TEST RESULTS SUMMARY

Source Name:	**Basic Oxygen Furnace Vessels and BOF Reladling**
Source ID Number:	**FGBOFSHOP**
Control Device:	**Baghouse**
Source ID Number:	**SVBOFBH**
Test Date:	**May 14-15, 2019**
Sampling Location:	**Secondary Baghouse Exhaust Stack**
Production Rate (tons/hour)*	**324.7**
Filterable PM Mass Emission Rate (lb/hr)†	**<0.47**
Permit Limit - Filterable PM (lb/hr)	*15.6*
Filterable PM Mass Emission Rate (gr/dscf)†	**<0.0001**
NESHAP Limit - Filterable PM (gr/dscf)	*0.01*
Permit Limit - Filterable PM (gr/dscf)	*0.003*
Visible Emissions (%-Opacity)‡	**10**
NESHAP Limit - Visible Emissions (%-Opacity)	*20*
Permit Limit - Visible Emissions (%-Opacity)	*15*
Permit No.	**EGLE Renewable Operating Permit No. MI-ROP-A8640-2016a**

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

† The "<" symbol indicates that compound measured in one or more of the sample runs was below the Minimum Detection Limit (MDL) of the analytical method.

‡ Reported visible emissions are for the highest 3-minute block average BOF Roof Monitor opacity observed that was attributable to operations controlled by the Secondary Baghouse (Reladling, Charging, and Tapping). Emissions of 18% from 8:30 to 8:33 and 8:33 to 8:36 on May 14, 2019, were confirmed to be from primary oxygen blowing operations. Emissions of 29% from 9:24 to 9:27 on May, 15, 2019, were confirmed to be from the desulfurization operation.

REVIEW AND CERTIFICATION

The results of the Compliance Test conducted on May 14-15, 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, Appendix A, 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: 6/28/19

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: 6/28/19

Name: Randal Tysar Title: District Manager

1.0 INTRODUCTION

1.1 SUMMARY OF TEST PROGRAM

The AK Steel Corporation-Dearborn Works (State Registration Number: 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 Vessels and BOF Reladling (FGBOFSHOP). Testing was performed to satisfy the emissions testing requirements pursuant to Michigan Department of Environment, Great Lakes and Energy (EGLE) Renewable Operating Permit No. MI-ROP-A8640-2016a. In addition, the testing was performed to reestablish operating limits for the Secondary Baghouse as allowed by NESHAP 40 CFR 63.7824(c), Subpart FFFFF. The testing was performed on May 14-15, 2019.

Sampling was performed at the Secondary Baghouse Exhaust Stack (SVBOFBH) to determine the emissions of filterable particulate matter (PM). Concurrent with the PM sampling, opacity observations were performed at the BOF Roof Monitor. Testing was conducted during normal shop operating conditions.

The test methods that were conducted during this test were US EPA Methods 1, 2, 4, 5, and 9.

1.2 KEY PERSONNEL

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

- David Pate, Sr. Environmental Engineer, AK Steel, 313-323-1261
- Regina Angelloti, EQA, EGLE, 313-418-0895
- Jonathan Lamb, EQA, EGLE, 313-456-4685
- Robert Bingham, VE Observer, Smoke Reader LLC, 586-942-8548
- Steven Smith, Client Project Manager, Montrose, 734-751-9701

2.0 SUMMARY AND DISCUSSION OF TEST RESULTS

2.1 OBJECTIVES AND TEST MATRIX

The purpose of this test was to determine the filterable PM at the Secondary Baghouse Exhaust Stack and the percent opacity of VEs at the BOF Roof Monitor while establishing minimum operating limits pursuant to NESHAP 40 CFR 63.7824(c), Subpart FFFFF. Testing was performed to satisfy the emissions testing requirements pursuant to EGLE Renewable Operating Permit No. MI-ROP-A8640-2016a and the Integrated Iron and Steel NESHAP, 40 CFR Part 63, Subpart FFFFF.

The specific test objectives for this test are as follows:

- Measure the concentration of filterable PM at the Secondary Baghouse Exhaust Stack.
- Measure the actual and dry standard volumetric flow rate of the stack gas at the Secondary Baghouse Exhaust Stack.
- Utilize the above variables to determine the emissions of filterable PM at the Secondary Baghouse Exhaust Stack while operating at minimum baghouse outlet plenum pressure for each operating condition.
- Determine the VEs (as %-opacity) at the BOF Roof Monitor while operating at minimum baghouse outlet plenum pressure for each operating condition.

Table 2.1 presents the sampling matrix log for this test.

2.2 PROCESS OPACITY READINGS

During Run 1 of testing, roof emissions averaging 18% from 8:30 to 8:33 and from 8:33 to 8:36 were observed. The root cause of these emissions was that emissions escaped from the lance hole during the primary oxygen blowing process. These emissions were not related to Secondary Baghouse Operations.

During Run 3 of testing, roof emissions averaging 29% from 9:24 to 9:27 were observed. The root cause of these emissions was that the desulfurization ladle was overfilled which caused iron to splash on the ground when desulfurization started. The emissions were not related to Secondary Baghouse Operations.

Both events were brought to the attention of the onsite EGLE observer during the test event. Results reported in the Test Results Summary are for the highest observed opacity readings due to operations associated with the Secondary Baghouse. Results of the investigation for these two opacity events are provided in Appendix F, EGLE Correspondence.

2.3 FIELD TEST CHANGES AND PROBLEMS

2.3.1 US EPA Method 5

The thermocouple required in US EPA Method 5, Section 6.1.1.6, for monitoring and regulating filter exit temperature was not utilized. In lieu of monitoring filter exit temperatures, filter hot box temperatures were monitored.

2.3.2 Extended Run Sampling Procedures

Testing was performed for an integral number of production cycles. While testing, if all sample points were sampled and 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.

2.3.3 BOF Vessels Overlapping Heat Cycles

The BOF facility at Dearborn Works consisted of two 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 three minutes after slag was emptied into a slag pot from the vessel being tested. For production calculations, production from the overlapping heat was pro-rated and included in the production rate calculations.

2.4 PRESENTATION OF RESULTS

A single sampling train was utilized during each run at the Secondary Baghouse Exhaust Stack to determine the emissions of filterable PM. This sampling train measured the stack gas volumetric flow rate, moisture content, and concentration of filterable PM.

Table 2.2 displays the emissions of filterable PM measured at the Secondary Baghouse Exhaust Stack during normal operating conditions.

Table 2.3 displays the 3-minute block average opacity measured at the Secondary Baghouse Exhaust Stack during normal operating conditions.

Tables 2.4.1 to 2.5.3 display the measured results for the VE readings performed at the BOF Roof Monitor for Runs 1 to 3.

A dry molecular weight value of 29.0 g/g-mole was utilized at the Secondary Baghouse Exhaust Stack as per US EPA Method 2, Section 8.6.

The Run 3 concentration value in Table 2.2 denoted with a '<' was measured to be below the minimum detection limit (MDL) of the applicable analytical method. The Run 3 mass emission rate denoted with a '<' in Table 2.2 was calculated utilizing the applicable MDL concentration value instead of the "as measured" concentration value.

