MONTROSE
AIR QUALITY SERVICES

COMPLIANCE STACK EMISSION TEST REPORT

BASIC OXYGEN FURNACE (EUBOF) AND BASIC OXYGEN FURNACE SHOP OPERATIONS (FGBOFSHOP)

Determination of Manganese and Lead Emissions

Utilizing US EPA Methods 1, 2, 3, 4, and 29

Test Date(s): September 17, 2019
Facility ID: A8640
Source Location: Dearborn, Michigan
Permit: EGLE Renewable Operating Permit
No. MI-ROP-A8640-2016a

Prepared For:

AK Steel Corporation - Dearborn Works
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Test Plan: M049AS-555875-PP-7 & M049AS-555875-PP-16

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TEST RESULTS SUMMARY-1

Source Name:	**Basic Oxygen Furnace (BOF)**	**BOF Shop Operations**
Source ID :	**EUBOF**	**FGBOFSHOP**
Control Device:	**Electrostatic Precipitator (ESP)**	**Secondary Emissions Capture (SEC) Baghouse**
Sampling Location:	**Exhaust Stack**	**Exhaust Stack**
Sampling Location ID:	**SVBOFESP**	**SVBOFBH**
Test Date:	**9/17/2019**	
Production Rate (ton/hr)*	**343.2**	
Combined Manganese Emissions (lb/hr)	**0.16**	
Combined Permit Limit - Manganese (lb/hr)	*0.10*	
Compliance Permit Requirement Met (YES/NO)	*NO*	
Combined Lead Emissions (lb/hr)	**0.158**	
Combined Permit Limit - Lead (lb/hr)	*0.067*	
Compliance Permit Requirement Met (YES/NO)	*NO*	
Permit No.	**EGLE Renewable Operating Permit No. MI-ROP-A8640-2016a**	

* Production data was provided by AK Steel Corporation - Dearborn Works personnel.

REVIEW AND CERTIFICATION

The results of the Compliance Test conducted on September 17, 2019 are a product of the application of the United States Environmental Protection Agency (US EPA) Stationary Source Sampling Methods listed in 40 CFR Part 60, and Appendix A, 40 CFR Part 51, Appendix M, that were in effect at the time of this test.

All work, calculations, and other activities and tasks performed and presented in this document were carried out by me or under my direction and supervision. I hereby certify that, to the best of my knowledge, Montrose operated in conformance with the requirements of the Montrose Quality Management System and ASTM D7036-04 during this test project.

Signature: ____________ Date: 11/7/2019

Name: Steven Smith Title: Client Project Manager

I have reviewed, technically and editorially, details, calculations, results, conclusions, and other appropriate written materials contained herein. I hereby certify that, to the best of my knowledge, the presented material is authentic, accurate, and conforms to the requirements of the Montrose Quality Management System and ASTM D7036-04.

Signature: ____________ Date: 11-7-19

Name: Randal Tysar Title: District Manager

1.0 INTRODUCTION

1.1 SUMMARY OF TEST PROGRAM

The AK Steel Corporation - Dearborn Works (Facility ID: A8640), located in Dearborn, Michigan, contracted Montrose Air Quality Services, LLC (Montrose) of Detroit, Michigan, to conduct compliance stack emission testing for their Basic Oxygen Furnace (EUBOF) and Basic Oxygen Furnace Shop Operations (FGBOFSHOP). Testing was performed to satisfy the emissions testing requirements pursuant to Michigan Department of Environment, Great Lakes, and Energy (EGLE) Renewable Operating Permit MI-ROP-A8640-2016a. The testing was performed on September 17, 2019.

Simultaneous sampling was performed at the EUBOF electrostatic precipitator (ESP) Exhaust Stack (SVBOFESP) and FGBOFSHOP secondary emissions capture (SEC) Baghouse Exhaust Stack (SVBOFBH) to determine the combined emissions of manganese (Mn) and lead (Pb). Testing was conducted during normal shop operations. During this test emissions from EUBOF and FGBOFSHOP were controlled by an ESP and a baghouse.

The test methods that were conducted during this test were US EPA Methods 1, 2, 3, 4, and 29.

1.2 KEY PERSONNEL

The key personnel who coordinated this test program (and their phone numbers) were:

- David Pate, Senior Environmental Engineer, AK Steel Dearborn Works, 313-323-1261
- Mark Dziadosz, Environmental Quality Analyst (EQA), Michigan Department of Environment, Great Lakes and Energy (EGLE), 586-753-3745
- Jonathan Lamb, EQA, EGLE, 313-456-4685
- Steven Smith QI, Client Project Manager, Montrose, 734-751-9701
- Mason Sakshaug QI, Field Project Manager, Montrose, 248-548-7980
- Paul Diven QI, Field Project Manager, Montrose, 248-548-7980
- Jacob Young QI, Field Technician, Montrose, 248-548-7980
- David Koponen QI, Field Technician, Montrose, 248-548-7980

2.0 SUMMARY AND DISCUSSION OF TEST RESULTS

2.1 OBJECTIVES AND TEST MATRIX

The purpose of this test was to determine the emissions of Mn and Pb at the ESP Exhaust Stack and SEC Baghouse Exhaust Stack during normal shop operations. Testing was performed to satisfy the emissions testing requirements pursuant to EGLE Renewable Operating Permit MI-ROP-A8640-2016a.

