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.

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UNITED STATES STEEL CORPORATION
ENGINEERING-STEEL

PLANT ENGINEERING
GARY WORKS

CERTIFICATION SHEET

Having supervised this test program described in this report, and having written this report, I hereby certify the data, information and results in this report to be accurate and true according to the methods and procedures used.

William S. Kubiak
Supervisor
United States Steel Corporation
Gary Works

INTRODUCTION
Section 1

The purpose of this study was to measure the concentration of particulate matter in the exhaust gases from the West Pushing Emission Control Baghouse Stack at the Gary Works of United States Steel Corporation in Gary, Indiana on the dates of May 17, 18, 19, 1983.

The study was conducted by the following United States Steel Corporation, Gary Works, Plant Engineering personnel:

Name	Title	Function
W. S. Kubiak	Engineer	Test Engineer
P. K. Murphy	Field Technician	Sampling Team Leader
R. W. Elkins	" "	Sampling Technician
G. W. Hammar	" "	" "
R. P. Fedorchak	" "	" "
R. E. Trezak	Process Observer	Process Observer
T. Sandidge	" "	" "

On May 18, 1983, during the second run of this test program, a push from No. 53 Oven on No. 5 Coke Battery exhibited excessive emissions as observed at the battery. Investigation revealed that 16 of the 60 heating flues adjacent to this oven were blocked. When this heat was pushed, the inlet duct temperature to the baghouse rose to 375°F. The system's emergency air tempering damper is set to open when the inlet duct temperature exceeds 300°F to protect the bags from high temperature by drawing ambient air into the system, and thus reduces emission collection efficiency. Documentation of this incident is contained in Appendices G and H.

SUMMARY OF RESULTS
Section 2

During this test program the average particulate emission rate was .0056 grains/dscf, with an average volume of 121,594 dscfm, with an average temperature of 101.4 degrees F., for the three test runs. Table 2-1 is a summary of various parameters measured during this test program.

The mass emission rate was .010 pounds of particulate per ton of coke pushed. The limitation is .04 pounds of particulate per ton of coke pushed.

SOURCE TEST DATA SUMMARY
U. S. STEEL CORPORATION - GARY WORKS
PLANT ENGINEERING

DIVISION: COKE AND CHEMICALS

SOURCE: NO. 5/7 BATTERY PUSHING EMISSION CONTROL BAGHOUSE STACK

		1	2	3	AVERAGE
TEST NUMBER		1	2	3	
DATE		5/17/83	5/18/83	5/19/83	
TIME		0725 to 1215	0730 to 1300	0915 to 1800	
PARTICULATE CONCENTRATION (GR/DSCF)	C_s	.0096	.0051	.0021	.0056
C_s $\frac{\text{Lb. of Particulate}}{\text{T. of Coke Pushed}}$		.018	.009	.004	.010
MASS EMISSION RATE (Lb./Hr.)	PMR	10.10	5.26	2.19	5.85
DRY VOLUMETRIC STACK GAS FLOW RATE AT STANDARD CONDITIONS (DSCF/MIN.)	Q_s	122,699	120,323	121,761	121,594
STACK GAS TEMPERATURE (°F)	t_s	96.0	98.2	110.0	101.4
STACK GAS VELOCITY (FPS)	V_s	50.12	50.58	52.13	50.94
ABSOLUTE STACK GAS PRESSURE (In. Hg)	P_s	29.62	29.13	29.40	
BAROMETRIC PRESSURE AT TEST SITE (In. Hg)	P_{bar}	29.58	29.09	29.36	
CROSS-SECTIONAL AREA OF STACK (Ft.^{2})	A_s	44.18	44.18	44.18	
CROSS-SECTIONAL AREA OF NOZZEL (Ft.^{2})	A_n	3.247 x 10-4	3.247 x 10-4	3.247 x 10-4	
ABSOLUTE AVERAGE DRY GAS METER TEMPERATURE (°R)	T_m	515.3	528.8	532.6	
AVERAGE PRESSURE DIFFERENTIAL ACROSS ORIFICE METER (In. H_2O)	ΔH	2.67	2.70	2.80	
AVERAGE $\sqrt{\ }$ OF STACK VELOCITY HEAD MEASUREMENTS (In. H_2O)	$\sqrt{\Delta P}$ AVE.	.865	.862	.882	
STACK GAS COMPONENTS (%)	O_2	20	20	20	
	CO_2	0	0	0	
AVERAGE MOLECULAR WEIGHT OF STACK GAS - DRY BASIS (LB./LB. MOLE)	Md	28.96	28.96	28.96	
AVERAGE MOLECULAR WEIGHT OF STACK GAS - WET BASIS (LB./LB. MOLE)	M_s	28.77	28.69	28.62	
VOLUME OF GAS SAMPLED AT METER CONDITIONS (FT.^{3})	Vm	27.35	28.25	29.58	
VOLUME OF H_2O COLLECTED IN IMPINGER TRAIN (Ml)	Vi	11.0	14.7	20.5	
TOTAL SAMPLING TIME (MINUTES)	θ	32.4	32.4	32.4	
PERCENT WATER VAPOR IN GAS STREAM (BY VOLUME)	Bws	1.7	2.4	3.1	2.4
VOLUME OF WATER VAPOR IN GAS SAMPLE AT STANDARD CONDITIONS (FT.^{3})	Vwstd	.521	.696	.971	
VOLUME OF GAS SAMPLED AT STANDARD CONDITIONS (FT.^{3})	Vmstd	28.51	28.03	29.62	
GRAMS OF PARTICULATE COLLECTED DURING TEST		.0178	.0094	.0042	
PERCENT OF ISOKINETIC SAMPLING RATE	I	94.40	95.07	98.90	96.12

TABLE 2-1

PROCESS INFORMATION

Section 3

The land-based pushing emission control facilities service the three-meter coke oven batteries at Gary Works, with the west system serving batteries five and seven, and the east system serving batteries thirteen (13), fifteen (15) and sixteen (16).

Each system consists of a hooded coke guide, a single spot quench car, a baghouse, and associated ductwork. The hooded coke guides were constructed by the American Bridge Division of U. S. Steel Corporation. The single spot quench cars are a Mitsubishi design and were constructed by U. S. Steel Corporation at it's Johnstown Works. The emissions move through ductwork to a baghouse designed and constructed by Wheelabrator Frye, Inc. The baghouse has seven compartments, each compartment containing 352 fabric filter bags. A limestone precoat system is provided to protect the bags from condensible material present in the gas stream.

The induced draft fan at the baghouse operates in three different modes. During pushing, the fan is in the high flow mode to apply maximum draft to the hooded coke guide. Between pushes the fan assumes a low flow mode, supplying enough air flow to prevent the precoat material from falling off the bags. During the precoating operation, the fan assumes an intermediate flow mode.

When the pushing mode of operation is signaled by the door machine operator at the battery, the fan damper opens to provide full system flow. The duct system delivers the particulate laden air to a spark trap where large particulates are deflected into a hopper by baffle plates. The air flows from the spark trap through the baghouse inlet plenum and into the fabric filter compartments. The particulates are removed by the limestone coated bags allowing the cleaned gases to exit the baghouse through the outlet plenum. The outlet ductwork leads to the fan which delivers the cleaned gases to the stack to be discharged into the atmosphere.

The east pushing emission control facility discharges its gases to the stack which was sampled according to the protocol developed by the USEPA for this sampling program. The required unit operating data were collected by USSC personnel and are appended.

TESTING PROCEDURES
Section 4

All testing, sampling, analytical and calibration procedures used for this test program were performed as described in the Code of Federal Regulations, Title 40, Parts 60-80, July 1, 1979, using Methods 1-5 and the latest revisions thereof. Where applicable, the Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III, Stationary Source Specific Methods, EPA 600/4-77-027b was used to determine the precise procedures.

Layout of the sampling ports in relation to flow disturbances for duct is shown by Figure 4-1 . Based on the duct diameter and the upstream and downstream distances, the required number of sampling points according to Method I of the August 18, 1977, Federal Register, Volume 42, was determined to be 36 . Sampling was conducted through 2 ports at these 36 points for .9 minutes per point for each run. Figure 4-1 also shows the dimensions from the duct wall to each sampling point as directed by the previously mentioned Federal Register.

The particulate sampling train was a Model 201-100 Isokinetic Stack Sampler designed and manufactured by Nutech Corporation to meet all Environmental Protection Agency standards for source sampling equipment as outlined in the Office of Air Programs Publication No. APTD-0576. (Figure 4.1 shows a schematic of this sampling equipment.) A schematic of this sampling equipment is appended.

Prior to the start of the first particulate sampling run, stack gas temperature was measured and a velocity traverse was made in the stack. Moisture was estimated based on previous sampling data. Using the above data,

the appropriate nozzel diameter was calculated. Appropriate formulae are appended and exact nozzel diameter is shown on field data sheets, also appended.

Velocity pressures were determined simultaneously during sampling with a calibrated S-type pitot tube and inclined manometer. All temperatures were measured using calibrated thermocouples.

Carbon dioxide and oxygen flue gas grab samples, taken during the course of each test, were analyzed with Fyrite analyzers.

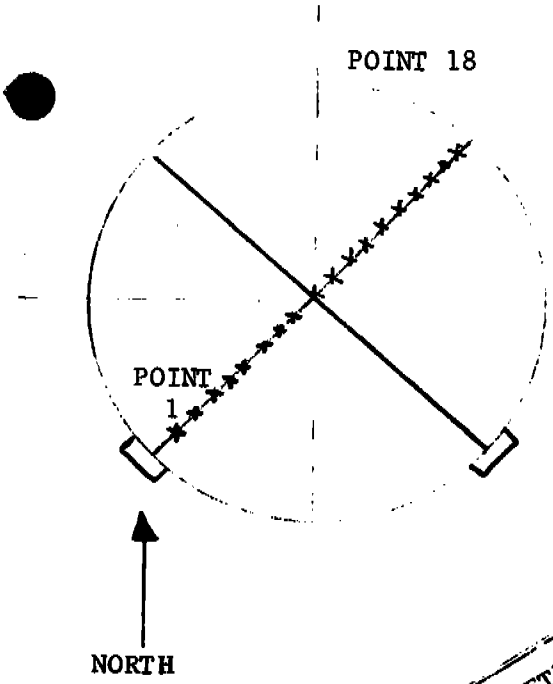
The filter media were Gelman type A/E glass fiber filters exhibiting a 99.95% efficiency on 0.3 micron DOP smoke particles in accordance with ASTM Method D 2986-1.

All sample contact surfaces of the train were washed with reagent grade acetone. These washings were placed in sealed and marked containers for analysis. Sample recovery was performed at Gary Works by the test crew. All sample analyses were performed at Gary Works by USSC personnel. Copies of all sample analysis sheets are appended in this report.

Using the field data taken during each sample run, along with corresponding laboratory data, calculations were made to determine various exhaust gas parameters and particulate emissions. A summary of these is found in section 2 and all fomulae and nomenclature used are appended.

GW-251455

ON ORIGINAL



EQUAL AREA TRAVERSE
FOR ROUND DUCTS
(USEPA RM 1)

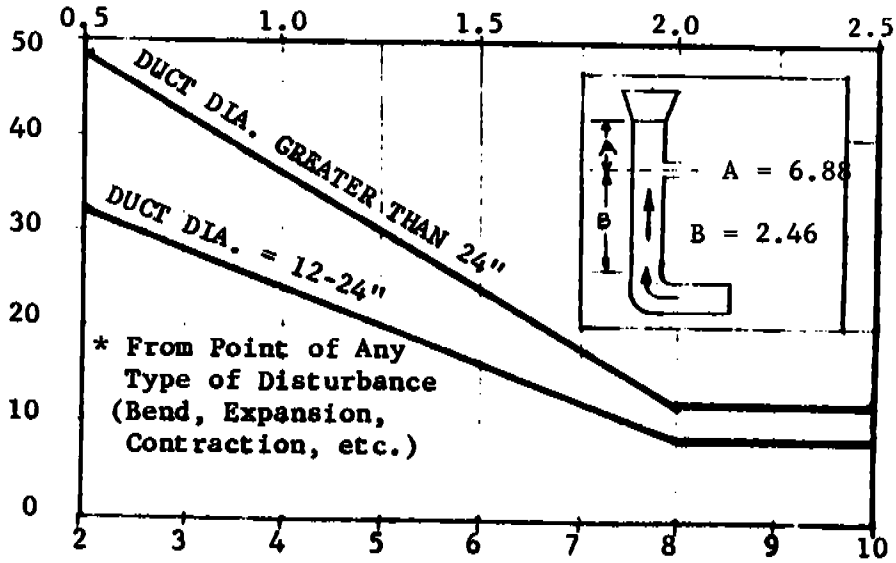
DIVISION: COKE AND CHEMICALS
NO. 5/7 BATT. PUSHING
FACILITY: EMISSION CONTROL BAGHOUSE
STACK
DATES: May 17, 18, 19, 1983

PERCENT OF DUCT DIAMETER FROM INSIDE WALL TO TRAVERSE POINT

NUMBER OF TRAVERSE POINTS ON A DIAMETER	2	4	6	8	10	12	14	16	18	20	22	24	TRAVERSE POINT NUMBERED ON A DIAMETER
												1.1	24
												3.2	23
											1.1	5.5	22
											3.5	7.9	21
										1.3	6.0	10.5	20
										3.9	8.7	13.2	19
									1.4	6.7	11.6	16.1	18
									4.4	9.7	14.6	19.4	17
								1.6	7.5	12.9	18.0	23.0	16
								4.9	10.9	16.5	21.8	27.2	15
							1.8	8.5	14.6	20.4	26.1	32.3	14
							5.7	12.5	18.8	25.0	31.5	39.8	13
						2.1	9.9	16.9	23.6	30.6	39.3	60.2	12
						6.7	14.6	22.0	29.6	38.8	60.7	67.7	11
					2.5	11.8	20.1	28.3	38.2	61.2	68.5	72.8	10
					8.2	17.7	26.9	37.5	61.8	69.4	73.9	77.0	9
				3.3	14.6	25.0	36.6	62.5	70.4	75.0	78.2	80.6	8
				10.5	22.6	35.5	63.4	71.7	76.4	79.6	82.0	83.9	7
			4.4	19.4	34.2	64.5	73.1	78.0	81.2	83.5	85.4	86.8	6
			14.7	32.3	65.8	75.0	79.9	83.1	85.4	87.1	88.4	89.5	5
		6.7	29.5	67.7	77.4	82.3	85.4	87.5	89.1	90.3	91.3	92.1	4
		25.0	70.5	80.6	85.4	88.2	90.1	91.5	92.5	93.3	94.0	94.5	3
	14.6	75.0	85.3	89.5	91.8	93.3	94.3	95.1	95.6	96.1	96.5	96.8	2
	85.4	93.3	95.6	96.7	97.5	97.9	98.2	98.4	98.6	98.7	98.9	98.9	

POINT NO.	DISTANCE FROM DUCT WALL TO POINT
1	88.74"
2	86.04"
3	83.25"
4	80.19"
5	76.86"
6	73.08"
7	68.76"
8	63.36"
9	55.62"
10	34.38"
11	26.64"
12	21.24"
13	16.92"
14	13.14"
15	9.81"
16	6.75"
17	3.96"
18	1.26"

DUCT DIAMETERS UPSTREAM FROM FLOW DISTURBANCE * (A)



DUCT DIAMETERS DOWNSTREAM FROM FLOW DISTURBANCE * (B)

DUCT DIA. 90", AREA 44.18 sq. ft.