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 4 ($\%H_2O$) Sampling Time† / Duration (min)	US EPA METHOD 5 (Filterable PM) Sampling Time† / Duration (min)	US EPA METHOD 9 (VEs)* Sampling Time† / Duration (min)
5/14/2019	1	Secondary Baghouse Exhaust Stack	8:20 - 12:16 / 218	8:20 - 12:16 / 218	8:20 - 12:16 / 218	8:18 - 12:16 / 237
5/14/2019	2	Secondary Baghouse Exhaust Stack	13:04 - 16:34 / 192	13:04 - 16:34 / 192	13:04 - 16:34 / 192	13:04 - 16:34 / 209
5/15/2019	3	Secondary Baghouse Exhaust Stack	8:18 - 12:26 / 230	8:18 - 12:26 / 230	8:18 - 12:26 / 230	8:18 - 11:26 / 187

* Testing was concluded before the end of the PM run since sufficient operating scenarios had been observed at that time.
† All times are Eastern Daylight Time.

TABLE 2.2
EMISSION RESULTS

Parameter	Secondary Baghouse Exhaust Stack			
	Run 1	Run 2	Run 3	Average
Production Rate (tons/hr)	337.8	299.8	336.5	324.7
Filterable Particulate Matter Emissions (lb/hr)*	0.57	0.53	<0.32	<0.47
Filterable Particulate Matter Concentration (grains/dscf)*	0.00017	0.00015	<0.00010	<0.00014
Stack Gas Average Flow Rate (acfm)	416,456	458,925	414,406	429,929
Stack Gas Average Flow Rate (scfm)	389,063	424,257	383,519	398,947
Stack Gas Average Flow Rate (dscfm)	385,217	420,746	380,458	395,474
Stack Gas Average Velocity (fpm)	1,549	1,707	1,542	1,599
Stack Gas Average Static Pressure (in-H_2O)	-0.30	-0.30	-0.30	-0.30
Stack Gas Average Temperature (°F)	92	98	98	96
Stack Gas Percent by Volume Moisture (%H_2O)	0.99	0.83	0.80	0.87
Measured Stack Inner Diameter (in)		222.0		

* The "<" symbol indicates that compound was below the Minimum Detection Limit (MDL) of the analytical method. See Section 2.3 for details.

TABLE 2.3
VE EMISSIONS SUMMARY

Parameter	BOF Roof Monitor			
	Run 1†	Run 2	Run 3†	Highest Observed
Maximum Three-Minute Average of Visible Emissions (% opacity)*	10	5	7	10

* Attributable to operations controlled by the Secondary Baghouse.
† The higher emissions observed from the BOF Roof Monitor were not attibutable to the Secondary Baghouse operation. See Section 2.2 for details.

TABLE 2.4.1
VISIBLE EMISSIONS - RUN 1 - PART 1 of 4

Start 5/14/2019 8:18
End 5/14/2019 12:16

Highest 3-Minute Average: 17.92
2nd Highest 3-Minute Average: 17.50
3rd Highest 3-Minute Average: 10.42

TIME	Minute	0 Sec.	15 Sec.	30 Sec.	45 Sec.	3-Minute Block Averages
8:18	0	0	0	0	0	
8:19	1	0	0	0	0	0.00
8:20	2	0	0	0	0	
8:21	3	0	0	0	0	
8:22	4	0	0	0	0	0.83
8:23	5	0	0	0	10	
8:24	6	10	10	10	10	
8:25	7	10	5	0	0	6.25
8:26	8	0	0	15	5	
8:27	9	10	10	10	20	
8:28	10	15	5	0	0	5.83
8:29	11	0	0	0	0	
8:30	12	10	20	30	25	
8:31	13	30	30	25	20	17.92
8:32	14	15	10	0	0	
8:33	15	5	10	10	10	
8:34	16	15	20	15	20	17.50
8:35	17	40	30	25	10	
8:36	18	15	5	0	0	
8:37	19	0	0	0	0	1.67
8:38	20	0	0	0	0	
8:39	21	0	0	0	0	
8:40	22	0	0	0	0	0.00
8:41	23	0	0	0	0	
8:42	24	0	0	0	0	
8:43	25	0	0	0	0	0.00
8:44	26	0	0	0	0	
8:45	27	0	0	0	0	
8:46	28	0	0	0	0	0.00
8:47	29	0	0	0	0	
8:48	30	0	0	0	0	
8:49	31	0	0	0	0	0.00
8:50	32	0	0	0	0	
8:51	33	0	0	0	0	
8:52	34	0	0	0	0	0.00
8:53	35	0	0	0	0	
8:54	36	0	0	0	0	
8:55	37	0	0	0	0	0.00
8:56	38	0	0	0	0	
8:57	39	0	0	0	0	
8:58	40	0	0	0	0	0.00
8:59	41	0	0	0	0	
9:00	42	0	0	0	0	
9:01	43	10	10	10	15	7.50
9:02	44	15	10	10	10	
9:03	45	5	5	5	0	
9:04	46	0	0	0	0	1.25
9:05	47	0	0	0	0	
9:06	48	0	0	0	0	
9:07	49	0	0	0	0	0.00
9:08	50	0	0	0	0	
9:09	51	0	0	0	0	
9:10	52	0	0	0	0	0.00
9:11	53	0	0	0	0	
9:12	54	0	0	0	0	
9:13	55	0	0	0	0	0.00
9:14	56	0	0	0	0	
9:15	57	0	0	0	0	
9:16	58	0	0	0	0	0.00
9:17	59	0	0	0	0	

TABLE 2.4.2
VISIBLE EMISSIONS - RUN 1 - PART 2 of 4

Start 5/14/2019 8:18
End 5/14/2019 12:16

Highest 3-Minute Average: 17.92
2nd Highest 3-Minute Average: 17.50
3rd Highest 3-Minute Average: 10.42

TIME	Minute	0 Sec.	15 Sec.	30 Sec.	45 Sec.	3-Minute Block Averages
9:18	60	0	0	0	0	
9:19	61	0	0	0	0	0.00
9:20	62	0	0	0	0	
9:21	63	0	0	0	0	
9:22	64	0	0	0	0	0.00
9:23	65	0	0	0	0	
9:24	66	0	0	0	0	
9:25	67	0	0	0	0	0.00
9:26	68	0	0	0	0	
9:27	69	0	0	0	0	
9:28	70	0	0	0	0	0.00
9:29	71	0	0	0	0	
9:30	72	0	0	0	0	
9:31	73	0	0	0	0	0.00
9:32	74	0	0	0	0	
9:33	75	0	0	0	0	
9:34	76	0	0	0	0	0.00
9:35	77	0	0	0	0	
9:36	78	0	0	0	0	
9:37	79	0	0	0	0	0.00
9:38	80	0	0	0	0	
9:39	81	0	0	0	0	
9:40	82	0	0	0	0	0.00
9:41	83	0	0	0	0	
9:42	84	0	0	0	0	
9:43	85	0	0	0	0	0.00
9:44	86	0	0	0	0	
9:45	87	0	0	0	0	
9:46	88	0	0	0	0	0.00
9:47	89	0	0	0	0	
9:48	90	0	0	0	0	
9:49	91	0	0	0	15	5.83
9:50	92	20	20	10	5	
9:51	93	0	0	0	0	
9:52	94	0	0	0	5	1.67
9:53	95	5	0	5	5	
9:54	96	5	5	0	0	
9:55	97	0	0	0	10	3.75
9:56	98	10	5	5	5	
9:57	99	5	0	5	10	
9:58	100	5	5	0	0	4.17
9:59	101	0	0	0	20	
10:00	102	15	10	5	0	
10:01	103	0	0	0	0	2.50
10:02	104	0	0	0	0	
10:03	105	0	0	0	0	
10:04	106	0	0	0	0	0.00
10:05	107	0	0	0	0	
10:06	108	0	0	0	0	
10:07	109	0	0	0	0	0.00
10:08	110	0	0	0	0	
10:09	111	0	0	0	0	
10:10	112	0	0	0	0	0.00
10:11	113	0	0	0	0	
10:12	114	0	0	0	0	
10:13	115	0	0	0	0	0.00
10:14	116	0	0	0	0	
10:15	117	0	0	0	5	
10:16	118	10	10	5	10	5.83
10:17	119	10	10	5	5	