The specific test objectives for this test were as follows:

- Simultaneously measure the concentrations of Mn and Pb at the ESP Exhaust Stack and SEC Baghouse Exhaust Stack.
- Simultaneously measure the actual and dry standard volumetric flow rate of the stack gas at the ESP Exhaust Stack and SEC Baghouse Exhaust Stack.
- Utilize the above variables to determine the emissions of Mn and Pb at the ESP Exhaust Stack and SEC Baghouse Exhaust Stack during normal shop operations.

Tables 2.1.1 and 2.1.2 present the sampling matrix log for this test.

2.2 FIELD TEST CHANGES AND PROBLEMS

No field test changes or problems occurred during the performance of this test that would bias the accuracy of the results of this test.

2.3 PRESENTATION OF RESULTS

One sampling train was utilized during each run at the ESP Exhaust Stack and SEC Baghouse Exhaust Stack to determine the emissions of Mn and Pb. At each location, the sampling train measured the stack gas volumetric flow rate, moisture content, and concentrations of Mn and Pb. Grab samples of the stack gas were analyzed for dry molecular weight determination.

Table 2.2 displays the emissions of Mn and Pb measured at the ESP Exhaust Stack and SEC Exhaust Stack during normal shop operations.

2.4 TEST METHOD DEVIATIONS

2.4.1 ESP Exhaust Stack Sampling

In order to provide a more representative sample, port changes did not take place during the oxygen blowing portion of the heat.

Testing was performed for an integral number of production cycles. All sample points were sampled while the heat was still in progress. Sampling was repeated for the final test port (and if necessary, moved to the previous test port) until the production cycle was completed.

The BOF facility at Dearborn Works consists of 2 BOF Vessels. The end of a heat on one vessel could overlap with portions of a heat on the other vessel. In this case, testing was concluded 3 minutes after the slag was emptied from the vessel being tested into a slag pot. For production calculations, production from the overlapping heat was pro-rated and included in the production rate calculations.

2.4.2 SEC Baghouse Exhaust Stack Sampling

Testing was performed for an integral number of production cycles. All sample points were sampled while the heat was still in progress. Sampling was repeated for the final test port (and if necessary, moved to the previous test port) until the production cycle was completed.

The BOF facility at Dearborn Works consists of 2 BOF Vessels. The end of a heat on one vessel could overlap with portions of a heat on the other vessel. In this case, testing was concluded 3 minutes after the slag was emptied from the vessel being tested into a slag pot. For production calculations, production from the overlapping heat was pro-rated and included in the production rate calculations.

All method deviations were specified in the test protocols and were approved in the EGLE test plan and approval letters. See Appendix E.

The ESP Test Plan specified that US EPA Method 3A would be utilized to measure O_2 anc CO_2 content in the ESP exhaust gas. During the August 13-14, 2019 testing, O_2 and CO_2 were measured along with NO_x and CO concentrations from a test trailer. A test trailer was not used during this mobilization, therefore, US EPA Method 3 was utilized to measure O_2 and CO_2 at the ESP. This was discussed with the EGLE Inspector onsite at the time of the test.

TABLE 2.1
SAMPLING MATRIX OF TEST METHODS UTILIZED

Date	Run No.	Sampling Location	US EPA METHODS 1/2 (Flow) Sampling Time / Duration (min)	US EPA METHOD 3 (Dry Molecular Wt.) Sampling Time / Duration (min)	US EPA METHOD 4 (%H_2O) Sampling Time / Duration (min)	US EPA METHOD 29 (Mn, Pb) Sampling Time / Duration (min)
9/17/2019	1	ESP Exhaust Stack	8:31 - 11:52 / 160	8:40 - 10:30 / 3	8:31 - 11:52 / 160	8:31 - 11:52 / 160
9/17/2019	2	ESP Exhaust Stack	12:42 - 15:15 / 132	12:50 - 14:30 / 3	12:42 - 15:15 / 132	12:42 - 15:15 / 132
9/17/2019	3	ESP Exhaust Stack	16:03 - 18:35 / 136	16:10 - 17:58 / 3	16:03 - 18:35 / 136	16:03 - 18:35 / 136
9/17/2019	1	SEC Baghouse Exhaust Stack	8:30 - 11:50 / 169	10:13 - 10:15 / 2	8:30 - 11:50 / 169	8:30 - 11:50 / 169
9/17/2019	2	SEC Baghouse Exhaust Stack	12:42 - 15:15 / 128	14:57 - 15:00 / 3	12:42 - 15:15 / 128	12:42 - 15:15 / 128
9/17/2019	3	SEC Baghouse Exhaust Stack	16:02 - 18:35 / 135	17:38 - 17:40 / 3	16:02 - 18:35 / 135	16:02 - 18:35 / 135

All times are Eastern Daylight Time.

