261	59	98	94	4.3
	110	1835	211.89		1.4	1.4		255	255	53	98	93	4.5
	120	1845	218.685		1.4	1.4		256	257	53	98	93	5
	130	1855	225.4		1.4	1.4		254	257	53	98	93	5
	140	1905	232.26		1.4	1.4		255	256	53	98	93	6
	150	1915	238.96		1.4	1.4		255	261	54	98	94	6.7
	160	1925	245.6		1.4	1.4		256	255	56	98	94	7.2
	170	1935	252.37		1.4	1.4		256	260	57	97	93	7.5
	180	1945	259.048		1.4	1.4		255	258	59	97	93	8

ΔV= 121.805 $\overline{\sqrt{\Delta p}}$= $\overline{\Delta H}$= 1.4 $\overline{Ts}$= PURGE 259.248 269.725 $\overline{Tm}$= ~~96~~ ~~[illegible]~~ 96

PES

SAMPLE RECOVERY DATA

PLANT Nanport Steel Run No. BI-2

DATE 10/3/00 Sample Box No. RN2 Job No. 5620.001

SAMPLE LOCATION Brandt Baghouse Inlet Filter No. —

TRAIN PREPARER GG/BB

SAMPLE RECOVERY PERSON [illegible]

COMMENTS SO_2 train

FRONT HALF

Acetone Container No. _____ Liquid Level Marked _____ Sealed _____

Filter Container No. _____ Sealed _____

Description of Filter _____

Samples Stored and Locked _____

BACK HALF/MOISTURE

Container No. _____

Liquid Level Marked _____ Sealed _____

IMP. NO.	CONTENTS	INITIAL VOL (ml)	WEIGHT (grams)		
			INITIAL	FINAL	NET
1	IPA	100	~~630.1~~ 590.5	551.7	-38.8
2	H_2O_2	100	713.2	745.6	32.4
3	H_2O_2	100	682.8	700.1	17.3
4	S/G	8250	~~871.3~~	866.9	49.4
5			817.5		
6					
TOTAL					60.3

Description of Impinger Catch: clear

GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant: NEWPORT STEEL — Date: 10/3/00

Sampling Location: BEAMS BAGHOUSE INLET — Clock Time: 1920

Run #: VELOCITY 3 — Operators: JG/BB/RK

Barometric Pressure, in. Hg: 29.66 — Static Pressure, in. H_2O: -3.6

Moisture, %: 2.4 — Molecular wt., Dry: 28.84 — Pitot Tube, Cp: 0.84

Stack Dimension, in. Diameter or Side 1: 180" — Side 2: —

Wet Bulb, °F: — Dry Bulb, °F: —

	Traverse Point Number	Velocity Head in. H_2O	Stack Temp. °F
TOP	1	1.6	214
	2	1.6	203
	3	1.5	193
	4	1.6	203
	5	1.3	199
	6	1.3	195
	7	1.4	194
	8	1.3	185
SIDE	1	1.2	194
	2	1.3	186
	3	1.3	176
	4	1.2	175
	5	1.2	165
	6	1.1	167
	7	1.1	161
	8	1.3	152
		$\overline{\sqrt{\Delta P}}$ = 1.152	$\overline{T_s}$ = 185

$$M_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times \%N_2)$$

$$M_d = (0.44 \times 0.1) + (0.32 \times 20.7) + (0.28 \times \quad)$$

$$M_d = 28.84$$

$$M_s = M_d \times \left(1 - \frac{\%H_2O}{100}\right) + 18\left(\frac{\%H_2O}{100}\right)$$

$$M_s = (\quad) \times \left(1 - \frac{\quad}{100}\right) + 18\left(\frac{\quad}{100}\right)$$

$$M_s = 28.58$$

$\overline{T_s}$ = 185 °F = 645 °R (°F + 460)

$$P_s = P_b + \frac{S.P.}{13.6} = (\quad) + \frac{\quad}{13.6}$$

P_s = 29.80 in. Hg

$\overline{\sqrt{\Delta P}}$ = 1.152

$$V_s = 85.49 \times C_p \times \overline{\sqrt{\Delta P}} \times \sqrt{\frac{T_s\,(°R)}{P_s \times M_s}}$$

$$V_s = 85.49 \times (\quad) \times (\quad) \times \sqrt{\quad}$$

V_s = 72.48 ft/s

A_s = 176.71 ft^2

$Q_s = V_s \times A_s \times 60$ s/m

$Q_s = \quad \times \quad \times 60$

Q_s = ~~768,515~~ acfm 768,476.45

$$Q_{s_{std}} = Q_s \times 17.647 \times \frac{P_s}{T_s} \times \left(1 - \frac{\%H_2O}{100}\right)$$

$$Q_{s_{std}} = \quad \times 17.647 \times \frac{\quad}{\quad} \times \left(1 - \frac{\quad}{100}\right)$$

$Q_{s_{std}}$ = ~~603,241~~ dscfm 603,302.72

GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant: Newport Steel Date: 10/24/00
Sampling Location: Baghouse Inlet Clock Time: 0730
Run #: B1-B4A Operators: AG/BB/TG
Barometric Pressure, in. Hg: 29.68 Static Pressure, in. H_2O: -3.4
Moisture, %: 1.9 Molecular wt., Dry: 28.84 Pitot Tube, Cp: 0.84
Stack Dimension, in. Diameter or Side 1: 180" Side 2: _____
Wet Bulb, °F: _____ Dry Bulb, °F: _____ POST LEAK CHECK O.K.

	Traverse Point Number	Velocity Head in. H_2O	Stack Temp. °F
SIDE	1	1.1	166
	2	1.0	173
	3	1.2	181
	4	1.1	183
	5	1.2	196
	6	1.2	208
	7	1.1	212
	8	1.0	210
TOP	1	1.6	197
	2	1.5	206
	3	1.5	191
	4	1.3	175
	5	1.4	165
	6	1.4	156
	7	1.3	151
	8	1.2	154
		$\overline{\sqrt{\Delta P}}$ = 1.118	$\overline{Ts}$ = 183

$Md = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times \%N_2)$

$Md = (0.44 \times \quad) + (0.32 \times \quad) + (0.28 \times \quad)$

$Md = 28.84$

$Ms = Md \times (1 - \frac{\%H_2O}{100}) + 18 (\frac{\%H_2O}{100})$

$Ms = (\quad) \times (1 - \frac{\quad}{100}) + 18 (\frac{\quad}{100})$

$Ms = 28.63$

$\overline{Ts} = 183\ °F = 643\ °R\ (°F + 460)$

$Ps = Pb + \frac{S.P.}{13.6} = (\quad) + \frac{\quad}{13.6}$

$Ps = 29.43$ in. Hg

$\overline{\sqrt{\Delta P}} = 1.118$

$Vs = 85.49 \times Cp \times \overline{\sqrt{\Delta P}} \times \sqrt{\frac{Ts\ (°R)}{Ps \times Ms}}$

$Vs = 85.49 \times (\quad) \times (\quad) \times \sqrt{\quad}$

$Vs = 70.135$ ft/s

$As = 176.71$ ft²

$Qs = Vs \times As \times 60$ s/m

$Qs = \quad \times \quad \times 60$

$Qs = 742553$ acfm

$Qs_{std} = Qs \times 17.647 \times \frac{Ps}{Ts} \times (1 - \frac{\%H_2O}{100})$

$Qs_{std} = \quad \times 17.647 \times \frac{\quad}{\quad} \times (1 - \frac{\quad}{100})$

$Qs_{std} = 588,364.8$ dscfm ✓

589,230

FIELD DATA SHEET

Plant: Wanport Steel
Sampling Location: Brandt Baghouse
Run Number: BI-3 Date: 10/4/00
Pretest Leak Rate: 0.004 cfm @ 15 in. Hg.
Pretest Leak Check: Pitot: ✓ Orsat: ✓

Sample Type: SO2 Operator: BB
Pbar: 29.68 Ps:
CO2: 0.1 O2: 20.7
Probe Length/Type: 7' Glass Pitot #:
Stack Diameter: 180" As:

Nozzle ID: — Thermocouple #:
Assumed Bws: — Filter #: —
Meter Box #: 1 Y: 1.001 ΔH@: 1.795
Post-Test Leak Rate: TRIAN OK 0.002 cfm @ 12 in. Hg. * PROBE LINER BROKE DURING REMOVAL.
Post-Test Leak Check: Pitot: — Orsat: —

Traverse Point Number	Sampling Time (min)	Clock Time (24-hour clock)	Gas Meter Reading (Vm) ft³	Velocity Head (Δp) in H2O	Orifice Pressure Differential (ΔH) in H2O Desired	Orifice Pressure Differential (ΔH) in H2O Actual	Stack Temp. (Ts)	Temperature °F Probe	Temperature °F Filter	Impinger Temp. °F	Dry Gas Meter Temp. Inlet (Tm in °F)	Dry Gas Meter Temp. Outlet (Tm out °F)	Pump Vacuum (in. Hg)
	0		269.470										
	0	0800	269.470	1.4	1.40	1.40		255	241	59	65	65	3
	10	0810	276.0		1.40	1.40		255	257	45	67	66	3.2
	20	0820	282.6		1.40	1.40		256	260	48	73	68	3.6
	30	0830	289.115		1.40	1.40		253	257	54	77	70	4
	40	0840	295.82		1.40	1.40		255	257	60	80	72	5
	50	0850	302.44		1.40	1.40		252	259	61	82	74	5.4
	60	0900	309.11		1.40	1.40		257	257	61	83	76	5.5
	70	0910	315.805		1.40	1.40		256	256	60	85	78	5.5
	80	0920	322.49		1.40	1.40		256	258	58	86	79	5.5
	90	0930	329.19		1.40	1.40		253	258	55	87	80	5.5
	100	0940	335.87		1.40	1.40		249	259	56	87	81	6
	110	0950	342.56		1.40	1.40		251	257	56	88	82	6
	120	1000	349.245		1.40	1.40		255	259	57	89	83	6
	130	1010	355.98		1.40	1.40		255	261	57	90	84	6.5
	140	1020	362.71		1.40	1.40		256	256	58	90	84	7
	150	1030	369.46		1.40	1.40		252	262	59	90	85	7
	160	1040	376.21		1.40	1.40		252	257	59	90	85	7
	170	1050	382.96		1.40	1.40		252	256	58	91	86	7.2
	180	1100	389.709		1.40	1.40		249	259	57	91	86	7.2

ΔVm= 120.239 $\overline{\sqrt{\Delta p}}$= $\overline{\Delta H}$= 1.40 $\overline{Ts}$= Purge 390.970 401.314 $\overline{Tm}$= 81

SAMPLE RECOVERY DATA

PLANT Newport Steel Run No. BI-3

DATE 10/4/00 Sample Box No. N9 Job No. 5620.001

SAMPLE LOCATION Boudt Baghouse Filter No. —

TRAIN PREPARER GG/BB

SAMPLE RECOVERY PERSON RK

COMMENTS SO2 train

FRONT HALF

Acetone Container No. _____ Liquid Level Marked _____ Sealed _____

Filter Container No. _____ Sealed _____

Description of Filter _____

Samples Stored and Locked _____

BACK HALF/MOISTURE

Container No. _____

Liquid Level Marked _____ Sealed _____

IMP. NO.	CONTENTS	INITIAL VOL (ml)	WEIGHT (grams)		
			INITIAL	FINAL	NET
1	IPA	100	614.6	566.2	-48.4
2	H_2O_2	100	731.2	759.1	27.9
3	H_2O_2	100	611.4	618.0	6.6
4	S/G	250	832.5	893.6	61.1
5					
6					
TOTAL					47.2

Description of Impinger Catch: _____

GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant: NEWPORT STEEL — Date: 10/4/00
Sampling Location: BRANDT BAGHOUSE INLET — Clock Time: 1115
Run #: VELOCITY 5 — Operators: BB/RK/TG
Barometric Pressure, in. Hg: 29.68 — Static Pressure, in. H_2O: -3.4
Moisture, %: ~~2.7~~ 1.9 — Molecular wt., Dry: 28.84 — Pitot Tube, Cp: 0.84
Stack Dimension, in. Diameter or Side 1: 180" — Side 2:
Wet Bulb, °F: — Dry Bulb, °F:

	Traverse Point Number	Velocity Head in. H_2O	Stack Temp. °F
TOP	1	1.7	186
	2	1.6	205
	3	1.6	206
	4	1.5	186
	5	1.3	178
	6	1.3	169
	7	1.4	157
	8	1.3	154
SIDE	1	1.2	202
	2	1.2	207
	3	1.1	220
	4	1.2	224
	5	1.2	221
	6	1.1	213
	7	1.2	209
	8	1.2	207
		$\overline{\sqrt{\Delta P}}$ = 1.1458	$\overline{T_s}$ = ~~196~~ 197

$Md = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times \%N_2)$

$Md = (0.44 \times \quad) + (0.32 \times \quad) + (0.28 \times \quad)$

$Md = 28.84$

$Ms = Md \times (1 - \frac{\%H_2O}{100}) + 18 (\frac{\%H_2O}{100})$

$Ms = (\quad) \times (1 - \frac{}{100}) + 18 (\frac{}{100})$

$Ms = \cancel{28.64}\ 28.63$

$T_s = 197$ °F = 657 °R (°F + 460)

$P_s = P_b + \frac{S.P.}{13.6} = (\quad) + \frac{}{13.6}$

$P_s = 29.43$ in. Hg

$\overline{\sqrt{\Delta P}} = 1.1458$

$V_s = 85.49 \times C_p \times \overline{\sqrt{\Delta P}} \times \sqrt{\frac{T_s (°R)}{P_s \times M_s}}$

$V_s = 85.49 \times (\quad) \times (\quad) \times \sqrt{\quad}$

$V_s = 72.66$ ft/s

$A_s = 176.71$ ft²

$Q_s = V_s \times A_s \times 60$ s/m

$Q_s = \quad \times \quad \times 60$

$Q_s = \cancel{770,274}$ acfm 770,384.92

$Q_{s_{std}} = Q_s \times 17.647 \times \frac{P_s}{T_s} \times (1 - \frac{\%H_2O}{100})$

$Q_{s_{std}} = \quad \times 17.647 \times \frac{}{} \times (1 - \frac{}{100})$

$Q_{s_{std}} = \cancel{597,538}$ dscfm 597,410.1

FIELD DATA SHEET

Plant: Newport Steel
Sampling Location: Brandt Baghouse Inlet
Run Number: BF-4 Date: 10/4/00
Pretest Leak Rate: 0.006 cfm @ 15 in. Hg.
Pretest Leak Check: Pitot: — Orsat: —

Sample Type: SO_2 Operator: BB
Pbar: 29.68 Ps:
CO2: 0 O2: 21
Probe Length/Type: 7' Glass Pitot #:
Stack Diameter: 180" As:

Nozzle ID: — Thermocouple #:
Assumed Bws: — Filter #:
Meter Box #: 1 Y: 1.001 ΔH@: 1.795
Post-Test Leak Rate: .001 cfm @ 10 in. Hg.
Post-Test Leak Check: Pitot: — Orsat: —

Traverse Point Number	Sampling Time (min)	Clock Time (24-hour clock)	Gas Meter Reading (Vm) ft³	Velocity Head (Δp) in H2O	Orifice Pressure Differential (ΔH) in H2O Desired	Orifice Pressure Differential (ΔH) in H2O Actual	Stack Temp. (Ts)	Temperature °F Probe	Temperature °F Filter	Impinger Temp. °F	Dry Gas Meter Temp. Inlet (Tm in °F)	Dry Gas Meter Temp. Outlet (Tm out °F)	Pump Vacuum (in. Hg)
			401.524										
	0	1143	401.524		1.40	1.40		255	247	58	84.	84.	4½
	10	1153	408.2		1.40	1.40		255	259	52	86.	83.	5
	20	1203	414.88		1.40	1.40		254	258	55	88.	83.	5
	30	1213	421.6		1.40	1.40		254	259	55	88.	84.	5½
	40	1223	428.25		1.40	1.40		255	258	55	89.	84.	6
	50	1233	434.93		1.40	1.40		255	256	57	89.	84.	7
	60	1243	441.6		1.40	1.40		255	257	58	89.	84.	7.5
	70	1253	448.32		1.40	1.40		255	260	59	90.	85.	7.8
	80	1303	454.95		1.40	1.40		255	258	50	89.	85.	8
	90	1313	461.7		1.40	1.40		256	259	53	90.	85.	9
	100	1323	468.495		1.40	1.40		255	257	55	90.	85.	9
	110	1333	475.045		1.40	1.40		255	256	57	91.	86.	9.8
	120	1343	481.666		1.40	1.40		256	259	60	92.	87.	11
	130	1353	488.64		1.40	1.40		255	239	55	93.	88.	4.5
	140	1403	495.382		1.40	1.40		254	252	59	94.	89.	5
	150	1413	502.16		1.40	1.40		256	257	61	96	90	5.2
	160	1423	508.946		1.40	1.40		255	259	63	98	91.	5.5
	170	1433	515.6		1.40	1.40		255	256	64	99	92.	6.5
	180	1443	522.393		1.40	1.40		255	260	67	100	94.	7

.234

ΔVi ~~[illegible]~~ 20.125 OK

ΔH= 1.4 Ts=

PURGE FOR 11 MINUTES. Tm= 89

PES

SAMPLE RECOVERY DATA

PLANT Newport Steel Run No. BI-4

DATE 6/4/00 Sample Box No. N-4 Job No. 5620.001

SAMPLE LOCATION Brandt Baghouse Inlet Filter No. —

TRAIN PREPARER RH

SAMPLE RECOVERY PERSON RH

COMMENTS SO_2 Train

FRONT HALF

Acetone Container No. _____ Liquid Level Marked _____ Sealed _____

Filter Container No. _____ Sealed _____

Description of Filter _____

Samples Stored and Locked _____

BACK HALF/MOISTURE

Container No. _____

Liquid Level Marked _____ Sealed _____

IMP. NO.	CONTENTS	INITIAL VOL (ml)	WEIGHT (grams)		
			INITIAL	FINAL	NET
1	IPA	600	637.5	605.9	-31.6
2	H_2O_2	100	627.9	660.1	32.2
3	H_2O_2	200	643.1	663.1	20.0
4	S G	250	790.2	833.0	42.8
5					
6					
TOTAL					63.4

PES

GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant: NEWPORT STEEL Date: 10/4/00

Sampling Location: BRANDT BAGHOUSE INLET Clock Time: 1510

Run #: VELOCITY 6 Operators: RK/BB/TG

Barometric Pressure, in. Hg: 29.68 Static Pressure, in. H_2O: -3.7

Moisture, %: 1.9 Molecular wt., Dry: 28.84 Pitot Tube, Cp: 0.84

Stack Dimension, in. Diameter or Side 1: _____ Side 2: _____ PITOT LEAK CHECK O.K.

Wet Bulb, °F: _____ Dry Bulb, °F: _____

	Traverse Point Number	Velocity Head In. H_2O	Stack Temp. °F
TOP	1	1.4	190
	2	1.5	186
	3	1.4	182
	4	1.6	178
	5	1.4	169
	6	1.5	164
	7	1.4	159
	8	1.3	156
SIDE	1	1.2	141
	2	1.3	141
	3	1.3	140
	4	1.4	139
	5	1.3	138
	6	1.2	136
	7	1.2	132
	8	1.3	131
		$\overline{\sqrt{\Delta P}}$ = 1.164	$\overline{Ts}$ = 155.1

$Md = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times \%N_2)$

$Md = (0.44 \times \quad) + (0.32 \times \quad) + (0.28 \times \quad)$

$Md = 28.84$

$Ms = Md \times (1 - \frac{\%H_2O}{100}) + 18 (\frac{\%H_2O}{100})$

$Ms = (\quad) \times (1 - \frac{\quad}{100}) + 18 (\frac{\quad}{100})$

$Ms = 28.63$

$\overline{Ts} = 155$ °F = 615 °R (°F + 460)

$Ps = Pb + \frac{S.P.}{13.6} = (\quad) + \frac{\quad}{13.6}$

$Ps = 29.41$ in. Hg

$\overline{\sqrt{\Delta P}} = 1.164$

$Vs = 85.49 \times Cp \times \overline{\sqrt{\Delta P}} \times \sqrt{\frac{Ts\,(°R)}{Ps \times Ms}}$

$Vs = 85.49 \times (\quad) \times (\quad) \times \sqrt{\quad}$

$Vs = 71.44$ ft/s

$As = 176.71$ ft^2

$Qs = Vs \times As \times 60$ s/m

$Qs = \quad \times \quad \times 60$

~~Qs = 757449.7~~ acfm 758,018

$Qs_{std} = Qs \times 17.647 \times \frac{Ps}{Ts} \times (1 - \frac{\%H_2O}{100})$

$Qs_{std} = \quad \times 17.647 \times \frac{\quad}{\quad} \times (1 - \frac{\quad}{100})$

~~Qs_{std} = 627066.5~~ dscfm 623,650 ✓

DA

10/3/00 Newport Steel - Orsat Data

Run No. BI-1 Bag 1 1014-1114

	CO_2	O_2	
1	0.0	20.6 - 0.0 = 20.6	* VOIDED Run
2	0.0	20.8 - 0.0 = 20.8	
	0.0	20.7 - 0.0 = 20.7	

Run No. BI-2 Bag 2 1645-1945

	CO_2	O_2	
1	0.1	20.6	= 20.5
2	0.1	20.7	= 20.6

Run No. BI-3 10/4/00 0800-1100

	CO_2	O_2	
1	0.1	20.7	= 20.6
2	0.1	20.7	= 20.6

Run No. BI-4 1143-1443

	CO_2	O_2	
1	0.1	20.7	= 20.6
2	0.1	20.6	= 20.5

METHOD 6 SULFUR DIOXIDE ANALYTICAL DATA

Plant: Newport Steel Date: 10/24/00
Sample Location: Brandt Baghouse Inlet Analyst: Ron Kolde

STANDARDIZATION OF TITRANT

			Volume of Titrant		Normality of Titrant	
Titrant Used	$BaCl(O_4)_2$ ~~0.0100~~	1	20.6	ml	0.00971 N	
Normality of H_2SO_4 Standard	0.0100	2	20.6	ml	0.00971 N	0.00973 N
Volume of Standard	20 ml	3	20.5	ml	0.00976 N	(Avg., N_2)

CONTROL SAMPLE ANALYSIS

			Volume of Titrant		
Normality of $(NH_4)_2SO_4$	(N_1) _____	1	_____	ml	
Volume of $(NH_4)_2SO_4$	(V_1) _____	2	_____	ml	_____ ml
Meq_1 $(NH_4)_2SO_4$	($N_1 \times V_1$) _____	3	_____	ml	(Avg., V_2)
Meq_2 $(NH_4)_2SO_4$	($N_2 \times V_2$) _____				

$$\frac{Meq_1}{Meq_2} = \_\_\_\_\_ = 0.95 \text{ to } 1.05$$

Run Number	Total Volume of Sample	Sample Aliquot	Volume of Titrant, Vt, ml			
			1st Titration	2nd Titration	3rd Titration	Average
BLANK		20 ml	0.05	0.05		0.05
AUDIT NO.						
B-2	500	20 ml	0.80	0.80		0.80
B-3	500	20 ml	1.0	1.1		1.05
B-4	500	20 ml	1.0	0.9		0.95

$$C_{SO_2}(\text{ppm, dry}) = \frac{(424.5)(V_t - V_{tb})(N)(V_{soln.})}{(V_{m_{std.}})(V_a)}$$

$$E_{SO_2}(\text{lb/hr}) = \frac{(C_{SO_2})(MW_{SO_2})}{(385.3 \times 10^6)}(Q_{s_{std.}})(60)$$

Signature of Analyst: Ron J. Kolde Signature of Reviewer: D Schuffel

Appendix C

Analyzer Data

CEM CALIBRATION DATA

Plant Name	Newport Steel
Sampling Location	Baghouse Inlet
Date	10/03/2000
Run Number	1
Start Time	1007
Stop Time	1051

Plant Rep.	Jennifer Mcdaniels
Team Leader	Ron Kolde
CEM Operator	Gary Gay
Project Number	5620.001

	Analyzer Number	Analyzer Span
CO		1015
CO2		25
O2		25
THC		100
NOx		100
ML THC		5000

	Calibration Gas Specification (% of Span)	CALIBRATION ERROR CHECK				SYSTEM CAL CHECK					Calibration Correction Factors
						PRETEST		POST TEST			
		Calibration Value (% or ppm)	Cylinder Number (1)	Analyzer Calibration Response	Difference (% of Span)	System Response	Syst. Bias (% of Span)	System Response	Syst. Bias (% of Span)	Drift (% of Span)	
CO Zero	0	0		4.6	0.5	4.5	4.5	4.5	0.0	0.0	Co=4.5
CO Low	~30	300.2		322.2	2.2						
CO Mid	~60	600.6		611.7	1.1	611.7	0.0	608.2	-0.3	-0.3	Cm=610.0
CO High	80-100 (2)	896.4		899.2	0.3						
CO2 Zero	0	0		1.8	7.2	1.8	0.0	1.8	0.0	0.0	Co=1.8
CO2 Low	NR										
CO2 Mid	40-60	10.12		11.1	3.9	11.1	0.0	11.1	0.0	0.0	Cm=11.1
CO2 High	80-100	19.97		20	0.1						
O2 Zero	0	0		0	0.0	0.1	0.4	0.1	0.4	0.0	Co=0.1
O2 Low	NR										
O2 Mid	40-60	12.91		12.9	0.0	12.9	0.0	12.8	-0.4	-0.4	Cm=12.9
O2 High	80-100	20.9		20.9	0.0						
THC Zero	0	0		0				0.1		0.1	
THC Low	25-35	29.76		31	4.2						
THC Mid	45-55	49		51.2	4.5			50.3		-0.9	
THC High	80-90	84.55		84.7							
NOx Zero	0	0		0	0.0	0.14	0.1	0.7	0.7	0.6	Co=0.4
NOx Low	20-30 (3)										
NOx Mid	45-55	49.49		50.27	0.8	50.27	0.0	52.5	2.2	2.2	Cm=51.4
NOx High	80-90	90.7		90.79	0.1						
ML THC Zer	0	0		899.2				31		-17.4	
ML THC Lo	25-35	867.9		850	-2.1						
ML THC Mi	45-55	2418		2436	0.7			2390		-0.9	
ML THC Hi	80-90	4467		4475							

CEM CALIBRATION DATA

Plant Name	Newport Steel	Plant Rep.	Jennifer Mcdaniels
Sampling Location	Baghouse Inlet	Team Leader	Ron Kolde
Date	10/03/00	CEM Operator	Gary Gay
Run Number	1	Project Number	5620.001
Start Time	1629		
Stop Time	1928		

	Analyzer Number	Analyzer Span
CO		1015
CO2		25
O2		25
THC		100
NOx		100
SO2		5000

	Calibration Gas Specification (% of Span)	CALIBRATION ERROR CHECK				SYSTEM CAL CHECK					Calibration Correction Factors
						PRETEST		POST TEST			
		Calibration Value (% or ppm)	Cylinder Number (1)	Analyzer Calibration Response	Difference (% of Span)	System Response	Syst. Bias (% of Span)	System Response	Syst. Bias (% of Span)	Drift (% of Span)	
CO Zero	0	0		4.6	0.5	1	-0.4	1	-0.4	0.0	Co=1.0
CO Low	~30	300.2		322.2	2.2						
CO Mid	~60	600.6		611.7	1.1	611.4	0.0	610.2	-0.1	-0.1	Cm=610.8
CO High	80-100 (2)	896.4		899.2	0.3						
CO2 Zero	0	0		1.8	7.2	1.8	0.0	1.8	0.0	0.0	Co=1.8
CO2 Low	NR										
CO2 Mid	40-60	10.12		11.1	3.9	11.1	0.0	11.1	0.0	0.0	Cm=11.1
CO2 High	80-100	19.97		20	0.1						
O2 Zero	0	0		0	0.0	0.1	0.4	0	0.0	-0.4	Co=0.1
O2 Low	NR										
O2 Mid	40-60	12.91		12.9	0.0	12.8	-0.4	12.8	-0.4	0.0	Cm=12.8
O2 High	80-100	20.9		20.9	0.0						
THC Zero	0	0		0				0.8		0.8	
THC Low	25-35	29.76		31	4.2						
THC Mid	45-55	49		51.2	4.5			49		-2.2	
THC High	80-90	84.55		84.7							
NOx Zero	0	0		0	0.0	0.2	0.2	0.2	0.2	0.0	Co=0.2
NOx Low	20-30 (3)										
NOx Mid	45-55	49.49		50.27	0.8	51.9	1.6	52.5	2.2	0.6	Cm=52.2
NOx High	80-90	90.7		90.79	0.1						
ML THC Zer	0	0		899.2		31		10		-17.8	
ML THC Lo	25-35	867.9		850	-2.1						
ML THC Mi	45-55	2418		2436	0.7	2390		2455		0.4	
ML THC Hi	80-90	4467		4475							

CEM CALIBRATION DATA

Plant Name	Newport Steel
Sampling Location	Baghouse Inlet
Date	10/04/00
Run Number	2
Start Time	0800
Stop Time	0959

Plant Rep.	Jennifer Mcdaniels
Team Leader	Ron Kolde
CEM Operator	Gary Gay
Project Number	5620.001

	Analyzer Number	Analyzer Span
CO		1015
CO2		25
O2		25
THC		100
NOx		100
SO2		5000

	Calibration Gas Specification (% of Span)	CALIBRATION ERROR CHECK				SYSTEM CAL CHECK					Calibration Correction Factors
						PRETEST		POST TEST			
		Calibration Value (% or ppm)	Cylinder Number (1)	Analyzer Calibration Response	Difference (% of Span)	System Response	Syst. Bias (% of Span)	System Response	Syst. Bias (% of Span)	Drift (% of Span)	
CO Zero	0	0		1.1	0.1	1.1	0.0	1	0.0	0.0	Co=1.1
CO Low	~30	300.2		319.8	1.9						
CO Mid	~60	600.6		601.7	0.1	601.7	0.0	614	1.2	1.2	Cm=607.9
CO High	80-100 (2)	896.4		870.8	-2.5						
CO2 Zero	0	0		1.8	7.2	1.8	0.0	1.8	0.0	0.0	Co=1.8
CO2 Low	NR										
CO2 Mid	40-60	10.12		11.1	3.9	11.1	0.0	11	-0.4	-0.4	Cm=11.1
CO2 High	80-100	19.97		20	0.1						
O2 Zero	0	0		0	0.0	0	0.0	0	0.0	0.0	Co=0.0
O2 Low	NR										
O2 Mid	40-60	12.91		12.9	0.0	12.8	-0.4	12.7	-0.8	-0.4	Cm=12.8
O2 High	80-100	20.9		20.9	0.0						
THC Zero	0	0		0				0.3		0.3	
THC Low	25-35	29.76		31	4.2						
THC Mid	45-55	49		51.2	4.5			49.5		-1.7	
THC High	80-90	84.55		84.7							
NOx Zero	0	0		0.12	0.1	0.12	0.0	0.12	0.0	0.0	Co=0.1
NOx Low	20-30 (3)										
NOx Mid	45-55	49.49		51.1	1.6	51.06	0.0	49.1	-2.0	-2.0	Cm=50.1
NOx High	80-90	90.7		90.96	0.3						
ML THC Zer	0	0		899.2		10		24		-17.5	
ML THC Lo	25-35	867.9		850	-2.1						
ML THC Mi	45-55	2418		2436	0.7	2455		2510		1.5	
ML THC Hi	80-90	4467		4475							

CEM CALIBRATION DATA

Plant Name	Newport Steel
Sampling Location	Baghouse Inlet
Date	10/04/00
Run Number	2B
Start Time	1045
Stop Time	1159

Plant Rep.	Jennifer Mcdaniels
Team Leader	Ron Kolde
CEM Operator	Gary Gay
Project Number	5620.001

	Analyzer Number	Analyzer Span
CO		1015
CO2		25
O2		25
THC		100
NOx		100
SO2		5000

	Calibration Gas Specification (% of Span)	CALIBRATION ERROR CHECK				SYSTEM CAL CHECK					Calibration Correction Factors
						PRETEST		POST TEST			
		Calibration Value (% or ppm)	Cylinder Number (1)	Analyzer Calibration Response	Difference (% of Span)	System Response	Syst. Bias (% of Span)	System Response	Syst. Bias (% of Span)	Drift (% of Span)	
CO Zero	0	0		1.1	0.1	1	0.0	1.1	0.0	0.0	Co=1.1
CO Low	~30	300.2		319.8	1.9						
CO Mid	~60	600.6		601.7	0.1	614	1.2	612	1.0	-0.2	Cm=613.0
CO High	80-100 (2)	896.4		870.8	-2.5						
CO2 Zero	0	0		1.8	7.2	1.8	0.0	1.8	0.0	0.0	Co=1.8
CO2 Low	NR										
CO2 Mid	40-60	10.12		11.1	3.9	11	-0.4	11	-0.4	0.0	Cm=11.0
CO2 High	80-100	19.97		20	0.1						
O2 Zero	0	0		0	0.0	0	0.0	0	0.0	0.0	Co=0.0
O2 Low	NR										
O2 Mid	40-60	12.91		12.9	0.0	12.7	-0.8	12.8	-0.4	0.4	Cm=12.8
O2 High	80-100	20.9		20.9	0.0						
THC Zero	0	0		0				0		0.0	
THC Low	25-35	29.76		31	4.2						
THC Mid	45-55	49		51.2	4.5			49.2		-2.0	
THC High	80-90	84.55		84.7							
NOx Zero	0	0		0.12	0.1	0.12	0.0	0.2	0.1	0.1	Co=0.2
NOx Low	20-30 (3)										
NOx Mid	45-55	49.49		51.1	1.6	49.1	-2.0	49.3	-1.8	0.2	Cm=49.2
NOx High	80-90	90.7		90.96	0.3						
ML THC Zer	0	0		899.2		24		25		-17.5	
ML THC Lo	25-35	867.9		850	-2.1						
ML THC Mi	45-55	2418		2436	0.7	2510		2550		2.3	
ML THC Hi	80-90	4467		4475							

CEM CALIBRATION DATA

Plant Name	Newport Steel
Sampling Location	Baghouse Inlet
Date	10/04/00
Run Number	3
Start Time	1245
Stop Time	1405

Plant Rep.	Jennifer Mcdaniels
Team Leader	Ron Kolde
CEM Operator	Gary Gay
Project Number	5620.001

	Analyzer Number	Analyzer Span
CO		1015
CO2		25
O2		25
THC		100
NOx		100
SO2		5000

	Calibration Gas Specification (% of Span)	CALIBRATION ERROR CHECK				SYSTEM CAL CHECK					Calibration Correction Factors
						PRETEST		POST TEST			
		Calibration Value (% or ppm)	Cylinder Number (1)	Analyzer Calibration Response	Difference (% of Span)	System Response	Syst. Bias (% of Span)	System Response	Syst. Bias (% of Span)	Drift (% of Span)	
CO Zero	0	0		1.1	0.1	1.1	0.0	1	0.0	0.0	Co=1.1
CO Low	~30	300.2		319.8	1.9						
CO Mid	~60	600.6		601.7	0.1	612	1.0	612	1.0	0.0	Cm=612.0
CO High	80-100 (2)	896.4		870.8	-2.5						
CO2 Zero	0	0		1.8	7.2	1.8	0.0	2	0.8	0.8	Co=1.9
CO2 Low	NR										
CO2 Mid	40-60	10.12		11.1	3.9	11	-0.4	12.4	5.2	5.6	Cm=11.7
CO2 High	80-100	19.97		20	0.1						
O2 Zero	0	0		0	0.0	0	0.0	0	0.0	0.0	Co=0.0
O2 Low	NR										
O2 Mid	40-60	12.91		12.9	0.0	12.8	-0.4	12.9	0.0	0.4	Cm=12.9
O2 High	80-100	20.9		20.9	0.0						
THC Zero	0	0		0				0.3		0.3	
THC Low	25-35	29.76		31	4.2						
THC Mid	45-55	49		51.2	4.5			49.9		-1.3	
THC High	80-90	84.55		84.7							
NOx Zero	0	0		0.12	0.1	0.2	0.1	0.12	0.0	-0.1	Co=0.2
NOx Low	20-30 (3)										
NOx Mid	45-55	49.49		51.1	1.6	49.3	-1.8	49.1	-2.0	-0.2	Cm=49.2
NOx High	80-90	90.7		90.96	0.3						
ML THC Zer	0	0		899.2		25					
ML THC Lo	25-35	867.9		850	-2.1						
ML THC Mi	45-55	2418		2436	0.7	2550					
ML THC Hi	80-90	4467		4475							

CEM CALIBRATION DATA

Plant Name	Newport Steel
Sampling Location	Baghouse Inlet
Date	10/04/00
Run Number	3
Start Time	1422
Stop Time	1621

Plant Rep.	Jennifer Mcdaniels
Team Leader	Ron Kolde
CEM Operator	Gary Gay
Project Number	5620.001

	Analyzer Number	Analyzer Span
CO		1015
CO2		25
O2		25
THC		100
NOx		100
SO2		5000

	Calibration Gas Specification (% of Span)	CALIBRATION ERROR CHECK				SYSTEM CAL CHECK					Calibration Correction Factors
						PRETEST		POST TEST			
		Calibration Value (% or ppm)	Cylinder Number (1)	Analyzer Calibration Response	Difference (% of Span)	System Response	Syst. Bias (% of Span)	System Response	Syst. Bias (% of Span)	Drift (% of Span)	
CO Zero	0	0		1.1	0.1	1	0.0	0.04	-0.1	-0.1	Co=0.5
CO Low	~30	300.2		319.8	1.9						
CO Mid	~60	600.6		601.7	0.1	612	1.0	618.7	1.7	0.7	Cm=615.4
CO High	80-100 (2)	896.4		870.8	-2.5						
CO2 Zero	0	0		1.8	7.2	2	0.8	2	0.8	0.0	Co=2.0
CO2 Low	NR										
CO2 Mid	40-60	10.12		11.1	3.9	12.4	5.2	12.5	5.6	0.4	Cm=12.5
CO2 High	80-100	19.97		20	0.1						
O2 Zero	0	0		0	0.0	0	0.0	0	0.0	0.0	Co=0.0
O2 Low	NR										
O2 Mid	40-60	12.91		12.9	0.0	12.9	0.0	12.9	0.0	0.0	Cm=12.9
O2 High	80-100	20.9		20.9	0.0						
THC Zero	0	0		0				0.5		0.5	
THC Low	25-35	29.76		31	4.2						
THC Mid	45-55	49		51.2	4.5			49.8		-1.4	
THC High	80-90	84.55		84.7							
NOx Zero	0	0		0.12	0.1	0.12	0.0	0.2	0.1	0.1	Co=0.2
NOx Low	20-30 (3)										
NOx Mid	45-55	49.49		51.1	1.6	49.1	-2.0	48.1	-3.0	-1.0	Cm=48.6
NOx High	80-90	90.7		90.96	0.3						
ML THC Zer	0	0		899.2		0					
ML THC Lo	25-35	867.9		850	-2.1						
ML THC Mi	45-55	2418		2436	0.7	0					
ML THC Hi	80-90	4467		4475							

CEM CALIBRATION DATA

Plant Name	Newport Steel
Sampling Location	Baghouse Inlet
Date	10/04/00
Run Number	4
Start Time	
Stop Time	

Plant Rep.	Jennifer Mcdaniels
Team Leader	Ron Kolde
CEM Operator	Gary Gay
Project Number	5620.001

	Analyzer Number	Analyzer Span
CO		1015
CO2		25
O2		25
THC		100
NOx		100
SO2		5000

	Calibration Gas Specification (% of Span)	CALIBRATION ERROR CHECK				SYSTEM CAL CHECK					Calibration Correction Factors
						PRETEST		POST TEST			
		Calibration Value (% or ppm)	Cylinder Number (1)	Analyzer Calibration Response	Difference (% of Span)	System Response	Syst. Bias (% of Span)	System Response	Syst. Bias (% of Span)	Drift (% of Span)	
CO Zero	0	0		1.1	0.1	0.04	-0.1				
CO Low	~30	300.2		319.8	1.9						
CO Mid	~60	600.6		601.7	0.1	618.7	1.7				
CO High	80-100 (2)	896.4		870.8	-2.5						
CO2 Zero	0	0		1.8	7.2	2	0.8				
CO2 Low	NR										
CO2 Mid	40-60	10.12		11.1	3.9	12.5	5.6				
CO2 High	80-100	19.97		20	0.1						
O2 Zero	0	0				0	#VALUE!				
O2 Low	NR										
O2 Mid	40-60	12.91		12.9	0.0	12.9	0.0				
O2 High	80-100	20.9		20.9	0.0						
THC Zero	0	0									
THC Low	25-35	29.76		31	4.2						
THC Mid	45-55	49		51.2	4.5						
THC High	80-90	84.55		84.7							
NOx Zero	0	0		0.12	0.1	0.2	0.1				
NOx Low	20-30 (3)										
NOx Mid	45-55	49.49		51.1	1.6	48.1	-3.0				
NOx High	80-90	90.7		90.96	0.3						
SO2 Zero	0	0		899.2	18.0						
SO2 Low	NR	867.9									
SO2 Mid	40-60	2418		2436	0.4						
SO2 High	80-100	4467		4475	0.2						

10/03/2000	9:33:27	-0.04	0.05	899.33
10/03/2000	9:34:27	-0.05	0.05	898.71
10/03/2000	9:35:27	-0.04	0.05	813.34
10/03/2000	9:36:27	-0.04	0.05	613.76
10/03/2000	9:37:27	-0.05	0.05	612.5
10/03/2000	9:38:27	-0.04	0.05	582.33
10/03/2000	9:39:27	-0.05	0.05	343.65
10/03/2000	9:40:27	-0.04	0.05	321.86
10/03/2000	9:41:27	-0.04	0.05	321.64
10/03/2000	9:42:27	-0.04	0.05	321.79
10/03/2000	9:43:27	-0.05	0.05	321.36
10/03/2000	9:44:27	-0.04	0.05	121.18
10/03/2000	9:45:27	-0.04	0.05	5.06
10/03/2000	9:46:27	-0.04	0.05	12.17
10/03/2000	9:47:27	-0.05	0.05	693.23
10/03/2000	9:48:27	-0.04	0.05	899.6
10/03/2000	9:49:27	-0.04	0.05	903.04
10/03/2000	9:50:27	-0.04	0.05	904.4
10/03/2000	9:51:27	-0.04	0.05	862.69
10/03/2000	9:52:27	-0.04	0.05	626.09
10/03/2000	9:53:27	-0.05	0.04	612.55
10/03/2000	9:54:27	-0.04	0.05	600.36
10/03/2000	9:55:27	-0.04	0.05	363.19
10/03/2000	9:56:27	-0.04	0.05	321.88
10/03/2000	9:57:27	-0.04	0.05	142.13
10/03/2000	9:58:27	-0.04	0.05	5.32
10/03/2000	9:59:27	-0.04	0.05	8.35
10/03/2000	10:00:27	17.08	0.05	33.36
10/03/2000	10:01:27	86.1	0.06	4.5
10/03/2000	10:02:27	93.91	0.06	4.56
10/03/2000	10:03:27	89.12	0.06	4.55
10/03/2000	10:04:27	37.83	0.05	4.45
10/03/2000	10:05:27	0.96	0.05	4.55
10/03/2000	10:06:27	0.44	0.05	63.15
Run 1	Start	NOX		CO
10/03/2000	10:07:27	1.77	0.07	103.57
10/03/2000	10:08:27	3.98	0.05	31.04
10/03/2000	10:09:27	4.52	0.05	50.2
10/03/2000	10:10:27	2.99	0.05	111.01
10/03/2000	10:11:27	2.78	0.05	99.99
10/03/2000	10:12:27	5.28	0.05	84.54
10/03/2000	10:13:27	4.4	0.05	24.29
10/03/2000	10:14:27	3.2	0.05	36.24
10/03/2000	10:15:27	3	0.05	47.51
10/03/2000	10:16:27	2.81	0.05	68.29
10/03/2000	10:17:27	2.66	0.05	118.1
10/03/2000	10:18:27	2.78	0.05	256.99
10/03/2000	10:19:27	2.97	0.05	438.31
10/03/2000	10:20:27	2.95	0.05	359.94

10/03/2000	10:21:27	2.81	0.05	302.08
10/03/2000	10:22:27	2.74	0.05	351.92
10/03/2000	10:23:27	2.91	0.05	262.69
10/03/2000	10:24:27	2.72	0.05	332.79
10/03/2000	10:25:27	2.52	0.05	136.16
10/03/2000	10:26:27	2.08	0.05	164.99
10/03/2000	10:27:27	2.1	0.05	191.94
10/03/2000	10:28:27	2.1	0.05	165.78
10/03/2000	10:29:27	1.86	0.05	100.79
10/03/2000	10:30:27	1.69	0.05	148.07
10/03/2000	10:31:27	1.43	0.05	166.24
10/03/2000	10:32:27	1.32	0.05	131.12
10/03/2000	10:33:27	3.36	0.05	109.7
10/03/2000	10:34:27	8.95	0.05	35.31
10/03/2000	10:35:27	10.94	0.05	110.89
10/03/2000	10:36:27	2.97	0.05	131.22
10/03/2000	10:37:27	1.5	0.05	160.02
10/03/2000	10:38:27	1.71	0.05	211.42
10/03/2000	10:39:27	1.79	0.05	138.74
10/03/2000	10:40:27	1.82	0.05	120.64
10/03/2000	10:41:27	2.12	0.05	113.46
10/03/2000	10:42:27	2.95	0.05	92.22
10/03/2000	10:43:27	15.49	0.05	34.22
10/03/2000	10:44:27	12.87	0.05	70.81
10/03/2000	10:45:27	1.67	0.05	65.95
10/03/2000	10:46:27	3.54	0.05	34.31
10/03/2000	10:47:27	14.04	0.05	40.29
10/03/2000	10:48:27	4.86	0.05	60.84
10/03/2000	10:49:27	2.05	0.05	42.77
10/03/2000	10:50:27	8.6	0.05	13.12
10/03/2000	10:51:27	9.88	0.05	10.63
Avrge	End	4.1		130.7
10/03/2000	10:52:27	7.68	0.04	10.47
10/03/2000	10:53:27	7.26	0.04	15.16
10/03/2000	10:54:27	7.51	0.04	20.93
10/03/2000	10:55:27	7.16	0.04	25.76
10/03/2000	10:56:27	8.53	0.04	92.34
10/03/2000	10:57:27	7	0.04	25.41
10/03/2000	10:58:27	6.4	0.04	14.16
10/03/2000	10:59:27	6.66	0.04	12.45
10/03/2000	11:00:27	6.74	0.04	11.88
10/03/2000	11:01:27	6.56	0.04	11.54
10/03/2000	11:02:27	5.4	0.04	12.28
10/03/2000	11:03:27	4.82	0.04	37.71
10/03/2000	11:04:27	3.23	0.04	66.2
10/03/2000	11:05:27	2.33	0.04	57.98
10/03/2000	11:06:27	2.29	0.04	44.07
10/03/2000	11:07:27	2.43	0.04	43.52
10/03/2000	11:08:27	2.36	0.04	47.06

