ESS

ENVIRONMENTAL
SOURCE SAMPLERS

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1.0 INTRODUCTION

On September 28, 1995, Environmental Source Samplers, Inc. (ESS) conducted source testing for Griffin Wheel Company. Testing was performed at the Bessemer, Alabama faciity on the baghouse serving the two (2) electric arc furnaces.

Sampling was performed for particulates, antimony, arsenic, beryllium, cadmium, chromium, cobalt, lead, manganese, nickel, selenium, zinc, mercury, oxides of nitrogen (NOX), carbon monoxide (CO), sulfur dioxide (SO2), and volatile organic compounds (VOCs). Particulate and metals emissions were measured by U. S. Environmental Protection Agency (EPA) Method 29 using an EPA Multiple Metals Train (MMT). NOX was sampled by EPA Method 7E, CO by EPA Method 10, SO2 by EPA Method 6C, and VOCs by EPA Method 25A. EPA Methods 1 - 4 were used in support of the above test procedures.

This sampling was performed as part of an in-house study of air emissions for Title V estimates. Personnel present included:

Mr. Butch Allen, Jefferson County Dept. of Health
Mr. Craig Peters, Griffin Wheel Company
Mr. Ray Ostrowski, Griffin Wheel Company
Mr. Walter Castleberry, Griffin Wheel Company
Mr. Mark Looney, Environmental Source Samplers
Mr. Robert Jackson, Environmental Source Samplers
Mr. John Mahoney, Environmental Source Samplers

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2.0 SUMMARY AND DISCUSSION OF RESULTS

The test results are summarized on the following three (3) pages. Field data sheets are included in Appendix A; calculations in Appendix B; operational data in Appendix C; laboratory data in Appendix D; and calibration data in Appendix E.

Particulate emissions averaged 1.407 lbs/hr, NOX emissions averaged 4.75 lbs/hr, SO2 emissions averaged 0.46 lb/hr, VOCs averaged 1.06 lb/hr as carbon, and CO averaged 47.65 lbs/hr. Small amounts of antimony, cadmium, chromium, cobalt, lead, manganese, nickel, zinc, and mercury were detected, and are reported on page 5.

Visual opacity was observed by Mr. Walter Castleberry of Griffin Whhel Company. This data appears in Appendix A.

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GRIFFIN WHEEL COMPANY
BESSEMER ALABAMA
PARTICULATE EMISSIONS TEST SUMMARY

RUN #	1	2	3	AVG
DATE	9/28/95	9/28/95	9/28/95	
TIME START (CDT)	11:26	13:26	15:28	
TIME COMPLETE (CDT)	12:33	14:33	16:33	
FLUE GAS TEMP (F)	121.0	130.0	126.2	125.7
FLUE GAS VELOCITY (FPS)	50.23	50.77	52.53	51.18
FLUE GAS FLOWRATE (MM ACFM)	0.122	0.123	0.127	0.124
FLUE GAS FLOWRATE (MM DSCFM)	0.109	0.108	0.113	0.110
VOL OF GAS SAMPLES (DSCF)	51.48	53.76	53.26	52.83
MOISTURE (%)	0.1	0.2	0.1	0.1
ISOKINETIC SAMPLE RATE (%)	93.3	98.0	93.2	94.8
BAROMETRIC PRESSURE (IN HG)	29.55	29.55	29.55	29.55
STACK PRESSURE (IN HG)	29.49	29.50	29.48	29.49
OXYGEN (%)	20.5	20.4	20.1	20.3
CARBON DIOXIDE (%)	0.1	0.3	0.2	0.2
CARBON MONOXIDE (%)	0.0	0.0	0.0	0.0
NITROGEN (%)	79.4	79.3	79.6	79.4
MOLECULAR WEIGHT OF GAS(MOLES)	28.98	29.00	28.96	28.98
PARTICULATE (GR/DSCF)	0.0019	0.0017	0.0009	0.0015
PARTICULATE (LBS/HR)	1.773	1.577	0.870	1.407

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GRIFFIN WHEEL BAGHOUSE - BESSEMER, ALABAMA