NO. OF SAMPLE POINTS ACROSS DIA. 18

APPENDIX A

APPENDIX B

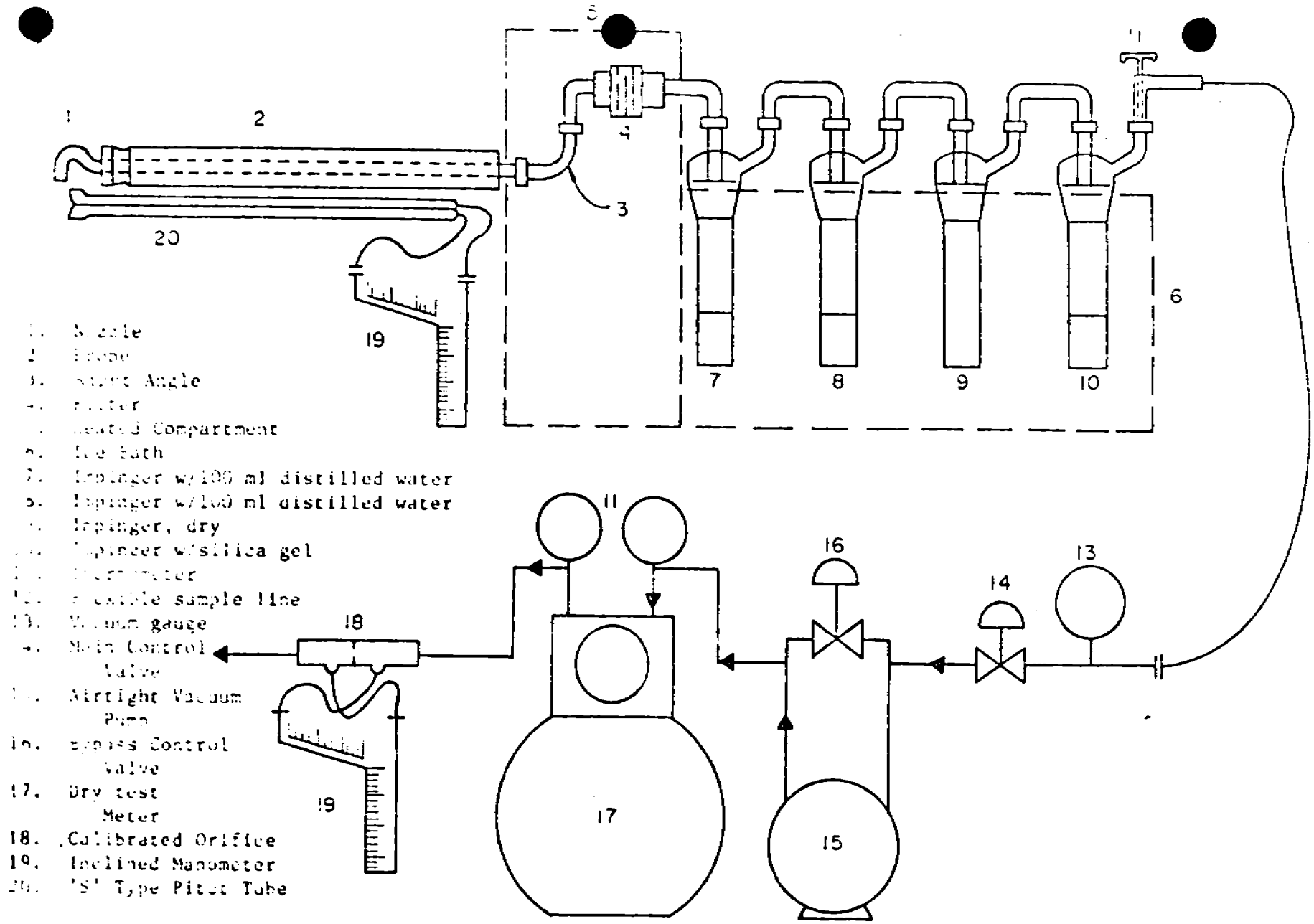


FIGURE 4 PARTICULATE SAMPLING TRAIN

UNITED STATES STEEL CORPORATION
ENGINEERING-STEEL

PLANT ENGINEERING
GARY WORKS

LABORATORY DATA

DIVISION COKE AND CHEMICALS

SOURCE NO. 5/7 BATTERY PUSHING EMISSION CONTROL BAGHOUSE STACK

PARTICULATE SOURCE	RUN NO. 1			RUN NO. 2			RUN NO. 3			BLANKS		
	DATE: 5/17/83			DATE: 5/18/83			DATE: 5/19/83			DATE:		
	FINAL Wt. (g)	INITIAL Wt. (g)	DIFF. (g)	FINAL Wt.(g)	INITIAL Wt. (g)	DIFF. (g)	FINAL Wt.(g)	INITIAL Wt. (g)	DIFF. (g)	FINAL Wt.(g)	INITIAL Wt.(g)	DIFF. (g)
(1) FILTER			.0023			.0039			.0035			
(2) ACETONE RINSE		___ g ml	.0155		___ g ml	.0055		___ g ml	.0007		___ g ml	
3)												
4)												
5)												
		GROSS WT.			GROSS WT.			GROSS WT.				
		LESS BLANK WT.			LESS BLANK WT.			LESS BLANK WT.				
		NET WEIGHT	.0178		NET WEIGHT	.0094		NET WEIGHT	.0042			

COMMENTS:

STACK TEST

Particulate Source: #5,7 Baghouse

	Run #1	Run #2	Run #3
	Date: 5-17-83	Date: 5-18-83	Date: 5-19-83
Filter	0.0023 g	0.0039 g	0.0035 g
Acetone Rinse	0.0155 g	0.0055 g	0.0007 g
Gross Weight	0.0178 g	0.0094 g	0.0042 g

Particulate Source:

	Run #1	Run #2	Run #3
	Date:	Date:	Date:
Filter			
Acetone Rinse			
Gross Weight			

APPENDIX C

United States Steel Corporation
Engineering - Steel

Plant Engineering
Gary Works

ORIFICE AND DRY GAS METER CALIBRATION FORM

Console No. 801-8 Date 4-25-83

Calibrated by Murphy P_{bar} 29.27

ΔH (" wg)	Vt gas volume test meter (ft.³)	Vd gas volume dry gas meter (ft³)	temp °R Tt test meter	temp °R Td dry gas meter	Θ time (min.)	Y	ΔH@
0.50	2.040	2.022	529	529	5	1.007	1.68
1.00	2.920	2.880	532	537	5	1.017	1.64
2.00	4.017	3.947	530	535	5	1.020	1.74
4.00	5.621	5.500	530	539	5	1.029	1.77
6.00	6.733	6.596	530	544	5	1.032	1.84
8.00	7.761	7.590	530	547	5	1.034	1.71
					Average	1.023	1.730

Tolerance: Y ± 0.02
ΔH@ ± 0.15

$$Y = \frac{V_t \, P_{bar} \, T_d}{V_d \left(P_{bar} + \frac{\Delta H}{13.6}\right) T_t}$$

$$\Delta H@ = \frac{0.0317 \, (\Delta H)}{P_{bar} \, T_d} \left(\frac{T_t \, \Theta}{V_t} \right)^2$$

Comments: _____

APPENDIX D

UNITED STATES STEEL CORPORATION
ENGINEERING - STEEL

PLANT ENGINEERING
GARY WORKS

NOZZEL CALIBRATION FORM

DATE May 2, 1983

CALIBRATED BY W.S. Kubiak

NOZZEL IDENTIFICATION NUMBER	NOZZEL DIAMETER[a]			ΔD[b] (IN.)	D_{avg}[c]
	D_1 (IN.)	D_2 (IN.)	D_3 (IN.)		
.25 III	0.246	0.246	0.246	0	0.246
				A =	3.301×10^{-4} ft^2
					(.0003301)

WHERE:

a - $D_{1,2,3}$ = THREE DIFFERENT NOZZEL DIAMETERS; EACH DIAMETER MEASURED TO CLOSEST 0.001 IN.

b - ΔD = MAXIMUM DIFFERENCE BETWEEN ANY TWO DIAMETERS; $\Delta D \leq 0.004$ IN.

c - D_{avg} = AVERAGE OF D_1, D_2, AND D_3

APPENDIX D

USEPA RM 5 NOMENCLATURE

An	CROSS-SECTION AREA OF NOZZEL ($FT.^2$)
As	CROSS-SECTION AREA OF STACK ($FT.^2$)
Bws	PERCENT WATER VAPOR IN GAS STEAM (BY VOLUME)
I	PERCENT OF ISOKINETIC SAMPLING
Pbar	BAROMETRIC PRESSURE AT SAMPLING SITE (INCHES OF Hg)
Ps	ABSOLUTE STACK GAS PRESSURE (INCHES OF Hg)
Pstd	STANDARD ABSOLUTE PRESSURE (29.92 INCHES Hg)
R	IDEAL GAS CONSTANT (21.85 INCHES Hg - $FT.^3/^oR$ - LB MOLE)
Tm	AVERAGE ABSOLUTE DGM TEMPERATURE (^oR)
Ts	AVERAGE ABSOLUTE STACK GAS TEMPERATURE (^oR)
Tstd	STANDARD ABSOLUTE TEMPERATURE (530^oR)
Vi	VOLUME OF LIQUID COLLECTED IN IMPINGER TRAIN (ml)
Vm	VOLUME OF GAS SAMPLED AT METER CONDITIONS ($Ft.^3$)
Vmstd	Vm CORRECTED TO STANDARD CONDITIONS ($Ft.^3$)
Vwstd	VOLUME OF WATER VAPOR IN GAS SAMPLE AT STANDARD CONDITIONS ($Ft.^3$)
Vs	STACK GAS VELOCITY (Ft./SEC)
Y	DGM CALIBRATION FACTOR
ΔH	AVERAGE PRESSURE DIFFERENTIAL ACROSS ORIFICE METER (Inches of H_2O)
Md	MOLECULAR WEIGHT OF STACK GAS, DRY BASIS (Lb./Lb. Mole)
Ms	MOLECULAR WEIGHT OF STACK GAS, WET BASIS (Lb./Lb. Mole)
Qs	DRY VOLUMETRIC STACK GAS FLOW RATE AT STANDARD CONDITION (dscf/Min.)
ΔP	STACK GAS VELOCITY HEAD (Inches of H_2O)
O	TOTAL SAMPLING TIME (Minutes)
PMR	MASS EMISSION RATE (Lb./Hr.)
Cp	PITOT TUBE COEFFICIENT (0.84)
^oR	= ^oF + 460
Qm	= .75

APPENDIX E

UNITED STATES STEEL CORPORATION
ENGINEERING-STEEL

PLANT ENGINEERING
GARY WORKS

USEPA RM 5 FORMULAE

CALCULATE REQUIRED NOZZEL DIAMETER (INCHES)

$$D_n = \sqrt{\left(\frac{.0358\ Q_m\ P_m}{T_m\ C_p\ (1-B_{ws})}\right)\sqrt{\frac{T_s\ M_s}{P_s\ (\Delta P)}}}$$

CALCULATE K FACTOR

$$K = 846.72\ D_n^4\ \Delta H_@\ C_p^2\ (1-B_{ws})^2\ \frac{M_d}{M_s}\ \frac{T_m}{T_s}\ \frac{P_s}{P_m}$$

CALCULATE ΔH

$$\Delta H = K(\Delta P)$$

CALCULATE ISOKINETIC SAMPLING RATE

$$I = \frac{T_s\ (1.667)\left[(0.00267)\ V_i + \frac{V_m}{T_m}\left(P_{bar} + \frac{\Delta H}{13.6}\right)\right]}{\theta\ V_s\ P_s\ A_n}$$

CALCULATE MOLECULAR WEIGHT OF GAS (DRY BASIS)

$$M_d = (.44 \times \%\ CO_2) + (.32 \times \%\ O_2) + [(.28 \times (\%\ CO + \%\ N_2)]$$

CALCULATE MOLECULAR WEIGHT OF GAS (WET BASIS)

$$M_s = M_d\ (1-B_{ws}) + 18\ (B_{ws})$$

CALCULATE STACK GAS VELOCITY (Ft./Sec)

$$V_s = 85.49\ C_p\ (\sqrt{\Delta P})_{AVG}\sqrt{\frac{T_s}{P_s\ M_s}}$$

APPENDIX E

CALCULATE VOLUME OF WATER VAPOR IN GAS SAMPLED AT STANDARD CONDITIONS (Cu. Ft.)

$$V_{wstd} = 0.0474\ V_{lc}$$

CALCULATE VOLUME OF GAS SAMPLED AT STANDARD CONDITIONS (SCF)

$$V_{mstd} = (17.64)\ (V_m)\ \left(\frac{P_{bar} + \frac{\Delta H}{13.6}}{T_m}\right) Y$$

CALCULATE PERCENT WATER VAPOR IN GAS STREAM (By Volume)

$$B_{ws} = \frac{V_{wstd}}{V_{mstd} + V_{wstd}}$$

CALCULATE VOLUMETRIC FLOW RATE (dscf/Min.)

$$Q_s = 60\,(1 - B_{ws})\,V_s\,A_s\left(\frac{528}{T_s}\right)\left(\frac{P_s}{29.92}\right)$$

CALCULATE PARTICULATE CONCENTRATION (gr./dscf)

$$C_s\ \frac{15.43 \times \text{grams of particulate collected}}{V_{mstd}}$$

CALCULATE MASS EMISSION RATE (Lb./Hr.)

$$PMR = C_s\ Q_s\ (8.58 \times 10^{-3})$$

CALCULATE POUNDS OF PARTICULATE PER TON OF COKE PUSHED

$$\frac{\text{lb. of Particulate}}{\text{T. of Coke Pushed}} = \frac{Q_s\left(\frac{C_s}{7000\ gr/lb}\right)(32.4\ min./test)}{295.2\ T.\ coke\ pushed/test}$$

Appendix E

PARTICULATE FIELD DATA

U.S. STEEL CORPORATION
USS ENGINEERING

DIVISION: [illegible]
SOURCE: [illegible]
TEST ENGINEER:
OPERATOR: [illegible]
TECHNICIANS:

RUN NO.: 1
DATE: 5/17/83

AMBIENT TEMP = 30 °F.
BAROMETRIC PRS. = ____ In Hg.