10/03/2000	16:10:48	1.4	-0.01	222.73
10/03/2000	16:11:48	1.61	-0.01	218.8
10/03/2000	16:12:48	1.7	-0.01	231.93
10/03/2000	16:13:48	1.6	-0.01	256.84
10/03/2000	16:14:48	1.49	-0.01	165.53
10/03/2000	16:15:48	0.39	-0.01	3.57
10/03/2000	16:16:48	0.01	-0.01	38.54
10/03/2000	16:17:48	0.01	-0.01	776.3
10/03/2000	16:18:48	0.01	-0.01	873.44
10/03/2000	16:19:48	0.01	-0.01	865.38
10/03/2000	16:20:48	0.01	-0.01	673.6
10/03/2000	16:21:48	0.01	-0.01	612.88
10/03/2000	16:22:48	0.01	-0.01	607.12
10/03/2000	16:23:48	0.01	-0.01	397.02
10/03/2000	16:24:48	0	-0.01	328.97
10/03/2000	16:25:48	0.01	-0.01	303.17
10/03/2000	16:26:48	0.01	-0.01	32.38
10/03/2000	16:27:48	0.01	-0.01	1
10/03/2000	16:28:48	0.26	-0.01	102.68
Run 1		NOX		CO
10/03/2000	16:29:48	2.3	-0.01	338.97
10/03/2000	16:30:48	3.3	-0.01	494
10/03/2000	16:31:48	2.93	-0.01	322.24
10/03/2000	16:32:48	2.19	-0.01	246.26
10/03/2000	16:33:48	1.82	-0.01	206.8
10/03/2000	16:34:48	1.61	-0.01	177.02
10/03/2000	16:35:48	1.36	-0.01	185.94
10/03/2000	16:36:48	1.32	-0.01	213.6
10/03/2000	16:37:48	1.99	-0.01	94.82
10/03/2000	16:38:48	7.91	-0.01	19.44
10/03/2000	16:39:48	5.1	-0.01	143.54
10/03/2000	16:40:48	2.05	-0.01	130.02
10/03/2000	16:41:48	1.51	-0.01	99.85
10/03/2000	16:42:48	1.5	-0.01	121.03
10/03/2000	16:43:48	1.58	-0.01	114.37
10/03/2000	16:44:48	1.55	-0.01	82.59
10/03/2000	16:45:48	1.34	-0.01	82.45
10/03/2000	16:46:48	1.34	-0.01	117.87
10/03/2000	16:47:48	1.5	-0.01	93.68
10/03/2000	16:48:48	1.44	-0.01	62.08
10/03/2000	16:49:48	1.63	-0.01	49.35
10/03/2000	16:50:48	1.92	-0.01	37.43
10/03/2000	16:51:48	4.48	-0.01	13.12.
10/03/2000	16:52:48	6.08	-0.01	8.61
10/03/2000	16:53:48	4.52	-0.01	8.2
10/03/2000	16:54:48	4.16	-0.01	8.56
10/03/2000	16:55:48	3.91	-0.01	8.01
10/03/2000	16:56:48	9.66	-0.01	7.94
10/03/2000	16:57:48	26.26	-0.01	44.49

10/03/2000	16:58:48	3.17	-0.01	61.34
10/03/2000	16:59:48	3.61	-0.01	31.65
10/03/2000	17:00:48	7.34	-0.01	8
10/03/2000	17:01:48	5.69	-0.01	5.96
10/03/2000	17:02:48	5.46	-0.01	5.96
10/03/2000	17:03:48	5.32	-0.01	5.97
10/03/2000	17:04:48	4.96	-0.01	5.95
10/03/2000	17:05:48	5.21	-0.01	5.52
10/03/2000	17:06:48	5.09	-0.01	4.97
10/03/2000	17:07:48	4.31	-0.01	4.18
10/03/2000	17:08:48	4.61	-0.01	3.97
10/03/2000	17:09:48	4.77	-0.01	4.76
10/03/2000	17:10:48	4.94	-0.01	8.16
10/03/2000	17:11:48	5.39	-0.01	18.62
10/03/2000	17:12:48	5.92	-0.01	22.06
10/03/2000	17:13:48	8.12	-0.01	48.26
10/03/2000	17:14:48	5.86	-0.01	16.84
10/03/2000	17:15:48	5.22	-0.01	11.67
10/03/2000	17:16:48	5.48	-0.01	9.18
10/03/2000	17:17:48	5.7	-0.01	8.35
10/03/2000	17:18:48	5.53	-0.01	7.18
10/03/2000	17:19:48	5.21	-0.01	7.31
10/03/2000	17:20:48	5.16	-0.01	6.95
10/03/2000	17:21:48	4.31	-0.01	6.36
10/03/2000	17:22:48	1.9	-0.01	5.99
10/03/2000	17:23:48	1.35	-0.01	6.75
10/03/2000	17:24:48	1.22	-0.01	6.97
10/03/2000	17:25:48	1.41	-0.01	6.97
10/03/2000	17:26:48	1.54	-0.01	6.97
10/03/2000	17:27:48	1.59	-0.01	7.1
10/03/2000	17:28:48	1.6	-0.01	7.97
10/03/2000	17:29:48	1.67	-0.01	7.94
10/03/2000	17:30:48	1.69	-0.01	7.96
10/03/2000	17:31:48	1.6	-0.01	7.98
10/03/2000	17:32:48	1.55	-0.01	7.96
10/03/2000	17:33:48	1.54	-0.01	7.98
10/03/2000	17:34:48	1.6	-0.01	7.96
10/03/2000	17:35:48	1.47	-0.01	7.96
10/03/2000	17:36:48	1.57	-0.01	7.96
10/03/2000	17:37:48	1.53	-0.01	7.82
10/03/2000	17:38:48	1.42	-0.01	7.09
10/03/2000	17:39:48	2.48	-0.01	66.78
10/03/2000	17:40:48	3.65	-0.01	164.18
10/03/2000	17:41:48	2.53	-0.01	156.98
10/03/2000	17:42:48	2.28	-0.01	89.61
10/03/2000	17:43:48	1.91	-0.01	55.41
10/03/2000	17:44:48	4.32	-0.01	81.46
10/03/2000	17:45:48	6.76	-0.01	70.37
10/03/2000	17:46:48	2.26	-0.01	28.46

10/03/2000	17:47:48	1.87	-0.01	20.94
10/03/2000	17:48:48	1.76	-0.01	19.53
10/03/2000	17:49:48	1.98	-0.01	17
10/03/2000	17:50:48	2.01	-0.01	16.84
10/03/2000	17:51:48	1.84	-0.01	15.49
10/03/2000	17:52:48	1.76	-0.01	15.29
10/03/2000	17:53:48	1.77	-0.01	13.84
10/03/2000	17:54:48	1.58	-0.01	12.96
10/03/2000	17:55:48	1.43	-0.01	12.16
10/03/2000	17:56:48	1.4	-0.01	11
10/03/2000	17:57:48	1.46	-0.01	11.58
10/03/2000	17:58:48	1.63	-0.01	10.85
10/03/2000	17:59:48	1.37	-0.01	11.43
10/03/2000	18:00:48	1.76	-0.01	11.49
10/03/2000	18:01:48	1.78	-0.01	10.97
10/03/2000	18:02:48	1.67	-0.01	9.96
10/03/2000	18:03:48	1.66	-0.01	10.15
10/03/2000	18:04:48	1.64	-0.01	9.96
10/03/2000	18:05:48	1.45	-0.01	8.82
10/03/2000	18:06:48	1.55	-0.01	9.47
10/03/2000	18:07:48	1.61	-0.01	7.98
10/03/2000	18:08:48	1.53	-0.01	7.97
10/03/2000	18:09:48	1.6	-0.01	7.97
10/03/2000	18:10:48	1.6	-0.01	7.97
10/03/2000	18:11:48	1.52	-0.01	7.95
10/03/2000	18:12:48	1.58	-0.01	8.79
10/03/2000	18:13:48	1.77	-0.01	8.31
10/03/2000	18:14:48	1.7	-0.01	8.46
10/03/2000	18:15:48	1.7	-0.01	7.97
10/03/2000	18:16:48	1.74	-0.01	7.96
10/03/2000	18:17:48	1.54	-0.01	7.31
10/03/2000	18:18:48	1.25	-0.01	6.96
10/03/2000	18:19:48	1.15	-0.01	6.96
10/03/2000	18:20:48	1.06	-0.01	6.98
10/03/2000	18:21:48	1.01	-0.01	6.96
10/03/2000	18:22:48	1.1	-0.01	6.97
10/03/2000	18:23:48	1.01	-0.01	6.95
10/03/2000	18:24:48	1	-0.01	6.96
10/03/2000	18:25:48	1	-0.01	6.63
10/03/2000	18:26:48	0.97	-0.01	7.11
10/03/2000	18:27:48	18.45	-0.01	38.76
10/03/2000	18:28:48	9.56	-0.01	94.75
10/03/2000	18:29:48	2.74	-0.01	139.35
10/03/2000	18:30:48	3.59	-0.01	157.84
10/03/2000	18:31:48	3.72	-0.01	109.04
10/03/2000	18:32:48	4.07	-0.01	163.5
10/03/2000	18:33:48	3.53	-0.01	326.35
10/03/2000	18:34:48	2.34	-0.01	337.33
10/03/2000	18:35:48	1.82	-0.01	211.91

10/03/2000	18:36:48	1.62	-0.01	180.47
10/03/2000	18:37:48	1.35	-0.01	215.78
10/03/2000	18:38:48	1.35	-0.01	207.44
10/03/2000	18:39:48	2.91	-0.01	62.58
10/03/2000	18:40:48	4.56	-0.01	16.5
10/03/2000	18:41:48	3.65	-0.01	65.94
10/03/2000	18:42:48	2.54	-0.01	176.92
10/03/2000	18:43:48	2.23	-0.01	182.34
10/03/2000	18:44:48	2.96	-0.01	208.78
10/03/2000	18:45:48	10.43	-0.01	113.21
10/03/2000	18:46:48	3.92	-0.01	39.47
10/03/2000	18:47:48	3.79	-0.01	50.25
10/03/2000	18:48:48	3.61	-0.01	88.94
10/03/2000	18:49:48	3.55	-0.01	251.85
10/03/2000	18:50:48	3.68	-0.01	274.27
10/03/2000	18:51:48	3.59	-0.01	373.25
10/03/2000	18:52:48	3.42	-0.01	305.05
10/03/2000	18:53:48	3.61	-0.01	317.83
10/03/2000	18:54:48	3.45	-0.01	161.12
10/03/2000	18:55:48	3.12	-0.01	167.28
10/03/2000	18:56:48	2.34	-0.01	303.78
10/03/2000	18:57:48	1.67	-0.01	410.54
10/03/2000	18:58:48	1.62	-0.01	313.53
10/03/2000	18:59:48	2.4	-0.01	159.58
10/03/2000	19:00:48	4.28	-0.01	20.74
10/03/2000	19:01:48	3.99	-0.01	156.42
10/03/2000	19:02:48	1.25	-0.01	161.79
10/03/2000	19:03:48	1.27	-0.01	142.18
10/03/2000	19:04:48	1.53	-0.01	131.17
10/03/2000	19:05:48	1.44	-0.01	81.43
10/03/2000	19:06:48	1.48	-0.01	151.8
10/03/2000	19:07:48	1.6	-0.01	162.47
10/03/2000	19:08:48	1.65	-0.01	173.37
10/03/2000	19:09:48	1.71	-0.01	137.88
10/03/2000	19:10:48	2.08	-0.01	207.78
10/03/2000	19:11:48	1.98	-0.01	103.82
10/03/2000	19:12:48	1.62	-0.01	69.42
10/03/2000	19:13:48	1.55	-0.01	71.48
10/03/2000	19:14:48	2	-0.01	123.46
10/03/2000	19:15:48	2.27	-0.01	77.78
10/03/2000	19:16:48	2.52	-0.01	101.85
10/03/2000	19:17:48	1.95	-0.01	169.84
10/03/2000	19:18:48	2.88	-0.01	62.53
10/03/2000	19:19:48	2.43	-0.01	43.43
10/03/2000	19:20:48	6.88	-0.01	41.37
10/03/2000	19:21:48	2.15	-0.01	27.83
10/03/2000	19:22:48	7.66	-0.01	32.75
10/03/2000	19:23:48	8.99	-0.01	33.92
10/03/2000	19:24:48	10.2	-0.01	31.77

10/03/2000	19:25:48	4.02	-0.01	34.84
10/03/2000	19:26:48	5.54	-0.01	22.24
10/03/2000	19:27:48	9.24	-0.01	19.74
10/03/2000	19:28:48	9.62	-0.01	26.62
Average End		3.2		77.5
10/03/2000	19:29:48	8.72	-0.01	40.26
10/03/2000	19:30:48	2.07	-0.01	2.99
10/03/2000	19:31:48	0.01	-0.01	0.94
10/03/2000	19:32:48	0	-0.01	0.93
10/03/2000	19:33:48	0	-0.01	133.87
10/03/2000	19:34:48	0	-0.01	844.51
10/03/2000	19:35:48	0	-0.01	869.89
10/03/2000	19:36:48	0	-0.01	872.03
10/03/2000	19:37:48	0	-0.01	830.36
10/03/2000	19:38:48	0	-0.01	620.64
10/03/2000	19:39:48	0	-0.01	608.92
10/03/2000	19:40:48	0	-0.01	477.09
10/03/2000	19:41:48	0	-0.01	329.39
10/03/2000	19:42:48	0	-0.01	312.37
10/03/2000	19:43:48	0	-0.01	41.1
10/03/2000	19:44:48	0	-0.01	0.93
10/03/2000	19:45:48	0.75	-0.01	28.14
10/03/2000	19:46:48	16.1	-0.01	162.72
10/03/2000	19:47:48	81.35	0	1.63
10/03/2000	19:48:48	95.23	0	-0.06
10/03/2000	19:49:48	95.09	0	-0.07
10/03/2000	19:50:48	71.6	0	0.92
10/03/2000	19:51:48	52.56	-0.01	0.93
10/03/2000	19:52:48	50.05	-0.01	0.92
10/03/2000	19:53:48	16.19	-0.01	0.94
10/03/2000	19:54:48	0.21	-0.01	0.92
10/03/2000	19:55:48	0.12	-0.01	11.61
10/03/2000	19:56:48	1.62	-0.01	106.57

Run 2	Start	NOX		CO
10/04/2000	8:00:54	2.99	0	71.76
10/04/2000	8:01:54	3.3	0	63.93
10/04/2000	8:02:54	2.91	0	75.6
10/04/2000	8:03:54	2.42	0	81.53
10/04/2000	8:04:54	2.13	0	78.54
10/04/2000	8:05:54	1.77	0	117.42
10/04/2000	8:06:54	1.42	0	90.15
10/04/2000	8:07:54	1.22	0	79.97
10/04/2000	8:08:54	1.01	0	79.35
10/04/2000	8:09:54	0.9	0	56.22
10/04/2000	8:10:54	2.56	0	21.68
10/04/2000	8:11:54	4.47	0	58.17
10/04/2000	8:12:54	2.34	0	128.05
10/04/2000	8:13:54	4.45	0	102.63
10/04/2000	8:14:54	5.27	0	32.49
10/04/2000	8:15:54	3.65	0	25.19
10/04/2000	8:16:54	3.27	0	63.59
10/04/2000	8:17:54	3.01	0	162.33
10/04/2000	8:18:54	2.94	0	288.95
10/04/2000	8:19:54	2.57	0	281.73
10/04/2000	8:20:54	1.39	0	243.78
10/04/2000	8:21:54	1.11	0	152.87
10/04/2000	8:22:54	1	0	96.73
10/04/2000	8:23:54	1.2	0	94.54
10/04/2000	8:24:54	1.36	0	136.06
10/04/2000	8:25:54	1.29	0.01	196.66
10/04/2000	8:26:54	1.21	0.01	222.75
10/04/2000	8:27:54	1.66	0.01	152.26
10/04/2000	8:28:54	4.6	0.01	46.08
10/04/2000	8:29:54	4.8	0.01	179.91
10/04/2000	8:30:54	1	0.01	227.91
10/04/2000	8:31:54	0.72	0.01	264.45
10/04/2000	8:32:54	0.66	0.01	249.98
10/04/2000	8:33:54	0.66	0.01	215.88
10/04/2000	8:34:54	0.73	0.01	190.05
10/04/2000	8:35:54	0.82	0.01	165.1
10/04/2000	8:36:54	0.83	0.01	128.68
10/04/2000	8:37:54	0.94	0.01	177.95
10/04/2000	8:38:54	1.11	0.01	192.53
10/04/2000	8:39:54	1.45	0.01	182.29
10/04/2000	8:40:54	1.77	0.01	160.74
10/04/2000	8:41:54	2.43	0.01	119.9
10/04/2000	8:42:54	10.2	0.01	67.14
10/04/2000	8:43:54	5.83	0.01	125.91
10/04/2000	8:44:54	10.87	0.01	28.13
10/04/2000	8:45:54	17.85	0.01	13.77
10/04/2000	8:46:54	10.89	0.01	53.47
10/04/2000	8:47:54	2.98	0.01	42.74

10/04/2000	8:48:54	11.94	0.01	13.11
10/04/2000	8:49:54	14.34	0.01	12.14
10/04/2000	8:50:54	11.39	0.01	20.72
10/04/2000	8:51:54	11.19	0.01	63.25
10/04/2000	8:52:54	8.48	0.01	12.29
10/04/2000	8:53:54	7.06	0.01	8.3
10/04/2000	8:54:54	7.04	0.01	6.56
10/04/2000	8:55:54	7.62	0.01	5.89
10/04/2000	8:56:54	6.86	0.01	5.88
10/04/2000	8:57:54	6.48	0.01	5.06
10/04/2000	8:58:54	6.24	0.01	5.1
10/04/2000	8:59:54	6.05	0.01	5.17
10/04/2000	9:00:54	6	0.01	5.14
10/04/2000	9:01:54	6.15	0.01	5.81
10/04/2000	9:02:54	5.96	0.01	7.09
10/04/2000	9:03:54	5.4	0.01	11.28
10/04/2000	9:04:54	5.34	0.01	12.81
10/04/2000	9:05:54	5.06	0.01	13.11
10/04/2000	9:06:54	5.36	0.01	13.82
10/04/2000	9:07:54	5.38	0.01	14.85
10/04/2000	9:08:54	5.28	0.01	15.1
10/04/2000	9:09:54	5.29	0.01	15.44
10/04/2000	9:10:54	5.4	0.01	16.54
10/04/2000	9:11:54	5.18	0.01	14.46
10/04/2000	9:12:54	5.11	0.01	14.7
10/04/2000	9:13:54	5.44	0.01	15.09
10/04/2000	9:14:54	5.25	0.01	15.06
10/04/2000	9:15:54	4.19	0.01	35.26
10/04/2000	9:16:54	3.05	0.01	46.94
10/04/2000	9:17:54	3.86	0.01	44.03
10/04/2000	9:18:54	6.81	0.01	78.76
10/04/2000	9:19:54	2.26	0.01	92.32
10/04/2000	9:20:54	1.62	0.01	98.76
10/04/2000	9:21:54	1.5	0.01	105.77
10/04/2000	9:22:54	1.42	0	103.81
10/04/2000	9:23:54	1.22	0.01	84.47
10/04/2000	9:24:54	1.12	0.01	63.85
10/04/2000	9:25:54	1.12	0	77.39
10/04/2000	9:26:54	1.12	0.01	85.09
10/04/2000	9:27:54	1.23	0.01	88.42
10/04/2000	9:28:54	1.22	0	103.34
10/04/2000	9:29:54	1.12	0	68.7
10/04/2000	9:30:54	1.12	0	106.78
10/04/2000	9:31:54	1.15	0	120.22
10/04/2000	9:32:54	1.83	0.01	14.15
10/04/2000	9:33:54	2.25	0.01	36.14
10/04/2000	9:34:54	1.77	0.01	165.54
10/04/2000	9:35:54	1.43	0.01	165.2
10/04/2000	9:36:54	1.42	0.01	156.18

10/04/2000	9:37:54	2.64	0.01	100.22
10/04/2000	9:38:54	3.72	0.01	49.98
10/04/2000	9:39:54	2.5	0.01	23.57
10/04/2000	9:40:54	2.22	0.01	37
10/04/2000	9:41:54	2.05	0.01	57.17
10/04/2000	9:42:54	1.95	0.01	74.1
10/04/2000	9:43:54	1.73	0.01	193.41
10/04/2000	9:44:54	1.85	0.01	238.66
10/04/2000	9:45:54	1.83	0.01	264.87
10/04/2000	9:46:54	2.3	0.01	200.5
10/04/2000	9:47:54	2.54	0.01	303.66
10/04/2000	9:48:54	2.87	0.01	369.16
10/04/2000	9:49:54	3.1	0.01	374.46
10/04/2000	9:50:54	2.74	0.01	323.52
10/04/2000	9:51:54	2.67	0.01	258.54
10/04/2000	9:52:54	1.82	0.01	217.47
10/04/2000	9:53:54	1.38	0.01	170.68
10/04/2000	9:54:54	1.27	0.01	192.72
10/04/2000	9:55:54	1.25	0.01	208.32
10/04/2000	9:56:54	1.05	0.01	321.44
10/04/2000	9:57:54	1.08	0.01	287.23
10/04/2000	9:58:54	1.04	0.01	237.59
10/04/2000	9:59:54	1.5	0.01	220.56
Average End		3.5		109.2
10/04/2000	10:00:54	4.14	0.01	68.86
10/04/2000	10:01:54	6.9	0.01	137.23
10/04/2000	10:02:54	1.59	0.01	25.01
10/04/2000	10:03:54	0.02	0.01	1.33
10/04/2000	10:04:54	0.02	0.01	233.9
10/04/2000	10:05:54	0.02	0.01	865.25
10/04/2000	10:06:54	0.02	0.01	873.58
10/04/2000	10:07:54	0.02	0.01	874.17
10/04/2000	10:08:54	0.02	0.01	811.41
10/04/2000	10:09:54	0.02	0.01	619.66
10/04/2000	10:10:54	0.02	0.01	614.25
10/04/2000	10:11:54	0.02	0.01	614.56
10/04/2000	10:12:54	1.39	0.01	262.14
10/04/2000	10:13:54	2.61	0.01	88
10/04/2000	10:14:54	0.87	0.01	302.7
10/04/2000	10:15:54	0.03	0.01	328.61
10/04/2000	10:16:54	0.02	0.01	87.47
10/04/2000	10:17:54	0.02	0.01	1.26
10/04/2000	10:18:54	0.02	0.01	1.23
10/04/2000	10:19:54	11.97	0.01	0.89
10/04/2000	10:20:54	74.66	0.02	0.14
10/04/2000	10:21:54	84.61	0.02	0.25
10/04/2000	10:22:54	84.94	0.02	0.12
10/04/2000	10:23:54	85.1	0.02	0.18
10/04/2000	10:24:54	85.45	0.02	0.19

10/04/2000	10:25:54	87.92	0.02	0.04
10/04/2000	10:26:54	91.36	0.02	0.17
10/04/2000	10:27:54	88.96	0.02	0.14
10/04/2000	10:28:54	69.85	0.02	0.2
10/04/2000	10:29:54	47.58	0.02	0.14
10/04/2000	10:30:54	47.65	0.02	0.21
10/04/2000	10:31:54	48.72	0.02	0.13
10/04/2000	10:32:54	49.11	0.02	0.17
10/04/2000	10:33:54	35.41	0.02	1.11
10/04/2000	10:34:54	3.35	0.01	1.18
10/04/2000	10:35:54	0.01	0.01	1.22
10/04/2000	10:36:54	2.89	0.01	5.26
10/04/2000	10:37:54	59.22	0.02	1.18
10/04/2000	10:38:54	84.5	0.02	0.19
10/04/2000	10:39:54	89.98	0.02	0.2
10/04/2000	10:40:54	82.47	0.02	0.58
10/04/2000	10:41:54	19.08	0.01	1.23
10/04/2000	10:42:54	0.12	0.01	1.16
10/04/2000	10:44:30	0.3	0	89.42
Run 2	Start	NOX		CO
10/04/2000	10:45:30	1.09	0	156.42
10/04/2000	10:46:30	0.95	0	147.98
10/04/2000	10:47:30	2.53	0	45.06
10/04/2000	10:48:30	4.34	0	58.15
10/04/2000	10:49:30	2.6	0	72.59
10/04/2000	10:50:30	3.56	0	66.05
10/04/2000	10:51:30	2.88	0	33.02
10/04/2000	10:52:30	2.12	0	57.27
10/04/2000	10:53:30	2.01	0	79.68
10/04/2000	10:54:30	1.86	0	108.2
10/04/2000	10:55:30	1.71	0	114.25
10/04/2000	10:56:30	1.71	0	109.75
10/04/2000	10:57:30	1.68	0	154.54
10/04/2000	10:58:30	1.68	0	176.84
10/04/2000	10:59:30	1.8	0	147.77
10/04/2000	11:00:30	1.45	0.01	161
10/04/2000	11:01:30	1.4	0	223.03
10/04/2000	11:02:30	1.48	0.01	223.73
10/04/2000	11:03:30	1.27	0	169.04
10/04/2000	11:04:30	0.9	0	99.98
10/04/2000	11:05:30	0.89	0	62.56
10/04/2000	11:06:30	1.11	0	26.09
10/04/2000	11:07:30	1.24	0	30.96
10/04/2000	11:08:30	2.45	0	28.48
10/04/2000	11:09:30	2.56	0	71.33
10/04/2000	11:10:30	0.93	0	115.27
10/04/2000	11:11:30	0.37	0	125.18
10/04/2000	11:12:30	0.32	0	176.78
10/04/2000	11:13:30	0.32	0	125.08

10/04/2000	11:14:30	0.63	0	102.07
10/04/2000	11:15:30	3.81	0	34.6
10/04/2000	11:16:30	7.85	0	59.2
10/04/2000	11:17:30	1.91	0	77.88
10/04/2000	11:18:30	0.71	0	76.19
10/04/2000	11:19:30	0.47	0	94.56
10/04/2000	11:20:30	0.44	0	98.73
10/04/2000	11:21:30	0.57	0	109.95
10/04/2000	11:22:30	1.3	0	89.42
10/04/2000	11:23:30	6.05	0	18.23
10/04/2000	11:24:30	8.36	0	31.53
10/04/2000	11:25:30	2.86	0	46.48
10/04/2000	11:26:30	3.48	0	23.2
10/04/2000	11:27:30	6.02	0	29.88
10/04/2000	11:28:30	2.12	0	47.38
10/04/2000	11:29:30	3.05	0	27.73
10/04/2000	11:30:30	6.43	0	7.78
10/04/2000	11:31:30	7	0	8.98
10/04/2000	11:32:30	6.4	0	13.79
10/04/2000	11:33:30	5.67	0	16.36
10/04/2000	11:34:30	5.36	0	43.47
10/04/2000	11:35:30	4.38	0	14.44
10/04/2000	11:36:30	4	0	6.54
10/04/2000	11:37:30	3.06	0	6.21
10/04/2000	11:38:30	3.06	0	8.73
10/04/2000	11:39:30	3.64	0	66.97
10/04/2000	11:40:30	2.32	0	75.52
10/04/2000	11:41:30	3.38	0	33.53
10/04/2000	11:42:30	2.88	0	43.72
10/04/2000	11:43:30	1.01	0	69.96
10/04/2000	11:44:30	0.79	0	66.81
10/04/2000	11:45:30	0.52	0	54.64
10/04/2000	11:46:30	0.51	0	69.33
10/04/2000	11:47:30	0.51	0	82.75
10/04/2000	11:48:30	0.59	0	105.83
10/04/2000	11:49:30	0.54	0	105.09
10/04/2000	11:50:30	0.5	0	101.05
10/04/2000	11:51:30	0.44	0	78.25
10/04/2000	11:52:30	0.44	0	80.62
10/04/2000	11:53:30	0.32	0	68.78
10/04/2000	11:54:30	0.32	0	49.61
10/04/2000	11:55:30	0.31	0	33.39
10/04/2000	11:56:30	0.32	0	28.49
10/04/2000	11:57:30	0.87	0	10.37
10/04/2000	11:58:30	2.02	0	17.33
10/04/2000	11:59:30	1.68	0	57.13
Average	End	2.2		74.1
10/04/2000	12:00:30	1.03	0	62.17
10/04/2000	12:01:30	2.4	0	27.57

10/04/2000	12:02:30	1.54	0	10.39
10/04/2000	12:03:30	-0.04	0	0.82
10/04/2000	12:04:30	-0.19	0	492.54
10/04/2000	12:05:30	-0.19	0	891.43
10/04/2000	12:06:30	-0.19	0	870.71
10/04/2000	12:07:30	-0.19	0	864.93
10/04/2000	12:08:30	-0.19	0	248.15
10/04/2000	12:09:30	-0.19	0	1.42
10/04/2000	12:10:30	-0.19	0	1.07
10/04/2000	12:11:30	4.96	0	0.71
10/04/2000	12:12:30	57.78	0.01	-0.08
10/04/2000	12:13:30	75.28	0.01	0.17
10/04/2000	12:14:30	75.83	0.01	0.08
10/04/2000	12:15:30	77.21	0.01	0.04
10/04/2000	12:16:30	77.62	0.01	0.08
10/04/2000	12:17:30	78.43	0.01	0.08
10/04/2000	12:18:30	87.43	0.01	0.08
10/04/2000	12:19:30	99.78	0.01	0.07
10/04/2000	12:20:30	98.7	0.01	0.2
10/04/2000	12:21:30	94.4	0.01	0.03
10/04/2000	12:22:30	93.9	0.01	0.17
10/04/2000	12:23:30	93.74	0.01	0.04
10/04/2000	12:24:30	93.69	0.01	0.03
10/04/2000	12:25:30	93.58	0.01	0.07
10/04/2000	12:26:30	97.56	0.01	0.07
10/04/2000	12:27:30	98.8	0.01	-0.11
10/04/2000	12:28:30	90.79	0.01	0.08
10/04/2000	12:29:30	90.6	0.01	3.82
10/04/2000	12:30:30	49.81	0	570.02
10/04/2000	12:31:30	1.03	0	808.45
10/04/2000	12:32:30	0.05	0	810.71
10/04/2000	12:33:30	-0.05	0	805.59
10/04/2000	12:34:30	-0.09	0	836.62
10/04/2000	12:35:30	-0.09	0	854.57
10/04/2000	12:36:30	-0.09	0	155.94
10/04/2000	12:37:30	-0.09	0	1.74
10/04/2000	12:38:30	-0.09	0	3.43
10/04/2000	12:39:30	-0.09	0	569.02
10/04/2000	12:40:30	-0.17	0	868.41
10/04/2000	12:41:30	0.46	0	683.33
10/04/2000	12:42:30	9.45	0	29.8
10/04/2000	12:43:30	10.32	0	15.28
10/04/2000	12:44:52	8.06	0.01	23.86
Run 3	Start	NOX		CO
10/04/2000	12:45:52	8.32	0.01	52.26
10/04/2000	12:46:52	7.33	0.01	18.66
10/04/2000	12:47:52	6.34	0.01	10.3
10/04/2000	12:48:52	7.3	0.01	8.73
10/04/2000	12:49:52	7.02	0.01	7.46

10/04/2000	12:50:52	5.58	0.01	8.05
10/04/2000	12:51:52	5.36	0.01	10.51
10/04/2000	12:52:52	5.29	0.01	11.15
10/04/2000	12:53:52	5.84	0.01	17.75
10/04/2000	12:54:52	5.28	0.01	65.19
10/04/2000	12:55:52	7.81	0.01	33.08
10/04/2000	12:56:52	8.79	0.01	23.83
10/04/2000	12:57:52	11.92	0.01	24.25
10/04/2000	12:58:52	4.1	0.01	27.5
10/04/2000	12:59:52	3.44	0.01	28.77
10/04/2000	13:00:52	3.24	0	78.93
10/04/2000	13:01:52	4.91	0.01	107.31
10/04/2000	13:02:52	3.61	0.01	121.87
10/04/2000	13:03:52	1.85	0	143.19
10/04/2000	13:04:52	3.08	0	100.7
10/04/2000	13:05:52	2.38	0	103.97
10/04/2000	13:06:52	1.19	0	152.99
10/04/2000	13:07:52	0.77	0	273.18
10/04/2000	13:08:52	1.05	0	251.14
10/04/2000	13:09:52	6.47	0.01	50.96
10/04/2000	13:10:52	4.98	0	104.8
10/04/2000	13:11:52	2.13	0	110.73
10/04/2000	13:12:52	2.12	0	74.77
10/04/2000	13:13:52	2.21	0	60.27
10/04/2000	13:14:52	7.85	0.01	33.7
10/04/2000	13:15:52	5.6	0	30.25
10/04/2000	13:16:52	2.83	0	42.68
10/04/2000	13:17:52	2.39	0	43.5
10/04/2000	13:18:52	2.34	0.01	65.53
10/04/2000	13:19:52	2.23	0	104.86
10/04/2000	13:20:52	2.3	0	150.95
10/04/2000	13:21:52	2.38	0	110.44
10/04/2000	13:22:52	2.42	0.01	66.62
10/04/2000	13:23:52	2.11	0	234.46
10/04/2000	13:24:52	1.79	0	116.69
10/04/2000	13:25:52	2.48	0	200.68
10/04/2000	13:26:52	1.69	0	210.86
10/04/2000	13:27:52	0.86	0	273.48
10/04/2000	13:28:52	0.74	0	282.42
10/04/2000	13:29:52	0.87	0	212.32
10/04/2000	13:30:52	2.22	0	109.07
10/04/2000	13:31:52	7.04	0	14.9
10/04/2000	13:32:52	6.73	0	8.4
10/04/2000	13:33:52	8.21	0	59.28
10/04/2000	13:34:52	2.37	0	86.05
10/04/2000	13:35:52	1.28	0	156.73
10/04/2000	13:36:52	1.52	0	233.71
10/04/2000	13:37:52	1.41	0	246.61
10/04/2000	13:38:52	1.33	0	315.66

10/04/2000	13:39:52	1.55	0	372.27
10/04/2000	13:40:52	1.6	0	317.74
10/04/2000	13:41:52	1.67	0	267.81
10/04/2000	13:42:52	2.04	0	278.83
10/04/2000	13:43:52	2.22	0	347.09
10/04/2000	13:44:52	2.45	0	200.47
10/04/2000	13:45:52	7.85	0	56.9
10/04/2000	13:46:52	13.65	0	52.06
10/04/2000	13:47:52	3.64	0	171.55
10/04/2000	13:48:52	1.27	0	244.64
10/04/2000	13:49:52	2.23	0	188.82
10/04/2000	13:50:52	10.83	0	43.76
10/04/2000	13:51:52	17.13	0	21.6
10/04/2000	13:52:52	11.07	0	15.26
10/04/2000	13:53:52	11.76	0	17
10/04/2000	13:54:52	11.62	0	14.15
10/04/2000	13:55:52	12.99	0	46.97
10/04/2000	13:56:52	8.6	0	23.14
10/04/2000	13:57:52	7.87	0	14.61
10/04/2000	13:58:52	6.36	0	12.32
10/04/2000	13:59:52	5.26	0	11.11
10/04/2000	14:00:52	5.34	0	9.74
10/04/2000	14:01:52	6.44	0	9.45
10/04/2000	14:02:52	6.11	0	9.06
10/04/2000	14:03:52	4.41	0	11.35
10/04/2000	14:04:52	4.58	0	61.67
10/04/2000	14:05:52	1.75	0	118.64
Average	End	4.8		104.1
10/04/2000	14:06:52	0	0	1.72
10/04/2000	14:07:52	-0.13	0	1.02
10/04/2000	14:08:52	-0.19	0	356.43
10/04/2000	14:09:52	-0.19	0	869.25
10/04/2000	14:10:52	-0.19	0	869.39
10/04/2000	14:11:52	0.92	0	740.8
10/04/2000	14:12:52	55.92	0.01	34.32
10/04/2000	14:13:52	88.69	0.01	0.93
10/04/2000	14:14:52	90.11	0.01	0.83
10/04/2000	14:15:52	91.26	0.01	0.08
10/04/2000	14:16:52	80.62	0.01	0.61
10/04/2000	14:17:52	12.98	0	1.08
10/04/2000	14:19:40	0.33	0	57.31
10/04/2000	14:20:40	2.26	0	142.75
10/04/2000	14:21:40	3.5	0	42.1
Run 3		NOX		CO
10/04/2000	14:22:40	4.02	0	102.36
10/04/2000	14:23:40	2.68	0	129.08
10/04/2000	14:24:40	2.66	0	86.21
10/04/2000	14:25:40	5.13	0	47.83
10/04/2000	14:26:40	3.95	0	46.53

10/04/2000	14:27:40	3.6	0	38.14
10/04/2000	14:28:40	2.66	0	108.78
10/04/2000	14:29:40	2.01	0	206.05
10/04/2000	14:30:40	2.25	0	249.71
10/04/2000	14:31:40	2.41	0	184.63
10/04/2000	14:32:40	2.36	0	159.7
10/04/2000	14:33:40	2.09	0	262.44
10/04/2000	14:34:40	2.39	0	394.78
10/04/2000	14:35:40	1.62	0	449.89
10/04/2000	14:36:40	1.47	0	396.37
10/04/2000	14:37:40	0.91	0	289.74
10/04/2000	14:38:40	0.78	0	265.58
10/04/2000	14:39:40	0.62	0	279.13
10/04/2000	14:40:40	0.77	0	241.59
10/04/2000	14:41:40	0.81	0	292.94
10/04/2000	14:42:40	1.44	0	275.78
10/04/2000	14:43:40	5.58	0	97.55
10/04/2000	14:44:40	6.54	0	26.38
10/04/2000	14:45:40	7.74	0	14.28
10/04/2000	14:46:40	16.22	0	11.48
10/04/2000	14:47:40	5.54	0	8.67
10/04/2000	14:48:40	5.14	0	6.64
10/04/2000	14:49:40	6.39	0	6.39
10/04/2000	14:50:40	6.14	0	5.81
10/04/2000	14:51:40	5.08	0	5.01
10/04/2000	14:52:40	5.69	0	4.77
10/04/2000	14:53:40	5.39	0	4.4
10/04/2000	14:54:40	5.91	0	4.58
10/04/2000	14:55:40	6.98	0	5.16
10/04/2000	14:56:40	6.65	0	4.17
10/04/2000	14:57:40	5.26	0	3.63
10/04/2000	14:58:40	4.75	0	4.01
10/04/2000	14:59:40	5.87	0	3.92
10/04/2000	15:00:40	6.54	0	4.1
10/04/2000	15:01:40	9.34	0	6.31
10/04/2000	15:02:40	16.07	0	70.22
10/04/2000	15:03:40	1.48	0	79.81
10/04/2000	15:04:40	1.31	0	104.25
10/04/2000	15:05:40	1.36	0	147.98
10/04/2000	15:06:40	1.01	0	222.77
10/04/2000	15:07:40	0.81	0	173.86
10/04/2000	15:08:40	0.83	0	338.39
10/04/2000	15:09:40	1.17	0	224.19
10/04/2000	15:10:40	1.59	0	142.41
10/04/2000	15:11:40	1.6	0	153.41
10/04/2000	15:12:40	1.75	0	199.95
10/04/2000	15:13:40	4.29	0	76.72
10/04/2000	15:14:40	8.09	0	19.51
10/04/2000	15:15:40	13.73	0	10.42

10/04/2000	15:16:40	14.33	0	8.95
10/04/2000	15:17:40	12.71	0	9.18
10/04/2000	15:18:40	10.66	0	17.59
10/04/2000	15:19:40	9.41	0	29.55
10/04/2000	15:20:40	10.34	0	66.21
10/04/2000	15:21:40	6.62	0	22.37
10/04/2000	15:22:40	4.5	0	10.72
10/04/2000	15:23:40	4.44	0	7.48
10/04/2000	15:24:40	4.66	0	6.01
10/04/2000	15:25:40	4.38	0	5.52
10/04/2000	15:26:40	4.09	0	5.76
10/04/2000	15:27:40	5.09	0	9.15
10/04/2000	15:28:40	8.55	0	73.67
10/04/2000	15:29:40	6.73	0	111.02
10/04/2000	15:30:40	5.65	0	95.18
10/04/2000	15:31:40	6.61	0	65.19
10/04/2000	15:32:40	7.42	0	32.5
10/04/2000	15:33:40	2.79	0	77.58
10/04/2000	15:34:40	3.21	0	93.55
10/04/2000	15:35:40	3.05	0	109.49
10/04/2000	15:36:40	3.23	0	226.64
10/04/2000	15:37:40	3.57	0	292.95
10/04/2000	15:38:40	3.48	0	278.17
10/04/2000	15:39:40	2.81	0	220.99
10/04/2000	15:40:40	2.24	0	206.4
10/04/2000	15:41:40	2.29	0	231.99
10/04/2000	15:42:40	1.8	0	263.3
10/04/2000	15:43:40	1.13	0	263.46
10/04/2000	15:44:40	0.9	0	219.23
10/04/2000	15:45:40	2.96	0	24.24
10/04/2000	15:46:40	5.56	0	102.53
10/04/2000	15:47:40	2.54	0	198.53
10/04/2000	15:48:40	1.6	0	166.99
10/04/2000	15:49:40	1.41	0	144.6
10/04/2000	15:50:40	1.31	0	162.25
10/04/2000	15:51:40	1.35	0	196.34
10/04/2000	15:52:40	1.53	0	201.7
10/04/2000	15:53:40	4.01	0	69.85
10/04/2000	15:54:40	4.59	0	32.15
10/04/2000	15:55:40	2.22	0	34.05
10/04/2000	15:56:40	2.28	0	66.59
10/04/2000	15:57:40	2.15	0	125.86
10/04/2000	15:58:40	2.1	0	192.06
10/04/2000	15:59:40	1.8	0	276
10/04/2000	16:00:40	1.51	0	281.12
10/04/2000	16:01:40	1.54	0	312.21
10/04/2000	16:02:40	1.52	0	371.12
10/04/2000	16:03:40	1.75	0	382.28
10/04/2000	16:04:40	1.76	0	295.58

10/04/2000	16:05:40	0.83	0	204.22
10/04/2000	16:06:40	0.65	0	193.42
10/04/2000	16:07:40	0.55	0	264.4
10/04/2000	16:08:40	0.57	0	259.75
10/04/2000	16:09:40	0.81	0	227.64
10/04/2000	16:10:40	2.8	0	100.98
10/04/2000	16:11:40	3.79	0	10.84
10/04/2000	16:12:40	3.4	0	6.22
10/04/2000	16:13:40	5.01	0	6.54
10/04/2000	16:14:40	7.66	0	85.94
10/04/2000	16:15:40	0.91	0	118.32
10/04/2000	16:16:40	0.59	0	137.55
10/04/2000	16:17:40	0.61	0	183.17
10/04/2000	16:18:40	0.76	0	174.54
10/04/2000	16:19:40	0.77	0	204.67
10/04/2000	16:20:40	0.65	0	152.61
10/04/2000	16:21:40	0.74	0	165.48
Average	End	3.8		132.4

INITIAL CEM CALIBRATION AND PERFORMANCE EVALUATION

Plant: New Port Steel
Location: Bag House Field
Date: 10-3-0[illegible]
Operator: G[illegible]
Project #: 5620.001

Parameter: SO_2, CO_2, O_2, NO_x, THC
Monitor: ppm or %
Span Value: 100
Chart Scale: 99.[illegible]
Pbar, in. Hg.: 29.6[illegible]

Cylinder #	Cal. Gas Conc., ppm or %	Chart Divisions: Direct Injection to Monitor	Chart Divisions: Injection Through System	Concentration Predicted by Equation,* Direct System		Calibration Error,** % of Span	Sampling System Bias,*** % of Span
	0	0	0	-.16	-.16	—	—
	49.49	50.2	50.20	49.8	49.8	-1.4	—
	90.7	91	91	90.5	90.5	-.33	-.56

* Perform linear regression of pretest cal. gas concentration vs. chart divisions to determine the following equation:

$y = mx + b$ $\quad$ x = ppm $\quad$ y = chart divisions

For Data Reduction:

$$\text{Pollutant, ppm/\%} = \frac{(\text{Chart Division} - b)}{m} = \frac{(CD - 16501)}{(1.008)}$$

Correlation Coefficient = .9999

Calculation concentration predicted by equatio using actual chart response obtained from each calibration gas response.

$$\text{** Analyzer cal. error, \% cal. gas value} = \frac{(\text{Cal. gas conc., ppm} - \text{conc. predicted, ppm}) \times 100}{\text{Cal. gas value, ppm}}$$

Acceptable limit = ≤ 2% of calibration gas value (≤ 5% for THC)

$$\text{*** Sampling system bias} = \frac{(\text{Direct inject. gas conc.} - \text{System inject. gas conc.}) \times 100}{\text{Span value}}$$

Acceptable limit ≤ 5% of span

Minimum detectable limit = 2% of span or _____ ppm or % (circle one)

Rise time to 95% of response for high cal. gas injected through the system (return to zero after each injection): _____ s, _____ s, _____ s Average = _____ s

Precision, % scale = difference in chart division response for two repeated injections of the gas concentrations = _____ - _____ = _____ %
(Clock time =)

DAILY CEM CALIBRATION AND PERFORMANCE EVALUATION

Plant: New Port Steel
Location: Bag House Inlet
Date: 10-3-06
Operator: GG
Project #: 5620.001
Time, Pretest: _____ Post-test: _____
Run #: _____

Parameter: SO_2, CO_2, O_2, NO_x, THC
Monitor: ppm or %
Span Value: 100
Chart Scale: 99.4
Pbar, in. Hg.: 29.66
Ambient Temp., F: _____

Cyl. #	Cal. Gas Conc., ppm or %	Calibrations (Chart Divisions) 1255			1999	Concentration Predicted By Equation*				Analyzer Calibration Error,** % of Span	Drift,*** % of Span
	0	0	0	0	0	-.16	-.16	-.16	-.16	—	—
	49.49	50.2	52.5	52	53.0	49.85	52.1	51.6	52.6		
	90.7	91	95	91	95.5	90.5	94	90.5	99.9		

* Perform linear regression of pretest cal. gas concentration vs. chart divisions to determine the following equation:

$y = mx + b$ $\quad x = \text{ppm}$ $\quad y = \text{chart divisions}$

For Data Reduction:

$$\text{Pollutant, ppm/\%} = \frac{(\text{Chart Division} - b)}{m} = \frac{(CD - 16501)}{(1.0036)}$$

Correlation Coefficient = .9997

$$\text{** Analyzer cal. error, \% cal. gas value} = \frac{(\text{Cal. gas conc.} - \text{conc. predicted}) \times 100}{\text{Cal. gas value, ppm}}$$

Acceptable limit = ≤ 2% of calibration gas value (≤ 5% for THC)

$$\text{*** Drift, \% Span} = \frac{(\text{Post-test cal. response} - \text{initial cal. response}) \times 100}{\text{Span value}}$$

Acceptable limit ≤ 3% of span

Minimum detectable limit = 2% of span or _____ ppm or % (circle one)

Maximum zero drift = _____ % of span or _____ ppm or % (circle one)

Maximum calibration drift = _____ % of span or _____ ppm or % (circle one)

COMMENTS: Pretest or post-test (circle one) calibration used to quantitate sample data. Post-test is used if drift exceeds limits and if post-test

15

CEM DATA REDUCTION - BAG ANALYSIS OR STEADY READINGS

Plant: New Port Steel
Location: Bag House Front
Date: 10-3-00

Parameter: SO_2, CO_2, O_2, NO_X*, THC
Operator: G Gay
Project #:

$$\text{Pollutant, ppm/\%} = \frac{(\text{Chart Division} - b)}{m} = \frac{(CD - 1.6501)}{(1.00367)}$$

Run #	Time** (24-Hr)	Average Chart Division	Concentration	Comments
1	1012 1022	3	2.8	
	1022 1032	2	1.8	
	1032 1042	2	1.8	
	1042 1052	8	7.8	
	1052 1102	8	7.8	
	1102 1112	2	1.8	
	1112 1122	2	1.8	
	1122 1132	3	2.82	
	1132 1142	4	3.82	
	1142 1152	4	3.82	3.60
	1152 1202			Press Pour 45
	1202 1212			

* For NO_X Indicate whether NO, NO + NO_2, or NO_2 for specific interval.