RUN NUMBER	1	2	3	AVG
DATE	9/28/95	9/28/95	9/28/95	
TIME START (CDT)	10:37	13:07	15:22	
TIME STOP (CDT)	12:37	15:07	17:22	
FLOWRATE (DSCFM)	109000	108000	113000	110000
CO2 (%-DRY)	0.13	0.29	0.22	0.21
O2 (%-DRY)	20.49	20.42	20.14	20.35
SO2 (PPM-DRY)	1.05	-0.00	0.20	0.42
SO2 (LBS/HR)	1.14	-0.00	0.22	0.46
NOX (PPM-DRY)	4.11	7.91	6.08	6.04
NOX (LBS/HR)	3.21	6.12	4.93	4.75
VOC AS CARBON (PPM)	3.89	4.96	6.54	5.13
VOC AS CARBON (LBS/HR)	0.79	1.00	1.38	1.06
CO (PPM-DRY)	117.49	68.05	111.64	99.06
CO (LBS/HR)	55.86	32.06	55.03	47.65

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SOURCE SAMPLERS

GRIFFIN WHEEL COMPANY
BESSEMER, ALABAMA
LAB ANALYSIS - AMOUNT COLLECTED

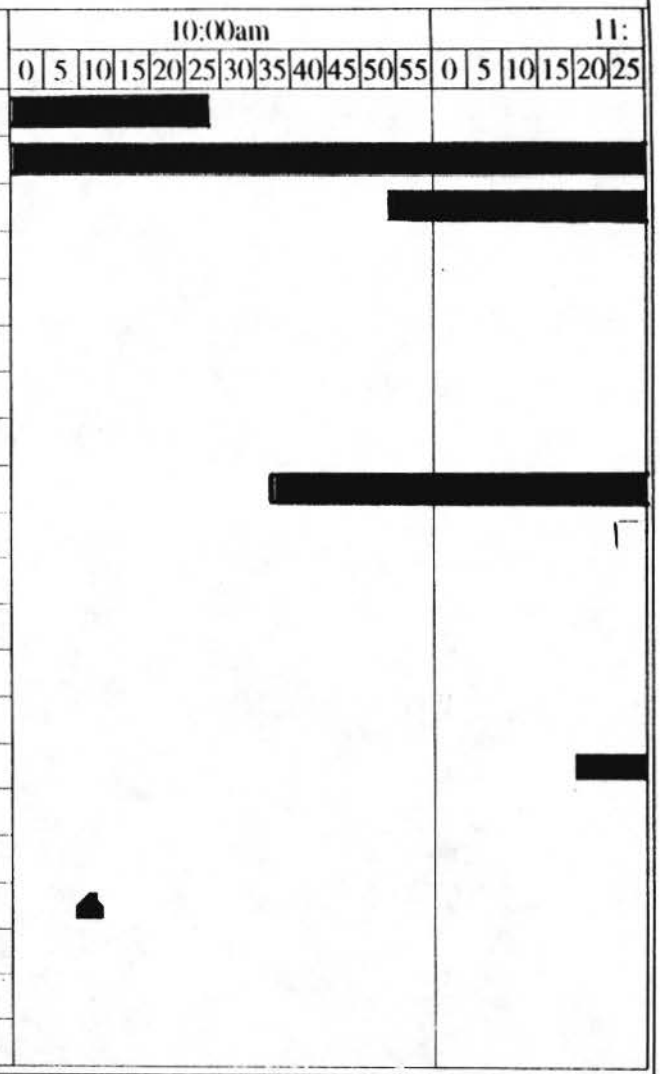
	RUN 1	RUN 2	RUN 3	AVG
PARTICULATE (GRAMS)	0.00640000	0.00600000	0.00320000	0.00520000
ANTIMONY (GRAMS)	0.00000000	0.00000000	0.00000054	0.00000018
ARSENIC (GRAMS)	0.00000000	0.00000000	0.00000000	0.00000000
BERYLLIUM (GRAMS)	0.00000000	0.00000000	0.00000000	0.00000000
CADMIUM (GRAMS)	0.00000111	0.00000111	0.00000088	0.00000103
CHROMIUM (GRAMS)	0.00000986	0.00000810	0.00003340	0.00001712
COBALT (GRAMS)	0.00000060	0.00000000	0.00000085	0.00000048
LEAD (GRAMS)	0.00000645	0.00000568	0.00000625	0.00000613
MANGANESE (GRAMS)	0.00029000	0.00007110	0.00007150	0.00014420
NICKEL (GRAMS)	0.00001010	0.00001210	0.00009960	0.00004060
SELENIUM (GRAMS)	0.00000000	0.00000000	0.00000000	0.00000000
ZINC (GRAMS)	0.00006440	0.00005250	0.00005040	0.00005577
MERCURY (GRAMS)	0.00000296	0.00001355	0.00000620	0.00000757