METER BOX:
ID No. = 8C1-8
H @ = 1.73
Y =
PITOT TUBE Cp = .84
NOZZLE:
ID No. = [illegible]
DIAMETER = .246 In

PROBE:
LENGTH = 8 Ft
LINER MATERIAL = 316 SS

DUCT:
DIAMETER = 90 In.
STATIC PRS = 1.66 In. H2O
ASSUMED MOISTURE 2 %
REF. Δ P = 1.0 In. H2O

FINAL LEAK CHECK:
0 CF/M @ 10 In. Hg.

K FACTOR = 2.51

FLUE GAS ANALYSIS

O2	CO2	CO
20%	0%	

FILTER NO.: 1 INIT. WT: 0.3793

IMPINGER NO.	INITIAL WEIGHT (GRAMS)	FINAL WEIGHT (GRAMS)	
1	447.59	450.0	.5
2	454.0	454.0	0
3	333.09	333.5	.5
4	514.0	522.0	8.0
			11.0

POINT NO.	PORT	SAMPLING TIME (MIN.)	CLOCK TIME (24 Hr.)	VACUUM (In. Hg)	Δ P (In. H2O)	√Δ P	Δ H (In. H2O)	DGM READING (Cu. Ft.)	STACK TEMP. (°F.)	FILTER TEMP. (°F.)	DGM TEMP. (°F.)	IMPINGER TEMP. (°F.)
1	5C	9	7:42	1	.69	.830	2.72	803.47	96	250	57	45
2			:47	1	.70	.836	2.45	804.-	85	260	57	46
3			:58	1	.95	.974	3.33	805.[illegible]	87	250	54	45
4			8:00	1	.95	.974	3.33	805.7	92	252	54	44
5			:11	2	[illegible]	.979	3.36	805.[illegible]	92	[illegible]	53	47
6			:16	2	1.0	1.0	3.51	807.4	89	260	54	47
7			:25	2	.95	.974	3.33	808.3	92	260	55	50
8			:27	2	.95	.974	3.33	809.2	95	259	56	49
9			:37	2	.92	.959	3.22	810.1	100	260	58	50
10			:39	2	.85	.921	2.98	811.0	97	258	58	50
11			:47	1	.70	.836	2.45	811.8	95	253	57	51
12			:49	1	.74	.86	2.60	812.6	96	255	57	57
13			9:00	2	.65	.806	2.28	813.4	93	265	55	52
14			:03	1	.55	.741	1.93	814.1	96	259	55	50
15			:37	2	.60	.774	2.1	814.8	92	262	53	52
16			:39	3	.55	.741	1.93	815.5	90	260	53	53
17			:48	3	.51	.714	1.79	816.2	97	266	52	53
18			:54	3	.52	.721	1.82	816.9	90	262	53	55
		TOTAL		MAXIMUM		AVERAGE	AVERAGE	TOTAL	AVERAGE		AVERAGE	MAXIMUM

APPENDIX E

PARTICULATE FIELD DATA

SHEET 2 OF 2

U.S. STEEL CORPORATION
USS ENGINEERING

DIVISION: Coke + Chemicals
SOURCE: #3, 7 B&E
No. SE
TEST ENGINEER:
OPERATOR:
TECHNICIANS:

RUN NO.: 1
DATE: 5/17/83

AMBIENT TEMP = 50 °F.
BAROMETRIC PRS. = 29.58 In Hg.

METER BOX:
ID No. = 581.8
H @ = 1.73
Y =
PITOT TUBE Cp = [illegible]
NOZZLE:
ID No. = [illegible]
DIAMETER = In

PROBE:
LENGTH = 5 Ft
LINER MATERIAL = [illegible]

DUCT:
DIAMETER = [illegible] In.
STATIC PRS = [illegible] In. H2O
ASSUMED MOISTURE ___ %
REF. Δ P = ___ In. H2O

FINAL LEAK CHECK:
___ CF/M @ ___ In. Hg.

K FACTOR = 3.51

FLUE GAS ANALYSIS

O2	CO2	CO

FILTER NO.: INIT. WT:

IMPINGER NO.	INITIAL WEIGHT (GRAMS)	FINAL WEIGHT (GRAMS)
1		
2		
3		
4		

POINT NO.	PORT	SAMPLING TIME (MIN.)	CLOCK TIME (24 Hr.)	VACUUM (In. Hg)	Δ P (In. H2O)	√Δ P	Δ H (In. H2O)	DGM READING (Cu. Ft.)	STACK TEMP. (°F.)	FILTER TEMP. (°F.)	DGM TEMP. (°F.)	IMPINGER TEMP. (°F.)
1	NW	.9	10:00	5	1.0	1.0	3.51	817.57	98	266	52	46
2			10:06	5	1.1	1.04	3.86	818.42	98	265	52	46
3			10:13	5	1.1	1.04	3.86	819.35	96	257	52	48
4			10:[illegible]	5	1.1	1.04	3.86	821.77	100	256	52	46
5			[illegible]	6	1.0	1.0	3.51	821.16	100	256	52	48
6			10:26	6	1.0	1.0	3.51	821.76	100	260	50	48
7			137	6	1.0	1.0	3.51	822.54	102	259	55	46
8			139	7	1.0	1.0	3.51	823.3	102	262	54	46
9			150	7	1.2	1.09	4.2	824.2	105	247	53	46
10			152	5	.45	.707	1.58	825.2	103	240	52	46
11			11:04	5	.53	.728	1.79	825.8	97	238	52	49
12			113	5	.50	.707	1.75	826.49	100	242	52	46
13			22	5	.49	.70	1.71	827.15	95	249	50	49
14			32	5	.46	.679	1.61	827.80	96	253	52	48
15			41	5	.42	.648	1.47	828.41	97	250	52	48
16			50	5	.45	.670	1.57	829.01	94	245	52	50
17			59	5	.47	.836	1.64	829.62	96	240	52	50
18		✓	12:09	4	.42	.648	1.47	830.23	95	246	52	51
								830.82				
						[illegible]	2.67	27.35	96		55.3	
		TOTAL		MAXIMUM		AVERAGE	AVERAGE	TOTAL	AVERAGE		AVERAGE	MAXIMUM

SHEET 1 OF 2

PARTICULATE FIELD DATA

U.S. STEEL CORPORATION
USS ENGINEERING

DIVISION: Coke + Chemicals
SOURCE: HS 7 Bag [illegible]
TEST ENGINEER: Gary
OPERATOR:
TECHNICIANS:

RUN NO.: 12
DATE: 5/18/83

AMBIENT TEMP = 50 °F.
BAROMETRIC PRS. = 29.09 In Hg.

METER BOX:
ID No. = 8018
H @ = 1.73
Y = 1.023
PITOT TUBE Cp = .84
NOZZLE:
ID No. = [illegible]
DIAMETER = [illegible] In

PROBE:
LENGTH = 8 Ft
LINER MATERIAL = 316SS

DUCT:
DIAMETER = 96 In.
STATIC PRS = 1.66 In. H2O
ASSUMED MOISTURE 2 %
REF. Δ P = 1.0 In. H2O

FINAL LEAK CHECK:
0 CF/M @ 10 In. Hg.

K FACTOR = 3.51

FLUE GAS ANALYSIS

O2	CO2	CO
20%	0%	

FILTER NO.: 2 INIT. WT: 0.3989g

IMPINGER NO.	INITIAL WEIGHT (GRAMS)	FINAL WEIGHT (GRAMS)
1	435.0g	[illegible]
2	451.0g	450.9
3	330.0g	331.4
4	539.5g	547.1

5.7
.9
1.4
7.6
14.7

POINT NO.	PORT	SAMPLING TIME (MIN.)	CLOCK TIME (24 Hr.)	VACUUM (In. Hg)	Δ P (In. H2O)	√Δ P	Δ H (In. H2O)	DGM READING (Cu. Ft.)	STACK TEMP. (°F.)	FILTER TEMP. (°F.)	DGM TEMP. (°F.)	IMPINGER TEMP. (°F.)
	SW	4	7:25	4	.83	.911	2.91	831.24	82	230	56	48
2			:30	8	1.0	1.0	3.51	831.98	84	250	56	50
3			:37	8	1.0	1.0	3.51	832.73	90	265	57	52
4			:48	8	.93	.964	3.26	833.62	88	246	57	51
5			8:41	9	1.0	1.0	3.51	834.48	84	230	60	53
6			:48	8	.95	.974	3.33	835.36	96	252	60	53
7			:55	8	.93	.964	3.26	836.24	94	230	62	54
8			9:00	8	.95	.974	3.33	837.10	94	246	62	55
9			:08	8	.89	.943	3.12	837.96	95	275	63	55
10			:17	6	.75	.866	2.63	838.82	96	260	64	54
11			:30	6	.70	.836	2.46	839.62	97	233	65	55
12			:36	5	.62	.787	2.17	840.40	97	275	66	55
13			:45	4	.52	.721	1.82	841.12	99	275	66	55
14			:56	4	.49	.70	1.72	841.78	100	270	65	56
15			10:04	4	.59	.768	2.07	842.44	99	267	67	56
16			:13	3	.49	.70	1.72	843.12	100	238	68	56
17			:22	3	.45	.67	1.58	843.78	100	242	68	56
18			:28	3	.45	.67	1.58	844.40	99	230	69	57
		TOTAL		MAXIMUM		AVERAGE	AVERAGE	TOTAL	AVERAGE		AVERAGE	MAXIMUM

SHEET 2 OF 2

PARTICULATE FIELD DATA

U.S. STEEL CORPORATION
USS ENGINEERING

DIVISION: Coke + Chemicals
SOURCE: #3 7 Bag. [illegible]
TEST ENGINEER:
OPERATOR:
TECHNICIANS:

RUN NO.: 12
DATE: 5/18/83

AMBIENT TEMP = 55 °F.
BAROMETRIC PRS. = ____ In Hg.

METER BOX:
ID No. = [illegible] 8
H @ = 1.73
Y =
PITOT TUBE Cp = [illegible]
NOZZLE:
ID No. = [illegible]
DIAMETER = [illegible] In

PROBE:
LENGTH = ____ Ft
LINER MATERIAL = 316 SS

DUCT:
DIAMETER = 96 In.
STATIC PRS = [illegible] In. H2O
ASSUMED MOISTURE 2 %
REF. Δ P = 1.0 In. H2O

FINAL LEAK CHECK:
____ CF/M @ ____ In. Hg.

K FACTOR = 3.51

FLUE GAS ANALYSIS

O2	CO2	CO

FILTER NO.: INIT. WT:

IMPINGER NO.	INITIAL WEIGHT (GRAMS)	FINAL WEIGHT (GRAMS)
1		
2		
3		
4		

POINT NO.	PORT	SAMPLING TIME (MIN.)	CLOCK TIME (24 Hr.)	VACUUM (In. Hg)	Δ P (In. H2O)	√Δ P	Δ H (In. H2O)	DGM READING (Cu. Ft.)	STACK TEMP. (°F.)	FILTER TEMP. (°F.)	DGM TEMP. (°F.)	IMPINGER TEMP. (°F.)
		7	10:35	8	.02	1.0	3.58	845.02	108	238	70	56
2			:41	9	1.1	1.04	3.86	845.89	103	244	70	60
3			:48	9	1.1	1.04	3.86	846.82	96	243	70	59
4			:54	10	1.2	1.09	4.21	847.76	107	243	70	59
5			11:00	10	1.2	1.09	4.21	848.72	106	240	71	59
6			:41	10	1.1	1.04	3.86	849.68	93	275	71	58
7			:47	10	1.0	1.0	3.51	850.63	97	260	70	58
8			:54	9	.93	.964	3.26	851.56	98	253	70	58
9			12:00	9	1.0	1.0	3.51	852.46	97	247	70	58
10			:08	5	.58	.761	2.03	853.36	100	250	70	59
11			:16	5	.51	.754	2.00	854.11	102	245	70	59
12			:23	4	.45	.670	1.58	854.81	103	264	70	60
13			:28	4	.43	.655	1.51	855.47	104	274	71	60
14			:35	3	.43	.655	1.51	856.09	106	274	72	61
15			:42	3	.42	.648	1.47	856.68	106	275	72	62
16			:49	4	.57	.754	2.00	857.28	106	272	74	62
17			:54	5	.55	.741	1.93	857.96	107	262	74	62
18		✓	1:02	4	.48	.692	1.68	858.62	104	262	73	63
								859.265				
						.862	2.70	25.25	98.2		68.8	
		TOTAL		MAXIMUM		AVERAGE	AVERAGE	TOTAL	AVERAGE		AVERAGE	MAXIMUM

PARTICULATE FIELD DATA

U.S. STEEL CORPORATION
USS ENGINEERING

DIVISION: COKE + CHEMICALS
SOURCE: #6, 7 BAG-HOUSE
TEST ENGINEER:
OPERATOR:
TECHNICIANS:

RUN NO.: 3
DATE: 5/19/83

AMBIENT TEMP = 66 °F.
BAROMETRIC PRS. = 29.36 In Hg.