** Indicate whether time interval is from beginning of first time to beginning of second time or to end of second time (circle one, or describe alternate).

Calculated By: G Gay Date: 10-3-00

CEM DATA REDUCTION - BAG ANALYSIS OR STEADY READINGS

Plant: New Port Steel
Location: Bag House Inlet
Date: 10-3-00

Parameter: SO_2, CO_2, O_2, (NO_X*), THC, CO
Operator: G Gay
Project #: 5620.001

$$\text{Pollutant, ppm/\%} = \frac{(\text{Chart Division - b})}{m} = \frac{(CD - 1650)}{(1.00)}$$

Run #	Time** (24-Hr)		Average Chart Division	Concentration	Comments
2	1629	1639	2	1.8	
	1639	1649	2	1.8	
	1649	1659	4	3.8	
	1659	1709	5	4.8	
	1709	1719	3	2.8	
	1719	1729	2	1.8	
	1729	1739	4	3.8	
	1739	1749	2	1.8	
	1749	1759	2	1.8	
	1759	1804	2	1.8	
	1809	1819	8	7.8	
	1819	1829	3	2.8	
	1829	1839	3	2.8	
	1839	1849	4	3.8	
	1849	1859	4	3.8	
	1857	1909	4	3.8	
	1909	1919	2	1.8	
	1919	1929	5	4.8	3.38 Avg

* For NO_X Indicate whether NO, NO + NO_2, or NO_2 for specific interval.

** Indicate whether time interval is from beginning of first time to beginning of second time or to end of second time (circle one, or describe alternate).

Calculated By: G Gay Date: 10-3-00

DAILY CEM CALIBRATION AND PERFORMANCE EVALUATION

Plant: New Port Steel
Location: Bag House Fuel
Date: 10-4-00
Operator: GGM
Project #: 5620.001
Time, Pretest: _____ Post-test: _____
Run #: _____

Parameter: SO_2, CO_2, O_2, NO_x, THC
Monitor: ppm or %
Span Value: 100
Chart Scale: 99.1
Pbar, in. Hg.: 29.68
Ambient Temp., F: _____

Cyl. #	Cal. Gas Conc., ppm or %	Calibrations (Chart Divisions) 725 10 12 1405 1640	Concentration Predicted By Equation*	Analyzer Calibration Error,** % of Span	Drift,*** % of Span
	0	0 0 0	-.40		
	49.49	51 985	50.3		
	90.7	91 88 90 90 91 88	90.2		

* Perform linear regression of pretest cal. gas concentration vs. chart divisions to determine the following equation:

$y = mx + b$ x = ppm y = chart divisions

For Data Reduction:

$$\text{Pollutant, ppm/\%} = \frac{(\text{Chart Division} - b)}{m} = \frac{(CD - .4066)}{(1.004)}$$

Correlation Coefficient = .9993

$$\text{** Analyzer cal. error, \% cal. gas value} = \frac{(\text{Cal. gas conc.} - \text{conc. predicted}) \times 100}{\text{Cal. gas value, ppm}}$$

Acceptable limit = ≤ 2% of calibration gas value (≤ 5% for THC)

$$\text{*** Drift, \% Span} = \frac{(\text{Post-test cal. response} - \text{initial cal. response}) \times 100}{\text{Span value}}$$

Acceptable limit ≤ 3% of span
Minimum detectable limit = 2% of span or _____ ppm or % (circle one)
Maximum zero drift = _____ % of span or _____ ppm or % (circle one)
Maximum calibration drift = ____ % of span or _____ ppm or % (circle one)

COMMENTS: Pretest or post-test (circle one) calibration used to quantitate sample data. Post-test is used if drift exceeds limits and if post-test yields higher concentrations.

CEM DATA REDUCTION - BAG ANALYSIS OR STEADY READINGS

Plant: Newport Steel
Location: Bag House Inlet
Date: 10-9-00

Parameter: SO_2, CO_2, O_2, NO_X*, THC, CO
Operator: GGn
Project #: 5620.001

$$\text{Pollutant, ppm/\%} = \frac{(\text{Chart Division - b})}{m} = \frac{(CD - .1066)}{(1.004)}$$

Run #	Time** (24-Hr)	Average Chart Division	Concentration	Comments
1	1245 1255	6	5.65	
	1255 1305	3	2.5	
	1305 1315	4	3.57	
	1315 1325	3	2.5	
	1325 1335	4	3.57	
	1335 1345	2	1.58	
	1345 1355	11	10.5	
	1355 1405	6	5.56	4.0
STOP TO CAL	1422 1432	3	2.5	
	1432 1442	2	1.58	
	1442 1452	6	5.56	
	1452 1502	5	4.5	
	1502 1512	2	1.58	
	1512 1522	7	6.56	
	1522 1532	7	6.56	
	1532 1542	4	3.57	
	1542 1552	2	1.58	
	1552 1602	2	1.58	

* For NO_X Indicate whether NO, NO + NO_2, or NO_2 for specific interval.

** Indicate whether time interval is from beginning of first time to beginning of second time or to end of second time (circle one, or describe alternate).

Calculated By: GGn Date: 10-9-00

CEM DATA REDUCTION - BAG ANALYSIS OR STEADY READINGS

Plant: New Post Steel
Location: Bag House Inlet
Date: 10-4-00

Parameter: SO_2, CO_2, O_2, NO_X*, THC, CO
Operator: G Gay
Project #: 5620.001

$$\text{Pollutant, ppm/\%} = \frac{(\text{Chart Division} - b)}{m} = \frac{(CD - .4066)}{(1.004)}$$

Run #	Time** (24-Hr)	Average Chart Division	Concentration	Comments
	1602 1612	5	4.57	
	1612 1622	1	1	3.78
	1632			

* For NO_X Indicate whether NO, NO + NO_2, or NO_2 for specific interval.

** Indicate whether time interval is from beginning of first time to beginning of second time or to end of second time (circle one, or describe alternate).

Calculated By: [illegible] Date: 10-4-00

CEM DATA REDUCTION - BAG ANALYSIS OR STEADY READINGS

Plant: Newport Steel
Location: Bag House F-6
Date: 10-4-00

Parameter: SO_2, CO_2, O_2, NO_X*, THC, CO
Operator: G Gay
Project #:

$$\text{Pollutant, ppm/\%} = \frac{(\text{Chart Division} - b)}{m} = \frac{(CD\ \cancel{1.000}\ 14.0667)}{(1.004)}$$

Run #	Time** (24-Hr)	Average Chart Division	Concentration	Comments
3	800 810	2	1.5	
	810 820	3	2.5	
	820 830	3	2.5	
	830 840	3	2.5	
	840 850	8	7.5	
	850 900	6	5.5	
	900 910	6	5.5	
	910 920	3	2.5	
	920 930	2	1.5	
	930 940	2	1.5	
	940 950	2	1.5	
	950 1000	2	1.5	1.65 Ave 3.52
	1000 1010			

* For NO_X Indicate whether NO, NO + NO_2, or NO_2 for specific interval.

** Indicate whether time interval is from beginning of first time to beginning of second time or to end of second time (circle one, or describe alternate).

Calculated By: [signature] Date: 10-4-00

CEM DATA REDUCTION - BAG ANALYSIS OR STEADY READINGS

Plant: Newport Steel
Location: Bag House Inlet
Date: 10-4-00

Parameter: SO_2, CO_2, O_2, NO_X*, THC, CO
Operator: G Gay
Project #: 5620.001

$$\text{Pollutant, ppm/\%} = \frac{(\text{Chart Division} - b)}{m} = \frac{(CD - .40667)}{(\ 1.004\ )}$$

Run #	Time** (24-Hr)	Average Chart Division	Concentration	Comments
3	1045 1055	2.5	2.08	
	1055 1105	1.5	1.08	
	1105 1115	1.5	1.08	
	1115 1125	2.5	2.08	
	1125 1135	4	3.5	
	1135 1145	4	3.5	
	1145 1155	1.5	1.08	2.1
	1155 1200	1.5	1.08	

* For NO_X Indicate whether NO, NO + NO_2, or NO_2 for specific interval.

** Indicate whether time interval is from beginning of first time to beginning of second time or to end of second time (circle one, or describe alternate).

Calculated By: [illegible] Date: [illegible]

INITIAL CEM CALIBRATION AND PERFORMANCE EVALUATION

Plant: New Post Steel
Location: Bag House Fuel
Date: 10-3-00
Operator: GGay
Project #: 5620.001

Parameter: SO_2, CO, O_2, NO_X, THC
Monitor: ppm or %
Span Value: 100
Chart Scale: 999.7
Pbar, in. Hg.: 29.66

Cylinder #	Cal. Gas Conc., ppm or %	Chart Divisions: Direct Injection to Monitor	Chart Divisions: Injection Through System	Concentration Predicted by Equation,* Direct System		Calibration Error,** % of Span	Sampling System Bias,*** % of Span
	0	0	0	-6.6	-6.6		
	300.2	31.5	31.5	309.8	309.8		
	600.6	60.5	60.5	601.2	601.2		
	896.4	89.5	89.5	892.9	892.7		

* Perform linear regression of pretest cal. gas concentration vs. chart divisions to determine the following equation:

$y = mx + b$ $\quad$ x = ppm $\quad$ y = chart divisions

For Data Reduction:

$$\text{Pollutant, ppm/\%} = \frac{(\text{Chart Division} - b)}{m} = \frac{(CD - 6.6385)}{(.099515)}$$

Correlation Coefficient = .9999

Calculation concentration predicted by equatio using actual chart response obtained from each calibration gas response.

$$\text{** Analyzer cal. error, \% cal. gas value} = \frac{(\text{Cal. gas conc., ppm} - \text{conc. predicted, ppm}) \times 100}{\text{Cal. gas value, ppm}}$$

Acceptable limit = ≤ 2% of calibration gas value (≤ 5% for THC)

$$\text{*** Sampling system bias} = \frac{(\text{Direct inject. gas conc.} - \text{System inject. gas conc.}) \times 100}{\text{Span value}}$$

Acceptable limit ≤ 5% of span

Minimum detectable limit = 2% of span or _____ ppm or % (circle one)

Rise time to 95% of response for high cal. gas injected through the system (return to zero after each injection): _____s, _____s, _____s Average = _____s

Precision, % scale = difference in chart division response for two repeated injections of the gas concentrations = _____ - _____ = _____ %
(Clock time =)

DAILY CEM CALIBRATION AND PERFORMANCE EVALUATION

Plant: New Port Steel
Location: BAC House Fuel
Date: 10-3-00
Operator: G Gay
Project #: 5620.001
Time, Pretest: _____ Post-test: _____
Run #: _____

Parameter: SO_2, CO_2, O_2, NO_x, THC
Monitor: ppm or %
Span Value: 100
Chart Scale: _____
Pbar, in. Hg.: 29.66
Ambient Temp., F: _____

Cyl. #	Cal. Gas Conc., ppm or %	Calibrations (Chart Divisions)				Concentration Predicted By Equation*	Analyzer Calibration Error,** % of Span	Drift,*** % of Span
				1619	1932			
	0	0	0	0	0	-6.6		
	300.7	31.5	31.5	32.5	32.5	309.7		
	600.6	60.5	60.0	60.5	60.5	601.2		
	896.9	89.5	88	86.5	86.5	897.7		

* Perform linear regression of pretest cal. gas concentration vs. chart divisions to determine the following equation:

$y = mx + b$ x = ppm y = chart divisions

For Data Reduction:

$$\text{Pollutant, ppm/\%} = \frac{(\text{Chart Division} - b)}{m} = \frac{(\text{CD} - \quad)}{(\quad)}$$

Correlation Coefficient = _____

$$\text{** Analyzer cal. error, \% cal. gas value} = \frac{(\text{Cal. gas conc.} - \text{conc. predicted}) \times 100}{\text{Cal. gas value, ppm}}$$

Acceptable limit = ≤ 2% of calibration gas value (≤ 5% for THC)

$$\text{*** Drift, \% Span} = \frac{(\text{Post-test cal. response} - \text{initial cal. response}) \times 100}{\text{Span value}}$$

Acceptable limit ≤ 3% of span

Minimum detectable limit = 2% of span or _____ ppm or % (circle one)

Maximum zero drift = _____ % of span or _____ ppm or % (circle one)

Maximum calibration drift = ____ % of span or _____ ppm or % (circle one)

COMMENTS: Pretest or post-test (circle one) calibration used to quantitate sample data. Post-test is used if drift exceeds limits and if post-test

CEM DATA REDUCTION - BAG ANALYSIS OR STEADY READINGS

Plant: New Port Steel
Location: Bag House Inlet
Date: 10-3-00

Parameter: SO_2, CO_2, O_2, [illegible], THC, CO
Operator: G Gay
Project #:

$$\text{Pollutant, ppm/\%} = \frac{(\text{Chart Division} - b)}{m} = \frac{(CD - .[illegible]5)}{(\ \ )} = \frac{.66785}{.099515}$$

Run #	Time** (24-Hr)		Average Chart Division	Concentration	Comments
1	1012	1022	28	275	
	1022	1032	15	144	
	1032	1042	12	113	
	1042	1052	9	83	
	1052	1102	2	13.4	
	1102	1112	4	33.5	
	1112	1122	4	33.5	
	1122	1132	3	23.4	
	1132	1142	2	13.4	
	1142	1152	2	13.4	74,56
	1152	1202			Process Down 45
	1202	1212			

* For NO_X Indicate whether NO, NO + NO_2, or NO_2 for specific interval.

** Indicate whether time interval is from beginning of first time to beginning of second time or to end of second time (circle one, or describe alternate).

Calculated By: G Gay Date: 10-3-00

CEM DATA REDUCTION - BAG ANALYSIS OR STEADY READINGS

Plant: New Port Steel
Location: Bag House Inlet
Date: 10.3.00

Parameter: SO_2, CO_2, O_2, NO_X*, THC, CO
Operator: G Gay
Project #: 5620.001

$$\text{Pollutant, ppm/\%} = \frac{(\text{Chart Division} - b)}{m} = \frac{(CD - \quad)}{(\quad)}$$

Run #	Time** (24-Hr)	Average Chart Division	Concentration	Comments
2	1629 1639	11	97	
	1639 1649	11	97	
	1649 1659	6	45.1	
	1659 1709	2.0	3.5	
	1709 1719	2.0	3.5	
	1719 1729	1.0	1.0	
	1729 1739	1.5	1.5	
	1739 1749	5.8	43.0	
	1749 1759	1.0	1.0	
	1759 1809	1.5	1.5	
	1809 1819	1.2	1.2	
	1819 1829	8	65.9	
	1829 1839	22	211	
	1839 1849	10	86.7	
	1849 1859	18	169.8	
	1859 1909	13	117	
	1909 1919	10	86.6	
	1919 1929	3	23.4	58.6 AVG

* For NO_X Indicate whether NO, NO + NO_2, or NO_2 for specific interval.

** Indicate whether time interval is from beginning of first time to beginning of second time or to end of second time (circle one, or describe alternate).

Calculated By: G Gay Date: 10.3.00

DAILY CEM CALIBRATION AND PERFORMANCE EVALUATION

Plant: New Post Steel
Location: Bag House Inlet
Date: 10-4-00
Operator: GGay
Project #: 5620-001
Time, Pretest: _____ Post-test: _____
Run #: _____

Parameter: SO_2, CO_2, O_2, NO_X, THC
Monitor: ppm or %
Span Value: 100
Chart Scale: 1015
Pbar, in. Hg.: 29.68
Ambient Temp., F: _____

Cyl. #	Cal. Gas Conc., ppm or %	Calibrations (Chart Divisions) 700	10:00	12:00	1405	1625	Concentration Predicted By Equation*	Analyzer Calibration Error,** % of Span	Drift,*** % of Span
	0	0	0	0		0	-12.0		
	300.2	32	33			33.3	316		
	600.6	60	61			61.5	604		
	896.4	87.6	87.5	86.5	86.5	87	888		

* Perform linear regression of pretest cal. gas concentration vs. chart divisions to determine the following equation:

$y = mx + b$ $\quad$ x = ppm $\quad$ y = chart divisions

For Data Reduction:

$$\text{Pollutant, ppm/\%} = \frac{(\text{Chart Division} - b)}{m} = \frac{(CD - 1.1929)}{(.09727)}$$

Correlation Coefficient = .9999

$$\text{** Analyzer cal. error, \% cal. gas value} = \frac{(\text{Cal. gas conc.} - \text{conc. predicted}) \times 100}{\text{Cal. gas value, ppm}}$$

Acceptable limit = ≤ 2% of calibration gas value (≤ 5% for THC)

$$\text{*** Drift, \% Span} = \frac{(\text{Post-test cal. response} - \text{initial cal. response}) \times 100}{\text{Span value}}$$

Acceptable limit ≤ 3% of span
Minimum detectable limit = 2% of span or _____ ppm or % (circle one)
Maximum zero drift = _____ % of span or _____ ppm or % (circle one)
Maximum calibration drift = ____ % of span or _____ ppm or % (circle one)

COMMENTS: Pretest or post-test (circle one) calibration used to quantitate sample data. Post-test is used if drift exceeds limits and if post-test yields higher concentrations.

CEM DATA REDUCTION - BAG ANALYSIS OR STEADY READINGS

Plant: New Boat Steel
Location: Bag House Inlet
Date: 10-4-00

Parameter: SO_2, CO_2, O_2, NO_X*, THC, CO
Operator: GGM
Project #: 5620.001

$$\text{Pollutant, ppm/\%} = \frac{(\text{Chart Division} - b)}{m} = \frac{(CD - 1.1929)}{(.09727)}$$

Run #	Time** (24-Hr)	Average Chart Division	Concentration	Comments
3	800 810	8.5	75	
	810 820	15	141	
	820 830	15	141	
	830 840	17	162	
	840 850	9	80	
	850 900	1	1.9	
	900 910	1.5	3.1	
	910 920	4	28.8	
	920 930	8	69.9	
	930 940	8	69.9	
	940 950	20	193	
	950 1000	25	244	100
	1000 1010			

109

* For NO_X indicate whether NO, NO + NO_2, or NO_2 for specific interval.

** Indicate whether time interval is from beginning of first time to beginning of second time or to end of second time (circle one, or describe alternate).

Calculated By: GGM Date: 10-4-00

CEM DATA REDUCTION - BAG ANALYSIS OR STEADY READINGS

Plant: Newport Steel
Location: Bag House Inlet
Date: 10-4-00

Parameter: SO_2, CO_2, O_2, NO_X*, THC, CO
Operator: Cook
Project #: 56 20.001

$$\text{Pollutant, ppm/\%} = \frac{(\text{Chart Division} - b)}{m} = \frac{(CD - 1.1929)}{(.09727)}$$

Run #	Time** (24-Hr)		Average Chart Division	Concentration	Comments
3	1045	1055	10	90	
	1055	1105	15	142	
	1105	1115	9	80	
	1115	1125	9	80	
	1125	1135	3	18.5	
	1135	1145	5	39	
	1145	1155	7	59.6	71.7
	1155	1200	4	28	

* For NO_X Indicate whether NO, NO + NO_2, or NO_2 for specific interval.

** Indicate whether time interval is from beginning of first time to beginning of second time or to end of second time (circle one, or describe alternate).

Calculated By: [illegible] Date: 10-4-00

CEM DATA REDUCTION - BAG ANALYSIS OR STEADY READINGS

Plant: New Post Steel
Location: Big Horn Iron
Date: 10-4-00

Parameter: SO_2, CO_2, O_2, NO_X*, THC, (CO)
Operator: GGar
Project #: 5620.001

$$\text{Pollutant, ppm/\%} = \frac{(\text{Chart Division - b})}{\text{m}} = \frac{(\text{CD} - 1.1926)}{(\ 109727\ )}$$

Run #	Time** (24-Hr)	Average Chart Division	Concentration	Comments
4	1245 1255	1.5	3.15	
	1255 1305	8	70	
	1305 1315	15	141	
	1315 1325	10	90	
	1325 1335	13	121	
	1335 1345	25	244	
	1345 1355	12	111	
	1355 1405	2	8.2	
STOP TO CAL				
	1422 1432	15	141	
	1432 1442	32	316	
	1442 1452	2.0	8.2	
	1452 1502	1.5	1.5	
	1502 1512	20	193	
	1512 1522	2.0	8.2	
	1522 1532	4.5	33	
	1533 1543	15	141	
	1542 1552	15	141	
	1552 1602	15	141	

103

* For NO_X Indicate whether NO, NO + NO_2, or NO_2 for specific interval.

** Indicate whether time interval is from beginning of first time to beginning of second time or to end of second time (circle one, or describe alternate).

Calculated By: GGar Date: 10-4-00

CEM DATA REDUCTION - BAG ANALYSIS OR STEADY READINGS

Plant: Newport Steel
Location: Bag House Exhaust
Date: 10-4-00

Parameter: SO_2, CO_2, O_2, NO_X*, THC, (CO)
Operator: G Gay
Project #: 5620.001

$$\text{Pollutant, ppm/\%} = \frac{(\text{Chart Division - b})}{\text{m}} = \frac{(\text{CD} - 1.1920)}{(.09727)}$$

Run #	Time** (24-Hr)	Average Chart Division	Concentration	Comments
	1602 1612	15	141	
	1612 1622	10	90.5	

131

* For NO_X indicate whether NO, NO + NO_2, or NO_2 for specific interval.

** Indicate whether time interval is from beginning of first time to beginning of second time or to end of second time (circle one, or describe alternate).

Calculated By: G Gay Date: 10-4-00

23

CEM Calibration Data Sheet

PES, Inc.
5209 E. Kemper Rd.
Cincinnati, OH 45249
513.489.6611
www.pes.com

Company: NewPort Steel
Location: Bag House Inlet
Project No.: 5620.001

CEM Operator: G Gay
Date: 10-4-00

	Cal Gas Conc.	Direct Calibration Response ppm / %	Direct Calibration % Error	System Calibration: Pretest Run 1 Response ppm / %	Pretest Run 1 % Bias	Post Test Run 1 Response ppm / %	Post Test Run 1 % Drift	Post Test Run 2 Response ppm / %	Post Test Run 2 % Drift	Post Test Run 3 Response ppm / %	Post Test Run 3 % Drift	Comments
		Time:		Time:		Time:		Time:		Time:		
THC Zero		700		10:00		12:00		1405		1675		
THC Low												
THC Mid												
THC High												
NOx Zero	0		0.12	.02	.62	.07		.17		.19		
NOx Low												
NOx Mid	9947		51.06	49.1						48.14		48.14
NOx High	90.7		90.90	88.60	90.46	90.83		90.28		87.32		
CO Zero	0		1.12	1.03		1.07		1.03		.04		
CO Low	300.2		319.75	332.17						334.68		
CO Mid	600.6		601.67	614.14						618.65		
CO High	8964		870.81	873.94	~~870.96~~	870.16		870.52		870.3		
CO_2 Zero												
CO_2 Mid												
CO_2 High												
O_2 Zero												
O_2 Mid												
O_2 High												
SO_2 Zero												
SO_2 Mid												
SO_2 High												

CEM Calibration Data Sheet

PES, Inc.
5209 E. Kemper Rd.
Cincinnati, OH 45249
513.489.6611
www.pes.com

Company: New Post Steel
Location: Bag House Inlet
Project No.: 56 20.001

CEM Operator: G Gra
Date: 10-3-00

	Cal Gas Conc.	Direct Calibration Response ppm / %	Direct Calibration % Error	System Calibration: Pretest Run 1 Response ppm / %	Pretest Run 1 % Bias	Post Test Run 1 Response ppm / %	Post Test Run 1 % Drift	Post Test Run 2 Response ppm / %	Post Test Run 2 % Drift	Post Test Run 3 Response ppm / %	Post Test Run 3 % Drift	Comments
		Time:		Time:		Time:		Time:		Time:		
THC Zero				1211		319		1932				
THC Low												
THC Mid												
THC High												
NOx Zero	0	0	.14		0.7	.20			.20			
NOx Low	—											
NOx Mid	49.41	50.27	50.27		52.51	51.9			52.50			
NOx High	90.7	90.79	90.79		95.03	90.12			95.10			
CO Zero	0	4.6	4.54		4.47	4.15 .99		1932	.95			
CO Low	300.2	322.19	322.19		317.12	328.72			329.66			
CO Mid	600.6	612.80	611.71		608.2	6[illegible].41			610.23			
CO High	896.4	898.4	899.2		891.71	868.36			873.92			
CO_2 Zero												
CO_2 Mid												
CO_2 High												
O_2 Zero												
O_2 Mid												
O_2 High												
SO_2 Zero												
SO_2 Mid												
SO_2 High												

RATA CLASS

Scott Specialty Gases

Dual-Analyzed Calibration Standard

1290 COMBERMERE STREET,TROY,MI 48083 Phone: 248-589-2950 248-589-2134

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
1290 COMBERMERE STREET
TROY,MI 48083

P.O. No.: 103-00-224
Project No.: 05-63123-001

Customer

PACIFIC ENVIRONMENTAL SERVICES,INC
DOUG ALLEN
7209 E. KEMPER RD
CINCINNATI OH 45249-1030

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure #G1; September, 1997.

Cylinder Number: ALM058040 **Certification Date:** 6/23/00 **Exp. Date:** 6/23/2002
Cylinder Pressure*:** 1900 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
NITRIC OXIDE	49.49	PPM	+/- 1%	Direct NIST and NMi
NITROGEN - OXYGEN FREE		BALANCE		
TOTAL OXIDES OF NITROGEN	52.081	PPM		Reference Value Only

*** Do not use when cylinder pressure is below 150 psig.

** Analytical accuracy is based on the requirements of EPA Protocal procedure G1, September 1997.
Product certified as +/- 1% analytical accuracy is directly traceable to NIST or NMi standards.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
SRM 1683B	11/01/01	CAL013527	47.99 PPM	NITRIC OXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
HORIBA/OPE235/563956034	06/23/00	CHEMILUMENECENCE

ANALYZER READINGS

(Z = Zero Gas R = Reference Gas T = Test Gas r = Correlation Coefficient)

NITRIC OXIDE

First Triad Analysis

Date:06/16/00	Response Unit:MV	
Z1 = 0.00000	R1 = 100.0000	T1 = 48.50000
R2 = 100.0000	Z2 = 0.00000	T2 = 48.80000
Z3 = 0.00000	T3 = 48.60000	R3 = 100.0000
Avg. Concentration:	49.32	PPM

Second Triad Analysis

Date: 06/23/00	Response Unit: MV	
Z1 = 0.00000	R1 = 100.0000	T1 = 48.90000
R2 = 100.0000	Z2 = 0.00000	T2 = 48.90000
Z3 = 0.00000	T3 = 49.10000	R3 = 100.0000
Avg. Concentration:	49.66	PPM

Calibration Curve

Concentration = A + Bx + Cx2 + Dx3 + Ex4	
r = .999997	1683B
Constants:	A = -0.04993
B = 1.031701	C = -0.00034
D = 0	E = 0

APPROVED BY: _____

PRAXAIR

Praxair Distribution, Inc.
145 Shimersville Road
Bethlehem, PA 18015
Tel. (610) 691-2474
Fax (610) 758-8384

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER PRAXAIR CINCINNATI

P.O NUMBER 936353-00

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
NITRIC OXIDE 99.8 PPM VS.	1684B	CAL-013252	97.8 PPM

ANALYZER READINGS

R = REFERENCE STANDARD *Z = ZERO GAS* *C = GAS CANDIDATE*

1. COMPONENT NITRIC OXIDE 99.8 PPM VS. ANALYZER MAKE-MODEL-S/N TECO MODEL 42C 42CH-57352-312

ANALYTICAL PRINCIPLE Chemiluminescence

FIRST ANALYSIS DATE 09/01/99

Z	0	R	99.9	C	90.9	CONC.	90.6	Z	0	R	100.0
R	100.4	Z	0	C	91.0	CONC.	90.7	R	100.1	Z	0
Z	0	C	90.9	R	100.2	CONC.	90.6	Z	0	C	91.0

U/M PPM MEAN TEST ASSAY 90.6

LAST CALIBRATION DATE 09/03/99

SECOND ANALYSIS DATE 09/08/99

C	90.9	CONC.	90.7
C	91.0	CONC.	90.8
R	100.0	CONC.	90.8

U/M PPM MEAN TEST ASSAY 90.8

VALUES NOT VALID BELOW 150 PSIG

UNCERTAINTY OF NITRIC OXIDE: ± 0.6 PPM

THIS CYLINDER NO. CC76285
HAS BEEN CERTIFIED ACCORDING TO SECTION 2.2
OF TRACEABILITY PROTOCOL NO. EPA-600/R97/121
PROCEDURE G1
CERTIFIED ACCURACY ± 1 % NIST TRACEABLE
CYLINDER PRESSURE 2000 PSIG
CERTIFICATION DATE 09/08/99
EXPIRATION DATE 09/08/01 TERM

CERTIFIED CONCENTRATION

NITRIC OXIDE	90.7 PPM
NITROGEN	BALANCE
NOx (FOR REFERENCE ONLY)	90.7 PPM

ANALYZED BY JOHN PRIBISH

CERTIFIED BY JASON BEARY

Making Our Planet More Productive

PRAXAIR

Praxair Distribution, Inc.
145 Shimersville Road
Bethlehem, PA 18015
Tel. (610) 691-2474
Fax (610) 758-8384

CERTIFICATE OF ANALYSIS

PRODUCT NUMBER: NI COXP-AS CUSTOMER: PRAXAIR CINCINNATI

PRODUCT DESCRIPTION: 300 PPM CARBON MONOXIDE, BALANCE NITROGEN-SIZE AS

CUSTOMER ORDER NUMBER: 987890-00 * PRIMARY STANDARD *

CYLINDER SERIAL NUMBER: CC103091

FILL DATE: JANUARY 23, 1999

COMPONENTS	REQUESTED CONCENTRATION	PREPARATION TOLERANCE	CERTIFIED CONCENTRATION
CARBON MONOXIDE	300 PPM	±5%	300.2 PPM
NITROGEN	BALANCE	-	BALANCE

ANALYTICAL ACCURACY: ±1%

CYLINDER VOLUME: 135 CUBIC FEET

CYLINDER PRESSURE: 2000 PSIG

CGA VALVE NUMBER: 350

METHOD OF ANALYSIS: SPECIFIC CARBON MONOXIDE ANALYZER

Certified concentrations were determined by individual analysis.

DATE: JANURAY 28, 1999 ANALYZED BY: DARLENE SANTIAGO

CERTIFIED MASTER CLASS

Single-Certified Calibration Standard

Scott Specialty Gases
1290 COMBERMERE STREET, TROY, MI 48083
Phone: 248-589-2950 Fax: 248-589-2134

CERTIFICATE OF ACCURACY: Certified Master Class Calibration Standard

Product Information
Project No.: 05-63123-004
Item No.:
P.O. No.: 103-00-224

Cylinder Number: AAL9143
Cylinder Size: AL
Certification Date: 6/15/2000
Expiration Date: 6/15/2003

Customer

PACIFIC ENVIRONMENTAL SER
DON ALLEN
560 HERNDON PARKWAY
SUITE 200
HERNDON, VA 20170-5240

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
CARBON MONOXIDE	450.	PPM	2
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

NIST

APPROVED BY: _____ DATE: 6-16-00

PRAXAIR

Praxair Distribution, Inc.
145 Shimersville Road
Bethlehem, PA 18015
Tel. (610) 691-2474
Fax (610) 758-8384

CERTIFICATE OF ANALYSIS

PRODUCT NUMBER: NI COXP-AS CUSTOMER: PRAXAIR CINCINNATI

PRODUCT DESCRIPTION: 600 PPM CARBON MONOXIDE, BALANCE NITROGEN-SIZE AS

CUSTOMER ORDER NUMBER: 987890-00 * PRIMARY STANDARD *

CYLINDER SERIAL NUMBER: CC102910

FILL DATE: JANUARY 23, 1999

COMPONENTS	REQUESTED CONCENTRATION	PREPARATION TOLERANCE	CERTIFIED CONCENTRATION
CARBON MONOXIDE	600 PPM	±5%	600.6 PPM
NITROGEN	BALANCE	-	BALANCE

ANALYTICAL ACCURACY: ±1%

CYLINDER VOLUME: 135 CUBIC FEET

CYLINDER PRESSURE: 2000 PSIG

CGA VALVE NUMBER: 350

METHOD OF ANALYSIS: SPECIFIC CARBON MONOXIDE ANALYZER

Certified concentrations were determined by individual analysis.

DATE: JANURAY 28, 1999 ANALYZED BY: DARLENE SANTIAGO

PRAXAIR

Praxair Distribution, Inc.
145 Shimersville Road
Bethlehem, PA 18015
Tel (610) 691-2474
Fax (610) 758-8384

CERTIFICATE OF ANALYSIS

PRODUCT NUMBER: NI COXP-AS

CUSTOMER: PRAXAIR WHSE CINCINNATI

PRODUCT DESCRIPTION: 896 PPM CARBON MONOXIDE BALANCE NITROGEN – SIZE AS

CUSTOMER ORDER NUMBER: 212761-00

CYLINDER NUMBER: SA2558

* PRIMARY STANDARD*

FILL DATE: JUNE 07, 1999

COMPONENTS	SPECIFICATIONS	PREPARATION TOLERANCE	CERTIFIED CONCENTRATION
CARBON MONOXIDE	896 PPM	+/-5%	896.4 PPM
NITROGEN	BALANCE		BALANCE

Certified concentration was determined by individual analysis.

ANALYTICAL ACCURACY: +/-1%

CYLINDER VOLUME: 135 Cubic Feet

CGA VALVE NUMBER: 350

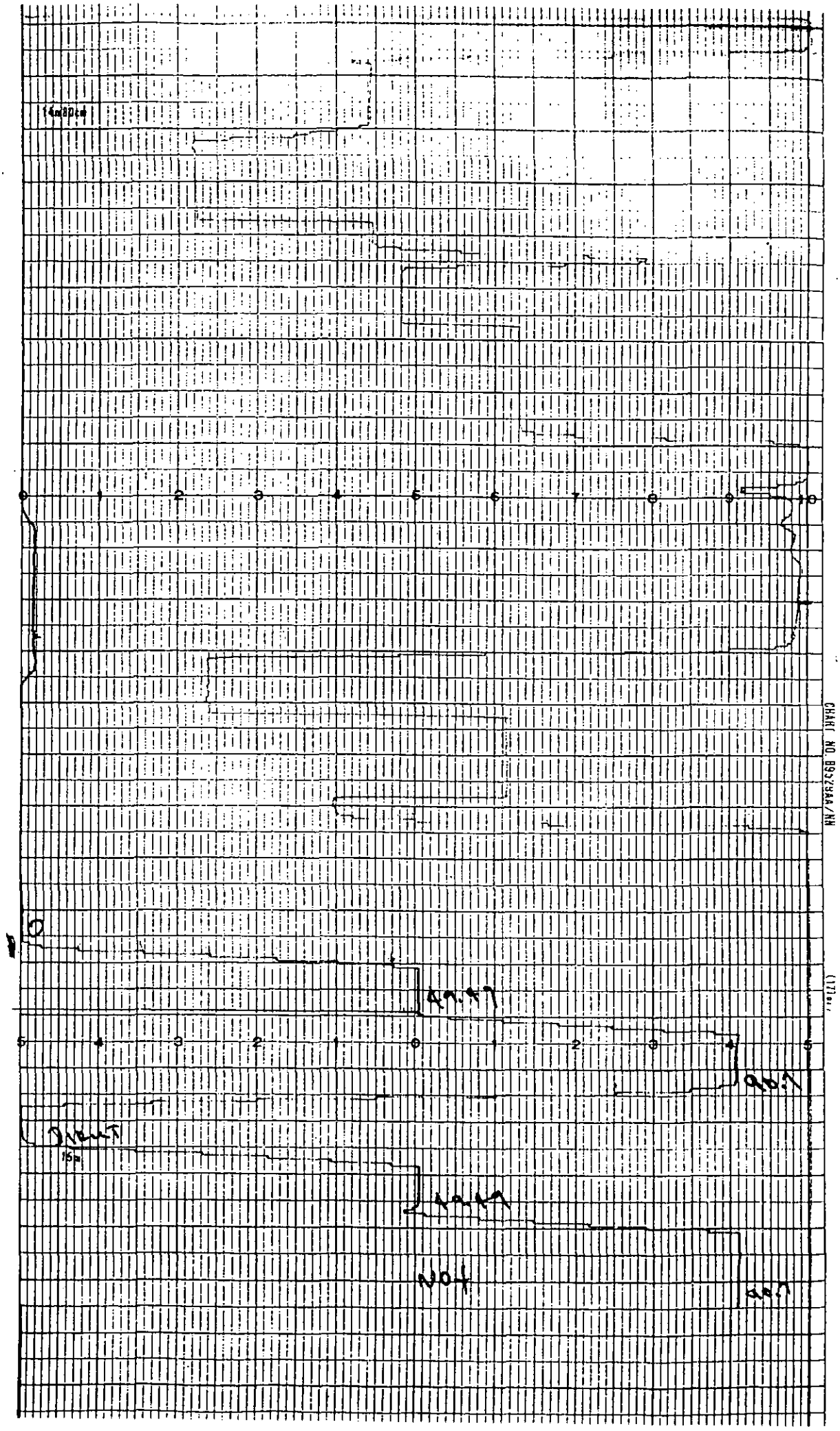
CYLINDER PRESSURE: 2000 psig

METHOD OF ANALYSIS: SPECIFIC CARBON MONOXIDE ANALYZER

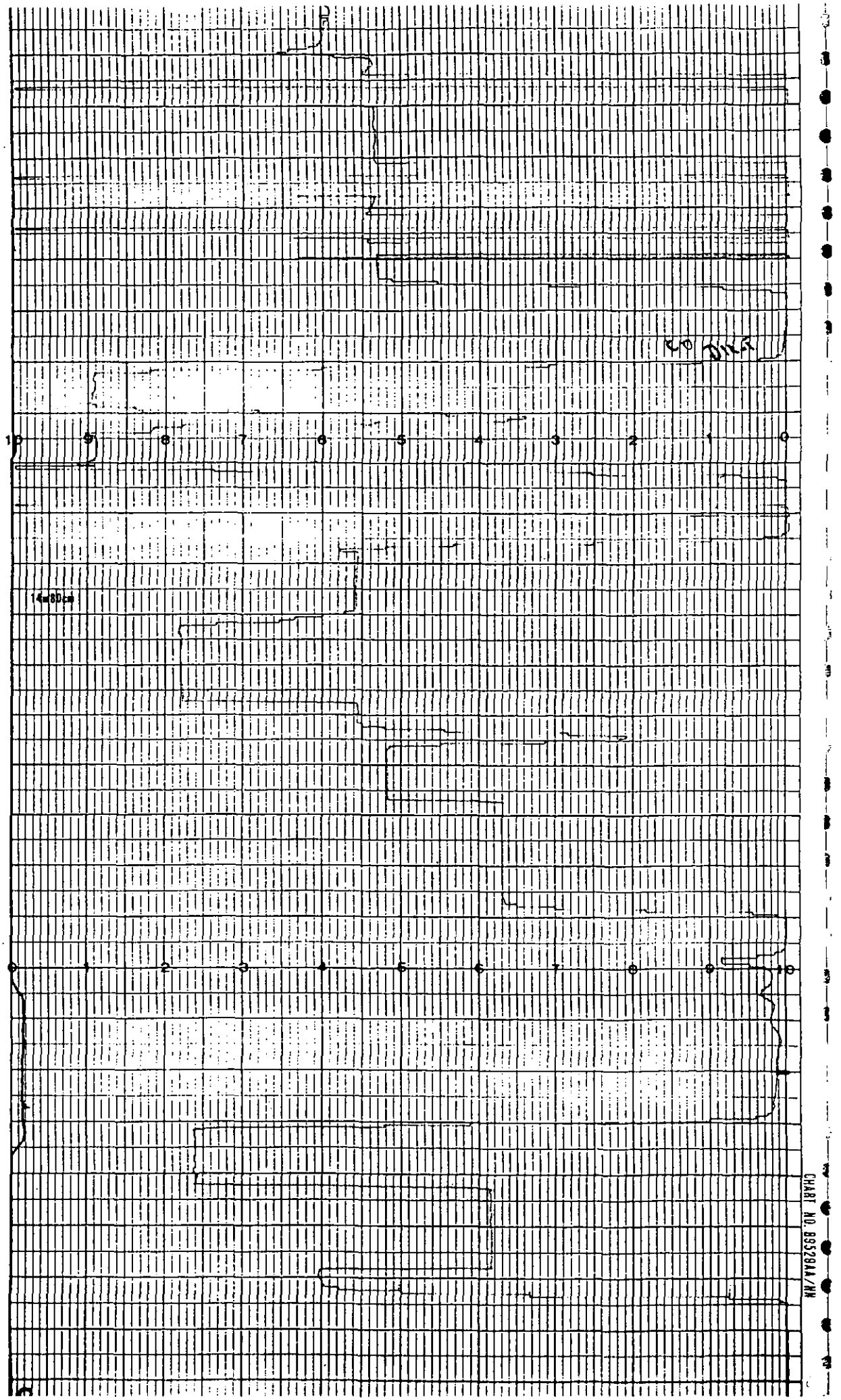
CERTIFICATION DATE: JUNE 09, 1999

ANALYZED BY: DARLENE SANTIAGO

It is recommended that cylinders not be depleted below 50 psig unless otherwise indicated.