EMISSION RATE (LBS/HR)

	RUN 1	RUN 2	RUN 3	AVG
PARTICULATE (LBS/HR)	1.77300000	1.57700000	0.87000000	1.40666667
ANTIMONY (LB/HR)	0.00000000	0.00000000	0.00014681	0.00004894
ARSENIC (LB/HR)	0.00000000	0.00000000	0.00000000	0.00000000
BERYLLIUM (LB/HR)	0.00000000	0.00000000	0.00000000	0.00000000
CADMIUM (LB/HR)	0.00030750	0.00029175	0.00023952	0.00027959
CHROMIUM (LB/HR)	0.00213314	0.00156123	0.00849338	0.00406258
COBALT (LB/HR)	0.00016594	0.00000000	0.00023109	0.00013235
LEAD (LB/HR)	0.00164141	0.00135491	0.00155648	0.00151760
MANGANESE (LB/HR)	0.07857991	0.01701846	0.01771266	0.03777034
NICKEL (LB/HR	0.00222456	0.00263622	0.02651597	0.01045892
SELENIUM (LB/HR)	0.00000000	0.00000000	0.00000000	0.00000000
ZINC (LB/HR)	0.01630606	0.01234265	0.01219631	0.01361501
MERCURY (LB/HR)	0.00082001	0.00356139	0.00168563	0.00202234

PRODUCTION DATA DURING STACK TEST ON September 28,1995

Name	Scheduled Start	Scheduled Finish	Resource Names	Notes
Heat # J5405	8:34am	10:28am	Furnace #2	36464 lbs. Charged
Heat # J5406	9:54am	11:54am	Furnace #1	36350 lbs. Charged
Heat # J5407	10:54am	1:01pm	Furnace #2	36665 lbs. Charged
Heat # J5408	12:10pm	2:06pm	Furnace #1	36253 lbs. Charged
Heat # J5409	1:24pm	3:20pm	Furnace #2	36673 lbs. Charged
Heat # J5410	2:20pm	4:19pm	Furnace #1	36095 lbs. Charged
Heat # J5411	3:30pm	5:26pm	Furnace #2	36711 lbs. Charged
Heat # J5412	4:34pm	6:36pm	Furnace #1	37469 lbs. Charged
Gas Test # 1	10:37am	12:37pm	ESS	
Particulate Test # 1	11:26am	12:33pm	ESS	
Gas Test # 2	1:07pm	3:07pm	ESS	
Particulate Test # 2	1:26pm	2:33pm	ESS	
Gas Test # 3	3:22pm	5:22pm	ESS	
Particulate Test # 3	3:28pm	4:33pm	ESS	
Visible Emissions #1	11:20am	12:33pm	Griffin Wheel	
Visible Emissions #2	1:25pm	2:36pm	Griffin Wheel	
Visible Emissions #3	3:05pm	4:37pm	Griffin Wheel	
Pressure Drop Read'g	10:11am	10:12am	Griffin Wheel	4.3" W.C. 1 off-line
Pressure Drop Read'g	1:25pm	1:26pm	Griffin Wheel	3.7" W.C. all on-line
Pressure Drop Read'g	5:35pm	5:36pm	Griffin Wheel	4.0" W.C. all on-line
Pressure Drop Read'g	5:42pm	5:43pm	Griffin Wheel	4.0" W.C. all on-line



