



EMISSIONS TEST REPORT

EAGLE FOUNDRY COMPANY

MAIN FOUNDRY AND COOLING BUNKER BAGHOUSES EMISSION FACTOR DETERMINATION and MAIN FOUNDRY PTE VERIFICATION

Oregon Department of Environmental Quality
Air Contaminant Discharge Permit No. 03-2631-ST-01

Prepared for:

Eagle Foundry Co.
23123 SE Eagle Creek Rd.
Eagle Creek, OR 97022

Prepared by:

Bison Engineering, Inc.
3143 E Lyndale Ave.
Helena, MT 59601
(406) 442-5768
www.bison-eng.com

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EXECUTIVE SUMMARY

Eagle Foundry Company contracted Bison Engineering, Inc. to perform emissions testing at the Eagle Foundry facility in Eagle Creek, Oregon. Testing was performed on the Main Foundry and Cooling Bunker baghouses to determine emission factors. Permanent Total Enclosure verification was performed on the Main Foundry building to demonstrate that all suspended particulate in the work area is captured by the baghouses. The Eagle Foundry facility is subject to the provisions of Oregon Department of Environmental Quality (ODEQ) Standard Air Contaminant Discharge Permit Number 03-2631-ST-01. However, this testing was conducted to develop emission factors in support of the emissions inventory for the Cleaner Air Oregon program, rather than for permit compliance demonstration. This report presents emissions test data, describes the methods employed and details the quality assurance measures taken to ensure accurate data. Tables 1 through 5 summarize the test results.

Table 1 White Iron Results Summary (lb/ton melt)

Analyte	Main Foundry Baghouse		Cooling Bunker Baghouse	
	Inlet	Outlet	Inlet	Outlet
Aluminum	7.89E-03	1.95E-03	2.61E-02	1.73E-03
Antimony	< 1.79E-05	1.49E-05	< 8.74E-06	< 1.05E-05
Arsenic	< 3.57E-05	< 5.05E-05	< 3.57E-05	< 4.43E-05
Barium	7.17E-05	7.47E-05	1.44E-04	3.72E-05
Beryllium	< 1.02E-06	< 1.45E-06	< 1.13E-06	< 1.24E-06
Cadmium	< 7.05E-06	< 3.72E-06	< 1.23E-05	< 2.47E-06
Cobalt	3.56E-06	< 2.45E-06	4.29E-06	< 2.03E-06
Copper	3.43E-04	< 9.56E-05	2.98E-04	7.89E-05
Lead	< 5.75E-04	< 5.51E-05	< 2.81E-04	< 4.44E-05
Mercury	< 1.62E-07	< 1.99E-06	< 1.02E-06	< 1.53E-06
Nickel	< 1.22E-04	< 9.80E-05	1.01E-04	6.46E-05
Phosphorus	< 1.77E-04	< 1.67E-04	< 3.47E-04	< 4.20E-05
Selenium	< 7.65E-05	< 1.08E-04	< 7.65E-05	< 9.25E-05
Silver	< 3.37E-05	< 1.75E-05	< 1.88E-05	< 1.23E-05
Thallium	< 5.10E-05	< 7.22E-05	< 5.10E-05	< 6.17E-05
Vanadium	< 8.84E-06	< 7.22E-06	< 1.87E-05	< 6.17E-06
Zinc	6.49E-03	2.29E-04	2.92E-03	2.03E-04

lb/ton melt – pounds of given metal per ton of melt poured

Note: “<” indicates results which were calculated using the method detection limit (MDL) for front or back half results that were non-detect.

Table 2 White Iron Specific Emission Factors

Source		Analyte	Units	Result
Main Foundry Baghouse	Inlet	Chromium	lb Cr/ton Cr in melt	1.93E-03
		Manganese	lb Mn/ton Mn in melt	5.54E-01
	Outlet	Cr ⁺⁶	lb Cr ⁺⁶ /ton Cr in melt	7.20E-07
		Chromium	lb Cr/ton Cr in melt	2.32E-04
		Manganese	lb Mn/ton Mn in melt	3.46E-02
Cooling Bunker Baghouse	Inlet	Chromium	lb Cr/ton Cr in melt	1.61E-03
		Manganese	lb Mn/ton Mn in melt	4.25E-01
	Outlet	Cr ⁺⁶	lb Cr ⁺⁶ /ton Cr in melt	<1.16E-06
		Chromium	lb Cr/ton Cr in melt	9.28E-05
		Manganese	lb Mn/ton Mn in melt	1.22E-02

Cr⁺⁶ – hexavalent chromium**Table 3** Steel Alloy Results Summary (lb/ton melt)

Analyte	Main Foundry Baghouse		Cooling Bunker Baghouse	
	Inlet	Outlet	Inlet	Outlet
Aluminum	1.88E-02	1.90E-03	6.31E-02	1.45E-03
Antimony	< 3.42E-05	< 1.61E-05	< 2.49E-05	< 1.48E-05
Arsenic	< 1.29E-04	< 6.02E-05	< 1.80E-04	< 5.44E-05
Barium	1.58E-04	1.29E-04	3.36E-04	4.78E-05
Beryllium	< 1.10E-06	< 1.43E-06	< 1.60E-06	< 1.16E-06
Cadmium	2.39E-05	< 7.80E-06	2.81E-05	< 3.15E-06
Cobalt	5.42E-06	< 2.43E-06	6.45E-06	< 1.98E-06
Copper	< 7.57E-04	< 7.97E-05	< 5.75E-04	< 7.43E-05
Lead	< 1.81E-03	< 3.57E-05	< 5.73E-04	< 3.67E-05
Mercury	< 2.46E-06	< 4.17E-06	< 1.80E-06	< 2.92E-06
Phosphorus	< 5.17E-04	< 2.14E-04	< 7.51E-04	< 1.74E-04
Selenium	< 7.60E-05	< 1.07E-04	< 7.34E-05	< 8.67E-05
Silver	< 2.94E-05	< 1.50E-05	< 3.49E-05	< 1.16E-05
Thallium	< 5.03E-05	< 7.13E-05	< 4.90E-05	< 5.78E-05
Vanadium	< 8.21E-06	< 7.13E-06	< 2.37E-05	< 5.78E-06
Zinc	1.36E-02	2.17E-04	5.13E-03	2.17E-04

Table 4 Steel Alloy Specific Emission Factors

Source		Analyte	Units	Results
Main Foundry Baghouse	Inlet	Chromium	lb Cr/ton Cr in melt	7.48E-02
		Manganese	lb Mn/ton Mn in melt	1.16E+00
		Nickel	lb Ni/ton Ni in melt	<2.18E-02
	Outlet	Chromium	lb Cr ton Cr in melt	3.44E-03
		Cr ⁺⁶	lb Cr ⁺⁶ /ton Cr in melt	1.32E-05
		Manganese	lb Mn/ton Mn in melt	4.12E-03
		Nickel	lb Ni/ton Ni in melt	<1.97E-02
Cooling Bunker Baghouse	Inlet	Chromium	lb Cr/ton Cr in melt	4.64E-02
		Manganese	lb Mn/ton Mn in melt	4.44E-01
		Nickel	lb Ni/ton Ni in melt	1.69E-02
	Outlet	Chromium	lb Cr/ton Cr in melt	9.40E-04
		Cr ⁺⁶	lb Cr ⁺⁶ /ton Cr in melt	1.87E-05
		Manganese	lb Mn/ton Mn in melt	2.20E-03
		Nickel	lb Ni/ton Ni in melt	5.99E-03

Table 5 Main Foundry Building PTE Verification Results Summary

Parameter	Units	Test Result	Criteria	Criteria Status
NEAR	N/A	0.004	≤ 0.05	Pass
Facial velocity (via differential pressure measurement approach)	inH ₂ O	All readings were less than -0.007	All readings ≤ -0.007	Pass
Distance to any NDO from each emission point	Equivalent opening diameters	≥ 4 from each emission point to any NDO	≥ 4	Pass
Inward direction of air flow	N/A	Visually confirmed inward direction of flow at each NDO*	Continuous inward direction at each NDO	Pass

PTE – permanent total enclosure

NEAR – natural draft opening to enclosure area ratio

NDO – natural draft opening

N/A – not applicable

inH₂O – inches of water

ED – equivalent opening diameter

* Documented photographically

The results of the PTE verification on the Main Foundry building confirm that 100% of emissions in the building are being captured by emissions control systems. All captured emissions are directed to either the Main Foundry baghouse or Cooling Bunker baghouse.

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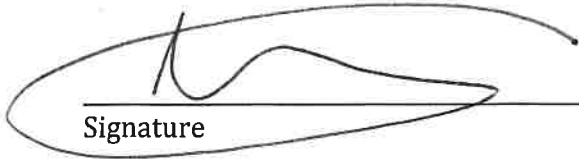
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CERTIFICATION FROM RESPONSIBLE OFFICIAL

I have reviewed the information being submitted in its entirety. Based on information and belief formed after reasonable inquiry, I certify that the statements and information contained in this submittal are true, accurate, and complete.


Signature

10-18-23
Date

Jack Scott
Name (printed)

General Manager
Title

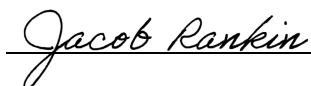
Eagle Foundry Company
Company

REVIEW AND CERTIFICATION

All work, calculations, other activities, and tasks performed and documented in this report were carried out under my direction and supervision. This test project conforms to the requirements of Bison Engineering, Inc.'s quality manual and American Society for Testing and Materials (ASTM) D7036-04.

Project Manager: Jacob Rankin, QSTI

Title: Helena Source Team Lead

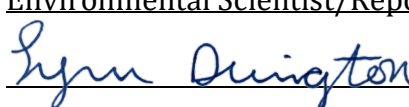
Signature: 

Date: 10/20/2023

I have reviewed all testing details, calculations, results, conclusions and other appropriate written material contained herein, and hereby certify that the presented material is authentic and accurate.

Reviewer: Lynn Dunnington

Title: Environmental Scientist/Reporting Lead

Signature: 

Date: 10/13/2023

1.0 INTRODUCTION

1.1 Project Summary and Objectives

Eagle Foundry Company (Eagle Foundry) contracted Bison Engineering, Inc. (Bison) to perform emissions testing and permanent total enclosure (PTE) verification at the Eagle Foundry facility in Eagle Creek, Oregon. While Eagle Foundry is subject to ODEQ Standard Air Contaminant Discharge Permit Number 03-2631-ST-01, this test campaign was conducted to develop emission factors in support of the emission inventory for the Cleaner Air Oregon program, rather than to satisfy permit requirements.

Emissions testing was performed on the inlet and outlet of both the Main Foundry baghouse and the Cooling Bunker baghouse. The Chester LabNet report identifies the Main Foundry baghouse as BH 1 and the Cooling Bunker baghouse as BH 2. Eagle Foundry performed two full melt cycles each day, the first melt was for white iron and the second was for steel alloy. PTE verification was performed on the Main Foundry building. Bison performed all testing in accordance with the pre-test protocol dated February 7, 2023, that was submitted to the Oregon Department of Environmental Quality (ODEQ). Bison employed U.S. Environmental Protection Agency (EPA) test methods as described in Title 40 Code of Federal Regulations (40 CFR). The pollutants measured include aluminum (Al), antimony (Sb), arsenic (As), barium (Ba), beryllium (Be), cadmium (Cd), chromium (Cr), cobalt (Co), copper (Cu), lead (Pb), manganese (Mn), mercury (Hg), nickel (Ni), phosphorus (P), selenium (Se), silver (Ag), thallium (Tl), vanadium (V), zinc (Zn) and hexavalent chromium (Cr⁺⁶). Other parameters measured during testing include moisture, flow rate, oxygen (O₂), and carbon dioxide (CO₂).

Permanent Total Enclosure (PTE) verification was performed on the Main Foundry building following Method 204.

Tables 6 and 7 summarize the emissions test methods used during the test campaign. Each test run encompassed a full melt cycle, which included final cooling on the foundry floor. Method 3A for molecular weight determination was performed on the outlets only; the inlets were assumed to have the same O₂ and CO₂ concentrations as the corresponding outlet.

Table 6 Test Matrix – Main Foundry and Cooling Bunker Baghouses:
White Iron Product

Source	EPA Method	Parameter	Details
Inlets – White Iron	1	Measurement locations	Determined once, prior to testing.
	2	Volumetric flow	Concurrent with Method 29 test runs.
	4	Moisture	Three, 240-minute test runs, concurrent with outlet test runs.
	29	Speciated metals	
Outlets – White Iron	1	Measurement locations	Determined once, prior to testing.
	2	Volumetric flow	Concurrent with Methods 29 and 0061 test runs.
	3A	O ₂ and CO ₂	Concurrent with Methods 29 and 0061 test runs.
	4	Moisture	Incorporated with Methods 29 and 0061.
	29	Speciated metals	Three, 240-minute test runs, concurrent with inlet test runs.
	0061	Cr ⁺⁶	

Table 7 Test Matrix – Main Foundry and Cooling Bunker Baghouses:
Steel Alloy

Source	EPA Method	Parameter	Details
Inlets – Steel Alloy	1	Measurement locations	Determined once, prior to testing.
	2	Volumetric flow	Concurrent with Method 29 test runs.
	4	Moisture	Three, 250-minute test runs, concurrent with outlet test runs.
	29	Speciated metals	
Outlets – Steel Alloy	1	Measurement locations	Determined once, prior to testing.
	2	Volumetric flow	Concurrent with Methods 29 and 0061 test runs.
	3A	O ₂ and CO ₂	Concurrent with Methods 29 and 0061 test runs.
	4	Moisture	Incorporated with Methods 29 and 0061.
	29	Speciated metals	Three, 250-minute test runs, concurrent with inlet test runs.
	0061	Cr ⁺⁶	

1.2 Project Contacts

Facility: **Eagle Foundry Company**
Address: 23123 SE Eagle Creek Rd.
Eagle Creek, OR 97022
Contact: Jack Scott
Phone: (503) 637-3048
Email: jacks@eaglefoundryco.com

Consultant: **Bison Engineering, Inc.**
Address: 3143 E Lyndale Ave.
Helena, MT 59601
Contact: Jacob Rankin
Phone: (208) 954-7138
Email: jrankin@bison-eng.com

State Authority: **Oregon Department of Environmental Quality
Northwest Region**
Address: 700 NE Multnomah St., Suite 600
Portland, OR 97232
Contact: Julia DeGagne
Phone: (503) 866-9643
Email: julia.degagne@deq.oregon.gov

Contract Laboratory: **Chester LabNet**
Address: 12242 SW Garden Pl.
Tigard, OR 97223
Contact: Paul Duda
Phone: (503) 624-2183 ext. 100
Website: www.chesterlab.net

1.3 Testing Personnel

The Bison on-site testing team was led by Jacob Rankin, Qualified Source Testing Individual (QSTI), Helena Source Team Lead. Mr. Rankin was assisted during field testing by Adam Bender, Qualified Individual (QI), Project Scientist; Andrew Van Sickle, Environmental Scientist; Angel Medina, QSTI, Tucson Source Team Lead; Jeremy Clark, QI, Environmental Scientist; Nathan Wikstrom, Environmental Technician; Kyle DeVerna, QSTI, Environmental Engineer; and Jennifer Kessler, QI, Environmental Scientist/Quality Manager. Mr. Rankin served as project manager. Ms. Kessler processed the test data and authored this report. Lynn Dunnington, Environmental Scientist/Reporting Lead, performed a final quality assurance review of the data and test report.

Jack Scott, General Manager, was the primary contact for Eagle Foundry. Greg Lasslett, Project Manager, was on-site monitoring the process and collecting process data during testing.

Thomas Rhodes from ODEQ was on-site during the test campaign and observed a portion of the testing. Julia Degagne was on site to observe a portion of the PTE verification.

2.0 SOURCE DESCRIPTION

2.1 Facility Description

Eagle Foundry owns and operates a white iron and steel alloy casting facility in Eagle Creek, Oregon. The facility specializes in custom cast metal components for end users primarily in the aggregate industry, but also in the wood products and mining industries. The casting facility generally operates during normal business hours Monday through Friday and is capable of pouring up to 8,060 tons of metal per year.

2.2 Emission Source Description

Eagle Foundry operates four small induction furnaces. Two furnaces melt and hold the white iron and the other two furnaces melt and hold various steel alloys. For this emission factor verification test, the facility produced white iron and a combination of a chrome steel and manganese steel alloy. Eagle Foundry used two of their larger furnaces to complete the melting of the separate products. The two furnaces each have a 3,000-pound capacity and must operate in alternating fashion due to the limited power available to run the furnaces.

The white iron product represents a high chromium product and is the main alloy produced by Eagle Foundry. The combination steel product is the second most frequently produced metal alloy. The combination steel product was chosen to ensure a high manganese alloy was tested while also including an alloy that contains chromium and nickel. This will support the development of emission factors for all three metals.

The emissions from the melting and holding furnaces area and the pouring and casting area are ducted to the Main Foundry baghouse. The cooling bunker emissions are ducted to the Cooling Bunker baghouse. Both baghouses were manufactured by Donaldson and are rated for 50,000 cubic feet per minute (cfm).

The Main Foundry baghouse inlet is 48 inches inner diameter and was accessed from the roof. The Main Foundry baghouse exhaust stack inner diameter is 61 inches.

The Cooling Bunker baghouse inlet is 48 inches inner diameter and was also accessed from the roof. The Cooling Bunker baghouse exhaust stack inner diameter is 55.75 inches.

Purpose-built sampling ports on the outlets were approximately 50 feet above grade. Test ports were accessed via a manlift. Figure 1 presents a photo of the stack and sampling locations prior to testing. During testing, the Main Foundry sampling ports were rotated approximately 90° from what is shown in the photo. While on-site, Bison verified that each exhaust stack meets EPA Method 1 specifications; detailed Method 1 information is included in the appendices to this report.

Figure 1 Main Foundry and Cooling Bunker Baghouses



3.0 EMISSION TEST RESULTS

3.1 Emissions Test Results

Tables 8 through 19 summarize the Main Foundry and Cooling Bunker baghouses emission testing details. All runs for each operating scenario encompassed a full melt cycle for each product and were completed simultaneously, including inlet and outlet testing. Additional supporting material, including raw and processed test data, plant data, example calculations and calibration records, can be found in the appendices to this report. Average results were presented in the executive summary. Detailed run results are presented in the appendices.

3.1.1 White Iron Test Results

Table 8 Main Foundry BH Inlet – Metals Test Summary – White Iron

Parameter	Units	Run 1	Run 2	Run 3	Average
Date		3/27/2023	3/28/2023	3/29/2023	
Run start time		6:40	5:10	5:15	
Run end time		10:40	9:10	9:15	
Run duration	minutes	240	240	240	
Barometric pressure	inHg	29.98	29.41	29.41	29.60
Isokinetic average	%	97.0	99.8	100.4	99.1
Sample volume	dscf	316.575	297.402	353.897	322.625
CO ₂	%vd	0.25	0.15	0.10	0.17
O ₂	%vd	20.85	20.91	20.59	20.78
H ₂ O	%v	0.54	0.66	0.56	0.59
Velocity	fps	63.44	60.04	69.78	64.42
Flow rate	dscfm	49,692	45,376	53,648	49,572
Stack temperature	°F	45.4	53.2	45.0	47.9

BH – baghouse

inHg – inches of mercury

dscf – dry standard cubic feet

%vd – percent by volume on a dry basis

%v – percent by volume

fps – feet per second

dscfm – dry standard cubic feet per minute

Table 9 Main Foundry BH Outlet – Metals Test Summary – White Iron

Parameter	Units	Run 1	Run 2	Run 3	Average
Date		3/27/2023	3/28/2023	3/29/2023	
Run start time		6:40	5:10	5:15	
Run end time		10:40	9:10	9:15	
Run duration	minutes	240	240	240	
Barometric pressure	inHg	29.98	29.41	29.41	29.60
Isokinetic average	%	99.7	101.2	100.7	100.5
Sample volume	dscf	254.654	243.575	253.844	250.691
CO ₂	%vd	0.25	0.15	0.10	0.17
O ₂	%vd	20.85	20.91	20.59	20.78
H ₂ O	%v	0.50	0.99	0.69	0.73
Velocity	fps	45.22	44.32	45.58	45.04
Flow rate	dscfm	57,267	53,968	56,540	55,925
Stack temperature	°F	46.3	54.0	46.1	48.8

Table 10 Main Foundry BH Outlet – Cr⁺⁶ Test Summary – White Iron

Parameter	Units	Run 1	Run 2	Run 3	Average
Date		3/27/2023	3/28/2023	3/29/2023	
Run start time		6:40	5:10	5:15	
Run end time		10:40	9:10	9:15	
Run duration	minutes	240	240	240	
Barometric pressure	inHg	29.98	29.41	29.41	29.60
Isokinetic average	%	100.2	101.7	101.3	101.1
Sample volume	dscf	244.179	230.177	240.436	238.264
CO ₂	%vd	0.25	0.15	0.10	0.17
O ₂	%vd	20.85	20.91	20.59	20.78
H ₂ O	%v	0.49	1.28	1.30	1.02
Velocity	fps	45.67	44.25	45.70	45.21
Flow rate	dscfm	57,254	53,145	55,756	55,385
Stack temperature	°F	51.5	59.6	51.4	54.2

Note: A difference in stack temperatures measured via Methods 29 and 0061 on the same outlet source could be due to differences in orientation in the sampling ports and the weather at the time of testing (rain, wind, etc.). Some sampling equipment may have been more susceptible to cold weather conditions, resulting in lower field temperature readings. All post-test equipment calibrations were within acceptable tolerance. The difference in temperatures do not result in significant differences in isokinetic percentage or average volumetric flow rate.

Table 11 Cooling Bunker BH Inlet – Metals Test Summary – White Iron

Parameter	Units	Run 1	Run 2	Run 3	Average
Date		3/27/2023	3/28/2023	3/29/2023	
Run start time		6:40	5:10	5:15	
Run end time		10:40	9:10	9:15	
Run duration	minutes	240	240	240	
Barometric pressure	inHg	29.98	29.41	29.41	29.60
Isokinetic average	%	100.6	100.7	100.8	100.7
Sample volume	dscf	292.604	274.574	318.952	295.377
CO ₂	%vd	0.07	0.06	0.07	0.07
O ₂	%vd	20.79	20.73	20.92	20.81
H ₂ O	%v	0.51	0.28	0.25	0.35
Velocity	fps	56.73	55.11	62.92	58.25
Flow rate	dscfm	44,670	41,875	48,592	45,046
Stack temperature	°F	42.9	52.4	44.3	46.5

Table 12 Cooling Bunker BH Outlet – Metals Test Summary – White Iron

Parameter	Units	Run 1	Run 2	Run 3	Average
Date		3/27/2023	3/28/2023	3/29/2023	
Run start time		6:40	5:10	5:15	
Run end time		10:40	9:10	9:15	
Run duration	minutes	240	240	240	
Barometric pressure	inHg	29.88	29.41	29.41	29.57
Isokinetic average	%	98.0	100.0	99.0	99.0
Sample volume	dscf	250.081	233.696	236.686	240.154
CO ₂	%vd	0.07	0.06	0.07	0.07
O ₂	%vd	20.79	20.73	20.92	20.81
H ₂ O	%v	0.59	1.00	0.51	0.70
Velocity	fps	44.43	42.14	42.33	42.97
Flow rate	dscfm	46,710	42,771	43,736	44,406
Stack temperature	°F	48.4	56.2	49.6	51.4

Table 13 Cooling Bunker BH Outlet – Cr⁺⁶ Test Summary – White Iron

Parameter	Units	Run 1	Run 2	Run 3	Average
Date		3/27/2023	3/28/2023	3/29/2023	
Run start time		6:40	5:10	5:15	
Run end time		10:40	9:10	9:15	
Run duration	minutes	240	240	240	
Barometric pressure	inHg	29.88	29.41	29.41	29.57
Isokinetic average	%	97.5	98.6	99.3	98.5
Sample volume	dscf	239.679	227.989	223.862	230.510
CO ₂	%vd	0.07	0.06	0.07	0.07
O ₂	%vd	20.79	20.73	20.92	20.81
H ₂ O	%v	0.57	0.36	0.71	0.55
Velocity	fps	43.52	42.21	40.74	42.16
Flow rate	dscfm	46,053	43,329	42,224	43,869
Stack temperature	°F	45.2	53.7	47.0	48.6

3.1.2 Steel Alloy Test Summaries

Table 14 Main Foundry BH Inlet – Metals Test Summary – Steel Alloy

Parameter	Units	Run 1	Run 2	Run 3	Average
Date		3/27/2023	3/28/2023	3/29/2023	
Run start time		13:00	10:30	10:35	
Run end time		17:10	14:40	14:45	
Run duration	minutes	250	250	250	
Barometric pressure	inHg	29.79	29.38	29.45	29.54
Isokinetic average	%	96.9	100.4	100.0	99.1
Sample volume	dscf	299.332	305.505	333.168	312.668
CO ₂	%vd	0.26	0.08	0.08	0.14
O ₂	%vd	20.99	20.93	20.98	20.97
H ₂ O	%v	0.35	0.99	0.62	0.65
Velocity	fps	59.65	59.49	64.69	61.28
Flow rate	dscfm	45,139	44,453	48,664	46,085
Stack temperature	°F	60.8	56.8	56.5	58.0

Table 15 Main Foundry BH Outlet – Metals Test Summary – Steel Alloy

Parameter	Units	Run 1	Run 2	Run 3	Average
Date		3/27/2023	3/28/2023	3/29/2023	
Run start time		13:00	10:30	10:35	
Run end time		17:10	14:40	14:45	
Run duration	minutes	250	250	250	
Barometric pressure	inHg	29.79	29.38	29.45	29.54
Isokinetic average	%	99.9	100.2	100.8	100.3
Sample volume	dscf	254.576	256.756	250.481	253.938
CO ₂	%vd	0.26	0.08	0.08	0.14
O ₂	%vd	20.99	20.93	20.98	20.97
H ₂ O	%v	0.40	0.90	0.79	0.70
Velocity	fps	44.95	45.63	44.25	44.94
Flow rate	dscfm	54,854	55,159	53,482	54,498
Stack temperature	°F	62.6	57.7	59.6	60.0

Table 16 Main Foundry BH Outlet – Cr⁺⁶ Test Summary – Steel Alloy

Parameter	Units	Run 1	Run 2	Run 3	Average
Date		3/27/2023	3/28/2023	3/29/2023	
Run start time		13:00	10:30	10:35	
Run end time		17:10	14:40	14:45	
Run duration	minutes	250	250	250	
Barometric pressure	inHg	29.79	29.38	29.45	29.54
Isokinetic average	%	101.5	100.9	101.2	101.2
Sample volume	dscf	241.418	241.940	234.342	239.233
CO ₂	%vd	0.26	0.08	0.08	0.14
O ₂	%vd	20.99	20.93	20.98	20.97
H ₂ O	%v	0.27	0.76	0.63	0.55
Velocity	fps	44.85	45.64	43.94	44.81
Flow rate	dscfm	54,079	54,512	52,665	53,752
Stack temperature	°F	69.6	64.7	64.8	66.4

Table 17 Cooling Bunker BH Inlet – Metals Test Summary – Steel Alloy

Parameter	Units	Run 1	Run 2	Run 3	Average
Date		3/27/2023	3/28/2023	3/29/2023	
Run start time		13:00	10:30	10:35	
Run end time		17:10	14:40	14:45	
Run duration	minutes	250	250	250	
Barometric pressure	inHg	29.79	29.38	29.45	29.54
Isokinetic average	%	99.0	101.2	100.9	100.4
Sample volume	dscf	291.103	274.533	295.936	287.191
CO ₂	%vd	0.09	0.09	0.06	0.08
O ₂	%vd	20.64	20.84	20.90	20.79
H ₂ O	%v	0.28	0.69	0.69	0.55
Velocity	fps	57.67	53.76	57.96	56.46
Flow rate	dscfm	43,321	39,968	43,227	42,172
Stack temperature	°F	65.0	61.0	60.6	62.2

Table 18 Cooling Bunker BH Outlet – Metals Test Summary – Steel Alloy

Parameter	Units	Run 1	Run 2	Run 3	Average
Date		3/27/2023	3/28/2023	3/29/2023	
Run start time		13:00	10:30	10:35	
Run end time		17:10	14:40	14:45	
Run duration	minutes	250	250	250	
Barometric pressure	inHg	29.89	29.38	29.45	29.57
Isokinetic average	%	100.2	100.2	100.6	100.3
Sample volume	dscf	241.322	233.772	237.319	237.471
CO ₂	%vd	0.09	0.09	0.06	0.08
O ₂	%vd	20.64	20.84	20.90	20.79
H ₂ O	%v	0.55	0.94	1.30	0.93
Velocity	fps	41.84	41.11	41.69	41.55
Flow rate	dscfm	42,288	40,978	41,432	41,566
Stack temperature	°F	69.2	65.4	66.3	67.0

Table 19 Cooling Bunker BH Outlet – Cr⁺⁶ Test Summary – Steel Alloy

Parameter	Units	Run 1	Run 2	Run 3	Average
Date		3/27/2023	3/28/2023	3/29/2023	
Run start time		13:00	10:30	10:35	
Run end time		17:10	14:40	14:45	
Run duration	minutes	250	250	250	
Barometric pressure	inHg	29.89	29.38	29.45	29.57
Isokinetic average	%	98.7	98.9	98.6	98.7
Sample volume	dscf	235.731	239.568	224.172	233.157
CO ₂	%vd	0.09	0.09	0.06	0.08
O ₂	%vd	20.64	20.84	20.90	20.79
H ₂ O	%v	0.49	0.75	0.29	0.51
Velocity	fps	42.30	43.41	40.57	42.09
Flow rate	dscfm	42,966	43,586	40,903	42,485
Stack temperature	°F	66.9	62.6	64.1	64.5

3.2 Permanent Total Enclosure Verification Results

Bison followed EPA Method 204 to assess whether the Main Foundry Building can be considered a PTE, indicating 100% capture of emissions within the foundry building. Area measurements were taken for each natural draft opening (NDO) in an “as-found” condition. Supporting data and photographic evidence of inward flow are included in the appendices to this report. Bison measured differential pressure at each NDO in lieu of calculating facial velocity.

3.2.1 Natural Draft Opening to Enclosure Area Ratio

Bison field personnel calculated the total interior area (walls, floor, ceiling) of the Main Foundry building to be 48,219 square feet (ft²). Using Method 204, Eq. 204-2 the NEAR was calculated as follows:

$$\begin{aligned}\text{Eq. 204-2} \quad \text{NEAR} &= \text{total area of all NDOs} / \text{total enclosure area} \\ \text{NEAR} &= 197 \text{ ft}^2 / 48,219 \text{ ft}^2 = 0.004\end{aligned}$$

The NEAR for the Main Foundry building was calculated to be 0.004, which is less than the limit of 0.05 for a PTE as stipulated by Method 204, Section 8.2. All NDOs were measured as found for normal operating conditions.

Table 20 presents the NDO dimensions, which were measured as follows:

- The NW Loading opening (M-1) is primarily used for forklift traffic and is covered with freezer strips to provide building access without compromising visibility for forklift operators. The opening area measurements were taken from the cut-out of the freezer strips and not from the entire doorway opening because the freezer strips have good overlap across the width of the doorway.
- The Waste Sand Exit (M-2) is approximately the size of a man door with freezer strips covering the door down to the top of the mold sand bucket. Area measurements were taken between the ground and the bottom of the freezer strips because the freezer strips overlap on the top half of the doorway.
- The Mold Wash opening (M-3) has freezer strips covering the opening from top to bottom with a gap of approximately one inch at the bottom. The area of M-3 was measured as the width of the opening (93 inches) times the height of the bottom gap (one inch), since the freezer strips provide coverage across the opening.
- The NE Man Door (M-4) is occasionally used by Eagle Foundry personnel working in the mold preparation area and has a space between the door and the floor. This space varies in height but is about an inch at the tallest point; therefore, one inch was assumed for the height of the gap for area calculations. The SE Man Door (M-5) is identical to the NE Man Door.
- The East Loading opening (M-6) is covered with freezer strips from top to bottom but did not have good overlap across the width, so the opening area was determined by multiplying the full width by half of its height (84 inches was the point where the breaks in the freezer strips began).
- The Reclaim Loading opening (M-7) is another doorway primarily used for forklift traffic and is designed like the NW Loading opening with the freezer strips only coming down low enough to still provide adequate visibility for forklift operators. The area measurements were taken from the bottom of the freezer strips to the ground across the width of the opening.

Table 20 NDO Dimensions

NDO #	NDO Description	Length (in)	Width (in)	Area (in ²)
M-1	NW Loading	91	103	9,373
M-2	Waste Sand Exit	36	54	1,944
M-3	Mold Wash	1	93	93
M-4	NE Man Door	1	35	35
M-5	SE Man Door	1	35	35
M-6	East Loading	84	121	10,164
M-7	Reclaim Loading	91	74	6,734
Total area of all NDOs				197 ft²

in – inches

in² – square inches

3.2.2 Equivalent Opening Diameters

Method 204, Section 5.1 requires each NDO to be at least four equivalent opening diameters (ED) from each emitting point. Using the dimensions from Table 20, Bison calculated the number of EDs from each NDO to their closest emitting point in the Main Foundry building. Emitting points (EP) in the Main Foundry building include the furnaces (EP-1), the cooling bunker rock pile (EP-2), the reclaim unit dump bin (EP-3), and the pouring area (EP-4). Each emitting point is labeled in the building diagram included in the appendices to this report. Table 21 presents the calculated distances as ED. ED calculations are included in the appendices to this report.

Table 21 Equivalent Opening Diameters

NDO #	NDO Description	ED (in)	Distance to Emitting Point (in)	Nearest Emitting Point	# of Diameters
M-1	NW Loading	96.63	426	EP-3	4.4
M-2	Waste Sand Exit	43.20	900	EP-3	20.8
M-3	Mold Wash	1.98	840	EP-3	424.5
M-4	NE Man Door	1.94	720	EP-1	370.3
M-5	SE Man Door	1.94	660	EP-1	339.4
M-6	East Loading	99.16	420	EP-4	4.2
M-7	Reclaim Loading	81.62	465	EP-2	5.7

3.2.3 Differential Pressure Measurements and Inward Flow

Bison conducted three rounds of five differential pressure measurements at each NDO. The five measurements were taken approximately one minute apart. After recording the five pressure measurements, field personnel moved to the next location and performed five measurements on that NDO. This procedure was repeated until three rounds of five measurements were complete. Table 22 presents averages of the differential pressure measurements. All direct measurements of differential pressure were made using a Shortridge micromanometer, serial number M22572, with a four decimal place display and current calibration certificate demonstrating instrument accuracy to differential pressures as low as 0.0100 inches of water (inH₂O).

Verification of inward flow was determined photographically. A photo montage presenting inward flow from each NDO is included in the appendices to this report.

Table 22 Differential Pressure Measurement Summary

NDO #	Measurement Location	Units	Round 1 Average	Round 2 Average	Round 3 Average
M-1	NW Loading	inH ₂ O	-0.0456	-0.0356	-0.0139
M-2	Waste Sand Exit	inH ₂ O	-0.0092	-0.0240	-0.0112
M-3	Mold Wash	inH ₂ O	-0.0167	-0.0218	-0.0246
M-4	NE Man Door	inH ₂ O	-0.0118	-0.0114	-0.0126
M-5	SE Man Door	inH ₂ O	-0.0099	-0.0189	-0.0088
M-6	East Loading	inH ₂ O	-0.0110	-0.0102	-0.0083
M-7	Reclaim Loading	inH ₂ O	-0.0086	-0.0097	-0.0093

3.3 Operating Conditions

Eagle Foundry personnel compiled the raw process data and details of plant operations during testing and provided them to Bison for use in this report. Process data is presented in the report appendices.

3.4 Field Observations

Testing was performed as outlined in the test protocol. No adverse or unusual environmental conditions were noted that are known to have influenced the outcome of these tests.

Bison would like to note the following:

- On Monday, March 27, the data logger for recording O₂ and CO₂ data for the Main Foundry baghouse malfunctioned and recorded data every six seconds instead of every 60 seconds. The issue was resolved for subsequent days of testing.
- Mid-run port changes were not completed during testing on the baghouse inlets. Despite Bison's best efforts to ensure adequate and safe access to both inlet sampling locations, weather conditions made port changes unsafe. Bison believes the data collected from the inlet sampling trains is adequate because it is used primarily as indication of target metal analytes and baghouse control efficiency.
- Port changes were not practical at the outlet sampling locations because two sampling trains were operating in the outlet stacks simultaneously and both had to be positioned via manlift. Bison decided that the port change process was prohibitive to collecting adequate sample volume in the limited sampling time available. In addition, mid-run port changes would have occurred when the furnaces were still firing, and continuous emissions sampling was crucial to this testing.

Sampling trains alternated ports each test run corresponding to their respective products to sample across both axes of the outlet stacks and obtain measurements that were as representative as possible. Bison believes that volumetric flow was accurately measured for every test run due to the following:

- Sampling ports were located >4 diameters downstream of any flow disturbance.
- Velocity profiles were consistent across both port traverses.
- An isokinetic sampling train was present and measuring velocity at each traverse point, in each port in both outlet stacks simultaneously for every test run, thus ensuring a complete velocity profile for each outlet.
- Baghouse operation was consistent during all test runs.

Bison discussed this with ODEQ personnel on-site. With the points discussed above, Bison believes the data collected for the Main Foundry and Cooling Bunker baghouses is defensible and adequately represents the true emissions of the two sources.

- The Container 5C sample for Run 3 on the Cooling Bunker BH Outlet – Steel Alloy (Lab ID 23-S728) was misplaced in transit to Chester LabNet. Because all Container 5C results were below the MDL for this source, and for all others tested during this campaign, it is reasonable to assume that the quantity of Hg in the missing sample would have also been below the MDL, and therefore had no contribution to the total Hg sample. Container 5C is a secondary rinse of the potassium permanganate impingers using 25 milliliters (ml) of 8 N hydrochloric acid (HCl), which is placed in a sample jar containing 200 ml of reagent grade high purity, low concentration (HPLC) water.
- Method 0061 trains were purged for approximately 30 minutes following the end of each run. Purge logs are included in the appendices to Revision 01 of this report.
- Several Method 0061 trains had negative gain in the first impinger. Bison believes this was due to a high vacuum rate during leak checks, which may have resulted in the transfer of contents from the first impinger to the second or third impingers. Because the overall volume of the impingers was not affected, Bison believes this occurrence did not affect the integrity of the test results.

4.0 EMISSION TEST METHODS AND PROCEDURES

4.1 Testing Methods and Procedures

Bison testing personnel performed the following EPA methods as described in 40 CFR. Instrumental analyzers used by Bison to measure pollutant and diluent concentrations in stack gas are purpose-built by reputable companies and have been subjected to comprehensive interference response test procedures by their respective manufacturers. Further documentation regarding interferences for individual analyzers can be provided upon request.

EPA Reference Method 1, "Sample and Velocity Traverses for Stationary Sources." The objective of Method 1 is to determine a suitable location for testing and to determine the velocity and/or sample points for the source. The results of Method 1 sampling location and sample or velocity point measurement locations are included in the appendices.

EPA Reference Method 2, "Determination of Stack Gas Velocity and Volumetric Flow Rate (Type-S Pitot Tube)." The objective of Method 2 is to determine volumetric flow. The average velocity, temperature, static pressure, and source area are used to calculate volumetric flow for the source.

EPA Reference Method 3A, "Determination of Oxygen and Carbon Dioxide Concentrations in Emissions from Stationary Sources (Instrumental Analyzer Procedure)." The objective of Method 3A is to determine the O₂ and CO₂ concentrations in the stack gas stream.

EPA Reference Method 4, "Determination of Moisture Content in the Stack Gases." The objective of Method 4 is to determine the moisture content of a gas stream. This method is incorporated within the performance of Method 29.

EPA Reference Method 29, "Determination of Metals Emissions from Stationary Sources" (Methods 2 & 4 Inclusive). The objective of Method 29 is to determine particulate matter and metals emissions from a source. Method 29 is an isokinetic sampling method. The exhaust gas stream is sampled along a cross-section of the stack and metal emissions are captured within the front-half and back-half of the sampling system. The front-half includes the nozzle, probe, filter-bell, and glass fiber filter. The back-half consists of the impinger solutions. The front-half and back-half samples are sent to a contract lab for analysis. Method 29 incorporates Method 2 "velocity measurements" and Method 4 "moisture measurements".

EPA Method 0061, "Determination of Hexavalent Chromium Emission from Stationary Sources" (Methods 2 & 4 Inclusive). The objective of Method 0061 is to determine hexavalent chromium emission from a source. Method 0061 is an isokinetic sampling method. The exhaust gas stream is sampled along a cross-section of the stack and hexavalent chromium emissions are captured within the back half of the sampling system. The front half

includes the nozzle and probe. The back half consists of the impinger solution and an aspirating system. The back half samples are sent to a contract lab for analysis. Method 0061 incorporates Method 2 “velocity measurements” and Method 4 “moisture measurements”.

EPA Reference Method 204, “Criteria for and Verification of a Permanent or Temporary Total Enclosure.” The objective of Method 204 is to determine whether a permanent or temporary enclosure meets the criteria for being considered a total enclosure. If all the criteria are met, then the volatile organic compound capture efficiency (CE) is assumed to be 100 percent.

4.2 Sample Handling and Analytical Procedures

Sampling procedures are cited in the appropriate methods and there was no deviation from those methods.

Bison’s project manager retained custody of the samples and supervised their preparation and subsequent delivery to Chester LabNet. Copies of the chain of custody forms are included in the appendices.

4.3 Audit Samples

The stationary source audit program (SSAP) is effectively suspended as of March 2022 because there are currently no independent accredited audit sample providers (AASP).

APPENDIX A: WHITE IRON TEST DATA



COMPANY	Eagle Foundry Company
FACILITY	Eagle Foundry
LOCATION	Eagle Creek, OR
SOURCE	Main Foundry BH Inlet - White Iron
DATE	3/27/2023 - 3/29/2023
METHOD	29
POLLUTANT	Metals

EPA Method 1
Stack Parameters and Traverse Points

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Main Foundry BH Inlet - White Iron
Facility: Eagle Foundry

Type of Testing: P (P for Particulate; V for Velocity/Nonparticulate)
Type of Duct: C (C for circular; R for rectangular)

Number of ports available: 2
Number of ports to be used: 2
Port diameter: 4 inches
Sampling location height (approx.): feet
Stack height (approx.): feet

Circular ID (Rectangular Depth): 48.00 inches
Port depth and/or wall thickness: 6.25 inches
Stack width (Rectangular only): inches

Equivalent Diameter
If rectangular = $\frac{2 * \text{Depth} * \text{Width}}{\text{Depth} + \text{Width}}$ = 48.00 inches (If circular = duct ID)

Stack/duct area = 12.566 sq. feet 1809.6 sq. inches

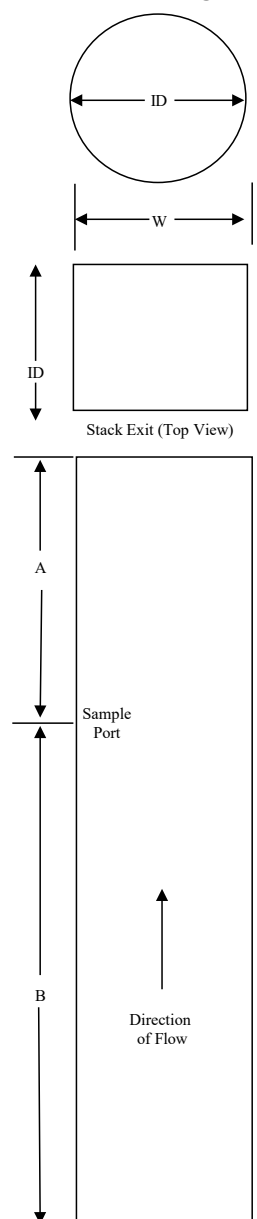
Sample Port Location: Downstream flow disturbance from process B Upstream flow disturbance toward exit A
Number of Inches: 444.00 53.00
Number of Diameters: 9.25 1.10

Minimum Number of Traverse Points: 24

Traverse points less than 1.0 inch from the stack wall are relocated to a distance of 1.0 inch.

Points	% of diameter	Distance from inside wall (in.)	Distance including port (in.)
1	2.1	1.01	7 1/4
2	6.7	3.22	9 1/2
3	11.8	5.66	11 7/8
4	17.7	8.50	14 3/4
5	25.0	12.00	18 1/4
6	35.6	17.09	23 3/8
7	64.4	30.91	37 1/8
8	75.0	36.00	42 1/4
9	82.3	39.50	45 3/4
10	88.2	42.34	48 5/8
11	93.3	44.78	51
12	97.9	46.99	53 1/4

Reference Diagram



Drawing NOT to scale and
NOT an accurate representation of stack.

Pre-Test Traverse

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Main Foundry BH Inlet - White Iron

Stack Temp: 60 °F

Traverse Point	Velocity ΔP ("H ₂ O)	Null Angle
1	0.91	0
2	1.08	0
3	1.00	0
4	1.00	5
5	1.15	0
6	1.00	5
7	1.10	5
8	1.15	5
9	1.20	0
10	1.10	0
11	1.10	0
12	1.00	0
13	1.00	0
14	1.00	0
15	1.10	0
16	1.10	0
17	1.15	5
18	1.15	5
19	1.20	0
20	1.50	5
21	1.00	0
22	1.00	5
23	0.90	0
24	0.90	0

Average: 1.08 2

Flow is found to be: Non-cyclonic

Isokinetic Field Data
Field Data Entry

Client:	Eagle Foundry Company	Run:	1
Location:	Eagle Creek, OR	Start Time:	6:40
Source:	Main Foundry BH Inlet - White Iron	End Time:	10:40
EPA Method:	29	Environmental Conditions/Test Notes:	Date: 3/27/2023
Box Operator:	AAM		
Technician(s):	NEW		

Stack Dimensional Data:		Equipment:					
Circular		Meterbox ID	SB-2	Probe ID	5B	Liner type	Glass
Diameter	48.000 in	Y factor	1.0028	Nozzle ID	3P	Nozzle size	0.251 inches
Rectangular		$\Delta H@$	1.601	Hot box ID	HHB2	Nozzle area	0.000344 sq.ft.
Width	in	Bp ID	TS-1	Pitot Cp	0.84	Probe heat	250 °F
Length	in	Balance ID	HLN FB-1	Pitot ID	55	Filter heat	250 °F
Stack Area	12.566 sq.ft.	Weights ID	HLN FW-1	Probe Length, ft	6		

Source Information:				Leak Checks:		
Barometric Pressure	29.98 "Hg	O ₂	20.90 %	Pitot	x	x
Static Pressure	-0.9 "H ₂ O	CO ₂	0.00 %	Leak rate, dcf	0.000	0.000
Ave. ΔP	1.08 "H ₂ O	Rec. Nz.	0.206 inches	Leak check vacuum, "Hg	15	10
Stack Temperature	60 °F					
Assumed moisture	3.00 %					
Assumed meter temp.	40 °F					
Total number of points	24					
Time per point	10 min.					
Total run time	240 min.					

Nozzle check for roundness:		
1	2	3
0.251	0.252	0.250 inches
Caliper ID	WS-1	

Post Test Calculations:				Moisture/Lab:			
Sample volume	300.534 dcf	Ave. ΔP	1.333 "H ₂ O	Filter, #	NA		
Wet mol. weight	28.78 M _s (actual)	Ave. $\sqrt{\Delta P}$	1.154 "H ₂ O		Initial	Final	Gain
Actual H ₂ O	0.54 %	Ave. ΔH	4.967 "H ₂ O	Impingers, g	3,709.4	3,702.9	-6.5
Std. meter vol.	316.575 dscf	Ave. T _s	45.4 °F	Silica gel, g	886.6	929.7	43.1
Isokinetic Average	96.9 %	Ave. T _m	49.8 °F		Total water gain, g:		36.6

Traverse Point	Time (min.)	Meter Volume (dcf)	Velocity ΔP ("H ₂ O)	Stack Temp. (°F)	Meter Temp. (°F)	Calc. ΔH	Run ΔH	Vacuum ("Hg)	Filter Box (°F)	Condenser Temp (≤68°F)
1	10.0	139.898	1.30	41	34	4.73	4.70	2	250	33
2	20.0	163.735	1.30	41	35	4.74	4.75	2	250	39
3	30.0	175.800	1.30	40	37	4.77	4.80	2	255	45
4	40.0	187.930	1.30	40	40	4.80	4.80	2	252	50
5	50.0	200.100	1.30	40	42	4.82	4.80	2	254	56
6	60.0	212.860	1.40	39	53	5.31	5.30	3	250	53
7	70.0	225.670	1.40	40	45	5.22	5.20	3	249	50
8	80.0	238.430	1.40	41	46	5.22	5.20	3	252	50
9	90.0	251.410	1.45	41	47	5.42	5.40	4	251	49
10	100.0	264.170	1.40	42	48	5.23	5.25	3	251	50
11	110.0	276.980	1.40	45	49	5.21	5.20	3	250	52
12	120.0	289.800	1.40	45	50	5.22	5.20	3	256	54
13	130.0	302.720	1.40	46	51	5.22	5.25	3	256	55
14	140.0	315.740	1.40	46	52	5.23	5.25	3	255	54
15	150.0	328.480	1.35	47	53	5.04	5.05	3	254	48
16	160.0	341.390	1.40	48	54	5.23	5.25	3	255	46
17	170.0	354.090	1.35	50	55	5.03	5.05	3	250	46
18	180.0	366.850	1.35	49	55	5.04	5.05	3	255	47
19	190.0	379.320	1.30	49	55	4.86	4.85	3	252	48
20	200.0	391.800	1.30	50	57	4.87	4.85	3	256	48
21	210.0	404.000	1.20	52	58	4.48	4.50	3	251	50
22	220.0	416.130	1.20	53	59	4.48	4.50	3	249	51
23	230.0	428.410	1.20	52	60	4.50	4.50	3	250	53
24	240.0	440.432	1.20	52	61	4.51	4.50	3	249	54

**Isokinetic Field Data
Field Data Entry**

Client:	Eagle Foundry Company	Run:	2
Location:	Eagle Creek, OR	Start Time:	5:10
Source:	Main Foundry BH Inlet - White Iron	End Time:	9:10
EPA Method:	29	Environmental Conditions/Test Notes:	Date: 3/28/2023
Box Operator:	AAM	40-65 °F, Rainy/cloudy	
Technician(s):	NEW		

Stack Dimensional Data:		Equipment:					
Circular		Meterbox ID	SB-2	Probe ID	5B	Liner type	Glass
Diameter	48.000 in	Y factor	1.0028	Nozzle ID	3P	Nozzle size	0.251 inches
Rectangular		ΔH@	1.601	Hot box ID	HHB2	Nozzle area	0.000344 sq.ft.
Width	in	Bp ID	TS-1	Pitot Cp	0.84	Probe heat	250 °F
Length	in	Balance ID	HLN FB-1	Pitot ID	55	Filter heat	250 °F
Stack Area	12.566 sq.ft.	Weights ID	HLN FW-1	Probe Length, ft	6		

Source Information:				Leak Checks:		
Barometric Pressure	29.41 "Hg	O ₂	20.90 %		Pre-test	Post-test
Static Pressure	-0.9 "H ₂ O	CO ₂	0.00 %	Pitot	x	x
Ave. ΔP	1.08 "H ₂ O	Rec. Nz.	0.201 inches	Leak rate, dcf	0.010	0.005
Stack Temperature	60 °F			Leak check vacuum, "Hg	16	10
Assumed moisture	0.54 %					
Assumed meter temp.	49.8 °F					
Total number of points	24					
Time per point	10 min.					
Total run time	240 min.					

Nozzle check for roundness:		
1	2	3
0.251	0.252	0.250 inches
	Caliper ID	WS-1

Post Test Calculations:				Moisture/Lab:			
Sample volume	291.421 dcf	Ave. ΔP	1.155 "H ₂ O	Filter, #	NA		
Wet mol. weight	28.77 M _s (actual)	Ave. √ΔP	1.073 "H ₂ O		Initial	Final	Gain
Actual H ₂ O	0.66 %	Ave. ΔH	4.475 "H ₂ O	Impingers, g	3,719.4	3,718.4	-1.0
Std. meter vol.	297.402 dscf	Ave. T _s	53.2 °F	Silica gel, g	878.8	921.4	42.6
Isokinetic Average	99.7 %	Ave. T _m	55.7 °F		Total water gain:		41.6

Traverse Point	Time (min.)	Meter Volume (dcf)	Velocity ΔP ("H ₂ O)	Stack Temp. (°F)	Meter Temp. (°F)	Calc. ΔH	Run ΔH	Vacuum ("Hg)	Filter Box (°F)	Condenser Temp (≤68°F)
		738.975								
1	10.0	749.320	0.90	52	47	3.43	3.45	1	255	44
2	20.0	759.980	0.90	51	48	3.44	3.45	1	248	48
3	30.0	770.240	0.90	51	50	3.45	3.45	1	256	51
4	40.0	781.090	0.92	51	52	3.54	3.55	1	255	53
5	50.0	793.600	1.20	51	53	4.63	4.65	3	254	55
6	60.0	806.000	1.30	52	54	5.02	5.00	3	251	55
7	70.0	818.900	1.30	53	55	5.02	5.05	3	257	56
8	80.0	831.930	1.30	52	55	5.03	5.05	3	248	55
9	90.0	844.470	1.20	53	55	4.63	4.65	3	253	54
10	100.0	857.100	1.20	53	55	4.63	4.65	3	253	54
11	110.0	869.750	1.20	55	55	4.61	4.60	3	250	53
12	120.0	881.800	1.15	55	56	4.43	4.45	3	256	54
13	130.0	894.050	1.15	57	56	4.41	4.40	3	254	54
14	140.0	906.200	1.20	54	57	4.64	4.65	3	249	55
15	150.0	918.630	1.20	54	57	4.64	4.65	3	254	56
16	160.0	931.520	1.30	55	58	5.03	5.05	4	249	57
17	170.0	944.470	1.30	55	59	5.04	5.05	4	250	56
18	180.0	957.930	1.40	54	59	5.44	5.45	4	256	56
19	190.0	970.390	1.20	54	60	4.67	4.65	3	253	56
20	200.0	982.440	1.10	54	60	4.28	4.30	3	251	56
21	210.0	994.490	1.10	54	60	4.28	4.30	3	254	54
22	220.0	1006.485	1.10	53	59	4.28	4.30	3	254	54
23	230.0	1018.500	1.10	52	59	4.29	4.30	3	252	54
24	240.0	1030.396	1.10	52	58	4.28	4.30	3	258	54

Isokinetic Field Data
Field Data Entry

Client:	Eagle Foundry Company	Run:	3
Location:	Eagle Creek, OR	Start Time:	5:15
Source:	Main Foundry BH Inlet - White Iron	End Time:	9:15
EPA Method:	29	Environmental Conditions/Test Notes:	Date: 3/29/2023
Box Operator:	AAM	40-65 °F, Rainy/cloudy	
Technician(s):	NEW		

Stack Dimensional Data:		Equipment:					
Circular		Meterbox ID	SB-2	Probe ID	5B	Liner type	Glass
Diameter	48.000 in	Y factor	1.0028	Nozzle ID	3P	Nozzle size	0.251 inches
Rectangular		ΔH@	1.601	Hot box ID	HHB2	Nozzle area	0.000344 sq.ft.
Width	in	Bp ID	TS-1	Pitot Cp	0.84	Probe heat	250 °F
Length	in	Balance ID	HLNFB1	Pitot ID	55	Filter heat	250 °F
Stack Area	12.566 sq.ft.	Weights ID	HLNFW1	Probe Length, ft	6		

Source Information:				Leak Checks:		
Barometric Pressure	29.41 "Hg	O ₂	20.90 %	Pre-test	Post-test	
Static Pressure	-0.9 "H ₂ O	CO ₂	0.00 %	Pitot	x	x
Ave. ΔP	1.08 "H ₂ O	Rec. Nz.	0.2 inches	Leak rate, dcf	0.000	0.012
Stack Temperature	60 °F			Leak check vacuum, "Hg	15	10
Assumed moisture	0.66 %					
Assumed meter temp.	55.7 °F					
Total number of points	24					
Time per point	10 min.					
Total run time	240 min.					

Nozzle check for roundness:		
1	2	3
0.251	0.252	0.250 inches
Caliper ID	WS-1	

Post Test Calculations:				Moisture/Lab:			
Sample volume	340.326 dcf	Ave. ΔP	1.592 "H ₂ O	Filter, #	NA		
Wet mol. weight	28.78 M _s (actual)	Ave. √ΔP	1.257 "H ₂ O	Initial		Final	Gain
Actual H ₂ O	0.56 %	Ave. ΔH	6.146 "H ₂ O	Impingers, g	3,738.7	3,733.1	-5.6
Std. meter vol.	353.897 dscf	Ave. T _s	45.0 °F	Silica gel, g	899.5	947.4	47.9
Isokinetic Average	100.4 %	Ave. T _m	48.2 °F	Total water gain:			42.3

Traverse Point	Time (min.)	Meter Volume (dcf)	Velocity ΔP ("H ₂ O)	Stack Temp. (°F)	Meter Temp. (°F)	Calc. ΔH	Run ΔH	Vacuum ("Hg)	Filter Box (°F)	Condenser Temp (≤68°F)
1	10.0	333.976	1.10	47	36	4.13	4.15	1	258	37
2	20.0	345.575	1.40	43	37	5.31	5.30	2	255	43
3	30.0	372.500	1.60	43	40	6.10	6.10	3	256	52
4	40.0	388.175	2.00	43	43	7.67	7.65	4.5	257	60
5	50.0	403.300	1.80	44	45	6.92	6.90	4	249	60
6	60.0	419.920	2.20	44	47	8.49	8.50	5	257	53
7	70.0	436.680	2.20	44	48	8.51	8.50	5	256	50
8	80.0	450.635	1.50	44	49	5.81	5.80	3	252	49
9	90.0	463.940	1.40	45	49	5.41	5.40	2	253	47
10	100.0	477.300	1.40	45	50	5.43	5.40	2	256	46
11	110.0	490.280	1.30	46	50	5.03	5.05	2	256	46
12	120.0	503.330	1.30	47	50	5.02	5.05	2	250	46
13	130.0	516.365	1.30	44	50	5.05	5.05	2	248	46
14	140.0	529.790	1.40	45	51	5.44	5.45	2.5	249	46
15	150.0	543.680	1.50	46	51	5.81	5.80	3	256	47
16	160.0	557.650	1.50	47	51	5.80	5.80	3	256	45
17	170.0	571.950	1.60	47	51	6.19	6.20	3	258	45
18	180.0	586.250	1.60	46	51	6.20	6.20	3	257	45
19	190.0	601.340	1.80	46	51	6.97	6.95	4	257	45
20	200.0	616.300	1.70	47	51	6.57	6.55	3	257	45
21	210.0	630.700	1.60	45	51	6.21	6.20	3	257	46
22	220.0	644.740	1.60	45	51	6.21	6.20	3	248	46
23	230.0	659.500	1.70	44	52	6.63	6.65	3.5	251	47
24	240.0	674.302	1.70	44	52	6.63	6.65	3.5	259	48

EPA Method 4
Impinger Weights Summary

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Main Foundry BH Inlet - White Iron
EPA Method: 29
Box Operator: AAM
Technician(s): NEW

Run 1

Impinger gain by weight (g):

#	Initial	Final	Gain
1	742.6	655.8	-86.8
2	750.3	757.9	7.6
3	647.3	684.5	37.2
4	812.7	838.3	25.6
5	756.5	766.4	9.9
Totals:	3,709.4	3,702.9	-6.5

Run 2

Impinger gain by weight (g):

#	Initial	Final	Gain
1	741.2	657.4	-83.8
2	756.6	762.8	6.2
3	652.0	699.4	47.4
4	761.9	784.6	22.7
5	807.7	814.2	6.5
Totals:	3,719.4	3,718.4	-1.0

Run 3

Impinger gain by weight (g):

#	Initial	Final	Gain
1	747.0	650.9	-96.1
2	760.0	773.1	13.1
3	651.8	696.6	44.8
4	771.7	794.6	22.9
5	808.2	817.9	9.7
Totals:	3,738.7	3,733.1	-5.6

Isokinetic Field Data
Field Data and Calculations
Gas Stream Characteristics

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Main Foundry BH Inlet - White Iron
Method: 29

Run: 1
Start Time: 6:40
End Time: 10:40
Date: 3/27/2023

Sampling Data				Traverse Data			
Time min.	Meter ft ³	ΔH "H ₂ O	Meter T _m °F	Traverse Point	Dp "H ₂ O	Stack T _s °F	$\sqrt{Dp}$
	139.898						
10.0	151.700	4.70	34	1	1.30	41	1.140
20.0	163.735	4.75	35	2	1.30	41	1.140
30.0	175.800	4.80	37	3	1.30	40	1.140
40.0	187.930	4.80	40	4	1.30	40	1.140
50.0	200.100	4.80	42	5	1.30	40	1.140
60.0	212.860	5.30	53	6	1.40	39	1.183
70.0	225.670	5.20	45	7	1.40	40	1.183
80.0	238.430	5.20	46	8	1.40	41	1.183
90.0	251.410	5.40	47	9	1.45	41	1.204
100.0	264.170	5.25	48	10	1.40	42	1.183
110.0	276.980	5.20	49	11	1.40	45	1.183
120.0	289.800	5.20	50	12	1.40	45	1.183
130.0	302.720	5.25	51	13	1.40	46	1.183
140.0	315.740	5.25	52	14	1.40	46	1.183
150.0	328.480	5.05	53	15	1.35	47	1.162
160.0	341.390	5.25	54	16	1.40	48	1.183
170.0	354.090	5.05	55	17	1.35	50	1.162
180.0	366.850	5.05	55	18	1.35	49	1.162
190.0	379.320	4.85	55	19	1.30	49	1.140
200.0	391.800	4.85	57	20	1.30	50	1.140
210.0	404.000	4.50	58	21	1.20	52	1.095
220.0	416.130	4.50	59	22	1.20	53	1.095
230.0	428.410	4.50	60	23	1.20	52	1.095
240.0	440.432	4.50	61	24	1.20	52	1.095

Client:	Eagle Foundry Company	Run:	1
Source:	Main Foundry BH Inlet - White Iron	Date:	03/27/23

Field Data Input Continued

Moisture Data

Total Test Time	240.0 min
Sample Time Interval	10.0 min
Meter Volume, V_m	300.534 dcf
Water Mass	36.6 g
Nozzle Diameter, N_z	0.2510 in.
Nozzle Area	0.000344 sq.ft.

Stack Dimensional Data:

Circular	
Diameter	48.000 in
Rectangular	
Width	in
Length	in
Stack Area	12.566 sq.ft.

Traverse Data

Barometric Pressure, P_b	29.98 "Hg
Static Pressure	-0.90 "H ₂ O
Pitot Factor, cp	0.84
Meter Cal Factor	1.0028 Y

Molecular Weight:

CO ₂ Average	0.25 %vd
O ₂ Average	20.85 %vd

Field Data Averages

Meter

ΔH	4.967 "H ₂ O
Temperature, T_m	49.8 °F
Temperature, T_m	509.5 °A (°R)
Pressure Meter, P_m	30.345 "Hg

Stack

$\sqrt{D_p}$	1.154 "H ₂ O
Temperature, T_s	45.4 °F
Temperature, T_s	505.1 °A (°R)
Pressure Stack, P_s	29.914 "Hg

Field Data Calculations

Meter Box Capture

Standard Volume, $V_{m(std)}$	316.575 dscf
	8.964 dscm
Actual Volume, $V_{m(actual)}$	304.723 awcf

EPA Method 2 Stack Gas Flowrate:

Velocity, V_s	63.44 fps
Flow Rate (actual), Q_{aw}	47,831 acfm
	47,573 adcfm
Flow Rate (standard), Q	2,997,688 wscf/hr
	2,981,500 dscf/hr
	49,692 dscf/min
	49,961 wscf/min

Gas Stream Moisture

Moisture Vapor, $V_{w(std)}$	1.726 scf
Moisture, B_{ws}	0.0054
Moisture EPA M4	0.54 %v
Moisture @ Saturation	1.02 %v (for $T_s < 212^\circ F$)

EPA Method 3 Gas Density

Dry, M_d	28.87 lb/lb-mole
Wet, M_s	28.81 lb/lb-mole

Percent Isokinetic	97.0 %

Isokinetic Field Data
Field Data and Calculations
Gas Stream Characteristics

Client:	Eagle Foundry Company	Run:	2
Location:	Eagle Creek, OR	Start Time:	5:10
Source:	Main Foundry BH Inlet - White Iron	End Time:	9:10
Method:	29	Date:	03/28/23

Sampling Data				Traverse Data			
Time min.	Meter ft ³	ΔH "H ₂ O	Meter T _m °F	Traverse Point	Dp "H ₂ O	Stack T _s °F	$\sqrt{Dp}$
	738.975						
10.0	749.320	3.45	47	1	0.90	52	0.949
20.0	759.980	3.45	48	2	0.90	51	0.949
30.0	770.240	3.45	50	3	0.90	51	0.949
40.0	781.090	3.55	52	4	0.92	51	0.959
50.0	793.600	4.65	53	5	1.20	51	1.095
60.0	806.000	5.00	54	6	1.30	52	1.140
70.0	818.900	5.05	55	7	1.30	53	1.140
80.0	831.930	5.05	55	8	1.30	52	1.140
90.0	844.470	4.65	55	9	1.20	53	1.095
100.0	857.100	4.65	55	10	1.20	53	1.095
110.0	869.750	4.60	55	11	1.20	55	1.095
120.0	881.800	4.45	56	12	1.15	55	1.072
130.0	894.050	4.40	56	13	1.15	57	1.072
140.0	906.200	4.65	57	14	1.20	54	1.095
150.0	918.630	4.65	57	15	1.20	54	1.095
160.0	931.520	5.05	58	16	1.30	55	1.140
170.0	944.470	5.05	59	17	1.30	55	1.140
180.0	957.930	5.45	59	18	1.40	54	1.183
190.0	970.390	4.65	60	19	1.20	54	1.095
200.0	982.440	4.30	60	20	1.10	54	1.049
210.0	994.490	4.30	60	21	1.10	54	1.049
220.0	1006.485	4.30	59	22	1.10	53	1.049
230.0	1018.500	4.30	59	23	1.10	52	1.049
240.0	1030.396	4.30	58	24	1.10	52	1.049

Client:	Eagle Foundry Company	Run:	2
Source:	Main Foundry BH Inlet - White Iron	Date:	03/28/23

Field Data Input Continued

<u>Moisture Data</u>		<u>Stack Dimensional Data:</u>	
Total Test Time	240.0 min	Circular	
Sample Time Interval	10.0 min	Diameter	48.000 in
Meter Volume, V _m	291.421 dcf	Rectangular	
Water Mass	41.6 g	Width	in
Nozzle Diameter, N _z	0.2510 in.	Length	in
Nozzle Area	0.000344 sq.ft.	Stack Area	12.566 sq.ft.

<u>Traverse Data</u>		<u>Molecular Weight:</u>	
Barometric Pressure, P _b	29.41 "Hg	CO ₂ Average	0.15 %vd
Static Pressure	-0.90 "H ₂ O	O ₂ Average	20.91 %vd
Pitot Factor, cp	0.84		
Meter Cal Factor	1.0028 Y		

Field Data Averages

<u>Meter</u>		<u>Stack</u>	
ΔH	4.475 "H ₂ O	√Dp	1.073 "H ₂ O
Temperature, T _m	55.7 °F	Temperature, T _s	53.2 °F
Temperature, T _m	515.4 °A (°R)	Temperature, T _s	512.9 °A (°R)
Pressure Meter, P _m	29.739 "Hg	Pressure Stack, P _s	29.344 "Hg

Field Data Calculations

<u>Meter Box Capture</u>		<u>EPA Method 2 Stack Gas Flowrate:</u>	
Standard Volume, V _{m(std)}	297.402 dscf	Velocity, V _s	60.04 fps
	8.421 dscm	Flow Rate (actual), Q _{aw}	45,268 acfm
Actual Volume, V _{m(actual)}	296.692 awcf		44,969 adcfm
<u>Gas Stream Moisture</u>		Flow Rate (standard), Q	2,740,647 wscf/hr
Moisture Vapor, V _{w(std)}	1.962 scf		2,722,559 dscf/hr
Moisture, B _{ws}	0.0066		45,376 dscf/min
Moisture EPA M4	0.66 %v		45,677 wscf/min
Moisture @ Saturation	1.39 %v (for T _s < 212°F)		
<u>EPA Method 3 Gas Density</u>			
Dry, M _d	28.86 lb/lb-mole		
Wet, M _s	28.79 lb/lb-mole		
Percent Isokinetic	99.8 %		

Isokinetic Field Data
Field Data and Calculations
Gas Stream Characteristics

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Main Foundry BH Inlet - White Iron
Method: 29

Run: 3
Start Time: 5:15
End Time: 9:15
Date: 03/29/23

Sampling Data				Traverse Data			
Time min.	Meter ft ³	ΔH "H ₂ O	Meter T _m °F	Traverse Point	Dp "H ₂ O	Stack T _s °F	$\sqrt{Dp}$
	333.976						
10.0	345.575	4.15	36	1	1.10	47	1.049
20.0	358.580	5.30	37	2	1.40	43	1.183
30.0	372.500	6.10	40	3	1.60	43	1.265
40.0	388.175	7.65	43	4	2.00	43	1.414
50.0	403.300	6.90	45	5	1.80	44	1.342
60.0	419.920	8.50	47	6	2.20	44	1.483
70.0	436.680	8.50	48	7	2.20	44	1.483
80.0	450.635	5.80	49	8	1.50	44	1.225
90.0	463.940	5.40	49	9	1.40	45	1.183
100.0	477.300	5.40	50	10	1.40	45	1.183
110.0	490.280	5.05	50	11	1.30	46	1.140
120.0	503.330	5.05	50	12	1.30	47	1.140
130.0	516.365	5.05	50	13	1.30	44	1.140
140.0	529.790	5.45	51	14	1.40	45	1.183
150.0	543.680	5.80	51	15	1.50	46	1.225
160.0	557.650	5.80	51	16	1.50	47	1.225
170.0	571.950	6.20	51	17	1.60	47	1.265
180.0	586.250	6.20	51	18	1.60	46	1.265
190.0	601.340	6.95	51	19	1.80	46	1.342
200.0	616.300	6.55	51	20	1.70	47	1.304
210.0	630.700	6.20	51	21	1.60	45	1.265
220.0	644.740	6.20	51	22	1.60	45	1.265
230.0	659.500	6.65	52	23	1.70	44	1.304
240.0	674.302	6.65	52	24	1.70	44	1.304

Client: Eagle Foundry Company
Source: Main Foundry BH Inlet - White Iron

Run: 3
Date: 03/29/23

Field Data Input ContinuedMoisture Data

Total Test Time 240.0 min
Sample Time Interval 10.0 min
Meter Volume, V_m 340.326 dcf
Water Mass 42.3 g
Nozzle Diameter, N_z 0.2510 in.
Nozzle Area 0.000344 sq.ft.

Stack Dimensional Data:

Circular
Diameter 48.000 in
Rectangular
Width in
Length in
Stack Area 12.566 sq.ft.

Traverse Data

Barometric Pressure, P_b 29.41 "Hg
Static Pressure -0.90 "H₂O
Pitot Factor, cp 0.84
Meter Cal Factor 1.0028 Y

Molecular Weight:

CO₂ Average 0.10 %vd
O₂ Average 20.59 %vd

Field Data AveragesMeter

ΔH 6.146 "H₂O
Temperature, T_m 48.2 °F
Temperature, T_m 507.9 °A (°R)
Pressure Meter, P_m 29.862 "Hg

Stack

$\sqrt{D_p}$ 1.257 "H₂O
Temperature, T_s 45.0 °F
Temperature, T_s 504.7 °A (°R)
Pressure Stack, P_s 29.344 "Hg

Field Data CalculationsMeter Box Capture

Standard Volume, $V_{m(std)}$ 353.897 dscf
10.021 dscm
Actual Volume, $V_{m(actual)}$ 347.059 awcf

EPA Method 2 Stack Gas Flowrate:

Velocity, V_s 69.78 fps
Flow Rate (actual), Q_{aw} 52,611 acfm
52,316 adcfm
Flow Rate (standard), Q 3,237,003 wscf/hr
3,218,876 dscf/hr
53,648 dscf/min
53,950 wscf/min

Gas Stream Moisture

Moisture Vapor, $V_{w(std)}$ 1.995 scf
Moisture, B_{ws} 0.0056
Moisture EPA M4 0.56 %v
Moisture @ Saturation 1.02 %v (for $T_s < 212^\circ\text{F}$)

EPA Method 3 Gas Density

Dry, M_d 28.84 lb/lb-mole
Wet, M_s 28.78 lb/lb-mole

Percent Isokinetic 100.4 %

Eagle Foundry Company
Main Foundry BH Inlet - White Iron
Method 29 Laboratory Results

Run: 1
Sample Date: 03/27/23

Analyte	Filter + FH Rinse Cont. 1&3		BH Cap.Soln. + BH Rinse Cont. 4		Units
	< Result	MDL	< Result	MDL	
Aluminum	520	7.50	28.8	4.14	µg/sample
Antimony	3.57	1.25	< MDL	0.690	µg/sample
Arsenic	< MDL	1.75	< MDL	0.966	µg/sample
Barium	5.38	0.125	2.06	0.069	µg/sample
Beryllium	< MDL	0.050	< MDL	0.028	µg/sample
Cadmium	0.488	0.100	0.182	0.055	µg/sample
Chromium	41.4	0.200	0.473	0.110	µg/sample
Cobalt	0.196	0.125	0.249	0.069	µg/sample
Copper	18.5	1.25	0.865	0.690	µg/sample
Lead	39.8	1.25	3.01	0.690	µg/sample
Manganese	284	0.075	1.59	0.041	µg/sample
Nickel	13.1	0.750	< MDL	0.414	µg/sample
Phosphorus	21.2	5.00	< MDL	2.76	µg/sample
Selenium	< MDL	3.75	< MDL	2.07	µg/sample
Silver	2.03	0.500	< MDL	0.276	µg/sample
Thallium	< MDL	2.50	< MDL	1.38	µg/sample
Vanadium	0.638	0.250	< MDL	0.138	µg/sample
Zinc	460	0.750	5.18	0.414	µg/sample

Lab ID:	23-S609	23-S610	
Sample Vol:	250	218	ml

Eagle Foundry Company
Main Foundry BH Inlet - White Iron
Method 29 Laboratory Results

Run: 2
Sample Date: 03/28/23

Analyte	Filter + FH Rinse Cont. 1&3		BH Cap.Soln. + BH Rinse Cont. 4		Units
	<	Result FH MDL	<	Result BH MDL	
Aluminum		746 7.50		33.9 3.66	µg/sample
Antimony		3.92 1.25		0.661 0.610	µg/sample
Arsenic	<	MDL 1.75	<	MDL 0.854	µg/sample
Barium		6.79 0.125		1.96 0.061	µg/sample
Beryllium	<	MDL 0.050	<	MDL 0.024	µg/sample
Cadmium		0.377 0.100	<	MDL 0.049	µg/sample
Chromium		41.5 0.200		0.511 0.098	µg/sample
Cobalt		0.287 0.125	<	MDL 0.061	µg/sample
Copper		24.9 1.25		1.49 0.610	µg/sample
Lead		41.2 1.25	<	MDL 0.610	µg/sample
Manganese		519 0.075		3.32 0.037	µg/sample
Nickel		10.1 0.750	<	MDL 0.366	µg/sample
Phosphorus		26.1 5.00	<	MDL 2.44	µg/sample
Selenium	<	MDL 3.75	<	MDL 1.83	µg/sample
Silver		2.22 0.500	<	MDL 0.244	µg/sample
Thallium	<	MDL 2.50	<	MDL 1.22	µg/sample
Vanadium		0.515 0.250	<	MDL 0.122	µg/sample
Zinc		397 0.750		2.61 0.366	µg/sample

Lab ID:	23-S614	23-S615	
Sample Vol:	250	224	ml

Eagle Foundry Company
Main Foundry BH Inlet - White Iron
Method 29 Laboratory Results

Run: 3
Sample Date: 03/29/23

Analyte	Filter + FH Rinse Cont. 1&3		BH Cap.Soln. + BH Rinse Cont. 4		Units
	<	Result FH MDL	<	Result BH MDL	
Aluminum		489 7.50		29.5 3.63	µg/sample
Antimony		3.10 1.25	<	MDL 0.605	µg/sample
Arsenic	<	MDL 1.75	<	MDL 0.847	µg/sample
Barium		5.02 0.125		1.58 0.060	µg/sample
Beryllium	<	MDL 0.050	<	MDL 0.024	µg/sample
Cadmium		0.327 0.100		0.135 0.048	µg/sample
Chromium		29.7 0.200		0.597 0.097	µg/sample
Cobalt		0.212 0.125		0.123 0.060	µg/sample
Copper		28.5 1.25		2.01 0.605	µg/sample
Lead		41.0 1.25		1.82 0.605	µg/sample
Manganese		464 0.075		2.43 0.036	µg/sample
Nickel		14.5 0.750	<	MDL 0.363	µg/sample
Phosphorus		19.3 5.00	<	MDL 2.42	µg/sample
Selenium	<	MDL 3.75	<	MDL 1.82	µg/sample
Silver		2.46 0.500	<	MDL 0.242	µg/sample
Thallium	<	MDL 2.50	<	MDL 1.21	µg/sample
Vanadium		0.422 0.250	<	MDL 0.121	µg/sample
Zinc		579 0.750		1.81 0.363	µg/sample

Lab ID:	23-S619	23-S620	
Sample Vol:	250	230	ml

Eagle Foundry Company
Main Foundry BH Inlet - White Iron
Method 29 Blank Results

Sample Dates: 3/27/2023
3/28/2023
3/29/2023

Analyte	Filter Cont. 12 µg/filter		BH Cap.Soln. Cont. 9 5% HNO ₃ / 10% H ₂ O ₂ µg/sample		FH/BH Rinse Cont. 8A 0.1 N HNO ₃ µg/sample	
	< Result	MDL	< Result	MDL	< Result	MDL
Aluminum	58.8	7.50	16.3	3.78	< MDL	7.50
Antimony	2.86	1.25	< MDL	0.630	< MDL	1.25
Arsenic	< MDL	1.75	< MDL	0.882	< MDL	1.75
Barium	1.40	0.125	0.718	0.063	0.193	0.125
Beryllium	< MDL	0.050	< MDL	0.025	< MDL	0.050
Cadmium	< MDL	0.100	< MDL	0.050	< MDL	0.100
Chromium	1.03	0.200	0.306	0.101	< MDL	0.200
Cobalt	< MDL	0.125	0.153	0.063	< MDL	0.125
Copper	< MDL	1.25	< MDL	0.630	< MDL	1.25
Lead	< MDL	1.25	< MDL	0.630	< MDL	1.25
Manganese	0.741	0.075	0.742	0.038	< MDL	0.375
Nickel	3.96	0.750	< MDL	0.378	< MDL	0.750
Phosphorus	17.0	5.00	< MDL	2.52	< MDL	5.00
Selenium	< MDL	3.75	< MDL	1.89	< MDL	3.75
Silver	< MDL	0.500	< MDL	0.252	< MDL	0.500
Thallium	< MDL	2.50	< MDL	1.26	< MDL	2.50
Vanadium	< MDL	0.250	< MDL	0.126	< MDL	0.250
Zinc	1.52	0.750	0.415	0.378	< MDL	0.750

Lab ID: 23-S729
Blank Vol, ml: N/A

23-S731
196

23-S730
250

Eagle Foundry Company
Main Foundry BH Inlet - White Iron
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 1
Test Date: 3/27/2023
Page: 1 of 3

Analyte	I Sample FH Rinse+Filter µg	II Blank Correction FH Rinse µg	III Blank Correction Filter µg	IV Sample BH Cap.Soln. + BH Rinse µg	V Blank BH Cap.Soln. µg/ml	VI Blank Correction BH Cap.Soln. µg	VII Blank Correction BH Rinse µg	VIII Total BH Blank Correction µg	
Aluminum	520.000	0.000	58.800	28.800	0.083	16.633	0.000	16.633	Al
Antimony	3.570	0.000	2.860	< 0.690	0.000	0.000	0.000	0.000	Sb
Arsenic	< 1.750	0.000	0.000	< 0.966	0.000	0.000	0.000	0.000	As
Barium	5.380	0.077	1.400	2.060	0.004	0.733	0.077	0.810	Ba
Beryllium	< 0.050	0.000	0.000	< 0.028	0.000	0.000	0.000	0.000	Be
Cadmium	0.488	0.000	0.000	0.182	0.000	0.000	0.000	0.000	Cd
Chromium	41.400	0.000	1.030	0.473	0.002	0.312	0.000	0.312	Cr
Cobalt	0.196	0.000	0.000	0.249	0.001	0.156	0.000	0.156	Co
Copper	18.500	0.000	0.000	0.865	0.000	0.000	0.000	0.000	Cu
Lead	39.800	0.000	0.000	3.010	0.000	0.000	0.000	0.000	Pb
Manganese	284.000	0.000	0.741	1.590	0.004	0.757	0.000	0.757	Mn
Nickel	13.100	0.000	3.960	< 0.414	0.000	0.000	0.000	0.000	Ni
Phosphorus	21.200	0.000	17.000	< 2.760	0.000	0.000	0.000	0.000	P
Selenium	< 3.750	0.000	0.000	< 2.070	0.000	0.000	0.000	0.000	Se
Silver	2.030	0.000	0.000	< 0.276	0.000	0.000	0.000	0.000	Ag
Thallium	< 2.500	0.000	0.000	< 1.380	0.000	0.000	0.000	0.000	Tl
Vanadium	0.638	0.000	0.000	< 0.138	0.000	0.000	0.000	0.000	V
Zinc	460.000	0.000	1.520	5.180	0.002	0.423	0.000	0.423	Zn

Lab ID:	23-S609	23-S730	23-S729	23-S610	23-S731	N/A	N/A
Notes:	0.1N HNO ₃	0.1N HNO ₃	5% HNO ₃ /10% H ₂ O ₂	5% HNO ₃ /	5% HNO ₃ /	0.1N HNO ₃	
	FH Filter & Probe Rinse		BH Imps 1-3	10% H ₂ O ₂	10% H ₂ O ₂		
	100ml 0.1N HNO ₃ Rinse		100ml .1N HNO ₃ Rinse				
			200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent				

Blank Rules: < indicates value is below the method detection limit (MDL).
If blank is '<' it is treated as zero.
If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Main Foundry BH Inlet - White Iron
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 1
Test Date: 3/27/2023
Page: 2 of 3

Analyte	X Allowable FH Blank Correction µg	XI Total FH Blank Correction µg	XII 5% of FH Sample µg	XIII Lessor of XI or XII µg	XIV Greater of A or XIII µg	XV FH Net Sample µg	
Aluminum	26.000	58.800	26.000	26.000	26.00	494.000	Al
Antimony	2.860	2.860	0.179	0.179	11.63	0.710	Sb
Arsenic	0.000	0.000	< 0.088	0.000	11.63	< 1.750	As
Barium	1.477	1.477	0.269	0.269	11.63	3.903	Ba
Beryllium	0.000	0.000	< 0.003	0.000	11.63	< 0.050	Be
Cadmium	0.000	0.000	0.024	0.000	11.63	0.488	Cd
Chromium	1.030	1.030	2.070	1.030	11.63	40.370	Cr
Cobalt	0.000	0.000	0.010	0.000	11.63	0.196	Co
Copper	0.000	0.000	0.925	0.000	11.63	18.500	Cu
Lead	0.000	0.000	1.990	0.000	11.63	39.800	Pb
Manganese	0.741	0.741	14.200	0.741	11.63	283.259	Mn
Nickel	3.960	3.960	0.655	0.655	11.63	9.140	Ni
Phosphorus	11.630	17.000	1.060	1.060	11.63	9.570	P
Selenium	0.000	0.000	< 0.188	0.000	11.63	< 3.750	Se
Silver	0.000	0.000	0.102	0.000	11.63	2.030	Ag
Thallium	0.000	0.000	< 0.125	0.000	11.63	< 2.500	Tl
Vanadium	0.000	0.000	0.032	0.000	11.63	0.638	V
Zinc	1.520	1.520	23.000	1.520	11.63	458.480	Zn

Note: Allowable FH Blank (A) = (area of filter)*(1.4 µg/in²) = 11.63 µg
where area of filter = 8.306 in²

If A > blank > 0, use blank-derived value, M_{hb}.

If blank > A, use greater of A or [lessor of 5% of sample µg or FH blank].

Blank Rules: < indicates value is below the method detection limit (MDL).

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Eagle Foundry Company
Main Foundry BH Inlet - White Iron
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 1
Test Date: 3/27/2023
Page: 3 of 3

Analyte	XVI Allowable BH Blank Correction µg	XVII Total BH Blank Correction µg	XVIII 5% of BH Sample µg	XIX Lessor of XVII or XVIII µg	XX Greater of 1 µg or XIX µg	XXI BH Net Sample µg	XXII FH Net Sample µg	XXIII FH+BH Total Net Sample µg	
Aluminum	1.440	16.633		1.440	1.440	27.360	494.000	521.360	Al
Antimony	0.000	0.000	<	0.035	0.000	0.690	0.710	1.400	Sb
Arsenic	0.000	0.000	<	0.048	0.000	0.966	1.750	2.716	As
Barium	0.810	0.810		0.103	0.103	1.250	3.903	5.153	Ba
Beryllium	0.000	0.000	<	0.001	0.000	0.028	0.050	0.078	Be
Cadmium	0.000	0.000		0.009	0.000	0.182	0.488	0.670	Cd
Chromium	0.312	0.312		0.024	0.024	0.161	40.370	40.531	Cr
Cobalt	0.156	0.156		0.012	0.012	0.093	0.196	0.289	Co
Copper	0.000	0.000		0.043	0.000	0.865	18.500	19.365	Cu
Lead	0.000	0.000		0.151	0.000	3.010	39.800	42.810	Pb
Manganese	0.757	0.757		0.080	0.080	0.833	283.259	284.092	Mn
Nickel	0.000	0.000	<	0.021	0.000	0.414	9.140	9.554	Ni
Phosphorus	0.000	0.000	<	0.138	0.000	2.760	9.570	12.330	P
Selenium	0.000	0.000	<	0.104	0.000	2.070	3.750	5.820	Se
Silver	0.000	0.000	<	0.014	0.000	0.276	2.030	2.306	Ag
Thallium	0.000	0.000	<	0.069	0.000	1.380	2.500	3.880	Tl
Vanadium	0.000	0.000	<	0.007	0.000	0.138	0.638	0.776	V
Zinc	0.423	0.423		0.259	0.259	4.757	458.480	463.237	Zn

Note: Allowable BH Blank rules:

If 1.00 µg > blank > 0 , use blank-derived value.

If blank > 1.00 µg, use greater of 1.00 µg or [lessor of 5% of sample µg or BH blank].

Blank Rules: <' indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Main Foundry BH Inlet - White Iron
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 2
Test Date: 3/28/2023
Page: 1 of 3

	I Sample FH Rinse+Filter µg	II Blank Correction FH Rinse µg	III Blank Correction Filter µg	IV Sample BH Cap.Soln. + BH Rinse µg	V Blank BH Cap.Soln. µg/ml	VI Blank Correction BH Cap.Soln. µg	VII Blank Correction BH Rinse µg	VIII Total BH Blank Correction µg	
Analyte	<								
Aluminum	746.000	0.000	58.800	33.900	0.083	16.633	0.000	16.633	Al
Antimony	3.920	0.000	2.860	0.661	0.000	0.000	0.000	0.000	Sb
Arsenic	< 1.750	0.000	0.000	0.854	0.000	0.000	0.000	0.000	As
Barium	6.790	0.077	1.400	1.960	0.004	0.733	0.077	0.810	Ba
Beryllium	< 0.050	0.000	0.000	0.024	0.000	0.000	0.000	0.000	Be
Cadmium	0.377	0.000	0.000	0.049	0.000	0.000	0.000	0.000	Cd
Chromium	41.500	0.000	1.030	0.511	0.002	0.312	0.000	0.312	Cr
Cobalt	0.287	0.000	0.000	0.061	0.001	0.156	0.000	0.156	Co
Copper	24.900	0.000	0.000	1.490	0.000	0.000	0.000	0.000	Cu
Lead	41.200	0.000	0.000	0.610	0.000	0.000	0.000	0.000	Pb
Manganese	519.000	0.000	0.741	3.320	0.004	0.757	0.000	0.757	Mn
Nickel	10.100	0.000	3.960	0.366	0.000	0.000	0.000	0.000	Ni
Phosphorus	26.100	0.000	17.000	2.440	0.000	0.000	0.000	0.000	P
Selenium	< 3.750	0.000	0.000	1.830	0.000	0.000	0.000	0.000	Se
Silver	2.220	0.000	0.000	0.244	0.000	0.000	0.000	0.000	Ag
Thallium	< 2.500	0.000	0.000	1.220	0.000	0.000	0.000	0.000	Tl
Vanadium	0.515	0.000	0.000	0.122	0.000	0.000	0.000	0.000	V
Zinc	397.000	0.000	1.520	2.610	0.002	0.423	0.000	0.423	Zn

Lab ID:	23-S614	23-S730	23-S729	23-S615	23-S731	N/A	N/A
Content:	0.1N HNO ₃ FH Filter & Probe Rinse 100ml 0.1N HNO ₃ Rinse	0.1N HNO ₃	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	0.1N HNO ₃

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Eagle Foundry Company
Main Foundry BH Inlet - White Iron
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 2
Test Date: 3/28/2023
Page: 2 of 3

	X Allowable FH Blank Correction	XI Total FH Blank Correction	XII 5% of FH Sample	XIII Lessor of XI or XII	XIV Greater of A or XIII	XV FH Net Sample	
Analyte	µg	µg	µg	µg	µg	µg	
Aluminum	37.300	58.800	37.300	37.300	37.30	708.700	Al
Antimony	2.860	2.860	0.196	0.196	11.63	1.060	Sb
Arsenic	0.000	0.000	< 0.088	0.000	11.63	< 1.750	As
Barium	1.477	1.477	0.340	0.340	11.63	5.313	Ba
Beryllium	0.000	0.000	< 0.003	0.000	11.63	< 0.050	Be
Cadmium	0.000	0.000	0.019	0.000	11.63	0.377	Cd
Chromium	1.030	1.030	2.075	1.030	11.63	40.470	Cr
Cobalt	0.000	0.000	0.014	0.000	11.63	0.287	Co
Copper	0.000	0.000	1.245	0.000	11.63	24.900	Cu
Lead	0.000	0.000	2.060	0.000	11.63	41.200	Pb
Manganese	0.741	0.741	25.950	0.741	11.63	518.259	Mn
Nickel	3.960	3.960	0.505	0.505	11.63	6.140	Ni
Phosphorus	11.630	17.000	1.305	1.305	11.63	14.470	P
Selenium	0.000	0.000	< 0.188	0.000	11.63	< 3.750	Se
Silver	0.000	0.000	0.111	0.000	11.63	2.220	Ag
Thallium	0.000	0.000	< 0.125	0.000	11.63	< 2.500	Tl
Vanadium	0.000	0.000	0.026	0.000	11.63	0.515	V
Zinc	1.520	1.520	19.850	1.520	11.63	395.480	Zn

Note: Allowable FH Blank (A) = (area of filter)*(1.4 µg/in²) = 11.63 µg
where area of filter = 8.306 in²

If A > blank > 0, use blank-derived value.

If blank > A, use greater of A or [lessor of 5% of sample µg or FH blank].

Blank Rules: < indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Main Foundry BH Inlet - White Iron
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 2
Test Date: 3/28/2023
Page: 3 of 3

Analyte	XVI Allowable BH Blank Correction µg	XVII Total BH Blank Correction µg	XVIII 5% of BH Sample µg	XIX Lessor of XVII or XVIII µg	XX Greater of 1 µg or XIX µg	XXI BH Net Sample µg	XXII FH Net Sample µg	XXIII FH+BH Total Net Sample µg	
Aluminum	1.695	16.633	1.695	1.695	1.695	32.205	708.700	740.905	Al
Antimony	0.000	0.000	0.033	0.000	1.000	0.661	1.060	1.721	Sb
Arsenic	0.000	0.000	< 0.043	0.000	1.000	0.854	< 1.750	< 2.604	As
Barium	0.810	0.810	0.098	0.098	1.000	1.150	5.313	6.463	Ba
Beryllium	0.000	0.000	< 0.001	0.000	1.000	0.024	< 0.050	< 0.074	Be
Cadmium	0.000	0.000	< 0.002	0.000	1.000	0.049	0.377	0.426	Cd
Chromium	0.312	0.312	0.026	0.026	1.000	0.199	40.470	40.669	Cr
Cobalt	0.156	0.156	< 0.003	0.156	1.000	0.000	0.287	0.287	Co
Copper	0.000	0.000	0.075	0.000	1.000	1.490	24.900	26.390	Cu
Lead	0.000	0.000	< 0.031	0.000	1.000	0.610	41.200	41.810	Pb
Manganese	0.757	0.757	0.166	0.166	1.000	2.563	518.259	520.822	Mn
Nickel	0.000	0.000	< 0.018	0.000	1.000	0.366	6.140	6.506	Ni
Phosphorus	0.000	0.000	< 0.122	0.000	1.000	2.440	14.470	16.910	P
Selenium	0.000	0.000	< 0.092	0.000	1.000	1.830	< 3.750	< 5.580	Se
Silver	0.000	0.000	< 0.012	0.000	1.000	0.244	2.220	2.464	Ag
Thallium	0.000	0.000	< 0.061	0.000	1.000	1.220	< 2.500	< 3.720	Tl
Vanadium	0.000	0.000	< 0.006	0.000	1.000	0.122	0.515	0.637	V
Zinc	0.423	0.423	0.131	0.131	1.000	2.187	395.480	397.667	Zn

Note: Allowable BH Blank rules:

If 1.00 µg > blank > 0 , use blank-derived value.

If blank > 1.00 µg, use greater of 1.00 µg or [lessor of 5% of sample µg or BH blank].

Blank Rules: < indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Main Foundry BH Inlet - White Iron
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 3
Test Date: 3/29/2023
Page: 1 of 3

	I Sample FH Rinse+Filter µg	II Blank Correction FH Rinse µg	III Blank Correction Filter µg	IV Sample BH Cap.Soln. + BH Rinse µg	V Blank BH Cap.Soln. µg/ml	VI Blank Correction BH Cap.Soln. µg	VII Blank Correction BH Rinse µg	VIII Total BH Blank Correction µg	
Analyte	<								
Aluminum	489.000	0.000	58.800	29.500	0.083	16.633	0.000	16.633	Al
Antimony	3.100	0.000	2.860	< 0.605	0.000	0.000	0.000	0.000	Sb
Arsenic	< 1.750	0.000	0.000	< 0.847	0.000	0.000	0.000	0.000	As
Barium	5.020	0.077	1.400	1.580	0.004	0.733	0.077	0.810	Ba
Beryllium	< 0.050	0.000	0.000	< 0.024	0.000	0.000	0.000	0.000	Be
Cadmium	0.327	0.000	0.000	0.135	0.000	0.000	0.000	0.000	Cd
Chromium	29.700	0.000	1.030	0.597	0.002	0.312	0.000	0.312	Cr
Cobalt	0.212	0.000	0.000	0.123	0.001	0.156	0.000	0.156	Co
Copper	28.500	0.000	0.000	2.010	0.000	0.000	0.000	0.000	Cu
Lead	41.000	0.000	0.000	1.820	0.000	0.000	0.000	0.000	Pb
Manganese	464.000	0.000	0.741	2.430	0.004	0.757	0.000	0.757	Mn
Nickel	14.500	0.000	3.960	< 0.363	0.000	0.000	0.000	0.000	Ni
Phosphorus	19.300	0.000	17.000	< 2.420	0.000	0.000	0.000	0.000	P
Selenium	< 3.750	0.000	0.000	< 1.820	0.000	0.000	0.000	0.000	Se
Silver	2.460	0.000	0.000	< 0.242	0.000	0.000	0.000	0.000	Ag
Thallium	< 2.500	0.000	0.000	< 1.210	0.000	0.000	0.000	0.000	Tl
Vanadium	0.422	0.000	0.000	< 0.121	0.000	0.000	0.000	0.000	V
Zinc	579.000	0.000	1.520	1.810	0.002	0.423	0.000	0.423	Zn

Lab ID:	23-S619	23-S730	23-S729	23-S620	23-S731	N/A	N/A
Content:	0.1N HNO ₃ FH Filter & Probe Rinse 100ml 0.1N HNO ₃ Rinse	0.1N HNO ₃	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	5% HNO ₃ /10% H ₂ O ₂	5% HNO ₃ /10% H ₂ O ₂	0.1N HNO ₃

Blank Rules: < indicates value is below the method detection limit (MDL).
If blank is '<' it is treated as zero.
If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Main Foundry BH Inlet - White Iron
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 3
Test Date: 3/29/2023
Page: 2 of 3

	X Allowable FH Blank Correction	XI Total FH Blank Correction	XII 5% of FH Sample	XIII Lessor of XI or XII	XIV Greater of A or XIII	XV FH Net Sample	
Analyte	µg	µg	µg	µg	µg	µg	
Aluminum	24.450	58.800	24.450	24.450	24.45	464.550	Al
Antimony	2.860	2.860	0.155	0.155	11.63	0.240	Sb
Arsenic	0.000	0.000	<	0.088	11.63	1.750	As
Barium	1.477	1.477	0.251	0.251	11.63	3.543	Ba
Beryllium	0.000	0.000	<	0.003	11.63	0.050	Be
Cadmium	0.000	0.000	0.016	0.000	11.63	0.327	Cd
Chromium	1.030	1.030	1.485	1.030	11.63	28.670	Cr
Cobalt	0.000	0.000	0.011	0.000	11.63	0.212	Co
Copper	0.000	0.000	1.425	0.000	11.63	28.500	Cu
Lead	0.000	0.000	2.050	0.000	11.63	41.000	Pb
Manganese	0.741	0.741	23.200	0.741	11.63	463.259	Mn
Nickel	3.960	3.960	0.725	0.725	11.63	10.540	Ni
Phosphorus	11.630	17.000	0.965	0.965	11.63	7.670	P
Selenium	0.000	0.000	<	0.188	11.63	3.750	Se
Silver	0.000	0.000	0.123	0.000	11.63	2.460	Ag
Thallium	0.000	0.000	<	0.125	11.63	2.500	Tl
Vanadium	0.000	0.000	0.021	0.000	11.63	0.422	V
Zinc	1.520	1.520	28.950	1.520	11.63	577.480	Zn

Note: Allowable FH Blank (A) = (area of filter)*(1.4 µg/in²) = 11.63 µg
where area of filter = 8.306 in²

If A > blank > 0, use blank-derived value.

If blank > A, use greater of A or [lessor of 5% of sample µg or FH blank].

Blank Rules: < indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Main Foundry BH Inlet - White Iron
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 3
Test Date: 3/29/2023
Page: 3 of 3

Analyte	XVI Allowable BH Blank Correction µg	XVII Total BH Blank Correction µg	XVIII 5% of BH Sample µg	XIX Lessor of XVII or XVIII µg	XX Greater of 1 µg or XIX µg	XXI BH Net Sample µg	XXII FH Net Sample µg	XXIII FH+BH Total Net Sample µg	
Aluminum	1.475	16.633	1.475	1.475	1.475	28.025	464.550	492.575	Al
Antimony	0.000	0.000	< 0.030	0.000	1.000	< 0.605	0.240	< 0.845	Sb
Arsenic	0.000	0.000	< 0.042	0.000	1.000	< 0.847	< 1.750	< 2.597	As
Barium	0.810	0.810	0.079	0.079	1.000	0.770	3.543	4.313	Ba
Beryllium	0.000	0.000	< 0.001	0.000	1.000	< 0.024	< 0.050	< 0.074	Be
Cadmium	0.000	0.000	0.007	0.000	1.000	0.135	0.327	0.462	Cd
Chromium	0.312	0.312	0.030	0.030	1.000	0.285	28.670	28.955	Cr
Cobalt	0.156	0.156	0.006	0.006	1.000	0.000	0.212	0.212	Co
Copper	0.000	0.000	0.101	0.000	1.000	2.010	28.500	30.510	Cu
Lead	0.000	0.000	0.091	0.000	1.000	1.820	41.000	42.820	Pb
Manganese	0.757	0.757	0.122	0.122	1.000	1.673	463.259	464.932	Mn
Nickel	0.000	0.000	< 0.018	0.000	1.000	< 0.363	10.540	< 10.903	Ni
Phosphorus	0.000	0.000	< 0.121	0.000	1.000	< 2.420	7.670	< 10.090	P
Selenium	0.000	0.000	< 0.091	0.000	1.000	< 1.820	< 3.750	< 5.570	Se
Silver	0.000	0.000	< 0.012	0.000	1.000	< 0.242	2.460	< 2.702	Ag
Thallium	0.000	0.000	< 0.061	0.000	1.000	< 1.210	< 2.500	< 3.710	Tl
Vanadium	0.000	0.000	< 0.006	0.000	1.000	< 0.121	0.422	< 0.543	V
Zinc	0.423	0.423	0.091	0.091	1.000	1.387	577.480	578.867	Zn

Note: Allowable BH Blank rules:

If 1.00 µg > blank > 0 , use blank-derived value.

If blank > 1.00 µg, use greater of 1.00 µg or [lessor of 5% of sample µg or BH blank].

Blank Rules: '<' indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Main Foundry BH Inlet - White Iron
Mercury Blank Correction Calculations

Blank Lab Values

Analyte	Filter Cont. 12 µg/filter		BH Imps. 2&3 Cap.Soln. Cont. 9 5% HNO ₃ /10% H ₂ O ₂ µg/sample		FH/BH Rinse Cont. 8A 0.1 N HNO ₃ µg/sample		BH Imps. 5&6 Rinse Cont. 8B H ₂ O µg/sample		BH Imps. 5&6 Cap.Soln. + Rinse Cont. 10 KMnO ₄ µg/sample		BH Imps. 5&6 Rinse Cont. 11 HCl µg/sample	
	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Result	MDL
Mercury	0.0406	0.0219	0.118	0.0172	< MDL	0.0219	< MDL	0.0295	0.0628	0.0163	< MDL	0.0108

Lab ID: 23-S729 23-S731 23-S730 23-S732 23-S733 23-S734
Blank Vol, ml: NA 196 250 337 186 124

Blank Correction Values

Analyte: Mercury	Blank FH Rinse µg	Blank Filter µg	Blank BH Cap.Soln. µg	Blank BH HNO ₃ Rinse µg	Blank BH H ₂ O Rinse µg	Blank BH KMnO ₄ Cap.Soln. + Rinse µg	Blank BH HCl Rinse µg	Total Blank Correction µg	Is Total Blank Correction ≥ 0 and ≤ 0.6?
Run 1	0.00	0.0406	0.12	0.00	0.00	0.10	0.00	0.2623	Yes
Reagent vol, ml	100		200	200	100	300	225		
Run 2	0.00	0.0406	0.12	0.00	0.00	0.10	0.00	0.2623	Yes
Reagent vol, ml	100		200	200	100	300	225		
Run 3	0.00	0.0406	0.12	0.00	0.00	0.10	0.00	0.2623	Yes
Reagent vol, ml	100		200	200	100	300	225		

Notes: 0.1N HNO₃ FH Filter 5% HNO₃/ 0.1N HNO₃ H₂O H₂O 4% KMnO₄/ 25 ml 8N HCl/
FH Probe Rinse 10% H₂O₂ BH Imps 2&3 10% H₂SO₄ 200 ml H₂O
BH Imps 5&6 BH Imps 5&6 BH Imps 5&6

Blank Corrected Results

Analyte: Mercury	Sample FH Rinse + Filter Cont. 1&3 µg	Sample BH Cap.Soln. + HNO ₃ Rinse Cont. 4 µg	Sample BH Imp. 4 + Rinse Cont. 5A µg	Sample BH Imps. 5&6 + Rinses Cont. 5B µg	Sample BH HCl Rinse + Water Cont. 5C µg	Total Sample µg	Total Blank Correction µg	Total Net Sample µg
Run 1	0.0406	0.0981	0.00928	0.126	0.0198	0.2938	0.2623	0.0315
Lab ID	23-S609	23-S610	23-S621	23-S612	23-S613			
Run 2	< 0.0219	0.0924	0.0121	0.120	0.0196	0.2660	0.2623	0.0037
Lab ID	23-S614	23-S615	23-S616	23-S617	23-S618			
Run 3	< 0.0219	0.112	0.00942	0.0914	0.0194	0.2541	0.2623	0.0000
Lab ID	23-S619	23-S620	23-S621	23-S622	23-S623			

Blank Rules: < indicates value is below the method detection limit (MDL)
If blank is '<' it is treated as zero.
If sample is '<' it is used for emission rate calculations but results are preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.
If the total blank correction value is less than or equal to 0.6 µg, subtract the total blank correction value from the total sample value to determine total net Hg. Otherwise, the value used for the blank correction shall be the greater of (1) 0.6 µg or (2) the lesser of [total FH blank + total BH blank] or 5% of the total sample value

EPA Method 29
Gas Stream Characteristics
Test Summary

Client: Eagle Foundry Company
Source: Main Foundry BH Inlet - White Iron
Location: Eagle Creek, OR

Parameter	Units	Run 1	Run 2	Run 3	
Date		3/27/2023	3/28/2023	3/29/2023	
Run Start Time		6:40	5:10	5:15	
Run End Time		10:40	9:10	9:15	
Duration	minutes	240	240	240	Average
Barometric Pressure	inHg	29.98	29.41	29.41	29.60
Nozzle Diameter	inches	0.251	0.251	0.251	0.251
Isokinetic Average	%	97.0	99.8	100.4	99.1
Sample Volume	dscf	316.575	297.402	353.897	322.625
Sample Volume	dscm	8.964	8.421	10.021	9.135
Stack Diameter	inches	48.00	48.00	48.00	48.00
Stack Area	ft ²	12.566	12.566	12.566	12.566
CO ₂	%vd	0.25	0.15	0.10	0.17
O ₂	%vd	20.85	20.91	20.59	20.78
Static Pressure	inH ₂ O	-0.90	-0.90	-0.90	-0.90
H ₂ O	%v	0.54	0.66	0.56	0.59
Wet Molecular Weight	lb/lb-mole	28.81	28.79	28.78	28.79
Velocity	fps	63.44	60.04	69.78	64.42
Flow Rate	adcfm	47,573	44,969	52,316	48,286
	acfm	47,831	45,268	52,611	48,570
	dscfm	49,692	45,376	53,648	49,572
Stack Temperature	°F	45.4	53.2	45.0	47.9
Production Data	lb melt/pour	11,955.985	12,165.997	11,960.006	
	ton melt/pour	5.978	6.083	5.980	
	lb Cr/melt	3,106.941	3,124.611	3,071.140	
	ton Cr/melt	1.553	1.562	1.536	
	lb Mn/melt	120.685	126.908	122.799	
	ton Mn/melt	0.060	0.063	0.061	

Run 1										
Analyte	Total				FH Net			BH Net		
	µg	µg/dscm	lb/hr	lb/ton melt	µg	µg/dscm	lb/hr	µg	µg/dscm	lb/hr
Aluminum	521.360	58.162	1.08E-02	7.24E-03	494.000	55.109	1.03E-02	27.360	3.052	5.68E-04
Antimony	< 1.400	< 0.156	< 2.91E-05	< 1.95E-05	0.710	0.079	1.47E-05	< 0.690	< 0.077	< 1.43E-05
Arsenic	< 2.716	< 0.303	< 5.64E-05	< 3.77E-05	< 1.750	< 0.195	< 3.63E-05	< 0.966	< 0.108	< 2.01E-05
Barium	5.153	0.575	1.07E-04	7.16E-05	3.903	0.435	8.10E-05	1.250	0.139	2.60E-05
Beryllium	< 0.078	< 0.009	< 1.62E-06	< 1.08E-06	< 0.050	< 0.006	< 1.04E-06	< 0.028	< 0.003	< 5.81E-07
Cadmium	0.670	0.075	1.39E-05	9.31E-06	0.488	0.054	1.01E-05	0.182	0.020	3.78E-06
Chromium	40.531	4.522	8.42E-04		40.370	4.504	8.38E-04	0.161	0.018	3.34E-06
Cobalt	0.289	0.032	6.00E-06	4.02E-06	0.196	0.022	4.07E-06	0.093	0.010	1.93E-06
Copper	19.365	2.160	4.02E-04	2.69E-04	18.500	2.064	3.84E-04	0.865	0.096	1.80E-05
Lead	42.810	4.776	8.89E-04	5.95E-04	39.800	4.440	8.26E-04	3.010	0.336	6.25E-05
Manganese	284.092	31.693	5.90E-03		283.259	31.600	5.88E-03	0.833	0.093	1.73E-05
Mercury	< 0.031	< 0.004	< 6.54E-07	< 4.38E-07						
Nickel	< 9.554	< 1.066	< 1.98E-04	< 1.33E-04	9.140	1.020	1.90E-04	< 0.414	< 0.046	< 8.60E-06
Phosphorus	< 12.330	< 1.376	< 2.56E-04	< 1.71E-04	9.570	1.068	1.99E-04	< 2.760	< 0.308	< 5.73E-05
Selenium	< 5.820	< 0.649	< 1.21E-04	< 8.09E-05	< 3.750	< 0.418	< 7.79E-05	< 2.070	< 0.231	< 4.30E-05
Silver	< 2.306	< 0.257	< 4.79E-05	< 3.20E-05	2.030	0.226	4.22E-05	< 0.276	< 0.031	< 5.73E-06
Thallium	< 3.880	< 0.433	< 8.06E-05	< 5.39E-05	< 2.500	< 0.279	< 5.19E-05	< 1.380	< 0.154	< 2.87E-05
Vanadium	< 0.776	< 0.087	< 1.61E-05	< 1.08E-05	0.638	0.071	1.32E-05	< 0.138	< 0.015	< 2.87E-06
Zinc	463.237	51.677	9.62E-03	6.44E-03	458.480	51.147	9.52E-03	4.757	0.531	9.88E-05

Chromium	lb Cr / ton Cr in melt =	2.17E-03
Manganese	lb Mn / ton Mn in melt =	3.91E-01

Run 1 Emission Factors

Run 2										
Analyte	Total				FH Net			BH Net		
	µg	µg/dscm	lb/hr	lb/ton melt	µg	µg/dscm	lb/hr	µg	µg/dscm	lb/hr
Aluminum	740.905	87.983	1.50E-02	9.83E-03	708.700	84.159	1.43E-02	32.205	3.824	6.50E-04
Antimony	1.721	0.204	3.47E-05	2.28E-05	1.060	0.126	2.14E-05	0.661	0.078	1.33E-05
Arsenic	< 2.604	< 0.309	< 5.26E-05	< 3.46E-05	< 1.750	< 0.208	< 3.53E-05	< 0.854	< 0.101	< 1.72E-05
Barium	6.463	0.767	1.30E-04	8.58E-05	5.313	0.631	1.07E-04	1.150	0.137	2.32E-05
Beryllium	< 0.074	< 0.009	< 1.49E-06	< 9.82E-07	< 0.050	< 0.006	< 1.01E-06	< 0.024	< 0.003	< 4.84E-07
Cadmium	< 0.426	< 0.051	< 8.60E-06	< 5.65E-06	0.377	0.045	7.61E-06	< 0.049	< 0.006	< 9.89E-07
Chromium	40.669	4.829	8.21E-04		40.470	4.806	8.17E-04	0.199	0.024	4.02E-06
Cobalt	0.287	0.034	5.79E-06	3.81E-06	0.287	0.034	5.79E-06	0.000	0.000	0.00E+00
Copper	26.390	3.134	5.33E-04	3.50E-04	24.900	2.957	5.03E-04	1.490	0.177	3.01E-05
Lead	< 41.810	< 4.965	< 8.44E-04	< 5.55E-04	41.200	4.893	8.32E-04	< 0.610	< 0.072	< 1.23E-05
Manganese	520.822	61.848	1.05E-02		518.259	61.544	1.05E-02	2.563	0.304	5.17E-05
Mercury	< 0.004	< 0.000	< 7.50E-08	< 4.93E-08						
Nickel	< 6.506	< 0.773	< 1.31E-04	< 8.63E-05	6.140	0.729	1.24E-04	< 0.366	< 0.043	< 7.39E-06
Phosphorus	< 16.910	< 2.008	< 3.41E-04	< 2.24E-04	14.470	1.718	2.92E-04	< 2.440	< 0.290	< 4.92E-05
Selenium	< 5.580	< 0.663	< 1.13E-04	< 7.41E-05	< 3.750	< 0.445	< 7.57E-05	< 1.830	< 0.217	< 3.69E-05
Silver	< 2.464	< 0.293	< 4.97E-05	< 3.27E-05	2.220	0.264	4.48E-05	< 0.244	< 0.029	< 4.93E-06
Thallium	< 3.720	< 0.442	< 7.51E-05	< 4.94E-05	< 2.500	< 0.297	< 5.05E-05	< 1.220	< 0.145	< 2.46E-05
Vanadium	< 0.637	< 0.076	< 1.29E-05	< 8.45E-06	0.515	0.061	1.04E-05	< 0.122	< 0.014	< 2.46E-06
Zinc	397.667	47.223	8.03E-03	5.28E-03	395.480	46.964	7.98E-03	2.187	0.260	4.41E-05

Chromium	lb Cr / ton Cr in melt =	2.10E-03
Manganese	lb Mn / ton Mn in melt =	6.63E-01

Run 2 Emission Factors

Note: Results for Hg front half and back half fractions are not shown because these values are not blank-corrected. Per EPA Method 29, only the sum of Hg front and back half results is subject to blank correction.

'<' denotes results which were calculated using the method detection limit for front half or back half results that were non-detect.

Run 3										
Analyte	Total				FH Net			BH Net		
	µg	µg/dscm	lb/hr	lb/ton melt	µg	µg/dscm	lb/hr	µg	µg/dscm	lb/hr
Aluminum	492.575	49.154	9.88E-03	6.61E-03	464.550	46.358	9.32E-03	28.025	2.797	5.62E-04
Antimony	< 0.845	< 0.084	< 1.69E-05	< 1.13E-05	0.240	0.024	4.81E-06	< 0.605	< 0.060	< 1.21E-05
Arsenic	< 2.597	< 0.259	< 5.21E-05	< 3.48E-05	< 1.750	< 0.175	< 3.51E-05	< 0.847	< 0.085	< 1.70E-05
Barium	4.313	0.430	8.65E-05	5.78E-05	3.543	0.354	7.10E-05	0.770	0.077	1.54E-05
Beryllium	< 0.074	< 0.007	< 1.48E-06	< 9.93E-07	< 0.050	< 0.005	< 1.00E-06	< 0.024	< 0.002	< 4.81E-07
Cadmium	0.462	0.046	9.26E-06	6.20E-06	0.327	0.033	6.56E-06	0.135	0.013	2.71E-06
Chromium	28.955	2.889	5.81E-04		28.670	2.861	5.75E-04	0.285	0.028	5.72E-06
Cobalt	0.212	0.021	4.25E-06	2.84E-06	0.212	0.021	4.25E-06	0.000	0.000	0.00E+00
Copper	30.510	3.045	6.12E-04	4.09E-04	28.500	2.844	5.72E-04	2.010	0.201	4.03E-05
Lead	42.820	4.273	8.59E-04	5.74E-04	41.000	4.091	8.22E-04	1.820	0.182	3.65E-05
Manganese	464.932	46.396	9.32E-03		463.259	46.229	9.29E-03	1.673	0.167	3.35E-05
Mercury	< 0.000	< 0.000	< 0.00E+00	< 0.00E+00						
Nickel	< 10.903	< 1.088	< 2.19E-04	< 1.46E-04	10.540	1.052	2.11E-04	< 0.363	< 0.036	< 7.28E-06
Phosphorus	< 10.090	< 1.007	< 2.02E-04	< 1.35E-04	7.670	0.765	1.54E-04	< 2.420	< 0.241	< 4.85E-05
Selenium	< 5.570	< 0.556	< 1.12E-04	< 7.47E-05	< 3.750	< 0.374	< 7.52E-05	< 1.820	< 0.182	< 3.65E-05
Silver	< 2.702	< 0.270	< 5.42E-05	< 3.62E-05	2.460	0.245	4.93E-05	< 0.242	< 0.024	< 4.85E-06
Thallium	< 3.710	< 0.370	< 7.44E-05	< 4.98E-05	< 2.500	< 0.249	< 5.01E-05	< 1.210	< 0.121	< 2.43E-05
Vanadium	< 0.543	< 0.054	< 1.09E-05	< 7.28E-06	0.422	0.042	8.46E-06	< 0.121	< 0.012	< 2.43E-06
Zinc	578.867	57.765	1.16E-02	7.76E-03	577.480	57.627	1.16E-02	1.387	0.138	2.78E-05

Chromium	lb Cr / ton Cr in melt =	1.51E-03
Manganese	lb Mn / ton Mn in melt =	6.07E-01

Run 3 Emission Factors

Mean Runs 1-3										
Analyte	Total				FH Net			BH Net		
	µg	µg/dscm	lb/hr	lb/ton melt	µg	µg/dscm	lb/hr	µg	µg/dscm	lb/hr
Aluminum	584.947	65.100	1.19E-02	7.89E-03	555.750	61.875	1.13E-02	29.197	3.224	5.93E-04
Antimony	< 1.322	< 0.148	< 2.69E-05	< 1.79E-05	0.670	0.076	1.36E-05	< 0.652	< 0.072	< 1.33E-05
Arsenic	< 2.639	< 0.290	< 5.37E-05	< 3.57E-05	< 1.750	< 0.193	< 3.56E-05	< 0.889	< 0.098	< 1.81E-05
Barium	5.309	0.591	1.08E-04	7.17E-05	4.253	0.473	8.64E-05	1.056	0.118	2.15E-05
Beryllium	< 0.075	< 0.008	< 1.53E-06	< 1.02E-06	< 0.050	< 0.006	< 1.02E-06	< 0.025	< 0.003	< 5.15E-07
Cadmium	< 0.519	< 0.057	< 1.06E-05	< 7.05E-06	0.397	0.044	8.10E-06	< 0.122	< 0.013	< 2.49E-06
Chromium	36.718	4.080	7.48E-04		36.503	4.057	7.43E-04	0.215	0.023	4.36E-06
Cobalt	0.263	0.029	5.35E-06	3.56E-06	0.232	0.026	4.70E-06	0.031	0.003	6.44E-07
Copper	25.422	2.780	5.16E-04	3.43E-04	23.967	2.622	4.86E-04	1.455	0.158	2.94E-05
Lead	< 42.480	< 4.671	< 8.64E-04	< 5.75E-04	40.667	4.475	8.27E-04	< 1.813	< 0.197	< 3.71E-05
Manganese	423.282	46.645	8.58E-03		421.592	46.457	8.54E-03	1.690	0.188	3.42E-05
Mercury	< 0.012	< 0.001	< 2.43E-07	< 1.62E-07						
Nickel	< 8.988	< 0.975	< 1.83E-04	< 1.22E-04	8.607	0.934	1.75E-04	< 0.381	< 0.042	< 7.75E-06
Phosphorus	< 13.110	< 1.463	< 2.67E-04	< 1.77E-04	10.570	1.184	2.15E-04	< 2.540	< 0.280	< 5.17E-05
Selenium	< 5.657	< 0.623	< 1.15E-04	< 7.65E-05	< 3.750	< 0.413	< 7.62E-05	< 1.907	< 0.210	< 3.88E-05
Silver	< 2.491	< 0.273	< 5.06E-05	< 3.37E-05	2.237	0.245	4.54E-05	< 0.254	< 0.028	< 5.17E-06
Thallium	< 3.770	< 0.415	< 7.67E-05	< 5.10E-05	< 2.500	< 0.275	< 5.08E-05	< 1.270	< 0.140	< 2.58E-05
Vanadium	< 0.652	< 0.072	< 1.33E-05	< 8.84E-06	0.525	0.058	1.07E-05	< 0.127	< 0.014	< 2.58E-06
Zinc	479.924	52.222	9.75E-03	6.49E-03	477.147	51.912	9.69E-03	2.777	0.310	5.69E-05

Chromium	lb Cr / ton Cr in melt =	1.93E-03
Manganese	lb Mn / ton Mn in melt =	5.54E-01

Mean Runs 1-3

Note: Results for Hg front half and back half fractions are not shown because these values are not blank-corrected. Per EPA Method 29, only the sum of Hg front and back half results is subject to blank correction.

'<' denotes results which were calculated using the method detection limit for front half or back half results that were non-detect.