14m80cm
0
1
2
3
4
5
6
7
8
9
10
5
4
3
2
1
0
1
2
3
4
5
49.49
90.7
Direct
15m
49.49
Not
90.7
CHART NO. B9529AA/NN


CO DILT
10 9 8 7 6 5 4 3 2 1 0
14x80cm
0 1 2 3 4 5 6 7 8 9 10
CHART NO. 89529AA/NN

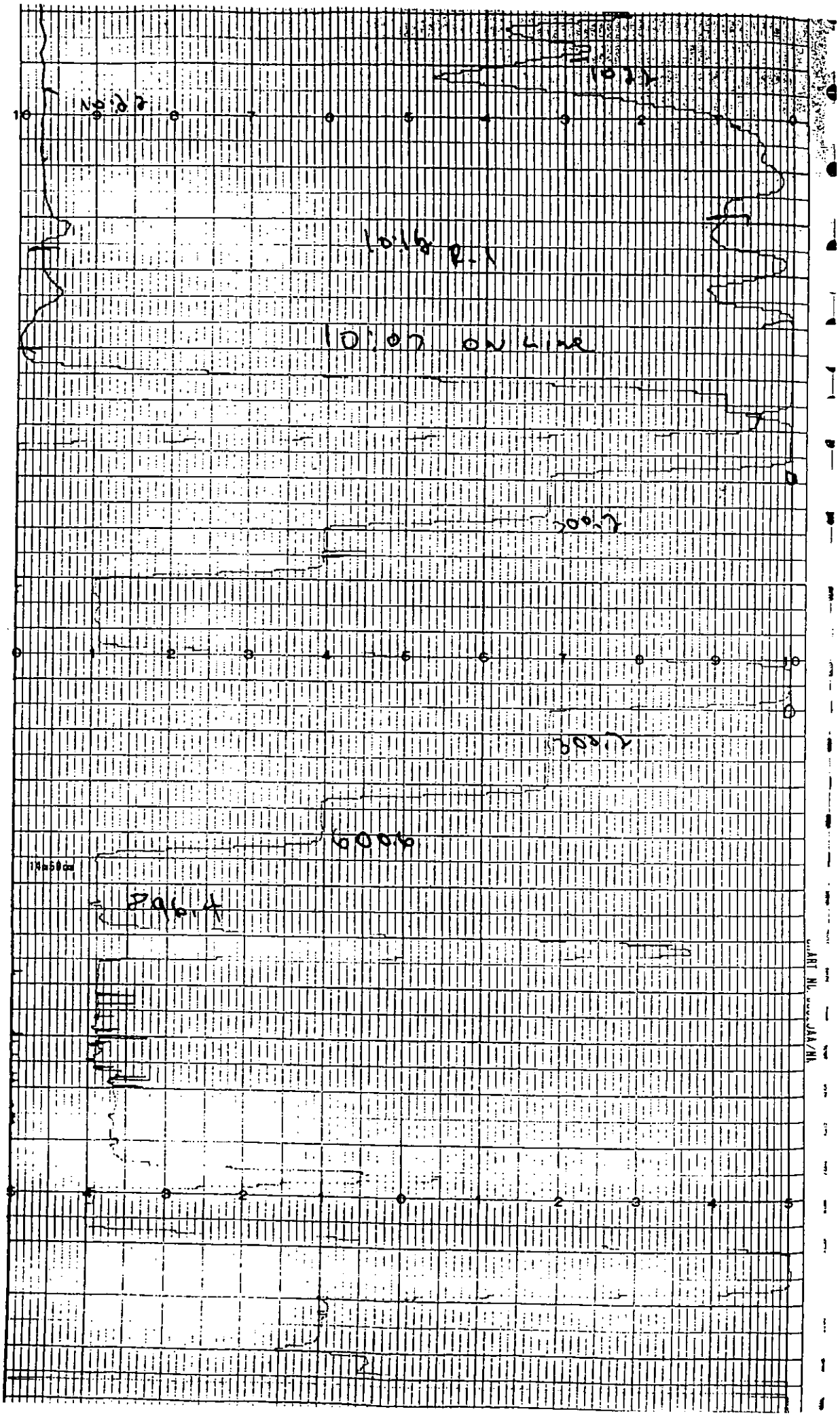

10:22
10:16 R-1
10:07 ON LINE
6006
896.4

CHART NO. B9529AA/NR
1132
1122
1112
1102
1052
1042
1032
1022
1012
1002
1052
1122
1142
1162
1182
1202
1222
1242
1262
1282
1302
1322
1342
1362
1382
1402
1422
1442
1462
1482
1502
1522
1542
1562
1582
1602
1622
1642
1662
1682
1702
1722
1742
1762
1782
1802
1822
1842
1862
1882
1902

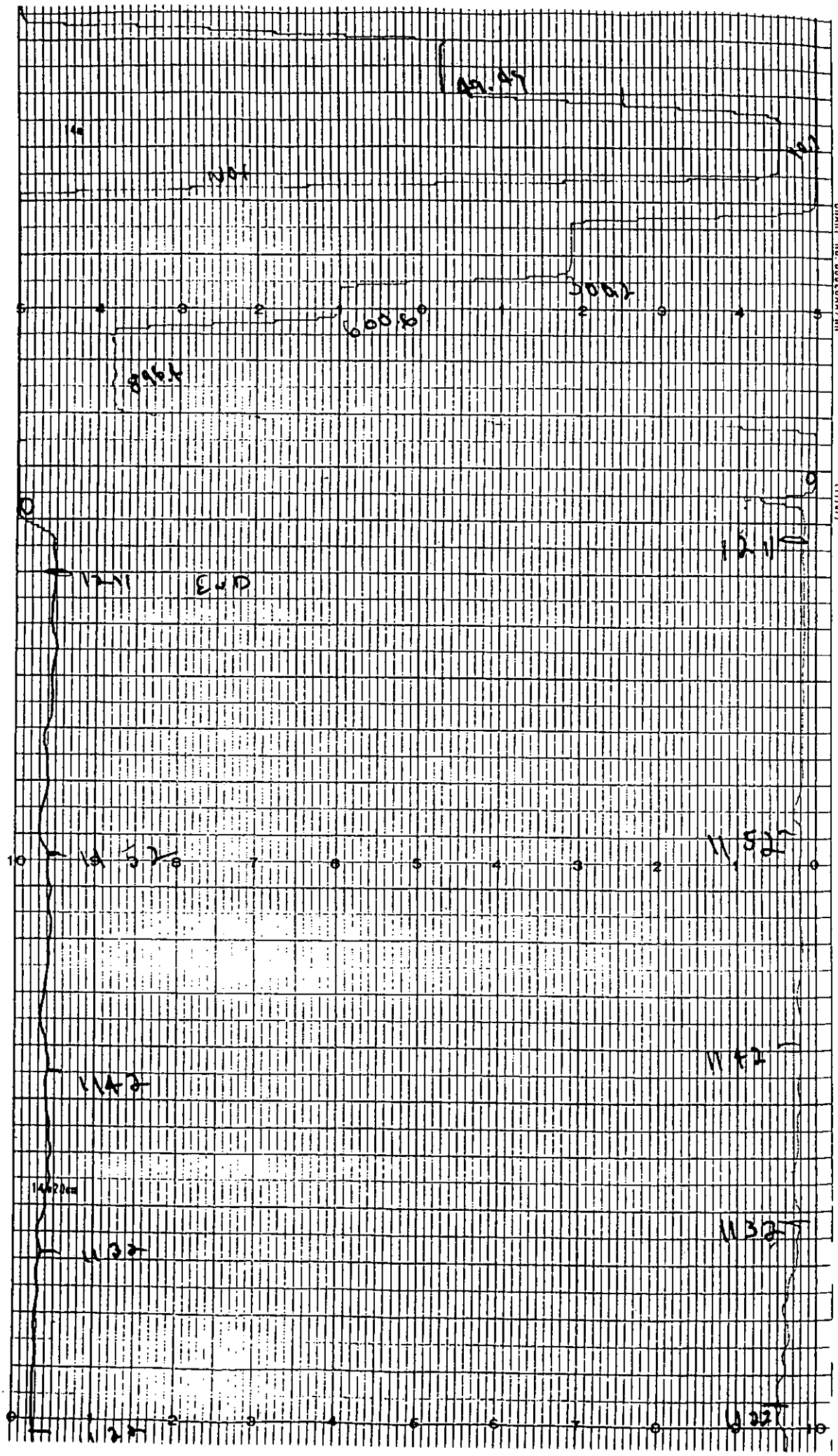


CHART NO. B9529AA/NN
11/7/71
14
10
0
1149
1148
1147
1146
1145
1144
1143
1142
1141
1140
1139
1138
1137
1136
1135
1134
1133
1132
1131
1130
1129
1128
1127
1126
1125
1124
1123
1122
1121
1120
1119
1118
1117
1116
1115
1114
1113
1112
1111
1110
1109
1108
1107
1106
1105
1104
1103
1102
1101
1100
1099
1098
1097
1096
1095
1094
1093
1092
1091
1090
1089
1088
1087
1086
1085
1084
1083
1082
1081
1080
1079
1078
1077
1076
1075
1074
1073
1072
1071
1070
1069
1068
1067
1066
1065
1064
1063
1062
1061
1060
1059
1058
1057
1056
1055
1054
1053
1052
1051
1050
1049
1048
1047
1046
1045
1044
1043
1042
1041
1040
1039
1038
1037
1036
1035
1034
1033
1032
1031
1030
1029
1028
1027
1026
1025
1024
1023
1022
1021
1020
1019
1018
1017
1016
1015
1014
1013
1012
1011
1010
1009
1008
1007
1006
1005
1004
1003
1002
1001
1000
999
998
997
996
995
994
993
992
991
990
989
988
987
986
985
984
983
982
981
980
979
978
977
976
975
974
973
972
971
970
969
968
967
966
965
964
963
962
961
960
959
958
957
956
955
954
953
952
951
950
949
948
947
946
945
944
943
942
941
940
939
938
937
936
935
934
933
932
931
930
929
928
927
926
925
924
923
922
921
920
919
918
917
916
915
914
913
912
911
910
909
908
907
906
905
904
903
902
901
900
899
898
897
896
895
894
893
892
891
890
889
888
887
886
885
884
883
882
881
880
879
878
877
876
875
874
873
872
871
870
869
868
867
866
865
864
863
862
861
860
859
858
857
856
855
854
853
852
851
850
849
848
847
846
845
844
843
842
841
840
839
838
837
836
835
834
833
832
831
830
829
828
827
826
825
824
823
822
821
820
819
818
817
816
815
814
813
812
811
810
809
808
807
806
805
804
803
802
801
800
799
798
797
796
795
794
793
792
791
790
789
788
787
786
785
784
783
782
781
780
779
778
777
776
775
774
773
772
771
770
769
768
767
766
765
764
763
762
761
760
759
758
757
756
755
754
753
752
751
750
749
748
747
746
745
744
743
742
741
740
739
738
737
736
735
734
733
732
731
730
729
728
727
726
725
724
723
722
721
720
719
718
717
716
715
714
713
712
711
710
709
708
707
706
705
704
703
702
701
700
699
698
697
696
695
694
693
692
691
690
689
688
687
686
685
684
683
682
681
680
679
678
677
676
675
674
673
672
671
670
669
668
667
666
665
664
663
662
661
660
659
658
657
656
655
654
653
652
651
650
649
648
647
646
645
644
643
642
641
640
639
638
637
636
635
634
633
632
631
630
629
628
627
626
625
624
623
622
621
620
619
618
617
616
615
614
613
612
611
610
609
608
607
606
605
604
603
602
601
600
599
598
597
596
595
594
593
592
591
590
589
588
587
586
585
584
583
582
581
580
579
578
577
576
575
574
573
572
571
570
569
568
567
566
565
564
563
562
561
560
559
558
557
556
555
554
553
552
551
550
549
548
547
546
545
544
543
542
541
540
539
538
537
536
535
534
533
532
531
530
529
528
527
526
525
524
523
522
521
520
519
518
517
516
515
514
513
512
511
510
509
508
507
506
505
504
503
502
501
500
499
498
497
496
495
494
493
492
491
490
489
488
487
486
485
484
483
482
481
480
479
478
477
476
475
474
473
472
471
470
469
468
467
466
465
464
463
462
461
460
459
458
457
456
455
454
453
452
451
450
449
448
447
446
445
444
443
442
441
440
439
438
437
436
435
434
433
432
431
430
429
428
427
426
425
424
423
422
421
420
419
418
417
416
415
414
413
412
411
410
409
408
407
406
405
404
403
402
401
400
399
398
397
396
395
394
393
392
391
390
389
388
387
386
385
384
383
382
381
380
379
378
377
376
375
374
373
372
371
370
369
368
367
366
365
364
363
362
361
360
359
358
357
356
355
354
353
352
351
350
349
348
347
346
345
344
343
342
341
340
339
338
337
336
335
334
333
332
331
330
329
328
327
326
325
324
323
322
321
320
319
318
317
316
315
314
313
312
311
310
309
308
307
306
305
304
303
302
301
300
299
298
297
296
295
294
293
292
291
290
289
288
287
286
285
284
283
282
281
280
279
278
277
276
275
274
273
272
271
270
269
268
267
266
265
264
263
262
261
260
259
258
257
256
255
254
253
252
251
250
249
248
247
246
245
244
243
242
241
240
239
238
237
236
235
234
233
232
231
230
229
228
227
226
225
224
223
222
221
220
219
218
217
216
215
214
213
212
211
210
209
208
207
206
205
204
203
202
201
200
199
198
197
196
195
194
193
192
191
190
189
188
187
186
185
184
183
182
181
180
179
178
177
176
175
174
173
172
171
170
169
168
167
166
165
164
163
162
161
160
159
158
157
156
155
154
153
152
151
150
149
148
147
146
145
144
143
142
141
140
139
138
137
136
135
134
133
132
131
130
129
128
127
126
125
124
123
122
121
120
119
118
117
116
115
114
113
112
111
110
109
108
107
106
105
104
103
102
101
100
99
98
97
96
95
94
93
92
91
90
89
88
87
86
85
84
83
82
81
80
79
78
77
76
75
74
73
72
71
70
69
68
67
66
65
64
63
62
61
60
59
58
57
56
55
54
53
52
51
50
49
48
47
46
45
44
43
42
41
40
39
38
37
36
35
34
33
32
31
30
29
28
27
26
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0

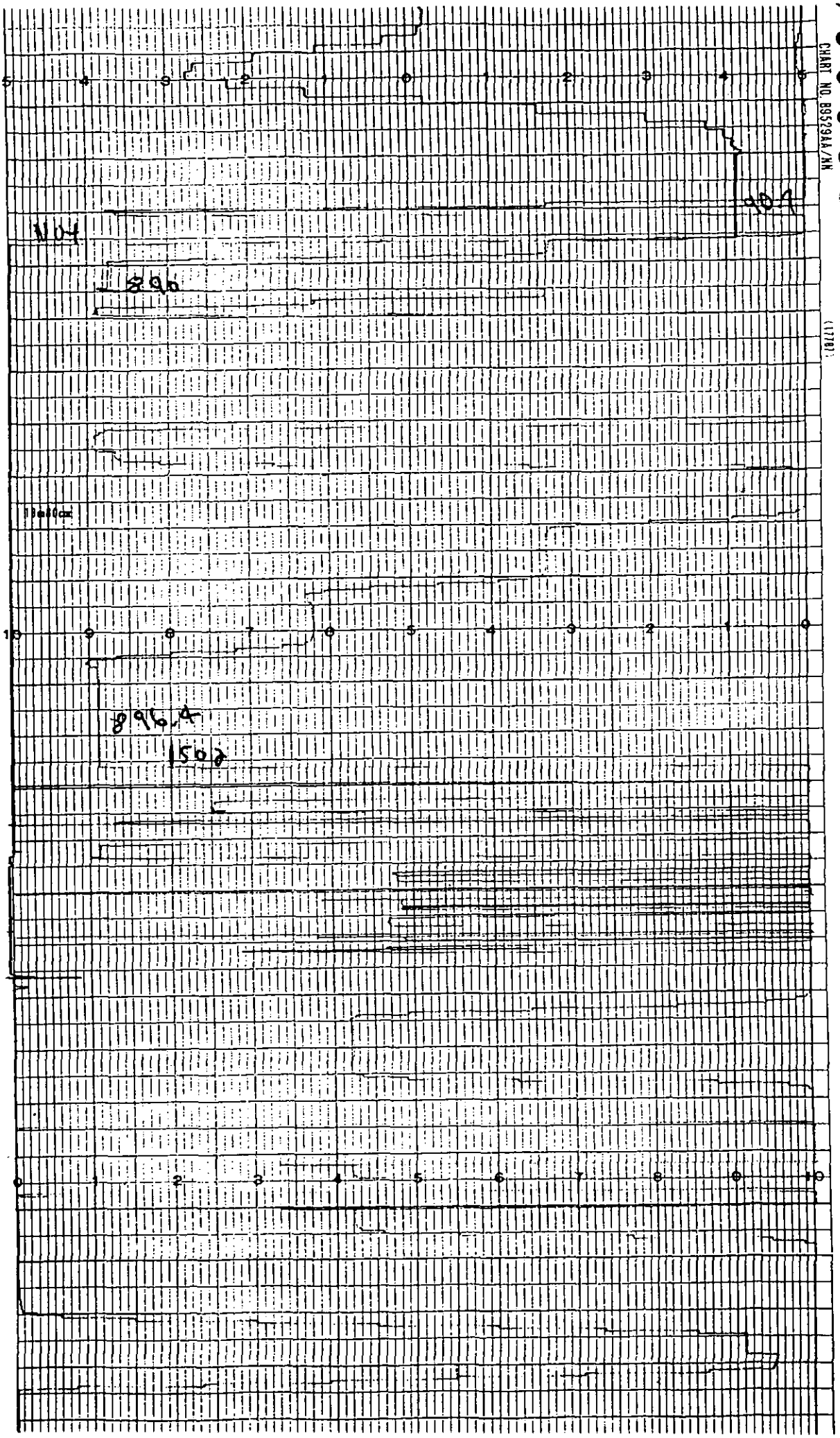
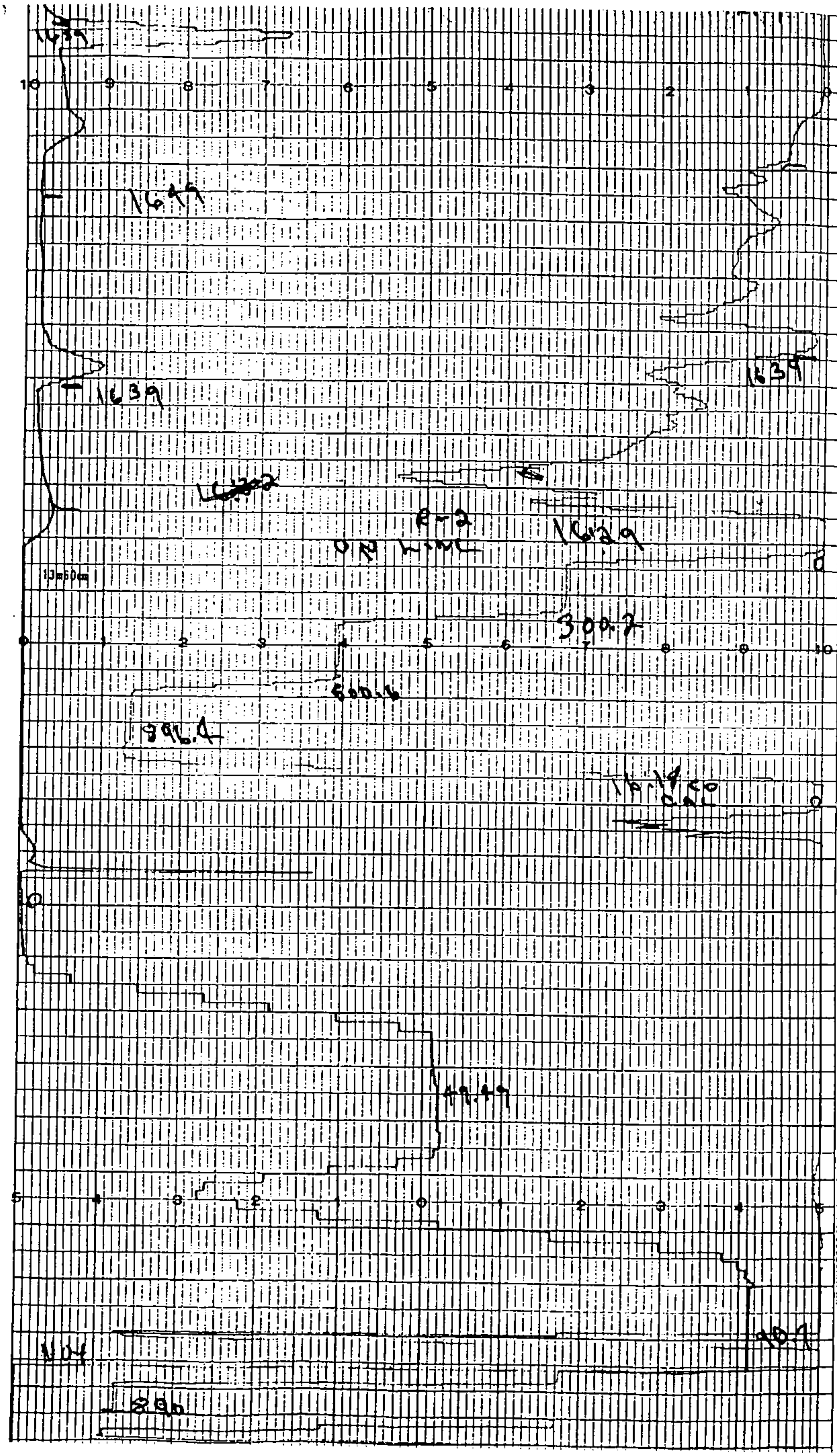
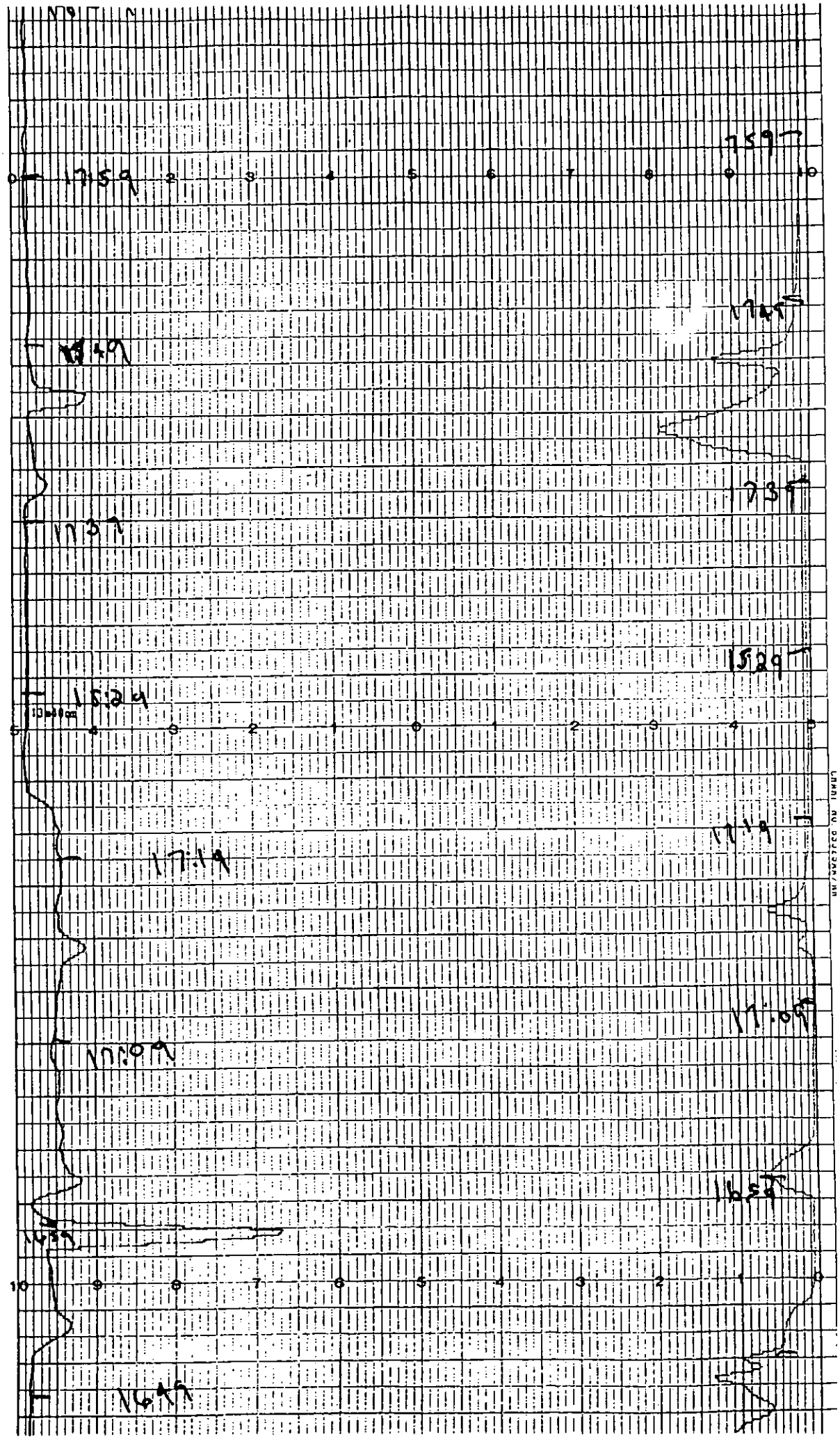
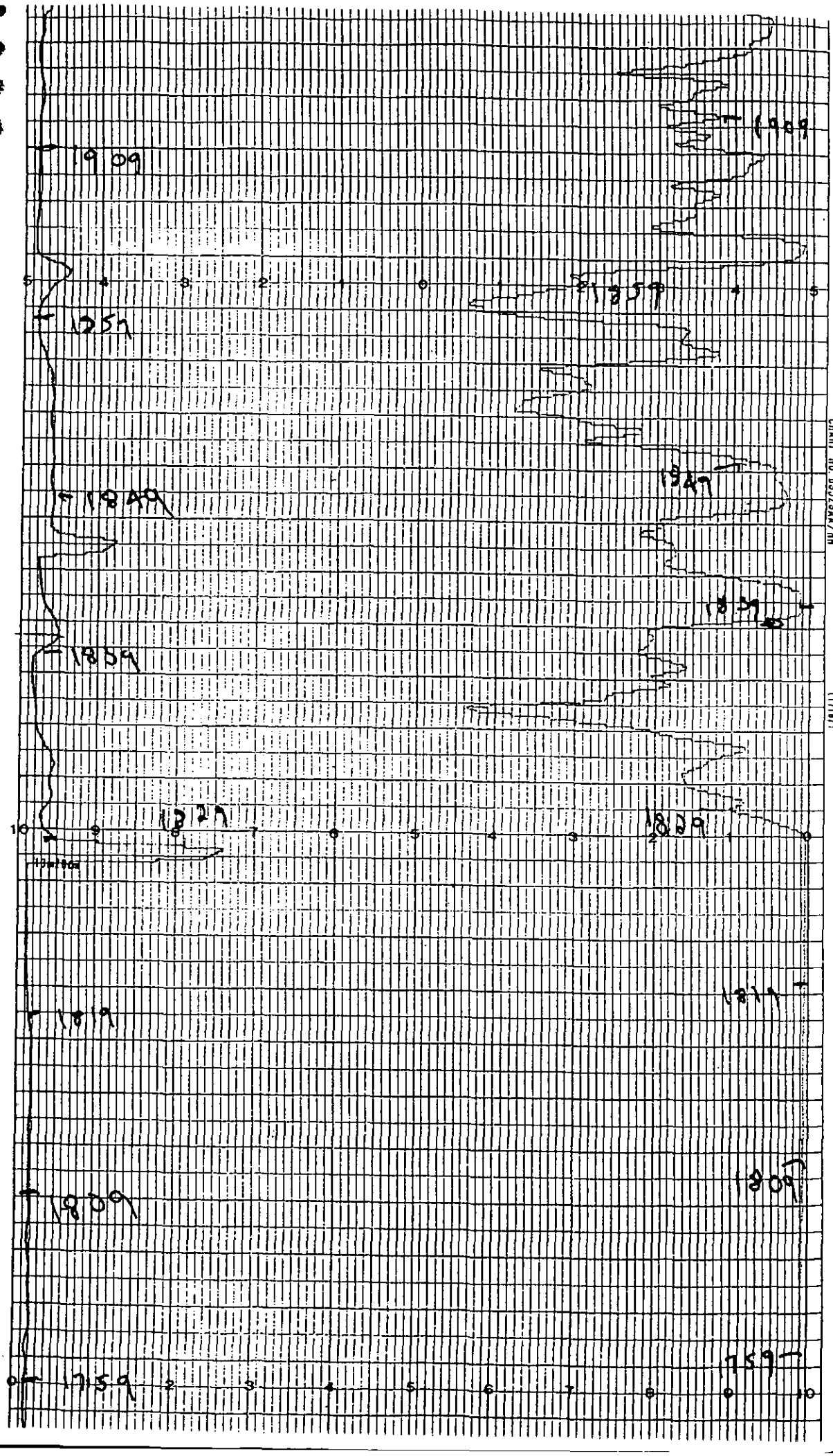


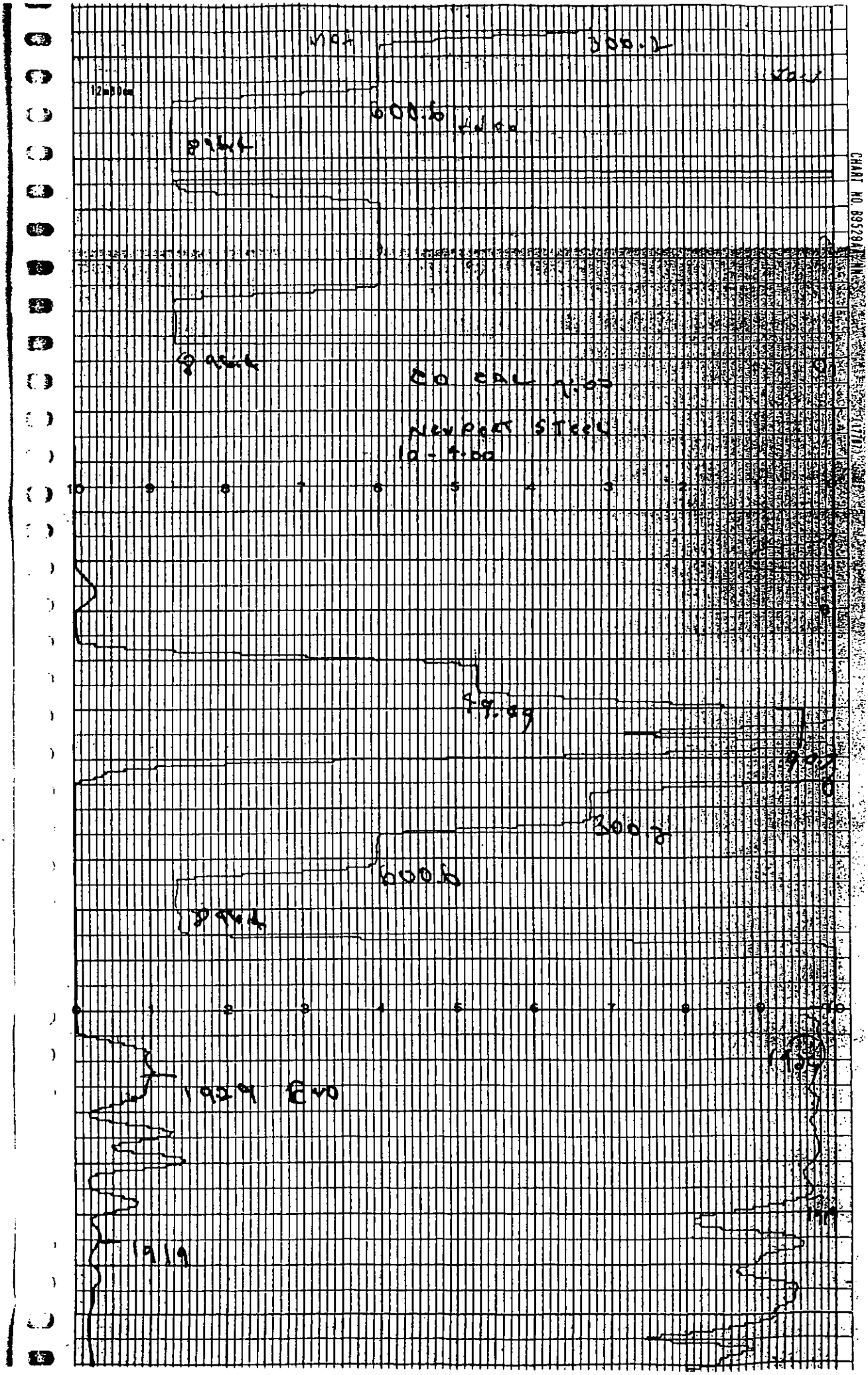
CHART NO. B9529AA/NN
(17787)
NO4
890
896.4
1502