Project: Bessemer Stack Test
Date: 9/28/95

Furnace Operation
Gas Test
Particulate Test
Visible Emission Test
Delta P

Average Heat Duration 118.1 minutes
Average Duration Between Heats 17.3 minutes
Average Heats per Day 21.2
Average Tons per Day 387.2

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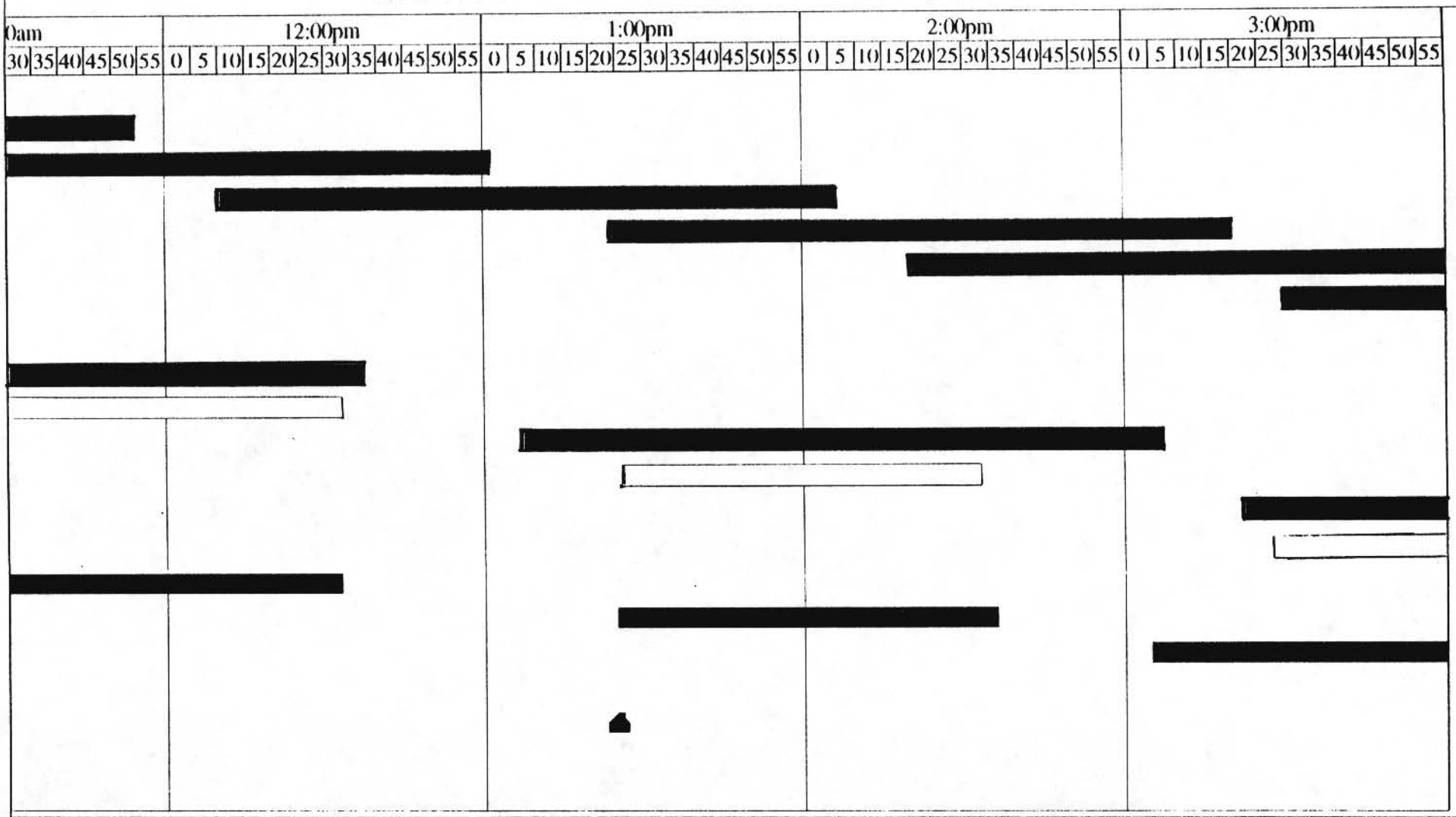
PRODUCTION DATA DURING STACK TEST ON September 28,1995