EPA Methods 1-4, 29
Example Calculations

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Main Foundry BH Inlet - White Iron
Method: 29

Run: 1
Start Time: 6:40
End Time: 10:40
Date: 3/27/2023

EPA Methods 1-4:

$$1) P_m = P_b + (\Delta H/13.6) = 30.345 \text{ inHg}$$

where P_b : 29.98 inHg
 ΔH : 4.967 inH₂O

$$2) P_s = P_b + (\text{Static Press.}/13.6) = 29.914 \text{ inHg}$$

where P_b : 29.98 inHg
 Static Pressure: -0.90 inH₂O

$$3) V_m(\text{std}) = V_m(527.67/29.92)(Y)\left(\frac{P_m}{T_m}\right) = 316.575 \text{ dscf}$$

where V_m : 300.534 dcf
 Y : 1.0028
 P_m : 30.345 inHg
 T_m : 509.5 °A

$$4) V_{w(\text{std})} = V_{H_2O} \left(\frac{\rho_w \cdot R \cdot T_{\text{std}}}{P_{\text{std}} \cdot M_w} \right) = 1.726 \text{ scf}$$

where H_2O : 36.60 g
 ρ_w : 2.2046E-03 lb/mol
 R : 21.85 inHg ft³/lb-mol °R
 T_{std} : 527.67 °R
 P_{std} : 29.92 inHg
 M_w : 18.015 lb/lb-mol

$$5) B_{ws} = \left(\frac{V_{w(\text{std})}}{V_{w(\text{std})} + V_{m(\text{std})}} \right) = 0.0054$$

where $V_{w(\text{std})}$: 1.726 scf
 $V_{m(\text{std})}$: 316.575 dscf

$$6) \% H_2O = B_{ws} \times 100 = 0.54 \%v$$

EPA Methods 1-4, 29
Example Calculations

$$7) V_m(\text{actual}) = \left(\frac{Y \times V_m}{(1 - B_{ws})} \right) \left(\frac{T_s}{T_m} \right) \left(\frac{P_m}{P_s} \right) = 304.723 \text{ awcf}$$

where Y: 1.0028
 V_m : 300.5340 dcf
 B_{ws} : 0.0054
 T_s : 505.1 °A
 T_m : 509.5 °A
 P_m : 30.345 inHg
 P_s : 29.914 inHg

$$8) M_d = 0.44(\text{CO}_2) + 0.32(\text{O}_2) + 0.28(\text{N}_2 + \text{CO}) = 28.87 \text{ lb/lb-mole}$$

where CO_2 : 0.25 %vd
 O_2 : 20.85 %vd
 $\text{N}_2 + \text{CO} = (100 - (\text{O}_2 + \text{CO}_2))$: 78.90 %vd

$$9) M_s = M_d(1 - B_{ws}) + (18 \times B_{ws}) = 28.81 \text{ lb/lb-mole}$$

where M_d : 28.87 lb/lb-mole
 B_{ws} : 0.0054

$$10) \text{ Stack Area(cir.)} = \pi (\text{stack diameter}/24)^2 = 12.566 \text{ sq. ft.}$$

where Stack ID: 48 inches

$$11) \text{ Velocity, } V_s = 85.49(\text{Cp})(\text{Ave. Sqrt } \Delta P) \left(\sqrt{\frac{T_s}{(P_s \times M_s)}} \right) = 63.44 \text{ fps}$$

where Cp: 0.84
Ave. Sqrt ΔP : 1.154
 T_s : 505.1 °A
 P_s : 29.914 inHg
 M_s : 28.81 lb/lb-mole

$$12) \text{ acfm} = (V_s)(\text{stack area})(60 \text{ sec/min}) = 47,831 \text{ acfm}$$

where V_s : 63.44 ft/sec
Stack Area: 12.566 sq. ft

$$13) \text{ adcfm} = (\text{acfm})(1 - B_{ws}) = 47,573 \text{ adcfm}$$

where acfm: 47,831
 B_{ws} : 0.0054

$$14) Q_{sw} = 3600(V_s)(\text{stack area}) \left(\frac{527.67^\circ R}{T_s} \right) \left(\frac{P_s}{29.92 \text{ "Hg}} \right) = 2,997,688 \text{ wscf/hr}$$

where V_s : 63.44 ft/sec
Stack Area: 12.5660 sq. ft.
 T_s : 505.1 °A
 P_s : 29.914 inHg

EPA Methods 1-4, 29

Example Calculations

$$15) Q_{sd} = (wscf/hr)(1 - B_{ws}) = 2,981,500 \text{ dscf/hr}$$

where wscf/hr: 2,997,688
B_{ws} 0.0054

$$16) \text{ dscfm} = (\text{dscf/hr}) / 60 \text{ mins/hr} = 49,692 \text{ dscfm}$$

where dscf/hr: 2,981,500

$$17) \text{ Nozzle Area} = 3.1416 (\text{Nozzle Size}/24)^2 = 0.000344 \text{ sq. ft.}$$

where Nozzle Size: 0.251 inches

$$18) \text{ Isokinetic \%} = \left(\frac{0.0945(T_s)(V_m(\text{std}))}{P_s(V_s)(\text{nozzle area})(\text{sampling time})(1 - B_{ws})} \right) = 97.0 \%$$

where T_s: 505.1 °A
V_{m(Std)}: 316.575 dscf
P_s: 29.914 inHg
V_s: 63.44 ft/sec
Nozzle Area: 0.000344 sq. ft.
Sampling Time: 240 min.
B_{ws}: 0.0054

EPA Method 29:

Chromium

$$19) \text{ Cr Laboratory Results (blank corrected)}$$

Front half (FH): 40.370 µg/sample
Back half (BH): 0.161 µg/sample
Total (FH + BH): 40.531 µg/sample

$$20) C_s = \mu\text{g}/V_m(\text{std}) = 4.522 \mu\text{g/dscm}$$

where Run 1 Total: 40.531 µg/sample
V_{m(std)}: 8.964 dscm

$$21) \text{ Emission Rate} = (C_s) \left(\frac{0.0283168 \text{ m}^3}{\text{ft}^3} \right) (\text{stack flow}) \left(\frac{2.2046 \text{E}-9 \text{ lb}}{\mu\text{g}} \right) = 8.42\text{E}-04 \text{ lb/hr}$$

where C_s: 4.522 µg/dscm
Stack Flow: 2,981,500 dscf/hr

$$22) \text{ lb Cr / ton Cr in melt} = (\text{lb/hr} * \text{run duration}) / \text{ton Cr} = 2.17\text{E}-03 \text{ lb Cr/ton Cr in melt}$$

where lb/hr: 8.42E-04 lb/hr
run duration: 4 hours
ton Cr in melt: 1.553 tons

EPA Methods 1-4, 29
Example Calculations

Hg Blank Correction:

23) Hg Total Net Results (blank corrected)

FH total + BH total - total blank = 0.031 µg

Where front half (FH): 0.0406 µg

Back half (BH): 0.2532 µg

Total Blank: 0.2623 µg



COMPANY	Eagle Foundry Company
FACILITY	Eagle Foundry
LOCATION	Eagle Creek, OR
SOURCE	Main Foundry BH Outlet - White Iron
DATE	3/27/2023 - 3/29/2023
METHOD	29
POLLUTANT	Metals

EPA Method 1
Stack Parameters and Traverse Points

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Main Foundry BH Outlet - White Iron
Facility: Eagle Foundry

Type of Testing: P (P for Particulate; V for Velocity/Nonparticulate)
Type of Duct: C (C for circular; R for rectangular)

Number of ports available: 2
Number of ports to be used: 2
Port diameter: 3 inches
Sampling location height (approx.): feet
Stack height (approx.): feet

Circular ID (Rectangular Depth): 61.00 inches
Port depth and/or wall thickness: 6.00 inches
Stack width (Rectangular only): inches

Equivalent Diameter
If rectangular = $\frac{2 * \text{Depth} * \text{Width}}{\text{Depth} + \text{Width}}$ = 61.00 inches (If circular = duct ID)

Stack/duct area = 20.295 sq. feet 2922.5 sq. inches

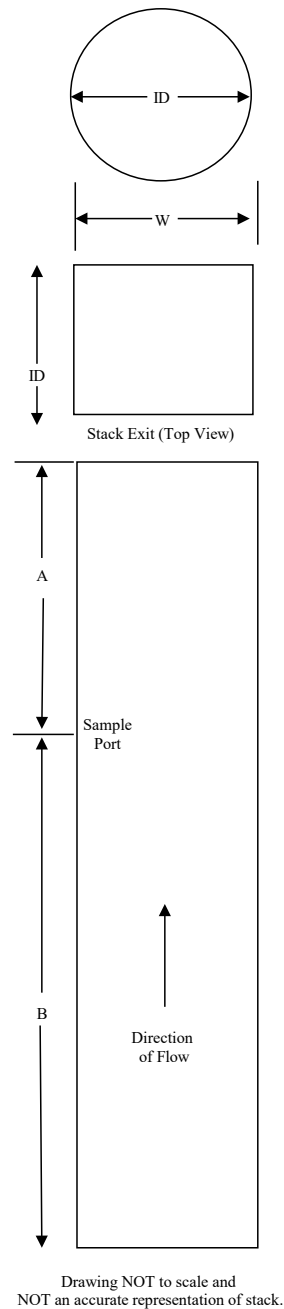
Sample Port Location: Downstream flow disturbance Upstream flow disturbance
from process toward exit
B A
Number of Inches: 264.00 44.00
Number of Diameters: 4.33 0.72

Minimum Number of Traverse Points: 24

Traverse points less than 1.0 inch from the stack wall are relocated to a distance of 1.0 inch.

Points	% of diameter	Distance from inside wall (in.)	Distance including port (in.)
1	2.1	1.28	7 1/4
2	6.7	4.09	10 1/8
3	11.8	7.20	13 1/4
4	17.7	10.80	16 3/4
5	25.0	15.25	21 1/4
6	35.6	21.72	27 3/4
7	64.4	39.28	45 1/4
8	75.0	45.75	51 3/4
9	82.3	50.20	56 1/4
10	88.2	53.80	59 3/4
11	93.3	56.91	62 7/8
12	97.9	59.72	65 3/4

Reference Diagram



Pre-Test Traverse

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Main Foundry BH Outlet - White Iron

Stack Temp: 63 °F

Traverse Point	Velocity ΔP ("H ₂ O)	Null Angle
1	0.64	0
2	0.65	5
3	0.64	0
4	0.62	5
5	0.61	5
6	0.62	0
7	0.66	5
8	0.62	0
9	0.52	5
10	0.59	0
11	0.58	5
12	0.55	5

Average: 0.61 3

Flow is found to be: Non-cyclonic

**Isokinetic Field Data
Field Data Entry**

Client:	Eagle Foundry Company	Run:	1
Location:	Eagle Creek, OR	Start Time:	6:40
Source:	Main Foundry BH Outlet - White Iron	End Time:	10:40
EPA Method:	29	Environmental Conditions/Test Notes:	Date: 3/27/2023
Box Operator:	JPC	overcast, 30-50 °F	
Technician(s):	KAD		

Stack Dimensional Data:		Equipment:					
Circular		Meterbox ID	15	Probe ID	7D	Liner type	glass
Diameter	61.000 in	Y factor	1.0057	Nozzle ID	0.25	Nozzle size	0.263 inches
Rectangular		ΔH@	1.919	Hot box ID	HHB7	Nozzle area	0.000377 sq.ft.
Width	in	Bp ID	TS1	Pitot Cp	0.84	Probe heat	248 °F
Length	in	Balance ID	HLN FB-1	Pitot ID	7D	Filter heat	248 °F
Stack Area	20.295 sq.ft.	Weights ID	HLN FW-1	Probe Length, ft	7 Ft		

Source Information:				Leak Checks:		
Barometric Pressure	29.98 "Hg	O ₂	20.90 %	Pitot	x	x
Static Pressure	0.1 "H ₂ O	CO ₂	0.00 %	Leak rate, dcf	0.000	0.001
Ave. ΔP	0.61 "H ₂ O	Rec. Nz.	0.236 inches	Leak check vacuum, "Hg	15	15
Stack Temperature	60 °F					
Assumed moisture	2.00 %					
Assumed meter temp.	40 °F					
Total number of points	24					
Time per point	10 min.					
Total run time	240 min.					

Nozzle check for roundness:		
1	2	3
0.263	0.263	0.263 inches
Caliper ID	WS1	

Post Test Calculations:				Moisture/Lab:			
Sample volume	253.684 dcf	Ave. ΔP	0.678 "H ₂ O	Filter, #	N/A		
Wet mol. weight	28.79 M _s (actual)	Ave. √ΔP	0.823 "H ₂ O		Initial	Final	Gain
Actual H ₂ O	0.50 %	Ave. ΔH	3.896 "H ₂ O	Impingers, g	3,658.5	3,648.4	-10.1
Std. meter vol.	254.654 dscf	Ave. T _s	46.3 °F	Silica gel, g	898.0	935.0	37.0
Isokinetic Average	99.7 %	Ave. T _m	75.1 °F		Total water gain, g:		26.9

Traverse Point	Time (min.)	Meter Volume (dcf)	Velocity ΔP ("H ₂ O)	Stack Temp. (°F)	Meter Temp. (°F)	Calc. ΔH	Run ΔH	Vacuum ("Hg)	Filter Box (°F)	Condenser Temp (≤68°F)
1	10.0	9.550	0.61	41	46	3.35	3.30	8	250	30
2	20.0	19.420	0.65	41	46	3.57	3.60	7	251	26
3	30.0	29.260	0.63	41	50	3.49	3.50	7	250	32
4	40.0	39.380	0.66	41	54	3.68	3.70	7	250	35
5	50.0	49.770	0.68	41	58	3.82	3.80	7	250	36
6	60.0	60.430	0.74	41	60	4.18	4.20	6	251	38
7	70.0	71.410	0.75	41	66	4.28	4.30	7	252	38
8	80.0	82.510	0.75	41	70	4.31	4.30	8	250	42
9	90.0	93.420	0.71	41	72	4.10	4.10	8	251	44
10	100.0	104.350	0.71	41	74	4.11	4.10	7	250	44
11	110.0	114.720	0.64	43	77	3.72	3.70	7	250	45
12	120.0	124.990	0.63	46	78	3.64	3.60	7	252	45
13	130.0	135.880	0.69	46	79	4.00	4.00	8	251	47
14	140.0	146.270	0.65	47	82	3.78	3.80	8	250	47
15	150.0	156.690	0.64	48	83	3.72	3.70	8	251	50
16	160.0	166.910	0.62	50	84	3.60	3.60	8	252	51
17	170.0	177.390	0.70	51	85	4.06	4.10	8	251	51
18	180.0	188.710	0.73	51	88	4.26	4.30	8	250	53
19	190.0	199.900	0.74	51	89	4.32	4.30	8	250	55
20	200.0	210.900	0.71	52	90	4.15	4.20	8	249	56
21	210.0	222.030	0.70	53	91	4.09	4.10	8	250	57
22	220.0	232.950	0.68	53	93	3.99	4.00	8	250	58
23	230.0	243.590	0.64	55	93	3.74	3.70	8	250	58
24	240.0	253.684	0.61	55	94	3.57	3.50	8	251	58

**Isokinetic Field Data
Field Data Entry**

Client:	Eagle Foundry Company	Run:	2
Location:	Eagle Creek, OR	Start Time:	5:10
Source:	Main Foundry BH Outlet - White Iron	End Time:	9:10
EPA Method:	29	Environmental Conditions/Test Notes:	Date: 3/28/2023
Box Operator:	JPC	overcast, 30-50 °F	
Technician(s):	KAD		

Stack Dimensional Data:

Circular
Diameter 61.000 in
Rectangular
Width in
Length in
Stack Area 20.295 sq.ft.

Equipment:

Meterbox ID	15	Probe ID	7D	Liner type	glass
Y factor	1.0057	Nozzle ID	0.25	Nozzle size	0.263 inches
ΔH@	1.919	Hot box ID	HHB7	Nozzle area	0.000377 sq.ft.
Bp ID	TS1	Pitot Cp	0.84	Probe heat	248 °F
Balance ID	HLN FB-1	Pitot ID	7D	Filter heat	248 °F
Weights ID	HLN FW-1	Probe Length, ft	7 Ft		

Source Information:

Barometric Pressure	29.41 "Hg	O ₂	20.90 %
Static Pressure	0.1 "H ₂ O	CO ₂	0.00 %
Ave. ΔP	0.61 "H ₂ O	Rec. Nz.	0.226 inches
Stack Temperature	60 °F		
Assumed moisture	0.50 %		
Assumed meter temp.	75.1 °F		
Total number of points	24		
Time per point	10 min.		
Total run time	240 min.		

Leak Checks:

	Pre-test	Post-test
Pitot	x	x
Leak rate, dcf	0.000	0.000
Leak check vacuum, "Hg	15	9

Nozzle check for roundness:

1	2	3
0.263	0.263	0.263 inches
Caliper ID	WS1	

Post Test Calculations:

Sample volume	247.602 dcf	Ave. ΔP	0.627 "H ₂ O
Wet mol. weight	28.73 M _s (actual)	Ave. √ΔP	0.792 "H ₂ O
Actual H ₂ O	0.99 %	Ave. ΔH	3.633 "H ₂ O
Std. meter vol.	243.575 dscf	Ave. T _s	54.0 °F
Isokinetic Average	101.2 %	Ave. T _m	75.4 °F

Moisture/Lab:

Filter, #	N/A		
	Initial	Final	Gain
Impingers, g	3,693.6	3,709.2	15.6
Silica gel, g	859.3	895.3	36.0
	Total water gain:		51.6

Traverse Point	Time (min.)	Meter Volume (dcf)	Velocity ΔP ("H ₂ O)	Stack Temp. (°F)	Meter Temp. (°F)	Calc. ΔH	Run ΔH	Vacuum ("Hg)	Filter Box (°F)	Condenser Temp (≤68°F)
1	10.0	10.530	0.69	49	55	3.89	3.80	4	250	38
2	20.0	20.930	0.68	53	58	3.83	3.80	4	251	39
3	30.0	31.020	0.63	55	61	3.55	3.60	4	252	41
4	40.0	41.150	0.62	55	63	3.51	3.50	4	250	41
5	50.0	51.580	0.66	54	65	3.76	3.80	4	251	41
6	60.0	61.920	0.62	54	66	3.54	3.50	4	250	41
7	70.0	71.780	0.60	54	68	3.43	3.40	4	249	42
8	80.0	81.840	0.60	53	70	3.45	3.50	4	252	42
9	90.0	91.980	0.60	54	72	3.46	3.50	4	250	42
10	100.0	102.140	0.63	53	74	3.65	3.70	4	251	42
11	110.0	112.270	0.62	55	76	3.60	3.60	4	250	42
12	120.0	122.590	0.60	55	78	3.49	3.50	4	251	43
13	130.0	132.840	0.60	55	79	3.50	3.50	4	250	42
14	140.0	142.910	0.61	54	80	3.57	3.60	4	251	42
15	150.0	153.290	0.63	54	81	3.69	3.70	4	250	42
16	160.0	163.860	0.65	55	82	3.81	3.80	4	251	42
17	170.0	175.120	0.72	56	83	4.22	4.20	4	251	42
18	180.0	186.010	0.65	55	84	3.83	3.80	4	250	42
19	190.0	196.320	0.60	54	85	3.54	3.50	4	250	42
20	200.0	206.140	0.60	54	85	3.54	3.50	4	250	42
21	210.0	216.740	0.62	55	86	3.66	3.70	4	250	41
22	220.0	227.310	0.60	55	86	3.54	3.50	4	250	42
23	230.0	237.490	0.61	53	86	3.62	3.60	4	251	41
24	240.0	247.602	0.60	53	86	3.56	3.60	4	249	42

Isokinetic Field Data
Field Data Entry

Client:	Eagle Foundry Company	Run:	3
Location:	Eagle Creek, OR	Start Time:	5:15
Source:	Main Foundry BH Outlet - White Iron	End Time:	9:15
EPA Method:	29	Environmental Conditions/Test Notes:	Date: 3/29/2023
Box Operator:	JPC		
Technician(s):	KAD		

Stack Dimensional Data:		Equipment:					
Circular		Meterbox ID	15	Probe ID	7D	Liner type	glass
Diameter	61.000 in	Y factor	1.0057	Nozzle ID	0.25	Nozzle size	0.263 inches
Rectangular		ΔH@	1.919	Hot box ID	HHB7	Nozzle area	0.000377 sq.ft.
Width	in	Bp ID	TS1	Pitot Cp	0.84	Probe heat	248 °F
Length	in	Balance ID	HLN FB-1	Pitot ID	7D	Filter heat	248 °F
Stack Area	20.295 sq.ft.	Weights ID	HLN FW-1	Probe Length, ft	7 Ft		

Source Information:				Leak Checks:			
Barometric Pressure	29.41 "Hg	O ₂	20.90 %		Pre-test	Post-test	
Static Pressure	0.1 "H ₂ O	CO ₂	0.00 %	Pitot	x	x	
Ave. ΔP	0.61 "H ₂ O	Rec. Nz.	0.226 inches	Leak rate, dcf	0.000	0.000	
Stack Temperature	60 °F			Leak check vacuum, "Hg	15	12	
Assumed moisture	0.99 %						
Assumed meter temp.	75.4 °F						
Total number of points	24						
Time per point	10 min.						
Total run time	240 min.						

Nozzle check for roundness:			
1	2	3	
0.263	0.263	0.263 inches	
	Caliper ID	WS1	

Post Test Calculations:				Moisture/Lab:			
Sample volume	257.359 dcf	Ave. ΔP	0.674 "H ₂ O	Filter, #	N/A		
Wet mol. weight	28.77 M _s (actual)	Ave. √ΔP	0.821 "H ₂ O		Initial	Final	Gain
Actual H ₂ O	0.69 %	Ave. ΔH	3.942 "H ₂ O	Impingers, g	3,687.2	3,688.9	1.7
Std. meter vol.	253.844 dscf	Ave. T _s	46.1 °F	Silica gel, g	915.2	950.7	35.5
Isokinetic Average	100.7 %	Ave. T _m	74.4 °F		Total water gain:		37.2

Traversal Point	Time (min.)	Meter Volume (dcf)	Velocity ΔP ("H ₂ O)	Stack Temp. (°F)	Meter Temp. (°F)	Calc. ΔH	Run ΔH	Vacuum ("Hg)	Filter Box (°F)	Condenser Temp (≤68°F)
1	10.0	10.590	0.72	41	51	4.06	4.10	4	250	33
2	20.0	21.250	0.72	46	52	4.03	4.00	4	250	35
3	30.0	31.680	0.67	46	57	3.78	3.80	4	250	37
4	40.0	42.090	0.65	45	61	3.71	3.70	4	250	37
5	50.0	52.360	0.62	46	65	3.56	3.60	4	250	37
6	60.0	63.190	0.69	45	68	3.99	4.00	4	250	38
7	70.0	74.250	0.73	45	71	4.24	4.20	5	250	38
8	80.0	85.230	0.73	45	73	4.26	4.30	5	250	38
9	90.0	96.350	0.72	46	75	4.21	4.20	5	250	38
10	100.0	107.350	0.72	46	75	4.21	4.20	5	250	38
11	110.0	118.340	0.69	46	78	4.06	4.10	5	250	38
12	120.0	129.290	0.69	46	78	4.06	4.10	5	250	39
13	130.0	140.350	0.69	46	79	4.06	4.10	5	250	40
14	140.0	150.760	0.62	46	80	3.66	3.70	4	250	40
15	150.0	161.220	0.62	47	80	3.65	3.70	4	250	40
16	160.0	171.420	0.61	47	80	3.59	3.60	4	250	40
17	170.0	181.860	0.65	48	80	3.82	3.80	4	251	40
18	180.0	192.590	0.65	47	81	3.83	3.80	4	250	41
19	190.0	203.160	0.63	48	82	3.72	3.70	4	251	43
20	200.0	214.070	0.70	48	83	4.14	4.10	4	250	44
21	210.0	224.700	0.66	47	84	3.92	3.90	4	250	45
22	220.0	235.310	0.65	47	84	3.86	3.90	4	250	43
23	230.0	246.310	0.67	46	84	3.98	4.00	4	250	41
24	240.0	257.359	0.67	46	85	3.99	4.00	4	250	43

EPA Method 4
Impinger Weights Summary

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Main Foundry BH Outlet - White Iron
EPA Method: 29
Box Operator: JPC
Technician(s): KAD

Run 1

Impinger gain by weight (g):

#	Initial	Final	Gain
1	747.9	668.8	-79.1
2	755.8	772.7	16.9
3	631.7	681.8	50.1
4	755.7	828.9	73.2
5	767.4	696.2	-71.2
Totals:	3,658.5	3,648.4	-10.1

Run 2

Impinger gain by weight (g):

#	Initial	Final	Gain
1	758.7	726.3	-32.4
2	760.4	791.7	31.3
3	635.7	642.8	7.1
4	755.4	762.3	6.9
5	783.4	786.1	2.7
Totals:	3,693.6	3,709.2	15.6

Run 3

Impinger gain by weight (g):

#	Initial	Final	Gain
1	756.8	714.1	-42.7
2	760.0	790.5	30.5
3	637.4	643.8	6.4
4	757.1	762.5	5.4
5	775.9	778.0	2.1
Totals:	3,687.2	3,688.9	1.7

Isokinetic Field Data
Field Data and Calculations
Gas Stream Characteristics

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Main Foundry BH Outlet - White Iron
Method: 29

Run: 1
Start Time: 6:40
End Time: 10:40
Date: 3/27/2023

Sampling Data				Traverse Data			
Time min.	Meter ft ³	ΔH "H ₂ O	Meter T _m °F	Traverse Point	Dp "H ₂ O	Stack T _s °F	$\sqrt{Dp}$
	0.000						
10.0	9.550	3.30	46	1	0.61	41	0.781
20.0	19.420	3.60	46	2	0.65	41	0.806
30.0	29.260	3.50	50	3	0.63	41	0.794
40.0	39.380	3.70	54	4	0.66	41	0.812
50.0	49.770	3.80	58	5	0.68	41	0.825
60.0	60.430	4.20	60	6	0.74	41	0.860
70.0	71.410	4.30	66	7	0.75	41	0.866
80.0	82.510	4.30	70	8	0.75	41	0.866
90.0	93.420	4.10	72	9	0.71	41	0.843
100.0	104.350	4.10	74	10	0.71	41	0.843
110.0	114.720	3.70	77	11	0.64	43	0.800
120.0	124.990	3.60	78	12	0.63	46	0.794
130.0	135.880	4.00	79	13	0.69	46	0.831
140.0	146.270	3.80	82	14	0.65	47	0.806
150.0	156.690	3.70	83	15	0.64	48	0.800
160.0	166.910	3.60	84	16	0.62	50	0.787
170.0	177.390	4.10	85	17	0.70	51	0.837
180.0	188.710	4.30	88	18	0.73	51	0.854
190.0	199.900	4.30	89	19	0.74	51	0.860
200.0	210.900	4.20	90	20	0.71	52	0.843
210.0	222.030	4.10	91	21	0.70	53	0.837
220.0	232.950	4.00	93	22	0.68	53	0.825
230.0	243.590	3.70	93	23	0.64	55	0.800
240.0	253.684	3.50	94	24	0.61	55	0.781

Client:	Eagle Foundry Company	Run:	1
Source:	Main Foundry BH Outlet - White Iron	Date:	03/27/23

Field Data Input Continued

Moisture Data

Total Test Time	240.0 min
Sample Time Interval	10.0 min
Meter Volume, V_m	253.684 dcf
Water Mass	26.9 g
Nozzle Diameter, N_z	0.2630 in.
Nozzle Area	0.000377 sq.ft.

Stack Dimensional Data:

Circular	
Diameter	61.000 in
Rectangular	
Width	in
Length	in
Stack Area	20.295 sq.ft.

Traverse Data

Barometric Pressure, P_b	29.98 "Hg
Static Pressure	0.10 "H ₂ O
Pitot Factor, cp	0.84
Meter Cal Factor	1.0057 Y

Molecular Weight:

CO ₂ Average	0.25 %vd
O ₂ Average	20.85 %vd

Field Data Averages

Meter

ΔH	3.896 "H ₂ O
Temperature, T_m	75.1 °F
Temperature, T_m	534.8 °A (°R)
Pressure Meter, P_m	30.266 "Hg

Stack

$\sqrt{D_p}$	0.823 "H ₂ O
Temperature, T_s	46.3 °F
Temperature, T_s	506.0 °A (°R)
Pressure Stack, P_s	29.987 "Hg

Field Data Calculations

Meter Box Capture

Standard Volume, $V_{m(std)}$	254.654 dscf
	7.211 dscm
Actual Volume, $V_{m(actual)}$	244.860 awcf

EPA Method 2 Stack Gas Flowrate:

Velocity, V_s	45.22 fps
Flow Rate (actual), Q_{aw}	55,064 acfm
	54,789 adcfm
Flow Rate (standard), Q	3,453,275 wscf/hr
	3,436,009 dscf/hr
	57,267 dscf/min
	57,555 wscf/min

Gas Stream Moisture

Moisture Vapor, $V_{w(std)}$	1.269 scf
Moisture, B_{ws}	0.0050
Moisture EPA M4	0.50 %v
Moisture @ Saturation	1.05 %v (for $T_s < 212^\circ F$)

EPA Method 3 Gas Density

Dry, M_d	28.87 lb/lb-mole
Wet, M_s	28.82 lb/lb-mole

Percent Isokinetic	99.7 %

Isokinetic Field Data
Field Data and Calculations
Gas Stream Characteristics

Client:	Eagle Foundry Company	Run:	2
Location:	Eagle Creek, OR	Start Time:	5:10
Source:	Main Foundry BH Outlet - White Iron	End Time:	9:10
Method:	29	Date:	03/28/23

Sampling Data				Traverse Data			
Time min.	Meter ft ³	ΔH "H ₂ O	Meter T _m °F	Traverse Point	Dp "H ₂ O	Stack T _s °F	$\sqrt{Dp}$
	0.000						
10.0	10.530	3.80	55	1	0.69	49	0.831
20.0	20.930	3.80	58	2	0.68	53	0.825
30.0	31.020	3.60	61	3	0.63	55	0.794
40.0	41.150	3.50	63	4	0.62	55	0.787
50.0	51.580	3.80	65	5	0.66	54	0.812
60.0	61.920	3.50	66	6	0.62	54	0.787
70.0	71.780	3.40	68	7	0.60	54	0.775
80.0	81.840	3.50	70	8	0.60	53	0.775
90.0	91.980	3.50	72	9	0.60	54	0.775
100.0	102.140	3.70	74	10	0.63	53	0.794
110.0	112.270	3.60	76	11	0.62	55	0.787
120.0	122.590	3.50	78	12	0.60	55	0.775
130.0	132.840	3.50	79	13	0.60	55	0.775
140.0	142.910	3.60	80	14	0.61	54	0.781
150.0	153.290	3.70	81	15	0.63	54	0.794
160.0	163.860	3.80	82	16	0.65	55	0.806
170.0	175.120	4.20	83	17	0.72	56	0.849
180.0	186.010	3.80	84	18	0.65	55	0.806
190.0	196.320	3.50	85	19	0.60	54	0.775
200.0	206.140	3.50	85	20	0.60	54	0.775
210.0	216.740	3.70	86	21	0.62	55	0.787
220.0	227.310	3.50	86	22	0.60	55	0.775
230.0	237.490	3.60	86	23	0.61	53	0.781
240.0	247.602	3.60	86	24	0.60	53	0.775

Client:	Eagle Foundry Company	Run:	2
Source:	Main Foundry BH Outlet - White Iron	Date:	03/28/23

Field Data Input Continued

Moisture Data

Total Test Time	240.0 min
Sample Time Interval	10.0 min
Meter Volume, V_m	247.602 dcf
Water Mass	51.6 g
Nozzle Diameter, N_z	0.2630 in.
Nozzle Area	0.000377 sq.ft.

Stack Dimensional Data:

Circular	
Diameter	61.000 in
Rectangular	
Width	in
Length	in
Stack Area	20.295 sq.ft.

Traverse Data

Barometric Pressure, P_b	29.41 "Hg
Static Pressure	0.10 "H ₂ O
Pitot Factor, cp	0.84
Meter Cal Factor	1.0057 Y

Molecular Weight:

CO ₂ Average	0.15 %vd
O ₂ Average	20.91 %vd

Field Data Averages

Meter

ΔH	3.633 "H ₂ O
Temperature, T_m	75.4 °F
Temperature, T_m	535.1 °A (°R)
Pressure Meter, P_m	29.677 "Hg

Stack

$\sqrt{D_p}$	0.792 "H ₂ O
Temperature, T_s	54.0 °F
Temperature, T_s	513.7 °A (°R)
Pressure Stack, P_s	29.417 "Hg

Field Data Calculations

Meter Box Capture

Standard Volume, $V_{m(std)}$	243.575 dscf
	6.897 dscm
Actual Volume, $V_{m(actual)}$	243.578 awcf

EPA Method 2 Stack Gas Flowrate:

Velocity, V_s	44.32 fps
Flow Rate (actual), Q_{aw}	53,968 acfm
	53,434 adcfm
Flow Rate (standard), Q	3,270,441 wscf/hr
	3,238,064 dscf/hr
	53,968 dscf/min
	54,507 wscf/min

Gas Stream Moisture

Moisture Vapor, $V_{w(std)}$	2.433 scf
Moisture, B_{ws}	0.0099
Moisture EPA M4	0.99 %v
Moisture @ Saturation	1.43 %v (for $T_s < 212^\circ\text{F}$)

EPA Method 3 Gas Density

Dry, M_d	28.86 lb/lb-mole
Wet, M_s	28.75 lb/lb-mole

Percent Isokinetic	101.2 %

Isokinetic Field Data
Field Data and Calculations
Gas Stream Characteristics

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Main Foundry BH Outlet - White Iron
Method: 29

Run: 3
Start Time: 5:15
End Time: 9:15
Date: 03/29/23

Sampling Data				Traverse Data			
Time min.	Meter ft ³	ΔH "H ₂ O	Meter T _m °F	Traverse Point	Dp "H ₂ O	Stack T _s °F	$\sqrt{Dp}$
	0.000						
10.0	10.590	4.10	51	1	0.72	41	0.849
20.0	21.250	4.00	52	2	0.72	46	0.849
30.0	31.680	3.80	57	3	0.67	46	0.819
40.0	42.090	3.70	61	4	0.65	45	0.806
50.0	52.360	3.60	65	5	0.62	46	0.787
60.0	63.190	4.00	68	6	0.69	45	0.831
70.0	74.250	4.20	71	7	0.73	45	0.854
80.0	85.230	4.30	73	8	0.73	45	0.854
90.0	96.350	4.20	75	9	0.72	46	0.849
100.0	107.350	4.20	75	10	0.72	46	0.849
110.0	118.340	4.10	78	11	0.69	46	0.831
120.0	129.290	4.10	78	12	0.69	46	0.831
130.0	140.350	4.10	79	13	0.69	46	0.831
140.0	150.760	3.70	80	14	0.62	46	0.787
150.0	161.220	3.70	80	15	0.62	47	0.787
160.0	171.420	3.60	80	16	0.61	47	0.781
170.0	181.860	3.80	80	17	0.65	48	0.806
180.0	192.590	3.80	81	18	0.65	47	0.806
190.0	203.160	3.70	82	19	0.63	48	0.794
200.0	214.070	4.10	83	20	0.70	48	0.837
210.0	224.700	3.90	84	21	0.66	47	0.812
220.0	235.310	3.90	84	22	0.65	47	0.806
230.0	246.310	4.00	84	23	0.67	46	0.819
240.0	257.359	4.00	85	24	0.67	46	0.819

Client:	Eagle Foundry Company	Run:	3
Source:	Main Foundry BH Outlet - White Iron	Date:	03/29/23

Field Data Input Continued

Moisture Data

Total Test Time	240.0 min
Sample Time Interval	10.0 min
Meter Volume, V_m	257.359 dcf
Water Mass	37.2 g
Nozzle Diameter, N_z	0.2630 in.
Nozzle Area	0.000377 sq.ft.

Stack Dimensional Data:

Circular	
Diameter	61.000 in
Rectangular	
Width	in
Length	in
Stack Area	20.295 sq.ft.

Traverse Data

Barometric Pressure, P_b	29.41 "Hg
Static Pressure	0.10 "H ₂ O
Pitot Factor, cp	0.84
Meter Cal Factor	1.0057 Y

Molecular Weight:

CO ₂ Average	0.10 %vd
O ₂ Average	20.59 %vd

Field Data Averages

Meter

ΔH	3.942 "H ₂ O
Temperature, T_m	74.4 °F
Temperature, T_m	534.1 °A (°R)
Pressure Meter, P_m	29.700 "Hg

Stack

$\sqrt{Dp}$	0.821 "H ₂ O
Temperature, T_s	46.1 °F
Temperature, T_s	505.8 °A (°R)
Pressure Stack, P_s	29.417 "Hg

Field Data Calculations

Meter Box Capture

Standard Volume, $V_{m(std)}$	253.844 dscf
	7.188 dscm
Actual Volume, $V_{m(actual)}$	249.188 awcf

EPA Method 2 Stack Gas Flowrate:

Velocity, V_s	45.58 fps
Flow Rate (actual), Q_{aw}	55,503 acfm
	55,120 adcfm
Flow Rate (standard), Q	3,415,954 wscf/hr
	3,392,384 dscf/hr
	56,540 dscf/min
	56,933 wscf/min

Gas Stream Moisture

Moisture Vapor, $V_{w(std)}$	1.754 scf
Moisture, B_{ws}	0.0069
Moisture EPA M4	0.69 %v
Moisture @ Saturation	1.07 %v (for $T_s < 212^\circ F$)

EPA Method 3 Gas Density

Dry, M_d	28.84 lb/lb-mole
Wet, M_s	28.77 lb/lb-mole

Percent Isokinetic	100.7 %

Eagle Foundry Company
Main Foundry BH Outlet - White Iron
Method 29 Laboratory Results

Run: 1
Sample Date: 03/27/23

Analyte	Filter + FH Rinse Cont. 1&3		BH Cap.Soln. + BH Rinse Cont. 4		Units
	< Result	MDL	< Result	MDL	
Aluminum	78.7	7.50	22.9	3.72	µg/sample
Antimony	1.71	1.25	0.903	0.620	µg/sample
Arsenic	< MDL	1.75	< MDL	0.868	µg/sample
Barium	2.23	0.125	3.68	0.062	µg/sample
Beryllium	< MDL	0.050	< MDL	0.025	µg/sample
Cadmium	< MDL	0.100	0.175	0.050	µg/sample
Chromium	3.35	0.200	0.615	0.099	µg/sample
Cobalt	< MDL	0.125	0.134	0.062	µg/sample
Copper	< MDL	1.25	3.03	0.620	µg/sample
Lead	2.20	1.25	2.53	0.620	µg/sample
Manganese	21.90	0.075	0.610	0.037	µg/sample
Nickel	4.58	0.750	0.460	0.372	µg/sample
Phosphorus	29.8	5.00	< MDL	2.48	µg/sample
Selenium	< MDL	3.75	< MDL	1.86	µg/sample
Silver	< MDL	0.500	< MDL	0.248	µg/sample
Thallium	< MDL	2.50	< MDL	1.24	µg/sample
Vanadium	< MDL	0.250	< MDL	0.124	µg/sample
Zinc	18.3	0.750	3.55	0.372	µg/sample

Lab ID: 23-S639
Sample Vol: 250

23-S640
208 ml

Eagle Foundry Company
Main Foundry BH Outlet - White Iron
Method 29 Laboratory Results

Run: 3
Sample Date: 03/29/23

Analyte	Filter + FH Rinse Cont. 1&3		BH Cap.Soln. + BH Rinse Cont. 4		Units
	<	Result MDL	<	Result MDL	
Aluminum		81.5 7.50		27.8 3.42	µg/sample
Antimony		2.04 1.25		0.634 0.570	µg/sample
Arsenic	<	MDL 1.75	<	MDL 0.798	µg/sample
Barium		2.81 0.125		1.45 0.057	µg/sample
Beryllium	<	MDL 0.050	<	MDL 0.023	µg/sample
Cadmium	<	MDL 0.100	<	MDL 0.046	µg/sample
Chromium		4.66 0.200		0.455 0.091	µg/sample
Cobalt	<	MDL 0.125		0.112 0.057	µg/sample
Copper		3.28 1.25		0.923 0.570	µg/sample
Lead	<	MDL 1.25	<	MDL 0.570	µg/sample
Manganese		10.2 0.075		11.1 0.034	µg/sample
Nickel		12.4 0.750	<	MDL 0.342	µg/sample
Phosphorus		6.20 5.00	<	MDL 2.28	µg/sample
Selenium	<	MDL 3.75	<	MDL 1.71	µg/sample
Silver		0.974 0.500	<	MDL 0.228	µg/sample
Thallium	<	MDL 2.50	<	MDL 1.14	µg/sample
Vanadium	<	MDL 0.250	<	MDL 0.114	µg/sample
Zinc		5.84 0.750		0.737 0.342	µg/sample

Lab ID: 23-S649 23-S650
Sample Vol: 250 324 ml

Eagle Foundry Company
Main Foundry BH Outlet - White Iron
Method 29 Laboratory Results

Run: 2
Sample Date: 03/28/23

Analyte	Filter + FH Rinse Cont. 1&3		BH Cap.Soln. + BH Rinse Cont. 4		Units
	<	Result MDL	<	Result MDL	
Aluminum		105 7.50		20.6 3.45	µg/sample
Antimony		1.77 1.25		0.743 0.575	µg/sample
Arsenic	<	MDL 1.75	<	MDL 0.805	µg/sample
Barium		6.18 0.125		1.97 0.058	µg/sample
Beryllium	<	MDL 0.050	<	MDL 0.023	µg/sample
Cadmium	<	MDL 0.100	<	MDL 0.046	µg/sample
Chromium		3.54 0.200		0.526 0.092	µg/sample
Cobalt	<	MDL 0.125		0.088 0.058	µg/sample
Copper		3.84 1.25		2.32 0.575	µg/sample
Lead	<	MDL 1.25	<	MDL 0.575	µg/sample
Manganese		5.92 0.075		8.57 0.034	µg/sample
Nickel		8.74 0.750		0.383 0.345	µg/sample
Phosphorus		9.34 5.00	<	MDL 2.30	µg/sample
Selenium	<	MDL 3.75	<	MDL 1.72	µg/sample
Silver	<	MDL 0.500	<	MDL 0.230	µg/sample
Thallium	<	MDL 2.50	<	MDL 1.15	µg/sample
Vanadium	<	MDL 0.250	<	MDL 0.115	µg/sample
Zinc		11.0 0.750		1.33 0.345	µg/sample

Lab ID:	23-S644	23-S645	
Sample Vol:	250	313	ml

Eagle Foundry Company
Main Foundry BH Outlet - White Iron
Method 29 Blank Results

Sample Dates: 3/27/2023
3/28/2023
3/29/2023

Analyte	Filter Cont. 12		BH Cap.Soln. Cont. 9 5% HNO ₃ / 10% H ₂ O ₂		FH/BH Rinse Cont. 8A 0.1 N HNO ₃	
	µg/filter		µg/sample		µg/sample	
	< Result	MDL	< Result	MDL	< Result	MDL
Aluminum	58.8	7.50	16.3	3.78	< MDL	7.50
Antimony	2.86	1.25	< MDL	0.630	< MDL	1.25
Arsenic	< MDL	1.75	< MDL	0.882	< MDL	1.75
Barium	1.40	0.125	0.718	0.063	0.193	0.125
Beryllium	< MDL	0.050	< MDL	0.025	< MDL	0.050
Cadmium	< MDL	0.100	< MDL	0.050	< MDL	0.100
Chromium	1.03	0.200	0.306	0.101	< MDL	0.200
Cobalt	< MDL	0.125	0.153	0.063	< MDL	0.125
Copper	< MDL	1.25	< MDL	0.630	< MDL	1.25
Lead	< MDL	1.25	< MDL	0.630	< MDL	1.25
Manganese	0.741	0.075	0.742	0.038	< MDL	0.375
Nickel	3.96	0.750	< MDL	0.378	< MDL	0.750
Phosphorus	17.0	5.00	< MDL	2.52	< MDL	5.00
Selenium	< MDL	3.75	< MDL	1.89	< MDL	3.75
Silver	< MDL	0.500	< MDL	0.252	< MDL	0.500
Thallium	< MDL	2.50	< MDL	1.26	< MDL	2.50
Vanadium	< MDL	0.250	< MDL	0.126	< MDL	0.250
Zinc	1.52	0.750	0.415	0.378	< MDL	0.750

Lab ID: 23-S729 23-S731 23-S730
Blank Vol, ml: N/A 196 250

Eagle Foundry Company
Main Foundry BH Outlet - White Iron
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 1
Test Date: 3/27/2023
Page: 1 of 3

	I Sample FH Rinse+Filter µg	II Blank Correction FH Rinse µg	III Blank Correction Filter µg	IV Sample BH Cap.Soln. + BH Rinse µg	V Blank BH Cap.Soln. µg/ml	VI Blank Correction BH Cap.Soln. µg	VII Blank Correction BH Rinse µg	VIII Total BH Blank Correction µg	
Aluminum	78.700	0.0000	58.800	22.900	0.0832	16.633	0.000	16.633	Al
Antimony	1.710	0.0000	2.860	0.903	0.0000	0.000	0.000	0.000	Sb
Arsenic	< 1.750	0.0000	0.000	< 0.868	0.0000	0.000	0.000	0.000	As
Barium	2.230	0.0772	1.400	3.680	0.0037	0.733	0.077	0.810	Ba
Beryllium	< 0.050	0.0000	0.000	< 0.025	0.0000	0.000	0.000	0.000	Be
Cadmium	< 0.100	0.0000	0.000	0.175	0.0000	0.000	0.000	0.000	Cd
Chromium	3.350	0.0000	1.030	0.615	0.0016	0.312	0.000	0.312	Cr
Cobalt	< 0.125	0.0000	0.000	0.134	0.0008	0.156	0.000	0.156	Co
Copper	< 1.250	0.0000	0.000	3.030	0.0000	0.000	0.000	0.000	Cu
Lead	2.200	0.0000	0.000	2.530	0.0000	0.000	0.000	0.000	Pb
Manganese	21.900	0.0000	0.741	0.610	0.0038	0.757	0.000	0.757	Mn
Nickel	4.580	0.0000	3.960	0.460	0.0000	0.000	0.000	0.000	Ni
Phosphorus	29.800	0.0000	17.000	< 2.480	0.0000	0.000	0.000	0.000	P
Selenium	< 3.750	0.0000	0.000	< 1.860	0.0000	0.000	0.000	0.000	Se
Silver	< 0.500	0.0000	0.000	< 0.248	0.0000	0.000	0.000	0.000	Ag
Thallium	< 2.500	0.0000	0.000	< 1.240	0.0000	0.000	0.000	0.000	Tl
Vanadium	< 0.250	0.0000	0.000	< 0.124	0.0000	0.000	0.000	0.000	V
Zinc	18.300	0.0000	1.520	3.550	0.0021	0.423	0.000	0.423	Zn

Lab ID:	23-S639	23-S730	23-S729	23-S640	23-S731	N/A	N/A
Notes:	0.1N HNO ₃	0.1N HNO ₃	5% HNO ₃ / 10% H ₂ O ₂	5% HNO ₃ /	5% HNO ₃ /	0.1N HNO ₃	
	FH Filter & Probe Rinse		BH Imps 1-3	10% H ₂ O ₂	10% H ₂ O ₂		
	100ml 0.1N HNO ₃ Rinse		100ml .1N HNO ₃ Rinse				
			200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent				

Blank Rules: <' indicates value is below the method detection limit (MDL).
If blank is '<' it is treated as zero.
If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Main Foundry BH Outlet - White Iron
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 1
Test Date: 3/27/2023
Page: 2 of 3

Analyte	X Allowable FH Blank Correction µg	XI Total FH Blank Correction (M _{fb}) µg	XII 5% of FH Sample µg	XIII Lessor of XI or XII µg	XIV Greater of A or XIII µg	XV FH Net Sample µg	
Aluminum	11.630	58.800	3.935	3.935	11.63	67.070	Al
Antimony	2.860	2.860	0.086	0.086	11.63	-1.150	Sb
Arsenic	0.000	0.000	< 0.088	0.000	11.63	< 1.750	As
Barium	1.477	1.477	0.112	0.112	11.63	< 0.753	Ba
Beryllium	0.000	0.000	< 0.003	0.000	11.63	< 0.050	Be
Cadmium	0.000	0.000	< 0.005	0.000	11.63	< 0.100	Cd
Chromium	1.030	1.030	0.168	0.168	11.63	< 2.320	Cr
Cobalt	0.000	0.000	< 0.006	0.000	11.63	< 0.125	Co
Copper	0.000	0.000	< 0.063	0.000	11.63	< 1.250	Cu
Lead	0.000	0.000	0.110	0.000	11.63	< 2.200	Pb
Manganese	0.741	0.741	1.095	0.741	11.63	< 21.159	Mn
Nickel	3.960	3.960	0.229	0.229	11.63	< 0.620	Ni
Phosphorus	11.630	17.000	1.490	1.490	11.63	< 18.170	P
Selenium	0.000	0.000	< 0.188	0.000	11.63	< 3.750	Se
Silver	0.000	0.000	< 0.025	0.000	11.63	< 0.500	Ag
Thallium	0.000	0.000	< 0.125	0.000	11.63	< 2.500	Tl
Vanadium	0.000	0.000	< 0.013	0.000	11.63	< 0.250	V
Zinc	1.520	1.520	0.915	0.915	11.63	< 16.780	Zn

Note: Allowable FH Blank (A) = (area of filter)*(1.4 µg/in²) = 11.63 µg
where area of filter = 8.306 in²

If A > blank > 0, use blank-derived value, M_{fb}.

If blank > A, use greater of A or [lessor of 5% of sample µg or FH blank].

Blank Rules: <' indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Main Foundry BH Outlet - White Iron
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 1
Test Date: 3/27/2023
Page: 3 of 3

Analyte	XVI Allowable BH Blank Correction µg	XVII Total BH (M _{bhb}) Blank Correction µg	XVIII 5% of BH Sample µg	XIX Lessor of XVII or XVIII µg	XX Greater of 1 µg or XIX µg	XXI BH Net Sample µg	XXII FH Net Sample µg	XXIII FH+BH Total Net Sample µg	
Aluminum	1.145	16.633	1.145	1.145	1.145	21.755	67.070	88.825	Al
Antimony	0.000	0.000	0.045	0.000	1.000	0.903	0.000	0.903	Sb
Arsenic	0.000	0.000	< 0.043	0.000	1.000	0.868	< 1.750	< 2.618	As
Barium	0.810	0.810	0.184	0.184	1.000	2.870	0.753	3.623	Ba
Beryllium	0.000	0.000	< 0.001	0.000	1.000	0.025	< 0.050	< 0.075	Be
Cadmium	0.000	0.000	0.009	0.000	1.000	0.175	< 0.100	< 0.275	Cd
Chromium	0.312	0.312	0.031	0.031	1.000	0.303	2.320	2.623	Cr
Cobalt	0.156	0.156	0.007	0.007	1.000	0.000	< 0.125	< 0.125	Co
Copper	0.000	0.000	0.152	0.000	1.000	3.030	< 1.250	< 4.280	Cu
Lead	0.000	0.000	0.127	0.000	1.000	2.530	2.200	4.730	Pb
Manganese	0.757	0.757	0.031	0.031	1.000	0.000	21.159	21.159	Mn
Nickel	0.000	0.000	0.023	0.000	1.000	0.460	0.620	1.080	Ni
Phosphorus	0.000	0.000	< 0.124	0.000	1.000	2.480	18.170	< 20.650	P
Selenium	0.000	0.000	< 0.093	0.000	1.000	1.860	< 3.750	< 5.610	Se
Silver	0.000	0.000	< 0.012	0.000	1.000	0.248	< 0.500	< 0.748	Ag
Thallium	0.000	0.000	< 0.062	0.000	1.000	1.240	< 2.500	< 3.740	Tl
Vanadium	0.000	0.000	< 0.006	0.000	1.000	0.124	< 0.250	< 0.374	V
Zinc	0.423	0.423	0.178	0.178	1.000	3.127	16.780	19.907	Zn

Note: Allowable BH Blank rules:

If 1.00 µg > blank > 0 , use blank-derived value.

If blank > 1.00 µg, use greater of 1.00 µg or [lessor of 5% of sample µg or BH blank].

Blank Rules: <' indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Main Foundry BH Outlet - White Iron
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 2
Test Date: 3/28/2023
Page: 1 of 3

	I Sample FH Rinse+Filter µg	II Blank Correction FH Rinse µg	III Blank Correction Filter µg	IV Sample BH Cap.Soln. + BH Rinse µg	V Blank BH Cap.Soln. µg/ml	VI Blank Correction BH Cap.Soln. µg	VII Blank Correction BH Rinse µg	VIII Total BH Blank Correction µg	
Analyte	<								
Aluminum	105.000	0.000	58.800	20.600	0.0832	16.633	0.000	16.633	Al
Antimony	1.770	0.000	2.860	0.743	0.0000	0.000	0.000	0.000	Sb
Arsenic	<	0.000	0.000	0.805	0.0000	0.000	0.000	0.000	As
Barium	6.180	0.077	1.400	1.970	0.0037	0.733	0.077	0.810	Ba
Beryllium	<	0.000	0.000	0.023	0.0000	0.000	0.000	0.000	Be
Cadmium	<	0.000	0.000	0.046	0.0000	0.000	0.000	0.000	Cd
Chromium	3.540	0.000	1.030	0.526	0.0016	0.312	0.000	0.312	Cr
Cobalt	<	0.000	0.000	0.088	0.0008	0.156	0.000	0.156	Co
Copper	3.840	0.000	0.000	2.320	0.0000	0.000	0.000	0.000	Cu
Lead	<	0.000	0.000	0.575	0.0000	0.000	0.000	0.000	Pb
Manganese	5.920	0.000	0.741	8.570	0.0038	0.757	0.000	0.757	Mn
Nickel	8.740	0.000	3.960	0.383	0.0000	0.000	0.000	0.000	Ni
Phosphorus	9.340	0.000	17.000	2.300	0.0000	0.000	0.000	0.000	P
Selenium	<	0.000	0.000	1.720	0.0000	0.000	0.000	0.000	Se
Silver	<	0.000	0.000	0.230	0.0000	0.000	0.000	0.000	Ag
Thallium	<	0.000	0.000	1.150	0.0000	0.000	0.000	0.000	Tl
Vanadium	<	0.000	0.000	0.115	0.0000	0.000	0.000	0.000	V
Zinc	11.000	0.000	1.520	1.330	0.0021	0.423	0.000	0.423	Zn

Lab ID:	23-S644	23-S730	23-S729	23-S645	23-S731	N/A	N/A
Content:	0.1N HNO ₃ FH Filter & Probe Rinse 100ml 0.1N HNO ₃ Rinse	0.1N HNO ₃	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	5% HNO ₃ / 10% H ₂ O ₂	5% HNO ₃ / 10% H ₂ O ₂	0.1N HNO ₃

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Eagle Foundry Company
Main Foundry BH Outlet - White Iron
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 2
Test Date: 3/28/2023
Page: 2 of 3

	X Allowable FH Blank Correction	XI Total FH Blank Correction	XII 5% of FH Sample	XIII Lessor of XI or XII	XIV Greater of A or XIII	XV FH Net Sample			
Analyte	µg	µg	µg	µg	µg	µg			
Aluminum	11.630	58.800	5.250	5.250	11.63	93.370	Al		
Antimony	2.860	2.860	0.089	0.089	11.63	-1.090	Sb		
Arsenic	0.000	0.000	<	0.088	0.000	11.63	<	1.750	As
Barium	1.477	1.477	0.309	0.309	11.63	4.703	Ba		
Beryllium	0.000	0.000	<	0.003	0.000	11.63	<	0.050	Be
Cadmium	0.000	0.000	<	0.005	0.000	11.63	<	0.100	Cd
Chromium	1.030	1.030	0.177	0.177	11.63	2.510	Cr		
Cobalt	0.000	0.000	<	0.006	0.000	11.63	<	0.125	Co
Copper	0.000	0.000	0.192	0.000	11.63	3.840	Cu		
Lead	0.000	0.000	<	0.063	0.000	11.63	<	1.250	Pb
Manganese	0.741	0.741	0.296	0.296	11.63	5.179	Mn		
Nickel	3.960	3.960	0.437	0.437	11.63	4.780	Ni		
Phosphorus	11.630	17.000	0.467	0.467	11.63	-2.290	P		
Selenium	0.000	0.000	<	0.188	0.000	11.63	<	3.750	Se
Silver	0.000	0.000	<	0.025	0.000	11.63	<	0.500	Ag
Thallium	0.000	0.000	<	0.125	0.000	11.63	<	2.500	Tl
Vanadium	0.000	0.000	<	0.013	0.000	11.63	<	0.250	V
Zinc	1.520	1.520	0.550	0.550	11.63	9.480	Zn		

Note: Allowable FH Blank (A) = (area of filter)*(1.4 µg/in²) = 11.63 µg
where area of filter = 8.306 in²

If A > blank > 0, use blank-derived value.

If blank > A, use greater of A or [lessor of 5% of sample µg or FH blank].

Blank Rules: <' indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Main Foundry BH Outlet - White Iron
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 2
Test Date: 3/28/2023
Page: 3 of 3

Analyte	XVI Allowable BH Blank Correction µg	XVII Total BH Blank Correction µg	XVIII 5% of BH Sample µg	XIX Lessor of XVII or XVIII µg	XX Greater of 1 µg or XIX µg	XXI BH Net Sample µg	XXII FH Net Sample µg	XXIII FH+BH Total Net Sample µg	
Aluminum	1.030	16.633	1.030	1.030	1.030	19.570	93.370	112.940	Al
Antimony	0.000	0.000	0.037	0.000	1.000	0.743	0.000	0.743	Sb
Arsenic	0.000	0.000	<	0.040	1.000	0.805	<	1.750	As
Barium	0.810	0.810	0.099	0.099	1.000	1.160	4.703	5.863	Ba
Beryllium	0.000	0.000	<	0.001	1.000	0.023	<	0.050	Be
Cadmium	0.000	0.000	<	0.002	1.000	0.046	<	0.100	Cd
Chromium	0.312	0.312	0.026	0.026	1.000	0.214	2.510	2.724	Cr
Cobalt	0.156	0.156	0.004	0.004	1.000	0.000	<	0.125	Co
Copper	0.000	0.000	0.116	0.000	1.000	2.320	3.840	6.160	Cu
Lead	0.000	0.000	<	0.029	1.000	0.575	<	1.250	Pb
Manganese	0.757	0.757	0.429	0.429	1.000	7.813	5.179	12.992	Mn
Nickel	0.000	0.000	0.019	0.000	1.000	0.383	4.780	5.163	Ni
Phosphorus	0.000	0.000	<	0.115	1.000	2.300	0.000	2.300	P
Selenium	0.000	0.000	<	0.086	1.000	1.720	<	3.750	Se
Silver	0.000	0.000	<	0.012	1.000	0.230	<	0.500	Ag
Thallium	0.000	0.000	<	0.058	1.000	1.150	<	2.500	Tl
Vanadium	0.000	0.000	<	0.006	1.000	0.115	<	0.250	V
Zinc	0.423	0.423	0.067	0.067	1.000	0.907	9.480	10.387	Zn

Note: Allowable BH Blank rules:

If 1.00 µg > blank > 0 , use blank-derived value.

If blank > 1.00 µg, use greater of 1.00 µg or [lessor of 5% of sample µg or BH blank].

Blank Rules: <' indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Main Foundry BH Outlet - White Iron
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 3
Test Date: 3/29/2023
Page: 1 of 3

	I Sample FH Rinse+Filter µg	II Blank Correction FH Rinse µg	III Blank Correction Filter µg	IV Sample BH Cap.Soln. + BH Rinse µg	V Blank BH Cap.Soln. µg/ml	VI Blank Correction BH Cap.Soln. µg	VII Blank Correction BH Rinse µg	VIII Total BH Blank Correction µg	
Analyte	<								
Aluminum	81.500	0.000	58.800	27.800	0.083	16.633	0.000	16.633	Al
Antimony	2.040	0.000	2.860	0.634	0.000	0.000	0.000	0.000	Sb
Arsenic	< 1.750	0.000	0.000	< 0.798	0.000	0.000	0.000	0.000	As
Barium	2.810	0.077	1.400	1.450	0.004	0.733	0.077	0.810	Ba
Beryllium	< 0.050	0.000	0.000	< 0.023	0.000	0.000	0.000	0.000	Be
Cadmium	< 0.100	0.000	0.000	< 0.046	0.000	0.000	0.000	0.000	Cd
Chromium	4.660	0.000	1.030	0.455	0.002	0.312	0.000	0.312	Cr
Cobalt	< 0.125	0.000	0.000	0.112	0.001	0.156	0.000	0.156	Co
Copper	3.280	0.000	0.000	0.923	0.000	0.000	0.000	0.000	Cu
Lead	< 1.250	0.000	0.000	< 0.570	0.000	0.000	0.000	0.000	Pb
Manganese	10.200	0.000	0.741	11.100	0.004	0.757	0.000	0.757	Mn
Nickel	12.400	0.000	3.960	< 0.342	0.000	0.000	0.000	0.000	Ni
Phosphorus	6.200	0.000	17.000	< 2.280	0.000	0.000	0.000	0.000	P
Selenium	< 3.750	0.000	0.000	< 1.710	0.000	0.000	0.000	0.000	Se
Silver	0.974	0.000	0.000	< 0.228	0.000	0.000	0.000	0.000	Ag
Thallium	< 2.500	0.000	0.000	< 1.140	0.000	0.000	0.000	0.000	Tl
Vanadium	< 0.250	0.000	0.000	< 0.114	0.000	0.000	0.000	0.000	V
Zinc	5.840	0.000	1.520	0.737	0.002	0.423	0.000	0.423	Zn

Lab ID:	23-S649	23-S730	23-S729	23-S650	23-S731	N/A	N/A
Content:	0.1N HNO ₃	0.1N HNO ₃	5% HNO ₃ /10% H ₂ O ₂	5% HNO ₃ /10% H ₂ O ₂	5% HNO ₃ /10% H ₂ O ₂	5% HNO ₃ /10% H ₂ O ₂	0.1N HNO ₃
	FH Filter & Probe Rinse		BH Imps 1-3				
	100ml 0.1N HNO ₃ Rinse		100ml .1N HNO ₃ Rinse				
			200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent				

Blank Rules: < indicates value is below the method detection limit (MDL).
If blank is '<' it is treated as zero.
If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Main Foundry BH Outlet - White Iron
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 3
Test Date: 3/29/2023
Page: 2 of 3

Analyte	X Allowable FH Blank Correction µg	XI Total FH Blank Correction µg	XII 5% of FH Sample µg	XIII Lessor of XI or XII µg	XIV Greater of A or XIII µg	XV FH Net Sample µg	
Aluminum	11.630	58.800	4.075	4.075	11.63	69.870	Al
Antimony	2.860	2.860	0.102	0.102	11.63	-0.820	Sb
Arsenic	0.000	0.000	<	0.088	11.63	<	As
Barium	1.477	1.477	0.141	0.141	11.63	1.333	Ba
Beryllium	0.000	0.000	<	0.003	11.63	<	Be
Cadmium	0.000	0.000	<	0.005	11.63	<	Cd
Chromium	1.030	1.030	0.233	0.233	11.63	3.630	Cr
Cobalt	0.000	0.000	<	0.006	11.63	<	Co
Copper	0.000	0.000	0.164	0.000	11.63	3.280	Cu
Lead	0.000	0.000	<	0.063	11.63	<	Pb
Manganese	0.741	0.741	0.510	0.510	11.63	9.459	Mn
Nickel	3.960	3.960	0.620	0.620	11.63	8.440	Ni
Phosphorus	11.630	17.000	0.310	0.310	11.63	-5.430	P
Selenium	0.000	0.000	<	0.188	11.63	<	Se
Silver	0.000	0.000	0.049	0.000	11.63	0.974	Ag
Thallium	0.000	0.000	<	0.125	11.63	<	Tl
Vanadium	0.000	0.000	<	0.013	11.63	<	V
Zinc	1.520	1.520	0.292	0.292	11.63	4.320	Zn

Note: Allowable FH Blank (A) = (area of filter)*(1.4 µg/in²) = 11.63 µg
where area of filter = 8.306 in²

If A > blank > 0, use blank-derived value.

If blank > A, use greater of A or [lessor of 5% of sample µg or FH blank].

Blank Rules: <' indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Main Foundry BH Outlet - White Iron
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 3
Test Date: 3/29/2023
Page: 3 of 3

Analyte	XVI Allowable BH Blank Correction µg	XVII Total BH Blank Correction µg	XVIII 5% of BH Sample µg	XIX Lessor of XVII or XVIII µg	XX Greater of 1 µg or XIX µg	XXI BH Net Sample µg	XXII FH Net Sample µg	XXIII FH+BH Total Net Sample µg	
Aluminum	1.390	16.633	1.390	1.390	1.390	26.410	69.870	96.280	Al
Antimony	0.000	0.000	0.032	0.000	1.000	0.634	0.000	0.634	Sb
Arsenic	0.000	0.000	< 0.040	0.000	1.000	< 0.798	< 1.750	< 2.548	As
Barium	0.810	0.810	0.073	0.073	1.000	0.640	1.333	1.973	Ba
Beryllium	0.000	0.000	< 0.001	0.000	1.000	< 0.023	< 0.050	< 0.073	Be
Cadmium	0.000	0.000	< 0.002	0.000	1.000	< 0.046	< 0.100	< 0.146	Cd
Chromium	0.312	0.312	0.023	0.023	1.000	0.143	3.630	3.773	Cr
Cobalt	0.156	0.156	0.006	0.006	1.000	0.000	< 0.125	< 0.125	Co
Copper	0.000	0.000	0.046	0.000	1.000	0.923	3.280	4.203	Cu
Lead	0.000	0.000	< 0.029	0.000	1.000	< 0.570	< 1.250	< 1.820	Pb
Manganese	0.757	0.757	0.555	0.555	1.000	10.343	9.459	19.802	Mn
Nickel	0.000	0.000	< 0.017	0.000	1.000	< 0.342	< 8.440	< 8.782	Ni
Phosphorus	0.000	0.000	< 0.114	0.000	1.000	< 2.280	< 0.000	< 2.280	P
Selenium	0.000	0.000	< 0.086	0.000	1.000	< 1.710	< 3.750	< 5.460	Se
Silver	0.000	0.000	< 0.011	0.000	1.000	< 0.228	< 0.974	< 1.202	Ag
Thallium	0.000	0.000	< 0.057	0.000	1.000	< 1.140	< 2.500	< 3.640	Tl
Vanadium	0.000	0.000	< 0.006	0.000	1.000	< 0.114	< 0.250	< 0.364	V
Zinc	0.423	0.423	0.037	0.037	1.000	0.314	4.320	4.634	Zn

Note: Allowable BH Blank rules:

If 1.00 µg > blank > 0 , use blank-derived value.

If blank > 1.00 µg, use greater of 1.00 µg or [lessor of 5% of sample µg or BH blank].

Blank Rules: <' indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Main Foundry BH Outlet - White Iron
Mercury Blank Correction Calculations

Blank Lab Values

Analyte	Filter Cont. 12 µg/filter		BH Imps. 2&3 Cap.Soln. Cont. 9 5% HNO ₃ / 10% H ₂ O ₂ µg/sample		FH/BH Rinse Cont. 8A 0.1 N HNO ₃ µg/sample		BH Imps. 5&6 Rinse Cont. 8B H ₂ O µg/sample		BH Imps. 5&6 Cap.Soln. + Rinse Cont. 10 KMnO ₄ µg/sample		BH Imps. 5&6 Rinse Cont. 11 HCl µg/sample	
	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Result	MDL
Mercury	0.0406	0.0219	0.118	0.0172	< MDL	0.0219	< MDL	0.0295	0.0628	0.0163	< MDL	0.0108

Lab ID: 23-S729 23-S731 23-S730 23-S732 23-S733 23-S734
Blank vol, ml: NA 196 250 337 186 124

Blank Correction Values

Analyte: Mercury	Blank FH HNO ₃ Rinse µg	Blank Filter µg	Blank BH Cap.Soln. µg	Blank BH HNO ₃ Rinse µg	Blank BH H ₂ O Rinse µg	Blank BH KMnO ₄ Cap.Soln. + Rinse µg	Blank BH HCl Rinse µg	Total Blank Correction µg	Is Total Blank Correction ≥ 0 and ≤ 0.6?
Run 1	0.00	0.0406	0.12	0.00	0.00	0.10	0.00	0.2623	Yes
Reagent vol, ml	100.0		200.0	200.0	100.0	300.0	225.0		
Run 2	0.00	0.0406	0.12	0.00	0.00	0.10	0.00	0.2623	Yes
Reagent vol, ml	100.0		200.0	200.0	100.0	300.0	225.0		
Run 3	0.00	0.0406	0.12	0.00	0.00	0.10	0.00	0.2623	Yes
Reagent vol, ml	100.0		200.0	200.0	100.0	300.0	225.0		

Notes: 0.1N HNO₃ FH Filter 5% HNO₃/ 10% H₂O₂ 0.1N HNO₃ H₂O 4% KMnO₄/ 10% H₂SO₄ 25 ml 8N HCl/
FH Probe Rinse BH Imps 2&3 BH Imps 1-4 BH Imps 5&6 BH Imps 5&6 BH Imps 5&6

Blank Corrected Results

Analyte: Mercury	Sample FH Rinse + Filter Cont. 1&3 µg	Sample BH Cap.Soln. + HNO ₃ Rinse Cont. 4 µg	Sample BH Imp. 4 + Rinse Cont. 5A µg	Sample BH Imps. 5&6 + Rinses Cont. 5B µg	Sample BH HCl Rinse + Water Cont. 5C µg	Total Sample µg	Total Blank Correction µg	Total Net Sample µg
Run 1	< 0.0219	0.169	0.0242	0.121	< 0.0198	< 0.3559	0.2623	< 0.0936
Lab ID	23-S639	23-S640	23-S641*	23-S642	23-S643			
Run 2	< 0.0219	0.192	0.00586	0.146	< 0.0200	< 0.3858	0.2623	< 0.1235
Lab ID	23-S644	23-S645	23-S646	23-S647	23-S648			
Run 3	< 0.0219	0.186	0.00542	0.117	< 0.0196	< 0.3499	0.2623	< 0.0876
Lab ID	23-S649	23-S650	23-S651	23-S652	23-S653			

*This result is taken from a run that is invalid because there was not enough sample to redigest. This reported result is likely biased high based on the results for the other samples from the failed run that were redigested and reanalyzed.

Blank Rules:

< indicates value is below the method detection limit (MDL)

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations but results are preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

If the total blank correction value is less than or equal to 0.6 µg, subtract the total blank correction value from the total sample value to determine total net Hg. Otherwise, the value used for the blank correction shall be the greater of (1) 0.6 µg or (2) the lesser of [total FH blank + total BH blank] or 5% of the total sample value.

EPA Method 29
Gas Stream Characteristics
Test Summary

Client: Eagle Foundry Company
Source: Main Foundry BH Outlet - White Iron
Location: Eagle Creek, OR

Parameter	Units	Run 1	Run 2	Run 3	
Date		3/27/2023	3/28/2023	3/29/2023	
Run Start Time		6:40	5:10	5:15	
Run End Time		10:40	9:10	9:15	
Duration	minutes	240	240	240	Average
Barometric Pressure	inHg	29.98	29.41	29.41	29.60
Nozzle Diameter	inches	0.263	0.263	0.263	0.263
Isokinetic Average	%	99.7	101.2	100.7	100.5
Sample Volume	dscf	254.654	243.575	253.844	250.691
Sample Volume	dscm	7.211	6.897	7.188	7.099
Stack Diameter	inches	61.00	61.00	61.00	61.00
Stack Area	ft ²	20.295	20.295	20.295	20.295
CO ₂	%vd	0.25	0.15	0.10	0.17
O ₂	%vd	20.85	20.91	20.59	20.78
Static Pressure	inH ₂ O	0.10	0.10	0.10	0.10
H ₂ O	%v	0.50	0.99	0.69	0.73
Wet Molecular Weight	lb/lb-mole	28.82	28.75	28.77	28.78
Velocity	fps	45.22	44.32	45.58	45.04
Flow Rate	adcfm	54,789	53,434	55,120	54,448
	acfm	55,064	53,968	55,503	54,845
	dscfm	57,267	53,968	56,540	55,925
Stack Temperature	°F	46.3	54.0	46.1	48.8
Production Data	lb melt/pour	11,955.985	12,165.997	11,960.006	
	ton melt/pour	5.978	6.083	5.980	
	lb Cr/melt	3,106.941	3,124.611	3,071.140	
	ton Cr/melt	1.553	1.562	1.536	
	lb Mn/melt	120.685	126.908	122.799	
	ton Mn/melt	0.060	0.063	0.061	

Run 1											
Analyte	Total				FH Net			BH Net			
	µg	µg/dscm	lb/hr	lb/ton melt	µg	µg/dscm	lb/hr	µg	µg/dscm	lb/hr	
Aluminum	88.825	12.318	2.64E-03	1.77E-03	67.070	9.301	2.00E-03	21.755	3.017	6.47E-04	Al
Antimony	0.903	0.125	2.69E-05	1.80E-05	0.000	0.000	0.00E+00	0.903	0.125	2.69E-05	Sb
Arsenic	< 2.618	< 0.363	< 7.79E-05	< 5.21E-05	< 1.750	< 0.243	< 5.21E-05	< 0.868	< 0.120	< 2.58E-05	As
Barium	3.623	0.502	1.08E-04	7.21E-05	0.753	0.104	2.24E-05	2.870	0.398	8.54E-05	Ba
Beryllium	< 0.075	< 0.010	< 2.23E-06	< 1.49E-06	< 0.050	< 0.007	< 1.49E-06	< 0.025	< 0.003	< 7.44E-07	Be
Cadmium	< 0.275	< 0.038	< 8.18E-06	< 5.47E-06	< 0.100	< 0.014	< 2.98E-06	0.175	0.024	5.21E-06	Cd
Chromium	2.623	0.364	7.80E-05		2.320	0.322	6.90E-05	0.303	0.042	9.01E-06	Cr
Cobalt	< 0.125	< 0.017	< 3.72E-06	< 2.49E-06	< 0.125	< 0.017	< 3.72E-06	0.000	0.000	0.00E+00	Co
Copper	< 4.280	< 0.594	< 1.27E-04	< 8.52E-05	< 1.250	< 0.173	< 3.72E-05	3.030	0.420	9.01E-05	Cu
Lead	4.730	0.656	1.41E-04	9.41E-05	2.200	0.305	6.54E-05	2.530	0.351	7.53E-05	Pb
Manganese	21.159	2.934	6.29E-04		21.159	2.934	6.29E-04	0.000	0.000	0.00E+00	Mn
Mercury	< 0.094	< 0.013	< 2.78E-06	< 1.86E-06							Hg
Nickel	1.080	0.150	3.21E-05	2.15E-05	0.620	0.086	1.84E-05	0.460	0.064	1.37E-05	Ni
Phosphorus	< 20.650	< 2.864	< 6.14E-04	< 4.11E-04	18.170	2.520	5.40E-04	< 2.480	< 0.344	< 7.38E-05	P
Selenium	< 5.610	< 0.778	< 1.67E-04	< 1.12E-04	< 3.750	< 0.520	< 1.12E-04	< 1.860	< 0.258	< 5.53E-05	Se
Silver	< 0.748	< 0.104	< 2.23E-05	< 1.49E-05	< 0.500	< 0.069	< 1.49E-05	< 0.248	< 0.034	< 7.38E-06	Ag
Thallium	< 3.740	< 0.519	< 1.11E-04	< 7.44E-05	< 2.500	< 0.347	< 7.44E-05	< 1.240	< 0.172	< 3.69E-05	Tl
Vanadium	< 0.374	< 0.052	< 1.11E-05	< 7.44E-06	< 0.250	< 0.035	< 7.44E-06	< 0.124	< 0.017	< 3.69E-06	V
Zinc	19.907	2.761	5.92E-04	3.96E-04	16.780	2.327	4.99E-04	3.127	0.434	9.30E-05	Zn

Chromium	lb Cr / ton Cr in melt =	2.01E-04
Manganese	lb Mn / ton Mn in melt =	4.17E-02

Run 1 Emission Factors

Run 2											
Analyte	Total				FH Net			BH Net			
	µg	µg/dscm	lb/hr	lb/ton melt	µg	µg/dscm	lb/hr	µg	µg/dscm	lb/hr	
Aluminum	112.940	16.375	3.31E-03	2.18E-03	93.370	13.538	2.74E-03	19.570	2.837	5.74E-04	Al
Antimony	0.743	0.108	2.18E-05	1.43E-05	0.000	0.000	0.00E+00	0.743	0.108	2.18E-05	Sb
Arsenic	< 2.555	< 0.370	< 7.49E-05	< 4.92E-05	< 1.750	< 0.254	< 5.13E-05	< 0.805	< 0.117	< 2.36E-05	As
Barium	5.863	0.850	1.72E-04	1.13E-04	4.703	0.682	1.38E-04	1.160	0.168	3.40E-05	Ba
Beryllium	< 0.073	< 0.011	< 2.14E-06	< 1.41E-06	< 0.050	< 0.007	< 1.47E-06	< 0.023	< 0.003	< 6.74E-07	Be
Cadmium	< 0.146	< 0.021	< 4.28E-06	< 2.81E-06	< 0.100	< 0.014	< 2.93E-06	< 0.046	< 0.007	< 1.35E-06	Cd
Chromium	2.724	0.395	7.98E-05		2.510	0.364	7.36E-05	0.214	0.031	6.27E-06	Cr
Cobalt	< 0.125	< 0.018	< 3.66E-06	< 2.41E-06	< 0.125	< 0.018	< 3.66E-06	0.000	0.000	0.00E+00	Co
Copper	6.160	0.893	1.81E-04	1.19E-04	3.840	0.557	1.13E-04	2.320	0.336	6.80E-05	Cu
Lead	< 1.825	< 0.265	< 5.35E-05	< 3.52E-05	< 1.250	< 0.181	< 3.66E-05	< 0.575	< 0.083	< 1.69E-05	Pb
Manganese	12.992	1.884	3.81E-04		5.179	0.751	1.52E-04	7.813	1.133	2.29E-04	Mn
Mercury	< 0.123	< 0.018	< 3.62E-06	< 2.38E-06							Hg
Nickel	5.163	0.749	1.51E-04	9.95E-05	4.780	0.693	1.40E-04	0.383	0.056	1.12E-05	Ni
Phosphorus	< 2.300	< 0.333	< 6.74E-05	< 4.43E-05	0.000	0.000	0.00E+00	< 2.300	< 0.333	< 6.74E-05	P
Selenium	< 5.470	< 0.793	< 1.60E-04	< 1.05E-04	< 3.750	< 0.544	< 1.10E-04	< 1.720	< 0.249	< 5.04E-05	Se
Silver	< 0.730	< 0.106	< 2.14E-05	< 1.41E-05	< 0.500	< 0.072	< 1.47E-05	< 0.230	< 0.033	< 6.74E-06	Ag
Thallium	< 3.650	< 0.529	< 1.07E-04	< 7.03E-05	< 2.500	< 0.362	< 7.33E-05	< 1.150	< 0.167	< 3.37E-05	Tl
Vanadium	< 0.365	< 0.053	< 1.07E-05	< 7.03E-06	< 0.250	< 0.036	< 7.33E-06	< 0.115	< 0.017	< 3.37E-06	V
Zinc	10.387	1.506	3.04E-04	2.00E-04	9.480	1.375	2.78E-04	0.907	0.132	2.66E-05	Zn

Chromium	lb Cr / ton Cr in melt =	2.04E-04
Manganese	lb Mn / ton Mn in melt =	2.40E-02

Run 2 Emission Factors

Note: Results for Hg front half and back half fractions are not shown because these values are not blank-corrected. Per EPA Method 29, only the sum of Hg front and back half results is subject to blank correction.

'<' denotes results which were calculated using the method detection limit for front half or back half results that were non-detect.

Run 3											
Analyte	Total				FH Net			BH Net			
	µg	µg/dscm	lb/hr	lb/ton melt	µg	µg/dscm	lb/hr	µg	µg/dscm	lb/hr	
Aluminum	96.280	13.395	2.84E-03	1.90E-03	69.870	9.720	2.06E-03	26.410	3.674	7.78E-04	Al
Antimony	0.634	0.088	1.87E-05	1.25E-05	0.000	0.000	0.00E+00	0.634	0.088	1.87E-05	Sb
Arsenic	< 2.548	< 0.354	< 7.51E-05	< 5.02E-05	< 1.750	< 0.243	< 5.16E-05	< 0.798	< 0.111	< 2.35E-05	As
Barium	1.973	0.274	5.81E-05	3.89E-05	1.333	0.185	3.93E-05	0.640	0.089	1.89E-05	Ba
Beryllium	< 0.073	< 0.010	< 2.15E-06	< 1.44E-06	< 0.050	< 0.007	< 1.47E-06	< 0.023	< 0.003	< 6.78E-07	Be
Cadmium	< 0.146	< 0.020	< 4.30E-06	< 2.88E-06	< 0.100	< 0.014	< 2.95E-06	< 0.046	< 0.006	< 1.36E-06	Cd
Chromium	3.773	0.525	1.11E-04		3.630	0.505	1.07E-04	0.143	0.020	4.21E-06	Cr
Cobalt	< 0.125	< 0.017	< 3.68E-06	< 2.46E-06	< 0.125	< 0.017	< 3.68E-06	0.000	0.000	0.00E+00	Co
Copper	4.203	0.585	1.24E-04	8.28E-05	3.280	0.456	9.66E-05	0.923	0.128	2.72E-05	Cu
Lead	< 1.820	< 0.253	< 5.36E-05	< 3.59E-05	< 1.250	< 0.174	< 3.68E-05	< 0.570	< 0.079	< 1.68E-05	Pb
Manganese	19.802	2.755	5.83E-04		9.459	1.316	2.79E-04	10.343	1.439	3.05E-04	Mn
Mercury	< 0.088	< 0.012	< 2.58E-06	< 1.73E-06							Hg
Nickel	< 8.782	< 1.222	< 2.59E-04	< 1.73E-04	8.440	1.174	2.49E-04	< 0.342	< 0.048	< 1.01E-05	Ni
Phosphorus	< 2.280	< 0.317	< 6.72E-05	< 4.49E-05	0.000	0.000	0.00E+00	< 2.280	< 0.317	< 6.72E-05	P
Selenium	< 5.460	< 0.760	< 1.61E-04	< 1.08E-04	< 3.750	< 0.522	< 1.10E-04	< 1.710	< 0.238	< 5.04E-05	Se
Silver	< 1.202	< 0.167	< 3.54E-05	< 2.37E-05	0.974	0.136	2.87E-05	< 0.228	< 0.032	< 6.72E-06	Ag
Thallium	< 3.640	< 0.506	< 1.07E-04	< 7.17E-05	< 2.500	< 0.348	< 7.37E-05	< 1.140	< 0.159	< 3.36E-05	Tl
Vanadium	< 0.364	< 0.051	< 1.07E-05	< 7.17E-06	< 0.250	< 0.035	< 7.37E-06	< 0.114	< 0.016	< 3.36E-06	V
Zinc	4.634	0.645	1.37E-04	9.13E-05	4.320	0.601	1.27E-04	0.314	0.044	9.25E-06	Zn

Chromium	lb Cr / ton Cr in melt =	2.90E-04
Manganese	lb Mn / ton Mn in melt =	3.80E-02

Run 3 Emission Factors

Mean Runs 1-3											
Analyte	Total				FH Net			BH Net			
	µg	µg/dscm	lb/hr	lb/ton melt	µg	µg/dscm	lb/hr	µg	µg/dscm	lb/hr	
Aluminum	99.348	14.029	2.93E-03	1.95E-03	76.770	10.853	2.26E-03	22.578	3.176	6.66E-04	
Antimony	0.760	0.107	2.24E-05	1.49E-05	0.000	0.000	0.00E+00	0.760	0.107	2.24E-05	Sb
Arsenic	< 2.574	< 0.363	< 7.59E-05	< 5.05E-05	< 1.750	< 0.247	< 5.16E-05	< 0.824	< 0.116	< 2.43E-05	As
Barium	3.819	0.542	1.13E-04	7.47E-05	2.263	0.324	6.65E-05	1.556	0.218	4.61E-05	Ba
Beryllium	< 0.074	< 0.010	< 2.17E-06	< 1.45E-06	< 0.050	< 0.007	< 1.48E-06	< 0.024	< 0.003	< 6.99E-07	Be
Cadmium	< 0.189	< 0.027	< 5.59E-06	< 3.72E-06	< 0.100	< 0.014	< 2.95E-06	< 0.089	< 0.012	< 2.64E-06	Cd
Chromium	3.040	0.428	8.97E-05		2.820	0.397	8.32E-05	0.220	0.031	6.50E-06	Cr
Cobalt	< 0.125	< 0.018	< 3.69E-06	< 2.45E-06	< 0.125	< 0.018	< 3.69E-06	0.000	0.000	0.00E+00	Co
Copper	< 4.881	< 0.690	< 1.44E-04	< 9.56E-05	< 2.790	< 0.395	< 8.21E-05	2.091	0.295	6.18E-05	Cu
Lead	< 2.792	< 0.391	< 8.26E-05	< 5.51E-05	< 1.567	< 0.220	< 4.63E-05	< 1.225	< 0.171	< 3.63E-05	Pb
Manganese	17.984	2.524	5.31E-04		11.932	1.667	3.53E-04	6.052	0.857	1.78E-04	Mn
Mercury	< 0.102	< 0.014	< 3.00E-06	< 1.99E-06							Hg
Nickel	< 5.008	< 0.707	< 1.47E-04	< 9.80E-05	4.613	0.651	1.36E-04	< 0.395	< 0.056	< 1.17E-05	Ni
Phosphorus	< 8.410	< 1.171	< 2.50E-04	< 1.67E-04	6.057	0.840	1.80E-04	< 2.353	< 0.332	< 6.95E-05	P
Selenium	< 5.513	< 0.777	< 1.63E-04	< 1.08E-04	< 3.750	< 0.528	< 1.11E-04	< 1.763	< 0.248	< 5.20E-05	Se
Silver	< 0.893	< 0.126	< 2.64E-05	< 1.75E-05	< 0.658	< 0.092	< 1.94E-05	< 0.235	< 0.033	< 6.95E-06	Ag
Thallium	< 3.677	< 0.518	< 1.08E-04	< 7.22E-05	< 2.500	< 0.352	< 7.38E-05	< 1.177	< 0.166	< 3.47E-05	Tl
Vanadium	< 0.368	< 0.052	< 1.08E-05	< 7.22E-06	< 0.250	< 0.035	< 7.38E-06	< 0.118	< 0.017	< 3.47E-06	V
Zinc	11.643	1.637	3.44E-04	2.29E-04	10.193	1.434	3.01E-04	1.449	0.203	4.30E-05	Zn

Chromium	lb Cr / ton Cr in melt =	2.32E-04
Manganese	lb Mn / ton Mn in melt =	3.46E-02

Mean Runs 1-3

Note: Results for Hg front half and back half fractions are not shown because these values are not blank-corrected. Per EPA Method 29, only the sum of Hg front and back half results is subject to blank correction.

'<' denotes results which were calculated using the method detection limit for front half or back half results that were non-detect.



COMPANY	Eagle Foundry Company
FACILITY	Eagle Foundry
LOCATION	Eagle Creek, OR
SOURCE	Main Foundry BH Outlet - White Iron
DATE	3/27/2023 - 3/29/2023
METHOD	0061
POLLUTANT	Cr VI

EPA Method 1
Stack Parameters and Traverse Points

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Main Foundry BH Outlet - White Iron
Facility: Eagle Foundry

Type of Testing: P (P for Particulate; V for Velocity/Nonparticulate)
Type of Duct: C (C for circular; R for rectangular)

Number of ports available: 2
Number of ports to be used: 2
Port diameter: inches
Sampling location height (approx.): feet
Stack height (approx.): feet

Circular ID (Rectangular Depth): 61.00 inches
Port depth and/or wall thickness: 6.00 inches
Stack width (Rectangular only): inches

Equivalent Diameter
If rectangular = $\frac{2 * \text{Depth} * \text{Width}}{\text{Depth} + \text{Width}}$ = 61.00 inches (If circular = duct ID)

Stack/duct area = 20.295 sq.feet 2922.5 sq. inches

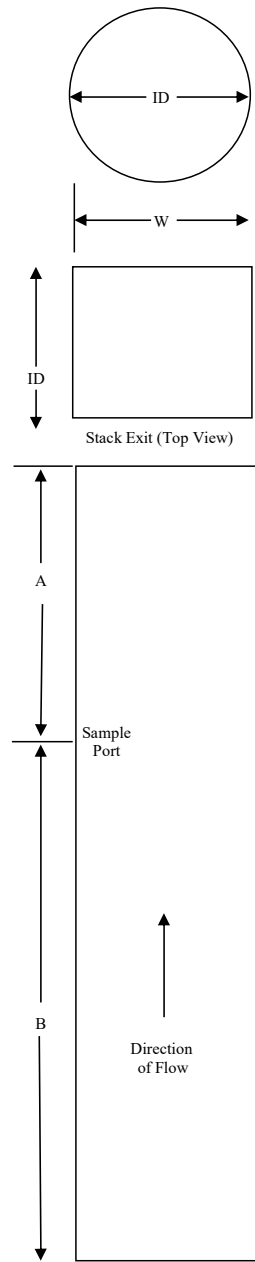
Sample Port Location: Downstream flow disturbance from process Upstream flow disturbance toward exit
Number of Inches: 264.00 44.00
Number of Diameters: 4.33 0.72

Minimum Number of Traverse Points: 24

Traverse points less than 1.0 inch from the stack wall are relocated to a distance of 1.0 inch.

Points	% of diameter	Distance from inside wall (in.)	Distance including port (in.)
1	2.1	1.28	7 1/4
2	6.7	4.09	10 1/8
3	11.8	7.20	13 1/4
4	17.7	10.80	16 3/4
5	25.0	15.25	21 1/4
6	35.6	21.72	27 3/4
7	64.4	39.28	45 1/4
8	75.0	45.75	51 3/4
9	82.3	50.20	56 1/4
10	88.2	53.80	59 3/4
11	93.3	56.91	62 7/8
12	97.9	59.72	65 3/4

Reference Diagram



Drawing NOT to scale and NOT an accurate representation of stack.

Isokinetic Field Data
Field Data Entry

Client:	Eagle Foundry Company	Run:	1
Location:	Eagle Creek, OR	Start Time:	6:40
Source:	Main Foundry BH Outlet - White Iron	End Time:	10:40
EPA Method:	0061	Environmental Conditions/Test Notes:	Date: 3/27/2023
Box Operator:	JMK	overcast and 30-50 °F	
Technician(s):	KAD		

Stack Dimensional Data:		Equipment:					
Circular		Meterbox ID	10	Probe ID	B5C	Liner type	Glass
Diameter	61.000 in	Y factor	0.9737	Nozzle ID	0.25	Nozzle size	0.257 inches
Rectangular		ΔH@	1.720	Hot box ID	NA	Nozzle area	0.00036 sq.ft.
Width	in	Bp ID	TS1	Pitot Cp	0.84	Probe heat	250 °F
Length	in	Balance ID	HLNFB1	Pitot ID	B5C	Filter heat	N/A °F
Stack Area	20.295 sq.ft.	Weights ID	HLNFW1	Probe Length, ft	5		

Source Information:				Leak Checks:			
Barometric Pressure	29.98 "Hg	O ₂	20.90 %		Pre-test	Post-test	
Static Pressure	0.1 "H ₂ O	CO ₂	0.00 %	Pitot	x	x	
Ave. ΔP	0.61 "H ₂ O	Rec. Nz.	0.235 inches	Leak rate, dcf	0.003	0.003	
Stack Temperature	60 °F			Leak check vacuum, "Hg	15	15	
Assumed moisture	2.00 %			Nozzle check for roundness:			
Assumed meter temp.	45 °F			1	2	3	
Total number of points	24			0.257	0.257	0.256 inches	
Time per point	10 min.			Caliper ID	WS1		
Total run time	240 min.						

Post Test Calculations:				Moisture/Lab:			
Sample volume	251.590 dcf	Ave. ΔP	0.684 "H ₂ O	Filter, #	NA		
Wet mol. weight	28.79 M _s (actual)	Ave. √ΔP	0.827 "H ₂ O	Initial	Final	Gain	
Actual H ₂ O	0.49 %	Ave. ΔH	3.165 "H ₂ O	Impingers, g	1,730.8	1,656.3	-74.5
Std. meter vol.	244.179 dscf	Ave. T _s	51.5 °F	Silica gel, g	823.7	923.5	99.8
Isokinetic Average	100.1 %	Ave. T _m	74.9 °F	Total water gain, g:			25.3

Traverse Point	Time (min.)	Meter Volume (dcf)	Velocity ΔP ("H ₂ O)	Stack Temp. (°F)	Meter Temp. (°F)	Calc. ΔH	Run ΔH	Vacuum ("Hg)	Filter Box (°F)	Condenser Temp (≤68°F)
1	10.0	340.705	0.67	44	50	3.01	3.00	3.5	NA	35
2	20.0	350.700	0.65	44	50	2.92	2.95	3.5	NA	36
3	30.0	370.740	0.69	44	59	3.16	3.20	4	NA	40
4	40.0	380.680	0.68	44	54	3.08	2.90	3.5	NA	49
5	50.0	391.120	0.71	45	60	3.25	3.20	5	NA	57
6	60.0	401.780	0.73	46	64	3.36	3.40	5	NA	58
7	70.0	412.790	0.75	46	66	3.46	3.50	5.5	NA	59
8	80.0	423.580	0.74	46	69	3.44	3.40	6	NA	56
9	90.0	434.330	0.73	46	69	3.39	3.40	7	NA	56
10	100.0	444.390	0.63	46	71	2.94	2.90	7	NA	56
11	110.0	454.910	0.69	48	74	3.22	3.20	8	NA	56
12	120.0	465.710	0.72	51	77	3.36	3.40	9	NA	58
13	130.0	476.680	0.71	52	78	3.32	3.30	9	NA	59
14	140.0	487.190	0.66	52	80	3.09	3.10	8.5	NA	62
15	150.0	497.240	0.62	54	81	2.90	2.90	8	NA	61
16	160.0	507.210	0.60	55	83	2.81	2.80	8	NA	59
17	170.0	517.790	0.69	57	84	3.23	3.20	9	NA	58
18	180.0	528.880	0.74	57	85	3.47	3.50	9.5	NA	58
19	190.0	540.010	0.75	57	87	3.53	3.50	9.5	NA	58
20	200.0	550.830	0.71	58	89	3.34	3.30	9	NA	58
21	210.0	561.610	0.69	59	89	3.24	3.20	9	NA	57
22	220.0	572.120	0.66	61	91	3.10	3.10	9	NA	56
23	230.0	582.310	0.62	62	93	2.92	2.90	8	NA	56
24	240.0	592.295	0.58	62	94	2.74	2.70	7.5	NA	53

Isokinetic Field Data
Field Data Entry

Client:	Eagle Foundry Company	Run:	2
Location:	Eagle Creek, OR	Start Time:	5:10
Source:	Main Foundry BH Outlet - White Iron	End Time:	9:10
EPA Method:	0061	Environmental Conditions/Test Notes:	Date: 3/28/2023
Box Operator:	JMK	overcast and 30-50 °F	
Technician(s):	KAD		

Stack Dimensional Data:		Equipment:	
Circular		Meterbox ID	10
Diameter	61.000 in	Y factor	0.9737
Rectangular		ΔH@	1.720
Width	in	Bp ID	TS1
Length	in	Balance ID	HLNFB1
Stack Area	20.295 sq.ft.	Weights ID	HLNFW1
		Probe ID	B5C
		Nozzle ID	0.25
		Hot box ID	NA
		Pitot Cp	0.84
		Pitot ID	B5C
		Probe Length, ft	5
		Liner type	Glass
		Nozzle size	0.257 inches
		Nozzle area	0.00036 sq.ft.
		Probe heat	250 °F
		Filter heat	N/A
			°F

Source Information:				Leak Checks:		
Barometric Pressure	29.41 "Hg	O ₂	20.90 %	Pre-test	Post-test	
Static Pressure	0.1 "H ₂ O	CO ₂	0.00 %	Pitot	x	x
Ave. ΔP	0.61 "H ₂ O	Rec. Nz.	0.226 inches	Leak rate, dcf	0.000	0.000
Stack Temperature	60 °F			Leak check vacuum, "Hg	15	17
Assumed moisture	0.49 %					
Assumed meter temp.	74.9 °F					
Total number of points	24					
Time per point	10 min.					
Total run time	240 min.					

Nozzle check for roundness:		
1	2	3
0.257	0.257	0.256 inches
Caliper ID	WS1	

Post Test Calculations:				Moisture/Lab:			
Sample volume	243.779 dcf	Ave. ΔP	0.618 "H ₂ O	Filter, #	NA		
Wet mol. weight	28.7 M _s (actual)	Ave. √ΔP	0.786 "H ₂ O		Initial	Final	Gain
Actual H ₂ O	1.28 %	Ave. ΔH	2.908 "H ₂ O	Impingers, g	1,717.8	1,714.0	-3.8
Std. meter vol.	230.177 dscf	Ave. T _s	59.6 °F	Silica gel, g	856.6	923.5	66.9
Isokinetic Average	101.7 %	Ave. T _m	79.1 °F		Total water gain:		63.1

Traverse Point	Time (min.)	Meter Volume (dcf)	Velocity ΔP ("H ₂ O)	Stack Temp. (°F)	Meter Temp. (°F)	Calc. ΔH	Run ΔH	Vacuum ("Hg)	Filter Box (°F)	Condenser Temp (≤68°F)
1	10.0	860.050	0.65	58	62	2.98	3.00	5	NA	42
2	20.0	870.010	0.62	58	63	2.85	2.90	5	NA	46
3	30.0	880.070	0.63	58	65	2.91	2.90	5	NA	49
4	40.0	889.910	0.59	58	66	2.73	2.70	5	NA	51
5	50.0	900.050	0.65	59	68	3.01	3.00	5	NA	51
6	60.0	909.890	0.60	58	70	2.80	2.80	5	NA	52
7	70.0	919.620	0.59	59	71	2.75	2.70	5	NA	52
8	80.0	929.510	0.60	59	71	2.80	2.80	5	NA	51
9	90.0	939.460	0.61	60	74	2.85	2.90	5	NA	51
10	100.0	949.430	0.63	60	74	2.95	2.90	5	NA	51
11	110.0	959.310	0.58	61	79	2.73	2.70	4.5	NA	51
12	120.0	969.340	0.59	61	81	2.79	2.80	4.5	NA	51
13	130.0	979.410	0.60	61	82	2.84	2.80	4.5	NA	51
14	140.0	989.310	0.59	61	84	2.81	2.80	4.5	NA	51
15	150.0	999.750	0.65	61	85	3.10	3.10	5	NA	51
16	160.0	1010.790	0.71	61	85	3.38	3.40	5.5	NA	51
17	170.0	1022.190	0.72	60	88	3.46	3.50	5.5	NA	51
18	180.0	1032.690	0.65	62	88	3.11	3.10	5	NA	58
19	190.0	1042.990	0.61	60	89	2.93	2.90	5	NA	58
20	200.0	1053.120	0.59	60	90	2.84	2.80	5	NA	58
21	210.0	1063.380	0.60	62	91	2.88	2.90	5	NA	61
22	220.0	1073.530	0.59	59	91	2.85	2.80	5	NA	61
23	230.0	1083.490	0.57	59	91	2.76	2.70	5	NA	56
24	240.0	1093.739	0.60	55	91	2.92	2.90	5	NA	54

Isokinetic Field Data
Field Data Entry

Client:	Eagle Foundry Company	Run:	3
Location:	Eagle Creek, OR	Start Time:	5:15
Source:	Main Foundry BH Outlet - White Iron	End Time:	9:15
EPA Method:	0061	Environmental Conditions/Test Notes:	Date: 3/29/2023
Box Operator:	JMK	overcast and 30-50 °F	
Technician(s):	KAD		

Stack Dimensional Data:		Equipment:					
Circular		Meterbox ID	10	Probe ID	B5C	Liner type	Glass
Diameter	61.000 in	Y factor	0.9737	Nozzle ID	0.25	Nozzle size	0.257 inches
Rectangular		ΔH@	1.720	Hot box ID	NA	Nozzle area	0.00036 sq.ft.
Width	in	Bp ID	TS1	Pitot Cp	0.84	Probe heat	250 °F
Length	in	Balance ID	HLNFB1	Pitot ID	B5C	Filter heat	N/A °F
Stack Area	20.295 sq.ft.	Weights ID	HLNFW1	Probe Length, ft	5		

Source Information:				Leak Checks:		
Barometric Pressure	29.41 "Hg	O ₂	20.90 %	Pre-test	Post-test	
Static Pressure	0.1 "H ₂ O	CO ₂	0.00 %	Pitot	x	x
Ave. ΔP	0.61 "H ₂ O	Rec. Nz.	0.226 inches	Leak rate, dcf	0.001	0.001
Stack Temperature	60 °F			Leak check vacuum, "Hg	15	16
Assumed moisture	1.28 %			Nozzle check for roundness:		
Assumed meter temp.	79.1 °F			1	2	3
Total number of points	24			0.257	0.257	0.256 inches
Time per point	10 min.			Caliper ID		
Total run time	240 min.			WS1		

Post Test Calculations:				Moisture/Lab:			
Sample volume	253.867 dcf	Ave. ΔP	0.670 "H ₂ O	Filter, #	NA		
Wet mol. weight	28.7 M _s (actual)	Ave. √ΔP	0.818 "H ₂ O	Initial		Final	Gain
Actual H ₂ O	1.30 %	Ave. ΔH	3.163 "H ₂ O	Impingers, g	1,722.2	1,707.6	-14.6
Std. meter vol.	240.436 dscf	Ave. T _s	51.4 °F	Silica gel, g	509.1	929.9	420.8
Isokinetic Average	101.3 %	Ave. T _m	77.8 °F	Total water gain:			
				406.2			

Traverse Point	Time (min.)	Meter Volume (dcf)	Velocity ΔP ("H ₂ O)	Stack Temp. (°F)	Meter Temp. (°F)	Calc. ΔH	Run ΔH	Vacuum ("Hg)	Filter Box (°F)	Condenser Temp (≤68°F)
1	10.0	366.030	0.72	39	55	3.34	3.00	4	NA	36
2	20.0	376.080	0.65	51	55	2.95	3.30	5	NA	42
3	30.0	386.390	0.67	50	58	3.06	3.10	5	NA	45
4	40.0	396.490	0.64	50	62	2.95	2.90	4.5	NA	45
5	50.0	406.480	0.62	50	65	2.87	2.90	4.5	NA	44
6	60.0	417.070	0.68	50	69	3.17	3.20	5	NA	48
7	70.0	427.900	0.71	51	72	3.32	3.30	5	NA	49
8	80.0	438.740	0.70	50	75	3.30	3.30	5	NA	49
9	90.0	449.610	0.71	51	77	3.35	3.30	5	NA	49
10	100.0	460.470	0.69	51	77	3.26	3.30	5	NA	49
11	110.0	471.370	0.71	51	81	3.38	3.30	5	NA	49
12	120.0	482.120	0.69	52	82	3.28	3.30	5	NA	51
13	130.0	492.960	0.68	51	82	3.24	3.20	5	NA	51
14	140.0	503.410	0.64	52	83	3.05	3.10	4.5	NA	49
15	150.0	513.510	0.61	52	83	2.91	2.90	4.5	NA	48
16	160.0	523.790	0.62	53	85	2.96	3.00	4.5	NA	48
17	170.0	534.130	0.64	54	86	3.06	3.00	4.5	NA	47
18	180.0	544.580	0.64	54	86	3.06	3.10	4.5	NA	47
19	190.0	555.520	0.70	54	87	3.35	3.30	5	NA	47
20	200.0	566.360	0.69	54	88	3.31	3.30	5	NA	47
21	210.0	576.890	0.64	54	89	3.07	3.10	5	NA	48
22	220.0	587.610	0.66	54	89	3.17	3.20	5	NA	48
23	230.0	598.580	0.69	53	90	3.33	3.30	5	NA	48
24	240.0	609.322	0.67	52	91	3.24	3.20	5	NA	48

EPA Method 4
Impinger Weights Summary

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Main Foundry BH Outlet - White Iron
EPA Method: 0061
Box Operator: JMK
Technician(s): KAD

Run 1

Impinger gain by weight (g):

#	Initial	Final	Gain
1	509.5	399.2	-110.3
2	441.0	440.5	-0.5
3	432.2	416.2	-16.0
4	348.1	400.4	52.3
Totals:	1,730.8	1,656.3	-74.5

Run 2

Impinger gain by weight (g):

#	Initial	Final	Gain
1	507.1	429.3	-77.8
2	429.6	457.8	28.2
3	433.0	437.2	4.2
4	348.1	389.7	41.6
Totals:	1,717.8	1,714.0	-3.8

Run 3

Impinger gain by weight (g):

#	Initial	Final	Gain
1	509.1	400.0	-109.1
2	433.8	452.0	18.2
3	430.6	441.3	10.7
4	348.7	414.3	65.6
Totals:	1,722.2	1,707.6	-14.6

Isokinetic Field Data
Field Data and Calculations
Emissions and Gas Stream Characteristics

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Main Foundry BH Outlet - White Iron
Method: 0061

Run: 1
Start Time: 6:40
End Time: 10:40
Date: 3/27/2023

Sampling Data				Traverse Data			
Time min.	Meter ft ³	ΔH "H ₂ O	Meter T _m °F	Traverse Point	Dp "H ₂ O	Stack T _s °F	$\sqrt{Dp}$
	340.705						
10	350.700	3.00	50	1	0.67	44	0.819
20	360.490	2.95	50	2	0.65	44	0.806
30	370.740	3.20	59	3	0.69	44	0.831
40	380.680	2.90	54	4	0.68	44	0.825
50	391.120	3.20	60	5	0.71	45	0.843
60	401.780	3.40	64	6	0.73	46	0.854
70	412.790	3.50	66	7	0.75	46	0.866
80	423.580	3.40	69	8	0.74	46	0.860
90	434.330	3.40	69	9	0.73	46	0.854
100	444.390	2.90	71	10	0.63	46	0.794
110	454.910	3.20	74	11	0.69	48	0.831
120	465.710	3.40	77	12	0.72	51	0.849
130	476.680	3.30	78	13	0.71	52	0.843
140	487.190	3.10	80	14	0.66	52	0.812
150	497.240	2.90	81	15	0.62	54	0.787
160	507.210	2.80	83	16	0.60	55	0.775
170	517.790	3.20	84	17	0.69	57	0.831
180	528.880	3.50	85	18	0.74	57	0.860
190	540.010	3.50	87	19	0.75	57	0.866
200	550.830	3.30	89	20	0.71	58	0.843
210	561.610	3.20	89	21	0.69	59	0.831
220	572.120	3.10	91	22	0.66	61	0.812
230	582.310	2.90	93	23	0.62	62	0.787
240	592.295	2.70	94	24	0.58	62	0.762

Client: Eagle Foundry Company**Run: 1****Source: Main Foundry BH Outlet - White Iron****Date: 03/27/23****Field Data Input Continued**Moisture Data

Total Test Time 240.0 min
 Sample Time Interval 10.0 min
 Meter Volume, V_m 251.590 dcf
 Water Volume 25.3 g
 Nozzle Diameter, N_z 0.2570 in.
 Nozzle Area 0.000360 sq.ft.

Stack Dimensional Data:

Circular
 Diameter 61.000 in
 Rectangular
 Width in
 Length in
 Stack Area 20.295 sq.ft.

Traverse Data

Barometric Pressure, P_b 29.98 "Hg
 Static Pressure 0.10 "H₂O
 Pitot Factor, cp 0.84
 Meter Cal Factor 0.9737 Y

Molecular Weight:

CO₂ Average 0.25 %vd
 O₂ Average 20.85 %vd

Field Data AveragesMeter

ΔH 3.165 "H₂O
 Temperature, T_m 74.9 °F
 Temperature, T_m 534.6 °A (°R)
 Pressure Meter, P_m 30.213 "Hg

Stack

$\sqrt{Dp}$ 0.827 "H₂O
 Temperature, T_s 51.5 °F
 Temperature, T_s 511.2 °A (°R)
 Pressure Stack, P_s 29.987 "Hg

Field Data CalculationsMeter Box Capture

Standard Volume, $V_{m(std)}$ 244.179 dscf
 6.914 dscm
 Actual Volume, $V_{m(actual)}$ 237.177 awcf

EPA Method 2 Stack Gas Flowrate:

Velocity, V_s 45.67 fps
 Volume (actual) 55,612 acfm
 55,340 adcfm
 Volume (standard) 3,452,161 wscf/hr
 3,435,245 dscf/hr
 57,254 dscf/min
 57,536 wscf/min

Gas Stream Moisture

Moisture Vapor, $V_{w(std)}$ 1.193 scf
 Moisture, B_{ws} 0.0049
 Moisture EPA M4 0.49 %v
 Moisture @ Saturation 1.28 %v (for $T_s < 212^\circ F$)

EPA Method 3 Gas Density

Volume/Mole, V/M 372.154
 Dry, M_d 28.87 lb/lb-mole
 Wet, M_s 28.82 lb/lb-mole

Percent Isokinetic 100.2 %

Laboratory Results

Cr VI 9.22E-04 µg/sample
 Cr VI 9.22E-10 grams

Emissions:

Concentration Cr VI, C_s 5.83E-11 gr/dscf
 1.33E-04 µg/dscm
 Mass Emissions Cr VI 2.86E-08 lb/hr

"<" represents MDL value

Isokinetic Field Data
Field Data and Calculations
Emissions and Gas Stream Characteristics

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Main Foundry BH Outlet - White Iron
Method: 0061

Run: 2
Start Time: 5:10
End Time: 9:10
Date: 03/28/23

Sampling Data				Traverse Data			
Time min.	Meter ft ³	ΔH "H ₂ O	Meter T _m °F	Traverse Point	Dp "H ₂ O	Stack T _s °F	$\sqrt{Dp}$
	849.960						
10	860.050	3.00	62	1	0.65	58	0.806
20	870.010	2.90	63	2	0.62	58	0.787
30	880.070	2.90	65	3	0.63	58	0.794
40	889.910	2.70	66	4	0.59	58	0.768
50	900.050	3.00	68	5	0.65	59	0.806
60	909.890	2.80	70	6	0.60	58	0.775
70	919.620	2.70	71	7	0.59	59	0.768
80	929.510	2.80	71	8	0.60	59	0.775
90	939.460	2.90	74	9	0.61	60	0.781
100	949.430	2.90	74	10	0.63	60	0.794
110	959.310	2.70	79	11	0.58	61	0.762
120	969.340	2.80	81	12	0.59	61	0.768
130	979.410	2.80	82	13	0.60	61	0.775
140	989.310	2.80	84	14	0.59	61	0.768
150	999.750	3.10	85	15	0.65	61	0.806
160	1010.790	3.40	85	16	0.71	61	0.843
170	1022.190	3.50	88	17	0.72	60	0.849
180	1032.690	3.10	88	18	0.65	62	0.806
190	1042.990	2.90	89	19	0.61	60	0.781
200	1053.120	2.80	90	20	0.59	60	0.768
210	1063.380	2.90	91	21	0.60	62	0.775
220	1073.530	2.80	91	22	0.59	59	0.768
230	1083.490	2.70	91	23	0.57	59	0.755
240	1093.739	2.90	91	24	0.60	55	0.775

Client: Eagle Foundry Company**Run: 2****Source: Main Foundry BH Outlet - White Iron****Date: 03/28/23****Field Data Input Continued**Moisture Data

Total Test Time 240.0 min
 Sample Time Interval 10.0 min
 Meter Volume, V_m 243.779 dcf
 Water Volume 63.1 g
 Nozzle Diameter, N_z 0.2570 in.
 Nozzle Area 0.000360 sq.ft.

Stack Dimensional Data:

Circular
 Diameter 61.000 in
 Rectangular
 Width in
 Length in
 Stack Area 20.295 sq.ft.

Traverse Data

Barometric Pressure, P_b 29.41 "Hg
 Static Pressure 0.10 "H₂O
 Pitot Factor, cp 0.84
 Meter Cal Factor 0.9737 Y

Molecular Weight:

CO₂ Average 0.15 %vd
 O₂ Average 20.91 %vd

Field Data AveragesMeter

ΔH 2.908 "H₂O
 Temperature, T_m 79.1 °F
 Temperature, T_m 538.8 °A (°R)
 Pressure Meter, P_m 29.624 "Hg

Stack

$\sqrt{Dp}$ 0.786 "H₂O
 Temperature, T_s 59.6 °F
 Temperature, T_s 519.3 °A (R)
 Pressure Stack, P_s 29.417 "Hg

Field Data CalculationsMeter Box Capture

Standard Volume, $V_{m(std)}$ 230.177 dscf
 6.518 dscm
 Actual Volume, $V_{m(actual)}$ 233.373 awcf

EPA Method 2 Stack Gas Flowrate:

Velocity, V_s 44.25 fps
 Volume (actual) 53,883 acfm
 53,193 adcfm
 Volume (standard) 3,230,062 wscf/hr
 3,188,717 dscf/hr
 53,145 dscf/min
 53,834 wscf/min

Gas Stream Moisture

Moisture Vapor, $V_{w(std)}$ 2.976 scf
 Moisture, B_{ws} 0.0128
 Moisture EPA M4 1.28 %v
 Moisture @ Saturation 1.75 %v (for $T_s < 212^\circ\text{F}$)

EPA Method 3 Gas Density

Dry, M_d 28.86 lb/lb-mole
 Wet, M_s 28.72 lb/lb-mole
 Volume/Mole, V/M 385.377

Percent Isokinetic 101.7 %

Laboratory Results

Cr VI 1.42E-02 µg/sample
 Cr VI 1.42E-08 grams

Emissions:

Concentration Cr VI, C_s 9.54E-10 gr/dscf
 2.18E-03 µg/dscm
 Mass Emissions Cr VI 4.35E-07 lb/hr

"<" represents MDL value

Isokinetic Field Data
Field Data and Calculations
Emissions and Gas Stream Characteristics

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Main Foundry BH Outlet - White Iron
Method: 0061

Run: 3
Start Time: 5:15
End Time: 9:15
Date: 03/29/23

Sampling Data				Traverse Data			
Time min.	Meter ft ³	ΔH "H ₂ O	Meter T _m °F	Traverse Point	Dp "H ₂ O	Stack T _s °F	$\sqrt{Dp}$
	355.455						
10	366.030	3.00	55	1	0.72	39	0.849
20	376.080	3.30	55	2	0.65	51	0.806
30	386.390	3.10	58	3	0.67	50	0.819
40	396.490	2.90	62	4	0.64	50	0.800
50	406.480	2.90	65	5	0.62	50	0.787
60	417.070	3.20	69	6	0.68	50	0.825
70	427.900	3.30	72	7	0.71	51	0.843
80	438.740	3.30	75	8	0.70	50	0.837
90	449.610	3.30	77	9	0.71	51	0.843
100	460.470	3.30	77	10	0.69	51	0.831
110	471.370	3.30	81	11	0.71	51	0.843
120	482.120	3.30	82	12	0.69	52	0.831
130	492.960	3.20	82	13	0.68	51	0.825
140	503.410	3.10	83	14	0.64	52	0.800
150	513.510	2.90	83	15	0.61	52	0.781
160	523.790	3.00	85	16	0.62	53	0.787
170	534.130	3.00	86	17	0.64	54	0.800
180	544.580	3.10	86	18	0.64	54	0.800
190	555.520	3.30	87	19	0.70	54	0.837
200	566.360	3.30	88	20	0.69	54	0.831
210	576.890	3.10	89	21	0.64	54	0.800
220	587.610	3.20	89	22	0.66	54	0.812
230	598.580	3.30	90	23	0.69	53	0.831
240	609.322	3.20	91	24	0.67	52	0.819

Client: Eagle Foundry Company**Run: 3****Source: Main Foundry BH Outlet - White Iron****Date: 03/29/23****Field Data Input Continued**Moisture Data

Total Test Time 240.0 min
Sample Time Interval 10.0 min
Meter Volume, V_m 253.867 dcf
Water Volume 406.2 g
Nozzle Diameter, N_z 0.2570 in.
Nozzle Area 0.000360 sq.ft.

Stack Dimensional Data:

Circular
Diameter 61.000 in
Rectangular
Width in
Length in
Stack Area 20.295 sq.ft.

Traverse Data

Barometric Pressure, P_b 29.41 "Hg
Static Pressure 0.10 "H₂O
Pitot Factor, cp 0.84
Meter Cal Factor 0.9737 Y

Molecular Weight:

CO₂ Average 0.10 %vd
O₂ Average 20.59 %vd

Field Data AveragesMeter

ΔH 3.163 "H₂O
Temperature, T_m 77.8 °F
Temperature, T_m 537.5 °A (°R)
Pressure Meter, P_m 29.643 "Hg

Stack

$\sqrt{Dp}$ 0.818 "H₂O
Temperature, T_s 51.4 °F
Temperature, T_s 511.1 °A (R)
Pressure Stack, P_s 29.417 "Hg

Field Data CalculationsMeter Box Capture

Standard Volume, $V_{m(std)}$ 240.436 dscf
6.808 dscm
Actual Volume, $V_{m(actual)}$ 239.974 awcf

EPA Method 2 Stack Gas Flowrate:

Velocity, V_s 45.70 fps
Volume (actual) 55,649 acfm
54,926 adcfm
Volume (standard) 3,389,429 wscf/hr
3,345,366 dscf/hr
55,756 dscf/min
56,490 wscf/min

Gas Stream Moisture

Moisture Vapor, $V_{w(std)}$ 19.155 scf
Moisture, B_{ws} 0.0130
Moisture EPA M4 7.38 %v
Moisture @ Saturation 1.30 %v (for $T_s < 212^\circ\text{F}$)

EPA Method 3 Gas Density

Dry, M_d 28.84 lb/lb-mole
Wet, M_s 28.70 lb/lb-mole

Volume/Mole, V/M 379.291

Percent Isokinetic 101.3 %

Laboratory Results

Cr VI 1.22E-02 µg/sample
Cr VI 1.22E-08 grams

Emissions:

Concentration Cr VI, C_s 7.82E-10 gr/dscf
1.79E-03 µg/dscm
Mass Emissions Cr VI 3.74E-07 lb/hr

"<" represents MDL value

Method 0061**Laboratory Results****Cr VI****Client:** Eagle Foundry Company**Location:** Eagle Creek, OR**Source:** Main Foundry BH Outlet - White Iron

Lab ID	Sample ID	Sample Date	<	Result (µg/sample)	MDL (µg/sample)	Sample Vol. (ml)	H ₂ O Rinse Vol. (ml)	Blank Correction (µg)	Blank Corrected Results (µg/sample)
23-S595	Run 1	3/27/2023		0.0075	0.0050	500	274	6.58E-03	9.22E-04
23-S596	Run 2	3/28/2023		0.0178	0.0044	445	149	3.57E-03	1.42E-02
23-S597	Run 3	3/29/2023		0.0195	0.0059	590	305	7.31E-03	1.22E-02
23-S607	KOH Blank	3/29/2023	<	MDL	0.0030	300		0.00	µg/ml
23-S608	H ₂ O Blank	3/29/2023		0.0048	0.0020	200		2.40E-05	µg/ml

Notes

A "<" sign designates a result less than the minimum detection limit (MDL). If sample results are below MDL, the MDL value is used for calculations.

If blank value(s) are below MDL, no blank correction is performed.

H₂O rinse volume was calculated as the total sample volume minus the final (post-test) volume of liquid in impingers 1-3.