TABLE 2.2
EMISSION RESULTS

Parameter	ESP Exhaust Stack			
	Run 1	Run 2	Run 3	Average
Lead Emissions (lb/hr)	0.09	0.21	0.12	0.14
Lead Concentration (mg/dscm)	0.039	0.093	0.048	0.060
Manganese Emissions (lb/hr)	0.15	0.20	0.13	0.16
Manganese Concentration (mg/dscm)	0.06	0.09	0.05	0.07
Stack Gas Average Flow Rate (acfm)	925,268	870,700	910,112	902,027
Stack Gas Average Flow Rate (scfm)	728,349	691,491	720,880	713,573
Stack Gas Average Flow Rate (dscfm)	645,438	610,359	642,502	632,766
Stack Gas Average Velocity (fpm)	4,076	3,836	4,010	3,974
Stack Gas Average Static Pressure (in-H_2O)	-0.60	-0.60	-0.60	-0.60
Stack Gas Average Temperature (°F)	199	194	195	196
Stack Gas Percent by Volume Moisture (%H_2O)	11.4	11.7	10.9	11.3
Measured Stack Inner Diameter (in)	204			
Percent by Volume Carbon Dioxide in Stack Gas (%-dry)	2.33	2.67	2.33	2.44
Percent by Volume Oxygen in Stack Gas (%-dry)	18.33	17.67	19.00	18.33
Percent by Volume Nitrogen in Stack Gas (%-dry)	79.33	79.67	78.67	79.22

TABLE 2.3
EMISSION RESULTS

Parameter	SEC Baghouse Exhaust Stack			
	Run 1	Run 2	Run 3	Average
Lead Emissions (lb/hr)	0.02	0.02	0.01	0.02
Lead Concentration (mg/dscm)	0.012	0.0097	0.0066	0.0095
Manganese Emissions (lb/hr)	0.005	0.004	0.004	0.004
Manganese Concentration (mg/dscm)	0.002	0.002	0.003	0.003
Stack Gas Average Flow Rate (acfm)	555,327	528,240	502,844	528,804
Stack Gas Average Flow Rate (scfm)	507,931	483,943	455,713	482,529
Stack Gas Average Flow Rate (dscfm)	498,633	476,325	447,535	474,165
Stack Gas Average Velocity (fpm)	2,066	1,965	1,871	1,967
Stack Gas Average Static Pressure (in-H_2O)	-0.31	-0.31	-0.31	-0.31
Stack Gas Average Temperature (°F)	108	107	113	109
Stack Gas Percent by Volume Moisture (%H_2O)	1.83	1.57	1.79	1.73
Measured Stack Inner Diameter (in)	222			
Percent by Volume Carbon Dioxide in Stack Gas (%-dry)	0.00	0.00	0.00	0.00
Percent by Volume Oxygen in Stack Gas (%-dry)	20.90	20.90	20.90	20.90
Percent by Volume Nitrogen in Stack Gas (%-dry)	79.10	79.10	79.10	79.10

3.0 PLANT AND SAMPLING LOCATION DESCRIPTIONS

3.1 PROCESS DESCRIPTION AND OPERATION

AK Steel Corporation - Dearborn Works is a steel-producing facility. The facility operates a Basic Oxygen Furnace (BOF) (EUBOF) which was in operation during this test event. The process and its operations are described in detail in Sections 1.b - 1.f of Test Plans M049AS-555875-PP-7 and M049AS-555875-PP-16 in Appendix E.

Figure 3.1 schematically depicts the sampling location.

3.2 CONTROL EQUIPMENT DESCRIPTION

During this test, emissions from BOF and FGBOFSHOP were controlled by an ESP and a baghouse.

3.3 SAMPLING LOCATION(S)

3.3.1 ESP Exhaust Stack

The ESP Exhaust Stack had an inner diameter of 204-inches, was oriented in the vertical plane, and was accessed from a permanent platform. Four sampling ports were located 90° apart from one another at a location that met US EPA Method 1, Section 11.1.1 criteria. Prior to emissions sampling (August 12, 2019), the stack was traversed to verify the absence of cyclonic flow. An average yaw angle of 0.21° was measured. Therefore, the sampling location also met US EPA Method 1, Section 11.4.2 criteria. During emissions sampling, the stack was traversed for stack gas volumetric flow rate, moisture content, Pb, and Mn concentration determinations. Grab samples were obtained for stack gas dry molecular weight determination.

3.3.2 SEC Baghouse Exhaust Stack

The SEC Baghouse Exhaust Stack had an inner diameter of 222-inches, was oriented in the vertical plane, and was accessed from a permanent platform. Four sampling ports were located 90° apart from one another at a location that met US EPA Method 1, Section 11.1.1 criteria. Prior to emissions sampling, the stack was traversed to verify the absence of cyclonic flow. An average yaw angle of 0.5° was measured. Therefore, the sampling location also met US EPA Method 1, Section 11.4.2 criteria. During emissions sampling, the stack was traversed for stack gas volumetric flow rate, moisture content, Pb, and Mn concentration determinations. Grab samples were obtained for stack gas dry molecular weight determination.