TABLE 2.4.3
VISIBLE EMISSIONS - RUN 1 - PART 3 of 4

Start 5/14/2019 8:18
End 5/14/2019 12:16

Highest 3-Minute Average: 17.92
2nd Highest 3-Minute Average: 17.50
3rd Highest 3-Minute Average: 10.42

TIME	Minute	0 Sec.	15 Sec.	30 Sec.	45 Sec.	3-Minute Block Averages
10:18	120	0	0	0	0	
10:19	121	0	0	0	0	0.00
10:20	122	0	0	0	0	
10:21	123	0	0	0	0	
10:22	124	0	0	0	0	0.00
10:23	125	0	0	0	0	
10:24	126	0	0	0	0	
10:25	127	0	0	0	0	0.00
10:26	128	0	0	0	0	
10:27	129	0	0	0	0	
10:28	130	0	0	0	0	0.00
10:29	131	0	0	0	0	
10:30	132	0	0	0	0	
10:31	133	5	10	10	10	6.25
10:32	134	10	10	10	10	
10:33	135	10	10	10	10	
10:34	136	10	5	10	5	7.08
10:35	137	5	5	5	0	
10:36	138	0	0	0	0	
10:37	139	0	0	0	0	0.00
10:38	140	0	0	0	0	
10:39	141	0	0	0	0	
10:40	142	5	0	5	10	5.42
10:41	143	10	10	15	10	
10:42	144	5	5	5	10	
10:43	145	0	0	0	0	5.00
10:44	146	15	10	10	0	
10:45	147	0	0	0	0	
10:46	148	0	0	0	0	0.00
10:47	149	0	0	0	0	
10:48	150	0	0	0	0	
10:49	151	0	0	0	0	0.42
10:50	152	0	0	0	5	
10:51	153	5	0	0	0	
10:52	154	0	0	0	0	4.58
10:53	155	0	0	30	20	
10:54	156	10	5	10	15	
10:55	157	10	10	5	5	5.83
10:56	158	0	0	0	0	
10:57	159	0	0	0	0	
10:58	160	0	0	0	0	0.00
10:59	161	0	0	0	0	
11:00	162	0	0	0	0	
11:01	163	0	0	0	0	0.00
11:02	164	0	0	0	0	
11:03	165	0	0	0	0	
11:04	166	0	0	0	0	0.00
11:05	167	0	0	0	0	
11:06	168	0	0	0	15	
11:07	169	20	15	20	15	10.42
11:08	170	10	15	10	5	
11:09	171	0	0	0	0	
11:10	172	0	0	0	0	0.00
11:11	173	0	0	0	0	
11:12	174	0	0	0	0	
11:13	175	0	0	0	0	0.00
11:14	176	0	0	0	0	
11:15	177	0	0	0	0	
11:16	178	0	0	0	0	0.00
11:17	179	0	0	0	0	

TABLE 2.4.4
VISIBLE EMISSIONS - RUN 1 - PART 4 of 4

Start 5/14/2019 8:18
End 5/14/2019 12:16

Highest 3-Minute Average: 17.92
2nd Highest 3-Minute Average: 17.50
3rd Highest 3-Minute Average: 10.42

TIME	Minute	0 Sec.	15 Sec.	30 Sec.	45 Sec.	3-Minute Block Averages
11:18	180	0	0	0	0	
11:19	181	0	0	0	0	0.00
11:20	182	0	0	0	0	
11:21	183	0	0	0	0	
11:22	184	0	0	0	0	0.00
11:23	185	0	0	0	0	
11:24	186	0	0	0	0	
11:25	187	0	5	5	5	2.08
11:26	188	5	5	0	0	
11:27	189	0	0	0	0	
11:28	190	0	0	5	5	0.83
11:29	191	0	0	0	0	
11:30	192	0	0	0	0	
11:31	193	0	0	0	0	0.00
11:32	194	0	0	0	0	
11:33	195	0	0	0	0	
11:34	196	0	0	0	0	0.00
11:35	197	0	0	0	0	
11:36	198	0	0	0	0	
11:37	199	0	0	0	0	2.08
11:38	200	5	10	5	5	
11:39	201	5	0	0	0	
11:40	202	0	0	0	0	0.42
11:41	203	0	0	0	0	
11:42	204	0	0	0	0	
11:43	205	0	0	0	0	0.00
11:44	206	0	0	0	0	
11:45	207	0	0	0	0	
11:46	208	0	0	0	0	0.00
11:47	209	0	0	0	0	
11:48	210	0	0	0	0	
11:49	211	0	0	0	0	0.00
11:50	212	0	0	0	0	
11:51	213	0	0	0	0	
11:52	214	0	0	0	0	0.00
11:53	215	0	0	0	0	
11:54	216	0	0	0	0	
11:55	217	0	0	0	0	0.00
11:56	218	0	0	0	0	
11:57	219	0	0	0	0	
11:58	220	0	0	0	0	0.00
11:59	221	0	0	0	0	
12:00	222	0	0	0	0	
12:01	223	0	0	0	0	0.00
12:02	224	0	0	0	0	
12:03	225	0	0	0	0	
12:04	226	0	0	0	0	0.00
12:05	227	0	0	0	0	
12:06	228	0	0	0	0	
12:07	229	0	0	0	0	0.00
12:08	230	0	0	0	0	
12:09	231	0	0	0	0	
12:10	232	0	0	0	0	0.00
12:11	233	0	0	0	0	
12:12	234	0	0	0	0	
12:13	235	0	0	0	0	0.00
12:14	236	0	0	0	0	
12:15	237	0	0	0	0	
						0.00

TABLE 2.5.1
VISIBLE EMISSIONS - RUN 2 - PART 1 of 4

Start 5/14/2019 13:04
End 5/14/2019 16:34

Highest 3-Minute Average: 5.00
2nd Highest 3-Minute Average: 3.75
3rd Highest 3-Minute Average: 1.25

TIME	Minute	0 Sec.	15 Sec.	30 Sec.	45 Sec.	3-Minute Block Averages
13:04	0	0	0	0	0	
13:05	1	0	0	0	0	0.00
13:06	2	0	0	0	0	
13:07	3	0	0	0	0	
13:08	4	0	0	0	0	0.00
13:09	5	0	0	0	0	
13:10	6	0	0	0	0	
13:11	7	0	0	0	0	0.00
13:12	8	0	0	0	0	
13:13	9	0	0	0	0	
13:14	10	0	0	0	0	0.00
13:15	11	0	0	0	0	
13:16	12	0	0	0	0	
13:17	13	0	0	15	10	5.00
13:18	14	10	10	10	5	
13:19	15	10	5	0	0	
13:20	16	0	0	0	0	1.25
13:21	17	0	0	0	0	
13:22	18	0	0	0	0	
13:23	19	0	0	0	0	0.00
13:24	20	0	0	0	0	
13:25	21	0	0	0	0	
13:26	22	0	0	0	0	0.00
13:27	23	0	0	0	0	
13:28	24	0	0	0	0	
13:29	25	0	0	0	0	0.00
13:30	26	0	0	0	0	
13:31	27	0	0	0	0	
13:32	28	0	0	0	0	0.00
13:33	29	0	0	0	0	
13:34	30	0	0	0	0	
13:35	31	0	0	0	0	0.00
13:36	32	0	0	0	0	
13:37	33	0	0	0	0	
13:38	34	0	0	0	0	0.00
13:39	35	0	0	0	0	
13:40	36	0	0	0	0	
13:41	37	0	0	0	0	0.00
13:42	38	0	0	0	0	
13:43	39	0	0	0	0	
13:44	40	0	0	0	0	0.00
13:45	41	0	0	0	0	
13:46	42	0	0	0	0	
13:47	43	0	0	0	0	0.00
13:48	44	0	0	0	0	
13:49	45	0	0	0	0	
13:50	46	0	0	0	0	0.00
13:51	47	0	0	0	0	
13:52	48	0	0	0	0	
13:53	49	0	0	0	0	0.00
13:54	50	0	0	0	0	
13:55	51	0	0	10	5	
13:56	52	0	0	0	0	1.25
13:57	53	0	0	0	0	
13:58	54	0	0	0	0	
13:59	55	0	0	0	0	0.00
14:00	56	0	0	0	0	
14:01	57	0	0	0	0	
14:02	58	0	0	0	0	0.00
14:03	59	0	0	0	0	