Method 0061
Results Summary

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Main Foundry BH Outlet - White Iron

Run			1	2	3	
Date			3/27/2023	3/28/2023	3/29/2023	
Start Time			6:40	5:10	5:15	
End Time			10:40	9:10	9:15	
Duration, min.			240	240	240	Average
Barometric Pressure, "Hg			29.98	29.41	29.41	29.60
Nozzle Dia., in.			0.257	0.257	0.257	0.257
Isokinetic Average, %			100.2	101.7	101.3	101.1
Sample Volume, dscf			244.179	230.177	240.436	238.264
Sample Volume, dscm			6.914	6.518	6.808	6.747
Stack Diameter, in.			61.000	61.000	61.000	61.000
Stack Area, sq.ft.			20.295	20.295	20.295	20.295
CO ₂ %vd			0.25	0.15	0.10	0.17
O ₂ %vd			20.85	20.91	20.59	20.78
Static Pressure, "H ₂ O			0.10	0.10	0.10	0.10
H ₂ O %v			0.49	1.28	1.30	1.02
Wet Molecular Weight, lb/lb-mole			28.82	28.72	28.70	28.75
Velocity, FPS			45.67	44.25	45.70	45.21
ADCFM			55,340	53,193	54,926	54,486
ACFM			55,612	53,883	55,649	55,048
DSCFM			57,254	53,145	55,756	55,385
Stack Temperature, °F			51.5	59.6	51.4	54.2
Cr VI	Concentration, C _s	gr/dscf	5.83E-11	9.54E-10	7.82E-10	5.98E-10
		µg/dscm	1.33E-04	2.18E-03	1.79E-03	1.37E-03
	Mass	lb/hr	2.86E-08	4.35E-07	3.74E-07	2.79E-07
	lb Cr VI/ton Cr in melt		7.36E-08	1.11E-06	9.74E-07	7.20E-07
Process Data	Cr processed	lb/melt	3,106.941	3,124.611	3,071.140	
		ton/melt	1.553	1.562	1.536	

Methods 1-4, 0061
Example Calculations

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Main Foundry BH Outlet - White Iron
Method: 0061

Run: 1
Start Time: 6:40
End Time: 10:40
Date: 3/27/2023

EPA Methods 1-4:

- 1) $P_m = P_b + (\Delta H/13.6) =$ 30.213 "Hg
 where P_b : 29.98 "Hg
 ΔH : 3.165 "H₂O
- 2) $P_s = P_b + (\text{Static Press.}/13.6) =$ 29.987 "Hg
 where P_b : 29.98 "Hg
 Static Press.: 0.10 "H₂O
- 3) $V_m(\text{std}) = V_m(527.67/29.92)(Y)\left(\frac{P_m}{T_m}\right) =$ 244.179 dscf
 where V_m : 251.590 dcf
 Y : 0.9737
 P_m : 30.213 "Hg
 T_m : 534.6 °A
- 4) $V_w(\text{std}) = (0.04716)(H_2O) =$ 1.193 scf
 where H_2O : 25.30 g
- 5) $Bws = \left(\frac{Vw(\text{std})}{Vw(\text{std}) + Vm(\text{std})}\right) =$ 0.0049
 where $Vw(\text{std})$: 1.193 scf
 $Vm(\text{std})$: 244.179 dscf
- 6) % H₂O = Bws x 100 = 0.49 %v
- 7) $V_m(\text{actual}) = \left(\frac{Y \times Vm}{(1 - Bws)}\right)\left(\frac{T_s}{T_m}\right)\left(\frac{P_m}{P_s}\right) =$ 237.177 awcf
 where Y : 0.9737
 V_m : 251.5900 dcf
 Bws: 0.0049
 T_s : 511.2 °A
 T_m : 534.6 °A
 P_m : 30.213 "Hg
 P_s : 29.987 "Hg
- 8) $M_d = 0.44(\text{CO}_2) + 0.32(\text{O}_2) + 0.28(\text{N}_2 + \text{CO}) =$ 28.87 lb/lb-mole
 where CO_2 : 0.25 %vd
 O_2 : 20.85 %vd
 $\text{N}_2 + \text{CO} = (100 - (\text{O}_2 + \text{CO}_2))$: 78.90 %vd
- 9) $M_s = M_d(1 - Bws) + (18 \times Bws) =$ 28.82 lb/lb-mole
 where M_d : 28.87 lb/lb-mole
 Bws: 0.0049
- 10) Stack Area(cir.) = $3.1416 (\text{stack diameter}/24)^2 =$ 20.295 sq. ft.
 where Stack ID: 61 inches
 / ————— \

Methods 1-4, 0061
Example Calculations

- 11) Velocity, $V_s = 85.49(C_p)(\text{Ave. Sqrt } \Delta P) \left(\sqrt{\frac{T_s}{(P_s \times M_s)}} \right) =$ 45.67 fps
 where C_p : 0.84
 Ave. Sqrt ΔP : 0.827
 T_s : 511.2 °A
 P_s : 29.987 "Hg
 M_s : 28.82 lb/lb-mole
- 12) ACFM = (V_s)(stack area)(60 sec/min) = 55,612 ACFM
 where V_s : 45.67 ft/sec
 Stack Area: 20.295 sq. ft
- 13) ADCFM = (ACFM)(1-Bws) = 55,340 ADCFM
 where ACFM: 55,612
 Bws: 0.0049
- 14) $Q_{sw} = 3600(V_s)(\text{stack area}) \left(\frac{527.67^\circ R}{T_s} \right) \left(\frac{P_s}{29.92 \text{ "Hg}} \right) =$ 3,452,161 wscf/hr
 where V_s : 45.67 ft/sec
 Stack Area: 20.2950 sq. ft.
 T_s : 511.2 °A
 P_s : 29.987 "Hg
- 15) $Q_{sd} = (\text{wscf/hr})(1-Bws) =$ 3,435,245 dscf/hr
 where wscf/hr: 3,452,161
 Bws: 0.0049
- 16) DSCFM = (dscf/hr)/60 mins/hr = 57,254 DSCFM
 where dscf/hr: 3,435,245
- 17) Nozzle Area = $3.1416 (\text{Nozzle Size}/24)^2 =$ 0.000360 sq. ft.
 where Nozzle Size: 0.257 inches
- 18) Isokinetic % = $\left(\frac{0.0945(T_s)(V_m(\text{std}))}{P_s(V_s)(\text{nozzle area})(\text{sampling time})(1-Bws)} \right) =$ 100.2 %
 where T_s : 511.2 °A
 $V_m(\text{Std})$: 244.179 dscf
 P_s : 29.987 "Hg
 V_s : 45.67 ft/sec
 Nozzle Area: 0.000360 sq. ft.
 Sampling Time: 240 min.
 Bws: 0.0049

Method 0061:

- 19) Laboratory result Cr VI = 0.0075 µg/sample
- 20) H₂O Blank Correction
- a) Density of 0.1M KOH impinger sol'n (g/ml) = (mass KOH + mass H₂O) / vol of sol'n = 1.0056 g/ml
 where mass KOH: 5.6 g
 mass H₂O: 1,000 g
 vol of sol'n: 1,000 ml

Note: Values derived from procedure in Method 0061 Section 5.2.2.

Methods 1-4, 0061
Example Calculations

b) Impinger gain (ml) = impinger gain (g) / density of 0.1M KOH impinger sol'n (g/ml) = -74.1 ml
 where impinger gain*: -74.5 g
 density of impinger sol'n: 1.0056

* Recorded on Method 0061 field data sheet

c) Final impinger volume = initial vol (ml) + gain (ml) = 225.9 ml
 where initial vol*: 300 ml
 gain: -74.1 ml

* Initial contents of impingers 1-3, per method specifications

d) H₂O rinses volume = total sample vol (ml) - final impinger vol (ml) = 274.1 ml
 where total sample vol: 500 ml
 final impinger vol: 225.9 ml

e) Cr VI concentration in H₂O blank = Cr VI mass in blank (µg) / blank vol (ml) = 2.40E-05 µg/ml
 where Cr VI mass in blank: 0.0048 µg
 blank vol: 200 ml

f) Blank correction = Cr VI concentration in H₂O blank (µg/ml) * H₂O rinses vol (ml) = 6.58E-03 µg
 where Cr VI concentration in H₂O blank: 2.40E-05 µg/ml
 H₂O rinses vol: 274.1 ml

g) Blank-corrected result = lab result Cr VI (µg/sample) - blank correction (µg) = 9.22E-04 µg/sample
 where lb result Cr VI: 0.0075 µg/sample
 blank correction: 6.58E-03 µg

Note: KOH blank results were <MDL, therefore no KOH blank correction was applied.

21) $C_s = (\text{Sample grams} / V_m(\text{Std})) (15.43 \text{ grains/gram}) = 5.83\text{E-}11 \text{ gr/dscf}$
 where sample: 9.22E-10 grams
 V_m(std): 244.179 dscf

22) $C_s = (\text{Sample grams}) (1,000,000 \text{ µg/gram}) / V_m(\text{std}) = 1.33\text{E-}04 \text{ µg/dscm}$
 where sample: 9.22E-10 grams
 V_m(std): 6.914 dscm

23) Mass emission rate = (C_s)(Stack flow)/7000gr/lb = 2.86E-08 lb/hr
 where C_s: 5.83E-11 gr/dscf
 Stack flow: 3,435,245 dscf/hr

24) Mass emission rate = (lb/hr * 4 hr) / Cr processed 7.36E-08 lb Cr VI/ton Cr in melt
 where: 2.86E-08 lb/hr
 Cr processed: 1.553 ton/melt



COMPANY	Eagle Foundry Company
FACILITY	Eagle Foundry
LOCATION	Eagle Creek, OR
SOURCE	Cooling Bunker BH Inlet - White Iron
DATE	3/27/2023 - 3/29/2023
METHOD	29
POLLUTANT	Metals

EPA Method 1
Stack Parameters and Traverse Points

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Cooling Bunker BH Inlet - White Iron
Facility: Eagle Foundry

Type of Testing: P (P for Particulate; V for Velocity/Nonparticulate)
Type of Duct: C (C for circular; R for rectangular)

Number of ports available: 2
Number of ports to be used: 2
Port diameter: 4 inches
Sampling location height (approx.): feet
Stack height (approx.): feet

Circular ID (Rectangular Depth): 48.00 inches
Port depth and/or wall thickness: 6.25 inches
Stack width (Rectangular only): inches

Equivalent Diameter
If rectangular = $\frac{2 \times \text{Depth} \times \text{Width}}{\text{Depth} + \text{Width}}$ = 48.00 inches (If circular = duct ID)

Stack/duct area = 12.566 sq. feet 1809.6 sq. inches

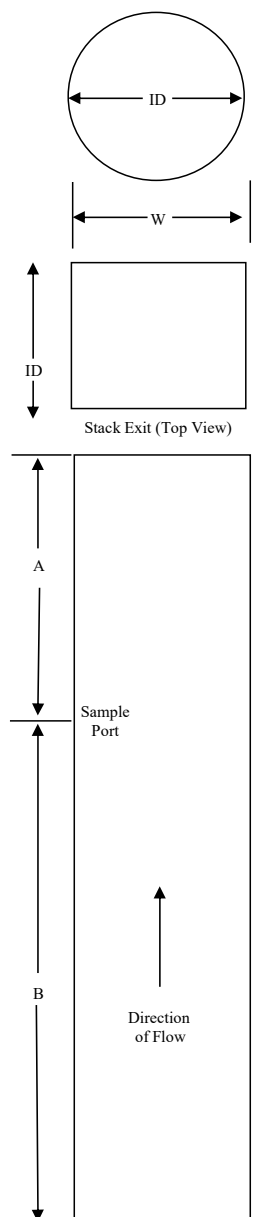
Sample Port Location: Downstream flow disturbance from process B Upstream flow disturbance toward exit A
Number of Inches: 990.00 114.00
Number of Diameters: 20.63 2.38

Minimum Number of Traverse Points: 12

Traverse points less than 1.0 inch from the stack wall are relocated to a distance of 1.0 inch.

Points	% of diameter	Distance from inside wall (in.)	Distance including port (in.)
1	4.4	2.11	8 3/8
2	14.6	7.01	13 1/4
3	29.6	14.21	20 1/2
4	70.4	33.79	40
5	85.4	40.99	47 1/4
6	95.6	45.89	52 1/8

Reference Diagram



Drawing NOT to scale and
NOT an accurate representation of stack.

Pre-Test Traverse

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Cooling Bunker BH Inlet - White Iron

Stack Temp: 53 °F

Traverse Point	Velocity ΔP ("H ₂ O)	Null Angle
1	0.78	0
2	1.10	5
3	1.10	0
4	1.10	5
5	1.20	5
6	1.20	0
7	1.20	5
8	1.10	0
9	1.00	5
10	0.90	0
11	0.80	5
12	0.80	5

Average: 1.02 3

Flow is found to be: Non-cyclonic

Isokinetic Field Data
Field Data Entry

Client:	Eagle Foundry Company	Run:	1
Location:	Eagle Creek, OR	Start Time:	6:40
Source:	Cooling Bunker BH Inlet - White Iron	End Time:	10:40
EPA Method:	29	Environmental Conditions/Test Notes:	Date: 3/27/2023
Box Operator:	AAM	30-50 °F, Cloudy	
Technician(s):	NEW		

Stack Dimensional Data:		Equipment:					
Circular		Meterbox ID	11	Probe ID	Bison 1	Liner type	Glass
Diameter	48.000 in	Y factor	0.9686	Nozzle ID	0.25	Nozzle size	0.250 inches
Rectangular		ΔH@	1.865	Hot box ID	HHB-2	Nozzle area	0.000341 sq.ft.
Width	in	Bp ID	TS-1	Pitot Cp	0.84	Probe heat	250 °F
Length	in	Balance ID	HLN FB-1	Pitot ID	Bison 1	Filter heat	250 °F
Stack Area	12.566 sq.ft.	Weights ID	HLN FW-1	Probe Length, ft	6		

Source Information:				Leak Checks:		
Barometric Pressure	29.98 "Hg	O ₂	20.90 %		Pre-test	Post-test
Static Pressure	-0.9 "H ₂ O	CO ₂	0.00 %	Pitot	X	X
Ave. ΔP	1.02 "H ₂ O	Rec. Nz.	0.208 inches	Leak rate, dcf	0.016	0.018
Stack Temperature	53 °F			Leak check vacuum, "Hg	15	18
Assumed moisture	3.00 %					
Assumed meter temp.	40 °F			Nozzle check for roundness:		
Total number of points	12			1	2	3
Time per point	20 min.			0.250	0.250	0.251 inches
Total run time	240 min.			Caliper ID	WS-2	

Post Test Calculations:				Moisture/Lab:			
Sample volume	284.809 dcf	Ave. ΔP	1.078 "H ₂ O	Filter, #	NA		
Wet mol. weight	28.78 M _s (actual)	Ave. √ΔP	1.034 "H ₂ O		Initial	Final	Gain
Actual H ₂ O	0.51 %	Ave. ΔH	4.575 "H ₂ O	Impingers, g	3,850.5	3,839.9	-10.6
Std. meter vol.	292.604 dscf	Ave. T _s	42.9 °F	Silica gel, g	924.3	966.6	42.3
Isokinetic Average	100.6 %	Ave. T _m	44.4 °F		Total water gain, g:		31.7

Traverse Point	Time (min.)	Meter Volume (dcf)	Velocity ΔP ("H ₂ O)	Stack Temp. (°F)	Meter Temp. (°F)	Calc. ΔH	Run ΔH	Vacuum ("Hg)	Filter Box (°F)	Condenser Temp (≤68°F)
1	20.0	139.226	0.75	35	32	3.16	3.15	7	257	30
2	40.0	159.190	1.05	33	34	4.45	4.45	10	256	39
3	60.0	182.100	1.05	39	38	4.44	4.45	10	261	45
4	80.0	205.810	1.20	39	41	5.10	5.10	12	261	51
5	100.0	230.880	1.20	40	42	5.10	5.10	12	249	48
6	120.0	255.890	1.30	42	44	5.52	5.50	13	250	46
7	140.0	281.590	1.20	44	46	5.10	5.10	12.5	259	49
8	160.0	306.800	1.20	45	48	5.11	5.10	12.5	258	54
9	180.0	332.100	1.30	47	49	5.52	5.50	14	257	46
10	200.0	358.350	1.10	48	51	4.68	4.70	11	257	46
11	220.0	382.610	0.80	50	53	3.41	3.40	9	253	45
12	240.0	403.280	0.79	53	55	3.36	3.35	8	252	45

Isokinetic Field Data
Field Data Entry

Client:	Eagle Foundry Company	Run:	3
Location:	Eagle Creek, OR	Start Time:	5:15
Source:	Cooling Bunker BH Inlet - White Iron	End Time:	9:15
EPA Method:	29	Environmental Conditions/Test Notes:	Date: 3/29/2023
Box Operator:	AAM	40-65 °F, Rainy/cloudy	
Technician(s):	NEW		

Stack Dimensional Data:

Circular
Diameter 48.000 in
Rectangular
Width in
Length in
Stack Area 12.566 sq.ft.

Equipment:

Meterbox ID 11
Y factor 0.9686
ΔH@ 1.865
Bp ID TS-1
Balance ID HLN FB-1
Weights ID HLN FW-1
Probe ID
Nozzle ID 0.25
Hot box ID HHB-2
Pitot Cp 0.84
Pitot ID
Bison 1
Liner type Glass
Nozzle size 0.250 inches
Nozzle area 0.000341 sq.ft.
Probe heat 250 °F
Filter heat 250 °F
Probe Length, ft 6

Source Information:

Barometric Pressure	29.41 "Hg	O ₂	20.90 %
Static Pressure	-0.9 "H ₂ O	CO ₂	0.00 %
Ave. ΔP	1.02 "H ₂ O	Rec. Nz.	0.202 inches
Stack Temperature	53 °F		
Assumed moisture	0.28 %		
Assumed meter temp.	52.1 °F		
Total number of points	12		
Time per point	20 min.		
Total run time	240 min.		

Leak Checks:

	Pre-test	Post-test
Pitot	x	x
Leak rate, dcf	0.000	0.000
Leak check vacuum, "Hg	15	20

Nozzle check for roundness:

1	2	3
0.250	0.250	0.251 inches
Caliper ID		WS-2

Post Test Calculations:

Sample volume	316.368 dcf	Ave. ΔP	1.292 "H ₂ O
Wet mol. weight	28.81 M _s (actual)	Ave. √ΔP	1.135 "H ₂ O
Actual H ₂ O	0.25 %	Ave. ΔH	5.738 "H ₂ O
Std. meter vol.	318.952 dscf	Ave. T _s	44.3 °F
Isokinetic Average	100.8 %	Ave. T _m	45.8 °F

Moisture/Lab:

Filter, #	Initial	Final	Gain
Impingers, g	3,877.1	3,844.9	-32.2
Silica gel, g	857.9	907.0	49.1
Total water gain:			16.9

Traverse Point	Time (min.)	Meter Volume (dcf)	Velocity ΔP ("H ₂ O)	Stack Temp. (°F)	Meter Temp. (°F)	Calc. ΔH	Run ΔH	Vacuum ("Hg)	Filter Box (°F)	Condenser Temp (≤68°F)
1	20.0	282.331	1.10	36	35	4.86	4.85	5	255	36
2	40.0	333.475	1.40	41	37	6.15	6.15	6	257	54
3	60.0	359.990	1.30	46	41	5.70	5.70	5	256	58
4	80.0	385.480	1.20	45	45	5.31	5.30	5	255	59
5	100.0	410.960	1.20	45	47	5.33	5.35	5	240	57
6	120.0	437.640	1.30	45	48	5.79	5.80	5.5	258	53
7	140.0	464.235	1.30	45	49	5.80	5.80	5.5	257	54
8	160.0	489.660	1.20	50	49	5.30	5.30	5	256	51
9	180.0	515.040	1.20	49	49	5.31	5.30	5	257	51
10	200.0	541.450	1.30	49	49	5.75	5.75	5	257	49
11	220.0	568.080	1.30	43	50	5.83	5.85	5.5	256	49
12	240.0	598.699	1.70	37	50	7.72	7.70	7	257	48

EPA Method 4
Impinger Weights Summary

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Cooling Bunker BH Inlet - White Iron
EPA Method: 29
Box Operator: AAM
Technician(s): NEW

Run 1

Impinger gain by weight (g):

#	Initial	Final	Gain
1	788.1	735.9	-52.2
2	753.8	770.7	16.9
3	689.6	698.3	8.7
4	809.1	819.9	10.8
5	809.9	815.1	5.2
Totals:	3,850.5	3,839.9	-10.6

Run 2

Impinger gain by weight (g):

#	Initial	Final	Gain
1	788.1	717.5	-70.6
2	753.8	781.1	27.3
3	689.6	711.7	22.1
4	809.1	829.4	20.3
5	809.9	819.3	9.4
Totals:	3,850.5	3,859.0	8.5

Run 3

Impinger gain by weight (g):

#	Initial	Final	Gain
1	796.6	697.3	-99.3
2	762.4	739.1	-23.3
3	694.3	735.1	40.8
4	812.1	846.4	34.3
5	811.7	827.0	15.3
Totals:	3,877.1	3,844.9	-32.2

Isokinetic Field Data
Field Data and Calculations
Gas Stream Characteristics

Client:	Eagle Foundry Company	Run:	1
Location:	Eagle Creek, OR	Start Time:	6:40
Source:	Cooling Bunker BH Inlet - White Iron	End Time:	10:40
Method:	29	Date:	3/27/2023

Sampling Data				Traverse Data			
Time min.	Meter ft ³	ΔH "H ₂ O	Meter T _m °F	Traverse Point	Dp "H ₂ O	Stack T _s °F	$\sqrt{Dp}$
	139.226						
20.0	159.190	3.15	32	1	0.75	35	0.866
40.0	182.100	4.45	34	2	1.05	33	1.025
60.0	205.810	4.45	38	3	1.05	39	1.025
80.0	230.880	5.10	41	4	1.20	39	1.095
100.0	255.890	5.10	42	5	1.20	40	1.095
120.0	281.590	5.50	44	6	1.30	42	1.140
140.0	306.800	5.10	46	7	1.20	44	1.095
160.0	332.100	5.10	48	8	1.20	45	1.095
180.0	358.350	5.50	49	9	1.30	47	1.140
200.0	382.610	4.70	51	10	1.10	48	1.049
220.0	403.280	3.40	53	11	0.80	50	0.894
240.0	424.035	3.35	55	12	0.79	53	0.889

Client:	Eagle Foundry Company	Run:	1
Source:	Cooling Bunker BH Inlet - White Iron	Date:	03/27/23

Field Data Input Continued

Moisture Data

Total Test Time	240.0 min
Sample Time Interval	20.0 min
Meter Volume, V_m	284.809 dcf
Water Mass	31.7 g
Nozzle Diameter, N_z	0.2500 in.
Nozzle Area	0.000341 sq.ft.

Stack Dimensional Data:

Circular	
Diameter	48.000 in
Rectangular	
Width	in
Length	in
Stack Area	12.566 sq.ft.

Traverse Data

Barometric Pressure, P_b	29.98 "Hg
Static Pressure	-0.90 "H ₂ O
Pitot Factor, cp	0.84
Meter Cal Factor	0.9686 Y

Molecular Weight:

CO ₂ Average	0.07 %vd
O ₂ Average	20.79 %vd

Field Data Averages

Meter

ΔH	4.575 "H ₂ O
Temperature, T_m	44.4 °F
Temperature, T_m	504.1 °A (°R)
Pressure Meter, P_m	30.316 "Hg

Stack

$\sqrt{D_p}$	1.034 "H ₂ O
Temperature, T_s	42.9 °F
Temperature, T_s	502.6 °A (°R)
Pressure Stack, P_s	29.914 "Hg

Field Data Calculations

Meter Box Capture

Standard Volume, $V_{m(std)}$	292.604 dscf
	8.286 dscm
Actual Volume, $V_{m(actual)}$	280.170 awcf

EPA Method 2 Stack Gas Flowrate:

Velocity, V_s	56.73 fps
Flow Rate (actual), Q_{aw}	42,772 acfm
	42,554 adcfm
Flow Rate (standard), Q	2,693,960 wscf/hr
	2,680,221 dscf/hr
	44,670 dscf/min
	44,899 wscf/min

Gas Stream Moisture

Moisture Vapor, $V_{w(std)}$	1.495 scf
Moisture, B_{ws}	0.0051
Moisture EPA M4	0.51 %v
Moisture @ Saturation	0.93 %v (for $T_s < 212^\circ\text{F}$)

EPA Method 3 Gas Density

Dry, M_d	28.84 lb/lb-mole
Wet, M_s	28.78 lb/lb-mole

Percent Isokinetic	100.6 %

Isokinetic Field Data
Field Data and Calculations
Gas Stream Characteristics

Client:	Eagle Foundry Company	Run:	2
Location:	Eagle Creek, OR	Start Time:	5:10
Source:	Cooling Bunker BH Inlet - White Iron	End Time:	9:10
Method:	29	Date:	03/28/23

Sampling Data				Traverse Data			
Time min.	Meter ft ³	ΔH "H ₂ O	Meter T _m °F	Traverse Point	Dp "H ₂ O	Stack T _s °F	$\sqrt{Dp}$
	724.396						
20.0	742.880	2.80	45	1	0.64	47	0.800
40.0	762.100	3.00	47	2	0.69	52	0.831
60.0	785.650	4.40	49	3	1.00	52	1.000
80.0	812.090	5.70	51	4	1.30	52	1.140
100.0	838.800	5.75	52	5	1.30	52	1.140
120.0	864.290	5.30	51	6	1.20	52	1.095
140.0	888.630	4.80	52	7	1.10	59	1.049
160.0	914.110	5.25	53	8	1.20	56	1.095
180.0	940.780	5.75	55	9	1.30	55	1.140
200.0	964.380	4.45	57	10	1.00	54	1.000
220.0	983.460	2.95	57	11	0.66	52	0.812
240.0	1001.068	2.40	56	12	0.53	46	0.728

Client:	Eagle Foundry Company	Run:	2
Source:	Cooling Bunker BH Inlet - White Iron	Date:	03/28/23

Field Data Input Continued

<u>Moisture Data</u>		<u>Stack Dimensional Data:</u>	
Total Test Time	240.0 min	Circular	
Sample Time Interval	20.0 min	Diameter	48.000 in
Meter Volume, V _m	276.672 dcf	Rectangular	
Water Mass	16.4 g	Width	in
Nozzle Diameter, N _z	0.2500 in.	Length	in
Nozzle Area	0.000341 sq.ft.	Stack Area	12.566 sq.ft.

<u>Traverse Data</u>		<u>Molecular Weight:</u>	
Barometric Pressure, P _b	29.41 "Hg	CO ₂ Average	0.06 %vd
Static Pressure	-0.90 "H ₂ O	O ₂ Average	20.73 %vd
Pitot Factor, cp	0.84		
Meter Cal Factor	0.9686 Y		

Field Data Averages

<u>Meter</u>		<u>Stack</u>	
ΔH	4.379 "H ₂ O	√Dp	0.986 "H ₂ O
Temperature, T _m	52.1 °F	Temperature, T _s	52.4 °F
Temperature, T _m	511.8 °A (°R)	Temperature, T _s	512.1 °A (°R)
Pressure Meter, P _m	29.732 "Hg	Pressure Stack, P _s	29.344 "Hg

Field Data Calculations

<u>Meter Box Capture</u>		<u>EPA Method 2 Stack Gas Flowrate:</u>	
Standard Volume, V _{m(std)}	274.574 dscf	Velocity, V _s	55.11 fps
	7.775 dscm	Flow Rate (actual), Q _{aw}	41,551 acfm
Actual Volume, V _{m(actual)}	272.450 awcf		41,435 adcfm
<u>Gas Stream Moisture</u>		Flow Rate (standard), Q	2,519,537 wscf/hr
Moisture Vapor, V _{w(std)}	0.773 scf		2,512,482 dscf/hr
Moisture, B _{ws}	0.0028		41,875 dscf/min
Moisture EPA M4	0.28 %v		41,992 wscf/min
Moisture @ Saturation	1.35 %v (for T _s < 212°F)		
<u>EPA Method 3 Gas Density</u>			
Dry, M _d	28.84 lb/lb-mole		
Wet, M _s	28.81 lb/lb-mole		
Percent Isokinetic	100.7 %		

Isokinetic Field Data
Field Data and Calculations
Gas Stream Characteristics

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Cooling Bunker BH Inlet - White Iron
Method: 29

Run: 3
Start Time: 5:15
End Time: 9:15
Date: 03/29/23

Sampling Data				Traverse Data			
Time min.	Meter ft ³	ΔH "H ₂ O	Meter T _m °F	Traverse Point	Dp "H ₂ O	Stack T _s °F	$\sqrt{Dp}$
	282.331						
20.0	306.140	4.85	35	1	1.10	36	1.049
40.0	333.475	6.15	37	2	1.40	41	1.183
60.0	359.990	5.70	41	3	1.30	46	1.140
80.0	385.480	5.30	45	4	1.20	45	1.095
100.0	410.960	5.35	47	5	1.20	45	1.095
120.0	437.640	5.80	48	6	1.30	45	1.140
140.0	464.235	5.80	49	7	1.30	45	1.140
160.0	489.660	5.30	49	8	1.20	50	1.095
180.0	515.040	5.30	49	9	1.20	49	1.095
200.0	541.450	5.75	49	10	1.30	49	1.140
220.0	568.080	5.85	50	11	1.30	43	1.140
240.0	598.699	7.70	50	12	1.70	37	1.304

Client:	Eagle Foundry Company	Run:	3
Source:	Cooling Bunker BH Inlet - White Iron	Date:	03/29/23

Field Data Input Continued

Moisture Data

Total Test Time	240.0 min
Sample Time Interval	20.0 min
Meter Volume, V_m	316.368 dcf
Water Mass	16.9 g
Nozzle Diameter, N_z	0.2500 in.
Nozzle Area	0.000341 sq.ft.

Stack Dimensional Data:

Circular	
Diameter	48.000 in
Rectangular	
Width	in
Length	in
Stack Area	12.566 sq.ft.

Traverse Data

Barometric Pressure, P_b	29.41 "Hg
Static Pressure	-0.90 "H ₂ O
Pitot Factor, cp	0.84
Meter Cal Factor	0.9686 Y

Molecular Weight:

CO ₂ Average	0.07 %vd
O ₂ Average	20.92 %vd

Field Data Averages

Meter

ΔH	5.738 "H ₂ O
Temperature, T_m	45.8 °F
Temperature, T_m	505.5 °A (°R)
Pressure Meter, P_m	29.832 "Hg

Stack

$\sqrt{D_p}$	1.135 "H ₂ O
Temperature, T_s	44.3 °F
Temperature, T_s	504.0 °A (°R)
Pressure Stack, P_s	29.344 "Hg

Field Data Calculations

Meter Box Capture

Standard Volume, $V_{m(std)}$	318.952 dscf
	9.032 dscm
Actual Volume, $V_{m(actual)}$	311.384 awcf

EPA Method 2 Stack Gas Flowrate:

Velocity, V_s	62.92 fps
Flow Rate (actual), Q_{aw}	47,439 acfm
	47,320 adcfm
Flow Rate (standard), Q	2,922,831 wscf/hr
	2,915,524 dscf/hr
	48,592 dscf/min
	48,714 wscf/min

Gas Stream Moisture

Moisture Vapor, $V_{w(std)}$	0.797 scf
Moisture, B_{ws}	0.0025
Moisture EPA M4	0.25 %v
Moisture @ Saturation	1.00 %v (for $T_s < 212^\circ F$)

EPA Method 3 Gas Density

Dry, M_d	28.85 lb/lb-mole
Wet, M_s	28.82 lb/lb-mole

Percent Isokinetic	100.8 %

Eagle Foundry Company
Cooling Bunker BH Inlet - White Iron
Method 29 Laboratory Results

Run: 1
Sample Date: 03/27/23

Analyte	Filter + FH Rinse Cont. 1&3		BH Cap.Soln. + BH Rinse Cont. 4		Units
	< Result	MDL	< Result	MDL	
Aluminum	584	7.50	34.5	3.57	µg/sample
Antimony	2.17	1.25	< MDL	0.595	µg/sample
Arsenic	< MDL	1.75	< MDL	0.833	µg/sample
Barium	6.20	0.125	1.87	0.060	µg/sample
Beryllium	< MDL	0.050	< MDL	0.024	µg/sample
Cadmium	1.86	0.100	0.064	0.048	µg/sample
Chromium	28.5	0.200	2.59	0.095	µg/sample
Cobalt	0.212	0.125	0.120	0.060	µg/sample
Copper	12.5	1.25	1.79	0.595	µg/sample
Lead	24.0	1.25	0.680	0.595	µg/sample
Manganese	134	0.075	0.894	0.036	µg/sample
Nickel	6.85	0.750	1.70	0.357	µg/sample
Phosphorus	19.1	5.00	< MDL	2.38	µg/sample
Selenium	< MDL	3.75	< MDL	1.78	µg/sample
Silver	1.16	0.500	< MDL	0.238	µg/sample
Thallium	< MDL	2.50	< MDL	1.19	µg/sample
Vanadium	0.352	0.250	< MDL	0.119	µg/sample
Zinc	189	0.750	5.33	0.357	µg/sample

Lab ID:	23-S624	23-S625	
Sample Vol:	250	250	ml

Eagle Foundry Company
Cooling Bunker BH Inlet - White Iron
Method 29 Laboratory Results

Run: 3
Sample Date: 03/29/23

Analyte	Filter + FH Rinse Cont. 1&3		BH Cap.Soln. + BH Rinse Cont. 4		Units
	< Result	MDL	< Result	MDL	
Aluminum	1,900	7.50	25.4	3.81	µg/sample
Antimony	2.36	1.25	< MDL	0.635	µg/sample
Arsenic	< MDL	1.75	< MDL	0.889	µg/sample
Barium	11.6	0.125	1.26	0.064	µg/sample
Beryllium	< MDL	0.050	< MDL	0.025	µg/sample
Cadmium	0.359	0.100	< MDL	0.051	µg/sample
Chromium	26.2	0.200	0.959	0.102	µg/sample
Cobalt	0.294	0.125	< MDL	0.064	µg/sample
Copper	24.2	1.25	1.81	0.635	µg/sample
Lead	17.7	1.25	< MDL	0.635	µg/sample
Manganese	414	0.075	4.13	0.038	µg/sample
Nickel	10.7	0.750	0.488	0.381	µg/sample
Phosphorus	38.0	5.00	< MDL	2.54	µg/sample
Selenium	< MDL	3.75	< MDL	1.90	µg/sample
Silver	1.10	0.500	< MDL	0.254	µg/sample
Thallium	< MDL	2.50	< MDL	1.27	µg/sample
Vanadium	1.37	0.250	< MDL	0.127	µg/sample
Zinc	265	0.750	2.03	0.381	µg/sample

Lab ID:	23-S634	23-S635	
Sample Vol:	250	188	ml

Eagle Foundry Company
Cooling Bunker BH Inlet - White Iron
Method 29 Laboratory Results

Run: 2
Sample Date: 03/28/23

Analyte	Filter + FH Rinse Cont. 1&3		BH Cap.Soln. + BH Rinse Cont. 4		Units
	<	Result MDL	<	Result MDL	
Aluminum		3,460 7.50		19.4 4.35	µg/sample
Antimony		2.69 1.25	<	MDL 0.725	µg/sample
Arsenic	<	MDL 1.75	<	MDL 1.02	µg/sample
Barium		16.8 0.125		1.31 0.072	µg/sample
Beryllium		0.074 0.050	<	MDL 0.029	µg/sample
Cadmium		0.338 0.100	<	MDL 0.058	µg/sample
Chromium		37.4 0.200		1.31 0.116	µg/sample
Cobalt		0.455 0.125		0.084 0.072	µg/sample
Copper		25.6 1.25		0.836 0.725	µg/sample
Lead		19.1 1.25	<	MDL 0.725	µg/sample
Manganese		432 0.075		1.51 0.044	µg/sample
Nickel		14.3 0.750		0.563 0.435	µg/sample
Phosphorus		47.8 5.00	<	MDL 2.90	µg/sample
Selenium	<	MDL 3.75	<	MDL 2.18	µg/sample
Silver		1.02 0.500		0.433 0.290	µg/sample
Thallium	<	MDL 2.50	<	MDL 1.45	µg/sample
Vanadium		2.08 0.250	<	MDL 0.145	µg/sample
Zinc		194 0.750		2.05 0.435	µg/sample

Lab ID: 23-S629 23-S630
Sample Vol: 250 256 ml

Eagle Foundry Company
Cooling Bunker BH Inlet - White Iron
Method 29 Blank Results

Sample Dates: 3/27/2023
3/28/2023
3/29/2023

Analyte	Filter Cont. 12		BH Cap.Soln. Cont. 9 5% HNO ₃ / 10% H ₂ O ₂		FH/BH Rinse Cont. 8A 0.1 N HNO ₃	
	µg/filter		µg/sample		µg/sample	
	< Result	MDL	< Result	MDL	< Result	MDL
Aluminum	58.8	7.50	16.30	3.78	< MDL	7.50
Antimony	2.86	1.25	< MDL	0.630	< MDL	1.25
Arsenic	< MDL	1.75	< MDL	0.882	< MDL	1.75
Barium	1.40	0.125	0.718	0.063	0.193	0.125
Beryllium	< MDL	0.050	< MDL	0.025	< MDL	0.050
Cadmium	< MDL	0.100	< MDL	0.050	< MDL	0.100
Chromium	1.03	0.200	0.306	0.101	< MDL	0.200
Cobalt	< MDL	0.125	0.153	0.063	< MDL	0.125
Copper	< MDL	1.25	< MDL	0.630	< MDL	1.25
Lead	< MDL	1.25	< MDL	0.630	< MDL	1.25
Manganese	0.74	0.08	0.742	0.038	< MDL	0.375
Nickel	3.96	0.75	< MDL	0.378	< MDL	0.750
Phosphorus	17.0	5.00	< MDL	2.52	< MDL	5.00
Selenium	< MDL	3.75	< MDL	1.89	< MDL	3.75
Silver	< MDL	0.500	< MDL	0.252	< MDL	0.500
Thallium	< MDL	2.50	< MDL	1.26	< MDL	2.50
Vanadium	< MDL	0.250	< MDL	0.126	< MDL	0.250
Zinc	1.52	0.750	0.415	0.378	< MDL	0.750

Lab ID: 23-S729
Blank Vol, ml: N/A

23-S731
196

23-S730
250

Eagle Foundry Company
Cooling Bunker BH Inlet - White Iron
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 1
Test Date: 3/27/2023
Page: 1 of 3

Analyte	I Sample FH Rinse+Filter µg	II Blank Correction FH Rinse µg	III Blank Correction Filter µg	IV Sample BH Cap.Soln. + BH Rinse µg	V Blank BH Cap.Soln. µg/ml	VI Blank Correction BH Cap.Soln. µg	VII Blank Correction BH Rinse µg	VIII Total BH Blank Correction µg	
Aluminum	584.000	0.000	58.800	34.500	0.083	16.633	0.000	16.633	Al
Antimony	2.170	0.000	2.860	<	0.595	0.000	0.000	0.000	Sb
Arsenic	<	0.000	0.000	<	0.833	0.000	0.000	0.000	As
Barium	6.200	0.077	1.400	1.870	0.004	0.733	0.077	0.810	Ba
Beryllium	<	0.000	0.000	<	0.024	0.000	0.000	0.000	Be
Cadmium	1.860	0.000	0.000	0.064	0.000	0.000	0.000	0.000	Cd
Chromium	28.500	0.000	1.030	2.590	0.002	0.312	0.000	0.312	Cr
Cobalt	0.212	0.000	0.000	0.120	0.001	0.156	0.000	0.156	Co
Copper	12.500	0.000	0.000	1.790	0.000	0.000	0.000	0.000	Cu
Lead	24.000	0.000	0.000	0.680	0.000	0.000	0.000	0.000	Pb
Manganese	134.000	0.000	0.741	0.894	0.004	0.757	0.000	0.757	Mn
Nickel	6.850	0.000	3.960	1.700	0.000	0.000	0.000	0.000	Ni
Phosphorus	19.100	0.000	17.000	<	2.380	0.000	0.000	0.000	P
Selenium	<	0.000	0.000	<	1.780	0.000	0.000	0.000	Se
Silver	1.160	0.000	0.000	<	0.238	0.000	0.000	0.000	Ag
Thallium	<	0.000	0.000	<	1.190	0.000	0.000	0.000	Tl
Vanadium	0.352	0.000	0.000	<	0.119	0.000	0.000	0.000	V
Zinc	189.000	0.000	1.520	5.330	0.002	0.423	0.000	0.423	Zn

Lab ID:	23-S624	23-S730	23-S729	23-S625	23-S731	N/A	N/A
Notes:	0.1N HNO ₃	0.1N HNO ₃	5% HNO ₃ /10% H ₂ O ₂	5% HNO ₃ /	5% HNO ₃ /	0.1N HNO ₃	
	FH Filter & Probe Rinse		BH Imps 1-3	10% H ₂ O ₂	10% H ₂ O ₂		
	100ml 0.1N HNO ₃ Rinse		100ml .1N HNO ₃ Rinse				
			200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent				

Blank Rules: <' indicates value is below the method detection limit (MDL).
If blank is '<' it is treated as zero.
If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Cooling Bunker BH Inlet - White Iron
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 1
Test Date: 3/27/2023
Page: 2 of 3

Analyte	X Allowable FH Blank Correction µg	XI Total FH Blank Correction (M _{fhb}) µg	XII 5% of FH Sample µg	XIII Lessor of XI or XII µg	XIV Greater of A or XIII µg	XV FH Net Sample µg	
Aluminum	29.200	58.800	29.200	29.200	29.20	554.800	Al
Antimony	2.860	2.860	0.109	0.109	11.63	-0.690	Sb
Arsenic	0.000	0.000	< 0.088	0.000	11.63	< 1.750	As
Barium	1.477	1.477	0.310	0.310	11.63	4.723	Ba
Beryllium	0.000	0.000	< 0.003	0.000	11.63	< 0.050	Be
Cadmium	0.000	0.000	0.093	0.000	11.63	1.860	Cd
Chromium	1.030	1.030	1.425	1.030	11.63	27.470	Cr
Cobalt	0.000	0.000	0.011	0.000	11.63	0.212	Co
Copper	0.000	0.000	0.625	0.000	11.63	12.500	Cu
Lead	0.000	0.000	1.200	0.000	11.63	24.000	Pb
Manganese	0.741	0.741	6.700	0.741	11.63	133.259	Mn
Nickel	3.960	3.960	0.343	0.343	11.63	2.890	Ni
Phosphorus	11.630	17.000	0.955	0.955	11.63	7.470	P
Selenium	0.000	0.000	< 0.188	0.000	11.63	< 3.750	Se
Silver	0.000	0.000	0.058	0.000	11.63	1.160	Ag
Thallium	0.000	0.000	< 0.125	0.000	11.63	< 2.500	Tl
Vanadium	0.000	0.000	0.018	0.000	11.63	0.352	V
Zinc	1.520	1.520	9.450	1.520	11.63	187.480	Zn

Note: Allowable FH Blank (A) = (area of filter)*(1.4 µg/in²) = 11.63 µg
where area of filter = 8.306 in²

If A > blank > 0, use blank-derived value, M_{fhb}.

If blank > A, use greater of A or [lessor of 5% of sample µg or FH blank].

Blank Rules: < indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

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Eagle Foundry Company
Cooling Bunker BH Inlet - White Iron
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 1
Test Date: 3/27/2023
Page: 3 of 3

Analyte	XVI Allowable BH Blank Correction µg	XVII Total BH (M _{bhb}) Blank Correction µg	XVIII 5% of BH Sample µg	XIX Lessor of XVII or XVIII µg	XX Greater of 1 µg or XIX µg	XXI BH Net Sample µg	XXII FH Net Sample µg	XXIII FH+BH Total Net Sample µg	
Aluminum	1.725	16.633		1.725	1.725	32.775	554.800	587.575	Al
Antimony	0.000	0.000	<	0.030	0.000	0.595	0.000	0.595	Sb
Arsenic	0.000	0.000	<	0.042	0.000	0.833	1.750	2.583	As
Barium	0.810	0.810		0.094	0.094	1.060	4.723	5.783	Ba
Beryllium	0.000	0.000	<	0.001	0.000	0.024	0.050	0.074	Be
Cadmium	0.000	0.000		0.003	0.000	0.064	1.860	1.924	Cd
Chromium	0.312	0.312		0.130	0.130	2.278	27.470	29.748	Cr
Cobalt	0.156	0.156		0.006	0.006	0.000	0.212	0.212	Co
Copper	0.000	0.000		0.090	0.000	1.790	12.500	14.290	Cu
Lead	0.000	0.000		0.034	0.000	0.680	24.000	24.680	Pb
Manganese	0.757	0.757		0.045	0.045	0.137	133.259	133.396	Mn
Nickel	0.000	0.000		0.085	0.000	1.700	2.890	4.590	Ni
Phosphorus	0.000	0.000	<	0.119	0.000	2.380	7.470	9.850	P
Selenium	0.000	0.000	<	0.089	0.000	1.780	3.750	5.530	Se
Silver	0.000	0.000	<	0.012	0.000	0.238	1.160	1.398	Ag
Thallium	0.000	0.000	<	0.060	0.000	1.190	2.500	3.690	Tl
Vanadium	0.000	0.000	<	0.006	0.000	0.119	0.352	0.471	V
Zinc	0.423	0.423		0.267	0.267	4.907	187.480	192.387	Zn

Note: Allowable BH Blank rules:

If 1.00 µg > blank > 0 , use blank-derived value.

If blank > 1.00 µg, use greater of 1.00 µg or [lessor of 5% of sample µg or BH blank].

Blank Rules: <' indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Cooling Bunker BH Inlet - White Iron
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 2
Test Date: 3/28/2023
Page: 1 of 3

	I Sample FH Rinse+Filter µg	II Blank Correction FH Rinse µg	III Blank Correction Filter µg	IV Sample BH Cap.Soln. + BH Rinse µg	V Blank BH Cap.Soln. µg/ml	VI Blank Correction BH Cap.Soln. µg	VII Blank Correction BH Rinse µg	VIII Total BH Blank Correction µg	
Analyte	<								
Aluminum	3460.000	0.000	58.800	19.400	0.083	16.633	0.000	16.633	Al
Antimony	2.690	0.000	2.860	< 0.725	0.000	0.000	0.000	0.000	Sb
Arsenic	< 1.750	0.000	0.000	< 1.020	0.000	0.000	0.000	0.000	As
Barium	16.800	0.077	1.400	1.310	0.004	0.733	0.077	0.810	Ba
Beryllium	0.074	0.000	0.000	< 0.029	0.000	0.000	0.000	0.000	Be
Cadmium	0.338	0.000	0.000	< 0.058	0.000	0.000	0.000	0.000	Cd
Chromium	37.400	0.000	1.030	1.310	0.002	0.312	0.000	0.312	Cr
Cobalt	0.455	0.000	0.000	0.084	0.001	0.156	0.000	0.156	Co
Copper	25.600	0.000	0.000	0.836	0.000	0.000	0.000	0.000	Cu
Lead	19.100	0.000	0.000	< 0.725	0.000	0.000	0.000	0.000	Pb
Manganese	432.000	0.000	0.741	1.510	0.004	0.757	0.000	0.757	Mn
Nickel	14.300	0.000	3.960	0.563	0.000	0.000	0.000	0.000	Ni
Phosphorus	47.800	0.000	17.000	< 2.900	0.000	0.000	0.000	0.000	P
Selenium	< 3.750	0.000	0.000	< 2.180	0.000	0.000	0.000	0.000	Se
Silver	1.020	0.000	0.000	0.433	0.000	0.000	0.000	0.000	Ag
Thallium	< 2.500	0.000	0.000	< 1.450	0.000	0.000	0.000	0.000	Tl
Vanadium	2.080	0.000	0.000	< 0.145	0.000	0.000	0.000	0.000	V
Zinc	194.000	0.000	1.520	2.050	0.002	0.423	0.000	0.423	Zn

Lab ID:	23-S629	23-S730	23-S729	23-S630	23-S731	N/A	N/A
Content:	0.1N HNO ₃ FH Filter & Probe Rinse 100ml 0.1N HNO ₃ Rinse	0.1N HNO ₃	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	5% HNO ₃ / 10% H ₂ O ₂	5%HNO ₃ / 10%H ₂ O ₂	0.1NHNO ₃	

Blank Rules: < indicates value is below the method detection limit (MDL).
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Eagle Foundry Company
Cooling Bunker BH Inlet - White Iron
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 2
Test Date: 3/28/2023
Page: 2 of 3

	X Allowable FH Blank Correction	XI Total FH Blank Correction	XII 5% of FH Sample	XIII Lessor of XI or XII	XIV Greater of A or XIII	XV FH Net Sample	
Analyte	µg	µg	µg	µg	µg	µg	
Aluminum	58.800	58.800	173.000	58.800	58.80	3401.200	Al
Antimony	2.860	2.860	0.135	0.135	11.63	-0.170	Sb
Arsenic	0.000	0.000	0.088	0.000	11.63	1.750	As
Barium	1.477	1.477	0.840	0.840	11.63	15.323	Ba
Beryllium	0.000	0.000	0.004	0.000	11.63	0.074	Be
Cadmium	0.000	0.000	0.017	0.000	11.63	0.338	Cd
Chromium	1.030	1.030	1.870	1.030	11.63	36.370	Cr
Cobalt	0.000	0.000	0.023	0.000	11.63	0.455	Co
Copper	0.000	0.000	1.280	0.000	11.63	25.600	Cu
Lead	0.000	0.000	0.955	0.000	11.63	19.100	Pb
Manganese	0.741	0.741	21.600	0.741	11.63	431.259	Mn
Nickel	3.960	3.960	0.715	0.715	11.63	10.340	Ni
Phosphorus	11.630	17.000	2.390	2.390	11.63	36.170	P
Selenium	0.000	0.000	0.188	0.000	11.63	3.750	Se
Silver	0.000	0.000	0.051	0.000	11.63	1.020	Ag
Thallium	0.000	0.000	0.125	0.000	11.63	2.500	Tl
Vanadium	0.000	0.000	0.104	0.000	11.63	2.080	V
Zinc	1.520	1.520	9.700	1.520	11.63	192.480	Zn

Note: Allowable FH Blank (A) = (area of filter)*(1.4 µg/in²) = 11.63 µg
where area of filter = 8.306 in²

If A > blank > 0, use blank-derived value.

If blank > A, use greater of A or [lessor of 5% of sample µg or FH blank].

Blank Rules: <' indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Cooling Bunker BH Inlet - White Iron
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 2
Test Date: 3/28/2023
Page: 3 of 3

Analyte	XVI Allowable BH Blank Correction µg	XVII Total BH Blank Correction µg	XVIII 5% of BH Sample µg	XIX Lessor of XVII or XVIII µg	XX Greater of 1 µg or XIX µg	XXI BH Net Sample µg	XXII FH Net Sample µg	XXIII FH+BH Total Net Sample µg	
Aluminum	1.000	16.633	0.970	0.970	1.000	18.400	3401.200	3419.600	Al
Antimony	0.000	0.000	< 0.036	0.000	1.000	< 0.725	0.000	< 0.725	Sb
Arsenic	0.000	0.000	< 0.051	0.000	1.000	< 1.020	< 1.750	< 2.770	As
Barium	0.810	0.810	0.066	0.066	1.000	0.500	15.323	15.823	Ba
Beryllium	0.000	0.000	< 0.001	0.000	1.000	< 0.029	0.074	< 0.103	Be
Cadmium	0.000	0.000	< 0.003	0.000	1.000	< 0.058	0.338	< 0.396	Cd
Chromium	0.312	0.312	0.066	0.066	1.000	0.998	36.370	37.368	Cr
Cobalt	0.156	0.156	0.004	0.004	1.000	0.000	0.455	0.455	Co
Copper	0.000	0.000	0.042	0.000	1.000	0.836	25.600	26.436	Cu
Lead	0.000	0.000	< 0.036	0.000	1.000	< 0.725	19.100	< 19.825	Pb
Manganese	0.757	0.757	0.076	0.076	1.000	0.753	431.259	432.012	Mn
Nickel	0.000	0.000	0.028	0.000	1.000	0.563	10.340	10.903	Ni
Phosphorus	0.000	0.000	< 0.145	0.000	1.000	< 2.900	36.170	< 39.070	P
Selenium	0.000	0.000	< 0.109	0.000	1.000	< 2.180	< 3.750	< 5.930	Se
Silver	0.000	0.000	0.022	0.000	1.000	0.433	1.020	1.453	Ag
Thallium	0.000	0.000	< 0.073	0.000	1.000	< 1.450	< 2.500	< 3.950	Tl
Vanadium	0.000	0.000	< 0.007	0.000	1.000	< 0.145	2.080	< 2.225	V
Zinc	0.423	0.423	0.103	0.103	1.000	1.627	192.480	194.107	Zn

Note: Allowable BH Blank rules:

If 1.00 µg > blank > 0, use blank-derived value.

If blank > 1.00 µg, use greater of 1.00 µg or [lessor of 5% of sample µg or BH blank].

Blank Rules: '<' indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Cooling Bunker BH Inlet - White Iron
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 3
Test Date: 3/29/2023
Page: 1 of 3

	I Sample FH Rinse+Filter µg	II Blank Correction FH Rinse µg	III Blank Correction Filter µg	IV Sample BH Cap.Soln. + BH Rinse µg	V Blank BH Cap.Soln. µg/ml	VI Blank Correction BH Cap.Soln. µg	VII Blank Correction BH Rinse µg	VIII Total BH Blank Correction µg	
Analyte	<								
Aluminum	1900.000	0.000	58.800	25.400	0.083	16.633	0.000	16.633	Al
Antimony	2.360	0.000	2.860	< 0.635	0.000	0.000	0.000	0.000	Sb
Arsenic	< 1.750	0.000	0.000	< 0.889	0.000	0.000	0.000	0.000	As
Barium	11.600	0.077	1.400	1.260	0.004	0.733	0.077	0.810	Ba
Beryllium	< 0.050	0.000	0.000	< 0.025	0.000	0.000	0.000	0.000	Be
Cadmium	0.359	0.000	0.000	< 0.051	0.000	0.000	0.000	0.000	Cd
Chromium	26.200	0.000	1.030	0.959	0.002	0.312	0.000	0.312	Cr
Cobalt	0.294	0.000	0.000	< 0.064	0.001	0.156	0.000	0.156	Co
Copper	24.200	0.000	0.000	1.810	0.000	0.000	0.000	0.000	Cu
Lead	17.700	0.000	0.000	< 0.635	0.000	0.000	0.000	0.000	Pb
Manganese	414.000	0.000	0.741	4.130	0.004	0.757	0.000	0.757	Mn
Nickel	10.700	0.000	3.960	0.488	0.000	0.000	0.000	0.000	Ni
Phosphorus	38.000	0.000	17.000	< 2.540	0.000	0.000	0.000	0.000	P
Selenium	< 3.750	0.000	0.000	< 1.900	0.000	0.000	0.000	0.000	Se
Silver	1.100	0.000	0.000	< 0.254	0.000	0.000	0.000	0.000	Ag
Thallium	< 2.500	0.000	0.000	< 1.270	0.000	0.000	0.000	0.000	Tl
Vanadium	1.370	0.000	0.000	< 0.127	0.000	0.000	0.000	0.000	V
Zinc	265.000	0.000	1.520	2.030	0.002	0.423	0.000	0.423	Zn

Lab ID:	23-S634	23-S730	23-S729	23-S635	23-S731	N/A	N/A
Content:	0.1N HNO ₃ FH Filter & Probe Rinse 100ml 0.1N HNO ₃ Rinse	0.1N HNO ₃	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	0.1N HNO ₃

Blank Rules: < indicates value is below the method detection limit (MDL).
If blank is '<' it is treated as zero.
If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Cooling Bunker BH Inlet - White Iron
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 3
Test Date: 3/29/2023
Page: 2 of 3

Analyte	X Allowable FH Blank Correction µg	XI Total FH Blank Correction µg	XII 5% of FH Sample µg	XIII Lessor of XI or XII µg	XIV Greater of A or XIII µg	XV FH Net Sample µg	
Aluminum	58.800	58.800	95.000	58.800	58.80	1841.200	Al
Antimony	2.860	2.860	0.118	0.118	11.63	-0.500	Sb
Arsenic	0.000	0.000	< 0.088	0.000	11.63	< 1.750	As
Barium	1.477	1.477	0.580	0.580	11.63	10.123	Ba
Beryllium	0.000	0.000	< 0.003	0.000	11.63	< 0.050	Be
Cadmium	0.000	0.000	0.018	0.000	11.63	0.359	Cd
Chromium	1.030	1.030	1.310	1.030	11.63	25.170	Cr
Cobalt	0.000	0.000	0.015	0.000	11.63	0.294	Co
Copper	0.000	0.000	1.210	0.000	11.63	24.200	Cu
Lead	0.000	0.000	0.885	0.000	11.63	17.700	Pb
Manganese	0.741	0.741	20.700	0.741	11.63	413.259	Mn
Nickel	3.960	3.960	0.535	0.535	11.63	6.740	Ni
Phosphorus	11.630	17.000	1.900	1.900	11.63	26.370	P
Selenium	0.000	0.000	< 0.188	0.000	11.63	< 3.750	Se
Silver	0.000	0.000	0.055	0.000	11.63	1.100	Ag
Thallium	0.000	0.000	< 0.125	0.000	11.63	< 2.500	Tl
Vanadium	0.000	0.000	0.069	0.000	11.63	1.370	V
Zinc	1.520	1.520	13.250	1.520	11.63	263.480	Zn

Note: Allowable FH Blank (A) = (area of filter)*(1.4 µg/in²) = 11.63 µg
where area of filter = 8.306 in²

If A > blank > 0, use blank-derived value.

If blank > A, use greater of A or [lessor of 5% of sample µg or FH blank].

Blank Rules: < indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Cooling Bunker BH Inlet - White Iron
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 3
Test Date: 3/29/2023
Page: 3 of 3

Analyte	XVI Allowable BH Blank Correction µg	XVII Total BH Blank Correction µg	XVIII 5% of BH Sample µg	XIX Lessor of XVII or XVIII µg	XX Greater of 1 µg or XIX µg	XXI BH Net Sample µg	XXII FH Net Sample µg	XXIII FH+BH Total Net Sample µg	
Aluminum	1.270	16.633	1.270	1.270	1.270	24.130	1841.200	1865.330	Al
Antimony	0.000	0.000	< 0.032	0.000	1.000	< 0.635	0.000	< 0.635	Sb
Arsenic	0.000	0.000	< 0.044	0.000	1.000	< 0.889	< 1.750	< 2.639	As
Barium	0.810	0.810	0.063	0.063	1.000	0.450	10.123	10.573	Ba
Beryllium	0.000	0.000	< 0.001	0.000	1.000	< 0.025	< 0.050	< 0.075	Be
Cadmium	0.000	0.000	< 0.003	0.000	1.000	< 0.051	< 0.359	< 0.410	Cd
Chromium	0.312	0.312	0.048	0.048	1.000	0.647	25.170	25.817	Cr
Cobalt	0.156	0.156	< 0.003	0.156	1.000	0.000	0.294	0.294	Co
Copper	0.000	0.000	0.091	0.000	1.000	1.810	24.200	26.010	Cu
Lead	0.000	0.000	< 0.032	0.000	1.000	< 0.635	< 17.700	< 18.335	Pb
Manganese	0.757	0.757	0.207	0.207	1.000	3.373	413.259	416.632	Mn
Nickel	0.000	0.000	0.024	0.000	1.000	0.488	6.740	7.228	Ni
Phosphorus	0.000	0.000	< 0.127	0.000	1.000	< 2.540	< 26.370	< 28.910	P
Selenium	0.000	0.000	< 0.095	0.000	1.000	< 1.900	< 3.750	< 5.650	Se
Silver	0.000	0.000	< 0.013	0.000	1.000	< 0.254	< 1.100	< 1.354	Ag
Thallium	0.000	0.000	< 0.064	0.000	1.000	< 1.270	< 2.500	< 3.770	Tl
Vanadium	0.000	0.000	< 0.006	0.000	1.000	< 0.127	< 1.370	< 1.497	V
Zinc	0.423	0.423	0.102	0.102	1.000	1.607	263.480	265.087	Zn

Note: Allowable BH Blank rules:

If 1.00 µg > blank > 0, use blank-derived value.

If blank > 1.00 µg, use greater of 1.00 µg or [lessor of 5% of sample µg or BH blank].

Blank Rules: '<' indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Cooling Bunker BH Inlet - White Iron
Mercury Blank Correction Calculations

Blank Lab Values

Analyte	Filter Cont. 12 µg/filter		BH Imps. 2&3 Cap.Soln. Cont. 9 5% HNO ₃ / 10% H ₂ O ₂ µg/sample		FH/BH Rinse Cont. 8A 0.1 N HNO ₃ µg/sample		BH Imps. 5&6 Rinse Cont. 8B H ₂ O µg/sample		BH Imps. 5&6 Cap.Soln. + Rinse Cont. 10 KMnO ₄ µg/sample		BH Imps. 5&6 Rinse Cont. 11 HCl µg/sample	
	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Result	MDL
Mercury	0.0406	0.0219	0.118	0.0172	< MDL	0.0219	< MDL	0.0295	0.0628	0.0163	< MDL	0.0108

Lab ID: 23-S729 23-S731 23-S730 23-S732 23-S733 23-S734
Blank vol, ml: NA 196 250 337 186 124

Blank Correction Values

Analyte: Mercury	Blank FH HNO ₃ Rinse µg	Blank Filter µg	Blank BH Cap.Soln. µg	Blank BH HNO ₃ Rinse µg	Blank BH H ₂ O Rinse µg	Blank BH KMnO ₄ Cap.Soln. + Rinse µg	Blank BH HCl Rinse µg	Total Blank Correction µg	Is Total Blank Correction ≥ 0 and ≤ 0.6?
Run 1	0.00	0.0406	0.12	0.00	0.00	0.10	0.00	0.2623	Yes
Reagent vol, ml	100.0		200.0	200.0	100.0	300.0	225.0		
Run 2	0.00	0.0406	0.12	0.00	0.00	0.10	0.00	0.2623	Yes
Reagent vol, ml	100.0		200.0	200.0	100.0	300.0	225.0		
Run 3	0.00	0.0406	0.12	0.00	0.00	0.10	0.00	0.2623	Yes
Reagent vol, ml	100.0		200.0	200.0	100.0	300.0	225.0		

Notes: 0.1N HNO₃ FH Filter 5% HNO₃/ 10% H₂O₂ 0.1N HNO₃ H₂O 4% KMnO₄/ 10% H₂SO₄ 25 ml 8N HCl/
FH Probe Rinse BH Imps 1-4 BH Imps 5&6 BH Imps 5&6 BH Imps 5&6

Blank Corrected Results

Analyte: Mercury	Sample FH Rinse + Filter Cont. 1&3 µg	Sample BH Cap.Soln. + HNO ₃ Rinse Cont. 4 µg	Sample BH Imp. 4 + Rinse Cont. 5A µg	Sample BH Imps. 5&6 + Rinses Cont. 5B µg	Sample BH HCl Rinse + Water Cont. 5C µg	Total Sample µg	Total Blank Correction µg	Total Net Sample µg
Run 1	< 0.0219	0.134	0.00664	0.141	< 0.0198	< 0.3233	0.2623	< 0.0610
Lab ID	23-S624	23-S625	23-S626	23-S627	23-S628			
Run 2	< 0.0219	0.176	0.00735	0.131	< 0.0198	< 0.3561	0.2623	< 0.0938
Lab ID	23-S629	23-S630	23-S631	23-S632	23-S633			
Run 3	< 0.0219	0.169	0.00910	0.117	< 0.0196	< 0.3366	0.2623	< 0.0743
Lab ID	23-S634	23-S635	23-S636	23-S637	23-S638			

Blank Rules: < indicates value is below the method detection limit (MDL)
If blank is '<' it is treated as zero.
If sample is '<' it is used for emission rate calculations but results are preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.
If the total blank correction value is less than or equal to 0.6 µg, subtract the total blank correction value from the total sample value to determine total net Hg. Otherwise, the value used for the blank correction shall be the greater of (1) 0.6 µg or (2) the lesser of [total FH blank + total BH blank] or 5% of the total sample value

EPA Method 29
Gas Stream Characteristics
Test Summary

Client: Eagle Foundry Company
Source: Cooling Bunker BH Inlet - White Iron
Location: Eagle Creek, OR

Parameter	Units	Run 1	Run 2	Run 3	
Date		3/27/2023	3/28/2023	3/29/2023	
Run Start Time		6:40	5:10	5:15	
Run End Time		10:40	9:10	9:15	
Duration	minutes	240	240	240	Average
Barometric Pressure	inHg	29.98	29.41	29.41	29.60
Nozzle Diameter	inches	0.250	0.250	0.250	0.250
Isokinetic Average	%	100.6	100.7	100.8	100.7
Sample Volume	dscf	292.604	274.574	318.952	295.377
Sample Volume	dscm	8.286	7.775	9.032	8.364
Stack Diameter	inches	48.00	48.00	48.00	48.00
Stack Area	ft ²	12.566	12.566	12.566	12.566
CO ₂	%vd	0.07	0.06	0.07	0.07
O ₂	%vd	20.79	20.73	20.92	20.81
Static Pressure	inH ₂ O	-0.90	-0.90	-0.90	-0.90
H ₂ O	%v	0.51	0.28	0.25	0.35
Wet Molecular Weight	lb/lb-mole	28.78	28.81	28.82	28.80
Velocity	fps	56.73	55.11	62.92	58.25
Flow Rate	adcfm	42,554	41,435	47,320	43,770
	acfm	42,772	41,551	47,439	43,921
	dscfm	44,670	41,875	48,592	45,046
Stack Temperature	°F	42.9	52.4	44.3	46.5
Production Data	lb melt/pour	11,955.985	12,165.997	11,960.006	
	ton melt/pour	5.978	6.083	5.980	
	lb Cr/melt	3,106.941	3,124.611	3,071.140	
	ton Cr/melt	1.553	1.562	1.536	
	lb Mn/melt	120.685	126.908	122.799	
	ton Mn/melt	0.060	0.063	0.061	

Run 1											
Analyte	Total				FH Net			BH Net			
	µg	µg/dscm	lb/hr	lb/ton melt	µg	µg/dscm	lb/hr	µg	µg/dscm	lb/hr	
Aluminum	587.575	70.912	1.19E-02	7.94E-03	554.800	66.956	1.12E-02	32.775	3.955	6.62E-04	Al
Antimony	< 0.595	< 0.072	< 1.20E-05	< 8.04E-06	0.000	0.000	0.00E+00	< 0.595	< 0.072	< 1.20E-05	Sb
Arsenic	< 2.583	< 0.312	< 5.22E-05	< 3.49E-05	< 1.750	< 0.211	< 3.53E-05	< 0.833	< 0.101	< 1.68E-05	As
Barium	5.783	0.698	1.17E-04	7.81E-05	4.723	0.570	9.54E-05	1.060	0.128	2.14E-05	Ba
Beryllium	< 0.074	< 0.009	< 1.49E-06	< 1.00E-06	< 0.050	< 0.006	< 1.01E-06	< 0.024	< 0.003	< 4.85E-07	Be
Cadmium	1.924	0.232	3.89E-05	2.60E-05	1.860	0.224	3.76E-05	0.064	0.008	1.29E-06	Cd
Chromium	29.748	3.590	6.01E-04		27.470	3.315	5.55E-04	2.278	0.275	4.60E-05	Cr
Cobalt	0.212	0.026	4.28E-06	2.86E-06	0.212	0.026	4.28E-06	0.000	0.000	0.00E+00	Co
Copper	14.290	1.725	2.89E-04	1.93E-04	12.500	1.509	2.52E-04	1.790	0.216	3.61E-05	Cu
Lead	24.680	2.979	4.98E-04	3.33E-04	24.000	2.896	4.85E-04	0.680	0.082	1.37E-05	Pb
Manganese	133.396	16.099	2.69E-03		133.259	16.082	2.69E-03	0.137	0.017	2.77E-06	Mn
Mercury	< 0.061	< 0.007	< 1.23E-06	< 8.25E-07							Hg
Nickel	4.590	0.554	9.27E-05	6.20E-05	2.890	0.349	5.84E-05	1.700	0.205	3.43E-05	Ni
Phosphorus	< 9.850	< 1.189	< 1.99E-04	< 1.33E-04	7.470	0.902	1.51E-04	< 2.380	< 0.287	< 4.81E-05	P
Selenium	< 5.530	< 0.667	< 1.12E-04	< 7.47E-05	< 3.750	< 0.453	< 7.57E-05	< 1.780	< 0.215	< 3.59E-05	Se
Silver	< 1.398	< 0.169	< 2.82E-05	< 1.89E-05	1.160	0.140	2.34E-05	< 0.238	< 0.029	< 4.81E-06	Ag
Thallium	< 3.690	< 0.445	< 7.45E-05	< 4.99E-05	< 2.500	< 0.302	< 5.05E-05	< 1.190	< 0.144	< 2.40E-05	Tl
Vanadium	< 0.471	< 0.057	< 9.51E-06	< 6.36E-06	0.352	0.042	7.11E-06	< 0.119	< 0.014	< 2.40E-06	V
Zinc	192.387	23.218	3.88E-03	2.60E-03	187.480	22.626	3.79E-03	4.907	0.592	9.91E-05	Zn

Chromium	lb Cr / ton Cr in melt =	1.55E-03
Manganese	lb Mn / ton Mn in melt =	1.79E-01

Run 1 Emission Factors

Run 2											
Analyte	Total				FH Net			BH Net			
	µg	µg/dscm	lb/hr	lb/ton melt	µg	µg/dscm	lb/hr	µg	µg/dscm	lb/hr	
Aluminum	3419.600	439.820	6.90E-02	4.54E-02	3401.200	437.453	6.86E-02	18.400	2.367	3.71E-04	Al
Antimony	< 0.725	< 0.093	< 1.46E-05	< 9.62E-06	0.000	0.000	0.00E+00	< 0.725	< 0.093	< 1.46E-05	Sb
Arsenic	< 2.770	< 0.356	< 5.59E-05	< 3.67E-05	< 1.750	< 0.225	< 3.53E-05	< 1.020	< 0.131	< 2.06E-05	As
Barium	15.823	2.035	3.19E-04	2.10E-04	15.323	1.971	3.09E-04	0.500	0.064	1.01E-05	Ba
Beryllium	< 0.103	< 0.013	< 2.08E-06	< 1.37E-06	0.074	0.010	1.49E-06	< 0.029	< 0.004	< 5.85E-07	Be
Cadmium	< 0.396	< 0.051	< 7.99E-06	< 5.25E-06	0.338	0.043	6.82E-06	< 0.058	< 0.007	< 1.17E-06	Cd
Chromium	37.368	4.806	7.54E-04		36.370	4.678	7.34E-04	0.998	0.128	2.01E-05	Cr
Cobalt	0.455	0.059	9.18E-06	6.04E-06	0.455	0.059	9.18E-06	0.000	0.000	0.00E+00	Co
Copper	26.436	3.400	5.33E-04	3.51E-04	25.600	3.293	5.16E-04	0.836	0.108	1.69E-05	Cu
Lead	< 19.825	< 2.550	< 4.00E-04	< 2.63E-04	19.100	2.457	3.85E-04	< 0.725	< 0.093	< 1.46E-05	Pb
Manganese	432.012	55.564	8.72E-03		431.259	55.467	8.70E-03	0.753	0.097	1.52E-05	Mn
Mercury	< 0.094	< 0.012	< 1.89E-06	< 1.24E-06							Hg
Nickel	10.903	1.402	2.20E-04	1.45E-04	10.340	1.330	2.09E-04	0.563	0.072	1.14E-05	Ni
Phosphorus	< 39.070	< 5.025	< 7.88E-04	< 5.18E-04	36.170	4.652	7.30E-04	< 2.900	< 0.373	< 5.85E-05	P
Selenium	< 5.930	< 0.763	< 1.20E-04	< 7.87E-05	< 3.750	< 0.482	< 7.57E-05	< 2.180	< 0.280	< 4.40E-05	Se
Silver	1.453	0.187	2.93E-05	1.93E-05	1.020	0.131	2.06E-05	0.433	0.056	8.74E-06	Ag
Thallium	< 3.950	< 0.508	< 7.97E-05	< 5.24E-05	< 2.500	< 0.322	< 5.04E-05	< 1.450	< 0.186	< 2.93E-05	Tl
Vanadium	< 2.225	< 0.286	< 4.49E-05	< 2.95E-05	2.080	0.268	4.20E-05	< 0.145	< 0.019	< 2.93E-06	V
Zinc	194.107	24.966	3.92E-03	2.57E-03	192.480	24.756	3.88E-03	1.627	0.209	3.28E-05	Zn

Chromium	lb Cr / ton Cr in melt =	1.93E-03
Manganese	lb Mn / ton Mn in melt =	5.49E-01

Run 2 Emission Factors

Note: Results for Hg front half and back half fractions are not shown because these values are not blank-corrected. Per EPA Method 29, only the sum of Hg front and back half results is subject to blank correction.

'<' denotes results which were calculated using the method detection limit for front half or back half results that were non-detect.

Run 3										
Analyte	Total				FH Net			BH Net		
	µg	µg/dscm	lb/hr	lb/ton melt	µg	µg/dscm	lb/hr	µg	µg/dscm	lb/hr
Aluminum	1865.330	206.525	3.76E-02	2.51E-02	1841.200	203.853	3.71E-02	24.130	2.672	4.86E-04
Antimony	< 0.635	< 0.070	< 1.28E-05	< 8.56E-06	0.000	0.000	0.00E+00	< 0.635	< 0.070	< 1.28E-05
Arsenic	< 2.639	< 0.292	< 5.32E-05	< 3.56E-05	< 1.750	< 0.194	< 3.53E-05	< 0.889	< 0.098	< 1.79E-05
Barium	10.573	1.171	2.13E-04	1.43E-04	10.123	1.121	2.04E-04	0.450	0.050	9.06E-06
Beryllium	< 0.075	< 0.008	< 1.51E-06	< 1.01E-06	< 0.050	< 0.006	< 1.01E-06	< 0.025	< 0.003	< 5.04E-07
Cadmium	< 0.410	< 0.045	< 8.26E-06	< 5.53E-06	0.359	0.040	7.23E-06	< 0.051	< 0.006	< 1.03E-06
Chromium	25.817	2.858	5.20E-04		25.170	2.787	5.07E-04	0.647	0.072	1.30E-05
Cobalt	0.294	0.033	5.93E-06	3.96E-06	0.294	0.033	5.93E-06	0.000	0.000	0.00E+00
Copper	26.010	2.880	5.24E-04	3.51E-04	24.200	2.679	4.88E-04	1.810	0.200	3.65E-05
Lead	< 18.335	< 2.030	< 3.69E-04	< 2.47E-04	17.700	1.960	3.57E-04	< 0.635	< 0.070	< 1.28E-05
Manganese	416.632	46.128	8.40E-03		413.259	45.755	8.33E-03	3.373	0.373	6.80E-05
Mercury	< 0.074	< 0.008	< 1.50E-06	< 1.00E-06						
Nickel	7.228	0.800	1.46E-04	9.74E-05	6.740	0.746	1.36E-04	0.488	0.054	9.83E-06
Phosphorus	< 28.910	< 3.201	< 5.83E-04	< 3.90E-04	26.370	2.920	5.31E-04	< 2.540	< 0.281	< 5.12E-05
Selenium	< 5.650	< 0.626	< 1.14E-04	< 7.62E-05	< 3.750	< 0.415	< 7.56E-05	< 1.900	< 0.210	< 3.83E-05
Silver	< 1.354	< 0.150	< 2.73E-05	< 1.83E-05	1.100	0.122	2.22E-05	< 0.254	< 0.028	< 5.12E-06
Thallium	< 3.770	< 0.417	< 7.60E-05	< 5.08E-05	< 2.500	< 0.277	< 5.04E-05	< 1.270	< 0.141	< 2.56E-05
Vanadium	< 1.497	< 0.166	< 3.02E-05	< 2.02E-05	1.370	0.152	2.76E-05	< 0.127	< 0.014	< 2.56E-06
Zinc	265.087	29.350	5.34E-03	3.57E-03	263.480	29.172	5.31E-03	1.607	0.178	3.24E-05

Chromium	lb Cr / ton Cr in melt =	1.36E-03
Manganese	lb Mn / ton Mn in melt =	5.47E-01

Run 3 Emission Factors

Mean Runs 1-3										
Analyte	Total				FH Net			BH Net		
	µg	µg/dscm	lb/hr	lb/ton melt	µg	µg/dscm	lb/hr	µg	µg/dscm	lb/hr
Aluminum	1957.502	239.085	3.95E-02	2.61E-02	1932.400	236.088	3.90E-02	25.102	2.998	5.06E-04
Antimony	< 0.652	< 0.078	< 1.31E-05	< 8.74E-06	0.000	0.000	0.00E+00	< 0.652	< 0.078	< 1.31E-05
Arsenic	< 2.664	< 0.320	< 5.37E-05	< 3.57E-05	< 1.750	< 0.210	< 3.53E-05	< 0.914	< 0.110	< 1.84E-05
Barium	10.726	1.301	2.16E-04	1.44E-04	10.056	1.221	2.03E-04	0.670	0.081	1.35E-05
Beryllium	< 0.084	< 0.010	< 1.69E-06	< 1.13E-06	< 0.058	< 0.007	< 1.17E-06	< 0.026	< 0.003	< 5.25E-07
Cadmium	< 0.910	< 0.110	< 1.84E-05	< 1.23E-05	0.852	0.103	1.72E-05	< 0.058	< 0.007	< 1.16E-06
Chromium	30.978	3.752	6.25E-04		29.670	3.593	5.99E-04	1.308	0.158	2.64E-05
Cobalt	0.320	0.039	6.46E-06	4.29E-06	0.320	0.039	6.46E-06	0.000	0.000	0.00E+00
Copper	22.245	2.668	4.49E-04	2.98E-04	20.767	2.494	4.19E-04	1.479	0.175	2.98E-05
Lead	< 20.947	< 2.519	< 4.23E-04	< 2.81E-04	20.267	2.438	4.09E-04	< 0.680	< 0.082	< 1.37E-05
Manganese	327.347	39.264	6.60E-03		325.926	39.102	6.57E-03	1.421	0.162	2.86E-05
Mercury	< 0.076	< 0.009	< 1.54E-06	< 1.02E-06						
Nickel	7.574	0.919	1.53E-04	1.01E-04	6.657	0.808	1.34E-04	0.917	0.111	1.85E-05
Phosphorus	< 25.943	< 3.138	< 5.23E-04	< 3.47E-04	23.337	2.824	4.71E-04	< 2.607	< 0.314	< 5.26E-05
Selenium	< 5.703	< 0.685	< 1.15E-04	< 7.65E-05	< 3.750	< 0.450	< 7.56E-05	< 1.953	< 0.235	< 3.94E-05
Silver	< 1.402	< 0.169	< 2.83E-05	< 1.88E-05	1.093	0.131	2.21E-05	< 0.308	< 0.038	< 6.22E-06
Thallium	< 3.803	< 0.457	< 7.67E-05	< 5.10E-05	< 2.500	< 0.300	< 5.04E-05	< 1.303	< 0.157	< 2.63E-05
Vanadium	< 1.398	< 0.170	< 2.82E-05	< 1.87E-05	1.267	0.154	2.56E-05	< 0.130	< 0.016	< 2.63E-06
Zinc	217.194	25.845	4.38E-03	2.92E-03	214.480	25.518	4.33E-03	2.714	0.326	5.48E-05

Chromium	lb Cr / ton Cr in melt =	1.61E-03
Manganese	lb Mn / ton Mn in melt =	4.25E-01

Mean Runs 1-3

Note: Results for Hg front half and back half fractions are not shown because these values are not blank-corrected. Per EPA Method 29, only the sum of Hg front and back half results is subject to blank correction.

'<' denotes results which were calculated using the method detection limit for front half or back half results that were non-detect.



COMPANY	Eagle Foundry Company
FACILITY	Eagle Foundry
LOCATION	Eagle Creek, OR
SOURCE	Cooling Bunker BH Outlet - White Iron
DATE	3/27/2023 - 3/29/2023
METHOD	29
POLLUTANT	Metals

EPA Method 1
Stack Parameters and Traverse Points

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Cooling Bunker BH Outlet - White Iron
Facility: Eagle Foundry

Type of Testing: P (P for Particulate; V for Velocity/Nonparticulate)
Type of Duct: C (C for circular; R for rectangular)

Number of ports available: 2
Number of ports to be used: 2
Port diameter: 4 inches
Sampling location height (approx.): feet
Stack height (approx.): feet

Circular ID (Rectangular Depth): 55.75 inches
Port depth and/or wall thickness: 6.50 inches
Stack width (Rectangular only): inches

Equivalent Diameter
If rectangular = $\frac{2 * \text{Depth} * \text{Width}}{\text{Depth} + \text{Width}}$ = 55.75 inches (If circular = duct ID)

Stack/duct area = 16.952 sq.feet 2441.1 sq. inches

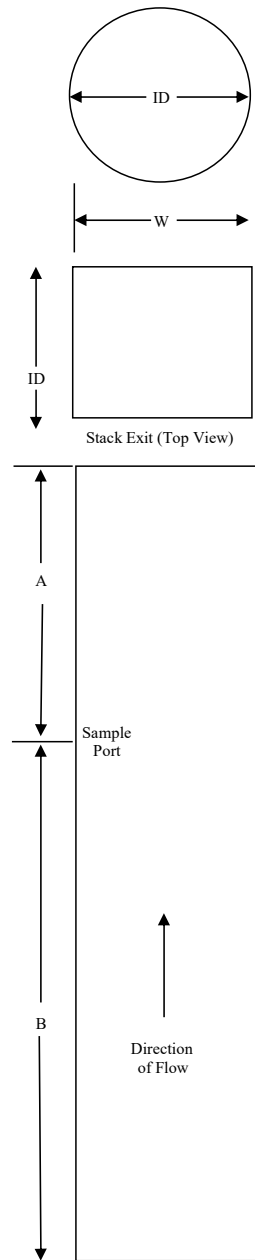
Sample Port Location: Downstream flow disturbance from process Upstream flow disturbance toward exit
Number of Inches: 246.00 45.00
Number of Diameters: 4.41 0.81

Minimum Number of Traverse Points: 24

Traverse points less than 1.0 inch from the stack wall are relocated to a distance of 1.0 inch.

Points	% of diameter	Distance from inside wall (in.)	Distance including port (in.)
1	2.1	1.17	7 5/8
2	6.7	3.74	10 1/4
3	11.8	6.58	13 1/8
4	17.7	9.87	16 3/8
5	25.0	13.94	20 1/2
6	35.6	19.85	26 3/8
7	64.4	35.90	42 3/8
8	75.0	41.81	48 3/8
9	82.3	45.88	52 3/8
10	88.2	49.17	55 5/8
11	93.3	52.01	58 1/2
12	97.9	54.58	61 1/8

Reference Diagram



Drawing NOT to scale and NOT an accurate representation of stack.

Pre-Test Traverse

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Cooling Bunker BH Outlet - White Iron

Stack Temp: 58 °F

Traverse Point	Velocity ΔP ("H ₂ O)	Null Angle
1	0.67	0
2	0.71	5
3	0.73	0
4	0.69	5
5	0.65	5
6	0.69	0
7	0.72	5
8	0.76	0
9	0.75	5
10	0.72	0
11	0.71	5
12	0.62	5

Average: 0.70 3

Flow is found to be: Non-cyclonic

Isokinetic Field Data
Field Data Entry

Client:	Eagle Foundry Company	Run:	1
Location:	Eagle Creek, OR	Start Time:	6:40
Source:	Cooling Bunker BH Outlet - White Iron	End Time:	10:40
EPA Method:	29	Environmental Conditions/Test Notes:	Date: 3/27/2023
Box Operator:	JCR	mostly cloudy and 30s °F	
Technician(s):	AJV		

Stack Dimensional Data:		Equipment:					
Circular		Meterbox ID	12	Probe ID	7C	Liner type	GLASS
Diameter	55.750 in	Y factor	1.0267	Nozzle ID	0.266	Nozzle size	0.266 inches
Rectangular		ΔH@	1.800	Hot box ID	HHB4	Nozzle area	0.000386 sq.ft.
Width	in	Bp ID	TS1	Pitot Cp	0.84	Probe heat	250 °F
Length	in	Balance ID	HLN FB-1	Pitot ID	7C	Filter heat	250 °F
Stack Area	16.952 sq.ft.	Weights ID	HLN FW-1	Probe Length, ft	7		

Source Information:				Leak Checks:			
Barometric Pressure	29.88 "Hg	O ₂	20.90 %		Pre-test	Post-test	
Static Pressure	1 "H ₂ O	CO ₂	0.00 %	Pitot	X	X	
Ave. ΔP	0.7 "H ₂ O	Rec. Nz.	0.223 inches	Leak rate, dcf	0.000	0.000	
Stack Temperature	60 °F			Leak check vacuum, "Hg	10	11	
Assumed moisture	3.00 %			Nozzle check for roundness:			
Assumed meter temp.	65 °F			1	2	3	
Total number of points	24			0.265	0.266	0.267 inches	
Time per point	10 min.				Caliper ID	WS1	
Total run time	240 min.						

Post Test Calculations:				Moisture/Lab:			
Sample volume	239.654 dcf	Ave. ΔP	0.651 "H ₂ O	Filter, #	N/A		
Wet mol. weight	28.78 M _s (actual)	Ave. √ΔP	0.806 "H ₂ O		Initial	Final	Gain
Actual H ₂ O	0.59 %	Ave. ΔH	3.527 "H ₂ O	Impingers, g	3,707.0	3,700.9	-6.1
Std. meter vol.	250.081 dscf	Ave. T _s	48.4 °F	Silica gel, g	925.6	963.2	37.6
Isokinetic Average	98.0 %	Ave. T _m	63.3 °F		Total water gain, g:		31.5

Traverse Point	Time (min.)	Meter Volume (dcf)	Velocity ΔP ("H ₂ O)	Stack Temp. (°F)	Meter Temp. (°F)	Calc. ΔH	Run ΔH	Vacuum ("Hg)	Filter Box (°F)	Condenser Temp (≤68°F)
1	10.0	10.710	0.80	41	54	4.32	4.30	7.5	255	35
2	20.0	21.520	0.80	43	54	4.30	4.30	7.5	252	40
3	30.0	32.240	0.80	43	55	4.31	4.30	7.5	252	45
4	40.0	41.960	0.60	43	56	3.24	3.25	6	252	45
5	50.0	52.080	0.69	43	57	3.73	3.75	6.5	252	43
6	60.0	61.510	0.57	43	58	3.09	3.10	6	246	42
7	70.0	71.050	0.59	43	58	3.20	3.20	6	253	43
8	80.0	81.130	0.65	44	59	3.52	3.50	6.5	259	42
9	90.0	90.520	0.58	44	59	3.14	3.15	6	259	46
10	100.0	100.090	0.55	44	60	2.98	3.00	5.5	252	46
11	110.0	110.030	0.71	45	62	3.86	3.85	7	254	47
12	120.0	120.650	0.71	47	65	3.87	3.85	7	256	51
13	130.0	131.440	0.78	48	67	4.26	4.25	7.5	250	52
14	140.0	141.910	0.68	48	68	3.72	3.75	7	251	54
15	150.0	152.170	0.65	49	70	3.56	3.55	6.5	253	57
16	160.0	161.880	0.59	50	71	3.23	3.25	6	256	59
17	170.0	171.860	0.62	51	71	3.39	3.40	6	252	57
18	180.0	181.860	0.65	52	70	3.54	3.55	6.5	253	56
19	190.0	191.670	0.59	53	69	3.20	3.20	6	251	55
20	200.0	201.540	0.64	55	68	3.45	3.45	6.5	254	57
21	210.0	210.820	0.56	56	67	3.01	3.00	5.5	258	58
22	220.0	220.200	0.57	57	67	3.06	3.05	5.5	256	58
23	230.0	230.160	0.63	59	67	3.36	3.35	6	256	58
24	240.0	239.654	0.62	61	67	3.30	3.30	6	253	55

Isokinetic Field Data
Field Data Entry

Client:	Eagle Foundry Company	Run:	2
Location:	Eagle Creek, OR	Start Time:	5:10
Source:	Cooling Bunker BH Outlet - White Iron	End Time:	9:10
EPA Method:	29	Environmental Conditions/Test Notes:	Date: 3/28/2023
Box Operator:	JCR	mostly cloudy and 30s °F	
Technician(s):	AJV		

Stack Dimensional Data:		Equipment:	
Circular		Meterbox ID	12
Diameter	55.750 in	Y factor	1.0267
Rectangular		ΔH@	1.800
Width	in	Bp ID	TS1
Length	in	Balance ID	HLN FB-1
Stack Area	16.952 sq.ft.	Weights ID	HLN FW-1
		Probe ID	7C
		Nozzle ID	0.266
		Hot box ID	HHB4
		Pitot Cp	0.84
		Pitot ID	7C
		Probe Length, ft	7
		Liner type	GLASS
		Nozzle size	0.266 inches
		Nozzle area	0.000386 sq.ft.
		Probe heat	250 °F
		Filter heat	250 °F

Source Information:				Leak Checks:		
Barometric Pressure	29.41 "Hg	O ₂	20.90 %		Pre-test	Post-test
Static Pressure	1 "H ₂ O	CO ₂	0.00 %	Pitot	X	X
Ave. ΔP	0.7 "H ₂ O	Rec. Nz.	0.221 inches	Leak rate, dcf	0.000	0.000
Stack Temperature	60 °F			Leak check vacuum, "Hg	10	10
Assumed moisture	0.59 %					
Assumed meter temp.	63.3 °F					
Total number of points	24					
Time per point	10 min.					
Total run time	240 min.					

Nozzle check for roundness:		
1	2	3
0.265	0.266	0.267 inches
Caliper ID		WS1

Post Test Calculations:				Moisture/Lab:			
Sample volume	229.338 dcf	Ave. ΔP	0.568 "H ₂ O	Filter, #	N/A		
Wet mol. weight	28.73 M _s (actual)	Ave. √ΔP	0.752 "H ₂ O		Initial	Final	Gain
Actual H ₂ O	1.00 %	Ave. ΔH	3.19 "H ₂ O	Impingers, g	3,727.8	3,743.8	16.0
Std. meter vol.	233.696 dscf	Ave. T _s	56.2 °F	Silica gel, g	858.3	892.5	34.2
Isokinetic Average	100.0 %	Ave. T _m	67.1 °F		Total water gain:		50.2

Traverse Point	Time (min.)	Meter Volume (dcf)	Velocity ΔP ("H ₂ O)	Stack Temp. (°F)	Meter Temp. (°F)	Calc. ΔH	Run ΔH	Vacuum ("Hg)	Filter Box (°F)	Condenser Temp (≤68°F)
1	10.0	10.290	0.67	52	65	3.76	3.80	4	251	39
2	20.0	20.290	0.62	55	66	3.47	3.50	4	251	42
3	30.0	30.160	0.62	55	66	3.47	3.50	4	251	43
4	40.0	39.400	0.50	55	65	2.79	2.80	3.5	254	43
5	50.0	47.950	0.47	54	65	2.63	2.65	3.5	257	43
6	60.0	56.390	0.45	54	65	2.52	2.50	3.5	256	43
7	70.0	64.800	0.45	54	65	2.52	2.50	3.5	254	43
8	80.0	73.860	0.49	54	65	2.74	2.75	3.5	256	42
9	90.0	82.400	0.47	54	65	2.63	2.65	3.5	262	43
10	100.0	92.190	0.60	55	65	3.35	3.35	4	252	43
11	110.0	102.470	0.66	57	66	3.68	3.70	4.5	247	44
12	120.0	112.840	0.66	57	66	3.68	3.70	4.5	265	44
13	130.0	123.100	0.64	61	67	3.54	3.55	4.5	258	45
14	140.0	133.270	0.63	61	67	3.49	3.50	4.5	255	45
15	150.0	142.970	0.65	59	68	3.62	3.60	4	250	44
16	160.0	153.260	0.65	58	68	3.63	3.65	4	250	44
17	170.0	163.590	0.65	58	69	3.63	3.65	4	252	44
18	180.0	173.900	0.64	57	69	3.58	3.60	4	257	44
19	190.0	184.110	0.64	57	69	3.58	3.60	4	256	43
20	200.0	194.100	0.60	57	70	3.37	3.40	4	255	44
21	210.0	203.030	0.48	56	70	2.70	2.70	3.5	258	44
22	220.0	211.990	0.48	56	70	2.70	2.70	3.5	256	45
23	230.0	220.620	0.47	56	69	2.64	2.65	3.5	255	45
24	240.0	229.338	0.45	56	70	2.53	2.55	3.5	254	45

Isokinetic Field Data
Field Data Entry

Client:	Eagle Foundry Company	Run:	3
Location:	Eagle Creek, OR	Start Time:	5:15
Source:	Cooling Bunker BH Outlet - White Iron	End Time:	9:15
EPA Method:	29	Environmental Conditions/Test Notes:	Date: 3/29/2023
Box Operator:	JCR	mostly cloudy and 30s °F	
Technician(s):	AJV		

Stack Dimensional Data:		Equipment:					
Circular		Meterbox ID	12	Probe ID	7C	Liner type	GLASS
Diameter	55.750 in	Y factor	1.0267	Nozzle ID	0.266	Nozzle size	0.266 inches
Rectangular		ΔH@	1.800	Hot box ID	HHB4	Nozzle area	0.000386 sq.ft.
Width	in	Bp ID	TS1	Pitot Cp	0.84	Probe heat	250 °F
Length	in	Balance ID	HLN FB-1	Pitot ID	7C	Filter heat	250 °F
Stack Area	16.952 sq.ft.	Weights ID	HLN FW-1	Probe Length, ft	7		

Source Information:				Leak Checks:			
Barometric Pressure	29.41 "Hg	O ₂	20.90 %		Pre-test	Post-test	
Static Pressure	1 "H ₂ O	CO ₂	0.00 %	Pitot	X	X	
Ave. ΔP	0.7 "H ₂ O	Rec. Nz.	0.22 inches	Leak rate, dcf	0.000	0.000	
Stack Temperature	60 °F			Leak check vacuum, "Hg	10	10	
Assumed moisture	1.00 %						
Assumed meter temp.	67.1 °F						
Total number of points	24						
Time per point	10 min.						
Total run time	240 min.						

Nozzle check for roundness:			
1	2	3	
0.265	0.266	0.267 inches	
	Caliper ID	WS1	

Post Test Calculations:				Moisture/Lab:			
Sample volume	230.265 dcf	Ave. ΔP	0.580 "H ₂ O	Filter, #	N/A		
Wet mol. weight	28.78 M _s (actual)	Ave. √ΔP	0.761 "H ₂ O		Initial	Final	Gain
Actual H ₂ O	0.51 %	Ave. ΔH	3.231 "H ₂ O	Impingers, g	3,731.2	3,711.4	-19.8
Std. meter vol.	236.686 dscf	Ave. T _s	49.6 °F	Silica gel, g	929.4	974.9	45.5
Isokinetic Average	99.0 %	Ave. T _m	62.6 °F		Total water gain:		25.7

Traverse Point	Time (min.)	Meter Volume (dcf)	Velocity ΔP ("H ₂ O)	Stack Temp. (°F)	Meter Temp. (°F)	Calc. ΔH	Run ΔH	Vacuum ("Hg)	Filter Box (°F)	Condenser Temp (≤68°F)
		0.000								
1	10.0	8.950	0.53	46	58	2.95	2.95	4	253	37
2	20.0	17.690	0.48	49	58	2.66	2.65	3.5	254	39
3	30.0	27.160	0.57	49	61	3.17	3.15	4	251	42
4	40.0	36.790	0.56	48	63	3.13	3.15	4	255	42
5	50.0	46.270	0.55	49	65	3.08	3.10	4	250	43
6	60.0	55.980	0.58	49	65	3.25	3.25	4	254	45
7	70.0	66.380	0.67	49	64	3.75	3.75	5	253	47
8	80.0	76.650	0.68	49	62	3.79	3.80	5	249	47
9	90.0	86.290	0.60	48	61	3.35	3.35	4	257	48
10	100.0	95.460	0.53	48	61	2.96	2.95	4	255	46
11	110.0	104.610	0.53	48	61	2.96	2.95	4	258	48
12	120.0	113.900	0.53	48	61	2.96	2.95	4	255	51
13	130.0	123.460	0.61	48	60	3.40	3.40	4.5	254	52
14	140.0	133.760	0.66	49	60	3.67	3.65	4.5	256	50
15	150.0	143.390	0.62	52	60	3.42	3.40	4.5	258	52
16	160.0	153.140	0.62	52	60	3.42	3.40	4.5	251	53
17	170.0	163.000	0.63	52	59	3.47	3.45	4.5	251	55
18	180.0	172.600	0.59	50	60	3.27	3.25	4	250	55
19	190.0	182.900	0.64	52	62	3.55	3.55	4.5	252	56
20	200.0	193.100	0.64	52	65	3.57	3.55	4.5	256	54
21	210.0	202.940	0.53	51	68	2.98	3.00	4	247	52
22	220.0	211.870	0.54	51	68	3.03	3.05	4	257	52
23	230.0	221.160	0.53	51	69	2.98	3.00	4	257	51
24	240.0	230.265	0.50	50	71	2.83	2.85	4	257	53

EPA Method 4
Impinger Weights Summary

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Cooling Bunker BH Outlet - White Iron
EPA Method: 29
Box Operator: JCR
Technician(s): AJV

Run 1

Impinger gain by weight (g):

#	Initial	Final	Gain
1	751.2	674.4	-76.8
2	744.0	765.0	21.0
3	658.8	683.5	24.7
4	758.6	775.4	16.8
5	794.4	802.6	8.2
Totals:	3,707.0	3,700.9	-6.1

Run 2

Impinger gain by weight (g):

#	Initial	Final	Gain
1	758.4	726.9	-31.5
2	748.7	780.1	31.4
3	664.0	670.1	6.1
4	752.6	759.7	7.1
5	804.1	807.0	2.9
Totals:	3,727.8	3,743.8	16.0

Run 3

Impinger gain by weight (g):

#	Initial	Final	Gain
1	752.9	687.9	-65.0
2	745.1	774.8	29.7
3	664.4	675.5	11.1
4	759.9	765.8	5.9
5	808.9	807.4	-1.5
Totals:	3,731.2	3,711.4	-19.8

Isokinetic Field Data
Field Data and Calculations
Gas Stream Characteristics

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Cooling Bunker BH Outlet - White Iron
Method: 29

Run: 1
Start Time: 6:40
End Time: 10:40
Date: 3/27/2023

Sampling Data				Traverse Data			
Time min.	Meter ft ³	ΔH "H ₂ O	Meter T _m °F	Traverse Point	Dp "H ₂ O	Stack T _s °F	$\sqrt{Dp}$
	0.000						
10.0	10.710	4.30	54	1	0.80	41	0.894
20.0	21.520	4.30	54	2	0.80	43	0.894
30.0	32.240	4.30	55	3	0.80	43	0.894
40.0	41.960	3.25	56	4	0.60	43	0.775
50.0	52.080	3.75	57	5	0.69	43	0.831
60.0	61.510	3.10	58	6	0.57	43	0.755
70.0	71.050	3.20	58	7	0.59	43	0.768
80.0	81.130	3.50	59	8	0.65	44	0.806
90.0	90.520	3.15	59	9	0.58	44	0.762
100.0	100.090	3.00	60	10	0.55	44	0.742
110.0	110.030	3.85	62	11	0.71	45	0.843
120.0	120.650	3.85	65	12	0.71	47	0.843
130.0	131.440	4.25	67	13	0.78	48	0.883
140.0	141.910	3.75	68	14	0.68	48	0.825
150.0	152.170	3.55	70	15	0.65	49	0.806
160.0	161.880	3.25	71	16	0.59	50	0.768
170.0	171.860	3.40	71	17	0.62	51	0.787
180.0	181.860	3.55	70	18	0.65	52	0.806
190.0	191.670	3.20	69	19	0.59	53	0.768
200.0	201.540	3.45	68	20	0.64	55	0.800
210.0	210.820	3.00	67	21	0.56	56	0.748
220.0	220.200	3.05	67	22	0.57	57	0.755
230.0	230.160	3.35	67	23	0.63	59	0.794
240.0	239.654	3.30	67	24	0.62	61	0.787

Client:	Eagle Foundry Company	Run:	1
Source:	Cooling Bunker BH Outlet - White Iron	Date:	03/27/23

Field Data Input Continued

Moisture Data

Total Test Time	240.0 min
Sample Time Interval	10.0 min
Meter Volume, V_m	239.654 dcf
Water Mass	31.5 g
Nozzle Diameter, N_z	0.2660 in.
Nozzle Area	0.000386 sq.ft.

Stack Dimensional Data:

Circular	
Diameter	55.750 in
Rectangular	
Width	in
Length	in
Stack Area	16.952 sq.ft.

Traverse Data

Barometric Pressure, P_b	29.88 "Hg
Static Pressure	1.00 "H ₂ O
Pitot Factor, cp	0.84
Meter Cal Factor	1.0267 Y

Molecular Weight:

CO ₂ Average	0.07 %vd
O ₂ Average	20.79 %vd

Field Data Averages

Meter

ΔH	3.527 "H ₂ O
Temperature, T_m	63.3 °F
Temperature, T_m	523.0 °A (°R)
Pressure Meter, P_m	30.139 "Hg

Stack

$\sqrt{D_p}$	0.806 "H ₂ O
Temperature, T_s	48.4 °F
Temperature, T_s	508.1 °A (°R)
Pressure Stack, P_s	29.954 "Hg

Field Data Calculations

Meter Box Capture

Standard Volume, $V_{m(std)}$	250.081 dscf
	7.081 dscm
Actual Volume, $V_{m(actual)}$	241.946 awcf

EPA Method 2 Stack Gas Flowrate:

Velocity, V_s	44.43 fps
Flow Rate (actual), Q_{aw}	45,191 acfm
	44,924 adcfm
Flow Rate (standard), Q	2,819,239 wscf/hr
	2,802,605 dscf/hr
	46,710 dscf/min
	46,987 wscf/min

Gas Stream Moisture

Moisture Vapor, $V_{w(std)}$	1.485 scf
Moisture, B_{ws}	0.0059
Moisture EPA M4	0.59 %v
Moisture @ Saturation	1.14 %v (for $T_s < 212^\circ\text{F}$)

EPA Method 3 Gas Density

Dry, M_d	28.84 lb/lb-mole
Wet, M_s	28.78 lb/lb-mole

Percent Isokinetic	98.0 %

Isokinetic Field Data
Field Data and Calculations
Gas Stream Characteristics

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Cooling Bunker BH Outlet - White Iron
Method: 29

Run: 2
Start Time: 5:10
End Time: 9:10
Date: 03/28/23

Sampling Data				Traverse Data			
Time min.	Meter ft ³	ΔH "H ₂ O	Meter T _m °F	Traverse Point	Dp "H ₂ O	Stack T _s °F	$\sqrt{Dp}$
	0.000						
10.0	10.290	3.80	65	1	0.67	52	0.819
20.0	20.290	3.50	66	2	0.62	55	0.787
30.0	30.160	3.50	66	3	0.62	55	0.787
40.0	39.400	2.80	65	4	0.50	55	0.707
50.0	47.950	2.65	65	5	0.47	54	0.686
60.0	56.390	2.50	65	6	0.45	54	0.671
70.0	64.800	2.50	65	7	0.45	54	0.671
80.0	73.860	2.75	65	8	0.49	54	0.700
90.0	82.400	2.65	65	9	0.47	54	0.686
100.0	92.190	3.35	65	10	0.60	55	0.775
110.0	102.470	3.70	66	11	0.66	57	0.812
120.0	112.840	3.70	66	12	0.66	57	0.812
130.0	123.100	3.55	67	13	0.64	61	0.800
140.0	133.270	3.50	67	14	0.63	61	0.794
150.0	142.970	3.60	68	15	0.65	59	0.806
160.0	153.260	3.65	68	16	0.65	58	0.806
170.0	163.590	3.65	69	17	0.65	58	0.806
180.0	173.900	3.60	69	18	0.64	57	0.800
190.0	184.110	3.60	69	19	0.64	57	0.800
200.0	194.100	3.40	70	20	0.60	57	0.775
210.0	203.030	2.70	70	21	0.48	56	0.693
220.0	211.990	2.70	70	22	0.48	56	0.693
230.0	220.620	2.65	69	23	0.47	56	0.686
240.0	229.338	2.55	70	24	0.45	56	0.671

Client:	Eagle Foundry Company	Run:	2
Source:	Cooling Bunker BH Outlet - White Iron	Date:	03/28/23

Field Data Input Continued

<u>Moisture Data</u>		<u>Stack Dimensional Data:</u>	
Total Test Time	240.0 min	Circular	
Sample Time Interval	10.0 min	Diameter	55.750 in
Meter Volume, V _m	229.338 dcf	Rectangular	
Water Mass	50.2 g	Width	in
Nozzle Diameter, N _z	0.2660 in.	Length	in
Nozzle Area	0.000386 sq.ft.	Stack Area	16.952 sq.ft.

<u>Traverse Data</u>		<u>Molecular Weight:</u>	
Barometric Pressure, P _b	29.41 "Hg	CO ₂ Average	0.06 %vd
Static Pressure	1.00 "H ₂ O	O ₂ Average	20.73 %vd
Pitot Factor, cp	0.84		
Meter Cal Factor	1.0267 Y		

Field Data Averages

<u>Meter</u>		<u>Stack</u>	
ΔH	3.190 "H ₂ O	√Dp	0.752 "H ₂ O
Temperature, T _m	67.1 °F	Temperature, T _s	56.2 °F
Temperature, T _m	526.8 °A (°R)	Temperature, T _s	515.9 °A (°R)
Pressure Meter, P _m	29.645 "Hg	Pressure Stack, P _s	29.484 "Hg

Field Data Calculations

<u>Meter Box Capture</u>		<u>EPA Method 2 Stack Gas Flowrate:</u>	
Standard Volume, V _{m(std)}	233.696 dscf	Velocity, V _s	42.14 fps
	6.618 dscm	Flow Rate (actual), Q _{aw}	42,861 acfm
Actual Volume, V _{m(actual)}	234.190 awcf		42,432 adcfm
<u>Gas Stream Moisture</u>		Flow Rate (standard), Q	2,592,179 wscf/hr
Moisture Vapor, V _{w(std)}	2.367 scf		2,566,257 dscf/hr
Moisture, B _{ws}	0.0100		42,771 dscf/min
Moisture EPA M4	1.00 %v		43,203 wscf/min
Moisture @ Saturation	1.55 %v (for T _s < 212°F)		
<u>EPA Method 3 Gas Density</u>			
Dry, M _d	28.84 lb/lb-mole		
Wet, M _s	28.73 lb/lb-mole		
Percent Isokinetic	100.0 %		

Isokinetic Field Data
Field Data and Calculations
Gas Stream Characteristics

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Cooling Bunker BH Outlet - White Iron
Method: 29

Run: 3
Start Time: 5:15
End Time: 9:15
Date: 03/29/23

Sampling Data				Traverse Data			
Time min.	Meter ft ³	ΔH "H ₂ O	Meter T _m °F	Traverse Point	Dp "H ₂ O	Stack T _s °F	$\sqrt{Dp}$
	0.000						
10.0	8.950	2.95	58	1	0.53	46	0.728
20.0	17.690	2.65	58	2	0.48	49	0.693
30.0	27.160	3.15	61	3	0.57	49	0.755
40.0	36.790	3.15	63	4	0.56	48	0.748
50.0	46.270	3.10	65	5	0.55	49	0.742
60.0	55.980	3.25	65	6	0.58	49	0.762
70.0	66.380	3.75	64	7	0.67	49	0.819
80.0	76.650	3.80	62	8	0.68	49	0.825
90.0	86.290	3.35	61	9	0.60	48	0.775
100.0	95.460	2.95	61	10	0.53	48	0.728
110.0	104.610	2.95	61	11	0.53	48	0.728
120.0	113.900	2.95	61	12	0.53	48	0.728
130.0	123.460	3.40	60	13	0.61	48	0.781
140.0	133.760	3.65	60	14	0.66	49	0.812
150.0	143.390	3.40	60	15	0.62	52	0.787
160.0	153.140	3.40	60	16	0.62	52	0.787
170.0	163.000	3.45	59	17	0.63	52	0.794
180.0	172.600	3.25	60	18	0.59	50	0.768
190.0	182.900	3.55	62	19	0.64	52	0.800
200.0	193.100	3.55	65	20	0.64	52	0.800
210.0	202.940	3.00	68	21	0.53	51	0.728
220.0	211.870	3.05	68	22	0.54	51	0.735
230.0	221.160	3.00	69	23	0.53	51	0.728
240.0	230.265	2.85	71	24	0.50	50	0.707

Client:	Eagle Foundry Company	Run:	3
Source:	Cooling Bunker BH Outlet - White Iron	Date:	03/29/23

Field Data Input Continued

Moisture Data

Total Test Time	240.0 min
Sample Time Interval	10.0 min
Meter Volume, V_m	230.265 dcf
Water Mass	25.7 g
Nozzle Diameter, N_z	0.2660 in.
Nozzle Area	0.000386 sq.ft.

Stack Dimensional Data:

Circular	
Diameter	55.750 in
Rectangular	
Width	in
Length	in
Stack Area	16.952 sq.ft.

Traverse Data

Barometric Pressure, P_b	29.41 "Hg
Static Pressure	1.00 "H ₂ O
Pitot Factor, cp	0.84
Meter Cal Factor	1.0267 Y

Molecular Weight:

CO ₂ Average	0.07 %vd
O ₂ Average	20.92 %vd

Field Data Averages

Meter

ΔH	3.231 "H ₂ O
Temperature, T_m	62.6 °F
Temperature, T_m	522.3 °A (°R)
Pressure Meter, P_m	29.648 "Hg

Stack

$\sqrt{D_p}$	0.761 "H ₂ O
Temperature, T_s	49.6 °F
Temperature, T_s	509.3 °A (°R)
Pressure Stack, P_s	29.484 "Hg

Field Data Calculations

Meter Box Capture

Standard Volume, $V_{m(std)}$	236.686 dscf
	6.702 dscm
Actual Volume, $V_{m(actual)}$	232.999 awcf

EPA Method 2 Stack Gas Flowrate:

Velocity, V_s	42.33 fps
Flow Rate (actual), Q_{aw}	43,055 acfm
	42,835 adcfm
Flow Rate (standard), Q	2,637,612 wscf/hr
	2,624,160 dscf/hr
	43,736 dscf/min
	43,960 wscf/min

Gas Stream Moisture

Moisture Vapor, $V_{w(std)}$	1.212 scf
Moisture, B_{ws}	0.0051
Moisture EPA M4	0.51 %v
Moisture @ Saturation	1.21 %v (for $T_s < 212^\circ\text{F}$)

EPA Method 3 Gas Density

Dry, M_d	28.85 lb/lb-mole
Wet, M_s	28.79 lb/lb-mole

Percent Isokinetic	99.0 %

Eagle Foundry Company
Cooling Bunker BH Outlet - White Iron
Method 29 Laboratory Results

Run: 1
Sample Date: 03/27/23

Analyte	Filter + FH Rinse Cont. 1&3		BH Cap.Soln. + BH Rinse Cont. 4		Units
	< Result	MDL	< Result	MDL	
Aluminum	102	7.50	31.7	4.59	µg/sample
Antimony	2.00	1.25	< MDL	0.765	µg/sample
Arsenic	< MDL	1.75	< MDL	1.07	µg/sample
Barium	3.87	0.125	0.902	0.076	µg/sample
Beryllium	< MDL	0.050	< MDL	0.031	µg/sample
Cadmium	< MDL	0.100	< MDL	0.061	µg/sample
Chromium	2.48	0.200	0.858	0.122	µg/sample
Cobalt	< MDL	0.125	0.122	0.076	µg/sample
Copper	5.14	1.25	1.17	0.765	µg/sample
Lead	3.05	1.25	< MDL	0.765	µg/sample
Manganese	5.96	0.075	0.665	0.046	µg/sample
Nickel	8.33	0.750	1.53	0.459	µg/sample
Phosphorus	10.4	5.00	< MDL	3.06	µg/sample
Selenium	< MDL	3.75	< MDL	2.30	µg/sample
Silver	< MDL	0.500	< MDL	0.306	µg/sample
Thallium	< MDL	2.50	< MDL	1.53	µg/sample
Vanadium	< MDL	0.250	< MDL	0.153	µg/sample
Zinc	19.2	0.750	4.04	0.459	µg/sample

Lab ID:	23-S654	23-S655	
Sample Vol:	250	230	ml

Eagle Foundry Company
Cooling Bunker BH Outlet - White Iron
Method 29 Laboratory Results

Run: 2
Sample Date: 03/28/23

Analyte	Filter + FH Rinse Cont. 1&3		BH Cap.Soln. + BH Rinse Cont. 4		Units
	<	Result MDL	<	Result MDL	
Aluminum		96.2 7.50		17.8 3.45	µg/sample
Antimony		2.00 1.25	<	MDL 0.575	µg/sample
Arsenic		1.96 1.75	<	MDL 0.805	µg/sample
Barium		4.70 0.125		0.656 0.058	µg/sample
Beryllium	<	MDL 0.050	<	MDL 0.023	µg/sample
Cadmium	<	MDL 0.100	<	MDL 0.046	µg/sample
Chromium		2.20 0.200		1.03 0.092	µg/sample
Cobalt	<	MDL 0.125		0.072 0.058	µg/sample
Copper		4.76 1.25		0.674 0.575	µg/sample
Lead		1.93 1.25	<	MDL 0.575	µg/sample
Manganese		5.32 0.075		1.24 0.034	µg/sample
Nickel		7.70 0.750		0.921 0.345	µg/sample
Phosphorus		6.11 5.00	<	MDL 2.30	µg/sample
Selenium	<	MDL 3.75	<	MDL 1.72	µg/sample
Silver	<	MDL 0.500	<	MDL 0.230	µg/sample
Thallium	<	MDL 2.50	<	MDL 1.15	µg/sample
Vanadium	<	MDL 0.250	<	MDL 0.115	µg/sample
Zinc		12.6 0.750		1.57 0.345	µg/sample

Lab ID:	23-S659	23-S660	
Sample Vol:	250	250	ml

Eagle Foundry Company
Cooling Bunker BH Outlet - White Iron
Method 29 Laboratory Results

Run: 3
Sample Date: 03/29/23

Analyte	Filter + FH Rinse Cont. 1&3		BH Cap.Soln. + BH Rinse Cont. 4		Units
	< Result	MDL	< Result	MDL	
Aluminum	85.9	7.50	22.9	3.57	µg/sample
Antimony	1.76	1.25	< MDL	0.595	µg/sample
Arsenic	< MDL	1.75	< MDL	0.833	µg/sample
Barium	2.65	0.125	0.742	0.060	µg/sample
Beryllium	< MDL	0.050	< MDL	0.024	µg/sample
Cadmium	< MDL	0.100	< MDL	0.048	µg/sample
Chromium	1.36	0.200	0.524	0.095	µg/sample
Cobalt	< MDL	0.125	< MDL	0.060	µg/sample
Copper	1.96	1.25	0.846	0.595	µg/sample
Lead	< MDL	1.25	< MDL	0.595	µg/sample
Manganese	2.70	0.075	11.6	0.036	µg/sample
Nickel	4.85	0.750	0.454	0.357	µg/sample
Phosphorus	6.98	5.00	< MDL	2.38	µg/sample
Selenium	< MDL	3.75	< MDL	1.78	µg/sample
Silver	< MDL	0.500	< MDL	0.238	µg/sample
Thallium	< MDL	2.50	< MDL	1.19	µg/sample
Vanadium	< MDL	0.250	< MDL	0.119	µg/sample
Zinc	4.69	0.750	1.06	0.357	µg/sample

Lab ID:	23-S664	23-S665	
Sample Vol:	250	256	ml

Eagle Foundry Company
Cooling Bunker BH Outlet - White Iron
Method 29 Blank Results

Sample Date: 3/27/2023
3/28/2023
3/29/2023

Analyte	Filter Cont. 12		BH Cap.Soln. Cont. 9 5% HNO ₃ / 10% H ₂ O ₂		FH/BH Rinse Cont. 8A 0.1 N HNO ₃	
	µg/filter		µg/sample		µg/sample	
	< Result	MDL	< Result	MDL	< Result	MDL
Aluminum	58.8	7.50	16.3	3.78	< MDL	7.50
Antimony	2.86	1.25	< MDL	0.630	< MDL	1.25
Arsenic	< MDL	1.75	< MDL	0.882	< MDL	1.75
Barium	1.40	0.125	0.718	0.063	0.193	0.125
Beryllium	< MDL	0.050	< MDL	0.025	< MDL	0.050
Cadmium	< MDL	0.100	< MDL	0.050	< MDL	0.100
Chromium	1.03	0.200	0.306	0.101	< MDL	0.200
Cobalt	< MDL	0.125	0.153	0.063	< MDL	0.125
Copper	< MDL	1.25	< MDL	0.630	< MDL	1.25
Lead	< MDL	1.25	< MDL	0.630	< MDL	1.25
Manganese	0.741	0.075	0.742	0.038	< MDL	0.375
Nickel	3.96	0.750	< MDL	0.378	< MDL	0.750
Phosphorus	17.0	5.00	< MDL	2.52	< MDL	5.00
Selenium	< MDL	3.75	< MDL	1.89	< MDL	3.75
Silver	< MDL	0.500	< MDL	0.252	< MDL	0.500
Thallium	< MDL	2.50	< MDL	1.26	< MDL	2.50
Vanadium	< MDL	0.250	< MDL	0.126	< MDL	0.250
Zinc	1.52	0.750	0.415	0.378	< MDL	0.750

Lab ID: 23-S729
Blank Vol, ml: N/A

23-S731
196

23-S730
250

Eagle Foundry Company
Cooling Bunker BH Outlet - White Iron
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 1
Test Date: 3/27/2023
Page: 1 of 3

Analyte	I Sample FH Rinse+Filter µg	II Blank Correction FH Rinse µg	III Blank Correction Filter µg	IV Sample BH Cap.Soln. + BH Rinse µg	V Blank BH Cap.Soln. µg/ml	VI Blank Correction BH Cap.Soln. µg	VII Blank Correction BH Rinse µg	VIII Total BH Blank Correction µg	
Aluminum	102.000	0.000	58.800	31.700	0.083	16.633	0.000	16.633	Al
Antimony	2.000	0.000	2.860	< 0.765	0.000	0.000	0.000	0.000	Sb
Arsenic	< 1.750	0.000	0.000	< 1.071	0.000	0.000	0.000	0.000	As
Barium	3.870	0.077	1.400	0.902	0.004	0.733	0.077	0.810	Ba
Beryllium	< 0.050	0.000	0.000	< 0.031	0.000	0.000	0.000	0.000	Be
Cadmium	< 0.100	0.000	0.000	< 0.061	0.000	0.000	0.000	0.000	Cd
Chromium	2.480	0.000	1.030	0.858	0.002	0.312	0.000	0.312	Cr
Cobalt	< 0.125	0.000	0.000	0.122	0.001	0.156	0.000	0.156	Co
Copper	5.140	0.000	0.000	1.170	0.000	0.000	0.000	0.000	Cu
Lead	3.050	0.000	0.000	< 0.765	0.000	0.000	0.000	0.000	Pb
Manganese	5.960	0.000	0.741	0.665	0.004	0.757	0.000	0.757	Mn
Nickel	8.330	0.000	3.960	1.530	0.000	0.000	0.000	0.000	Ni
Phosphorus	10.400	0.000	17.000	< 3.060	0.000	0.000	0.000	0.000	P
Selenium	< 3.750	0.000	0.000	< 2.300	0.000	0.000	0.000	0.000	Se
Silver	< 0.500	0.000	0.000	< 0.306	0.000	0.000	0.000	0.000	Ag
Thallium	< 2.500	0.000	0.000	< 1.530	0.000	0.000	0.000	0.000	Tl
Vanadium	< 0.250	0.000	0.000	< 0.153	0.000	0.000	0.000	0.000	V
Zinc	19.200	0.000	1.520	4.040	0.002	0.423	0.000	0.423	Zn

Lab ID:	23-S654	23-S730	23-S729	23-S655	23-S731	N/A	N/A
Notes:	0.1N HNO ₃	0.1N HNO ₃	5% HNO ₃ /10% H ₂ O ₂	5% HNO ₃ /	5%HNO ₃ /	0.1NHNO ₃	
	FH Filter & Probe Rinse		BH Imps 1-3	10% H ₂ O ₂	10%H ₂ O ₂		
	100ml 0.1N HNO ₃ Rinse		100ml .1N HNO ₃ Rinse				
			200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent				

Blank Rules: <' indicates value is below the method detection limit (MDL).
If blank is '<' it is treated as zero.
If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Cooling Bunker BH Outlet - White Iron
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 1
Test Date: 3/27/2023
Page: 2 of 3

Analyte	X Allowable FH Blank Correction µg	XI Total FH Blank Correction µg	XII 5% of FH Sample µg	XIII Lessor of XI or XII µg	XIV Greater of A or XIII µg	XV FH Net Sample µg	
Aluminum	11.630	58.800	5.100	5.100	11.63	90.370	Al
Antimony	2.860	2.860	0.100	0.100	11.63	-0.860	Sb
Arsenic	0.000	0.000	< 0.088	0.000	11.63	< 1.750	As
Barium	1.477	1.477	0.194	0.194	11.63	2.393	Ba
Beryllium	0.000	0.000	< 0.003	0.000	11.63	< 0.050	Be
Cadmium	0.000	0.000	< 0.005	0.000	11.63	< 0.100	Cd
Chromium	1.030	1.030	0.124	0.124	11.63	1.450	Cr
Cobalt	0.000	0.000	< 0.006	0.000	11.63	< 0.125	Co
Copper	0.000	0.000	0.257	0.000	11.63	5.140	Cu
Lead	0.000	0.000	0.153	0.000	11.63	3.050	Pb
Manganese	0.741	0.741	0.298	0.298	11.63	5.219	Mn
Nickel	3.960	3.960	0.417	0.417	11.63	4.370	Ni
Phosphorus	11.630	17.000	0.520	0.520	11.63	-1.230	P
Selenium	0.000	0.000	< 0.188	0.000	11.63	< 3.750	Se
Silver	0.000	0.000	< 0.025	0.000	11.63	< 0.500	Ag
Thallium	0.000	0.000	< 0.125	0.000	11.63	< 2.500	Tl
Vanadium	0.000	0.000	< 0.013	0.000	11.63	< 0.250	V
Zinc	1.520	1.520	0.960	0.960	11.63	17.680	Zn

Note: Allowable FH Blank (A) = (area of filter)*(1.4 µg/in²) = 11.63 µg
where area of filter = 8.306 in²

If A > blank > 0, use blank-derived value, M_{hb}.