METER BOX:
ID No. = 6
H @ = .72
Y = [illegible]
PITOT TUBE Cp = .84
NOZZLE:
ID No. = 777
DIAMETER = .246 In

PROBE:
LENGTH = 5 Ft
LINER MATERIAL = 316SS

DUCT:
DIAMETER = 96 In.
STATIC PRS = [illegible] In. H2O
ASSUMED MOISTURE [illegible] %
REF. Δ P = 1.6 In H2O

FINAL LEAK CHECK:
0 CF/M @ 12 In. Hg.

K FACTOR = 3.61

FLUE GAS ANALYSIS

O2	CO2	CO
20%	0%	

FILTER NO.: 3 INIT. WT: .4029

IMPINGER NO.	INITIAL WEIGHT (GRAMS)	FINAL WEIGHT (GRAMS)
1	442.0	450.0
2	447.0	447.5
3	332.5	334.0
4	526.5	537.0

205

POINT NO.	PORT	SAMPLING TIME (MIN.)	CLOCK TIME (24 Hr.)	VACUUM (In. Hg)	Δ P (In. H2O)	√Δ P	Δ H (In. H2O)	DGM READING (Cu. Ft.)	STACK TEMP. (°F.)	FILTER TEMP. (°F.)	DGM TEMP. (°F.)	IMPINGER TEMP. (°F.)
		4	[illegible]	10	1.0	1.0	3.51	859.53	138	254	68	48
			[illegible]	10	1.0	1.0	3.51	860.3	137	257	69	47
			10:[illegible]2	10	1.0	1.0	3.51	861.2	121	263	72	47
			:27	9	.95	.974	3.33	[illegible]	113	263	74	48
			:46	7	.81	.90	2.84	863.1	109	265	75	49
			:56	7	.75	.866	2.63	863.9	103	260	75	50
			11:06	8	.87	.932	3.05	864.7	105	261	75	50
			:17	10	.9	.948	3.16	865.6	107	253	74	50
			:44	11	.95	.974	3.33	866.5	113	254	73	51
			:57	10	.85	.921	2.98	867.4	115	255	73	53
			12:23	9	.81	.90	2.84	868.2	106	251	75	52
			:33	8	.74	.860	2.60	869.1	109	259	76	52
			:43	8	.78	.88	2.74	869.9	107	253	77	53
			1:06	9	.85	.921	2.98	870.7	104	251	74	54
			:14	8	.71	.842	2.49	871.6	112	255	74	55
			:23	8	.72	.848	2.53	872.4	114	261	75	54
			:33	7	.70	.836	2.46	873.2	111	259	76	53
		✓	:48	7	.69	.830	2.42	874.0	108	259	76	53
								874.8				
		TOTAL		MAXIMUM		AVERAGE	AVERAGE	TOTAL	AVERAGE		AVERAGE	MAXIMUM

PARTICULATE FIELD DATA

U.S. STEEL CORPORATION
USS ENGINEERING

DIVISION: Coke + Chemicals
SOURCE: [illegible]
TEST ENGINEER:
OPERATOR:
TECHNICIANS:

RUN NO.: 3
DATE: 5/10/83

AMBIENT TEMP = [illegible] °F.
BAROMETRIC PRS. = ____ In Hg.

METER BOX:
ID No. = 861-8
H @ = 1.3
Y = [illegible]
PITOT TUBE Cp= ____
NOZZLE:
ID No. = 777
DIAMETER = .246 In

PROBE:
LENGTH = 8 Ft
LINER MATERIAL = 316SS

DUCT:
DIAMETER = 96 In.
STATIC PRS = [illegible] In. H2O
ASSUMED MOISTURE 2 %
REF. Δ P = [illegible] In. H2O

FINAL LEAK CHECK:
____ CF/M @ ____ In. Hg.

K FACTOR = 3.51

FLUE GAS ANALYSIS

O2	CO2	CO

FILTER NO.: INIT. WT:

IMPINGER NO.	INITIAL WEIGHT (GRAMS)	FINAL WEIGHT (GRAMS)
1		
2		
3		
4		

POINT NO.	PORT	SAMPLING TIME (MIN.)	CLOCK TIME (24 Hr.)	VACUUM (In. Hg)	Δ P (In. H2O)	√Δ P	Δ H (In. H2O)	DGM READING (Cu. Ft.)	STACK TEMP. (°F.)	FILTER TEMP. (°F.)	DGM TEMP. (°F.)	IMPINGER TEMP. (°F.)
1		1	1:57	11	1.1	1.04	3.86	874.8	106	262	75	54
2			2:04	11	1.1	1.04	3.86	875.7	105	260	74	55
3			:16	11	1.1	1.04	3.86	876.7	109	261	73	55
4			:27	11	1.1	1.04	3.86	877.7	110	262	72	55
5			:36	11	1.1	1.04	3.86	878.6	114	261	71	56
6			:47	11	1.1	1.04	3.86	879.5	114	258	71	56
7			3:32	10	1.0	1.0	3.51	880.5	104	263	73	56
8			:43	11	1.1	1.04	3.86	881.43	106	258	72	56
9			:54	6	.6	.774	2.11	882.39	110	257	71	57
10			4:07	6	.61	.781	2.14	883.1	110	255	71	57
11			:20	5	.54	.734	1.90	883.8	104	256	70	57
12			:29	5	.51	.714	1.79	884.5	104	253	70	56
13			:37	4	.47	.648	1.47	885.2	103	250	70	57
14			:47	4	.4	.632	1.40	885.8	101	246	70	57
15			5:03	4	.4	.632	1.40	886.4	106	261	70	57
16			:14	4	.46	.678	1.61	887.1	109	260	70	56
17			:26	6	.62	.787	2.18	887.7	109	259	70	57
18			:39	6	.47	.685	1.65	888.4	107	261	70	58
								889.11				
		TOTAL		MAXIMUM		AVERAGE .882	AVERAGE 2.50	TOTAL 29.58	AVERAGE 110°		AVERAGE 72.6	MINIMUM

Sheet 1 of 5

Visible Emission Evaluation
United States Steel Corp.
Gary Works

Facility: #5+7 BAGHOUSE STACK
Run #1

Date: 5.17.83
Process Observer: FEDORCHAK
Inspecting Agency:
Observation Began: 7:30 A.M.
Ended: 9:29 A.M.

Observation Point: DUE EAST OF STACK

Distance From Stack: 300 ft
Color of Emission: VARIOUS
Background: Sky

Sky Condition: GOOD

Sun Position: META. #9
Temperature: 45°
Wind N At 5 MPH
Reading Conditions: GOOD

General Comments:

Regulatory Personnel:

Signature: R. P. Fedorchak

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

WK 5-2-80

APPENDIX G

Sheet 2 of 5

Visible Emission Evaluation
United States Steel Corp.
Gary Works

Facility: #5+7 BAGHOUSE STACK

Date: 5-17-83
Process Observer: FEDORCHAK
Inspecting Agency:
Observation Began: 8:30
Ended: 9:29

Observation Point: DUE EAST OF STACK

Distance From Stack: 300 ft
Color of Emission: V
Background: Sky

Sky Condition: Good

Sun Position: METH 9
Temperature: 41°
Wind N At 5 MPH
Reading Conditions: Good

General Comments:

Regulatory Personnel:

Signature: R. P. Fedorchak

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

WK 5-2-80

Visible Emission Evaluation
United States Steel Corp.
Gary Works

Facility: #547 BAGHOUSE STACK

Date: 5-17-83
Process Observer: FEDORCHAK
Inspecting Agency:
Observation Began: 9:30 A.M.
Ended: 10:28 A.M.

Observation Point: N.E. OF STACK

Distance From Stack: 500 ft
Color of Emission: VARIOUS
Background: SKY

Sky Condition: GOOD

Sun Position: MERIDIAN 9
Temperature: [illegible]
Wind N At 3 MPH
Reading Conditions: GOOD

General Comments:

Regulatory Personnel:

Signature: R. Fedorchak

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

Sheet 4 of 5

Visible Emission Evaluation
United States Steel Corp.
Gary Works

Facility: #5+7 BAGHOUSE STACK

Date: 5-17-83
Process Observer: FEDORCHAK
Inspecting Agency:
Observation Began: 10:30
Ended: 11:29

Observation Point: N.E. OF STACK

Distance From Stack: 500 ft
Color of Emission: VARIOUS
Background: Sky

Sky Condition: GOOD

Sun Position: METH. 9
Temperature: 48
Wind N At 5 MPH
Reading Conditions: GOOD

General Comments:

Regulatory Personnel:

Signature: R. Fedorchak

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

WK 5-2-80

Sheet 5 of 5

Visible Emission Evaluation
United States Steel Corp.
Gary Works

Facility: #5+7 BAGHOUSE STACK

Date: 5-17-83
Process Observer: FEDORCHAK
Inspecting Agency:
Observation Began: 11:30 A.M.
Ended: 12:15 P.M.

Observation Point: N.E. OF STACK

Distance From Stack: 500 ft
Color of Emission: VARIOUS
Background: Sky

Sky Condition: Good

Sun Position: METH. 9
Temperature: 50°
Wind N At 2 MPH
Reading Conditions: Good

General Comments:

Regulatory Personnel:

Signature: [illegible]

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

WK 5-2-80

Visible Emission Evaluation
United States Steel Corp.
Gary Works

Facility: #5+7 BAGHOUSE STACK

Run #2

Date: 5-18-83
Process Observer: FEDORCHAK
Inspecting Agency:
Observation Began: 7:30 A.M.
Ended: 8:29 A.M.

Observation Point: NE OF STACK

Distance From Stack: 600 ft
Color of Emission: VARIOUS
Background: SKY

Sky Condition: OVERCAST

Sun Position: METH. 9
Temperature: 48°
Wind 5 At 5 MPH
Reading Conditions: GOOD

General Comments:

Regulatory Personnel:

Signature: R. Fedorchak

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

Sheet 2 of 6

Visible Emission Evaluation
United States Steel Corp.
Gary Works

Facility: #5+7 BAGHOUSE STACK

Date: 5-17-83
Process Observer: FEDORCHAK
Inspecting Agency:
Observation Began: 8:30 Am
Ended: 9:20 Am

Observation Point: N.E. OF STACK

Distance From Stack: 600 ft
Color of Emission: VARIOUS
Background: SKY

Sky Condition: OVERCAST

Sun Position: METH 4
Temperature: 49°
Wind 5 At 5 MPH
Reading Conditions: GOOD

General Comments:

Regulatory Personnel:

Signature: R. F. DeDorchak

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

WK 5-2-80

Visible Emission Evaluation
United States Steel Corp.
Gary Works

Facility: #5+7 BAGHOUSE STACK

Date: 5-18-83
Process Observer: FEDORCHAK
Inspecting Agency:
Observation Began: 9:30 A.M.
Ended: 10:29 A.M.

Observation Point: NE OF STACK

Distance From Stack: 600 ft
Color of Emission: VARIOUS
Background: Sky
Sky Condition: OVERCAST
Sun Position: METH. C
Temperature: 50°
Wind 5 At 5 MPH
Reading Conditions: GOOD

General Comments:

Regulatory Personnel:

Signature: R. D. Fedorchak

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

Visible Emission Evaluation
United States Steel Corp.
Gary Works

Facility: 4 SH7 BAGHOUSE STACK

Date: 5.18.83
Process Observer: FEDORCHAK
Inspecting Agency:
Observation Began: 10:30 A.M.
Ended: 11:29 A.M.

Observation Point: NE OF STACK

Distance From Stack: 600 ft
Color of Emission: VARIOUS
Background: Sky

Sky Condition: OVERCAST

Sun Position: METH-9
Temperature: 54°
Wind S At 5 MPH
Reading Conditions: GOOD

General Comments:

Regulatory Personnel:

Signature: R.D. Fedorchak

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

Sheet 5 of 6

Visible Emission Evaluation
United States Steel Corp.
Gary Works

Facility: #5+7 BAGHOUSE STACK

Date: 5-18-83
Process Observer: FEDORCHAK
Inspecting Agency:
Observation Began: 11:30 A.M.
Ended: 12:29 P.M.

Observation Point: NE. OF STACK

Distance From Stack: 600 ft
Color of Emission: VARIOUS
Background: Sky

Sky Condition: OVERCAST

Sun Position: METH 9
Temperature: 60°
Wind 5 At 5 MPH
Reading Conditions: GOOD

General Comments:

Regulatory Personnel:

Signature: R. P. Fedorchak

	0	15	30	45	X	X	0	15	30	45
	0	0	0	0	0	30	0	0	0	0
					1	31				
					2	32				
					3	33				
					4	34				
					5	35				
					6	36				
					7	37				
					8	38				
					9	39				
					10	40				
					11	41				
					12	42				
					13	43				
					14	44				
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					26	56				
					27	57				
					28	58				
					29	59				

WK 5-2-80

Visible Emission Evaluation
United States Steel Corp.
Gary Works

Facility: #5+7 BAGHOUSE STACK

Date: 5-18-83
Process Observer: FEDORCHAK
Inspecting Agency:
Observation Began: 12:30 PM
Ended: 1:00 PM

Observation Point: NE OF STACK

Distance From Stack: 600 ft
Color of Emission: VARIOUS
Background: Sky

Sky Condition: OVERCAST

Sun Position: METH. 9
Temperature: 60°
Wind S At 5 MPH
Reading Conditions: GOOD

General Comments:

Regulatory Personnel:

Signature: R. Fedorchak

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

Sheet 1 of X

Visible Emission Evaluation
United States Steel Corp.
Gary Works

Facility: #5+7 BAGHOUSE STACK
Run #3

Date: 5-19-83
Process Observer: FEDORCHAK
Inspecting Agency:
Observation Began: 9:00 A.M.
Ended: 10:30 A.M.