TABLE 2.5.2
VISIBLE EMISSIONS - RUN 2 - PART 2 of 4

Start 5/14/2019 13:04
End 5/14/2019 16:34

Highest 3-Minute Average: 5.00
2nd Highest 3-Minute Average: 3.75
3rd Highest 3-Minute Average: 1.25

TIME	Minute	0 Sec.	15 Sec.	30 Sec.	45 Sec.	3-Minute Block Averages
14:04	60	0	0	0	0	
14:05	61	0	0	0	0	0.00
14:06	62	0	0	0	0	
14:07	63	0	0	0	0	
14:08	64	0	0	0	0	0.00
14:09	65	0	0	0	0	
14:10	66	0	0	0	0	
14:11	67	0	0	5	5	3.75
14:12	68	10	10	10	5	
14:13	69	0	0	0	0	
14:14	70	0	0	0	0	0.00
14:15	71	0	0	0	0	
14:16	72	0	0	0	0	
14:17	73	0	0	0	0	0.00
14:18	74	0	0	0	0	
14:19	75	0	0	0	0	
14:20	76	0	0	0	0	0.00
14:21	77	0	0	0	0	
14:22	78	0	0	0	0	
14:23	79	0	0	0	0	0.00
14:24	80	0	0	0	0	
14:25	81	0	0	0	0	
14:26	82	0	0	0	0	0.00
14:27	83	0	0	0	0	
14:28	84	0	0	0	0	
14:29	85	0	0	0	0	0.00
14:30	86	0	0	0	0	
14:31	87	0	0	0	0	
14:32	88	0	0	0	0	0.00
14:33	89	0	0	0	0	
14:34	90	0	0	0	0	
14:35	91	0	0	0	0	0.00
14:36	92	0	0	0	0	
14:37	93	0	0	0	0	
14:38	94	0	0	0	0	0.00
14:39	95	0	0	0	0	
14:40	96	0	0	0	0	
14:41	97	0	0	0	0	1.25
14:42	98	0	5	5	5	
14:43	99	0	0	0	0	
14:44	100	0	0	0	0	0.00
14:45	101	0	0	0	0	
14:46	102	0	0	0	0	
14:47	103	0	0	0	0	0.00
14:48	104	0	0	0	0	
14:49	105	0	0	0	0	
14:50	106	0	0	0	0	0.00
14:51	107	0	0	0	0	
14:52	108	0	0	0	0	
14:53	109	0	0	0	0	0.00
14:54	110	0	0	0	0	
14:55	111	10	5	0	0	
14:56	112	0	0	0	0	1.25
14:57	113	0	0	0	0	
14:58	114	0	0	0	0	
14:59	115	0	0	0	0	0.00
15:00	116	0	0	0	0	
15:01	117	0	0	0	0	
15:02	118	0	0	0	0	0.00
15:03	119	0	0	0	0	

TABLE 2.5.3
VISIBLE EMISSIONS - RUN 2 - PART 3of 4

Start 5/14/2019 13:04
End 5/14/2019 16:34

Highest 3-Minute Average: 5.00
2nd Highest 3-Minute Average: 3.75
3rd Highest 3-Minute Average: 1.25

TIME	Minute	0 Sec.	15 Sec.	30 Sec.	45 Sec.	3-Minute Block Averages
15:04	120	0	0	0	0	
15:05	121	0	0	0	0	0.00
15:06	122	0	0	0	0	
15:07	123	0	0	0	0	
15:08	124	0	0	0	0	0.00
15:09	125	0	0	0	0	
15:10	126	0	0	0	0	
15:11	127	0	0	0	0	0.00
15:12	128	0	0	0	0	
15:13	129	0	0	0	0	
15:14	130	0	0	0	0	0.00
15:15	131	0	0	0	0	
15:16	132	0	0	0	0	
15:17	133	0	0	0	0	0.00
15:18	134	0	0	0	0	
15:19	135	0	0	0	0	
15:20	136	0	0	0	0	0.00
15:21	137	0	0	0	0	
15:22	138	0	0	0	0	
15:23	139	0	0	0	0	0.00
15:24	140	0	0	0	0	
15:25	141	0	0	0	0	
15:26	142	0	0	0	0	0.00
15:27	143	0	0	0	0	
15:28	144	0	0	0	0	
15:29	145	0	0	0	0	0.00
15:30	146	0	0	0	0	
15:31	147	0	0	0	0	
15:32	148	0	0	0	0	0.00
15:33	149	0	0	0	0	
15:34	150	0	0	0	0	
15:35	151	0	0	0	0	0.83
15:36	152	5	5	0	0	
15:37	153	0	0	0	0	
15:38	154	0	0	0	0	0.00
15:39	155	0	0	0	0	
15:40	156	0	0	0	0	
15:41	157	0	0	0	0	0.00
15:42	158	0	0	0	0	
15:43	159	0	0	0	0	
15:44	160	0	0	0	0	0.00
15:45	161	0	0	0	0	
15:46	162	0	0	0	0	
15:47	163	0	0	0	0	0.00
15:48	164	0	0	0	0	
15:49	165	0	0	0	0	
15:50	166	0	0	0	0	0.00
15:51	167	0	0	0	0	
15:52	168	0	0	0	0	
15:53	169	0	0	0	0	0.00
15:54	170	0	0	0	0	
15:55	171	0	0	0	0	
15:56	172	0	0	0	0	0.00
15:57	173	0	0	0	0	
15:58	174	0	0	0	0	
15:59	175	0	0	0	0	0.00
16:00	176	0	0	0	0	
16:01	177	0	0	0	0	
16:02	178	0	0	0	0	0.00
16:03	179	0	0	0	0	

TABLE 2.5.4
VISIBLE EMISSIONS - RUN 2 - PART 4 of 4

Start 5/14/2019 13:04
End 5/14/2019 16:34

Highest 3-Minute Average: 5.00
2nd Highest 3-Minute Average: 3.75
3rd Highest 3-Minute Average: 1.25