If blank > A, use greater of A or [lessor of 5% of sample µg or FH blank].

Blank Rules: <' indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Cooling Bunker BH Outlet - White Iron
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 1
Test Date: 3/27/2023
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Analyte	XVI Allowable BH Blank Correction µg	XVII Total BH (M _{bhb}) Blank Correction µg	XVIII 5% of BH Sample µg	XIX Lessor of XVII or XVIII µg	XX Greater of 1 µg or XIX µg	XXI BH Net Sample µg	XXII FH Net Sample µg	XXIII FH+BH Total Net Sample µg	
Aluminum	1.585	16.633	1.585	1.585	1.585	30.115	90.370	120.485	Al
Antimony	0.000	0.000	< 0.038	0.000	1.000	0.765	0.000	0.765	Sb
Arsenic	0.000	0.000	< 0.054	0.000	1.000	1.071	1.750	2.821	As
Barium	0.810	0.810	0.045	0.045	1.000	0.092	2.393	2.485	Ba
Beryllium	0.000	0.000	< 0.002	0.000	1.000	0.031	0.050	0.081	Be
Cadmium	0.000	0.000	< 0.003	0.000	1.000	0.061	0.100	0.161	Cd
Chromium	0.312	0.312	0.043	0.043	1.000	0.546	1.450	1.996	Cr
Cobalt	0.156	0.156	0.006	0.006	1.000	0.000	0.125	0.125	Co
Copper	0.000	0.000	0.059	0.000	1.000	1.170	5.140	6.310	Cu
Lead	0.000	0.000	< 0.038	0.000	1.000	0.765	3.050	3.815	Pb
Manganese	0.757	0.757	0.033	0.033	1.000	0.000	5.219	5.219	Mn
Nickel	0.000	0.000	0.077	0.000	1.000	1.530	4.370	5.900	Ni
Phosphorus	0.000	0.000	< 0.153	0.000	1.000	3.060	0.000	3.060	P
Selenium	0.000	0.000	< 0.115	0.000	1.000	2.300	3.750	6.050	Se
Silver	0.000	0.000	< 0.015	0.000	1.000	0.306	0.500	0.806	Ag
Thallium	0.000	0.000	< 0.077	0.000	1.000	1.530	2.500	4.030	Tl
Vanadium	0.000	0.000	< 0.008	0.000	1.000	0.153	0.250	0.403	V
Zinc	0.423	0.423	0.202	0.202	1.000	3.617	17.680	21.297	Zn

Note: Allowable BH Blank rules:

If 1.00 µg > blank > 0 , use blank-derived value.

If blank > 1.00 µg, use greater of 1.00 µg or [lessor of 5% of sample µg or BH blank].

Blank Rules: <' indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Cooling Bunker BH Outlet - White Iron
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 2
Test Date: 3/28/2023
Page: 1 of 3

	I Sample FH Rinse+Filter µg	II Blank Correction FH Rinse µg	III Blank Correction Filter µg	IV Sample BH Cap.Soln. + BH Rinse µg	V Blank BH Cap.Soln. µg/ml	VI Blank Correction BH Cap.Soln. µg	VII Blank Correction BH Rinse µg	VIII Total BH Blank Correction µg	
Analyte	<								
Aluminum	96.200	0.000	58.800	17.800	0.083	16.633	0.000	16.633	Al
Antimony	2.000	0.000	2.860	< 0.575	0.000	0.000	0.000	0.000	Sb
Arsenic	1.960	0.000	0.000	< 0.805	0.000	0.000	0.000	0.000	As
Barium	4.700	0.077	1.400	0.656	0.004	0.733	0.077	0.810	Ba
Beryllium	< 0.050	0.000	0.000	< 0.023	0.000	0.000	0.000	0.000	Be
Cadmium	< 0.100	0.000	0.000	< 0.046	0.000	0.000	0.000	0.000	Cd
Chromium	2.200	0.000	1.030	1.030	0.002	0.312	0.000	0.312	Cr
Cobalt	< 0.125	0.000	0.000	0.072	0.001	0.156	0.000	0.156	Co
Copper	4.760	0.000	0.000	0.674	0.000	0.000	0.000	0.000	Cu
Lead	1.930	0.000	0.000	< 0.575	0.000	0.000	0.000	0.000	Pb
Manganese	5.320	0.000	0.741	1.240	0.004	0.757	0.000	0.757	Mn
Nickel	7.700	0.000	3.960	0.921	0.000	0.000	0.000	0.000	Ni
Phosphorus	6.110	0.000	17.000	< 2.300	0.000	0.000	0.000	0.000	P
Selenium	< 3.750	0.000	0.000	< 1.720	0.000	0.000	0.000	0.000	Se
Silver	< 0.500	0.000	0.000	< 0.230	0.000	0.000	0.000	0.000	Ag
Thallium	< 2.500	0.000	0.000	< 1.150	0.000	0.000	0.000	0.000	Tl
Vanadium	< 0.250	0.000	0.000	< 0.115	0.000	0.000	0.000	0.000	V
Zinc	12.600	0.000	1.520	1.570	0.002	0.423	0.000	0.423	Zn

Lab ID:	23-S659	23-S730	23-S729	23-S660	23-S731	N/A	N/A
Content:	0.1N HNO ₃ FH Filter & Probe Rinse 100ml 0.1N HNO ₃ Rinse	0.1N HNO ₃	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	5% HNO ₃ /10% H ₂ O ₂	5% HNO ₃ /10% H ₂ O ₂	0.1N HNO ₃

Blank Rules: < indicates value is below the method detection limit (MDL).
If blank is '<' it is treated as zero.
If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Cooling Bunker BH Outlet - White Iron
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 2
Test Date: 3/28/2023
Page: 2 of 3

	X Allowable FH Blank Correction	XI Total FH Blank Correction	XII 5% of FH Sample	XIII Lessor of XI or XII	XIV Greater of A or XIII	XV FH Net Sample	
Analyte	µg	µg	µg	µg	µg	µg	
Aluminum	11.630	58.800	4.810	4.810	11.63	84.570	Al
Antimony	2.860	2.860	0.100	0.100	11.63	-0.860	Sb
Arsenic	0.000	0.000	0.098	0.000	11.63	1.960	As
Barium	1.477	1.477	0.235	0.235	11.63	3.223	Ba
Beryllium	0.000	0.000	< 0.003	0.000	11.63	< 0.050	Be
Cadmium	0.000	0.000	< 0.005	0.000	11.63	< 0.100	Cd
Chromium	1.030	1.030	0.110	0.110	11.63	1.170	Cr
Cobalt	0.000	0.000	< 0.006	0.000	11.63	< 0.125	Co
Copper	0.000	0.000	0.238	0.000	11.63	4.760	Cu
Lead	0.000	0.000	0.097	0.000	11.63	1.930	Pb
Manganese	0.741	0.741	0.266	0.266	11.63	4.579	Mn
Nickel	3.960	3.960	0.385	0.385	11.63	3.740	Ni
Phosphorus	11.630	17.000	0.306	0.306	11.63	-5.520	P
Selenium	0.000	0.000	< 0.188	0.000	11.63	< 3.750	Se
Silver	0.000	0.000	< 0.025	0.000	11.63	< 0.500	Ag
Thallium	0.000	0.000	< 0.125	0.000	11.63	< 2.500	Tl
Vanadium	0.000	0.000	< 0.013	0.000	11.63	< 0.250	V
Zinc	1.520	1.520	0.630	0.630	11.63	11.080	Zn

Note: Allowable FH Blank (A) = (area of filter)*(1.4 µg/in²) = 11.63 µg
where area of filter = 8.306 in²

If A > blank > 0, use blank-derived value.

If blank > A, use greater of A or [lessor of 5% of sample µg or FH blank].

Blank Rules: < indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Cooling Bunker BH Outlet - White Iron
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 2
Test Date: 3/28/2023
Page: 3 of 3

Analyte	XVI Allowable BH Blank Correction µg	XVII Total BH Blank Correction µg	XVIII 5% of BH Sample µg	XIX Lessor of XVII or XVIII µg	XX Greater of 1 µg or XIX µg	XXI BH Net Sample µg	XXII FH Net Sample µg	XXIII FH+BH Total Net Sample µg	
Aluminum	1.000	16.633	0.890	0.890	1.000	16.800	84.570	101.370	Al
Antimony	0.000	0.000	<	0.029	0.000	1.000	<	0.575	Sb
Arsenic	0.000	0.000	<	0.040	0.000	1.000	<	0.805	As
Barium	0.810	0.810	0.033	0.033	1.000	0.000	3.223	3.223	Ba
Beryllium	0.000	0.000	<	0.001	0.000	1.000	<	0.023	Be
Cadmium	0.000	0.000	<	0.002	0.000	1.000	<	0.046	Cd
Chromium	0.312	0.312	0.052	0.052	1.000	0.718	1.170	1.888	Cr
Cobalt	0.156	0.156	0.004	0.004	1.000	0.000	<	0.125	Co
Copper	0.000	0.000	0.034	0.000	1.000	0.674	4.760	5.434	Cu
Lead	0.000	0.000	<	0.029	0.000	1.000	<	0.575	Pb
Manganese	0.757	0.757	0.062	0.062	1.000	0.483	4.579	5.062	Mn
Nickel	0.000	0.000	0.046	0.000	1.000	0.921	3.740	4.661	Ni
Phosphorus	0.000	0.000	<	0.115	0.000	1.000	<	2.300	P
Selenium	0.000	0.000	<	0.086	0.000	1.000	<	1.720	Se
Silver	0.000	0.000	<	0.012	0.000	1.000	<	0.230	Ag
Thallium	0.000	0.000	<	0.058	0.000	1.000	<	1.150	Tl
Vanadium	0.000	0.000	<	0.006	0.000	1.000	<	0.115	V
Zinc	0.423	0.423	0.079	0.079	1.000	1.147	11.080	12.227	Zn

Note: Allowable BH Blank rules:

If 1.00 µg > blank > 0, use blank-derived value.

If blank > 1.00 µg, use greater of 1.00 µg or [lessor of 5% of sample µg or BH blank].

Blank Rules: '<' indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Cooling Bunker BH Outlet - White Iron
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 3
Test Date: 3/29/2023
Page: 1 of 3

	I Sample FH Rinse+Filter µg	II Blank Correction FH Rinse µg	III Blank Correction Filter µg	IV Sample BH Cap.Soln. + BH Rinse µg	V Blank BH Cap.Soln. µg/ml	VI Blank Correction BH Cap.Soln. µg	VII Blank Correction BH Rinse µg	VIII Total BH Blank Correction µg	
Analyte	<								
Aluminum	85.900	0.000	58.800	22.900	0.083	16.633	0.000	16.633	Al
Antimony	1.760	0.000	2.860	< 0.595	0.000	0.000	0.000	0.000	Sb
Arsenic	< 1.750	0.000	0.000	< 0.833	0.000	0.000	0.000	0.000	As
Barium	2.650	0.077	1.400	0.742	0.004	0.733	0.077	0.810	Ba
Beryllium	< 0.050	0.000	0.000	< 0.024	0.000	0.000	0.000	0.000	Be
Cadmium	< 0.100	0.000	0.000	< 0.048	0.000	0.000	0.000	0.000	Cd
Chromium	1.360	0.000	1.030	0.524	0.002	0.312	0.000	0.312	Cr
Cobalt	< 0.125	0.000	0.000	< 0.060	0.001	0.156	0.000	0.156	Co
Copper	1.960	0.000	0.000	0.846	0.000	0.000	0.000	0.000	Cu
Lead	< 1.250	0.000	0.000	< 0.595	0.000	0.000	0.000	0.000	Pb
Manganese	2.700	0.000	0.741	11.600	0.004	0.757	0.000	0.757	Mn
Nickel	4.850	0.000	3.960	0.454	0.000	0.000	0.000	0.000	Ni
Phosphorus	6.980	0.000	17.000	< 2.380	0.000	0.000	0.000	0.000	P
Selenium	< 3.750	0.000	0.000	< 1.780	0.000	0.000	0.000	0.000	Se
Silver	< 0.500	0.000	0.000	< 0.238	0.000	0.000	0.000	0.000	Ag
Thallium	< 2.500	0.000	0.000	< 1.190	0.000	0.000	0.000	0.000	Tl
Vanadium	< 0.250	0.000	0.000	< 0.119	0.000	0.000	0.000	0.000	V
Zinc	4.690	0.000	1.520	1.060	0.002	0.423	0.000	0.423	Zn

Lab ID:	23-S664	23-S730	23-S729	23-S665	23-S731	N/A	N/A
Content:	0.1N HNO ₃ FH Filter & Probe Rinse 100ml 0.1N HNO ₃ Rinse	0.1N HNO ₃	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	0.1N HNO ₃

Blank Rules: < indicates value is below the method detection limit (MDL).
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Eagle Foundry Company
Cooling Bunker BH Outlet - White Iron
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 3
Test Date: 3/29/2023
Page: 2 of 3

	X Allowable FH Blank Correction	XI Total FH Blank Correction	XII 5% of FH Sample	XIII Lessor of XI or XII	XIV Greater of A or XIII	XV FH Net Sample	
Analyte	µg	µg	µg	µg	µg	µg	
Aluminum	11.630	58.800	4.295	4.295	11.63	74.270	Al
Antimony	2.860	2.860	0.088	0.088	11.63	-1.100	Sb
Arsenic	0.000	0.000	<	0.000	11.63	1.750	As
Barium	1.477	1.477	0.133	0.133	11.63	1.173	Ba
Beryllium	0.000	0.000	<	0.003	11.63	0.050	Be
Cadmium	0.000	0.000	<	0.005	11.63	0.100	Cd
Chromium	1.030	1.030	0.068	0.068	11.63	0.330	Cr
Cobalt	0.000	0.000	<	0.006	11.63	0.125	Co
Copper	0.000	0.000	0.098	0.000	11.63	1.960	Cu
Lead	0.000	0.000	<	0.063	11.63	1.250	Pb
Manganese	0.741	0.741	0.135	0.135	11.63	1.959	Mn
Nickel	3.960	3.960	0.243	0.243	11.63	0.890	Ni
Phosphorus	11.630	17.000	0.349	0.349	11.63	-4.650	P
Selenium	0.000	0.000	<	0.188	11.63	3.750	Se
Silver	0.000	0.000	<	0.025	11.63	0.500	Ag
Thallium	0.000	0.000	<	0.125	11.63	2.500	Tl
Vanadium	0.000	0.000	<	0.013	11.63	0.250	V
Zinc	1.520	1.520	0.235	0.235	11.63	3.170	Zn

Note: Allowable FH Blank (A) = (area of filter)*(1.4 µg/in²) = 11.63 µg
where area of filter = 8.306 in²

If A > blank > 0, use blank-derived value.

If blank > A, use greater of A or [lessor of 5% of sample µg or FH blank].

Blank Rules: < indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Cooling Bunker BH Outlet - White Iron
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 3
Test Date: 3/29/2023
Page: 3 of 3

Analyte	XVI Allowable BH Blank Correction µg	XVII Total BH Blank Correction µg	XVIII 5% of BH Sample µg	XIX Lessor of XVII or XVIII µg	XX Greater of 1 µg or XIX µg	XXI BH Net Sample µg	XXII FH Net Sample µg	XXIII FH+BH Total Net Sample µg	
Aluminum	1.145	16.633	1.145	1.145	1.145	21.755	74.270	96.025	Al
Antimony	0.000	0.000	< 0.030	0.000	1.000	< 0.595	0.000	< 0.595	Sb
Arsenic	0.000	0.000	< 0.042	0.000	1.000	< 0.833	< 1.750	< 2.583	As
Barium	0.810	0.810	0.037	0.037	1.000	0.000	1.173	1.173	Ba
Beryllium	0.000	0.000	< 0.001	0.000	1.000	< 0.024	< 0.050	< 0.074	Be
Cadmium	0.000	0.000	< 0.002	0.000	1.000	< 0.048	< 0.100	< 0.148	Cd
Chromium	0.312	0.312	0.026	0.026	1.000	0.212	0.330	0.542	Cr
Cobalt	0.156	0.156	< 0.003	0.156	1.000	< 0.000	< 0.125	< 0.125	Co
Copper	0.000	0.000	0.042	0.000	1.000	0.846	1.960	2.806	Cu
Lead	0.000	0.000	< 0.030	0.000	1.000	< 0.595	< 1.250	< 1.845	Pb
Manganese	0.757	0.757	0.580	0.580	1.000	10.843	1.959	12.802	Mn
Nickel	0.000	0.000	0.023	0.000	1.000	0.454	0.890	1.344	Ni
Phosphorus	0.000	0.000	< 0.119	0.000	1.000	< 2.380	< 0.000	< 2.380	P
Selenium	0.000	0.000	< 0.089	0.000	1.000	< 1.780	< 3.750	< 5.530	Se
Silver	0.000	0.000	< 0.012	0.000	1.000	< 0.238	< 0.500	< 0.738	Ag
Thallium	0.000	0.000	< 0.060	0.000	1.000	< 1.190	< 2.500	< 3.690	Tl
Vanadium	0.000	0.000	< 0.006	0.000	1.000	< 0.119	< 0.250	< 0.369	V
Zinc	0.423	0.423	0.053	0.053	1.000	0.637	3.170	3.807	Zn

Note: Allowable BH Blank rules:

If 1.00 µg > blank > 0, use blank-derived value.

If blank > 1.00 µg, use greater of 1.00 µg or [lessor of 5% of sample µg or BH blank].

Blank Rules: '<' indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Cooling Bunker BH Outlet - White Iron
Mercury Blank Correction Calculations

Blank Lab Values

Analyte	Filter Cont. 12 µg/filter		BH Imps. 2&3 Cap.Soln. Cont. 9 5% HNO ₃ / 10% H ₂ O ₂ µg/sample		FH/BH Rinse Cont. 8A 0.1 N HNO ₃ µg/sample		BH Imps. 5&6 Rinse Cont. 8B H ₂ O µg/sample		BH Imps. 5&6 Cap.Soln. + Rinse Cont. 10 KMnO ₄ µg/sample		BH Imps. 5&6 Rinse Cont. 11 HCl µg/sample	
	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Result	MDL
Mercury	0.0406	0.0219	0.118	0.0172	< MDL	0.0219	< MDL	0.0295	0.0628	0.0163	< MDL	0.0108

Lab ID: 23-S729 23-S731 23-S730 23-S732 23-S733 23-S734
Blank vol, ml: NA 196 250 337 186 124

Blank Correction Values

Analyte: Mercury	Blank FH HNO ₃ Rinse µg	Blank Filter µg	Blank BH Cap.Soln. µg	Blank BH HNO ₃ Rinse µg	Blank BH H ₂ O Rinse µg	Blank BH KMnO ₄ Cap.Soln. + Rinse µg	Blank BH HCl Rinse µg	Total Blank Correction µg	Is Total Blank Correction ≥ 0 and ≤ 0.6?
Run 1	0.00	0.04	0.12	0.00	0.00	0.10	0.00	0.2623	Yes
Reagent vol, ml	100.0		200.0	200.0	100.0	300.0	225.0		
Run 2	0.00	0.04	0.12	0.00	0.00	0.10	0.00	0.2623	Yes
Reagent vol, ml	100.0		200.0	200.0	100.0	300.0	225.0		
Run 3	0.00	0.04	0.12	0.00	0.00	0.10	0.00	0.2623	Yes
Reagent vol, ml	100.0		200.0	200.0	100.0	300.0	225.0		

Notes: 0.1N HNO₃ FH Filter 5% HNO₃/ 10% H₂O₂ 0.1N HNO₃ H₂O 4% KMnO₄/ 10% H₂SO₄ 25 ml 8N HCl/
FH Probe Rinse BH Imps 1-4 BH Imps 5&6 BH Imps 5&6 BH Imps 5&6

Blank Corrected Results

Analyte: Mercury	Sample FH Rinse + Filter Cont. 1&3 µg	Sample BH Cap.Soln. + HNO ₃ Rinse Cont. 4 µg	Sample BH Imp. 4 + Rinse Cont. 5A µg	Sample BH Imps. 5&6 + Rinses Cont. 5B µg	Sample BH HCl Rinse + Water Cont. 5C µg	Total Sample µg	Total Blank Correction µg	Total Net Sample µg
Run 1	< 0.0219	0.152	< 0.0103	0.150	< 0.0196	< 0.3538	0.2623	< 0.0915
Lab ID	23-S654	23-S655	23-S656	23-S657	23-S658			
Run 2	< 0.0219	0.162	< 0.00884	0.144	< 0.0194	< 0.3561	0.2623	< 0.0938
Lab ID	23-S659	23-S660	23-S661	23-S662	23-S663			
Run 3	< 0.0219	0.176	< 0.0137	0.127	< 0.0198	< 0.3584	0.2623	< 0.0961
Lab ID	23-S664	23-S665	23-S666	23-S667	23-S668			

Blank Rules: < indicates value is below the method detection limit (MDL)
If blank is '<' it is treated as zero.
If sample is '<' it is used for emission rate calculations but results are preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.
If the total blank correction value is less than or equal to 0.6 µg, subtract the total blank correction value from the total sample value to determine total net Hg. Otherwise, the value used for the blank correction shall be the greater of (1) 0.6 µg or (2) the lesser of [total FH blank + total BH blank] or 5% of the total sample value

EPA Method 29
Gas Stream Characteristics
Test Summary

Client: Eagle Foundry Company
Source: Cooling Bunker BH Outlet - White Iron
Location: Eagle Creek, OR

Parameter	Units	Run 1	Run 2	Run 3	
Date		3/27/2023	3/28/2023	3/29/2023	
Run Start Time		6:40	5:10	5:15	
Run End Time		10:40	9:10	9:15	
Duration	minutes	240	240	240	Average
Barometric Pressure	inHg	29.88	29.41	29.41	29.57
Nozzle Diameter	inches	0.266	0.266	0.266	0.266
Isokinetic Average	%	98.0	100.0	99.0	99.0
Sample Volume	dscf	250.081	233.696	236.686	240.154
Sample Volume	dscm	7.081	6.618	6.702	6.800
Stack Diameter	inches	55.75	55.75	55.75	55.75
Stack Area	ft ²	16.952	16.952	16.952	16.952
CO ₂	%vd	0.07	0.06	0.07	0.07
O ₂	%vd	20.79	20.73	20.92	20.81
Static Pressure	inH ₂ O	1.00	1.00	1.00	1.00
H ₂ O	%v	0.59	1.00	0.51	0.70
Wet Molecular Weight	lb/lb-mole	28.78	28.73	28.79	28.77
Velocity	fps	44.43	42.14	42.33	42.97
Flow Rate	adcfm	44,924	42,432	42,835	43,397
	acfm	45,191	42,861	43,055	43,702
	dscfm	46,710	42,771	43,736	44,406
Stack Temperature	°F	48.4	56.2	49.6	51.4
Production Data	lb melt/pour	11,955.985	12,165.997	11,960.006	
	ton melt/pour	5.978	6.083	5.980	
	lb Cr/melt	3,106.941	3,124.611	3,071.140	
	ton Cr/melt	1.553	1.562	1.536	
	lb Mn/melt	120.685	126.908	122.799	
	ton Mn/melt	0.060	0.063	0.061	

Run 1											
Analyte	Total				FH Net			BH Net			
	µg	µg/dscm	lb/hr	lb/ton melt	µg	µg/dscm	lb/hr	µg	µg/dscm	lb/hr	
Aluminum	120.485	17.015	2.98E-03	1.99E-03	90.370	12.762	2.23E-03	30.115	4.253	7.44E-04	Al
Antimony	< 0.765	< 0.108	< 1.89E-05	< 1.26E-05	0.000	0.000	0.00E+00	< 0.765	< 0.108	< 1.89E-05	Sb
Arsenic	< 2.821	< 0.398	< 6.97E-05	< 4.66E-05	< 1.750	< 0.247	< 4.32E-05	< 1.071	< 0.151	< 2.65E-05	As
Barium	2.485	0.351	6.14E-05	4.11E-05	2.393	0.338	5.91E-05	0.092	0.013	2.27E-06	Ba
Beryllium	< 0.081	< 0.011	< 2.00E-06	< 1.34E-06	< 0.050	< 0.007	< 1.24E-06	< 0.031	< 0.004	< 7.66E-07	Be
Cadmium	< 0.161	< 0.023	< 3.98E-06	< 2.66E-06	< 0.100	< 0.014	< 2.47E-06	< 0.061	< 0.009	< 1.51E-06	Cd
Chromium	1.996	0.282	4.93E-05		1.450	0.205	3.58E-05	0.546	0.077	1.35E-05	Cr
Cobalt	< 0.125	< 0.018	< 3.09E-06	< 2.07E-06	< 0.125	< 0.018	< 3.09E-06	0.000	0.000	0.00E+00	Co
Copper	6.310	0.891	1.56E-04	1.04E-04	5.140	0.726	1.27E-04	1.170	0.165	2.89E-05	Cu
Lead	< 3.815	< 0.539	< 9.43E-05	< 6.31E-05	3.050	0.431	7.54E-05	< 0.765	< 0.108	< 1.89E-05	Pb
Manganese	5.219	0.737	1.29E-04		5.219	0.737	1.29E-04	0.000	0.000	0.00E+00	Mn
Mercury	< 0.092	< 0.013	< 2.26E-06	< 1.51E-06							Hg
Nickel	5.900	0.833	1.46E-04	9.75E-05	4.370	0.617	1.08E-04	1.530	0.216	3.78E-05	Ni
Phosphorus	< 3.060	< 0.432	< 7.56E-05	< 5.06E-05	0.000	0.000	0.00E+00	< 3.060	< 0.432	< 7.56E-05	P
Selenium	< 6.050	< 0.854	< 1.49E-04	< 1.00E-04	< 3.750	< 0.530	< 9.27E-05	< 2.300	< 0.325	< 5.68E-05	Se
Silver	< 0.806	< 0.114	< 1.99E-05	< 1.33E-05	< 0.500	< 0.071	< 1.24E-05	< 0.306	< 0.043	< 7.56E-06	Ag
Thallium	< 4.030	< 0.569	< 9.96E-05	< 6.66E-05	< 2.500	< 0.353	< 6.18E-05	< 1.530	< 0.216	< 3.78E-05	Tl
Vanadium	< 0.403	< 0.057	< 9.96E-06	< 6.66E-06	< 0.250	< 0.035	< 6.18E-06	< 0.153	< 0.022	< 3.78E-06	V
Zinc	21.297	3.008	5.26E-04	3.52E-04	17.680	2.497	4.37E-04	3.617	0.511	8.94E-05	Zn

Chromium	lb Cr / ton Cr in melt =	1.27E-04
Manganese	lb Mn / ton Mn in melt =	8.55E-03

Run 1 Emission Factors

Run 2											
Analyte	Total				FH Net			BH Net			
	µg	µg/dscm	lb/hr	lb/ton melt	µg	µg/dscm	lb/hr	µg	µg/dscm	lb/hr	
Aluminum	101.370	15.317	2.45E-03	1.61E-03	84.570	12.779	2.05E-03	16.800	2.539	4.07E-04	Al
Antimony	< 0.575	< 0.087	< 1.39E-05	< 9.15E-06	0.000	0.000	0.00E+00	< 0.575	< 0.087	< 1.39E-05	Sb
Arsenic	< 2.765	< 0.418	< 6.69E-05	< 4.40E-05	1.960	0.296	4.74E-05	< 0.805	< 0.122	< 1.95E-05	As
Barium	3.223	0.487	7.80E-05	5.13E-05	3.223	0.487	7.80E-05	0.000	0.000	0.00E+00	Ba
Beryllium	< 0.073	< 0.011	< 1.77E-06	< 1.16E-06	< 0.050	< 0.008	< 1.21E-06	< 0.023	< 0.003	< 5.57E-07	Be
Cadmium	< 0.146	< 0.022	< 3.53E-06	< 2.32E-06	< 0.100	< 0.015	< 2.42E-06	< 0.046	< 0.007	< 1.11E-06	Cd
Chromium	1.888	0.285	4.57E-05		1.170	0.177	2.83E-05	0.718	0.108	1.74E-05	Cr
Cobalt	< 0.125	< 0.019	< 3.03E-06	< 1.99E-06	< 0.125	< 0.019	< 3.03E-06	0.000	0.000	0.00E+00	Co
Copper	5.434	0.821	1.32E-04	8.65E-05	4.760	0.719	1.15E-04	0.674	0.102	1.63E-05	Cu
Lead	< 2.505	< 0.379	< 6.06E-05	< 3.99E-05	1.930	0.292	4.67E-05	< 0.575	< 0.087	< 1.39E-05	Pb
Manganese	5.062	0.765	1.23E-04		4.579	0.692	1.11E-04	0.483	0.073	1.17E-05	Mn
Mercury	< 0.094	< 0.014	< 2.27E-06	< 1.49E-06							Hg
Nickel	4.661	0.704	1.13E-04	7.42E-05	3.740	0.565	9.05E-05	0.921	0.139	2.23E-05	Ni
Phosphorus	< 2.300	< 0.348	< 5.57E-05	< 3.66E-05	0.000	0.000	0.00E+00	< 2.300	< 0.348	< 5.57E-05	P
Selenium	< 5.470	< 0.827	< 1.32E-04	< 8.71E-05	< 3.750	< 0.567	< 9.08E-05	< 1.720	< 0.260	< 4.16E-05	Se
Silver	< 0.730	< 0.110	< 1.77E-05	< 1.16E-05	< 0.500	< 0.076	< 1.21E-05	< 0.230	< 0.035	< 5.57E-06	Ag
Thallium	< 3.650	< 0.552	< 8.84E-05	< 5.81E-05	< 2.500	< 0.378	< 6.05E-05	< 1.150	< 0.174	< 2.78E-05	Tl
Vanadium	< 0.365	< 0.055	< 8.84E-06	< 5.81E-06	< 0.250	< 0.038	< 6.05E-06	< 0.115	< 0.017	< 2.78E-06	V
Zinc	12.227	1.848	2.96E-04	1.95E-04	11.080	1.674	2.68E-04	1.147	0.173	2.78E-05	Zn

Chromium	lb Cr / ton Cr in melt =	1.17E-04
Manganese	lb Mn / ton Mn in melt =	7.72E-03

Run 2 Emission Factors

Note: Results for Hg front half and back half fractions are not shown because these values are not blank-corrected. Per EPA Method 29, only the sum of Hg front and back half results is subject to blank correction.

'<' denotes results which were calculated using the method detection limit for front half or back half results that were non-detect.

Run 3											
Analyte	Total				FH Net			BH Net			
	µg	µg/dscm	lb/hr	lb/ton melt	µg	µg/dscm	lb/hr	µg	µg/dscm	lb/hr	
Aluminum	96.025	14.328	2.35E-03	1.57E-03	74.270	11.082	1.82E-03	21.755	3.246	5.32E-04	Al
Antimony	< 0.595	< 0.089	< 1.45E-05	< 9.73E-06	0.000	0.000	0.00E+00	< 0.595	< 0.089	< 1.45E-05	Sb
Arsenic	< 2.583	< 0.385	< 6.31E-05	< 4.22E-05	< 1.750	< 0.261	< 4.28E-05	< 0.833	< 0.124	< 2.04E-05	As
Barium	1.173	0.175	2.87E-05	1.92E-05	1.173	0.175	2.87E-05	0.000	0.000	0.00E+00	Ba
Beryllium	< 0.074	< 0.011	< 1.81E-06	< 1.21E-06	< 0.050	< 0.007	< 1.22E-06	< 0.024	< 0.004	< 5.87E-07	Be
Cadmium	< 0.148	< 0.022	< 3.62E-06	< 2.42E-06	< 0.100	< 0.015	< 2.44E-06	< 0.048	< 0.007	< 1.17E-06	Cd
Chromium	0.542	0.081	1.32E-05		0.330	0.049	8.07E-06	0.212	0.032	5.18E-06	Cr
Cobalt	< 0.125	< 0.019	< 3.06E-06	< 2.04E-06	< 0.125	< 0.019	< 3.06E-06	0.000	0.000	0.00E+00	Co
Copper	2.806	0.419	6.86E-05	4.59E-05	1.960	0.292	4.79E-05	0.846	0.126	2.07E-05	Cu
Lead	< 1.845	< 0.275	< 4.51E-05	< 3.02E-05	< 1.250	< 0.187	< 3.06E-05	< 0.595	< 0.089	< 1.45E-05	Pb
Manganese	12.802	1.910	3.13E-04		1.959	0.292	4.79E-05	10.843	1.618	2.65E-04	Mn
Mercury	< 0.096	< 0.014	< 2.35E-06	< 1.57E-06							Hg
Nickel	1.344	0.201	3.29E-05	2.20E-05	0.890	0.133	2.18E-05	0.454	0.068	1.11E-05	Ni
Phosphorus	< 2.380	< 0.355	< 5.82E-05	< 3.89E-05	0.000	0.000	0.00E+00	< 2.380	< 0.355	< 5.82E-05	P
Selenium	< 5.530	< 0.825	< 1.35E-04	< 9.04E-05	< 3.750	< 0.560	< 9.17E-05	< 1.780	< 0.266	< 4.35E-05	Se
Silver	< 0.738	< 0.110	< 1.80E-05	< 1.21E-05	< 0.500	< 0.075	< 1.22E-05	< 0.238	< 0.036	< 5.82E-06	Ag
Thallium	< 3.690	< 0.551	< 9.02E-05	< 6.03E-05	< 2.500	< 0.373	< 6.11E-05	< 1.190	< 0.178	< 2.91E-05	Tl
Vanadium	< 0.369	< 0.055	< 9.02E-06	< 6.03E-06	< 0.250	< 0.037	< 6.11E-06	< 0.119	< 0.018	< 2.91E-06	V
Zinc	3.807	0.568	9.31E-05	6.22E-05	3.170	0.473	7.75E-05	0.637	0.095	1.56E-05	Zn

Chromium	lb Cr / ton Cr in melt =	3.45E-05
Manganese	lb Mn / ton Mn in melt =	2.04E-02

Run 3 Emission Factors

Mean Runs 1-3											
Analyte	Total				FH Net			BH Net			
	µg	µg/dscm	lb/hr	lb/ton melt	µg	µg/dscm	lb/hr	µg	µg/dscm	lb/hr	
Aluminum	105.960	15.553	2.59E-03	1.73E-03	83.070	12.208	2.03E-03	22.890	3.346	5.61E-04	
Antimony	< 0.645	< 0.095	< 1.58E-05	< 1.05E-05	0.000	0.000	0.00E+00	< 0.645	< 0.095	< 1.58E-05	Sb
Arsenic	< 2.723	< 0.401	< 6.66E-05	< 4.43E-05	< 1.820	< 0.268	< 4.45E-05	< 0.903	< 0.132	< 2.21E-05	As
Barium	2.293	0.338	5.60E-05	3.72E-05	2.263	0.333	5.53E-05	0.031	0.004	7.56E-07	Ba
Beryllium	< 0.076	< 0.011	< 1.86E-06	< 1.24E-06	< 0.050	< 0.007	< 1.22E-06	< 0.026	< 0.004	< 6.37E-07	Be
Cadmium	< 0.152	< 0.022	< 3.71E-06	< 2.47E-06	< 0.100	< 0.015	< 2.45E-06	< 0.052	< 0.008	< 1.26E-06	Cd
Chromium	1.475	0.216	3.61E-05		0.983	0.144	2.41E-05	0.492	0.072	1.20E-05	Cr
Cobalt	< 0.125	< 0.018	< 3.06E-06	< 2.03E-06	< 0.125	< 0.018	< 3.06E-06	0.000	0.000	0.00E+00	Co
Copper	4.850	0.710	1.19E-04	7.89E-05	3.953	0.579	9.67E-05	0.897	0.131	2.20E-05	Cu
Lead	< 2.722	< 0.398	< 6.67E-05	< 4.44E-05	< 2.077	< 0.303	< 5.09E-05	< 0.645	< 0.095	< 1.58E-05	Pb
Manganese	7.694	1.137	1.88E-04		3.919	0.574	9.59E-05	3.775	0.564	9.22E-05	Mn
Mercury	< 0.094	< 0.014	< 2.29E-06	< 1.53E-06							Hg
Nickel	3.968	0.579	9.72E-05	6.46E-05	3.000	0.438	7.34E-05	0.968	0.141	2.37E-05	Ni
Phosphorus	< 2.580	< 0.378	< 6.32E-05	< 4.20E-05	0.000	0.000	0.00E+00	< 2.580	< 0.378	< 6.32E-05	P
Selenium	< 5.683	< 0.835	< 1.39E-04	< 9.25E-05	< 3.750	< 0.552	< 9.17E-05	< 1.933	< 0.283	< 4.73E-05	Se
Silver	< 0.758	< 0.111	< 1.85E-05	< 1.23E-05	< 0.500	< 0.074	< 1.22E-05	< 0.258	< 0.038	< 6.32E-06	Ag
Thallium	< 3.790	< 0.557	< 9.27E-05	< 6.17E-05	< 2.500	< 0.368	< 6.11E-05	< 1.290	< 0.189	< 3.16E-05	Tl
Vanadium	< 0.379	< 0.056	< 9.27E-06	< 6.17E-06	< 0.250	< 0.037	< 6.11E-06	< 0.129	< 0.019	< 3.16E-06	V
Zinc	12.444	1.808	3.05E-04	2.03E-04	10.643	1.548	2.61E-04	1.800	0.260	4.42E-05	Zn

Chromium	lb Cr / ton Cr in melt =	9.28E-05
Manganese	lb Mn / ton Mn in melt =	1.22E-02

Mean Runs 1-3

Note: Results for Hg front half and back half fractions are not shown because these values are not blank-corrected. Per EPA Method 29, only the sum of Hg front and back half results is subject to blank correction.

'<' denotes results which were calculated using the method detection limit for front half or back half results that were non-detect.



COMPANY	Eagle Foundry Company
FACILITY	Eagle Foundry
LOCATION	Eagle Creek, OR
SOURCE	Cooling Bunker BH Outlet - White Iron
DATE	3/27/2023 - 3/29/2023
METHOD	0061
POLLUTANT	Cr VI

EPA Method 1
Stack Parameters and Traverse Points

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Cooling Bunker BH Outlet - White Iron
Facility: Eagle Foundry

Type of Testing: P (P for Particulate; V for Velocity/Nonparticulate)
Type of Duct: C (C for circular; R for rectangular)

Number of ports available: 2
Number of ports to be used: 2
Port diameter: 4 inches
Sampling location height (approx.): feet
Stack height (approx.): feet

Circular ID (Rectangular Depth): 55.75 inches
Port depth and/or wall thickness: 6.50 inches
Stack width (Rectangular only): inches

Equivalent Diameter
If rectangular = $\frac{2 * \text{Depth} * \text{Width}}{\text{Depth} + \text{Width}}$ = 55.75 inches (If circular = duct ID)

Stack/duct area = 16.952 sq.feet 2441.1 sq. inches

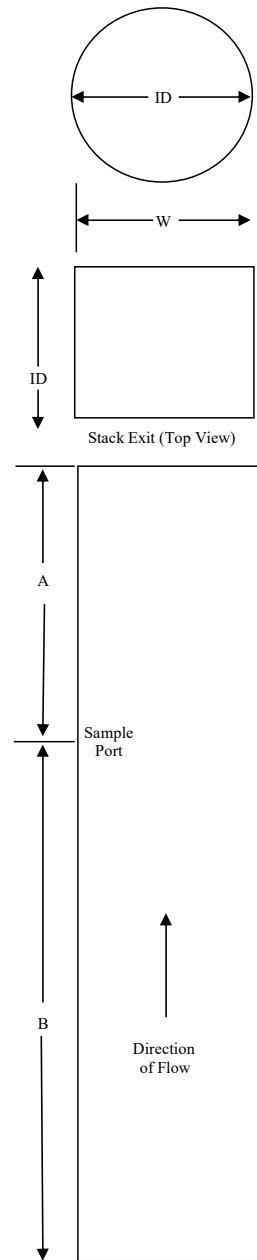
Sample Port Location: Downstream flow disturbance from process Upstream flow disturbance toward exit
Number of Inches: 246.00 45.00
Number of Diameters: 4.41 0.81

Minimum Number of Traverse Points: 24

Traverse points less than 1.0 inch from the stack wall are relocated to a distance of 1.0 inch.

Points	% of diameter	Distance from inside wall (in.)	Distance including port (in.)
1	2.1	1.17	7 5/8
2	6.7	3.74	10 1/4
3	11.8	6.58	13 1/8
4	17.7	9.87	16 3/8
5	25.0	13.94	20 1/2
6	35.6	19.85	26 3/8
7	64.4	35.90	42 3/8
8	75.0	41.81	48 3/8
9	82.3	45.88	52 3/8
10	88.2	49.17	55 5/8
11	93.3	52.01	58 1/2
12	97.9	54.58	61 1/8

Reference Diagram



Drawing NOT to scale and NOT an accurate representation of stack.

Pre-Test Traverse

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Cooling Bunker BH Outlet - White Iron

Stack Temp: 58 °F

Traverse Point	Velocity ΔP ("H ₂ O)	Null Angle
1	0.67	0
2	0.71	5
3	0.73	0
4	0.69	5
5	0.65	5
6	0.69	0
7	0.72	5
8	0.76	0
9	0.75	5
10	0.72	0
11	0.71	5
12	0.62	5

Average: 0.70 3

Flow is found to be: Non-cyclonic

Isokinetic Field Data
Field Data Entry

Client:	Eagle Foundry Company	Run:	1
Location:	Eagle Creek, OR	Start Time:	6:40
Source:	Cooling Bunker BH Outlet - White Iron	End Time:	10:42
EPA Method:	0061	Date:	3/27/2023
Box Operator:	JCR	Environmental Conditions/Test Notes:	
Technician(s):	AJV	Mostly cloudy and 30s °F	

Stack Dimensional Data:		Equipment:					
Circular		Meterbox ID	13	Probe ID	8A	Liner type	GLASS
Diameter	55.750 in	Y factor	1.0122	Nozzle ID	N/A	Nozzle size	0.263 inches
Rectangular		ΔH@	1.743	Hot box ID	N/A	Nozzle area	0.000377 sq.ft.
Width	in	Bp ID	TS1	Pitot Cp	0.84	Probe heat	250 °F
Length	in	Balance ID	HLN FB1	Pitot ID	8A	Filter heat	N/A °F
Stack Area	16.952 sq.ft.	Weights ID	HLN FW1	Probe Length, ft	8		

Source Information:				Leak Checks:			
Barometric Pressure	29.88 "Hg	O ₂	20.90 %		Pre-test	Post-test	
Static Pressure	1 "H ₂ O	CO ₂	0.00 %	Pitot	X	X	
Ave. ΔP	0.7 "H ₂ O	Rec. Nz.	0.223 inches	Leak rate, dcf	0.000	0.000	
Stack Temperature	60 °F			Leak check vacuum, "Hg	10	10	
Assumed moisture	3.00 %			Nozzle check for roundness:			
Assumed meter temp.	65 °F			1	2	3	
Total number of points	24			0.262	0.263	0.263 inches	
Time per point	10 min.				Caliper ID	WS1	
Total run time	240 min.						

Post Test Calculations:				Moisture/Lab:			
Sample volume	232.999 dcf	Ave. ΔP	0.628 "H ₂ O	Filter, #	N/A		
Wet mol. weight	28.78 M _s (actual)	Ave. √ΔP	0.792 "H ₂ O		Initial	Final	Gain
Actual H ₂ O	0.57 %	Ave. ΔH	3.165 "H ₂ O	Impingers, g	1,745.8	1,735.0	-10.8
Std. meter vol.	239.679 dscf	Ave. T _s	45.2 °F	Silica gel, g	914.0	954.2	40.2
Isokinetic Average	97.5 %	Ave. T _m	62.9 °F		Total water gain, g:		29.4

Traverse Point	Time (min.)	Meter Volume (dcf)	Velocity ΔP ("H ₂ O)	Stack Temp. (°F)	Meter Temp. (°F)	Calc. ΔH	Run ΔH	Vacuum ("Hg)	Filter Box (°F)	Condenser Temp (≤68°F)
1	10.0	8.810	0.56	38	54	2.81	2.80	6	N/A	45
2	20.0	17.720	0.56	40	54	2.80	2.80	6	N/A	46
3	30.0	26.880	0.59	40	55	2.96	2.95	7	N/A	46
4	40.0	35.940	0.53	39	57	2.67	2.65	7	N/A	51
5	50.0	45.480	0.63	40	58	3.18	3.20	7.5	N/A	47
6	60.0	55.030	0.63	40	59	3.18	3.20	7.5	N/A	47
7	70.0	65.080	0.69	40	59	3.49	3.50	9	N/A	50
8	80.0	75.150	0.70	40	60	3.54	3.55	9.5	N/A	52
9	90.0	85.230	0.67	40	60	3.39	3.40	9	N/A	46
10	100.0	95.130	0.64	41	60	3.23	3.25	9	N/A	41
11	110.0	105.490	0.67	42	62	3.39	3.40	9	N/A	40
12	120.0	115.250	0.66	43	64	3.35	3.35	9	N/A	41
13	130.0	125.470	0.70	44	65	3.55	3.55	9	N/A	40
14	140.0	135.510	0.62	45	66	3.14	3.15	8.5	N/A	40
15	150.0	145.360	0.62	45	69	3.16	3.15	8.5	N/A	41
16	160.0	155.060	0.59	47	69	3.00	3.00	8	N/A	42
17	170.0	164.640	0.58	48	69	2.94	2.95	8	N/A	42
18	180.0	174.030	0.55	50	69	2.78	2.80	7.5	N/A	43
19	190.0	183.480	0.61	50	68	3.07	3.05	7.5	N/A	43
20	200.0	193.630	0.70	52	68	3.51	3.50	9	N/A	44
21	210.0	203.890	0.65	53	67	3.25	3.25	9	N/A	45
22	220.0	213.690	0.65	54	66	3.24	3.25	9	N/A	45
23	230.0	223.320	0.63	56	66	3.13	3.15	8.5	N/A	45
24	240.0	232.999	0.63	58	66	3.11	3.10	8	N/A	45

Isokinetic Field Data
Field Data Entry

Client:	Eagle Foundry Company	Run:	2
Location:	Eagle Creek, OR	Start Time:	5:10
Source:	Cooling Bunker BH Outlet - White Iron	End Time:	9:11
EPA Method:	0061	Environmental Conditions/Test Notes:	Date: 3/28/2023
Box Operator:	JCR	Mostly cloudy and 30s °F	
Technician(s):	AJV		

Stack Dimensional Data:		Equipment:					
Circular		Meterbox ID	13	Probe ID	8A	Liner type	GLASS
Diameter	55.750 in	Y factor	1.0122	Nozzle ID	N/A	Nozzle size	0.263 inches
Rectangular		ΔH@	1.743	Hot box ID	N/A	Nozzle area	0.000377 sq.ft.
Width	in	Bp ID	TS1	Pitot Cp	0.84	Probe heat	250 °F
Length	in	Balance ID	HLN FB1	Pitot ID	8A	Filter heat	N/A °F
Stack Area	16.952 sq.ft.	Weights ID	HLN FW1	Probe Length, ft	8		

Source Information:				Leak Checks:		
Barometric Pressure	29.41 "Hg	O ₂	20.90 %	Pitot	X	X
Static Pressure	1 "H ₂ O	CO ₂	0.00 %	Leak rate, dcf	0.000	0.000
Ave. ΔP	0.7 "H ₂ O	Rec. Nz.	0.221 inches	Leak check vacuum, "Hg	10	11
Stack Temperature	60 °F					
Assumed moisture	0.57 %					
Assumed meter temp.	62.9 °F					
Total number of points	24					
Time per point	10 min.					
Total run time	240 min.					

Nozzle check for roundness:		
1	2	3
0.262	0.263	0.263 inches
Caliper ID	WS1	

Post Test Calculations:				Moisture/Lab:			
Sample volume	226.599 dcf	Ave. ΔP	0.571 "H ₂ O	Filter, #	N/A		
Wet mol. weight	28.8 M _s (actual)	Ave. √ΔP	0.756 "H ₂ O	Initial		Final	Gain
Actual H ₂ O	0.36 %	Ave. ΔH	2.965 "H ₂ O	Impingers, g	1,728.0	1,712.8	-15.2
Std. meter vol.	227.989 dscf	Ave. T _s	53.7 °F	Silica gel, g	872.8	905.5	32.7
Isokinetic Average	98.6 %	Ave. T _m	66.0 °F	Total water gain:			17.5

Traverse Point	Time (min.)	Meter Volume (dcf)	Velocity ΔP ("H ₂ O)	Stack Temp. (°F)	Meter Temp. (°F)	Calc. ΔH	Run ΔH	Vacuum ("Hg)	Filter Box (°F)	Condenser Temp (≤68°F)
1	10.0	9.480	0.59	50	64	3.07	3.10	6	N/A	34
2	20.0	18.600	0.56	52	65	2.91	2.90	6.5	N/A	41
3	30.0	28.130	0.55	52	66	2.86	2.85	7	N/A	41
4	40.0	37.260	0.56	52	65	2.91	2.90	7.5	N/A	41
5	50.0	46.920	0.60	52	65	3.12	3.10	8	N/A	42
6	60.0	56.390	0.57	52	65	2.96	2.95	7.5	N/A	41
7	70.0	65.860	0.57	52	64	2.96	2.95	7.5	N/A	41
8	80.0	75.420	0.60	52	64	3.11	3.10	7.5	N/A	40
9	90.0	84.940	0.58	52	64	3.01	3.00	7.5	N/A	40
10	100.0	94.540	0.57	52	64	2.96	2.95	7.5	N/A	40
11	110.0	103.730	0.54	55	65	2.79	2.80	7	N/A	40
12	120.0	113.310	0.59	55	65	3.05	3.05	7.5	N/A	41
13	130.0	122.720	0.57	59	66	2.93	2.95	7.5	N/A	40
14	140.0	132.180	0.55	58	66	2.83	2.85	7.5	N/A	40
15	150.0	141.480	0.57	57	66	2.94	2.95	7	N/A	40
16	160.0	150.910	0.57	55	67	2.96	2.95	7	N/A	40
17	170.0	160.400	0.58	55	67	3.01	3.00	7	N/A	40
18	180.0	169.820	0.56	54	68	2.91	2.90	7	N/A	40
19	190.0	179.260	0.57	54	68	2.97	3.00	7	N/A	40
20	200.0	189.000	0.57	54	68	2.97	3.00	7	N/A	40
21	210.0	198.500	0.55	54	68	2.86	2.85	7	N/A	39
22	220.0	207.530	0.58	54	68	3.02	3.00	7	N/A	39
23	230.0	217.080	0.57	53	68	2.97	2.95	7	N/A	39
24	240.0	226.599	0.59	53	68	3.08	3.10	7	N/A	39

Isokinetic Field Data
Field Data Entry

Client:	Eagle Foundry Company	Run:	3
Location:	Eagle Creek, OR	Start Time:	5:15
Source:	Cooling Bunker BH Outlet - White Iron	End Time:	9:15
EPA Method:	0061	Environmental Conditions/Test Notes:	Date: 3/29/2023
Box Operator:	JCR	Mostly cloudy and 30s °F	
Technician(s):	AJV		

Stack Dimensional Data:		Equipment:	
Circular		Meterbox ID	13
Diameter	55.750 in	Y factor	1.0122
Rectangular		ΔH@	1.743
Width	in	Bp ID	TS1
Length	in	Balance ID	HLN FB1
Stack Area	16.952 sq.ft.	Weights ID	HLN FW1
		Probe ID	8A
		Nozzle ID	N/A
		Hot box ID	N/A
		Pitot Cp	0.84
		Pitot ID	8A
		Probe Length, ft	8
		Liner type	GLASS
		Nozzle size	0.263 inches
		Nozzle area	0.000377 sq.ft.
		Probe heat	250 °F
		Filter heat	N/A °F

Source Information:		Leak Checks:		Pre-test	Post-test
Barometric Pressure	29.41 "Hg	O ₂	20.90 %	Pitot	X
Static Pressure	1 "H ₂ O	CO ₂	0.00 %	Leak rate, dcf	0.000
Ave. ΔP	0.7 "H ₂ O	Rec. Nz.	0.22 inches	Leak check vacuum, "Hg	10
Stack Temperature	60 °F				13
Assumed moisture	0.36 %				
Assumed meter temp.	66 °F				
Total number of points	24				
Time per point	10 min.				
Total run time	240 min.				

Nozzle check for roundness:			
1	2	3	
0.262	0.263	0.263 inches	
	Caliper ID	WS1	

Post Test Calculations:		Moisture/Lab:	
Sample volume	220.582 dcf	Ave. ΔP	0.540 "H ₂ O
Wet mol. weight	28.76 M _s (actual)	Ave. √ΔP	0.734 "H ₂ O
Actual H ₂ O	0.71 %	Ave. ΔH	2.823 "H ₂ O
Std. meter vol.	223.862 dscf	Ave. T _s	47.0 °F
Isokinetic Average	99.3 %	Ave. T _m	61.3 °F

Filter, #	N/A		
Initial		Final	Gain
Impingers, g	1,726.1	1,716.0	-10.1
Silica gel, g	1,040.7	1,084.6	43.9
		Total water gain:	33.8

Traverse Point	Time (min.)	Meter Volume (dcf)	Velocity ΔP ("H ₂ O)	Stack Temp. (°F)	Meter Temp. (°F)	Calc. ΔH	Run ΔH	Vacuum ("Hg)	Filter Box (°F)	Condenser Temp (≤68°F)
		0.000								
1	10.0	8.440	0.48	43	56	2.50	2.50	6.5	N/A	31
2	20.0	17.300	0.52	47	55	2.69	2.70	7.5	N/A	36
3	30.0	26.310	0.52	46	57	2.70	2.70	7.5	N/A	37
4	40.0	35.380	0.52	46	60	2.72	2.70	7.5	N/A	37
5	50.0	44.590	0.54	45	62	2.84	2.85	8	N/A	38
6	60.0	54.280	0.59	45	64	3.11	3.10	8.5	N/A	39
7	70.0	63.660	0.55	47	65	2.90	2.90	8.5	N/A	39
8	80.0	73.330	0.61	46	64	3.21	3.20	8.5	N/A	39
9	90.0	82.750	0.55	46	64	2.90	2.90	8.5	N/A	40
10	100.0	91.860	0.52	46	63	2.73	2.75	8	N/A	39
11	110.0	100.730	0.49	45	62	2.58	2.60	7.5	N/A	39
12	120.0	109.650	0.49	46	62	2.57	2.55	7.5	N/A	39
13	130.0	118.530	0.54	46	61	2.83	2.85	8	N/A	39
14	140.0	128.300	0.59	46	60	3.08	3.10	8.5	N/A	39
15	150.0	137.420	0.56	49	59	2.90	2.90	8.5	N/A	39
16	160.0	146.640	0.55	50	59	2.85	2.85	8.5	N/A	39
17	170.0	156.000	0.55	50	59	2.85	2.85	8.5	N/A	40
18	180.0	165.230	0.59	49	59	3.06	3.05	8.5	N/A	39
19	190.0	175.280	0.56	50	59	2.90	2.90	8.5	N/A	40
20	200.0	184.800	0.56	49	61	2.91	2.90	8.5	N/A	39
21	210.0	192.990	0.46	48	64	2.41	2.40	7	N/A	39
22	220.0	201.610	0.46	48	64	2.41	2.40	7	N/A	39
23	230.0	211.140	0.61	48	65	3.21	3.20	8.5	N/A	38
24	240.0	220.582	0.55	47	66	2.90	2.90	8.5	N/A	39

EPA Method 4
Impinger Weights Summary

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Cooling Bunker BH Outlet - White Iron
EPA Method: 0061
Box Operator: JCR
Technician(s): AJV

Run 1

Impinger gain by weight (g):

#	Initial	Final	Gain
1	526.3	474.6	-51.7
2	433.7	425.6	-8.1
3	427.3	422.7	-4.6
4	358.5	412.1	53.6
Totals:	1,745.8	1,735.0	-10.8

Run 2

Impinger gain by weight (g):

#	Initial	Final	Gain
1	506.4	417.9	-88.5
2	431.4	451.4	20.0
3	430.8	429.3	-1.5
4	359.4	414.2	54.8
Totals:	1,728.0	1,712.8	-15.2

Run 3

Impinger gain by weight (g):

#	Initial	Final	Gain
1	505.6	420.3	-85.3
2	428.3	438.0	9.7
3	433.1	453.6	20.5
4	359.1	404.1	45.0
Totals:	1,726.1	1,716.0	-10.1

Isokinetic Field Data
Field Data and Calculations
Emissions and Gas Stream Characteristics

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Cooling Bunker BH Outlet - White Iron
Method: 0061

Run: 1
Start Time: 6:40
End Time: 10:40
Date: 3/27/2023

Sampling Data				Traverse Data			
Time min.	Meter ft ³	ΔH "H ₂ O	Meter T _m °F	Traverse Point	Dp "H ₂ O	Stack T _s °F	$\sqrt{Dp}$
	0.000						
10	8.810	2.80	54	1	0.56	38	0.748
20	17.720	2.80	54	2	0.56	40	0.748
30	26.880	2.95	55	3	0.59	40	0.768
40	35.940	2.65	57	4	0.53	39	0.728
50	45.480	3.20	58	5	0.63	40	0.794
60	55.030	3.20	59	6	0.63	40	0.794
70	65.080	3.50	59	7	0.69	40	0.831
80	75.150	3.55	60	8	0.70	40	0.837
90	85.230	3.40	60	9	0.67	40	0.819
100	95.130	3.25	60	10	0.64	41	0.800
110	105.490	3.40	62	11	0.67	42	0.819
120	115.250	3.35	64	12	0.66	43	0.812
130	125.470	3.55	65	13	0.70	44	0.837
140	135.510	3.15	66	14	0.62	45	0.787
150	145.360	3.15	69	15	0.62	45	0.787
160	155.060	3.00	69	16	0.59	47	0.768
170	164.640	2.95	69	17	0.58	48	0.762
180	174.030	2.80	69	18	0.55	50	0.742
190	183.480	3.05	68	19	0.61	50	0.781
200	193.630	3.50	68	20	0.70	52	0.837
210	203.890	3.25	67	21	0.65	53	0.806
220	213.690	3.25	66	22	0.65	54	0.806
230	223.320	3.15	66	23	0.63	56	0.794
240	232.999	3.10	66	24	0.63	58	0.794

Client:	Eagle Foundry Company	Run:	1
Source:	Cooling Bunker BH Outlet - White Iron	Date:	03/27/23

Field Data Input Continued

<u>Moisture Data</u>		<u>Stack Dimensional Data:</u>	
Total Test Time	240.0 min	Circular	
Sample Time Interval	10.0 min	Diameter	55.750 in
Meter Volume, V _m	232.999 dcf	Rectangular	
Water Volume	29.4 g	Width	in
Nozzle Diameter, N _z	0.2630 in.	Length	in
Nozzle Area	0.000377 sq.ft.	Stack Area	16.952 sq.ft.

<u>Traverse Data</u>		<u>Molecular Weight:</u>	
Barometric Pressure, P _b	29.88 "Hg	CO ₂ Average	0.07 %vd
Static Pressure	1.00 "H ₂ O	O ₂ Average	20.79 %vd
Pitot Factor, cp	0.84		
Meter Cal Factor	1.0122 Y		

Field Data Averages

<u>Meter</u>		<u>Stack</u>	
ΔH	3.165 "H ₂ O	√Dp	0.792 "H ₂ O
Temperature, T _m	62.9 °F	Temperature, T _s	45.2 °F
Temperature, T _m	522.6 °A (°R)	Temperature, T _s	504.9 °A (R)
Pressure Meter, P _m	30.113 "Hg	Pressure Stack, P _s	29.954 "Hg

Field Data Calculations

<u>Meter Box Capture</u>		<u>EPA Method 2 Stack Gas Flowrate:</u>	
Standard Volume, V _{m(std)}	239.679 dscf	Velocity, V _s	43.52 fps
	6.787 dscm	Volume (actual)	44,265 acfm
Actual Volume, V _{m(actual)}	230.376 awcf		44,013 adcfm
<u>Gas Stream Moisture</u>		Volume (standard)	2,778,999 wscf/hr
Moisture Vapor, V _{w(std)}	1.386 scf		2,763,159 dscf/hr
Moisture, B _{ws}	0.0057		46,053 dscf/min
Moisture EPA M4	0.57 %v		46,317 wscf/min
Moisture @ Saturation	1.01 %v (for T _s < 212°F)		
<u>EPA Method 3 Gas Density</u>		Volume/Mole, V/M	367.973
Dry, M _d	28.84 lb/lb-mole		
Wet, M _s	28.78 lb/lb-mole		
Percent Isokinetic	97.5 %		

Laboratory Results

Cr VI	< 5.60E-03	μg/sample
Cr VI	< 5.60E-09	grams
Emissions:		
Concentration Cr VI, C _s	< 3.61E-10	gr/dscf
	< 8.25E-04	μg/dscm
Mass Emissions Cr VI	< 1.42E-07	lb/hr

"<" represents MDL value

Isokinetic Field Data
Field Data and Calculations
Emissions and Gas Stream Characteristics

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Cooling Bunker BH Outlet - White Iron
Method: 0061

Run: 2
Start Time: 5:10
End Time: 9:10
Date: 03/28/23

Sampling Data				Traverse Data			
Time min.	Meter ft ³	ΔH "H ₂ O	Meter T _m °F	Traverse Point	Dp "H ₂ O	Stack T _s °F	$\sqrt{Dp}$
	0.000						
10	9.480	3.10	64	1	0.59	50	0.768
20	18.600	2.90	65	2	0.56	52	0.748
30	28.130	2.85	66	3	0.55	52	0.742
40	37.260	2.90	65	4	0.56	52	0.748
50	46.920	3.10	65	5	0.60	52	0.775
60	56.390	2.95	65	6	0.57	52	0.755
70	65.860	2.95	64	7	0.57	52	0.755
80	75.420	3.10	64	8	0.60	52	0.775
90	84.940	3.00	64	9	0.58	52	0.762
100	94.540	2.95	64	10	0.57	52	0.755
110	103.730	2.80	65	11	0.54	55	0.735
120	113.310	3.05	65	12	0.59	55	0.768
130	122.720	2.95	66	13	0.57	59	0.755
140	132.180	2.85	66	14	0.55	58	0.742
150	141.480	2.95	66	15	0.57	57	0.755
160	150.910	2.95	67	16	0.57	55	0.755
170	160.400	3.00	67	17	0.58	55	0.762
180	169.820	2.90	68	18	0.56	54	0.748
190	179.260	3.00	68	19	0.57	54	0.755
200	189.000	3.00	68	20	0.57	54	0.755
210	198.500	2.85	68	21	0.55	54	0.742
220	207.530	3.00	68	22	0.58	54	0.762
230	217.080	2.95	68	23	0.57	53	0.755
240	226.599	3.10	68	24	0.59	53	0.768

Client: Eagle Foundry Company**Run: 2****Source: Cooling Bunker BH Outlet - White Iron****Date: 03/28/23****Field Data Input Continued**Moisture Data

Total Test Time 240.0 min
 Sample Time Interval 10.0 min
 Meter Volume, V_m 226.599 dcf
 Water Volume 17.5 g
 Nozzle Diameter, N_z 0.2630 in.
 Nozzle Area 0.000377 sq.ft.

Stack Dimensional Data:

Circular
 Diameter 55.750 in
 Rectangular
 Width in
 Length in
 Stack Area 16.952 sq.ft.

Traverse Data

Barometric Pressure, P_b 29.41 "Hg
 Static Pressure 1.00 "H₂O
 Pitot Factor, cp 0.84
 Meter Cal Factor 1.0122 Y

Molecular Weight:

CO₂ Average 0.06 %vd
 O₂ Average 20.73 %vd

Field Data AveragesMeter

ΔH 2.965 "H₂O
 Temperature, T_m 66.0 °F
 Temperature, T_m 525.7 °A (°R)
 Pressure Meter, P_m 29.628 "Hg

Stack

$\sqrt{Dp}$ 0.756 "H₂O
 Temperature, T_s 53.7 °F
 Temperature, T_s 513.4 °A (R)
 Pressure Stack, P_s 29.484 "Hg

Field Data CalculationsMeter Box Capture

Standard Volume, $V_{m(std)}$ 227.989 dscf
 6.456 dscm
 Actual Volume, $V_{m(actual)}$ 225.904 awcf

EPA Method 2 Stack Gas Flowrate:

Velocity, V_s 42.21 fps
 Volume (actual) 42,933 acfm
 42,778 adcfm
 Volume (standard) 2,609,129 wscf/hr
 2,599,736 dscf/hr
 Moisture, B_{ws} 0.0036 43,329 dscf/min
 Moisture EPA M4 0.36 %v 43,485 wscf/min

Gas Stream Moisture

Moisture Vapor, $V_{w(std)}$ 0.825 scf
 Moisture, B_{ws} 0.0036
 Moisture EPA M4 0.36 %v
 Moisture @ Saturation 1.41 %v (for $T_s < 212^\circ\text{F}$)

EPA Method 3 Gas Density

Dry, M_d 28.84 lb/lb-mole
 Wet, M_s 28.80 lb/lb-mole
 Volume/Mole, V/M 380.133

Percent Isokinetic 98.6 %

Laboratory Results

Cr VI 1.11E-02 µg/sample
 Cr VI 1.11E-08 grams

Emissions:

Concentration Cr VI, C_s 7.52E-10 gr/dscf
 1.72E-03 µg/dscm
 Mass Emissions Cr VI 2.79E-07 lb/hr

"<" represents MDL value

Isokinetic Field Data
Field Data and Calculations
Emissions and Gas Stream Characteristics

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Cooling Bunker BH Outlet - White Iron
Method: 0061

Run: 3
Start Time: 5:15
End Time: 9:15
Date: 03/29/23

Sampling Data				Traverse Data			
Time min.	Meter ft ³	ΔH "H ₂ O	Meter T _m °F	Traverse Point	Dp "H ₂ O	Stack T _s °F	$\sqrt{Dp}$
	0.000						
10	8.440	2.50	56	1	0.48	43	0.693
20	17.300	2.70	55	2	0.52	47	0.721
30	26.310	2.70	57	3	0.52	46	0.721
40	35.380	2.70	60	4	0.52	46	0.721
50	44.590	2.85	62	5	0.54	45	0.735
60	54.280	3.10	64	6	0.59	45	0.768
70	63.660	2.90	65	7	0.55	47	0.742
80	73.330	3.20	64	8	0.61	46	0.781
90	82.750	2.90	64	9	0.55	46	0.742
100	91.860	2.75	63	10	0.52	46	0.721
110	100.730	2.60	62	11	0.49	45	0.700
120	109.650	2.55	62	12	0.49	46	0.700
130	118.530	2.85	61	13	0.54	46	0.735
140	128.300	3.10	60	14	0.59	46	0.768
150	137.420	2.90	59	15	0.56	49	0.748
160	146.640	2.85	59	16	0.55	50	0.742
170	156.000	2.85	59	17	0.55	50	0.742
180	165.230	3.05	59	18	0.59	49	0.768
190	175.280	2.90	59	19	0.56	50	0.748
200	184.800	2.90	61	20	0.56	49	0.748
210	192.990	2.40	64	21	0.46	48	0.678
220	201.610	2.40	64	22	0.46	48	0.678
230	211.140	3.20	65	23	0.61	48	0.781
240	220.582	2.90	66	24	0.55	47	0.742

Client: Eagle Foundry Company Run: 3
Source: Cooling Bunker BH Outlet - White Iron Date: 03/29/23

Field Data Input Continued

Moisture Data

Total Test Time 240.0 min
Sample Time Interval 10.0 min
Meter Volume, V_m 220.582 dcf
Water Volume 33.8 g
Nozzle Diameter, N_z 0.2630 in.
Nozzle Area 0.000377 sq.ft.

Stack Dimensional Data:

Circular
Diameter 55.750 in
Rectangular
Width in
Length in
Stack Area 16.952 sq.ft.

Traverse Data

Barometric Pressure, P_b 29.41 "Hg
Static Pressure 1.00 "H₂O
Pitot Factor, cp 0.84
Meter Cal Factor 1.0122 Y

Molecular Weight:

CO₂ Average 0.07 %vd
O₂ Average 20.92 %vd

Field Data Averages

Meter

ΔH 2.823 "H₂O
Temperature, T_m 61.3 °F
Temperature, T_m 521.0 °A (°R)
Pressure Meter, P_m 29.618 "Hg

Stack

$\sqrt{Dp}$ 0.734 "H₂O
Temperature, T_s 47.0 °F
Temperature, T_s 506.7 °A (R)
Pressure Stack, P_s 29.484 "Hg

Field Data Calculations

Meter Box Capture

Standard Volume, $V_{m(std)}$ 223.862 dscf
6.339 dscm
Actual Volume, $V_{m(actual)}$ 219.691 awcf

EPA Method 2 Stack Gas Flowrate:

Velocity, V_s 40.74 fps
Volume (actual) 41,437 acfm
41,143 adcfm
Volume (standard) 2,551,564 wscf/hr
2,533,448 dscf/hr
42,224 dscf/min
42,526 wscf/min

Gas Stream Moisture

Moisture Vapor, $V_{w(std)}$ 1.594 scf
Moisture, B_{ws} 0.0071
Moisture EPA M4 0.71 %v
Moisture @ Saturation 1.10 %v (for $T_s < 212^\circ\text{F}$)

EPA Method 3 Gas Density

Dry, M_d 28.85 lb/lb-mole
Wet, M_s 28.77 lb/lb-mole
Volume/Mole, V/M 375.171

Percent Isokinetic 99.3 %

Laboratory Results

Cr VI 3.70E-02 µg/sample
Cr VI 3.70E-08 grams

Emissions:

Concentration Cr VI, C_s 2.55E-09 gr/dscf
5.83E-03 µg/dscm
Mass Emissions Cr VI 9.22E-07 lb/hr

"<" represents MDL value

Method 0061**Laboratory Results****Cr VI****Client:** Eagle Foundry Company**Location:** Eagle Creek, OR**Source:** Cooling Bunker BH Outlet - White Iron

Lab ID	Sample ID	Sample Date	<	Result (µg/sample)	MDL (µg/sample)	Sample Vol. (ml)	H ₂ O Rinse Vol. (ml)	Blank Correction (µg)	Blank Corrected Results (µg/sample)
23-S598	Run 1	3/27/2023	<	MDL	0.0056	555	266	6.38E-03	5.60E-03
23-S599	Run 2	3/28/2023		0.0158	0.0048	480	195	4.68E-03	1.11E-02
23-S600	Run 3	3/29/2023		0.0444	0.0060	600	310	7.44E-03	3.70E-02
23-S607	KOH Blank	3/29/2023	<	MDL	0.0030	300		0.00	µg/ml
23-S608	H ₂ O Blank	3/29/2023		0.005	0.0020	200		2.40E-05	µg/ml

Notes

A "<" sign designates a result less than the minimum detection limit (MDL). If sample results are below MDL, the MDL value is used for calculations.

If blank value(s) are below MDL, no blank correction is performed.

H₂O rinse volume was calculated as the total sample volume minus the final (post-test) volume of liquid in impingers 1-3.

Method 0061
Results Summary

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Cooling Bunker BH Outlet - White Iron

Run			1	2	3	
Date			3/27/2023	3/28/2023	3/29/2023	
Start Time			6:40	5:10	5:15	
End Time			10:40	9:10	9:15	Average
Duration, min.			240	240	240	240
Barometric Pressure, "Hg			29.88	29.41	29.41	29.57
Nozzle Dia., in.			0.263	0.263	0.263	0.263
Isokinetic Average, %			97.5	98.6	99.3	98.5
Sample Volume, dscf			239.679	227.989	223.862	230.510
Sample Volume, dscm			6.787	6.456	6.339	6.527
Stack Diameter, in.			55.750	55.750	55.750	55.750
Stack Area, sq.ft.			16.952	16.952	16.952	16.952
CO ₂ %vd			0.07	0.06	0.07	0.07
O ₂ %vd			20.79	20.73	20.92	20.81
Static Pressure, "H ₂ O			1.00	1.00	1.00	1.00
H ₂ O %v			0.57	0.36	0.71	0.55
Wet Molecular Weight, lb/lb-mole			28.78	28.80	28.77	28.78
Velocity, FPS			43.52	42.21	40.74	42.16
ADCFM			44,013	42,778	41,143	42,645
ACFM			44,265	42,933	41,437	42,878
DSCFM			46,053	43,329	42,224	43,869
Stack Temperature, °F			45.2	53.7	47.0	48.6
Cr VI	Concentration, C _s	gr/dscf	< 3.61E-10	7.52E-10	2.55E-09	< 1.22E-09
		µg/dscm	< 8.25E-04	1.72E-03	5.83E-03	< 2.79E-03
	Mass	lb/hr	< 1.42E-07	2.79E-07	9.22E-07	< 4.48E-07
		lb Cr VI/ton Cr in melt	< 3.66E-07	7.15E-07	2.40E-06	< 1.16E-06
Process Data	Cr processed	lb/melt	3,106.941	3,124.611	3,071.140	
		ton/melt	1.553	1.562	1.536	

APPENDIX B: STEEL ALLOY TEST DATA



COMPANY	Eagle Foundry Company
FACILITY	Eagle Foundry
LOCATION	Eagle Creek, OR
SOURCE	Main Foundry BH Inlet - Steel Alloy
DATE	3/27/2023 - 3/29/2023
METHOD	29
POLLUTANT	Metals

Pre-Test Traverse

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Main Foundry BH Inlet - Steel Alloy

Stack Temp: 60 °F

Traverse Point	Velocity ΔP ("H ₂ O)	Null Angle
1	0.91	0
2	1.08	0
3	1.00	0
4	1.00	5
5	1.15	0
6	1.00	5
7	1.10	5
8	1.15	5
9	1.20	0
10	1.10	0
11	1.10	0
12	1.00	0
13	1.00	0
14	1.00	0
15	1.10	0
16	1.10	0
17	1.15	5
18	1.15	5
19	1.20	0
20	1.50	5
21	1.00	0
22	1.00	5
23	0.90	0
24	0.90	0

Average: 1.08 2

Flow is found to be: Non-cyclonic

Isokinetic Field Data
Field Data Entry

Client:	Eagle Foundry Company	Run:	1
Location:	Eagle Creek, OR	Start Time:	13:00
Source:	Main Foundry BH Inlet - Steel Alloy	End Time:	17:10
EPA Method:	29	Environmental Conditions/Test Notes:	Date: 3/27/2023
Box Operator:	AAM	40-60 °F	
Technician(s):	NEW		

Stack Dimensional Data:

Circular	
Diameter	48.000 in
Rectangular	
Width	in
Length	in
Stack Area	12.566 sq.ft.

Equipment:

Meterbox ID	SB-2	Probe ID	5B	Liner type	Glass
Y factor	1.0028	Nozzle ID	3P	Nozzle size	0.251 inches
ΔH@	1.601	Hot box ID	HHB2	Nozzle area	0.000344 sq.ft.
Bp ID	TS-1	Pitot Cp	0.84	Probe heat	250 °F
Balance ID	HLN FB-1	Pitot ID	55	Filter heat	250 °F
Weights ID	HLN FW-1	Probe Length, ft	6		

Source Information:

Barometric Pressure	29.79 "Hg	O ₂	20.90 %
Static Pressure	-0.9 "H ₂ O	CO ₂	0.00 %
Ave. ΔP	1.08 "H ₂ O	Rec. Nz.	0.201 inches
Stack Temperature	60 °F		
Assumed moisture	3.00 %		
Assumed meter temp.	60 °F		
Total number of points	20		
Time per point	12.5 min.		
Total run time	250 min.		

Leak Checks:

	Pre-test	Post-test
Pitot	x	x
Leak rate, dcf	0.000	0.000
Leak check vacuum, "Hg	15	15

Nozzle check for roundness:

1	2	3
0.251	0.252	0.250 inches
Caliper ID	WS1	

Post Test Calculations:

Sample volume	297.684 dcf	Ave. ΔP	1.138 "H ₂ O
Wet mol. weight	28.8 M _s (actual)	Ave. √ΔP	1.066 "H ₂ O
Actual H ₂ O	0.35 %	Ave. ΔH	4.273 "H ₂ O
Std. meter vol.	299.332 dscf	Ave. T _s	60.8 °F
Isokinetic Average	96.8 %	Ave. T _m	69.8 °F

Moisture/Lab:

Filter, #	NA		
	Initial	Final	Gain
Impingers, g	3,611.5	3,587.8	-23.7
Silica gel, g	868.2	914.0	45.8
	Total water gain, g:		22.1

Traverse Point	Time (min.)	Meter Volume (dcf)	Velocity ΔP ("H ₂ O)	Stack Temp. (°F)	Meter Temp. (°F)	Calc. ΔH	Run ΔH	Vacuum ("Hg)	Filter Box (°F)	Condenser Temp (≤68°F)
1	12.5	455.000	1.10	57	61	4.09	4.10	2	250	50
2	25.0	469.750	1.15	58	63	4.29	4.30	2	254	60
3	37.5	484.600	1.15	58	66	4.31	4.30	2	250	60
4	50.0	499.270	1.10	59	68	4.13	4.15	2	250	59
5	62.5	514.400	1.20	59	70	4.52	4.50	2	253	57
6	75.0	529.675	1.20	60	71	4.52	4.50	2	253	57
7	87.5	545.590	1.30	61	72	4.90	4.90	3	252	57
8	100.0	561.100	1.20	61	72	4.52	4.50	2	247	55
9	112.5	576.680	1.20	64	73	4.51	4.50	2	253	54
10	125.0	591.000	1.10	61	73	4.15	4.15	2	252	53
11	137.5	605.790	1.10	62	72	4.14	4.15	2	249	53
12	150.0	620.680	1.10	62	72	4.14	4.15	2	253	53
13	162.5	635.540	1.10	62	71	4.13	4.15	2	255	53
14	175.0	650.500	1.10	62	71	4.13	4.15	2	254	53
15	187.5	665.000	1.10	64	71	4.12	4.10	2	246	53
16	200.0	679.530	1.10	63	71	4.12	4.10	2	250	54
17	212.5	694.200	1.10	61	70	4.13	4.15	2	256	54
18	225.0	709.000	1.10	61	70	4.13	4.15	2	246	54
19	237.5	723.550	1.10	60	69	4.13	4.15	2	258	55
20	250.0	738.442	1.15	60	69	4.32	4.30	2	252	55

**Isokinetic Field Data
Field Data Entry**

Client:	Eagle Foundry Company	Run:	2
Location:	Eagle Creek, OR	Start Time:	10:30
Source:	Main Foundry BH Inlet - Steel Alloy	End Time:	14:40
EPA Method:	29	Environmental Conditions/Test Notes:	Date: 3/28/2023
Box Operator:	AAM	40-60 °F	
Technician(s):	NEW		

Stack Dimensional Data:

Circular	
Diameter	48.000 in
Rectangular	
Width	in
Length	in
Stack Area	12.566 sq.ft.

Equipment:

Meterbox ID	SB-2	Probe ID	5B	Liner type	Glass
Y factor	1.0028	Nozzle ID	3P	Nozzle size	0.251 inches
$\Delta H@$	1.601	Hot box ID	HHB2	Nozzle area	0.000344 sq.ft.
Bp ID	TS-1	Pitot Cp	0.84	Probe heat	250 °F
Balance ID	HLN FB-1	Pitot ID	55	Filter heat	250 °F
Weights ID	HLN FW-1	Probe Length, ft	6		

Source Information:

Barometric Pressure	29.38 "Hg	O ₂	20.90 %
Static Pressure	-0.9 "H ₂ O	CO ₂	0.00 %
Ave. ΔP	1.08 "H ₂ O	Rec. Nz.	0.197 inches
Stack Temperature	60 °F		
Assumed moisture	0.35 %		
Assumed meter temp.	69.8 °F		
Total number of points	20		
Time per point	12.5 min.		
Total run time	250 min.		

Leak Checks:

	Pre-test	Post-test
Pitot	x	x
Leak rate, dcf	0.000	0.000
Leak check vacuum, "Hg	15	8

Nozzle check for roundness:

1	2	3
0.251	0.252	0.250 inches
Caliper ID	WS1	

Post Test Calculations:

Sample volume	302.711 dcf	Ave. ΔP	1.124 "H ₂ O
Wet mol. weight	28.73 M _s (actual)	Ave. $\sqrt{\Delta P}$	1.058 "H ₂ O
Actual H ₂ O	0.99 %	Ave. ΔH	4.365 "H ₂ O
Std. meter vol.	305.505 dscf	Ave. T _s	56.8 °F
Isokinetic Average	100.4 %	Ave. T _m	60.8 °F

Moisture/Lab:

Filter, #	NA		
	Initial	Final	Gain
Impingers, g	3,626.1	3,649.1	23.0
Silica gel, g	826.2	867.7	41.5
	Total water gain:		64.5

Traverse Point	Time (min.)	Meter Volume (dcf)	Velocity ΔP ("H ₂ O)	Stack Temp. (°F)	Meter Temp. (°F)	Calc. ΔH	Run ΔH	Vacuum ("Hg)	Filter Box (°F)	Condenser Temp (≤68°F)
1	12.5	44.240	0.90	52	50	3.46	3.45	1	249	43
2	25.0	57.480	0.88	53	51	3.38	3.40	1	253	47
3	37.5	71.290	0.95	54	54	3.66	3.65	1	253	50
4	50.0	85.180	0.94	55	56	3.63	3.65	1	254	52
5	62.5	100.020	1.10	54	57	4.27	4.25	1	252	53
6	75.0	115.740	1.20	54	59	4.67	4.65	1	250	54
7	87.5	132.000	1.30	57	60	5.04	5.05	1	249	54
8	100.0	147.700	1.20	55	61	4.68	4.70	1	255	54
9	112.5	163.410	1.20	59	61	4.65	4.65	1	251	55
10	125.0	179.110	1.20	56	62	4.68	4.70	1	255	54
11	137.5	194.830	1.20	56	62	4.68	4.70	1	249	55
12	150.0	210.440	1.20	57	62	4.67	4.65	1	248	55
13	162.5	226.110	1.20	57	63	4.68	4.65	1	256	56
14	175.0	241.850	1.20	60	64	4.66	4.65	1	255	56
15	187.5	257.600	1.20	60	64	4.66	4.65	1	250	57
16	200.0	273.420	1.20	62	65	4.65	4.65	1	255	57
17	212.5	288.920	1.20	60	66	4.68	4.70	1	250	56
18	225.0	304.060	1.10	59	66	4.30	4.30	1	254	56
19	237.5	319.260	1.10	58	66	4.31	4.30	1	254	55
20	250.0	333.751	1.00	57	66	3.92	3.90	1	252	55

Isokinetic Field Data
Field Data Entry

Client:	Eagle Foundry Company	Run:	3
Location:	Eagle Creek, OR	Start Time:	10:35
Source:	Main Foundry BH Inlet - Steel Alloy	End Time:	14:45
EPA Method:	29	Environmental Conditions/Test Notes:	Date: 3/29/2023
Box Operator:	AAM	40-60 °F	
Technician(s):	NEW		

Stack Dimensional Data:		Equipment:					
Circular		Meterbox ID	SB-2	Probe ID	5B	Liner type	Glass
Diameter	48.000 in	Y factor	1.0028	Nozzle ID	3P	Nozzle size	0.251 inches
Rectangular		ΔH@	1.601	Hot box ID	HHB2	Nozzle area	0.000344 sq.ft.
Width	in	Bp ID	TS-1	Pitot Cp	0.84	Probe heat	250 °F
Length	in	Balance ID	HLN FB-1	Pitot ID	55	Filter heat	250 °F
Stack Area	12.566 sq.ft.	Weights ID	HLN FW-1	Probe Length, ft	6		

Source Information:				Leak Checks:		
Barometric Pressure	29.45 "Hg	O ₂	20.90 %	Pitot	x	x
Static Pressure	-0.9 "H ₂ O	CO ₂	0.00 %	Leak rate, dcf	0.000	0.000
Ave. ΔP	1.08 "H ₂ O	Rec. Nz.	0.199 inches	Leak check vacuum, "Hg	15	10
Stack Temperature	60 °F					
Assumed moisture	0.99 %					
Assumed meter temp.	60.8 °F					
Total number of points	20					
Time per point	12.5 min.					
Total run time	250 min.					

Nozzle check for roundness:			
1	2	3	
0.251	0.252	0.250 inches	
Caliper ID	WS1		

Post Test Calculations:				Moisture/Lab:			
Sample volume	328.600 dcf	Ave. ΔP	1.335 "H ₂ O	Filter, #	NA		
Wet mol. weight	28.77 M _s (actual)	Ave. √ΔP	1.153 "H ₂ O	Initial	Final	Gain	
Actual H ₂ O	0.62 %	Ave. ΔH	5.13 "H ₂ O	Impingers, g	3,668.0	3,670.4	2.4
Std. meter vol.	333.168 dscf	Ave. T _s	56.5 °F	Silica gel, g	859.9	901.7	41.8
Isokinetic Average	100.0 %	Ave. T _m	60.6 °F	Total water gain:			44.2

Traverse Point	Time (min.)	Meter Volume (dcf)	Velocity ΔP ("H ₂ O)	Stack Temp. (°F)	Meter Temp. (°F)	Calc. ΔH	Run ΔH	Vacuum ("Hg)	Filter Box (°F)	Condenser Temp (≤68°F)
1	12.5	678.139	1.10	48	44	4.17	4.15	1	230	41
2	25.0	707.510	1.20	49	47	4.56	4.55	1	251	51
3	37.5	723.555	1.30	50	51	4.97	4.95	1	249	53
4	50.0	739.770	1.30	51	54	4.99	5.00	1	253	53
5	62.5	756.490	1.40	52	56	5.39	5.40	1	256	55
6	75.0	772.840	1.30	54	58	5.00	5.00	1	253	54
7	87.5	791.415	1.70	53	59	6.56	6.55	2	254	55
8	100.0	808.460	1.40	55	61	5.41	5.40	2	250	55
9	112.5	822.850	1.00	57	62	3.85	3.85	1	248	53
10	125.0	837.050	1.00	55	61	3.86	3.85	1	249	52
11	137.5	854.910	1.60	56	60	6.15	6.15	2	254	53
12	150.0	871.930	1.40	58	62	5.38	5.40	2	250	54
13	162.5	889.550	1.50	59	64	5.78	5.80	2	250	55
14	175.0	904.635	1.10	60	65	4.24	4.25	2	252	56
15	187.5	921.430	1.40	63	65	5.36	5.35	2	255	57
16	200.0	938.280	1.40	63	66	5.37	5.35	2	251	58
17	212.5	954.230	1.20	63	67	4.62	4.60	2	255	58
18	225.0	971.790	1.50	63	67	5.77	5.75	2	250	56
19	237.5	989.415	1.50	61	70	5.82	5.80	2	247	56
20	250.0	1006.739	1.40	60	72	5.47	5.45	2	247	57

EPA Method 4
Impinger Weights Summary

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Main Foundry BH Inlet - Steel Alloy
EPA Method: 29
Box Operator: AAM
Technician(s): NEW

Run 1

Impinger gain by weight (g):

#	Initial	Final	Gain
1	713.8	644.2	-69.6
2	742.8	763.1	20.3
3	663.9	680.5	16.6
4	748.6	755.9	7.3
5	742.4	744.1	1.7
Totals:	3,611.5	3,587.8	-23.7

Run 2

Impinger gain by weight (g):

#	Initial	Final	Gain
1	723.0	631.3	-91.7
2	744.9	740.6	-4.3
3	667.3	740.0	72.7
4	744.1	772.5	28.4
5	746.8	764.7	17.9
Totals:	3,626.1	3,649.1	23.0

Run 3

Impinger gain by weight (g):

#	Initial	Final	Gain
1	721.7	639.1	-82.6
2	746.9	774.7	27.8
3	669.0	698.1	29.1
4	758.2	778.4	20.2
5	772.2	780.1	7.9
Totals:	3,668.0	3,670.4	2.4

Isokinetic Field Data
Field Data and Calculations
Gas Stream Characteristics

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Main Foundry BH Inlet - Steel Alloy
Method: 29

Run: 1
Start Time: 13:00
End Time: 17:10
Date: 3/27/2023

Sampling Data				Traverse Data			
Time min.	Meter ft ³	ΔH "H ₂ O	Meter T _m °F	Traverse Point	Dp "H ₂ O	Stack T _s °F	$\sqrt{Dp}$
	440.758						
12.5	455.000	4.10	61	1	1.10	57	1.049
25.0	469.750	4.30	63	2	1.15	58	1.072
37.5	484.600	4.30	66	3	1.15	58	1.072
50.0	499.270	4.15	68	4	1.10	59	1.049
62.5	514.400	4.50	70	5	1.20	59	1.095
75.0	529.675	4.50	71	6	1.20	60	1.095
87.5	545.590	4.90	72	7	1.30	61	1.140
100.0	561.100	4.50	72	8	1.20	61	1.095
112.5	576.680	4.50	73	9	1.20	64	1.095
125.0	591.000	4.15	73	10	1.10	61	1.049
137.5	605.790	4.15	72	11	1.10	62	1.049
150.0	620.680	4.15	72	12	1.10	62	1.049
162.5	635.540	4.15	71	13	1.10	62	1.049
175.0	650.500	4.15	71	14	1.10	62	1.049
187.5	665.000	4.10	71	15	1.10	64	1.049
200.0	679.530	4.10	71	16	1.10	63	1.049
212.5	694.200	4.15	70	17	1.10	61	1.049
225.0	709.000	4.15	70	18	1.10	61	1.049
237.5	723.550	4.15	69	19	1.10	60	1.049
250.0	738.442	4.30	69	20	1.15	60	1.072

Client:	Eagle Foundry Company	Run:	1
Source:	Main Foundry BH Inlet - Steel Alloy	Date:	03/27/23

Field Data Input Continued

Moisture Data

Total Test Time	250.0 min
Sample Time Interval	12.5 min
Meter Volume, V_m	297.684 dcf
Water Mass	22.1 g
Nozzle Diameter, N_z	0.2510 in.
Nozzle Area	0.000344 sq.ft.

Stack Dimensional Data:

Circular	
Diameter	48.000 in
Rectangular	
Width	in
Length	in
Stack Area	12.566 sq.ft.

Traverse Data

Barometric Pressure, P_b	29.79 "Hg
Static Pressure	-0.90 "H ₂ O
Pitot Factor, cp	0.84
Meter Cal Factor	1.0028 Y

Molecular Weight:

CO ₂ Average	0.26 %vd
O ₂ Average	20.99 %vd

Field Data Averages

Meter

ΔH	4.273 "H ₂ O
Temperature, T_m	69.8 °F
Temperature, T_m	529.5 °A (°R)
Pressure Meter, P_m	30.104 "Hg

Stack

$\sqrt{D_p}$	1.066 "H ₂ O
Temperature, T_s	60.8 °F
Temperature, T_s	520.5 °A (°R)
Pressure Stack, P_s	29.724 "Hg

Field Data Calculations

Meter Box Capture

Standard Volume, $V_{m(std)}$	299.332 dscf
	8.476 dscm
Actual Volume, $V_{m(actual)}$	298.239 awcf

EPA Method 2 Stack Gas Flowrate:

Velocity, V_s	59.65 fps
Flow Rate (actual), Q_{aw}	44,974 acfm
	44,817 adcfm
Flow Rate (standard), Q	2,717,831 wscf/hr
	2,708,319 dscf/hr
	45,139 dscf/min
	45,297 wscf/min

Gas Stream Moisture

Moisture Vapor, $V_{w(std)}$	1.042 scf
Moisture, B_{ws}	0.0035
Moisture EPA M4	0.35 %v
Moisture @ Saturation	1.81 %v (for $T_s < 212^\circ F$)

EPA Method 3 Gas Density

Dry, M_d	28.88 lb/lb-mole
Wet, M_s	28.84 lb/lb-mole

Percent Isokinetic	96.9 %

Isokinetic Field Data
Field Data and Calculations
Gas Stream Characteristics

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Main Foundry BH Inlet - Steel Alloy
Method: 29

Run: 2
Start Time: 10:30
End Time: 14:40
Date: 03/28/23

Sampling Data				Traverse Data			
Time min.	Meter ft ³	ΔH "H ₂ O	Meter T _m °F	Traverse Point	Dp "H ₂ O	Stack T _s °F	$\sqrt{Dp}$
	31.040						
12.5	44.240	3.45	50	1	0.90	52	0.949
25.0	57.480	3.40	51	2	0.88	53	0.938
37.5	71.290	3.65	54	3	0.95	54	0.975
50.0	85.180	3.65	56	4	0.94	55	0.970
62.5	100.020	4.25	57	5	1.10	54	1.049
75.0	115.740	4.65	59	6	1.20	54	1.095
87.5	132.000	5.05	60	7	1.30	57	1.140
100.0	147.700	4.70	61	8	1.20	55	1.095
112.5	163.410	4.65	61	9	1.20	59	1.095
125.0	179.110	4.70	62	10	1.20	56	1.095
137.5	194.830	4.70	62	11	1.20	56	1.095
150.0	210.440	4.65	62	12	1.20	57	1.095
162.5	226.110	4.65	63	13	1.20	57	1.095
175.0	241.850	4.65	64	14	1.20	60	1.095
187.5	257.600	4.65	64	15	1.20	60	1.095
200.0	273.420	4.65	65	16	1.20	62	1.095
212.5	288.920	4.70	66	17	1.20	60	1.095
225.0	304.060	4.30	66	18	1.10	59	1.049
237.5	319.260	4.30	66	19	1.10	58	1.049
250.0	333.751	3.90	66	20	1.00	57	1.000

Client: Eagle Foundry Company
Source: Main Foundry BH Inlet - Steel Alloy

Run: 2
Date: 03/28/23

Field Data Input Continued

Moisture Data

Total Test Time 250.0 min
Sample Time Interval 12.5 min
Meter Volume, V_m 302.711 dcf
Water Mass 64.5 g
Nozzle Diameter, N_z 0.2510 in.
Nozzle Area 0.000344 sq.ft.

Stack Dimensional Data:

Circular
Diameter 48.000 in
Rectangular
Width in
Length in
Stack Area 12.566 sq.ft.

Traverse Data

Barometric Pressure, P_b 29.38 "Hg
Static Pressure -0.90 "H₂O
Pitot Factor, cp 0.84
Meter Cal Factor 1.0028 Y

Molecular Weight:

CO₂ Average 0.08 %vd
O₂ Average 20.93 %vd

Field Data Averages

Meter

ΔH 4.365 "H₂O
Temperature, T_m 60.8 °F
Temperature, T_m 520.5 °A (°R)
Pressure Meter, P_m 29.701 "Hg

Stack

$\sqrt{D_p}$ 1.058 "H₂O
Temperature, T_s 56.8 °F
Temperature, T_s 516.5 °A (°R)
Pressure Stack, P_s 29.314 "Hg

Field Data Calculations

Meter Box Capture

Standard Volume, $V_{m(std)}$ 305.505 dscf
8.651 dscm
Actual Volume, $V_{m(actual)}$ 308.254 awcf

EPA Method 2 Stack Gas Flowrate:

Velocity, V_s 59.49 fps
Flow Rate (actual), Q_{aw} 44,853 acfm
44,409 adcfm
Flow Rate (standard), Q 2,693,856 wscf/hr
2,667,187 dscf/hr
44,453 dscf/min
44,898 wscf/min

Gas Stream Moisture

Moisture Vapor, $V_{w(std)}$ 3.042 scf
Moisture, B_{ws} 0.0099
Moisture EPA M4 0.99 %v
Moisture @ Saturation 1.59 %v (for $T_s < 212^\circ\text{F}$)

EPA Method 3 Gas Density

Dry, M_d 28.85 lb/lb-mole
Wet, M_s 28.74 lb/lb-mole

Percent Isokinetic 100.4 %

Isokinetic Field Data
Field Data and Calculations
Gas Stream Characteristics

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Main Foundry BH Inlet - Steel Alloy
Method: 29

Run: 3
Start Time: 10:35
End Time: 14:45
Date: 03/29/23

Sampling Data				Traverse Data			
Time min.	Meter ft ³	ΔH "H ₂ O	Meter T _m °F	Traverse Point	Dp "H ₂ O	Stack T _s °F	$\sqrt{Dp}$
	678.139						
12.5	692.220	4.15	44	1	1.10	48	1.049
25.0	707.510	4.55	47	2	1.20	49	1.095
37.5	723.555	4.95	51	3	1.30	50	1.140
50.0	739.770	5.00	54	4	1.30	51	1.140
62.5	756.490	5.40	56	5	1.40	52	1.183
75.0	772.840	5.00	58	6	1.30	54	1.140
87.5	791.415	6.55	59	7	1.70	53	1.304
100.0	808.460	5.40	61	8	1.40	55	1.183
112.5	822.850	3.85	62	9	1.00	57	1.000
125.0	837.050	3.85	61	10	1.00	55	1.000
137.5	854.910	6.15	60	11	1.60	56	1.265
150.0	871.930	5.40	62	12	1.40	58	1.183
162.5	889.550	5.80	64	13	1.50	59	1.225
175.0	904.635	4.25	65	14	1.10	60	1.049
187.5	921.430	5.35	65	15	1.40	63	1.183
200.0	938.280	5.35	66	16	1.40	63	1.183
212.5	954.230	4.60	67	17	1.20	63	1.095
225.0	971.790	5.75	67	18	1.50	63	1.225
237.5	989.415	5.80	70	19	1.50	61	1.225
250.0	1006.739	5.45	72	20	1.40	60	1.183

Client: Eagle Foundry Company
Source: Main Foundry BH Inlet - Steel Alloy

Run: 3
Date: 03/29/23

Field Data Input ContinuedMoisture Data

Total Test Time 250.0 min
Sample Time Interval 12.5 min
Meter Volume, V_m 328.600 dcf
Water Mass 44.2 g
Nozzle Diameter, N_z 0.2510 in.
Nozzle Area 0.000344 sq.ft.

Stack Dimensional Data:

Circular
Diameter 48.000 in
Rectangular
Width in
Length in
Stack Area 12.566 sq.ft.

Traverse Data

Barometric Pressure, P_b 29.45 "Hg
Static Pressure -0.90 "H₂O
Pitot Factor, cp 0.84
Meter Cal Factor 1.0028 Y

Molecular Weight:

CO₂ Average 0.08 %vd
O₂ Average 20.98 %vd

Field Data AveragesMeter

ΔH 5.130 "H₂O
Temperature, T_m 60.6 °F
Temperature, T_m 520.3 °A (°R)
Pressure Meter, P_m 29.827 "Hg

Stack

$\sqrt{D_p}$ 1.153 "H₂O
Temperature, T_s 56.5 °F
Temperature, T_s 516.2 °A (°R)
Pressure Stack, P_s 29.384 "Hg

Field Data CalculationsMeter Box Capture

Standard Volume, $V_{m(std)}$ 333.168 dscf
9.434 dscm
Actual Volume, $V_{m(actual)}$ 333.922 awcf

EPA Method 2 Stack Gas Flowrate:

Velocity, V_s 64.69 fps
Flow Rate (actual), Q_{aw} 48,774 acfm
48,472 adcfm
Flow Rate (standard), Q 2,938,026 wscf/hr
2,919,810 dscf/hr
48,664 dscf/min
48,967 wscf/min

Gas Stream Moisture

Moisture Vapor, $V_{w(std)}$ 2.084 scf
Moisture, B_{ws} 0.0062
Moisture EPA M4 0.62 %v
Moisture @ Saturation 1.57 %v (for $T_s < 212^\circ\text{F}$)

EPA Method 3 Gas Density

Dry, M_d 28.85 lb/lb-mole
Wet, M_s 28.78 lb/lb-mole

Percent Isokinetic 100.0 %

Eagle Foundry Company
Main Foundry BH Inlet - Steel Alloy
Method 29 Laboratory Results

Run: 1
Sample Date: 03/27/23

Analyte	Filter + FH Rinse Cont. 1&3		BH Cap.Soln. + BH Rinse Cont. 4		Units
	< Result	MDL	< Result	MDL	
Aluminum	1,680	7.50	51.5	4.08	µg/sample
Antimony	5.77	1.25	< MDL	0.680	µg/sample
Arsenic	< MDL	8.75	< MDL	0.952	µg/sample
Barium	13.5	0.125	1.63	0.068	µg/sample
Beryllium	0.069	0.050	< MDL	0.027	µg/sample
Cadmium	1.05	0.100	0.803	0.054	µg/sample
Chromium	109	0.200	0.689	0.109	µg/sample
Cobalt	0.440	0.125	0.127	0.068	µg/sample
Copper	59.4	1.25	< MDL	0.680	µg/sample
Lead	135	1.25	< MDL	0.680	µg/sample
Manganese	5,800	0.075	1.08	0.041	µg/sample
Nickel	11.7	0.750	< MDL	0.408	µg/sample
Phosphorus	46.7	5.00	< MDL	2.72	µg/sample
Selenium	< MDL	3.75	< MDL	2.04	µg/sample
Silver	2.43	0.50	< MDL	0.272	µg/sample
Thallium	< MDL	2.50	< MDL	1.36	µg/sample
Vanadium	0.653	0.250	< MDL	0.136	µg/sample
Zinc	1,120	0.750	7.24	0.408	µg/sample

Lab ID:	23-S669	23-S670	
Sample Vol:	250	229	ml

Eagle Foundry Company
Main Foundry BH Inlet - Steel Alloy
Method 29 Laboratory Results

Run: 2
Sample Date: 03/28/23

Analyte	Filter + FH Rinse Cont. 1&3		BH Cap.Soln. + BH Rinse Cont. 4		Units
	<	Result MDL	<	Result MDL	
Aluminum		1,320 7.50		24.7 3.72	µg/sample
Antimony		3.06 1.25	<	MDL 0.620	µg/sample
Arsenic	<	MDL 8.75	<	MDL 0.868	µg/sample
Barium		12.3 0.125		1.43 0.062	µg/sample
Beryllium		0.052 0.050	<	MDL 0.025	µg/sample
Cadmium		1.36 0.100		0.210 0.050	µg/sample
Chromium		92.6 0.200		0.429 0.099	µg/sample
Cobalt		0.355 0.125		0.071 0.062	µg/sample
Copper		51.9 1.25		0.815 0.620	µg/sample
Lead		145 1.25	<	MDL 0.620	µg/sample
Manganese		6,670 0.075		3.61 0.037	µg/sample
Nickel		13.1 0.750		0.501 0.372	µg/sample
Phosphorus		48.4 5.00	<	MDL 2.48	µg/sample
Selenium		3.88 3.75	<	MDL 1.86	µg/sample
Silver		1.57 0.500	<	MDL 0.248	µg/sample
Thallium	<	MDL 2.50	<	MDL 1.24	µg/sample
Vanadium		0.471 0.250	<	MDL 0.124	µg/sample
Zinc		1,040 0.750		3.40 0.372	µg/sample

Lab ID:	23-S674	23-S675	
Sample Vol:	250	206	ml

Eagle Foundry Company
Main Foundry BH Inlet - Steel Alloy
Method 29 Laboratory Results

Run: 3
Sample Date: 03/29/23

Analyte	Filter + FH Rinse Cont. 1&3		BH Cap.Soln. + BH Rinse Cont. 4		Units
	< Result	MDL	< Result	MDL	
Aluminum	1,300	7.50	20.6	3.54	µg/sample
Antimony	4.58	1.25	1.49	0.590	µg/sample
Arsenic	< MDL	8.75	< MDL	0.826	µg/sample
Barium	12.1	0.125	1.26	0.059	µg/sample
Beryllium	< MDL	0.050	< MDL	0.024	µg/sample
Cadmium	1.85	0.100	0.079	0.047	µg/sample
Chromium	83.0	0.200	0.357	0.094	µg/sample
Cobalt	0.420	0.125	< MDL	0.059	µg/sample
Copper	56.3	1.25	0.681	0.590	µg/sample
Lead	125	1.25	< MDL	0.590	µg/sample
Manganese	5,340	0.075	4.79	0.035	µg/sample
Nickel	14.4	0.750	0.509	0.354	µg/sample
Phosphorus	48.2	5.00	< MDL	2.36	µg/sample
Selenium	< MDL	3.75	< MDL	1.77	µg/sample
Silver	1.82	0.500	< MDL	0.236	µg/sample
Thallium	< MDL	2.50	< MDL	1.18	µg/sample
Vanadium	0.337	0.250	< MDL	0.118	µg/sample
Zinc	879	0.750	2.06	0.354	µg/sample

Lab ID:	23-S679	23-S680	
Sample Vol:	250	260	ml

Eagle Foundry Company
Main Foundry BH Inlet - Steel Alloy
Method 29 Blank Results

Sample Dates: 3/27/2023
3/28/2023
3/29/2023

Analyte	Filter Cont. 12		BH Cap.Soln. Cont. 9 5% HNO ₃ / 10% H ₂ O ₂		FH/BH Rinse Cont. 8A 0.1 N HNO ₃	
	µg/filter		µg/sample		µg/sample	
	< Result	MDL	< Result	MDL	< Result	MDL
Aluminum	58.8	7.50	16.3	3.78	< MDL	7.50
Antimony	2.86	1.25	< MDL	0.630	< MDL	1.25
Arsenic	< MDL	1.75	< MDL	0.882	< MDL	1.75
Barium	1.40	0.125	0.718	0.063	0.193	0.125
Beryllium	< MDL	0.050	< MDL	0.025	< MDL	0.050
Cadmium	< MDL	0.100	< MDL	0.050	< MDL	0.100
Chromium	1.03	0.200	0.306	0.101	< MDL	0.200
Cobalt	< MDL	0.125	0.153	0.063	< MDL	0.125
Copper	< MDL	1.25	< MDL	0.630	< MDL	1.25
Lead	< MDL	1.25	< MDL	0.630	< MDL	1.25
Manganese	0.741	0.075	0.742	0.038	< MDL	0.375
Nickel	3.96	0.750	< MDL	0.378	< MDL	0.750
Phosphorus	17.0	5.00	< MDL	2.52	< MDL	5.00
Selenium	< MDL	3.75	< MDL	1.89	< MDL	3.75
Silver	< MDL	0.500	< MDL	0.252	< MDL	0.500
Thallium	< MDL	2.50	< MDL	1.26	< MDL	2.50
Vanadium	< MDL	0.250	< MDL	0.126	< MDL	0.250
Zinc	1.52	0.750	0.415	0.378	< MDL	0.750

Lab ID: 23-S729
Blank Vol, ml: N/A

23-S731
196

23-S730
250

Eagle Foundry Company
Main Foundry BH Inlet - Steel Alloy
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 1
Test Date: 3/27/2023
Page: 1 of 3

Analyte	I Sample FH Rinse+Filter µg	II Blank Correction FH Rinse µg	III Blank Correction Filter µg	IV Sample BH Cap.Soln. + BH Rinse µg	V Blank BH Cap.Soln. µg/ml	VI Blank Correction BH Cap.Soln. µg	VII Blank Correction BH Rinse µg	VIII Total BH Blank Correction µg	
Aluminum	1680.000	0.000	58.800	51.500	0.0832	16.633	0.000	16.633	Al
Antimony	5.770	0.000	2.860	< 0.680	0.0000	0.000	0.000	0.000	Sb
Arsenic	< 8.750	0.000	0.000	< 0.952	0.0000	0.000	0.000	0.000	As
Barium	13.500	0.077	1.400	1.630	0.0037	0.733	0.077	0.810	Ba
Beryllium	0.069	0.000	0.000	< 0.027	0.0000	0.000	0.000	0.000	Be
Cadmium	1.050	0.000	0.000	0.803	0.0000	0.000	0.000	0.000	Cd
Chromium	109.000	0.000	1.030	0.689	0.0016	0.312	0.000	0.312	Cr
Cobalt	0.440	0.000	0.000	0.127	0.0008	0.156	0.000	0.156	Co
Copper	59.400	0.000	0.000	< 0.680	0.0000	0.000	0.000	0.000	Cu
Lead	135.000	0.000	0.000	< 0.680	0.0000	0.000	0.000	0.000	Pb
Manganese	5800.000	0.000	0.741	1.080	0.0038	0.757	0.000	0.757	Mn
Nickel	11.700	0.000	3.960	< 0.408	0.0000	0.000	0.000	0.000	Ni
Phosphorus	46.700	0.000	17.000	< 2.720	0.0000	0.000	0.000	0.000	P
Selenium	< 3.750	0.000	0.000	< 2.040	0.0000	0.000	0.000	0.000	Se
Silver	2.430	0.000	0.000	< 0.272	0.0000	0.000	0.000	0.000	Ag
Thallium	< 2.500	0.000	0.000	< 1.360	0.0000	0.000	0.000	0.000	Tl
Vanadium	0.653	0.000	0.000	< 0.136	0.0000	0.000	0.000	0.000	V
Zinc	1120.000	0.000	1.520	7.240	0.0021	0.423	0.000	0.423	Zn

Lab ID:	23-S669	23-S730	23-S729	23-S670	23-S731	N/A	N/A
Notes:	0.1N HNO ₃	0.1N HNO ₃	5% HNO ₃ /10% H ₂ O ₂	5% HNO ₃ /	5% HNO ₃ /	0.1N HNO ₃	
	FH Filter & Probe Rinse		BH Imps 1-3	10% H ₂ O ₂	10% H ₂ O ₂		
	100ml 0.1N HNO ₃ Rinse		100ml .1N HNO ₃ Rinse				
			200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent				

Blank Rules: <' indicates value is below the method detection limit (MDL).
If blank is '<' it is treated as zero.
If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Main Foundry BH Inlet - Steel Alloy
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 1
Test Date: 3/27/2023
Page: 2 of 3

Analyte	X Allowable FH Blank Correction µg	XI Total FH Blank Correction µg	XII 5% of FH Sample µg	XIII Lessor of XI or XII µg	XIV Greater of A or XIII µg	XV FH Net Sample µg	
Aluminum	58.800	58.800	84.000	58.800	58.80	1621.200	Al
Antimony	2.860	2.860	0.289	0.289	11.63	2.910	Sb
Arsenic	0.000	0.000	< 0.438	0.000	11.63	< 8.750	As
Barium	1.477	1.477	0.675	0.675	11.63	12.023	Ba
Beryllium	0.000	0.000	0.003	0.000	11.63	0.069	Be
Cadmium	0.000	0.000	0.053	0.000	11.63	1.050	Cd
Chromium	1.030	1.030	5.450	1.030	11.63	107.970	Cr
Cobalt	0.000	0.000	0.022	0.000	11.63	0.440	Co
Copper	0.000	0.000	2.970	0.000	11.63	59.400	Cu
Lead	0.000	0.000	6.750	0.000	11.63	135.000	Pb
Manganese	0.741	0.741	290.000	0.741	11.63	5799.259	Mn
Nickel	3.960	3.960	0.585	0.585	11.63	7.740	Ni
Phosphorus	11.630	17.000	2.335	2.335	11.63	35.070	P
Selenium	0.000	0.000	< 0.188	0.000	11.63	< 3.750	Se
Silver	0.000	0.000	0.122	0.000	11.63	2.430	Ag
Thallium	0.000	0.000	< 0.125	0.000	11.63	< 2.500	Tl
Vanadium	0.000	0.000	0.033	0.000	11.63	0.653	V
Zinc	1.520	1.520	56.000	1.520	11.63	1118.480	Zn

Note: Allowable FH Blank (A) = (area of filter)*(1.4 µg/in²) = 11.63 µg
where area of filter = 8.306 in²

If A > blank > 0, use blank-derived value, M_{hb}.

If blank > A, use greater of A or [lessor of 5% of sample µg or FH blank].

Blank Rules: < indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Main Foundry BH Inlet - Steel Alloy
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 1
Test Date: 3/27/2023
Page: 3 of 3

Analyte	XVI Allowable BH Blank Correction µg	XVII Total BH (M _{bhb}) Blank Correction µg	XVIII 5% of BH Sample µg	XIX Lessor of XVII or XVIII µg	XX Greater of 1 µg or XIX µg	XXI BH Net Sample µg	XXII FH Net Sample µg	XXIII FH+BH Total Net Sample µg	
Aluminum	2.575	16.633	2.575	2.575	2.575	48.925	1621.200	1670.125	Al
Antimony	0.000	0.000	< 0.034	0.000	1.000	0.680	2.910	3.590	Sb
Arsenic	0.000	0.000	< 0.048	0.000	1.000	0.952	8.750	9.702	As
Barium	0.810	0.810	0.082	0.082	1.000	0.820	12.023	12.843	Ba
Beryllium	0.000	0.000	< 0.001	0.000	1.000	0.027	0.069	0.096	Be
Cadmium	0.000	0.000	0.040	0.000	1.000	0.803	1.050	1.853	Cd
Chromium	0.312	0.312	0.034	0.034	1.000	0.377	107.970	108.347	Cr
Cobalt	0.156	0.156	0.006	0.006	1.000	0.000	0.440	0.440	Co
Copper	0.000	0.000	< 0.034	0.000	1.000	0.680	59.400	60.080	Cu
Lead	0.000	0.000	< 0.034	0.000	1.000	0.680	135.000	135.680	Pb
Manganese	0.757	0.757	0.054	0.054	1.000	0.323	5799.259	5799.582	Mn
Nickel	0.000	0.000	< 0.020	0.000	1.000	0.408	7.740	8.148	Ni
Phosphorus	0.000	0.000	< 0.136	0.000	1.000	2.720	35.070	37.790	P
Selenium	0.000	0.000	< 0.102	0.000	1.000	2.040	3.750	5.790	Se
Silver	0.000	0.000	< 0.014	0.000	1.000	0.272	2.430	2.702	Ag
Thallium	0.000	0.000	< 0.068	0.000	1.000	1.360	2.500	3.860	Tl
Vanadium	0.000	0.000	< 0.007	0.000	1.000	0.136	0.653	0.789	V
Zinc	0.423	0.423	0.362	0.362	1.000	6.817	1118.480	1125.297	Zn

Note: Allowable BH Blank rules:

If 1.00 µg > blank > 0 , use blank-derived value.

If blank > 1.00 µg, use greater of 1.00 µg or [lessor of 5% of sample µg or BH blank].

Blank Rules: <' indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Main Foundry BH Inlet - Steel Alloy
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 2
Test Date: 3/28/2023
Page: 1 of 3

	I Sample FH Rinse+Filter µg	II Blank Correction FH Rinse µg	III Blank Correction Filter µg	IV Sample BH Cap.Soln. + BH Rinse µg	V Blank BH Cap.Soln. µg/ml	VI Blank Correction BH Cap.Soln. µg	VII Blank Correction BH Rinse µg	VIII Total BH Blank Correction µg	
Analyte	<								
Aluminum	1320.000	0.000	58.800	24.700	0.083	16.633	0.000	16.633	Al
Antimony	3.060	0.000	2.860	< 0.620	0.000	0.000	0.000	0.000	Sb
Arsenic	< 8.750	0.000	0.000	< 0.868	0.000	0.000	0.000	0.000	As
Barium	12.300	0.077	1.400	1.430	0.004	0.733	0.077	0.810	Ba
Beryllium	0.052	0.000	0.000	< 0.025	0.000	0.000	0.000	0.000	Be
Cadmium	1.360	0.000	0.000	0.210	0.000	0.000	0.000	0.000	Cd
Chromium	92.600	0.000	1.030	0.429	0.002	0.312	0.000	0.312	Cr
Cobalt	0.355	0.000	0.000	0.071	0.001	0.156	0.000	0.156	Co
Copper	51.900	0.000	0.000	0.815	0.000	0.000	0.000	0.000	Cu
Lead	145.000	0.000	0.000	< 0.620	0.000	0.000	0.000	0.000	Pb
Manganese	6670.000	0.000	0.741	3.610	0.004	0.757	0.000	0.757	Mn
Nickel	13.100	0.000	3.960	0.501	0.000	0.000	0.000	0.000	Ni
Phosphorus	48.400	0.000	17.000	< 2.480	0.000	0.000	0.000	0.000	P
Selenium	3.880	0.000	0.000	< 1.860	0.000	0.000	0.000	0.000	Se
Silver	1.570	0.000	0.000	< 0.248	0.000	0.000	0.000	0.000	Ag
Thallium	< 2.500	0.000	0.000	< 1.240	0.000	0.000	0.000	0.000	Tl
Vanadium	0.471	0.000	0.000	< 0.124	0.000	0.000	0.000	0.000	V
Zinc	1040.000	0.000	1.520	3.400	0.002	0.423	0.000	0.423	Zn

Lab ID:	23-S674	23-S730	23-S729	23-S675	23-S731	N/A	N/A
Content:	0.1N HNO ₃ FH Filter & Probe Rinse 100ml 0.1N HNO ₃ Rinse	0.1N HNO ₃	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	0.1N HNO ₃

Blank Rules: < indicates value is below the method detection limit (MDL).
If blank is '<' it is treated as zero.
If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Main Foundry BH Inlet - Steel Alloy
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 2
Test Date: 3/28/2023
Page: 2 of 3

	X Allowable FH Blank Correction	XI Total FH Blank Correction	XII 5% of FH Sample	XIII Lessor of XI or XII	XIV Greater of A or XIII	XV FH Net Sample	
Analyte	µg	µg	µg	µg	µg	µg	
Aluminum	58.800	58.800	66.000	58.800	58.80	1261.200	Al
Antimony	2.860	2.860	0.153	0.153	11.63	0.200	Sb
Arsenic	0.000	0.000	0.438	0.000	11.63	8.750	As
Barium	1.477	1.477	0.615	0.615	11.63	10.823	Ba
Beryllium	0.000	0.000	0.003	0.000	11.63	0.052	Be
Cadmium	0.000	0.000	0.068	0.000	11.63	1.360	Cd
Chromium	1.030	1.030	4.630	1.030	11.63	91.570	Cr
Cobalt	0.000	0.000	0.018	0.000	11.63	0.355	Co
Copper	0.000	0.000	2.595	0.000	11.63	51.900	Cu
Lead	0.000	0.000	7.250	0.000	11.63	145.000	Pb
Manganese	0.741	0.741	333.500	0.741	11.63	6669.259	Mn
Nickel	3.960	3.960	0.655	0.655	11.63	9.140	Ni
Phosphorus	11.630	17.000	2.420	2.420	11.63	36.770	P
Selenium	0.000	0.000	0.194	0.000	11.63	3.880	Se
Silver	0.000	0.000	0.079	0.000	11.63	1.570	Ag
Thallium	0.000	0.000	0.125	0.000	11.63	2.500	Tl
Vanadium	0.000	0.000	0.024	0.000	11.63	0.471	V
Zinc	1.520	1.520	52.000	1.520	11.63	1038.480	Zn

Note: Allowable FH Blank (A) = (area of filter)*(1.4 µg/in²) = 11.63 µg
where area of filter = 8.306 in²

If A > blank > 0, use blank-derived value.

If blank > A, use greater of A or [lessor of 5% of sample µg or FH blank].

Blank Rules: <' indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Main Foundry BH Inlet - Steel Alloy
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 2
Test Date: 3/28/2023
Page: 3 of 3

Analyte	XVI Allowable BH Blank Correction µg	XVII Total BH Blank Correction µg	XVIII 5% of BH Sample µg	XIX Lessor of XVII or XVIII µg	XX Greater of 1 µg or XIX µg	XXI BH Net Sample µg	XXII FH Net Sample µg	XXIII FH+BH Total Net Sample µg	
Aluminum	1.235	16.633	1.235	1.235	1.235	23.465	1261.200	1284.665	Al
Antimony	0.000	0.000	< 0.031	0.000	1.000	< 0.620	0.200	< 0.820	Sb
Arsenic	0.000	0.000	< 0.043	0.000	1.000	< 0.868	8.750	< 9.618	As
Barium	0.810	0.810	0.072	0.072	1.000	0.620	10.823	11.443	Ba
Beryllium	0.000	0.000	< 0.001	0.000	1.000	< 0.025	0.052	< 0.077	Be
Cadmium	0.000	0.000	0.011	0.000	1.000	0.210	1.360	1.570	Cd
Chromium	0.312	0.312	0.021	0.021	1.000	0.117	91.570	91.687	Cr
Cobalt	0.156	0.156	0.004	0.004	1.000	0.000	0.355	0.355	Co
Copper	0.000	0.000	0.041	0.000	1.000	0.815	51.900	52.715	Cu
Lead	0.000	0.000	< 0.031	0.000	1.000	< 0.620	145.000	< 145.620	Pb
Manganese	0.757	0.757	0.181	0.181	1.000	2.853	6669.259	6672.112	Mn
Nickel	0.000	0.000	0.025	0.000	1.000	0.501	9.140	9.641	Ni
Phosphorus	0.000	0.000	< 0.124	0.000	1.000	< 2.480	36.770	< 39.250	P
Selenium	0.000	0.000	< 0.093	0.000	1.000	< 1.860	3.880	< 5.740	Se
Silver	0.000	0.000	< 0.012	0.000	1.000	< 0.248	1.570	< 1.818	Ag
Thallium	0.000	0.000	< 0.062	0.000	1.000	< 1.240	2.500	< 3.740	Tl
Vanadium	0.000	0.000	< 0.006	0.000	1.000	< 0.124	0.471	< 0.595	V
Zinc	0.423	0.423	0.170	0.170	1.000	2.977	1038.480	1041.457	Zn

Note: Allowable BH Blank rules:

If 1.00 µg > blank > 0, use blank-derived value.