Figures 3.2 and 3.3 schematically illustrate the traverse point and sample port locations utilized.

3.4 PROCESS SAMPLING LOCATION(S)

The US EPA Reference Test Methods performed did not specifically require that process samples were to be taken during the performance of this testing event. It is in the best knowledge of Montrose that no process samples were obtained and therefore no process sampling location was identified in this report.

FIGURE 3.1
BOF/FGBOFSHOP SAMPLING LOCATION SCHEMATIC

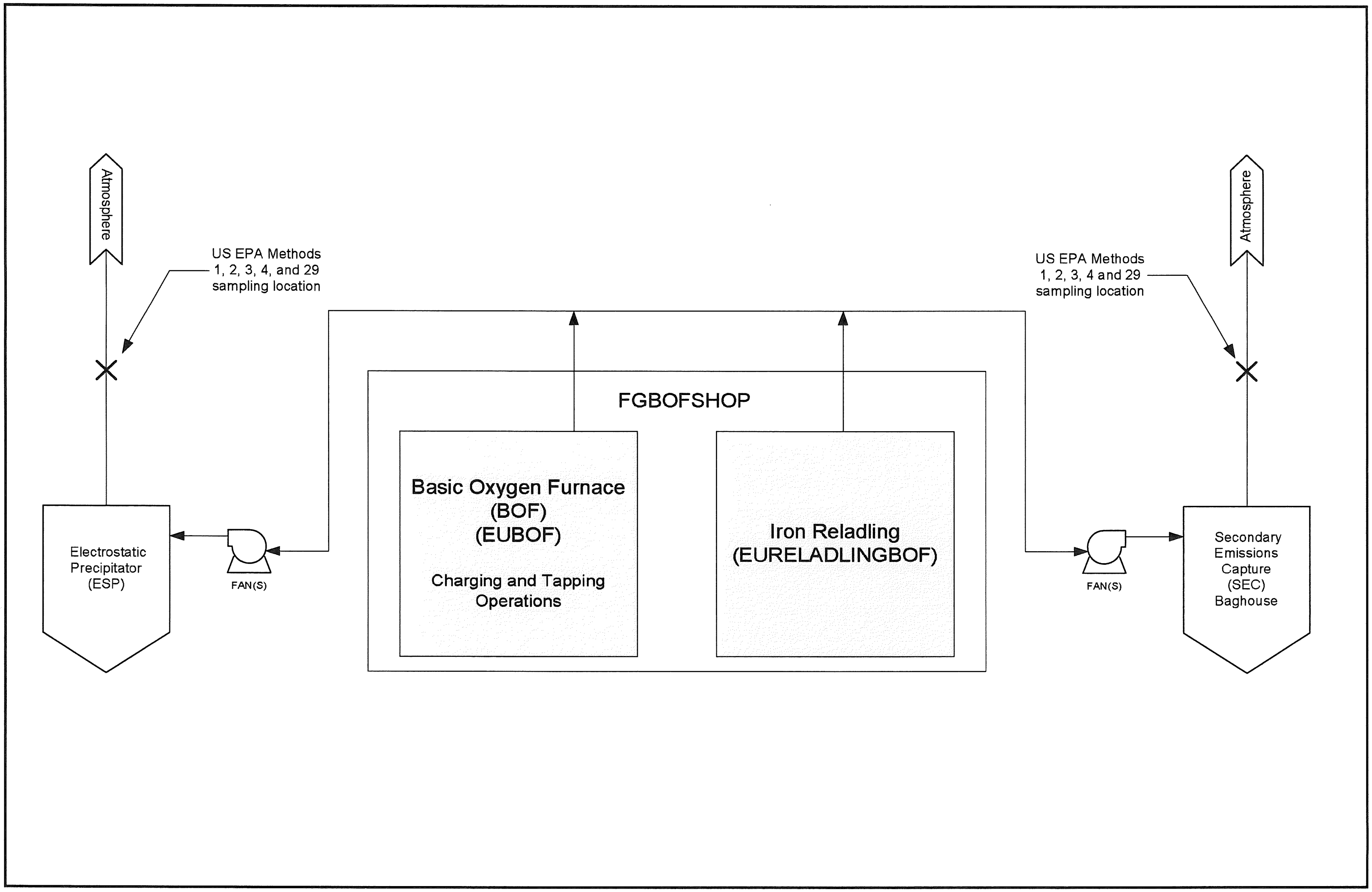
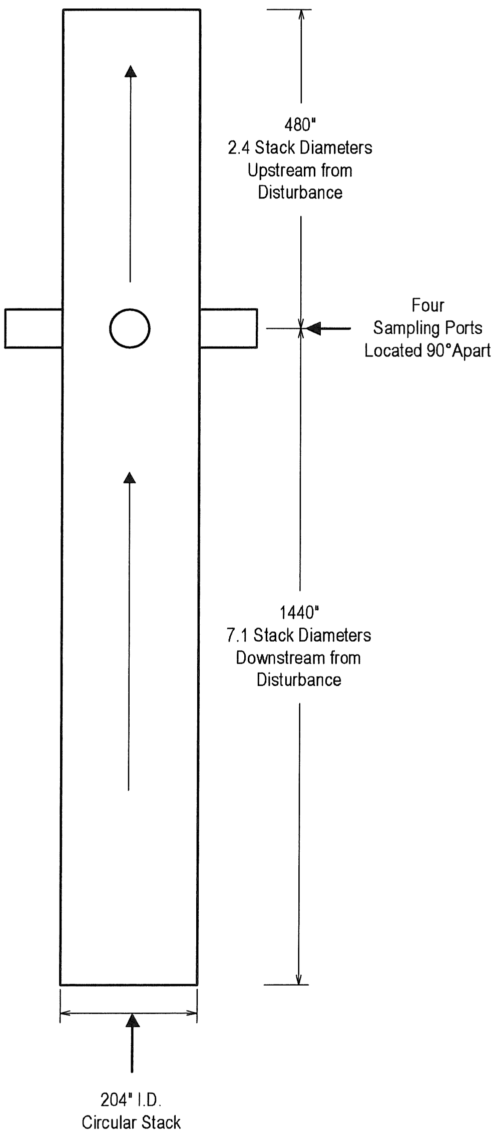
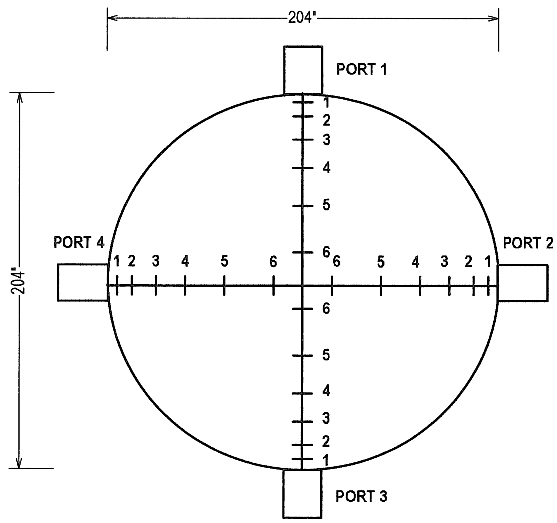