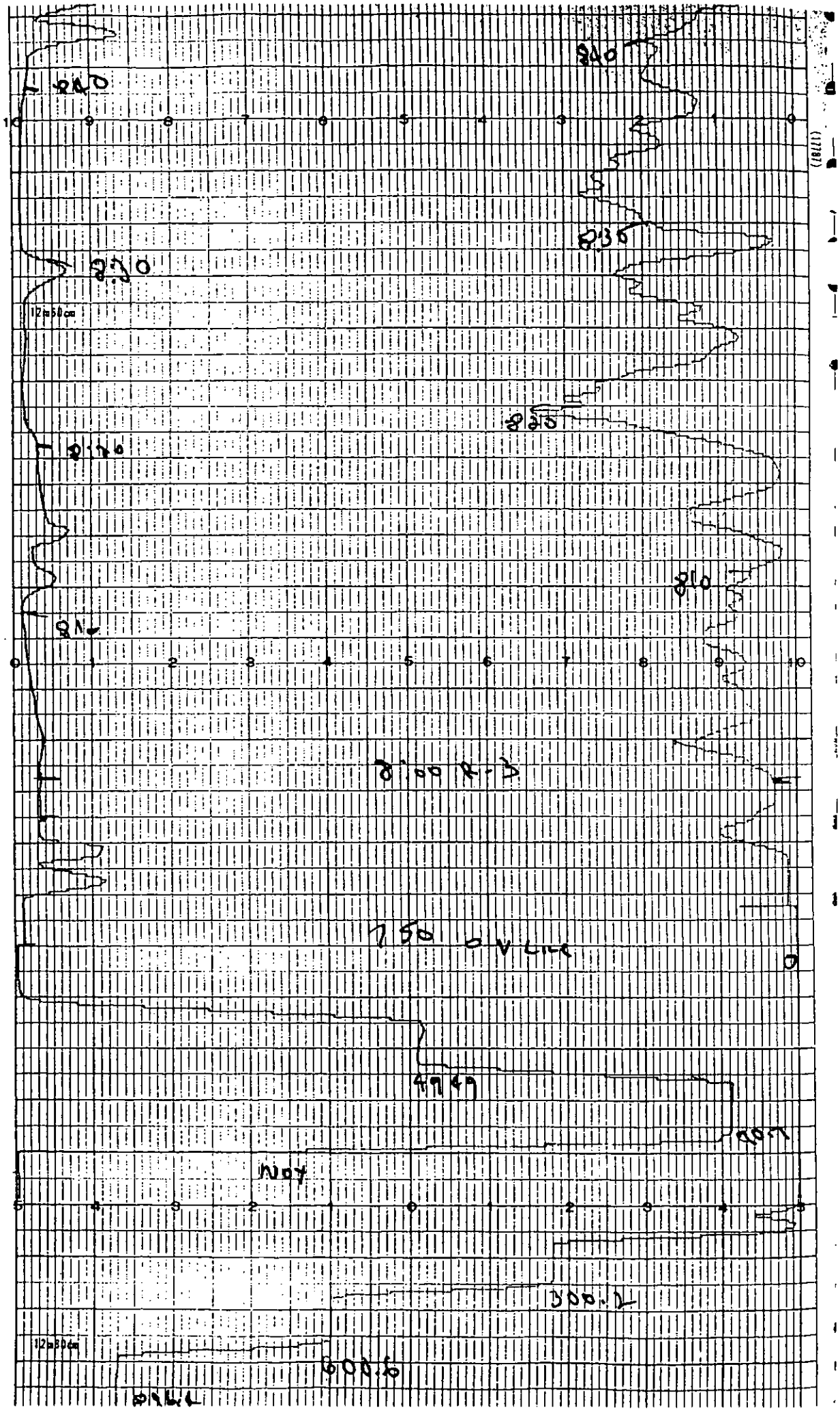

1649
1639
1639
R-2
ON LINE
1629
300.7
600.6
396.4



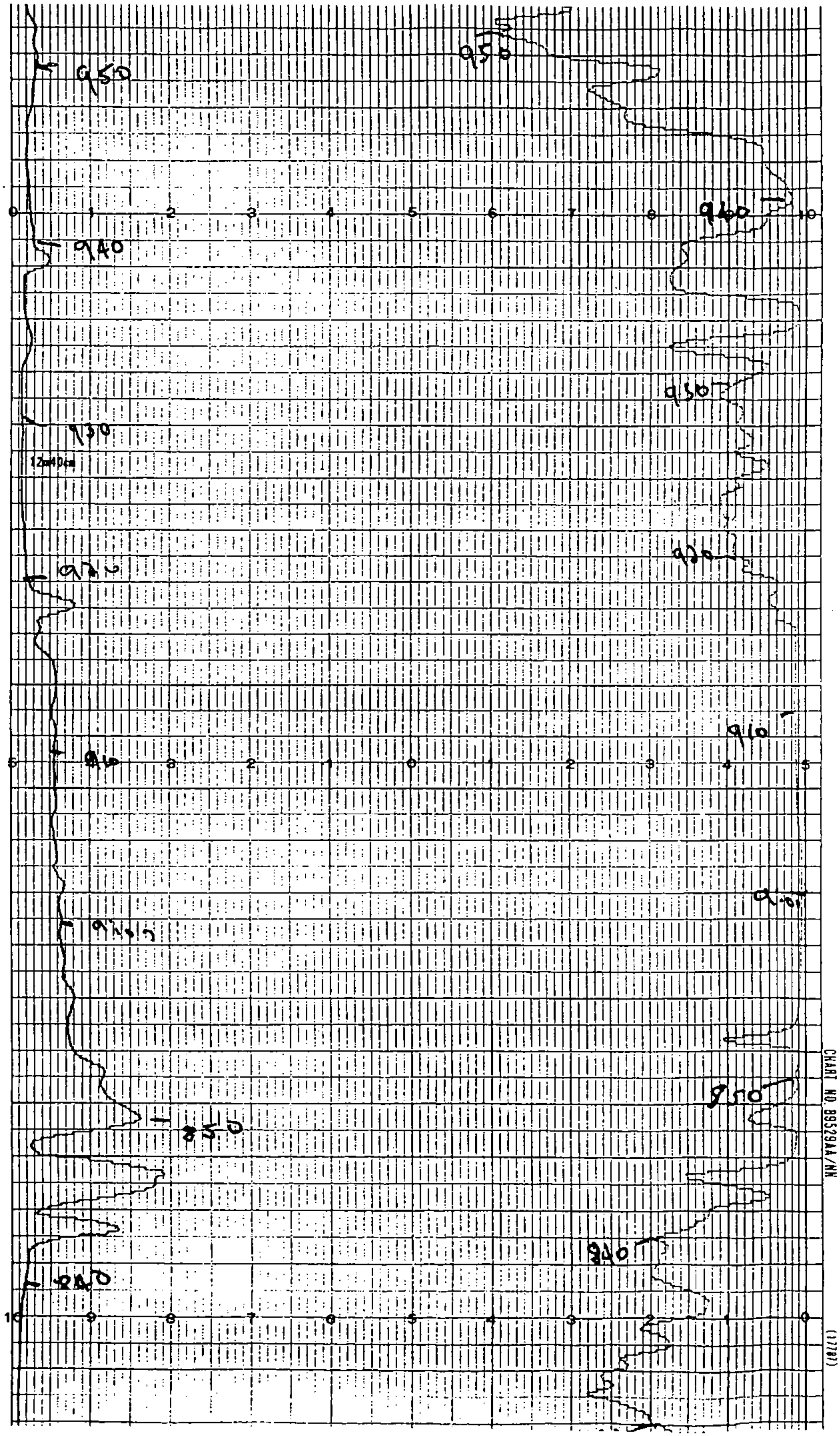
1759
1749
1739
1529
1719
1709
1659
1649


1909
1859
1849
1839
1829
1819
1809
1759
CHART NO. B9529AA/NN


300.2
600.6
CO CAL
NEWPORT STEEL
10 - 4.00
49.49
300.2
600.6
1929 END
1919
CHART NO. B9528A



840
840
830
830
820
810
810
8:00 R-3
750 OV LINE
4949
NOY
300.2
600.6


950
940
930
920
910
950
940
CHART NO. B9529AA/NN

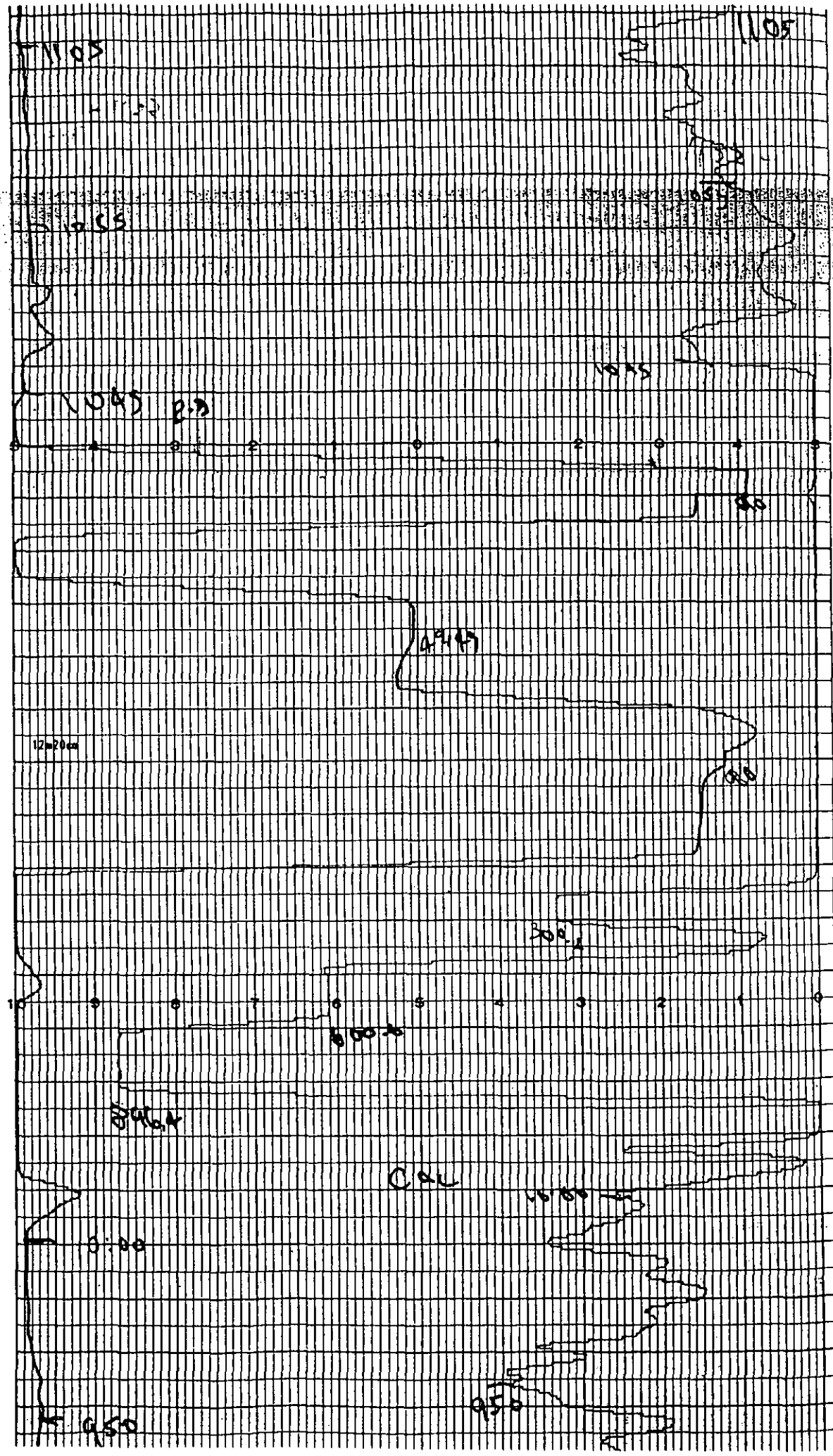
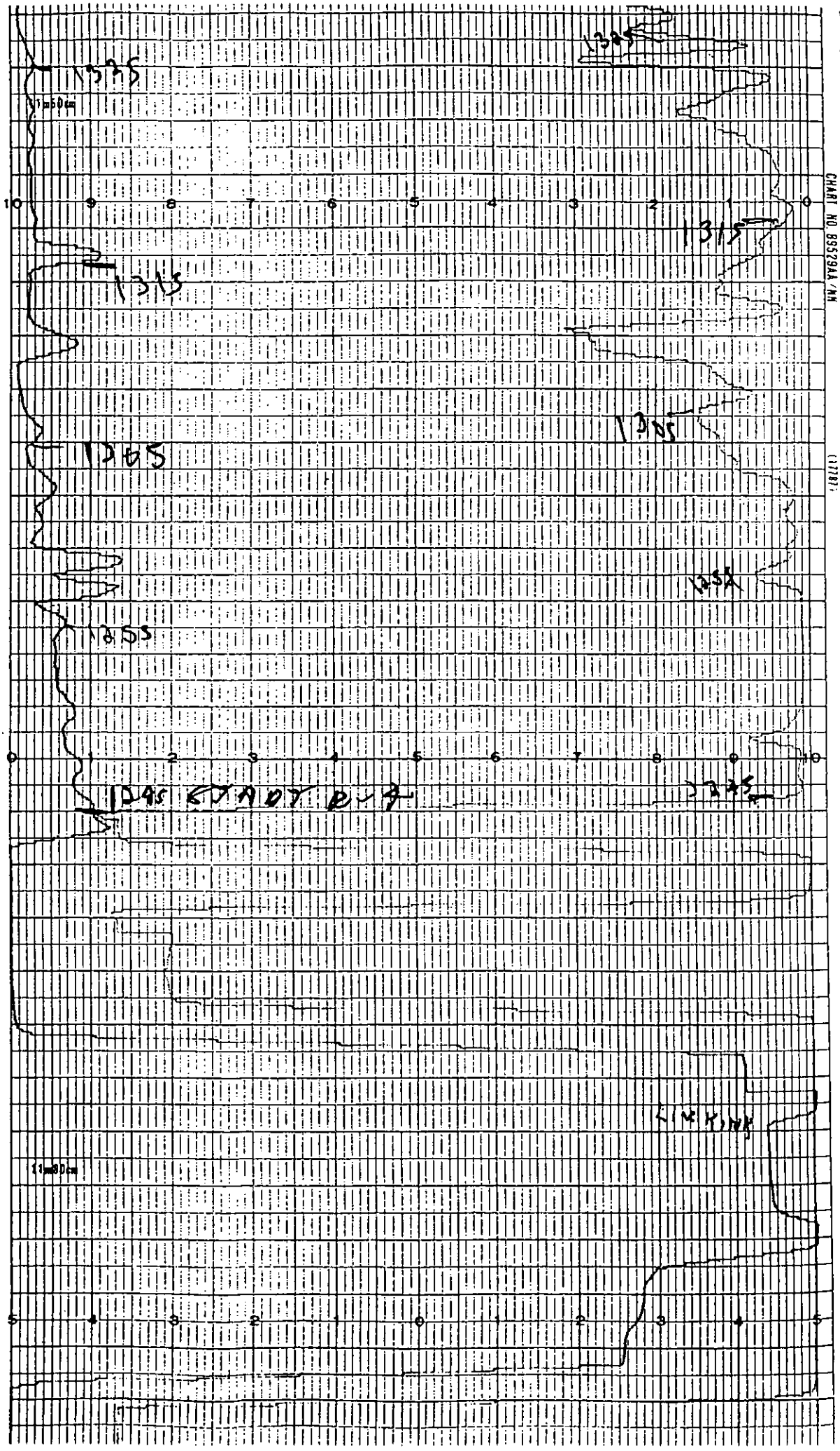
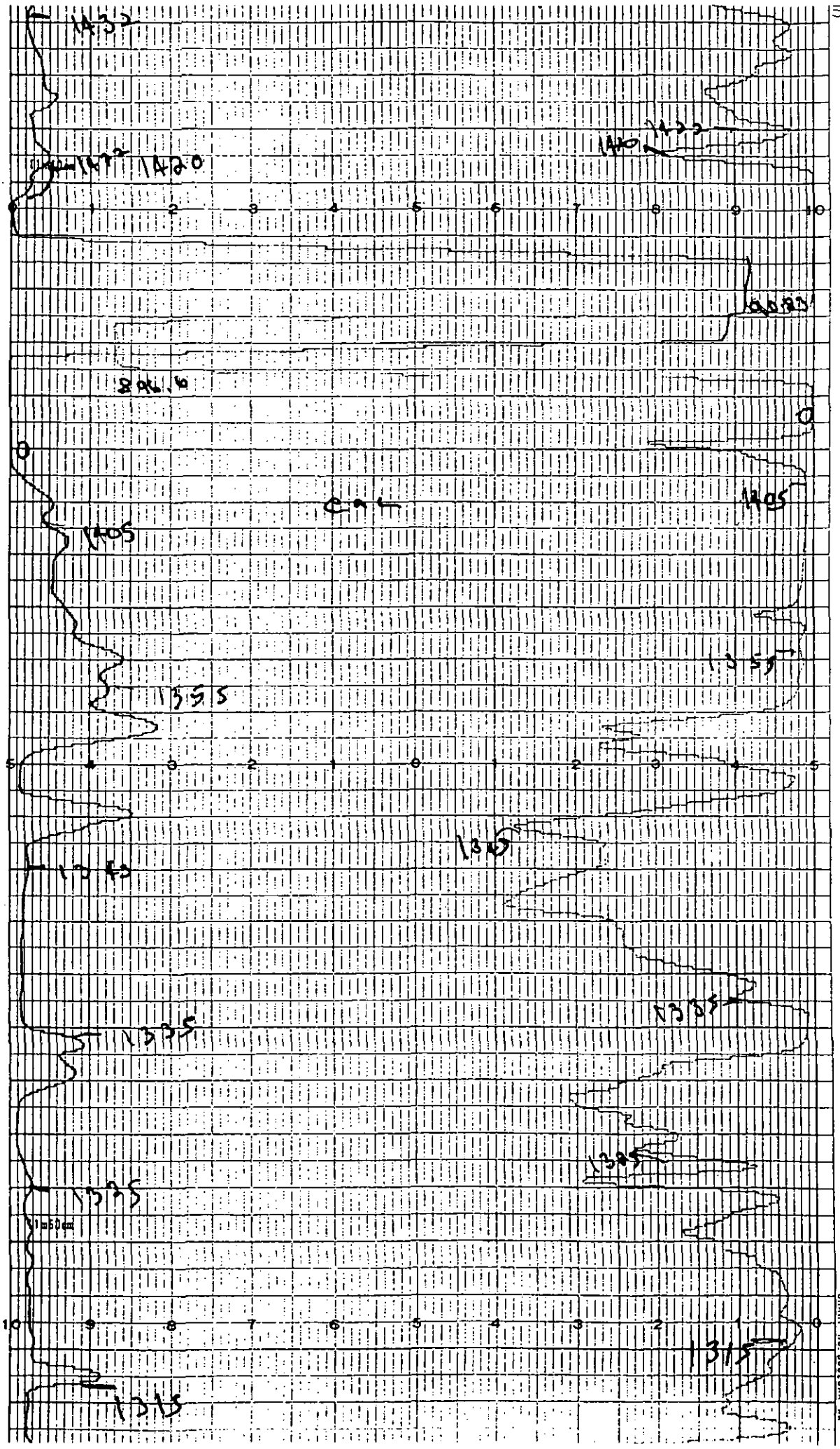
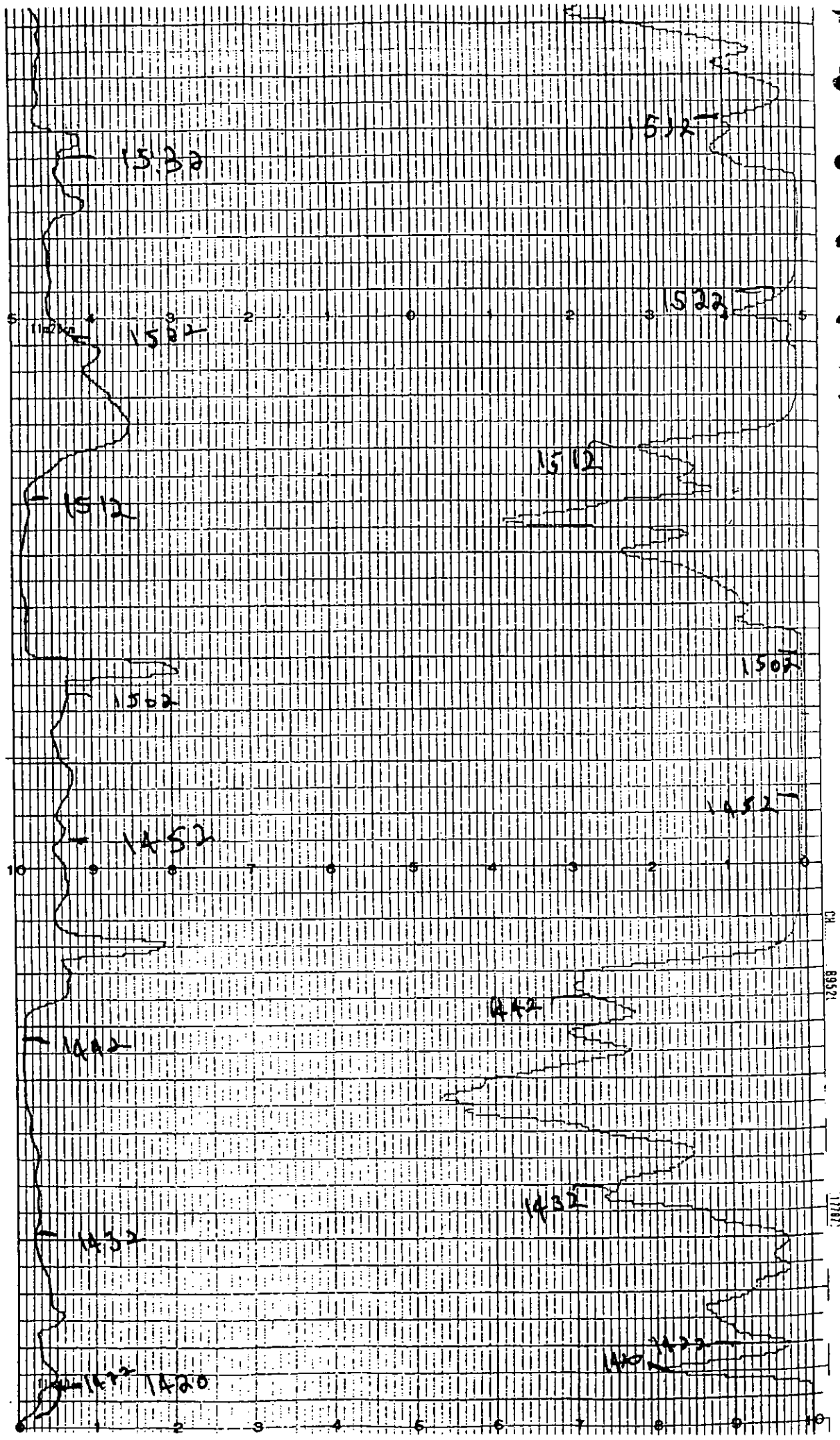
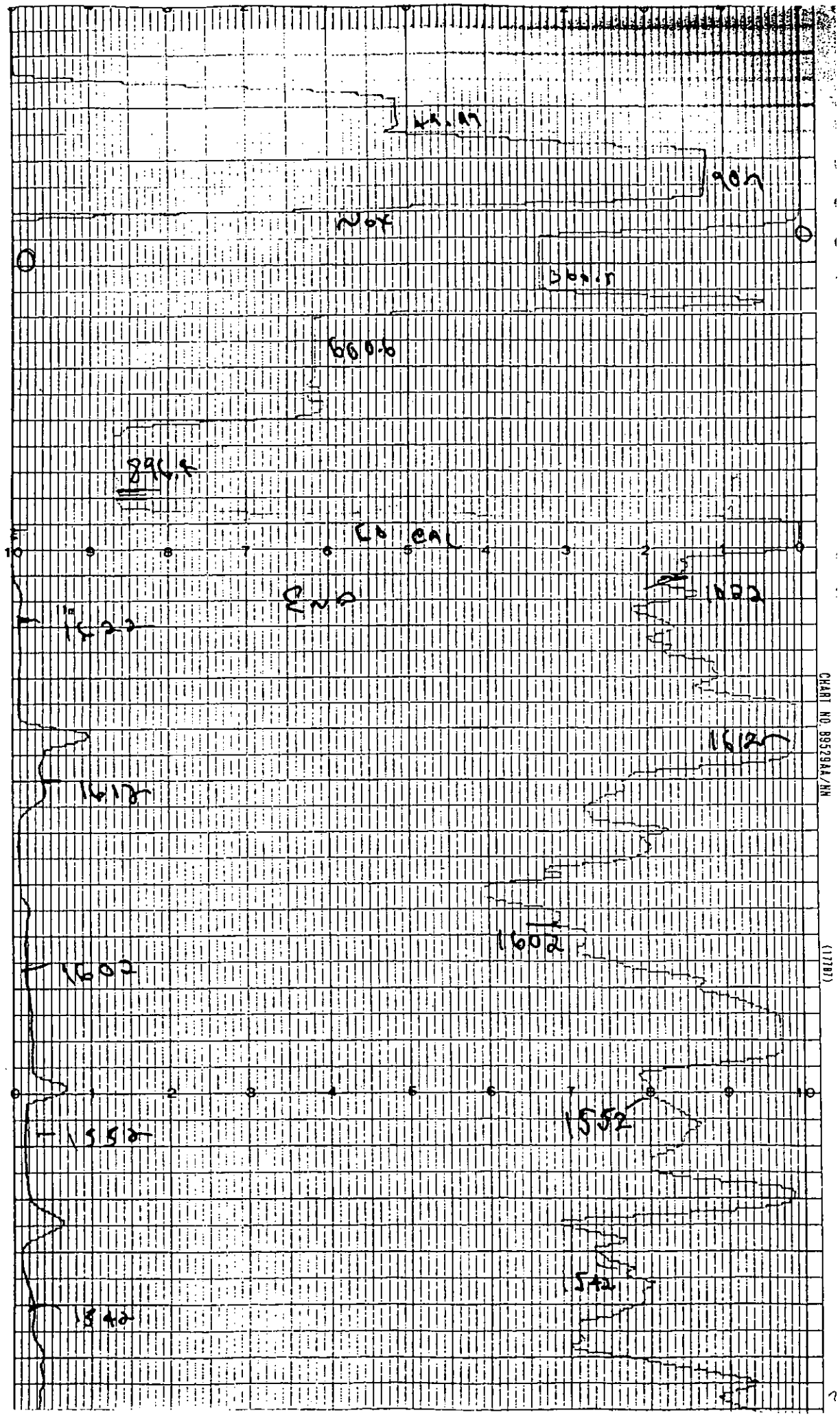

1105
1055
1045
1105
1045
12m20cm
CAL
0:00
950
950

CHART NO. B9528AA/NN (17787)


1325
1315
1305
1255
1245 START
CHART NO. 89529AA/NN


1432
1422
1420
1422
1410
1405
1405
1355
1355
1345
1345
1335
1335
1325
1325
1315
1315
CHART NO. 89529AA-NN


1532
1512
1522
1522
1512
1512
1502
1502
1452
1452
1442
1442
1432
1432
1422
1420
1422
1420



NOX
600.6
896.4
END
1622
1612
1602
1552
1542
CHART NO. B9529AA/NN

Appendix D

Process Data

PRODUCTION WORKSHEET

Heats During Tests

Date	Heat No.	Tons	Tap-Tap Time, min	Operating Time, hr	Tons/Hr
TEST 1					
3-Oct	6535	94.8	65	1.1	87.5
	6536	93.4	67	1.1	83.6
	6537	92.4	137	2.3	40.5
	Totals	**280.6**	**269**	**4.5**	**62.6 tons/hr**
TEST 2					
4-Oct	6548	92.8	70	1.2	79.5
	6549	94.4	89	1.5	63.6
	6550	95.3	72	1.2	79.4
	6551	94.8	71	1.2	80.1
	Totals	**377.3**	**302**	**5.0**	**75.0 tons/hr**
TEST 3	6551	94.80	71	1.2	80.1
4-Oct	6552	95.20	72	1.2	79.3
	6553	93.00	84	1.4	66.4
	6554	95.40	104	1.7	55.0
	Totals	**378.4**	**331**	**5.5**	**68.6 tons/hr**

10-4-00 . Daily Heat Report

1491
470

Ht #	Grade	Melter	Tap Time	Tap-Tap	Power on	KWH	Oxy.	Gas	Carb.	Tap "T"	Tap C	Tap S	Ladle #	Scp chg	Tap wt	Heat wt.	Adds tap se	Elect+	Al.	Carb	Sil.	Mn	Lime	Delay	
6540	US95	LN3	11:32P	1:27	46.3	42.9	37.3	14.0	4140	3079	4.5	—	8	218	95.5	8+	130	B&C	250	175	374	2472	2018	Auto	92
6541	"	"	12:41	1:09	47.4	44.8	49.8	11.8	4220	3150	5.5	—	6	218.2	91.2	8+	125	—	250	150	374	2473	2022	Auto	91
6542	UN80	"	1:59A	1:18	45.7	42.9	28.6	10.5	4260	3128	5.7	—	8	218.2	91.6	8+	125	—	250	75	382	2573	2019	"	91
6543	"	"	3:03A	1:04	46.7	45.0	32.3	11.5	4210	3063	10.9	—	4	216.2	95.5	8+	125	—	250	0	375	2573	2021	"	92
6544	"	"	4:05A	1:02	46.1	43.9	31.4	11.1	4130	3090	0.1	—	2	218.1	92.2	10T	125	—	250	75	378	2575	2017	"	"
6545	"	"	5:25A	1:20	46.9	44.9	32.8	12.1	4160	3139	10.3	—	6	217.9	95.4	10T	125	—	250	0	350	2576	2000	"	"
6546	"	"	6:32A	1:07	43.7	42.4	23.6	8.8	4140	3030	10.0	—	8	217.2	94.1	10T	125	32B 13.2	250	25	345	2580	2003	"	"
6547	"	"	7:43A	1:09	45.6	43.2	29.2	9.7	4320	3097	10.8	—	4	217.7	93.2	2T	120	—	250	0	355	2577	2009	"	92
6548	"	"	8:54A	1:10	44.0	40.9	40.1	15.2	4200	3021	10.2	—	6	215.2	92.8	3T	120	—	250	0	370	2572	2021	"	91
6549	"	"	10:02	1:09	49.1	45.9	29.8	9.7	4300	3165	09.1	—	3	218.0	94.4	5T	115	—	250	50	380	2571	2019	"	91
6550	355	"	11:31	1:12	48.4	46.2	35.1	11.9	4200	3173	10.2	—	4	220.1	95.3	5T	115	—	250	0	0	1922	2016	"	92
6551	355	"	12:43A	1:11	46.9	44.8	26.6	10.1	4200	3083	9.8	—	8	218	94.8	5T	115	—	250	75	0	1922	2014	"	92
6552	355	"	1:55	1:12	43.9	40.1	24.2	24.7	4200	3066	11.3	—	6	218	95.2	5T	115	—	250	50	0	1915	2013	"	92
6553	1144	RR	3:20	1:24	43.4	39.9	72740	13008	4200	3065	.10	—	3	218	93.0	4T	111	—	300	125	0	1916	2014		
6554	"	"	5:04	1:45	47.0	93.1	70850	20543	4520	3020	.07	—	4	214	95.4	6T	—	—	300	175	0	1943	2015		
6555	"	"	6:33	1:29	44.8	42.0	68340	16923	4300	3081	.09	—	6	217	93.4	9T	111	—	300	175	6	1934	2016		
6556	"	"	7:54	1:21	43.7	41.0	64300	16161	4220	3040	.10	—	2	218	94.8	7T	111	—	300	200	0	1965	2013		
6557	"	"	9:10	1:15	42.1	39.5	63020	15740	4180	3049	.09	—	4	217	95.5	7T	111	—	300	200	0	1941	2011		
6558	"	"	10:22	1:12	44.9	42.6	67160	14842	4300	3076	.10	—	8	218	94.4	6T	111	—	300	175	0	1967	2014		

Night shift info.
Elect. adds etc.
Stat. Pres. -2.99 11:30P
Damp pos.
Amps 1 2 3
204 196 197 6:60 AM

Day shift info.
Elect. adds etc...
Stat. Pres. -2.82 15 8P
Damp pos.
Amps 1 2 3
204 195 197

Aft. Shift info.
Elect. adds etc...
Stat. Pres -3.22 -2 0:11
Damp pos.
Amps 1 2 3
213 2.06 2.06 -11:30

Delay
1 Scrap
2 Crane
3 Ladle
4 Gun
5 Hyd.
6 Water
7 Elect.
8 Other

10-3-00, Daily Heat Repo..

.500 10 49/P

Adds B&C

Ht #	Grade	Meller	Tap Time	Tap-Tap	Power on	KWH	Oxy.	Gas	Carb.	Tap "T"	Tap C	Tap S	Ladle #	Scp chg	Tap wt	Heat wt.	tap se	Elect+	Al.	Carb	Sil.	Mn	Lime	Delay
6529	J55	LNS OT	12 23/A	1:34	46.7	45.5	24.0	91.4	4100	3099	11.3	—	2	217.7	95.2	10+	140	—	250	75	0	1863	2004	Auto 9
6530	"	"	1 28/A	1:05	45.9	45.0	30.9	108	4300	3075	9.3	—	4	217.7	94.6	10+	140	—	250	25	0	1868	2007	"
6531	"	"	4:10/A	2.38	47.1	45.8	215	811	4100	3042	12.1	—	6	216.3	94.2	10+	140	Slip B&C	250	0	0	1868	2002	"
6532	"	"	5:12	1:02	48.4	49.9	288	892	4120	3060	10.0	—	2	218.7	95.6	10+	140	—	250	50	0	1865	2000	"
6533	"	"	6:00/A	1 28	45.8	44.8	258	10.4	4000	3140	04.8	—	8	217.8	94.8	10T	140	—	300	175	0	1867	2004	"
6534	"	R.W	7 47/A	1:17	48.0	46.1	39.2	14.8	4100	3188	04	—	6	217.5	93.4	7T	140	—	300	150	0	2018	2001	"
6535	"	"	10:53/A	3 07	50.2	45.6	216	8081	4040	3150	7.1	—	4	215.6	94.8	4T	—	—	300	75	0	2023	2020	"
6536	"	RR	5 13		44.3	41.8	38730	21189	4100	3072	.06	—	8	[illegible]	93.4	7T	—	—	300	175	0	2020	1993	
6537	"	"	7 27	2 15	48.9	46.7	58720	8567	4100	3023	.06	—	2	220	92.4	8T	—	—	400	175	0	2167	2019	
6538	US-95	"	8 38	1 10	45.0	42.2	55390	13183	4460	3026	.05	—	4	219	94.8	8T	135	—	300	125	3.91	2466	2019	MAN
6539	"	"	10 05	1 27	43.7	40.3	53570	18274	4360	3053	.05	—	2	219	93.6	8T	13T	—	300	125	3.71	2466	2019	"

Night shift info.

Elect. adds etc.. ADD 3 to A SLIP B&C Day shift info.
Stat. Pres. -3.41 3:30 AM
Damp pos.
Amps 1 2 3
216 212 209
3:40 AM

Elect. adds etc...
Stat. Pres. -1.38 8 18/A
Damp pos.
Amps 1 2 3
23 225 222

Aft. Shift info.

Elect. adds etc... B&C
Stat. Pres. -3.40 18:30
Damp pos.
Amps 1 2 3
216 196 199 -14:04

Delay
1 Scrap
2 Crane
3 Ladle
4 Gun
5 Hyd.
6 Water
7 Elect.
8 Other

Oct 30 00 02:34p

HEAT LOG

SEQ. No. M3034

DATE 10-3-00 GRADE J55 CODE 84 HEAT No. D65535

CARBON ANALYZER TESTS	TIME OF TEST	
TIME MELT	TO LAB.	REC'D

POWER	
ON	OFF
r	
ore	
l Min.	
On	

THERMOCOUPLE READING FURNACE		TIME
EST		
TEST		
EST		
EST		
CK	3150	
LE #1		
LE #2		
stone		
e		
gen After		
r Before		
Used		

ER AFTER	
ER BEFORE	
ER AT MELT	
H. USED TO MELT	
o.	

COMMENTS

STRIPPING
ip
me

WEIGHMASTER

ANALYSIS	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	Va	Cb	AL	FEO	L.S.
ORDERED	26/28	95/105	.015	.008	.08/.15	.35	.15	.12	.03			.020/.040		
MADE									Las	6.0				
Prelim.														
Prelim.														
Prelim.	.071													
Prelim.														
Prelim.														
Lollypop														
Ladle Analysis														

ACTUAL TIME

TAPPED PREVIOUS HEAT	BEGAN CHARGE	POWER ON	FINISH CHARGE	SLAG OFF START	SLAG OFF FINISH	TAPPED	TIME OF HEAT
7:47/A		9:50/A				10:55/A	1:05

ELAPSED TIME

ACTUAL CHARGE TIME	CHARGE TO TAP	MAKE BOTTOMS	CHARGE TO CHARGE	DELAYS	FURNACE PATCH	K.W.H.	TAP TO TAP
							3:10

METALS CHARGED	WEIGHT
NO. 1 STEEL	
NO. 1 BUNDLES-FACTORY	
NO. 1 BUNDLES-DEALER	20040
NO. 2 STEEL	31140
BUSHLINGS	52240
BROKEN MOULDS	
PREPARED PIT SCRAP	8760
COMPANY SCRAP-CARBON	30840
COMPANY SCRAP-INGOTS & BUTTS	
SHREDD	59600
NO. 2 BUNDLES	
BORING & TURNINGS	
TIN PLATE	
TOTAL	202620

FURNACE AND LADLE ADDITIONS	WEIGHT
MILL SCALE	
NICKEL	
COPPER	
H. C. MANGANESE	2023
FERRO PHOSPHORUS	
75% FE. SILICON	
ALUMINUM 39/300	339
MOLYBDENUM	
FE. COLUMBIUM (CONT. WGT.)	
LC. MANGANESE	
FE. VANADIUM	
CHROME	
COKE	375
CALCIUM	17
Air Cart	300
TOTAL	3054

PRODUCTION 29490 WEIGHT

PRODUCT	NO. OF SLABS	MOLD SIZE	MOLD CODE	WEIGHT
SLABS	6	8 46/2-282		176940
SLABS				
INGOTS				
FRONT ENDCROPS				
TAIL ENDCROPS				
SKULL				
TONS IN TUNDISH				
PIT				
TOTAL INGOT WEIGHT				

TONNAGE	WEIGHT	
TOTAL CHARGED	102837	86.0
TOTAL PRODUCED	88470	YIELD %

FURNACE DELAYS AND REMARKS	TIME	ELAPSED TIME	TYPE
WATER LEAK ON PANEL 2 A	8:45/A-9:45/A	:60	
METECH GUN STUCK INSIDE OF FCE	7:50/A-8:45/A	:55	

CLOCK TIME OF RECARB OR DECARB

NSC-0109

DATE 10-3

CHARGE	WEIGHT	TYPE	HOW LOADED	TIME
				9:50/A

CARBON ANALYZER TESTS		TIME OF TEST	
C.	TIME MELT.	TO LAB.	REC'D

ANALYSIS	C
ORDERED	26/28 9
MADE	
Prelim.	
Prelim.	
Prelim.	071
Prelim.	
Prelim.	
Lollypop	
Ladle Analysis	

ORDERED

FURNACE AND LADLE ALLOWANCE

ALLOYS	%	WEIGHT	TIME
FE. MN. FURNACE			
FE. MN. FURNACE			
FE. MN. FURNACE			
FE. MN. LADLE	80%	2023	
FE. MN. LADLE			
FE. SI. FURNACE			
FE. SI.	75%	0	
FE. SI.			
MISCH ALLOY			
FE. VANADIUM			
MOLYBDENUM			
AL. LADLE	Brig.	300	
AL. MOULDS			
COKE		75	
A.K. FLUX			
RIM. ACCEL. MOULDS			
FE. COLUMBIUM			
DESULFURIZER TAP	N-16.	2020	
DESULFURIZER LADLE			
CALCIUM NO. OF FT.			
POUNDS OF HOT TOP			
ELAPSED TIME OF TAP	Secs	140	
ARGON TIME			
ARGON GAUGE READING			
	Sood	500	
	S.L.	300	
	Sol.	50	

POWER

ON	OFF
After	
Before	
Total Min.	
% P. On	

THERMOCOUPLE READING FURNACE		TIME
1st TEST		
2nd TEST		
3rd TEST		
4th TEST		
BLOCK	3180	
TAP		
LADLE #1		
LADLE #2		
Limestone		
Lime		
Lime		
Coke		
Spar		
Scale		
Oxygen After		
Meter Before		
O_2 Used		

TAPPED PREVIOUS HEAT 7:47/A

ACTUAL CHARGE TIME

METALS C

NO. 1 STEEL
NO. 1 BUNDLES-FAC
NO. 1 BUNDLES-DEA
NO. 2 STEEL
BUSHLINGS
BROKEN MOULDS
PREPARED PIT SCRA
COMPANY SCRAP-C.
COMPANY SCRAP-IN
SHREDD
NO. 2 BUNDLES
BORING & TURNING
TIN PLATE

ELECTRODE DATA

PHASE	NO. ADDED	TIME	BY WHOM	SUPPLIER
No. 1				
No. 2				SGL
No. 3				

METER AFTER
METER BEFORE
METER AT MELT
K.W.H. USED TO MELT

PRODU

PRO-DUCT	NO. OF SLABS	M
SLABS	6	8
SLABS		
INGOTS		
FRONT ENDCROPS		
TAIL ENDCROPS		
SKULL		
TONS IN TUNDISH		
PIT		

TOTAL

HEATS ON LINING: ROOF ROOF No.

WALLS	Used: GUN MIX	SYNDOLAG	COMMENTS
TAP HOLE			
BANKS			
BOTTOM			

LADDLE NO. NO. HEATS NOZ. SIZE

STOPPER: MOLD CONDITION:

BLEEDERS:

POURED BY: PIT FOREMAN

TESTS: LAB. JOMINY GR. SIZE

STRIPPING

Start Strip
Finish Strip
Lapsed Time
Delays
Delivered

Water Le
Metech

MELTER	1st HELPER	WEIGHMASTER
12-8	12-8	12-8
8-4 RW	8-4 GB	8-4
4-12	4-12	4-12

CLOCK TIME OF RECA

HEAT LOG

SEQ. No. M3035

DATE 10-3-00 GRADE J05 CODE 84 HEAT No. 06536

ARBON ALYZER TESTS	TIME OF TEST	
TIME MELT.	TO LAB.	REC'D

ANALYSIS	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	Va	Cb	AL	FEO	L.S.
ORDERED	26/28	95/105	015	008	08/15	35	15	12	05			020/045		
MADE									Mos	00				
Prelim.	.06													
Prelim.														
Prelim.	.19			.020										
Prelim.														
Prelim.														
Lollypop														
Ladle Analysis														

POWER	
ON	OFF
re	
Min.	
On	

HERMOCOUPLE ADING FURNACE		TIME
ST	3072	
EST		
EST		
EST		
K		
E #1		
E #2		
tone		
en After		
r Before		
Used		
ER AFTER		
ER BEFORE		
ER AT MELT		
H. USED TO MELT		
o.		

ACTUAL TIME

TAPPED PREVIOUS HEAT	BEGAN CHARGE	POWER ON	FINISH CHARGE	SLAG OFF START	SLAG OFF FINISH	TAPPED	TIME OF HEAT
10:55/A	11:05/A	405	421			512	6:10

ELAPSED TIME

ACTUAL CHARGE TIME	CHARGE TO TAP	MAKE BOTTOMS	CHARGE TO CHARGE	DELAYS	FURNACE PATCH	K.W.H.	TAP TO TAP
							6:15

METALS CHARGED	WEIGHT
NO. 1 STEEL	—
NO. 1 BUNDLES-FACTORY	—
NO. 1 BUNDLES-DEALER	19120
NO. 2 STEEL	30160
BUSHLINGS	54400
BROKEN MOULDS	—
PREPARED PIT SCRAP	9660
COMPANY SCRAP-CARBON	33340
COMPANY SCRAP-INGOTS & BUTTS	—
SHREDD	58820
NO. 2 BUNDLES	—
BORING & TURNINGS	—
TIN PLATE	—
TOTAL	205500

FURNACE AND LADLE ADDITIONS	WEIGHT
MILL SCALE	
NICKEL	
COPPER	
H. C. MANGANESE	2520
FERRO PHOSPHORUS	—
75% FE. SILICON	180
ALUMINUM 110/300	410
MOLYBDENUM	
FE. COLUMBIUM (CONT. WGT.)	
LC. MANGANESE	
FE. VANADIUM	
CHROME	
COKE	175
CALCIUM	31
Fe Carb	400
TOTAL	3716

PRODUCTION 29490 **WEIGHT**

PRODUCT	NO. OF SLABS	MOLD SIZE	MOLD CODE	
SLABS	7	8-46½-282		206430
SLABS				
INGOTS				
FRONT ENDCROPS				
TAIL ENDCROPS				
SKULL				
TONS IN TUNDISH				
PIT				
TOTAL INGOT WEIGHT				

TONNAGE	WEIGHT	
TOTAL CHARGED	104608	98.7
TOTAL PRODUCED	103215	YIELD %

COMMENTS

STRIPPING
ip
me

WEIGHMASTER

FURNACE DELAYS AND REMARKS	TIME	ELAPSED TIME	TYPE
Shut-off for waiting for caster to start	11:05/A - 405	5:00	
F.D wont open	455 500	:05	
wait for Heckell to push ladle car		:10	

CLOCK TIME OF RECARB OR DECARB

NSC-0109

DATE 10-

CHARGE	WEIGHT	TYPE	HOW LOADED	TIME

CARBON ANALYZER TESTS		TIME OF TEST	
C.	TIME MELT.	TO LAB.	REC'D

ANALYSIS	C
ORDERED	2.6/2.8
MADE	
Prelim.	.06
Prelim.	
Prelim.	.19
Prelim.	
Prelim.	
Lollypop	
Ladle Analysis	

ORDERED	FURNACE AND LADLE ALLOWANCE			
	ALLOYS	%	WEIGHT	TIME
	FE. MN. FURNACE			
	FE. MN. FURNACE			
	FE. MN. FURNACE			
	FE. MN. LADLE	80%	2020	
	FE. MN. LADLE			
	FE. SI. FURNACE			
	FE. SI.	75%	0	
	FE. SI.			
	MISCH ALLOY			
	FE. VANADIUM			
	MOLYBDENUM			
	AL. LADLE	BRIQ	300	
	AL. MOULDS			
	COKE	100		
	A.K. FLUX			
	RIM. ACCEL. MOULDS			
	FE. COLUMBIUM			
	DESULFURIZER TAP	21-16	1993	
	DESULFURIZER LADLE			
	CALCIUM NO. OF FT.			
	POUNDS OF HOT TOP			
	ELAPSED TIME OF TAP	sec		
	ARGON TIME			
	ARGON GAUGE READING			
		5000	350	
		SiL	400	
		O2/L	100	

POWER	
ON	OFF
After	
Before	
Total Min.	
% P. On	

THERMOCOUPLE READING FURNACE		TIME
1st TEST	3072	
2nd TEST		
3rd TEST		
4th TEST		
BLOCK		
TAP		
LADLE #1		
LADLE #2		
Limestone		
Lime		
Lime		
Coke		
Spar		
Scale		
Oxygen After		
Meter Before		
O_2 Used		

TAPPED PREVIOUS HEAT 10:55/p

ACTUAL CHARGE TIME

METALS

NO. 1 STEEL
NO. 1 BUNDLES-FA
NO. 1 BUNDLES-DE
NO. 2 STEEL
BUSHLINGS
BROKEN MOULDS
PREPARED PIT SCR
COMPANY SCRAP-
COMPANY SCRAP-
SHREDD
NO. 2 BUNDLES
BORING & TURNIN
TIN PLATE

ELECTRODE DATA

PHASE	NO. ADDED	TIME	BY WHOM	SUPPLIER
No. 1				
No. 2				Slel
No. 3				

METER AFTER	
METER BEFORE	
METER AT MELT	
K.W.H. USED TO MELT	

PROD

PRO-DUCT	NO. OF SLABS	
SLABS	7	8
SLABS		
INGOTS		
FRONT ENDCROPS		
TAIL ENDCROPS		
SKULL		
TONS IN TUNDISH		
PIT		
TOT		

HEATS ON LINING: ROOF ROOF No.

WALLS	Used: GUN MIX	SYNDOLAG	COMMENTS
TAP HOLE			
BANKS			
BOTTOM			

LADLE NO. NO. HEATS NOZ. SIZE

STOPPER: MOLD CONDITION:

BLEEDERS:

POURED BY: PIT FOREMAN

TESTS: LAB. JOMINY GR. SIZE

STRIPPING	
Start Strip	Shut-of
Finish Strip	
Lapsed Time	
Delays	F.D wont
Delivered	wait For

MELTER	1st HELPER	WEIGHMASTER
12 - 8	12 - 8	12 - 8
8 - 4	8 - 4	8 - 4
4 - 12 RA	4 - 12	4 - 12

CLOCK TIME OF RE

HEAT LOG

SEQ. No. M3036

DATE 10-3-00 GRADE J55 CODE 84 HEAT No. 06537

CARBON ANALYZER TESTS		TIME OF TEST	
C.	TIME MELT.	TO LAB.	REC'D

ANALYSIS	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	Va	Cb	AL.	FEO	L.S.
ORDERED	26/28	95/105	015	008	08/15	35	15	12	03			020/040		
MADE									Ros 60					
Prelim.														
Prelim.														
Prelim.														
Prelim.														
Prelim.														
Lollypop														
Ladle Analysis														

POWER	
ON	OFF
fter	
efore	
otal Min.	
. P. On	

THERMOCOUPLE READING FURNACE		TIME
1 TEST		
d TEST		
d TEST		
n TEST		
OCK		
AP		
DLE #1		
DLE #2		
nestone		
ne		
ne		
oke		
ar		
ale		
ygen After		
eter Before		
Used		

ETER AFTER
ETER BEFORE
ETER AT MELT
W.H. USED TO MELT
No.

G	COMMENTS

ACTUAL TIME

TAPPED PREVIOUS HEAT	BEGAN CHARGE	POWER ON	FINISH CHARGE	SLAG OFF START	SLAG OFF FINISH	TAPPED	TIME OF HEAT
512		545	646			729	1:45

ELAPSED TIME

ACTUAL CHARGE TIME	CHARGE TO TAP	MAKE BOTTOMS	CHARGE TO CHARGE	DELAYS	FURNACE PATCH	K.W.H.	TAP TO TAP
							2:20

METALS CHARGED	WEIGHT
NO. 1 STEEL	—
NO. 1 BUNDLES-FACTORY	—
NO. 1 BUNDLES-DEALER	8720
NO. 2 STEEL	36820
BUSHLINGS	—
BROKEN MOULDS	—
PREPARED PIT SCRAP	6260
COMPANY SCRAP-CARBON	114120
COMPANY SCRAP-INGOTS & BUTTS	—
SHREDD	28140
NO. 2 BUNDLES	11460
BORING & TURNINGS	—
TIN PLATE	—
TOTAL	205520

FURNACE AND LADLE ADDITIONS	WEIGHT
MILL SCALE	
NICKEL	
COPPER	
H. C. MANGANESE	229
FERRO PHOSPHORUS	—
75% FE. SILICON	—
ALUMINUM 19/400	41
MOLYBDENUM	
FE. COLUMBIUM (CONT. WGT.)	
LC. MANGANESE	
FE. VANADIUM	
CHROME	
COKE	27
CALCIUM	17
Ac Carb	40
TOTAL	340

PRODUCTION 29490

PRODUCT	NO. OF SLABS	MOLD SIZE	MOLD CODE	WEIGHT
SLABS	3	846½-282		88470
SLABS	2	46½-231		48300
INGOTS				
FRONT ENDCROPS				
TAIL ENDCROPS	1	46½-12		1265
SKULL				
TONS IN TUNDISH	~~25~~	4.9		9800 ~~5000~~
PIT				
TOTAL INGOT WEIGHT				136770

TONNAGE	WEIGHT	
TOTAL CHARGED	104462	65.5
TOTAL PRODUCED	68385	YIELD %

STRIPPING
trip
Strip
l Time
red

WEIGHMASTER
- 8
- 4
- 12

FURNACE DELAYS AND REMARKS	TIME	ELAPSED TIME	TYPE
Gun FB, SL Around Fee	520/540	:20	/
Level 1st Charge	540/545	:05	/
Level roof / up and down limits	548/628	:20	/
Cave in / lost temp		615	
CLOCK TIME OF RECARB OR DECARB			

NSC-0109

DATE 10-3-C

CHARGE	WEIGHT	TYPE	HOW LOADED	TIME

CARBON ANALYZER TESTS		TIME OF TEST	
C.	TIME MELT.	TO LAB.	REC'D

ANALYSIS	C	M
ORDERED	26/28	95
MADE		
Prelim.		
Prelim.		
Prelim.		
Prelim.		
Prelim.		
Lollypop		
Ladle Analysis		

ORDERED

FURNACE AND LADLE ALLOWANCE			
ALLOYS	%	WEIGHT	TIME
FE. MN. FURNACE			
FE. MN. FURNACE			
FE. MN. FURNACE			
FE. MN. LADLE	60%	2167	
FE. MN. LADLE			
FE. SI. FURNACE			
FE. SI.	75%	0	
FE. SI.			
MISCH ALLOY			
FE. VANADIUM			
MOLYBDENUM			
AL. LADLE	Brig	400	
AL. MOULDS			
COKE	100	175	
A.K. FLUX			
RIM. ACCEL. MOULDS			
FE. COLUMBIUM			
DESULFURIZER TAP	N-16	2019	
DESULFURIZER LADLE			
CALCIUM NO. OF FT.			
POUNDS OF HOT TOP			
ELAPSED TIME OF TAP	Scr.	—	
ARGON TIME			
ARGON GAUGE READING			
	Coke	350	
	Silc	400	
	Silc	100	

POWER		
	ON	OFF
After		
Before		
Total Min.		
% P. On		

THERMOCOUPLE READING FURNACE		TIME
1st TEST		
2nd TEST		
3rd TEST		
4th TEST		
BLOCK		
TAP		
LADLE #1		
LADLE #2		

Limestone	
Lime	
Lime	
Coke	
Spar	
Scale	
Oxygen After	
Meter Before	
O_2 Used	
METER AFTER	
METER BEFORE	
METER AT MELT	
K.W.H. USED TO MELT	

TAPPED PREVIOUS HEAT	
512	

ACTUAL CHARGE TIME	

METALS CH/

NO. 1 STEEL	
NO. 1 BUNDLES-FACTO	
NO. 1 BUNDLES-DEALE	
NO. 2 STEEL	
BUSHLINGS	
BROKEN MOULDS	
PREPARED PIT SCRAP	
COMPANY SCRAP-CAR	
COMPANY SCRAP-INGC	
SHREDD	
NO. 2 BUNDLES	
BORING & TURNINGS	
TIN PLATE	

ELECTRODE DATA

PHASE	NO. ADDED	TIME	BY WHOM	SUPPLIER
No. 1				
No. 2				
No. 3				SGL

HEATS ON LINING: ROOF ROOF No.

WALLS	Used: GUN MIX	SYNDOLAG	COMMENTS
TAP HOLE			
BANKS			
BOTTOM			

PRODUCT

PRO-DUCT	NO. OF SLABS	MOLD
SLABS	3	84/6
SLABS	2	4/6
INGOTS		
FRONT ENDCROPS		
TAIL ENDCROPS	1	4/6
SKULL		
TONS IN TUNDISH	2.5	4
PIT		

TOTAL IN

LADLE NO. NO. HEATS NOZ. SIZE

STOPPER: MOLD CONDITION:

BLEEDERS:

POURED BY: PIT FOREMAN

TESTS: LAB. JOMINY GR. SIZE

STRIPPING

Start Strip	
Finish Strip	
Lapsed Time	
Delays	
Delivered	

Gun F13, 5L
Level 1st
Level roof
Carb 12/

MELTER	1st HELPER	WEIGHMASTER
12 - 8	12 - 8	12 - 8
8 - 4	8 - 4	8 - 4
4 - 12	4 - 12	4 - 12

CLOCK TIME OF RECARB

HEAT LOG

SEQ. No. M3029

DATE 10-4-00 GRADE UN80 CODE 85 HEAT No. D6548

CARBON ANALYZER TESTS		TIME OF TEST	
C.	TIME MELT.	TO LAB.	REC'D

ANALYSIS	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	Va	Cb	AL.	FEO	L.S.
ORDERED	23/25	120/130	015	005	15/25	3.5	15	12	03			020/045		
MADE									Lab 6					
Prelim.														
Prelim.														
Prelim.	10.2													
Prelim.														
Prelim.														
Lollypop														
Ladle Analysis														

POWER	
ON	OFF
ter	
fore	
tal Min.	
P. On	

THERMOCOUPLE READING FURNACE		TIME
TEST		
TEST		
TEST		
TEST		
CK	3051	
LE #1		
LE #2		
stone		
e		
e		
e		
r		
e		
gen After		
er Before		
Used		
TER AFTER		
TER BEFORE		
TER AT MELT		
H. USED TO MELT		
No.		

ACTUAL TIME							
TAPPED PREVIOUS HEAT	BEGAN CHARGE	POWER ON	FINISH CHARGE	SLAG OFF START	SLAG OFF FINISH	TAPPED	TIME OF HEAT
7:40/A		7:55/A	8:14/A			8:50/A	55

ELAPSED TIME							
ACTUAL CHARGE TIME	CHARGE TO TAP	MAKE BOTTOMS	CHARGE TO CHARGE	DELAYS	FURNACE PATCH	K.W.H.	TAP TO TAP
							1:10

METALS CHARGED	WEIGHT
NO. 1 STEEL	—
NO. 1 BUNDLES-FACTORY	—
NO. 1 BUNDLES-DEALER	19420
NO. 2 STEEL	32120
BUSHLINGS	50400
BROKEN MOULDS	—
PREPARED PIT SCRAP	9340
COMPANY SCRAP-CARBON	30420
COMPANY SCRAP-INGOTS & BUTTS	—
SHREDD	60040
NO. 2 BUNDLES	—
BORING & TURNINGS	—
TIN PLATE	—
TOTAL	201740

FURNACE AND LADLE ADDITIONS	WEIGHT
MILL SCALE	
NICKEL	
COPPER	
H. C. MANGANESE	2797
FERRO PHOSPHORUS	—
75% FE. SILICON	379
ALUMINUM 49/250	299
MOLYBDENUM	
FE. COLUMBIUM (CONT. WGT.)	
LC. MANGANESE	
FE. VANADIUM	
CHROME	
COKE	75
CALCIUM	38
In Carb	200
TOTAL	3788

PRODUCTION 29380 WEIGHT

PRO-DUCT	NO. OF SLABS	MOLD SIZE	MOLD CODE	WEIGHT
SLABS	6	8x46½x281		176280
SLABS				
INGOTS				
FRONT ENDCROPS	1	8x46½x12"		1265
TAIL ENDCROPS				
SKULL				
TONS IN TUNDISH				
PIT				
TOTAL INGOT WEIGHT				

TONNAGE	WEIGHT
TOTAL CHARGED	102764
TOTAL PRODUCED	88140

YIELD 85.8 %

COMMENTS

STRIPPING

P

ip

ime

WEIGHMASTER

FURNACE DELAYS AND REMARKS	TIME	ELAPSED TIME	TYPE

CLOCK TIME OF RECARB OR DECARB

NSC-0109

DATE 10-4-

CHARGE	WEIGHT	TYPE	HOW LOADED	TIME

CARBON ANALYZER TESTS		TIME OF TEST	
C.	TIME MELT.	TO LAB.	REC'D

ANALYSIS	C	M
ORDERED	23/25	12
MADE		
Prelim.		
Prelim.		
Prelim.	10.2	
Prelim.		
Prelim.		
Lollypop		
Ladle Analysis		

ORDERED

FURNACE AND LADLE ALLOWANCE			
ALLOYS	%	WEIGHT	TIME
FE. MN. FURNACE			
FE. MN. FURNACE			
FE. MN. FURNACE			
FE. MN. LADLE	80%	2572	
FE. MN. LADLE			
FE. SI. FURNACE			
FE. SI.	25%	379	
FE. SI.			
MISCH ALLOY			
FE. VANADIUM			
MOLYBDENUM			
AL. LADLE	Brig.	250	
AL. MOULDS			
COKE			
A.K. FLUX			
RIM. ACCEL. MOULDS			
FE. COLUMBIUM			
DESULFURIZER TAP	15-16	2021	
DESULFURIZER LADLE			
CALCIUM NO. OF FT.			
POUNDS OF HOT TOP			
ELAPSED TIME OF TAP			
ARGON TIME			
ARGON GAUGE READING			
	5050	300	
	Silc	200	
	Calc	50	

POWER	
ON	OFF
After	
Before	
Total Min.	
% P. On	

THERMOCOUPLE READING FURNACE		TIME
1st TEST		
2nd TEST		
3rd TEST		
4th TEST		
BLOCK	3051	
TAP		
LADLE #1		
LADLE #2		
Limestone		
Lime		
Lime		
Coke		
Spar		
Scale		
Oxygen After		
Meter Before		
O_2 Used		

TAPPED PREVIOUS HEAT
7:40A

ACTUAL CHARGE TIME

METALS CH.

NO. 1 STEEL
NO. 1 BUNDLES-FACTC
NO. 1 BUNDLES-DEALE
NO. 2 STEEL
BUSHLINGS
BROKEN MOULDS
PREPARED PIT SCRAP
COMPANY SCRAP-CAR
COMPANY SCRAP-ING
SHREDD
NO. 2 BUNDLES
BORING & TURNINGS
TIN PLATE

ELECTRODE DATA

PHASE	NO. ADDED	TIME	BY WHOM	SUPPLIER
No. 1				S Cob
No. 2				
No. 3				

METER AFTER
METER BEFORE
METER AT MELT
K.W.H. USED TO MELT

HEATS ON LINING: ROOF ROOF No.

WALLS	Used: GUN MIX	SYNDOLAG	COMMENTS
TAP HOLE			
BANKS			
BOTTOM			

PRODUCT

PRODUCT	NO. OF SLABS	MOL
SLABS	6	8x4
SLABS		
INGOTS		
FRONT ENDCROPS	1	8x4
TAIL ENDCROPS		
SKULL		
TONS IN TUNDISH		
PIT		

TOTAL I

LADDLE NO. NO. HEATS NOZ. SIZE

STOPPER: MOLD CONDITION:

BLEEDERS:

POURED BY: PIT FOREMAN

TESTS: LAB. JOMINY GR. SIZE

STRIPPING
Start Strip
Finish Strip
Lapsed Time
Delays
Delivered

MELTER		1st HELPER		WEIGHMASTER	
12 - 8		12 - 8		12 - 8	
8 - 4	RW	8 - 4	GB	8 - 4	
4 - 12		4 - 12		4 - 12	

CLOCK TIME OF RECARI

HEAT LOG

SEQ. No. M3030

DATE 10-4-00 GRADE DWFO CODE 85 HEAT No. D6549

ANALYSIS	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	Va	Cb	AL.	FEO	L.S.
ORDERED	23/25	120/150	015	005	15/25	35	15	12	03			025/045		
MADE								1c	6c					
Prelim.														
Prelim.														
Prelim.	.091													
Prelim.														
Prelim.														
Lollypop														
Ladle Analysis														

CARBON ANALYZER TESTS — TIME OF TEST

C.	TIME MELT.	TO LAB.	REC'D

POWER

	ON	OFF
iter		
efore		
otal Min.		
P. On		

THERMOCOUPLE READING FURNACE		TIME
TEST		
d TEST		
I TEST		
TEST		
OCK	3165	
P		
DLE #1		
DLE #2		

lestone
ne
ne
ke
ar
ale
ygen After
ter Before
Used
ETER AFTER
ETER BEFORE
ETER AT MELT
W.H. USED TO MELT
No.