Project: Bessemer Stack Test
Date: 9/28/95

Furnace Operation	
Gas Test	
Particulate Test	
Visible Emission Test	
Delta P	
Average Heat Duration	118.1 minutes
Average Duration Between Heats	17.3 minutes
Average Heats per Day	21.2
Average Tons per Day	387.2

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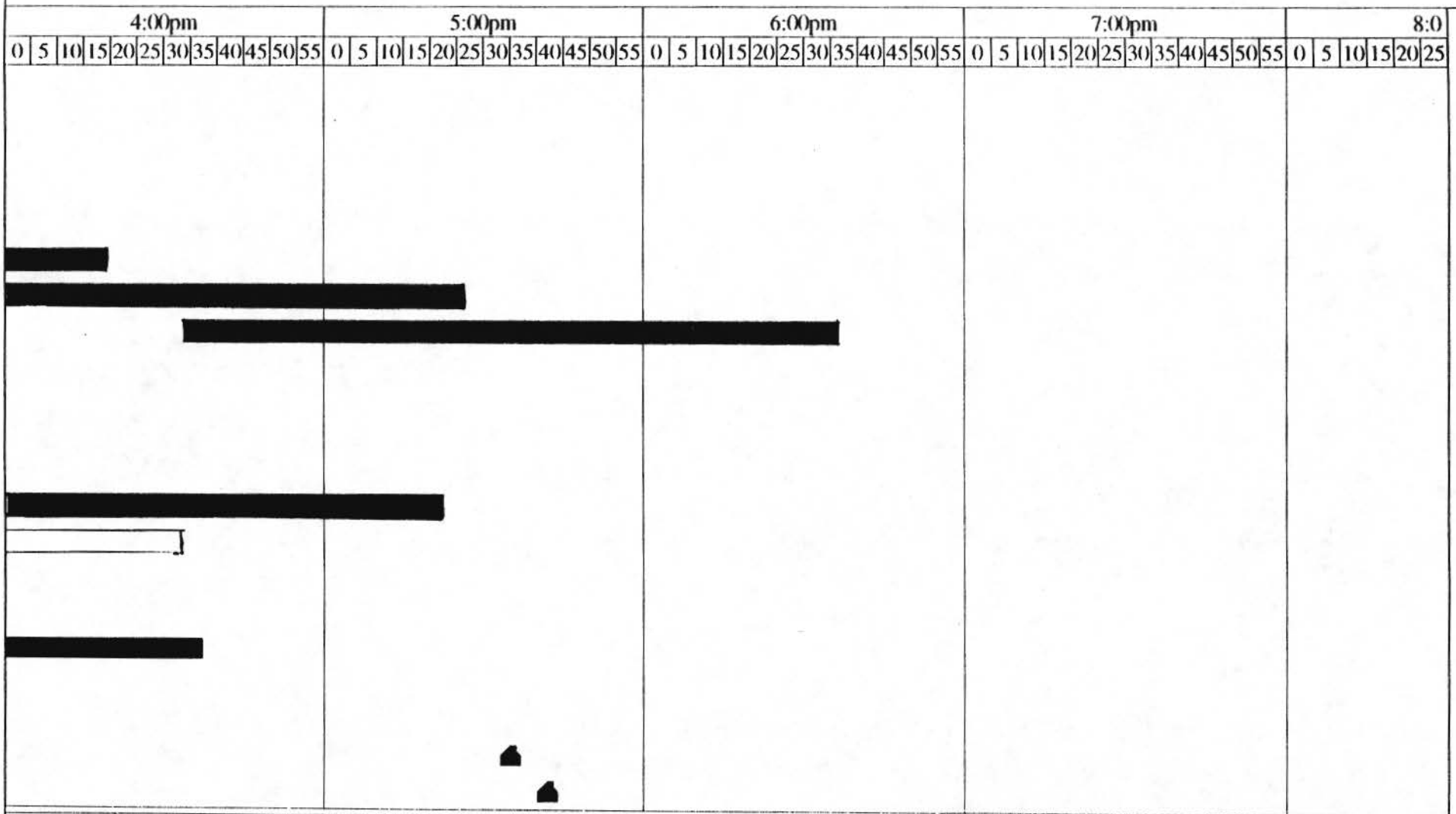
PRODUCTION DATA DURING STACK TEST ON September 28,1995