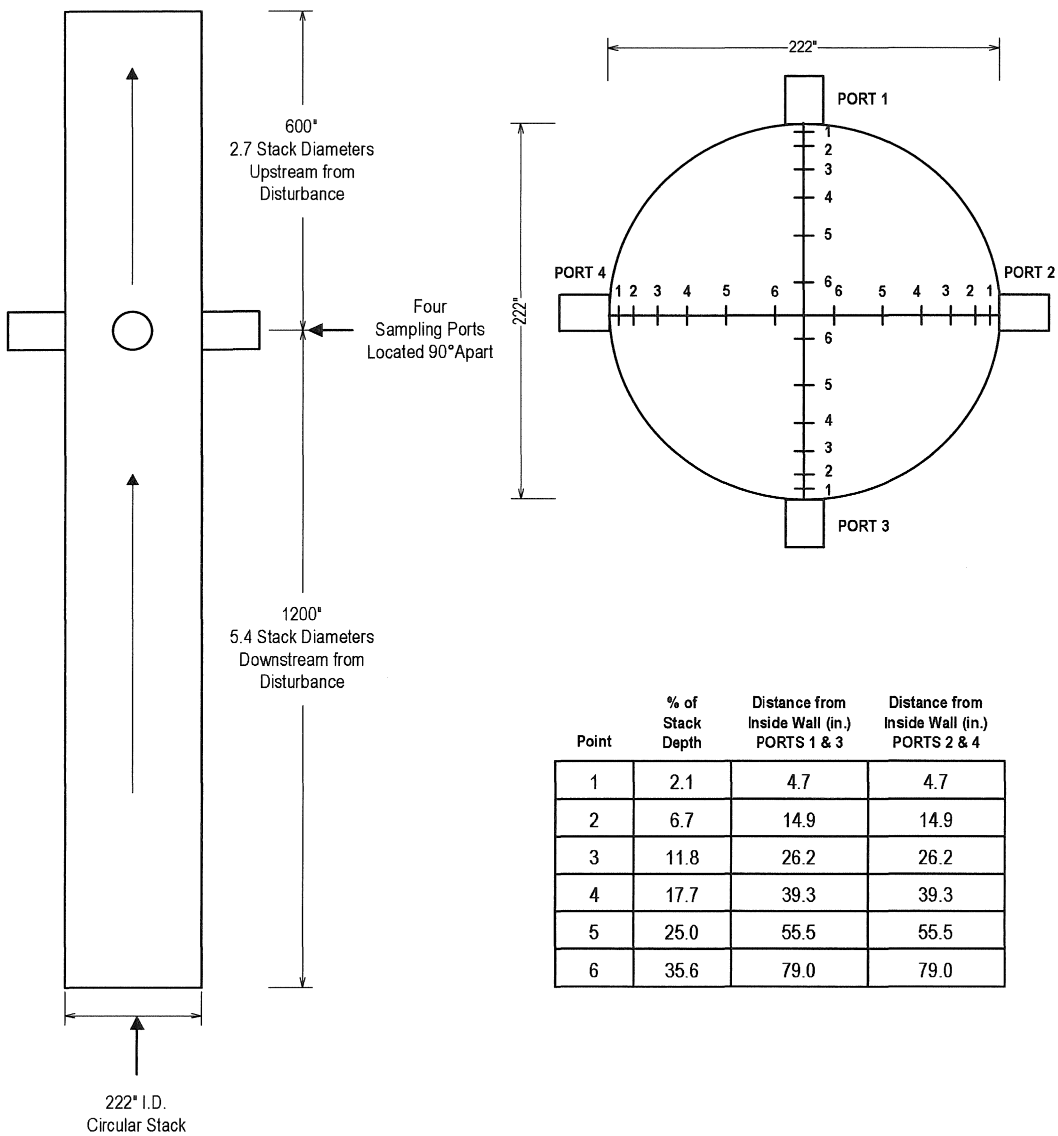
FIGURE 3.2
ESP EXHAUST TRAVERSE POINT LOCATION DRAWING





Point	% of Stack Depth	Distance from Inside Wall (in.) PORTS 1 & 3	Distance from Inside Wall (in.) PORTS 2 & 4
1	2.1	4.3	4.3
2	6.7	13.7	13.7
3	11.8	24.1	24.1
4	17.7	36.1	36.1
5	25.0	51.0	51.0
6	35.6	72.6	72.6

FIGURE 3.3
SEC BAGHOUSE EXHAUST TRAVERSE POINT LOCATION DRAWING



Point	% of Stack Depth	Distance from Inside Wall (in.) PORTS 1 & 3	Distance from Inside Wall (in.) PORTS 2 & 4
1	2.1	4.7	4.7
2	6.7	14.9	14.9
3	11.8	26.2	26.2
4	17.7	39.3	39.3
5	25.0	55.5	55.5
6	35.6	79.0	79.0

4.0 SAMPLING AND ANALYTICAL PROCEDURES

4.1 TEST METHODS

4.1.1 US EPA Method 1: "Sample and Velocity Traverses for Stationary Sources"

Principle: To aid in the representative measurement of pollutant emissions and/or total volumetric flow rate from a stationary source, a measurement site where the effluent stream is flowing in a known direction is selected, and the cross-section of the stack is divided into a number of equal areas. A traverse point is then located within each of these equal areas. This method was utilized in its entirety as per the procedures outlined in 40 CFR Part 60, Appendix A.

4.1.2 US EPA Method 2: "Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube)"

Principle: The average gas velocity in a stack is determined from the gas density and from measurement of the average velocity head with a Type S (Stausscheibe or reverse type) pitot tube. This method was utilized in its entirety as per the procedures outlined in 40 CFR Part 60, Appendix A.

4.1.3 US EPA Method 3: "Gas Analysis for the Determination of Dry Molecular Weight"

Principle: A gas sample is extracted from a stack by one of the following methods: (1) single-point, grab sampling; (2) single-point, integrated sampling; or (3) multi-point, integrated sampling. The gas sample is analyzed for percent CO_2, percent O_2, and if necessary, for percent CO. For dry molecular weight determination, either an Orsat or a Fyrite analyzer may be used for the analysis. This method was utilized in its entirety as per the procedures outlined in 40 CFR Part 60, Appendix A.

4.1.4 US EPA Method 4: "Determination of Moisture Content in Stack Gases"

Principle: A gas sample is extracted at a constant rate from the source; moisture is removed from the sample stream and determined either volumetrically or gravimetrically. This method was utilized in its entirety as per the procedures outlined in 40 CFR Part 60, Appendix A.