G — COMMENTS

ACTUAL TIME

TAPPED PREVIOUS HEAT	BEGAN CHARGE	POWER ON	FINISH CHARGE	SLAG OFF START	SLAG OFF FINISH	TAPPED	TIME OF HEAT
8:50/A		9:19/A				10:19/A	1:00

ELAPSED TIME

ACTUAL CHARGE TIME	CHARGE TO TAP	MAKE BOTTOMS	CHARGE TO CHARGE	DELAYS	FURNACE PATCH	K.W.H.	TAP TO TAP
							1:30

METALS CHARGED	WEIGHT
NO. 1 STEEL	—
NO. 1 BUNDLES-FACTORY	—
NO. 1 BUNDLES-DEALER	19840
NO. 2 STEEL	32540
BUSHLINGS	52920
BROKEN MOULDS	—
PREPARED PIT SCRAP	8680
COMPANY SCRAP-CARBON	30140
COMPANY SCRAP-INGOTS & BUTTS	—
SHREDD	60620
NO. 2 BUNDLES	—
BORING & TURNINGS	—
TIN PLATE	—
TOTAL	204740

FURNACE AND LADLE ADDITIONS	WEIGHT
MILL SCALE	
NICKEL	
COPPER	
H. C. MANGANESE	274
FERRO PHOSPHORUS	—
75% FE. SILICON	38
ALUMINUM 45/250	29
MOLYBDENUM	
FE. COLUMBIUM (CONT. WGT.)	
LC. MANGANESE	
FE. VANADIUM	
CHROME	
COKE	15
CALCIUM	17
Ar Carb	20
TOTAL	378

PRODUCTION 2938-

PRODUCT	NO. OF SLABS	MOLD SIZE	MOLD CODE		WEIGHT
SLABS	7	8x46½x281			205660
SLABS					
INGOTS		Apply Slabs	6 & 7		to 3567" 3
FRONT ENDCROPS					
TAIL ENDCROPS					
SKULL					
TONS IN TUNDISH					
PIT					
TOTAL INGOT WEIGHT					

TONNAGE	WEIGHT	
TOTAL CHARGED	104264	98.6
TOTAL PRODUCTED	102830	YIELD %

STRIPPING

rip
Strip
Time

d

WEIGHMASTER

2

FURNACE DELAYS AND REMARKS	TIME	ELAPSED TIME	TYPE
ADDED ONE Electrode (A phase)	9:00/A - 9:19/A	:19	

CLOCK TIME OF RECARB OR DECARB

NSC-0109

DATE 10-

CHARGE	WEIGHT	TYPE	HOW LOADED	TIME

CARBON ANALYZER TESTS		TIME OF TEST	
C.	TIME MELT.	TO LAB.	REC'D

ANALYSIS	C
ORDERED	23/25
MADE	
Prelim.	
Prelim.	
Prelim.	091
Prelim.	
Prelim.	
Lollypop	
Ladle Analysis	

ORDERED

FURNACE AND LADLE ALLOWANCE

ALLOYS	%	WEIGHT	TIME
FE. MN. FURNACE			
FE. MN. FURNACE			
FE. MN. FURNACE			
FE. MN. LADLE	80%	2371	
FE. MN. LADLE			
FE. SI. FURNACE			
FE. SI.	75%	380	
FE. SI.			
MISCH ALLOY			
FE. VANADIUM			
MOLYBDENUM			
AL. LADLE	Brig.	250	
AL. MOULDS			
COKE		50	
A.K. FLUX			
RIM. ACCEL. MOULDS			
FE. COLUMBIUM			
DESULFURIZER TAP	N-16	2019	
DESULFURIZER LADLE			
CALCIUM NO. OF FT.			
POUNDS OF HOT TOP			
ELAPSED TIME OF TAP	Sec S.	115	
ARGON TIME			
ARGON GAUGE READING			
	5000	300	
	Silc	200	
	Calc		

POWER

ON	OFF
After	
Before	
Total Min.	
% P. On	

THERMOCOUPLE READING FURNACE		TIME
1st TEST		
2nd TEST		
3rd TEST		
4th TEST		
BLOCK	3165	
TAP		
LADLE #1		
LADLE #2		
Limestone		
Lime		
Lime		
Coke		
Spar		
Scale		
Oxygen After		
Meter Before		
O_2 Used		

TAPPED PREVIOUS HEAT 8:50/A

ACTUAL CHARGE TIME

METALS

NO. 1 STEEL
NO. 1 BUNDLES-FA
NO. 1 BUNDLES-DE
NO. 2 STEEL
BUSHLINGS
BROKEN MOULDS
PREPARED PIT SCR
COMPANY SCRAP-
COMPANY SCRAP-
SHREDD
NO. 2 BUNDLES
BORING & TURNIN
TIN PLATE

ELECTRODE DATA

PHASE	NO. ADDED	TIME	BY WHOM	SUPPLIER
No. 1	1 stick A			
No. 2				Sbl
No. 3				

METER AFTER
METER BEFORE
METER AT MELT
K.W.H. USED TO MELT

PROD

PRO-DUCT	NO. OF SLABS	
SLABS	7	8
SLABS		
INGOTS		A
FRONT ENDCROPS		
TAIL ENDCROPS		
SKULL		
TONS IN TUNDISH		
PIT		

TOTA

HEATS ON LINING: ROOF ROOF No.

WALLS	Used: GUN MIX	SYNDOLAG	COMMENTS
TAP HOLE			
BANKS			
BOTTOM			

LADDLE NO. NO. HEATS NOZ. SIZE

STOPPER: MOLD CONDITION:

BLEEDERS:

POURED BY: PIT FOREMAN

TESTS: LAB. JOMINY GR. SIZE

STRIPPING

Start Strip
Finish Strip
Lapsed Time
Delays
Delivered

ADDED O

MELTER	1st HELPER	WEIGHMASTER
12 - 8	12 - 8	12 - 8
8 - 4 BW	8 - 4 G B	8 - 4
4 - 12	4 - 12	4 - 12

CLOCK TIME OF REC

HEAT LOG

SEQ. No. 6550

DATE 10-4-00 GRADE J55 CODE 84 HEAT No. D6550

ANALYSIS	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	Va	Cb	AL.	FEO	L.S.
ORDERED	26/28	95/105	.015	.008	08/15	35	15	12	03			024/040		
MADE														
Prelim.														
Prelim.														
Prelim.	10.2													
Prelim.														
Prelim.														
Lollypop														
Ladle Analysis														

CARBON ANALYZER TESTS	TIME OF TEST	
TIME MELT.	TO LAB.	REC'D

POWER

	ON	OFF
...r		
...ore		
...al Min.		
...On		

THERMOCOUPLE READING FURNACE		TIME
TEST		
TEST		
TEST		
TEST		
...CK	3173	
...LE #1		
...LE #2		

...stone

...gen After

...r Before

...Used

...ER AFTER

...ER BEFORE

...ER AT MELT

...H. USED TO MELT

...o.

COMMENTS

ACTUAL TIME

TAPPED PREVIOUS HEAT	BEGAN CHARGE	POWER ON	FINISH CHARGE	SLAG OFF START	SLAG OFF FINISH	TAPPED	TIME OF HEAT
10:19/A		10:32	10:50			11:31/A	1:00

ELAPSED TIME

ACTUAL CHARGE TIME	CHARGE TO TAP	MAKE BOTTOMS	CHARGE TO CHARGE	DELAYS	FURNACE PATCH	K.W.H.	TAP TO TAP
							1:15

METALS CHARGED	WEIGHT
NO. 1 STEEL	—
NO. 1 BUNDLES-FACTORY	—
NO. 1 BUNDLES-DEALER	21760
NO. 2 STEEL	34360
BUSHLINGS	51680
BROKEN MOULDS	—
PREPARED PIT SCRAP	9500
COMPANY SCRAP-CARBON	30780
COMPANY SCRAP-INGOTS & BUTTS	—
SHREDD	58440
NO. 2 BUNDLES	—
BORING & TURNINGS	—
TIN PLATE	—
TOTAL	206520

FURNACE AND LADLE ADDITIONS		WEIGHT
MILL SCALE		
NICKEL		
COPPER		
H. C. MANGANESE		2082
FERRO PHOSPHORUS		—
75% FE. SILICON		—
ALUMINUM	39/250	289
MOLYBDENUM		
FE. COLUMBIUM	(CONT. WGT.)	
LC. MANGANESE		
FE. VANADIUM		
CHROME		
COKE		250
CALCIUM		17
Ar Carb		300
TOTAL		2938

PRODUCTION 29490 WEIGHT

PRODUCT	NO. OF SLABS	MOLD SIZE	MOLD CODE	WEIGHT
SLABS	6	8X46 1/2 X 282		176940
SLABS				
INGOTS				
FRONT ENDCROPS				
TAIL ENDCROPS				
SKULL				
TONS IN TUNDISH				
PIT				
TOTAL INGOT WEIGHT				

TONNAGE	WEIGHT	
TOTAL CHARGED	104729	84.5
TOTAL PRODUCED	88470	YIELD %

STRIPPING

...ip

...ime

WEIGHMASTER

FURNACE DELAYS AND REMARKS	TIME	ELAPSED TIME	TYPE
Clean B. Jet	10:24 10:32	10	

CLOCK TIME OF RECARB OR DECARB

NSC-0109

DATE 10-4

CHARGE	WEIGHT	TYPE	HOW LOADED	TIME
				10:50/r

CARBON ANALYZER TESTS		TIME OF TEST	
C.	TIME MELT.	TO LAB.	REC'D

ANALYSIS	C
ORDERED	2.6/2.8
MADE	
Prelim.	
Prelim.	
Prelim.	10.2
Prelim.	
Prelim.	
Lollypop	
Ladle Analysis	

POWER	
ON	OFF
After	
Before	
Total Min.	
% P. On	

THERMOCOUPLE READING FURNACE		TIME
1st TEST		
2nd TEST		
3rd TEST		
4th TEST		
BLOCK	3173	
TAP		
LADLE #1		
LADLE #2		

TAPPED PREVIOUS HEAT 10:19/A

ACTUAL CHARGE TIME

ORDERED	FURNACE AND LADLE ALLOWANCE			
	ALLOYS	%	WEIGHT	TIME
	FE. MN. FURNACE			
	FE. MN. FURNACE			
	FE. MN. FURNACE			
	FE. MN. LADLE	80%	1822	
	FE. MN. LADLE			
	FE. SI. FURNACE			
	FE. SI.	75%	0	
	FE. SI.			
	MISCH ALLOY			
	FE. VANADIUM			
	MOLYBDENUM			
	AL. LADLE	Bag	250	
	AL. MOULDS			
	COKE		50	
	A.K. FLUX			
	RIM. ACCEL. MOULDS			
	FE. COLUMBIUM			
	DESULFURIZER TAP			
	DESULFURIZER LADLE			
	CALCIUM NO. OF FT.			
	POUNDS OF HOT TOP			
	ELAPSED TIME OF TAP			
	ARGON TIME			
	ARGON GAUGE READING			
	Lime		2016	
	50/50		300	
	Sil Carbide		300	
	Ca Carbide		50	

Limestone	
Lime	
Lime	
Coke	
Spar	
Scale	
Oxygen After	
Meter Before	
O_2 Used	
METER AFTER	
METER BEFORE	
METER AT MELT	
K.W.H. USED TO MELT	

METALS	
NO. 1 STEEL	
NO. 1 BUNDLES-FA	
NO. 1 BUNDLES-DE	
NO. 2 STEEL	
BUSHLINGS	
BROKEN MOULDS	
PREPARED PIT SCRA	
COMPANY SCRAP-C	
COMPANY SCRAP-IN	
SHREDD	
NO. 2 BUNDLES	
BORING & TURNING	
TIN PLATE	

ELECTRODE DATA

PHASE	NO. ADDED	TIME	BY WHOM	SUPPLIER
No. 1				
No. 2				
No. 3				

HEATS ON LINING: ROOF ROOF No.

WALLS Used: GUN MIX SYNDOLAG COMMENTS

TAP HOLE

BANKS

BOTTOM

PRODU

PRO-DUCT	NO. OF SLABS	M
SLABS	6	8946
SLABS		
INGOTS		
FRONT ENDCROPS		
TAIL ENDCROPS		
SKULL		
TONS IN TUNDISH		
PIT		

TOTA

LADLE NO. NO. HEATS NOZ. SIZE

STOPPER: MOLD CONDITION:

BLEEDERS:

POURED BY: PIT FOREMAN

TESTS: LAB. JOMINY GR. SIZE

STRIPPING	
Start Strip	
Finish Strip	
Lapsed Time	
Delays	
Delivered	

MELTER	1st HELPER	WEIGHMASTER
12 - 8	12 - 8	12 - 8
8 - 4 RW	8 - 4 GB	8 - 4
4 - 12	4 - 12	4 - 12

CLOCK TIME OF REC

HEAT LOG

SEQ. No. 6551

DATE 10-4-06 GRADE J55 CODE 84 HEAT No. D6551

ANALYSIS	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	Va	Cb	AL	FEO	LS
ORDERED	26/28	95/105	015	008	08/15	35	15	12	03			020/040		
MADE										Rev. 4.0				
Prelim.														
Prelim.														
Prelim.														
Prelim.														
Prelim.														
Lollypop														
Ladle Analysis														

CARBON ANALYZER TESTS C.	TIME MELT.	TIME OF TEST TO LAB.	REC'D

POWER

	ON	OFF
After		
Before		
Total Min.		
% P. On		

THERMOCOUPLE READING FURNACE		TIME
1st TEST		
2nd TEST		
3rd TEST		
4th TEST		
LOCK		
AP		
ADLE # 1		
ADLE # 2		

ACTUAL TIME

TAPPED PREVIOUS HEAT	BEGAN CHARGE	POWER ON	FINISH CHARGE	SLAG OFF START	SLAG OFF FINISH	TAPPED	TIME OF HEAT
11:31/p		11:41/p	12:00/			12:43/p	1:00

ELAPSED TIME

ACTUAL CHARGE TIME	CHARGE TO TAP	MAKE BOTTOMS	CHARGE TO CHARGE	DELAYS	FURNACE PATCH	K.W.H.	TAP TO TAP
							1:15

METALS CHARGED	WEIGHT
NO. 1 STEEL	—
NO. 1 BUNDLES-FACTORY	—
NO. 1 BUNDLES-DEALER	11840
NO. 2 STEEL	36420
BUSHLINGS	—
BROKEN MOULDS	—
PREPARED PIT SCRAP	6780
COMPANY SCRAP-CARBON	106740
COMPANY SCRAP-INGOTS & BUTTS	—
SHREDD	32680
NO. 2 BUNDLES	9140
BORING & TURNINGS	—
TIN PLATE	—
TOTAL	203600

FURNACE AND LADLE ADDITIONS		WEIGHT
MILL SCALE		
NICKEL		
COPPER		
H. C. MANGANESE		1991
FERRO PHOSPHORUS		—
75% FE. SILICON		—
ALUMINUM	26/250	276
MOLYBDENUM		
FE. COLUMBIUM	(CONT. WGT.)	
LC. MANGANESE		
FE. VANADIUM		
CHROME		
COKE		100
CALCIUM		17
Ar Carb		300
TOTAL		2690

PRODUCTION 25490 WEIGHT

PRODUCT	NO. OF SLABS	MOLD SIZE	MOLD CODE	WEIGHT
SLABS	7	8 46½ 282		206430
SLABS				
INGOTS				
FRONT END CROPS				
TAIL END CROPS				
SKULL				
TONS IN TUNDISH				
PIT				
TOTAL INGOT WEIGHT				

TONNAGE	WEIGHT	
TOTAL CHARGED	203145	100.1
TOTAL PRODUCED	193215	YIELD %

nestone
ne
ne
oke
ar
ale
xygen After
eter Before
Used

ETER AFTER
ETER BEFORE
ETER AT MELT
V.H. USED TO MELT
No.
G COMMENTS

STRIPPING
ip
rip
ime

WEIGHMASTER

FURNACE DELAYS AND REMARKS	TIME	ELAPSED TIME	TYPE

CLOCK TIME OF RECARB OR DECARB

NSC-0109

DATE 10-4

CHARGE	WEIGHT	TYPE	HOW LOADED	TIME
				12:00p

CARBON ANALYZER TESTS		TIME OF TEST	
C.	TIME MELT.	TO LAB.	REC'D

ANALYSIS	C
ORDERED	26/28
MADE	
Prelim.	
Prelim.	
Prelim.	
Prelim.	
Prelim.	
Lollypop	
Ladle Analysis	

ORDERED

FURNACE AND LADLE ALLOWANCE			
ALLOYS	%	WEIGHT	TIME
FE. MN. FURNACE			
FE. MN. FURNACE			
FE. MN. FURNACE			
FE. MN. LADLE	80%	1922	
FE. MN. LADLE			
FE. SI. FURNACE			
FE. SI.	75%	0	
FE. SI.			
MISCH ALLOY			
FE. VANADIUM			
MOLYBDENUM			
AL. LADLE		250	
AL. MOULDS			
COKE		75	
A.K. FLUX			
RIM. ACCEL. MOULDS			
FE. COLUMBIUM			
DESULFURIZER TAP			
DESULFURIZER LADLE			
CALCIUM NO. OF FT.			
POUNDS OF HOT TOP			
ELAPSED TIME OF TAP			
ARGON TIME			
ARGON GAUGE READING			
Lime		2014	
50/50		300	
Si/Carbide		300	
Ca Carbide		50	

POWER		
	ON	OFF
After		
Before		
Total Min.		
% P. On		

THERMOCOUPLE READING FURNACE		TIME
1st TEST		
2nd TEST		
3rd TEST		
4th TEST		
BLOCK		
TAP		
LADLE #1		
LADLE #2		

Limestone	
Lime	
Lime	
Coke	
Spar	
Scale	
Oxygen After	
Meter Before	
O_2 Used	
METER AFTER	
METER BEFORE	
METER AT MELT	
K.W.H. USED TO MELT	

TAPPED PREVIOUS HEAT
11:31p

ACTUAL CHARGE TIME

METALS C

NO. 1 STEEL
NO. 1 BUNDLES-FAC
NO. 1 BUNDLES-DEA
NO. 2 STEEL
BUSHLINGS
BROKEN MOULDS
PREPARED PIT SCRA
COMPANY SCRAP-C/
COMPANY SCRAP-IN
SHREDD
NO. 2 BUNDLES
BORING & TURNING
TIN PLATE

ELECTRODE DATA

PHASE	NO. ADDED	TIME	BY WHOM	SUPPLIER
No. 1				
No. 2				
No. 3				

HEATS ON LINING: ROOF ROOF No.

WALLS	Used: GUN MIX	SYNDOLAG	COMMENTS
TAP HOLE			
BANKS			
BOTTOM			

PRODUC

PRO-DUCT	NO. OF SLABS	MC
SLABS	7	5.96
SLABS		
INGOTS		
FRONT ENDCROPS		
TAIL ENDCROPS		
SKULL		
TONS IN TUNDISH		
PIT		
TOTAL		

LADLE NO. NO. HEATS NOZ. SIZE

STOPPER: MOLD CONDITION:

BLEEDERS:

POURED BY: PIT FOREMAN

TESTS: LAB. JOMINY GR. SIZE

STRIPPING
Start Strip
Finish Strip
Lapsed Time
Delays
Delivered

MELTER	1st HELPER	WEIGHMASTER
12 - 8	12 - 8	12 - 8
8 - 4 RW	8 - 4 GB	8 - 4
4 - 12	4 - 12	4 - 12

CLOCK TIME OF RECA

10

HEAT LOG

SEQ. No. 6552

DATE. 10-4-00 GRADE J55 CODE 84 HEAT No. D6552

CARBON ANALYZER TESTS		TIME OF TEST	
C.	TIME MELT.	TO LAB.	REC'D

ANALYSIS	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	Va	Cb	AL.	FEO	L.S.
ORDERED	26/28	95/105	015	008	08/15	35	15	12	03			020/04		
MADE										Per	60			
Prelim.														
Prelim.														
Prelim.														
Prelim.														
Prelim.														
Lollypop														
Ladle Analysis														

POWER	
ON	OFF
fter	
efore	
otal Min.	
P. On	

THERMOCOUPLE READING FURNACE		TIME
TEST		
d TEST		
d TEST		
TEST		
OCK		
P		
DLE #1		
DLE #2		
estone		
e		
e		
ke		
r		
le		
ygen After		
ter Before		
Used		
TER AFTER		
TER BEFORE		
TER AT MELT		
V.H. USED TO MELT		
No.		

ACTUAL TIME							
TAPPED PREVIOUS HEAT	BEGAN CHARGE	POWER ON	FINISH CHARGE	SLAG OFF START	SLAG OFF FINISH	TAPPED	TIME OF HEAT
12:43/p		12:55/p	1:14/p			1:55/p	1:00

ELAPSED TIME							
ACTUAL CHARGE TIME	CHARGE TO TAP	MAKE BOTTOMS	CHARGE TO CHARGE	DELAYS	FURNACE PATCH	K.W.H.	TAP TO TAP
							1:15

METALS CHARGED	WEIGHT
NO. 1 STEEL	
NO. 1 BUNDLES-FACTORY	
NO. 1 BUNDLES-DEALER	8400
NO. 2 STEEL	36060
BUSHLINGS	
BROKEN MOULDS	
PREPARED PIT SCRAP	5980
COMPANY SCRAP-CARBON	112280
COMPANY SCRAP-INGOTS & BUTTS	
SHREDD	32440
NO. 2 BUNDLES	9220
BORING & TURNINGS	
TIN PLATE	
TOTAL	204380

FURNACE AND LADLE ADDITIONS	WEIGHT
MILL SCALE	
NICKEL	
COPPER	
H. C. MANGANESE	2015
FERRO PHOSPHORUS	
75% FE. SILICON	
ALUMINUM	
MOLYBDENUM	
FE. COLUMBIUM (CONT. WGT.)	
LC. MANGANESE	
FE. VANADIUM	
CHROME	
COKE	125
CALCIUM	17
Si Carb	300
TOTAL	2457

PRODUCTION 29490

PRODUCT	NO. OF SLABS	MOLD SIZE	MOLD CODE	WEIGHT
SLABS	3	8.46½-282		88470
SLABS	3	46½-211		66180
INGOTS				
FRONT ENDCROPS				
TAIL ENDCROPS		46½-12		1265
SKULL				9800
TONS IN TUNDISH	2	4.9		5000
PIT				
TOTAL INGOT WEIGHT				154650

TONNAGE	WEIGHT	
TOTAL CHARGED	103419	74.8
TOTAL PRODUCED	77325	YIELD %

COMMENTS

STRIPPING
ip
trip
Time
d

WEIGHMASTER
2

FURNACE DELAYS AND REMARKS	TIME	ELAPSED TIME	TYPE
CLEAN OFF BEZEL	1:10/p-1:14/p	.04	

CLOCK TIME OF RECARB OR DECARB

NSC-0109

DATE 10-4-

CHARGE	WEIGHT	TYPE	HOW LOADED	TIME	CARBON ANALYZER TESTS		TIME OF TEST	
					C.	TIME MELT.	TO LAB.	REC'D

ANALYSIS	C	
ORDERED	26/28	
MADE		
Prelim.		
Prelim.		
Prelim.		
Prelim.		
Prelim.		
Lollypop		
Ladle Analysis		

ORDERED	FURNACE AND LADLE ALLOWANCE ALLOYS	%	WEIGHT	TIME
	FE. MN. FURNACE			
	FE. MN. FURNACE			
	FE. MN. FURNACE			
	FE. MN. LADLE			
	FE. MN. LADLE	80/	1815	
	FE. SI. FURNACE			
	FE. SI.			
	FE. SI.	75%	0	
	MISCH ALLOY			
	FE. VANADIUM			
	MOLYBDENUM			
	AL. LADLE Bri			
	AL. MOULDS			
	COKE			
	A.K. FLUX			
	RIM. ACCEL. MOULDS			
	FE. COLUMBIUM			
	DESULFURIZER TAP			
	DESULFURIZER LADLE			
	CALCIUM NO. OF FT.			
	POUNDS OF HOT TOP			
	ELAPSED TIME OF TAP			
	ARGON TIME			
	ARGON GAUGE READING			
	Lime		2013	
	50/50		300	
	Sil Carbide		300	
	Ca Carbide		50	

POWER	ON	OFF
After		
Before		
Total Min.		
% P. On		

THERMOCOUPLE READING FURNACE		TIME
1st TEST		
2nd TEST		
3rd TEST		
4th TEST		
BLOCK		
TAP		
LADLE #1		
LADLE #2		

Limestone	
Lime	
Lime	
Coke	
Spar	
Scale	
Oxygen After	
Meter Before	
O_2 Used	

TAPPED PREVIOUS HEAT 12:43/p

ACTUAL CHARGE TIME

METALS CH
NO. 1 STEEL
NO. 1 BUNDLES-FACT
NO. 1 BUNDLES-DEAL
NO. 2 STEEL
BUSHLINGS
BROKEN MOULDS
PREPARED PIT SCRAP
COMPANY SCRAP-CA
COMPANY SCRAP-ING
SHREDD
NO. 2 BUNDLES
BORING & TURNINGS
TIN PLATE

ELECTRODE DATA

PHASE	NO. ADDED	TIME	BY WHOM	SUPPLIER
No. 1				
No. 2				
No. 3				

METER AFTER	
METER BEFORE	
METER AT MELT	
K.W.H. USED TO MELT	

PRODUC

PRO-DUCT	NO. OF SLABS	MOL
SLABS	3	8.46
SLABS	3	46
INGOTS		
FRONT ENDCROPS		
TAIL ENDCROPS		46
SKULL		
TONS IN TUNDISH	26	4
PIT		

TOTAL

HEATS ON LINING: ROOF ROOF No.

	Used: GUN MIX	SYNDOLAG	COMMENTS
WALLS			
TAP HOLE			
BANKS			
BOTTOM			

LADDLE NO. NO. HEATS NOZ. SIZE

STOPPER: MOLD CONDITION:

BLEEDERS:

POURED BY: PIT FOREMAN

TESTS: LAB. JOMINY GR. SIZE

STRIPPING	
Start Strip	
Finish Strip	
Lapsed Time	
Delays	
Delivered	

CLEAN OFF

MELTER		1st HELPER		WEIGHMASTER	
12-8		12-8		12-8	
8-4	RW	8-4	GB	8-4	
4-12		4-12		4-12	

CLOCK TIME OF RECA

HEAT LOG

SEQ. No. 3037

DATE 10-4-00 GRADE J55 CODE 84 HEAT No. D6553

CARBON ANALYZER TESTS		TIME OF TEST	
C.	TIME MELT.	TO LAB.	REC'D

POWER	
ON	OFF
After	
Before	
Total Min.	
% P. On	

THERMOCOUPLE READING FURNACE		TIME
1st TEST	3065	
2nd TEST		
3rd TEST		
4th TEST		
CLOCK		
TAP		
LADLE #1		
LADLE #2		
Limestone		
Lime		
Lime		
Coke		
Spar		
Scale		
Oxygen After		
Meter Before		
O2 Used		

METER AFTER
METER BEFORE
METER AT MELT
K.W.H. USED TO MELT
Heat No.

TAG	COMMENTS

STRIPPING
Strip
Strip
Time

WEIGHMASTER

ANALYSIS	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	Va	Cb	AL.	FEO	L.S.
ORDERED	.28/.30	.100/.110	.015	.010	.04/.15	.35	.15	.12	.03			.020/.040		
MADE										Run 64				
Prelim.	.10													
Prelim.														
Prelim.	.26			.008										
Prelim.														
Prelim.														
Lollypop														
Ladle Analysis														

ACTUAL TIME

TAPPED PREVIOUS HEAT	BEGAN CHARGE	POWER ON	FINISH CHARGE	SLAG OFF START	SLAG OFF FINISH	TAPPED	TIME OF HEAT
1:55/p		2:00				3:20	1:15

ELAPSED TIME

ACTUAL CHARGE TIME	CHARGE TO TAP	MAKE BOTTOMS	CHARGE TO CHARGE	DELAYS	FURNACE PATCH	K.W.H.	TAP TO TAP
							1:25

METALS CHARGED	WEIGHT
NO. 1 STEEL	—
NO. 1 BUNDLES-FACTORY	—
NO. 1 BUNDLES-DEALER	9140
NO. 2 STEEL	35300
BUSHLINGS	—
BROKEN MOULDS	—
PREPARED PIT SCRAP	7080
COMPANY SCRAP-CARBON	11420
COMPANY SCRAP-INGOTS & BUTTS	—
SHREDD	31920
NO. 2 BUNDLES	10280
BORING & TURNINGS	—
TIN PLATE	—
TOTAL	205140

FURNACE AND LADLE ADDITIONS	WEIGHT
MILL SCALE	
NICKEL	
COPPER	
H. C. MANGANESE	1861
FERRO PHOSPHORUS	—
75% FE. SILICON	—
ALUMINUM	306
MOLYBDENUM	
FE. COLUMBIUM (CONT. WGT.)	
LC. MANGANESE	
FE. VANADIUM	
CHROME	
COKE	12
CALCIUM	17
In Carb	40
TOTAL	270

PRODUCTION 280 80 WEIGHT

PRODUCT	NO. OF SLABS	MOLD SIZE	MOLD CODE	WEIGHT
SLABS	6	8.34/8.36		168480
SLABS				
INGOTS				
FRONT ENDCROPS				
TAIL ENDCROPS				
SKULL				
TONS IN TUNDISH				
PIT				
TOTAL INGOT WEIGHT				

TONNAGE	WEIGHT
TOTAL CHARGED	103924
TOTAL PRODUCED	84240

YIELD 81.1 %

FURNACE DELAYS AND REMARKS

	TIME	ELAPSED TIME	TYPE
BROKEN CHAIN ON FRONT DOOR	2:45/p 3:03	:18	

CLOCK TIME OF RECARB OR DECARB

NSC-0108

DATE 10-4-0

CHARGE	WEIGHT	TYPE	HOW LOADED	TIME

CARBON ANALYZER TESTS		TIME OF TEST	
C.	TIME MELT	TO LAB.	REC'D

ANALYSIS	C	M
ORDERED	28/30	100
MADE		
Prelim.	10	
Prelim.		
Prelim.	26	
Prelim.		
Prelim.		
Lollypop		
Ladle Analysis		

ORDERED

FURNACE AND LADLE ALLOWANCE			
ALLOYS	%	WEIGHT	TIME
FE. MN. FURNACE			
FE. MN. FURNACE			
FE. MN. FURNACE			
FE. MN. LADLE			
FE. MN. LADLE	80%	1816	
FE. SI. FURNACE			
FE. SI.			
FE. SI.	75%	0	
MISCH ALLOY			
FE. VANADIUM			
MOLYBDENUM			
AL. LADLE Bag		300	
AL. MOULDS			
COKE	100	125	
A.K. FLUX			
RIM. ACCEL. MOULDS			
FE. COLUMBIUM			
DESULFURIZER TAP			
DESULFURIZER LADLE			
CALCIUM NO. OF FT.			
POUNDS OF HOT TOP			
ELAPSED TIME OF TAP			
ARGON TIME			
ARGON GAUGE READING			
Lime		2014	
50/50		350	
Sib Carbide		400	
Ca Carbide		100	

POWER	
ON	OFF
After	
Before	
Total Min.	
% P. On	

THERMOCOUPLE READING FURNACE		TIME
1st TEST	3065	
2nd TEST		
3rd TEST		
4th TEST		
BLOCK		
TAP		
LADLE #1		
LADLE #2		

Limestone	
Lime	
Lime	
Coke	
Spar	
Scale	
Oxygen After	
Meter Before	
O_2 Used	
METER AFTER	
METER BEFORE	
METER AT MELT	
K.W.H. USED TO MELT	

TAPPED PREVIOUS HEAT 1:55p

ACTUAL CHARGE TIME

METALS CHA

NO. 1 STEEL
NO. 1 BUNDLES-FACTO
NO. 1 BUNDLES-DEALE
NO. 2 STEEL
BUSHLINGS
BROKEN MOULDS
PREPARED PIT SCRAP
COMPANY SCRAP-CARE
COMPANY SCRAP-INGO
SHREDD
NO. 2 BUNDLES
BORING & TURNINGS
TIN PLATE

ELECTRODE DATA

PHASE	NO. ADDED	TIME	BY WHOM	SUPPLIER
No. 1				
No. 2				
No. 3				

HEATS ON LINING: ROOF ROOF No.

WALLS	Used: GUN MIX	SYNDOLAG	COMMENTS
TAP HOLE			
BANKS			
BOTTOM			

PRODUCTI

PRO-DUCT	NO. OF SLABS	MOLD
SLABS	6	8-34½
SLABS		
INGOTS		
FRONT ENDCROPS		
TAIL ENDCROPS		
SKULL		
TONS IN TUNDISH		
PIT		

TOTAL IN

LADLE NO. NO. HEATS NOZ. SIZE

STOPPER: MOLD CONDITION:

BLEEDERS:

POURED BY: PIT FOREMAN

TESTS: LAB. JOMINY GR. SIZE

STRIPPING
Start Strip
Finish Strip
Lapsed Time
Delays
Delivered

BROKEN CHA

MELTER	1st HELPER	WEIGHMASTER
12 - 8	12 - 8	12 - 8
8 - 4 RW	8 - 4 GB	8 - 4
4 - 12 RM	4 - 12 Kerry	4 - 12

CLOCK TIME OF RECARB

HEAT LOG

SEQ. No. M 3038

DATE 10/4/00 GRADE J-55 CODE 84 HEAT No. D6554 ~~D6564~~

CARBON ANALYZER TESTS		TIME OF TEST	
C.	TIME MELT.	TO LAB.	REC'D

ANALYSIS	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	Va	Cb	AL	FEO	L.S.
ORDERED	28/30	100/110	015	010	08/15	35	15	12	03			020/046		
MADE											Cu 60			
Prelim.	.07													
Prelim.														
Prelim.	25	90		.008										
Prelim.														
Prelim.														
Lollypop														
Ladle Analysis														

POWER	
ON	OFF
After	
Before	
Total Min.	
% P. On	

THERMOCOUPLE READING FURNACE		TIME
st TEST	3020	
nd TEST		
rd TEST		
th TEST		
LOCK		
AP		
ADLE #1		
ADLE #2		
mestone		
me		
me		
oke		
par		
cale		
xygen After		
leter Before		
2 Used		

ACTUAL TIME							
TAPPED PREVIOUS HEAT	BEGAN CHARGE	POWER ON	FINISH CHARGE	SLAG OFF START	SLAG OFF FINISH	TAPPED	TIME OF HEAT
320		333	355			504	1:30

ELAPSED TIME							
ACTUAL CHARGE TIME	CHARGE TO TAP	MAKE BOTTOMS	CHARGE TO CHARGE	DELAYS	FURNACE PATCH	K.W.H.	TAP TO TAP
							1:45

METALS CHARGED	WEIGHT
NO. 1 STEEL	—
NO. 1 BUNDLES-FACTORY	—
NO. 1 BUNDLES-DEALER	10820
NO. 2 STEEL	35120
BUSHLINGS	—
BROKEN MOULDS	—
PREPARED PIT SCRAP	9240
COMPANY SCRAP-CARBON	112700
COMPANY SCRAP-INGOTS & BUTTS	—
SHREDD	27660
NO. 2 BUNDLES	9780
BORING & TURNINGS	—
TIN PLATE	—
TOTAL	205320

FURNACE AND LADLE ADDITIONS	WEIGHT
MILL SCALE	
NICKEL	
COPPER	
H. C. MANGANESE	194
FERRO PHOSPHORUS	—
75% FE. SILICON	—
ALUMINUM 45/300	34
MOLYBDENUM	
FE. COLUMBIUM (CONT. WGT.)	
LC. MANGANESE	
FE. VANADIUM	
CHROME	
COKE	225
CALCIUM	23
Sr Carb	40
TOTAL	2936

PRODUCTION 28080				WEIGHT
PRODUCT	NO. OF SLABS	MOLD SIZE	MOLD CODE	
SLABS	7	8.34 5/8-360		196560
SLABS				
INGOTS				
FRONT ENDCROPS	1	34 5/8-12		941
TAIL ENDCROPS				
SKULL				
TONS IN TUNDISH				
PIT				
TOTAL INGOT WEIGHT				

TONNAGE	WEIGHT	
TOTAL CHARGED	104128	94.4
TOTAL PRODUCED	98280	YIELD %

ETER AFTER	
ETER BEFORE	
ETER AT MELT	
W.H. USED TO MELT	
No.	

G	COMMENTS

STRIPPING	
rip	
Strip	
Time	
ed	

WEIGHMASTER
2

FURNACE DELAYS AND REMARKS	TIME	ELAPSED TIME	TYPE
Level 2nd charge		:05	
L+N Temp Box, replace, cond, poly	440 504	:24	

CLOCK TIME OF RECARB OR DECARB

NSC-0108

DATE 10/4/c

CHARGE	WEIGHT	TYPE	HOW LOADED	TIME

CARBON ANALYZER TESTS		TIME OF TEST	
C.	TIME MELT.	TO LAB.	REC'D

ANALYSIS	C	
ORDERED	2.8/30	10
MADE		
Prelim.	.07	
Prelim.		
Prelim.	25	9
Prelim.		
Prelim.		
Lollypop		
Ladle Analysis		

ORDERED

FURNACE AND LADLE ALLOWANCE			
ALLOYS	%	WEIGHT	TIME
FE. MN. FURNACE			
FE. MN. FURNACE			
FE. MN. FURNACE			
FE. MN. LADLE	78	1942	
FE. MN. LADLE			
FE. SI. FURNACE			
FE. SI.	75	0	
FE. SI.			
MISCH ALLOY			
FE. VANADIUM			
MOLYBDENUM			
AL. LADLE	Bag	300	
AL. MOULDS			
COKE	100	125	
A.K. FLUX			
RIM. ACCEL. MOULDS			
FE. COLUMBIUM			
DESULFURIZER TAP	N-16	2015	
DESULFURIZER LADLE			
CALCIUM NO. OF FT.			
POUNDS OF HOT TOP			
ELAPSED TIME OF TAP	SCL		
ARGON TIME			
ARGON GAUGE READING			
	50/50	356	
	SIC	400	
	CaC	102	

POWER		
	ON	OFF
After		
Before		
Total Min.		
% P. On		

THERMOCOUPLE READING FURNACE		TIME
1st TEST	3020	
2nd TEST		
3rd TEST		
4th TEST		
BLOCK		
TAP		
LADLE #1		
LADLE #2		

Limestone	
Lime	
Lime	
Coke	
Spar	
Scale	
Oxygen After	
Meter Before	
O_2 Used	
METER AFTER	
METER BEFORE	
METER AT MELT	
K.W.H. USED TO MELT	

TAPPED PREVIOUS HEAT	
320	

ACTUAL CHARGE TIME	

METALS CHA	
NO. 1 STEEL	
NO. 1 BUNDLES-FACTO.	
NO. 1 BUNDLES-DEALER	
NO. 2 STEEL	
BUSHLINGS	
BROKEN MOULDS	
PREPARED PIT SCRAP	
COMPANY SCRAP-CARB	
COMPANY SCRAP-INGOT	
SHREDD	
NO. 2 BUNDLES	
BORING & TURNINGS	
TIN PLATE	

ELECTRODE DATA				
PHASE	NO. ADDED	TIME	BY WHOM	SUPPLIER
No. 1				SGL
No. 2				SGL
No. 3				SGL

PRODUCTI		
PRO-DUCT	NO. OF SLABS	MOLD
SLABS	7	8.34/5
SLABS		
INGOTS		
FRONT ENDCROPS	1	34/58
TAIL ENDCROPS		
SKULL		
TONS IN TUNDISH		
PIT		
TOTAL IN		

HEATS ON LINING: ROOF ROOF No.

WALLS Used: GUN MIX SYNDOLAG COMMENTS

TAP HOLE

BANKS

BOTTOM

LADDLE NO. NO. HEATS NOZ. SIZE

STOPPER: MOLD CONDITION:

BLEEDERS:

POURED BY: PIT FOREMAN

TESTS: LAB. JOMINY GR. SIZE

STRIPPING
Start Strip
Finish Strip
Lapsed Time
Delays
Delivered

Level 2nd
L+R Temp

MELTER	1st HELPER	WEIGHMASTER
12 - 8	12 - 8	12 - 8
8 - 4	8 - 4	8 - 4
4 - 12	4 - 12	4 - 12

CLOCK TIME OF RECARB

6969

NEWPORT STEEL CORPORATION
BRANDT BAGHOUSE TEST PROCESS MONITORING FORM

Date 10/3/00 Run Number 1

Tapping 6534 @07:48

Time	Baghouse Fan Amperage 1	2	3	Baghouse Pressure Drop, in. WG	CEM Readings ppm / Damper Positions (Describe)	Notes (Heat No. and time; Other)
10:00	219	206	215	6.03	9:57 CO: 67.3 NO_x: 3.78	Heat 6535 Melting
10:13	217	207	214	6.21	CEM clock 8:54	
10:30	206	195	200	6.04	CO: 48.3 9:12 NO_x: 3.59	Test start 10:12
11:00	225	210	217	5.91	10:28 CO 50.3	CEM Clock 1 hr Behind
11:30	224	214	221	5.94	NO_x 2.88	Tapped 10:55
12:00	226	217	223	5.72		Heat 6536
12:30	RUN		TERMINATED -		CASTER DOWN	
13:00						
13:30						
14:00						

x6969

NEWPORT STEEL CORPORATION
BRANDT BAGHOUSE TEST PROCESS MONITORING FORM

Date 10/3/00 Run Number 1 Test Start 16:29

Time	Baghouse Fan Amperage 1	2	3	Baghouse Pressure Drop, in. WG	CEM Readings ~~Damper Positions~~ (Describe)	Notes (Heat No. and time; Other)
16:30	212	201	207	5.99	(15:40) CO 42 ppm CST NO_x = 1.6	Heat 6536
17:00	218	206	212	5.78	(16:27) CST	2nd Charge 16:18
17:30	223	215	223	5.76	CO 29.29	Tapped ~~17:25~~ 17:15
18:00	226	217	225	5.72	NO_x 1.7	~~Heat~~ Heat 6537 EAF
18:30	223	212	217	5.34	(17:31) CST	Roof problem-down
19:00	210	200	204	5.96	CO 94.	~ ~~5~~ 17:45 - 18:30
19:30	206	196	206	6.21	NO_x 4.5	Tap 6:28
19:45	217	206	211	5.88		Heat 6538

Test End 7:44 P
19:44

NEWPORT STEEL CORPORATION
BRANDT BAGHOUSE TEST PROCESS MONITORING FORM

Date 10/4/00 Run Number 2 & 3

x6969

Time	Baghouse Fan Amperage 1	2	3	Baghouse Pressure Drop, in. WG	CEM DATA ~~Damper Positions (Describe)~~	Notes (Heat No. and time; Other)
0800	220	212	218	6.22	NOx 3.5 ppm CO 101.2 ppm	1) 6548 DROP CHARGE @ 0755 - 2ND CHARGE @ 0830 FINISHED TAPPING #6547 @ 0745 TAP 6548 @ ~~0900~~ 0850
0830	204	191	195	6.79	NOx 0.88 CO 97.2	
0900	221	211	217	6.01	CO 34 ppm NOx 6 ppm	
0930	213	204	209	6.13	CO 49.3 NOx 2.9	2) 6549 START 0855 LAST CHARGE 0936 TAP @ ~~1000~~ 1020
1000	203	193	198	6.47	CO 90.2 NOx 1.9	3) 6550 2ND CHARGE @ 1048 1131 START TAP
1030	210	198	206	6.92		
1100	216	206	211	6.26	CO 57.4 NOx 2.7	4) 6551 START 1141 TAP @ 1243
1130	215	203	212	6.24	CO ~~29~~ 29.3 NOx 8.3	
1200	214	202	208	6.15	CO 239 NOx 2.6	5) 6552 1255 START 2ND CHARGE 1320 TAP @ 1355
1230	219	210	215	6.28	CO 42 ppm NOx 8.2 ppm	
1300	218	209	213	6.06		6) 6553 START 1402 TAP @ 1510
1330	217	205	207	6.23	CO 53 NOx 4.2	
1400	213	201	211	6.72	CO 78.2 NOx 2.8	7) 6554 START 1533 TAP @ ~~1640~~ 1630
1430	211	198	211	6.31	CO 104 NOx 1.9	
1500	205	200	211	6.15	CO 87 NOx 0.98	
1530	209	199	205	6.02		
1600	208	198	202	5.91	CO 103 NOx 2.1	
1622	204	192	196	6.69		

UW2

UW3

UN
PLETE

NEWPORT STEEL CORPORATION
BRANDT BAGHOUSE TEST PROCESS MONITORING FORM

Date _____ Run Number _____

Time	Baghouse Fan Amperage			Baghouse Pressure Drop, in. WG	Damper Positions (Describe)	Notes (Heat No. and time; Other)
	1	2	3			

Appendix E

Calibration Data

PACIFIC ENVIRONMENTAL SERVICES, INC.

CALIBRATION PROCEDURES AND RESULTS

All of the equipment used is calibrated in accordance with the procedures outlined in the Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III.* The following pages describe these procedures and include the data sheets.