If blank > 1.00 µg, use greater of 1.00 µg or [lessor of 5% of sample µg or BH blank].

Blank Rules: '<' indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Main Foundry BH Inlet - Steel Alloy
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 3
Test Date: 3/29/2023
Page: 1 of 3

	I Sample FH Rinse+Filter µg	II Blank Correction FH Rinse µg	III Blank Correction Filter µg	IV Sample BH Cap.Soln. + BH Rinse µg	V Blank BH Cap.Soln. µg/ml	VI Blank Correction BH Cap.Soln. µg	VII Blank Correction BH Rinse µg	VIII Total BH Blank Correction µg	
Analyte	<								
Aluminum	1300.000	0.000	58.800	20.600	0.083	16.633	0.000	16.633	Al
Antimony	4.580	0.000	2.860	1.490	0.000	0.000	0.000	0.000	Sb
Arsenic	< 8.750	0.000	0.000	< 0.826	0.000	0.000	0.000	0.000	As
Barium	12.100	0.077	1.400	1.260	0.004	0.733	0.077	0.810	Ba
Beryllium	< 0.050	0.000	0.000	< 0.024	0.000	0.000	0.000	0.000	Be
Cadmium	1.850	0.000	0.000	0.079	0.000	0.000	0.000	0.000	Cd
Chromium	83.000	0.000	1.030	0.357	0.002	0.312	0.000	0.312	Cr
Cobalt	0.420	0.000	0.000	< 0.059	0.001	0.156	0.000	0.156	Co
Copper	56.300	0.000	0.000	0.681	0.000	0.000	0.000	0.000	Cu
Lead	125.000	0.000	0.000	< 0.590	0.000	0.000	0.000	0.000	Pb
Manganese	5340.000	0.000	0.741	4.790	0.004	0.757	0.000	0.757	Mn
Nickel	14.400	0.000	3.960	0.509	0.000	0.000	0.000	0.000	Ni
Phosphorus	48.200	0.000	17.000	< 2.360	0.000	0.000	0.000	0.000	P
Selenium	< 3.750	0.000	0.000	< 1.770	0.000	0.000	0.000	0.000	Se
Silver	1.820	0.000	0.000	< 0.236	0.000	0.000	0.000	0.000	Ag
Thallium	< 2.500	0.000	0.000	< 1.180	0.000	0.000	0.000	0.000	Tl
Vanadium	0.337	0.000	0.000	< 0.118	0.000	0.000	0.000	0.000	V
Zinc	879.000	0.000	1.520	2.060	0.002	0.423	0.000	0.423	Zn

Lab ID:	23-S679	23-S730	23-S729	23-S680	23-S731	N/A	N/A
Content:	0.1N HNO ₃ FH Filter & Probe Rinse 100ml 0.1N HNO ₃ Rinse	0.1N HNO ₃	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	5% HNO ₃ /10% H ₂ O ₂	5% HNO ₃ /10% H ₂ O ₂	0.1N HNO ₃

Blank Rules: < indicates value is below the method detection limit (MDL).
If blank is '<' it is treated as zero.
If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Main Foundry BH Inlet - Steel Alloy
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 3
Test Date: 3/29/2023
Page: 2 of 3

Analyte	X Allowable FH Blank Correction µg	XI Total FH Blank Correction µg	XII 5% of FH Sample µg	XIII Lessor of XI or XII µg	XIV Greater of A or XIII µg	XV FH Net Sample µg	
Aluminum	58.800	58.800	65.000	58.800	58.80	1241.200	Al
Antimony	2.860	2.860	0.229	0.229	11.63	1.720	Sb
Arsenic	0.000	0.000	< 0.438	0.000	11.63	< 8.750	As
Barium	1.477	1.477	0.605	0.605	11.63	10.623	Ba
Beryllium	0.000	0.000	< 0.003	0.000	11.63	< 0.050	Be
Cadmium	0.000	0.000	0.093	0.000	11.63	1.850	Cd
Chromium	1.030	1.030	4.150	1.030	11.63	81.970	Cr
Cobalt	0.000	0.000	0.021	0.000	11.63	0.420	Co
Copper	0.000	0.000	2.815	0.000	11.63	56.300	Cu
Lead	0.000	0.000	6.250	0.000	11.63	125.000	Pb
Manganese	0.741	0.741	267.000	0.741	11.63	5339.259	Mn
Nickel	3.960	3.960	0.720	0.720	11.63	10.440	Ni
Phosphorus	11.630	17.000	2.410	2.410	11.63	36.570	P
Selenium	0.000	0.000	< 0.188	0.000	11.63	< 3.750	Se
Silver	0.000	0.000	0.091	0.000	11.63	1.820	Ag
Thallium	0.000	0.000	< 0.125	0.000	11.63	< 2.500	Tl
Vanadium	0.000	0.000	0.017	0.000	11.63	0.337	V
Zinc	1.520	1.520	43.950	1.520	11.63	877.480	Zn

Note: Allowable FH Blank (A) = (area of filter)*(1.4 µg/in²) = 11.63 µg
where area of filter = 8.306 in²

If A > blank > 0, use blank-derived value.

If blank > A, use greater of A or [lessor of 5% of sample µg or FH blank].

Blank Rules: < indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Main Foundry BH Inlet - Steel Alloy
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 3
Test Date: 3/29/2023
Page: 3 of 3

Analyte	XVI Allowable BH Blank Correction µg	XVII Total BH Blank Correction µg	XVIII 5% of BH Sample µg	XIX Lessor of XVII or XVIII µg	XX Greater of 1 µg or XIX µg	XXI BH Net Sample µg	XXII FH Net Sample µg	XXIII FH+BH Total Net Sample µg	
Aluminum	1.030	16.633	1.030	1.030	1.030	19.570	1241.200	1260.770	Al
Antimony	0.000	0.000	0.075	0.000	1.000	1.490	1.720	3.210	Sb
Arsenic	0.000	0.000	0.041	0.000	1.000	0.826	8.750	9.576	As
Barium	0.810	0.810	0.063	0.063	1.000	0.450	10.623	11.073	Ba
Beryllium	0.000	0.000	0.001	0.000	1.000	0.024	0.050	0.074	Be
Cadmium	0.000	0.000	0.004	0.000	1.000	0.079	1.850	1.929	Cd
Chromium	0.312	0.312	0.018	0.018	1.000	0.045	81.970	82.015	Cr
Cobalt	0.156	0.156	0.003	0.156	1.000	0.000	0.420	0.420	Co
Copper	0.000	0.000	0.034	0.000	1.000	0.681	56.300	56.981	Cu
Lead	0.000	0.000	0.030	0.000	1.000	0.590	125.000	125.590	Pb
Manganese	0.757	0.757	0.240	0.240	1.000	4.033	5339.259	5343.292	Mn
Nickel	0.000	0.000	0.025	0.000	1.000	0.509	10.440	10.949	Ni
Phosphorus	0.000	0.000	0.118	0.000	1.000	2.360	36.570	38.930	P
Selenium	0.000	0.000	0.089	0.000	1.000	1.770	3.750	5.520	Se
Silver	0.000	0.000	0.012	0.000	1.000	0.236	1.820	2.056	Ag
Thallium	0.000	0.000	0.059	0.000	1.000	1.180	2.500	3.680	Tl
Vanadium	0.000	0.000	0.006	0.000	1.000	0.118	0.337	0.455	V
Zinc	0.423	0.423	0.103	0.103	1.000	1.637	877.480	879.117	Zn

Note: Allowable BH Blank rules:

If 1.00 µg > blank > 0 , use blank-derived value.

If blank > 1.00 µg, use greater of 1.00 µg or [lessor of 5% of sample µg or BH blank].

Blank Rules: '<' indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Main Foundry BH Inlet - Steel Alloy
Mercury Blank Correction Calculations

Blank Lab Values

Analyte	Filter Cont. 12 µg/filter		BH Imps. 2&3 Cap.Soln. Cont. 9 5% HNO ₃ / 10% H ₂ O ₂ µg/sample		FH/BH Rinse Cont. 8A 0.1 N HNO ₃ µg/sample		BH Imps. 5&6 Rinse Cont. 8B H ₂ O µg/sample		BH Imps. 5&6 Cap.Soln. + Rinse Cont. 10 KMnO ₄ µg/sample		BH Imps. 5&6 Rinse Cont. 11 HCl µg/sample	
	< Result	MDL	< Result	MDL	< Result	MDL	< Result	MDL	< Result	MDL	< Result	MDL
Mercury	0.0406	0.0219	0.118	0.0172	< MDL	0.0219	< MDL	0.0295	0.0628	0.0163	< MDL	0.0108

Lab ID: 23-S729 23-S731 23-S730 23-S732 23-S733 23-S734
Blank vol, ml: NA 196 250 337 186 124

Blank Correction Values

Analyte: Mercury	Blank FH HNO ₃ Rinse µg	Blank Filter µg	Blank BH Cap.Soln. µg	Blank BH HNO ₃ Rinse µg	Blank BH H ₂ O Rinse µg	Blank BH KMnO ₄ Cap.Soln. + Rinse µg	Blank BH HCl Rinse µg	Total Blank Correction µg	Is Total Blank Correction ≥ 0 and ≤ 0.6?
Run 1	0.00	0.0406	0.12	0.00	0.00	0.10	0.00	0.2623	Yes
Reagent vol, ml	100.0		200.0	200.0	100.0	300.0	225.0		
Run 2	0.00	0.0406	0.12	0.00	0.00	0.10	0.00	0.2623	Yes
Reagent vol, ml	100.0		200.0	200.0	100.0	300.0	225.0		
Run 3	0.00	0.0406	0.12	0.00	0.00	0.10	0.00	0.2623	Yes
Reagent vol, ml	100.0		200.0	200.0	100.0	300.0	225.0		

Notes: 0.1N HNO₃ FH Filter 5% HNO₃/ 10% H₂O₂ 0.1N HNO₃ H₂O 4% KMnO₄/ 10% H₂SO₄ 25 ml 8N HCl/
FH Probe Rinse BH Imps 2&3 BH Imps 1-4 BH Imps 5&6 BH Imps 5&6 BH Imps 5&6

Blank Corrected Results

Analyte: Mercury	Sample FH Rinse + Filter Cont. 1&3 µg	Sample BH Cap.Soln. + HNO ₃ Rinse Cont. 4 µg	Sample BH Imp. 4 + Rinse Cont. 5A µg	Sample BH Imps. 5&6 + Rinses Cont. 5B µg	Sample BH HCl Rinse + Water Cont. 5C µg	Total Sample µg	Total Blank Correction µg	Total Net Sample µg
Run 1	0.0438	0.229	0.0268	0.195	0.0192	0.5138	0.2623	0.2515
Lab ID	23-S669	23-S670	23-S671	23-S672	23-S673			
Run 2	< 0.0219	0.173	0.0116	0.176	0.0159	0.3984	0.2623	0.1361
Lab ID	23-S674	23-S675	23-S676	23-S677	23-S678			
Run 3	< 0.0219	0.179	0.0108	0.194	0.0194	0.4251	0.2623	0.1628
Lab ID	23-S679	23-S680	23-S681	23-S682	23-S683			

Blank Rules: < indicates value is below the method detection limit (MDL)
If blank is '<' it is treated as zero.
If sample is '<' it is used for emission rate calculations but results are preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.
If the total blank correction value is less than or equal to 0.6 µg, subtract the total blank correction value from the total sample value to determine total net Hg. Otherwise, the value used for the blank correction shall be the greater of (1) 0.6 µg or (2) the lesser of [total FH blank + total BH blank] or 5% of the total sample value

EPA Method 29
Gas Stream Characteristics
Test Summary

Client: Eagle Foundry Company
Source: Main Foundry BH Inlet - Steel Alloy
Location: Eagle Creek, OR

Parameter	Units	Run 1	Run 2	Run 3	
Date		3/27/2023	3/28/2023	3/29/2023	
Run Start Time		13:00	10:30	10:35	
Run End Time		17:10	14:40	14:45	
Duration	minutes	250	250	250	Average
Barometric Pressure	inHg	29.79	29.38	29.45	29.54
Nozzle Diameter	inches	0.251	0.251	0.251	0.251
Isokinetic Average	%	96.9	100.4	100.0	99.1
Sample Volume	dscf	299.332	305.505	333.168	312.668
Sample Volume	dscm	8.476	8.651	9.434	8.854
Stack Diameter	inches	48.00	48.00	48.00	48.00
Stack Area	ft ²	12.566	12.566	12.566	12.566
CO ₂	%vd	0.26	0.08	0.08	0.14
O ₂	%vd	20.99	20.93	20.98	20.97
Static Pressure	inH ₂ O	-0.90	-0.90	-0.90	-0.90
H ₂ O	%v	0.35	0.99	0.62	0.65
Wet Molecular Weight	lb/lb-mole	28.84	28.74	28.78	28.79
Velocity	fps	59.65	59.49	64.69	61.28
Flow Rate	adcfm	44,817	44,409	48,472	45,899
	acfm	44,974	44,853	48,774	46,200
	dscfm	45,139	44,453	48,664	46,085
Stack Temperature	°F	60.8	56.8	56.5	58.0
Production Data	lb melt/pour	12,201.579	12,201.119	12,077.535	
	ton melt/pour	6.101	6.101	6.039	
	lb Cr/melt	209.764	201.394	201.494	
	ton Cr/melt	0.105	0.101	0.101	
	lb Mn/melt	834.059	834.082	822.739	
	ton Mn/melt	0.417	0.417	0.411	
	lb Ni/melt	74.327	70.459	69.572	
	ton Ni/melt	0.037	0.035	0.035	

Eagle Foundry Company
Main Foundry BH Inlet - Steel Alloy
EPA Method 29 Results Summary

Test Dates: 3/27/2023
3/28/2023
3/29/2023

Run 1										
Analyte	Total				FH Net			BH Net		
	µg	µg/dscm	lb/hr	lb/ton melt	µg	µg/dscm	lb/hr	µg	µg/dscm	lb/hr
Aluminum	1670.125	197.042	3.33E-02	2.28E-02	1621.200	191.269	3.23E-02	48.925	5.772	9.76E-04
Antimony	< 3.590	< 0.424	< 7.16E-05	< 4.89E-05	2.910	0.343	5.80E-05	< 0.680	< 0.080	< 1.36E-05
Arsenic	< 9.702	< 1.145	< 1.94E-04	< 1.32E-04	< 8.750	< 1.032	< 1.75E-04	< 0.952	< 0.112	< 1.90E-05
Barium	12.843	1.515	2.56E-04	1.75E-04	12.023	1.418	2.40E-04	0.820	0.097	1.64E-05
Beryllium	< 0.096	< 0.011	< 1.92E-06	< 1.31E-06	0.069	0.008	1.38E-06	< 0.027	< 0.003	< 5.39E-07
Cadmium	1.853	0.219	3.70E-05	2.52E-05	1.050	0.124	2.09E-05	0.803	0.095	1.60E-05
Chromium	108.347	12.783	2.16E-03		107.970	12.738	2.15E-03	0.377	0.044	7.52E-06
Cobalt	0.440	0.052	8.78E-06	5.99E-06	0.440	0.052	8.78E-06	0.000	0.000	0.00E+00
Copper	< 60.080	< 7.088	< 1.20E-03	< 8.19E-04	59.400	7.008	1.18E-03	< 0.680	< 0.080	< 1.36E-05
Lead	< 135.680	< 16.008	< 2.71E-03	< 1.85E-03	135.000	15.927	2.69E-03	< 0.680	< 0.080	< 1.36E-05
Manganese	5799.582	684.236	1.16E-01		5799.259	684.198	1.16E-01	0.323	0.038	6.44E-06
Mercury	< 0.252	< 0.030	< 5.02E-06	< 3.43E-06						
Nickel	< 8.148	< 0.961	< 1.63E-04		7.740	0.913	1.54E-04	< 0.408	< 0.048	< 8.14E-06
Phosphorus	< 37.790	< 4.458	< 7.54E-04	< 5.15E-04	35.070	4.138	7.00E-04	< 2.720	< 0.321	< 5.43E-05
Selenium	< 5.790	< 0.683	< 1.15E-04	< 7.89E-05	< 3.750	< 0.442	< 7.48E-05	< 2.040	< 0.241	< 4.07E-05
Silver	< 2.702	< 0.319	< 5.39E-05	< 3.68E-05	2.430	0.287	4.85E-05	< 0.272	< 0.032	< 5.43E-06
Thallium	< 3.860	< 0.455	< 7.70E-05	< 5.26E-05	< 2.500	< 0.295	< 4.99E-05	< 1.360	< 0.160	< 2.71E-05
Vanadium	< 0.789	< 0.093	< 1.57E-05	< 1.07E-05	0.653	0.077	1.30E-05	< 0.136	< 0.016	< 2.71E-06
Zinc	1125.297	132.763	2.24E-02	1.53E-02	1118.480	131.958	2.23E-02	6.817	0.804	1.36E-04

Chromium	lb Cr / ton Cr in melt =	8.59E-02	Run 1 Emission Factors
Manganese	lb Mn / ton Mn in melt =	1.16E+00	
Nickel	lb Ni / ton Ni in melt =	< 1.82E-02	

Run 2										
Analyte	Total				FH Net			BH Net		
	µg	µg/dscm	lb/hr	lb/ton melt	µg	µg/dscm	lb/hr	µg	µg/dscm	lb/hr
Aluminum	1284.665	148.499	2.47E-02	1.69E-02	1261.200	145.787	2.43E-02	23.465	2.712	4.52E-04
Antimony	< 0.820	< 0.095	< 1.58E-05	< 1.08E-05	0.200	0.023	3.85E-06	< 0.620	< 0.072	< 1.19E-05
Arsenic	< 9.618	< 1.112	< 1.85E-04	< 1.26E-04	< 8.750	< 1.011	< 1.68E-04	< 0.868	< 0.100	< 1.67E-05
Barium	11.443	1.323	2.20E-04	1.50E-04	10.823	1.251	2.08E-04	0.620	0.072	1.19E-05
Beryllium	< 0.077	< 0.009	< 1.48E-06	< 1.01E-06	0.052	0.006	1.00E-06	< 0.025	< 0.003	< 4.81E-07
Cadmium	1.570	0.181	3.02E-05	2.06E-05	1.360	0.157	2.62E-05	0.210	0.024	4.04E-06
Chromium	91.687	10.598	1.76E-03		91.570	10.585	1.76E-03	0.117	0.014	2.25E-06
Cobalt	0.355	0.041	6.83E-06	4.67E-06	0.355	0.041	6.83E-06	0.000	0.000	0.00E+00
Copper	52.715	6.094	1.01E-03	6.93E-04	51.900	5.999	9.99E-04	0.815	0.094	1.57E-05
Lead	< 145.620	< 16.833	< 2.80E-03	< 1.91E-03	145.000	16.761	2.79E-03	< 0.620	< 0.072	< 1.19E-05
Manganese	6672.112	771.253	1.28E-01		6669.259	770.923	1.28E-01	2.853	0.330	5.49E-05
Mercury	< 0.136	< 0.016	< 2.62E-06	< 1.79E-06						
Nickel	9.641	1.114	1.86E-04		9.140	1.057	1.76E-04	0.501	0.058	9.64E-06
Phosphorus	< 39.250	< 4.537	< 7.55E-04	< 5.16E-04	36.770	4.250	7.08E-04	< 2.480	< 0.287	< 4.77E-05
Selenium	< 5.740	< 0.664	< 1.10E-04	< 7.55E-05	3.880	0.449	7.47E-05	< 1.860	< 0.215	< 3.58E-05
Silver	< 1.818	< 0.210	< 3.50E-05	< 2.39E-05	1.570	0.181	3.02E-05	< 0.248	< 0.029	< 4.77E-06
Thallium	< 3.740	< 0.432	< 7.20E-05	< 4.92E-05	< 2.500	< 0.289	< 4.81E-05	< 1.240	< 0.143	< 2.39E-05
Vanadium	< 0.595	< 0.069	< 1.15E-05	< 7.82E-06	0.471	0.054	9.07E-06	< 0.124	< 0.014	< 2.39E-06
Zinc	1041.457	120.386	2.00E-02	1.37E-02	1038.480	120.042	2.00E-02	2.977	0.344	5.73E-05

Chromium	lb Cr / ton Cr in melt =	7.30E-02	Run 2 Emission Factors
Manganese	lb Mn / ton Mn in melt =	1.28E+00	
Nickel	lb Ni / ton Ni in melt =	2.19E-02	

Note: Results for Hg front half and back half fractions are not shown because these values are not blank-corrected. Per EPA Method 29, only the sum of Hg front and back half results is subject to blank correction.

'<' denotes results which were calculated using the method detection limit for front half or back half results that were non-detect.

Run 3										
Analyte	Total				FH Net			BH Net		
	µg	µg/dscm	lb/hr	lb/ton melt	µg	µg/dscm	lb/hr	µg	µg/dscm	lb/hr
Aluminum	1260.770	133.641	2.44E-02	1.68E-02	1241.200	131.567	2.40E-02	19.570	2.074	3.78E-04
Antimony	3.210	0.340	6.20E-05	4.28E-05	1.720	0.182	3.32E-05	1.490	0.158	2.88E-05
Arsenic	< 9.576	< 1.015	< 1.85E-04	< 1.28E-04	< 8.750	< 0.927	< 1.69E-04	< 0.826	< 0.088	< 1.60E-05
Barium	11.073	1.174	2.14E-04	1.48E-04	10.623	1.126	2.05E-04	0.450	0.048	8.69E-06
Beryllium	< 0.074	< 0.008	< 1.43E-06	< 9.87E-07	< 0.050	< 0.005	< 9.66E-07	< 0.024	< 0.003	< 4.64E-07
Cadmium	1.929	0.204	3.73E-05	2.57E-05	1.850	0.196	3.57E-05	0.079	0.008	1.53E-06
Chromium	82.015	8.694	1.58E-03		81.970	8.689	1.58E-03	0.045	0.005	8.69E-07
Cobalt	0.420	0.045	8.12E-06	5.60E-06	0.420	0.045	8.12E-06	0.000	0.000	0.00E+00
Copper	56.981	6.040	1.10E-03	7.60E-04	56.300	5.968	1.09E-03	0.681	0.072	1.32E-05
Lead	< 125.590	< 13.312	< 2.43E-03	< 1.67E-03	125.000	13.250	2.42E-03	< 0.590	< 0.063	< 1.14E-05
Manganese	5343.292	566.387	1.03E-01		5339.259	565.959	1.03E-01	4.033	0.427	7.79E-05
Mercury	< 0.163	< 0.017	< 3.15E-06	< 2.17E-06						
Nickel	10.949	1.161	2.12E-04		10.440	1.107	2.02E-04	0.509	0.054	9.84E-06
Phosphorus	< 38.930	< 4.127	< 7.52E-04	< 5.19E-04	36.570	3.876	7.07E-04	< 2.360	< 0.250	< 4.56E-05
Selenium	< 5.520	< 0.585	< 1.07E-04	< 7.36E-05	< 3.750	< 0.397	< 7.25E-05	< 1.770	< 0.188	< 3.42E-05
Silver	< 2.056	< 0.218	< 3.97E-05	< 2.74E-05	1.820	0.193	3.52E-05	< 0.236	< 0.025	< 4.56E-06
Thallium	< 3.680	< 0.390	< 7.11E-05	< 4.91E-05	< 2.500	< 0.265	< 4.83E-05	< 1.180	< 0.125	< 2.28E-05
Vanadium	< 0.455	< 0.048	< 8.79E-06	< 6.07E-06	0.337	0.036	6.51E-06	< 0.118	< 0.013	< 2.28E-06
Zinc	879.117	93.186	1.70E-02	1.17E-02	877.480	93.013	1.70E-02	1.637	0.174	3.16E-05

Chromium	lb Cr / ton Cr in melt =	6.55E-02
Manganese	lb Mn / ton Mn in melt =	1.05E+00
Nickel	lb Ni / ton Ni in melt =	2.53E-02

Run 3 Emission Factors

Mean Runs 1-3										
Analyte	Total				FH Net			BH Net		
	µg	µg/dscm	lb/hr	lb/ton melt	µg	µg/dscm	lb/hr	µg	µg/dscm	lb/hr
Aluminum	1405.187	159.727	2.75E-02	1.88E-02	1374.533	156.208	2.69E-02	30.653	3.520	6.02E-04
Antimony	< 2.540	< 0.286	< 4.98E-05	< 3.42E-05	1.610	0.183	3.17E-05	< 0.930	< 0.103	< 1.81E-05
Arsenic	< 9.632	< 1.090	< 1.88E-04	< 1.29E-04	< 8.750	< 0.990	< 1.71E-04	< 0.882	< 0.100	< 1.72E-05
Barium	11.786	1.337	2.30E-04	1.58E-04	11.156	1.265	2.18E-04	0.630	0.072	1.23E-05
Beryllium	< 0.082	< 0.009	< 1.61E-06	< 1.10E-06	< 0.057	< 0.006	< 1.11E-06	< 0.025	< 0.003	< 4.95E-07
Cadmium	1.784	0.202	3.48E-05	2.39E-05	1.420	0.159	2.76E-05	0.364	0.042	7.20E-06
Chromium	94.016	10.692	1.84E-03		93.837	10.671	1.83E-03	0.180	0.021	3.55E-06
Cobalt	0.405	0.046	7.91E-06	5.42E-06	0.405	0.046	7.91E-06	0.000	0.000	0.00E+00
Copper	< 56.592	< 6.407	< 1.10E-03	< 7.57E-04	55.867	6.325	1.09E-03	< 0.725	< 0.082	< 1.41E-05
Lead	< 135.630	< 15.384	< 2.65E-03	< 1.81E-03	135.000	15.313	2.63E-03	< 0.630	< 0.071	< 1.23E-05
Manganese	5938.329	673.959	1.16E-01		5935.926	673.693	1.16E-01	2.403	0.265	4.64E-05
Mercury	< 0.183	< 0.021	< 3.59E-06	< 2.46E-06						
Nickel	< 9.579	< 1.079	< 1.87E-04		9.107	1.025	1.77E-04	< 0.473	< 0.053	< 9.21E-06
Phosphorus	< 38.657	< 4.374	< 7.54E-04	< 5.17E-04	36.137	4.088	7.05E-04	< 2.520	< 0.286	< 4.92E-05
Selenium	< 5.683	< 0.644	< 1.11E-04	< 7.60E-05	< 3.793	< 0.429	< 7.40E-05	< 1.890	< 0.214	< 3.69E-05
Silver	< 2.192	< 0.249	< 4.29E-05	< 2.94E-05	1.940	0.220	3.80E-05	< 0.252	< 0.029	< 4.92E-06
Thallium	< 3.760	< 0.426	< 7.34E-05	< 5.03E-05	< 2.500	< 0.283	< 4.88E-05	< 1.260	< 0.143	< 2.46E-05
Vanadium	< 0.613	< 0.070	< 1.20E-05	< 8.21E-06	0.487	0.056	9.53E-06	< 0.126	< 0.014	< 2.46E-06
Zinc	1015.290	115.445	1.98E-02	1.36E-02	1011.480	115.004	1.98E-02	3.810	0.441	7.50E-05

Chromium	lb Cr / ton Cr in melt =	7.48E-02
Manganese	lb Mn / ton Mn in melt =	1.16E+00
Nickel	lb Ni / ton Ni in melt =	< 2.18E-02

Mean Runs 1-3

Note: Results for Hg front half and back half fractions are not shown because these values are not blank-corrected. Per EPA Method 29, only the sum of Hg front and back half results is subject to blank correction.

'<' denotes results which were calculated using the method detection limit for front half or back half results that were non-detect.



COMPANY	Eagle Foundry Company
FACILITY	Eagle Foundry
LOCATION	Eagle Creek, OR
SOURCE	Main Foundry BH Outlet - Steel Alloy
DATE	3/27/2023 - 3/29/2023
METHOD	29
POLLUTANT	Metals

EPA Method 1
Stack Parameters and Traverse Points

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Main Foundry BH Outlet - Steel Alloy
Facility: Eagle Foundry

Type of Testing: P (P for Particulate; V for Velocity/Nonparticulate)
Type of Duct: C (C for circular; R for rectangular)

Number of ports available: 2
Number of ports to be used: 2
Port diameter: 3 inches
Sampling location height (approx.): feet
Stack height (approx.): feet

Circular ID (Rectangular Depth): 61.00 inches
Port depth and/or wall thickness: 6.00 inches
Stack width (Rectangular only): inches

Equivalent Diameter
If rectangular = $\frac{2 \times \text{Depth} \times \text{Width}}{\text{Depth} + \text{Width}}$ = 61.00 inches (If circular = duct ID)

Stack/duct area = 20.295 sq. feet 2922.5 sq. inches

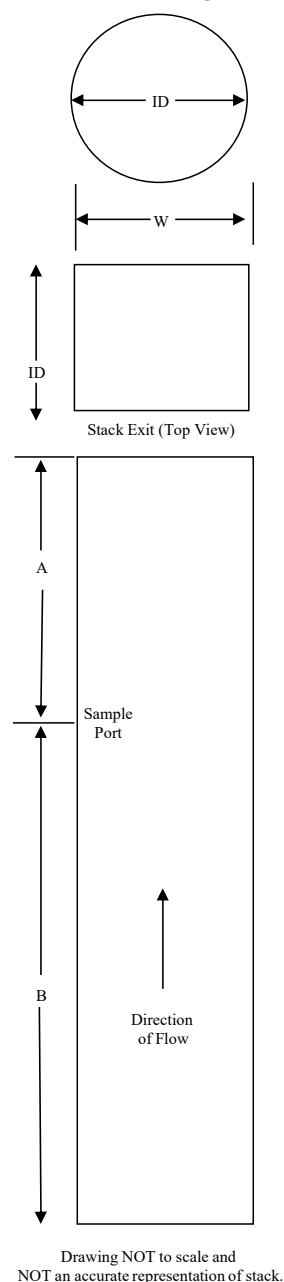
Sample Port Location: Downstream flow disturbance from process B Upstream flow disturbance toward exit A
Number of Inches: 264.00 44.00
Number of Diameters: 4.33 0.72

Minimum Number of Traverse Points: 24

Traverse points less than 1.0 inch from the stack wall are relocated to a distance of 1.0 inch.

Points	% of diameter	Distance from inside wall (in.)	Distance including port (in.)
1	2.1	1.28	7 1/4
2	6.7	4.09	10 1/8
3	11.8	7.20	13 1/4
4	17.7	10.80	16 3/4
5	25.0	15.25	21 1/4
6	35.6	21.72	27 3/4
7	64.4	39.28	45 1/4
8	75.0	45.75	51 3/4
9	82.3	50.20	56 1/4
10	88.2	53.80	59 3/4
11	93.3	56.91	62 7/8
12	97.9	59.72	65 3/4

Reference Diagram



Pre-Test Traverse

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Main Foundry BH Outlet - Steel Alloy

Stack Temp: 60 °F

Traverse Point	Velocity ΔP ("H ₂ O)	Null Angle
1	0.64	0
2	0.65	5
3	0.64	0
4	0.62	5
5	0.61	5
6	0.62	0
7	0.66	5
8	0.62	0
9	0.52	5
10	0.59	0
11	0.58	5
12	0.55	5

Average: 0.61 3

Flow is found to be: Non-cyclonic

**Isokinetic Field Data
Field Data Entry**

Client:	Eagle Foundry Company	Run:	1
Location:	Eagle Creek, OR	Start Time:	13:00
Source:	Main Foundry BH Outlet - Steel Alloy	End Time:	17:10
EPA Method:	29	Environmental Conditions/Test Notes:	Date: 3/27/2023
Box Operator:	JPC	Overcast and 40-60°F	
Technician(s):	KAD		

Stack Dimensional Data:		Equipment:					
Circular		Meterbox ID	15	Probe ID	7D	Liner type	Glass
Diameter	61.000 in	Y factor	1.0057	Nozzle ID	0.25	Nozzle size	0.263 inches
Rectangular		$\Delta H@$	1.919	Hot box ID	HHB7	Nozzle area	0.000377 sq.ft.
Width	in	Bp ID	TS1	Pitot Cp	0.84	Probe heat	248 °F
Length	in	Balance ID	HLN FB-1	Pitot ID	7D	Filter heat	248 °F
Stack Area	20.295 sq.ft.	Weights ID	HLN FW-1	Probe Length, ft	7		

Source Information:				Leak Checks:		
Barometric Pressure	29.79 "Hg	O ₂	20.90 %	Pitot	x	x
Static Pressure	0.1 "H ₂ O	CO ₂	0.00 %	Leak rate, dcf	0.000	0.000
Ave. ΔP	0.61 "H ₂ O	Rec. Nz.	0.228 inches	Leak check vacuum, "Hg	15	9
Stack Temperature	60 °F					
Assumed moisture	2.00 %					
Assumed meter temp.	75 °F					
Total number of points	20					
Time per point	12.5 min.					
Total run time	250 min.					

Nozzle check for roundness:		
1	2	3
0.263	0.263	0.263 inches
	Caliper ID	WS1

Post Test Calculations:				Moisture/Lab:			
Sample volume	262.394 dcf	Ave. ΔP	0.646 "H ₂ O	Filter, #	N/A		
Wet mol. weight	28.8 M _s (actual)	Ave. $\sqrt{\Delta P}$	0.803 "H ₂ O		Initial	Final	Gain
Actual H ₂ O	0.40 %	Ave. ΔH	3.695 "H ₂ O	Impingers, g	3,453.3	3,430.9	-22.4
Std. meter vol.	254.576 dscf	Ave. T _s	62.6 °F	Silica gel, g	940.1	984.1	44.0
Isokinetic Average	99.8 %	Ave. T _m	89.9 °F		Total water gain, g:		21.6

Traverse Point	Time (min.)	Meter Volume (dcf)	Velocity ΔP ("H ₂ O)	Stack Temp. (°F)	Meter Temp. (°F)	Calc. ΔH	Run ΔH	Vacuum ("Hg)	Filter Box (°F)	Condenser Temp (≤68°F)
1	12.5	14.700	0.84	61	74	4.68	4.70	5	249	46
2	25.0	29.390	0.84	61	72	4.66	4.70	5	250	54
3	37.5	43.420	0.79	62	75	4.40	4.40	5	251	58
4	50.0	56.010	0.63	62	79	3.54	3.50	4	251	59
5	62.5	69.110	0.64	62	83	3.62	3.60	4	250	56
6	75.0	82.010	0.64	62	85	3.63	3.60	4	250	57
7	87.5	94.780	0.63	65	88	3.58	3.60	4	251	56
8	100.0	107.590	0.62	63	90	3.55	3.60	4	252	56
9	112.5	120.530	0.63	65	92	3.60	3.60	4	250	54
10	125.0	133.590	0.63	63	93	3.62	3.60	4	250	54
11	137.5	146.350	0.59	63	94	3.40	3.40	4	250	53
12	150.0	159.100	0.59	63	95	3.40	3.40	4	250	53
13	162.5	171.760	0.60	64	96	3.46	3.50	4	250	53
14	175.0	184.650	0.62	64	96	3.58	3.60	4	251	52
15	187.5	197.360	0.61	63	97	3.53	3.50	4	250	51
16	200.0	210.090	0.59	63	97	3.42	3.40	4	251	50
17	212.5	223.150	0.59	62	98	3.43	3.40	4	250	51
18	225.0	235.970	0.60	62	98	3.49	3.50	4	250	49
19	237.5	248.890	0.60	61	98	3.49	3.50	4	250	49
20	250.0	262.394	0.64	61	98	3.73	3.80	4	250	50

**Isokinetic Field Data
Field Data Entry**

Client:	Eagle Foundry Company	Run:	2
Location:	Eagle Creek, OR	Start Time:	10:30
Source:	Main Foundry BH Outlet - Steel Alloy	End Time:	14:40
EPA Method:	29	Environmental Conditions/Test Notes:	Date: 3/28/2023
Box Operator:	JPC		
Technician(s):	KAD		

Stack Dimensional Data:		Equipment:	
Circular		Meterbox ID	15
Diameter	61.000 in	Y factor	1.0057
Rectangular		ΔH@	1.919
Width	in	Bp ID	TS1
Length	in	Balance ID	HLN FB-1
Stack Area	20.295 sq.ft.	Weights ID	HLN FW-1
		Probe ID	7D
		Nozzle ID	0.25
		Hot box ID	HHB7
		Pitot Cp	0.84
		Pitot ID	7D
		Probe Length, ft	7
		Liner type	Glass
		Nozzle size	0.263 inches
		Nozzle area	0.000377 sq.ft.
		Probe heat	248 °F
		Filter heat	248 °F

Source Information:		Leak Checks:	
Barometric Pressure	29.38 "Hg	Pre-test	Post-test
Static Pressure	0.1 "H ₂ O	Pitot	x
Ave. ΔP	0.61 "H ₂ O	Leak rate, dcf	0.000
Stack Temperature	60 °F	Leak check vacuum, "Hg	15
Assumed moisture	0.40 %		11
Assumed meter temp.	89.9 °F		
Total number of points	20		
Time per point	12.5 min.		
Total run time	250 min.		

Post Test Calculations:		Moisture/Lab:	
Sample volume	265.375 dcf	Filter, #	N/A
Wet mol. weight	28.74 M _s (actual)	Initial	Final
Actual H ₂ O	0.90 %	Impingers, g	3,471.3
Std. meter vol.	256.756 dscf	Silica gel, g	901.3
Isokinetic Average	100.2 %		937.1
			Total water gain:

Traverse Point	Time (min.)	Meter Volume (dcf)	Velocity ΔP ("H ₂ O)	Stack Temp. (°F)	Meter Temp. (°F)	Calc. ΔH	Run ΔH	Vacuum ("Hg)	Filter Box (°F)	Condenser Temp (≤68°F)
1	12.5	0.000	0.72	55	67	4.11	4.00	5	250	41
2	25.0	13.780	0.70	55	69	4.01	3.90	4	250	41
3	37.5	40.380	0.68	55	73	3.93	3.90	4	249	41
4	50.0	53.750	0.69	55	78	4.02	3.90	4	250	41
5	62.5	67.550	0.69	55	81	4.05	3.90	5	250	42
6	75.0	80.320	0.60	55	83	3.53	3.40	4	250	42
7	87.5	93.030	0.60	57	84	3.52	3.40	4	251	43
8	100.0	106.150	0.67	56	85	3.95	3.90	4	250	43
9	112.5	119.600	0.68	59	86	3.99	3.90	4	250	43
10	125.0	133.450	0.68	57	88	4.02	3.90	4	250	44
11	137.5	147.010	0.66	57	89	3.91	3.80	4	251	45
12	150.0	160.030	0.62	57	90	3.68	3.60	4	250	44
13	162.5	172.690	0.61	58	89	3.61	3.50	3	251	44
14	175.0	185.340	0.61	60	90	3.60	3.50	3	252	45
15	187.5	198.450	0.62	60	91	3.67	3.50	3	251	44
16	200.0	211.990	0.67	61	91	3.95	3.90	4	250	45
17	212.5	225.630	0.67	61	91	3.95	3.90	4	251	47
18	225.0	239.580	0.71	61	85	4.15	4.00	4	250	47
19	237.5	252.520	0.63	61	84	3.67	3.60	4	250	47
20	250.0	265.375	0.68	59	85	3.99	3.90	4	251	47

Isokinetic Field Data
Field Data Entry

Client:	Eagle Foundry Company	Run:	3
Location:	Eagle Creek, OR	Start Time:	10:35
Source:	Main Foundry BH Outlet - Steel Alloy	End Time:	14:45
EPA Method:	29	Environmental Conditions/Test Notes:	Date: 3/29/2023
Box Operator:	JPC	Overcast and 40-60°F	
Technician(s):	KAD		

Stack Dimensional Data:		Equipment:					
Circular		Meterbox ID	15	Probe ID	7D	Liner type	Glass
Diameter	61.000 in	Y factor	1.0057	Nozzle ID	0.25	Nozzle size	0.263 inches
Rectangular		ΔH@	1.919	Hot box ID	HHB7	Nozzle area	0.000377 sq.ft.
Width	in	Bp ID	TS1	Pitot Cp	0.84	Probe heat	248 °F
Length	in	Balance ID	HLN FB-1	Pitot ID	7D	Filter heat	248 °F
Stack Area	20.295 sq.ft.	Weights ID	HLN FW-1	Probe Length, ft	7		

Source Information:				Leak Checks:		
Barometric Pressure	29.45 "Hg	O ₂	20.90 %		Pre-test	Post-test
Static Pressure	0.1 "H ₂ O	CO ₂	0.00 %	Pitot	x	x
Ave. ΔP	0.61 "H ₂ O	Rec. Nz.	0.224 inches	Leak rate, dcf	0.006	0.004
Stack Temperature	60 °F			Leak check vacuum, "Hg	15	9
Assumed moisture	0.90 %					
Assumed meter temp.	84 °F			Nozzle check for roundness:		
Total number of points	20			1	2	3
Time per point	12.5 min.			0.263	0.263	0.263 inches
Total run time	250 min.			Caliper ID	WS1	

Post Test Calculations:				Moisture/Lab:			
Sample volume	255.977 dcf	Ave. ΔP	0.620 "H ₂ O	Filter, #	N/A		
Wet mol. weight	28.75 M _s (actual)	Ave. √ΔP	0.787 "H ₂ O		Initial	Final	Gain
Actual H ₂ O	0.79 %	Ave. ΔH	3.57 "H ₂ O	Impingers, g	3,493.3	3,498.6	5.3
Std. meter vol.	250.481 dscf	Ave. T _s	59.6 °F	Silica gel, g	935.0	971.8	36.8
Isokinetic Average	100.8 %	Ave. T _m	78.9 °F		Total water gain:		42.1

Traverse Point	Time (min.)	Meter Volume (dcf)	Velocity ΔP ("H ₂ O)	Stack Temp. (°F)	Meter Temp. (°F)	Calc. ΔH	Run ΔH	Vacuum ("Hg)	Filter Box (°F)	Condenser Temp (≤68°F)
1	12.5	13.230	0.66	51	67	3.77	3.80	5	250	40
2	25.0	26.260	0.65	52	69	3.72	3.70	4	250	39
3	37.5	38.950	0.61	53	72	3.50	3.50	4	250	39
4	50.0	51.530	0.60	54	76	3.46	3.50	4	249	41
5	62.5	64.010	0.59	55	80	3.43	3.40	4	250	42
6	75.0	76.490	0.59	55	82	3.44	3.40	4	250	42
7	87.5	89.350	0.62	57	81	3.59	3.60	4	250	42
8	100.0	102.110	0.61	57	82	3.54	3.50	4	251	42
9	112.5	115.040	0.61	58	84	3.55	3.60	4	255	42
10	125.0	128.490	0.66	57	86	3.86	3.90	4	251	42
11	137.5	141.690	0.66	57	88	3.87	3.90	4	252	45
12	150.0	154.560	0.64	60	90	3.75	3.80	5	251	45
13	162.5	167.490	0.62	63	86	3.58	3.60	4	252	48
14	175.0	179.950	0.57	64	82	3.26	3.30	4	251	47
15	187.5	193.200	0.69	66	78	3.91	3.90	4	252	48
16	200.0	205.670	0.59	66	75	3.32	3.30	4	250	49
17	212.5	217.930	0.59	67	72	3.30	3.30	4	251	49
18	225.0	230.410	0.59	67	75	3.32	3.30	4	251	49
19	237.5	242.640	0.58	67	76	3.27	3.30	4	250	49
20	250.0	255.977	0.67	66	77	3.79	3.80	5	251	49

EPA Method 4
Impinger Weights Summary

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Main Foundry BH Outlet - Steel Alloy
EPA Method: 29
Box Operator: JPC
Technician(s): KAD

Run 1

Impinger gain by weight (g):

#	Initial	Final	Gain
1	712.2	639.2	-73.0
2	716.4	735.6	19.2
3	542.8	552.1	9.3
4	741.6	754.8	13.2
5	740.3	749.2	8.9
Totals:	3,453.3	3,430.9	-22.4

Run 2

Impinger gain by weight (g):

#	Initial	Final	Gain
1	721.1	685.0	-36.1
2	727.0	760.3	33.3
3	547.1	553.6	6.5
4	735.2	741.4	6.2
5	740.9	744.6	3.7
Totals:	3,471.3	3,484.9	13.6

Run 3

Impinger gain by weight (g):

#	Initial	Final	Gain
1	716.1	688.6	-27.5
2	731.8	757.8	26.0
3	545.5	548.4	2.9
4	744.5	748.1	3.6
5	755.4	755.7	0.3
Totals:	3,493.3	3,498.6	5.3

Isokinetic Field Data
Field Data and Calculations
Gas Stream Characteristics

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Main Foundry BH Outlet - Steel Alloy
Method: 29

Run: 1
Start Time: 13:00
End Time: 17:10
Date: 3/27/2023

Sampling Data				Traverse Data			
Time min.	Meter ft ³	ΔH "H ₂ O	Meter T _m °F	Traverse Point	Dp "H ₂ O	Stack T _s °F	$\sqrt{Dp}$
	0.000						
12.5	14.700	4.70	74	1	0.84	61	0.917
25.0	29.390	4.70	72	2	0.84	61	0.917
37.5	43.420	4.40	75	3	0.79	62	0.889
50.0	56.010	3.50	79	4	0.63	62	0.794
62.5	69.110	3.60	83	5	0.64	62	0.800
75.0	82.010	3.60	85	6	0.64	62	0.800
87.5	94.780	3.60	88	7	0.63	65	0.794
100.0	107.590	3.60	90	8	0.62	63	0.787
112.5	120.530	3.60	92	9	0.63	65	0.794
125.0	133.590	3.60	93	10	0.63	63	0.794
137.5	146.350	3.40	94	11	0.59	63	0.768
150.0	159.100	3.40	95	12	0.59	63	0.768
162.5	171.760	3.50	96	13	0.60	64	0.775
175.0	184.650	3.60	96	14	0.62	64	0.787
187.5	197.360	3.50	97	15	0.61	63	0.781
200.0	210.090	3.40	97	16	0.59	63	0.768
212.5	223.150	3.40	98	17	0.59	62	0.768
225.0	235.970	3.50	98	18	0.60	62	0.775
237.5	248.890	3.50	98	19	0.60	61	0.775
250.0	262.394	3.80	98	20	0.64	61	0.800

Client:	Eagle Foundry Company	Run:	1
Source:	Main Foundry BH Outlet - Steel Alloy	Date:	03/27/23

Field Data Input Continued

Moisture Data

Total Test Time	250.0 min
Sample Time Interval	12.5 min
Meter Volume, V_m	262.394 dcf
Water Mass	21.6 g
Nozzle Diameter, N_z	0.2630 in.
Nozzle Area	0.000377 sq.ft.

Stack Dimensional Data:

Circular	
Diameter	61.000 in
Rectangular	
Width	in
Length	in
Stack Area	20.295 sq.ft.

Traverse Data

Barometric Pressure, P_b	29.79 "Hg
Static Pressure	0.10 "H ₂ O
Pitot Factor, cp	0.84
Meter Cal Factor	1.0057 Y

Molecular Weight:

CO ₂ Average	0.26 %vd
O ₂ Average	20.99 %vd

Field Data Averages

Meter

ΔH	3.695 "H ₂ O
Temperature, T_m	89.9 °F
Temperature, T_m	549.6 °A (°R)
Pressure Meter, P_m	30.062 "Hg

Stack

$\sqrt{D_p}$	0.803 "H ₂ O
Temperature, T_s	62.6 °F
Temperature, T_s	522.3 °A (°R)
Pressure Stack, P_s	29.797 "Hg

Field Data Calculations

Meter Box Capture

Standard Volume, $V_{m(std)}$	254.576 dscf
	7.209 dscm
Actual Volume, $V_{m(actual)}$	254.027 awcf

EPA Method 2 Stack Gas Flowrate:

Velocity, V_s	44.95 fps
Flow Rate (actual), Q_{aw}	54,736 acfm
	54,517 adcfm
Flow Rate (standard), Q	3,304,453 wscf/hr
	3,291,235 dscf/hr
	54,854 dscf/min
	55,074 wscf/min

Gas Stream Moisture

Moisture Vapor, $V_{w(std)}$	1.019 scf
Moisture, B_{ws}	0.0040
Moisture EPA M4	0.40 %v
Moisture @ Saturation	1.92 %v (for $T_s < 212^\circ\text{F}$)

EPA Method 3 Gas Density

Dry, M_d	28.88 lb/lb-mole
Wet, M_s	28.84 lb/lb-mole

Percent Isokinetic	99.9 %

Isokinetic Field Data
Field Data and Calculations
Gas Stream Characteristics

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Main Foundry BH Outlet - Steel Alloy
Method: 29

Run: 2
Start Time: 10:30
End Time: 14:40
Date: 03/28/23

Sampling Data				Traverse Data			
Time min.	Meter ft ³	ΔH "H ₂ O	Meter T _m °F	Traverse Point	Dp "H ₂ O	Stack T _s °F	$\sqrt{Dp}$
	0.000						
12.5	13.780	4.00	67	1	0.72	55	0.849
25.0	27.080	3.90	69	2	0.70	55	0.837
37.5	40.380	3.90	73	3	0.68	55	0.825
50.0	53.750	3.90	78	4	0.69	55	0.831
62.5	67.550	3.90	81	5	0.69	55	0.831
75.0	80.320	3.40	83	6	0.60	55	0.775
87.5	93.030	3.40	84	7	0.60	57	0.775
100.0	106.150	3.90	85	8	0.67	56	0.819
112.5	119.600	3.90	86	9	0.68	59	0.825
125.0	133.450	3.90	88	10	0.68	57	0.825
137.5	147.010	3.80	89	11	0.66	57	0.812
150.0	160.030	3.60	90	12	0.62	57	0.787
162.5	172.690	3.50	89	13	0.61	58	0.781
175.0	185.340	3.50	90	14	0.61	60	0.781
187.5	198.450	3.50	91	15	0.62	60	0.787
200.0	211.990	3.90	91	16	0.67	61	0.819
212.5	225.630	3.90	91	17	0.67	61	0.819
225.0	239.580	4.00	85	18	0.71	61	0.843
237.5	252.520	3.60	84	19	0.63	61	0.794
250.0	265.375	3.90	85	20	0.68	59	0.825

Client:	Eagle Foundry Company	Run:	2
Source:	Main Foundry BH Outlet - Steel Alloy	Date:	03/28/23

Field Data Input Continued

<u>Moisture Data</u>		<u>Stack Dimensional Data:</u>	
Total Test Time	250.0 min	Circular	
Sample Time Interval	12.5 min	Diameter	61.000 in
Meter Volume, V_m	265.375 dcf	Rectangular	
Water Mass	49.4 g	Width	in
Nozzle Diameter, N_z	0.2630 in.	Length	in
Nozzle Area	0.000377 sq.ft.	Stack Area	20.295 sq.ft.

<u>Traverse Data</u>		<u>Molecular Weight:</u>	
Barometric Pressure, P_b	29.38 "Hg	CO ₂ Average	0.08 %vd
Static Pressure	0.10 "H ₂ O	O ₂ Average	20.93 %vd
Pitot Factor, cp	0.84		
Meter Cal Factor	1.0057 Y		

Field Data Averages

<u>Meter</u>		<u>Stack</u>	
ΔH	3.765 "H ₂ O	$\sqrt{D_p}$	0.812 "H ₂ O
Temperature, T_m	84.0 °F	Temperature, T_s	57.7 °F
Temperature, T_m	543.7 °A (°R)	Temperature, T_s	517.4 °A (°R)
Pressure Meter, P_m	29.657 "Hg	Pressure Stack, P_s	29.387 "Hg

Field Data Calculations

<u>Meter Box Capture</u>		<u>EPA Method 2 Stack Gas Flowrate:</u>	
Standard Volume, $V_{m(std)}$	256.756 dscf	Velocity, V_s	45.63 fps
	7.271 dscm	Flow Rate (actual), Q_{aw}	55,564 acfm
Actual Volume, $V_{m(actual)}$	258.638 awcf		55,064 adcfm
<u>Gas Stream Moisture</u>		Flow Rate (standard), Q	3,339,618 wscf/hr
Moisture Vapor, $V_{w(std)}$	2.330 scf		3,309,561 dscf/hr
Moisture, B_{ws}	0.0090		55,159 dscf/min
Moisture EPA M4	0.90 %v		55,660 wscf/min
Moisture @ Saturation	1.64 %v (for $T_s < 212^\circ F$)		
<u>EPA Method 3 Gas Density</u>			
Dry, M_d	28.85 lb/lb-mole		
Wet, M_s	28.75 lb/lb-mole		
Percent Isokinetic	100.2 %		

Isokinetic Field Data
Field Data and Calculations
Gas Stream Characteristics

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Main Foundry BH Outlet - Steel Alloy
Method: 29

Run: 3
Start Time: 10:35
End Time: 14:45
Date: 03/29/23

Sampling Data				Traverse Data			
Time min.	Meter ft ³	ΔH "H ₂ O	Meter T _m °F	Traverse Point	Dp "H ₂ O	Stack T _s °F	$\sqrt{Dp}$
	0.000						
12.5	13.230	3.80	67	1	0.66	51	0.812
25.0	26.260	3.70	69	2	0.65	52	0.806
37.5	38.950	3.50	72	3	0.61	53	0.781
50.0	51.530	3.50	76	4	0.60	54	0.775
62.5	64.010	3.40	80	5	0.59	55	0.768
75.0	76.490	3.40	82	6	0.59	55	0.768
87.5	89.350	3.60	81	7	0.62	57	0.787
100.0	102.110	3.50	82	8	0.61	57	0.781
112.5	115.040	3.60	84	9	0.61	58	0.781
125.0	128.490	3.90	86	10	0.66	57	0.812
137.5	141.690	3.90	88	11	0.66	57	0.812
150.0	154.560	3.80	90	12	0.64	60	0.800
162.5	167.490	3.60	86	13	0.62	63	0.787
175.0	179.950	3.30	82	14	0.57	64	0.755
187.5	193.200	3.90	78	15	0.69	66	0.831
200.0	205.670	3.30	75	16	0.59	66	0.768
212.5	217.930	3.30	72	17	0.59	67	0.768
225.0	230.410	3.30	75	18	0.59	67	0.768
237.5	242.640	3.30	76	19	0.58	67	0.762
250.0	255.977	3.80	77	20	0.67	66	0.819

Client:	Eagle Foundry Company	Run:	3
Source:	Main Foundry BH Outlet - Steel Alloy	Date:	03/29/23

Field Data Input Continued

Moisture Data

Total Test Time	250.0 min
Sample Time Interval	12.5 min
Meter Volume, V_m	255.977 dcf
Water Mass	42.1 g
Nozzle Diameter, N_z	0.2630 in.
Nozzle Area	0.000377 sq.ft.

Stack Dimensional Data:

Circular	
Diameter	61.000 in
Rectangular	
Width	in
Length	in
Stack Area	20.295 sq.ft.

Traverse Data

Barometric Pressure, P_b	29.45 "Hg
Static Pressure	0.10 "H ₂ O
Pitot Factor, cp	0.84
Meter Cal Factor	1.0057 Y

Molecular Weight:

CO ₂ Average	0.08 %vd
O ₂ Average	20.98 %vd

Field Data Averages

Meter

ΔH	3.570 "H ₂ O
Temperature, T_m	78.9 °F
Temperature, T_m	538.6 °A (°R)
Pressure Meter, P_m	29.713 "Hg

Stack

$\sqrt{D_p}$	0.787 "H ₂ O
Temperature, T_s	59.6 °F
Temperature, T_s	519.3 °A (°R)
Pressure Stack, P_s	29.457 "Hg

Field Data Calculations

Meter Box Capture

Standard Volume, $V_{m(std)}$	250.481 dscf
	7.093 dscm
Actual Volume, $V_{m(actual)}$	252.361 awcf

EPA Method 2 Stack Gas Flowrate:

Velocity, V_s	44.25 fps
Flow Rate (actual), Q_{aw}	53,883 acfm
	53,457 adcfm
Flow Rate (standard), Q	3,234,454 wscf/hr
	3,208,902 dscf/hr
	53,482 dscf/min
	53,908 wscf/min

Gas Stream Moisture

Moisture Vapor, $V_{w(std)}$	1.985 scf
Moisture, B_{ws}	0.0079
Moisture EPA M4	0.79 %v
Moisture @ Saturation	1.75 %v (for $T_s < 212^\circ F$)

EPA Method 3 Gas Density

Dry, M_d	28.85 lb/lb-mole
Wet, M_s	28.76 lb/lb-mole

Percent Isokinetic	100.8 %

Eagle Foundry Company
Main Foundry BH Outlet - Steel Alloy
Method 29 Laboratory Results

Run: 1
Sample Date: 03/27/23

Analyte	Filter + FH Rinse Cont. 1&3		BH Cap.Soln. + BH Rinse Cont. 4		Units
	< Result	MDL	< Result	MDL	
Aluminum	99.0	7.50	20.4	3.60	µg/sample
Antimony	2.91	1.25	< MDL	0.600	µg/sample
Arsenic	2.29	1.75	< MDL	0.840	µg/sample
Barium	6.75	0.125	2.37	0.060	µg/sample
Beryllium	< MDL	0.050	< MDL	0.024	µg/sample
Cadmium	< MDL	0.100	0.514	0.048	µg/sample
Chromium	4.97	0.200	0.481	0.096	µg/sample
Cobalt	< MDL	0.125	0.067	0.060	µg/sample
Copper	4.18	1.25	< MDL	0.600	µg/sample
Lead	< MDL	1.25	< MDL	0.600	µg/sample
Manganese	13.4	0.075	1.73	0.036	µg/sample
Nickel	10.4	0.750	< MDL	0.360	µg/sample
Phosphorus	22.1	5.00	< MDL	2.40	µg/sample
Selenium	< MDL	3.75	< MDL	1.80	µg/sample
Silver	0.608	0.500	< MDL	0.240	µg/sample
Thallium	< MDL	2.50	< MDL	1.20	µg/sample
Vanadium	< MDL	0.250	< MDL	0.120	µg/sample
Zinc	12.0	0.750	6.09	0.360	µg/sample

Lab ID:	23-S699	23-S700	
Sample Vol:	250	236	ml

Eagle Foundry Company
Main Foundry BH Outlet - Steel Alloy
Method 29 Laboratory Results

Run: 2
Sample Date: 03/28/23

Analyte	Filter + FH Rinse Cont. 1&3		BH Cap.Soln. + BH Rinse Cont. 4		Units
	<	Result MDL	<	Result MDL	
Aluminum		87.8 7.50		20.0 3.45	µg/sample
Antimony		3.24 1.25	<	MDL 0.575	µg/sample
Arsenic		2.04 1.75	<	MDL 0.805	µg/sample
Barium		6.14 0.125		2.62 0.058	µg/sample
Beryllium	<	MDL 0.050	<	MDL 0.023	µg/sample
Cadmium	<	MDL 0.100		0.298 0.046	µg/sample
Chromium		4.11 0.200		0.333 0.092	µg/sample
Cobalt	<	MDL 0.125	<	MDL 0.058	µg/sample
Copper		3.74 1.25		1.31 0.575	µg/sample
Lead	<	MDL 1.25	<	MDL 0.575	µg/sample
Manganese		15.5 0.075		3.26 0.034	µg/sample
Nickel		12.4 0.750		0.946 0.345	µg/sample
Phosphorus		18.2 5.00	<	MDL 2.30	µg/sample
Selenium	<	MDL 3.75	<	MDL 1.72	µg/sample
Silver	<	MDL 0.500	<	MDL 0.230	µg/sample
Thallium	<	MDL 2.50	<	MDL 1.15	µg/sample
Vanadium	<	MDL 0.250	<	MDL 0.115	µg/sample
Zinc		7.35 0.750		3.69 0.345	µg/sample

Lab ID:	23-S704	23-S705	
Sample Vol:	250	300	ml

Eagle Foundry Company
Main Foundry BH Outlet - Steel Alloy
Method 29 Laboratory Results

Run: 3
Sample Date: 03/29/23

Analyte	Filter + FH Rinse Cont. 1&3		BH Cap.Soln. + BH Rinse Cont. 4		Units
	< Result	MDL	< Result	MDL	
Aluminum	84.5	7.50	18.5	3.45	µg/sample
Antimony	3.16	1.25	< MDL	0.575	µg/sample
Arsenic	2.51	1.75	< MDL	0.805	µg/sample
Barium	7.06	0.125	1.83	0.058	µg/sample
Beryllium	< MDL	0.050	< MDL	0.023	µg/sample
Cadmium	< MDL	0.100	0.091	0.046	µg/sample
Chromium	2.75	0.200	0.328	0.092	µg/sample
Cobalt	< MDL	0.125	< MDL	0.058	µg/sample
Copper	< MDL	1.25	1.22	0.575	µg/sample
Lead	< MDL	1.25	< MDL	0.575	µg/sample
Manganese	12.5	0.075	1.50	0.034	µg/sample
Nickel	5.35	0.750	< MDL	0.345	µg/sample
Phosphorus	20.6	5.00	< MDL	2.30	µg/sample
Selenium	< MDL	3.75	< MDL	1.72	µg/sample
Silver	< MDL	0.500	< MDL	0.230	µg/sample
Thallium	< MDL	2.50	< MDL	1.15	µg/sample
Vanadium	< MDL	0.250	< MDL	0.115	µg/sample
Zinc	8.84	0.750	1.35	0.345	µg/sample

Lab ID:	23-S709	23-S710	
Sample Vol:	250	299	ml

Eagle Foundry Company
Main Foundry BH Outlet - Steel Alloy
Method 29 Blank Results

Sample Dates: 3/27/2023
3/28/2023
3/29/2023

Analyte	Filter Cont. 12 µg/filter		BH Cap.Soln. Cont. 9 5% HNO ₃ / 10% H ₂ O ₂ µg/sample		FH/BH Rinse Cont. 8A 0.1 N HNO ₃ µg/sample	
	< Result	MDL	< Result	MDL	< Result	MDL
Aluminum	58.8	7.50	16.30	3.78	< MDL	7.50
Antimony	2.86	1.25	< MDL	0.630	< MDL	1.25
Arsenic	< MDL	1.75	< MDL	0.882	< MDL	1.75
Barium	1.40	0.125	0.718	0.063	0.193	0.125
Beryllium	< MDL	0.050	< MDL	0.025	< MDL	0.050
Cadmium	< MDL	0.100	< MDL	0.050	< MDL	0.100
Chromium	1.03	0.200	0.306	0.101	< MDL	0.200
Cobalt	< MDL	0.125	0.153	0.063	< MDL	0.125
Copper	< MDL	1.25	< MDL	0.630	< MDL	1.25
Lead	< MDL	1.25	< MDL	0.630	< MDL	1.25
Manganese	0.74	0.08	0.742	0.038	< MDL	0.375
Nickel	3.96	0.75	< MDL	0.378	< MDL	0.750
Phosphorus	17.0	5.00	< MDL	2.52	< MDL	5.00
Selenium	< MDL	3.75	< MDL	1.89	< MDL	3.75
Silver	< MDL	0.500	< MDL	0.252	< MDL	0.500
Thallium	< MDL	2.50	< MDL	1.26	< MDL	2.50
Vanadium	< MDL	0.250	< MDL	0.126	< MDL	0.250
Zinc	1.52	0.750	0.415	0.378	< MDL	0.750

Lab ID: 23-S729
Blank Vol, ml: N/A

23-S731
196

23-S730
250

Eagle Foundry Company
Main Foundry BH Outlet - Steel Alloy
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 1
Test Date: 3/27/2023
Page: 1 of 3

Analyte	I Sample FH Rinse+Filter µg	II Blank Correction FH Rinse µg	III Blank Correction Filter µg	IV Sample BH Cap.Soln. + BH Rinse µg	V Blank BH Cap.Soln. µg/ml	VI Blank Correction BH Cap.Soln. µg	VII Blank Correction BH Rinse µg	VIII Total BH Blank Correction µg	
Aluminum	99.000	0.000	58.800	20.400	0.0832	16.633	0.000	16.633	Al
Antimony	2.910	0.000	2.860	< 0.600	0.0000	0.000	0.000	0.000	Sb
Arsenic	2.290	0.000	0.000	< 0.840	0.0000	0.000	0.000	0.000	As
Barium	6.750	0.077	1.400	2.370	0.0037	0.733	0.077	0.810	Ba
Beryllium	< 0.050	0.000	0.000	< 0.024	0.0000	0.000	0.000	0.000	Be
Cadmium	< 0.100	0.000	0.000	0.514	0.0000	0.000	0.000	0.000	Cd
Chromium	4.970	0.000	1.030	0.481	0.0016	0.312	0.000	0.312	Cr
Cobalt	< 0.125	0.000	0.000	0.067	0.0008	0.156	0.000	0.156	Co
Copper	4.180	0.000	0.000	< 0.600	0.0000	0.000	0.000	0.000	Cu
Lead	< 1.250	0.000	0.000	< 0.600	0.0000	0.000	0.000	0.000	Pb
Manganese	13.400	0.000	0.741	1.730	0.0038	0.757	0.000	0.757	Mn
Nickel	10.400	0.000	3.960	< 0.360	0.0000	0.000	0.000	0.000	Ni
Phosphorus	22.100	0.000	17.000	< 2.400	0.0000	0.000	0.000	0.000	P
Selenium	< 3.750	0.000	0.000	< 1.800	0.0000	0.000	0.000	0.000	Se
Silver	0.608	0.000	0.000	< 0.240	0.0000	0.000	0.000	0.000	Ag
Thallium	< 2.500	0.000	0.000	< 1.200	0.0000	0.000	0.000	0.000	Tl
Vanadium	< 0.250	0.000	0.000	< 0.120	0.0000	0.000	0.000	0.000	V
Zinc	12.000	0.000	1.520	6.090	0.0021	0.423	0.000	0.423	Zn

Lab ID:	23-S699	23-S730	23-S729	23-S700	23-S731	N/A	N/A
Notes:	0.1N HNO ₃	0.1N HNO ₃	5% HNO ₃ /10% H ₂ O ₂	5% HNO ₃ /	5%HNO ₃ /	0.1NHNO ₃	
	FH Filter & Probe Rinse		BH Imps 1-3	10% H ₂ O ₂	10%H ₂ O ₂		
	100ml 0.1N HNO ₃ Rinse		100ml .1N HNO ₃ Rinse				
			200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent				

Blank Rules: < indicates value is below the method detection limit (MDL).
If blank is '<' it is treated as zero.
If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Main Foundry BH Outlet - Steel Alloy
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 1
Test Date: 3/27/2023
Page: 2 of 3

Analyte	X Allowable FH Blank Correction µg	XI Total FH Blank Correction µg	XII 5% of FH Sample µg	XIII Lessor of XI or XII µg	XIV Greater of A or XIII µg	XV FH Net Sample µg	
Aluminum	11.630	58.800	4.950	4.950	11.63	87.370	Al
Antimony	2.860	2.860	0.146	0.146	11.63	0.050	Sb
Arsenic	0.000	0.000	0.115	0.000	11.63	2.290	As
Barium	1.477	1.477	0.338	0.338	11.63	5.273	Ba
Beryllium	0.000	0.000	0.003	0.000	11.63	0.050	Be
Cadmium	0.000	0.000	0.005	0.000	11.63	0.100	Cd
Chromium	1.030	1.030	0.249	0.249	11.63	3.940	Cr
Cobalt	0.000	0.000	0.006	0.000	11.63	0.125	Co
Copper	0.000	0.000	0.209	0.000	11.63	4.180	Cu
Lead	0.000	0.000	0.063	0.000	11.63	1.250	Pb
Manganese	0.741	0.741	0.670	0.670	11.63	12.659	Mn
Nickel	3.960	3.960	0.520	0.520	11.63	6.440	Ni
Phosphorus	11.630	17.000	1.105	1.105	11.63	10.470	P
Selenium	0.000	0.000	0.188	0.000	11.63	3.750	Se
Silver	0.000	0.000	0.030	0.000	11.63	0.608	Ag
Thallium	0.000	0.000	0.125	0.000	11.63	2.500	Tl
Vanadium	0.000	0.000	0.013	0.000	11.63	0.250	V
Zinc	1.520	1.520	0.600	0.600	11.63	10.480	Zn

Note: Allowable FH Blank (A) = (area of filter)*(1.4 µg/in²) = 11.63 µg
where area of filter = 8.306 in²

If A > blank > 0, use blank-derived value, M_{hb}.

If blank > A, use greater of A or [lessor of 5% of sample µg or FH blank].

Blank Rules: <' indicates value is below the method detection limit (MDL).

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Eagle Foundry Company
Main Foundry BH Outlet - Steel Alloy
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 1
Test Date: 3/27/2023
Page: 3 of 3

Analyte	XVI Allowable BH Blank Correction µg	XVII Total BH Blank Correction µg	XVIII 5% of BH Sample µg	XIX Lessor of XVII or XVIII µg	XX Greater of 1 µg or XIX µg	XXI BH Net Sample µg	XXII FH Net Sample µg	XXIII FH+BH Total Net Sample µg	
Aluminum	1.020	16.633	1.020	1.020	1.020	19.380	87.370	106.750	Al
Antimony	0.000	0.000	< 0.030	0.000	1.000	0.600	0.050	0.650	Sb
Arsenic	0.000	0.000	< 0.042	0.000	1.000	0.840	2.290	3.130	As
Barium	0.810	0.810	0.119	0.119	1.000	1.560	5.273	6.833	Ba
Beryllium	0.000	0.000	< 0.001	0.000	1.000	0.024	0.050	0.074	Be
Cadmium	0.000	0.000	0.026	0.000	1.000	0.514	0.100	0.614	Cd
Chromium	0.312	0.312	0.024	0.024	1.000	0.169	3.940	4.109	Cr
Cobalt	0.156	0.156	0.003	0.003	1.000	0.000	0.125	0.125	Co
Copper	0.000	0.000	< 0.030	0.000	1.000	0.600	4.180	4.780	Cu
Lead	0.000	0.000	< 0.030	0.000	1.000	0.600	1.250	1.850	Pb
Manganese	0.757	0.757	0.087	0.087	1.000	0.973	12.659	13.632	Mn
Nickel	0.000	0.000	< 0.018	0.000	1.000	0.360	6.440	6.800	Ni
Phosphorus	0.000	0.000	< 0.120	0.000	1.000	2.400	10.470	12.870	P
Selenium	0.000	0.000	< 0.090	0.000	1.000	1.800	3.750	5.550	Se
Silver	0.000	0.000	< 0.012	0.000	1.000	0.240	0.608	0.848	Ag
Thallium	0.000	0.000	< 0.060	0.000	1.000	1.200	2.500	3.700	Tl
Vanadium	0.000	0.000	< 0.006	0.000	1.000	0.120	0.250	0.370	V
Zinc	0.423	0.423	0.305	0.305	1.000	5.667	10.480	16.147	Zn

Note: Allowable BH Blank rules:

If 1.00 µg > blank > 0 , use blank-derived value.

If blank > 1.00 µg, use greater of 1.00 µg or [lessor of 5% of sample µg or BH blank].

Blank Rules: <' indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Main Foundry BH Outlet - Steel Alloy
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 2
Test Date: 3/28/2023
Page: 1 of 3

	I Sample	II Blank	III Blank	IV Sample	V Blank	VI Blank Correction	VII Blank Correction	VIII Total BH Blank Correction	
Analyte	< FH Rinse+Filter µg	FH Rinse µg	Filter µg	BH Cap.Soln. µg	BH Cap.Soln. µg/ml	BH Cap.Soln. µg	BH Rinse µg	µg	
Aluminum	87.800	0.000	58.800	20.000	0.0832	16.633	0.000	16.633	Al
Antimony	3.240	0.000	2.860	< 0.575	0.0000	0.000	0.000	0.000	Sb
Arsenic	2.040	0.000	0.000	< 0.805	0.0000	0.000	0.000	0.000	As
Barium	6.140	0.077	1.400	2.620	0.0037	0.733	0.077	0.810	Ba
Beryllium	< 0.050	0.000	0.000	< 0.023	0.0000	0.000	0.000	0.000	Be
Cadmium	< 0.100	0.000	0.000	0.298	0.0000	0.000	0.000	0.000	Cd
Chromium	4.110	0.000	1.030	0.333	0.0016	0.312	0.000	0.312	Cr
Cobalt	< 0.125	0.000	0.000	< 0.058	0.0008	0.156	0.000	0.156	Co
Copper	3.740	0.000	0.000	1.310	0.0000	0.000	0.000	0.000	Cu
Lead	< 1.250	0.000	0.000	< 0.575	0.0000	0.000	0.000	0.000	Pb
Manganese	15.500	0.000	0.741	3.260	0.0038	0.757	0.000	0.757	Mn
Nickel	12.400	0.000	3.960	0.946	0.0000	0.000	0.000	0.000	Ni
Phosphorus	18.200	0.000	17.000	< 2.300	0.0000	0.000	0.000	0.000	P
Selenium	< 3.750	0.000	0.000	< 1.720	0.0000	0.000	0.000	0.000	Se
Silver	< 0.500	0.000	0.000	< 0.230	0.0000	0.000	0.000	0.000	Ag
Thallium	< 2.500	0.000	0.000	< 1.150	0.0000	0.000	0.000	0.000	Tl
Vanadium	< 0.250	0.000	0.000	< 0.115	0.0000	0.000	0.000	0.000	V
Zinc	7.350	0.000	1.520	3.690	0.0021	0.423	0.000	0.423	Zn

Lab ID:	23-S704	23-S730	23-S729	23-S705	23-S731	N/A	N/A
Content:	0.1N HNO ₃ FH Filter & Probe Rinse 100ml 0.1N HNO ₃ Rinse	0.1N HNO ₃	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	5% HNO ₃ /10% H ₂ O ₂	5% HNO ₃ /10% H ₂ O ₂	0.1N HNO ₃

Blank Rules: < indicates value is below the method detection limit (MDL).
If blank is '<' it is treated as zero.
If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Main Foundry BH Outlet - Steel Alloy
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 2
Test Date: 3/28/2023
Page: 2 of 3

	X Allowable FH Blank Correction	XI Total FH Blank Correction	XII 5% of FH Sample	XIII Lessor of XI or XII	XIV Greater of A or XIII	XV FH Net Sample	
Analyte	µg	µg	µg	µg	µg	µg	
Aluminum	11.630	58.800	4.390	4.390	11.63	76.170	Al
Antimony	2.860	2.860	0.162	0.162	11.63	0.380	Sb
Arsenic	0.000	0.000	0.102	0.000	11.63	2.040	As
Barium	1.477	1.477	0.307	0.307	11.63	4.663	Ba
Beryllium	0.000	0.000 <	0.003	0.000	11.63 <	0.050	Be
Cadmium	0.000	0.000 <	0.005	0.000	11.63 <	0.100	Cd
Chromium	1.030	1.030	0.206	0.206	11.63	3.080	Cr
Cobalt	0.000	0.000 <	0.006	0.000	11.63 <	0.125	Co
Copper	0.000	0.000	0.187	0.000	11.63	3.740	Cu
Lead	0.000	0.000 <	0.063	0.000	11.63 <	1.250	Pb
Manganese	0.741	0.741	0.775	0.741	11.63	14.759	Mn
Nickel	3.960	3.960	0.620	0.620	11.63	8.440	Ni
Phosphorus	11.630	17.000	0.910	0.910	11.63	6.570	P
Selenium	0.000	0.000 <	0.188	0.000	11.63 <	3.750	Se
Silver	0.000	0.000 <	0.025	0.000	11.63 <	0.500	Ag
Thallium	0.000	0.000 <	0.125	0.000	11.63 <	2.500	Tl
Vanadium	0.000	0.000 <	0.013	0.000	11.63 <	0.250	V
Zinc	1.520	1.520	0.368	0.368	11.63	5.830	Zn

Note: Allowable FH Blank (A) = (area of filter)*(1.4 µg/in²) = 11.63 µg
where area of filter = 8.306 in²

If A > blank > 0, use blank-derived value.

If blank > A, use greater of A or [lessor of 5% of sample µg or FH blank].

Blank Rules: < indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Main Foundry BH Outlet - Steel Alloy
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 2
Test Date: 3/28/2023
Page: 3 of 3

	XVI Allowable BH Blank Correction	XVII Total BH Blank Correction	XVIII 5% of BH Sample	XIX Lessor of XVII or XVIII	XX Greater of 1 µg or XIX	XXI BH Net Sample	XXII FH Net Sample	XXIII FH+BH Total Net Sample				
Analyte	µg	µg	µg	µg	µg	µg	µg	µg	µg			
Aluminum	1.000	16.633	1.000	1.000	1.000	19.000	76.170	95.170	Al			
Antimony	0.000	0.000	<	0.029	0.000	1.000	<	0.575	0.380	<	0.955	Sb
Arsenic	0.000	0.000	<	0.040	0.000	1.000	<	0.805	2.040	<	2.845	As
Barium	0.810	0.810		0.131	0.131	1.000		1.810	4.663		6.473	Ba
Beryllium	0.000	0.000	<	0.001	0.000	1.000	<	0.023	0.050	<	0.073	Be
Cadmium	0.000	0.000		0.015	0.000	1.000	<	0.298	0.100	<	0.398	Cd
Chromium	0.312	0.312		0.017	0.017	1.000		0.021	3.080		3.101	Cr
Cobalt	0.156	0.156	<	0.003	0.156	1.000	<	0.000	0.125	<	0.125	Co
Copper	0.000	0.000		0.066	0.000	1.000		1.310	3.740		5.050	Cu
Lead	0.000	0.000	<	0.029	0.000	1.000	<	0.575	1.250	<	1.825	Pb
Manganese	0.757	0.757		0.163	0.163	1.000		2.503	14.759		17.262	Mn
Nickel	0.000	0.000		0.047	0.000	1.000		0.946	8.440		9.386	Ni
Phosphorus	0.000	0.000	<	0.115	0.000	1.000	<	2.300	6.570	<	8.870	P
Selenium	0.000	0.000	<	0.086	0.000	1.000	<	1.720	3.750	<	5.470	Se
Silver	0.000	0.000	<	0.012	0.000	1.000	<	0.230	0.500	<	0.730	Ag
Thallium	0.000	0.000	<	0.058	0.000	1.000	<	1.150	2.500	<	3.650	Tl
Vanadium	0.000	0.000	<	0.006	0.000	1.000	<	0.115	0.250	<	0.365	V
Zinc	0.423	0.423		0.185	0.185	1.000		3.267	5.830		9.097	Zn

Note: Allowable BH Blank rules:

If 1.00 µg > blank > 0, use blank-derived value.

If blank > 1.00 µg, use greater of 1.00 µg or [lessor of 5% of sample µg or BH blank].

Blank Rules: '<' indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Main Foundry BH Outlet - Steel Alloy
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 3
Test Date: 3/29/2023
Page: 1 of 3

	I Sample FH Rinse+Filter µg	II Blank Correction FH Rinse µg	III Blank Correction Filter µg	IV Sample BH Cap.Soln. + BH Rinse µg	V Blank BH Cap.Soln. µg/ml	VI Blank Correction BH Cap.Soln. µg	VII Blank Correction BH Rinse µg	VIII Total BH Blank Correction µg	
Analyte	<								
Aluminum	84.500	0.000	58.800	18.500	0.0832	16.633	0.000	16.633	Al
Antimony	3.160	0.000	2.860	< 0.575	0.0000	0.000	0.000	0.000	Sb
Arsenic	2.510	0.000	0.000	< 0.805	0.0000	0.000	0.000	0.000	As
Barium	7.060	0.077	1.400	1.830	0.0037	0.733	0.077	0.810	Ba
Beryllium	< 0.050	0.000	0.000	< 0.023	0.0000	0.000	0.000	0.000	Be
Cadmium	< 0.100	0.000	0.000	0.091	0.0000	0.000	0.000	0.000	Cd
Chromium	2.750	0.000	1.030	0.328	0.0016	0.312	0.000	0.312	Cr
Cobalt	< 0.125	0.000	0.000	< 0.058	0.0008	0.156	0.000	0.156	Co
Copper	< 1.250	0.000	0.000	1.220	0.0000	0.000	0.000	0.000	Cu
Lead	< 1.250	0.000	0.000	< 0.575	0.0000	0.000	0.000	0.000	Pb
Manganese	12.500	0.000	0.741	1.500	0.0038	0.757	0.000	0.757	Mn
Nickel	5.350	0.000	3.960	< 0.345	0.0000	0.000	0.000	0.000	Ni
Phosphorus	20.600	0.000	17.000	< 2.300	0.0000	0.000	0.000	0.000	P
Selenium	< 3.750	0.000	0.000	< 1.720	0.0000	0.000	0.000	0.000	Se
Silver	< 0.500	0.000	0.000	< 0.230	0.0000	0.000	0.000	0.000	Ag
Thallium	< 2.500	0.000	0.000	< 1.150	0.0000	0.000	0.000	0.000	Tl
Vanadium	< 0.250	0.000	0.000	< 0.115	0.0000	0.000	0.000	0.000	V
Zinc	8.840	0.000	1.520	1.350	0.0021	0.423	0.000	0.423	Zn

Lab ID:	23-S709	23-S730	23-S729	23-S710	23-S731	N/A	N/A
Content:	0.1N HNO ₃ FH Filter & Probe Rinse 100ml 0.1N HNO ₃ Rinse	0.1N HNO ₃	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	5% HNO ₃ / 10% H ₂ O ₂	5%HNO ₃ / 10%H ₂ O ₂	0.1NHNO ₃

Blank Rules: < indicates value is below the method detection limit (MDL).
If blank is '<' it is treated as zero.
If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Main Foundry BH Outlet - Steel Alloy
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 3
Test Date: 3/29/2023
Page: 2 of 3

Analyte	X Allowable FH Blank Correction µg	XI Total FH Blank Correction µg	XII 5% of FH Sample µg	XIII Lessor of XI or XII µg	XIV Greater of A or XIII µg	XV FH Net Sample µg	
Aluminum	11.630	58.800	4.225	4.225	11.63	72.870	Al
Antimony	2.860	2.860	0.158	0.158	11.63	0.300	Sb
Arsenic	0.000	0.000	0.126	0.000	11.63	2.510	As
Barium	1.477	1.477	0.353	0.353	11.63	5.583	Ba
Beryllium	0.000	0.000	0.003	0.000	11.63	0.050	Be
Cadmium	0.000	0.000	0.005	0.000	11.63	0.100	Cd
Chromium	1.030	1.030	0.138	0.138	11.63	1.720	Cr
Cobalt	0.000	0.000	0.006	0.000	11.63	0.125	Co
Copper	0.000	0.000	0.063	0.000	11.63	1.250	Cu
Lead	0.000	0.000	0.063	0.000	11.63	1.250	Pb
Manganese	0.741	0.741	0.625	0.625	11.63	11.759	Mn
Nickel	3.960	3.960	0.268	0.268	11.63	1.390	Ni
Phosphorus	11.630	17.000	1.030	1.030	11.63	8.970	P
Selenium	0.000	0.000	0.188	0.000	11.63	3.750	Se
Silver	0.000	0.000	0.025	0.000	11.63	0.500	Ag
Thallium	0.000	0.000	0.125	0.000	11.63	2.500	Tl
Vanadium	0.000	0.000	0.013	0.000	11.63	0.250	V
Zinc	1.520	1.520	0.442	0.442	11.63	7.320	Zn

Note: Allowable FH Blank (A) = (area of filter)*(1.4 µg/in²) = 11.63 µg
where area of filter = 8.306 in²

If A > blank > 0, use blank-derived value.

If blank > A, use greater of A or [lessor of 5% of sample µg or FH blank].

Blank Rules: <' indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Main Foundry BH Outlet - Steel Alloy
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 3
Test Date: 3/29/2023
Page: 3 of 3

	XVI Allowable BH Blank Correction	XVII Total BH Blank Correction	XVIII 5% of BH Sample	XIX Lessor of XVII or XVIII	XX Greater of 1 µg or XIX	XXI BH Net Sample	XXII FH Net Sample	XXIII FH+BH Total Net Sample					
Analyte	µg	µg	µg	µg	µg	µg	µg	µg	µg				
Aluminum	1.000	16.633	0.925	0.925	1.000	17.500	72.870	90.370	Al				
Antimony	0.000	0.000	<	0.029	0.000	1.000	<	0.575	0.300	<	0.875	Sb	
Arsenic	0.000	0.000	<	0.040	0.000	1.000	<	0.805	2.510	<	3.315	As	
Barium	0.810	0.810	0.092	0.092	1.000	1.020	5.583	6.603	Ba				
Beryllium	0.000	0.000	<	0.001	0.000	1.000	<	0.023	0.050	<	0.073	Be	
Cadmium	0.000	0.000	0.005	0.000	1.000	0.091	<	0.100	<	0.191	Cd		
Chromium	0.312	0.312	0.016	0.016	1.000	0.016	1.720	1.736	Cr				
Cobalt	0.156	0.156	<	0.003	0.156	1.000	0.000	<	0.125	<	0.125	Co	
Copper	0.000	0.000	0.061	0.000	1.000	1.220	<	1.250	<	2.470	Cu		
Lead	0.000	0.000	<	0.029	0.000	1.000	<	0.575	<	1.250	<	1.825	Pb
Manganese	0.757	0.757	0.075	0.075	1.000	0.743	11.759	12.502	Mn				
Nickel	0.000	0.000	<	0.017	0.000	1.000	<	0.345	1.390	<	1.735	Ni	
Phosphorus	0.000	0.000	<	0.115	0.000	1.000	<	2.300	8.970	<	11.270	P	
Selenium	0.000	0.000	<	0.086	0.000	1.000	<	1.720	<	3.750	<	5.470	Se
Silver	0.000	0.000	<	0.012	0.000	1.000	<	0.230	<	0.500	<	0.730	Ag
Thallium	0.000	0.000	<	0.058	0.000	1.000	<	1.150	<	2.500	<	3.650	Tl
Vanadium	0.000	0.000	<	0.006	0.000	1.000	<	0.115	<	0.250	<	0.365	V
Zinc	0.423	0.423	0.068	0.068	1.000	0.927	7.320	8.247	Zn				

Note: Allowable BH Blank rules:

If 1.00 µg > blank > 0 , use blank-derived value.

If blank > 1.00 µg, use greater of 1.00 µg or [lessor of 5% of sample µg or BH blank].

Blank Rules: '<' indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Main Foundry BH Outlet - Steel Alloy
Mercury Blank Correction Calculations

Blank Lab Values

Analyte	Filter Cont. 12 µg/filter		BH Imps. 2&3 Cap.Soln. Cont. 9 5% HNO ₃ / 10% H ₂ O ₂ µg/sample		FH/BH Rinse Cont. 8A 0.1 N HNO ₃ µg/sample		BH Imps. 5&6 Rinse Cont. 8B H ₂ O µg/sample		BH Imps. 5&6 Cap.Soln. + Rinse Cont. 10 KMnO ₄ µg/sample		BH Imps. 5&6 Rinse Cont. 11 HCl µg/sample	
	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Result	MDL
Mercury	0.0406	0.0219	0.118	0.0172	MDL	0.0219	MDL	0.0295	0.0628	0.0163	MDL	0.0108

Lab ID: 23-S729 23-S731 23-S730 23-S732 23-S733 23-S734
Blank vol, ml: NA 196 250 337 186 124

Blank Correction Values

Analyte: Mercury	Blank FH HNO ₃ Rinse µg	Blank Filter µg	Blank BH Cap.Soln. µg	Blank BH HNO ₃ Rinse µg	Blank BH H ₂ O Rinse µg	Blank BH KMnO ₄ Cap.Soln. + Rinse µg	Blank BH HCl Rinse µg	Total Blank Correction µg	Is Total Blank Correction ≥ 0 and ≤ 0.6?
Run 1	0.00	0.0406	0.12	0.00	0.00	0.10	0.00	0.2623	Yes
Reagent vol, ml	100.0		200.0	200.0	100.0	300.0	225.0		
Run 2	0.00	0.0406	0.12	0.00	0.00	0.10	0.00	0.2623	Yes
Reagent vol, ml	100.0		200.0	200.0	100.0	300.0	225.0		
Run 3	0.00	0.0406	0.12	0.00	0.00	0.10	0.00	0.2623	Yes
Reagent vol, ml	100.0		200.0	200.0	100.0	300.0	225.0		

Notes: 0.1N HNO₃ FH Filter 5% HNO₃/ 10% H₂O₂ 0.1N HNO₃ H₂O 4% KMnO₄/ 10% H₂SO₄ 25 ml 8N HCl/
FH Probe Rinse BH Imps 2&3 BH Imps 1-4 BH Imps 5&6 BH Imps 5&6 BH Imps 5&6

Blank Corrected Results

Analyte: Mercury	Sample FH Rinse + Filter Cont. 1&3 µg	Sample BH Cap.Soln. + HNO ₃ Rinse Cont. 4 µg	Sample BH Imp. 4 + Rinse Cont. 5A µg	Sample BH Imps. 5&6 + Rinses Cont. 5B µg	Sample BH HCl Rinse + Water Cont. 5C µg	Total Sample µg	Total Blank Correction µg	Total Net Sample µg
Run 1	< 0.0219	0.183	< 0.00910	0.215	< 0.0203	< 0.4493	0.2623	< 0.1870
Lab ID	23-S699	23-S700	23-S701	23-S702	23-S703			
Run 2	< 0.0219	0.244	< 0.00827	0.231	< 0.0201	< 0.5253	0.2623	< 0.2630
Lab ID	23-S704	23-S705	23-S706	23-S707	23-S708			
Run 3	< 0.0219	0.183	< 0.00838	0.223	< 0.0196	< 0.4559	0.2623	< 0.1936
Lab ID	23-S709	23-S710	23-S711	23-S712	23-S713			

Blank Rules: < indicates value is below the method detection limit (MDL)
If blank is '<' it is treated as zero.
If sample is '<' it is used for emission rate calculations but results are preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.
If the total blank correction value is less than or equal to 0.6 µg, subtract the total blank correction value from the total sample value to determine total net Hg. Otherwise, the value used for the blank correction shall be the greater of (1) 0.6 µg or (2) the lesser of [total FH blank + total BH blank] or 5% of the total sample value

EPA Method 29
Gas Stream Characteristics
Test Summary

Client: Eagle Foundry Company
Source: Main Foundry BH Outlet - Steel Alloy
Location: Eagle Creek, OR

Parameter	Units	Run 1	Run 2	Run 3	
Date		3/27/2023	3/28/2023	3/29/2023	
Run Start Time		13:00	10:30	10:35	
Run End Time		17:10	14:40	14:45	
Duration	minutes	250	250	250	Average
Barometric Pressure	inHg	29.79	29.38	29.45	29.54
Nozzle Diameter	inches	0.263	0.263	0.263	0.263
Isokinetic Average	%	99.9	100.2	100.8	100.3
Sample Volume	dscf	254.576	256.756	250.481	253.938
Sample Volume	dscm	7.209	7.271	7.093	7.191
Stack Diameter	inches	61.00	61.00	61.00	61.00
Stack Area	ft ²	20.295	20.295	20.295	20.295
CO ₂	%vd	0.26	0.08	0.08	0.14
O ₂	%vd	20.99	20.93	20.98	20.97
Static Pressure	inH ₂ O	0.10	0.10	0.10	0.10
H ₂ O	%v	0.40	0.90	0.79	0.70
Wet Molecular Weight	lb/lb-mole	28.84	28.75	28.76	28.78
Velocity	fps	44.95	45.63	44.25	44.94
Flow Rate	adcfm	54,517	55,064	53,457	54,346
	acfm	54,736	55,564	53,883	54,728
	dscfm	54,854	55,159	53,482	54,498
Stack Temperature	°F	62.6	57.7	59.6	60.0
Production Data	lb melt/pour	12,201.579	12,201.119	12,077.535	
	ton melt/pour	6.101	6.101	6.039	
	lb Cr/melt	209.764	201.394	201.494	
	ton Cr/melt	0.105	0.101	0.101	
	lb Mn/melt	834.059	834.082	822.739	
	ton Mn/melt	0.417	0.417	0.411	
	lb Ni/melt	74.327	70.459	69.572	
	ton Ni/melt	0.037	0.035	0.035	

Run 1										
Analyte	Total				FH Net			BH Net		
	µg	µg/dscm	lb/hr	lb/ton melt	µg	µg/dscm	lb/hr	µg	µg/dscm	lb/hr
Aluminum	106.750	14.808	3.04E-03	2.08E-03	87.370	12.120	2.49E-03	19.380	2.688	5.52E-04
Antimony	< 0.650	< 0.090	< 1.85E-05	< 1.27E-05	0.050	0.007	1.43E-06	< 0.600	< 0.083	< 1.71E-05
Arsenic	< 3.130	< 0.434	< 8.92E-05	< 6.09E-05	2.290	0.318	6.53E-05	< 0.840	< 0.117	< 2.39E-05
Barium	6.833	0.948	1.95E-04	1.33E-04	5.273	0.731	1.50E-04	1.560	0.216	4.45E-05
Beryllium	< 0.074	< 0.010	< 2.11E-06	< 1.44E-06	< 0.050	< 0.007	< 1.43E-06	< 0.024	< 0.003	< 6.84E-07
Cadmium	< 0.614	< 0.085	< 1.75E-05	< 1.20E-05	< 0.100	< 0.014	< 2.85E-06	0.514	0.071	1.47E-05
Chromium	4.109	0.570	1.17E-04		3.940	0.547	1.12E-04	0.169	0.023	4.82E-06
Cobalt	< 0.125	< 0.017	< 3.56E-06	< 2.43E-06	< 0.125	< 0.017	< 3.56E-06	0.000	0.000	0.00E+00
Copper	< 4.780	< 0.663	< 1.36E-04	< 9.30E-05	4.180	0.580	1.19E-04	< 0.600	< 0.083	< 1.71E-05
Lead	< 1.850	< 0.257	< 5.27E-05	< 3.60E-05	< 1.250	< 0.173	< 3.56E-05	< 0.600	< 0.083	< 1.71E-05
Manganese	13.632	1.891	3.89E-04		12.659	1.756	3.61E-04	0.973	0.135	2.77E-05
Mercury	< 0.187	< 0.026	< 5.33E-06	< 3.64E-06						
Nickel	< 6.800	< 0.943	< 1.94E-04		6.440	0.893	1.84E-04	< 0.360	< 0.050	< 1.03E-05
Phosphorus	< 12.870	< 1.785	< 3.67E-04	< 2.51E-04	10.470	1.452	2.98E-04	< 2.400	< 0.333	< 6.84E-05
Selenium	< 5.550	< 0.770	< 1.58E-04	< 1.08E-04	< 3.750	< 0.520	< 1.07E-04	< 1.800	< 0.250	< 5.13E-05
Silver	< 0.848	< 0.118	< 2.42E-05	< 1.65E-05	0.608	0.084	1.73E-05	< 0.240	< 0.033	< 6.84E-06
Thallium	< 3.700	< 0.513	< 1.05E-04	< 7.20E-05	< 2.500	< 0.347	< 7.13E-05	< 1.200	< 0.166	< 3.42E-05
Vanadium	< 0.370	< 0.051	< 1.05E-05	< 7.20E-06	< 0.250	< 0.035	< 7.13E-06	< 0.120	< 0.017	< 3.42E-06
Zinc	16.147	2.240	4.60E-04	3.14E-04	10.480	1.454	2.99E-04	5.667	0.786	1.62E-04

Chromium	lb Cr / ton Cr in melt =	4.65E-03	Run 1 Emission Factors
Manganese	lb Mn / ton Mn in melt =	3.88E-03	
Nickel	lb Ni / ton Ni in melt =	< 2.17E-02	

Run 2										
Analyte	Total				FH Net			BH Net		
	µg	µg/dscm	lb/hr	lb/ton melt	µg	µg/dscm	lb/hr	µg	µg/dscm	lb/hr
Aluminum	95.170	13.089	2.70E-03	1.85E-03	76.170	10.476	2.16E-03	19.000	2.613	5.40E-04
Antimony	< 0.955	< 0.131	< 2.71E-05	< 1.85E-05	0.380	0.052	1.08E-05	< 0.575	< 0.079	< 1.63E-05
Arsenic	< 2.845	< 0.391	< 8.08E-05	< 5.52E-05	2.040	0.281	5.80E-05	< 0.805	< 0.111	< 2.29E-05
Barium	6.473	0.890	1.84E-04	1.26E-04	4.663	0.641	1.32E-04	1.810	0.249	5.14E-05
Beryllium	< 0.073	< 0.010	< 2.07E-06	< 1.42E-06	< 0.050	< 0.007	< 1.42E-06	< 0.023	< 0.003	< 6.54E-07
Cadmium	< 0.398	< 0.055	< 1.13E-05	< 7.72E-06	< 0.100	< 0.014	< 2.84E-06	0.298	0.041	8.47E-06
Chromium	3.101	0.426	8.81E-05		3.080	0.424	8.75E-05	0.021	0.003	5.97E-07
Cobalt	< 0.125	< 0.017	< 3.55E-06	< 2.43E-06	< 0.125	< 0.017	< 3.55E-06	0.000	0.000	0.00E+00
Copper	5.050	0.695	1.43E-04	9.80E-05	3.740	0.514	1.06E-04	1.310	0.180	3.72E-05
Lead	< 1.825	< 0.251	< 5.19E-05	< 3.54E-05	< 1.250	< 0.172	< 3.55E-05	< 0.575	< 0.079	< 1.63E-05
Manganese	17.262	2.374	4.91E-04		14.759	2.030	4.19E-04	2.503	0.344	7.11E-05
Mercury	< 0.263	< 0.036	< 7.47E-06	< 5.10E-06						
Nickel	9.386	1.291	2.67E-04		8.440	1.161	2.40E-04	0.946	0.130	2.69E-05
Phosphorus	< 8.870	< 1.220	< 2.52E-04	< 1.72E-04	6.570	0.904	1.87E-04	< 2.300	< 0.316	< 6.54E-05
Selenium	< 5.470	< 0.752	< 1.55E-04	< 1.06E-04	< 3.750	< 0.516	< 1.07E-04	< 1.720	< 0.237	< 4.89E-05
Silver	< 0.730	< 0.100	< 2.07E-05	< 1.42E-05	< 0.500	< 0.069	< 1.42E-05	< 0.230	< 0.032	< 6.54E-06
Thallium	< 3.650	< 0.502	< 1.04E-04	< 7.08E-05	< 2.500	< 0.344	< 7.10E-05	< 1.150	< 0.158	< 3.27E-05
Vanadium	< 0.365	< 0.050	< 1.04E-05	< 7.08E-06	< 0.250	< 0.034	< 7.10E-06	< 0.115	< 0.016	< 3.27E-06
Zinc	9.097	1.251	2.58E-04	1.77E-04	5.830	0.802	1.66E-04	3.267	0.449	9.28E-05

Chromium	lb Cr / ton Cr in melt =	3.65E-03	Run 2 Emission Factors
Manganese	lb Mn / ton Mn in melt =	4.90E-03	
Nickel	lb Ni / ton Ni in melt =	3.15E-02	

Note: Results for Hg front half and back half fractions are not shown because these values are not blank-corrected. Per EPA Method 29, only the sum of Hg front and back half results is subject to blank correction.

'<' denotes results which were calculated using the method detection limit for front half or back half results that were non-detect.

Run 3										
Analyte	Total				FH Net			BH Net		
	µg	µg/dscm	lb/hr	lb/ton melt	µg	µg/dscm	lb/hr	µg	µg/dscm	lb/hr
Aluminum	90.370	12.741	2.55E-03	1.76E-03	72.870	10.274	2.06E-03	17.500	2.467	4.94E-04
Antimony	< 0.875	< 0.123	< 2.47E-05	< 1.71E-05	0.300	0.042	8.47E-06	< 0.575	< 0.081	< 1.62E-05
Arsenic	< 3.315	< 0.467	< 9.36E-05	< 6.46E-05	2.510	0.354	7.09E-05	< 0.805	< 0.113	< 2.27E-05
Barium	6.603	0.931	1.86E-04	1.29E-04	5.583	0.787	1.58E-04	1.020	0.144	2.88E-05
Beryllium	< 0.073	< 0.010	< 2.06E-06	< 1.42E-06	< 0.050	< 0.007	< 1.41E-06	< 0.023	< 0.003	< 6.50E-07
Cadmium	< 0.191	< 0.027	< 5.39E-06	< 3.72E-06	< 0.100	< 0.014	< 2.82E-06	0.091	0.013	2.57E-06
Chromium	1.736	0.245	4.90E-05		1.720	0.242	4.86E-05	0.016	0.002	4.52E-07
Cobalt	< 0.125	< 0.018	< 3.53E-06	< 2.44E-06	< 0.125	< 0.018	< 3.53E-06	0.000	0.000	0.00E+00
Copper	< 2.470	< 0.348	< 6.98E-05	< 4.81E-05	< 1.250	< 0.176	< 3.53E-05	1.220	0.172	3.45E-05
Lead	< 1.825	< 0.257	< 5.15E-05	< 3.56E-05	< 1.250	< 0.176	< 3.53E-05	< 0.575	< 0.081	< 1.62E-05
Manganese	12.502	1.763	3.53E-04		11.759	1.658	3.32E-04	0.743	0.105	2.10E-05
Mercury	< 0.194	< 0.027	< 5.47E-06	< 3.77E-06						
Nickel	< 1.735	< 0.245	< 4.90E-05		1.390	0.196	3.93E-05	< 0.345	< 0.049	< 9.74E-06
Phosphorus	< 11.270	< 1.589	< 3.18E-04	< 2.20E-04	8.970	1.265	2.53E-04	< 2.300	< 0.324	< 6.50E-05
Selenium	< 5.470	< 0.771	< 1.54E-04	< 1.07E-04	< 3.750	< 0.529	< 1.06E-04	< 1.720	< 0.242	< 4.86E-05
Silver	< 0.730	< 0.103	< 2.06E-05	< 1.42E-05	< 0.500	< 0.070	< 1.41E-05	< 0.230	< 0.032	< 6.50E-06
Thallium	< 3.650	< 0.515	< 1.03E-04	< 7.11E-05	< 2.500	< 0.352	< 7.06E-05	< 1.150	< 0.162	< 3.25E-05
Vanadium	< 0.365	< 0.051	< 1.03E-05	< 7.11E-06	< 0.250	< 0.035	< 7.06E-06	< 0.115	< 0.016	< 3.25E-06
Zinc	8.247	1.163	2.33E-04	1.61E-04	7.320	1.032	2.07E-04	0.927	0.131	2.62E-05

Chromium	lb Cr / ton Cr in melt =	2.03E-03	Run 3 Emission Factors
Manganese	lb Mn / ton Mn in melt =	3.58E-03	
Nickel	lb Ni / ton Ni in melt =	< 5.87E-03	

Mean Runs 1-3										
Analyte	Total				FH Net			BH Net		
	µg	µg/dscm	lb/hr**	lb/ton melt	µg	µg/dscm	lb/hr	µg	µg/dscm	lb/hr
Aluminum	97.430	13.546	2.77E-03	1.90E-03	78.803	10.956	2.24E-03	18.627	2.590	5.29E-04
Antimony	< 0.827	< 0.115	< 2.35E-05	< 1.61E-05	0.243	0.034	6.90E-06	< 0.583	< 0.081	< 1.66E-05
Arsenic	< 3.097	< 0.431	< 8.79E-05	< 6.02E-05	2.280	0.317	6.47E-05	< 0.817	< 0.114	< 2.32E-05
Barium	6.636	0.923	1.88E-04	1.29E-04	5.173	0.720	1.47E-04	1.463	0.203	4.16E-05
Beryllium	< 0.073	< 0.010	< 2.08E-06	< 1.43E-06	< 0.050	< 0.007	< 1.42E-06	< 0.023	< 0.003	< 6.63E-07
Cadmium	< 0.401	< 0.056	< 1.14E-05	< 7.80E-06	< 0.100	< 0.014	< 2.84E-06	0.301	0.042	8.56E-06
Chromium	2.982	0.414	8.48E-05		2.913	0.404	8.28E-05	0.069	0.010	1.96E-06
Cobalt	< 0.125	< 0.017	< 3.55E-06	< 2.43E-06	< 0.125	< 0.017	< 3.55E-06	0.000	0.000	0.00E+00
Copper	< 4.100	< 0.569	< 1.16E-04	< 7.97E-05	< 3.057	< 0.423	< 8.69E-05	< 1.043	< 0.145	< 2.96E-05
Lead	< 1.833	< 0.255	< 5.20E-05	< 3.57E-05	< 1.250	< 0.174	< 3.55E-05	< 0.583	< 0.081	< 1.66E-05
Manganese	14.465	2.009	4.11E-04		13.059	1.815	3.71E-04	1.406	0.195	3.99E-05
Mercury	< 0.215	< 0.030	< 6.09E-06	< 4.17E-06						
Nickel	< 5.974	< 0.826	< 1.70E-04		5.423	0.750	1.54E-04	< 0.550	< 0.076	< 1.56E-05
Phosphorus	< 11.003	< 1.531	< 3.12E-04	< 2.14E-04	8.670	1.207	2.46E-04	< 2.333	< 0.325	< 6.62E-05
Selenium	< 5.497	< 0.764	< 1.56E-04	< 1.07E-04	< 3.750	< 0.522	< 1.06E-04	< 1.747	< 0.243	< 4.96E-05
Silver	< 0.769	< 0.107	< 2.18E-05	< 1.50E-05	< 0.536	< 0.075	< 1.52E-05	< 0.233	< 0.032	< 6.62E-06
Thallium	< 3.667	< 0.510	< 1.04E-04	< 7.13E-05	< 2.500	< 0.348	< 7.10E-05	< 1.167	< 0.162	< 3.31E-05
Vanadium	< 0.367	< 0.051	< 1.04E-05	< 7.13E-06	< 0.250	< 0.035	< 7.10E-06	< 0.117	< 0.016	< 3.31E-06
Zinc	11.164	1.551	3.17E-04	2.17E-04	7.877	1.096	2.24E-04	3.287	0.455	9.35E-05

Chromium	lb Cr / ton Cr in melt =	3.44E-03	Mean Runs 1-3
Manganese	lb Mn / ton Mn in melt =	4.12E-03	
Nickel	lb Ni / ton Ni in melt =	< 1.97E-02	

Note: Results for Hg front half and back half fractions are not shown because these values are not blank-corrected. Per EPA Method 29, only the sum of Hg front and back half results is subject to blank correction.

'<' denotes results which were calculated using the method detection limit for front half or back half results that were non-detect.

EPA Methods 1-4, 29
Example Calculations

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Main Foundry BH Outlet - Steel Alloy
Method: 29

Run: 1
Start Time: 13:00
End Time: 17:10
Date: 3/27/2023

EPA Methods 1-4:

$$1) \quad P_m = P_b + (\Delta H/13.6) = 30.062 \text{ "Hg}$$

where P_b : 29.79 "Hg
 ΔH : 3.695 "H₂O

$$2) \quad P_s = P_b + (\text{Static Press.}/13.6) = 29.797 \text{ "Hg}$$

where P_b : 29.79 "Hg
 Static Pressure: 0.10 "H₂O

$$3) \quad V_m(\text{std}) = V_m(527.67/29.92)(Y)\left(\frac{P_m}{T_m}\right) = 254.576 \text{ dscf}$$

where V_m : 262.394 dcf
 Y : 1.0057
 P_m : 30.062 "Hg
 T_m : 549.6 °A

$$4) \quad V_{w(\text{std})} = V_{H_2O} \left(\frac{\rho_w \cdot R \cdot T_{\text{std}}}{P_{\text{std}} \cdot M_w} \right) = 1.019 \text{ scf}$$

where H_2O : 21.60 g
 ρ_w : 2.2046E-03 lb/mol
 R : 21.85 "Hg ft³/lb-mol °R
 T_{std} : 527.67 °R
 P_{std} : 29.92 "Hg
 M_w : 18.015 lb/lb-mol

$$5) \quad B_{ws} = \left(\frac{V_{w(\text{std})}}{V_{w(\text{std})} + V_{m(\text{std})}} \right) = 0.0040$$

where $V_{w(\text{std})}$: 1.019 scf
 $V_{m(\text{std})}$: 254.576 dscf

$$6) \quad \% H_2O = B_{ws} \times 100 = 0.40 \%V$$

EPA Methods 1-4, 29
Example Calculations

- 7) $V_m(\text{actual}) = \left(\frac{1}{1 - B_{ws}} \right) \left(\frac{T_s}{T_m} \right) \left(\frac{P_m}{P_s} \right) =$ 254.027 awcf
 where Y: 1.0057
 V_m : 262.3939 dcf
 B_{ws} : 0.0040
 T_s : 522.3 °A
 T_m : 549.6 °A
 P_m : 30.062 "Hg
 P_s : 29.797 "Hg
- 8) $M_d = 0.44(\text{CO}_2) + 0.32(\text{O}_2) + 0.28(\text{N}_2 + \text{CO}) =$ 28.88 lb/lb-mole
 where CO_2 : 0.26 %vd
 O_2 : 20.99 %vd
 $\text{N}_2 + \text{CO} = (100 - (\text{O}_2 + \text{CO}_2))$: 78.75 %vd
- 9) $M_s = M_d(1 - B_{ws}) + (18 \times B_{ws}) =$ 28.84 lb/lb-mole
 where M_d : 28.88 lb/lb-mole
 B_{ws} : 0.0040
- 10) $\text{Stack Area}(\text{cir.}) = \pi (\text{stack diameter}/24)^2 =$ 20.295 sq. ft.
 where Stack ID: 61 inches
- 11) $\text{Velocity, } V_s = 85.49(\text{Cp})(\text{Ave. Sqrt } \Delta P) \left(\sqrt{\frac{T_s}{(P_s \times M_s)}} \right) =$ 44.95 fps
 where Cp: 0.84
 Ave. Sqrt ΔP : 0.803
 T_s : 522.3 °A
 P_s : 29.797 "Hg
 M_s : 28.84 lb/lb-mole
- 12) $\text{acfm} = (V_s)(\text{stack area})(60 \text{ sec/min}) =$ 54,736 acfm
 where V_s : 44.95 ft/sec
 Stack Area: 20.295 sq. ft

EPA Methods 1-4, 29
Example Calculations

$$\begin{aligned}
 13) \text{ adcfm} &= (\text{acfm})(1-B_{ws}) = & 54,517 \text{ adcfm} \\
 &\text{where acfm: } 54,736 \\
 &B_{ws}: 0.0040 \\
 14) Q_{sw} &= 3600(V_s)(\text{stack area}) \left(\frac{527.67^\circ R}{T_s} \right) \left(\frac{P_s}{29.92 \text{ "Hg}} \right) & 3,304,453 \text{ wscf/hr} \\
 &\text{where } V_s: 44.95 \text{ ft/sec} \\
 &\text{Stack Area: } 20.2950 \text{ sq. ft.} \\
 &T_s: 522.3 ^\circ A \\
 &P_s: 29.797 \text{ "Hg} \\
 15) Q_{sd} &= (\text{wscf/hr})(1-B_{ws}) = & 3,291,235 \text{ dscf/hr} \\
 &\text{where wscf/hr: } 3,304,453 \\
 &B_{ws} 0.0040 \\
 16) \text{ dscfm} &= (\text{dscf/hr})/60 \text{ mins/hr} = & 54,854 \text{ dscfm} \\
 &\text{where dscf/hr: } 3,291,235 \\
 17) \text{ Nozzle Area} &= 3.1416 (\text{Nozzle Size}/24)^2 = & 0.000377 \text{ sq. ft.} \\
 &\text{where Nozzle Size: } 0.263 \text{ inches} \\
 18) \text{ Isokinetic \%} &= \left(\frac{0.0945(T_s)(V_{m(std)})}{P_s(V_s)(\text{nozzle area})(\text{sampling time})(1-B_{ws})} \right) = & 99.9 \% \\
 &\text{where } T_s: 522.3 ^\circ A \\
 &V_{m(std)}: 254.576 \text{ dscf} \\
 &P_s: 29.797 \text{ "Hg} \\
 &V_s 44.95 \text{ ft/sec} \\
 &\text{Nozzle Area: } 0.000377 \text{ sq. ft.} \\
 &\text{Sampling Time: } 250 \text{ min.} \\
 &B_{ws}: 0.0040
 \end{aligned}$$

EPA Methods 1-4, 29
Example Calculations

EPA Method 29:
Chromium

19) Cr Laboratory Results (blank corrected)

Front half (FH):	3.940 µg/sample
Back half (BH):	0.169 µg/sample
Total (FH + BH):	4.109 µg/sample

20) $C_s = \mu\text{g}/V_{m(\text{std})} =$

0.570 µg/dscm

where Run 1 Total: 4.109 µg/sample

$V_{m(\text{std})}$: 7.209 dscm

21) Emission Rate = $(C_s) \left(\frac{0.0283168 \text{ m}^3}{f t^3} \right) (\text{stack flow}) \left(\frac{2.2046 \text{E}-9 \text{ lb}}{\mu\text{g}} \right) =$ 1.17E-04 lb/hr

where C_s : 0.570 µg/dscm

Stack Flow: 3,291,235 dscf/hr

22) lb Cr/ton Cr in melt = lb/hr * (run duration [min]/(60 min/hr)/ton Cr = 4.65E-03 lb Cr/ton Cr in melt

where : 1.17E-04 lb/hr

run duration: 250 minutes

ton Cr in melt: 0.105 ton

Hg Blank Correction:

24) Hg Laboratory Results (blank corrected)

FH total + BH total - total blank = 0.187 µg

Where front half (FH): 0.0219 µg

Back half (BH): 0.4274 µg

Total Blank: 0.2623 µg



COMPANY	Eagle Foundry Company
FACILITY	Eagle Foundry
LOCATION	Eagle Creek, OR
SOURCE	Main Foundry BH Outlet - Steel Alloy
DATE	3/27/2023 - 3/29/2023
METHOD	0061
POLLUTANT	Cr VI

Isokinetic Field Data
Field Data Entry

Client:	Eagle Foundry Company	Run:	1
Location:	Eagle Creek, OR	Start Time:	13:00
Source:	Main Foundry BH Outlet - Steel Alloy	End Time:	17:10
EPA Method:	0061	Environmental Conditions/Test Notes:	Date: 3/27/2023
Box Operator:	JMK	40-60°F	
Technician(s):	KAD		

Stack Dimensional Data:		Equipment:	
Circular		Meterbox ID	10
Diameter	61.000 in	Y factor	0.9737
Rectangular		ΔH@	1.72
Width	in	Bp ID	TS1
Length	in	Balance ID	HLNFB1
Stack Area	20.295 sq.ft.	Weights ID	HLNFW1
		Probe ID	B5C
		Nozzle ID	0.256
		Hot box ID	HHB
		Pitot Cp	0.84
		Pitot ID	B5C
		Probe Length, ft	5
		Liner type	glass
		Nozzle size	0.256 inches
		Nozzle area	0.000357 sq.ft.
		Probe heat	250 °F
		Filter heat	NA °F

Source Information:		Leak Checks:	
Barometric Pressure	29.79 "Hg	Pre-test	Post-test
Static Pressure	0.1 "H ₂ O	Pitot	x
Ave. ΔP	0.6 "H ₂ O	Leak rate, dcf	0.001
Stack Temperature	65 °F	Leak check vacuum, "Hg	15
Assumed moisture	0.50 %		
Assumed meter temp.	75 °F		
Total number of points	20		
Time per point	12.5 min.		
Total run time	250 min.		

Post Test Calculations:		Moisture/Lab:	
Sample volume	255.764 dcf	Filter, #	NA
Wet mol. weight	28.81 M _s (actual)	Initial	Final
Actual H ₂ O	0.27 %	Impingers, g	1,739.4
Std. meter vol.	241.418 dscf	Silica gel, g	900.5
Isokinetic Average	101.4 %	Total water gain, g:	14.0

Traverse Point	Time (min.)	Meter Volume (dcf)	Velocity ΔP ("H ₂ O)	Stack Temp. (°F)	Meter Temp. (°F)	Calc. ΔH	Run ΔH	Vacuum ("Hg)	Filter Box (°F)	Condenser Temp (≤68°F)
1	12.5	607.710	0.84	66	71	3.80	3.80	11	NA	48
2	25.0	621.920	0.83	66	72	3.76	3.80	11	NA	59
3	37.5	635.620	0.75	66	73	3.41	3.40	10.5	NA	58
4	50.0	647.980	0.62	67	75	2.82	2.80	9.5	NA	58
5	62.5	660.840	0.63	68	79	2.88	2.80	9.5	NA	62
6	75.0	673.980	0.65	69	82	2.99	3.00	10	NA	62
7	87.5	686.460	0.62	71	84	2.85	2.80	9	NA	62
8	100.0	699.540	0.63	70	85	2.90	2.90	9	NA	61
9	112.5	712.200	0.61	72	89	2.82	2.80	8.5	NA	61
10	125.0	724.850	0.62	70	90	2.88	2.90	9	NA	58
11	137.5	737.200	0.57	70	90	2.65	2.60	8.5	NA	58
12	150.0	749.870	0.60	70	91	2.80	2.80	9	NA	56
13	162.5	762.270	0.59	72	92	2.74	2.70	8	NA	55
14	175.0	774.610	0.59	71	92	2.75	2.70	8	NA	54
15	187.5	787.110	0.60	71	93	2.80	2.80	8	NA	53
16	200.0	799.320	0.57	73	93	2.65	2.60	8	NA	53
17	212.5	811.780	0.57	73	93	2.65	2.70	8	NA	53
18	225.0	823.940	0.59	69	93	2.77	2.80	8	NA	52
19	237.5	836.320	0.59	69	93	2.77	2.80	8.5	NA	52
20	250.0	849.174	0.63	69	93	2.95	2.90	9	NA	50

Isokinetic Field Data
Field Data Entry

Client:	Eagle Foundry Company	Run:	2
Location:	Eagle Creek, OR	Start Time:	10:30
Source:	Main Foundry BH Outlet - Steel Alloy	End Time:	14:40
EPA Method:	0061	Environmental Conditions/Test Notes:	Date: 3/28/2023
Box Operator:	JMK	40-60°F	
Technician(s):	KAD		

Stack Dimensional Data:		Equipment:					
Circular		Meterbox ID	10	Probe ID	B5C	Liner type	glass
Diameter	61.000 in	Y factor	0.9737	Nozzle ID	0.256	Nozzle size	0.256 inches
Rectangular		ΔH@	1.72	Hot box ID	HHB	Nozzle area	0.000357 sq.ft.
Width	in	Bp ID	TS1	Pitot Cp	0.84	Probe heat	250 °F
Length	in	Balance ID	HLNFB1	Pitot ID	B5C	Filter heat NA	°F
Stack Area	20.295 sq.ft.	Weights ID	HLNFW1	Probe Length, ft	5		

Source Information:				Leak Checks:		
Barometric Pressure	29.38 "Hg	O ₂	20.90 %		Pre-test	Post-test
Static Pressure	0.1 "H ₂ O	CO ₂	0.00 %	Pitot	x	x
Ave. ΔP	0.6 "H ₂ O	Rec. Nz.	0.225 inches	Leak rate, dcf	0.000	0.000
Stack Temperature	65 °F			Leak check vacuum, "Hg	16	17
Assumed moisture	0.27 %			Nozzle check for roundness:		
Assumed meter temp.	86.2 °F			1	2	3
Total number of points	20			0.256	0.256	0.256 inches
Time per point	12.5 min.			Caliper ID	WS-2	
Total run time	250 min.					