4.1.5 US EPA Method 29: "Determination of Metals Emissions from Stationary Sources"

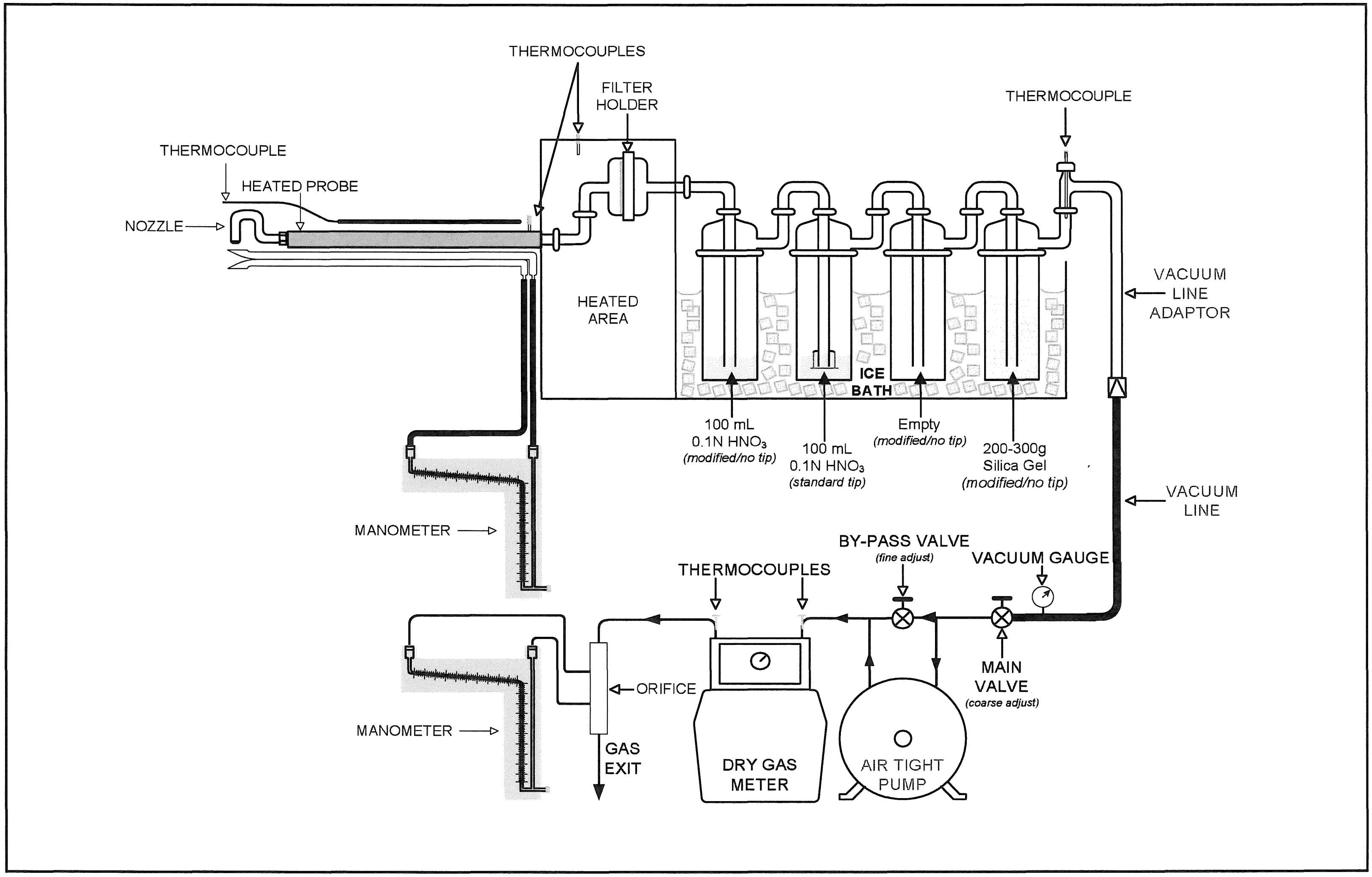
Principle: A stack sample is withdrawn isokinetically from the source, particulate emissions are collected in the probe and on a heated filter, and gaseous emissions are then collected in an aqueous acidic solution of hydrogen peroxide (analyzed for all metals including Hg) and an aqueous acidic solution of potassium permanganate (analyzed only for Hg). The recovered samples are digested, and appropriate fractions are analyzed for Hg by cold vapor atomic absorption spectroscopy (CVAAS) and for Sb, As, Ba, Be, Cd, Cr, Co, Cu, Pb, Mn, Ni, P, Se, Ag, Tl, and Zn by inductively coupled argon plasma emission absorption spectroscopy (AAS). Graphite furnace atomic absorption spectroscopy (GFAAS) is used for analysis of Sb, As, Cd, Co, Pb, Se, and Tl if these elements require greater analytical sensitivity than can be obtained by ICAP. Additionally, if desired, the tester may use AAS for analysis of all listed metals if the resulting in-stack method detection limits meet the goal of the testing program. Only Mn and Pb were sampled during this test event. This method was utilized in its entirety as per the procedures outlined in 40 CFR Part 60, Appendix A.

The sampling train utilized during this testing project is depicted in Figure 4.1.

4.2 PROCEDURES FOR OBTAINING PROCESS DATA

Process data was recorded by AK Steel Corporation - Dearborn Works personnel utilizing their typical record keeping procedures. Recorded process data was provided to Montrose personnel at the conclusion of this test event. The process data is located in the Appendix A.

FIGURE 4.1
US EPA METHOD 29 SAMPLING TRAIN SCHEMATIC



5.0 INTERNAL QA/QC ACTIVITIES

5.1 QA AUDITS

Tables 5.1 to 5.4.2 illustrate the QA audits that were performed during this test.

All meter boxes and sampling trains used during sampling performed within the requirements of their respective methods as is shown in Tables 5.1 to 5.2.2. All post-test leak checks were well below the applicable limit. Minimum metered volumes and percent isokinetics were also met where applicable.