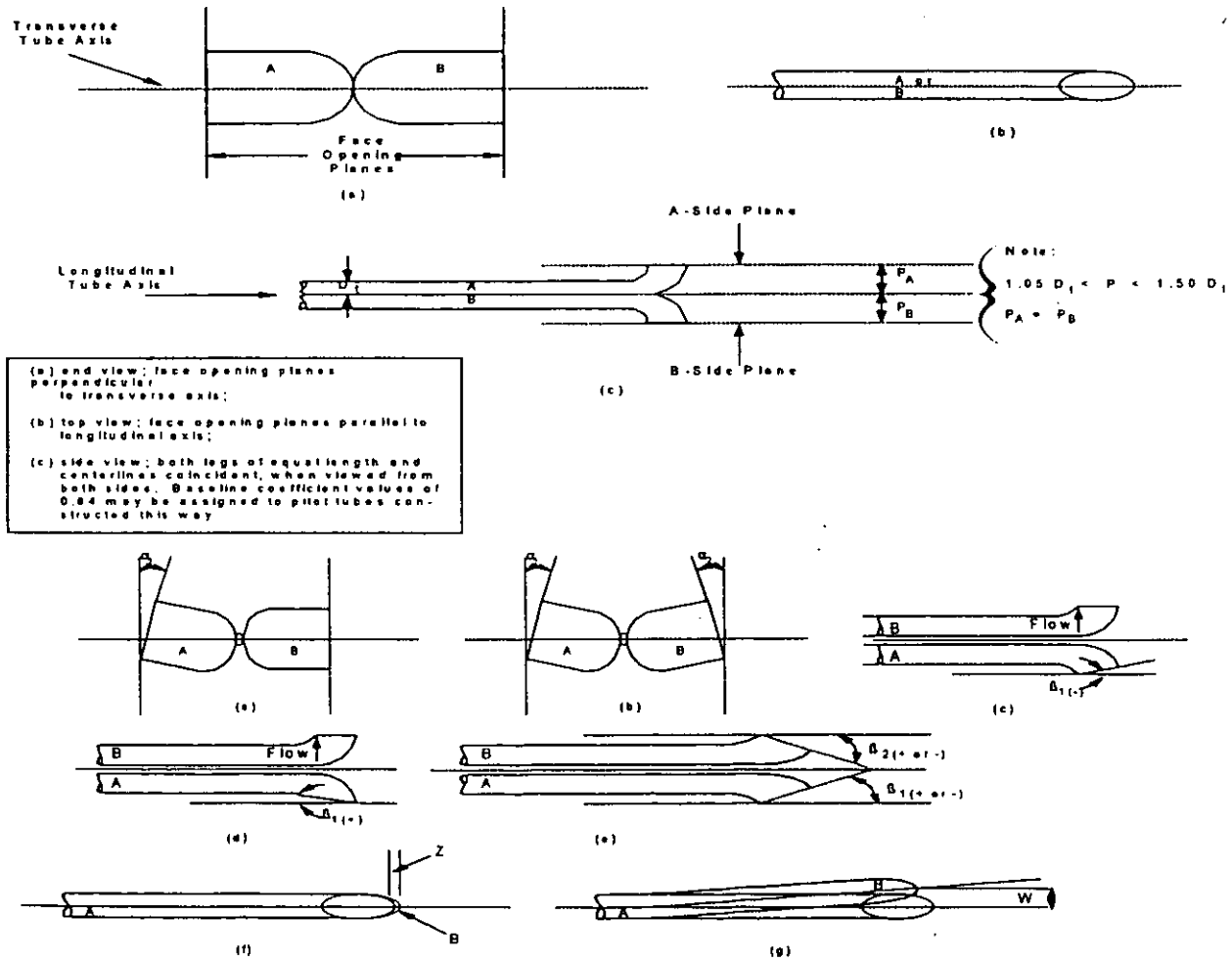
---

*EPA 600/4-77-027b

PACIFIC ENVIRONMENTAL SERVICES, INC.

Pitot Tube Calibration

Each pitot tube used in sampling meets all requirements of EPA Method 2, Section 4.1. Therefore, a baseline coefficient of 0.84 is assigned to each pitot tube. The following pages show the alignment requirements of Method 2 and the Pitot Tube Inspection Data Sheet(s) for each pitot tube used during the test program.



**40 CFR 60, Appendix A, July 1995

PACIFIC ENVIRONMENTAL SERVICES

7209 East Kemper Rd.
Cincinnati, OH 45249
513.489.6611
513.489.6619 Fax
www.pes.com

PITOT TUBE CALIBRATIONS

Pitot ID	Date Calibrated	α_1	B_1	α_2	B_2	Y	θ	A	z	w	P_α	P_β	D_t	A/2/D_t	Accept/Reject
2-M-1	01/13/2000	1.8	0.1	1.4	0.1	0.1	0.6	0.948	0.002	0.010	0.474	0.474	0.375	1.264	ACCEPT
2-M-2	01/13/2000	0.6	1.4	2.8	0.7	1.1	1.7	0.955	0.018	0.028	0.477	0.478	0.375	1.273	ACCEPT
3-1	10/29/1999	1.3	1.6	3.8	3.7	2.1	0.3	1.077	0.039	0.006	0.538	0.539	0.364	1.479	ACCEPT
3-M-1	10/29/1999	1.1	1.8	0.9	0.1	1.4	1.7	0.948	0.023	0.028	0.474	0.474	0.375	1.264	ACCEPT
3-M-2	10/28/1999	1.6	0.8	0.6	0.6	0.7	0.8	0.954	0.012	0.013	0.477	0.477	0.375	1.272	ACCEPT
3-M-3	01/13/2000	0.7	0.2	1.6	0.2	2.6	1.6	0.945	0.043	0.026	0.473	0.472	0.375	1.260	ACCEPT
3-X-2	10/28/1999	0.4	0.4	0.7	0.7	0.7	0.9	0.945	0.012	0.015	0.472	0.473	0.375	1.260	ACCEPT
3-X-1	10/29/1999	0.4	0.6	0.8	0.6	0.1	0.2	0.945	0.002	0.003	0.473	0.472	0.375	1.260	ACCEPT
3-P-1	05/30/2000	1.0	1.0	1.0	1.0	1.0	0.1	0.748	0.013	0.001	0.374	0.374	0.250	1.496	ACCEPT
4-M-1	10/28/1999	0.3	0.6	0.5	0.4	0.6	0.4	0.949	0.010	0.007	0.474	0.475	0.375	1.265	ACCEPT
4-M-2	10/29/1999	0.7	0.4	0.2	1.4	1.1	0.4	0.958	0.018	0.007	0.479	0.479	0.375	1.277	ACCEPT
4-X-1	10/29/1999	4.7	1.2	4.4	0.4	2.7	0.4	0.945	0.045	0.007	0.472	0.473	0.375	1.260	ACCEPT
4-X-2	10/28/1999	0.2	0.9	1.6	1.3	0.1	0.1	0.949	0.002	0.002	0.474	0.475	0.375	1.265	ACCEPT
4-X-3	10/28/1999	0.2	0.6	0.2	0.5	0.2	0.4	0.956	0.003	0.007	0.478	0.478	0.375	1.275	ACCEPT
5' TIP	10/29/1999	1.9	3.5	1.0	1.4	1.8	1.6	0.937	0.029	0.026	0.468	0.469	0.375	1.249	ACCEPT
5-I-1	10/28/1999	1.6	0.8	1.0	0.6	0.1	0.7	0.968	0.002	0.012	0.484	0.484	0.375	1.291	ACCEPT
5-M-1	10/28/1999	0.2	0.3	0.2	0.2	1.0	0.6	0.896	0.016	0.009	0.448	0.448	0.375	1.195	ACCEPT
5-M-2	01/13/2000	0.9	0.1	3.9	3.9	1.3	1.2	0.921	0.021	0.019	0.461	0.460	0.375	1.228	ACCEPT
5-X-1	10/29/1999	0.3	0.0	0.3	0.5	1.6	0.3	0.950	0.027	0.005	0.475	0.475	0.373	1.273	ACCEPT
5-X-2	10/28/1999	1.6	1.4	1.2	0.7	0.7	0.7	0.947	0.012	0.012	0.474	0.473	0.372	1.273	ACCEPT
5-X-3	10/29/1999	0.4	0.4	0.1	0.3	1.0	0.9	0.948	0.017	0.015	0.474	0.474	0.375	1.264	ACCEPT
5-1	10/27/1999	1.4	1.3	1.0	1.4	0.7	0.8	1.042	0.013	0.015	0.521	0.521	0.375	1.389	ACCEPT
5-2	10/29/1999	0.4	1.8	3.7	2.9	1.4	0.9	0.971	0.024	0.015	0.485	0.486	0.375	1.295	ACCEPT
5-3	10/28/1999	0.8	0.2	0.9	1.0	0.2	0.3	1.009	0.004	0.005	0.504	0.505	0.375	1.345	ACCEPT
5-4	10/29/1999	2.3	1.2	0.5	0.7	2.7	1.0	0.625	0.029	0.011	0.312	0.313	0.250	1.250	ACCEPT
5-5	10/29/1999	1.0	0.8	0.8	0.5	0.5	0.6	1.022	0.009	0.011	0.511	0.511	0.375	1.363	ACCEPT
5-6	01/13/2000	1.3	0.1	1.2	1.4	2.5	0.7	0.938	0.041	0.011	0.469	0.469	0.375	1.251	ACCEPT
6-1	10/27/1999	1.6	1.5	1.7	1.3	0.2	0.2	0.956	0.003	0.003	0.478	0.478	0.375	1.275	ACCEPT
6-2	10/28/1999	0.1	0.2	0.7	1.7	0.4	0.3	1.097	0.008	0.006	0.548	0.549	0.375	1.463	ACCEPT
6-3	01/13/2000	1.9	2.1	2.6	1.7	1.5	0.1	1.041	0.027	0.002	0.520	0.521	0.375	1.388	ACCEPT
6-I-1	10/27/1999	1.4	2.7	1.3	0.6	2.2	0.4	0.986	0.038	0.007	0.493	0.493	0.375	1.315	ACCEPT
6-I-2	10/28/1999	0.8	0.8	1.3	1.8	0.6	0.3	0.968	0.010	0.005	0.484	0.484	0.375	1.291	ACCEPT
7-1	01/13/2000	0.7	1.5	1.3	1.0	0.6	0.9	0.975	0.010	0.015	0.487	0.488	0.375	1.300	ACCEPT
7-I-1	10/29/1999	0.1	1.9	0.6	1.0	0.9	0.3	0.948	0.015	0.005	0.474	0.474	0.375	1.264	ACCEPT
7-I-2	06/08/2000	0.4	0.4	0.8	0.3	0.5	0.4	0.920	0.008	0.006	0.474	0.474	0.375	1.227	ACCEPT
7-M-1	10/28/1999	1.1	1.1	0.2	0.2	1.1	0.9	0.957	0.018	0.015	0.478	0.479	0.375	1.276	ACCEPT
7-M-2	10/28/1999	0.4	1.2	1.9	1.8	0.7	0.8	0.923	0.011	0.013	0.462	0.461	0.375	1.231	ACCEPT
7-M-3	10/29/1999	1.6	1.8	0.5	0.4	0.7	0.1	0.923	0.011	0.002	0.461	0.462	0.375	1.231	ACCEPT
8-1	10/28/1999	0.6	0.8	1.9	1.6	0.3	0.1	0.934	0.005	0.002	0.467	0.467	0.375	1.245	ACCEPT
8-2	10/29/1999	0.9	0.8	0.4	0.5	2.1	1.6	0.941	0.034	0.026	0.470	0.471	0.375	1.255	ACCEPT
8-3	11/04/1999	1.1	0.6	0.3	1.4	0.1	0.4	0.918	0.002	0.006	0.459	0.459	0.374	1.227	ACCEPT
8-M-2	10/29/1999	0.2	2.4	0.3	1.2	0.5	0.7	0.938	0.008	0.011	0.469	0.469	0.375	1.251	ACCEPT
9-M-1	10/29/1999	0.1	1.7	0.2	0.8	1	1	0.982	0.017	0.017	0.491	0.491	0.375	1.309	ACCEPT
10-M-1	10/29/1999	2.2	2.8	0.3	0.5	0.2	0.4	0.949	0.003	0.007	0.475	0.474	0.374	1.269	ACCEPT
11-1	10/29/1999	0.8	1.9	2.5	1.8	1.3	1.5	0.970	0.022	0.025	0.485	0.485	0.351	1.382	ACCEPT
12-X-1	10/29/1999	0.4	1.5	0.9	1.9	2.9	1.4	0.921	0.047	0.023	0.461	0.46	0.372	1.238	ACCEPT
12-1	10/29/1999	0.3	0.4	1.1	0.6	1.2	1.2	1.125	0.024	0.024	0.563	0.562	0.375	1.500	ACCEPT

- 1 = Pitot Alone # - M -1 = Pitot/Thermo. Combination # - X - 1 = Full Probe Assembly # - I - 1 = Inkonel # - T - 1 = Thermo. Alone

PACIFIC ENVIRONMENTAL SERVICES, INC.

Stack Thermocouples

Each thermocouple is calibrated by comparing it with an ASTM-3F thermometer at approximately 32°F, ambient temperature, 212°F, and 500°F. The thermocouple reads within 1.5 percent (%) of the reference thermometer throughout the entire range when expressed in degrees Rankine. The thermocouples may be checked at ambient temperature at the test site to verify the calibration. Calibration data are included in the following Thermocouple Calibration Data Sheet(s).

PACIFIC ENVIRONMENTAL SERVICES

STACK THERMOCOUPLES

7209 East Kemper Rd.
Cincinnati, OH 45249
513.489.6611
513.489.6619 Fax
www.pes.com

Thermo. ID	Therm.	Date Calibrated	Ambient Air	Diff., %	Cold Bath	Diff., %	Hot Bath	Diff., %	Hot Oil	Diff., %	Accept/Reject
1-T-1	Reference	01/13/2000	76	0.00	46	0.00	212	0.00	451	0.00	ACCEPT
	Pitot		76		46		212		451		
2-M-1	Reference	01/27/2000	75	0.00	42	0.00	210	0.00	410	0.00	ACCEPT
	Pitot		75		42		210		410		
2-M-2	Reference	01/27/2000	75	0.00	42	0.00	165	0.00	418	0.00	ACCEPT
	Pitot		75		42		165		418		
3-M-1	Reference	11/03/1999	65	1.14	35	0.00	201	0.00	423	0.00	ACCEPT
	Pitot		71		35		201		423		
3-M-2	Reference	11/02/1999	74	0.00	42	0.00	208	0.00	456	0.00	ACCEPT
	Pitot		74		42		208		456		
3-M-3	Reference	01/13/2000	75	0.00	36	0.00	192	0.00	410	0.00	ACCEPT
	Pitot		75		36		192		410		
3-M-4	Reference	01/27/2000	75	0.00	42	0.00	212	0.00	415	0.00	ACCEPT
	Pitot		75		42		212		415		
3-T-1	Reference	10/29/1999	77	0.19	42	0.00	214	0.00	393	0.23	ACCEPT
	Pitot		78		42		214		395		
3-T-2	Reference	10/29/1999	77	0.00	43	0.00	212	0.00	452	0.00	ACCEPT
	Pitot		77		43		212		452		
3-T-3	Reference	01/13/2000	75	0.00	46	0.00	207	0.00	423	0.00	ACCEPT
	Pitot		75		46		207		423		
3-T-4	Reference	01/13/2000	76	0.00	38	0.00	210	0.00	455	0.00	ACCEPT
	Pitot		76		38		210		455		
3-X-1	Reference	10/29/1999	77	0.00	42	0.20	211	0.00	500	0.10	ACCEPT
	Pitot		77		43		211		501		
3-X-2	Reference	11/03/1999	64	0.19	43	0.00	208	0.00	438	1.45	ACCEPT
	Pitot		65		43		208		425		
3-P-1	Reference	06/08/2000	73	0.00	38	0.00	118	0.17	429	0.45	ACCEPT
	Pitot		73		38		117		425		
4-M-1	Reference	11/02/1999	74	0.00	38	0.60	199	0.00	373	0.00	ACCEPT
	Pitot		74		41		199		373		
4-M-2	Reference	11/03/1999	74	0.00	58	0.00	192	0.31	411	0.00	ACCEPT
	Pitot		74		58		190		411		

PACIFIC ENVIRONMENTAL SERVICES

STACK THERMOCOUPLES

7209 East Kemper Rd.
Cincinnati, OH 45249
513.489.6611
513.489.6619 Fax
www.pes.com

Thermo. ID	Therm.	Date Calibrated	Ambient Air	Diff., %	Cold Bath	Diff., %	Hot Bath	Diff., %	Hot Oil	Diff., %	Accept/Reject
4-T-1	Reference	11/02/1999	74	0.00	42	0.00	199	0.00	402	0.58	ACCEPT
	Pitot		74		42		199		407		
4-T-2	Reference	11/02/1999	74	0.00	40	0.00	210	0.00	468	0.75	ACCEPT
	Pitot		74		40		210		475		
4-T-3	Reference	11/02/1999	74	0.00	41	0.00	204	0.00	410	0.00	ACCEPT
	Pitot		74		41		204		410		
4-X-1	Reference	11/03/1999	62	0.00	42	0.40	198	0.00	430	0.45	ACCEPT
	Pitot		62		44		198		426		
4-X-2	Reference	01/27/2000	75	0.00	45	0.00	189	0.00	410	0.00	ACCEPT
	Pitot		75		45		189		410		
4-X-3	Reference	01/27/2000	75	0.00	44	0.00	206	0.00	418	0.00	ACCEPT
	Pitot		75		44		206		418		
5-M-1	Reference	11/02/1999	73	0.19	56	0.00	190	0.00	400	5.93	REJECT
	Pitot		74		56		190		349		
5-M-2	Reference	01/13/2000	75	0.00	44	0.00	210	0.00	438	0.00	ACCEPT
	Pitot		75		44		210		438		
5-T-1	Reference	10/29/1999	75	0.00	42	0.00	214	0.00	489	0.21	ACCEPT
	Pitot		75		42		214		491		
5-T-2	Reference	11/02/1999	74	0.00	40	0.00	210	0.15	410	0.00	ACCEPT
	Pitot		74		40		211		410		
5-X-1	Reference	10/29/1999	78	0.00	40	0.00	209	0.15	496	0.00	ACCEPT
	Pitot		78		40		208		496		
5-X-2	Reference	11/04/1999	66	0.38	39	0.00	206	0.30	438	0.78	ACCEPT
	Pitot		68		39		204		431		
5-X-3	Reference	10/29/1999	77	0.00	38	0.00	208	0.30	506	0.00	ACCEPT
	Pitot		77		38		210		506		
6-I-1	Reference	11/04/1999	66	0.00	43	0.00	210	0.00	449	0.00	ACCEPT
	Pitot		66		43		210		449		
6-I-2	Reference	11/02/1999	73	0.00	41	0.00	170	0.00	460	0.00	ACCEPT
	Pitot		73		41		170		460		
6-T-1	Reference	11/04/1999	66	0.38	43	0.00	212	0.00	459	0.00	ACCEPT
	Pitot		64		43		212		459		
6-T-2	Reference	11/04/1999	66	0.00	42	0.00	212	0.00	461	0.00	ACCEPT
	Pitot		66		42		212		461		

PACIFIC ENVIRONMENTAL SERVICES

STACK THERMOCOUPLES

7209 East Kemper Rd.
Cincinnati, OH 45249
513.489.6611
513.489.6619 Fax
www.pes.com

Thermo. ID	Therm.	Date Calibrated	Ambient Air	Diff., %	Cold Bath	Diff., %	Hot Bath	Diff., %	Hot Oil	Diff., %	Accept/Reject
6-T-3	Reference	10/29/1999	77	0.00	40	0.00	210	0.15	510	0.41	ACCEPT
	Pitot		77		40		211		514		
6-T-4	Reference	01/13/2000	75	0.00	44	0.00	210	0.00	438	0.00	ACCEPT
	Pitot		75		44		210		438		
7-M-1	Reference	11/03/1999	73	0.00	36	0.00	205	0.00	421	0.00	ACCEPT
	Pitot		73		36		205		421		
7-M-2	Reference	11/03/1999	72	0.00	37	0.00	209	0.00	454	0.00	ACCEPT
	Pitot		72		37		209		454		
7-M-3	Reference	11/03/1999	62	0.00	40	0.00	208	0.00	458	0.00	ACCEPT
	Pitot		62		40		208		458		
7-T-I-1	Reference	01/13/2000	75	0.00	48	0.00	209	0.00	435	0.00	ACCEPT
	Pitot		75		48		209		435		
7-T-I-2	Reference	01/13/2000	75	0.00	48	0.00	210	0.00	440	0.00	ACCEPT
	Pitot		75		48		210		440		
7-T-I-3	Reference	06/08/2000	73	0.00	40	0.00	120	0.00	420	0.00	ACCEPT
	Pitot		73		40		120		420		
8-M-2	Reference	11/03/1999	65	0.00	36	0.00	187	0.00	378	0.00	ACCEPT
	Pitot		65		36		187		378		
8-T-1	Reference	11/04/1999	67	0.38	42	0.00	212	0.00	459	0.00	ACCEPT
	Pitot		69		42		212		459		
8-T-2	Reference	11/02/1999	74	0.00	40	0.00	195	0.61	396	0.70	ACCEPT
	Pitot		74		41		199		402		
8-T-3	Reference	11/02/1999	74	0.00	41	0.00	195	0.00	396	0.00	ACCEPT
	Pitot		74		41		195		396		
8-T-4	Reference	11/04/1999	66	0.38	42	0.40	209	0.30	446	0.22	ACCEPT
	Pitot		68		44		207		444		
8-T-5	Reference	11/04/1999	66	0.00	39	0.80	206	0.15	446	0.00	ACCEPT
	Pitot		66		43		205		446		
10-M-1	Reference	11/04/1999	67	0.38	44	0.20	211	0.00	444	0.00	ACCEPT
	Pitot		69		45		211		444		
10-T-1	Reference	01/27/2000	75	0.00	42	0.00	185	0.00	417	0.00	ACCEPT
	Pitot		75		42		185		417		
12-X-1	Reference	11/04/1999	63	0.00	39	0.00	191	0.00	384	0.00	ACCEPT
	Pitot		63		39		191		384		

Dry Gas Meter and Orifice Meter

Dry gas meters and orifices are calibrated in accordance with Section 3.3.2 of the QA Handbook. This procedure involves direct comparison of the dry gas meter to a reference dry test meter. The reference dry test meter is routinely calibrated using a liquid displacement technique. Before its initial use in the field, the metering system is calibrated over the entire range of operation. After each field use, the metering system is calibrated at a single intermediate setting based on the previous field test. Acceptable tolerances for the initial and final dry gas meter factors and orifice calibration factors are ± 0.02 and ± 0.20 from average, respectively.

Digital Indicators for Thermocouple Readout

A digital indicator is calibrated by feeding a series of millivolt signals to the input and comparing the indicator reading with the reading the signal should have generated. Errors did not exceed 0.5 percent (%) when the temperatures were expressed in degrees Rankine. Calibration data are included in the following Thermocouple Digital Indicator Calibration Data Sheet(s).

Dry Gas Thermocouples

The dry gas thermocouples are calibrated by comparing them with an ASTM-3 thermometer at approximately 32°F, ambient temperature, and a higher temperature between approximately 100°F and 200°F. The thermocouples agreed within 5°F of the reference thermometer.

PACIFIC ENVIRONMENTAL SERVICES, INC.

7209 E. Kemper Rd.
Cincinnati, Ohio 45249
Phone: 513.489.6611
Fax: 513.489.6619
www.pes.com

Meter Box No.: 1

Dry Gas Orifice Meter

Pb, in. Hg	29.36	RUN 1	RUN 2	RUN 3	RUN 4	RUN 5	RUN 6
DH	Delta H	0.50	0.75	1.00	1.50	2.00	4.00
in Hg	Vacuum	10	10	10	10	10	10
Vw_1	Initial RTM	873.531	888.480	899.509	910.499	921.676	933.875
Vw_2	Final RTM	888.088	899.083	910.341	921.430	933.245	947.460
Vd_1	Initial DGM	809.724	824.702	835.775	846.827	858.032	870.262
Vd_2	Final DGM	824.310	835.345	846.652	857.784	869.631	883.834
Tw	Ave. Temp RTM °	72	73	74	75	75	75
Td	Ave. Temp DGM °	77	82	84	87	88	89
t	Time (min.)	36.1	21.4	19.0	15.9	15.0	12.4
$Vw_2 - Vw_1$	Net Volume RTM	14.557	10.603	10.832	10.931	11.569	13.585
$Vd_2 - Vd_1$	Net Volume DGM	14.586	10.643	10.877	10.957	11.599	13.572
	Y	1.006	1.011	1.012	1.016	1.017	1.017
	dH@	1.747	1.724	1.732	1.793	1.896	1.876

AVERAGE Y **1.001** (Reference meter correction factor of 0.988)

Average Y Range = 0.981 TO 1.021 **ACCEPT**

AVERAGE dH **1.795**

Average dH@ Range = 1.595 TO 1.995 **ACCEPT**

Calculations

Y = (Vw * Pb * (Td + 460)) / (Vd * (Pb + (dHd / 13.6)) * (Tw +460))

dH@ = 0.0317 * dHd / (Pb (Td + 460)) * (((Tw +460) * t) / Vw)^2

Digital Indicator for Thermocouple Readout

TEST POINT NO.	MILLIVOLT SIGINAL	EQUIVALENT TEMP, °F	DIGITAL INDICATOR TEMP READING, °F	DIFFERENCE, %
1	-0.692	0	-1	0.2
2	1.520	100	100	0.0
3	3.819	200	201	0.2
4	6.092	300	299	0.1
5	8.314	400	399	0.1
6	10.560	500	501	0.1
7	22.251	1000	1001	0.1
8	29.315	1300	1300	0.0
9	36.166	1600	1601	0.0
10	42.732	1900	1899	0.0

Percent difference must be less than or equal to 0.5 %

% difference: (Equivalent Temp.,°R - Digital Indicator Temp., °R) * (100%) / (Equivalent Temp., °R)

Where °R = °F + 460

ACCEPT

Dry Gas Thermocouples

Reference point number	Source[a] (Specify)	Reference Thermometer Temperature,°F	Thermocouple Potentiometer Temperature,°F	Temperature Difference,[b] °F
Inlet				
1	Ambient Air	73	74	1
2	Cold Bath	41	40	1
3	Hot Bath	138	137	1
Outlet				
1	Ambient Air	73	73	0
2	Cold Bath	42	42	0
3	Hot Bath	136	135	1

[a]Type of calibration used.

[b]Allowable tolerance ±5°F

ACCEPT

Calibrated By : da

PACIFIC ENVIRONMENTAL SERVICES, INC.

7209 E. Kemper Road
Cincinnati, Ohio 45249
Phone: 513.489.6611
Fax: 513.489.6619
www.pes.com

Box No.:	MB-1	Bar. Press.(Pb):	29.12	in. Hg
Date:	10/5/00	Pretest Gamma:	1.001	
Calibrated By :	G Gay	Pretest dH@:	1.795	
Plant:	Newport Steel			

		RUN 1	RUN 2	RUN 3
DH	Delta H	1.80	1.80	1.80
in Hg	Vacuum	8.00	8.00	8.00
Vw_1	Initial RTM	422.019	433.168	444.365
Vw_2	Final RTM	433.168	444.365	456.724
Vd_1	Initial DGM	532.859	544.132	555.480
Vd_2	Final DGM	544.132	555.480	568.020
Tw	Ave. Temp RTM °F	69.0	70.0	71.0
Td	Ave. Temp DGM °F	72.0	73.0	74.0
t	Time (min.)	15.0	15.0	16.3
$Vw_2 - Vw_1$	Net Volume RTM	11.149	11.197	12.359
$Vd_2 - Vd_1$	Net Volume DGM	11.273	11.348	12.540
	Y	0.990	0.988	0.987
	dH@	1.866	1.853	1.800

AVERAGE Y = **0.980**

% Difference from Yearly Y = **-2.144** **ACCEPT**

AVERAGE dH@ = **1.840**

Calculations

Y = (Vw * Pb * (Td + 460)) / (Vd • (Pb + (dHd / 13.6)) * (Tw +460))

dH@ = 0.0317 • dHd / (Pb (Td + 460)) • (((Tw +460) • time) / Vw)^2

Posttest Dry Gas Meter Calibration Form (English Units)

PACIFIC ENVIRONMENTAL SERVICES, INC.

Impinger Thermocouples

The impinger thermocouples are checked in a similar manner at approximately 32°F and ambient temperature, and they agreed within 2°F. The thermocouples may be checked at ambient temperature prior to the test series to verify calibration. Calibration data are included in the following Impinger Thermocouple Calibration Data Sheet(s).

PACIFIC ENVIRONMENTAL SERVICES, INC.

7209 E. Kemper Rd.
Cincinnati, OH 45249
Phone: 513.489.6611
Fax: 513.489.6619

TEMPERATURE SENSOR CALIBRATION DATA FORM FOR SAMPLEHEADS

DATE: 13-Jan-00

Reference point number	Source[a] (Specify)	Reference Thermometer Temperature, °F	Thermocouple Potentiometer Temperature, °F	Temperature Difference,[b] °F	
Sample Head No. 1					
1	Ambient Air	75	75	0	ACCEPT
2	Cold Bath	36	36	0	
Sample Head No. 2					
1	Ambient Air	76	76	0	ACCEPT
2	Cold Bath	36	36	0	
Sample Head No. 3					
1	Ambient Air	76	76	0	ACCEPT
2	Cold Bath	38	38	0	
Sample Head No. 4					
1	Ambient Air	76	76	0	ACCEPT
2	Cold Bath	36	36	0	
Sample Head No. 5					
1	Ambient Air	76	78	2	ACCEPT
2	Cold Bath	36	36	0	
Sample Head No. 6					
1	Ambient Air	73	73	0	ACCEPT
2	Cold Bath	35	35	0	
Sample Head No. 7					
1	Ambient Air	74	74	0	ACCEPT
2	Cold Bath	35	35	0	
Sample Head No. 8					
1	Ambient Air	74	74	0	ACCEPT
2	Cold Bath	38	38	0	
Sample Head No. 9					
1	Ambient Air	75	75	0	ACCEPT
2	Cold Bath	40	40	0	

[a]Type of calibration used.

Calibrated By: ah

[b]Allowable tolerance ±2°F

Appendix G

Continuous Emission Monitoring Data

Run 1

Date	Hour	CO	NOX	COPPH	NOXPPH
10/3/00 0:00	9:14	68.9	3.33	176.64	14.05
10/3/00 0:00	9:15	83.5	3.14	214.15	13.24
10/3/00 0:00	9:16	122.2	2.99	313.40	12.60
10/3/00 0:00	9:17	250.0	3.10	641.33	13.06
10/3/00 0:00	9:18	421.8	3.19	1081.97	13.43
10/3/00 0:00	9:19	417.8	3.08	1071.72	12.98
10/3/00 0:00	9:20	331.6	3.00	850.58	12.66
10/3/00 0:00	9:21	374.3	2.74	960.03	11.55
10/3/00 0:00	9:22	268.1	2.96	687.80	12.47
10/3/00 0:00	9:23	380.4	2.96	975.68	12.48
10/3/00 0:00	9:24	174.1	2.57	446.50	10.84
10/3/00 0:00	9:25	145.1	1.97	372.17	8.32
10/3/00 0:00	9:26	170.9	1.92	438.37	8.09
10/3/00 0:00	9:27	159.5	1.88	409.23	7.91
10/3/00 0:00	9:28	112.3	1.71	288.19	7.21
10/3/00 0:00	9:29	121.0	1.55	310.39	6.52
10/3/00 0:00	9:30	155.9	1.34	399.86	5.66
10/3/00 0:00	9:31	129.2	1.30	331.50	5.47
10/3/00 0:00	9:32	116.3	3.92	298.43	16.49
10/3/00 0:00	9:33	59.8	10.71	153.43	45.11
10/3/00 0:00	9:34	102.0	12.95	261.68	54.54
10/3/00 0:00	9:35	124.0	3.00	318.16	12.65
10/3/00 0:00	9:36	137.0	1.44	351.50	6.08
10/3/00 0:00	9:37	184.6	1.70	473.50	7.16
10/3/00 0:00	9:38	141.8	1.71	363.75	7.21
10/3/00 0:00	9:39	118.0	1.81	302.69	7.63
10/3/00 0:00	9:40	117.5	2.21	301.52	9.33
10/3/00 0:00	9:41	104.3	3.17	267.49	13.36
10/3/00 0:00	9:42	60.2	15.50	154.31	65.28
10/3/00 0:00	9:43	79.2	12.49	203.28	52.63
10/3/00 0:00	9:44	80.3	2.09	205.98	8.80
10/3/00 0:00	9:45	58.3	3.87	149.48	16.31
10/3/00 0:00	9:46	50.6	12.10	129.74	50.96
10/3/00 0:00	9:47	70.8	4.00	181.67	16.86
10/3/00 0:00	9:48	60.8	1.99	155.95	8.39
10/3/00 0:00	9:49	41.0	7.73	105.14	32.56
10/3/00 0:00	9:50	36.7	8.37	94.24	35.27
10/3/00 0:00	9:51	36.3	7.16	93.09	30.17
10/3/00 0:00	9:52	38.0	6.64	97.54	27.95
10/3/00 0:00	9:53	43.6	6.77	111.96	28.52
10/3/00 0:00	9:54	44.1	6.63	113.19	27.93
10/3/00 0:00	9:55	98.9	7.72	253.79	32.52
10/3/00 0:00	9:56	55.7	6.69	142.75	28.19
10/3/00 0:00	9:57	39.9	6.07	102.42	25.57
10/3/00 0:00	9:58	37.5	5.89	96.08	24.80
10/3/00 0:00	9:59	37.4	5.91	95.83	24.91
10/3/00 0:00	10:00	36.3	6.01	93.08	25.32
10/3/00 0:00	10:01	37.1	4.96	95.14	20.88
10/3/00 0:00	10:02	52.3	4.70	134.04	19.82
10/3/00 0:00	10:03	74.9	3.03	192.13	12.76
10/3/00 0:00	10:04	75.1	2.41	192.66	10.13

10/3/00 0:00	10:05	62.6	2.40	160.69	10.10
10/3/00 0:00	10:06	59.0	2.37	151.33	9.99
10/3/00 0:00	10:07	59.0	2.19	151.22	9.24
10/3/00 0:00	10:08	59.5	2.21	152.60	9.30
10/3/00 0:00	10:09	61.3	2.34	157.21	9.87
10/3/00 0:00	10:10	61.6	2.34	157.97	9.85
10/3/00 0:00	10:11	63.9	2.22	163.79	9.37
10/3/00 0:00	10:12	63.8	2.24	163.69	9.46
10/3/00 0:00	10:13	61.9	2.10	158.66	8.86
10/3/00 0:00	10:14	64.1	1.91	164.31	8.05
10/3/00 0:00	10:15	60.8	1.88	156.07	7.94
10/3/00 0:00	10:16	59.0	1.93	151.30	8.14
10/3/00 0:00	10:17	58.9	2.22	150.97	9.36
10/3/00 0:00	10:18	57.5	2.46	147.54	10.36
10/3/00 0:00	10:19	60.4	2.48	154.90	10.43
10/3/00 0:00	10:20	62.2	2.32	159.52	9.77
10/3/00 0:00	10:21	61.9	2.11	158.76	8.89
10/3/00 0:00	10:22	59.3	2.14	152.07	9.03
10/3/00 0:00	10:23	62.5	2.31	160.20	9.73
10/3/00 0:00	10:24	59.3	2.56	152.06	10.78
10/3/00 0:00	10:25	63.0	2.56	161.71	10.78
10/3/00 0:00	10:26	61.9	2.49	158.70	10.47
10/3/00 0:00	10:27	56.0	2.58	143.74	10.86
10/3/00 0:00	10:28	50.6	2.86	129.87	12.05
10/3/00 0:00	10:29	48.8	2.69	125.15	11.31
10/3/00 0:00	10:30	46.5	3.09	119.40	13.00
10/3/00 0:00	10:31	48.7	2.94	124.94	12.36
10/3/00 0:00	10:32	51.2	3.18	131.37	13.38
10/3/00 0:00	10:33	50.4	3.37	129.21	14.19
10/3/00 0:00	10:34	47.6	3.60	121.98	15.17
10/3/00 0:00	10:35	48.1	3.72	123.45	15.66
10/3/00 0:00	10:36	48.2	4.02	123.68	16.95
10/3/00 0:00	10:37	46.2	3.83	118.53	16.14
10/3/00 0:00	10:38	46.5	3.53	119.19	14.88
10/3/00 0:00	10:39	45.8	3.58	117.48	15.07
10/3/00 0:00	10:40	46.3	3.67	118.75	15.47
10/3/00 0:00	10:41	46.3	3.94	118.75	16.59
10/3/00 0:00	10:42	47.0	3.65	120.67	15.40
10/3/00 0:00	10:43	47.5	2.84	121.91	11.94
10/3/00 0:00	10:44	44.7	2.84	114.56	11.97
10/3/00 0:00	10:45	43.3	3.35	111.07	14.12
10/3/00 0:00	10:46	43.3	3.74	111.06	15.75
10/3/00 0:00	10:47	44.1	3.75	113.03	15.80
10/3/00 0:00	10:48	44.3	3.95	113.62	16.63
10/3/00 0:00	10:49	44.6	3.85	114.32	16.23
10/3/00 0:00	10:50	44.7	3.67	114.64	15.47
10/3/00 0:00	10:51	44.1	3.74	113.21	15.76
10/3/00 0:00	10:52	43.4	3.70	111.22	15.59
10/3/00 0:00	10:53	47.5	3.17	121.74	13.34
10/3/00 0:00	10:54	45.7	2.60	117.30	10.96
10/3/00 0:00	10:55	43.1	3.01	110.54	12.66
10/3/00 0:00	10:56	42.3	3.42	108.50	14.43

10/3/00 0:00	10:57	42.3	3.33	108.49	14.02
10/3/00 0:00	10:58	42.2	3.26	108.23	13.72
10/3/00 0:00	10:59	42.1	3.05	107.88	12.85
10/3/00 0:00	11:00	41.8	3.58	107.21	15.09
10/3/00 0:00	11:01	42.0	3.82	107.79	16.10
10/3/00 0:00	11:02	41.3	3.73	105.93	15.73
10/3/00 0:00	11:03	40.7	3.88	104.38	16.35
10/3/00 0:00	11:04	41.2	4.13	105.76	17.40
10/3/00 0:00	11:05	41.1	4.13	105.49	17.41
10/3/00 0:00	11:06	41.3	3.89	105.92	16.39
10/3/00 0:00	11:07	41.3	3.96	105.93	16.70
10/3/00 0:00	11:08	42.1	4.14	107.94	17.42
10/3/00 0:00	11:09	41.5	4.32	106.46	18.19
10/3/00 0:00	11:10	41.9	4.21	107.50	17.72
10/3/00 0:00	11:11	42.6	4.09	109.24	17.23
10/3/00 0:00	11:12	42.8	4.00	109.90	16.83
10/3/00 0:00	11:13	41.5	3.69	106.49	15.54
10/3/00 0:00	11:14	41.3	3.61	105.92	15.19
		81.2	3.8		

Date	Hour	CO	NOX	COPPH	NOXPPH
10/3/00 0:00	15:29	328.2	3.67	841.76	15.44
10/3/00 0:00	15:30	340.5	3.35	873.40	14.10
10/3/00 0:00	15:31	238.0	2.76	610.42	11.61
10/3/00 0:00	15:32	197.6	2.20	506.96	9.26
10/3/00 0:00	15:33	174.4	1.92	447.34	8.10
10/3/00 0:00	15:34	147.6	1.64	378.65	6.89
10/3/00 0:00	15:35	166.1	1.44	426.14	6.08
10/3/00 0:00	15:36	154.3	1.46	395.91	6.13
10/3/00 0:00	15:37	61.0	6.31	156.45	26.57
10/3/00 0:00	15:38	54.0	8.12	138.41	34.21
10/3/00 0:00	15:39	132.1	3.14	338.73	13.22
10/3/00 0:00	15:40	102.1	1.78	262.02	7.51
10/3/00 0:00	15:41	89.6	1.58	229.84	6.65
10/3/00 0:00	15:42	93.7	1.62	240.41	6.81
10/3/00 0:00	15:43	86.8	1.67	222.70	7.05
10/3/00 0:00	15:44	69.6	1.47	178.48	6.19
10/3/00 0:00	15:45	81.2	1.38	208.34	5.83
10/3/00 0:00	15:46	88.6	1.53	227.16	6.46
10/3/00 0:00	15:47	76.1	1.49	195.10	6.28
10/3/00 0:00	15:48	56.1	1.59	143.86	6.69
10/3/00 0:00	15:49	51.4	1.80	131.91	7.58
10/3/00 0:00	15:50	41.8	3.74	107.11	15.75
10/3/00 0:00	15:51	30.8	7.13	78.93	30.03
10/3/00 0:00	15:52	30.3	5.62	77.64	23.66
10/3/00 0:00	15:53	29.3	4.74	75.07	19.98
10/3/00 0:00	15:54	29.8	4.50	76.34	18.95
10/3/00 0:00	15:55	29.3	5.16	75.07	21.74
10/3/00 0:00	15:56	36.6	26.91	93.86	113.36
10/3/00 0:00	15:57	63.7	10.39	163.50	43.79
10/3/00 0:00	15:58	58.6	2.71	150.26	11.40
10/3/00 0:00	15:59	35.9	7.61	92.17	32.05
10/3/00 0:00	16:00	28.6	7.23	73.36	30.44
10/3/00 0:00	16:01	28.3	6.81	72.52	28.68
10/3/00 0:00	16:02	28.3	6.64	72.50	27.99
10/3/00 0:00	16:03	28.3	6.42	72.52	27.03
10/3/00 0:00	16:04	28.3	6.20	72.51	26.12
10/3/00 0:00	16:05	27.9	5.84	71.67	24.59
10/3/00 0:00	16:06	27.3	5.39	69.96	22.71
10/3/00 0:00	16:07	27.3	5.12	69.95	21.57
10/3/00 0:00	16:08	27.3	5.18	69.95	21.82
10/3/00 0:00	16:09	27.5	5.32	70.42	22.41
10/3/00 0:00	16:10	32.9	5.42	84.39	22.85
10/3/00 0:00	16:11	32.7	5.61	83.88	23.65
10/3/00 0:00	16:12	47.6	7.02	122.12	29.59
10/3/00 0:00	16:13	41.9	7.23	107.60	30.46
10/3/00 0:00	16:14	32.9	6.10	84.35	25.69
10/3/00 0:00	16:15	30.8	6.10	78.89	25.68
10/3/00 0:00	16:16	29.7	6.16	76.30	25.93
10/3/00 0:00	16:17	29.3	6.03	75.08	25.41
10/3/00 0:00	16:18	29.3	5.88	75.08	24.77
10/3/00 0:00	16:19	28.9	5.77	74.19	24.32

10/3/00 0:00	16:20	28.3	5.12	72.52	21.57
10/3/00 0:00	16:21	28.3	2.84	72.51	11.95
10/3/00 0:00	16:22	28.3	1.56	72.51	6.58
10/3/00 0:00	16:23	28.3	1.30	72.52	5.49
10/3/00 0:00	16:24	28.3	1.44	72.51	6.05
10/3/00 0:00	16:25	28.3	1.67	72.52	7.04
10/3/00 0:00	16:26	28.8	1.68	73.84	7.07
10/3/00 0:00	16:27	29.3	1.68	75.08	7.07
10/3/00 0:00	16:28	29.3	1.70	75.07	7.18
10/3/00 0:00	16:29	29.3	1.78	75.08	7.49
10/3/00 0:00	16:30	29.3	1.74	75.07	7.32
10/3/00 0:00	16:31	29.3	1.67	75.08	7.03
10/3/00 0:00	16:32	29.3	1.61	75.08	6.77
10/3/00 0:00	16:33	29.3	1.68	75.07	7.07
10/3/00 0:00	16:34	29.3	1.64	75.09	6.89
10/3/00 0:00	16:35	29.3	1.62	75.07	6.84
10/3/00 0:00	16:36	29.3	1.72	75.08	7.24
10/3/00 0:00	16:37	29.3	1.52	75.05	6.40
10/3/00 0:00	16:38	34.4	1.89	88.32	7.95
10/3/00 0:00	16:39	85.3	3.78	218.79	15.94
10/3/00 0:00	16:40	117.3	2.84	300.82	11.95
10/3/00 0:00	16:41	90.3	2.38	231.52	10.01
10/3/00 0:00	16:42	63.4	2.04	162.67	8.59
10/3/00 0:00	16:43	51.6	2.43	132.34	10.22
10/3/00 0:00	16:44	72.8	7.13	186.68	30.04
10/3/00 0:00	16:45	47.4	2.96	121.56	12.46
10/3/00 0:00	16:46	37.0	2.06	94.81	8.66
10/3/00 0:00	16:47	34.7	1.77	89.07	7.45
10/3/00 0:00	16:48	33.7	1.92	86.50	8.07
10/3/00 0:00	16:49	33.3	2.01	85.31	8.46
10/3/00 0:00	16:50	33.3	1.97	85.30	8.31
10/3/00 0:00	16:51	32.7	1.80	83.92	7.56
10/3/00 0:00	16:52	32.3	1.85	82.76	7.80
10/3/00 0:00	16:53	32.2	1.64	82.66	6.91
10/3/00 0:00	16:54	31.3	1.49	80.21	6.28
10/3/00 0:00	16:55	31.2	1.38	80.10	5.81
10/3/00 0:00	16:56	30.5	1.42	78.18	6.00
10/3/00 0:00	16:57	31.1	1.64	79.66	6.89
10/3/00 0:00	16:58	30.5	1.48	78.18	6.22
10/3/00 0:00	16:59	31.3	1.60	80.22	6.76
10/3/00 0:00	17:00	30.4	1.85	77.93	7.79
10/3/00 0:00	17:01	30.3	1.70	77.63	7.16
10/3/00 0:00	17:02	30.3	1.69	77.65	7.12
10/3/00 0:00	17:03	30.3	1.75	77.65	7.38
10/3/00 0:00	17:04	30.1	1.54	77.09	6.49
10/3/00 0:00	17:05	29.8	1.51	76.48	6.35
10/3/00 0:00	17:06	29.4	1.67	75.39	7.05
10/3/00 0:00	17:07	29.3	1.58	75.07	6.67
10/3/00 0:00	17:08	29.3	1.63	75.08	6.85
10/3/00 0:00	17:09	29.3	1.73	75.07	7.27
10/3/00 0:00	17:10	29.3	1.64	75.08	6.89
10/3/00 0:00	17:11	29.3	1.54	75.07	6.50