TIME	Minute	0 Sec.	15 Sec.	30 Sec.	45 Sec.	3-Minute Block Averages
16:04	180	0	0	0	0	
16:05	181	0	0	0	0	0.00
16:06	182	0	0	0	0	
16:07	183	0	0	0	0	
16:08	184	0	0	0	0	0.00
16:09	185	0	0	0	0	
16:10	186	0	0	0	0	
16:11	187	0	0	0	0	0.00
16:12	188	0	0	0	0	
16:13	189	0	0	0	0	
16:14	190	0	0	0	0	0.00
16:15	191	0	0	0	0	
16:16	192	0	0	0	0	
16:17	193	0	0	0	0	0.00
16:18	194	0	0	0	0	
16:19	195	0	0	0	0	
16:20	196	0	0	0	0	0.00
16:21	197	0	0	0	0	
16:22	198	0	0	0	0	
16:23	199	0	0	0	0	0.00
16:24	200	0	0	0	0	
16:25	201	0	0	0	0	
16:26	202	0	0	0	0	0.00
16:27	203	0	0	0	0	
16:28	204	0	0	0	0	
16:29	205	0	0	0	0	0.00
16:30	206	0	0	0	0	
16:31	207	0	0	0	0	
16:32	208	0	0	0	0	0.00
16:33	209	0	0	0	0	

TABLE 2.6.1
VISIBLE EMISSIONS - RUN 3 - PART 1 of 4

Start 5/15/2019 8:18
End 5/15/2019 11:26

Highest 3-Minute Average: 29.17
2nd Highest 3-Minute Average: 6.67
3rd Highest 3-Minute Average: 4.17

TIME	Minute	0 Sec.	15 Sec.	30 Sec.	45 Sec.	3-Minute Block Averages
8:18	0	0	0	0	0	
8:19	1	0	0	0	0	0.00
8:20	2	0	0	0	0	
8:21	3	0	0	0	0	
8:22	4	0	0	0	0	0.00
8:23	5	0	0	0	0	
8:24	6	0	0	0	10	
8:25	7	10	5	0	0	2.08
8:26	8	0	0	0	0	
8:27	9	0	0	0	0	
8:28	10	0	0	0	0	0.00
8:29	11	0	0	0	0	
8:30	12	10	10	5	0	
8:31	13	0	0	0	0	2.08
8:32	14	0	0	0	0	
8:33	15	0	0	0	0	
8:34	16	0	0	0	0	0.00
8:35	17	0	0	0	0	
8:36	18	0	0	0	0	
8:37	19	0	0	0	0	0.00
8:38	20	0	0	0	0	
8:39	21	0	0	0	0	
8:40	22	0	0	0	0	0.00
8:41	23	0	0	0	0	
8:42	24	0	0	0	0	
8:43	25	0	0	0	0	0.00
8:44	26	0	0	0	0	
8:45	27	0	0	0	0	
8:46	28	0	0	0	0	0.00
8:47	29	0	0	0	0	
8:48	30	0	0	0	0	
8:49	31	0	0	0	0	0.00
8:50	32	0	0	0	0	
8:51	33	0	0	10	10	
8:52	34	0	0	0	0	1.67
8:53	35	0	0	0	0	
8:54	36	0	0	0	0	
8:55	37	0	0	0	0	0.00
8:56	38	0	0	0	0	
8:57	39	0	0	0	0	
8:58	40	0	0	0	0	0.00
8:59	41	0	0	0	0	
9:00	42	0	0	0	0	
9:01	43	0	0	0	0	0.00
9:02	44	0	0	0	0	
9:03	45	0	0	0	0	
9:04	46	0	0	0	0	0.00
9:05	47	0	0	0	0	
9:06	48	0	0	0	0	
9:07	49	0	0	0	0	0.00
9:08	50	0	0	0	0	
9:09	51	0	0	0	0	
9:10	52	0	0	0	0	0.00
9:11	53	0	0	0	0	
9:12	54	0	0	0	0	
9:13	55	0	0	0	0	0.00
9:14	56	0	0	0	0	
9:15	57	0	0	0	0	
9:16	58	0	0	0	0	0.00
9:17	59	0	0	0	0	

TABLE 2.6.2
VISIBLE EMISSIONS - RUN 3 - PART 2 of 4

Start 5/15/2019 8:18
End 5/15/2019 11:26

Highest 3-Minute Average: 29.17
2nd Highest 3-Minute Average: 6.67
3rd Highest 3-Minute Average: 4.17

TIME	Minute	0 Sec.	15 Sec.	30 Sec.	45 Sec.	3-Minute Block Averages
9:18	60	0	0	0	0	
9:19	61	0	0	0	0	0.00
9:20	62	0	0	0	0	
9:21	63	0	0	0	0	
9:22	64	0	0	0	0	4.17
9:23	65	0	15	15	20	
9:24	66	50	70	70	50	
9:25	67	30	20	20	15	29.17
9:26	68	10	10	5	0	
9:27	69	0	0	0	0	
9:28	70	0	0	0	0	0.00
9:29	71	0	0	0	0	
9:30	72	0	0	0	0	
9:31	73	0	0	0	0	0.00
9:32	74	0	0	0	0	
9:33	75	0	0	0	0	
9:34	76	0	0	0	0	0.00
9:35	77	0	0	0	0	
9:36	78	0	0	0	0	
9:37	79	0	0	0	0	0.00
9:38	80	0	0	0	0	
9:39	81	0	0	0	0	
9:40	82	0	0	0	0	0.00
9:41	83	0	0	0	0	
9:42	84	0	0	0	0	
9:43	85	0	0	0	0	0.00
9:44	86	0	0	0	0	
9:45	87	0	0	0	0	
9:46	88	0	0	0	0	0.00
9:47	89	0	0	0	0	
9:48	90	0	0	0	0	
9:49	91	0	0	0	0	0.00
9:50	92	0	0	0	0	
9:51	93	0	0	0	0	
9:52	94	0	0	0	0	0.00
9:53	95	0	0	0	0	
9:54	96	0	0	0	0	
9:55	97	0	0	0	0	3.75
9:56	98	15	10	15	5	
9:57	99	5	5	0	0	
9:58	100	0	0	0	0	0.83
9:59	101	0	0	0	0	
10:00	102	0	0	0	0	
10:01	103	0	0	0	0	0.00
10:02	104	0	0	0	0	
10:03	105	0	0	0	0	
10:04	106	0	0	0	0	0.00
10:05	107	0	0	0	0	
10:06	108	0	0	0	0	
10:07	109	0	0	0	0	0.00
10:08	110	0	0	0	0	
10:09	111	0	0	0	0	
10:10	112	0	0	0	0	0.00
10:11	113	0	0	0	0	
10:12	114	0	0	0	0	
10:13	115	0	0	0	0	0.00
10:14	116	0	0	0	0	
10:15	117	0	0	0	0	
10:16	118	0	0	0	0	0.00
10:17	119	0	0	0	0	

TABLE 2.6.3
VISIBLE EMISSIONS - RUN 3 - PART 3 of 4

Start 5/15/2019 8:18
End 5/15/2019 11:26

Highest 3-Minute Average: 29.17
2nd Highest 3-Minute Average: 6.67
3rd Highest 3-Minute Average: 4.17