Observation Point: N.W. OF STACK

Distance From Stack: 600 ft
Color of Emission: VARIOUS
Background: Sky

Sky Condition: OVERCAST

Sun Position: MEDIUM-9
Temperature: 60
Wind 5 At 7 MPH
Reading Conditions: GOOD

General Comments:

Regulatory Personnel:

Signature: R. P. Fedorchak

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

WK 5-2-80

Sheet 2 of 8

Visible Emission Evaluation
United States Steel Corp.
Gary Works

Facility: #547 BAGHOUSE STACK

Date: 5.19.83
Process Observer: FEDORCHAK
Inspecting Agency:
Observation Began: 10:10 Am.
Ended: 11:39 Am.

Observation Point: NW. OF STACK

Distance From Stack: 600 ft
Color of Emission: VARIOUS
Background: SKY.

Sky Condition: OVERCAST

Sun Position: METH. 9
Temperature: 61°
Wind S At 7 MPH
Reading Conditions: GOOD

General Comments:

Regulatory Personnel:

Signature: R. P. Fedorchak

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

WK 5-2-80

Sheet 3 of 8

Visible Emission Evaluation
United States Steel Corp.
Gary Works

Facility: #5+7 BAGHOUSE STACK

Date: 5.19.83
Process Observer: FEDORCHAK
Inspecting Agency:
Observation Began: 11:10 A.m.
Ended: 12:39 A.m.

Observation Point: N.W. OF STACK

Distance From Stack: 600 ft
Color of Emission: VARIOUS
Background: SKY

Sky Condition: OVERCAST

Sun Position: METH-9
Temperature: 66°
Wind S At 10 MPH
Reading Conditions: CLOUD

General Comments:

Regulatory Personnel:

Signature: R. P. [signature]

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

WK 5-2-80

Visible Emission Evaluation
United States Steel Corp.
Gary Works

Facility: #5+7 BAGHOUSE STACK

Date: 5.19.83
Process Observer: FEDORCHAK
Inspecting Agency:
Observation Began: 10:10 Am
Ended: 1:39 Pm

Observation Point: N.W. OF STACK

Distance From Stack: 600 ft
Color of Emission: VARIOUS
Background: Sky

Sky Condition: OVERCAST

Sun Position: METH-9
Temperature: 68°
Wind S At 12 MPH
Reading Conditions: Good

General Comments:

Regulatory Personnel:

Signature: K. P. Fedorchak

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

Sheet 5 of 8

Visible Emission Evaluation
United States Steel Corp.
Gary Works

Facility: #5+7 BAGHOUSE STACK

Date: 5.19.83
Process Observer: FEDORCHAK
Inspecting Agency:
Observation Began: 1:00 P.M.
Ended: 2:30 P.M.

Observation Point: N.W. OF STACK

Distance From Stack: 600 ft
Color of Emission: VARIOUS
Background: SKY

Sky Condition: OVERCAST

Sun Position: METH. 9
Temperature: 70°
Wind 5 At 15 MPH
Reading Conditions: GOOD

General Comments:

Regulatory Personnel:

Signature: R. Fedorchak

	0	15	30	45			0	15	30	45
	0	0	0	0	0	30	0	0	0	0
					1	31				
					2	32				
					3	33				
					4	34				
					5	35				
					6	36				
					7	37				
					8	38				
					9	39				
					10	40				
					11	41				
					12	42				
					13	43				
					14	44				
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					26	56				
					27	57				
					28	58				
					29	59				

WK 5-2-80

Visible Emission Evaluation
United States Steel Corp.
Gary Works

Facility: #5 & 7 BAGHOUSE STACK

Date: 5-19-83
Process Observer: FEDORCHAK
Inspecting Agency:
Observation Began: 2:40 P.M.
Ended: 3:39 P.M.

Observation Point: N.W. OF STACK

Distance From Stack: 600 ft
Color of Emission: VARIOUS
Background: SKY

Sky Condition: OVERCAST

Sun Position: METH-9
Temperature: 70°
Wind 5 At 15 MPH
Reading Conditions: GOOD

General Comments:

Regulatory Personnel:

Signature: R. P. Fedorchak

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

Visible Emission Evaluation
United States Steel Corp.
Gary Works

Facility: #547 BAGHOUSE STACK

Date: 5-19-83
Process Observer: F. EDVRCHAK
Inspecting Agency:
Observation Began: 3:30 P.M.
Ended: 3:39 P.M.

Observation Point: N.W. OF STACK

Distance From Stack: 600 ft
Color of Emission: VARIOUS
Background: SKY

Sky Condition: OVERCAST

Sun Position: MEDIUM-G
Temperature: 54°
Wind SW At 10 MPH
Reading Conditions: GOOD

General Comments:

Regulatory Personnel:

Signature: R. P. [illegible]

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

Sheet 8 of 8

Visible Emission Evaluation
United States Steel Corp.
Gary Works

Facility: #5+7 BAGHOUSE STACK

Date: 5.19.83
Process Observer: FEDORCHAK
Inspecting Agency:
Observation Began: 4:40 P.M.
Ended: 5:39 P.M.

Observation Point: N.W. OF STACK

Distance From Stack: 600 ft
Color of Emission: VARIOUS
Background: Sky

Sky Condition: OVERCAST

Sun Position: METH-9
Temperature: 63°
Wind SW At 10 MPH
Reading Conditions: GOOD

General Comments:

Regulatory Personnel:

Signature: R. P. Fedorchak

	0	15	30	45	X	X	0	15	30	45
	0	0	0	0	0	30	0	0	0	0
					1	31				
					2	32				
					3	33				
					4	34				
					5	35				
					6	36				
					7	37				
					8	38				
					9	39				
					10	40				
					11	41				
					12	42				
					13	43				
					14	44				
					15	45				
					16	46				
					17	47				
					18	48				
					19	49				
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					28	58				
					29	59				

WK 5-2-80

INSPECTING AGENCY- ACUREX
REGULATORY PERSONNEL- JOE MICELI

PUSHING INSPECTION

DATE 5-17-83 BATTERY # 7

PROCESS OBSERVER BOB TREZAK
U.S. Steel Corp., Gary, Works

START TIME 7:25
FINISH TIME 8:42

OVEN NO.	DOOR REMOVED	PUSH BEGAN	PUSH ENDED	TRAVEL BEGAN	TRAVEL ENDED	DOOR REPLACED	COKING TIME	PUSH OPACITY 0	PUSH OPACITY 15	PUSH OPACITY 30	PUSH OPACITY 45	TRAVEL OPACITY 0	TRAVEL OPACITY 15	TRAVEL OPACITY 30	TRAVEL OPACITY 45
56	7:25	7:30	+46	46	+25	+128	30HRS 47MIN	0	0	0	0	0	0		
66	7:35	7:42	+43	43	+33	+96	30HRS 49MIN	0	0	0		0	0	0	
76	7:48	7:57	+47	47	+25	+101	30HRS 54MIN	0	0	0	0	0	0		
8	8:05	8:15	+39	39	+20	+117	30HRS 50MIN	0	0	0		0	0		
18	8:20	8:25	+48	48	+19	+104	30HRS 51MIN.	0	0	0	0	0	0		
28	8:32	8:38	+45	45	+18	+112	30HRS 54MIN	0	0	0	0	0	0		

PUSHES OBSERVED DURING SOURCE SAMPLING ON # 5-7 BAGHOUSE

OVEN NUMBERS OF PUSHES EXHIBITING AN AVERAGE OPACITY OF MORE THAN 20% NONE

USING ONE SPOT LAND BASED BAGHOUSE, HOOD AND DUCT COUPLED.

INSPECTING AGENCY - ACUREX
REGULATORY PERSONNEL - JOE MICELI

PUSHING INSPECTION

DATE 5-17-83 BATTERY # 7

PROCESS OBSERVER BOB TREZAK
U.S. Steel Corp., Gary, Works

START TIME 8:43
FINISH TIME 10:20

OVEN NO.	DOOR REMOVED	PUSH BEGAN	PUSH ENDED	TRAVEL BEGAN	TRAVEL ENDED	DOOR REPLACED	COKING TIME	PUSH OPACITY 0	PUSH OPACITY 15	PUSH OPACITY 30	PUSH OPACITY 45	TRAVEL OPACITY 0	TRAVEL OPACITY 15	TRAVEL OPACITY 30	TRAVEL OPACITY 45
38	8:43	8:48	+31	31	+25	+121	30HRS. 55MIN	0	0	0		0	0		
48	8:53	8:59	+37	37	+30	+128	30HRS. 56MIN	0	0	0		0	0	0	
58	9:05	9:38	+37	37	+51	+124	31HRS. 27MIN	0	0	0		0 0	0	0	0
68	9:42	9:53	+45	45	+32	+126	31HRS. 29MIN	0	0	0	0	0	0	0	
3	10:00	10:06	+41	41	+18	+89	31HRS. 33MIN	0	0	0		0	0		
13	10:12	10:17	+37	37	+21	+123	31HRS 34MIN	0	0	0		5	5		

PUSHES OBSERVED DURING SOURCE SAMPLING ON #5-7 BAGHOUSE

OVEN NUMBERS OF PUSHES EXHIBITING
AN AVERAGE OPACITY OF MORE THAN 20% NONE

USING ONE SPOT LAND BASED BAGHOUSE, HOOD AND DUCT COUPLED

INSPECTING AGENCY - ACUREX
REGULATORY PERSONNEL - JOE MICELI

PUSHING INSPECTION

DATE 5-17-83 BATTERY # 7

PROCESS OBSERVER BOB TREZAK
U.S. Steel Corp., Gary, Works

START TIME 10:21
FINISH TIME 11:29

OVEN NO.	DOOR REMOVED	PUSH BEGAN	PUSH ENDED	TRAVEL BEGAN	TRAVEL ENDED	DOOR REPLACED	COKING TIME	PUSH OPACITY 0	PUSH OPACITY 15	PUSH OPACITY 30	PUSH OPACITY 45	TRAVEL OPACITY 0	TRAVEL OPACITY 15	TRAVEL OPACITY 30	TRAVEL OPACITY 45
23	10:21	10:27	+34	34	+39	+125	31 HRS. 36 MIN	0	0	0		0	0	0	
33	10:33	10:40	+36	36	+29	+119	31 HRS. 40 MIN	0	0	0		0	0		
43	10:46	10:53	+36	36	+39	+116	31 HRS. 48 MIN	0	0	0		0	0	0	
53	10:57	11:03	+36	36	+33	+102	30 HRS. 45 MIN	0	0	0		0	0	0	
63	11:07	11:13	+38	38	+26	+112	30 HRS. 45 MIN	0	0	0		0	0		
73	11:19	11:24	+35	35	+30	+121	30 HRS. 44 MIN	0	0	0		0	0	0	

PUSHES OBSERVED DURING SOURCE SAMPLING ON #5-7 BAGHOUSE

OVEN NUMBERS OF PUSHES EXHIBITING AN AVERAGE OPACITY OF MORE THAN 20% NONE

USING ONE SPOT LAND BASED BAGHOUSE, HOOD AND DUCT COUPLED.

INSPECTING AGENCY- ACUREX
REGULATORY PERSONNEL- JOE MICELI

PUSHING INSPECTION

DATE 5-17-83 BATTERY # 7

PROCESS OBSERVER BOB TREZAK
U.S. Steel Corp., Gary, Works

START TIME 11:30
FINISH TIME 11:45

OVEN NO.	DOOR REMOVED	PUSH BEGAN	PUSH ENDED	TRAVEL BEGAN	TRAVEL ENDED	DOOR REPLACED	COKING TIME	PUSH OPACITY 0	PUSH OPACITY 15	PUSH OPACITY 30	PUSH OPACITY 45	TRAVEL OPACITY 0	TRAVEL OPACITY 15	TRAVEL OPACITY 30	TRAVEL OPACITY 45
1	11:30	11:34	+38	38	+16	+91	30HRS. 45MIN	0	0	0		0	0		
11	11:38	11:42	+35	35	+21	+100	30HRS. 40MIN								

PUSHES OBSERVED DURING SOURCE SAMPLING ON # 5-7 BAGHOUSE

OVEN NUMBERS OF PUSHES EXHIBITING
AN AVERAGE OPACITY OF MORE THAN 20% NONE

USING ONE SPOT LAND BASED BAGHOUSE, HOOD AND DUCT COUPLED

PUSHING INSPECTION

DATE 5/17/83 BATTERY # 5

PROCESS OBSERVER Thee Sandridge
U.S. Steel Corp., Gary, Works

START TIME 6:50
FINISH TIME 8:50

US EPA "REP." PETE KAUFMANN

OVEN NO.	DOOR REMOVED	PUSH BEGAN	PUSH ENDED	TRAVEL BEGAN	TRAVEL ENDED	DOOR REPLACED	COKING TIME	PUSH OPACITY 0	PUSH OPACITY 15	PUSH OPACITY 30	PUSH OPACITY 45	TRAVEL OPACITY 0	TRAVEL OPACITY 15	TRAVEL OPACITY 30	TRAVEL OPACITY 45
			AVG.	OPACITY	- 0		30HRS	0	0	0	0	0	0		
26	7:30	7:45	+ 45	45	+ 18	+ 76	16MIN								
			AVG.	OPACITY	- 0		30HRS	0	0	0	0	0	0		
36	7:49	7:59	+ 47	47	+ 20	+ 96	19MIN								
			AVG.	OPACITY	- 0.8		30HRS	0	0	0	0	0	0	5	
46	8:04	8:09	+ 45	45	+ 32	+ 110	19MIN								
			AVG.	OPACITY	- 2.5		30HRS	0	0	5	0	5	5		
56	8:13	8:22	+ 45	45	+ 20	+ 97	23MIN								
			AVG.	OPACITY	- 3.3		30HRS	0	5	5	0	5	5		
66	8:26	8:34	+ 46	46	+ 25	+ 118	27MIN								
			AVG.	OPACITY	—		30HRS	5	—	0	—	—	—		
76	8:40	8:45	+ 46	46	+ 18	+ 105	15MIN								