Post Test Calculations:				Moisture/Lab:			
Sample volume	260.788 dcf	Ave. ΔP	0.652 "H ₂ O	Filter, #	NA		
Wet mol. weight	28.76 M _s (actual)	Ave. √ΔP	0.807 "H ₂ O		Initial	Final	Gain
Actual H ₂ O	0.76 %	Ave. ΔH	3.04 "H ₂ O	Impingers, g	1,744.7	1,724.0	-20.7
Std. meter vol.	241.940 dscf	Ave. T _s	64.7 °F	Silica gel, g	933.6	993.7	60.1
Isokinetic Average	100.9 %	Ave. T _m	88.3 °F		Total water gain:		39.4

Traversal Point	Time (min.)	Meter Volume (dcf)	Velocity ΔP ("H ₂ O)	Stack Temp. (°F)	Meter Temp. (°F)	Calc. ΔH	Run ΔH	Vacuum ("Hg)	Filter Box (°F)	Condenser Temp (≤68°F)
1	12.5	107.610	0.72	60	74	3.33	3.30	8	NA	44
2	25.0	121.250	0.74	60	74	3.42	3.40	8	NA	46
3	37.5	134.710	0.72	60	74	3.33	3.30	8	NA	49
4	50.0	147.550	0.65	62	79	3.02	3.00	7	NA	49
5	62.5	160.010	0.61	62	79	2.83	2.80	6.5	NA	49
6	75.0	172.340	0.59	63	82	2.75	2.70	6	NA	50
7	87.5	185.210	0.63	64	87	2.96	2.90	7	NA	51
8	100.0	198.370	0.67	64	89	3.16	3.10	7	NA	52
9	112.5	211.710	0.68	64	91	3.22	3.20	7	NA	53
10	125.0	225.110	0.69	64	92	3.27	3.20	7	NA	53
11	137.5	238.320	0.65	65	93	3.08	3.10	7	NA	53
12	150.0	251.090	0.60	65	94	2.85	2.80	6.5	NA	54
13	162.5	263.650	0.59	65	95	2.81	2.80	6.5	NA	54
14	175.0	276.490	0.62	67	95	2.94	2.90	6.5	NA	55
15	187.5	289.190	0.61	67	95	2.89	2.90	6.5	NA	56
16	200.0	302.490	0.66	69	96	3.12	3.10	7	NA	56
17	212.5	316.120	0.70	69	96	3.31	3.30	7.5	NA	56
18	225.0	328.740	0.61	68	95	2.89	2.90	6.5	NA	56
19	237.5	341.690	0.65	67	95	3.08	3.10	7.5	NA	56
20	250.0	354.872	0.64	68	90	3.00	3.00	7	NA	56

Isokinetic Field Data
Field Data Entry

Client:	Eagle Foundry Company	Run:	3
Location:	Eagle Creek, OR	Start Time:	10:35
Source:	Main Foundry BH Outlet - Steel Alloy	End Time:	14:45
EPA Method:	0061	Environmental Conditions/Test Notes:	Date: 3/29/2023
Box Operator:	JMK	Chilly and foggy	
Technician(s):	KAD		

Stack Dimensional Data:			Equipment:					
Circular			Meterbox ID	10	Probe ID	B5C	Liner type	glass
Diameter	61.000 in		Y factor	0.9737	Nozzle ID	0.256	Nozzle size	0.256 inches
Rectangular			ΔH@	1.72	Hot box ID	HHB	Nozzle area	0.000357 sq.ft.
Width	in		Bp ID	TS1	Pitot Cp	0.84	Probe heat	250 °F
Length	in		Balance ID	HLNFB1	Pitot ID	B5C	Filter heat	NA °F
Stack Area	20.295 sq.ft.		Weights ID	HLNFW1	Probe Length, ft	5		

Source Information:				Leak Checks:		
Barometric Pressure	29.45 "Hg	O ₂	20.90 %		Pre-test	Post-test
Static Pressure	0.1 "H ₂ O	CO ₂	0.00 %		Pitot	x
Ave. ΔP	0.6 "H ₂ O	Rec. Nz.	0.225 inches		Leak rate, dcf	0.000
Stack Temperature	65 °F				Leak check vacuum, "Hg	15
Assumed moisture	0.76 %					17
Assumed meter temp.	88.3 °F					
Total number of points	20					
Time per point	12.5 min.					
Total run time	300 min.					

Leak Checks:		
	Pre-test	Post-test
	Pitot	x
	Leak rate, dcf	0.000
	Leak check vacuum, "Hg	15

Nozzle check for roundness:			
1	2	3	
0.256	0.256	0.256 inches	
	Caliper ID	WS-2	

Post Test Calculations:				Moisture/Lab:			
Sample volume	250.490 dcf	Ave. ΔP	0.607 "H ₂ O	Filter, #	NA		
Wet mol. weight	28.77 M _s (actual)	Ave. $\sqrt{\Delta P}$	0.778 "H ₂ O		Initial	Final	Gain
Actual H ₂ O	0.63 %	Ave. ΔH	2.81 "H ₂ O	Impingers, g	1,753.7	1,724.4	-29.3
Std. meter vol.	234.342 dscf	Ave. T _s	64.8 °F	Silica gel, g	909.3	970.1	60.8
Isokinetic Average	84.3 %	Ave. T _m	84.7 °F		Total water gain:		31.5

Traverse Point	Time (min.)	Meter Volume (dcf)	Velocity ΔP ("H ₂ O)	Stack Temp. (°F)	Meter Temp. (°F)	Calc. ΔH	Run ΔH	Vacuum ("Hg)	Filter Box (°F)	Condenser Temp (≤68°F)
1	12.5	610.263	0.65	55	74	3.01	3.00	7	NA	46
2	25.0	623.190	0.66	56	75	3.05	3.10	7	NA	46
3	37.5	636.130	0.60	58	76	2.77	2.80	7	NA	46
4	50.0	648.790	0.58	60	80	2.69	2.70	6.5	NA	46
5	62.5	661.010	0.59	61	82	2.74	2.70	6.5	NA	47
6	75.0	673.280	0.62	62	82	2.87	2.90	7	NA	47
7	87.5	685.890	0.64	62	86	2.99	3.00	7	NA	47
8	100.0	698.770	0.60	63	87	2.80	2.80	7	NA	48
9	112.5	711.310	0.63	65	89	2.94	2.90	7	NA	48
10	125.0	724.130	0.65	65	90	3.04	3.00	7	NA	48
11	137.5	737.080	0.66	66	92	3.09	3.10	7	NA	49
12	150.0	750.310	0.62	66	94	2.92	2.90	7	NA	50
13	162.5	763.210	0.59	66	93	2.77	2.80	7	NA	52
14	175.0	775.680	0.56	67	94	2.63	2.60	6	NA	50
15	187.5	787.890	0.57	68	89	2.65	2.70	6	NA	50
16	200.0	800.090	0.57	71	86	2.62	2.60	6	NA	50
17	212.5	812.010	0.59	71	81	2.68	2.70	7	NA	50
18	225.0	824.210	0.56	72	81	2.54	2.50	6.5	NA	51
19	237.5	836.090	0.57	71	81	2.59	2.60	6.5	NA	51
20	250.0	848.120	0.62	71	81	2.82	2.80	7	NA	52

EPA Method 4
Impinger Weights Summary

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Main Foundry BH Outlet - Steel Alloy
EPA Method: 0061
Box Operator: JMK
Technician(s): KAD

Run 1

Impinger gain by weight (g):

#	Initial	Final	Gain
1	504.9	365.7	-139.2
2	428.7	420.3	-8.4
3	446.8	432.7	-14.1
4	359.0	401.3	42.3
Totals:	1,739.4	1,620.0	-119.4

Run 2

Impinger gain by weight (g):

#	Initial	Final	Gain
1	505.6	432.7	-72.9
2	428.9	455.4	26.5
3	449.1	427.8	-21.3
4	361.1	408.1	47.0
Totals:	1,744.7	1,724.0	-20.7

Run 3

Impinger gain by weight (g):

#	Initial	Final	Gain
1	509.4	411.2	-98.2
2	432.0	452.5	20.5
3	451.4	451.4	0.0
4	360.9	409.3	48.4
Totals:	1,753.7	1,724.4	-29.3

Isokinetic Field Data
Field Data and Calculations
Emissions and Gas Stream Characteristics

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Main Foundry BH Outlet - Steel Alloy
Method: 0061

Run: 1
Start Time: 13:00
End Time: 17:10
Date: 3/27/2023

Sampling Data				Traverse Data			
Time min.	Meter ft ³	ΔH "H ₂ O	Meter T _m °F	Traverse Point	Dp "H ₂ O	Stack T _s °F	$\sqrt{Dp}$
	593.410						
13	607.710	3.80	71	1	0.84	66	0.917
25	621.920	3.80	72	2	0.83	66	0.911
38	635.620	3.40	73	3	0.75	66	0.866
50	647.980	2.80	75	4	0.62	67	0.787
63	660.840	2.80	79	5	0.63	68	0.794
75	673.980	3.00	82	6	0.65	69	0.806
88	686.460	2.80	84	7	0.62	71	0.787
100	699.540	2.90	85	8	0.63	70	0.794
113	712.200	2.80	89	9	0.61	72	0.781
125	724.850	2.90	90	10	0.62	70	0.787
138	737.200	2.60	90	11	0.57	70	0.755
150	749.870	2.80	91	12	0.60	70	0.775
163	762.270	2.70	92	13	0.59	72	0.768
175	774.610	2.70	92	14	0.59	71	0.768
188	787.110	2.80	93	15	0.60	71	0.775
200	799.320	2.60	93	16	0.57	73	0.755
213	811.780	2.70	93	17	0.57	73	0.755
225	823.940	2.80	93	18	0.59	69	0.768
238	836.320	2.80	93	19	0.59	69	0.768
250	849.174	2.90	93	20	0.63	69	0.794

Client:	Eagle Foundry Company	Run:	1
Source:	Main Foundry BH Outlet - Steel Alloy	Date:	03/27/23

Field Data Input Continued

<u>Moisture Data</u>		<u>Stack Dimensional Data:</u>	
Total Test Time	250.0 min	Circular	
Sample Time Interval	12.5 min	Diameter	61.000 in
Meter Volume, V _m	255.764 dcf	Rectangular	
Water Volume	14.0 g	Width	in
Nozzle Diameter, N _z	0.2560 in.	Length	in
Nozzle Area	0.000357 sq.ft.	Stack Area	20.295 sq.ft.

<u>Traverse Data</u>		<u>Molecular Weight:</u>	
Barometric Pressure, P _b	29.79 "Hg	CO ₂ Average	0.26 %vd
Static Pressure	0.10 "H ₂ O	O ₂ Average	20.99 %vd
Pitot Factor, cp	0.84		
Meter Cal Factor	0.9737 Y		

Field Data Averages

<u>Meter</u>		<u>Stack</u>	
ΔH	2.920 "H ₂ O	√Dp	0.796 "H ₂ O
Temperature, T _m	86.2 °F	Temperature, T _s	69.6 °F
Temperature, T _m	545.9 °A (°R)	Temperature, T _s	529.3 °A (R)
Pressure Meter, P _m	30.005 "Hg	Pressure Stack, P _s	29.797 "Hg

Field Data Calculations

<u>Meter Box Capture</u>		<u>EPA Method 2 Stack Gas Flowrate:</u>	
Standard Volume, V _{m(std)}	241.418 dscf	Velocity, V _s	44.85 fps
	6.836 dscm	Volume (actual)	54,614 acfm
Actual Volume, V _{m(actual)}	243.808 awcf		54,467 adcfm
<u>Gas Stream Moisture</u>		Volume (standard)	3,253,495 wscf/hr
Moisture Vapor, V _{w(std)}	0.660 scf		3,244,711 dscf/hr
Moisture, B _{ws}	0.0027		54,079 dscf/min
Moisture EPA M4	0.27 %v		54,225 wscf/min
Moisture @ Saturation	2.45 %v (for T _s < 212°F)		
<u>EPA Method 3 Gas Density</u>		Volume/Mole, V/M	387.789
Dry, M _d	28.88 lb/lb-mole		
Wet, M _s	28.85 lb/lb-mole		
Percent Isokinetic	101.5 %		

Laboratory Results

	Cr VI	1.23E-02	μg/sample
	Cr VI	1.23E-08	grams
Emissions:			
Concentration Cr VI, C _s	7.86E-10	gr/dscf	
	1.80E-03	μg/dscm	
Mass Emissions Cr VI	3.64E-07	lb/hr	

"<" represents MDL value

Isokinetic Field Data
Field Data and Calculations
Emissions and Gas Stream Characteristics

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Main Foundry BH Outlet - Steel Alloy
Method: 0061

Run: 2
Start Time: 10:30
End Time: 14:40
Date: 03/28/23

Sampling Data				Traverse Data			
Time min.	Meter ft ³	ΔH "H ₂ O	Meter T _m °F	Traverse Point	Dp "H ₂ O	Stack T _s °F	$\sqrt{Dp}$
	94.084						
13	107.610	3.30	74	1	0.72	60	0.849
25	121.250	3.40	74	2	0.74	60	0.860
38	134.710	3.30	74	3	0.72	60	0.849
50	147.550	3.00	79	4	0.65	62	0.806
63	160.010	2.80	79	5	0.61	62	0.781
75	172.340	2.70	82	6	0.59	63	0.768
88	185.210	2.90	87	7	0.63	64	0.794
100	198.370	3.10	89	8	0.67	64	0.819
113	211.710	3.20	91	9	0.68	64	0.825
125	225.110	3.20	92	10	0.69	64	0.831
138	238.320	3.10	93	11	0.65	65	0.806
150	251.090	2.80	94	12	0.60	65	0.775
163	263.650	2.80	95	13	0.59	65	0.768
175	276.490	2.90	95	14	0.62	67	0.787
188	289.190	2.90	95	15	0.61	67	0.781
200	302.490	3.10	96	16	0.66	69	0.812
213	316.120	3.30	96	17	0.70	69	0.837
225	328.740	2.90	95	18	0.61	68	0.781
238	341.690	3.10	95	19	0.65	67	0.806
250	354.872	3.00	90	20	0.64	68	0.800

Client: Eagle Foundry Company**Run: 2****Source: Main Foundry BH Outlet - Steel Alloy****Date: 03/28/23****Field Data Input Continued**Moisture Data

Total Test Time 250.0 min
 Sample Time Interval 12.5 min
 Meter Volume, V_m 260.788 dcf
 Water Volume 39.4 g
 Nozzle Diameter, N_z 0.2560 in.
 Nozzle Area 0.000357 sq.ft.

Stack Dimensional Data:

Circular
 Diameter 61.000 in
 Rectangular
 Width in
 Length in
 Stack Area 20.295 sq.ft.

Traverse Data

Barometric Pressure, P_b 29.38 "Hg
 Static Pressure 0.10 "H₂O
 Pitot Factor, cp 0.84
 Meter Cal Factor 0.9737 Y

Molecular Weight:

CO₂ Average 0.08 %vd
 O₂ Average 20.93 %vd

Field Data AveragesMeter

ΔH 3.040 "H₂O
 Temperature, T_m 88.3 °F
 Temperature, T_m 548.0 °A (°R)
 Pressure Meter, P_m 29.604 "Hg

Stack

$\sqrt{Dp}$ 0.807 "H₂O
 Temperature, T_s 64.7 °F
 Temperature, T_s 524.4 °A (R)
 Pressure Stack, P_s 29.387 "Hg

Field Data CalculationsMeter Box Capture

Standard Volume, $V_{m(std)}$ 241.940 dscf
 6.851 dscm
 Actual Volume, $V_{m(actual)}$ 246.662 awcf

EPA Method 2 Stack Gas Flowrate:

Velocity, V_s 45.64 fps
 Volume (actual) 55,576 acfm
 55,154 adcfm
 Volume (standard) 3,295,759 wscf/hr
 3,270,711 dscf/hr
 Moisture, B_{ws} 0.0076 54,512 dscf/min
 Moisture EPA M4 0.76 %v 54,929 wscf/min

Gas Stream Moisture

Moisture Vapor, $V_{w(std)}$ 1.858 scf
 Moisture @ Saturation 2.10 %v (for $T_s < 212^\circ\text{F}$)

EPA Method 3 Gas Density

Dry, M_d 28.85 lb/lb-mole
 Wet, M_s 28.77 lb/lb-mole
 Volume/Mole, V/M 389.559

Percent Isokinetic 100.9 %

Laboratory Results

Cr VI 6.71E-03 µg/sample
 Cr VI 6.71E-09 grams

Emissions:

Concentration Cr VI, C_s 4.28E-10 gr/dscf
 9.79E-04 µg/dscm
 Mass Emissions Cr VI 2.00E-07 lb/hr

"<" represents MDL value

Isokinetic Field Data
Field Data and Calculations
Emissions and Gas Stream Characteristics

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Main Foundry BH Outlet - Steel Alloy
Method: 0061

Run: 3
Start Time: 10:35
End Time: 14:45
Date: 03/29/23

Sampling Data				Traverse Data			
Time min.	Meter ft ³	ΔH "H ₂ O	Meter T _m °F	Traverse Point	Dp "H ₂ O	Stack T _s °F	$\sqrt{Dp}$
	610.263						
13	623.190	3.00	74	1	0.65	55	0.806
25	636.130	3.10	75	2	0.66	56	0.812
38	648.790	2.80	76	3	0.60	58	0.775
50	661.010	2.70	80	4	0.58	60	0.762
63	673.280	2.70	82	5	0.59	61	0.768
75	685.890	2.90	82	6	0.62	62	0.787
88	698.770	3.00	86	7	0.64	62	0.800
100	711.310	2.80	87	8	0.60	63	0.775
113	724.130	2.90	89	9	0.63	65	0.794
125	737.080	3.00	90	10	0.65	65	0.806
138	750.310	3.10	92	11	0.66	66	0.812
150	763.210	2.90	94	12	0.62	66	0.787
163	775.680	2.80	93	13	0.59	66	0.768
175	787.890	2.60	94	14	0.56	67	0.748
188	800.090	2.70	89	15	0.57	68	0.755
200	812.010	2.60	86	16	0.57	71	0.755
213	824.210	2.70	81	17	0.59	71	0.768
225	836.090	2.50	81	18	0.56	72	0.748
238	848.120	2.60	81	19	0.57	71	0.755
250	860.753	2.80	81	20	0.62	71	0.787

Client:	Eagle Foundry Company	Run:	3
Source:	Main Foundry BH Outlet - Steel Alloy	Date:	03/29/23

Field Data Input Continued

Moisture Data

Total Test Time	250.0 min
Sample Time Interval	12.5 min
Meter Volume, V_m	250.490 dcf
Water Volume	31.5 g
Nozzle Diameter, N_z	0.2560 in.
Nozzle Area	0.000357 sq.ft.

Stack Dimensional Data:

Circular	
Diameter	61.000 in
Rectangular	
Width	in
Length	in
Stack Area	20.295 sq.ft.

Traverse Data

Barometric Pressure, P_b	29.45 "Hg
Static Pressure	0.10 "H ₂ O
Pitot Factor, cp	0.84
Meter Cal Factor	0.9737 Y

Molecular Weight:

CO ₂ Average	0.08 %vd
O ₂ Average	20.98 %vd

Field Data Averages

Meter

ΔH	2.810 "H ₂ O
Temperature, T_m	84.7 °F
Temperature, T_m	544.4 °A (°R)
Pressure Meter, P_m	29.657 "Hg

Stack

$\sqrt{Dp}$	0.778 "H ₂ O
Temperature, T_s	64.8 °F
Temperature, T_s	524.5 °A (R)
Pressure Stack, P_s	29.457 "Hg

Field Data Calculations

Meter Box Capture

Standard Volume, $V_{m(std)}$	234.342 dscf
	6.636 dscm
Actual Volume, $V_{m(actual)}$	238.081 awcf

EPA Method 2 Stack Gas Flowrate:

Velocity, V_s	43.94 fps
Volume (actual)	53,506 acfm
	53,169 adcfm
Volume (standard)	3,179,950 wscf/hr
	3,159,916 dscf/hr
	52,665 dscf/min
	52,999 wscf/min

Gas Stream Moisture

Moisture Vapor, $V_{w(std)}$	1.486 scf
Moisture, B_{ws}	0.0063
Moisture EPA M4	0.63 %v
Moisture @ Saturation	2.10 %v (for $T_s < 212^\circ\text{F}$)

EPA Method 3 Gas Density

Dry, M_d	28.85 lb/lb-mole
Wet, M_s	28.78 lb/lb-mole

Volume/Mole, V/M	388.708

Percent Isokinetic	101.2 %

Laboratory Results

Cr VI	1.37E-02	µg/sample
Cr VI	1.37E-08	grams

Emissions:

Concentration Cr VI, C_s	8.99E-10	gr/dscf
	2.06E-03	µg/dscm
Mass Emissions Cr VI	4.06E-07	lb/hr

"<" represents MDL value

Method 0061
Laboratory Results
Cr VI

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Main Foundry BH Outlet - Steel Alloy

Lab ID	Sample ID	Sample Date	<	Result (µg/sample)	MDL (µg/sample)	Sample Vol. (ml)	H ₂ O Rinse Vol. (ml)	Blank Correction (ug)	Blank Corrected Results (µg/sample)
23-S601	Run 1	3/27/2023		0.0185	0.0044	440	259	6.21E-03	1.23E-02
23-S602	Run 2	3/28/2023		0.0096	0.0040	400	121	2.89E-03	6.71E-03
23-S603	Run 3	3/29/2023		0.0194	0.0051	510	239	5.74E-03	1.37E-02
23-S607	KOH Blank	3/29/2023	<	MDL	0.0030	300		0.00	µg/ml
23-S608	H ₂ O Blank	3/29/2023		0.005	0.0020	200		2.40E-05	µg/ml

Notes

A "<" sign designates a result less than the minimum detection limit (MDL). If sample results are below MDL, the MDL value is used for calculations.

If blank value(s) are below MDL, no blank correction is performed.

H₂O rinse volume was calculated as the total sample volume minus the final (post-test) volume of liquid in impingers 1-3.

Method 0061
Results Summary

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Main Foundry BH Outlet - Steel Alloy

Run			1	2	3	
Date			3/27/2023	3/28/2023	3/29/2023	
Start Time			13:00	10:30	10:35	
End Time			17:10	14:40	14:45	Average
Duration, min.			250	250	250	250
Barometric Pressure, "Hg			29.79	29.38	29.45	29.54
Nozzle Dia., in.			0.256	0.256	0.256	0.256
Isokinetic Average, %			101.5	100.9	101.2	101.2
Sample Volume, dscf			241.418	241.940	234.342	239.233
Sample Volume, dscm			6.836	6.851	6.636	6.774
Stack Diameter, in.			61.000	61.000	61.000	61.000
Stack Area, sq.ft.			20.295	20.295	20.295	20.295
CO ₂ %vd			0.26	0.08	0.08	0.14
O ₂ %vd			20.99	20.93	20.98	20.97
Static Pressure, "H ₂ O			0.10	0.10	0.10	0.10
H ₂ O %v			0.27	0.76	0.63	0.55
Wet Molecular Weight, lb/lb-mole			28.85	28.77	28.78	28.80
Velocity, FPS			44.85	45.64	43.94	44.81
ADCFM			54,467	55,154	53,169	54,263
ACFM			54,614	55,576	53,506	54,565
DSCFM			54,079	54,512	52,665	53,752
Stack Temperature, °F			69.6	64.7	64.8	66.4
Cr VI	Concentration,	gr/dscf	7.86E-10	4.28E-10	8.99E-10	7.04E-10
	C _s	µg/dscm	1.80E-03	9.79E-04	2.06E-03	1.61E-03
	Mass	lb/hr	3.64E-07	2.00E-07	4.06E-07	3.23E-07
	lb Cr VI/ton Cr in melt		1.45E-05	8.27E-06	1.68E-05	1.32E-05
Process Data	Cr processed	lb/melt	209.764	201.394	201.494	
		ton/melt	0.1049	0.1007	0.1007	



COMPANY	Eagle Foundry Company
FACILITY	Eagle Foundry
LOCATION	Eagle Creek, OR
SOURCE	Cooling Bunker BH Inlet - Steel Alloy
DATE	3/27/2023 - 3/29/2023
METHOD	29
POLLUTANT	Metals

EPA Method 1
Stack Parameters and Traverse Points

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Cooling Bunker BH Inlet - Steel Alloy
Facility: Eagle Foundry

Type of Testing: P (P for Particulate; V for Velocity/Nonparticulate)
Type of Duct: C (C for circular; R for rectangular)

Number of ports available: 2
Number of ports to be used: 2
Port diameter: 4 inches
Sampling location height (approx.): feet
Stack height (approx.): feet

Circular ID (Rectangular Depth): 48.00 inches
Port depth and/or wall thickness: 6.25 inches
Stack width (Rectangular only): inches

Equivalent Diameter
If rectangular = $\frac{2 * \text{Depth} * \text{Width}}{\text{Depth} + \text{Width}}$ = 48.00 inches (If circular = duct ID)

Stack/duct area = 12.566 sq.feet 1809.6 sq. inches

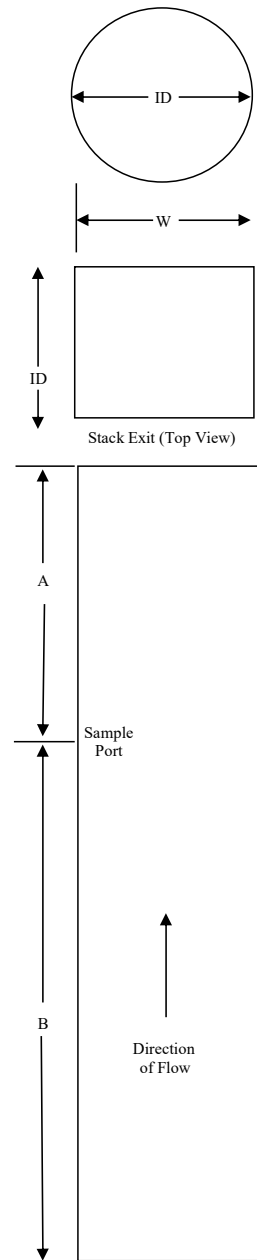
Sample Port Location: Downstream flow disturbance from process Upstream flow disturbance toward exit
Number of Inches: 990.00 114.00
Number of Diameters: 20.63 2.38

Minimum Number of Traverse Points: 12

Traverse points less than 1.0 inch from the stack wall are relocated to a distance of 1.0 inch.

Points	% of diameter	Distance from inside wall (in.)	Distance including port (in.)
1	4.4	2.11	8 3/8
2	14.6	7.01	13 1/4
3	29.6	14.21	20 1/2
4	70.4	33.79	40
5	85.4	40.99	47 1/4
6	95.6	45.89	52 1/8

Reference Diagram



Drawing NOT to scale and
NOT an accurate representation of stack.

Pre-Test Traverse

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Cooling Bunker BH Inlet - Steel Alloy

Stack Temp: 53 °F

Traverse Point	Velocity ΔP ("H ₂ O)	Null Angle
1	0.78	0
2	1.10	5
3	1.10	0
4	1.10	5
5	1.20	5
6	1.20	0
7	1.20	5
8	1.10	0
9	1.00	5
10	0.90	0
11	0.80	5
12	0.80	5

Average: 1.02 3

Flow is found to be: Non-cyclonic

Isokinetic Field Data
Field Data Entry

Client:	Eagle Foundry Company	Run:	1
Location:	Eagle Creek, OR	Start Time:	13:00
Source:	Cooling Bunker BH Inlet - Steel Alloy	End Time:	17:10
EPA Method:	29	Environmental Conditions/Test Notes:	Date: 3/27/2023
Box Operator:	AAM	40-60 °F	
Technician(s):	NEW		

Stack Dimensional Data:

Circular
Diameter 48.000 in
Rectangular
Width in
Length in
Stack Area 12.566 sq.ft.

Equipment:

Meterbox ID 11
Y factor 0.9686
 $\Delta H@$ 1.865
Bp ID TS-1
Balance ID HLNFB-1
Weights ID HLNFW-1
Probe ID Bison 1
Nozzle ID 0.25
Hot box ID HHB-1
Pitot Cp 0.84
Pitot ID Bison 1
Probe Length, ft 6
Liner type Glass
Nozzle size 0.250 inches
Nozzle area 0.000341 sq.ft.
Probe heat 250 °F
Filter heat 250 °F

Source Information:

Barometric Pressure	29.79 "Hg	O ₂	20.90 %
Static Pressure	-0.9 "H ₂ O	CO ₂	0.00 %
Ave. ΔP	1.02 "H ₂ O	Rec. Nz.	0.204 inches
Stack Temperature	53 °F		
Assumed moisture	3.00 %		
Assumed meter temp.	60 °F		
Total number of points	10		
Time per point	25 min.		
Total run time	250 min.		

Leak Checks:

	Pre-test	Post-test
Pitot	x	x
Leak rate, dcf	0.000	0.000
Leak check vacuum, "Hg	15	10

Nozzle check for roundness:

1	2	3
0.250	0.250	0.251 inches
Caliper ID		WS1

Post Test Calculations:

Sample volume	298.252 dcf	Ave. ΔP	1.060 "H ₂ O
Wet mol. weight	28.81 M _s (actual)	Ave. $\sqrt{\Delta P}$	1.026 "H ₂ O
Actual H ₂ O	0.28 %	Ave. ΔH	4.5 "H ₂ O
Std. meter vol.	291.103 dscf	Ave. T _s	65.0 °F
Isokinetic Average	99.0 %	Ave. T _m	67.5 °F

Moisture/Lab:

Filter, #	NA		
	Initial	Final	Gain
Impingers, g	3,342.1	3,313.7	-28.4
Silica gel, g	883.2	929.1	45.9
	Total water gain, g:		17.5

Traverse Point	Time (min.)	Meter Volume (dcf)	Velocity ΔP ("H ₂ O)	Stack Temp. (°F)	Meter Temp. (°F)	Calc. ΔH	Run ΔH	Vacuum ("Hg)	Filter Box (°F)	Condenser Temp (≤68°F)
1	25.0	425.831	0.80	55	61	3.43	3.40	4	253	48
2	50.0	476.200	0.70	66	63	2.95	2.90	3	257	57
3	75.0	506.200	1.10	68	66	4.64	4.65	4.5	254	51
4	100.0	538.310	1.20	68	69	5.09	5.10	5	254	52
5	125.0	570.200	1.20	66	70	5.12	5.10	5	256	51
6	150.0	600.985	1.10	66	70	4.69	4.70	4.5	254	50
7	175.0	631.570	1.10	65	70	4.70	4.70	4.5	256	50
8	200.0	663.250	1.20	67	69	5.10	5.10	5	256	49
9	225.0	694.940	1.20	65	69	5.12	5.10	5	254	49
10	250.0	724.083	1.00	64	68	4.26	4.25	4.5	257	49

Isokinetic Field Data
Field Data Entry

Client:	Eagle Foundry Company	Run:	2
Location:	Eagle Creek, OR	Start Time:	10:30
Source:	Cooling Bunker BH Inlet - Steel Alloy	End Time:	14:40
EPA Method:	29	Environmental Conditions/Test Notes:	Date: 3/28/2023
Box Operator:	AAM	40-60 °F	
Technician(s):	NEW		

Stack Dimensional Data:

Circular	
Diameter	48.000 in
Rectangular	
Width	in
Length	in
Stack Area	12.566 sq.ft.

Equipment:

Meterbox ID	11	Probe ID	Bison 1	Liner type	Glass
Y factor	0.9686	Nozzle ID	0.25	Nozzle size	0.250 inches
$\Delta H@$	1.865	Hot box ID	HHB-1	Nozzle area	0.000341 sq.ft.
Bp ID	TS-1	Pitot Cp	0.84	Probe heat	250 °F
Balance ID	HLNFB-1	Pitot ID	Bison 1	Filter heat	250 °F
Weights ID	HLNFW-1	Probe Length, ft	6		

Source Information:

Barometric Pressure	29.38 "Hg	O ₂	20.90 %
Static Pressure	-0.9 "H ₂ O	CO ₂	0.00 %
Ave. ΔP	1.02 "H ₂ O	Rec. Nz.	0.199 inches
Stack Temperature	53 °F		
Assumed moisture	0.28 %		
Assumed meter temp.	67.5 °F		
Total number of points	10		
Time per point	25 min.		
Total run time	250 min.		

Leak Checks:

	Pre-test	Post-test
Pitot	x	x
Leak rate, dcf	0.000	0.000
Leak check vacuum, "Hg	15	7

Nozzle check for roundness:

1	2	3
0.250	0.250	0.251 inches
Caliper ID	WS1	

Post Test Calculations:

Sample volume	280.284 dcf	Ave. ΔP	0.919 "H ₂ O
Wet mol. weight	28.77 M _s (actual)	Ave. $\sqrt{\Delta P}$	0.953 "H ₂ O
Actual H ₂ O	0.69 %	Ave. ΔH	4.045 "H ₂ O
Std. meter vol.	274.533 dscf	Ave. T _s	61.0 °F
Isokinetic Average	101.2 %	Ave. T _m	57.9 °F

Moisture/Lab:

Filter, #	NA		
	Initial	Final	Gain
Impingers, g	3,349.7	3,346.3	-3.4
Silica gel, g	898.5	942.1	43.6
	Total water gain:		40.2

Traversal Point	Time (min.)	Meter Volume (dcf)	Velocity ΔP ("H ₂ O)	Stack Temp. (°F)	Meter Temp. (°F)	Calc. ΔH	Run ΔH	Vacuum ("Hg)	Filter Box (°F)	Condenser Temp (≤68°F)
1	25.0	24.090	0.60	43	49	2.69	2.70	2	248	41
2	50.0	48.750	0.70	53	51	3.09	3.10	4	258	47
3	75.0	77.280	0.95	62	54	4.14	4.15	4	255	53
4	100.0	107.970	1.10	63	56	4.80	4.80	5	257	58
5	125.0	138.940	1.10	62	59	4.84	4.85	5	258	50
6	150.0	168.350	1.00	62	60	4.41	4.40	4	258	47
7	175.0	199.120	1.10	62	61	4.86	4.85	5	256	49
8	200.0	230.010	1.10	64	62	4.85	4.85	5	256	50
9	225.0	258.080	0.91	68	63	3.99	4.00	4	258	51
10	250.0	281.624	0.63	71	64	2.75	2.75	3	257	50

**Isokinetic Field Data
Field Data Entry**

Client:	Eagle Foundry Company	Run:	3
Location:	Eagle Creek, OR	Start Time:	10:35
Source:	Cooling Bunker BH Inlet - Steel Alloy	End Time:	14:45
EPA Method:	29	Environmental Conditions/Test Notes:	Date: 3/29/2023
Box Operator:	AAM		
Technician(s):	NEW		

Stack Dimensional Data:

Circular
Diameter 48.000 in
Rectangular
Width in
Length in
Stack Area 12.566 sq.ft.

Equipment:

Meterbox ID 11
Y factor 0.9686
 $\Delta H@$ 1.865
Bp ID TS-1
Balance ID HLNFB-1
Weights ID HLNFW-1
Probe ID
Nozzle ID 0.25
Hot box ID HHB-1
Pitot Cp 0.84
Pitot ID Bison 1
Probe Length, ft 6
Liner type Glass
Nozzle size 0.250 inches
Nozzle area 0.000341 sq.ft.
Probe heat 250 °F
Filter heat 250 °F

Source Information:

Barometric Pressure	29.45 "Hg	O ₂	20.90 %
Static Pressure	-0.9 "H ₂ O	CO ₂	0.00 %
Ave. ΔP	1.02 "H ₂ O	Rec. Nz.	0.202 inches
Stack Temperature	53 °F		
Assumed moisture	0.69 %		
Assumed meter temp.	57.9 °F		
Total number of points	10		
Time per point	25 min.		
Total run time	250 min.		

Leak Checks:

	Pre-test	Post-test
Pitot	x	x
Leak rate, dcf	0.000	0.000
Leak check vacuum, "Hg	15	15

Nozzle check for roundness:

1	2	3
0.250	0.250	0.251 inches
Caliper ID	WS1	

Post Test Calculations:

Sample volume	300.532 dcf	Ave. ΔP	1.073 "H ₂ O
Wet mol. weight	28.77 M _s (actual)	Ave. $\sqrt{\Delta P}$	1.029 "H ₂ O
Actual H ₂ O	0.69 %	Ave. ΔH	4.69 "H ₂ O
Std. meter vol.	295.936 dscf	Ave. T _s	60.6 °F
Isokinetic Average	100.9 %	Ave. T _m	57.2 °F

Moisture/Lab:

Filter, #	Initial	Final	Gain
Impingers, g	3,373.9	3,373.7	-0.2
Silica gel, g	892.5	936.0	43.5
	Total water gain:		43.3

Traverse Point	Time (min.)	Meter Volume (dcf)	Velocity ΔP ("H ₂ O)	Stack Temp. (°F)	Meter Temp. (°F)	Calc. ΔH	Run ΔH	Vacuum ("Hg)	Filter Box (°F)	Condenser Temp (≤68°F)
1	25.0	599.072	0.65	42	46	2.88	2.90	3	256	41
2	50.0	646.520	0.68	55	49	2.95	2.95	3	258	49
3	75.0	675.580	1.00	60	52	4.33	4.35	4	257	46
4	100.0	708.800	1.30	60	55	5.66	5.65	5	256	50
5	125.0	742.150	1.30	60	58	5.69	5.70	5	256	50
6	150.0	774.280	1.20	60	58	5.26	5.25	5	257	50
7	175.0	804.900	1.10	64	61	4.81	4.80	5	256	52
8	200.0	837.000	1.20	64	62	5.26	5.25	5	258	51
9	225.0	870.230	1.30	72	64	5.63	5.65	5	256	54
10	250.0	899.604	1.00	69	67	4.38	4.40	4.5	257	50

EPA Method 4
Impinger Weights Summary

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Cooling Bunker BH Inlet - Steel Alloy
EPA Method: 29
Box Operator: AAM
Technician(s): NEW

Run 1

Impinger gain by weight (g):

#	Initial	Final	Gain
1	723.1	646.9	-76.2
2	651.3	667.1	15.8
3	620.8	635.6	14.8
4	624.4	635.0	10.6
5	722.5	729.1	6.6
Totals:	3,342.1	3,313.7	-28.4

Run 2

Impinger gain by weight (g):

#	Initial	Final	Gain
1	725.6	656.9	-68.7
2	647.9	676.0	28.1
3	626.4	640.0	13.6
4	624.0	637.5	13.5
5	725.8	735.9	10.1
Totals:	3,349.7	3,346.3	-3.4

Run 3

Impinger gain by weight (g):

#	Initial	Final	Gain
1	734.5	659.0	-75.5
2	655.0	697.3	42.3
3	625.1	644.0	18.9
4	632.4	643.8	11.4
5	726.9	729.6	2.7
Totals:	3,373.9	3,373.7	-0.2

Isokinetic Field Data
Field Data and Calculations
Gas Stream Characteristics

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Cooling Bunker BH Inlet - Steel Alloy
Method: 29

Run: 1
Start Time: 13:00
End Time: 17:10
Date: 3/27/2023

Sampling Data				Traverse Data			
Time min.	Meter ft ³	ΔH "H ₂ O	Meter T _m °F	Traverse Point	Dp "H ₂ O	Stack T _s °F	$\sqrt{Dp}$
	425.831						
25.0	452.270	3.40	61	1	0.80	55	0.894
50.0	476.200	2.90	63	2	0.70	66	0.837
75.0	506.200	4.65	66	3	1.10	68	1.049
100.0	538.310	5.10	69	4	1.20	68	1.095
125.0	570.200	5.10	70	5	1.20	66	1.095
150.0	600.985	4.70	70	6	1.10	66	1.049
175.0	631.570	4.70	70	7	1.10	65	1.049
200.0	663.250	5.10	69	8	1.20	67	1.095
225.0	694.940	5.10	69	9	1.20	65	1.095
250.0	724.083	4.25	68	10	1.00	64	1.000

Client:	Eagle Foundry Company	Run:	1
Source:	Cooling Bunker BH Inlet - Steel Alloy	Date:	03/27/23

Field Data Input Continued

Moisture Data

Total Test Time	250.0 min
Sample Time Interval	25.0 min
Meter Volume, V_m	298.252 dcf
Water Mass	17.5 g
Nozzle Diameter, N_z	0.2500 in.
Nozzle Area	0.000341 sq.ft.

Stack Dimensional Data:

Circular	
Diameter	48.000 in
Rectangular	
Width	in
Length	in
Stack Area	12.566 sq.ft.

Traverse Data

Barometric Pressure, P_b	29.79 "Hg
Static Pressure	-0.90 "H ₂ O
Pitot Factor, cp	0.84
Meter Cal Factor	0.9686 Y

Molecular Weight:

CO ₂ Average	0.09 %vd
O ₂ Average	20.64 %vd

Field Data Averages

Meter

ΔH	4.500 "H ₂ O
Temperature, T_m	67.5 °F
Temperature, T_m	527.2 °A (°R)
Pressure Meter, P_m	30.121 "Hg

Stack

$\sqrt{D_p}$	1.026 "H ₂ O
Temperature, T_s	65.0 °F
Temperature, T_s	524.7 °A (°R)
Pressure Stack, P_s	29.724 "Hg

Field Data Calculations

Meter Box Capture

Standard Volume, $V_{m(std)}$	291.103 dscf
	8.243 dscm
Actual Volume, $V_{m(actual)}$	292.175 awcf

EPA Method 2 Stack Gas Flowrate:

Velocity, V_s	57.67 fps
Flow Rate (actual), Q_{aw}	43,481 acfm
	43,359 adcfm
Flow Rate (standard), Q	2,606,582 wscf/hr
	2,599,284 dscf/hr
	43,321 dscf/min
	43,443 wscf/min

Gas Stream Moisture

Moisture Vapor, $V_{w(std)}$	0.825 scf
Moisture, B_{ws}	0.0028
Moisture EPA M4	0.28 %v
Moisture @ Saturation	2.10 %v (for $T_s < 212^\circ F$)

EPA Method 3 Gas Density

Dry, M_d	28.84 lb/lb-mole
Wet, M_s	28.81 lb/lb-mole

Percent Isokinetic	99.0 %

Isokinetic Field Data
Field Data and Calculations
Gas Stream Characteristics

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Cooling Bunker BH Inlet - Steel Alloy
Method: 29

Run: 2
Start Time: 10:30
End Time: 14:40
Date: 03/28/23

Sampling Data				Traverse Data			
Time min.	Meter ft ³	ΔH "H ₂ O	Meter T _m °F	Traverse Point	Dp "H ₂ O	Stack T _s °F	$\sqrt{Dp}$
	1.340						
25.0	24.090	2.70	49	1	0.60	43	0.775
50.0	48.750	3.10	51	2	0.70	53	0.837
75.0	77.280	4.15	54	3	0.95	62	0.975
100.0	107.970	4.80	56	4	1.10	63	1.049
125.0	138.940	4.85	59	5	1.10	62	1.049
150.0	168.350	4.40	60	6	1.00	62	1.000
175.0	199.120	4.85	61	7	1.10	62	1.049
200.0	230.010	4.85	62	8	1.10	64	1.049
225.0	258.080	4.00	63	9	0.91	68	0.954
250.0	281.624	2.75	64	10	0.63	71	0.794

Client:	Eagle Foundry Company	Run:	2
Source:	Cooling Bunker BH Inlet - Steel Alloy	Date:	03/28/23

Field Data Input Continued

<u>Moisture Data</u>		<u>Stack Dimensional Data:</u>	
Total Test Time	250.0 min	Circular	
Sample Time Interval	25.0 min	Diameter	48.000 in
Meter Volume, V _m	280.284 dcf	Rectangular	
Water Mass	40.2 g	Width	in
Nozzle Diameter, N _z	0.2500 in.	Length	in
Nozzle Area	0.000341 sq.ft.	Stack Area	12.566 sq.ft.

<u>Traverse Data</u>		<u>Molecular Weight:</u>	
Barometric Pressure, P _b	29.38 "Hg	CO ₂ Average	0.09 %vd
Static Pressure	-0.90 "H ₂ O	O ₂ Average	20.84 %vd
Pitot Factor, cp	0.84		
Meter Cal Factor	0.9686 Y		

Field Data Averages

<u>Meter</u>		<u>Stack</u>	
ΔH	4.045 "H ₂ O	√Dp	0.953 "H ₂ O
Temperature, T _m	57.9 °F	Temperature, T _s	61.0 °F
Temperature, T _m	517.6 °A (°R)	Temperature, T _s	520.7 °A (°R)
Pressure Meter, P _m	29.677 "Hg	Pressure Stack, P _s	29.314 "Hg

Field Data Calculations

<u>Meter Box Capture</u>		<u>EPA Method 2 Stack Gas Flowrate:</u>	
Standard Volume, V _{m(std)}	274.533 dscf	Velocity, V _s	53.76 fps
	7.774 dscm	Flow Rate (actual), Q _{aw}	40,533 acfm
Actual Volume, V _{m(actual)}	278.412 awcf		40,253 adcfm
<u>Gas Stream Moisture</u>		Flow Rate (standard), Q	2,414,750 wscf/hr
Moisture Vapor, V _{w(std)}	1.896 scf		2,398,088 dscf/hr
Moisture, B _{ws}	0.0069		39,968 dscf/min
Moisture EPA M4	0.69 %v		40,246 wscf/min
Moisture @ Saturation	1.85 %v (for T _s < 212°F)		
<u>EPA Method 3 Gas Density</u>			
Dry, M _d	28.85 lb/lb-mole		
Wet, M _s	28.78 lb/lb-mole		
Percent Isokinetic	101.2 %		

Isokinetic Field Data
Field Data and Calculations
Gas Stream Characteristics

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Cooling Bunker BH Inlet - Steel Alloy
Method: 29

Run: 3
Start Time: 10:35
End Time: 14:45
Date: 03/29/23

Sampling Data				Traverse Data			
Time min.	Meter ft ³	ΔH "H ₂ O	Meter T _m °F	Traverse Point	Dp "H ₂ O	Stack T _s °F	$\sqrt{Dp}$
	599.072						
25.0	622.780	2.90	46	1	0.65	42	0.806
50.0	646.520	2.95	49	2	0.68	55	0.825
75.0	675.580	4.35	52	3	1.00	60	1.000
100.0	708.800	5.65	55	4	1.30	60	1.140
125.0	742.150	5.70	58	5	1.30	60	1.140
150.0	774.280	5.25	58	6	1.20	60	1.095
175.0	804.900	4.80	61	7	1.10	64	1.049
200.0	837.000	5.25	62	8	1.20	64	1.095
225.0	870.230	5.65	64	9	1.30	72	1.140
250.0	899.604	4.40	67	10	1.00	69	1.000

Client:	Eagle Foundry Company	Run:	3
Source:	Cooling Bunker BH Inlet - Steel Alloy	Date:	03/29/23

Field Data Input Continued

Moisture Data

Total Test Time	250.0 min
Sample Time Interval	25.0 min
Meter Volume, V_m	300.532 dcf
Water Mass	43.3 g
Nozzle Diameter, N_z	0.2500 in.
Nozzle Area	0.000341 sq.ft.

Stack Dimensional Data:

Circular	
Diameter	48.000 in
Rectangular	
Width	in
Length	in
Stack Area	12.566 sq.ft.

Traverse Data

Barometric Pressure, P_b	29.45 "Hg
Static Pressure	-0.90 "H ₂ O
Pitot Factor, cp	0.84
Meter Cal Factor	0.9686 Y

Molecular Weight:

CO ₂ Average	0.06 %vd
O ₂ Average	20.90 %vd

Field Data Averages

Meter

ΔH	4.690 "H ₂ O
Temperature, T_m	57.2 °F
Temperature, T_m	516.9 °A (°R)
Pressure Meter, P_m	29.795 "Hg

Stack

$\sqrt{D_p}$	1.029 "H ₂ O
Temperature, T_s	60.6 °F
Temperature, T_s	520.3 °A (°R)
Pressure Stack, P_s	29.384 "Hg

Field Data Calculations

Meter Box Capture

Standard Volume, $V_{m(std)}$	295.936 dscf
	8.380 dscm
Actual Volume, $V_{m(actual)}$	299.173 awcf

EPA Method 2 Stack Gas Flowrate:

Velocity, V_s	57.96 fps
Flow Rate (actual), Q_{aw}	43,700 acfm
	43,398 adcfm
Flow Rate (standard), Q	2,611,625 wscf/hr
	2,593,605 dscf/hr
	43,227 dscf/min
	43,527 wscf/min

Gas Stream Moisture

Moisture Vapor, $V_{w(std)}$	2.042 scf
Moisture, B_{ws}	0.0069
Moisture EPA M4	0.69 %v
Moisture @ Saturation	1.82 %v (for $T_s < 212^\circ F$)

EPA Method 3 Gas Density

Dry, M_d	28.85 lb/lb-mole
Wet, M_s	28.78 lb/lb-mole

Percent Isokinetic	100.9 %

Eagle Foundry Company
Cooling Bunker BH Inlet - Steel Alloy
Method 29 Laboratory Results

Run: 1
Sample Date: 03/27/23

Analyte	Filter + FH Rinse Cont. 1&3		BH Cap.Soln. + BH Rinse Cont. 4		Units
	< Result	MDL	< Result	MDL	
Aluminum	3,170	7.50	28.5	3.57	µg/sample
Antimony	3.28	1.25	< MDL	0.595	µg/sample
Arsenic	9.26	8.75	< MDL	0.833	µg/sample
Barium	17.9	0.125	1.54	0.060	µg/sample
Beryllium	0.074	0.050	< MDL	0.024	µg/sample
Cadmium	0.339	0.100	3.35	0.048	µg/sample
Chromium	75.1	0.200	0.879	0.095	µg/sample
Cobalt	0.404	0.125	0.121	0.060	µg/sample
Copper	29.8	1.25	1.04	0.595	µg/sample
Lead	37.0	1.25	0.633	0.595	µg/sample
Manganese	2,580	0.075	1.66	0.036	µg/sample
Nickel	9.92	0.75	0.610	0.357	µg/sample
Phosphorus	49.5	5.00	4.26	2.38	µg/sample
Selenium	< MDL	3.75	< MDL	1.78	µg/sample
Silver	3.32	0.500	< MDL	0.238	µg/sample
Thallium	< MDL	2.50	< MDL	1.19	µg/sample
Vanadium	1.12	0.250	< MDL	0.119	µg/sample
Zinc	360	0.750	4.44	0.357	µg/sample

Lab ID:	23-S684	23-S685	
Sample Vol:	250	246	ml

Eagle Foundry Company
Cooling Bunker BH Inlet - Steel Alloy
Method 29 Laboratory Results

Run: 2
Sample Date: 03/28/23

Analyte	Filter + FH Rinse Cont. 1&3		BH Cap.Soln. + BH Rinse Cont. 4		Units
	<	Result MDL	<	Result MDL	
Aluminum		5,480 7.50		28.6 3.57	µg/sample
Antimony		4.52 1.25	<	MDL 0.595	µg/sample
Arsenic		12.7 8.75	<	MDL 0.833	µg/sample
Barium		27.8 0.125		4.69 0.0595	µg/sample
Beryllium		0.110 0.050	<	MDL 0.024	µg/sample
Cadmium		0.630 0.100		1.02 0.0476	µg/sample
Chromium		53.3 0.200		0.946 0.0952	µg/sample
Cobalt		0.571 0.125		0.123 0.0595	µg/sample
Copper		46.2 1.25		0.953 0.595	µg/sample
Lead		44.0 1.25	<	MDL 0.595	µg/sample
Manganese		2,150 0.075		3.96 0.0357	µg/sample
Nickel		10.8 0.750		1.22 0.357	µg/sample
Phosphorus		64.8 5.00	<	MDL 2.38	µg/sample
Selenium	<	MDL 3.75	<	MDL 1.785	µg/sample
Silver		2.01 0.500	<	MDL 0.238	µg/sample
Thallium	<	MDL 2.50	<	MDL 1.19	µg/sample
Vanadium		1.99 0.250	<	MDL 0.119	µg/sample
Zinc		364 0.750		3.90 0.357	µg/sample

Lab ID: 23-S689 23-S690
Sample Vol: 250 253 ml

Eagle Foundry Company
Cooling Bunker BH Inlet - Steel Alloy
Method 29 Laboratory Results

Run: 3
Sample Date: 03/29/23

Analyte	Filter + FH Rinse Cont. 1&3		BH Cap.Soln. + BH Rinse Cont. 4		Units
	< Result	MDL	< Result	MDL	
Aluminum	5,680	7.50	30.6	3.48	µg/sample
Antimony	4.63	1.25	< MDL	0.580	µg/sample
Arsenic	16.2	8.75	< MDL	0.812	µg/sample
Barium	26.4	0.125	4.41	0.058	µg/sample
Beryllium	0.105	0.050	< MDL	0.023	µg/sample
Cadmium	0.686	0.100	0.281	0.046	µg/sample
Chromium	49.1	0.200	0.504	0.093	µg/sample
Cobalt	0.481	0.125	0.071	0.058	µg/sample
Copper	51.1	1.25	< MDL	0.580	µg/sample
Lead	46.0	1.25	0.905	0.580	µg/sample
Manganese	2,090	0.075	14.3	0.035	µg/sample
Nickel	11.1	0.750	0.552	0.348	µg/sample
Phosphorus	81.1	5.00	< MDL	2.32	µg/sample
Selenium	< MDL	3.75	< MDL	1.74	µg/sample
Silver	1.81	0.500	< MDL	0.232	µg/sample
Thallium	< MDL	2.50	< MDL	1.16	µg/sample
Vanadium	1.89	0.250	< MDL	0.116	µg/sample
Zinc	428	0.750	1.75	0.348	µg/sample

Lab ID:	23-S694	23-S695	
Sample Vol:	250	287	ml

Eagle Foundry Company
Cooling Bunker BH Inlet - Steel Alloy
Method 29 Blank Results

Sample Dates: 3/27/2023
3/28/2023
3/29/2023

Analyte	Filter Cont. 12 µg/filter		BH Cap.Soln. Cont. 9 5% HNO ₃ / 10% H ₂ O ₂ µg/sample		FH/BH Rinse Cont. 8A 0.1 N HNO ₃ µg/sample	
	< Result	MDL	< Result	MDL	< Result	MDL
Aluminum	58.8	7.50	16.3	3.78	< MDL	7.50
Antimony	2.86	1.25	< MDL	0.630	< MDL	1.25
Arsenic	< MDL	1.75	< MDL	0.882	< MDL	1.75
Barium	1.40	0.125	0.718	0.063	0.193	0.125
Beryllium	< MDL	0.050	< MDL	0.025	< MDL	0.050
Cadmium	< MDL	0.100	< MDL	0.050	< MDL	0.100
Chromium	1.03	0.200	0.306	0.101	< MDL	0.200
Cobalt	< MDL	0.125	0.153	0.063	< MDL	0.125
Copper	< MDL	1.25	< MDL	0.630	< MDL	1.25
Lead	< MDL	1.25	< MDL	0.630	< MDL	1.25
Manganese	0.741	0.075	0.742	0.038	< MDL	0.375
Nickel	3.96	0.750	< MDL	0.378	< MDL	0.750
Phosphorus	17.0	5.00	< MDL	2.52	< MDL	5.00
Selenium	< MDL	3.75	< MDL	1.89	< MDL	3.75
Silver	< MDL	0.500	< MDL	0.252	< MDL	0.500
Thallium	< MDL	2.50	< MDL	1.26	< MDL	2.50
Vanadium	< MDL	0.250	< MDL	0.126	< MDL	0.250
Zinc	1.52	0.750	0.415	0.378	< MDL	0.750

Lab ID: 23-S729
Blank Vol, ml: N/A

23-S731
196

23-S730
250

Eagle Foundry Company
Cooling Bunker BH Inlet - Steel Alloy
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 1
Test Date: 3/27/2023
Page: 1 of 3

Analyte	I Sample FH Rinse+Filter µg	II Blank Correction FH Rinse µg	III Blank Correction Filter µg	IV Sample BH Cap.Soln. + BH Rinse µg	V Blank BH Cap.Soln. µg/ml	VI Blank Correction BH Cap.Soln. µg	VII Blank Correction BH Rinse µg	VIII Total BH Blank Correction µg	
Aluminum	3170.000	0.000	58.800	28.500	0.083	16.633	0.000	16.633	Al
Antimony	3.280	0.000	2.860	< 0.595	0.000	0.000	0.000	0.000	Sb
Arsenic	9.260	0.000	0.000	< 0.833	0.000	0.000	0.000	0.000	As
Barium	17.900	0.077	1.400	1.540	0.004	0.733	0.077	0.810	Ba
Beryllium	0.074	0.000	0.000	< 0.024	0.000	0.000	0.000	0.000	Be
Cadmium	0.339	0.000	0.000	3.350	0.000	0.000	0.000	0.000	Cd
Chromium	75.100	0.000	1.030	0.879	0.002	0.312	0.000	0.312	Cr
Cobalt	0.404	0.000	0.000	0.121	0.001	0.156	0.000	0.156	Co
Copper	29.800	0.000	0.000	1.040	0.000	0.000	0.000	0.000	Cu
Lead	37.000	0.000	0.000	0.633	0.000	0.000	0.000	0.000	Pb
Manganese	2580.000	0.000	0.741	1.660	0.004	0.757	0.000	0.757	Mn
Nickel	9.920	0.000	3.960	0.610	0.000	0.000	0.000	0.000	Ni
Phosphorus	49.500	0.000	17.000	4.260	0.000	0.000	0.000	0.000	P
Selenium	< 3.750	0.000	0.000	< 1.780	0.000	0.000	0.000	0.000	Se
Silver	3.320	0.000	0.000	< 0.238	0.000	0.000	0.000	0.000	Ag
Thallium	< 2.500	0.000	0.000	< 1.190	0.000	0.000	0.000	0.000	Tl
Vanadium	1.120	0.000	0.000	< 0.119	0.000	0.000	0.000	0.000	V
Zinc	360.000	0.000	1.520	4.440	0.002	0.423	0.000	0.423	Zn

Lab ID:	23-S684	23-S730	23-S729	23-S685	23-S731	N/A	N/A
Notes:	0.1N HNO ₃	0.1N HNO ₃	5% HNO ₃ /10% H ₂ O ₂	5% HNO ₃ /	5% HNO ₃ /	0.1N HNO ₃	
	FH Filter & Probe Rinse		BH Imps 1-3	10% H ₂ O ₂	10% H ₂ O ₂		
	100ml 0.1N HNO ₃ Rinse		100ml .1N HNO ₃ Rinse				
			200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent				

Blank Rules: < indicates value is below the method detection limit (MDL).
If blank is '<' it is treated as zero.
If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Cooling Bunker BH Inlet - Steel Alloy
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 1
Test Date: 3/27/2023
Page: 2 of 3

Analyte	X Allowable FH Blank Correction µg	XI Total FH Blank Correction (M _{fhb}) µg	XII 5% of FH Sample µg	XIII Lessor of XI or XII µg	XIV Greater of A or XIII µg	XV FH Net Sample µg	
Aluminum	58.800	58.800	158.500	58.800	58.80	3111.200	Al
Antimony	2.860	2.860	0.164	0.164	11.63	0.420	Sb
Arsenic	0.000	0.000	0.463	0.000	11.63	9.260	As
Barium	1.477	1.477	0.895	0.895	11.63	16.423	Ba
Beryllium	0.000	0.000	0.004	0.000	11.63	0.074	Be
Cadmium	0.000	0.000	0.017	0.000	11.63	0.339	Cd
Chromium	1.030	1.030	3.755	1.030	11.63	74.070	Cr
Cobalt	0.000	0.000	0.020	0.000	11.63	0.404	Co
Copper	0.000	0.000	1.490	0.000	11.63	29.800	Cu
Lead	0.000	0.000	1.850	0.000	11.63	37.000	Pb
Manganese	0.741	0.741	129.000	0.741	11.63	2579.259	Mn
Nickel	3.960	3.960	0.496	0.496	11.63	5.960	Ni
Phosphorus	11.630	17.000	2.475	2.475	11.63	37.870	P
Selenium	0.000	0.000	< 0.188	0.000	11.63	< 3.750	Se
Silver	0.000	0.000	0.166	0.000	11.63	3.320	Ag
Thallium	0.000	0.000	< 0.125	0.000	11.63	< 2.500	Tl
Vanadium	0.000	0.000	0.056	0.000	11.63	1.120	V
Zinc	1.520	1.520	18.000	1.520	11.63	358.480	Zn

Note: Allowable FH Blank (A) = (area of filter)*(1.4 µg/in²) = 11.63 µg
where area of filter = 8.306 in²

If A > blank > 0, use blank-derived value, M_{fhb}.

If blank > A, use greater of A or [lessor of 5% of sample µg or FH blank].

Blank Rules: < indicates value is below the method detection limit (MDL).

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Eagle Foundry Company
Cooling Bunker BH Inlet - Steel Alloy
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 1
Test Date: 3/27/2023
Page: 3 of 3

Analyte	XVI Allowable BH Blank Correction µg	XVII Total BH (M _{bhb}) Blank Correction µg	XVIII 5% of BH Sample µg	XIX Lessor of XVII or XVIII µg	XX Greater of 1 µg or XIX µg	XXI BH Net Sample µg	XXII FH Net Sample µg	XXIII FH+BH Total Net Sample µg	
Aluminum	1.425	16.633		1.425	1.425	27.075	3111.200	3138.275	Al
Antimony	0.000	0.000	<	0.030	0.000	0.595	0.420	1.015	Sb
Arsenic	0.000	0.000	<	0.042	0.000	0.833	9.260	10.093	As
Barium	0.810	0.810		0.077	0.077	0.730	16.423	17.153	Ba
Beryllium	0.000	0.000	<	0.001	0.000	0.024	0.074	0.098	Be
Cadmium	0.000	0.000		0.168	0.000	3.350	0.339	3.689	Cd
Chromium	0.312	0.312		0.044	0.044	0.567	74.070	74.637	Cr
Cobalt	0.156	0.156		0.006	0.006	0.000	0.404	0.404	Co
Copper	0.000	0.000		0.052	0.000	1.040	29.800	30.840	Cu
Lead	0.000	0.000		0.032	0.000	0.633	37.000	37.633	Pb
Manganese	0.757	0.757		0.083	0.083	0.903	2579.259	2580.162	Mn
Nickel	0.000	0.000		0.031	0.000	0.610	5.960	6.570	Ni
Phosphorus	0.000	0.000		0.213	0.000	4.260	37.870	42.130	P
Selenium	0.000	0.000	<	0.089	0.000	1.780	3.750	5.530	Se
Silver	0.000	0.000	<	0.012	0.000	0.238	3.320	3.558	Ag
Thallium	0.000	0.000	<	0.060	0.000	1.190	2.500	3.690	Tl
Vanadium	0.000	0.000	<	0.006	0.000	0.119	1.120	1.239	V
Zinc	0.423	0.423		0.222	0.222	4.017	358.480	362.497	Zn

Note: Allowable BH Blank rules:

If 1.00 µg > blank > 0 , use blank-derived value.

If blank > 1.00 µg, use greater of 1.00 µg or [lessor of 5% of sample µg or BH blank].

Blank Rules: <' indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Cooling Bunker BH Inlet - Steel Alloy
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 2
Test Date: 3/28/2023
Page: 1 of 3

	I Sample FH Rinse+Filter µg	II Blank Correction FH Rinse µg	III Blank Correction Filter µg	IV Sample BH Cap.Soln. + BH Rinse µg	V Blank BH Cap.Soln. µg/ml	VI Blank Correction BH Cap.Soln. µg	VII Blank Correction BH Rinse µg	VIII Total BH Blank Correction µg	
Analyte	<								
Aluminum	5480.000	0.000	58.800	28.600	0.083	16.633	0.000	16.633	Al
Antimony	4.520	0.000	2.860	< 0.595	0.000	0.000	0.000	0.000	Sb
Arsenic	12.700	0.000	0.000	< 0.833	0.000	0.000	0.000	0.000	As
Barium	27.800	0.077	1.400	4.690	0.004	0.733	0.077	0.810	Ba
Beryllium	0.110	0.000	0.000	< 0.024	0.000	0.000	0.000	0.000	Be
Cadmium	0.630	0.000	0.000	1.020	0.000	0.000	0.000	0.000	Cd
Chromium	53.300	0.000	1.030	0.946	0.002	0.312	0.000	0.312	Cr
Cobalt	0.571	0.000	0.000	0.123	0.001	0.156	0.000	0.156	Co
Copper	46.200	0.000	0.000	0.953	0.000	0.000	0.000	0.000	Cu
Lead	44.000	0.000	0.000	< 0.595	0.000	0.000	0.000	0.000	Pb
Manganese	2150.000	0.000	0.741	3.960	0.004	0.757	0.000	0.757	Mn
Nickel	10.800	0.000	3.960	1.220	0.000	0.000	0.000	0.000	Ni
Phosphorus	64.800	0.000	17.000	< 2.380	0.000	0.000	0.000	0.000	P
Selenium	< 3.750	0.000	0.000	< 1.785	0.000	0.000	0.000	0.000	Se
Silver	2.010	0.000	0.000	< 0.238	0.000	0.000	0.000	0.000	Ag
Thallium	< 2.500	0.000	0.000	< 1.190	0.000	0.000	0.000	0.000	Tl
Vanadium	1.990	0.000	0.000	< 0.119	0.000	0.000	0.000	0.000	V
Zinc	364.000	0.000	1.520	3.900	0.002	0.423	0.000	0.423	Zn

Lab ID:	23-S689	23-S730	23-S729	23-S690	23-S731	N/A	N/A
Content:	0.1N HNO ₃ FH Filter & Probe Rinse 100ml 0.1N HNO ₃ Rinse	0.1N HNO ₃	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	5% HNO ₃ /10% H ₂ O ₂	5% HNO ₃ /10% H ₂ O ₂	0.1N HNO ₃

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If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Cooling Bunker BH Inlet - Steel Alloy
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 2
Test Date: 3/28/2023
Page: 2 of 3

	X Allowable FH Blank Correction	XI Total FH Blank Correction	XII 5% of FH Sample	XIII Lessor of XI or XII	XIV Greater of A or XIII	XV FH Net Sample	
Analyte	µg	µg	µg	µg	µg	µg	
Aluminum	58.800	58.800	274.000	58.800	58.80	5421.200	Al
Antimony	2.860	2.860	0.226	0.226	11.63	1.660	Sb
Arsenic	0.000	0.000	0.635	0.000	11.63	12.700	As
Barium	1.477	1.477	1.390	1.390	11.63	26.323	Ba
Beryllium	0.000	0.000	0.006	0.000	11.63	0.110	Be
Cadmium	0.000	0.000	0.032	0.000	11.63	0.630	Cd
Chromium	1.030	1.030	2.665	1.030	11.63	52.270	Cr
Cobalt	0.000	0.000	0.029	0.000	11.63	0.571	Co
Copper	0.000	0.000	2.310	0.000	11.63	46.200	Cu
Lead	0.000	0.000	2.200	0.000	11.63	44.000	Pb
Manganese	0.741	0.741	107.500	0.741	11.63	2149.259	Mn
Nickel	3.960	3.960	0.540	0.540	11.63	6.840	Ni
Phosphorus	11.630	17.000	3.240	3.240	11.63	53.170	P
Selenium	0.000	0.000	< 0.188	0.000	11.63	< 3.750	Se
Silver	0.000	0.000	0.101	0.000	11.63	2.010	Ag
Thallium	0.000	0.000	< 0.125	0.000	11.63	< 2.500	Tl
Vanadium	0.000	0.000	0.100	0.000	11.63	1.990	V
Zinc	1.520	1.520	18.200	1.520	11.63	362.480	Zn

Note: Allowable FH Blank (A) = (area of filter)*(1.4 µg/in²) = 11.63 µg
where area of filter = 8.306 in²

If A > blank > 0, use blank-derived value.

If blank > A, use greater of A or [lessor of 5% of sample µg or FH blank].

Blank Rules: < indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Cooling Bunker BH Inlet - Steel Alloy
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 2
Test Date: 3/28/2023
Page: 3 of 3

Analyte	XVI Allowable BH Blank Correction µg	XVII Total BH Blank Correction µg	XVIII 5% of BH Sample µg	XIX Lessor of XVII or XVIII µg	XX Greater of 1 µg or XIX µg	XXI BH Net Sample µg	XXII FH Net Sample µg	XXIII FH+BH Total Net Sample µg	
Aluminum	1.430	16.633	1.430	1.430	1.430	27.170	5421.200	5448.370	Al
Antimony	0.000	0.000	< 0.030	0.000	1.000	< 0.595	1.660	< 2.255	Sb
Arsenic	0.000	0.000	< 0.042	0.000	1.000	< 0.833	12.700	< 13.533	As
Barium	0.810	0.810	0.235	0.235	1.000	3.880	26.323	30.203	Ba
Beryllium	0.000	0.000	< 0.001	0.000	1.000	< 0.024	0.110	< 0.134	Be
Cadmium	0.000	0.000	0.051	0.000	1.000	1.020	0.630	1.650	Cd
Chromium	0.312	0.312	0.047	0.047	1.000	0.634	52.270	52.904	Cr
Cobalt	0.156	0.156	0.006	0.006	1.000	0.000	0.571	0.571	Co
Copper	0.000	0.000	0.048	0.000	1.000	0.953	46.200	47.153	Cu
Lead	0.000	0.000	< 0.030	0.000	1.000	< 0.595	44.000	< 44.595	Pb
Manganese	0.757	0.757	0.198	0.198	1.000	3.203	2149.259	2152.462	Mn
Nickel	0.000	0.000	0.061	0.000	1.000	1.220	6.840	8.060	Ni
Phosphorus	0.000	0.000	< 0.119	0.000	1.000	< 2.380	53.170	< 55.550	P
Selenium	0.000	0.000	< 0.089	0.000	1.000	< 1.785	< 3.750	< 5.535	Se
Silver	0.000	0.000	< 0.012	0.000	1.000	< 0.238	2.010	< 2.248	Ag
Thallium	0.000	0.000	< 0.060	0.000	1.000	< 1.190	< 2.500	< 3.690	Tl
Vanadium	0.000	0.000	< 0.006	0.000	1.000	< 0.119	1.990	< 2.109	V
Zinc	0.423	0.423	0.195	0.195	1.000	3.477	362.480	365.957	Zn

Note: Allowable BH Blank rules:

If 1.00 µg > blank > 0 , use blank-derived value.

If blank > 1.00 µg, use greater of 1.00 µg or [lessor of 5% of sample µg or BH blank].

Blank Rules: '<' indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

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Eagle Foundry Company
Cooling Bunker BH Inlet - Steel Alloy
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 3
Test Date: 3/29/2023
Page: 1 of 3

	I Sample FH Rinse+Filter µg	II Blank Correction FH Rinse µg	III Blank Correction Filter µg	IV Sample BH Cap.Soln. + BH Rinse µg	V Blank BH Cap.Soln. µg/ml	VI Blank Correction BH Cap.Soln. µg	VII Blank Correction BH Rinse µg	VIII Total BH Blank Correction µg	
Analyte	<								
Aluminum	5680.000	0.000	58.800	30.600	0.083	16.633	0.000	16.633	Al
Antimony	4.630	0.000	2.860	< 0.580	0.000	0.000	0.000	0.000	Sb
Arsenic	16.200	0.000	0.000	< 0.812	0.000	0.000	0.000	0.000	As
Barium	26.400	0.077	1.400	4.410	0.004	0.733	0.077	0.810	Ba
Beryllium	0.105	0.000	0.000	< 0.023	0.000	0.000	0.000	0.000	Be
Cadmium	0.686	0.000	0.000	0.281	0.000	0.000	0.000	0.000	Cd
Chromium	49.100	0.000	1.030	0.504	0.002	0.312	0.000	0.312	Cr
Cobalt	0.481	0.000	0.000	0.071	0.001	0.156	0.000	0.156	Co
Copper	51.100	0.000	0.000	< 0.580	0.000	0.000	0.000	0.000	Cu
Lead	46.000	0.000	0.000	0.905	0.000	0.000	0.000	0.000	Pb
Manganese	2090.000	0.000	0.741	14.300	0.004	0.757	0.000	0.757	Mn
Nickel	11.100	0.000	3.960	0.552	0.000	0.000	0.000	0.000	Ni
Phosphorus	81.100	0.000	17.000	< 2.320	0.000	0.000	0.000	0.000	P
Selenium	< 3.750	0.000	0.000	< 1.740	0.000	0.000	0.000	0.000	Se
Silver	1.810	0.000	0.000	< 0.232	0.000	0.000	0.000	0.000	Ag
Thallium	< 2.500	0.000	0.000	< 1.160	0.000	0.000	0.000	0.000	Tl
Vanadium	1.890	0.000	0.000	< 0.116	0.000	0.000	0.000	0.000	V
Zinc	428.000	0.000	1.520	1.750	0.002	0.423	0.000	0.423	Zn

Lab ID:	23-S694	23-S730	23-S729	23-S695	23-S731	N/A	N/A
Content:	0.1N HNO ₃ FH Filter & Probe Rinse 100ml 0.1N HNO ₃ Rinse	0.1N HNO ₃	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	0.1N HNO ₃

Blank Rules: < indicates value is below the method detection limit (MDL).
If blank is '<' it is treated as zero.
If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Cooling Bunker BH Inlet - Steel Alloy
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 3
Test Date: 3/29/2023
Page: 2 of 3

	X Allowable FH Blank Correction	XI Total FH Blank Correction	XII 5% of FH Sample	XIII Lessor of XI or XII	XIV Greater of A or XIII	XV FH Net Sample	
Analyte	µg	µg	µg	µg	µg	µg	
Aluminum	58.800	58.800	284.000	58.800	58.80	5621.200	Al
Antimony	2.860	2.860	0.232	0.232	11.63	1.770	Sb
Arsenic	0.000	0.000	0.810	0.000	11.63	16.200	As
Barium	1.477	1.477	1.320	1.320	11.63	24.923	Ba
Beryllium	0.000	0.000	0.005	0.000	11.63	0.105	Be
Cadmium	0.000	0.000	0.034	0.000	11.63	0.686	Cd
Chromium	1.030	1.030	2.455	1.030	11.63	48.070	Cr
Cobalt	0.000	0.000	0.024	0.000	11.63	0.481	Co
Copper	0.000	0.000	2.555	0.000	11.63	51.100	Cu
Lead	0.000	0.000	2.300	0.000	11.63	46.000	Pb
Manganese	0.741	0.741	104.500	0.741	11.63	2089.259	Mn
Nickel	3.960	3.960	0.555	0.555	11.63	7.140	Ni
Phosphorus	11.630	17.000	4.055	4.055	11.63	69.470	P
Selenium	0.000	0.000	< 0.188	0.000	11.63	< 3.750	Se
Silver	0.000	0.000	0.091	0.000	11.63	1.810	Ag
Thallium	0.000	0.000	< 0.125	0.000	11.63	< 2.500	Tl
Vanadium	0.000	0.000	0.095	0.000	11.63	1.890	V
Zinc	1.520	1.520	21.400	1.520	11.63	426.480	Zn

Note: Allowable FH Blank (A) = (area of filter)*(1.4 µg/in²) = 11.63 µg
where area of filter = 8.306 in²

If A > blank > 0, use blank-derived value.

If blank > A, use greater of A or [lessor of 5% of sample µg or FH blank].

Blank Rules: < indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Cooling Bunker BH Inlet - Steel Alloy
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 3
Test Date: 3/29/2023
Page: 3 of 3

Analyte	XVI Allowable BH Blank Correction µg	XVII Total BH Blank Correction µg	XVIII 5% of BH Sample µg	XIX Lessor of XVII or XVIII µg	XX Greater of 1 µg or XIX µg	XXI BH Net Sample µg	XXII FH Net Sample µg	XXIII FH+BH Total Net Sample µg	
Aluminum	1.530	16.633	1.530	1.530	1.530	29.070	5621.200	5650.270	Al
Antimony	0.000	0.000	< 0.029	0.000	1.000	< 0.580	1.770	< 2.350	Sb
Arsenic	0.000	0.000	< 0.041	0.000	1.000	< 0.812	16.200	< 17.012	As
Barium	0.810	0.810	0.221	0.221	1.000	3.600	24.923	28.523	Ba
Beryllium	0.000	0.000	< 0.001	0.000	1.000	< 0.023	0.105	< 0.128	Be
Cadmium	0.000	0.000	0.014	0.000	1.000	0.281	0.686	0.967	Cd
Chromium	0.312	0.312	0.025	0.025	1.000	0.192	48.070	48.262	Cr
Cobalt	0.156	0.156	0.004	0.004	1.000	0.000	0.481	0.481	Co
Copper	0.000	0.000	< 0.029	0.000	1.000	< 0.580	51.100	< 51.680	Cu
Lead	0.000	0.000	0.045	0.000	1.000	0.905	46.000	46.905	Pb
Manganese	0.757	0.757	0.715	0.715	1.000	13.543	2089.259	2102.802	Mn
Nickel	0.000	0.000	0.028	0.000	1.000	0.552	7.140	7.692	Ni
Phosphorus	0.000	0.000	< 0.116	0.000	1.000	< 2.320	69.470	< 71.790	P
Selenium	0.000	0.000	< 0.087	0.000	1.000	< 1.740	< 3.750	< 5.490	Se
Silver	0.000	0.000	< 0.012	0.000	1.000	< 0.232	1.810	< 2.042	Ag
Thallium	0.000	0.000	< 0.058	0.000	1.000	< 1.160	< 2.500	< 3.660	Tl
Vanadium	0.000	0.000	< 0.006	0.000	1.000	< 0.116	1.890	< 2.006	V
Zinc	0.423	0.423	0.088	0.088	1.000	1.327	426.480	427.807	Zn

Note: Allowable BH Blank rules:

If 1.00 µg > blank > 0 , use blank-derived value.

If blank > 1.00 µg, use greater of 1.00 µg or [lessor of 5% of sample µg or BH blank].

Blank Rules: '<' indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Cooling Bunker BH Inlet - Steel Alloy
Mercury Blank Correction Calculations

Blank Lab Values

Analyte	Filter Cont. 12 µg/filter		BH Imps. 2&3 Cap.Soln. Cont. 9 5% HNO ₃ / 10% H ₂ O ₂ µg/sample		FH/BH Rinse Cont. 8A 0.1 N HNO ₃ µg/sample		BH Imps. 5&6 Rinse Cont. 8B H ₂ O µg/sample		BH Imps. 5&6 Cap.Soln. + Rinse Cont. 10 KMnO ₄ µg/sample		BH Imps. 5&6 Rinse Cont. 11 HCl µg/sample	
	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Result	MDL
Mercury	0.0406	0.0219	0.118	0.0172	< MDL	0.0219	< MDL	0.0295	0.0628	0.0163	< MDL	0.0108

Lab ID: 23-S729 23-S731 23-S730 23-S732 23-S733 23-S734
Blank vol, ml: NA 196 250 337 186 124

Blank Correction Values

Analyte: Mercury	Blank FH HNO ₃ Rinse µg	Blank Filter µg	Blank BH Cap.Soln. µg	Blank BH HNO ₃ Rinse µg	Blank BH H ₂ O Rinse µg	Blank BH KMnO ₄ Cap.Soln. + Rinse µg	Blank BH HCl Rinse µg	Total Blank Correction µg	Is Total Blank Correction ≥ 0 and ≤ 0.6?
Run 1	0.00	0.0406	0.12	0.00	0.00	0.10	0.00	0.2623	Yes
Reagent vol, ml	100.0		200.0	200.0	100.0	300.0	225.0		
Run 2	0.00	0.0406	0.12	0.00	0.00	0.10	0.00	0.2623	Yes
Reagent vol, ml	100.0		200.0	200.0	100.0	300.0	225.0		
Run 3	0.00	0.0406	0.12	0.00	0.00	0.10	0.00	0.2623	Yes
Reagent vol, ml	100.0		200.0	200.0	100.0	300.0	225.0		

Notes: 0.1N HNO₃ FH Filter 5% HNO₃/ 10% H₂O₂ 0.1N HNO₃ H₂O 4% KMnO₄/ 10% H₂SO₄ 25 ml 8N HCl/
FH Probe Rinse BH Imps 1-4 BH Imps 5&6 BH Imps 5&6 BH Imps 5&6

Blank Corrected Results

Analyte: Mercury	Sample FH Rinse + Filter Cont. 1&3 µg	Sample BH Cap.Soln. + HNO ₃ Rinse Cont. 4 µg	Sample BH Imp. 4 + Rinse Cont. 5A µg	Sample BH Imps. 5&6 + Rinses Cont. 5B µg	Sample BH HCl Rinse + Water Cont. 5C µg	Total Sample µg	Total Blank Correction µg	Total Net Sample µg
Run 1	< 0.0219	0.135	0.00928	0.213	0.0201	0.3774	0.2623	0.1151
Lab ID	23-S684	23-S685	23-S686	23-S687	23-S688			
Run 2	0.0250	0.196	0.00998	0.124	0.0196	0.3746	0.2623	0.1123
Lab ID	23-S689	23-S690	23-S691	23-S692	23-S693			
Run 3	< 0.0219	0.215	0.00998	0.175	0.0196	0.4415	0.2623	0.1792
Lab ID	23-S694	23-S695	23-S696	23-S697	23-S698			

Blank Rules: < indicates value is below the method detection limit (MDL)
If blank is '<' it is treated as zero.
If sample is '<' it is used for emission rate calculations but results are preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.
If the total blank correction value is less than or equal to 0.6 µg, subtract the total blank correction value from the total sample value to determine total net Hg. Otherwise, the value used for the blank correction shall be the greater of (1) 0.6 µg or (2) the lesser of [total FH blank + total BH blank] or 5% of the total sample value

EPA Method 29
Gas Stream Characteristics
Test Summary

Client: Eagle Foundry Company
Source: Cooling Bunker BH Inlet - Steel Alloy
Location: Eagle Creek, OR

Parameter	Units	Run 1	Run 2	Run 3	
Date		3/27/2023	3/28/2023	3/29/2023	
Run Start Time		13:00	10:30	10:35	
Run End Time		17:10	14:40	14:45	
Duration	minutes	250	250	250	Average
Barometric Pressure	inHg	29.79	29.38	29.45	29.54
Nozzle Diameter	inches	0.250	0.250	0.250	0.250
Isokinetic Average	%	99.0	101.2	100.9	100.4
Sample Volume	dscf	291.103	274.533	295.936	287.191
Sample Volume	dscm	8.243	7.774	8.380	8.132
Stack Diameter	inches	48.00	48.00	48.00	48.00
Stack Area	ft ²	12.566	12.566	12.566	12.566
CO ₂	%vd	0.09	0.09	0.06	0.08
O ₂	%vd	20.64	20.84	20.90	20.79
Static Pressure	inH ₂ O	-0.90	-0.90	-0.90	-0.90
H ₂ O	%v	0.28	0.69	0.69	0.55
Wet Molecular Weight	lb/lb-mole	28.81	28.78	28.78	28.79
Velocity	fps	57.67	53.76	57.96	56.46
Flow Rate	adcfm	43,359	40,253	43,398	42,337
	acfm	43,481	40,533	43,700	42,571
	dscfm	43,321	39,968	43,227	42,172
Stack Temperature	°F	65.0	61.0	60.6	62.2
Production Data	lb melt/pour	12,201.579	12,201.119	12,077.535	
	ton melt/pour	6.101	6.101	6.039	
	lb Cr/melt	209.764	201.394	201.494	
	ton Cr/melt	0.105	0.101	0.101	
	lb Mn/melt	834.059	834.082	822.739	
	ton Mn/melt	0.417	0.417	0.411	
	lb Ni/Pour	74.327	70.459	69.572	
	ton Ni/Pour	0.037	0.035	0.035	

Run 1											
Analyte	Total				FH Net			BH Net			
	µg	µg/dscm	lb/hr	lb/ton melt	µg	µg/dscm	lb/hr	µg	µg/dscm	lb/hr	
Aluminum	3138.275	380.720	6.18E-02	4.22E-02	3111.200	377.435	6.12E-02	27.075	3.285	5.33E-04	Al
Antimony	< 1.015	< 0.123	< 2.00E-05	< 1.36E-05	0.420	0.051	8.27E-06	< 0.595	< 0.072	< 1.17E-05	Sb
Arsenic	< 10.093	< 1.224	< 1.99E-04	< 1.36E-04	9.260	1.123	1.82E-04	< 0.833	< 0.101	< 1.64E-05	As
Barium	17.153	2.081	3.38E-04	2.31E-04	16.423	1.992	3.23E-04	0.730	0.089	1.44E-05	Ba
Beryllium	< 0.098	< 0.012	< 1.93E-06	< 1.32E-06	0.074	0.009	1.46E-06	< 0.024	< 0.003	< 4.72E-07	Be
Cadmium	3.689	0.448	7.26E-05	4.96E-05	0.339	0.041	6.67E-06	3.350	0.406	6.59E-05	Cd
Chromium	74.637	9.055	1.47E-03		74.070	8.986	1.46E-03	0.567	0.069	1.12E-05	Cr
Cobalt	0.404	0.049	7.95E-06	5.43E-06	0.404	0.049	7.95E-06	0.000	0.000	0.00E+00	Co
Copper	30.840	3.741	6.07E-04	4.15E-04	29.800	3.615	5.87E-04	1.040	0.126	2.05E-05	Cu
Lead	37.633	4.565	7.41E-04	5.06E-04	37.000	4.489	7.28E-04	0.633	0.077	1.25E-05	Pb
Manganese	2580.162	313.012	5.08E-02		2579.259	312.903	5.08E-02	0.903	0.110	1.78E-05	Mn
Mercury	< 0.115	< 0.014	< 2.27E-06	< 1.55E-06							Hg
Nickel	6.570	0.797	1.29E-04		5.960	0.723	1.17E-04	0.610	0.074	1.20E-05	Ni
Phosphorus	42.130	5.111	8.29E-04	5.66E-04	37.870	4.594	7.45E-04	4.260	0.517	8.39E-05	P
Selenium	< 5.530	< 0.671	< 1.09E-04	< 7.43E-05	< 3.750	< 0.455	< 7.38E-05	< 1.780	< 0.216	< 3.50E-05	Se
Silver	< 3.558	< 0.432	< 7.00E-05	< 4.78E-05	3.320	0.403	6.54E-05	< 0.238	< 0.029	< 4.69E-06	Ag
Thallium	< 3.690	< 0.448	< 7.26E-05	< 4.96E-05	< 2.500	< 0.303	< 4.92E-05	< 1.190	< 0.144	< 2.34E-05	Tl
Vanadium	< 1.239	< 0.150	< 2.44E-05	< 1.67E-05	1.120	0.136	2.20E-05	< 0.119	< 0.014	< 2.34E-06	V
Zinc	362.497	43.976	7.14E-03	4.87E-03	358.480	43.489	7.06E-03	4.017	0.487	7.91E-05	Zn

Chromium	lb Cr / ton Cr in melt =	5.84E-02	Run 1 Emission Factors
Manganese	lb Mn / ton Mn in melt =	5.07E-01	
Nickel	lb Ni / ton Ni in melt =	1.45E-02	

Run 2											
Analyte	Total				FH Net			BH Net			
	µg	µg/dscm	lb/hr	lb/ton melt	µg	µg/dscm	lb/hr	µg	µg/dscm	lb/hr	
Aluminum	5448.370	700.845	1.05E-01	7.17E-02	5421.200	697.350	1.04E-01	27.170	3.495	5.23E-04	Al
Antimony	< 2.255	< 0.290	< 4.34E-05	< 2.97E-05	1.660	0.214	3.20E-05	< 0.595	< 0.077	< 1.15E-05	Sb
Arsenic	< 13.533	< 1.741	< 2.61E-04	< 1.78E-04	12.700	1.634	2.45E-04	< 0.833	< 0.107	< 1.60E-05	As
Barium	30.203	3.885	5.82E-04	3.97E-04	26.323	3.386	5.07E-04	3.880	0.499	7.47E-05	Ba
Beryllium	< 0.134	< 0.017	< 2.58E-06	< 1.76E-06	0.110	0.014	2.12E-06	< 0.024	< 0.003	< 4.62E-07	Be
Cadmium	1.650	0.212	3.18E-05	2.17E-05	0.630	0.081	1.21E-05	1.020	0.131	1.96E-05	Cd
Chromium	52.904	6.805	1.02E-03		52.270	6.724	1.01E-03	0.634	0.082	1.22E-05	Cr
Cobalt	0.571	0.073	1.10E-05	7.51E-06	0.571	0.073	1.10E-05	0.000	0.000	0.00E+00	Co
Copper	47.153	6.065	9.08E-04	6.20E-04	46.200	5.943	8.90E-04	0.953	0.123	1.84E-05	Cu
Lead	< 44.595	< 5.736	< 8.59E-04	< 5.87E-04	44.000	5.660	8.47E-04	< 0.595	< 0.077	< 1.15E-05	Pb
Manganese	2152.462	276.880	4.15E-02		2149.259	276.468	4.14E-02	3.203	0.412	6.17E-05	Mn
Mercury	< 0.112	< 0.014	< 2.16E-06	< 1.48E-06							Hg
Nickel	8.060	1.037	1.55E-04		6.840	0.880	1.32E-04	1.220	0.157	2.35E-05	Ni
Phosphorus	< 55.550	< 7.146	< 1.07E-03	< 7.31E-04	53.170	6.839	1.02E-03	< 2.380	< 0.306	< 4.58E-05	P
Selenium	< 5.535	< 0.712	< 1.07E-04	< 7.28E-05	< 3.750	< 0.482	< 7.22E-05	< 1.785	< 0.230	< 3.44E-05	Se
Silver	< 2.248	< 0.289	< 4.33E-05	< 2.96E-05	2.010	0.259	3.87E-05	< 0.238	< 0.031	< 4.58E-06	Ag
Thallium	< 3.690	< 0.475	< 7.11E-05	< 4.85E-05	< 2.500	< 0.322	< 4.81E-05	< 1.190	< 0.153	< 2.29E-05	Tl
Vanadium	< 2.109	< 0.271	< 4.06E-05	< 2.77E-05	1.990	0.256	3.83E-05	< 0.119	< 0.015	< 2.29E-06	V
Zinc	365.957	47.074	7.05E-03	4.81E-03	362.480	46.627	6.98E-03	3.477	0.447	6.70E-05	Zn

Chromium	lb Cr / ton Cr in melt =	4.22E-02	Run 2 Emission Factors
Manganese	lb Mn / ton Mn in melt =	4.14E-01	
Nickel	lb Ni / ton Ni in melt =	1.84E-02	

Note: Results for Hg front half and back half fractions are not shown because these values are not blank-corrected. Per EPA Method 29, only the sum of Hg front and back half results is subject to blank correction.

'<' denotes results which were calculated using the method detection limit for front half or back half results that were non-detect.

Run 3										
Analyte	Total				FH Net			BH Net		
	µg	µg/dscm	lb/hr	lb/ton melt	µg	µg/dscm	lb/hr	µg	µg/dscm	lb/hr
Aluminum	5650.270	674.257	1.09E-01	7.53E-02	5621.200	670.788	1.09E-01	29.070	3.469	5.62E-04
Antimony	< 2.350	< 0.280	< 4.54E-05	< 3.13E-05	1.770	0.211	3.42E-05	< 0.580	< 0.069	< 1.12E-05
Arsenic	< 17.012	< 2.030	< 3.29E-04	< 2.27E-04	16.200	1.933	3.13E-04	< 0.812	< 0.097	< 1.57E-05
Barium	28.523	3.404	5.51E-04	3.80E-04	24.923	2.974	4.82E-04	3.600	0.430	6.96E-05
Beryllium	< 0.128	< 0.015	< 2.47E-06	< 1.71E-06	0.105	0.013	2.03E-06	< 0.023	< 0.003	< 4.44E-07
Cadmium	0.967	0.115	1.87E-05	1.29E-05	0.686	0.082	1.33E-05	0.281	0.034	5.43E-06
Chromium	48.262	5.759	9.32E-04		48.070	5.736	9.29E-04	0.192	0.023	3.71E-06
Cobalt	0.481	0.057	9.29E-06	6.41E-06	0.481	0.057	9.29E-06	0.000	0.000	0.00E+00
Copper	< 51.680	< 6.167	< 9.99E-04	< 6.89E-04	51.100	6.098	9.87E-04	< 0.580	< 0.069	< 1.12E-05
Lead	46.905	5.597	9.06E-04	6.25E-04	46.000	5.489	8.89E-04	0.905	0.108	1.75E-05
Manganese	2102.802	250.931	4.06E-02		2089.259	249.315	4.04E-02	13.543	1.616	2.62E-04
Mercury	< 0.179	< 0.021	< 3.46E-06	< 2.39E-06						
Nickel	7.692	0.918	1.49E-04		7.140	0.852	1.38E-04	0.552	0.066	1.07E-05
Phosphorus	< 71.790	< 8.567	< 1.39E-03	< 9.57E-04	69.470	8.290	1.34E-03	< 2.320	< 0.277	< 4.48E-05
Selenium	< 5.490	< 0.655	< 1.06E-04	< 7.32E-05	< 3.750	< 0.447	< 7.25E-05	< 1.740	< 0.208	< 3.36E-05
Silver	< 2.042	< 0.244	< 3.95E-05	< 2.72E-05	1.810	0.216	3.50E-05	< 0.232	< 0.028	< 4.48E-06
Thallium	< 3.660	< 0.437	< 7.07E-05	< 4.88E-05	< 2.500	< 0.298	< 4.83E-05	< 1.160	< 0.138	< 2.24E-05
Vanadium	< 2.006	< 0.239	< 3.88E-05	< 2.67E-05	1.890	0.226	3.65E-05	< 0.116	< 0.014	< 2.24E-06
Zinc	427.807	51.051	8.27E-03	5.70E-03	426.480	50.893	8.24E-03	1.327	0.158	2.56E-05

Chromium	lb Cr / ton Cr in melt =	3.86E-02	Run 3 Emission Factors
Manganese	lb Mn / ton Mn in melt =	4.12E-01	
Nickel	lb Ni / ton Ni in melt =	1.78E-02	

Mean Runs 1-3										
Analyte	Total				FH Net			BH Net		
	µg	µg/dscm	lb/hr	lb/ton melt	µg	µg/dscm	lb/hr	µg	µg/dscm	lb/hr
Aluminum	4745.638	585.274	9.20E-02	6.31E-02	4717.867	581.858	9.14E-02	27.772	3.416	5.39E-04
Antimony	< 1.873	< 0.231	< 3.63E-05	< 2.49E-05	1.283	0.159	2.48E-05	< 0.590	< 0.073	< 1.15E-05
Arsenic	< 13.546	< 1.665	< 2.63E-04	< 1.80E-04	12.720	1.563	2.47E-04	< 0.826	< 0.102	< 1.60E-05
Barium	25.293	3.123	4.90E-04	3.36E-04	22.556	2.784	4.37E-04	2.736	0.339	5.29E-05
Beryllium	< 0.120	< 0.015	< 2.33E-06	< 1.60E-06	0.096	0.012	1.87E-06	< 0.024	< 0.003	< 4.59E-07
Cadmium	2.102	0.258	4.10E-05	2.81E-05	0.552	0.068	1.07E-05	1.550	0.190	3.03E-05
Chromium	58.601	7.206	1.14E-03		58.137	7.149	1.13E-03	0.464	0.058	9.03E-06
Cobalt	0.485	0.060	9.41E-06	6.45E-06	0.485	0.060	9.41E-06	0.000	0.000	0.00E+00
Copper	< 43.224	< 5.325	< 8.38E-04	< 5.75E-04	42.367	5.219	8.21E-04	< 0.858	< 0.106	< 1.67E-05
Lead	< 43.044	< 5.300	< 8.35E-04	< 5.73E-04	42.333	5.213	8.21E-04	< 0.711	< 0.087	< 1.38E-05
Manganese	2278.475	280.274	4.43E-02		2272.592	279.562	4.42E-02	5.883	0.713	1.14E-04
Mercury	< 0.136	< 0.017	< 2.63E-06	< 1.80E-06						
Nickel	7.441	0.917	1.44E-04		6.647	0.818	1.29E-04	0.794	0.099	1.54E-05
Phosphorus	< 56.490	< 6.941	< 1.10E-03	< 7.51E-04	53.503	6.575	1.04E-03	< 2.987	< 0.367	< 5.82E-05
Selenium	< 5.518	< 0.679	< 1.07E-04	< 7.34E-05	< 3.750	< 0.462	< 7.28E-05	< 1.768	< 0.218	< 3.43E-05
Silver	< 2.616	< 0.321	< 5.09E-05	< 3.49E-05	2.380	0.292	4.63E-05	< 0.236	< 0.029	< 4.58E-06
Thallium	< 3.680	< 0.453	< 7.15E-05	< 4.90E-05	< 2.500	< 0.308	< 4.86E-05	< 1.180	< 0.145	< 2.29E-05
Vanadium	< 1.785	< 0.220	< 3.46E-05	< 2.37E-05	1.667	0.206	3.23E-05	< 0.118	< 0.015	< 2.29E-06
Zinc	385.420	47.367	7.48E-03	5.13E-03	382.480	47.003	7.43E-03	2.940	0.364	5.72E-05

Chromium	lb Cr / ton Cr in melt =	4.64E-02	Mean Runs 1-3
Manganese	lb Mn / ton Mn in melt =	4.44E-01	
Nickel	lb Ni / ton Ni in melt =	1.69E-02	

Note: Results for Hg front half and back half fractions are not shown because these values are not blank-corrected. Per EPA Method 29, only the sum of Hg front and back half results is subject to blank correction.

'<' denotes results which were calculated using the method detection limit for front half or back half results that were non-detect.



COMPANY	Eagle Foundry Company
FACILITY	Eagle Foundry
LOCATION	Eagle Creek, OR
SOURCE	Cooling Bunker BH Outlet - Steel Alloy
DATE	3/27/2023 - 3/29/2023
METHOD	29
POLLUTANT	Metals

EPA Method 1
Stack Parameters and Traverse Points

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Cooling Bunker BH Outlet - Steel Alloy
Facility: Eagle Foundry

Type of Testing: P (P for Particulate; V for Velocity/Nonparticulate)
Type of Duct: C (C for circular; R for rectangular)

Number of ports available: 2
Number of ports to be used: 2
Port diameter: 4 inches
Sampling location height (approx.): feet
Stack height (approx.): feet

Circular ID (Rectangular Depth): 55.75 inches
Port depth and/or wall thickness: 6.50 inches
Stack width (Rectangular only): inches

Equivalent Diameter
If rectangular = $\frac{2 * \text{Depth} * \text{Width}}{\text{Depth} + \text{Width}}$ = 55.75 inches (If circular = duct ID)

Stack/duct area = 16.952 sq.feet 2441.1 sq. inches

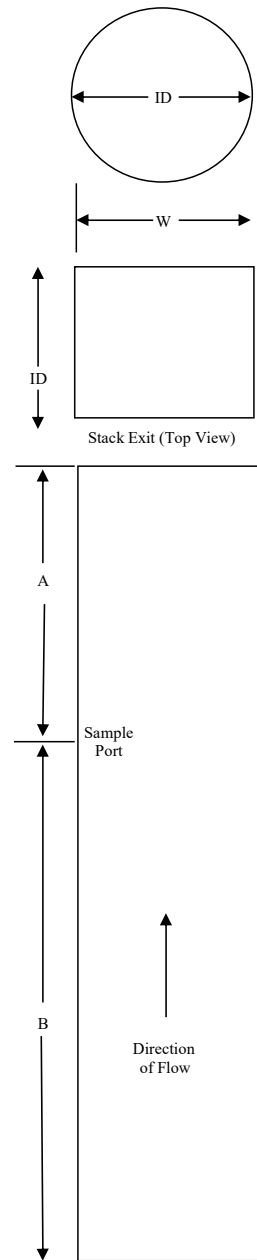
Sample Port Location: Downstream flow disturbance from process Upstream flow disturbance toward exit
Number of Inches: 246.00 45.00
Number of Diameters: 4.41 0.81

Minimum Number of Traverse Points: 24

Traverse points less than 1.0 inch from the stack wall are relocated to a distance of 1.0 inch.

Points	% of diameter	Distance from inside wall (in.)	Distance including port (in.)
1	2.1	1.17	7 5/8
2	6.7	3.74	10 1/4
3	11.8	6.58	13 1/8
4	17.7	9.87	16 3/8
5	25.0	13.94	20 1/2
6	35.6	19.85	26 3/8
7	64.4	35.90	42 3/8
8	75.0	41.81	48 3/8
9	82.3	45.88	52 3/8
10	88.2	49.17	55 5/8
11	93.3	52.01	58 1/2
12	97.9	54.58	61 1/8

Reference Diagram



Drawing NOT to scale and NOT an accurate representation of stack.

Pre-Test Traverse

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Cooling Bunker BH Outlet - Steel Alloy

Stack Temp: 58 °F

Traverse Point	Velocity ΔP ("H ₂ O)	Null Angle
1	0.67	0
2	0.71	5
3	0.73	0
4	0.69	5
5	0.65	5
6	0.69	0
7	0.72	5
8	0.76	0
9	0.75	5
10	0.72	0
11	0.71	5
12	0.62	5

Average: 0.70 3

Flow is found to be: Non-cyclonic

Isokinetic Field Data
Field Data Entry

Client: Eagle Foundry Company **Run:** 1
Location: Eagle Creek, OR **Start Time:** 13:00
Source: Cooling Bunker BH Outlet - Steel Alloy **End Time:** 17:10
EPA Method: 29 **Environmental Conditions/Test Notes:** **Date:** 3/27/2023
Box Operator: JCR Overcast and 40°F
Technician(s): AJV Stopped at approximately 4 hours because melting and pouring was completed, cooling was sampled for approximately 1 hour similar to white iron.

Stack Dimensional Data:

Circular		Meterbox ID	12	Probe ID	7C	Liner type	GLASS
Diameter	55.750 in	Y factor	1.0267	Nozzle ID	0.266	Nozzle size	0.266 inches
Rectangular		ΔH@	1.8	Hot box ID	HHB4	Nozzle area	0.000386 sq.ft.
Width	in	Bp ID	TS1	Pitot Cp	0.84	Probe heat	250 °F
Length	in	Balance ID	HLN FB-1	Pitot ID	7C	Filter heat	250 °F
Stack Area	16.952 sq.ft.	Weights ID	HLN FW-1	Probe Length, ft	7		

Equipment:

Source Information:

Barometric Pressure	29.89 "Hg	O ₂	20.90 %
Static Pressure	1 "H ₂ O	CO ₂	0.00 %
Ave. ΔP	0.7 "H ₂ O	Rec. Nz.	0.222 inches
Stack Temperature	58 °F		
Assumed moisture	0.50 %		
Assumed meter temp.	60 °F		
Total number of points	20		
Time per point	12.5 min.		
Total run time	250 min.		

Leak Checks:

	Pre-test	Post-test
Pitot	X	X
Leak rate, dcf	0.000	0.000
Leak check vacuum, "Hg	10	10

Nozzle check for roundness:

1	2	3
0.265	0.267	0.267 inches
Caliper ID	WS1	

Post Test Calculations:

Sample volume	234.771 dcf	Ave. ΔP	0.554 "H ₂ O
Wet mol. weight	28.78 M _s (actual)	Ave. √ΔP	0.744 "H ₂ O
Actual H ₂ O	0.55 %	Ave. ΔH	3.04 "H ₂ O
Std. meter vol.	241.322 dscf	Ave. T _s	69.2 °F
Isokinetic Average	100.2 %	Ave. T _m	70.8 °F

Moisture/Lab:

Filter, #	N/A		
	Initial	Final	Gain
Impingers, g	3,456.2	3,443.0	-13.2
Silica gel, g	864.5	906.1	41.6
	Total water gain, g:		28.4

Traverse Point	Time (min.)	Meter Volume (dcf)	Velocity ΔP ("H ₂ O)	Stack Temp. (°F)	Meter Temp. (°F)	Calc. ΔH	Run ΔH	Vacuum ("Hg)	Filter Box (°F)	Condenser Temp (≤68°F)
1	12.5	11.270	0.50	66	68	2.75	2.75	4	255	68
2	25.0	22.820	0.55	66	67	3.02	3.00	4	255	67
3	37.5	35.030	0.61	71	68	3.32	3.30	4	254	51
4	50.0	46.540	0.53	72	69	2.89	2.90	4	260	50
5	62.5	58.260	0.55	72	69	3.00	3.00	4	255	49
6	75.0	70.150	0.58	71	70	3.17	3.15	4	252	50
7	87.5	81.730	0.53	71	71	2.90	2.90	4	252	51
8	100.0	92.880	0.57	71	71	3.12	3.15	4	252	50
9	112.5	104.670	0.55	70	71	3.02	3.00	4	249	49
10	125.0	116.660	0.56	69	72	3.09	3.10	4	252	49
11	137.5	128.540	0.57	69	72	3.14	3.15	4	248	50
12	150.0	139.820	0.51	69	72	2.81	2.80	4	257	49
13	162.5	151.150	0.51	69	72	2.81	2.80	4	257	50
14	175.0	163.570	0.60	70	72	3.30	3.30	4	246	50
15	187.5	176.380	0.64	70	72	3.52	3.50	4	254	49
16	200.0	188.700	0.64	69	72	3.53	3.55	4	252	50
17	212.5	200.100	0.51	68	72	2.82	2.80	4	256	50
18	225.0	211.850	0.52	68	72	2.87	2.90	4	254	49
19	237.5	223.330	0.54	67	72	2.99	3.00	4	255	50
20	250.0	234.771	0.50	66	72	2.77	2.75	4	255	49

Isokinetic Field Data
Field Data Entry

Client:	Eagle Foundry Company	Run:	2
Location:	Eagle Creek, OR	Start Time:	10:30
Source:	Cooling Bunker BH Outlet - Steel Alloy	End Time:	14:40
EPA Method:	29	Environmental Conditions/Test Notes:	Date: 3/28/2023
Box Operator:	JCR	Overcast and 40°F	
Technician(s):	AJV		

Stack Dimensional Data:		Equipment:					
Circular		Meterbox ID	12	Probe ID	7C	Liner type	GLASS
Diameter	55.750 in	Y factor	1.0267	Nozzle ID	0.266	Nozzle size	0.266 inches
Rectangular		ΔH@	1.8	Hot box ID	HHB4	Nozzle area	0.000386 sq.ft.
Width	in	Bp ID	TS1	Pitot Cp	0.84	Probe heat	250 °F
Length	in	Balance ID	HLN FB-1	Pitot ID	7C	Filter heat	250 °F
Stack Area	16.952 sq.ft.	Weights ID	HLN FW-1	Probe Length, ft	7		

Source Information:				Leak Checks:		
Barometric Pressure	29.38 "Hg	O ₂	20.90 %		Pre-test	Post-test
Static Pressure	1 "H ₂ O	CO ₂	0.00 %	Pitot	X	X
Ave. ΔP	0.7 "H ₂ O	Rec. Nz.	0.219 inches	Leak rate, dcf	0.000	0.000
Stack Temperature	58 °F			Leak check vacuum, "Hg	10	10
Assumed moisture	0.55 %			Nozzle check for roundness:		
Assumed meter temp.	70.8 °F			1	2	3
Total number of points	20			0.265	0.267	0.267 inches
Time per point	12.5 min.			Caliper ID		
Total run time	250 min.			WS1		

Post Test Calculations:				Moisture/Lab:			
Sample volume	229.677 dcf	Ave. ΔP	0.530 "H ₂ O	Filter, #	N/A		
Wet mol. weight	28.74 M _s (actual)	Ave. √ΔP	0.727 "H ₂ O		Initial	Final	Gain
Actual H ₂ O	0.94 %	Ave. ΔH	2.91 "H ₂ O	Impingers, g	3,468.2	3,479.2	11.0
Std. meter vol.	233.772 dscf	Ave. T _s	65.4 °F	Silica gel, g	858.9	894.8	35.9
Isokinetic Average	100.2 %	Ave. T _m	66.8 °F	Total water gain:			46.9

Traversal Point	Time (min.)	Meter Volume (dcf)	Velocity ΔP ("H ₂ O)	Stack Temp. (°F)	Meter Temp. (°F)	Calc. ΔH	Run ΔH	Vacuum ("Hg)	Filter Box (°F)	Condenser Temp (≤68°F)
1	12.5	11.500	0.50	56	66	2.79	2.80	3	258	39
2	25.0	22.830	0.51	57	66	2.84	2.85	3	255	39
3	37.5	34.380	0.53	58	67	2.95	2.95	3	250	42
4	50.0	45.660	0.50	66	67	2.74	2.75	3	249	43
5	62.5	56.850	0.51	64	67	2.81	2.80	3	249	42
6	75.0	69.170	0.60	65	68	3.31	3.30	3.5	253	43
7	87.5	81.230	0.59	65	68	3.25	3.25	3.5	252	44
8	100.0	92.990	0.56	65	67	3.08	3.10	3.5	253	44
9	112.5	105.490	0.62	65	65	3.40	3.40	3.5	256	43
10	125.0	117.590	0.60	65	66	3.29	3.30	3.5	255	44
11	137.5	128.650	0.49	65	65	2.68	2.70	3	253	44
12	150.0	139.770	0.50	65	66	2.74	2.75	3	265	46
13	162.5	150.880	0.50	66	65	2.73	2.70	3	256	46
14	175.0	162.110	0.50	66	67	2.74	2.70	3	253	46
15	187.5	172.950	0.48	66	66	2.63	2.60	3	253	47
16	200.0	184.180	0.49	67	67	2.68	2.70	3	256	46
17	212.5	195.050	0.48	69	68	2.62	2.60	3	253	47
18	225.0	206.580	0.55	72	69	3.00	3.00	3.5	252	47
19	237.5	218.610	0.59	75	68	3.19	3.20	3.5	251	47
20	250.0	229.677	0.50	70	68	2.73	2.75	3	252	47

**Isokinetic Field Data
Field Data Entry**

Client:	Eagle Foundry Company	Run:	3
Location:	Eagle Creek, OR	Start Time:	10:35
Source:	Cooling Bunker BH Outlet - Steel Alloy	End Time:	14:45
EPA Method:	29	Environmental Conditions/Test Notes:	Date: 3/29/2023
Box Operator:	JCR	Overcast and 40°F	
Technician(s):	AJV		

Stack Dimensional Data:		Equipment:					
Circular		Meterbox ID	12	Probe ID	7C	Liner type	GLASS
Diameter	55.750 in	Y factor	1.0267	Nozzle ID	0.266	Nozzle size	0.266 inches
Rectangular		ΔH@	1.8	Hot box ID	HHB4	Nozzle area	0.000386 sq.ft.
Width	in	Bp ID	TS1	Pitot Cp	0.84	Probe heat	250 °F
Length	in	Balance ID	HLN FB-1	Pitot ID	7C	Filter heat	250 °F
Stack Area	16.952 sq.ft.	Weights ID	HLN FW-1	Probe Length, ft	7		

Source Information:				Leak Checks:		
Barometric Pressure	29.45 "Hg	O ₂	20.90 %	Pitot	Pre-test	Post-test
Static Pressure	1 "H ₂ O	CO ₂	0.00 %	Leak rate, dcf	0.000	0.000
Ave. ΔP	0.7 "H ₂ O	Rec. Nz.	0.22 inches	Leak check vacuum, "Hg	10	10
Stack Temperature	58 °F					
Assumed moisture	0.94 %					
Assumed meter temp.	66.8 °F					
Total number of points	20					
Time per point	12.5 min.					
Total run time	250 min.					

Nozzle check for roundness:			
1	2	3	
0.265	0.267	0.267 inches	
	Caliper ID	WS1	

Post Test Calculations:				Moisture/Lab:			
Sample volume	232.713 dcf	Ave. ΔP	0.544 "H ₂ O	Filter, #	N/A		
Wet mol. weight	28.7 M _s (actual)	Ave. √ΔP	0.737 "H ₂ O				
Actual H ₂ O	1.30 %	Ave. ΔH	2.965 "H ₂ O	Impingers, g	3,487.6	3,514.5	26.9
Std. meter vol.	237.319 dscf	Ave. T _s	66.3 °F	Silica gel, g	884.2	923.4	39.2
Isokinetic Average	100.6 %	Ave. T _m	67.1 °F			Total water gain:	66.1

Traverse Point	Time (min.)	Meter Volume (dcf)	Velocity ΔP ("H ₂ O)	Stack Temp. (°F)	Meter Temp. (°F)	Calc. ΔH	Run ΔH	Vacuum ("Hg)	Filter Box (°F)	Condenser Temp (≤68°F)
		0.000								
1	12.5	12.600	0.58	54	64	3.22	3.20	3	255	41
2	25.0	25.280	0.58	55	63	3.21	3.20	3	253	42
3	37.5	36.900	0.57	60	62	3.11	3.10	3	253	45
4	50.0	48.580	0.57	64	63	3.10	3.10	3	242	47
5	62.5	60.170	0.53	64	64	2.88	2.90	2.5	253	48
6	75.0	71.490	0.52	63	64	2.84	2.85	2.5	253	48
7	87.5	83.080	0.55	65	64	2.99	3.00	2.5	245	49
8	100.0	94.690	0.55	64	65	3.00	3.00	2.5	255	50
9	112.5	106.480	0.57	64	65	3.11	3.10	3	247	50
10	125.0	118.240	0.53	63	66	2.90	2.90	3	252	49
11	137.5	129.890	0.55	65	66	3.00	3.00	2.5	255	52
12	150.0	141.650	0.55	67	67	2.99	3.00	2.5	257	55
13	162.5	153.590	0.57	69	69	3.10	3.10	2.5	252	56
14	175.0	164.980	0.57	69	69	3.10	3.10	2.5	266	57
15	187.5	176.760	0.54	69	70	2.94	2.95	2.5	258	57
16	200.0	187.740	0.50	73	71	2.71	2.70	2.5	250	59
17	212.5	198.930	0.52	75	71	2.81	2.80	2.5	258	52
18	225.0	210.070	0.51	76	72	2.75	2.75	2.5	257	52
19	237.5	221.250	0.51	74	73	2.77	2.75	2.5	256	52
20	250.0	232.713	0.51	73	74	2.78	2.80	2.5	252	52

EPA Method 4
Impinger Weights Summary

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Cooling Bunker BH Outlet - Steel Alloy
EPA Method: 29
Box Operator: JCR
Technician(s): AJV

Run 1

Impinger gain by weight (g):

#	Initial	Final	Gain
1	730.1	702.3	-27.8
2	699.2	708.2	9.0
3	622.4	628.0	5.6
4	670.6	670.3	-0.3
5	733.9	734.2	0.3
Totals:	3,456.2	3,443.0	-13.2

Run 2

Impinger gain by weight (g):

#	Initial	Final	Gain
1	735.7	704.2	-31.5
2	705.1	736.5	31.4
3	628.7	635.2	6.5
4	736.8	740.4	3.6
5	661.9	662.9	1.0
Totals:	3,468.2	3,479.2	11.0

Run 3

Impinger gain by weight (g):

#	Initial	Final	Gain
1	741.2	698.9	-42.3
2	710.7	742.3	31.6
3	627.6	656.5	28.9
4	740.1	746.1	6.0
5	668.0	670.7	2.7
Totals:	3,487.6	3,514.5	26.9

Isokinetic Field Data
Field Data and Calculations
Gas Stream Characteristics

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Cooling Bunker BH Outlet - Steel Alloy
Method: 29

Run: 1
Start Time: 13:00
End Time: 17:10
Date: 3/27/2023

Sampling Data				Traverse Data			
Time min.	Meter ft ³	ΔH "H ₂ O	Meter T _m °F	Traverse Point	Dp "H ₂ O	Stack T _s °F	$\sqrt{Dp}$
	0.000						
12.5	11.270	2.75	68	1	0.50	66	0.707
25.0	22.820	3.00	67	2	0.55	66	0.742
37.5	35.030	3.30	68	3	0.61	71	0.781
50.0	46.540	2.90	69	4	0.53	72	0.728
62.5	58.260	3.00	69	5	0.55	72	0.742
75.0	70.150	3.15	70	6	0.58	71	0.762
87.5	81.730	2.90	71	7	0.53	71	0.728
100.0	92.880	3.15	71	8	0.57	71	0.755
112.5	104.670	3.00	71	9	0.55	70	0.742
125.0	116.660	3.10	72	10	0.56	69	0.748
137.5	128.540	3.15	72	11	0.57	69	0.755
150.0	139.820	2.80	72	12	0.51	69	0.714
162.5	151.150	2.80	72	13	0.51	69	0.714
175.0	163.570	3.30	72	14	0.60	70	0.775
187.5	176.380	3.50	72	15	0.64	70	0.800
200.0	188.700	3.55	72	16	0.64	69	0.800
212.5	200.100	2.80	72	17	0.51	68	0.714
225.0	211.850	2.90	72	18	0.52	68	0.721
237.5	223.330	3.00	72	19	0.54	67	0.735
250.0	234.771	2.75	72	20	0.50	66	0.707

Client:	Eagle Foundry Company	Run:	1
Source:	Cooling Bunker BH Outlet - Steel Alloy	Date:	03/27/23

Field Data Input Continued

Moisture Data

Total Test Time	250.0 min
Sample Time Interval	12.5 min
Meter Volume, V_m	234.771 dcf
Water Mass	28.4 g
Nozzle Diameter, N_z	0.2660 in.
Nozzle Area	0.000386 sq.ft.

Stack Dimensional Data:

Circular	
Diameter	55.750 in
Rectangular	
Width	in
Length	in
Stack Area	16.952 sq.ft.

Traverse Data

Barometric Pressure, P_b	29.89 "Hg
Static Pressure	1.00 "H ₂ O
Pitot Factor, cp	0.84
Meter Cal Factor	1.0267 Y

Molecular Weight:

CO ₂ Average	0.09 %vd
O ₂ Average	20.64 %vd

Field Data Averages

Meter

ΔH	3.040 "H ₂ O
Temperature, T_m	70.8 °F
Temperature, T_m	530.5 °A (°R)
Pressure Meter, P_m	30.114 "Hg

Stack

$\sqrt{Dp}$	0.744 "H ₂ O
Temperature, T_s	69.2 °F
Temperature, T_s	528.9 °A (°R)
Pressure Stack, P_s	29.964 "Hg

Field Data Calculations

Meter Box Capture

Standard Volume, $V_{m(std)}$	241.322 dscf
	6.833 dscm
Actual Volume, $V_{m(actual)}$	242.851 awcf

EPA Method 2 Stack Gas Flowrate:

Velocity, V_s	41.84 fps
Flow Rate (actual), Q_{aw}	42,556 acfm
	42,322 adcfm
Flow Rate (standard), Q	2,551,331 wscf/hr
	2,537,299 dscf/hr
	42,288 dscf/min
	42,522 wscf/min

Gas Stream Moisture

Moisture Vapor, $V_{w(std)}$	1.339 scf
Moisture, B_{ws}	0.0055
Moisture EPA M4	0.55 %v
Moisture @ Saturation	2.40 %v (for $T_s < 212^\circ F$)

EPA Method 3 Gas Density

Dry, M_d	28.84 lb/lb-mole
Wet, M_s	28.78 lb/lb-mole

Percent Isokinetic	100.2 %

Isokinetic Field Data
Field Data and Calculations
Gas Stream Characteristics

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Cooling Bunker BH Outlet - Steel Alloy
Method: 29

Run: 2
Start Time: 10:30
End Time: 14:40
Date: 03/28/23

Sampling Data				Traverse Data			
Time min.	Meter ft ³	ΔH "H ₂ O	Meter T _m °F	Traverse Point	Dp "H ₂ O	Stack T _s °F	$\sqrt{Dp}$
	0.000						
12.5	11.500	2.80	66	1	0.50	56	0.707
25.0	22.830	2.85	66	2	0.51	57	0.714
37.5	34.380	2.95	67	3	0.53	58	0.728
50.0	45.660	2.75	67	4	0.50	66	0.707
62.5	56.850	2.80	67	5	0.51	64	0.714
75.0	69.170	3.30	68	6	0.60	65	0.775
87.5	81.230	3.25	68	7	0.59	65	0.768
100.0	92.990	3.10	67	8	0.56	65	0.748
112.5	105.490	3.40	65	9	0.62	65	0.787
125.0	117.590	3.30	66	10	0.60	65	0.775
137.5	128.650	2.70	65	11	0.49	65	0.700
150.0	139.770	2.75	66	12	0.50	65	0.707
162.5	150.880	2.70	65	13	0.50	66	0.707
175.0	162.110	2.70	67	14	0.50	66	0.707
187.5	172.950	2.60	66	15	0.48	66	0.693
200.0	184.180	2.70	67	16	0.49	67	0.700
212.5	195.050	2.60	68	17	0.48	69	0.693
225.0	206.580	3.00	69	18	0.55	72	0.742
237.5	218.610	3.20	68	19	0.59	75	0.768
250.0	229.677	2.75	68	20	0.50	70	0.707

Client:	Eagle Foundry Company	Run:	2
Source:	Cooling Bunker BH Outlet - Steel Alloy	Date:	03/28/23

Field Data Input Continued

<u>Moisture Data</u>		<u>Stack Dimensional Data:</u>	
Total Test Time	250.0 min	Circular	
Sample Time Interval	12.5 min	Diameter	55.750 in
Meter Volume, V _m	229.677 dcf	Rectangular	
Water Mass	46.9 g	Width	in
Nozzle Diameter, N _z	0.2660 in.	Length	in
Nozzle Area	0.000386 sq.ft.	Stack Area	16.952 sq.ft.