TIME	Minute	0 Sec.	15 Sec.	30 Sec.	45 Sec.	3-Minute Block Averages
10:18	120	0	0	0	0	
10:19	121	0	0	0	0	0.00
10:20	122	0	0	0	0	
10:21	123	0	0	0	0	
10:22	124	0	0	0	0	0.00
10:23	125	0	0	0	0	
10:24	126	0	0	0	0	
10:25	127	0	0	0	0	0.00
10:26	128	0	0	0	0	
10:27	129	0	0	0	0	
10:28	130	0	0	0	0	0.00
10:29	131	0	0	0	0	
10:30	132	0	0	0	0	
10:31	133	0	0	0	0	0.00
10:32	134	0	0	0	0	
10:33	135	0	0	0	0	
10:34	136	0	0	0	0	0.00
10:35	137	0	0	0	0	
10:36	138	0	0	0	0	
10:37	139	0	0	0	0	0.00
10:38	140	0	0	0	0	
10:39	141	0	0	0	0	
10:40	142	0	0	0	0	0.00
10:41	143	0	0	0	0	
10:42	144	0	0	0	0	
10:43	145	0	0	0	0	3.75
10:44	146	10	15	15	5	
10:45	147	10	10	10	15	
10:46	148	15	10	5	5	6.67
10:47	149	0	0	0	0	
10:48	150	0	0	0	0	
10:49	151	0	0	0	0	0.00
10:50	152	0	0	0	0	
10:51	153	0	0	0	0	
10:52	154	0	0	0	0	0.00
10:53	155	0	0	0	0	
10:54	156	0	0	0	0	
10:55	157	0	0	0	0	1.67
10:56	158	0	10	5	5	
10:57	159	0	0	0	0	
10:58	160	0	0	0	0	0.00
10:59	161	0	0	0	0	
11:00	162	0	0	0	0	
11:01	163	0	0	0	0	0.00
11:02	164	0	0	0	0	
11:03	165	0	0	0	0	
11:04	166	0	0	0	0	0.00
11:05	167	0	0	0	0	
11:06	168	0	0	0	0	
11:07	169	0	0	0	0	0.00
11:08	170	0	0	0	0	
11:09	171	0	0	0	0	
11:10	172	0	0	0	0	0.00
11:11	173	0	0	0	0	
11:12	174	0	0	0	0	
11:13	175	0	0	0	0	0.00
11:14	176	0	0	0	0	
11:15	177	0	0	0	0	
11:16	178	0	0	0	0	0.00
11:17	179	0	0	0	0	

TABLE 2.6.4
VISIBLE EMISSIONS - RUN 3 - PART 4 of 4

Start 5/15/2019 8:18
End 5/15/2019 11:26

Highest 3-Minute Average: 29.17
2nd Highest 3-Minute Average: 6.67
3rd Highest 3-Minute Average: 4.17

TIME	Minute	0 Sec.	15 Sec.	30 Sec.	45 Sec.	3-Minute Block Averages
11:18	180	0	0	0	0	
11:19	181	0	0	0	0	0.00
11:20	182	0	0	0	0	
11:21	183	0	5	5	0	
11:22	184	0	0	0	0	0.83
11:23	185	0	0	0	0	
11:24	186	0	0	0	0	
11:25	187	0	0	0	0	0.00

3.0 PLANT AND SAMPLING LOCATION DESCRIPTIONS

3.1 PROCESS DESCRIPTION AND OPERATION

AK Steel Corporation-Dearborn Works is a steel-producing facility. The Basic Oxygen Furnace (BOF) (EUBOF) and Iron Reladling (EURELADLINGBOF) were in operation for this test event.

The operation of the BOF is a batch process that takes approximately forty (40) minutes to complete, including a 20-minute oxygen blow. Emissions occur during the scrap and hot metal charging, oxygen blowing, tapping and deslagging operations as well as during the iron reladling operations.

During the steel-making process, approximately 200 tons of iron per heat is charged into a BOF Vessel on top of approximately 70-80 tons of scrap steel. Lime is added as a flux. The iron is refined into steel by blowing oxygen into the molten iron/scrap mixture which causes the mixture to melt, reducing its carbon content. The heat for the steel-making process comes from the reaction of oxygen with the dissolved carbon in the molten iron. In addition, particulate emissions consisting of iron oxides and various other metal oxides are produced during the process, and approximately 30 tons of slag are generated per heat. Once oxygen blowing is complete, the Vessel is tapped and various alloys are added to obtain the desired chemistry for the grade of steel being produced.

Figure 3.1 depicts the sampling location schematic.

3.2 CONTROL EQUIPMENT DESCRIPTION

Primary emissions from the oxygen blowing process are controlled by a 32-field ESP. Secondary emissions (primarily charging, tapping, and reladling) are controlled by a 14-compartment secondary emissions capture (SEC) baghouse.

The ESP is considered the primary control device and is used to remove large amounts of particulates from the gas stream. The dust particles in the dust-laden gases entering the ESP are electrically charged. The charged particles migrate to the positively-charged collector plates, where the they are collected. Rappers are used to impart a vibration to both the discharge electrodes and the collection plates to dislodge the accumulated dust. The clean gases pass through the ID fans and the COM light pathway before being discharged out the stack.

The secondary control device is a baghouse. The baghouse collects and controls particulate emissions during the hot metal charging and tapping operations that occur at the BOF Vessels during the steel-making heats. The baghouse also controls emissions generated by the iron reladling operation. During the charging, tapping and reladling operations, the baghouse fan speed is controlled to draw the fumes through the hoods and ductwork for the secondary emission baghouse. Different fan speeds are used depending on what operation is taking place.

3.3 SAMPLING LOCATION(S)

The BOF Baghouse Exhaust Stack had a measured inner diameter of 222.0-inches and was oriented in the vertical plane. Four 4.0-inch I.D. 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 0.0° 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, and filterable PM concentration determinations.

Figure 3.2 schematically illustrates 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
FGBOFSHOP SAMPLING LOCATION SCHEMATIC