USING ONE SPOT CAR (9113) ; BAG HOUSE IN OPERATION

Duct-Hood Coupled

OVEN NUMBERS OF PUSHES EXHIBITING AN AVERAGE OPACITY OF MORE THAN 20% NONE

* 76 Push (Steam Blocked View of some Readings)

PUSHING INSPECTION

DATE 5/17/83 BATTERY # 5

PROCESS OBSERVER Thee Sandidge
U.S. Steel Corp., Gary, Works

START TIME 8:50
FINISH TIME 8:29

U.S EPA "Rep." PETE KAUFMANN

OVEN NO.	DOOR REMOVED	PUSH BEGAN	PUSH ENDED	TRAVEL BEGAN	TRAVEL ENDED	DOOR REPLACED	COKING TIME	PUSH OPACITY 0	PUSH OPACITY 15	PUSH OPACITY 30	PUSH OPACITY 45	TRAVEL OPACITY 0	TRAVEL OPACITY 15	TRAVEL OPACITY 30	TRAVEL OPACITY 45
			AVG.	OPACITY	- 0		30 HRS	0	0	0		0	0		
8	8:55	9:00	+ 42	42	+ 20	+ 206	17 MIN								
			AVG.	OPACITY	- 2.5		29 HRS	0	0	0	0	0	10	5	
18	9:06	9:34	+ 46	46	+ 31	+ 120	13 MIN								
			AVG.	OPACITY	- 0		29 HRS	0	0	0		0	0		
28	9:39	9:45	+ 42	42	+ 23	+ 96	12 MIN								
			AVG.	OPACITY	- 2.5		29 HRS	0	5	0	0	10	0		
38	9:50	10:00	+ 46	46	+ 24	+ 86	17 MIN								
			AVG.	OPACITY	- 3.3		29 HRS	0	0	0	0	10	10		
48	10:04	10:12	+ 46	46	+ 28	+ 88	10 MIN								
			AVG.	OPACITY	- 8.3		29 HRS	0	10	5	5	10	10	10	
58	10:17	10:24	+ 46	46	+ 31	+ 122	35 MIN								

USING ONE SPOT CAR (9113); BAG HOUSE IN OPERATION

Duct + Hood Coupled

OVEN NUMBERS OF PUSHES EXHIBITING AN AVERAGE OPACITY OF MORE THAN 20% NONE

* AT END of # 58, MAN should coke into CAR

PUSHING INSPECTION

DATE 5/17/83 BATTERY # 5

PROCESS OBSERVER Thee Sandidge
U.S. Steel Corp., Gary, Works

START TIME 10:30
FINISH TIME 12:15

U.S. EPA "REP" PETE KAUFMANN

OVEN NO.	DOOR REMOVED	PUSH BEGAN	PUSH ENDED	TRAVEL BEGAN	TRAVEL ENDED	DOOR REPLACED	COKING TIME	PUSH OPACITY 0	PUSH OPACITY 15	PUSH OPACITY 30	PUSH OPACITY 45	TRAVEL OPACITY 0	TRAVEL OPACITY 15	TRAVEL OPACITY 30	TRAVEL OPACITY 45
			AVG.	OPACITY	- 4.1		29 HRS	0	0	0	0	10	10	5	
68	10:31	10:36	+ 48	48	+ 30	+ 110	24 MIN								
			AVG.	OPACITY	- 5.8		29 HRS	0	0	0	0	10	15	10	
3	10:43	10:50	+ 45	45	+ 34	+ 108	17 MIN								
			AVG.	OPACITY	- 5.8		29 HRS	0	15	5	5	5	5		
13	10:56	11:03	+ 46	46	+ 28	+ 97	21 MIN								
			AVG.	OPACITY	- 17.0		30 HRS	0	35	25		10	15		
23	11:48	11:51	+ 40	40	+ 23	+ 87	0 MIN								
			AVG.	OPACITY	- 9.1		29 HRS	0	0	0	20	20	15		
33	11:56	12:00	+ 46	46	+ 28	+ 89	52 MIN								
			AVG	OPACITY	- 2.5		29 HRS	0	0	5	0	5	5		
43	12:05	12:09	+ 48	48	+ 23	+ 88	52 MIN								

USING ONE SPOT CAR (9113); BAG HOUSE IN OPERATION

Duct-Hood Coupled

OVEN NUMBERS OF PUSHES EXHIBITING AN AVERAGE OPACITY OF MORE THAN 20% NONE

PUSHING INSPECTION

DATE 5/18/83 BATTERY # 5

PROCESS OBSERVER THEE SANDIDGE START TIME 6:50
U.S. Steel Corp., Gary, Works FINISH TIME 10:05

U.S. EPA "REP." PETE KAUFMANN

OVEN NO.	DOOR REMOVED	PUSH BEGAN	PUSH ENDED	TRAVEL BEGAN	TRAVEL ENDED	DOOR REPLACED	COKING TIME	PUSH OPACITY 0	PUSH OPACITY 15	PUSH OPACITY 30	PUSH OPACITY 45	TRAVEL OPACITY 0	TRAVEL OPACITY 15	TRAVEL OPACITY 30	TRAVEL OPACITY 45
			AVG.	OPACITY	- 2.5		22 HRS	0	0	5		5			
58	8:40	8:44	+ 35	35	+ 10	+ 87	4 MIN								
			AVG.	OPACITY	- 0.8		22 HRS	0	0	0	0	0	5		
68	8:52	8:59	+ 48	48	+ 16	+ 73	6 MIN								
			AVG.	OPACITY	- 0.8	PATCHED OVEN	22 HRS	0	0	0	0	0	5		
3	9:03	9:13	+ 46	46	+ 28	+ 261	7 MIN								
			AVG.	OPACITY	- 0.8		22 HRS	0	0	0	0	5	0		
13	9:21	9:34	+ 46	46	+ 26	+ 74	24 MIN								
			AVG.	OPACITY	- 13.3		21 HRS	5	20	15	5	15	20		
23	9:50	9:53	+ 50	50	+ 29	+ 104	50 MIN								
			AVG.	OPACITY	- 7.5		21 HRS	0	10	5	5	15	10		
33	10:00	10:02	+ 56	56	+ 22	+ 65	50 MIN								

USING ONE SPOT OAP (9113); BAG HOUSE IN OPERATION

Ducts Hood Coupled

OVEN NUMBERS OF PUSHES EXHIBITING
AN AVERAGE OPACITY OF MORE THAN 20% NONE

PUSHING INSPECTION

DATE 5/18/83 BATTERY # 5

PROCESS OBSERVER Thee Sandidge
U.S. Steel Corp., Gary, Works

START TIME 10:06
FINISH TIME 12:03

U.S. EPA "REP." PETE KAUFMANN

OVEN NO.	DOOR REMOVED	PUSH BEGAN	PUSH ENDED	TRAVEL BEGAN	TRAVEL ENDED	DOOR REPLACED	COKING TIME	PUSH OPACITY 0	PUSH OPACITY 15	PUSH OPACITY 30	PUSH OPACITY 45	TRAVEL OPACITY 0	TRAVEL OPACITY 15	TRAVEL OPACITY 30	TRAVEL OPACITY 45
			AVG.	OPACITY	- 10.0		21 HRS	0	25	10	5	10	10		
							51 MIN								
43	10:06	10:11	+ 48	48	+ 26	+ 67									
			AVG.	OPACITY	- 65.0		21 HRS	10	25	100	85	90	80		
							57 MIN								
53	10:15	10:26	+ 49	49	+ 29	+ 69									
			AVG.	OPACITY	- 8.0		21 HRS	10	15	5		5	5		
							57 MIN								
63	10:30	10:39	+ 44	44	+ 16	+ 72									
			AVG.	OPACITY	- 4.1		21 HRS	0	5	5	5	5	5		
							58 MIN								
73	10:44	10:52	+ 48	48	+ 17	+ 88									
			AVG.	OPACITY	- 0.8		22 HRS	0	0	0	5	0	0	0	
							41 MIN								
1	11:40	11:46	+ 52	52	+ 30	+ 136									
			AVG.	OPACITY	- 4.1		22 HRS	0	5	10	5	0	5		
							45 MIN								
11	11:52	12:00	+ 51	51	+ 23	+ 64									

USING ONE SPOT CAR (9113); BAG HOUSE IN OPERATION

Duct + Hood Coupled

OVEN NUMBERS OF PUSHES EXHIBITING AN AVERAGE OPACITY OF MORE THAN 20% #53

PUSHING INSPECTION

DATE 5/18/83 BATTERY # 5

PROCESS OBSERVER Thee Sandidge
U.S. Steel Corp., Gary, Works

START TIME 12:03
FINISH TIME 1:00

U.S. EPA "Rep" Pete Kaufman

OVEN NO.	DOOR REMOVED	PUSH BEGAN	PUSH ENDED	TRAVEL BEGAN	TRAVEL ENDED	DOOR REPLACED	COKING TIME	PUSH OPACITY 0	PUSH OPACITY 15	PUSH OPACITY 30	PUSH OPACITY 45	TRAVEL OPACITY 0	TRAVEL OPACITY 15	TRAVEL OPACITY 30	TRAVEL OPACITY 45
			AVG.	OPACITY -	5.0		22 HRS	0	20	5	0	0	5	0	
							49 MIN								
21	12:04	12:14	+ 54	54	+ 31	+ 62									
			AVG.	OPACITY -	16.6		22 HRS	5	30	15	5	25	20		
							8 MIN								
31	12:19	12:27	+ 54	54	+ 26	+ 63									
			AVG.	OPACITY -	1.6		23 HRS	0	5	5	0	0	0		
							1 MIN								
41	12:34	12:41	+ 53	53	+ 22	+ 70									
			AVG	OPACITY -	1.6		22 HRS	5	5	0	0	0	0		
							18 MIN								
51	12:45	12:53	+ 49	49	+ 16	+ 68									
			+		+	+									

USING ONE SPOT CAR (9113); BAG HOUSE IN OPERATION
Duct + Hood Coupled

OVEN NUMBERS OF PUSHES EXHIBITING AN AVERAGE OPACITY OF MORE THAN 20% NONE

INSPECTING AGENCY - ACUREX
REGULATORY PERSONNEL - JOE MICELI

PUSHING INSPECTION

DATE 5-18-83 BATTERY # 7

PROCESS OBSERVER BOB TREZAK
U.S. Steel Corp., Gary, Works

START TIME 7:00
FINISH TIME 8:58

OVEN NO.	DOOR REMOVED	PUSH BEGAN	PUSH ENDED	TRAVEL BEGAN	TRAVEL ENDED	DOOR REPLACED	COKING TIME	PUSH OPACITY 0	PUSH OPACITY 15	PUSH OPACITY 30	PUSH OPACITY 45	TRAVEL OPACITY 0	TRAVEL OPACITY 15	TRAVEL OPACITY 30	TRAVEL OPACITY 45
13	7:22	7:24	+43	43	+18	+79	20 HRS. 19 MIN	0	5	20		10	10		
	AVE. OPACITY - 9%														
23	7:27	7:30	+42	42	+28	+88	20 HRS 35 MIN	0	0	0		0	0		
	AVE. OPACITY - 0%														
33	7:34	7:39	+40	40	+42	+83	20 HRS. 34 MIN	0	5	0		0	5	5	
	AVE. OPACITY - 2.5%														
43	7:45	7:47	+45	45	+24	+104	20 HRS 31 MIN	0	10	0	15	10	5		
	AVE. OPACITY - 6.7%														
53	8:37	8:40	+47	47	+18	+113	21 HRS. 14 MIN	0	5	15	30	15	5		
	AVE. OPACITY - 11.7%														
63	8:44	8:54	+54	54	+25	+116	21 HRS. 18 MIN	0	10	0	0	0	0		
	AVE. OPACITY - 1.7%														

PUSHES OBSERVED DURING SOURCE SAMPLING ON #5-7 BAGHOUSE

OVEN NUMBERS OF PUSHES EXHIBITING AN AVERAGE OPACITY OF MORE THAN 20% NONE

USING ONE SPOT LAND BASED BAGHOUSE, HOOD AND DUCT COUPLED.