<u>Traverse Data</u>		<u>Molecular Weight:</u>	
Barometric Pressure, P _b	29.38 "Hg	CO ₂ Average	0.09 %vd
Static Pressure	1.00 "H ₂ O	O ₂ Average	20.84 %vd
Pitot Factor, cp	0.84		
Meter Cal Factor	1.0267 Y		

Field Data Averages

<u>Meter</u>		<u>Stack</u>	
ΔH	2.910 "H ₂ O	√Dp	0.727 "H ₂ O
Temperature, T _m	66.8 °F	Temperature, T _s	65.4 °F
Temperature, T _m	526.5 °A (°R)	Temperature, T _s	525.1 °A (°R)
Pressure Meter, P _m	29.594 "Hg	Pressure Stack, P _s	29.454 "Hg

Field Data Calculations

<u>Meter Box Capture</u>		<u>EPA Method 2 Stack Gas Flowrate:</u>	
Standard Volume, V _{m(std)}	233.772 dscf	Velocity, V _s	41.11 fps
	6.620 dscm	Flow Rate (actual), Q _{aw}	41,814 acfm
Actual Volume, V _{m(actual)}	238.542 awcf		41,421 adcfm
<u>Gas Stream Moisture</u>		Flow Rate (standard), Q	2,481,983 wscf/hr
Moisture Vapor, V _{w(std)}	2.212 scf		2,458,652 dscf/hr
Moisture, B _{ws}	0.0094		40,978 dscf/min
Moisture EPA M4	0.94 %v		41,366 wscf/min
Moisture @ Saturation	2.14 %v (for T _s < 212°F)		
<u>EPA Method 3 Gas Density</u>			
Dry, M _d	28.85 lb/lb-mole		
Wet, M _s	28.75 lb/lb-mole		
Percent Isokinetic	100.2 %		

Isokinetic Field Data
Field Data and Calculations
Gas Stream Characteristics

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Cooling Bunker BH Outlet - Steel Alloy
Method: 29

Run: 3
Start Time: 10:35
End Time: 14:45
Date: 03/29/23

Sampling Data				Traverse Data			
Time min.	Meter ft ³	ΔH "H ₂ O	Meter T _m °F	Traverse Point	Dp "H ₂ O	Stack T _s °F	$\sqrt{Dp}$
	0.000						
12.5	12.600	3.20	64	1	0.58	54	0.762
25.0	25.280	3.20	63	2	0.58	55	0.762
37.5	36.900	3.10	62	3	0.57	60	0.755
50.0	48.580	3.10	63	4	0.57	64	0.755
62.5	60.170	2.90	64	5	0.53	64	0.728
75.0	71.490	2.85	64	6	0.52	63	0.721
87.5	83.080	3.00	64	7	0.55	65	0.742
100.0	94.690	3.00	65	8	0.55	64	0.742
112.5	106.480	3.10	65	9	0.57	64	0.755
125.0	118.240	2.90	66	10	0.53	63	0.728
137.5	129.890	3.00	66	11	0.55	65	0.742
150.0	141.650	3.00	67	12	0.55	67	0.742
162.5	153.590	3.10	69	13	0.57	69	0.755
175.0	164.980	3.10	69	14	0.57	69	0.755
187.5	176.760	2.95	70	15	0.54	69	0.735
200.0	187.740	2.70	71	16	0.50	73	0.707
212.5	198.930	2.80	71	17	0.52	75	0.721
225.0	210.070	2.75	72	18	0.51	76	0.714
237.5	221.250	2.75	73	19	0.51	74	0.714
250.0	232.713	2.80	74	20	0.51	73	0.714

Client:	Eagle Foundry Company	Run:	3
Source:	Cooling Bunker BH Outlet - Steel Alloy	Date:	03/29/23

Field Data Input Continued

Moisture Data

Total Test Time	250.0 min
Sample Time Interval	12.5 min
Meter Volume, V_m	232.713 dcf
Water Mass	66.1 g
Nozzle Diameter, N_z	0.2660 in.
Nozzle Area	0.000386 sq.ft.

Stack Dimensional Data:

Circular	
Diameter	55.750 in
Rectangular	
Width	in
Length	in
Stack Area	16.952 sq.ft.

Traverse Data

Barometric Pressure, P_b	29.45 "Hg
Static Pressure	1.00 "H ₂ O
Pitot Factor, cp	0.84
Meter Cal Factor	1.0267 Y

Molecular Weight:

CO ₂ Average	0.06 %vd
O ₂ Average	20.90 %vd

Field Data Averages

Meter

ΔH	2.965 "H ₂ O
Temperature, T_m	67.1 °F
Temperature, T_m	526.8 °A (°R)
Pressure Meter, P_m	29.668 "Hg

Stack

$\sqrt{D_p}$	0.737 "H ₂ O
Temperature, T_s	66.3 °F
Temperature, T_s	526.0 °A (°R)
Pressure Stack, P_s	29.524 "Hg

Field Data Calculations

Meter Box Capture

Standard Volume, $V_{m(std)}$	237.319 dscf
	6.720 dscm
Actual Volume, $V_{m(actual)}$	242.885 awcf

EPA Method 2 Stack Gas Flowrate:

Velocity, V_s	41.69 fps
Flow Rate (actual), Q_{aw}	42,404 acfm
	41,853 adcfm
Flow Rate (standard), Q	2,518,665 wscf/hr
	2,485,922 dscf/hr
	41,432 dscf/min
	41,978 wscf/min

Gas Stream Moisture

Moisture Vapor, $V_{w(std)}$	3.117 scf
Moisture, B_{ws}	0.0130
Moisture EPA M4	1.30 %v
Moisture @ Saturation	2.21 %v (for $T_s < 212^\circ F$)

EPA Method 3 Gas Density

Dry, M_d	28.85 lb/lb-mole
Wet, M_s	28.71 lb/lb-mole

Percent Isokinetic	100.6 %

Eagle Foundry Company
Cooling Bunker BH Outlet - Steel Alloy
Method 29 Laboratory Results

Run: 1
Sample Date: 03/27/23

Analyte	Filter + FH Rinse Cont. 1&3		BH Cap.Soln. + BH Rinse Cont. 4		Units
	< Result	MDL	< Result	MDL	
Aluminum	74.2	7.50	12.1	3.39	µg/sample
Antimony	3.54	1.25	< MDL	0.565	µg/sample
Arsenic	2.63	1.75	< MDL	0.791	µg/sample
Barium	3.30	0.125	0.703	0.056	µg/sample
Beryllium	< MDL	0.050	< MDL	0.023	µg/sample
Cadmium	< MDL	0.100	0.095	0.045	µg/sample
Chromium	1.90	0.200	0.778	0.090	µg/sample
Cobalt	< MDL	0.125	< MDL	0.056	µg/sample
Copper	1.48	1.25	< MDL	0.565	µg/sample
Lead	< MDL	1.25	0.687	0.565	µg/sample
Manganese	5.53	0.075	1.15	0.034	µg/sample
Nickel	4.60	0.750	0.536	0.339	µg/sample
Phosphorus	20.2	5.00	< MDL	2.26	µg/sample
Selenium	< MDL	3.75	< MDL	1.70	µg/sample
Silver	< MDL	0.500	< MDL	0.226	µg/sample
Thallium	< MDL	2.50	< MDL	1.13	µg/sample
Vanadium	< MDL	0.250	< MDL	0.113	µg/sample
Zinc	8.16	0.750	8.71	0.339	µg/sample

Lab ID:	23-S714	23-S715	
Sample Vol:	250	356	ml

Eagle Foundry Company
Cooling Bunker BH Outlet - Steel Alloy
Method 29 Laboratory Results

Run: 3
Sample Date: 03/29/23

Analyte	Filter + FH Rinse Cont. 1&3		BH Cap.Soln. + BH Rinse Cont. 4		Units
	< Result	MDL	< Result	MDL	
Aluminum	79.8	7.50	30.7	3.45	µg/sample
Antimony	2.36	1.25	< MDL	0.575	µg/sample
Arsenic	2.64	1.75	< MDL	0.805	µg/sample
Barium	3.59	0.125	1.85	0.058	µg/sample
Beryllium	< MDL	0.050	< MDL	0.023	µg/sample
Cadmium	< MDL	0.100	0.059	0.046	µg/sample
Chromium	1.35	0.200	0.698	0.092	µg/sample
Cobalt	< MDL	0.125	0.114	0.058	µg/sample
Copper	< MDL	1.25	6.39	0.575	µg/sample
Lead	< MDL	1.25	0.821	0.575	µg/sample
Manganese	5.81	0.075	12.7	0.034	µg/sample
Nickel	4.40	0.750	1.35	0.345	µg/sample
Phosphorus	20.3	5.00	< MDL	2.30	µg/sample
Selenium	< MDL	3.75	< MDL	1.72	µg/sample
Silver	< MDL	0.500	< MDL	0.230	µg/sample
Thallium	< MDL	2.50	< MDL	1.15	µg/sample
Vanadium	< MDL	0.250	< MDL	0.115	µg/sample
Zinc	4.20	0.750	8.61	0.345	µg/sample

Lab ID:	23-S724	23-S725	
Sample Vol:	250	310	ml

Eagle Foundry Company
Cooling Bunker BH Outlet - Steel Alloy
Method 29 Laboratory Results

Run: 2
Sample Date: 03/28/23

Analyte	Filter + FH Rinse Cont. 1&3		BH Cap.Soln. + BH Rinse Cont. 4		Units
	<	Result MDL	<	Result MDL	
Aluminum		89.0 7.50		26.9 3.45	µg/sample
Antimony		3.27 1.25	<	MDL 0.575	µg/sample
Arsenic		2.61 1.75	<	MDL 0.805	µg/sample
Barium		5.00 0.125		1.35 0.058	µg/sample
Beryllium	<	MDL 0.050	<	MDL 0.023	µg/sample
Cadmium	<	MDL 0.100		0.141 0.046	µg/sample
Chromium		1.57 0.200		0.725 0.092	µg/sample
Cobalt	<	MDL 0.125		0.106 0.058	µg/sample
Copper		2.60 1.25		1.74 0.575	µg/sample
Lead		1.56 1.25		1.37 0.575	µg/sample
Manganese		5.54 0.075		2.07 0.034	µg/sample
Nickel		5.68 0.750		1.91 0.345	µg/sample
Phosphorus		20.5 5.00	<	MDL 2.30	µg/sample
Selenium	<	MDL 3.75	<	MDL 1.72	µg/sample
Silver	<	MDL 0.500	<	MDL 0.230	µg/sample
Thallium	<	MDL 2.50	<	MDL 1.15	µg/sample
Vanadium	<	MDL 0.250	<	MDL 0.115	µg/sample
Zinc		7.78 0.750		9.40 0.345	µg/sample

Lab ID:	23-S719	23-S720	
Sample Vol:	250	302	ml

Eagle Foundry Company
Cooling Bunker BH Outlet - Steel Alloy
Method 29 Blank Results

Sample Dates: 3/27/2023
3/28/2023
3/29/2023

Analyte	Filter Cont. 12		BH Cap.Soln. Cont. 9 5% HNO ₃ / 10% H ₂ O ₂		FH/BH Rinse Cont. 8A 0.1 N HNO ₃	
	µg/filter		µg/sample		µg/sample	
	< Result	MDL	< Result	MDL	< Result	MDL
Aluminum	58.8	7.50	16.3	3.78	< MDL	7.50
Antimony	2.86	1.25	< MDL	0.630	< MDL	1.25
Arsenic	< MDL	1.75	< MDL	0.882	< MDL	1.75
Barium	1.40	0.125	0.718	0.063	0.193	0.125
Beryllium	< MDL	0.050	< MDL	0.025	< MDL	0.050
Cadmium	< MDL	0.100	< MDL	0.050	< MDL	0.100
Chromium	1.03	0.200	0.306	0.101	< MDL	0.200
Cobalt	< MDL	0.125	0.153	0.063	< MDL	0.125
Copper	< MDL	1.25	< MDL	0.630	< MDL	1.25
Lead	< MDL	1.25	< MDL	0.630	< MDL	1.25
Manganese	0.741	0.075	0.742	0.038	< MDL	0.375
Nickel	3.96	0.750	< MDL	0.378	< MDL	0.750
Phosphorus	17.0	5.00	< MDL	2.52	< MDL	5.00
Selenium	< MDL	3.75	< MDL	1.89	< MDL	3.75
Silver	< MDL	0.500	< MDL	0.252	< MDL	0.500
Thallium	< MDL	2.50	< MDL	1.26	< MDL	2.50
Vanadium	< MDL	0.250	< MDL	0.126	< MDL	0.250
Zinc	1.52	0.750	0.415	0.378	< MDL	0.750

Lab ID: 23-S729
Blank Vol, ml: N/A

23-S731
196

23-S730
250

Eagle Foundry Company
Cooling Bunker BH Outlet - Steel Alloy
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 1
Test Date: 3/27/2023
Page: 1 of 3

Analyte	I Sample FH Rinse+Filter µg	II Blank Correction FH Rinse µg	III Blank Correction Filter µg	IV Sample BH Cap.Soln. + BH Rinse µg	V Blank BH Cap.Soln. µg/ml	VI Blank Correction BH Cap.Soln. µg	VII Blank Correction BH Rinse µg	VIII Total BH Blank Correction µg	
Aluminum	74.200	0.000	58.800	12.100	0.083	16.633	0.000	16.633	Al
Antimony	3.540	0.000	2.860	<	0.565	0.000	0.000	0.000	Sb
Arsenic	2.630	0.000	0.000	<	0.791	0.000	0.000	0.000	As
Barium	3.300	0.077	1.400		0.703	0.004	0.733	0.077	Ba
Beryllium	<	0.050	0.000	<	0.023	0.000	0.000	0.000	Be
Cadmium	<	0.100	0.000		0.095	0.000	0.000	0.000	Cd
Chromium		1.900	0.000		0.778	0.002	0.312	0.000	Cr
Cobalt	<	0.125	0.000	<	0.056	0.001	0.156	0.000	Co
Copper		1.480	0.000	<	0.565	0.000	0.000	0.000	Cu
Lead	<	1.250	0.000		0.687	0.000	0.000	0.000	Pb
Manganese		5.530	0.000		1.150	0.004	0.757	0.000	Mn
Nickel		4.600	0.000		0.536	0.000	0.000	0.000	Ni
Phosphorus		20.200	0.000	<	2.260	0.000	0.000	0.000	P
Selenium	<	3.750	0.000	<	1.700	0.000	0.000	0.000	Se
Silver	<	0.500	0.000	<	0.226	0.000	0.000	0.000	Ag
Thallium	<	2.500	0.000	<	1.130	0.000	0.000	0.000	Tl
Vanadium	<	0.250	0.000	<	0.113	0.000	0.000	0.000	V
Zinc		8.160	0.000		8.710	0.002	0.423	0.000	Zn

Lab ID:	23-S714	23-S730	23-S729	23-S715	23-S731	N/A	N/A
Notes:	0.1N HNO ₃	0.1N HNO ₃	5% HNO ₃ /10% H ₂ O ₂	5% HNO ₃ /	5% HNO ₃ /	0.1N HNO ₃	
	FH Filter & Probe Rinse		BH Imps 1-3	10% H ₂ O ₂	10% H ₂ O ₂		
	100ml 0.1N HNO ₃ Rinse		100ml .1N HNO ₃ Rinse				
			200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent				

Blank Rules: < indicates value is below the method detection limit (MDL).
If blank is '<' it is treated as zero.
If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Cooling Bunker BH Outlet - Steel Alloy
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 1
Test Date: 3/27/2023
Page: 2 of 3

Analyte	X Allowable FH Blank Correction µg	XI Total FH Blank Correction µg	XII 5% of FH Sample µg	XIII Lessor of XI or XII µg	XIV Greater of A or XIII µg	XV FH Net Sample µg	
Aluminum	11.630	58.800	3.710	3.710	11.63	62.570	Al
Antimony	2.860	2.860	0.177	0.177	11.63	0.680	Sb
Arsenic	0.000	0.000	0.132	0.000	11.63	2.630	As
Barium	1.477	1.477	0.165	0.165	11.63	1.823	Ba
Beryllium	0.000	0.000	< 0.003	0.000	11.63	< 0.050	Be
Cadmium	0.000	0.000	< 0.005	0.000	11.63	< 0.100	Cd
Chromium	1.030	1.030	0.095	0.095	11.63	0.870	Cr
Cobalt	0.000	0.000	< 0.006	0.000	11.63	< 0.125	Co
Copper	0.000	0.000	0.074	0.000	11.63	1.480	Cu
Lead	0.000	0.000	< 0.063	0.000	11.63	< 1.250	Pb
Manganese	0.741	0.741	0.277	0.277	11.63	4.789	Mn
Nickel	3.960	3.960	0.230	0.230	11.63	0.640	Ni
Phosphorus	11.630	17.000	1.010	1.010	11.63	8.570	P
Selenium	0.000	0.000	< 0.188	0.000	11.63	< 3.750	Se
Silver	0.000	0.000	< 0.025	0.000	11.63	< 0.500	Ag
Thallium	0.000	0.000	< 0.125	0.000	11.63	< 2.500	Tl
Vanadium	0.000	0.000	< 0.013	0.000	11.63	< 0.250	V
Zinc	1.520	1.520	0.408	0.408	11.63	6.640	Zn

Note: Allowable FH Blank (A) = (area of filter)*(1.4 µg/in²) = 11.63 µg
where area of filter = 8.306 in²

If A > blank > 0, use blank-derived value, M_{hb}.

If blank > A, use greater of A or [lessor of 5% of sample µg or FH blank].

Blank Rules: < indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Cooling Bunker BH Outlet - Steel Alloy
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 1
Test Date: 3/27/2023
Page: 3 of 3

	XVI Allowable BH Blank Correction	XVII Total BH Blank Correction	XVIII 5% of BH Sample	XIX Lessor of XVII or XVIII	XX Greater of 1 µg or XIX	XXI BH Net Sample	XXII FH Net Sample	XXIII FH+BH Total Net Sample	
Analyte	µg	µg	µg	µg	µg	µg	µg	µg	µg
Aluminum	1.000	16.633	0.605	0.605	1.000	11.100	62.570	73.670	Al
Antimony	0.000	0.000	< 0.028	0.000	1.000	< 0.565	< 0.680	< 1.245	Sb
Arsenic	0.000	0.000	< 0.040	0.000	1.000	< 0.791	< 2.630	< 3.421	As
Barium	0.810	0.810	0.035	0.035	1.000	0.000	1.823	1.823	Ba
Beryllium	0.000	0.000	< 0.001	0.000	1.000	< 0.023	< 0.050	< 0.073	Be
Cadmium	0.000	0.000	0.005	0.000	1.000	0.095	< 0.100	< 0.195	Cd
Chromium	0.312	0.312	0.039	0.039	1.000	0.466	0.870	1.336	Cr
Cobalt	0.156	0.156	< 0.003	0.156	1.000	0.000	< 0.125	< 0.125	Co
Copper	0.000	0.000	< 0.028	0.000	1.000	< 0.565	< 1.480	< 2.045	Cu
Lead	0.000	0.000	0.034	0.000	1.000	0.687	< 1.250	< 1.937	Pb
Manganese	0.757	0.757	0.058	0.058	1.000	0.393	4.789	5.182	Mn
Nickel	0.000	0.000	0.027	0.000	1.000	0.536	Ni 0.640	1.176	Ni
Phosphorus	0.000	0.000	< 0.113	0.000	1.000	< 2.260	< 8.570	< 10.830	P
Selenium	0.000	0.000	< 0.085	0.000	1.000	< 1.700	< 3.750	< 5.450	Se
Silver	0.000	0.000	< 0.011	0.000	1.000	< 0.226	< 0.500	< 0.726	Ag
Thallium	0.000	0.000	< 0.057	0.000	1.000	< 1.130	< 2.500	< 3.630	Tl
Vanadium	0.000	0.000	< 0.006	0.000	1.000	< 0.113	< 0.250	< 0.363	V
Zinc	0.423	0.423	0.436	0.423	1.000	8.287	6.640	14.927	Zn

Note: Allowable BH Blank rules:

If 1.00 µg > blank > 0 , use blank-derived value.

If blank > 1.00 µg, use greater of 1.00 µg or [lessor of 5% of sample µg or BH blank].

Blank Rules: <' indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Cooling Bunker BH Outlet - Steel Alloy
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 2
Test Date: 3/28/2023
Page: 1 of 3

	I Sample FH Rinse+Filter µg	II Blank Correction FH Rinse µg	III Blank Correction Filter µg	IV Sample BH Cap.Soln. + BH Rinse µg	V Blank BH Cap.Soln. µg/ml	VI Blank Correction BH Cap.Soln. µg	VII Blank Correction BH Rinse µg	VIII Total BH Blank Correction µg	
Analyte	<								
Aluminum	89.000	0.000	58.800	26.900	0.083	16.633	0.000	16.633	Al
Antimony	3.270	0.000	2.860	< 0.575	0.000	0.000	0.000	0.000	Sb
Arsenic	2.610	0.000	0.000	< 0.805	0.000	0.000	0.000	0.000	As
Barium	5.000	0.077	1.400	1.350	0.004	0.733	0.077	0.810	Ba
Beryllium	< 0.050	0.000	0.000	< 0.023	0.000	0.000	0.000	0.000	Be
Cadmium	< 0.100	0.000	0.000	0.141	0.000	0.000	0.000	0.000	Cd
Chromium	1.570	0.000	1.030	0.725	0.002	0.312	0.000	0.312	Cr
Cobalt	< 0.125	0.000	0.000	0.106	0.001	0.156	0.000	0.156	Co
Copper	2.600	0.000	0.000	1.740	0.000	0.000	0.000	0.000	Cu
Lead	1.560	0.000	0.000	1.370	0.000	0.000	0.000	0.000	Pb
Manganese	5.540	0.000	0.741	2.070	0.004	0.757	0.000	0.757	Mn
Nickel	5.680	0.000	3.960	1.910	0.000	0.000	0.000	0.000	Ni
Phosphorus	20.500	0.000	17.000	< 2.300	0.000	0.000	0.000	0.000	P
Selenium	< 3.750	0.000	0.000	< 1.720	0.000	0.000	0.000	0.000	Se
Silver	< 0.500	0.000	0.000	< 0.230	0.000	0.000	0.000	0.000	Ag
Thallium	< 2.500	0.000	0.000	< 1.150	0.000	0.000	0.000	0.000	Tl
Vanadium	< 0.250	0.000	0.000	< 0.115	0.000	0.000	0.000	0.000	V
Zinc	7.780	0.000	1.520	9.400	0.002	0.423	0.000	0.423	Zn

Lab ID:	23-S719	23-S730	23-S729	23-S720	23-S731	N/A	N/A
Content:	0.1N HNO ₃ FH Filter & Probe Rinse 100ml 0.1N HNO ₃ Rinse	0.1N HNO ₃	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	5% HNO ₃ / 10% H ₂ O ₂	5%HNO ₃ / 10%H ₂ O ₂	0.1NHNO ₃

Blank Rules: < indicates value is below the method detection limit (MDL).
If blank is '<' it is treated as zero.
If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Cooling Bunker BH Outlet - Steel Alloy
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 2
Test Date: 3/28/2023
Page: 2 of 3

	X Allowable FH Blank Correction	XI Total FH Blank Correction	XII 5% of FH Sample	XIII Lessor of XI or XII	XIV Greater of A or XIII	XV FH Net Sample	
Analyte	µg	µg	µg	µg	µg	µg	
Aluminum	11.630	58.800	4.450	4.450	11.63	77.370	Al
Antimony	2.860	2.860	0.164	0.164	11.63	0.410	Sb
Arsenic	0.000	0.000	0.131	0.000	11.63	2.610	As
Barium	1.477	1.477	0.250	0.250	11.63	3.523	Ba
Beryllium	0.000	0.000 <	0.003	0.000	11.63 <	0.050	Be
Cadmium	0.000	0.000 <	0.005	0.000	11.63 <	0.100	Cd
Chromium	1.030	1.030	0.079	0.079	11.63	0.540	Cr
Cobalt	0.000	0.000 <	0.006	0.000	11.63 <	0.125	Co
Copper	0.000	0.000	0.130	0.000	11.63	2.600	Cu
Lead	0.000	0.000	0.078	0.000	11.63	1.560	Pb
Manganese	0.741	0.741	0.277	0.277	11.63	4.799	Mn
Nickel	3.960	3.960	0.284	0.284	11.63	1.720	Ni
Phosphorus	11.630	17.000	1.025	1.025	11.63	8.870	P
Selenium	0.000	0.000 <	0.188	0.000	11.63 <	3.750	Se
Silver	0.000	0.000 <	0.025	0.000	11.63 <	0.500	Ag
Thallium	0.000	0.000 <	0.125	0.000	11.63 <	2.500	Tl
Vanadium	0.000	0.000 <	0.013	0.000	11.63 <	0.250	V
Zinc	1.520	1.520	0.389	0.389	11.63	6.260	Zn

Note: Allowable FH Blank (A) = (area of filter)*(1.4 µg/in²) = 11.63 µg
where area of filter = 8.306 in²

If A > blank > 0, use blank-derived value.

If blank > A, use greater of A or [lessor of 5% of sample µg or FH blank].

Blank Rules: < indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Cooling Bunker BH Outlet - Steel Alloy
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 2
Test Date: 3/28/2023
Page: 3 of 3

Analyte	XVI Allowable BH Blank Correction µg	XVII Total BH Blank Correction µg	XVIII 5% of BH Sample µg	XIX Lessor of XVII or XVIII µg	XX Greater of 1 µg or XIX µg	XXI BH Net Sample µg	XXII FH Net Sample µg	XXIII FH+BH Total Net Sample µg	
Aluminum	1.345	16.633	1.345	1.345	1.345	25.555	77.370	102.925	Al
Antimony	0.000	0.000	< 0.029	0.000	1.000	< 0.575	0.410	< 0.985	Sb
Arsenic	0.000	0.000	< 0.040	0.000	1.000	< 0.805	2.610	< 3.415	As
Barium	0.810	0.810	0.068	0.068	1.000	0.540	3.523	4.063	Ba
Beryllium	0.000	0.000	< 0.001	0.000	1.000	< 0.023	0.050	< 0.073	Be
Cadmium	0.000	0.000	0.007	0.000	1.000	0.141	0.100	0.241	Cd
Chromium	0.312	0.312	0.036	0.036	1.000	0.413	0.540	0.953	Cr
Cobalt	0.156	0.156	0.005	0.005	1.000	0.000	0.125	0.125	Co
Copper	0.000	0.000	0.087	0.000	1.000	1.740	2.600	4.340	Cu
Lead	0.000	0.000	0.069	0.000	1.000	1.370	1.560	2.930	Pb
Manganese	0.757	0.757	0.104	0.104	1.000	1.313	4.799	6.112	Mn
Nickel	0.000	0.000	0.096	0.000	1.000	1.910	1.720	3.630	Ni
Phosphorus	0.000	0.000	< 0.115	0.000	1.000	< 2.300	8.870	< 11.170	P
Selenium	0.000	0.000	< 0.086	0.000	1.000	< 1.720	3.750	< 5.470	Se
Silver	0.000	0.000	< 0.012	0.000	1.000	< 0.230	0.500	< 0.730	Ag
Thallium	0.000	0.000	< 0.058	0.000	1.000	< 1.150	2.500	< 3.650	Tl
Vanadium	0.000	0.000	< 0.006	0.000	1.000	< 0.115	0.250	< 0.365	V
Zinc	0.423	0.423	0.470	0.423	1.000	8.977	6.260	15.237	Zn

Note: Allowable BH Blank rules:

If 1.00 µg > blank > 0 , use blank-derived value.

If blank > 1.00 µg, use greater of 1.00 µg or [lessor of 5% of sample µg or BH blank].

Blank Rules: '<' indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Cooling Bunker BH Outlet - Steel Alloy
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 3
Test Date: 3/29/2023
Page: 1 of 3

	I Sample FH Rinse+Filter µg	II Blank Correction FH Rinse µg	III Blank Correction Filter µg	IV Sample BH Cap.Soln. + BH Rinse µg	V Blank BH Cap.Soln. µg/ml	VI Blank Correction BH Cap.Soln. µg	VII Blank Correction BH Rinse µg	VIII Total BH Blank Correction µg	
Analyte	<								
Aluminum	79.800	0.000	58.800	30.700	0.083	16.633	0.000	16.633	Al
Antimony	2.360	0.000	2.860	< 0.575	0.000	0.000	0.000	0.000	Sb
Arsenic	2.640	0.000	0.000	< 0.805	0.000	0.000	0.000	0.000	As
Barium	3.590	0.077	1.400	1.850	0.004	0.733	0.077	0.810	Ba
Beryllium	< 0.050	0.000	0.000	< 0.023	0.000	0.000	0.000	0.000	Be
Cadmium	< 0.100	0.000	0.000	0.059	0.000	0.000	0.000	0.000	Cd
Chromium	1.350	0.000	1.030	0.698	0.002	0.312	0.000	0.312	Cr
Cobalt	< 0.125	0.000	0.000	0.114	0.001	0.156	0.000	0.156	Co
Copper	< 1.250	0.000	0.000	6.390	0.000	0.000	0.000	0.000	Cu
Lead	< 1.250	0.000	0.000	0.821	0.000	0.000	0.000	0.000	Pb
Manganese	5.810	0.000	0.741	12.700	0.004	0.757	0.000	0.757	Mn
Nickel	4.400	0.000	3.960	1.350	0.000	0.000	0.000	0.000	Ni
Phosphorus	20.300	0.000	17.000	< 2.300	0.000	0.000	0.000	0.000	P
Selenium	< 3.750	0.000	0.000	< 1.720	0.000	0.000	0.000	0.000	Se
Silver	< 0.500	0.000	0.000	< 0.230	0.000	0.000	0.000	0.000	Ag
Thallium	< 2.500	0.000	0.000	< 1.150	0.000	0.000	0.000	0.000	Tl
Vanadium	< 0.250	0.000	0.000	< 0.115	0.000	0.000	0.000	0.000	V
Zinc	4.200	0.000	1.520	8.610	0.002	0.423	0.000	0.423	Zn

Lab ID:	23-S724	23-S730	23-S729	23-S725	23-S731	N/A	N/A
Content:	0.1N HNO ₃ FH Filter & Probe Rinse 100ml 0.1N HNO ₃ Rinse	0.1N HNO ₃	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	5% HNO ₃ /10% H ₂ O ₂ BH Imps 1-3 100ml .1N HNO ₃ Rinse 200ml 5% HNO ₃ /10% H ₂ O ₂ Reagent	0.1N HNO ₃

Blank Rules: < indicates value is below the method detection limit (MDL).
If blank is '<' it is treated as zero.
If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Cooling Bunker BH Outlet - Steel Alloy
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 3
Test Date: 3/29/2023
Page: 2 of 3

	X Allowable FH Blank Correction	XI Total FH Blank Correction	XII 5% of FH Sample	XIII Lessor of XI or XII	XIV Greater of A or XIII	XV FH Net Sample	
Analyte	µg	µg	µg	µg	µg	µg	
Aluminum	11.630	58.800	3.990	3.990	11.63	68.170	Al
Antimony	2.860	2.860	0.118	0.118	11.63	-0.500	Sb
Arsenic	0.000	0.000	0.132	0.000	11.63	2.640	As
Barium	1.477	1.477	0.180	0.180	11.63	2.113	Ba
Beryllium	0.000	0.000	0.003	0.000	11.63	0.050	Be
Cadmium	0.000	0.000	0.005	0.000	11.63	0.100	Cd
Chromium	1.030	1.030	0.068	0.068	11.63	0.320	Cr
Cobalt	0.000	0.000	0.006	0.000	11.63	0.125	Co
Copper	0.000	0.000	0.063	0.000	11.63	1.250	Cu
Lead	0.000	0.000	0.063	0.000	11.63	1.250	Pb
Manganese	0.741	0.741	0.291	0.291	11.63	5.069	Mn
Nickel	3.960	3.960	0.220	0.220	11.63	0.440	Ni
Phosphorus	11.630	17.000	1.015	1.015	11.63	8.670	P
Selenium	0.000	0.000	0.188	0.000	11.63	3.750	Se
Silver	0.000	0.000	0.025	0.000	11.63	0.500	Ag
Thallium	0.000	0.000	0.125	0.000	11.63	2.500	Tl
Vanadium	0.000	0.000	0.013	0.000	11.63	0.250	V
Zinc	1.520	1.520	0.210	0.210	11.63	2.680	Zn

Note: Allowable FH Blank (A) = (area of filter)*(1.4 µg/in²) = 11.63 µg
where area of filter = 8.306 in²

If A > blank > 0, use blank-derived value.

If blank > A, use greater of A or [lessor of 5% of sample µg or FH blank].

Blank Rules: <' indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Cooling Bunker BH Outlet - Steel Alloy
Method 29 Non-Hg Metals Blank Correction Calculations

Run: 3
Test Date: 3/29/2023
Page: 3 of 3

Analyte	XVI Allowable BH Blank Correction µg	XVII Total BH Blank Correction µg	XVIII 5% of BH Sample µg	XIX Lessor of XVII or XVIII µg	XX Greater of 1 µg or XIX µg	XXI BH Net Sample µg	XXII FH Net Sample µg	XXIII FH+BH Total Net Sample µg	
Aluminum	1.535	16.633	1.535	1.535	1.535	29.165	68.170	97.335	Al
Antimony	0.000	0.000	< 0.029	0.000	1.000	< 0.575	0.000	< 0.575	Sb
Arsenic	0.000	0.000	< 0.040	0.000	1.000	< 0.805	2.640	< 3.445	As
Barium	0.810	0.810	0.093	0.093	1.000	1.040	2.113	3.153	Ba
Beryllium	0.000	0.000	< 0.001	0.000	1.000	< 0.023	< 0.050	< 0.073	Be
Cadmium	0.000	0.000	0.003	0.000	1.000	< 0.059	< 0.100	< 0.159	Cd
Chromium	0.312	0.312	0.035	0.035	1.000	0.386	0.320	0.706	Cr
Cobalt	0.156	0.156	0.006	0.006	1.000	< 0.000	< 0.125	< 0.125	Co
Copper	0.000	0.000	0.320	0.000	1.000	< 6.390	< 1.250	< 7.640	Cu
Lead	0.000	0.000	0.041	0.000	1.000	< 0.821	< 1.250	< 2.071	Pb
Manganese	0.757	0.757	0.635	0.635	1.000	11.943	5.069	17.012	Mn
Nickel	0.000	0.000	0.068	0.000	1.000	1.350	0.440	1.790	Ni
Phosphorus	0.000	0.000	< 0.115	0.000	1.000	< 2.300	< 8.670	< 10.970	P
Selenium	0.000	0.000	< 0.086	0.000	1.000	< 1.720	< 3.750	< 5.470	Se
Silver	0.000	0.000	< 0.012	0.000	1.000	< 0.230	< 0.500	< 0.730	Ag
Thallium	0.000	0.000	< 0.058	0.000	1.000	< 1.150	< 2.500	< 3.650	Tl
Vanadium	0.000	0.000	< 0.006	0.000	1.000	< 0.115	< 0.250	< 0.365	V
Zinc	0.423	0.423	0.431	0.423	1.000	8.187	2.680	10.867	Zn

Note: Allowable BH Blank rules:

If 1.00 µg > blank > 0, use blank-derived value.

If blank > 1.00 µg, use greater of 1.00 µg or [lessor of 5% of sample µg or BH blank].

Blank Rules: '<' indicates value is below the method detection limit (MDL).

If blank is '<' it is treated as zero.

If sample is '<' it is used for emission rate calculations, but results are also preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.

Eagle Foundry Company
Cooling Bunker BH Outlet - Steel Alloy
Mercury Blank Correction Calculations

Blank Lab Values

Analyte	Filter Cont. 12 µg/filter		BH Imps. 2&3 Cap.Soln. Cont. 9 5% HNO ₃ / 10% H ₂ O ₂ µg/sample		FH/BH Rinse Cont. 8A 0.1 N HNO ₃ µg/sample		BH Imps. 5&6 Rinse Cont. 8B H ₂ O µg/sample		BH Imps. 5&6 Cap.Soln. + Rinse Cont. 10 KMnO ₄ µg/sample		BH Imps. 5&6 Rinse Cont. 11 HCl µg/sample	
	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Result	MDL
Mercury	0.0406	0.0219	0.118	0.0172	< MDL	0.0219	< MDL	0.0295	0.0628	0.0163	< MDL	0.0108

Lab ID: 23-S729 23-S731 23-S730 23-S732 23-S733 23-S734
Blank vol, ml: NA 196 250 337 186 124

Blank Correction Values

Analyte: Mercury	Blank FH HNO ₃ Rinse µg	Blank Filter µg	Blank BH Cap.Soln. µg	Blank BH HNO ₃ Rinse µg	Blank BH H ₂ O Rinse µg	Blank BH KMnO ₄ Cap.Soln. + Rinse µg	Blank BH HCl Rinse µg	Total Blank Correction µg	Is Total Blank Correction ≥ 0 and ≤ 0.6?
Run 1	0.00	0.0406	0.12	0.00	0.00	0.10	0.00	0.2623	Yes
Reagent vol, ml	100.0		200.0	200.0	100.0	300.0	225.0		
Run 2	0.00	0.0406	0.12	0.00	0.00	0.10	0.00	0.2623	Yes
Reagent vol, ml	100.0		200.0	200.0	100.0	300.0	225.0		
Run 3	0.00	0.0406	0.12	0.00	0.00	0.10	0.00	0.2623	Yes
Reagent vol, ml	100.0		200.0	200.0	100.0	300.0	225.0		

Notes: 0.1N HNO₃ FH Filter 5% HNO₃/ 10% H₂O₂ 0.1N HNO₃ H₂O 4% KMnO₄/ 10% H₂SO₄ 25 ml 8N HCl/
FH Probe Rinse BH Imps 2&3 BH Imps 1-4 BH Imps 5&6 BH Imps 5&6 BH Imps 5&6

Blank Corrected Results

Analyte: Mercury	Sample FH Rinse + Filter Cont. 1&3 µg	Sample BH Cap.Soln. + HNO ₃ Rinse Cont. 4 µg	Sample BH Imp. 4 + Rinse Cont. 5A µg	Sample BH Imps. 5&6 + Rinses Cont. 5B µg	Sample BH HCl Rinse + Water Cont. 5C µg	Total Sample µg	Total Blank Correction µg	Total Net Sample µg
Run 1	0.0438	0.231	0.00796	0.207	0.0201	0.5099	0.2623	0.2476
Lab ID	23-S714	23-S715	23-S716	23-S717	23-S718			
Run 2	0.0438	0.181	0.00945	0.133	0.0189	0.3862	0.2623	0.1239
Lab ID	23-S719	23-S720	23-S721	23-S722	23-S723			
Run 3	0.0438	0.194	0.00870	0.197	No Sample*	0.4435	0.2623	0.1812
Lab ID	23-S724	23-S725	23-S726	23-S727	23-S728			

*The Container 5C sample was misplaced in transit to Chester LabNet. Because all Container 5C results were below the MDL for this source and for all others tested during this campaign, it is reasonable to assume that the quantity of Hg in the missing sample would have also been below the MDL, and therefore had no contribution to the total Hg sample

Blank Rules: < indicates value is below the method detection limit (MDL)
If blank is '<' it is treated as zero.
If sample is '<' it is used for emission rate calculations but results are preceded by a '<' symbol to indicate they were calculated using the MDL and the actual value is unknown.
If the total blank correction value is less than or equal to 0.6 µg, subtract the total blank correction value from the total sample value to determine total net Hg. Otherwise, the value used for the blank correction shall be the greater of (1) 0.6 µg or (2) the lesser of [total FH blank + total BH blank] or 5% of the total sample value

EPA Method 29
Gas Stream Characteristics
Test Summary

Client: Eagle Foundry Company
Source: Cooling Bunker BH Outlet - Steel Alloy
Location: Eagle Creek, OR

Parameter	Units	Run 1	Run 2	Run 3	
Date		3/27/2023	3/28/2023	3/29/2023	
Run Start Time		13:00	10:30	10:35	
Run End Time		17:10	14:40	14:45	
Duration	minutes	250	250	250	Average
Barometric Pressure	inHg	29.89	29.38	29.45	29.57
Nozzle Diameter	inches	0.266	0.266	0.266	0.266
Isokinetic Average	%	100.2	100.2	100.6	100.3
Sample Volume	dscf	241.322	233.772	237.319	237.471
Sample Volume	dscm	6.833	6.620	6.720	6.724
Stack Diameter	inches	55.75	55.75	55.75	55.75
Stack Area	ft ²	16.952	16.952	16.952	16.952
CO ₂	%vd	0.09	0.09	0.06	0.08
O ₂	%vd	20.64	20.84	20.90	20.79
Static Pressure	inH ₂ O	1.00	1.00	1.00	1.00
H ₂ O	%v	0.55	0.94	1.30	0.93
Wet Molecular Weight	lb/lb-mole	28.78	28.75	28.71	28.75
Velocity	fps	41.84	41.11	41.69	41.55
Flow Rate	adcfm	42,322	41,421	41,853	41,865
	acfm	42,556	41,814	42,404	42,258
	dscfm	42,288	40,978	41,432	41,566
Stack Temperature	°F	69.2	65.4	66.3	67.0
Production Data	lb melt/pour	12,201.579	12,201.119	12,077.535	
	ton melt/pour	6.101	6.101	6.039	
	lb Cr/melt	209.764	201.394	201.494	
	ton Cr/melt	0.105	0.101	0.101	
	lb Mn/melt	834.059	834.082	822.739	
	ton Mn/melt	0.417	0.417	0.411	
	lb Ni/Pour	74.327	70.459	69.572	
	ton Ni/Pour	0.037	0.035	0.035	

Run 1										
Analyte	Total				FH Net			BH Net		
	µg	µg/dscm	lb/hr	lb/ton melt	µg	µg/dscm	lb/hr	µg	µg/dscm	lb/hr
Aluminum	73.670	10.782	1.71E-03	1.17E-03	62.570	9.157	1.45E-03	11.100	1.624	2.57E-04
Antimony	< 1.245	< 0.182	< 2.89E-05	< 1.97E-05	0.680	0.100	1.58E-05	< 0.565	< 0.083	< 1.31E-05
Arsenic	< 3.421	< 0.501	< 7.93E-05	< 5.42E-05	2.630	0.385	6.10E-05	< 0.791	< 0.116	< 1.83E-05
Barium	1.823	0.267	4.23E-05	2.89E-05	1.823	0.267	4.23E-05	0.000	0.000	0.00E+00
Beryllium	< 0.073	< 0.011	< 1.69E-06	< 1.16E-06	< 0.050	< 0.007	< 1.16E-06	< 0.023	< 0.003	< 5.33E-07
Cadmium	< 0.195	< 0.029	< 4.52E-06	< 3.09E-06	< 0.100	< 0.015	< 2.32E-06	0.095	0.014	2.20E-06
Chromium	1.336	0.196	3.10E-05		0.870	0.127	2.02E-05	0.466	0.068	1.08E-05
Cobalt	< 0.125	< 0.018	< 2.90E-06	< 1.98E-06	< 0.125	< 0.018	< 2.90E-06	0.000	0.000	0.00E+00
Copper	< 2.045	< 0.299	< 4.74E-05	< 3.24E-05	1.480	0.217	3.43E-05	< 0.565	< 0.083	< 1.31E-05
Lead	< 1.937	< 0.283	< 4.49E-05	< 3.07E-05	< 1.250	< 0.183	< 2.90E-05	0.687	0.101	1.59E-05
Manganese	5.182	0.758	1.20E-04		4.789	0.701	1.11E-04	0.393	0.058	9.11E-06
Mercury	< 0.248	< 0.036	< 5.74E-06	< 3.92E-06						
Nickel	1.176	0.172	2.73E-05		0.640	0.094	1.48E-05	0.536	0.078	1.24E-05
Phosphorus	< 10.830	< 1.585	< 2.51E-04	< 1.71E-04	8.570	1.254	1.99E-04	< 2.260	< 0.331	< 5.24E-05
Selenium	< 5.450	< 0.798	< 1.26E-04	< 8.63E-05	< 3.750	< 0.549	< 8.69E-05	< 1.700	< 0.249	< 3.94E-05
Silver	< 0.726	< 0.106	< 1.68E-05	< 1.15E-05	< 0.500	< 0.073	< 1.16E-05	< 0.226	< 0.033	< 5.24E-06
Thallium	< 3.630	< 0.531	< 8.41E-05	< 5.75E-05	< 2.500	< 0.366	< 5.80E-05	< 1.130	< 0.165	< 2.62E-05
Vanadium	< 0.363	< 0.053	< 8.42E-06	< 5.75E-06	< 0.250	< 0.037	< 5.80E-06	< 0.113	< 0.017	< 2.62E-06
Zinc	14.927	2.185	3.46E-04	2.36E-04	6.640	0.972	1.54E-04	8.287	1.213	1.92E-04

Chromium	lb Cr / ton Cr in melt =	1.23E-03
Manganese	lb Mn / ton Mn in melt =	1.20E-03
Nickel	lb Ni / ton Ni in melt =	3.06E-03

Run 1 Emission Factors

Run 2										
Analyte	Total				FH Net			BH Net		
	µg	µg/dscm	lb/hr	lb/ton melt	µg	µg/dscm	lb/hr	µg	µg/dscm	lb/hr
Aluminum	102.925	15.548	2.39E-03	1.63E-03	77.370	11.687	1.79E-03	25.555	3.860	5.93E-04
Antimony	< 0.985	< 0.149	< 2.28E-05	< 1.56E-05	0.410	0.062	9.51E-06	< 0.575	< 0.087	< 1.33E-05
Arsenic	< 3.415	< 0.516	< 7.92E-05	< 5.41E-05	2.610	0.394	6.05E-05	< 0.805	< 0.122	< 1.87E-05
Barium	4.063	0.614	9.42E-05	6.43E-05	3.523	0.532	8.17E-05	0.540	0.082	1.25E-05
Beryllium	< 0.073	< 0.011	< 1.69E-06	< 1.16E-06	< 0.050	< 0.008	< 1.16E-06	< 0.023	< 0.003	< 5.33E-07
Cadmium	< 0.241	< 0.036	< 5.59E-06	< 3.82E-06	< 0.100	< 0.015	< 2.32E-06	0.141	0.021	3.27E-06
Chromium	0.953	0.144	2.21E-05		0.540	0.082	1.25E-05	0.413	0.062	9.58E-06
Cobalt	< 0.125	< 0.019	< 2.90E-06	< 1.98E-06	< 0.125	< 0.019	< 2.90E-06	0.000	0.000	0.00E+00
Copper	4.340	0.656	1.01E-04	6.87E-05	2.600	0.393	6.03E-05	1.740	0.263	4.03E-05
Lead	2.930	0.443	6.79E-05	4.64E-05	1.560	0.236	3.62E-05	1.370	0.207	3.18E-05
Manganese	6.112	0.923	1.42E-04		4.799	0.725	1.11E-04	1.313	0.198	3.04E-05
Mercury	< 0.124	< 0.019	< 2.87E-06	< 1.96E-06						
Nickel	3.630	0.548	8.42E-05		1.720	0.260	3.99E-05	1.910	0.289	4.43E-05
Phosphorus	< 11.170	< 1.687	< 2.59E-04	< 1.77E-04	8.870	1.340	2.06E-04	< 2.300	< 0.347	< 5.33E-05
Selenium	< 5.470	< 0.826	< 1.27E-04	< 8.66E-05	< 3.750	< 0.566	< 8.69E-05	< 1.720	< 0.260	< 3.99E-05
Silver	< 0.730	< 0.110	< 1.69E-05	< 1.16E-05	< 0.500	< 0.076	< 1.16E-05	< 0.230	< 0.035	< 5.33E-06
Thallium	< 3.650	< 0.551	< 8.46E-05	< 5.78E-05	< 2.500	< 0.378	< 5.80E-05	< 1.150	< 0.174	< 2.67E-05
Vanadium	< 0.365	< 0.055	< 8.46E-06	< 5.78E-06	< 0.250	< 0.038	< 5.80E-06	< 0.115	< 0.017	< 2.67E-06
Zinc	15.237	2.302	3.53E-04	2.41E-04	6.260	0.946	1.45E-04	8.977	1.356	2.08E-04

Chromium	lb Cr / ton Cr in melt =	9.14E-04
Manganese	lb Mn / ton Mn in melt =	1.42E-03
Nickel	lb Ni / ton Ni in melt =	9.95E-03

Run 2 Emission Factors

Note: Results for Hg front half and back half fractions are not shown because these values are not blank-corrected. Per EPA Method 29, only the sum of Hg front and back half results is subject to blank correction.

'<' denotes results which were calculated using the method detection limit for front half or back half results that were non-detect.

Run 3										
Analyte	Total				FH Net			BH Net		
	µg	µg/dscm	lb/hr	lb/ton melt	µg	µg/dscm	lb/hr	µg	µg/dscm	lb/hr
Aluminum	97.335	14.484	2.25E-03	1.55E-03	68.170	10.144	1.57E-03	29.165	4.340	6.74E-04
Antimony	< 0.575	< 0.086	< 1.33E-05	< 9.16E-06	0.000	0.000	0.00E+00	< 0.575	< 0.086	< 1.33E-05
Arsenic	< 3.445	< 0.513	< 7.96E-05	< 5.49E-05	2.640	0.393	6.10E-05	< 0.805	< 0.120	< 1.86E-05
Barium	3.153	0.469	7.28E-05	5.02E-05	2.113	0.314	4.88E-05	1.040	0.155	2.40E-05
Beryllium	< 0.073	< 0.011	< 1.69E-06	< 1.16E-06	< 0.050	< 0.007	< 1.16E-06	< 0.023	< 0.003	< 5.31E-07
Cadmium	< 0.159	< 0.024	< 3.67E-06	< 2.53E-06	< 0.100	< 0.015	< 2.31E-06	0.059	0.009	1.36E-06
Chromium	0.706	0.105	1.63E-05		0.320	0.048	7.39E-06	0.386	0.057	8.91E-06
Cobalt	< 0.125	< 0.019	< 2.89E-06	< 1.99E-06	< 0.125	< 0.019	< 2.89E-06	0.000	0.000	0.00E+00
Copper	< 7.640	< 1.137	< 1.76E-04	< 1.22E-04	< 1.250	< 0.186	< 2.89E-05	6.390	0.951	1.48E-04
Lead	< 2.071	< 0.308	< 4.78E-05	< 3.30E-05	< 1.250	< 0.186	< 2.89E-05	0.821	0.122	1.90E-05
Manganese	17.012	2.532	3.93E-04		5.069	0.754	1.17E-04	11.943	1.777	2.76E-04
Mercury	< 0.181	< 0.027	< 4.19E-06	< 2.89E-06						
Nickel	1.790	0.266	4.13E-05		0.440	0.065	1.02E-05	1.350	0.201	3.12E-05
Phosphorus	< 10.970	< 1.632	< 2.53E-04	< 1.75E-04	8.670	1.290	2.00E-04	< 2.300	< 0.342	< 5.31E-05
Selenium	< 5.470	< 0.814	< 1.26E-04	< 8.72E-05	< 3.750	< 0.558	< 8.66E-05	< 1.720	< 0.256	< 3.97E-05
Silver	< 0.730	< 0.109	< 1.69E-05	< 1.16E-05	< 0.500	< 0.074	< 1.15E-05	< 0.230	< 0.034	< 5.31E-06
Thallium	< 3.650	< 0.543	< 8.43E-05	< 5.82E-05	< 2.500	< 0.372	< 5.77E-05	< 1.150	< 0.171	< 2.66E-05
Vanadium	< 0.365	< 0.054	< 8.43E-06	< 5.82E-06	< 0.250	< 0.037	< 5.77E-06	< 0.115	< 0.017	< 2.66E-06
Zinc	10.867	1.617	2.51E-04	1.73E-04	2.680	0.399	6.19E-05	8.187	1.218	1.89E-04

Chromium	lb Cr / ton Cr in melt =	6.74E-04
Manganese	lb Mn / ton Mn in melt =	3.98E-03
Nickel	lb Ni / ton Ni in melt =	4.95E-03

Run 3 Emission Factors

Mean Runs 1-3										
Analyte	Total				FH Net			BH Net		
	µg	µg/dscm	lb/hr	lb/ton melt	µg	µg/dscm	lb/hr	µg	µg/dscm	lb/hr
Aluminum	91.310	13.604	2.11E-03	1.45E-03	69.370	10.330	1.61E-03	21.940	3.275	5.08E-04
Antimony	< 0.935	< 0.139	< 2.17E-05	< 1.48E-05	0.363	0.054	8.42E-06	< 0.572	< 0.085	< 1.32E-05
Arsenic	< 3.427	< 0.510	< 7.93E-05	< 5.44E-05	2.627	0.391	6.08E-05	< 0.800	< 0.119	< 1.85E-05
Barium	3.013	0.450	6.98E-05	4.78E-05	2.486	0.371	5.76E-05	0.527	0.079	1.22E-05
Beryllium	< 0.073	< 0.011	< 1.69E-06	< 1.16E-06	< 0.050	< 0.007	< 1.16E-06	< 0.023	< 0.003	< 5.32E-07
Cadmium	< 0.198	< 0.030	< 4.59E-06	< 3.15E-06	< 0.100	< 0.015	< 2.32E-06	0.098	0.015	2.28E-06
Chromium	0.998	0.148	2.31E-05		0.577	0.086	1.34E-05	0.422	0.063	9.76E-06
Cobalt	< 0.125	< 0.019	< 2.89E-06	< 1.98E-06	< 0.125	< 0.019	< 2.89E-06	0.000	0.000	0.00E+00
Copper	< 4.675	< 0.697	< 1.08E-04	< 7.43E-05	< 1.777	< 0.265	< 4.12E-05	< 2.898	< 0.432	< 6.70E-05
Lead	< 2.313	< 0.345	< 5.36E-05	< 3.67E-05	< 1.353	< 0.202	< 3.13E-05	0.959	0.143	2.22E-05
Manganese	9.435	1.404	2.18E-04		4.886	0.727	1.13E-04	4.550	0.678	1.05E-04
Mercury	< 0.184	< 0.027	< 4.27E-06	< 2.92E-06						
Nickel	2.199	0.329	5.09E-05		0.933	0.140	2.16E-05	1.265	0.189	2.93E-05
Phosphorus	< 10.990	< 1.635	< 2.54E-04	< 1.74E-04	8.703	1.295	2.02E-04	< 2.287	< 0.340	< 5.29E-05
Selenium	< 5.463	< 0.813	< 1.26E-04	< 8.67E-05	< 3.750	< 0.558	< 8.68E-05	< 1.713	< 0.255	< 3.97E-05
Silver	< 0.729	< 0.108	< 1.69E-05	< 1.16E-05	< 0.500	< 0.074	< 1.16E-05	< 0.229	< 0.034	< 5.29E-06
Thallium	< 3.643	< 0.542	< 8.44E-05	< 5.78E-05	< 2.500	< 0.372	< 5.79E-05	< 1.143	< 0.170	< 2.65E-05
Vanadium	< 0.364	< 0.054	< 8.44E-06	< 5.78E-06	< 0.250	< 0.037	< 5.79E-06	< 0.114	< 0.017	< 2.65E-06
Zinc	13.677	2.034	3.17E-04	2.17E-04	5.193	0.772	1.20E-04	8.484	1.262	1.96E-04

Chromium	lb Cr / ton Cr in melt =	9.40E-04
Manganese	lb Mn / ton Mn in melt =	2.20E-03
Nickel	lb Ni / ton Ni in melt =	5.99E-03

Mean Runs 1-3

Note: Results for Hg front half and back half fractions are not shown because these values are not blank-corrected. Per EPA Method 29, only the sum of Hg front and back half results is subject to blank correction.

'<' denotes results which were calculated using the method detection limit for front half or back half results that were non-detect.



COMPANY	Eagle Foundry Company
FACILITY	Eagle Foundry
LOCATION	Eagle Creek, OR
SOURCE	Cooling Bunker BH Outlet - Steel Alloy
DATE	3/27/2023 - 3/29/2023
METHOD	0061
POLLUTANT	Cr VI

EPA Method 1
Stack Parameters and Traverse Points

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Cooling Bunker BH Outlet - Steel Alloy
Facility: Eagle Foundry

Type of Testing: P (P for Particulate; V for Velocity/Nonparticulate)
Type of Duct: C (C for circular; R for rectangular)

Number of ports available: 2
Number of ports to be used: 2
Port diameter: 4 inches
Sampling location height (approx.): feet
Stack height (approx.): feet

Circular ID (Rectangular Depth): 55.75 inches
Port depth and/or wall thickness: 6.50 inches
Stack width (Rectangular only): inches

Equivalent Diameter
If rectangular = $\frac{2 * \text{Depth} * \text{Width}}{\text{Depth} + \text{Width}}$ = 55.75 inches (If circular = duct ID)

Stack/duct area = 16.952 sq. feet 2441.1 sq. inches

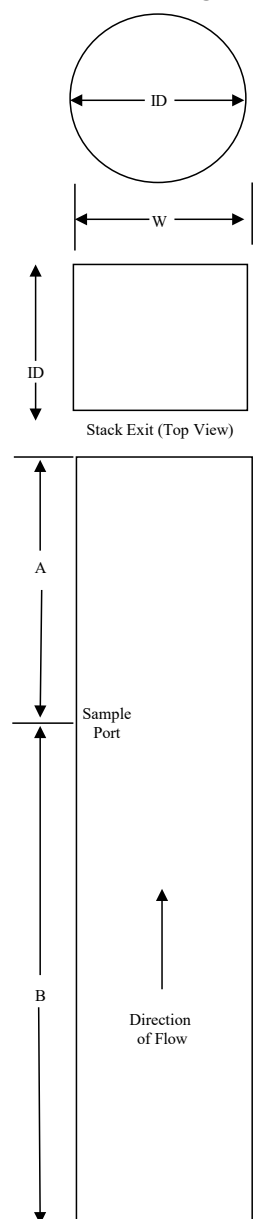
Sample Port Location: Downstream flow disturbance from process Upstream flow disturbance toward exit
Number of Inches: 246.00 45.00
Number of Diameters: 4.41 0.81

Minimum Number of Traverse Points: 24

Traverse points less than 1.0 inch from the stack wall are relocated to a distance of 1.0 inch.

Points	% of diameter	Distance from inside wall (in.)	Distance including port (in.)
1	2.1	1.17	7 5/8
2	6.7	3.74	10 1/4
3	11.8	6.58	13 1/8
4	17.7	9.87	16 3/8
5	25.0	13.94	20 1/2
6	35.6	19.85	26 3/8
7	64.4	35.90	42 3/8
8	75.0	41.81	48 3/8
9	82.3	45.88	52 3/8
10	88.2	49.17	55 5/8
11	93.3	52.01	58 1/2
12	97.9	54.58	61 1/8

Reference Diagram



Drawing NOT to scale and
NOT an accurate representation of stack.

Pre-Test Traverse

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Cooling Bunker BH Outlet - Steel Alloy

Stack Temp: 58 °F

Traverse Point	Velocity ΔP ("H ₂ O)	Null Angle
1	0.67	0
2	0.71	5
3	0.73	0
4	0.69	5
5	0.65	5
6	0.69	0
7	0.72	5
8	0.76	0
9	0.75	5
10	0.72	0
11	0.71	5
12	0.62	5

Average: 0.70 3

Flow is found to be: Non-cyclonic

Isokinetic Field Data
Field Data Entry

Client: Eagle Foundry Company **Run:** 1
Location: Eagle Creek, OR **Start Time:** 13:00
Source: Cooling Bunker BH Outlet - Steel Alloy **End Time:** 17:10
EPA Method: 0061 **Environmental Conditions/Test Notes:** **Date:** 3/27/2023
Box Operator: JCR Overcast and 40°F
Technician(s): AJV Stopped at approximately 4 hours because melting and pouring was completed, cooling was sampled for approximately 1 hour similar to white iron.

Stack Dimensional Data:

Circular		Meterbox ID	13	Probe ID	8A	Liner type	GLASS
Diameter	55.750 in	Y factor	1.0122	Nozzle ID	N/A	Nozzle size	0.263 inches
Rectangular		$\Delta H@$	1.743	Hot box ID	N/A	Nozzle area	0.000377 sq.ft.
Width	in	Bp ID	TS1	Pitot Cp	0.84	Probe heat	250 °F
Length	in	Balance ID	HLN FB1	Pitot ID	8A	Filter heat	N/A °F
Stack Area	16.952 sq.ft.	Weights ID	HLN FW1	Probe Length, ft	8		

Source Information:

Barometric Pressure	29.89 "Hg	O ₂	20.90 %
Static Pressure	1 "H ₂ O	CO ₂	0.00 %
Ave. ΔP	0.7 "H ₂ O	Rec. Nz.	0.221 inches
Stack Temperature	60 °F		
Assumed moisture	0.50 %		
Assumed meter temp.	65 °F		
Total number of points	20		
Time per point	12.5 min.		
Total run time	250 min.		

Leak Checks:	Pre-test	Post-test
Pitot	X	X
Leak rate, dcf	0.000	0.000
Leak check vacuum, "Hg	10	10

Nozzle check for roundness:

1	2	3
0.262	0.263	0.263 inches
Caliper ID	WS1	

Post Test Calculations:

Sample volume	231.913 dcf	Ave. ΔP	0.569 "H ₂ O
Wet mol. weight	28.79 M _s (actual)	Ave. $\sqrt{\Delta P}$	0.754 "H ₂ O
Actual H ₂ O	0.49 %	Ave. ΔH	2.893 "H ₂ O
Std. meter vol.	235.731 dscf	Ave. T _s	66.9 °F
Isokinetic Average	98.7 %	Ave. T _m	69.0 °F

Moisture/Lab:

Filter, #	N/A		
	Initial	Final	Gain
Impingers, g	1,732.5	1,703.6	-28.9
Silica gel, g	856.9	910.3	53.4
	Total water gain, g:		24.5

Traverse Point	Time (min.)	Meter Volume (dcf)	Velocity ΔP ("H ₂ O)	Stack Temp. (°F)	Meter Temp. (°F)	Calc. ΔH	Run ΔH	Vacuum ("Hg)	Filter Box (°F)	Condenser Temp (≤68°F)
		0.000								
1	12.5	12.230	0.62	63	67	3.17	3.15	5	N/A	59
2	25.0	24.190	0.60	63	65	3.05	3.05	5	N/A	60
3	37.5	35.490	0.54	68	66	2.73	2.75	4.5	N/A	58
4	50.0	46.890	0.56	70	67	2.82	2.80	4.5	N/A	57
5	62.5	58.280	0.55	69	67	2.78	2.80	4.5	N/A	55
6	75.0	69.860	0.56	69	68	2.83	2.85	4.5	N/A	53
7	87.5	81.520	0.58	69	69	2.94	2.95	5	N/A	52
8	100.0	93.080	0.55	68	69	2.79	2.80	5	N/A	53
9	112.5	104.640	0.63	68	69	3.20	3.20	5	N/A	54
10	125.0	116.230	0.57	67	70	2.91	2.90	5	N/A	55
11	137.5	127.850	0.56	67	70	2.86	2.85	5	N/A	55
12	150.0	139.380	0.55	67	70	2.81	2.80	5	N/A	55
13	162.5	150.800	0.59	67	70	3.01	3.00	5	N/A	54
14	175.0	161.890	0.52	67	70	2.65	2.65	5	N/A	53
15	187.5	173.790	0.57	67	70	2.91	2.90	5	N/A	52
16	200.0	185.650	0.59	66	70	3.02	3.00	5	N/A	52
17	212.5	197.290	0.56	66	70	2.86	2.85	5	N/A	51
18	225.0	208.670	0.55	68	70	2.80	2.80	4.5	N/A	51
19	237.5	220.260	0.57	65	70	2.92	2.90	4.5	N/A	50
20	250.0	231.913	0.55	64	72	2.83	2.85	4.5	N/A	50

**Isokinetic Field Data
Field Data Entry**

Client:	Eagle Foundry Company	Run:	2
Location:	Eagle Creek, OR	Start Time:	10:30
Source:	Cooling Bunker BH Outlet - Steel Alloy	End Time:	14:40
EPA Method:	0061	Environmental Conditions/Test Notes:	Date: 3/28/2023
Box Operator:	JCR	Overcast and 40°F	
Technician(s):	AJV	Cut test run short at 250 minutes because melting and casting was complete, this includes 45 minutes of cooling.	

Stack Dimensional Data:

Circular		Meterbox ID	13	Probe ID	8A	Liner type	GLASS
Diameter	55.750 in	Y factor	1.0122	Nozzle ID	N/A	Nozzle size	0.263 inches
Rectangular		ΔH@	1.743	Hot box ID	N/A	Nozzle area	0.000377 sq.ft.
Width	in	Bp ID	TS1	Pitot Cp	0.84	Probe heat	250 °F
Length	in	Balance ID	HLN FB1	Pitot ID	8A	Filter heat	N/A °F
Stack Area	16.952 sq.ft.	Weights ID	HLN FW1	Probe Length, ft	8		

Source Information:

Barometric Pressure	29.38 "Hg	O ₂	20.90 %
Static Pressure	1 "H ₂ O	CO ₂	0.00 %
Ave. ΔP	0.7 "H ₂ O	Rec. Nz.	0.219 inches
Stack Temperature	60 °F		
Assumed moisture	0.49 %		
Assumed meter temp.	69 °F		
Total number of points	20		
Time per point	12.5 min.		
Total run time	250 min.		

Leak Checks:

	Pre-test	Post-test
Pitot	X	X
Leak rate, dcf	0.000	0.000
Leak check vacuum, "Hg	10	10

Nozzle check for roundness:

1	2	3
0.262	0.263	0.263 inches
Caliper ID	WS1	

Post Test Calculations:

Sample volume	238.700 dcf	Ave. ΔP	0.596 "H ₂ O
Wet mol. weight	28.76 M _s (actual)	Ave. √ΔP	0.77 "H ₂ O
Actual H ₂ O	0.75 %	Ave. ΔH	3.055 "H ₂ O
Std. meter vol.	239.568 dscf	Ave. T _s	62.6 °F
Isokinetic Average	98.8 %	Ave. T _m	66.9 °F

Moisture/Lab:

Filter, #	N/A		
	Initial	Final	Gain
Impingers, g	1,738.6	1,732.0	-6.6
Silica gel, g	877.8	922.6	44.8
	Total water gain:		38.2

Traverse Point	Time (min.)	Meter Volume (dcf)	Velocity ΔP ("H ₂ O)	Stack Temp. (°F)	Meter Temp. (°F)	Calc. ΔH	Run ΔH	Vacuum ("Hg)	Filter Box (°F)	Condenser Temp (≤68°F)
		0.000								
1	12.5	10.820	0.49	54	67	2.55	2.55	4	N/A	41
2	25.0	21.880	0.50	54	65	2.59	2.60	4.5	N/A	47
3	37.5	34.440	0.69	54	66	3.58	3.60	5.5	N/A	43
4	50.0	47.140	0.67	63	66	3.42	3.40	5.5	N/A	42
5	62.5	59.760	0.66	62	66	3.37	3.35	5.5	N/A	44
6	75.0	72.330	0.66	62	66	3.37	3.35	5.5	N/A	43
7	87.5	84.350	0.60	63	66	3.06	3.05	5.5	N/A	45
8	100.0	96.080	0.56	62	66	2.86	2.85	5	N/A	44
9	112.5	109.210	0.69	62	67	3.53	3.55	6	N/A	44
10	125.0	121.370	0.63	62	66	3.22	3.20	5.5	N/A	45
11	137.5	133.950	0.63	62	66	3.22	3.20	5.5	N/A	45
12	150.0	144.610	0.46	62	67	2.36	2.35	4.5	N/A	45
13	162.5	155.360	0.48	62	67	2.46	2.50	4.5	N/A	45
14	175.0	166.020	0.48	63	67	2.45	2.50	4.5	N/A	44
15	187.5	178.380	0.60	63	67	3.07	3.10	5	N/A	45
16	200.0	190.140	0.56	64	68	2.86	2.90	4.5	N/A	45
17	212.5	201.780	0.56	67	69	2.85	2.90	4.5	N/A	46
18	225.0	213.290	0.65	71	69	3.29	3.30	5	N/A	46
19	237.5	226.370	0.72	72	69	3.63	3.65	6	N/A	47
20	250.0	238.700	0.63	68	68	3.20	3.20	5.5	N/A	47

**Isokinetic Field Data
Field Data Entry**

Client:	Eagle Foundry Company	Run:	3
Location:	Eagle Creek, OR	Start Time:	10:35
Source:	Cooling Bunker BH Outlet - Steel Alloy	End Time:	14:45
EPA Method:	0061	Environmental Conditions/Test Notes:	Date: 3/29/2023
Box Operator:	JCR		
Technician(s):	AJV		

Stack Dimensional Data:		Equipment:					
Circular		Meterbox ID	13	Probe ID	8A	Liner type	GLASS
Diameter	55.750 in	Y factor	1.0122	Nozzle ID	N/A	Nozzle size	0.263 inches
Rectangular		ΔH@	1.743	Hot box ID	N/A	Nozzle area	0.000377 sq.ft.
Width	in	Bp ID	TS1	Pitot Cp	0.84	Probe heat	250 °F
Length	in	Balance ID	HLN FB1	Pitot ID	8A	Filter heat	N/A °F
Stack Area	16.952 sq.ft.	Weights ID	HLN FW1	Probe Length, ft	8		

Source Information:				Leak Checks:		
Barometric Pressure	29.45 "Hg	O ₂	20.90 %	Pitot	Pre-test	Post-test
Static Pressure	1 "H ₂ O	CO ₂	0.00 %	Leak rate, dcf	0.000	0.000
Ave. ΔP	0.7 "H ₂ O	Rec. Nz.	0.22 inches	Leak check vacuum, "Hg	10	10
Stack Temperature	60 °F					
Assumed moisture	0.75 %					
Assumed meter temp.	66.9 °F					
Total number of points	20					
Time per point	12.5 min.					
Total run time	250 min.					

Nozzle check for roundness:			
1	2	3	
0.262	0.263	0.263 inches	
	Caliper ID	WS1	

Post Test Calculations:					Moisture/Lab:			
Sample volume	223.108 dcf	Ave. ΔP	0.519 "H ₂ O		Filter, #	N/A		
Wet mol. weight	28.81 M _s (actual)	Ave. √ΔP	0.72 "H ₂ O		Initial		Final	Gain
Actual H ₂ O	0.29 %	Ave. ΔH	2.643 "H ₂ O		Impingers, g	1,767.7	1,760.2	-7.5
Std. meter vol.	224.172 dscf	Ave. T _s	64.1 °F		Silica gel, g	858.5	880.0	21.5
Isokinetic Average	98.6 %	Ave. T _m	67.0 °F		Total water gain:			14.0

Traverse Point	Time (min.)	Meter Volume (dcf)	Velocity ΔP ("H ₂ O)	Stack Temp. (°F)	Meter Temp. (°F)	Calc. ΔH	Run ΔH	Vacuum ("Hg)	Filter Box (°F)	Condenser Temp (≤68°F)
1	12.5	11.760	0.55	51	66	2.86	2.85	2.5	N/A	39
2	25.0	23.090	0.55	52	64	2.84	2.85	2.5	N/A	37
3	37.5	34.420	0.54	57	63	2.76	2.75	2.5	N/A	39
4	50.0	45.730	0.53	62	63	2.68	2.70	2.5	N/A	40
5	62.5	57.580	0.57	62	63	2.89	2.90	2.5	N/A	40
6	75.0	67.930	0.45	61	64	2.29	2.30	2	N/A	41
7	87.5	78.980	0.50	62	65	2.54	2.55	2.5	N/A	42
8	100.0	90.060	0.51	62	65	2.59	2.60	2.5	N/A	43
9	112.5	101.170	0.51	61	65	2.60	2.60	2.5	N/A	44
10	125.0	112.370	0.52	61	66	2.65	2.65	2.5	N/A	44
11	137.5	123.600	0.51	63	67	2.60	2.60	2.5	N/A	46
12	150.0	134.890	0.51	65	67	2.59	2.60	2.5	N/A	48
13	162.5	146.380	0.54	68	69	2.73	2.75	2.5	N/A	50
14	175.0	157.190	0.54	68	69	2.73	2.75	2.5	N/A	50
15	187.5	168.610	0.53	68	69	2.68	2.70	2.5	N/A	50
16	200.0	179.970	0.55	70	70	2.78	2.80	2.5	N/A	52
17	212.5	190.550	0.49	73	70	2.46	2.45	2.5	N/A	53
18	225.0	201.470	0.50	74	71	2.51	2.50	2.5	N/A	53
19	237.5	212.280	0.48	71	71	2.42	2.40	2.5	N/A	54
20	250.0	223.108	0.50	70	72	2.54	2.55	2.5	N/A	55

EPA Method 4
Impinger Weights Summary

Client: Eagle Foundry Company
Location: Eagle Creek, OR
Source: Cooling Bunker BH Outlet - Steel Alloy
EPA Method: 0061
Box Operator: JCR
Technician(s): AJV

Run 1

Impinger gain by weight (g):

#	Initial	Final	Gain
1	508.9	445.5	-63.4
2	432.2	425.3	-6.9
3	433.4	443.9	10.5
4	358.0	388.9	30.9
Totals:	1,732.5	1,703.6	-28.9

Run 2

Impinger gain by weight (g):

#	Initial	Final	Gain
1	507.2	433.4	-73.8
2	432.8	466.7	33.9
3	438.9	434.0	-4.9
4	359.7	397.9	38.2
Totals:	1,738.6	1,732.0	-6.6

Run 3

Impinger gain by weight (g):

#	Initial	Final	Gain
1	529.4	494.9	-34.5
2	440.1	467.6	27.5
3	438.7	437.7	-1.0
4	359.5	360.0	0.5
Totals:	1,767.7	1,760.2	-7.5

Isokinetic Field Data
Field Data and Calculations
Emissions and Gas Stream Characteristics

Client: Eagle Foundry
Location: Eagle Creek, OR
Source: Cooling Bunker BH Outlet - Steel Alloy
Method: 0061

Run: 1
Start Time: 13:00
End Time: 17:10
Date: 3/27/2023

Sampling Data				Traverse Data			
Time min.	Meter ft ³	ΔH "H ₂ O	Meter T _m °F	Traverse Point	Dp "H ₂ O	Stack T _s °F	$\sqrt{Dp}$
	0.000						
13	12.230	3.15	67	1	0.62	63	0.787
25	24.190	3.05	65	2	0.60	63	0.775
38	35.490	2.75	66	3	0.54	68	0.735
50	46.890	2.80	67	4	0.56	70	0.748
63	58.280	2.80	67	5	0.55	69	0.742
75	69.860	2.85	68	6	0.56	69	0.748
88	81.520	2.95	69	7	0.58	69	0.762
100	93.080	2.80	69	8	0.55	68	0.742
113	104.640	3.20	69	9	0.63	68	0.794
125	116.230	2.90	70	10	0.57	67	0.755
138	127.850	2.85	70	11	0.56	67	0.748
150	139.380	2.80	70	12	0.55	67	0.742
163	150.800	3.00	70	13	0.59	67	0.768
175	161.890	2.65	70	14	0.52	67	0.721
188	173.790	2.90	70	15	0.57	67	0.755
200	185.650	3.00	70	16	0.59	66	0.768
213	197.290	2.85	70	17	0.56	66	0.748
225	208.670	2.80	70	18	0.55	68	0.742
238	220.260	2.90	70	19	0.57	65	0.755
250	231.913	2.85	72	20	0.55	64	0.742

Client: Eagle Foundry**Run: 1****Source: Cooling Bunker BH Outlet - Steel Alloy****Date: 03/27/23****Field Data Input Continued**Moisture Data

Total Test Time 250.0 min
 Sample Time Interval 12.5 min
 Meter Volume, V_m 231.913 dcf
 Water Volume 24.5 g
 Nozzle Diameter, N_z 0.2630 in.
 Nozzle Area 0.000377 sq.ft.

Stack Dimensional Data:

Circular
 Diameter 55.750 in
 Rectangular
 Width in
 Length in
 Stack Area 16.952 sq.ft.

Traverse Data

Barometric Pressure, P_b 29.89 "Hg
 Static Pressure 1.00 "H₂O
 Pitot Factor, cp 0.84
 Meter Cal Factor 1.0122 Y

Molecular Weight:

CO₂ Average 0.09 %vd
 O₂ Average 20.64 %vd

Field Data AveragesMeter

ΔH 2.893 "H₂O
 Temperature, T_m 69.0 °F
 Temperature, T_m 528.7 °A (°R)
 Pressure Meter, P_m 30.103 "Hg

Stack

$\sqrt{Dp}$ 0.754 "H₂O
 Temperature, T_s 66.9 °F
 Temperature, T_s 526.6 °A (°R)
 Pressure Stack, P_s 29.964 "Hg

Field Data CalculationsMeter Box Capture

Standard Volume, $V_{m(std)}$ 235.731 dscf
 6.675 dscm
 Actual Volume, $V_{m(actual)}$ 236.051 awcf

EPA Method 2 Stack Gas Flowrate:

Velocity, V_s 42.30 fps
 Volume (actual) 43,024 acfm
 42,813 adcfm
 Volume (standard) 2,590,647 wscf/hr
 2,577,953 dscf/hr
 42,966 dscf/min
 43,177 wscf/min

Gas Stream Moisture

Moisture Vapor, $V_{w(std)}$ 1.155 scf
 Moisture, B_{ws} 0.0049
 Moisture EPA M4 0.49 %v
 Moisture @ Saturation 2.22 %v (for $T_s < 212^\circ\text{F}$)

EPA Method 3 Gas Density

Volume/Mole, V/M 383.661
 Dry, M_d 28.84 lb/lb-mole
 Wet, M_s 28.79 lb/lb-mole

Percent Isokinetic 98.7 %

Laboratory Results

Cr VI 2.90E-02 µg/sample
 Cr VI 2.90E-08 grams

Emissions:

Concentration Cr VI, C_s 1.9E-09 gr/dscf
 4.35E-03 µg/dscm
 Mass Emissions Cr VI 6.99E-07 lb/hr

"<" represents MDL value

Isokinetic Field Data
Field Data and Calculations
Emissions and Gas Stream Characteristics

Client: Eagle Foundry
Location: Eagle Creek, OR
Source: Cooling Bunker BH Outlet - Steel Alloy
Method: 0061

Run: 2
Start Time: 10:30
End Time: 14:40
Date: 03/28/23

Sampling Data				Traverse Data			
Time min.	Meter ft ³	ΔH "H ₂ O	Meter T _m °F	Traverse Point	Dp "H ₂ O	Stack T _s °F	$\sqrt{Dp}$
	0.000						
13	10.820	2.55	67	1	0.49	54	0.700
25	21.880	2.60	65	2	0.50	54	0.707
38	34.440	3.60	66	3	0.69	54	0.831
50	47.140	3.40	66	4	0.67	63	0.819
63	59.760	3.35	66	5	0.66	62	0.812
75	72.330	3.35	66	6	0.66	62	0.812
88	84.350	3.05	66	7	0.60	63	0.775
100	96.080	2.85	66	8	0.56	62	0.748
113	109.210	3.55	67	9	0.69	62	0.831
125	121.370	3.20	66	10	0.63	62	0.794
138	133.950	3.20	66	11	0.63	62	0.794
150	144.610	2.35	67	12	0.46	62	0.678
163	155.360	2.50	67	13	0.48	62	0.693
175	166.020	2.50	67	14	0.48	63	0.693
188	178.380	3.10	67	15	0.60	63	0.775
200	190.140	2.90	68	16	0.56	64	0.748
213	201.780	2.90	69	17	0.56	67	0.748
225	213.290	3.30	69	18	0.65	71	0.806
238	226.370	3.65	69	19	0.72	72	0.849
250	238.700	3.20	68	20	0.63	68	0.794

Client: Eagle Foundry**Run: 2****Source: Cooling Bunker BH Outlet - Steel Alloy****Date: 03/28/23****Field Data Input Continued**Moisture Data

Total Test Time 250.0 min
 Sample Time Interval 12.5 min
 Meter Volume, V_m 238.700 dcf
 Water Volume 38.2 g
 Nozzle Diameter, N_z 0.2630 in.
 Nozzle Area 0.000377 sq.ft.

Stack Dimensional Data:

Circular
 Diameter 55.750 in
 Rectangular
 Width in
 Length in
 Stack Area 16.952 sq.ft.

Traverse Data

Barometric Pressure, P_b 29.38 "Hg
 Static Pressure 1.00 "H₂O
 Pitot Factor, cp 0.84
 Meter Cal Factor 1.0122 Y

Molecular Weight:

CO₂ Average 0.09 %vd
 O₂ Average 20.84 %vd

Field Data AveragesMeter

ΔH 3.055 "H₂O
 Temperature, T_m 66.9 °F
 Temperature, T_m 526.6 °A (°R)
 Pressure Meter, P_m 29.605 "Hg

Stack

$\sqrt{Dp}$ 0.770 "H₂O
 Temperature, T_s 62.6 °F
 Temperature, T_s 522.3 °A (R)
 Pressure Stack, P_s 29.454 "Hg

Field Data CalculationsMeter Box Capture

Standard Volume, $V_{m(std)}$ 239.568 dscf
 6.784 dscm
 Actual Volume, $V_{m(actual)}$ 242.688 awcf

EPA Method 2 Stack Gas Flowrate:

Velocity, V_s 43.41 fps
 Volume (actual) 44,153 acfm
 43,822 adcfm
 Volume (standard) 2,634,895 wscf/hr
 2,615,133 dscf/hr
 Moisture, B_{ws} 0.0075 43,586 dscf/min
 Moisture EPA M4 0.75 %v 43,915 wscf/min

Gas Stream Moisture

Moisture Vapor, $V_{w(std)}$ 1.802 scf
 Moisture @ Saturation 1.94 %v (for $T_s < 212^\circ\text{F}$)

EPA Method 3 Gas Density

Dry, M_d 28.85 lb/lb-mole
 Wet, M_s 28.77 lb/lb-mole
 Volume/Mole, V/M 387.117

Percent Isokinetic 98.9 %

Laboratory Results

Cr VI 2.29E-02 µg/sample
 Cr VI 2.29E-08 grams

Emissions:

Concentration Cr VI, C_s 1.47E-09 gr/dscf
 3.37E-03 µg/dscm
 Mass Emissions Cr VI 5.51E-07 lb/hr

"<" represents MDL value

Isokinetic Field Data
Field Data and Calculations
Emissions and Gas Stream Characteristics

Client: Eagle Foundry
Location: Eagle Creek, OR
Source: Cooling Bunker BH Outlet - Steel Alloy
Method: 0061

Run: 3
Start Time: 10:35
End Time: 14:45
Date: 03/29/23

Sampling Data				Traverse Data			
Time min.	Meter ft ³	ΔH "H ₂ O	Meter T _m °F	Traverse Point	Dp "H ₂ O	Stack T _s °F	$\sqrt{Dp}$
	0.000						
13	11.760	2.85	66	1	0.55	51	0.742
25	23.090	2.85	64	2	0.55	52	0.742
38	34.420	2.75	63	3	0.54	57	0.735
50	45.730	2.70	63	4	0.53	62	0.728
63	57.580	2.90	63	5	0.57	62	0.755
75	67.930	2.30	64	6	0.45	61	0.671
88	78.980	2.55	65	7	0.50	62	0.707
100	90.060	2.60	65	8	0.51	62	0.714
113	101.170	2.60	65	9	0.51	61	0.714
125	112.370	2.65	66	10	0.52	61	0.721
138	123.600	2.60	67	11	0.51	63	0.714
150	134.890	2.60	67	12	0.51	65	0.714
163	146.380	2.75	69	13	0.54	68	0.735
175	157.190	2.75	69	14	0.54	68	0.735
188	168.610	2.70	69	15	0.53	68	0.728
200	179.970	2.80	70	16	0.55	70	0.742
213	190.550	2.45	70	17	0.49	73	0.700
225	201.470	2.50	71	18	0.50	74	0.707
238	212.280	2.40	71	19	0.48	71	0.693
250	223.108	2.55	72	20	0.50	70	0.707

Client: Eagle Foundry**Run: 3****Source: Cooling Bunker BH Outlet - Steel Alloy****Date: 03/29/23****Field Data Input Continued**Moisture Data

Total Test Time 250.0 min
 Sample Time Interval 12.5 min
 Meter Volume, V_m 223.108 dcf
 Water Volume 14.0 g
 Nozzle Diameter, N_z 0.2630 in.
 Nozzle Area 0.000377 sq.ft.

Stack Dimensional Data:

Circular
 Diameter 55.750 in
 Rectangular
 Width in
 Length in
 Stack Area 16.952 sq.ft.

Traverse Data

Barometric Pressure, P_b 29.45 "Hg
 Static Pressure 1.00 "H₂O
 Pitot Factor, cp 0.84
 Meter Cal Factor 1.0122 Y

Molecular Weight:

CO₂ Average 0.06 %vd
 O₂ Average 20.90 %vd

Field Data AveragesMeter

ΔH 2.643 "H₂O
 Temperature, T_m 67.0 °F
 Temperature, T_m 526.7 °A (°R)
 Pressure Meter, P_m 29.644 "Hg

Stack

$\sqrt{Dp}$ 0.720 "H₂O
 Temperature, T_s 64.1 °F
 Temperature, T_s 523.8 °A (R)
 Pressure Stack, P_s 29.524 "Hg

Field Data CalculationsMeter Box Capture

Standard Volume, $V_{m(std)}$ 224.172 dscf
 6.348 dscm
 Actual Volume, $V_{m(actual)}$ 226.155 awcf

EPA Method 2 Stack Gas Flowrate:

Velocity, V_s 40.57 fps
 Volume (actual) 41,265 acfm
 41,145 adcfm
 Volume (standard) 2,461,296 wscf/hr
 2,454,158 dscf/hr
 40,903 dscf/min
 41,022 wscf/min

Gas Stream Moisture

Moisture Vapor, $V_{w(std)}$ 0.660 scf
 Moisture, B_{ws} 0.0029
 Moisture EPA M4 0.29 %v
 Moisture @ Saturation 2.04 %v (for $T_s < 212^\circ\text{F}$)

EPA Method 3 Gas Density

Dry, M_d 28.85 lb/lb-mole
 Wet, M_s 28.82 lb/lb-mole
 Volume/Mole, V/M 387.308

Percent Isokinetic 98.6 %

Laboratory Results

Cr VI 5.46E-03 µg/sample
 Cr VI 5.46E-09 grams

Emissions:

Concentration Cr VI, C_s 3.76E-10 gr/dscf
 8.60E-04 µg/dscm
 Mass Emissions Cr VI 1.32E-07 lb/hr

"<" represents MDL value

Method 0061**Laboratory Results****Cr VI****Client:** Eagle Foundry**Location:** Eagle Creek, OR**Source:** Cooling Bunker BH Outlet - Steel Alloy

Lab ID	Sample ID	Sample Date	<	Result (µg/sample)	MDL (µg/sample)	Sample Vol. (ml)	H ₂ O Rinse Vol. (ml)	Blank Correction (µg)	Blank Corrected Results (µg/sample)
23-S604	Run 1	3/27/2023		0.0333	0.0045	450	179	4.29E-03	2.90E-02
23-S605	Run 2	3/28/2023		0.0270	0.0046	465	172	4.12E-03	2.29E-02
23-S606	Run 3	3/29/2023		0.0108	0.0052	515	222	5.34E-03	5.46E-03
23-S607	KOH Blank	3/29/2023	<	MDL	0.0030	300		0.00	µg/ml
23-S608	H ₂ O Blank	3/29/2023		0.0048	0.0020	200		2.40E-05	µg/ml

Notes

A "<" sign designates a result less than the minimum detection limit (MDL). If sample results are below MDL, the MDL value is used for calculations.

If blank value(s) are below MDL, no blank correction is performed.

H₂O rinse volume was calculated as the total sample volume minus the final (post-test) volume of liquid in impingers 1-3.

Method 0061
Results Summary

Client: Eagle Foundry
Location: Eagle Creek, OR
Source: Cooling Bunker BH Outlet - Steel Alloy

Run			1	2	3	
Date			3/27/2023	3/28/2023	3/29/2023	
Start Time			13:00	10:30	10:35	
End Time			17:10	14:40	14:45	Average
Duration, min.			250	250	250	250
Barometric Pressure, "Hg			29.89	29.38	29.45	29.57
Nozzle Dia., in.			0.263	0.263	0.263	0.263
Isokinetic Average, %			98.7	98.9	98.6	98.7
Sample Volume, dscf			235.731	239.568	224.172	233.157
Sample Volume, dscm			6.675	6.784	6.348	6.602
Stack Diameter, in.			55.750	55.750	55.750	55.750
Stack Area, sq.ft.			16.952	16.952	16.952	16.952
CO ₂ %vd			0.09	0.09	0.06	0.08
O ₂ %vd			20.64	20.84	20.90	20.79
Static Pressure, "H ₂ O			1.00	1.00	1.00	1.00
H ₂ O %v			0.49	0.75	0.29	0.51
Wet Molecular Weight, lb/lb-mole			28.79	28.77	28.82	28.79
Velocity, FPS			42.30	43.41	40.57	42.09
ADCFM			42,813	43,822	41,145	42,593
ACFM			43,024	44,153	41,265	42,814
DSCFM			42,966	43,586	40,903	42,485
Stack Temperature, °F			66.9	62.6	64.1	64.5
Cr VI	Concentration, C _s	gr/dscf	1.90E-09	1.47E-09	3.76E-10	1.25E-09
		µg/dscm	4.35E-03	3.37E-03	8.60E-04	2.86E-03
	Mass	lb/hr	6.99E-07	5.51E-07	1.32E-07	4.61E-07
		lb Cr VI/ton Cr in melt	2.78E-05	2.28E-05	5.45E-06	1.87E-05
Process Data	Cr processed	lb/melt	209.764	201.394	201.494	
		ton/melt	0.1049	0.1007	0.1007	

APPENDIX C: O₂ AND CO₂ TEST DATA

Bison Engineering, Inc.
Gaseous Testing Summary

Client: **Eagle Foundry Company**
Facility: **Eagle Foundry**
Location: **Eagle Creek, OR**

Source: **Main Foundry BH Outlet**
Test Date: **3/27/2023 - Day 1**

Environmental Conditions / Test Notes:

See isokinetic field data sheets for environmental conditions. Logger data was having issues reporting 1 minute averages so data is reported in 6 second blocks (10 points per minute)

Testing Personnel:

JMK

Run	White Iron Run 1	Steel Alloy Run 1
Date	3/27/2023	3/27/2023
Run Start Time	6:40	13:00
Run End Time	10:40	17:10
Duration, min.	240	250
CO ₂ , %vd	0.25	0.26
O ₂ , %vd	20.85	20.99

Note: Negative concentrations are reported as zero.

Bison Engineering, Inc.
Method 3A Oxygen
Calibration Error, System Bias and System Drift

Client:	Eagle Foundry Company	Source:	Main Foundry BH Outlet	Instrument Make:	Servomex
Facility:	Eagle Foundry	Date:	3/27/2023 - Day 1	Instrument Model:	1440
Location:	Eagle Creek, OR			Instrument Serial #:	01440C1STD/2919

		Initial Values				Final Values						Raw Avg Gas Conc	Corrected Gas Conc	Instrument Cal. Reference Gas
		Analyzer Cal. Response	System Cal Response	Pre test System Cal. Bias		System Cal Response	Post test System Cal. Bias		System Drift		Analyzer Span			
				% of span	pass/fail		% of span	pass/fail	% of span	pass/fail				
White Iron	zero	0.00	-0.02	-0.09	pass	0.15	0.68	pass	0.77	pass				
Run 1	upscale	9.87	9.92	0.23	pass	9.84	-0.14	pass	0.36	pass	22.03	20.74	20.85	9.898
Mn and CM40 Steel	zero	0.00	0.15	0.68	pass	0.14	0.64	pass	0.05	pass				
Run 1	upscale	9.87	9.84	-0.14	pass	9.77	-0.45	pass	0.32	pass	22.03	20.63	20.99	9.898
				< 5%*				< 5%*		< 3%*				

Analyzer Calibration Error	Zero	Mid	High
Calibration Gas Standards	0	9.898	22.03
Cylinder Number		ALM026532	EB0155552
Calibration Gas Analyzer Response	0	9.87	22.02
Analyzer Calibration Error	0.00	-0.13	-0.05
Analyzer Calibration Error < 2%*	pass	pass	pass

System Response Time	
30	seconds

System Leak Check		
	Completed	Pass/Fail
Pre-test	Yes	Pass
Post-test	Yes	Pass

Note: All units are in %

*Or < 0.5 % absolute difference

Bison Engineering, Inc.

Method 3A CO₂

Calibration Error, System Bias and System Drift

Client:	Eagle Foundry Company	Source:	Main Foundry BH Outlet	Instrument Make:	Servomex
Facility:	Eagle Foundry	Date:	3/27/2023 - Day 1	Instrument Model:	1440
Location:	Eagle Creek, OR			Instrument Serial #:	01440C102/2927

		Initial Values				Final Values						Raw Avg Gas Conc	Corrected Gas Conc	Instrument Cal. Reference Gas
		Analyzer Cal. Response	System Cal Response	Pre test System Cal. Bias		System Cal Response	Post test System Cal. Bias		System Drift		Analyzer Span			
				% of span	pass/fail		% of span	pass/fail	% of span	pass/fail				
White Iron	zero	0.03	-0.02	-0.23	pass	-0.09	-0.56	pass	0.32	pass				
Run 1	upscale	9.85	9.90	0.23	pass	9.94	0.42	pass	0.19	pass	21.61	0.20	0.25	9.85
Mn and CM40 Steel	zero	0.03	-0.09	-0.56	pass	-0.07	-0.46	pass	0.09	pass				
Run 1	upscale	9.85	9.94	0.42	pass	10.01	0.74	pass	0.32	pass	21.61	0.19	0.26	9.85
				< 5%*		< 5%*		< 3%*						

Analyzer Calibration Error	Zero	Mid	High
Calibration Gas Standards	0	9.85	21.61
Cylinder Number		ALM026532	EB0155552
Calibration Gas Analyzer Response	0.03	9.85	21.56
Analyzer Calibration Error	0.14	0.00	-0.23
Analyzer Calibration Error < 2%*	pass	pass	pass

System Response Time	
30	seconds

System Leak Check		
	Completed	Pass/Fail
Pre-test	Yes	Pass
Post-test	Yes	Pass

Note: All units are in %

*Or < 0.5 % absolute difference

Bison Engineering, Inc.
Stratification Check

Client:	Eagle Foundry Company	Source:	Main Foundry BH Outlet
Facility:	Eagle Foundry	Test Date:	3/27/2023 - Day 1
Location:	Eagle Creek, OR		

Stack Diameter: 61 inches

Port Depth: 6 inches

3 POINT METHOD						
<u>% of diameter</u>	<u>Pt</u>	<u>Pt location</u>	<u>O2%</u>	<u>Diff (+/- 5%)</u>	<u>Pass/Fail</u>	
16.7%	S1	16.19	20.77	-0.02%	PASS	
50.0%	S2	36.50	20.77	-0.02%	PASS	
83.3%	S3	56.81	20.78	0.03%	PASS	
		AVERAGE:	20.77			

Bison Engineering, Inc.
EPA Method 3A (O₂)
Example Calculations

Client: **Eagle Foundry Company**
 Location: **Eagle Creek, OR**
 Source: **Main Foundry BH Outlet**

Run: **White Iron Run 1**
 Start Time: **6:40**
 End Time: **10:40**
 Date: **3/27/2023 - Day 1**

EPA Method 3A:

Analyzer Calibration Error (Mid)

$$1) \text{ ACE} = \left(\frac{C_{\text{Dir}} - C_V}{C_S} \right) \times 100 = -0.13 \%v$$

where C_{Dir} : 9.87 %
 C_V : 9.90 %
 C_S : 22.03 %

System Bias (Upscale)

$$2) \text{ SB} = \left(\frac{C_s - C_{\text{Dir}}}{C_S} \right) \times 100 = 0.23 \%v$$

where C_{Dir} : 9.87 %
 C_S : 9.92 %
 C_S : 22.03 %

Drift Assessment (Upscale)

$$3) \text{ D} = | \text{SB}_{\text{Final}} - \text{SB}_i | = 0.36 \%v$$

where SB_{Final} : -0.14 %
 SB_i : 0.23 %

Effluent Gas Concentration

$$4) \text{ C}_{\text{Gas}} = (C_{\text{Avg}} - C_O) \left(\frac{C_{\text{MA}}}{C_M - C_O} \right) = 20.85 \%v$$

where C_{Avg} : 20.74 %
 C_O : 0.07 %
 C_{MA} : 9.90 %
 C_M : 9.88 %

Bison Engineering, Inc.
EPA Method 3A (CO₂)
Example Calculations

Client: **Eagle Foundry Company**
 Location: **Eagle Creek, OR**
 Source: **Main Foundry BH Outlet**

Run: **White Iron Run 1**
 Start Time: **6:40**
 End Time: **10:40**
 Date: **3/27/2023 - Day 1**

EPA Method 3A:

Analyzer Calibration Error (Mid)

$$1) \text{ ACE} = \left(\frac{C_{\text{Dir}} - C_V}{C_S} \right) \times 100 = 0.00 \%v$$

where C_{Dir} : 9.85 %
 C_V : 9.85 %
 C_S : 21.61 %

System Bias (Upscale)

$$2) \text{ SB} = \left(\frac{C_s - C_{\text{Dir}}}{C_S} \right) \times 100 = 0.23 \%v$$

where C_{Dir} : 9.85 %
 C_S : 9.90 %
 C_S : 21.61 %

Drift Assessment (Upscale)

$$3) \text{ D} = | \text{SB}_{\text{Final}} - \text{SB}_i | = 0.19 \%v$$

where SB_{Final} : 0.42 %
 SB_i : 0.23 %

Effluent Gas Concentration

$$4) \text{ C}_{\text{Gas}} = (C_{\text{Avg}} - C_O) \left(\frac{C_{\text{MA}}}{C_M - C_O} \right) = 0.25 \%v$$

where C_{Avg} : 0.20 %
 C_O : -0.06 %
 C_{MA} : 9.85 %
 C_M : 9.92 %

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES	
3/27/2023	4:03:32	0.00	0.02		
3/27/2023	4:03:38	0.00	0.02		
3/27/2023	4:03:44	0.00	0.03	O2/CO2 Analyzer Zero	
3/27/2023	4:03:50	0.00	0.03	0.00	0.03
3/27/2023	4:03:56	0.00	0.03		
3/27/2023	4:04:02	0.00	0.03		
3/27/2023	4:04:08	0.00	0.03		
3/27/2023	4:04:14	0.00	0.03		
3/27/2023	4:04:20	0.00	0.03		
3/27/2023	4:04:26	0.00	0.03		
3/27/2023	4:04:32	0.00	0.03		
3/27/2023	4:04:38	0.00	0.03		
3/27/2023	4:04:44	0.00	0.03		
3/27/2023	4:04:50	0.00	0.04		
3/27/2023	4:04:56	0.00	0.04		
3/27/2023	4:09:50	22.01	21.79		
3/27/2023	4:09:56	22.01	21.74		
3/27/2023	4:10:02	22.01	21.70	O2/CO2 Analyzer Span	
3/27/2023	4:10:08	22.01	21.67	22.02	21.56
3/27/2023	4:10:14	22.01	21.64		
3/27/2023	4:10:20	22.02	21.62		
3/27/2023	4:10:26	22.01	21.59		
3/27/2023	4:10:32	22.02	21.57		
3/27/2023	4:10:38	22.02	21.56		
3/27/2023	4:10:44	22.01	21.54		
3/27/2023	4:10:50	22.02	21.51		
3/27/2023	4:10:56	22.02	21.48		
3/27/2023	4:11:02	22.02	21.46		
3/27/2023	4:11:08	22.02	21.46		
3/27/2023	4:11:14	22.02	21.44		
3/27/2023	5:01:01	10.73	4.69		
3/27/2023	5:01:07	4.94	1.66		
3/27/2023	5:01:13	9.66	5.37	O2/CO2 Analyzer Mid	
3/27/2023	5:01:19	9.84	9.87	9.87	9.85
3/27/2023	5:01:25	9.85	9.84		
3/27/2023	5:01:31	9.86	9.83		
3/27/2023	5:01:37	9.86	9.83		

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES	
3/27/2023	5:01:43	9.86	9.83		
3/27/2023	5:01:49	9.87	9.84		
3/27/2023	5:01:55	9.87	9.85		
3/27/2023	5:02:01	9.88	9.86		
3/27/2023	5:02:07	9.88	9.86		
3/27/2023	5:02:13	9.88	9.87		
3/27/2023	5:02:19	9.89	9.88		
3/27/2023	5:02:25	3.47	3.59		
3/27/2023	5:02:31	-0.19	-0.22	O2/CO2 System Zero	
3/27/2023	5:02:37	-0.05	-0.06	-0.02	-0.02
3/27/2023	5:02:43	-0.02	-0.03		
3/27/2023	5:02:49	-0.01	-0.02		
3/27/2023	5:02:55	-0.01	-0.01		
3/27/2023	5:03:01	-0.01	-0.02		
3/27/2023	5:03:07	-0.02	-0.01		
3/27/2023	5:03:13	-0.01	-0.01		
3/27/2023	5:03:19	-0.01	-0.01		
3/27/2023	5:03:25	-0.02	-0.02		
3/27/2023	5:03:31	-0.01	-0.02		
3/27/2023	5:03:37	13.32	7.78		
3/27/2023	5:03:43	9.86	9.59		
3/27/2023	5:03:49	9.87	9.60		
3/27/2023	5:03:55	9.87	9.60		
3/27/2023	5:04:01	9.87	9.61		
3/27/2023	5:04:07	9.87	9.62		
3/27/2023	5:04:13	9.88	9.63		
3/27/2023	5:04:19	9.88	9.64		
3/27/2023	5:04:25	9.88	9.64		
3/27/2023	5:04:31	9.89	9.65		
3/27/2023	5:04:37	9.89	9.66		
3/27/2023	5:04:43	9.89	9.67		
3/27/2023	5:04:49	9.90	9.67		
3/27/2023	5:04:55	9.90	9.68		
3/27/2023	5:05:01	9.90	9.71		
3/27/2023	5:05:07	9.90	9.84	O2/CO2 System Upscale	
3/27/2023	5:05:13	9.91	9.85	9.92	9.90
3/27/2023	5:05:19	9.91	9.86		
3/27/2023	5:05:25	9.91	9.87		
3/27/2023	5:05:31	9.91	9.90		

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	5:05:37	9.91	9.90	
3/27/2023	5:05:43	9.92	9.90	
3/27/2023	5:05:49	9.92	9.92	
3/27/2023	5:05:55	9.92	9.91	
3/27/2023	5:06:01	9.92	9.92	
3/27/2023	5:06:07	9.93	9.93	
3/27/2023	5:06:13	9.93	9.71	
3/27/2023	5:06:19	9.92	1.68	
3/27/2023	6:28:37	20.77	-0.72	
3/27/2023	6:28:43	20.77	-0.72	
3/27/2023	6:28:49	20.77	-0.72	Stratification Check
3/27/2023	6:28:55	20.77	-0.72	Point 1
3/27/2023	6:29:01	20.77	-0.72	20.77
3/27/2023	6:29:07	20.77	-0.72	
3/27/2023	6:29:13	20.77	-0.72	
3/27/2023	6:29:19	20.77	-0.72	
3/27/2023	6:29:25	20.77	-0.72	
3/27/2023	6:29:31	20.77	-0.72	
3/27/2023	6:29:37	20.77	-0.72	
3/27/2023	6:29:43	20.77	-0.72	
3/27/2023	6:29:49	20.77	-0.73	
3/27/2023	6:29:55	20.77	-0.73	
3/27/2023	6:30:01	20.77	-0.73	
3/27/2023	6:30:07	20.77	-0.73	
3/27/2023	6:30:13	20.77	-0.73	
3/27/2023	6:30:19	20.77	-0.73	
3/27/2023	6:30:25	20.77	-0.73	
3/27/2023	6:30:31	20.77	-0.73	
3/27/2023	6:30:37	20.77	-0.73	
3/27/2023	6:30:43	20.77	-0.73	
3/27/2023	6:30:49	20.77	-0.73	
3/27/2023	6:30:55	20.77	-0.73	
3/27/2023	6:31:01	20.77	-0.73	
3/27/2023	6:31:07	20.77	-0.73	
3/27/2023	6:31:13	20.77	-0.73	
3/27/2023	6:31:19	20.77	-0.73	
3/27/2023	6:31:25	20.77	-0.73	
3/27/2023	6:31:31	20.77	-0.73	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	6:31:37	20.77	-0.73	
3/27/2023	6:31:43	20.77	-0.73	
3/27/2023	6:31:49	20.77	-0.74	
3/27/2023	6:31:55	20.77	-0.74	
3/27/2023	6:32:01	20.77	-0.74	
3/27/2023	6:32:07	20.77	-0.74	
3/27/2023	6:32:13	20.77	-0.74	
3/27/2023	6:32:19	20.77	-0.74	
3/27/2023	6:32:25	20.77	-0.74	
3/27/2023	6:32:31	20.77	-0.74	
3/27/2023	6:32:37	20.77	-0.74	
3/27/2023	6:32:43	20.77	-0.74	
3/27/2023	6:32:49	20.77	-0.74	
3/27/2023	6:32:55	20.77	-0.74	Point 2
3/27/2023	6:33:01	20.77	-0.74	20.77
3/27/2023	6:33:07	20.77	-0.74	
3/27/2023	6:33:13	20.77	-0.74	
3/27/2023	6:33:19	20.77	-0.74	
3/27/2023	6:33:25	20.77	-0.74	
3/27/2023	6:33:31	20.77	-0.74	
3/27/2023	6:33:37	20.77	-0.74	
3/27/2023	6:33:43	20.77	-0.74	
3/27/2023	6:33:49	20.77	-0.75	
3/27/2023	6:33:55	20.77	-0.75	
3/27/2023	6:34:01	20.77	-0.75	
3/27/2023	6:34:07	20.77	-0.75	
3/27/2023	6:34:13	20.77	-0.75	
3/27/2023	6:34:19	20.77	-0.75	
3/27/2023	6:34:25	20.77	-0.75	
3/27/2023	6:34:31	20.77	-0.75	
3/27/2023	6:34:37	20.77	-0.75	
3/27/2023	6:34:43	20.77	-0.75	
3/27/2023	6:34:49	20.77	-0.75	
3/27/2023	6:34:55	20.77	-0.75	
3/27/2023	6:35:01	20.77	-0.75	
3/27/2023	6:35:07	20.77	-0.75	
3/27/2023	6:35:13	20.77	-0.75	
3/27/2023	6:35:19	20.77	-0.75	
3/27/2023	6:35:25	20.77	-0.75	

Eagle Foundry Company
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Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	6:35:31	20.77	-0.75	
3/27/2023	6:35:37	20.77	-0.75	
3/27/2023	6:35:43	20.77	-0.75	
3/27/2023	6:35:49	20.77	-0.76	
3/27/2023	6:35:55	20.77	-0.76	
3/27/2023	6:36:01	20.77	-0.76	
3/27/2023	6:36:07	20.77	-0.76	
3/27/2023	6:36:13	20.77	-0.76	
3/27/2023	6:36:19	20.77	-0.76	
3/27/2023	6:36:25	20.77	-0.76	
3/27/2023	6:36:31	20.77	-0.76	
3/27/2023	6:36:37	20.77	-0.76	
3/27/2023	6:36:43	20.77	-0.76	
3/27/2023	6:36:49	20.77	-0.76	
3/27/2023	6:36:55	20.77	-0.76	Point 3
3/27/2023	6:37:01	20.77	-0.76	20.78
3/27/2023	6:37:07	20.77	-0.76	
3/27/2023	6:37:13	20.77	-0.76	
3/27/2023	6:37:19	20.77	-0.76	
3/27/2023	6:37:25	20.77	-0.76	
3/27/2023	6:37:31	20.77	-0.76	
3/27/2023	6:37:37	20.77	-0.77	
3/27/2023	6:37:43	20.77	-0.76	
3/27/2023	6:37:49	20.77	-0.77	
3/27/2023	6:37:55	20.77	-0.77	
3/27/2023	6:38:01	20.77	-0.77	
3/27/2023	6:38:07	20.77	-0.77	
3/27/2023	6:38:13	20.77	-0.77	
3/27/2023	6:38:19	20.77	-0.77	
3/27/2023	6:38:25	20.78	-0.77	
3/27/2023	6:38:31	20.78	-0.77	
3/27/2023	6:38:37	20.78	-0.77	
3/27/2023	6:38:43	20.78	-0.77	
3/27/2023	6:38:49	20.78	-0.77	
3/27/2023	6:38:55	20.78	-0.77	
3/27/2023	6:39:01	20.78	-0.77	
3/27/2023	6:39:07	20.78	-0.77	
3/27/2023	6:39:13	20.78	-0.77	
3/27/2023	6:39:19	20.78	-0.77	

Eagle Foundry Company
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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	6:39:25	20.78	-0.77	
3/27/2023	6:39:31	20.78	-0.77	
3/27/2023	6:39:37	20.78	-0.77	
3/27/2023	6:39:43	20.78	-0.77	
3/27/2023	6:39:49	20.78	-0.77	
3/27/2023	6:39:55	20.78	-0.77	
				White Iron
3/27/2023	6:40:01	20.78	0.08	Start Run 1
3/27/2023	6:40:07	20.78	0.08	
3/27/2023	6:40:13	20.78	0.08	
3/27/2023	6:40:19	20.78	0.08	
3/27/2023	6:40:25	20.78	0.08	
3/27/2023	6:40:31	20.78	0.08	
3/27/2023	6:40:37	20.77	0.08	
3/27/2023	6:40:43	20.78	0.08	
3/27/2023	6:40:49	20.78	0.08	
3/27/2023	6:40:55	20.78	0.08	
3/27/2023	6:41:01	20.78	0.08	
3/27/2023	6:41:07	20.78	0.08	
3/27/2023	6:41:13	20.77	0.08	
3/27/2023	6:41:19	20.77	0.08	
3/27/2023	6:41:25	20.77	0.08	
3/27/2023	6:41:31	20.77	0.08	
3/27/2023	6:41:37	20.78	0.08	
3/27/2023	6:41:43	20.78	0.08	
3/27/2023	6:41:49	20.77	0.08	
3/27/2023	6:41:55	20.77	0.08	
3/27/2023	6:42:01	20.77	0.08	
3/27/2023	6:42:07	20.77	0.08	
3/27/2023	6:42:13	20.77	0.08	
3/27/2023	6:42:19	20.78	0.08	
3/27/2023	6:42:25	20.78	0.08	
3/27/2023	6:42:31	20.77	0.08	
3/27/2023	6:42:37	20.77	0.08	
3/27/2023	6:42:43	20.77	0.08	
3/27/2023	6:42:49	20.77	0.08	
3/27/2023	6:42:55	20.77	0.08	
3/27/2023	6:43:01	20.77	0.09	
3/27/2023	6:43:07	20.77	0.09	

Eagle Foundry Company
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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	6:43:13	20.77	0.09	
3/27/2023	6:43:19	20.77	0.09	
3/27/2023	6:43:25	20.77	0.09	
3/27/2023	6:43:31	20.77	0.09	
3/27/2023	6:43:37	20.77	0.09	
3/27/2023	6:43:43	20.77	0.09	
3/27/2023	6:43:49	20.77	0.09	
3/27/2023	6:43:55	20.77	0.09	
3/27/2023	6:44:01	20.77	0.09	
3/27/2023	6:44:07	20.77	0.08	
3/27/2023	6:44:13	20.77	0.08	
3/27/2023	6:44:19	20.77	0.08	
3/27/2023	6:44:25	20.77	0.08	
3/27/2023	6:44:31	20.77	0.08	
3/27/2023	6:44:37	20.77	0.08	
3/27/2023	6:44:43	20.77	0.08	
3/27/2023	6:44:49	20.77	0.08	
3/27/2023	6:44:55	20.77	0.08	
3/27/2023	6:45:01	20.77	0.08	
3/27/2023	6:45:07	20.77	0.08	
3/27/2023	6:45:13	20.77	0.08	
3/27/2023	6:45:19	20.77	0.08	
3/27/2023	6:45:25	20.77	0.08	
3/27/2023	6:45:31	20.77	0.08	
3/27/2023	6:45:37	20.77	0.08	
3/27/2023	6:45:43	20.77	0.08	
3/27/2023	6:45:49	20.77	0.08	
3/27/2023	6:45:55	20.77	0.08	
3/27/2023	6:46:01	20.77	0.08	
3/27/2023	6:46:07	20.77	0.08	
3/27/2023	6:46:13	20.77	0.08	
3/27/2023	6:46:19	20.77	0.08	
3/27/2023	6:46:25	20.77	0.08	
3/27/2023	6:46:31	20.76	0.08	
3/27/2023	6:46:37	20.77	0.08	
3/27/2023	6:46:43	20.76	0.08	
3/27/2023	6:46:49	20.76	0.08	
3/27/2023	6:46:55	20.76	0.08	
3/27/2023	6:47:01	20.76	0.08	

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Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	6:47:07	20.76	0.08	
3/27/2023	6:47:13	20.76	0.08	
3/27/2023	6:47:19	20.76	0.09	
3/27/2023	6:47:25	20.76	0.09	
3/27/2023	6:47:31	20.76	0.09	
3/27/2023	6:47:37	20.76	0.09	
3/27/2023	6:47:43	20.76	0.09	
3/27/2023	6:47:49	20.76	0.09	
3/27/2023	6:47:55	20.76	0.09	
3/27/2023	6:48:01	20.76	0.09	
3/27/2023	6:48:07	20.76	0.09	
3/27/2023	6:48:13	20.76	0.09	
3/27/2023	6:48:19	20.76	0.09	
3/27/2023	6:48:25	20.76	0.09	
3/27/2023	6:48:31	20.76	0.09	
3/27/2023	6:48:37	20.76	0.09	
3/27/2023	6:48:43	20.76	0.09	
3/27/2023	6:48:49	20.76	0.09	
3/27/2023	6:48:55	20.76	0.09	
3/27/2023	6:49:01	20.76	0.09	
3/27/2023	6:49:07	20.76	0.10	
3/27/2023	6:49:13	20.76	0.10	
3/27/2023	6:49:19	20.76	0.10	
3/27/2023	6:49:25	20.76	0.10	
3/27/2023	6:49:31	20.76	0.10	
3/27/2023	6:49:37	20.76	0.10	
3/27/2023	6:49:43	20.76	0.10	
3/27/2023	6:49:49	20.76	0.11	
3/27/2023	6:49:55	20.76	0.11	
3/27/2023	6:50:01	20.76	0.11	
3/27/2023	6:50:07	20.76	0.11	
3/27/2023	6:50:13	20.76	0.11	
3/27/2023	6:50:19	20.76	0.11	
3/27/2023	6:50:25	20.76	0.11	
3/27/2023	6:50:31	20.76	0.11	
3/27/2023	6:50:37	20.76	0.11	
3/27/2023	6:50:43	20.76	0.11	
3/27/2023	6:50:49	20.76	0.11	
3/27/2023	6:50:55	20.76	0.11	

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Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	6:51:01	20.76	0.11	
3/27/2023	6:51:07	20.76	0.11	
3/27/2023	6:51:13	20.76	0.11	
3/27/2023	6:51:19	20.76	0.11	
3/27/2023	6:51:25	20.76	0.11	
3/27/2023	6:51:31	20.76	0.11	
3/27/2023	6:51:37	20.76	0.11	
3/27/2023	6:51:43	20.76	0.11	
3/27/2023	6:51:49	20.76	0.11	
3/27/2023	6:51:55	20.76	0.11	
3/27/2023	6:52:01	20.76	0.11	
3/27/2023	6:52:07	20.76	0.11	
3/27/2023	6:52:13	20.76	0.11	
3/27/2023	6:52:19	20.76	0.11	
3/27/2023	6:52:25	20.76	0.11	
3/27/2023	6:52:31	20.76	0.12	
3/27/2023	6:52:37	20.76	0.14	
3/27/2023	6:52:43	20.76	0.17	
3/27/2023	6:52:49	20.76	0.32	
3/27/2023	6:52:55	20.76	0.21	
3/27/2023	6:53:01	20.76	0.13	
3/27/2023	6:53:07	20.76	0.12	
3/27/2023	6:53:13	20.76	0.11	
3/27/2023	6:53:19	20.76	0.11	
3/27/2023	6:53:25	20.76	0.11	
3/27/2023	6:53:31	20.76	0.11	
3/27/2023	6:53:37	20.75	0.11	
3/27/2023	6:53:43	20.75	0.11	
3/27/2023	6:53:49	20.76	0.11	
3/27/2023	6:53:55	20.75	0.10	
3/27/2023	6:54:01	20.75	0.10	
3/27/2023	6:54:07	20.75	0.10	
3/27/2023	6:54:13	20.75	0.10	
3/27/2023	6:54:19	20.75	0.10	
3/27/2023	6:54:25	20.75	0.10	
3/27/2023	6:54:31	20.75	0.10	
3/27/2023	6:54:37	20.75	0.09	
3/27/2023	6:54:43	20.75	0.09	
3/27/2023	6:54:49	20.75	0.09	

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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	6:54:55	20.75	0.09	
3/27/2023	6:55:01	20.75	0.09	
3/27/2023	6:55:07	20.75	0.09	
3/27/2023	6:55:13	20.75	0.09	
3/27/2023	6:55:19	20.75	0.09	
3/27/2023	6:55:25	20.75	0.09	
3/27/2023	6:55:31	20.75	0.09	
3/27/2023	6:55:37	20.75	0.09	
3/27/2023	6:55:43	20.75	0.09	
3/27/2023	6:55:49	20.75	0.09	
3/27/2023	6:55:55	20.75	0.09	
3/27/2023	6:56:01	20.75	0.09	
3/27/2023	6:56:07	20.75	0.09	
3/27/2023	6:56:13	20.75	0.10	
3/27/2023	6:56:19	20.75	0.10	
3/27/2023	6:56:25	20.75	0.10	
3/27/2023	6:56:31	20.75	0.10	
3/27/2023	6:56:37	20.75	0.10	
3/27/2023	6:56:43	20.75	0.10	
3/27/2023	6:56:49	20.75	0.10	
3/27/2023	6:56:55	20.75	0.11	
3/27/2023	6:57:01	20.75	0.11	
3/27/2023	6:57:07	20.75	0.11	
3/27/2023	6:57:13	20.75	0.11	
3/27/2023	6:57:19	20.75	0.11	
3/27/2023	6:57:25	20.75	0.11	
3/27/2023	6:57:31	20.75	0.11	
3/27/2023	6:57:37	20.75	0.11	
3/27/2023	6:57:43	20.75	0.11	
3/27/2023	6:57:49	20.75	0.11	
3/27/2023	6:57:55	20.75	0.11	
3/27/2023	6:58:01	20.75	0.11	
3/27/2023	6:58:07	20.75	0.12	
3/27/2023	6:58:13	20.75	0.12	
3/27/2023	6:58:19	20.75	0.12	
3/27/2023	6:58:25	20.75	0.12	
3/27/2023	6:58:31	20.75	0.12	
3/27/2023	6:58:37	20.75	0.12	
3/27/2023	6:58:43	20.75	0.13	

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Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	6:58:49	20.75	0.12	
3/27/2023	6:58:55	20.75	0.12	
3/27/2023	6:59:01	20.75	0.12	
3/27/2023	6:59:07	20.75	0.12	
3/27/2023	6:59:13	20.76	0.12	
3/27/2023	6:59:19	20.75	0.12	
3/27/2023	6:59:25	20.75	0.12	
3/27/2023	6:59:31	20.75	0.12	
3/27/2023	6:59:37	20.75	0.12	
3/27/2023	6:59:43	20.75	0.11	
3/27/2023	6:59:49	20.75	0.12	
3/27/2023	6:59:55	20.75	0.12	
3/27/2023	7:00:01	20.75	0.12	
3/27/2023	7:00:07	20.75	0.12	
3/27/2023	7:00:13	20.75	0.12	
3/27/2023	7:00:19	20.76	0.12	
3/27/2023	7:00:25	20.75	0.12	
3/27/2023	7:00:31	20.75	0.12	
3/27/2023	7:00:37	20.75	0.12	
3/27/2023	7:00:43	20.76	0.12	
3/27/2023	7:00:49	20.76	0.12	
3/27/2023	7:00:55	20.76	0.12	
3/27/2023	7:01:01	20.76	0.12	
3/27/2023	7:01:07	20.75	0.12	
3/27/2023	7:01:13	20.76	0.12	
3/27/2023	7:01:19	20.76	0.13	
3/27/2023	7:01:25	20.76	0.13	
3/27/2023	7:01:31	20.76	0.13	
3/27/2023	7:01:37	20.75	0.13	
3/27/2023	7:01:43	20.75	0.13	
3/27/2023	7:01:49	20.75	0.13	
3/27/2023	7:01:55	20.75	0.13	
3/27/2023	7:02:01	20.75	0.13	
3/27/2023	7:02:07	20.75	0.13	
3/27/2023	7:02:13	20.75	0.13	
3/27/2023	7:02:19	20.75	0.13	
3/27/2023	7:02:25	20.75	0.13	
3/27/2023	7:02:31	20.75	0.13	
3/27/2023	7:02:37	20.75	0.12	

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Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	7:02:43	20.75	0.12	
3/27/2023	7:02:49	20.75	0.12	
3/27/2023	7:02:55	20.75	0.12	
3/27/2023	7:03:01	20.75	0.12	
3/27/2023	7:03:07	20.75	0.12	
3/27/2023	7:03:13	20.75	0.12	
3/27/2023	7:03:19	20.75	0.12	
3/27/2023	7:03:25	20.75	0.12	
3/27/2023	7:03:31	20.75	0.12	
3/27/2023	7:03:37	20.75	0.12	
3/27/2023	7:03:43	20.75	0.12	
3/27/2023	7:03:49	20.75	0.12	
3/27/2023	7:03:55	20.75	0.12	
3/27/2023	7:04:01	20.75	0.12	
3/27/2023	7:04:07	20.75	0.12	
3/27/2023	7:04:13	20.75	0.13	
3/27/2023	7:04:19	20.75	0.13	
3/27/2023	7:04:25	20.75	0.14	
3/27/2023	7:04:31	20.75	0.14	
3/27/2023	7:04:37	20.75	0.14	
3/27/2023	7:04:43	20.75	0.14	
3/27/2023	7:04:49	20.75	0.13	
3/27/2023	7:04:55	20.75	0.13	
3/27/2023	7:05:01	20.75	0.13	
3/27/2023	7:05:07	20.75	0.13	
3/27/2023	7:05:13	20.75	0.13	
3/27/2023	7:05:19	20.75	0.13	
3/27/2023	7:05:25	20.75	0.13	
3/27/2023	7:05:31	20.75	0.13	
3/27/2023	7:05:37	20.75	0.12	
3/27/2023	7:05:43	20.75	0.12	
3/27/2023	7:05:49	20.74	0.12	
3/27/2023	7:05:55	20.75	0.12	
3/27/2023	7:06:01	20.75	0.12	
3/27/2023	7:06:07	20.75	0.12	
3/27/2023	7:06:13	20.74	0.12	
3/27/2023	7:06:19	20.74	0.11	
3/27/2023	7:06:25	20.74	0.11	
3/27/2023	7:06:31	20.74	0.11	