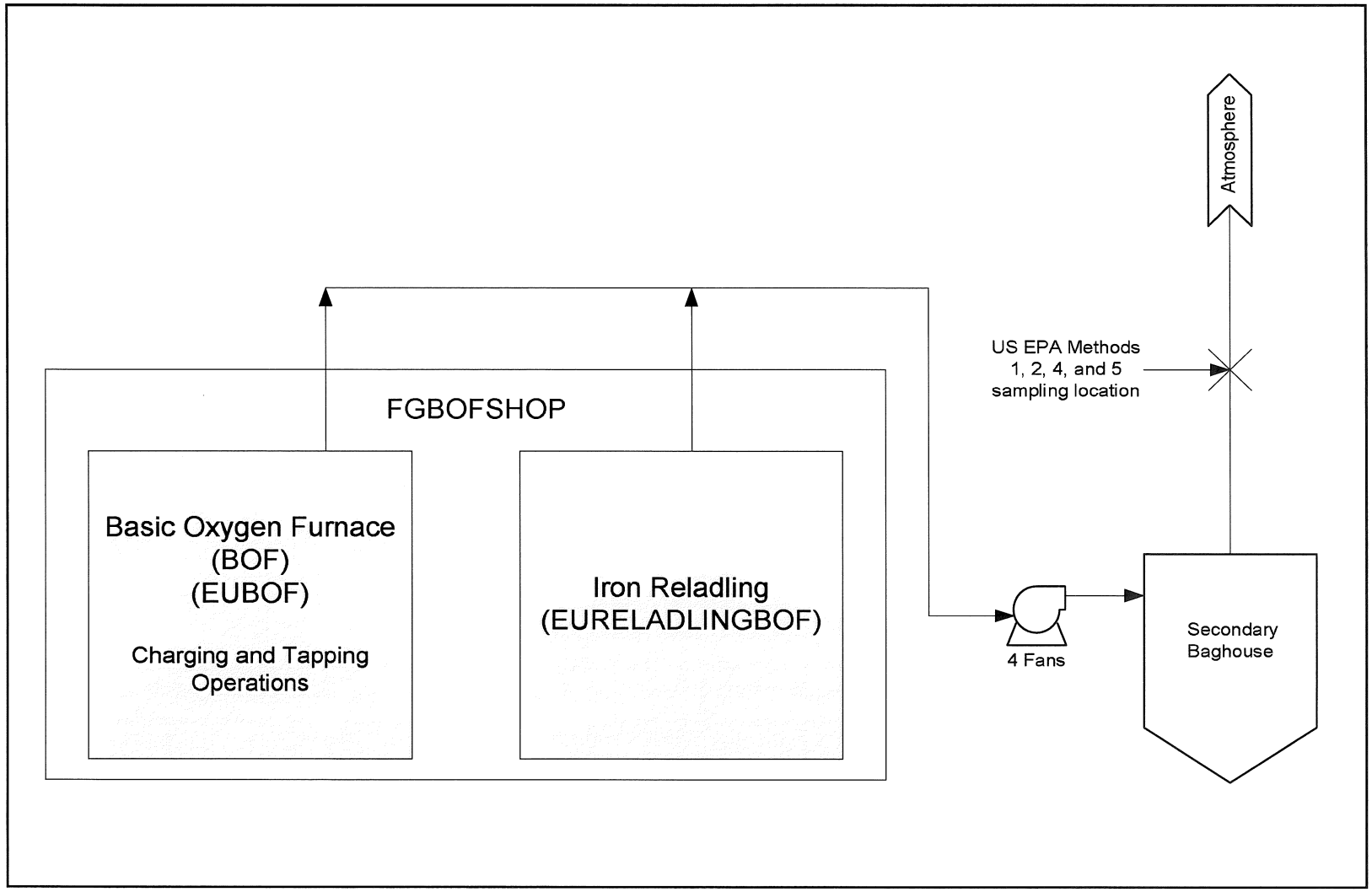
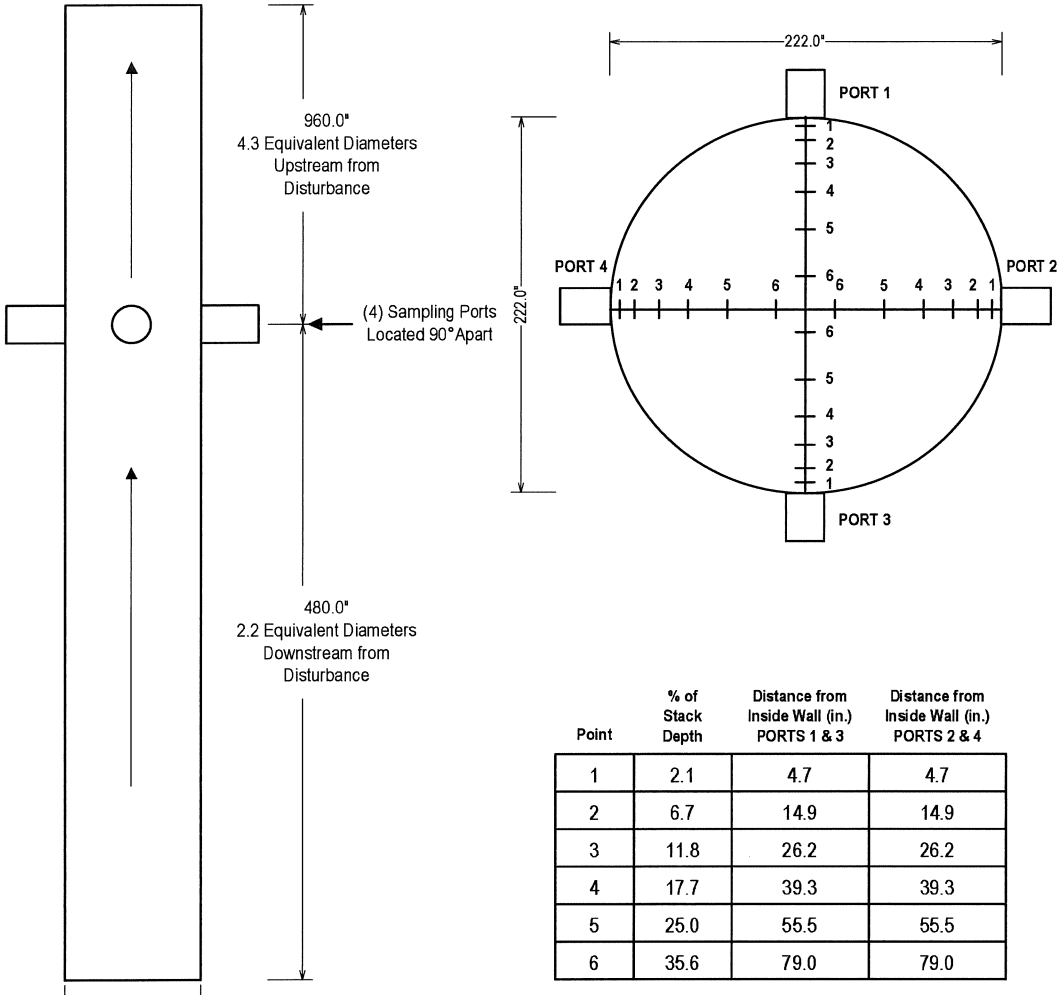


FIGURE 3.2
SECONDARY BAGHOUSE EXHAUST TRAVERSE POINT LOCATION DRAWING



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 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.

4.1.4 US EPA Method 5: "Determination of Particulate Emissions from Stationary Sources (Filterable PM Only)"

Principle: Particulate matter is withdrawn isokinetically from the source and collected on a glass fiber filter maintained at a temperature of 120 ± 14°C (248 ± 25°F) or such other temperature as specified by an applicable subpart of the standards or approved by the Administrator for a particular application. The PM mass, which includes any material that condenses at or above the filtration temperature, is determined gravimetrically after the removal of uncombined water. 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 9: "Visual Determination of Opacity of Emissions from Stationary Sources"

Principle: The opacity of emissions from stationary sources is determined visually by a qualified observer. This method was utilized in its entirety as per the procedures outlined in 40 CFR Part 60, Appendix A.

Observations are reported as 3-minute block averages in accordance with the Iron and Steel NESHAP (40 CFR Part 63, Subpart FFFFF) and covered each operating scenario.