Table 5.3 displays the US EPA Method 3 Fyrite Audits which were performed during this test in accordance with US EPA Method 3, Section 10.1 requirements. As shown, all Fyrite analyzer results were within ±0.5% of the respective Audit Gas concentrations.

Table 5.4 displays the laboratory QA results for US EPA Method 29. All the spike recoveries were within the US EPA Method 29 limits.

5.2 QA/QC PROBLEMS

No QA/QC problems occurred during this test event.

5.3 QUALITY STATEMENT

Montrose is qualified to conduct this test program and has established a quality management system that led to accreditation with ASTM Standard D7036-04 (Standard Practice for Competence of Air Emission Testing Bodies). Montrose participates in annual functional assessments for conformance with D7036-04 which are conducted by the American Association for Laboratory Accreditation (A2LA). All testing performed by Montrose is supervised on site by at least one Qualified Individual (QI) as defined in D7036-04 Section 8.3.2. Data quality objectives for estimating measurement uncertainty within the documented limits in the test methods are met by using approved test protocols for each project as defined in D7036-04 Sections 7.2.1 and 12.10. Additional quality assurance information is presented in the report appendices.

TABLE 5.1
US EPA METHOD 29 SAMPLING TRAIN AUDIT RESULTS

Parameter	Run 1	Run 2	Run 3
Sampling Location		**ESP Exhaust Stack**	
Post-Test Leak Rate Observed (cfm)	0.000	0.000	0.000
Applicable Method Allowable Leak Rate (cfm)	0.020	0.020	0.020
Acceptable	Yes	Yes	Yes
Volume of Dry Gas Collected (dscf)	137.239	108.826	116.494
Recommended Volume of Dry Gas Collected (dscf)	44.143	44.143	44.143
Acceptable	Yes	Yes	Yes
Percent of Isokinetic Sampling Rate (%)	96.0	97.6	96.3
Applicable Method Allowable Isokinetic Sampling Rate (%)	100 ± 10	100 ± 10	100 ± 10
Acceptable	Yes	Yes	Yes
Sampling Location		**SEC Baghouse Exhaust Stack**	
Post-Test Leak Rate Observed (cfm)	0.000	0.000	0.000
Applicable Method Allowable Leak Rate (cfm)	0.020	0.020	0.020
Acceptable	Yes	Yes	Yes
Volume of Dry Gas Collected (dscf)	149.186	108.497	105.530
Recommended Volume of Dry Gas Collected (dscf)	44.143	44.143	44.143
Acceptable	Yes	Yes	Yes
Percent of Isokinetic Sampling Rate (%)	100.3	100.8	98.9
Applicable Method Allowable Isokinetic Sampling Rate (%)	100 ± 10	100 ± 10	100 ± 10
Acceptable	Yes	Yes	Yes

TABLE 5.2.1
USEPA METHOD 29 DRY GAS METER AUDIT RESULTS

Sampling Location	Pre-Test Dry Gas Meter Calibration Factor (Y)	Average Post-Test Dry Gas Meter Calibration Check Value (Yqa)	Post Test Dry Gas Meter Calibration Check Value Difference From Pre-Test Calibration Factor (%)	Applicable Method Allowable Difference (%)	Acceptable
ESP Exhaust Stack	1.016	1.011	0.53%	5.00%	Yes

TABLE 5.2.2
USEPA METHOD 29 DRY GAS METER AUDIT RESULTS

Sampling Location	Pre-Test Dry Gas Meter Calibration Factor (Y)	Average Post-Test Dry Gas Meter Calibration Factor (Y)	Post Test Dry Gas Meter Calibration Factor Difference From Pre-Test Calibration Factor (%)	Applicable Method Allowable Difference (%)	Acceptable
SEC Baghouse Exhaust Stack	1.017	1.012	0.49%	5.00%	Yes

TABLE 5.3
US EPA METHOD 3 FYRITE AUDIT

Audit Date	**September 13, 2019**	
Audit Gas	**%CO_2**	**%O_2**
Audit Gas Concentration (%)	**10.0**	**10.1**
Fyrite Response 1 (%)	10.0	10.0
Fyrite Response 2 (%)	10.0	10.0
Fyrite Response 3 (%)	10.0	10.0
Average (%)	10.0	10.0
Average Within ±0.5%	Yes	Yes

Audit Gas Cylinder Number: EB0024944

TABLE 5.4
US EPA METHOD 29 LABORATORY QA

	Pb	Mn
Front-Half Spike Recovery (%)	100	104
Acceptable per US EPA Method 29 (Expected Range 70%-130%)	YES	YES
Back-Half Spike Recovery (%)	106	99
Acceptable per US EPA Method 29 (Expected Range 70%-130%)	YES	YES
Front-Half Duplicate , %RPD	5.4	N/A
Acceptable per US EPA Method 29 (Expected Difference Within 20%)	YES	N/A
Back-Half Duplicate, %RPD	6.7	N/A
Acceptable per US EPA Method 29 (Expected Difference Within 20%)	YES	N/A