INSPECTING AGENCY- ACUREX
REGULATORY PERSONNEL - JOE MICELI

PUSHING INSPECTION

DATE 5-18-83 BATTERY # 7

PROCESS OBSERVER BOB TREZAK
U.S. Steel Corp., Gary, Works

START TIME 8:59
FINISH TIME 10:53

OVEN NO.	DOOR REMOVED	PUSH BEGAN	PUSH ENDED	TRAVEL BEGAN	TRAVEL ENDED	DOOR REPLACED	COKING TIME	PUSH OPACITY 0	PUSH OPACITY 15	PUSH OPACITY 30	PUSH OPACITY 45	TRAVEL OPACITY 0	TRAVEL OPACITY 15	TRAVEL OPACITY 30	TRAVEL OPACITY 45
73	8:59	9:07	+43	43	+15	+123	21 HRS. 23 MIN.	0	0	10		10	10		
	AVE. OPACITY - 6%														
1	9:18	9:29	+39	39	+34	+107	21 HRS. 39 MIN.	0	5	0		0	0	0	
	AVE. OPACITY - 0.8%														
11	9:33	9:42	+45	45	+31	+114	21 HRS. 47 MIN.	0	0	0	0	0	0	0	
	AVE. OPACITY - 0%														
21	10:16	10:21	+43	43	+31	+96	21 HRS. 31 MIN.	0	0	0		0	0	0	
	AVE. OPACITY - 0%														
31	10:26	10:34	+54	54	+35	+108	21 HRS. 26 MIN.	0	0	0	0	0	0	0	
	AVE. OPACITY - 0%														
41	10:38	10:48	+44	44	+30	+89	21 HRS. 30 MIN.	0	0	40		25	20	15	
	AVE. OPACITY - 16.7%														

PUSHES OBSERVED DURING SOURCE SAMPLING ON #5-7 BAGHOUSE

OVEN NUMBERS OF PUSHES EXHIBITING
AN AVERAGE OPACITY OF MORE THAN 20% NONE

USING ONE SPOT LAND BASED BAGHOUSE, HOOD AND DUCT COUPLED

INSPECTING AGENCY- ACUREX
REGULATORY PERSONNEL-JOE MICELI

PUSHING INSPECTION

DATE 5-18-83 BATTERY # 7

PROCESS OBSERVER BOB TREZAK
U.S. Steel Corp., Gary, Works

START TIME 10:54
FINISH TIME 12:39

OVEN NO.	DOOR REMOVED	PUSH BEGAN	PUSH ENDED	TRAVEL BEGAN	TRAVEL ENDED	DOOR REPLACED	COKING TIME	PUSH OPACITY 0	PUSH OPACITY 15	PUSH OPACITY 30	PUSH OPACITY 45	TRAVEL OPACITY 0	TRAVEL OPACITY 15	TRAVEL OPACITY 30	TRAVEL OPACITY 45
51	10:54	11:00	+49	49	+20	+101	21 HRS. 32 MIN.	0	15	10	70	20	20		
	AVE. OPACITY - 22.5%														
61	11:37	11:40	+43	43	+25	+98	22 HRS. 3 MIN.	0	0	0		0	0		
	AVE. OPACITY - 0%														
71	11:44	11:54	+43	43	+25	+94	22 HRS. 6 MIN.	0	0	0		0	0		
	AVE. OPACITY - 0%														
5	12:01	12:08	+62	62	+24	+100	22 HRS. 12 MIN.	0	5	0	35	20	20		
								5							
	AVE. OPACITY - 14.2%														
15	12:12	12:22	+41	41	+34	+114	22 HRS. 18 MIN	0	0	0		0	0	0	
	AVE. OPACITY - 0%														
25	12:27	12:35	+42	42	+30	+99	22 HRS. 25 MIN.	0	0	0		0	0	0	
	AVE. OPACITY - 0%														

PUSHES OBSERVED DURING SOURCE SAMPLING ON # 5-7 BAGHOUSE

OVEN NUMBERS OF PUSHES EXHIBITING AN AVERAGE OPACITY OF MORE THAN 20% # 51

USING ONE SPOT LAND BASED BAGHOUSE, HOOD AND DUCT COUPLED.

INSPECTING AGENCY- ACUREX
REGULATORY PERSONNEL- JOE MICELI

PUSHING INSPECTION

DATE 5-18-83 BATTERY # 7

PROCESS OBSERVER BOB TREZAK
U.S. Steel Corp., Gary, Works

START TIME 12:40
FINISH TIME 1:05

OVEN NO.	DOOR REMOVED	PUSH BEGAN	PUSH ENDED	TRAVEL BEGAN	TRAVEL ENDED	DOOR REPLACED	COKING TIME	PUSH OPACITY 0	PUSH OPACITY 15	PUSH OPACITY 30	PUSH OPACITY 45	TRAVEL OPACITY 0	TRAVEL OPACITY 15	TRAVEL OPACITY 30	TRAVEL OPACITY 45
35	12:40	12:48	+43	43	+20	+97	22HRS. 33MIN	0	0	0		5	0		
	AVE. OPACITY - 1%														
45	12:56	1:02	+43	43	+28	+104	22HRS. 42MIN	0	10	0		0	0		
	AVE. OPACITY - 2%														

PUSHES OBSERVED DURING SOURCE SAMPLING ON #5-7 BAGHOUSE

OVEN NUMBERS OF PUSHES EXHIBITING AN AVERAGE OPACITY OF MORE THAN 20% NONE

USING ONE SPOT LAND BASED BAGHOUSE, HOOD AND DUCT COUPLED

PUSHING INSPECTION

DATE 5-19-83 BATTERY # 7

PROCESS OBSERVER BOB TREZAK
U.S. Steel Corp., Gary, Works

START TIME 9:40
FINISH TIME 12:27

INSPECTING AGENCY - ACUREX
REGULATORY PERSONNEL JOE MICELI

OVEN NO.	DOOR REMOVED	PUSH BEGAN	PUSH ENDED	TRAVEL BEGAN	TRAVEL ENDED	DOOR REPLACED	COKING TIME	PUSH OPACITY 0	PUSH OPACITY 15	PUSH OPACITY 30	PUSH OPACITY 45	TRAVEL OPACITY 0	TRAVEL OPACITY 15	TRAVEL OPACITY 30	TRAVEL OPACITY 45
45	9:40	9:45	+43	43	+25	+371	20 HRS. 25 MIN.	0	0	0		0	0		
	AVE. OPACITY - 0%														
55	10:40	10:45	+44	44	+22	+103	21 HRS 20 MIN.	0	0	0		0	0		
	AVE. OPACITY - 0%														
65	10:48	10:56	+43	43	+24	+96	21 HRS. 6 MIN	0	5	5		10	10		
	AVE. OPACITY - 6%														
75	11:00	11:06	+44	44	+23	+86	21 HRS. 11 MIN.	0	15	0		5	5		
	AVE. OPACITY - 5%														
9	11:12	11:17	+44	44	+20	+106	21 HRS. 2 MIN.	0	0	0		—	—		
	AVE. OPACITY - 0%														
19	12:08	12:22	+42	42	+30	+105	20 HRS. 41 MIN	0	0	0		0	0	0	

PUSHES OBSERVED DURING SOURCE SAMPLING ON # 5/7 BAGHOUSE

— = VIEW OBSTRUCTED.

OVEN NUMBERS OF PUSHES EXHIBITING
AN AVERAGE OPACITY OF MORE THAN 20% NONE

USING ONE SPOT LAND BASED BAGHOUSE, HOOD AND DUCT COUPLED.

PUSHING INSPECTION

DATE 5-19-83 BATTERY # 7

PROCESS OBSERVER BOB TREZAK
U.S. Steel Corp., Gary, Works

START TIME 12:28 PM
FINISH TIME 3:00 PM

INSPECTING AGENCY - ACUREX
REGULATORY PERSONNEL - JOE MICELI

OVEN NO.	DOOR REMOVED	PUSH BEGAN	PUSH ENDED	TRAVEL BEGAN	TRAVEL ENDED	DOOR REPLACED	COKING TIME	PUSH OPACITY 0	PUSH OPACITY 15	PUSH OPACITY 30	PUSH OPACITY 45	TRAVEL OPACITY 0	TRAVEL OPACITY 15	TRAVEL OPACITY 30	TRAVEL OPACITY 45
29	12:28	12:32	+43	43	+24	+146	20HRS. 39MIN.	0	5	5		0	0		
	AVE. OPACITY - 2%														
39	12:38	12:42	+43	43	+56	+126	20HRS. 44MIN	0	0	5		0	5	15	15
	AVE. OPACITY - 6.7%														
49	1:39	1:47	+40	40	+40	+76	20HRS. 44MIN	0	0	0		0	0	0	
	AVE. OPACITY - 0%														
59	1:52	1:56	+45	45	+23	+101	20HRS 43MIN.	0	0	0		0	0		
	AVE. OPACITY - 0%														
69	2:00	2:04	+42	42	+19	+103	20HRS. 41MIN	0	0	0		0	0		
	AVE. OPACITY - 0%														
7	2:12	2:17	+49	49	+39	+129	20HRS 42MIN	0	10	0		25	15	10	
	AVE. OPACITY - 10%														

PUSHES OBSERVED DURING SOURCE SAMPLING ON #5/7 BAGHOUSE

- = VIEW OBSTRUCTED

OVEN NUMBERS OF PUSHES EXHIBITING AN AVERAGE OPACITY OF MORE THAN 20% NONE

USING ONE SPOT LAND BASED BAGHOUSE, HOOD AND DUCT COUPLED

PUSHING INSPECTION

DATE 5-19-83 BATTERY # 7

PROCESS OBSERVER BOB TREZAK
U.S. Steel Corp., Gary, Works

START TIME 3:00 PM
FINISH TIME 6:00 PM

INSPECTING AGENCY - ACUREX
REGULATORY PERSONNEL - JOE MICELI

OVEN NO.	DOOR REMOVED	PUSH BEGAN	PUSH ENDED	TRAVEL BEGAN	TRAVEL ENDED	DOOR REPLACED	COKING TIME	PUSH OPACITY 0	PUSH OPACITY 15	PUSH OPACITY 30	PUSH OPACITY 45	TRAVEL OPACITY 0	TRAVEL OPACITY 15	TRAVEL OPACITY 30	TRAVEL OPACITY 45
17	4:15	4:21	+43	43	+19	+111	22HRS. 36MIN	0	0	0		0	5		
	AVE. OPACITY - 1%														
27	4:25	4:30	+42	42	+23	+108	22HRS. 35MIN	0	0	0		0	0		
	AVE. OPACITY - 0%														
37	4:34	4:39	+41	41	+26	+107	22HRS. 36MIN	0	0	0		0	0		
	AVE. OPACITY - 0%														
47	4:43	4:48	+43	43	+20	+113	22HRS. 40MIN	0	0	0		0	0		

PUSHES OBSERVED DURING SOURCE SAMPLING ON #5/7 BAGHOUSE.

- = VIEW OBSTRUCTED
OVEN NUMBERS OF PUSHES EXHIBITING
AN AVERAGE OPACITY OF MORE THAN 20% _____

USING ONE SPOT LAND BASED BAGHOUSE, HOOD AND DUCT COUPLED

PUSHING INSPECTION

DATE 5/19/83 BATTERY # 5

PROCESS OBSERVER Thee Sandridge
U.S. Steel Corp., Gary, Works

START TIME 9:15
FINISH TIME 1:08

US EPA "REP." Pete Kaufman

OVEN NO.	DOOR REMOVED	PUSH BEGAN	PUSH ENDED	TRAVEL BEGAN	TRAVEL ENDED	DOOR REPLACED	COKING TIME	PUSH OPACITY 0	PUSH OPACITY 15	PUSH OPACITY 30	PUSH OPACITY 45	TRAVEL OPACITY 0	TRAVEL OPACITY 15	TRAVEL OPACITY 30	TRAVEL OPACITY 45
			AVG	OPACITY	- 3.3		20 HRS	0	0	0	5	5	5	5	
61	9:33	9:42	+ 47	47	+31	+62	7MIN								
			AVG	OPACITY	- 2.5		20 HRS	0	5	0	0	5	5		
71	9:47	10:02	+ 58	58	+23	+74	14MIN								
			AVG	OPACITY	- 5.8		20 HRS	0	0	0	0	15	20		
5	10:13	10:26	+ 46	46	+24	+75	19MIN								
			AVG	OPACITY	- 14.1		21 HRS	0	35	10	0	20	20		
15	10:30	11:43	+ 62	62	+28	+135	23MIN	0							
			AVG	OPACITY	- 5.0		21 HRS	0	0	0	0	15	15		
35	11:51	11:57	+ 58	58	+28	+75	22MIN								
			AVG	OPACITY	- 5.8		21 HRS	0	5	10	5	10	5		
45	1:03	1:05	+ 48	48	+22	+60	16MIN								

USING ONE SPOT CAR (9114); BAG HOUSE IN OPERATION
Door & Hood Coupled

OVEN NUMBERS OF PUSHES EXHIBITING
AN AVERAGE OPACITY OF MORE THAN 20% NONE

NOTE: AFTER #15 Push (ONE SPOT CAR ENGINE PROBLEM
DELAYED TRAVEL TAKE off)

PUSHING INSPECTION

DATE 5/19/83 BATTERY # 5

PROCESS OBSERVER Thee Sandidge
U.S. Steel Corp., Gary, Works

START TIME 1:09
FINISH TIME 2:50

U.S. EPA "Rep" Pete Kaufman

OVEN NO.	DOOR REMOVED	PUSH BEGAN	PUSH ENDED	TRAVEL BEGAN	TRAVEL ENDED	DOOR REPLACED	COKING TIME	PUSH OPACITY 0	PUSH OPACITY 15	PUSH OPACITY 30	PUSH OPACITY 45	TRAVEL OPACITY 0	TRAVEL OPACITY 15	TRAVEL OPACITY 30	TRAVEL OPACITY 45
			AVG.	OPACITY	- 2.5		21 HRS	0	5	0	0	5	5		
55	1:10	1:13	+ 49	49	+ 21	+ 63	14 MIN								
			AVG.	OPACITY	- 1.6		21 HRS	0	0	0	0	5	5		
65	1:17	1:21	+ 45	45	+ 16	+ 69	16 MIN								
			AVG.	OPACITY	- 2.5		21 HRS	0	0	0	5	5	5		
75	1:29	1:32	+ 56	56	+ 18	+ 72	9 MIN								
			AVG	OPACITY	- 0		21 HRS	0	0	0		0	0	0	
9	2:23	2:28	+ 41	41	+ 30	+ 90	6 MIN								
			AVG.	OPACITY	- 0		21 HRS	0	0	0		0	0	0	
19	2:32	2:35	+ 44	44	+ 31	+ 65	7 MIN								
			AVG.	OPACITY	- 3.0		21 HRS	0	10	0		5	0		
29	2:39	2:47	+ 40	40	+ 23	+ 62	4 MIN								