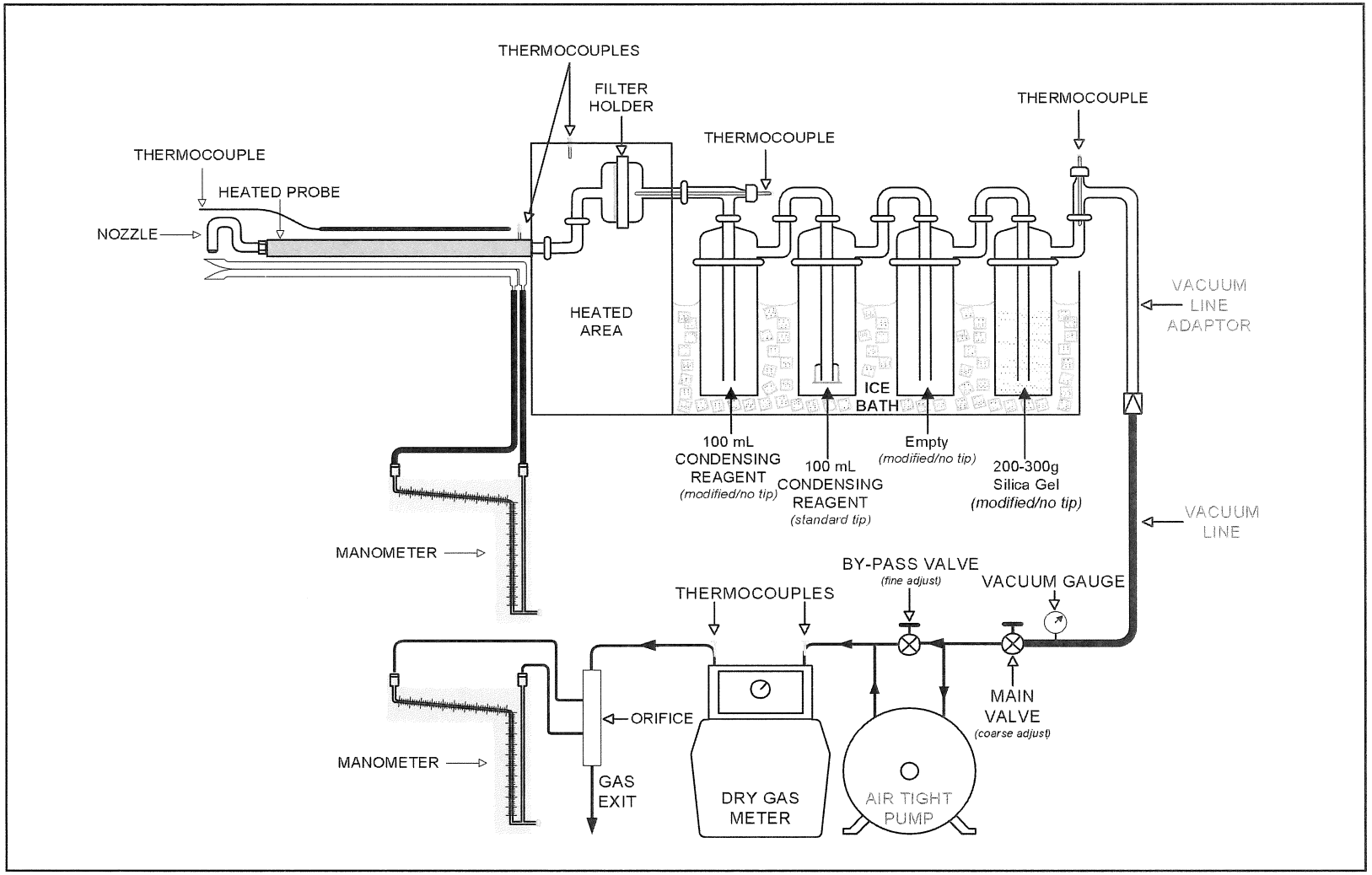
The sampling train utilized during this testing project is depicted in Figure 4.1.

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 Table 2.2 and in the Appendix. The following process data was recorded:

- Start and stop times of each production cycle.
- Production rate and tons per heat processed.
- Plenum pressure for each operating scenario.
- Damper position for each operating scenario.
- Baghouse compartment and overall differential pressure once per heat.
- Bag leak detector reading once per heat.
- Number of baghouse fans in operation during each test run.
- Start and stop times of each reladling cycle.

FIGURE 4.1
US EPA METHOD 5 SAMPLING TRAIN SCHEMATIC



5.0 NESHAP AND ROP TESTING REQUIREMENTS

Table 5.1 summarizes the NESHAP and ROP conditions as they relate to testing and notification requirements.

TABLE 5.1
NESHAP AND ROP TESTING REQUIREMENTS

NESHAP Reference	ROP Reference	NESHAP / ROP Language	Comments
40 CFR 63.7821(c)	FGBOFSHOP V.1 EURELADLINGBOF V.1	Conduct overlapping performance tests for particulate matter emissions from the BOF secondary baghouse and opacity from the BOF Roof Monitor (including reladling operation and BOF oxygen blows) at least once during the ROP renewal period.	This was the first test conducted within the current ROP Renewal Period (commenced April 22, 2016).
40 CFR 63.7822(b)(1)	N/A	Determine the concentration of particulate matter according to the listed test methods in 40 CFR 63.7822(b)(1)(i-v).	The particulate matter concentration was determined in accordance with the required test methods.
40 CFR 63.7822(b)(2)	N/A	Collect a minimum of 60 dscf of gas during the particulate matter test run. Three valid test runs are needed to comprise a performance test.	Between 146 and 158 dscf of gas were collected during each particulate matter test run.
40 CFR 63.7822(g)(1) and 40 CFR 63.7823(d)(5)	FGBOFSHOP V.3	Sample only during the steel production cycle. Conduct sampling under conditions that are representative of normal operation. Record the start and end time of each steel production cycle and each period of abnormal operation.	Sampling only occurred during the steel production cycle. The start and stop time of each steel production cycle was recorded as required.
40 CFR 63.7822(g)(2)	N/A	Sample for an integral number of steel production cycles. The steel production cycle begins when the scrap is charged to the furnace and ends 3 minutes after the slag is emptied from the vessel into the slag pot.	Sampling was conducted for an integral number of cycles subject to the limitation discussed in section 2.2. The cycle as described was documented and followed.

TABLE 5.1 continued
NESHAP AND ROP TESTING REQUIREMENTS

NESHAP Reference	ROP Reference	NESHAP / ROP Language	Comments
40 CFR 63.7823(d)(1)(ii)	EURELADLINGBOF V.3	Record observations to the nearest 5% at 15 second intervals for at least 3 steel production cycles rather than using the procedure specified in section 2.4 of Method 9.	A minimum of one complete steel production cycle was observed during each PM test run. The testing occurred over more than three production cycles.
40 CFR 63.7823(d)(1)(iii)	EURELADLINGBOF V.3	Determine the 3-minute block average opacity from the average of 12 consecutive observations recorded at 15-second intervals.	Opacity was calculated using the 3-minute block averages in accordance with this requirement.
40 CFR 63.7823(d)(4)	EUBOF V.5	Opacity observations from the roof monitors must cover at least 3 steel production cycles. The steel production cycle begins when the scrap is charged to the furnace and ends 3 minutes after the slag is emptied from the vessel into the slag pot.	An observation was conducted on a minimum of one complete steel production cycle per run. The observations occurred over more than three production cycles.
40 CFR 63.7823(b)	EURELADLINGBOF V.2	Performance tests shall be conducted such that the opacity observations overlap with performance test for particulate.	All opacity observations overlapped with the performance test for particulate.
40 CFR 63.7840(d)	FGBOFSHOP VII.4 EURELADLINGBOF VII.4	Submit a notification of intent to perform any performance testing under 40 CFR Part 63, Subpart FFFFF at least 60 days before testing is to begin.	The notification was submitted on March 11, 2019, 64 days prior to the start of the testing.
40 CFR 63.7824(a)	FGBOFSHOP V.4	Certify that the baghouse capture system operated during the performance test at the site-specific operating limits established in the operation and maintenance plan using procedures in 40 CFR 63.7824(a)(1-4)	The relevant certification is attached to this report. The O&M plan was revised on June 4, 2019 to reflect the new operating limits.
40 CFR 63.7824(c)	FGBOFSHOP V.5	The operating limits for the baghouse capture system may be changed if the requirements in 40 CFR 63.7824(c)(1-3) are met.	All requirements of 40 CFR 63.7824(c)(1-3) were met. The O&M plan was revised on June 4, 2019 to reflect the new operating limits.

6.0 INTERNAL QA/QC ACTIVITIES

6.1 QA AUDITS

Tables 6.1 to 6.2 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 6.1 and 6.2. All post-test leak checks were well below the applicable limit. Minimum metered volumes and percent isokinetics were also met where applicable.

Robert Bingham was certified on April 30, 2019 as a Visible Emissions Evaluator. The expiration date is six months from the issue date.

For quality assurance, the observer obtained a view of the emissions with the best available contrasting background and with the sun oriented in the 140° sector to their back. Readings were taken every 15 seconds and made to the nearest 5% opacity.

6.2 QA/QC PROBLEMS

No QA/QC problems occurred during this test event.

6.3 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.