Project: Bessemer Stack Test
Date: 9/28/95

Furnace Operation	
Gas Test	
Particulate Test	
Visible Emission Test	
Delta P	
Average Heat Duration	118.1 minutes
Average Duration Between Heats	17.3 minutes
Average Heats per Day	21.2
Average Tons per Day	387.2

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Comparison of Results from Bessemer Fume Collector Stack Test

	Stack %	Dust Sample %
Antimony	0.0035	0.0001
Arsenic	0	0.0008
Beryllium	0	0
Cadmium	0.0198	0.038
Chromium	0.3292	0.04
Cobalt	0.0092	0.0012
Lead	0.1179	1.2
Manganese	2.7731	3.8
Nickel	0.7808	0.01
Selenium	0	0
Zinc	1.0725	11
Mercury	0.1456	

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DLZ Laboratories, Inc.

ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

R.L. FERGUSON
GRIFFIN WHEEL COMPANY
2100 GRIFFIN WHEEL DRIVE
BESSEMER, ALA. 35020

Page 1
Lab Number: SL09970-1
Report Date: 10/20/95
SLI Project Number: 9995-02

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
AFD SAMPLE (STACK)	Solid	CLIENT	28 SEP 95/15:00	04 OCT 95

CONSTITUENT	RESULT	*PQL	UNITS	METHOD	ANALYZED	BY
Antimony, Total	0.55	0.1	mg/Kg	7041	10-20-95	JEW
Arsenic, Total	8.0	2.0	mg/Kg	6010	10-20-95	JEW
Beryllium, Total	<0.5	0.5	mg/Kg	6010	10-20-95	JEW
Cadmium, Total	380	0.25	mg/Kg	6010	10-18-95	JEW
Chromium, Total	400	0.38	mg/Kg	6010	10-18-95	JEW
Cobalt, Total	12	2.5	mg/Kg	6010	10-20-95	JEW
Lead, Total	12000	0.76	mg/Kg	6010	10-18-95	JEW
Manganese, Total	38000	0.5	mg/Kg	6010	10-19-95	JEW
Mercury, Total						
Nickel, Total	100	1.3	mg/Kg	6010	10-18-95	JEW
Selenium, Total	<1.3	1.3	mg/Kg	6010	10-19-95	JEW
Zinc, Total	110000	0.51	mg/Kg	6010	10-18-95	JEW
Metals Prep						

* Practical Quanitation Limit

RESULTS OF MATERIAL ANALYSIS OF PARTICULATE MATTER COLLECTED BY THE ELECTRIC ARC FURNACE BAGHOUSE DURING THE STACK TEST.

STILSON Laboratories, Inc.

Prudence Mendoza

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With Additional Laboratory Facilities in Lansing, Michigan

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DLZ Laboratories, Inc.

R.L. FERGUSON
GRIFFIN WHEEL COMPANY
2100 GRIFFIN WHEEL DRIVE
BESSEMER, ALA. 35020

Lab Number: SL09970
Report Date: 10/20/95
SLI Project Number: 9995-02

I certify that the data presented as part of this report meets the minimum quality assurance standards specified in the referenced analytical method(s). Based on my review of the data, I believe that the submitted information is true, accurate, complete and meets the minimum standards specified in 40 CFR 136 and/or SW-846. Any exceptions encountered in the analysis of samples contained within this report have been noted and an assessment of the quality of the data is presented. I am aware that there are significant penalties for submitting with knowlege, false information, including the possibility of fines and/or imprisonment.

QC Manager

STILSON Laboratories, Inc.

Project Manager