USING ONE SPOT CAR (9113); BAG HOUSE IN OPERATION
Duct - Hood Coupled

OVEN NUMBERS OF PUSHES EXHIBITING
AN AVERAGE OPACITY OF MORE THAN 20% NONE

PUSHING INSPECTION

DATE 5/19/83 BATTERY # 5

PROCESS OBSERVER Thee Sandidge
U.S. Steel Corp., Gary, Works

START TIME 2:51
FINISH TIME 5:18

U.S. EPA "Rep" PETE KAUFMANN

OVEN NO.	DOOR REMOVED	PUSH BEGAN	PUSH ENDED	TRAVEL BEGAN	TRAVEL ENDED	DOOR REPLACED	COKING TIME	PUSH OPACITY 0	PUSH OPACITY 15	PUSH OPACITY 30	PUSH OPACITY 45	TRAVEL OPACITY 0	TRAVEL OPACITY 15	TRAVEL OPACITY 30	TRAVEL OPACITY 45
			AVG.	OPACITY	- 0		22 HRS	0	0	0		0	0		
39	3:24	3:31	+ 43	43	+ 18	+ 101	31 MIN								
			AVG	OPACITY	- 0		22 HRS	0	0	0	0	0	0		
49	3:37	3:42	+ 45	45	+ 21	+ 115	33 MIN								
			AVG.	OPACITY	- 1.0		22 HRS	0	0	0		0	5		
59	3:49	3:54	+ 43	43	+ 18	+ 96	39 MIN								
			AVG.	OPACITY	- 0		22 HRS	0	0	0	0	0	0		
69	4:00	4:07	+ 45	45	+ 15	+ 92	41 MIN								
			AVG	OPACITY	- 1.6		23 HRS	0	10	0		0	0	0	
7	4:59	5:03	+ 44	44	+ 31	+ 90	20 MIN								
			AVG.	OPACITY	- 0		23 HRS	0	0	0	0	0	0		
17	5:08	5:13	+ 45	45	+ 18	+ 93	39 MIN								

USING ONE SPOT CAR (9113); BAG HOUSE IN OPERATION

Duct - Hood Coupled

OVEN NUMBERS OF PUSHES EXHIBITING AN AVERAGE OPACITY OF MORE THAN 20% NONE

PUSHING INSPECTION

DATE 5/19/83 BATTERY # 5

PROCESS OBSERVER Thee Sandidge START TIME 5:19
U.S. Steel Corp., Gary, Works FINISH TIME 6:00
U.S. EPA "REP" PETE KAUFMAN

OVEN NO.	DOOR REMOVED	PUSH BEGAN	PUSH ENDED	TRAVEL BEGAN	TRAVEL ENDED	DOOR REPLACED	COKING TIME	PUSH OPACITY 0	PUSH OPACITY 15	PUSH OPACITY 30	PUSH OPACITY 45	TRAVEL OPACITY 0	TRAVEL OPACITY 15	TRAVEL OPACITY 30	TRAVEL OPACITY 45
			AVG.	OPACITY	- 2.5		23 HRS	0	10	5	0	0	0		
27	5:20	5:25	+ 46	46	+ 17	+ 117	22 MIN								
			AVG.	OPACITY	- 1.0		23 HRS	0	0	5		0	0		
37	5:31	5:38	+ 43	43	+ 18	+ 98	30 MIN								

USING ONE SPOT CAR (9113); BAG HOUSE IN OPERATION.

Duct + Hood Coupled

OVEN NUMBERS OF PUSHES EXHIBITING AN AVERAGE OPACITY OF MORE THAN 20% NONE

United States Steel Corporation
Engineering – Steel

Plant Engineering
Gary Works

5-17-83

No. 5/7 Coke Battery
Pushing Emission Control System
Compliance Test Operating Data

Battery No.	Oven No.	I.D. Fan Amps	Baghouse ΔP (in. wg)	Inlet Duct Temp (°F)
7	66	65	9.2	105
5	26	66	9.2	185
7	76	65	9.2	100
5	36	65	9.2	165
5	46	65	9.2	160
7	8	66	9.0	120
5	56	65	9.0	160
7	18	65	8.8	130
5	66	65	9.2	170
7	28	67	9.2	130
5	76	68	9.6	145
7	38	67	9.0	125
7	48	67	9.2	120
5	8	66	9.2	180
5	18	66	9.2	170
7	58	67	9.0	115
5	28	66	9.2	180
7	68	67	9.0	120
5	38	66	9.2	165
7	3	67	9.2	140
5	48	67	9.2	180
7	13	67	9.2	160
5	58	66	9.2	170
7	23	67	9.4	150
5	68	67	9.4	170
7	33	66	9.2	140
5	3	67	9.4	190
7	43	66	9.4	130
7	53	66	9.4	130
5	13	67	9.8	170
7	63	67	9.2	125
7	73	66	9.2	120
7	1	66	9.2	135
7	11	66	9.0	145
5	23	66	9.2	135
5	33	66	9.4	180
5	43	66	9.4	170

APPENDIX #

United States Steel Corporation
Engineering - Steel

Plant Engineering
Gary Works

5-18-83

No. 5/7 Coke Battery
Pushing Emission Control System
Compliance Test Operating Data

Battery No.	Oven No.	ID Fan Amps	Baghouse ΔP (in. wg)	Inlet Duct Temp (°F)
7	13	66	10.0	160
7	23	66	10.0	135
7	33	67	10.0	130
7	43	66	10.0	140
7	53	67	10.0	145
5	58	66	10.0	165
7	63	66	10.0	125
5	68	66	11.0	175
7	73	66	10.0	130
5	3	68	11.2	200
7	1	67	10.2	150
5	13	66	10.5	210
7	11	66	10.5	165
5	23	66	11.0	210
5	33	66	11.0	210
5	43	66	11.0	200
7	21	66	10.5	145
5	53	67	12.0	375 *
7	31	66	11.3	150
5	63	66	11.0	180
7	41	66	10.5	150
5	73	66	12.0	185
7	51	66	11.0	170
7	61	66	10.0	130
5	1	66	11.5	190
7	71	66	10.5	125
5	11	66	11.2	220
7	5	66	11.0	195
5	21	66	11.2	205
7	15	66	11.0	155
5	31	66	11.8	195
7	25	66	11.0	155
5	41	66	11.0	190
7	35	66	12.0	175
5	51	66	11.2	180
7	45	67	11.0	140

* The inlet duct temperature exceeded 300°F during the push cycle of No. 53 oven on No. 5 Battery. This high temperature caused the emergency air tempering damper on the baghouse to open. This damper allows ambient air to be drawn into the system to reduce the gas temperature to protect the bags from heat damage.

APPENDIX H

United States Steel Corporation
Engineering - Steel

Plant Engineering
Gary Works
5-19-83

No. 5/7 Coke Battery
Pushing Emission Control System
Compliance Test Operating Data

Battery No.	Oven No.	ID Fan Amps	Baghouse ΔP (in. wg)	Inlet Duct Temp. (°F)
5	61	66	11.8	180
7	45	66	11.2	140
5	71	67	11.2	160
5	5	66	11.0	200
7	55	67	11.4	120
7	65	66	11.6	130
7	75	66	11.2	125
7	9	66	11.2	150
5	15	66	11.4	210
5	35	66	11.2	185
7	19	66	11.4	140
7	29	66	11.4	140
7	39	66	11.2	145
5	45	66	11.4	160
5	55	66	11.2	190
5	65	67	11.6	190
5	75	67	11.4	170
7	49	67	11.2	135
7	59	66	11.4	155
7	69	67	11.5	130
5	7	66	11.3	160
5	9	66	11.2	210
5	19	67	11.4	205
5	29	68	11.8	195
5	39	67	11.5	170
5	49	67	11.4	180
5	59	67	11.4	180
5	69	67	11.4	180
5	17	67	11.4	145
5	27	66	11.3	140
5	37	67	11.2	140
5	47	67	11.6	135
7	7	67	11.6	210
7	17	66	11.6	200
7	27	67	11.4	210
7	37	67	11.4	200

APPENDIX H

ACUREX Corporation

Energy & Environmental Division

May 2, 1983

Mr. Edward Wojciechowski (5AC-26)
U.S. ENVIRONMENTAL PROTECTION AGENCY
Air Compliance Branch, Region V
230 S. Dearborn St.
Chicago, IL 60604

Subject: Baghouse Testing at U.S. Steel Corporation
No. 5/7 Coke Battery Pushing Emission Control Stack

Dear Mr. Wojciechowski:

As you requested, I reviewed the traverse data supplied to me by Mr. William Kubick of U.S. Steel Corporation, Gary Works, Gary, Indiana. The No. 5/7 Coke Battery Pushing Emission Control Baghouse Stack ΔP data appears to be quite uniform.

It is my opinion that the reduction of sampling points from 44 to 36 would not compromise the sample. Testing 44 and 36 points should yield an approximate sample volume of 35 and 29 cubic feet, respectively; a reduction of six cubic feet, even at a low grain loading, should not create a significant change. However, a 32 point traverse might reduce the sample volume to questionable levels.

If you have any questions, please feel free to contact me.

Sincerely,

Joseph V. Miceli
Manager
Chicago Office

JVM:cfb

7767 WEST 96TH PLACE, HICKORY HILLS, IL 60457 PHONE (312) 430-4545

CORPORATE HEADQUARTERS
485 CLYDE AVENUE, MOUNTAIN VIEW, CA 94042 PHONE(415) 964-3200 TELEX: 34-6391 TWX: 910-3796593

G-15608 REV. 153 02.000.0483
UNITED STATES STEEL CORPORATION

MEMORANDUM

REDUCE WASTE | SAVE TIME and MATERIAL

TO Pete Kaufmann
Accurex

DATE 4-25-83
219-944-2000
3385

The existing test protocol requires that 44 points be sampled for this test — could this number be reduced to 36 without significantly affecting the test results? —

estimated grain loadings are ~ .005 gr/dscf (within compliance by a factor of 5)

Per Wojo's request

FROM _____
DEPARTMENT OR WORKS

SIGNED Bill Kubick

G-15608 REV. 153 02.000.0483
UNITED STATES STEEL CORPORATION

MEMORANDUM

REDUCE WASTE | SAVE TIME and MATERIAL

TO Wojo
Re: 5/7 Bat. Baghouse test

DATE 4-22-83

this is the velocity traverse that you requested. During actual testing, the volume of gas sampled at each point will be ~ 0.8 ft^3 (std) for ~ 0.9 minutes per point giving a sampling rate of ~ 0.72 scfm.

Baghouse operating parameters which will be recorded during the test are: (1) Fan Amps, (2) Baghouse ΔP, and (3) inlet duct temperature.

Please call when you reach a decision so that I can schedule personnel accordingly.

cc: Don Kuh

FROM _____
DEPARTMENT OR WORKS

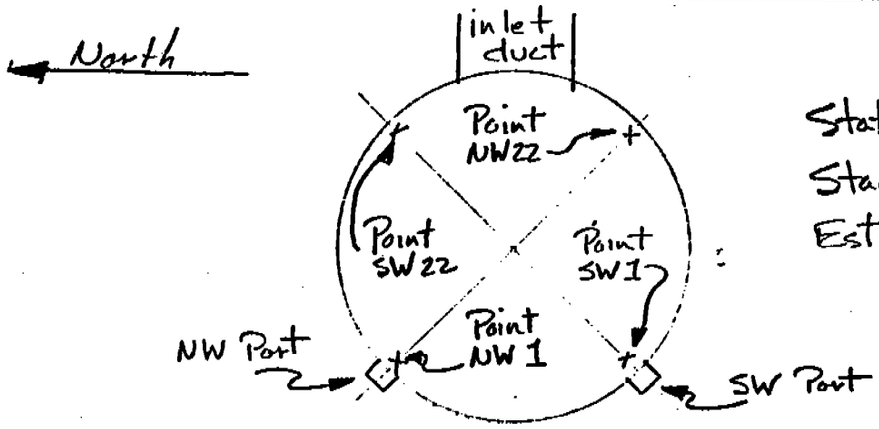
SIGNED Bill

United States Steel Corporation
Engineering – Steel

Plant Engineering
Gary Works

April 22, 1983

No. 5/7 Coke Battery Pushing Emission Control Baghouse Stack Duct Configuration and Velocity Traverse



Static pressure = + 0.66" wg.
Stack gas temp = ~98°F.
Estimated moisture = ~2%

Duct Diameter = 90.0"
Duct Area = 44.18 ft²
Distance from ports to downstream disturbance = 6.88 diameters
Distance from ports to upstream disturbance = 2.46 diameters

Velocity Traverse:

SW Port			NW Port		
Point No.	Distance from duct wall	ΔP (S-type pitot)	Point No.	Distance from duct wall	ΔP (S-type pitot)
1	89.01"	1.20" wg	1	89.01"	1.50" wg
2	86.85"	1.20"	2	86.85"	1.50"
3	84.60"	1.30"	3	84.60"	1.40"
4	82.17"	0.98"	4	82.17"	1.30"
5	79.56"	1.00"	5	79.56"	1.40"
6	76.86"	1.00"	6	76.86"	1.50"
7	73.80"	1.10"	7	73.80"	1.60"
8	70.38"	0.98"	8	70.38"	1.60"
9	66.51"	1.00"	9	66.51"	1.40"
10	61.65"	0.96"	10	61.65"	1.30"
11	54.63"	0.95"	11	54.63"	1.20"
12	35.37"	0.90"	12	35.37"	0.55"
13	28.35"	0.75"	13	28.35"	0.57"
14	23.49"	0.78"	14	23.49"	0.55"
15	19.62"	0.90"	15	19.62"	0.48"
16	16.20"	0.82"	16	16.20"	0.52"
17	13.14"	0.76"	17	13.14"	0.55"
18	10.44"	0.69"	18	10.44"	0.55"
19	7.83"	0.62"	19	7.83"	0.59"
20	5.40"	0.49"	20	5.40"	0.56"
21	3.15"	0.50"	21	3.15"	0.48"
22	0.99"	0.48"	22	0.99"	0.48"

W.S. Kubiak
(219-944-3385)