10/3/00 0:00	17:12	29.3	1.81	75.08	7.61
10/3/00 0:00	17:13	29.3	1.75	75.08	7.38
10/3/00 0:00	17:14	29.3	1.68	75.08	7.07
10/3/00 0:00	17:15	29.3	1.76	75.08	7.41
10/3/00 0:00	17:16	29.3	1.69	75.07	7.10
10/3/00 0:00	17:17	28.4	1.36	72.78	5.71
10/3/00 0:00	17:18	28.3	1.22	72.51	5.12
10/3/00 0:00	17:19	28.3	1.12	72.52	4.70
10/3/00 0:00	17:20	28.3	1.08	72.52	4.55
10/3/00 0:00	17:21	28.3	1.08	72.53	4.55
10/3/00 0:00	17:22	28.3	1.08	72.51	4.55
10/3/00 0:00	17:23	28.3	1.08	72.53	4.55
10/3/00 0:00	17:24	28.3	1.02	72.51	4.28
10/3/00 0:00	17:25	28.3	0.98	72.53	4.12
10/3/00 0:00	17:26	31.9	12.17	81.91	51.26
10/3/00 0:00	17:27	62.3	17.87	159.69	75.27
10/3/00 0:00	17:28	82.7	3.59	212.13	15.13
10/3/00 0:00	17:29	108.7	3.33	278.78	14.03
10/3/00 0:00	17:30	113.1	4.28	290.13	18.01
10/3/00 0:00	17:31	96.4	4.51	247.24	18.98
10/3/00 0:00	17:32	152.3	4.24	390.60	17.87
10/3/00 0:00	17:33	258.9	3.31	663.98	13.94
10/3/00 0:00	17:34	197.1	2.66	505.71	11.21
10/3/00 0:00	17:35	151.3	1.94	387.99	8.15
10/3/00 0:00	17:36	135.2	1.63	346.79	6.88
10/3/00 0:00	17:37	145.8	1.46	374.11	6.16
10/3/00 0:00	17:38	119.2	2.26	305.78	9.53
10/3/00 0:00	17:39	40.8	4.53	104.55	19.07
10/3/00 0:00	17:40	39.4	4.25	101.15	17.89
10/3/00 0:00	17:41	89.7	2.87	230.15	12.08
10/3/00 0:00	17:42	120.7	2.28	309.62	9.62
10/3/00 0:00	17:43	131.8	2.10	338.03	8.83
10/3/00 0:00	17:44	140.8	8.65	361.08	36.43
10/3/00 0:00	17:45	64.0	6.05	164.15	25.47
10/3/00 0:00	17:46	51.6	4.33	132.33	18.24
10/3/00 0:00	17:47	59.4	4.21	152.42	17.75
10/3/00 0:00	17:48	122.3	4.10	313.67	17.25
10/3/00 0:00	17:49	192.2	4.23	493.10	17.82
10/3/00 0:00	17:50	240.3	4.23	616.35	17.82
10/3/00 0:00	17:51	262.6	4.10	673.63	17.26
10/3/00 0:00	17:52	217.7	4.13	558.45	17.40
10/3/00 0:00	17:53	184.7	4.13	473.89	17.40
10/3/00 0:00	17:54	112.8	3.90	289.26	16.42
10/3/00 0:00	17:55	137.9	3.01	353.78	12.69
10/3/00 0:00	17:56	294.5	2.16	755.47	9.11
10/3/00 0:00	17:57	261.0	1.86	669.44	7.85
10/3/00 0:00	17:58	192.5	2.26	493.73	9.53
10/3/00 0:00	17:59	65.1	3.45	167.11	14.52
10/3/00 0:00	18:00	65.8	7.51	168.90	31.62
10/3/00 0:00	18:01	140.9	2.60	361.55	10.97
10/3/00 0:00	18:02	108.5	1.33	278.19	5.60
10/3/00 0:00	18:03	107.7	1.48	276.19	6.25

10/3/00 0:00	18:04	78.2	1.53	200.52	6.44
10/3/00 0:00	18:05	85.9	1.51	220.32	6.38
10/3/00 0:00	18:06	112.6	1.61	288.76	6.80
10/3/00 0:00	18:07	108.9	1.70	279.37	7.15
10/3/00 0:00	18:08	117.8	1.85	302.10	7.78
10/3/00 0:00	18:09	114.6	1.99	294.06	8.36
10/3/00 0:00	18:10	120.0	2.28	307.92	9.59
10/3/00 0:00	18:11	73.8	1.89	189.31	7.97
10/3/00 0:00	18:12	59.8	1.69	153.36	7.14
10/3/00 0:00	18:13	75.9	2.02	194.69	8.53
10/3/00 0:00	18:14	84.9	2.30	217.76	9.69
10/3/00 0:00	18:15	60.1	3.20	154.25	13.48
10/3/00 0:00	18:16	101.3	2.22	259.87	9.35
10/3/00 0:00	18:17	100.6	2.86	258.14	12.05
10/3/00 0:00	18:18	52.5	2.56	134.55	10.78
10/3/00 0:00	18:19	50.6	6.31	129.69	26.59
10/3/00 0:00	18:20	45.6	5.25	116.94	22.10
10/3/00 0:00	18:21	41.0	3.65	105.27	15.37
10/3/00 0:00	18:22	44.3	13.61	113.57	57.33
10/3/00 0:00	18:23	41.7	9.89	106.92	41.68
10/3/00 0:00	18:24	46.3	10.57	118.74	44.52
10/3/00 0:00	18:25	42.4	4.18	108.88	17.61
10/3/00 0:00	18:26	36.0	11.13	92.24	46.89
10/3/00 0:00	18:27	37.5	11.22	96.21	47.29
10/3/00 0:00	18:28	40.9	10.27	104.95	43.28
10/3/00 0:00	18:29	46.6	9.86	119.42	41.55
		71.9	3.6		

Run 2

Date	Hour	CO	NOX	COPPH	NOXPPH
10/4/00 0:00	7:00	60.8	3.64	155.90	15.33
10/4/00 0:00	7:01	63.4	3.56	162.75	15.01
10/4/00 0:00	7:02	73.9	3.08	189.50	12.99
10/4/00 0:00	7:03	67.1	2.73	172.14	11.50
10/4/00 0:00	7:04	78.0	2.31	200.08	9.74
10/4/00 0:00	7:05	88.7	1.85	227.60	7.81
10/4/00 0:00	7:06	72.4	1.49	185.63	6.27
10/4/00 0:00	7:07	68.9	1.31	176.75	5.53
10/4/00 0:00	7:08	67.3	1.03	172.75	4.33
10/4/00 0:00	7:09	51.2	1.62	131.22	6.83
10/4/00 0:00	7:10	41.4	4.51	106.23	19.01
10/4/00 0:00	7:11	70.8	3.18	181.50	13.40
10/4/00 0:00	7:12	89.4	2.62	229.36	11.04
10/4/00 0:00	7:13	62.2	4.86	159.59	20.49
10/4/00 0:00	7:14	40.0	4.09	102.64	17.22
10/4/00 0:00	7:15	45.3	3.90	116.09	16.45
10/4/00 0:00	7:16	81.7	3.70	209.61	15.61
10/4/00 0:00	7:17	133.1	3.28	341.36	13.81
10/4/00 0:00	7:18	192.2	2.94	492.90	12.38
10/4/00 0:00	7:19	174.9	1.95	448.67	8.23
10/4/00 0:00	7:20	149.6	1.26	383.76	5.31
10/4/00 0:00	7:21	100.4	1.10	257.41	4.64
10/4/00 0:00	7:22	74.8	1.18	191.92	4.95
10/4/00 0:00	7:23	90.0	1.47	230.76	6.18
10/4/00 0:00	7:24	103.8	1.55	266.28	6.54
10/4/00 0:00	7:25	138.5	1.37	355.25	5.77
10/4/00 0:00	7:26	147.1	1.48	377.24	6.23
10/4/00 0:00	7:27	85.7	3.57	219.87	15.04
10/4/00 0:00	7:28	80.7	8.06	206.91	33.96
10/4/00 0:00	7:29	139.1	3.46	356.71	14.56
10/4/00 0:00	7:30	164.2	0.97	421.11	4.07
10/4/00 0:00	7:31	170.4	0.78	436.97	3.27
10/4/00 0:00	7:32	159.4	0.69	408.97	2.90
10/4/00 0:00	7:33	134.6	0.78	345.24	3.28
10/4/00 0:00	7:34	134.1	0.86	343.87	3.60
10/4/00 0:00	7:35	106.1	0.88	272.10	3.70
10/4/00 0:00	7:36	102.5	0.95	262.87	4.00
10/4/00 0:00	7:37	124.8	1.11	320.21	4.66
10/4/00 0:00	7:38	124.2	1.36	318.61	5.74
10/4/00 0:00	7:39	122.1	1.71	313.19	7.20
10/4/00 0:00	7:40	102.8	2.13	263.64	8.99
10/4/00 0:00	7:41	78.8	8.39	202.04	35.36
10/4/00 0:00	7:42	79.6	10.91	204.27	45.97
10/4/00 0:00	7:43	80.1	9.19	205.39	38.72
10/4/00 0:00	7:44	37.3	20.89	95.58	88.02
10/4/00 0:00	7:45	37.2	19.62	95.41	82.66
10/4/00 0:00	7:46	60.5	4.91	155.24	20.69
10/4/00 0:00	7:47	41.6	9.03	106.61	38.05
10/4/00 0:00	7:48	33.4	15.65	85.58	65.92
10/4/00 0:00	7:49	31.9	13.10	81.76	55.20
10/4/00 0:00	7:50	56.5	12.52	144.98	52.73

10/4/00 0:00	7:51	46.0	11.10	117.90	46.77
10/4/00 0:00	7:52	32.2	9.22	82.67	38.86
10/4/00 0:00	7:53	30.4	8.45	77.90	35.60
10/4/00 0:00	7:54	29.5	8.37	75.70	35.25
10/4/00 0:00	7:55	29.3	8.13	75.09	34.24
10/4/00 0:00	7:56	29.3	7.85	75.07	33.08
10/4/00 0:00	7:57	28.9	7.94	74.01	33.46
10/4/00 0:00	7:58	28.3	8.04	72.50	33.89
10/4/00 0:00	7:59	28.3	8.05	72.53	33.91
10/4/00 0:00	8:00	28.7	7.98	73.58	33.62
10/4/00 0:00	8:01	29.3	7.49	75.08	31.56
10/4/00 0:00	8:02	30.5	6.27	78.29	26.43
10/4/00 0:00	8:03	32.4	6.21	82.99	26.15
10/4/00 0:00	8:04	33.3	5.83	85.32	24.55
10/4/00 0:00	8:05	33.3	5.82	85.32	24.51
10/4/00 0:00	8:06	33.7	6.15	86.40	25.90
10/4/00 0:00	8:07	33.9	6.02	87.00	25.35
10/4/00 0:00	8:08	34.3	6.04	87.89	25.46
10/4/00 0:00	8:09	34.5	6.11	88.51	25.74
10/4/00 0:00	8:10	34.4	6.04	88.32	25.46
10/4/00 0:00	8:11	33.3	5.65	85.32	23.79
10/4/00 0:00	8:12	34.0	6.10	87.25	25.70
10/4/00 0:00	8:13	34.2	6.04	87.66	25.44
10/4/00 0:00	8:14	36.5	5.45	93.58	22.96
10/4/00 0:00	8:15	47.0	3.44	120.54	14.48
10/4/00 0:00	8:16	47.6	3.33	122.18	14.01
10/4/00 0:00	8:17	60.8	7.48	156.01	31.49
10/4/00 0:00	8:18	81.1	5.59	208.12	23.56
10/4/00 0:00	8:19	88.7	2.33	227.52	9.81
10/4/00 0:00	8:20	90.7	1.95	232.70	8.22
10/4/00 0:00	8:21	95.8	1.83	245.81	7.70
10/4/00 0:00	8:22	87.4	1.69	224.12	7.11
10/4/00 0:00	8:23	70.1	1.35	179.87	5.69
10/4/00 0:00	8:24	69.4	1.28	177.95	5.38
10/4/00 0:00	8:25	69.3	1.31	177.69	5.52
10/4/00 0:00	8:26	72.9	1.39	186.93	5.87
10/4/00 0:00	8:27	78.2	1.46	200.60	6.17
10/4/00 0:00	8:28	76.3	1.30	195.66	5.47
10/4/00 0:00	8:29	60.5	1.28	155.23	5.39
10/4/00 0:00	8:30	102.7	1.26	263.55	5.32
10/4/00 0:00	8:31	64.7	1.70	165.91	7.18
10/4/00 0:00	8:32	33.2	2.43	85.24	10.23
10/4/00 0:00	8:33	72.7	2.18	186.56	9.18
10/4/00 0:00	8:34	117.8	1.55	302.11	6.51
10/4/00 0:00	8:35	111.8	1.38	286.89	5.81
10/4/00 0:00	8:36	108.3	1.68	277.81	7.07
10/4/00 0:00	8:37	70.7	5.46	181.24	23.01
10/4/00 0:00	8:38	49.7	3.21	127.51	13.53
10/4/00 0:00	8:39	42.6	3.08	109.34	12.97
10/4/00 0:00	8:40	56.1	2.85	143.83	11.99
10/4/00 0:00	8:41	64.3	2.68	164.97	11.29
10/4/00 0:00	8:42	94.2	2.35	241.73	9.88

10/4/00 0:00	8:43	167.3	2.35	429.15	9.88
10/4/00 0:00	8:44	186.0	2.38	477.20	10.02
10/4/00 0:00	8:45	188.8	2.71	484.30	11.43
10/4/00 0:00	8:46	169.2	3.26	434.09	13.74
10/4/00 0:00	8:47	253.4	3.55	649.96	14.94
10/4/00 0:00	8:48	287.8	3.86	738.12	16.27
10/4/00 0:00	8:49	254.7	3.41	653.45	14.38
10/4/00 0:00	8:50	237.1	3.54	608.16	14.91
10/4/00 0:00	8:51	172.3	2.62	441.85	11.02
10/4/00 0:00	8:52	156.7	1.98	401.93	8.36
10/4/00 0:00	8:53	116.5	1.49	298.94	6.30
10/4/00 0:00	8:54	142.0	1.51	364.20	6.37
10/4/00 0:00	8:55	158.0	1.28	405.39	5.37
10/4/00 0:00	8:56	208.6	1.18	535.17	4.97
10/4/00 0:00	8:57	176.2	1.21	452.06	5.11
10/4/00 0:00	8:58	158.5	1.26	406.62	5.30
10/4/00 0:00	8:59	124.2	3.36	318.50	14.14
10/4/00 0:00	9:00	58.5	7.67	150.04	32.31
10/4/00 0:00	9:01	115.5	5.47	296.28	23.06
10/4/00 0:00	9:02	94.2	1.34	241.53	5.65
10/4/00 0:00	9:03	125.3	1.33	321.47	5.60
10/4/00 0:00	9:04	136.3	1.40	349.61	5.88
10/4/00 0:00	9:05	105.6	1.38	270.82	5.81
10/4/00 0:00	9:06	77.2	1.46	197.96	6.17
10/4/00 0:00	9:07	84.6	1.70	216.91	7.14
10/4/00 0:00	9:08	76.3	2.21	195.72	9.31
10/4/00 0:00	9:09	64.3	2.47	165.06	10.39
10/4/00 0:00	9:10	50.4	7.80	129.26	32.86
10/4/00 0:00	9:11	39.4	16.27	100.98	68.55
10/4/00 0:00	9:12	64.2	8.30	164.62	34.97
10/4/00 0:00	9:13	60.1	3.14	154.29	13.23
10/4/00 0:00	9:14	52.4	4.41	134.39	18.59
10/4/00 0:00	9:15	41.0	16.25	105.08	68.47
10/4/00 0:00	9:16	53.0	6.22	135.84	26.19
10/4/00 0:00	9:17	34.2	9.43	87.81	39.72
10/4/00 0:00	9:18	32.1	15.18	82.41	63.95
10/4/00 0:00	9:19	32.6	14.24	83.51	59.99
10/4/00 0:00	9:20	57.0	14.21	146.08	59.88
10/4/00 0:00	9:21	54.4	11.89	139.64	50.10
10/4/00 0:00	9:22	33.5	9.43	86.05	39.72
10/4/00 0:00	9:23	30.5	8.94	78.13	37.67
10/4/00 0:00	9:24	29.6	8.49	75.97	35.78
10/4/00 0:00	9:25	29.3	8.07	75.07	34.00
10/4/00 0:00	9:26	28.4	6.89	72.95	29.02
10/4/00 0:00	9:27	29.9	6.14	76.75	25.88
10/4/00 0:00	9:28	30.3	6.05	77.63	25.48
10/4/00 0:00	9:29	31.4	6.54	80.56	27.56
10/4/00 0:00	9:30	37.6	10.78	96.37	45.41
10/4/00 0:00	9:31	57.7	10.59	147.89	44.60
10/4/00 0:00	9:32	55.9	5.75	143.45	24.23
10/4/00 0:00	9:33	50.9	5.05	130.62	21.28
10/4/00 0:00	9:34	51.8	4.30	132.90	18.13

10/4/00 0:00	9:35	77.5	4.00	198.92	16.87
10/4/00 0:00	9:36	80.0	3.03	205.27	12.76
10/4/00 0:00	9:37	99.3	2.09	254.77	8.81
10/4/00 0:00	9:38	109.8	1.15	281.56	4.86
10/4/00 0:00	9:39	100.1	0.96	256.71	4.03
10/4/00 0:00	9:40	100.7	0.96	258.33	4.02
10/4/00 0:00	9:41	112.0	1.24	287.39	5.22
10/4/00 0:00	9:42	123.4	1.27	316.44	5.36
10/4/00 0:00	9:43	114.7	1.16	294.26	4.87
10/4/00 0:00	9:44	107.5	1.02	275.87	4.31
10/4/00 0:00	9:45	112.2	1.05	287.84	4.42
10/4/00 0:00	9:46	72.6	2.62	186.16	11.05
10/4/00 0:00	9:47	49.1	4.93	125.93	20.78
10/4/00 0:00	9:48	62.6	3.14	160.52	13.24
10/4/00 0:00	9:49	67.7	4.44	173.76	18.72
10/4/00 0:00	9:50	52.4	3.72	134.47	15.67
10/4/00 0:00	9:51	55.4	2.88	142.15	12.15
10/4/00 0:00	9:52	77.2	2.70	198.15	11.37
10/4/00 0:00	9:53	92.6	2.48	237.41	10.46
10/4/00 0:00	9:54	108.2	2.34	277.58	9.85
10/4/00 0:00	9:55	93.4	2.28	239.56	9.60
10/4/00 0:00	9:56	120.7	2.26	309.63	9.53
10/4/00 0:00	9:57	149.2	2.37	382.66	9.97
10/4/00 0:00	9:58	124.9	2.38	320.31	10.02
10/4/00 0:00	9:59	132.7	2.02	340.38	8.52
10/4/00 0:00	10:00	171.7	2.06	440.34	8.68
10/4/00 0:00	10:01	181.8	2.05	466.41	8.62
10/4/00 0:00	10:02	161.8	1.75	415.11	7.39
10/4/00 0:00	10:03	106.1	1.47	272.10	6.20
10/4/00 0:00	10:04	84.6	1.49	216.97	6.27
10/4/00 0:00	10:05	48.8	2.02	125.28	8.51
10/4/00 0:00	10:06	45.2	2.86	115.86	12.06
10/4/00 0:00	10:07	43.9	5.60	112.60	23.61
10/4/00 0:00	10:08	72.0	5.05	184.74	21.26
10/4/00 0:00	10:09	98.8	1.74	253.39	7.32
10/4/00 0:00	10:10	96.4	0.95	247.24	3.98
10/4/00 0:00	10:11	124.3	0.84	318.77	3.53
10/4/00 0:00	10:12	98.5	0.82	252.75	3.46
10/4/00 0:00	10:13	85.3	2.16	218.76	9.11
10/4/00 0:00	10:14	48.9	9.36	125.41	39.45
10/4/00 0:00	10:15	60.8	11.62	155.84	48.93
10/4/00 0:00	10:16	75.6	2.80	193.85	11.78
10/4/00 0:00	10:17	71.2	1.60	182.65	6.76
10/4/00 0:00	10:18	78.8	1.10	202.04	4.64
10/4/00 0:00	10:19	81.1	1.01	207.96	4.24
10/4/00 0:00	10:20	83.9	1.29	215.19	5.42
10/4/00 0:00	10:21	82.2	3.33	210.76	14.01
10/4/00 0:00	10:22	38.4	13.71	98.48	57.75
10/4/00 0:00	10:23	41.8	17.95	107.11	75.63
10/4/00 0:00	10:24	53.5	4.99	137.28	21.02
10/4/00 0:00	10:25	41.5	9.52	106.34	40.09
10/4/00 0:00	10:26	42.8	17.18	109.69	72.36

10/4/00 0:00	10:27	55.9	4.19	143.37	17.64
10/4/00 0:00	10:28	44.6	7.95	114.49	33.48
10/4/00 0:00	10:29	30.9	12.17	79.18	51.25
10/4/00 0:00	10:30	30.7	11.49	78.76	48.41
10/4/00 0:00	10:31	33.3	10.72	85.31	45.15
10/4/00 0:00	10:32	33.5	9.54	86.01	40.19
10/4/00 0:00	10:33	49.9	9.61	128.07	40.49
10/4/00 0:00	10:34	35.4	8.64	90.79	36.42
10/4/00 0:00	10:35	29.6	8.30	75.86	34.98
10/4/00 0:00	10:36	29.3	7.40	75.07	31.19
10/4/00 0:00	10:37	30.0	5.76	76.88	24.25
10/4/00 0:00	10:38	59.0	6.00	151.37	25.29
10/4/00 0:00	10:39	69.5	3.74	178.20	15.76
10/4/00 0:00	10:40	51.2	9.75	131.30	41.06
10/4/00 0:00	10:41	60.8	6.77	155.85	28.53
10/4/00 0:00	10:42	86.4	2.91	221.69	12.24
10/4/00 0:00	10:43	86.4	2.13	221.63	8.98
10/4/00 0:00	10:44	71.9	1.49	184.44	6.28
10/4/00 0:00	10:45	84.3	1.36	216.27	5.73
10/4/00 0:00	10:46	93.1	1.34	238.74	5.65
10/4/00 0:00	10:47	112.6	1.39	288.73	5.86
10/4/00 0:00	10:48	109.2	1.36	280.00	5.71
10/4/00 0:00	10:49	109.4	1.23	280.75	5.20
10/4/00 0:00	10:50	81.2	1.18	208.31	4.96
10/4/00 0:00	10:51	85.2	1.06	218.45	4.45
10/4/00 0:00	10:52	82.5	0.95	211.51	3.98
10/4/00 0:00	10:53	64.9	0.88	166.48	3.72
10/4/00 0:00	10:54	53.3	0.85	136.76	3.58
10/4/00 0:00	10:55	44.0	1.01	112.89	4.24
10/4/00 0:00	10:56	33.1	2.76	84.92	11.61
10/4/00 0:00	10:57	34.1	4.01	87.34	16.89
10/4/00 0:00	10:58	55.6	2.80	142.71	11.78
10/4/00 0:00	10:59	67.8	2.55	173.89	10.75
10/4/00 0:00	11:00	49.7	6.93	127.38	29.20
		80.5	4.5		

Run 3

Date	Hour	CO	NOX	COPPH	NOXPPH	zero	avg
10/4/00 0:00	11:00	49.7	6.93	127.38	29.20	26.3	0
10/4/00 0:00	11:01	34.6	4.05	88.63	17.04	26.3	0
10/4/00 0:00	11:02	38.0	3.43	97.38	14.43	26.3	0
10/4/00 0:00	11:03	83.6	2.77	214.38	11.65	26.3	0
10/4/00 0:00	11:04	129.4	2.67	331.87	11.26	26.3	0
10/4/00 0:00	11:05	128.2	2.75	328.88	11.58	26.3	0
10/4/00 0:00	11:06	229.2	2.76	588.02	11.61	26.3	0
10/4/00 0:00	11:07	224.4	2.93	575.63	12.34	26.3	0
10/4/00 0:00	11:08	240.7	2.63	617.55	11.07	26.3	0
10/4/00 0:00	11:09	290.4	2.02	744.88	8.49	26.3	0
10/4/00 0:00	11:10	293.9	1.73	753.93	7.28	26.3	0
10/4/00 0:00	11:11	227.9	1.84	584.49	7.75	26.3	0
10/4/00 0:00	11:12	188.3	2.28	483.12	9.62	26.3	0
10/4/00 0:00	11:13	71.7	5.72	184.03	24.11	26.3	0
10/4/00 0:00	11:14	45.0	11.56	115.49	48.72	26.3	0
10/4/00 0:00	11:15	76.8	13.63	197.02	57.41	26.3	0
10/4/00 0:00	11:16	59.8	18.77	153.27	79.06	26.3	0
10/4/00 0:00	11:17	43.3	17.00	111.14	71.59	26.3	0
10/4/00 0:00	11:18	43.7	12.88	112.10	54.25	26.3	0
10/4/00 0:00	11:19	46.9	10.92	120.38	45.99	26.3	0
10/4/00 0:00	11:20	45.1	9.40	115.71	39.58	26.3	0
10/4/00 0:00	11:21	66.1	5.21	169.58	21.94	26.3	0
10/4/00 0:00	11:22	98.6	1.33	252.80	5.60	26.3	0
10/4/00 0:00	11:23	92.4	1.18	236.89	4.97	26.3	0
10/4/00 0:00	11:24	94.1	2.75	241.27	11.58	26.3	0
10/4/00 0:00	11:25	45.2	7.62	115.82	32.08	26.3	0
10/4/00 0:00	11:26	34.6	10.86	88.65	45.74	26.3	0
10/4/00 0:00	11:27	32.5	13.03	83.44	54.90	26.3	0
10/4/00 0:00	11:28	36.7	13.93	94.14	58.67	26.3	0
10/4/00 0:00	11:29	93.6	8.27	239.98	34.84	26.3	0
10/4/00 0:00	11:30	182.7	1.71	468.76	7.21	26.3	0
10/4/00 0:00	11:31	217.5	1.01	557.79	4.26	26.3	0
10/4/00 0:00	11:32	136.0	0.99	348.92	4.19	26.3	0
10/4/00 0:00	11:33	117.0	1.15	300.21	4.83	26.3	0
10/4/00 0:00	11:34	106.4	2.20	272.86	9.25	26.3	0
10/4/00 0:00	11:35	51.5	10.01	132.12	42.19	26.3	0
10/4/00 0:00	11:36	34.2	12.82	87.65	53.99	26.3	0
10/4/00 0:00	11:37	32.5	12.93	83.41	54.48	26.3	0
10/4/00 0:00	11:38	33.2	13.40	85.07	56.44	26.3	0
10/4/00 0:00	11:39	34.4	13.03	88.31	54.90	26.3	0
10/4/00 0:00	11:40	48.0	5.61	123.14	23.65	26.3	0
10/4/00 0:00	11:41	33.9	9.51	87.04	40.08	26.3	0
10/4/00 0:00	11:42	31.5	11.50	80.84	48.44	26.3	0
10/4/00 0:00	11:43	32.5	9.41	83.42	39.66	26.3	0
10/4/00 0:00	11:44	46.3	8.71	118.86	36.71	26.3	0
10/4/00 0:00	11:45	46.3	8.70	118.66	36.64	26.3	0
10/4/00 0:00	11:46	33.6	8.41	86.16	35.44	26.3	0
10/4/00 0:00	11:47	30.5	8.01	78.28	33.74	26.3	0
10/4/00 0:00	11:48	29.5	7.76	75.72	32.71	26.3	0
10/4/00 0:00	11:49	29.3	7.48	75.08	31.50	26.3	0
10/4/00 0:00	11:50	29.9	6.14	76.62	25.85	26.3	0

10/4/00 0:00	11:51	30.8	6.00	78.91	25.27	26.3	0
10/4/00 0:00	11:52	31.0	5.93	79.62	24.98	26.3	0
10/4/00 0:00	11:53	40.1	6.27	102.84	26.43	26.3	0
10/4/00 0:00	11:54	59.3	5.45	152.00	22.96	26.3	0
10/4/00 0:00	11:55	46.1	15.29	118.30	64.41	26.3	0
10/4/00 0:00	11:56	39.9	11.72	102.34	49.36	26.3	0
10/4/00 0:00	11:57	43.6	13.72	111.90	57.78	26.3	0
10/4/00 0:00	11:58	44.7	6.14	114.57	25.87	26.3	0
10/4/00 0:00	11:59	51.0	7.24	130.71	30.51	26.3	0
10/4/00 0:00	12:00	82.8	6.12	212.45	25.78	26.3	0
10/4/00 0:00	12:01	94.2	6.32	241.69	26.62	26.3	0
10/4/00 0:00	12:02	104.7	3.56	268.51	14.99	26.3	0
10/4/00 0:00	12:03	106.7	2.91	273.65	12.25	26.3	0
10/4/00 0:00	12:04	77.4	4.11	198.63	17.30	26.3	0
10/4/00 0:00	12:05	86.0	2.19	220.67	9.23	26.3	0
10/4/00 0:00	12:06	124.3	1.32	318.84	5.54	26.3	0
10/4/00 0:00	12:07	180.2	0.96	462.23	4.02	26.3	0
10/4/00 0:00	12:08	131.1	4.76	336.26	20.05	26.3	0
10/4/00 0:00	12:09	57.0	7.88	146.10	33.20	26.3	0
10/4/00 0:00	12:10	85.8	3.43	219.98	14.46	26.3	0
10/4/00 0:00	12:11	81.3	2.29	208.55	9.66	26.3	0
10/4/00 0:00	12:12	61.8	2.35	158.47	9.88	26.3	0
10/4/00 0:00	12:13	58.1	5.19	149.09	21.88	26.3	0
10/4/00 0:00	12:14	44.8	17.39	115.01	73.27	26.3	0
10/4/00 0:00	12:15	48.1	5.27	123.27	22.19	26.3	0
10/4/00 0:00	12:16	51.5	3.70	132.03	15.60	26.3	0
10/4/00 0:00	12:17	57.3	3.21	146.88	13.53	26.3	0
10/4/00 0:00	12:18	79.4	3.34	203.62	14.08	26.3	0
10/4/00 0:00	12:19	109.0	3.14	279.65	13.22	26.3	0
10/4/00 0:00	12:20	118.6	3.96	304.16	16.68	26.3	0
10/4/00 0:00	12:21	82.3	3.30	211.00	13.91	26.3	0
10/4/00 0:00	12:22	93.6	3.05	240.02	12.85	26.3	0
10/4/00 0:00	12:23	184.4	2.58	472.93	10.89	26.3	0
10/4/00 0:00	12:24	142.3	3.90	365.06	16.42	26.3	0
10/4/00 0:00	12:25	163.9	3.92	420.51	16.52	26.3	0
10/4/00 0:00	12:26	192.7	2.16	494.25	9.08	26.3	0
10/4/00 0:00	12:27	202.4	1.09	519.20	4.57	26.3	0
10/4/00 0:00	12:28	192.4	1.19	493.56	5.01	26.3	0
10/4/00 0:00	12:29	148.0	1.74	379.57	7.31	26.3	0
10/4/00 0:00	12:30	68.0	6.99	174.45	29.44	26.3	0
10/4/00 0:00	12:31	33.7	11.83	86.35	49.82	26.3	0
10/4/00 0:00	12:32	32.0	11.08	82.03	46.69	26.3	0
10/4/00 0:00	12:33	71.2	10.27	182.54	43.26	26.3	0
10/4/00 0:00	12:34	79.6	2.22	204.09	9.33	26.3	0
10/4/00 0:00	12:35	125.0	1.74	320.63	7.32	26.3	0
10/4/00 0:00	12:36	159.6	1.89	409.30	7.96	26.3	0
10/4/00 0:00	12:37	168.7	1.81	432.65	7.63	26.3	0
10/4/00 0:00	12:38	220.3	1.91	565.17	8.05	26.3	0
10/4/00 0:00	12:39	233.2	2.17	598.16	9.13	26.3	0
10/4/00 0:00	12:40	197.0	2.27	505.27	9.58	26.3	0
10/4/00 0:00	12:41	173.6	2.52	445.39	10.63	26.3	0
10/4/00 0:00	12:42	187.3	2.83	480.40	11.92	26.3	0

10/4/00 0:00	12:43	204.2	2.68	523.89	11.27	26.3	0
10/4/00 0:00	12:44	115.1	6.18	295.35	26.02	26.3	0
10/4/00 0:00	12:45	48.8	13.23	125.06	55.71	26.3	0
10/4/00 0:00	12:46	64.4	11.12	165.24	46.84	26.3	0
10/4/00 0:00	12:47	134.6	2.21	345.31	9.32	26.3	0
10/4/00 0:00	12:48	157.7	1.95	404.47	8.23	26.3	0
10/4/00 0:00	12:49	105.8	5.80	271.50	24.42	26.3	0
10/4/00 0:00	12:50	45.9	17.56	117.72	73.97	26.3	0
10/4/00 0:00	12:51	37.8	17.10	97.02	72.02	26.3	0
10/4/00 0:00	12:52	33.0	14.98	84.73	63.12	26.3	0
10/4/00 0:00	12:53	34.6	13.51	88.63	56.91	26.3	0
10/4/00 0:00	12:54	33.1	14.17	84.80	59.69	26.3	0
10/4/00 0:00	12:55	52.2	12.75	133.87	53.71	26.3	0
10/4/00 0:00	12:56	36.1	9.70	92.49	40.85	26.3	0
10/4/00 0:00	12:57	32.8	8.55	84.12	36.03	26.3	0
10/4/00 0:00	12:58	31.6	8.23	81.10	34.68	26.3	0
10/4/00 0:00	12:59	31.1	8.21	79.83	34.60	26.3	0
10/4/00 0:00	13:00	30.3	7.95	77.63	33.48	26.3	0
10/4/00 0:00	13:01	30.3	7.57	77.65	31.90	26.3	0
10/4/00 0:00	13:02	30.3	6.54	77.63	27.54	26.3	0
10/4/00 0:00	13:03	32.2	5.74	82.56	24.17	26.3	0
10/4/00 0:00	13:04	58.0	4.37	148.68	18.41	26.3	0
10/4/00 0:00	13:05	63.1	7.59	161.89	31.97	26.3	0
10/4/00 0:00	13:06	63.2	7.44	162.08	31.34	26.3	0
10/4/00 0:00	13:07	69.9	3.86	179.27	16.27	26.3	0
10/4/00 0:00	13:08	78.7	3.60	201.77	15.15	26.3	0
10/4/00 0:00	13:09	77.3	3.13	198.39	13.18	26.3	0
10/4/00 0:00	13:10	68.3	3.85	175.11	16.24	26.3	0
10/4/00 0:00	13:11	77.8	4.12	199.58	17.36	26.3	0
10/4/00 0:00	13:12	75.3	3.36	193.18	14.16	26.3	0
10/4/00 0:00	13:13	90.3	3.32	231.59	13.99	26.3	0
10/4/00 0:00	13:14	98.0	2.66	251.47	11.22	26.3	0
10/4/00 0:00	13:15	97.4	2.57	249.96	10.83	26.3	0
10/4/00 0:00	13:16	103.0	2.21	264.10	9.32	26.3	0
10/4/00 0:00	13:17	99.0	1.99	254.06	8.36	26.3	0
10/4/00 0:00	13:18	95.2	2.34	244.25	9.85	26.3	0
10/4/00 0:00	13:19	115.9	2.87	297.20	12.07	26.3	0
10/4/00 0:00	13:20	75.1	3.06	192.57	12.89	26.3	0
10/4/00 0:00	13:21	60.2	4.61	154.55	19.43	26.3	0
10/4/00 0:00	13:22	85.7	3.25	219.91	13.70	26.3	0
10/4/00 0:00	13:23	99.0	2.98	254.07	12.54	26.3	0
10/4/00 0:00	13:24	83.1	5.56	213.06	23.42	26.3	0
10/4/00 0:00	13:25	50.3	6.33	128.91	26.65	26.3	0
10/4/00 0:00	13:26	50.1	5.88	128.50	24.76	26.3	0
10/4/00 0:00	13:27	68.6	5.00	175.91	21.05	26.3	0
10/4/00 0:00	13:28	132.4	3.59	339.52	15.12	26.3	0
10/4/00 0:00	13:29	221.8	3.45	568.94	14.52	26.3	0
10/4/00 0:00	13:30	181.7	3.88	465.96	16.34	26.3	0
10/4/00 0:00	13:31	129.4	3.51	331.84	14.80	26.3	0
10/4/00 0:00	13:32	154.3	3.02	395.89	12.73	26.3	0
10/4/00 0:00	13:33	198.6	2.85	509.55	12.02	26.3	0
10/4/00 0:00	13:34	297.3	2.46	762.48	10.38	26.3	0

10/4/00 0:00	13:35	291.4	1.97	747.52	8.31	26.3	0
10/4/00 0:00	13:36	245.3	1.49	629.16	6.29	26.3	0
10/4/00 0:00	13:37	179.3	1.22	459.94	5.15	26.3	0
10/4/00 0:00	13:38	189.0	1.02	484.80	4.28	26.3	0
10/4/00 0:00	13:39	163.2	1.07	418.59	4.50	26.3	0
10/4/00 0:00	13:40	168.0	1.18	430.90	4.96	26.3	0
10/4/00 0:00	13:41	185.8	1.40	476.69	5.90	26.3	0
10/4/00 0:00	13:42	146.6	5.19	375.99	21.87	26.3	0
10/4/00 0:00	13:43	57.1	8.74	146.47	36.81	26.3	0
10/4/00 0:00	13:44	36.8	8.86	94.47	37.33	26.3	0
10/4/00 0:00	13:45	32.4	30.29	83.10	127.58	26.3	0
10/4/00 0:00	13:46	31.4	15.75	80.57	66.33	26.3	0
10/4/00 0:00	13:47	30.2	7.91	77.58	33.32	26.3	0
10/4/00 0:00	13:48	29.3	7.63	75.07	32.14	26.3	0
10/4/00 0:00	13:49	29.2	7.92	75.02	33.37	26.3	0
10/4/00 0:00	13:50	28.3	8.30	72.51	34.95	26.3	0
10/4/00 0:00	13:51	28.3	7.65	72.52	32.23	26.3	0
10/4/00 0:00	13:52	28.3	7.47	72.53	31.49	26.3	0
10/4/00 0:00	13:53	28.3	7.72	72.51	32.53	26.3	0
10/4/00 0:00	13:54	28.3	7.91	72.52	33.34	26.3	0
10/4/00 0:00	13:55	28.3	8.23	72.51	34.67	26.3	0
10/4/00 0:00	13:56	27.6	8.15	70.77	34.32	26.3	0
10/4/00 0:00	13:57	27.3	7.52	69.97	31.68	26.3	0
10/4/00 0:00	13:58	27.3	7.11	69.94	29.97	26.3	0
10/4/00 0:00	13:59	27.3	7.29	69.97	30.71	26.3	0
10/4/00 0:00	14:00	27.3	7.97	69.94	33.56	26.3	0
10/4/00 0:00	14:01	45.1	20.78	115.66	87.53	26.3	0
10/4/00 0:00	14:02	73.8	7.54	189.39	31.77	26.3	0
10/4/00 0:00	14:03	77.8	2.31	199.49	9.73	26.3	0
10/4/00 0:00	14:04	98.1	2.30	251.58	9.68	26.3	0
10/4/00 0:00	14:05	122.8	1.80	315.09	7.59	26.3	0
10/4/00 0:00	14:06	143.7	1.30	368.55	5.49	26.3	0
10/4/00 0:00	14:07	143.7	1.23	368.64	5.18	26.3	0
10/4/00 0:00	14:08	192.8	1.37	494.59	5.78	26.3	0
10/4/00 0:00	14:09	123.2	1.85	315.92	7.78	26.3	0
10/4/00 0:00	14:10	111.0	2.33	284.67	9.81	26.3	0
10/4/00 0:00	14:11	130.5	2.03	334.81	8.54	26.3	0
10/4/00 0:00	14:12	110.6	3.82	283.65	16.11	26.3	0
10/4/00 0:00	14:13	48.1	8.52	123.44	35.91	26.3	0
10/4/00 0:00	14:14	33.3	13.91	85.34	58.60	26.3	0
10/4/00 0:00	14:15	30.4	17.10	77.97	72.04	26.3	0
10/4/00 0:00	14:16	30.3	14.39	77.64	60.64	26.3	0
10/4/00 0:00	14:17	31.3	11.71	80.28	49.34	26.3	0
10/4/00 0:00	14:18	35.1	9.76	90.02	41.13	26.3	0
10/4/00 0:00	14:19	57.2	11.12	146.85	46.82	26.3	0
10/4/00 0:00	14:20	48.4	9.17	124.17	38.64	26.3	0
10/4/00 0:00	14:21	33.6	8.22	86.26	34.63	26.3	0
10/4/00 0:00	14:22	30.3	7.77	77.82	32.74	26.3	0
10/4/00 0:00	14:23	29.3	7.53	75.07	31.73	26.3	0
10/4/00 0:00	14:24	28.4	7.30	72.81	30.76	26.3	0
10/4/00 0:00	14:25	28.3	6.64	72.52	27.96	26.3	0
10/4/00 0:00	14:26	28.8	5.70	73.92	24.00	26.3	0

10/4/00 0:00	14:27	41.2	8.70	105.60	36.67	26.3	0
10/4/00 0:00	14:28	75.0	8.66	192.33	36.50	26.3	0
10/4/00 0:00	14:29	77.5	6.55	198.84	27.58	26.3	0
10/4/00 0:00	14:30	72.1	6.93	185.07	29.19	26.3	0
10/4/00 0:00	14:31	54.4	11.87	139.59	49.98	26.3	0
10/4/00 0:00	14:32	55.3	6.63	141.93	27.93	26.3	0
10/4/00 0:00	14:33	80.0	4.00	205.19	16.83	26.3	0
10/4/00 0:00	14:34	80.2	4.36	205.80	18.38	26.3	0
10/4/00 0:00	14:35	128.9	4.56	330.59	19.22	26.3	0
10/4/00 0:00	14:36	187.9	4.55	482.06	19.15	26.3	0
10/4/00 0:00	14:37	213.2	4.85	546.97	20.41	26.3	0
10/4/00 0:00	14:38	172.2	4.33	441.66	18.24	26.3	0
10/4/00 0:00	14:39	149.0	3.08	382.25	12.97	26.3	0
10/4/00 0:00	14:40	143.2	2.93	367.37	12.34	26.3	0
10/4/00 0:00	14:41	171.8	2.86	440.78	12.06	26.3	0
10/4/00 0:00	14:42	168.7	2.05	432.74	8.62	26.3	0
10/4/00 0:00	14:43	194.0	1.31	497.65	5.53	26.3	0
10/4/00 0:00	14:44	95.6	2.46	245.12	10.37	26.3	0
10/4/00 0:00	14:45	42.8	6.42	109.83	27.05	26.3	0
10/4/00 0:00	14:46	109.9	4.43	281.93	18.67	26.3	0
10/4/00 0:00	14:47	126.8	2.18	325.24	9.20	26.3	0
10/4/00 0:00	14:48	109.0	1.83	279.70	7.70	26.3	0
10/4/00 0:00	14:49	102.9	1.73	263.89	7.27	26.3	0
10/4/00 0:00	14:50	119.0	1.68	305.35	7.07	26.3	0
10/4/00 0:00	14:51	132.3	1.77	339.33	7.44	26.3	0
10/4/00 0:00	14:52	120.5	4.10	309.01	17.28	26.3	0
10/4/00 0:00	14:53	53.3	11.46	136.70	48.29	26.3	0
10/4/00 0:00	14:54	47.6	4.41	122.08	18.58	26.3	0
10/4/00 0:00	14:55	54.2	3.88	138.99	16.34	26.3	0
10/4/00 0:00	14:56	93.6	3.71	240.14	15.63	26.3	0
10/4/00 0:00	14:57	133.1	3.70	341.31	15.57	26.3	0
10/4/00 0:00	14:58	226.3	3.49	580.38	14.69	26.3	0
10/4/00 0:00	14:59	267.1	2.88	685.07	12.12	26.3	0
10/4/00 0:00	15:00	254.1	2.89	651.91	12.19	26.3	0
10/4/00 0:00	15:01	269.6	2.65	691.65	11.15		
10/4/00 0:00	15:02	352.8	2.92	904.98	12.30		
10/4/00 0:00	15:03	280.8	3.11	720.35	13.10		
10/4/00 0:00	15:04	182.5	1.66	468.09	6.97		
10/4/00 0:00	15:05	161.5	1.25	414.26	5.25		
10/4/00 0:00	15:06	166.4	1.22	426.87	5.15		
10/4/00 0:00	15:07	186.8	1.08	479.20	4.54		
10/4/00 0:00	15:08	169.2	1.24	434.14	5.20		
10/4/00 0:00	15:09	143.6	3.33	368.34	14.01		
10/4/00 0:00	15:10	51.0	6.51	130.83	27.41		
10/4/00 0:00	15:11	31.0	6.13	79.56	25.84		
10/4/00 0:00	15:12	29.3	5.88	75.08	24.77		
10/4/00 0:00	15:13	40.8	13.80	104.75	58.12		
10/4/00 0:00	15:14	90.0	5.71	230.76	24.07		
10/4/00 0:00	15:15	88.9	1.06	228.03	4.47		
10/4/00 0:00	15:16	111.5	0.98	286.10	4.12		
10/4/00 0:00	15:17	122.1	1.12	313.25	4.71		
10/4/00 0:00	15:18	124.8	1.18	320.08	4.96		

10/4/00 0:00	15:19	120.9	1.07	310.25	4.52
10/4/00 0:00	15:20	114.3	1.02	293.15	4.31
10/4/00 0:00	15:21	107.7	1.44	276.29	6.06
10/4/00 0:00	15:22	110.0	1.77	282.04	7.44
10/4/00 0:00	15:23	89.6	1.56	229.95	6.59
10/4/00 0:00	15:24	94.6	1.48	242.76	6.23
10/4/00 0:00	15:25	113.6	1.45	291.47	6.10
10/4/00 0:00	15:26	99.5	6.95	255.18	29.30
10/4/00 0:00	15:27	47.3	16.09	121.30	67.78
10/4/00 0:00	15:28	43.6	21.99	111.89	92.64
10/4/00 0:00	15:29	87.6	9.40	224.60	39.60
10/4/00 0:00	15:30	55.2	3.89	141.48	16.39
10/4/00 0:00	15:31	39.8	11.57	101.98	48.73
10/4/00 0:00	15:32	30.7	16.94	78.83	71.38
10/4/00 0:00	15:33	29.3	17.28	75.24	72.78
10/4/00 0:00	15:34	29.3	16.30	75.07	68.66
10/4/00 0:00	15:35	29.3	15.85	75.06	66.75
10/4/00 0:00	15:36	29.3	15.50	75.08	65.30
10/4/00 0:00	15:37	29.3	12.50	75.07	52.66
10/4/00 0:00	15:38	29.3	10.34	75.07	43.58
10/4/00 0:00	15:39	29.3	8.79	75.08	37.03
10/4/00 0:00	15:40	29.3	7.93	75.08	33.42
10/4/00 0:00	15:41	29.3	7.39	75.07	31.12
10/4/00 0:00	15:42	29.3	6.91	75.08	29.12
10/4/00 0:00	15:43	29.3	6.68	75.07	28.14
10/4/00 0:00	15:44	29.3	6.96	75.08	29.34
10/4/00 0:00	15:45	30.8	7.08	78.95	29.81
		93.4	6.1		