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Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	7:06:37	20.74	0.11	
3/27/2023	7:06:43	20.74	0.11	
3/27/2023	7:06:49	20.74	0.12	
3/27/2023	7:06:55	20.74	0.12	
3/27/2023	7:07:01	20.74	0.12	
3/27/2023	7:07:07	20.74	0.12	
3/27/2023	7:07:13	20.74	0.12	
3/27/2023	7:07:19	20.74	0.12	
3/27/2023	7:07:25	20.74	0.12	
3/27/2023	7:07:31	20.74	0.12	
3/27/2023	7:07:37	20.74	0.12	
3/27/2023	7:07:43	20.74	0.12	
3/27/2023	7:07:49	20.74	0.12	
3/27/2023	7:07:55	20.74	0.12	
3/27/2023	7:08:01	20.74	0.12	
3/27/2023	7:08:07	20.74	0.12	
3/27/2023	7:08:13	20.74	0.12	
3/27/2023	7:08:19	20.74	0.12	
3/27/2023	7:08:25	20.74	0.12	
3/27/2023	7:08:31	20.74	0.12	
3/27/2023	7:08:37	20.74	0.12	
3/27/2023	7:08:43	20.74	0.12	
3/27/2023	7:08:49	20.74	0.12	
3/27/2023	7:08:55	20.74	0.12	
3/27/2023	7:09:01	20.74	0.12	
3/27/2023	7:09:07	20.74	0.12	
3/27/2023	7:09:13	20.74	0.12	
3/27/2023	7:09:19	20.74	0.12	
3/27/2023	7:09:25	20.74	0.12	
3/27/2023	7:09:31	20.73	0.12	
3/27/2023	7:09:37	20.74	0.12	
3/27/2023	7:09:43	20.74	0.12	
3/27/2023	7:09:49	20.74	0.12	
3/27/2023	7:09:55	20.74	0.12	
3/27/2023	7:10:01	20.74	0.12	
3/27/2023	7:10:07	20.74	0.12	
3/27/2023	7:10:13	20.74	0.12	
3/27/2023	7:10:19	20.74	0.13	
3/27/2023	7:10:25	20.74	0.13	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	7:10:31	20.74	0.13	
3/27/2023	7:10:37	20.74	0.13	
3/27/2023	7:10:43	20.74	0.13	
3/27/2023	7:10:49	20.74	0.13	
3/27/2023	7:10:55	20.74	0.13	
3/27/2023	7:11:01	20.74	0.13	
3/27/2023	7:11:07	20.74	0.13	
3/27/2023	7:11:13	20.74	0.13	
3/27/2023	7:11:19	20.74	0.13	
3/27/2023	7:11:25	20.74	0.13	
3/27/2023	7:11:31	20.74	0.13	
3/27/2023	7:11:37	20.74	0.13	
3/27/2023	7:11:43	20.74	0.13	
3/27/2023	7:11:49	20.74	0.13	
3/27/2023	7:11:55	20.74	0.13	
3/27/2023	7:12:01	20.74	0.13	
3/27/2023	7:12:07	20.74	0.13	
3/27/2023	7:12:13	20.74	0.13	
3/27/2023	7:12:19	20.74	0.13	
3/27/2023	7:12:25	20.74	0.13	
3/27/2023	7:12:31	20.74	0.13	
3/27/2023	7:12:37	20.74	0.13	
3/27/2023	7:12:43	20.74	0.13	
3/27/2023	7:12:49	20.74	0.12	
3/27/2023	7:12:55	20.74	0.12	
3/27/2023	7:13:01	20.74	0.12	
3/27/2023	7:13:07	20.74	0.12	
3/27/2023	7:13:13	20.74	0.12	
3/27/2023	7:13:19	20.74	0.12	
3/27/2023	7:13:25	20.74	0.12	
3/27/2023	7:13:31	20.74	0.12	
3/27/2023	7:13:37	20.74	0.12	
3/27/2023	7:13:43	20.74	0.12	
3/27/2023	7:13:49	20.74	0.12	
3/27/2023	7:13:55	20.74	0.12	
3/27/2023	7:14:01	20.74	0.12	
3/27/2023	7:14:07	20.74	0.12	
3/27/2023	7:14:13	20.74	0.12	
3/27/2023	7:14:19	20.74	0.13	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	7:14:25	20.74	0.12	
3/27/2023	7:14:31	20.74	0.13	
3/27/2023	7:14:37	20.74	0.13	
3/27/2023	7:14:43	20.74	0.13	
3/27/2023	7:14:49	20.74	0.13	
3/27/2023	7:14:55	20.74	0.13	
3/27/2023	7:15:01	20.74	0.13	
3/27/2023	7:15:07	20.74	0.13	
3/27/2023	7:15:13	20.74	0.13	
3/27/2023	7:15:19	20.74	0.13	
3/27/2023	7:15:25	20.74	0.13	
3/27/2023	7:15:31	20.74	0.13	
3/27/2023	7:15:37	20.74	0.14	
3/27/2023	7:15:43	20.74	0.14	
3/27/2023	7:15:49	20.74	0.13	
3/27/2023	7:15:55	20.74	0.13	
3/27/2023	7:16:01	20.74	0.13	
3/27/2023	7:16:07	20.74	0.13	
3/27/2023	7:16:13	20.74	0.13	
3/27/2023	7:16:19	20.74	0.13	
3/27/2023	7:16:25	20.74	0.14	
3/27/2023	7:16:31	20.74	0.14	
3/27/2023	7:16:37	20.74	0.14	
3/27/2023	7:16:43	20.74	0.13	
3/27/2023	7:16:49	20.74	0.14	
3/27/2023	7:16:55	20.74	0.14	
3/27/2023	7:17:01	20.74	0.14	
3/27/2023	7:17:07	20.74	0.14	
3/27/2023	7:17:13	20.74	0.14	
3/27/2023	7:17:19	20.74	0.14	
3/27/2023	7:17:25	20.74	0.14	
3/27/2023	7:17:31	20.74	0.14	
3/27/2023	7:17:37	20.74	0.13	
3/27/2023	7:17:43	20.74	0.14	
3/27/2023	7:17:49	20.74	0.13	
3/27/2023	7:17:55	20.74	0.14	
3/27/2023	7:18:01	20.74	0.13	
3/27/2023	7:18:07	20.74	0.13	
3/27/2023	7:18:13	20.74	0.13	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	7:18:19	20.74	0.13	
3/27/2023	7:18:25	20.74	0.13	
3/27/2023	7:18:31	20.74	0.13	
3/27/2023	7:18:37	20.74	0.13	
3/27/2023	7:18:43	20.74	0.13	
3/27/2023	7:18:49	20.74	0.13	
3/27/2023	7:18:55	20.74	0.13	
3/27/2023	7:19:01	20.74	0.13	
3/27/2023	7:19:07	20.74	0.13	
3/27/2023	7:19:13	20.74	0.13	
3/27/2023	7:19:19	20.74	0.14	
3/27/2023	7:19:25	20.74	0.13	
3/27/2023	7:19:31	20.74	0.13	
3/27/2023	7:19:37	20.74	0.14	
3/27/2023	7:19:43	20.74	0.14	
3/27/2023	7:19:49	20.74	0.14	
3/27/2023	7:19:55	20.74	0.14	
3/27/2023	7:20:01	20.74	0.14	
3/27/2023	7:20:07	20.74	0.14	
3/27/2023	7:20:13	20.74	0.14	
3/27/2023	7:20:19	20.74	0.14	
3/27/2023	7:20:25	20.74	0.14	
3/27/2023	7:20:31	20.74	0.14	
3/27/2023	7:20:37	20.74	0.14	
3/27/2023	7:20:43	20.74	0.14	
3/27/2023	7:20:49	20.74	0.14	
3/27/2023	7:20:55	20.74	0.14	
3/27/2023	7:21:01	20.74	0.14	
3/27/2023	7:21:07	20.74	0.15	
3/27/2023	7:21:13	20.74	0.15	
3/27/2023	7:21:19	20.74	0.15	
3/27/2023	7:21:25	20.74	0.15	
3/27/2023	7:21:31	20.74	0.14	
3/27/2023	7:21:37	20.74	0.14	
3/27/2023	7:21:43	20.74	0.14	
3/27/2023	7:21:49	20.74	0.14	
3/27/2023	7:21:55	20.74	0.14	
3/27/2023	7:22:01	20.74	0.14	
3/27/2023	7:22:07	20.74	0.15	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	7:22:13	20.74	0.15	
3/27/2023	7:22:19	20.74	0.15	
3/27/2023	7:22:25	20.74	0.15	
3/27/2023	7:22:31	20.74	0.15	
3/27/2023	7:22:37	20.74	0.15	
3/27/2023	7:22:43	20.74	0.15	
3/27/2023	7:22:49	20.74	0.15	
3/27/2023	7:22:55	20.74	0.15	
3/27/2023	7:23:01	20.74	0.15	
3/27/2023	7:23:07	20.74	0.15	
3/27/2023	7:23:13	20.74	0.15	
3/27/2023	7:23:19	20.74	0.15	
3/27/2023	7:23:25	20.74	0.15	
3/27/2023	7:23:31	20.74	0.15	
3/27/2023	7:23:37	20.74	0.15	
3/27/2023	7:23:43	20.74	0.15	
3/27/2023	7:23:49	20.74	0.15	
3/27/2023	7:23:55	20.74	0.15	
3/27/2023	7:24:01	20.74	0.15	
3/27/2023	7:24:07	20.74	0.15	
3/27/2023	7:24:13	20.74	0.15	
3/27/2023	7:24:19	20.74	0.15	
3/27/2023	7:24:25	20.74	0.15	
3/27/2023	7:24:31	20.74	0.15	
3/27/2023	7:24:37	20.74	0.15	
3/27/2023	7:24:43	20.74	0.15	
3/27/2023	7:24:49	20.74	0.15	
3/27/2023	7:24:55	20.74	0.15	
3/27/2023	7:25:01	20.74	0.15	
3/27/2023	7:25:07	20.74	0.15	
3/27/2023	7:25:13	20.75	0.15	
3/27/2023	7:25:19	20.74	0.15	
3/27/2023	7:25:25	20.74	0.15	
3/27/2023	7:25:31	20.74	0.15	
3/27/2023	7:25:37	20.74	0.15	
3/27/2023	7:25:43	20.74	0.15	
3/27/2023	7:25:49	20.74	0.15	
3/27/2023	7:25:55	20.74	0.15	
3/27/2023	7:26:01	20.75	0.15	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	7:26:07	20.75	0.15	
3/27/2023	7:26:13	20.75	0.15	
3/27/2023	7:26:19	20.74	0.15	
3/27/2023	7:26:25	20.74	0.15	
3/27/2023	7:26:31	20.74	0.15	
3/27/2023	7:26:37	20.74	0.15	
3/27/2023	7:26:43	20.74	0.15	
3/27/2023	7:26:49	20.74	0.15	
3/27/2023	7:26:55	20.74	0.15	
3/27/2023	7:27:01	20.75	0.15	
3/27/2023	7:27:07	20.75	0.15	
3/27/2023	7:27:13	20.74	0.14	
3/27/2023	7:27:19	20.75	0.14	
3/27/2023	7:27:25	20.75	0.14	
3/27/2023	7:27:31	20.75	0.14	
3/27/2023	7:27:37	20.75	0.14	
3/27/2023	7:27:43	20.75	0.14	
3/27/2023	7:27:49	20.75	0.14	
3/27/2023	7:27:55	20.75	0.14	
3/27/2023	7:28:01	20.75	0.14	
3/27/2023	7:28:07	20.75	0.14	
3/27/2023	7:28:13	20.75	0.14	
3/27/2023	7:28:19	20.75	0.14	
3/27/2023	7:28:25	20.75	0.14	
3/27/2023	7:28:31	20.75	0.14	
3/27/2023	7:28:37	20.75	0.15	
3/27/2023	7:28:43	20.75	0.15	
3/27/2023	7:28:49	20.75	0.15	
3/27/2023	7:28:55	20.75	0.16	
3/27/2023	7:29:01	20.75	0.16	
3/27/2023	7:29:07	20.75	0.16	
3/27/2023	7:29:13	20.75	0.17	
3/27/2023	7:29:19	20.75	0.17	
3/27/2023	7:29:25	20.75	0.18	
3/27/2023	7:29:31	20.75	0.18	
3/27/2023	7:29:37	20.75	0.18	
3/27/2023	7:29:43	20.75	0.18	
3/27/2023	7:29:49	20.75	0.19	
3/27/2023	7:29:55	20.75	0.19	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	7:30:01	20.75	0.19	
3/27/2023	7:30:07	20.75	0.19	
3/27/2023	7:30:13	20.75	0.20	
3/27/2023	7:30:19	20.75	0.20	
3/27/2023	7:30:25	20.75	0.20	
3/27/2023	7:30:31	20.75	0.20	
3/27/2023	7:30:37	20.75	0.20	
3/27/2023	7:30:43	20.75	0.20	
3/27/2023	7:30:49	20.75	0.20	
3/27/2023	7:30:55	20.76	0.20	
3/27/2023	7:31:01	20.76	0.20	
3/27/2023	7:31:07	20.76	0.20	
3/27/2023	7:31:13	20.76	0.20	
3/27/2023	7:31:19	20.76	0.20	
3/27/2023	7:31:25	20.76	0.20	
3/27/2023	7:31:31	20.76	0.20	
3/27/2023	7:31:37	20.76	0.20	
3/27/2023	7:31:43	20.76	0.20	
3/27/2023	7:31:49	20.76	0.20	
3/27/2023	7:31:55	20.76	0.20	
3/27/2023	7:32:01	20.76	0.20	
3/27/2023	7:32:07	20.76	0.20	
3/27/2023	7:32:13	20.76	0.20	
3/27/2023	7:32:19	20.76	0.20	
3/27/2023	7:32:25	20.76	0.20	
3/27/2023	7:32:31	20.76	0.20	
3/27/2023	7:32:37	20.76	0.20	
3/27/2023	7:32:43	20.77	0.20	
3/27/2023	7:32:49	20.77	0.20	
3/27/2023	7:32:55	20.76	0.20	
3/27/2023	7:33:01	20.77	0.21	
3/27/2023	7:33:07	20.77	0.21	
3/27/2023	7:33:13	20.77	0.21	
3/27/2023	7:33:19	20.77	0.21	
3/27/2023	7:33:25	20.77	0.21	
3/27/2023	7:33:31	20.77	0.21	
3/27/2023	7:33:37	20.77	0.21	
3/27/2023	7:33:43	20.77	0.21	
3/27/2023	7:33:49	20.77	0.21	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	7:33:55	20.77	0.21	
3/27/2023	7:34:01	20.77	0.21	
3/27/2023	7:34:07	20.77	0.21	
3/27/2023	7:34:13	20.77	0.21	
3/27/2023	7:34:19	20.77	0.21	
3/27/2023	7:34:25	20.77	0.21	
3/27/2023	7:34:31	20.77	0.21	
3/27/2023	7:34:37	20.77	0.21	
3/27/2023	7:34:43	20.77	0.21	
3/27/2023	7:34:49	20.77	0.21	
3/27/2023	7:34:55	20.77	0.21	
3/27/2023	7:35:01	20.77	0.21	
3/27/2023	7:35:07	20.77	0.21	
3/27/2023	7:35:13	20.77	0.21	
3/27/2023	7:35:19	20.77	0.21	
3/27/2023	7:35:25	20.77	0.21	
3/27/2023	7:35:31	20.77	0.21	
3/27/2023	7:35:37	20.77	0.21	
3/27/2023	7:35:43	20.77	0.21	
3/27/2023	7:35:49	20.77	0.21	
3/27/2023	7:35:55	20.77	0.21	
3/27/2023	7:36:01	20.77	0.21	
3/27/2023	7:36:07	20.77	0.21	
3/27/2023	7:36:13	20.77	0.21	
3/27/2023	7:36:19	20.77	0.21	
3/27/2023	7:36:25	20.77	0.21	
3/27/2023	7:36:31	20.77	0.21	
3/27/2023	7:36:37	20.77	0.21	
3/27/2023	7:36:43	20.77	0.21	
3/27/2023	7:36:49	20.77	0.21	
3/27/2023	7:36:55	20.77	0.21	
3/27/2023	7:37:01	20.77	0.21	
3/27/2023	7:37:07	20.77	0.21	
3/27/2023	7:37:13	20.77	0.21	
3/27/2023	7:37:19	20.77	0.21	
3/27/2023	7:37:25	20.77	0.21	
3/27/2023	7:37:31	20.77	0.21	
3/27/2023	7:37:37	20.77	0.21	
3/27/2023	7:37:43	20.77	0.21	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	7:37:49	20.77	0.21	
3/27/2023	7:37:55	20.77	0.21	
3/27/2023	7:38:01	20.77	0.21	
3/27/2023	7:38:07	20.77	0.21	
3/27/2023	7:38:13	20.77	0.21	
3/27/2023	7:38:19	20.77	0.21	
3/27/2023	7:38:25	20.77	0.21	
3/27/2023	7:38:31	20.77	0.21	
3/27/2023	7:38:37	20.77	0.21	
3/27/2023	7:38:43	20.77	0.21	
3/27/2023	7:38:49	20.77	0.21	
3/27/2023	7:38:55	20.77	0.21	
3/27/2023	7:39:01	20.77	0.21	
3/27/2023	7:39:07	20.77	0.21	
3/27/2023	7:39:13	20.77	0.21	
3/27/2023	7:39:19	20.77	0.21	
3/27/2023	7:39:25	20.77	0.21	
3/27/2023	7:39:31	20.77	0.21	
3/27/2023	7:39:37	20.77	0.21	
3/27/2023	7:39:43	20.77	0.21	
3/27/2023	7:39:49	20.77	0.21	
3/27/2023	7:39:55	20.77	0.21	
3/27/2023	7:40:01	20.77	0.21	
3/27/2023	7:40:07	20.77	0.21	
3/27/2023	7:40:13	20.77	0.21	
3/27/2023	7:40:19	20.77	0.21	
3/27/2023	7:40:25	20.77	0.21	
3/27/2023	7:40:31	20.77	0.21	
3/27/2023	7:40:37	20.77	0.21	
3/27/2023	7:40:43	20.77	0.21	
3/27/2023	7:40:49	20.77	0.21	
3/27/2023	7:40:55	20.77	0.22	
3/27/2023	7:41:01	20.77	0.22	
3/27/2023	7:41:07	20.77	0.22	
3/27/2023	7:41:13	20.77	0.22	
3/27/2023	7:41:19	20.77	0.21	
3/27/2023	7:41:25	20.77	0.21	
3/27/2023	7:41:31	20.77	0.21	
3/27/2023	7:41:37	20.77	0.21	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	7:41:43	20.77	0.22	
3/27/2023	7:41:49	20.77	0.22	
3/27/2023	7:41:55	20.77	0.22	
3/27/2023	7:42:01	20.77	0.22	
3/27/2023	7:42:07	20.77	0.21	
3/27/2023	7:42:13	20.77	0.21	
3/27/2023	7:42:19	20.77	0.22	
3/27/2023	7:42:25	20.77	0.22	
3/27/2023	7:42:31	20.77	0.22	
3/27/2023	7:42:37	20.77	0.22	
3/27/2023	7:42:43	20.77	0.22	
3/27/2023	7:42:49	20.77	0.22	
3/27/2023	7:42:55	20.77	0.22	
3/27/2023	7:43:01	20.77	0.22	
3/27/2023	7:43:07	20.77	0.22	
3/27/2023	7:43:13	20.77	0.22	
3/27/2023	7:43:19	20.77	0.22	
3/27/2023	7:43:25	20.77	0.22	
3/27/2023	7:43:31	20.77	0.21	
3/27/2023	7:43:37	20.77	0.21	
3/27/2023	7:43:43	20.77	0.22	
3/27/2023	7:43:49	20.77	0.21	
3/27/2023	7:43:55	20.77	0.22	
3/27/2023	7:44:01	20.77	0.21	
3/27/2023	7:44:07	20.77	0.21	
3/27/2023	7:44:13	20.77	0.21	
3/27/2023	7:44:19	20.77	0.21	
3/27/2023	7:44:25	20.77	0.21	
3/27/2023	7:44:31	20.77	0.21	
3/27/2023	7:44:37	20.77	0.21	
3/27/2023	7:44:43	20.77	0.21	
3/27/2023	7:44:49	20.77	0.21	
3/27/2023	7:44:55	20.77	0.21	
3/27/2023	7:45:01	20.77	0.21	
3/27/2023	7:45:07	20.77	0.21	
3/27/2023	7:45:13	20.77	0.21	
3/27/2023	7:45:19	20.77	0.21	
3/27/2023	7:45:25	20.77	0.21	
3/27/2023	7:45:31	20.77	0.21	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	7:45:37	20.77	0.21	
3/27/2023	7:45:43	20.77	0.21	
3/27/2023	7:45:49	20.77	0.21	
3/27/2023	7:45:55	20.77	0.21	
3/27/2023	7:46:01	20.77	0.21	
3/27/2023	7:46:07	20.77	0.21	
3/27/2023	7:46:13	20.77	0.21	
3/27/2023	7:46:19	20.77	0.20	
3/27/2023	7:46:25	20.77	0.20	
3/27/2023	7:46:31	20.77	0.20	
3/27/2023	7:46:37	20.77	0.20	
3/27/2023	7:46:43	20.77	0.20	
3/27/2023	7:46:49	20.77	0.20	
3/27/2023	7:46:55	20.77	0.20	
3/27/2023	7:47:01	20.77	0.20	
3/27/2023	7:47:07	20.77	0.20	
3/27/2023	7:47:13	20.77	0.20	
3/27/2023	7:47:19	20.77	0.20	
3/27/2023	7:47:25	20.77	0.20	
3/27/2023	7:47:31	20.77	0.20	
3/27/2023	7:47:37	20.77	0.20	
3/27/2023	7:47:43	20.77	0.20	
3/27/2023	7:47:49	20.77	0.20	
3/27/2023	7:47:55	20.76	0.20	
3/27/2023	7:48:01	20.77	0.20	
3/27/2023	7:48:07	20.76	0.20	
3/27/2023	7:48:13	20.76	0.20	
3/27/2023	7:48:19	20.76	0.20	
3/27/2023	7:48:25	20.76	0.20	
3/27/2023	7:48:31	20.76	0.20	
3/27/2023	7:48:37	20.76	0.20	
3/27/2023	7:48:43	20.76	0.20	
3/27/2023	7:48:49	20.76	0.20	
3/27/2023	7:48:55	20.77	0.20	
3/27/2023	7:49:01	20.76	0.20	
3/27/2023	7:49:07	20.76	0.21	
3/27/2023	7:49:13	20.76	0.21	
3/27/2023	7:49:19	20.77	0.21	
3/27/2023	7:49:25	20.77	0.21	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	7:49:31	20.77	0.21	
3/27/2023	7:49:37	20.77	0.21	
3/27/2023	7:49:43	20.77	0.21	
3/27/2023	7:49:49	20.77	0.21	
3/27/2023	7:49:55	20.76	0.22	
3/27/2023	7:50:01	20.77	0.22	
3/27/2023	7:50:07	20.76	0.22	
3/27/2023	7:50:13	20.76	0.22	
3/27/2023	7:50:19	20.76	0.22	
3/27/2023	7:50:25	20.76	0.22	
3/27/2023	7:50:31	20.76	0.22	
3/27/2023	7:50:37	20.76	0.22	
3/27/2023	7:50:43	20.76	0.22	
3/27/2023	7:50:49	20.76	0.22	
3/27/2023	7:50:55	20.76	0.22	
3/27/2023	7:51:01	20.76	0.22	
3/27/2023	7:51:07	20.76	0.22	
3/27/2023	7:51:13	20.76	0.22	
3/27/2023	7:51:19	20.76	0.22	
3/27/2023	7:51:25	20.76	0.22	
3/27/2023	7:51:31	20.76	0.22	
3/27/2023	7:51:37	20.76	0.22	
3/27/2023	7:51:43	20.76	0.22	
3/27/2023	7:51:49	20.76	0.22	
3/27/2023	7:51:55	20.76	0.22	
3/27/2023	7:52:01	20.76	0.22	
3/27/2023	7:52:07	20.76	0.22	
3/27/2023	7:52:13	20.76	0.22	
3/27/2023	7:52:19	20.76	0.22	
3/27/2023	7:52:25	20.76	0.22	
3/27/2023	7:52:31	20.76	0.22	
3/27/2023	7:52:37	20.77	0.23	
3/27/2023	7:52:43	20.77	0.23	
3/27/2023	7:52:49	20.76	0.23	
3/27/2023	7:52:55	20.76	0.23	
3/27/2023	7:53:01	20.77	0.23	
3/27/2023	7:53:07	20.77	0.23	
3/27/2023	7:53:13	20.77	0.23	
3/27/2023	7:53:19	20.77	0.23	

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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	7:53:25	20.77	0.23	
3/27/2023	7:53:31	20.77	0.23	
3/27/2023	7:53:37	20.77	0.24	
3/27/2023	7:53:43	20.77	0.24	
3/27/2023	7:53:49	20.77	0.24	
3/27/2023	7:53:55	20.77	0.24	
3/27/2023	7:54:01	20.77	0.24	
3/27/2023	7:54:07	20.77	0.24	
3/27/2023	7:54:13	20.77	0.24	
3/27/2023	7:54:19	20.77	0.24	
3/27/2023	7:54:25	20.77	0.24	
3/27/2023	7:54:31	20.78	0.24	
3/27/2023	7:54:37	20.77	0.24	
3/27/2023	7:54:43	20.78	0.24	
3/27/2023	7:54:49	20.78	0.24	
3/27/2023	7:54:55	20.78	0.24	
3/27/2023	7:55:01	20.78	0.24	
3/27/2023	7:55:07	20.78	0.24	
3/27/2023	7:55:13	20.78	0.24	
3/27/2023	7:55:19	20.78	0.24	
3/27/2023	7:55:25	20.78	0.24	
3/27/2023	7:55:31	20.78	0.24	
3/27/2023	7:55:37	20.78	0.24	
3/27/2023	7:55:43	20.78	0.24	
3/27/2023	7:55:49	20.78	0.24	
3/27/2023	7:55:55	20.79	0.24	
3/27/2023	7:56:01	20.79	0.24	
3/27/2023	7:56:07	20.79	0.24	
3/27/2023	7:56:13	20.79	0.24	
3/27/2023	7:56:19	20.79	0.24	
3/27/2023	7:56:25	20.79	0.24	
3/27/2023	7:56:31	20.79	0.24	
3/27/2023	7:56:37	20.79	0.23	
3/27/2023	7:56:43	20.79	0.22	
3/27/2023	7:56:49	20.79	0.25	
3/27/2023	7:56:55	20.79	0.25	
3/27/2023	7:57:01	20.79	0.25	
3/27/2023	7:57:07	20.79	0.25	
3/27/2023	7:57:13	20.79	0.25	

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Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	7:57:19	20.79	0.25	
3/27/2023	7:57:25	20.79	0.25	
3/27/2023	7:57:31	20.79	0.25	
3/27/2023	7:57:37	20.79	0.25	
3/27/2023	7:57:43	20.79	0.25	
3/27/2023	7:57:49	20.79	0.25	
3/27/2023	7:57:55	20.79	0.25	
3/27/2023	7:58:01	20.79	0.25	
3/27/2023	7:58:07	20.79	0.25	
3/27/2023	7:58:13	20.79	0.25	
3/27/2023	7:58:19	20.79	0.25	
3/27/2023	7:58:25	20.79	0.25	
3/27/2023	7:58:31	20.79	0.25	
3/27/2023	7:58:37	20.79	0.25	
3/27/2023	7:58:43	20.79	0.25	
3/27/2023	7:58:49	20.79	0.25	
3/27/2023	7:58:55	20.79	0.25	
3/27/2023	7:59:01	20.79	0.25	
3/27/2023	7:59:07	20.79	0.25	
3/27/2023	7:59:13	20.79	0.25	
3/27/2023	7:59:19	20.79	0.25	
3/27/2023	7:59:25	20.79	0.25	
3/27/2023	7:59:31	20.79	0.25	
3/27/2023	7:59:37	20.79	0.25	
3/27/2023	7:59:43	20.79	0.25	
3/27/2023	7:59:49	20.79	0.25	
3/27/2023	7:59:55	20.79	0.25	
3/27/2023	8:00:01	20.79	0.25	
3/27/2023	8:00:07	20.79	0.25	
3/27/2023	8:00:13	20.79	0.25	
3/27/2023	8:00:19	20.79	0.25	
3/27/2023	8:00:25	20.79	0.25	
3/27/2023	8:00:31	20.79	0.25	
3/27/2023	8:00:37	20.79	0.25	
3/27/2023	8:00:43	20.79	0.25	
3/27/2023	8:00:49	20.79	0.25	
3/27/2023	8:00:55	20.79	0.25	
3/27/2023	8:01:01	20.79	0.25	
3/27/2023	8:01:07	20.79	0.25	

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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	8:01:13	20.79	0.26	
3/27/2023	8:01:19	20.79	0.26	
3/27/2023	8:01:25	20.79	0.26	
3/27/2023	8:01:31	20.79	0.26	
3/27/2023	8:01:37	20.79	0.26	
3/27/2023	8:01:43	20.79	0.26	
3/27/2023	8:01:49	20.79	0.26	
3/27/2023	8:01:55	20.79	0.26	
3/27/2023	8:02:01	20.79	0.26	
3/27/2023	8:02:07	20.79	0.26	
3/27/2023	8:02:13	20.79	0.26	
3/27/2023	8:02:19	20.79	0.26	
3/27/2023	8:02:25	20.79	0.26	
3/27/2023	8:02:31	20.79	0.26	
3/27/2023	8:02:37	20.79	0.26	
3/27/2023	8:02:43	20.79	0.26	
3/27/2023	8:02:49	20.79	0.26	
3/27/2023	8:02:55	20.79	0.26	
3/27/2023	8:03:01	20.79	0.26	
3/27/2023	8:03:07	20.79	0.26	
3/27/2023	8:03:13	20.79	0.26	
3/27/2023	8:03:19	20.79	0.26	
3/27/2023	8:03:25	20.79	0.26	
3/27/2023	8:03:31	20.79	0.26	
3/27/2023	8:03:37	20.79	0.26	
3/27/2023	8:03:43	20.79	0.26	
3/27/2023	8:03:49	20.79	0.26	
3/27/2023	8:03:55	20.79	0.26	
3/27/2023	8:04:01	20.79	0.26	
3/27/2023	8:04:07	20.79	0.26	
3/27/2023	8:04:13	20.79	0.26	
3/27/2023	8:04:19	20.79	0.26	
3/27/2023	8:04:25	20.79	0.26	
3/27/2023	8:04:31	20.79	0.26	
3/27/2023	8:04:37	20.79	0.26	
3/27/2023	8:04:43	20.79	0.26	
3/27/2023	8:04:49	20.79	0.26	
3/27/2023	8:04:55	20.79	0.26	
3/27/2023	8:05:01	20.79	0.26	

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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	8:05:07	20.79	0.26	
3/27/2023	8:05:13	20.79	0.26	
3/27/2023	8:05:19	20.79	0.26	
3/27/2023	8:05:25	20.79	0.26	
3/27/2023	8:05:31	20.79	0.26	
3/27/2023	8:05:37	20.79	0.26	
3/27/2023	8:05:43	20.79	0.26	
3/27/2023	8:05:49	20.79	0.26	
3/27/2023	8:05:55	20.79	0.26	
3/27/2023	8:06:01	20.79	0.26	
3/27/2023	8:06:07	20.79	0.26	
3/27/2023	8:06:13	20.79	0.26	
3/27/2023	8:06:19	20.79	0.26	
3/27/2023	8:06:25	20.79	0.26	
3/27/2023	8:06:31	20.79	0.26	
3/27/2023	8:06:37	20.79	0.26	
3/27/2023	8:06:43	20.79	0.26	
3/27/2023	8:06:49	20.79	0.26	
3/27/2023	8:06:55	20.79	0.26	
3/27/2023	8:07:01	20.79	0.26	
3/27/2023	8:07:07	20.79	0.26	
3/27/2023	8:07:13	20.79	0.26	
3/27/2023	8:07:19	20.79	0.26	
3/27/2023	8:07:25	20.79	0.26	
3/27/2023	8:07:31	20.79	0.26	
3/27/2023	8:07:37	20.79	0.26	
3/27/2023	8:07:43	20.79	0.26	
3/27/2023	8:07:49	20.79	0.26	
3/27/2023	8:07:55	20.79	0.26	
3/27/2023	8:08:01	20.79	0.26	
3/27/2023	8:08:07	20.79	0.26	
3/27/2023	8:08:13	20.79	0.25	
3/27/2023	8:08:19	20.79	0.25	
3/27/2023	8:08:25	20.79	0.25	
3/27/2023	8:08:31	20.79	0.25	
3/27/2023	8:08:37	20.79	0.25	
3/27/2023	8:08:43	20.79	0.25	
3/27/2023	8:08:49	20.79	0.25	
3/27/2023	8:08:55	20.79	0.25	

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Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	8:09:01	20.79	0.25	
3/27/2023	8:09:07	20.79	0.25	
3/27/2023	8:09:13	20.79	0.25	
3/27/2023	8:09:19	20.79	0.25	
3/27/2023	8:09:25	20.79	0.25	
3/27/2023	8:09:31	20.79	0.25	
3/27/2023	8:09:37	20.79	0.25	
3/27/2023	8:09:43	20.79	0.25	
3/27/2023	8:09:49	20.79	0.24	
3/27/2023	8:09:55	20.79	0.24	
3/27/2023	8:10:01	20.79	0.24	
3/27/2023	8:10:07	20.79	0.24	
3/27/2023	8:10:13	20.79	0.24	
3/27/2023	8:10:19	20.79	0.24	
3/27/2023	8:10:25	20.79	0.24	
3/27/2023	8:10:31	20.79	0.24	
3/27/2023	8:10:37	20.79	0.24	
3/27/2023	8:10:43	20.79	0.24	
3/27/2023	8:10:49	20.79	0.24	
3/27/2023	8:10:55	20.79	0.24	
3/27/2023	8:11:01	20.79	0.24	
3/27/2023	8:11:07	20.79	0.24	
3/27/2023	8:11:13	20.79	0.24	
3/27/2023	8:11:19	20.79	0.24	
3/27/2023	8:11:25	20.79	0.24	
3/27/2023	8:11:31	20.79	0.24	
3/27/2023	8:11:37	20.79	0.24	
3/27/2023	8:11:43	20.79	0.24	
3/27/2023	8:11:49	20.79	0.24	
3/27/2023	8:11:55	20.79	0.24	
3/27/2023	8:12:01	20.79	0.24	
3/27/2023	8:12:07	20.79	0.24	
3/27/2023	8:12:13	20.79	0.24	
3/27/2023	8:12:19	20.79	0.24	
3/27/2023	8:12:25	20.79	0.24	
3/27/2023	8:12:31	20.79	0.24	
3/27/2023	8:12:37	20.79	0.24	
3/27/2023	8:12:43	20.79	0.24	
3/27/2023	8:12:49	20.79	0.24	

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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	8:12:55	20.79	0.24	
3/27/2023	8:13:01	20.79	0.24	
3/27/2023	8:13:07	20.79	0.24	
3/27/2023	8:13:13	20.79	0.24	
3/27/2023	8:13:19	20.79	0.24	
3/27/2023	8:13:25	20.79	0.24	
3/27/2023	8:13:31	20.79	0.24	
3/27/2023	8:13:37	20.79	0.24	
3/27/2023	8:13:43	20.79	0.24	
3/27/2023	8:13:49	20.79	0.24	
3/27/2023	8:13:55	20.79	0.24	
3/27/2023	8:14:01	20.79	0.24	
3/27/2023	8:14:07	20.79	0.24	
3/27/2023	8:14:13	20.79	0.24	
3/27/2023	8:14:19	20.79	0.24	
3/27/2023	8:14:25	20.79	0.24	
3/27/2023	8:14:31	20.79	0.24	
3/27/2023	8:14:37	20.79	0.24	
3/27/2023	8:14:43	20.79	0.24	
3/27/2023	8:14:49	20.79	0.24	
3/27/2023	8:14:55	20.79	0.24	
3/27/2023	8:15:01	20.79	0.24	
3/27/2023	8:15:07	20.79	0.24	
3/27/2023	8:15:13	20.79	0.24	
3/27/2023	8:15:19	20.79	0.24	
3/27/2023	8:15:25	20.79	0.24	
3/27/2023	8:15:31	20.79	0.25	
3/27/2023	8:15:37	20.79	0.25	
3/27/2023	8:15:43	20.79	0.25	
3/27/2023	8:15:49	20.79	0.25	
3/27/2023	8:15:55	20.79	0.25	
3/27/2023	8:16:01	20.79	0.25	
3/27/2023	8:16:07	20.79	0.25	
3/27/2023	8:16:13	20.79	0.25	
3/27/2023	8:16:19	20.79	0.25	
3/27/2023	8:16:25	20.79	0.25	
3/27/2023	8:16:31	20.79	0.25	
3/27/2023	8:16:37	20.79	0.25	
3/27/2023	8:16:43	20.79	0.24	

Eagle Foundry Company
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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	8:16:49	20.79	0.24	
3/27/2023	8:16:55	20.79	0.24	
3/27/2023	8:17:01	20.79	0.24	
3/27/2023	8:17:07	20.79	0.24	
3/27/2023	8:17:13	20.79	0.24	
3/27/2023	8:17:19	20.79	0.24	
3/27/2023	8:17:25	20.79	0.24	
3/27/2023	8:17:31	20.79	0.24	
3/27/2023	8:17:37	20.79	0.24	
3/27/2023	8:17:43	20.79	0.24	
3/27/2023	8:17:49	20.79	0.24	
3/27/2023	8:17:55	20.79	0.24	
3/27/2023	8:18:01	20.79	0.24	
3/27/2023	8:18:07	20.79	0.24	
3/27/2023	8:18:13	20.79	0.24	
3/27/2023	8:18:19	20.79	0.24	
3/27/2023	8:18:25	20.79	0.24	
3/27/2023	8:18:31	20.79	0.24	
3/27/2023	8:18:37	20.79	0.24	
3/27/2023	8:18:43	20.79	0.24	
3/27/2023	8:18:49	20.79	0.24	
3/27/2023	8:18:55	20.79	0.24	
3/27/2023	8:19:01	20.79	0.24	
3/27/2023	8:19:07	20.79	0.24	
3/27/2023	8:19:13	20.79	0.24	
3/27/2023	8:19:19	20.79	0.24	
3/27/2023	8:19:25	20.79	0.24	
3/27/2023	8:19:31	20.79	0.24	
3/27/2023	8:19:37	20.79	0.24	
3/27/2023	8:19:43	20.79	0.24	
3/27/2023	8:19:49	20.79	0.24	
3/27/2023	8:19:55	20.79	0.24	
3/27/2023	8:20:01	20.79	0.24	
3/27/2023	8:20:07	20.79	0.24	
3/27/2023	8:20:13	20.79	0.24	
3/27/2023	8:20:19	20.79	0.24	
3/27/2023	8:20:25	20.79	0.24	
3/27/2023	8:20:31	20.79	0.24	
3/27/2023	8:20:37	20.79	0.24	

Eagle Foundry Company
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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	8:20:43	20.79	0.24	
3/27/2023	8:20:49	20.79	0.24	
3/27/2023	8:20:55	20.79	0.24	
3/27/2023	8:21:01	20.79	0.24	
3/27/2023	8:21:07	20.79	0.24	
3/27/2023	8:21:13	20.79	0.24	
3/27/2023	8:21:19	20.79	0.23	
3/27/2023	8:21:25	20.79	0.23	
3/27/2023	8:21:31	20.79	0.23	
3/27/2023	8:21:37	20.79	0.23	
3/27/2023	8:21:43	20.79	0.23	
3/27/2023	8:21:49	20.79	0.23	
3/27/2023	8:21:55	20.79	0.23	
3/27/2023	8:22:01	20.79	0.23	
3/27/2023	8:22:07	20.79	0.23	
3/27/2023	8:22:13	20.79	0.23	
3/27/2023	8:22:19	20.79	0.23	
3/27/2023	8:22:25	20.79	0.23	
3/27/2023	8:22:31	20.79	0.23	
3/27/2023	8:22:37	20.79	0.23	
3/27/2023	8:22:43	20.79	0.23	
3/27/2023	8:22:49	20.79	0.23	
3/27/2023	8:22:55	20.79	0.23	
3/27/2023	8:23:01	20.79	0.23	
3/27/2023	8:23:07	20.79	0.23	
3/27/2023	8:23:13	20.79	0.23	
3/27/2023	8:23:19	20.79	0.23	
3/27/2023	8:23:25	20.79	0.23	
3/27/2023	8:23:31	20.79	0.23	
3/27/2023	8:23:37	20.79	0.24	
3/27/2023	8:23:43	20.79	0.24	
3/27/2023	8:23:49	20.79	0.24	
3/27/2023	8:23:55	20.79	0.24	
3/27/2023	8:24:01	20.79	0.24	
3/27/2023	8:24:07	20.79	0.24	
3/27/2023	8:24:13	20.79	0.23	
3/27/2023	8:24:19	20.79	0.23	
3/27/2023	8:24:25	20.79	0.23	
3/27/2023	8:24:31	20.79	0.23	

Eagle Foundry Company
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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	8:24:37	20.79	0.24	
3/27/2023	8:24:43	20.79	0.23	
3/27/2023	8:24:49	20.79	0.24	
3/27/2023	8:24:55	20.79	0.24	
3/27/2023	8:25:01	20.79	0.24	
3/27/2023	8:25:07	20.79	0.24	
3/27/2023	8:25:13	20.79	0.24	
3/27/2023	8:25:19	20.79	0.24	
3/27/2023	8:25:25	20.79	0.24	
3/27/2023	8:25:31	20.78	0.24	
3/27/2023	8:25:37	20.79	0.24	
3/27/2023	8:25:43	20.79	0.24	
3/27/2023	8:25:49	20.79	0.24	
3/27/2023	8:25:55	20.78	0.24	
3/27/2023	8:26:01	20.78	0.24	
3/27/2023	8:26:07	20.78	0.24	
3/27/2023	8:26:13	20.79	0.24	
3/27/2023	8:26:19	20.79	0.24	
3/27/2023	8:26:25	20.79	0.24	
3/27/2023	8:26:31	20.79	0.24	
3/27/2023	8:26:37	20.79	0.24	
3/27/2023	8:26:43	20.79	0.24	
3/27/2023	8:26:49	20.79	0.24	
3/27/2023	8:26:55	20.79	0.24	
3/27/2023	8:27:01	20.79	0.24	
3/27/2023	8:27:07	20.79	0.24	
3/27/2023	8:27:13	20.78	0.23	
3/27/2023	8:27:19	20.78	0.24	
3/27/2023	8:27:25	20.78	0.24	
3/27/2023	8:27:31	20.78	0.24	
3/27/2023	8:27:37	20.78	0.24	
3/27/2023	8:27:43	20.78	0.24	
3/27/2023	8:27:49	20.78	0.24	
3/27/2023	8:27:55	20.78	0.24	
3/27/2023	8:28:01	20.78	0.23	
3/27/2023	8:28:07	20.78	0.24	
3/27/2023	8:28:13	20.78	0.24	
3/27/2023	8:28:19	20.78	0.24	
3/27/2023	8:28:25	20.78	0.23	

Eagle Foundry Company
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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	8:28:31	20.78	0.23	
3/27/2023	8:28:37	20.78	0.23	
3/27/2023	8:28:43	20.78	0.23	
3/27/2023	8:28:49	20.78	0.23	
3/27/2023	8:28:55	20.78	0.23	
3/27/2023	8:29:01	20.78	0.23	
3/27/2023	8:29:07	20.78	0.23	
3/27/2023	8:29:13	20.78	0.23	
3/27/2023	8:29:19	20.78	0.23	
3/27/2023	8:29:25	20.78	0.23	
3/27/2023	8:29:31	20.78	0.23	
3/27/2023	8:29:37	20.78	0.23	
3/27/2023	8:29:43	20.78	0.23	
3/27/2023	8:29:49	20.78	0.23	
3/27/2023	8:29:55	20.78	0.23	
3/27/2023	8:30:01	20.78	0.23	
3/27/2023	8:30:07	20.78	0.23	
3/27/2023	8:30:13	20.78	0.23	
3/27/2023	8:30:19	20.78	0.23	
3/27/2023	8:30:25	20.78	0.23	
3/27/2023	8:30:31	20.78	0.23	
3/27/2023	8:30:37	20.78	0.23	
3/27/2023	8:30:43	20.78	0.23	
3/27/2023	8:30:49	20.78	0.23	
3/27/2023	8:30:55	20.78	0.23	
3/27/2023	8:31:01	20.78	0.23	
3/27/2023	8:31:07	20.78	0.23	
3/27/2023	8:31:13	20.78	0.23	
3/27/2023	8:31:19	20.78	0.23	
3/27/2023	8:31:25	20.78	0.23	
3/27/2023	8:31:31	20.78	0.23	
3/27/2023	8:31:37	20.78	0.23	
3/27/2023	8:31:43	20.78	0.23	
3/27/2023	8:31:49	20.78	0.23	
3/27/2023	8:31:55	20.78	0.23	
3/27/2023	8:32:01	20.78	0.23	
3/27/2023	8:32:07	20.78	0.23	
3/27/2023	8:32:13	20.78	0.23	
3/27/2023	8:32:19	20.78	0.23	

Eagle Foundry Company
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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	8:32:25	20.78	0.23	
3/27/2023	8:32:31	20.78	0.23	
3/27/2023	8:32:37	20.78	0.23	
3/27/2023	8:32:43	20.78	0.23	
3/27/2023	8:32:49	20.78	0.23	
3/27/2023	8:32:55	20.78	0.23	
3/27/2023	8:33:01	20.78	0.23	
3/27/2023	8:33:07	20.78	0.23	
3/27/2023	8:33:13	20.78	0.23	
3/27/2023	8:33:19	20.78	0.23	
3/27/2023	8:33:25	20.78	0.23	
3/27/2023	8:33:31	20.78	0.23	
3/27/2023	8:33:37	20.78	0.23	
3/27/2023	8:33:43	20.78	0.23	
3/27/2023	8:33:49	20.78	0.23	
3/27/2023	8:33:55	20.78	0.23	
3/27/2023	8:34:01	20.78	0.23	
3/27/2023	8:34:07	20.78	0.23	
3/27/2023	8:34:13	20.77	0.23	
3/27/2023	8:34:19	20.77	0.23	
3/27/2023	8:34:25	20.77	0.23	
3/27/2023	8:34:31	20.77	0.23	
3/27/2023	8:34:37	20.77	0.23	
3/27/2023	8:34:43	20.77	0.23	
3/27/2023	8:34:49	20.77	0.23	
3/27/2023	8:34:55	20.77	0.23	
3/27/2023	8:35:01	20.77	0.23	
3/27/2023	8:35:07	20.77	0.23	
3/27/2023	8:35:13	20.77	0.23	
3/27/2023	8:35:19	20.77	0.23	
3/27/2023	8:35:25	20.77	0.23	
3/27/2023	8:35:31	20.77	0.23	
3/27/2023	8:35:37	20.77	0.23	
3/27/2023	8:35:43	20.77	0.23	
3/27/2023	8:35:49	20.77	0.23	
3/27/2023	8:35:55	20.77	0.23	
3/27/2023	8:36:01	20.77	0.23	
3/27/2023	8:36:07	20.77	0.23	
3/27/2023	8:36:13	20.77	0.23	

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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	8:36:19	20.77	0.23	
3/27/2023	8:36:25	20.77	0.23	
3/27/2023	8:36:31	20.77	0.23	
3/27/2023	8:36:37	20.77	0.23	
3/27/2023	8:36:43	20.77	0.23	
3/27/2023	8:36:49	20.77	0.23	
3/27/2023	8:36:55	20.77	0.23	
3/27/2023	8:37:01	20.77	0.23	
3/27/2023	8:37:07	20.77	0.23	
3/27/2023	8:37:13	20.77	0.23	
3/27/2023	8:37:19	20.77	0.23	
3/27/2023	8:37:25	20.77	0.23	
3/27/2023	8:37:31	20.77	0.23	
3/27/2023	8:37:37	20.77	0.23	
3/27/2023	8:37:43	20.77	0.23	
3/27/2023	8:37:49	20.77	0.23	
3/27/2023	8:37:55	20.77	0.23	
3/27/2023	8:38:01	20.77	0.23	
3/27/2023	8:38:07	20.77	0.23	
3/27/2023	8:38:13	20.77	0.23	
3/27/2023	8:38:19	20.77	0.23	
3/27/2023	8:38:25	20.77	0.23	
3/27/2023	8:38:31	20.77	0.23	
3/27/2023	8:38:37	20.77	0.23	
3/27/2023	8:38:43	20.77	0.23	
3/27/2023	8:38:49	20.77	0.23	
3/27/2023	8:38:55	20.77	0.23	
3/27/2023	8:39:01	20.77	0.23	
3/27/2023	8:39:07	20.77	0.23	
3/27/2023	8:39:13	20.77	0.23	
3/27/2023	8:39:19	20.77	0.23	
3/27/2023	8:39:25	20.77	0.23	
3/27/2023	8:39:31	20.77	0.23	
3/27/2023	8:39:37	20.77	0.23	
3/27/2023	8:39:43	20.76	0.23	
3/27/2023	8:39:49	20.76	0.23	
3/27/2023	8:39:55	20.76	0.23	
3/27/2023	8:40:01	20.76	0.23	
3/27/2023	8:40:07	20.76	0.23	

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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	8:40:13	20.76	0.23	
3/27/2023	8:40:19	20.76	0.23	
3/27/2023	8:40:25	20.76	0.23	
3/27/2023	8:40:31	20.76	0.23	
3/27/2023	8:40:37	20.76	0.23	
3/27/2023	8:40:43	20.76	0.23	
3/27/2023	8:40:49	20.76	0.23	
3/27/2023	8:40:55	20.76	0.23	
3/27/2023	8:41:01	20.76	0.23	
3/27/2023	8:41:07	20.76	0.23	
3/27/2023	8:41:13	20.76	0.23	
3/27/2023	8:41:19	20.76	0.23	
3/27/2023	8:41:25	20.76	0.23	
3/27/2023	8:41:31	20.76	0.23	
3/27/2023	8:41:37	20.76	0.23	
3/27/2023	8:41:43	20.76	0.23	
3/27/2023	8:41:49	20.76	0.23	
3/27/2023	8:41:55	20.76	0.23	
3/27/2023	8:42:01	20.76	0.23	
3/27/2023	8:42:07	20.76	0.24	
3/27/2023	8:42:13	20.76	0.24	
3/27/2023	8:42:19	20.76	0.24	
3/27/2023	8:42:25	20.76	0.24	
3/27/2023	8:42:31	20.76	0.24	
3/27/2023	8:42:37	20.76	0.24	
3/27/2023	8:42:43	20.76	0.23	
3/27/2023	8:42:49	20.76	0.23	
3/27/2023	8:42:55	20.76	0.23	
3/27/2023	8:43:01	20.76	0.23	
3/27/2023	8:43:07	20.76	0.23	
3/27/2023	8:43:13	20.76	0.23	
3/27/2023	8:43:19	20.76	0.23	
3/27/2023	8:43:25	20.76	0.23	
3/27/2023	8:43:31	20.76	0.23	
3/27/2023	8:43:37	20.76	0.23	
3/27/2023	8:43:43	20.76	0.23	
3/27/2023	8:43:49	20.76	0.23	
3/27/2023	8:43:55	20.76	0.23	
3/27/2023	8:44:01	20.76	0.23	

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Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	8:44:07	20.76	0.23	
3/27/2023	8:44:13	20.76	0.23	
3/27/2023	8:44:19	20.76	0.23	
3/27/2023	8:44:25	20.76	0.23	
3/27/2023	8:44:31	20.76	0.23	
3/27/2023	8:44:37	20.76	0.23	
3/27/2023	8:44:43	20.76	0.23	
3/27/2023	8:44:49	20.76	0.23	
3/27/2023	8:44:55	20.76	0.23	
3/27/2023	8:45:01	20.76	0.23	
3/27/2023	8:45:07	20.76	0.23	
3/27/2023	8:45:13	20.76	0.23	
3/27/2023	8:45:19	20.76	0.23	
3/27/2023	8:45:25	20.76	0.23	
3/27/2023	8:45:31	20.76	0.23	
3/27/2023	8:45:37	20.76	0.23	
3/27/2023	8:45:43	20.76	0.23	
3/27/2023	8:45:49	20.76	0.23	
3/27/2023	8:45:55	20.76	0.23	
3/27/2023	8:46:01	20.76	0.23	
3/27/2023	8:46:07	20.76	0.23	
3/27/2023	8:46:13	20.76	0.23	
3/27/2023	8:46:19	20.76	0.23	
3/27/2023	8:46:25	20.76	0.23	
3/27/2023	8:46:31	20.76	0.23	
3/27/2023	8:46:37	20.76	0.23	
3/27/2023	8:46:43	20.76	0.23	
3/27/2023	8:46:49	20.76	0.23	
3/27/2023	8:46:55	20.76	0.23	
3/27/2023	8:47:01	20.76	0.23	
3/27/2023	8:47:07	20.76	0.23	
3/27/2023	8:47:13	20.76	0.23	
3/27/2023	8:47:19	20.76	0.23	
3/27/2023	8:47:25	20.76	0.23	
3/27/2023	8:47:31	20.76	0.23	
3/27/2023	8:47:37	20.76	0.23	
3/27/2023	8:47:43	20.76	0.23	
3/27/2023	8:47:49	20.76	0.23	
3/27/2023	8:47:55	20.76	0.23	

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Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	8:48:01	20.76	0.23	
3/27/2023	8:48:07	20.76	0.23	
3/27/2023	8:48:13	20.76	0.23	
3/27/2023	8:48:19	20.76	0.23	
3/27/2023	8:48:25	20.76	0.23	
3/27/2023	8:48:31	20.76	0.23	
3/27/2023	8:48:37	20.76	0.23	
3/27/2023	8:48:43	20.76	0.23	
3/27/2023	8:48:49	20.76	0.23	
3/27/2023	8:48:55	20.76	0.23	
3/27/2023	8:49:01	20.76	0.23	
3/27/2023	8:49:07	20.76	0.23	
3/27/2023	8:49:13	20.76	0.23	
3/27/2023	8:49:19	20.76	0.23	
3/27/2023	8:49:25	20.76	0.23	
3/27/2023	8:49:31	20.76	0.23	
3/27/2023	8:49:37	20.76	0.23	
3/27/2023	8:49:43	20.76	0.23	
3/27/2023	8:49:49	20.76	0.23	
3/27/2023	8:49:55	20.76	0.23	
3/27/2023	8:50:01	20.76	0.23	
3/27/2023	8:50:07	20.76	0.23	
3/27/2023	8:50:13	20.76	0.23	
3/27/2023	8:50:19	20.76	0.23	
3/27/2023	8:50:25	20.76	0.23	
3/27/2023	8:50:31	20.76	0.23	
3/27/2023	8:50:37	20.76	0.23	
3/27/2023	8:50:43	20.76	0.23	
3/27/2023	8:50:49	20.76	0.23	
3/27/2023	8:50:55	20.76	0.23	
3/27/2023	8:51:01	20.76	0.23	
3/27/2023	8:51:07	20.76	0.23	
3/27/2023	8:51:13	20.76	0.23	
3/27/2023	8:51:19	20.76	0.23	
3/27/2023	8:51:25	20.76	0.23	
3/27/2023	8:51:31	20.76	0.22	
3/27/2023	8:51:37	20.76	0.22	
3/27/2023	8:51:43	20.76	0.22	
3/27/2023	8:51:49	20.76	0.22	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	8:51:55	20.76	0.22	
3/27/2023	8:52:01	20.76	0.22	
3/27/2023	8:52:07	20.76	0.23	
3/27/2023	8:52:13	20.76	0.23	
3/27/2023	8:52:19	20.76	0.23	
3/27/2023	8:52:25	20.76	0.23	
3/27/2023	8:52:31	20.76	0.23	
3/27/2023	8:52:37	20.76	0.23	
3/27/2023	8:52:43	20.76	0.23	
3/27/2023	8:52:49	20.76	0.23	
3/27/2023	8:52:55	20.76	0.23	
3/27/2023	8:53:01	20.76	0.23	
3/27/2023	8:53:07	20.76	0.23	
3/27/2023	8:53:13	20.76	0.23	
3/27/2023	8:53:19	20.76	0.23	
3/27/2023	8:53:25	20.76	0.23	
3/27/2023	8:53:31	20.76	0.22	
3/27/2023	8:53:37	20.76	0.23	
3/27/2023	8:53:43	20.76	0.22	
3/27/2023	8:53:49	20.76	0.22	
3/27/2023	8:53:55	20.76	0.22	
3/27/2023	8:54:01	20.76	0.22	
3/27/2023	8:54:07	20.76	0.22	
3/27/2023	8:54:13	20.76	0.22	
3/27/2023	8:54:19	20.76	0.23	
3/27/2023	8:54:25	20.76	0.23	
3/27/2023	8:54:31	20.76	0.23	
3/27/2023	8:54:37	20.76	0.22	
3/27/2023	8:54:43	20.76	0.22	
3/27/2023	8:54:49	20.76	0.22	
3/27/2023	8:54:55	20.76	0.23	
3/27/2023	8:55:01	20.76	0.23	
3/27/2023	8:55:07	20.76	0.23	
3/27/2023	8:55:13	20.76	0.23	
3/27/2023	8:55:19	20.75	0.23	
3/27/2023	8:55:25	20.75	0.23	
3/27/2023	8:55:31	20.76	0.23	
3/27/2023	8:55:37	20.76	0.23	
3/27/2023	8:55:43	20.76	0.23	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	8:55:49	20.76	0.23	
3/27/2023	8:55:55	20.76	0.23	
3/27/2023	8:56:01	20.76	0.23	
3/27/2023	8:56:07	20.76	0.23	
3/27/2023	8:56:13	20.76	0.23	
3/27/2023	8:56:19	20.76	0.23	
3/27/2023	8:56:25	20.76	0.23	
3/27/2023	8:56:31	20.75	0.23	
3/27/2023	8:56:37	20.75	0.23	
3/27/2023	8:56:43	20.75	0.23	
3/27/2023	8:56:49	20.75	0.23	
3/27/2023	8:56:55	20.75	0.23	
3/27/2023	8:57:01	20.75	0.23	
3/27/2023	8:57:07	20.75	0.23	
3/27/2023	8:57:13	20.75	0.23	
3/27/2023	8:57:19	20.75	0.23	
3/27/2023	8:57:25	20.75	0.23	
3/27/2023	8:57:31	20.75	0.23	
3/27/2023	8:57:37	20.75	0.23	
3/27/2023	8:57:43	20.75	0.23	
3/27/2023	8:57:49	20.75	0.23	
3/27/2023	8:57:55	20.75	0.23	
3/27/2023	8:58:01	20.75	0.23	
3/27/2023	8:58:07	20.75	0.23	
3/27/2023	8:58:13	20.75	0.23	
3/27/2023	8:58:19	20.75	0.23	
3/27/2023	8:58:25	20.75	0.23	
3/27/2023	8:58:31	20.75	0.23	
3/27/2023	8:58:37	20.75	0.23	
3/27/2023	8:58:43	20.75	0.23	
3/27/2023	8:58:49	20.75	0.23	
3/27/2023	8:58:55	20.75	0.23	
3/27/2023	8:59:01	20.75	0.23	
3/27/2023	8:59:07	20.75	0.23	
3/27/2023	8:59:13	20.75	0.23	
3/27/2023	8:59:19	20.75	0.23	
3/27/2023	8:59:25	20.75	0.23	
3/27/2023	8:59:31	20.75	0.23	
3/27/2023	8:59:37	20.75	0.23	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	8:59:43	20.75	0.23	
3/27/2023	8:59:49	20.75	0.23	
3/27/2023	8:59:55	20.75	0.23	
3/27/2023	9:00:01	20.75	0.23	
3/27/2023	9:00:07	20.75	0.23	
3/27/2023	9:00:13	20.75	0.23	
3/27/2023	9:00:19	20.75	0.23	
3/27/2023	9:00:25	20.75	0.23	
3/27/2023	9:00:31	20.75	0.23	
3/27/2023	9:00:37	20.75	0.23	
3/27/2023	9:00:43	20.75	0.23	
3/27/2023	9:00:49	20.75	0.23	
3/27/2023	9:00:55	20.75	0.23	
3/27/2023	9:01:01	20.75	0.23	
3/27/2023	9:01:07	20.75	0.23	
3/27/2023	9:01:13	20.75	0.23	
3/27/2023	9:01:19	20.75	0.23	
3/27/2023	9:01:25	20.75	0.23	
3/27/2023	9:01:31	20.75	0.23	
3/27/2023	9:01:37	20.75	0.23	
3/27/2023	9:01:43	20.75	0.23	
3/27/2023	9:01:49	20.75	0.23	
3/27/2023	9:01:55	20.75	0.23	
3/27/2023	9:02:01	20.75	0.23	
3/27/2023	9:02:07	20.75	0.23	
3/27/2023	9:02:13	20.75	0.23	
3/27/2023	9:02:19	20.75	0.23	
3/27/2023	9:02:25	20.75	0.23	
3/27/2023	9:02:31	20.75	0.23	
3/27/2023	9:02:37	20.75	0.23	
3/27/2023	9:02:43	20.76	0.23	
3/27/2023	9:02:49	20.76	0.23	
3/27/2023	9:02:55	20.76	0.23	
3/27/2023	9:03:01	20.76	0.23	
3/27/2023	9:03:07	20.76	0.23	
3/27/2023	9:03:13	20.76	0.23	
3/27/2023	9:03:19	20.76	0.23	
3/27/2023	9:03:25	20.76	0.23	
3/27/2023	9:03:31	20.76	0.23	

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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	9:03:37	20.76	0.23	
3/27/2023	9:03:43	20.76	0.23	
3/27/2023	9:03:49	20.76	0.23	
3/27/2023	9:03:55	20.76	0.23	
3/27/2023	9:04:01	20.76	0.23	
3/27/2023	9:04:07	20.76	0.23	
3/27/2023	9:04:13	20.76	0.23	
3/27/2023	9:04:19	20.76	0.23	
3/27/2023	9:04:25	20.75	0.23	
3/27/2023	9:04:31	20.75	0.23	
3/27/2023	9:04:37	20.75	0.23	
3/27/2023	9:04:43	20.75	0.23	
3/27/2023	9:04:49	20.75	0.23	
3/27/2023	9:04:55	20.75	0.23	
3/27/2023	9:05:01	20.75	0.23	
3/27/2023	9:05:07	20.75	0.23	
3/27/2023	9:05:13	20.75	0.23	
3/27/2023	9:05:19	20.75	0.23	
3/27/2023	9:05:25	20.75	0.23	
3/27/2023	9:05:31	20.75	0.23	
3/27/2023	9:05:37	20.75	0.23	
3/27/2023	9:05:43	20.75	0.23	
3/27/2023	9:05:49	20.75	0.23	
3/27/2023	9:05:55	20.74	0.23	
3/27/2023	9:06:01	20.74	0.23	
3/27/2023	9:06:07	20.74	0.23	
3/27/2023	9:06:13	20.74	0.23	
3/27/2023	9:06:19	20.74	0.23	
3/27/2023	9:06:25	20.74	0.23	
3/27/2023	9:06:31	20.74	0.23	
3/27/2023	9:06:37	20.74	0.23	
3/27/2023	9:06:43	20.74	0.23	
3/27/2023	9:06:49	20.74	0.23	
3/27/2023	9:06:55	20.74	0.23	
3/27/2023	9:07:01	20.74	0.23	
3/27/2023	9:07:07	20.74	0.23	
3/27/2023	9:07:13	20.74	0.23	
3/27/2023	9:07:19	20.74	0.23	
3/27/2023	9:07:25	20.74	0.23	

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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	9:07:31	20.74	0.23	
3/27/2023	9:07:37	20.74	0.23	
3/27/2023	9:07:43	20.74	0.23	
3/27/2023	9:07:49	20.74	0.23	
3/27/2023	9:07:55	20.74	0.23	
3/27/2023	9:08:01	20.74	0.23	
3/27/2023	9:08:07	20.74	0.23	
3/27/2023	9:08:13	20.74	0.23	
3/27/2023	9:08:19	20.74	0.23	
3/27/2023	9:08:25	20.74	0.23	
3/27/2023	9:08:31	20.74	0.23	
3/27/2023	9:08:37	20.74	0.23	
3/27/2023	9:08:43	20.74	0.23	
3/27/2023	9:08:49	20.74	0.23	
3/27/2023	9:08:55	20.74	0.23	
3/27/2023	9:09:01	20.74	0.23	
3/27/2023	9:09:07	20.74	0.23	
3/27/2023	9:09:13	20.74	0.23	
3/27/2023	9:09:19	20.74	0.23	
3/27/2023	9:09:25	20.74	0.23	
3/27/2023	9:09:31	20.74	0.23	
3/27/2023	9:09:37	20.74	0.23	
3/27/2023	9:09:43	20.74	0.23	
3/27/2023	9:09:49	20.74	0.23	
3/27/2023	9:09:55	20.74	0.22	
3/27/2023	9:10:01	20.74	0.22	
3/27/2023	9:10:07	20.74	0.22	
3/27/2023	9:10:13	20.74	0.22	
3/27/2023	9:10:19	20.74	0.22	
3/27/2023	9:10:25	20.74	0.22	
3/27/2023	9:10:31	20.74	0.22	
3/27/2023	9:10:37	20.74	0.22	
3/27/2023	9:10:43	20.74	0.22	
3/27/2023	9:10:49	20.74	0.23	
3/27/2023	9:10:55	20.74	0.22	
3/27/2023	9:11:01	20.74	0.23	
3/27/2023	9:11:07	20.74	0.23	
3/27/2023	9:11:13	20.74	0.23	
3/27/2023	9:11:19	20.74	0.23	

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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	9:11:25	20.74	0.22	
3/27/2023	9:11:31	20.74	0.22	
3/27/2023	9:11:37	20.74	0.22	
3/27/2023	9:11:43	20.74	0.22	
3/27/2023	9:11:49	20.74	0.22	
3/27/2023	9:11:55	20.74	0.22	
3/27/2023	9:12:01	20.74	0.22	
3/27/2023	9:12:07	20.74	0.22	
3/27/2023	9:12:13	20.74	0.22	
3/27/2023	9:12:19	20.74	0.22	
3/27/2023	9:12:25	20.74	0.22	
3/27/2023	9:12:31	20.74	0.22	
3/27/2023	9:12:37	20.74	0.22	
3/27/2023	9:12:43	20.74	0.22	
3/27/2023	9:12:49	20.74	0.22	
3/27/2023	9:12:55	20.74	0.22	
3/27/2023	9:13:01	20.74	0.22	
3/27/2023	9:13:07	20.74	0.22	
3/27/2023	9:13:13	20.74	0.22	
3/27/2023	9:13:19	20.74	0.22	
3/27/2023	9:13:25	20.74	0.22	
3/27/2023	9:13:31	20.74	0.22	
3/27/2023	9:13:37	20.74	0.22	
3/27/2023	9:13:43	20.74	0.22	
3/27/2023	9:13:49	20.74	0.22	
3/27/2023	9:13:55	20.74	0.22	
3/27/2023	9:14:01	20.74	0.22	
3/27/2023	9:14:07	20.74	0.22	
3/27/2023	9:14:13	20.74	0.22	
3/27/2023	9:14:19	20.74	0.22	
3/27/2023	9:14:25	20.74	0.22	
3/27/2023	9:14:31	20.74	0.22	
3/27/2023	9:14:37	20.74	0.22	
3/27/2023	9:14:43	20.74	0.22	
3/27/2023	9:14:49	20.74	0.22	
3/27/2023	9:14:55	20.74	0.22	
3/27/2023	9:15:01	20.74	0.22	
3/27/2023	9:15:07	20.74	0.22	
3/27/2023	9:15:13	20.74	0.22	

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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	9:15:19	20.74	0.22	
3/27/2023	9:15:25	20.74	0.22	
3/27/2023	9:15:31	20.74	0.22	
3/27/2023	9:15:37	20.74	0.22	
3/27/2023	9:15:43	20.74	0.22	
3/27/2023	9:15:49	20.74	0.22	
3/27/2023	9:15:55	20.74	0.22	
3/27/2023	9:16:01	20.74	0.22	
3/27/2023	9:16:07	20.74	0.22	
3/27/2023	9:16:13	20.74	0.22	
3/27/2023	9:16:19	20.74	0.22	
3/27/2023	9:16:25	20.74	0.22	
3/27/2023	9:16:31	20.74	0.22	
3/27/2023	9:16:37	20.74	0.22	
3/27/2023	9:16:43	20.74	0.22	
3/27/2023	9:16:49	20.74	0.22	
3/27/2023	9:16:55	20.74	0.22	
3/27/2023	9:17:01	20.74	0.22	
3/27/2023	9:17:07	20.74	0.22	
3/27/2023	9:17:13	20.74	0.22	
3/27/2023	9:17:19	20.74	0.22	
3/27/2023	9:17:25	20.74	0.22	
3/27/2023	9:17:31	20.74	0.22	
3/27/2023	9:17:37	20.74	0.22	
3/27/2023	9:17:43	20.74	0.22	
3/27/2023	9:17:49	20.74	0.22	
3/27/2023	9:17:55	20.74	0.22	
3/27/2023	9:18:01	20.74	0.22	
3/27/2023	9:18:07	20.74	0.22	
3/27/2023	9:18:13	20.74	0.22	
3/27/2023	9:18:19	20.74	0.22	
3/27/2023	9:18:25	20.74	0.22	
3/27/2023	9:18:31	20.74	0.22	
3/27/2023	9:18:37	20.74	0.22	
3/27/2023	9:18:43	20.74	0.22	
3/27/2023	9:18:49	20.74	0.22	
3/27/2023	9:18:55	20.73	0.22	
3/27/2023	9:19:01	20.73	0.22	
3/27/2023	9:19:07	20.74	0.22	

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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	9:19:13	20.73	0.22	
3/27/2023	9:19:19	20.73	0.22	
3/27/2023	9:19:25	20.73	0.22	
3/27/2023	9:19:31	20.73	0.22	
3/27/2023	9:19:37	20.73	0.22	
3/27/2023	9:19:43	20.73	0.22	
3/27/2023	9:19:49	20.73	0.22	
3/27/2023	9:19:55	20.73	0.22	
3/27/2023	9:20:01	20.73	0.22	
3/27/2023	9:20:07	20.73	0.22	
3/27/2023	9:20:13	20.73	0.22	
3/27/2023	9:20:19	20.73	0.22	
3/27/2023	9:20:25	20.73	0.22	
3/27/2023	9:20:31	20.73	0.22	
3/27/2023	9:20:37	20.73	0.22	
3/27/2023	9:20:43	20.73	0.22	
3/27/2023	9:20:49	20.73	0.22	
3/27/2023	9:20:55	20.73	0.22	
3/27/2023	9:21:01	20.73	0.22	
3/27/2023	9:21:07	20.73	0.22	
3/27/2023	9:21:13	20.73	0.22	
3/27/2023	9:21:19	20.73	0.22	
3/27/2023	9:21:25	20.73	0.22	
3/27/2023	9:21:31	20.73	0.22	
3/27/2023	9:21:37	20.73	0.22	
3/27/2023	9:21:43	20.73	0.22	
3/27/2023	9:21:49	20.73	0.22	
3/27/2023	9:21:55	20.73	0.22	
3/27/2023	9:22:01	20.73	0.22	
3/27/2023	9:22:07	20.73	0.22	
3/27/2023	9:22:13	20.73	0.22	
3/27/2023	9:22:19	20.73	0.22	
3/27/2023	9:22:25	20.73	0.22	
3/27/2023	9:22:31	20.73	0.22	
3/27/2023	9:22:37	20.73	0.22	
3/27/2023	9:22:43	20.73	0.22	
3/27/2023	9:22:49	20.73	0.22	
3/27/2023	9:22:55	20.73	0.22	
3/27/2023	9:23:01	20.73	0.22	

Eagle Foundry Company
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Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	9:23:07	20.73	0.22	
3/27/2023	9:23:13	20.73	0.22	
3/27/2023	9:23:19	20.73	0.22	
3/27/2023	9:23:25	20.73	0.22	
3/27/2023	9:23:31	20.73	0.22	
3/27/2023	9:23:37	20.73	0.22	
3/27/2023	9:23:43	20.73	0.22	
3/27/2023	9:23:49	20.73	0.22	
3/27/2023	9:23:55	20.73	0.22	
3/27/2023	9:24:01	20.73	0.22	
3/27/2023	9:24:07	20.73	0.22	
3/27/2023	9:24:13	20.73	0.22	
3/27/2023	9:24:19	20.73	0.22	
3/27/2023	9:24:25	20.73	0.22	
3/27/2023	9:24:31	20.73	0.22	
3/27/2023	9:24:37	20.73	0.22	
3/27/2023	9:24:43	20.73	0.22	
3/27/2023	9:24:49	20.73	0.22	
3/27/2023	9:24:55	20.73	0.22	
3/27/2023	9:25:01	20.73	0.22	
3/27/2023	9:25:07	20.73	0.22	
3/27/2023	9:25:13	20.73	0.22	
3/27/2023	9:25:19	20.73	0.22	
3/27/2023	9:25:25	20.73	0.22	
3/27/2023	9:25:31	20.73	0.22	
3/27/2023	9:25:37	20.73	0.22	
3/27/2023	9:25:43	20.73	0.22	
3/27/2023	9:25:49	20.73	0.22	
3/27/2023	9:25:55	20.73	0.22	
3/27/2023	9:26:01	20.73	0.22	
3/27/2023	9:26:07	20.73	0.22	
3/27/2023	9:26:13	20.73	0.22	
3/27/2023	9:26:19	20.73	0.22	
3/27/2023	9:26:25	20.73	0.22	
3/27/2023	9:26:31	20.73	0.22	
3/27/2023	9:26:37	20.73	0.22	
3/27/2023	9:26:43	20.73	0.22	
3/27/2023	9:26:49	20.73	0.22	
3/27/2023	9:26:55	20.73	0.22	

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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	9:27:01	20.73	0.22	
3/27/2023	9:27:07	20.73	0.22	
3/27/2023	9:27:13	20.73	0.22	
3/27/2023	9:27:19	20.73	0.22	
3/27/2023	9:27:25	20.73	0.22	
3/27/2023	9:27:31	20.73	0.22	
3/27/2023	9:27:37	20.73	0.22	
3/27/2023	9:27:43	20.73	0.22	
3/27/2023	9:27:49	20.73	0.22	
3/27/2023	9:27:55	20.73	0.22	
3/27/2023	9:28:01	20.73	0.22	
3/27/2023	9:28:07	20.73	0.22	
3/27/2023	9:28:13	20.73	0.22	
3/27/2023	9:28:19	20.73	0.22	
3/27/2023	9:28:25	20.73	0.22	
3/27/2023	9:28:31	20.73	0.22	
3/27/2023	9:28:37	20.73	0.22	
3/27/2023	9:28:43	20.73	0.22	
3/27/2023	9:28:49	20.73	0.21	
3/27/2023	9:28:55	20.73	0.21	
3/27/2023	9:29:01	20.73	0.21	
3/27/2023	9:29:07	20.73	0.21	
3/27/2023	9:29:13	20.73	0.21	
3/27/2023	9:29:19	20.73	0.21	
3/27/2023	9:29:25	20.73	0.21	
3/27/2023	9:29:31	20.73	0.21	
3/27/2023	9:29:37	20.73	0.22	
3/27/2023	9:29:43	20.73	0.22	
3/27/2023	9:29:49	20.73	0.21	
3/27/2023	9:29:55	20.73	0.21	
3/27/2023	9:30:01	20.73	0.21	
3/27/2023	9:30:07	20.73	0.22	
3/27/2023	9:30:13	20.73	0.21	
3/27/2023	9:30:19	20.73	0.21	
3/27/2023	9:30:25	20.73	0.21	
3/27/2023	9:30:31	20.73	0.21	
3/27/2023	9:30:37	20.73	0.21	
3/27/2023	9:30:43	20.73	0.21	
3/27/2023	9:30:49	20.73	0.21	

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Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	9:30:55	20.73	0.21	
3/27/2023	9:31:01	20.73	0.21	
3/27/2023	9:31:07	20.73	0.22	
3/27/2023	9:31:13	20.73	0.21	
3/27/2023	9:31:19	20.73	0.22	
3/27/2023	9:31:25	20.73	0.21	
3/27/2023	9:31:31	20.73	0.21	
3/27/2023	9:31:37	20.73	0.21	
3/27/2023	9:31:43	20.73	0.22	
3/27/2023	9:31:49	20.73	0.22	
3/27/2023	9:31:55	20.73	0.21	
3/27/2023	9:32:01	20.73	0.21	
3/27/2023	9:32:07	20.73	0.21	
3/27/2023	9:32:13	20.73	0.21	
3/27/2023	9:32:19	20.73	0.21	
3/27/2023	9:32:25	20.73	0.21	
3/27/2023	9:32:31	20.73	0.21	
3/27/2023	9:32:37	20.72	0.22	
3/27/2023	9:32:43	20.72	0.22	
3/27/2023	9:32:49	20.72	0.22	
3/27/2023	9:32:55	20.72	0.22	
3/27/2023	9:33:01	20.72	0.21	
3/27/2023	9:33:07	20.72	0.21	
3/27/2023	9:33:13	20.72	0.21	
3/27/2023	9:33:19	20.72	0.21	
3/27/2023	9:33:25	20.72	0.22	
3/27/2023	9:33:31	20.72	0.22	
3/27/2023	9:33:37	20.72	0.21	
3/27/2023	9:33:43	20.72	0.22	
3/27/2023	9:33:49	20.72	0.22	
3/27/2023	9:33:55	20.72	0.22	
3/27/2023	9:34:01	20.72	0.22	
3/27/2023	9:34:07	20.72	0.21	
3/27/2023	9:34:13	20.72	0.21	
3/27/2023	9:34:19	20.72	0.21	
3/27/2023	9:34:25	20.72	0.21	
3/27/2023	9:34:31	20.72	0.21	
3/27/2023	9:34:37	20.72	0.21	
3/27/2023	9:34:43	20.72	0.21	

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Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	9:34:49	20.72	0.21	
3/27/2023	9:34:55	20.72	0.21	
3/27/2023	9:35:01	20.72	0.21	
3/27/2023	9:35:07	20.72	0.21	
3/27/2023	9:35:13	20.72	0.21	
3/27/2023	9:35:19	20.72	0.21	
3/27/2023	9:35:25	20.72	0.21	
3/27/2023	9:35:31	20.72	0.21	
3/27/2023	9:35:37	20.72	0.22	
3/27/2023	9:35:43	20.72	0.22	
3/27/2023	9:35:49	20.72	0.21	
3/27/2023	9:35:55	20.72	0.21	
3/27/2023	9:36:01	20.72	0.21	
3/27/2023	9:36:07	20.72	0.22	
3/27/2023	9:36:13	20.72	0.22	
3/27/2023	9:36:19	20.72	0.21	
3/27/2023	9:36:25	20.72	0.21	
3/27/2023	9:36:31	20.72	0.21	
3/27/2023	9:36:37	20.72	0.21	
3/27/2023	9:36:43	20.72	0.22	
3/27/2023	9:36:49	20.72	0.21	
3/27/2023	9:36:55	20.72	0.21	
3/27/2023	9:37:01	20.72	0.21	
3/27/2023	9:37:07	20.72	0.22	
3/27/2023	9:37:13	20.72	0.21	
3/27/2023	9:37:19	20.72	0.21	
3/27/2023	9:37:25	20.72	0.21	
3/27/2023	9:37:31	20.72	0.21	
3/27/2023	9:37:37	20.72	0.21	
3/27/2023	9:37:43	20.72	0.21	
3/27/2023	9:37:49	20.72	0.21	
3/27/2023	9:37:55	20.72	0.21	
3/27/2023	9:38:01	20.72	0.21	
3/27/2023	9:38:07	20.72	0.21	
3/27/2023	9:38:13	20.72	0.21	
3/27/2023	9:38:19	20.72	0.22	
3/27/2023	9:38:25	20.72	0.21	
3/27/2023	9:38:31	20.72	0.21	
3/27/2023	9:38:37	20.72	0.22	

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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	9:38:43	20.72	0.22	
3/27/2023	9:38:49	20.72	0.22	
3/27/2023	9:38:55	20.72	0.22	
3/27/2023	9:39:01	20.72	0.22	
3/27/2023	9:39:07	20.72	0.22	
3/27/2023	9:39:13	20.72	0.22	
3/27/2023	9:39:19	20.72	0.22	
3/27/2023	9:39:25	20.72	0.22	
3/27/2023	9:39:31	20.72	0.22	
3/27/2023	9:39:37	20.72	0.22	
3/27/2023	9:39:43	20.72	0.22	
3/27/2023	9:39:49	20.72	0.22	
3/27/2023	9:39:55	20.72	0.22	
3/27/2023	9:40:01	20.72	0.22	
3/27/2023	9:40:07	20.72	0.22	
3/27/2023	9:40:13	20.72	0.22	
3/27/2023	9:40:19	20.72	0.22	
3/27/2023	9:40:25	20.72	0.22	
3/27/2023	9:40:31	20.72	0.22	
3/27/2023	9:40:37	20.72	0.22	
3/27/2023	9:40:43	20.72	0.22	
3/27/2023	9:40:49	20.72	0.22	
3/27/2023	9:40:55	20.72	0.22	
3/27/2023	9:41:01	20.72	0.22	
3/27/2023	9:41:07	20.72	0.22	
3/27/2023	9:41:13	20.72	0.22	
3/27/2023	9:41:19	20.72	0.22	
3/27/2023	9:41:25	20.72	0.22	
3/27/2023	9:41:31	20.72	0.22	
3/27/2023	9:41:37	20.72	0.22	
3/27/2023	9:41:43	20.72	0.22	
3/27/2023	9:41:49	20.72	0.21	
3/27/2023	9:41:55	20.72	0.21	
3/27/2023	9:42:01	20.72	0.21	
3/27/2023	9:42:07	20.72	0.21	
3/27/2023	9:42:13	20.72	0.21	
3/27/2023	9:42:19	20.72	0.21	
3/27/2023	9:42:25	20.72	0.21	
3/27/2023	9:42:31	20.72	0.21	

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Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	9:42:37	20.72	0.21	
3/27/2023	9:42:43	20.72	0.21	
3/27/2023	9:42:49	20.72	0.21	
3/27/2023	9:42:55	20.72	0.22	
3/27/2023	9:43:01	20.72	0.22	
3/27/2023	9:43:07	20.72	0.22	
3/27/2023	9:43:13	20.72	0.22	
3/27/2023	9:43:19	20.72	0.22	
3/27/2023	9:43:25	20.72	0.22	
3/27/2023	9:43:31	20.72	0.22	
3/27/2023	9:43:37	20.72	0.22	
3/27/2023	9:43:43	20.72	0.22	
3/27/2023	9:43:49	20.72	0.22	
3/27/2023	9:43:55	20.72	0.22	
3/27/2023	9:44:01	20.72	0.22	
3/27/2023	9:44:07	20.72	0.22	
3/27/2023	9:44:13	20.72	0.22	
3/27/2023	9:44:19	20.72	0.22	
3/27/2023	9:44:25	20.72	0.22	
3/27/2023	9:44:31	20.72	0.22	
3/27/2023	9:44:37	20.72	0.22	
3/27/2023	9:44:43	20.72	0.22	
3/27/2023	9:44:49	20.72	0.22	
3/27/2023	9:44:55	20.72	0.22	
3/27/2023	9:45:01	20.72	0.22	
3/27/2023	9:45:07	20.72	0.21	
3/27/2023	9:45:13	20.72	0.21	
3/27/2023	9:45:19	20.72	0.21	
3/27/2023	9:45:25	20.72	0.21	
3/27/2023	9:45:31	20.72	0.22	
3/27/2023	9:45:37	20.72	0.22	
3/27/2023	9:45:43	20.72	0.22	
3/27/2023	9:45:49	20.72	0.21	
3/27/2023	9:45:55	20.72	0.22	
3/27/2023	9:46:01	20.72	0.21	
3/27/2023	9:46:07	20.72	0.22	
3/27/2023	9:46:13	20.72	0.21	
3/27/2023	9:46:19	20.72	0.22	
3/27/2023	9:46:25	20.72	0.22	

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Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	9:46:31	20.72	0.21	
3/27/2023	9:46:37	20.72	0.21	
3/27/2023	9:46:43	20.72	0.21	
3/27/2023	9:46:49	20.72	0.21	
3/27/2023	9:46:55	20.72	0.21	
3/27/2023	9:47:01	20.72	0.21	
3/27/2023	9:47:07	20.72	0.21	
3/27/2023	9:47:13	20.72	0.21	
3/27/2023	9:47:19	20.72	0.21	
3/27/2023	9:47:25	20.72	0.21	
3/27/2023	9:47:31	20.72	0.21	
3/27/2023	9:47:37	20.72	0.21	
3/27/2023	9:47:43	20.72	0.21	
3/27/2023	9:47:49	20.72	0.21	
3/27/2023	9:47:55	20.72	0.21	
3/27/2023	9:48:01	20.72	0.21	
3/27/2023	9:48:07	20.72	0.21	
3/27/2023	9:48:13	20.72	0.21	
3/27/2023	9:48:19	20.72	0.21	
3/27/2023	9:48:25	20.72	0.21	
3/27/2023	9:48:31	20.72	0.21	
3/27/2023	9:48:37	20.72	0.21	
3/27/2023	9:48:43	20.72	0.21	
3/27/2023	9:48:49	20.72	0.21	
3/27/2023	9:48:55	20.72	0.20	
3/27/2023	9:49:01	20.72	0.20	
3/27/2023	9:49:07	20.72	0.21	
3/27/2023	9:49:13	20.72	0.21	
3/27/2023	9:49:19	20.72	0.21	
3/27/2023	9:49:25	20.72	0.21	
3/27/2023	9:49:31	20.72	0.21	
3/27/2023	9:49:37	20.72	0.21	
3/27/2023	9:49:43	20.72	0.21	
3/27/2023	9:49:49	20.72	0.20	
3/27/2023	9:49:55	20.72	0.20	
3/27/2023	9:50:01	20.72	0.20	
3/27/2023	9:50:07	20.72	0.20	
3/27/2023	9:50:13	20.72	0.20	
3/27/2023	9:50:19	20.72	0.20	

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Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	9:50:25	20.72	0.20	
3/27/2023	9:50:31	20.71	0.20	
3/27/2023	9:50:37	20.72	0.20	
3/27/2023	9:50:43	20.72	0.20	
3/27/2023	9:50:49	20.72	0.20	
3/27/2023	9:50:55	20.72	0.19	
3/27/2023	9:51:01	20.72	0.19	
3/27/2023	9:51:07	20.72	0.19	
3/27/2023	9:51:13	20.72	0.19	
3/27/2023	9:51:19	20.72	0.19	
3/27/2023	9:51:25	20.72	0.19	
3/27/2023	9:51:31	20.72	0.19	
3/27/2023	9:51:37	20.72	0.18	
3/27/2023	9:51:43	20.72	0.20	
3/27/2023	9:51:49	20.72	0.20	
3/27/2023	9:51:55	20.72	0.20	
3/27/2023	9:52:01	20.72	0.20	
3/27/2023	9:52:07	20.72	0.20	
3/27/2023	9:52:13	20.72	0.19	
3/27/2023	9:52:19	20.72	0.18	
3/27/2023	9:52:25	20.72	0.19	
3/27/2023	9:52:31	20.72	0.19	
3/27/2023	9:52:37	20.72	0.19	
3/27/2023	9:52:43	20.72	0.19	
3/27/2023	9:52:49	20.72	0.19	
3/27/2023	9:52:55	20.72	0.20	
3/27/2023	9:53:01	20.72	0.20	
3/27/2023	9:53:07	20.72	0.20	
3/27/2023	9:53:13	20.72	0.20	
3/27/2023	9:53:19	20.72	0.20	
3/27/2023	9:53:25	20.72	0.20	
3/27/2023	9:53:31	20.72	0.20	
3/27/2023	9:53:37	20.72	0.20	
3/27/2023	9:53:43	20.72	0.20	
3/27/2023	9:53:49	20.72	0.20	
3/27/2023	9:53:55	20.72	0.20	
3/27/2023	9:54:01	20.72	0.20	
3/27/2023	9:54:07	20.72	0.21	
3/27/2023	9:54:13	20.72	0.21	

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Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	9:54:19	20.72	0.20	
3/27/2023	9:54:25	20.72	0.21	
3/27/2023	9:54:31	20.72	0.20	
3/27/2023	9:54:37	20.72	0.20	
3/27/2023	9:54:43	20.72	0.20	
3/27/2023	9:54:49	20.72	0.20	
3/27/2023	9:54:55	20.72	0.20	
3/27/2023	9:55:01	20.72	0.20	
3/27/2023	9:55:07	20.72	0.20	
3/27/2023	9:55:13	20.72	0.20	
3/27/2023	9:55:19	20.72	0.20	
3/27/2023	9:55:25	20.72	0.20	
3/27/2023	9:55:31	20.72	0.20	
3/27/2023	9:55:37	20.72	0.20	
3/27/2023	9:55:43	20.72	0.20	
3/27/2023	9:55:49	20.72	0.20	
3/27/2023	9:55:55	20.72	0.19	
3/27/2023	9:56:01	20.72	0.19	
3/27/2023	9:56:07	20.72	0.19	
3/27/2023	9:56:13	20.72	0.19	
3/27/2023	9:56:19	20.71	0.20	
3/27/2023	9:56:25	20.71	0.19	
3/27/2023	9:56:31	20.71	0.19	
3/27/2023	9:56:37	20.72	0.19	
3/27/2023	9:56:43	20.71	0.19	
3/27/2023	9:56:49	20.71	0.19	
3/27/2023	9:56:55	20.71	0.20	
3/27/2023	9:57:01	20.71	0.20	
3/27/2023	9:57:07	20.71	0.20	
3/27/2023	9:57:13	20.71	0.20	
3/27/2023	9:57:19	20.71	0.20	
3/27/2023	9:57:25	20.71	0.20	
3/27/2023	9:57:31	20.71	0.20	
3/27/2023	9:57:37	20.72	0.20	
3/27/2023	9:57:43	20.71	0.20	
3/27/2023	9:57:49	20.71	0.20	
3/27/2023	9:57:55	20.71	0.20	
3/27/2023	9:58:01	20.71	0.20	
3/27/2023	9:58:07	20.71	0.20	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	9:58:13	20.71	0.20	
3/27/2023	9:58:19	20.71	0.20	
3/27/2023	9:58:25	20.71	0.20	
3/27/2023	9:58:31	20.71	0.20	
3/27/2023	9:58:37	20.71	0.20	
3/27/2023	9:58:43	20.71	0.20	
3/27/2023	9:58:49	20.71	0.20	
3/27/2023	9:58:55	20.71	0.20	
3/27/2023	9:59:01	20.71	0.20	
3/27/2023	9:59:07	20.71	0.20	
3/27/2023	9:59:13	20.71	0.20	
3/27/2023	9:59:19	20.71	0.20	
3/27/2023	9:59:25	20.71	0.20	
3/27/2023	9:59:31	20.71	0.20	
3/27/2023	9:59:37	20.71	0.19	
3/27/2023	9:59:43	20.71	0.19	
3/27/2023	9:59:49	20.71	0.19	
3/27/2023	9:59:55	20.71	0.19	
3/27/2023	10:00:01	20.71	0.19	
3/27/2023	10:00:07	20.71	0.19	
3/27/2023	10:00:13	20.71	0.19	
3/27/2023	10:00:19	20.71	0.19	
3/27/2023	10:00:25	20.71	0.19	
3/27/2023	10:00:31	20.71	0.19	
3/27/2023	10:00:37	20.71	0.19	
3/27/2023	10:00:43	20.71	0.19	
3/27/2023	10:00:49	20.71	0.20	
3/27/2023	10:00:55	20.71	0.20	
3/27/2023	10:01:01	20.71	0.20	
3/27/2023	10:01:07	20.71	0.21	
3/27/2023	10:01:13	20.71	0.21	
3/27/2023	10:01:19	20.71	0.20	
3/27/2023	10:01:25	20.71	0.21	
3/27/2023	10:01:31	20.71	0.21	
3/27/2023	10:01:37	20.71	0.21	
3/27/2023	10:01:43	20.71	0.20	
3/27/2023	10:01:49	20.71	0.20	
3/27/2023	10:01:55	20.71	0.20	
3/27/2023	10:02:01	20.71	0.20	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	10:02:07	20.71	0.20	
3/27/2023	10:02:13	20.71	0.20	
3/27/2023	10:02:19	20.71	0.20	
3/27/2023	10:02:25	20.71	0.20	
3/27/2023	10:02:31	20.71	0.20	
3/27/2023	10:02:37	20.71	0.20	
3/27/2023	10:02:43	20.71	0.20	
3/27/2023	10:02:49	20.71	0.20	
3/27/2023	10:02:55	20.71	0.20	
3/27/2023	10:03:01	20.71	0.20	
3/27/2023	10:03:07	20.71	0.20	
3/27/2023	10:03:13	20.71	0.20	
3/27/2023	10:03:19	20.71	0.20	
3/27/2023	10:03:25	20.71	0.20	
3/27/2023	10:03:31	20.71	0.20	
3/27/2023	10:03:37	20.71	0.20	
3/27/2023	10:03:43	20.71	0.20	
3/27/2023	10:03:49	20.71	0.20	
3/27/2023	10:03:55	20.71	0.20	
3/27/2023	10:04:01	20.71	0.20	
3/27/2023	10:04:07	20.71	0.20	
3/27/2023	10:04:13	20.71	0.20	
3/27/2023	10:04:19	20.71	0.20	
3/27/2023	10:04:25	20.71	0.20	
3/27/2023	10:04:31	20.71	0.20	
3/27/2023	10:04:37	20.71	0.20	
3/27/2023	10:04:43	20.71	0.20	
3/27/2023	10:04:49	20.71	0.20	
3/27/2023	10:04:55	20.71	0.20	
3/27/2023	10:05:01	20.71	0.20	
3/27/2023	10:05:07	20.71	0.20	
3/27/2023	10:05:13	20.70	0.20	
3/27/2023	10:05:19	20.70	0.20	
3/27/2023	10:05:25	20.70	0.19	
3/27/2023	10:05:31	20.71	0.19	
3/27/2023	10:05:37	20.71	0.20	
3/27/2023	10:05:43	20.71	0.19	
3/27/2023	10:05:49	20.71	0.19	
3/27/2023	10:05:55	20.71	0.19	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	10:06:01	20.71	0.20	
3/27/2023	10:06:07	20.71	0.20	
3/27/2023	10:06:13	20.71	0.19	
3/27/2023	10:06:19	20.71	0.19	
3/27/2023	10:06:25	20.71	0.20	
3/27/2023	10:06:31	20.71	0.20	
3/27/2023	10:06:37	20.71	0.20	
3/27/2023	10:06:43	20.71	0.20	
3/27/2023	10:06:49	20.71	0.20	
3/27/2023	10:06:55	20.71	0.20	
3/27/2023	10:07:01	20.71	0.20	
3/27/2023	10:07:07	20.71	0.19	
3/27/2023	10:07:13	20.71	0.19	
3/27/2023	10:07:19	20.70	0.19	
3/27/2023	10:07:25	20.70	0.20	
3/27/2023	10:07:31	20.70	0.19	
3/27/2023	10:07:37	20.70	0.19	
3/27/2023	10:07:43	20.70	0.18	
3/27/2023	10:07:49	20.70	0.19	
3/27/2023	10:07:55	20.70	0.20	
3/27/2023	10:08:01	20.70	0.19	
3/27/2023	10:08:07	20.70	0.19	
3/27/2023	10:08:13	20.70	0.19	
3/27/2023	10:08:19	20.70	0.19	
3/27/2023	10:08:25	20.70	0.19	
3/27/2023	10:08:31	20.70	0.19	
3/27/2023	10:08:37	20.70	0.19	
3/27/2023	10:08:43	20.70	0.19	
3/27/2023	10:08:49	20.70	0.19	
3/27/2023	10:08:55	20.70	0.19	
3/27/2023	10:09:01	20.70	0.19	
3/27/2023	10:09:07	20.70	0.19	
3/27/2023	10:09:13	20.70	0.19	
3/27/2023	10:09:19	20.70	0.19	
3/27/2023	10:09:25	20.70	0.19	
3/27/2023	10:09:31	20.70	0.20	
3/27/2023	10:09:37	20.70	0.20	
3/27/2023	10:09:43	20.70	0.19	
3/27/2023	10:09:49	20.70	0.20	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	10:09:55	20.70	0.20	
3/27/2023	10:10:01	20.70	0.20	
3/27/2023	10:10:07	20.70	0.19	
3/27/2023	10:10:13	20.70	0.19	
3/27/2023	10:10:19	20.70	0.20	
3/27/2023	10:10:25	20.70	0.19	
3/27/2023	10:10:31	20.70	0.19	
3/27/2023	10:10:37	20.70	0.19	
3/27/2023	10:10:43	20.70	0.19	
3/27/2023	10:10:49	20.70	0.19	
3/27/2023	10:10:55	20.70	0.19	
3/27/2023	10:11:01	20.70	0.19	
3/27/2023	10:11:07	20.70	0.19	
3/27/2023	10:11:13	20.70	0.19	
3/27/2023	10:11:19	20.70	0.19	
3/27/2023	10:11:25	20.70	0.19	
3/27/2023	10:11:31	20.70	0.19	
3/27/2023	10:11:37	20.70	0.19	
3/27/2023	10:11:43	20.70	0.19	
3/27/2023	10:11:49	20.70	0.19	
3/27/2023	10:11:55	20.70	0.19	
3/27/2023	10:12:01	20.70	0.19	
3/27/2023	10:12:07	20.70	0.19	
3/27/2023	10:12:13	20.70	0.19	
3/27/2023	10:12:19	20.70	0.19	
3/27/2023	10:12:25	20.70	0.19	
3/27/2023	10:12:31	20.70	0.19	
3/27/2023	10:12:37	20.70	0.19	
3/27/2023	10:12:43	20.70	0.19	
3/27/2023	10:12:49	20.70	0.19	
3/27/2023	10:12:55	20.70	0.19	
3/27/2023	10:13:01	20.70	0.19	
3/27/2023	10:13:07	20.70	0.19	
3/27/2023	10:13:13	20.70	0.19	
3/27/2023	10:13:19	20.70	0.19	
3/27/2023	10:13:25	20.70	0.19	
3/27/2023	10:13:31	20.70	0.19	
3/27/2023	10:13:37	20.70	0.19	
3/27/2023	10:13:43	20.70	0.19	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	10:13:49	20.70	0.19	
3/27/2023	10:13:55	20.70	0.19	
3/27/2023	10:14:01	20.70	0.19	
3/27/2023	10:14:07	20.70	0.19	
3/27/2023	10:14:13	20.70	0.19	
3/27/2023	10:14:19	20.70	0.18	
3/27/2023	10:14:25	20.70	0.19	
3/27/2023	10:14:31	20.70	0.19	
3/27/2023	10:14:37	20.70	0.19	
3/27/2023	10:14:43	20.70	0.19	
3/27/2023	10:14:49	20.70	0.19	
3/27/2023	10:14:55	20.70	0.19	
3/27/2023	10:15:01	20.70	0.19	
3/27/2023	10:15:07	20.70	0.19	
3/27/2023	10:15:13	20.70	0.18	
3/27/2023	10:15:19	20.70	0.18	
3/27/2023	10:15:25	20.70	0.19	
3/27/2023	10:15:31	20.70	0.19	
3/27/2023	10:15:37	20.70	0.19	
3/27/2023	10:15:43	20.70	0.19	
3/27/2023	10:15:49	20.70	0.19	
3/27/2023	10:15:55	20.70	0.19	
3/27/2023	10:16:01	20.70	0.19	
3/27/2023	10:16:07	20.70	0.19	
3/27/2023	10:16:13	20.70	0.19	
3/27/2023	10:16:19	20.70	0.19	
3/27/2023	10:16:25	20.70	0.19	
3/27/2023	10:16:31	20.70	0.19	
3/27/2023	10:16:37	20.70	0.19	
3/27/2023	10:16:43	20.70	0.19	
3/27/2023	10:16:49	20.69	0.19	
3/27/2023	10:16:55	20.70	0.19	
3/27/2023	10:17:01	20.70	0.20	
3/27/2023	10:17:07	20.70	0.19	
3/27/2023	10:17:13	20.69	0.19	
3/27/2023	10:17:19	20.69	0.19	
3/27/2023	10:17:25	20.69	0.19	
3/27/2023	10:17:31	20.69	0.19	
3/27/2023	10:17:37	20.69	0.19	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	10:17:43	20.69	0.19	
3/27/2023	10:17:49	20.69	0.19	
3/27/2023	10:17:55	20.69	0.19	
3/27/2023	10:18:01	20.69	0.19	
3/27/2023	10:18:07	20.69	0.19	
3/27/2023	10:18:13	20.69	0.19	
3/27/2023	10:18:19	20.69	0.19	
3/27/2023	10:18:25	20.69	0.19	
3/27/2023	10:18:31	20.69	0.19	
3/27/2023	10:18:37	20.69	0.19	
3/27/2023	10:18:43	20.69	0.19	
3/27/2023	10:18:49	20.69	0.19	
3/27/2023	10:18:55	20.69	0.19	
3/27/2023	10:19:01	20.69	0.19	
3/27/2023	10:19:07	20.69	0.19	
3/27/2023	10:19:13	20.69	0.19	
3/27/2023	10:19:19	20.69	0.19	
3/27/2023	10:19:25	20.69	0.19	
3/27/2023	10:19:31	20.69	0.19	
3/27/2023	10:19:37	20.69	0.19	
3/27/2023	10:19:43	20.69	0.19	
3/27/2023	10:19:49	20.69	0.19	
3/27/2023	10:19:55	20.69	0.19	
3/27/2023	10:20:01	20.69	0.19	
3/27/2023	10:20:07	20.69	0.19	
3/27/2023	10:20:13	20.69	0.19	
3/27/2023	10:20:19	20.69	0.19	
3/27/2023	10:20:25	20.69	0.19	
3/27/2023	10:20:31	20.69	0.19	
3/27/2023	10:20:37	20.69	0.19	
3/27/2023	10:20:43	20.69	0.19	
3/27/2023	10:20:49	20.69	0.19	
3/27/2023	10:20:55	20.69	0.19	
3/27/2023	10:21:01	20.69	0.19	
3/27/2023	10:21:07	20.69	0.18	
3/27/2023	10:21:13	20.69	0.18	
3/27/2023	10:21:19	20.69	0.18	
3/27/2023	10:21:25	20.69	0.18	
3/27/2023	10:21:31	20.69	0.18	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	10:21:37	20.69	0.18	
3/27/2023	10:21:43	20.69	0.18	
3/27/2023	10:21:49	20.69	0.18	
3/27/2023	10:21:55	20.69	0.18	
3/27/2023	10:22:01	20.69	0.18	
3/27/2023	10:22:07	20.69	0.18	
3/27/2023	10:22:13	20.69	0.18	
3/27/2023	10:22:19	20.69	0.18	
3/27/2023	10:22:25	20.69	0.18	
3/27/2023	10:22:31	20.69	0.18	
3/27/2023	10:22:37	20.70	0.18	
3/27/2023	10:22:43	20.70	0.18	
3/27/2023	10:22:49	20.70	0.18	
3/27/2023	10:22:55	20.70	0.18	
3/27/2023	10:23:01	20.70	0.18	
3/27/2023	10:23:07	20.69	0.18	
3/27/2023	10:23:13	20.70	0.18	
3/27/2023	10:23:19	20.69	0.18	
3/27/2023	10:23:25	20.70	0.18	
3/27/2023	10:23:31	20.70	0.18	
3/27/2023	10:23:37	20.70	0.18	
3/27/2023	10:23:43	20.70	0.18	
3/27/2023	10:23:49	20.70	0.18	
3/27/2023	10:23:55	20.70	0.18	
3/27/2023	10:24:01	20.70	0.18	
3/27/2023	10:24:07	20.70	0.18	
3/27/2023	10:24:13	20.70	0.18	
3/27/2023	10:24:19	20.70	0.18	
3/27/2023	10:24:25	20.70	0.18	
3/27/2023	10:24:31	20.70	0.18	
3/27/2023	10:24:37	20.70	0.18	
3/27/2023	10:24:43	20.70	0.18	
3/27/2023	10:24:49	20.69	0.19	
3/27/2023	10:24:55	20.70	0.19	
3/27/2023	10:25:01	20.70	0.19	
3/27/2023	10:25:07	20.69	0.18	
3/27/2023	10:25:13	20.69	0.18	
3/27/2023	10:25:19	20.69	0.18	
3/27/2023	10:25:25	20.69	0.18	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	10:25:31	20.70	0.18	
3/27/2023	10:25:37	20.70	0.18	
3/27/2023	10:25:43	20.69	0.18	
3/27/2023	10:25:49	20.69	0.18	
3/27/2023	10:25:55	20.69	0.18	
3/27/2023	10:26:01	20.69	0.18	
3/27/2023	10:26:07	20.69	0.18	
3/27/2023	10:26:13	20.69	0.18	
3/27/2023	10:26:19	20.69	0.18	
3/27/2023	10:26:25	20.69	0.18	
3/27/2023	10:26:31	20.69	0.18	
3/27/2023	10:26:37	20.69	0.18	
3/27/2023	10:26:43	20.69	0.18	
3/27/2023	10:26:49	20.69	0.18	
3/27/2023	10:26:55	20.69	0.18	
3/27/2023	10:27:01	20.69	0.18	
3/27/2023	10:27:07	20.69	0.18	
3/27/2023	10:27:13	20.69	0.18	
3/27/2023	10:27:19	20.69	0.18	
3/27/2023	10:27:25	20.69	0.18	
3/27/2023	10:27:31	20.69	0.18	
3/27/2023	10:27:37	20.69	0.18	
3/27/2023	10:27:43	20.69	0.18	
3/27/2023	10:27:49	20.69	0.18	
3/27/2023	10:27:55	20.69	0.18	
3/27/2023	10:28:01	20.69	0.19	
3/27/2023	10:28:07	20.69	0.19	
3/27/2023	10:28:13	20.69	0.19	
3/27/2023	10:28:19	20.69	0.19	
3/27/2023	10:28:25	20.69	0.19	
3/27/2023	10:28:31	20.69	0.19	
3/27/2023	10:28:37	20.69	0.19	
3/27/2023	10:28:43	20.69	0.18	
3/27/2023	10:28:49	20.69	0.18	
3/27/2023	10:28:55	20.69	0.18	
3/27/2023	10:29:01	20.69	0.18	
3/27/2023	10:29:07	20.69	0.18	
3/27/2023	10:29:13	20.69	0.18	
3/27/2023	10:29:19	20.69	0.18	

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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	10:29:25	20.69	0.18	
3/27/2023	10:29:31	20.69	0.18	
3/27/2023	10:29:37	20.69	0.19	
3/27/2023	10:29:43	20.69	0.19	
3/27/2023	10:29:49	20.69	0.18	
3/27/2023	10:29:55	20.69	0.18	
3/27/2023	10:30:01	20.69	0.18	
3/27/2023	10:30:07	20.69	0.18	
3/27/2023	10:30:13	20.69	0.18	
3/27/2023	10:30:19	20.69	0.18	
3/27/2023	10:30:25	20.69	0.18	
3/27/2023	10:30:31	20.69	0.18	
3/27/2023	10:30:37	20.69	0.18	
3/27/2023	10:30:43	20.69	0.18	
3/27/2023	10:30:49	20.69	0.18	
3/27/2023	10:30:55	20.69	0.18	
3/27/2023	10:31:01	20.69	0.18	
3/27/2023	10:31:07	20.69	0.18	
3/27/2023	10:31:13	20.69	0.18	
3/27/2023	10:31:19	20.69	0.18	
3/27/2023	10:31:25	20.69	0.18	
3/27/2023	10:31:31	20.69	0.18	
3/27/2023	10:31:37	20.69	0.18	
3/27/2023	10:31:43	20.69	0.18	
3/27/2023	10:31:49	20.69	0.18	
3/27/2023	10:31:55	20.69	0.19	
3/27/2023	10:32:01	20.69	0.19	
3/27/2023	10:32:07	20.69	0.18	
3/27/2023	10:32:13	20.69	0.18	
3/27/2023	10:32:19	20.69	0.18	
3/27/2023	10:32:25	20.69	0.18	
3/27/2023	10:32:31	20.69	0.19	
3/27/2023	10:32:37	20.69	0.18	
3/27/2023	10:32:43	20.69	0.18	
3/27/2023	10:32:49	20.69	0.18	
3/27/2023	10:32:55	20.69	0.18	
3/27/2023	10:33:01	20.69	0.19	
3/27/2023	10:33:07	20.69	0.19	
3/27/2023	10:33:13	20.69	0.19	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	10:33:19	20.69	0.19	
3/27/2023	10:33:25	20.69	0.19	
3/27/2023	10:33:31	20.69	0.19	
3/27/2023	10:33:37	20.69	0.19	
3/27/2023	10:33:43	20.69	0.18	
3/27/2023	10:33:49	20.69	0.18	
3/27/2023	10:33:55	20.69	0.18	
3/27/2023	10:34:01	20.69	0.18	
3/27/2023	10:34:07	20.69	0.18	
3/27/2023	10:34:13	20.69	0.18	
3/27/2023	10:34:19	20.69	0.18	
3/27/2023	10:34:25	20.69	0.18	
3/27/2023	10:34:31	20.69	0.18	
3/27/2023	10:34:37	20.69	0.18	
3/27/2023	10:34:43	20.69	0.18	
3/27/2023	10:34:49	20.69	0.18	
3/27/2023	10:34:55	20.69	0.18	
3/27/2023	10:35:01	20.69	0.18	
3/27/2023	10:35:07	20.69	0.18	
3/27/2023	10:35:13	20.69	0.18	
3/27/2023	10:35:19	20.69	0.18	
3/27/2023	10:35:25	20.69	0.18	
3/27/2023	10:35:31	20.69	0.18	
3/27/2023	10:35:37	20.69	0.18	
3/27/2023	10:35:43	20.69	0.18	
3/27/2023	10:35:49	20.69	0.18	
3/27/2023	10:35:55	20.69	0.18	
3/27/2023	10:36:01	20.69	0.18	
3/27/2023	10:36:07	20.69	0.18	
3/27/2023	10:36:13	20.69	0.18	
3/27/2023	10:36:19	20.69	0.18	
3/27/2023	10:36:25	20.69	0.18	
3/27/2023	10:36:31	20.69	0.18	
3/27/2023	10:36:37	20.69	0.18	
3/27/2023	10:36:43	20.69	0.18	
3/27/2023	10:36:49	20.70	0.18	
3/27/2023	10:36:55	20.70	0.18	
3/27/2023	10:37:01	20.69	0.18	
3/27/2023	10:37:07	20.69	0.18	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	10:37:13	20.69	0.18	
3/27/2023	10:37:19	20.69	0.17	
3/27/2023	10:37:25	20.69	0.17	
3/27/2023	10:37:31	20.69	0.17	
3/27/2023	10:37:37	20.69	0.17	
3/27/2023	10:37:43	20.69	0.17	
3/27/2023	10:37:49	20.70	0.18	
3/27/2023	10:37:55	20.69	0.18	
3/27/2023	10:38:01	20.70	0.18	
3/27/2023	10:38:07	20.69	0.18	
3/27/2023	10:38:13	20.69	0.18	
3/27/2023	10:38:19	20.69	0.18	
3/27/2023	10:38:25	20.69	0.18	
3/27/2023	10:38:31	20.69	0.18	
3/27/2023	10:38:37	20.69	0.18	
3/27/2023	10:38:43	20.69	0.18	
3/27/2023	10:38:49	20.69	0.18	
3/27/2023	10:38:55	20.69	0.18	
3/27/2023	10:39:01	20.69	0.18	
3/27/2023	10:39:07	20.69	0.18	
3/27/2023	10:39:13	20.69	0.18	
3/27/2023	10:39:19	20.69	0.18	
3/27/2023	10:39:25	20.69	0.18	
3/27/2023	10:39:31	20.69	0.18	
3/27/2023	10:39:37	20.69	0.18	
3/27/2023	10:39:43	20.70	0.18	
3/27/2023	10:39:49	20.69	0.18	
3/27/2023	10:39:55	20.69	0.18	
3/27/2023	10:40:01	20.69	0.18	
3/27/2023	10:40:07	20.69	0.18	
3/27/2023	10:40:13	20.70	0.18	
3/27/2023	10:40:19	20.69	0.18	
3/27/2023	10:40:25	20.69	0.17	
3/27/2023	10:40:31	20.69	0.17	
3/27/2023	10:40:37	20.70	0.17	
3/27/2023	10:40:43	20.70	0.17	
3/27/2023	10:40:49	20.69	0.17	
3/27/2023	10:40:55	20.70	0.18	End Run 1 White Iron
		20.74	0.20	Average

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES	
3/27/2023	10:41:01	20.69	-0.03		
3/27/2023	10:41:07	20.69	-0.03		
3/27/2023	10:41:13	20.69	-0.02		
3/27/2023	10:41:19	20.69	-0.02		
3/27/2023	10:41:25	20.69	-0.02		
3/27/2023	10:41:31	20.69	-0.02		
3/27/2023	10:41:37	20.69	-0.02		
3/27/2023	10:41:43	20.69	-0.02		
3/27/2023	10:41:49	20.69	-0.02		
3/27/2023	10:41:55	20.69	-0.02		
3/27/2023	10:42:01	20.69	-0.02		
3/27/2023	10:42:07	20.69	-0.02		
3/27/2023	10:42:13	20.69	-0.02		
3/27/2023	10:42:19	20.69	-0.02		
3/27/2023	10:42:25	20.69	-0.02		
3/27/2023	10:42:31	20.69	-0.02		
3/27/2023	10:42:37	20.69	-0.02		
3/27/2023	10:42:43	20.69	-0.02		
3/27/2023	10:42:49	20.69	-0.02		
3/27/2023	10:42:55	20.69	-0.02		
3/27/2023	10:43:01	20.69	-0.02		
3/27/2023	10:43:07	20.69	-0.02		
3/27/2023	10:43:13	20.69	-0.02		
3/27/2023	10:43:19	20.70	-0.03		
3/27/2023	10:43:25	20.50	-0.08		
3/27/2023	10:43:31	14.87	-0.08		
3/27/2023	10:43:37	6.42	-0.08		
3/27/2023	10:43:43	2.28	-0.08		
3/27/2023	10:43:49	0.83	-0.08		
3/27/2023	10:43:55	0.38	-0.08		
3/27/2023	10:44:01	0.24	-0.08		
3/27/2023	10:44:07	0.19	-0.08		
3/27/2023	10:44:13	0.17	-0.09	O2/CO2 System Zero	
3/27/2023	10:44:19	0.17	-0.09	0.15	-0.09
3/27/2023	10:44:25	0.16	-0.09		
3/27/2023	10:44:31	0.16	-0.09		
3/27/2023	10:44:37	0.15	-0.09		
3/27/2023	10:44:43	0.15	-0.09		

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	10:44:49	0.15	-0.09	
3/27/2023	10:44:55	0.15	-0.09	
3/27/2023	10:45:01	0.14	-0.09	
3/27/2023	10:45:07	0.14	-0.09	
3/27/2023	10:45:13	0.14	-0.09	
3/27/2023	10:45:19	0.14	-0.09	
3/27/2023	10:45:25	0.14	-0.09	
3/27/2023	10:45:31	0.13	-0.09	
3/27/2023	10:45:37	0.18	2.32	
3/27/2023	10:45:43	1.64	11.61	
3/27/2023	10:45:49	6.43	11.88	
3/27/2023	10:45:55	8.70	11.90	
3/27/2023	10:46:01	9.52	11.90	
3/27/2023	10:46:07	9.75	11.91	
3/27/2023	10:46:13	9.81	11.91	
3/27/2023	10:46:19	9.83	10.88	
3/27/2023	10:46:25	9.84	9.94	
3/27/2023	10:46:31	9.84	9.93	O2/CO2 System Upscale
3/27/2023	10:46:37	9.84	9.93	9.84 9.94
3/27/2023	10:46:43	9.84	9.93	
3/27/2023	10:46:49	9.84	9.93	
3/27/2023	10:46:55	9.84	9.94	
3/27/2023	10:47:01	9.84	9.94	
3/27/2023	10:47:07	9.84	9.95	
3/27/2023	10:47:13	9.84	9.95	
3/27/2023	10:47:19	9.84	9.95	
3/27/2023	10:47:25	9.84	9.95	
3/27/2023	10:47:31	9.84	9.96	
3/27/2023	10:47:37	9.84	9.96	
3/27/2023	10:47:43	9.84	9.96	
3/27/2023	10:47:49	9.84	9.97	
3/27/2023	10:47:55	9.84	9.79	
3/27/2023	10:48:01	9.84	9.64	
3/27/2023	10:48:07	9.85	5.69	
3/27/2023	10:48:13	9.86	1.29	
3/27/2023	10:48:19	9.87	0.37	

Mn and CM40 Steel

3/27/2023 13:00:02 20.70 0.21 **Start Run 1**

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	13:00:08	20.70	0.21	
3/27/2023	13:00:14	20.70	0.21	
3/27/2023	13:00:20	20.70	0.21	
3/27/2023	13:00:26	20.70	0.21	
3/27/2023	13:00:32	20.70	0.21	
3/27/2023	13:00:38	20.70	0.21	
3/27/2023	13:00:44	20.70	0.21	
3/27/2023	13:00:50	20.70	0.21	
3/27/2023	13:00:56	20.70	0.21	
3/27/2023	13:01:02	20.70	0.21	
3/27/2023	13:01:08	20.70	0.21	
3/27/2023	13:01:14	20.70	0.21	
3/27/2023	13:01:20	20.70	0.21	
3/27/2023	13:01:26	20.70	0.21	
3/27/2023	13:01:32	20.70	0.21	
3/27/2023	13:01:38	20.70	0.21	
3/27/2023	13:01:44	20.70	0.21	
3/27/2023	13:01:50	20.70	0.21	
3/27/2023	13:01:56	20.70	0.21	
3/27/2023	13:02:02	20.70	0.21	
3/27/2023	13:02:08	20.70	0.21	
3/27/2023	13:02:14	20.70	0.21	
3/27/2023	13:02:20	20.70	0.21	
3/27/2023	13:02:26	20.70	0.21	
3/27/2023	13:02:32	20.70	0.21	
3/27/2023	13:02:38	20.70	0.21	
3/27/2023	13:02:44	20.70	0.21	
3/27/2023	13:02:50	20.70	0.21	
3/27/2023	13:02:56	20.70	0.21	
3/27/2023	13:03:02	20.70	0.21	
3/27/2023	13:03:08	20.70	0.21	
3/27/2023	13:03:14	20.70	0.21	
3/27/2023	13:03:20	20.70	0.21	
3/27/2023	13:03:26	20.70	0.21	
3/27/2023	13:03:32	20.70	0.21	
3/27/2023	13:03:38	20.70	0.21	
3/27/2023	13:03:44	20.70	0.21	
3/27/2023	13:03:50	20.70	0.21	
3/27/2023	13:03:56	20.70	0.21	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	13:04:02	20.70	0.21	
3/27/2023	13:04:08	20.70	0.21	
3/27/2023	13:04:14	20.70	0.21	
3/27/2023	13:04:20	20.70	0.21	
3/27/2023	13:04:26	20.70	0.21	
3/27/2023	13:04:32	20.70	0.21	
3/27/2023	13:04:38	20.70	0.21	
3/27/2023	13:04:44	20.70	0.21	
3/27/2023	13:04:50	20.70	0.21	
3/27/2023	13:04:56	20.70	0.21	
3/27/2023	13:05:02	20.70	0.21	
3/27/2023	13:05:08	20.70	0.21	
3/27/2023	13:05:14	20.70	0.21	
3/27/2023	13:05:20	20.70	0.21	
3/27/2023	13:05:26	20.70	0.21	
3/27/2023	13:05:32	20.70	0.21	
3/27/2023	13:05:38	20.70	0.21	
3/27/2023	13:05:44	20.70	0.21	
3/27/2023	13:05:50	20.70	0.21	
3/27/2023	13:05:56	20.70	0.21	
3/27/2023	13:06:02	20.70	0.21	
3/27/2023	13:06:08	20.70	0.21	
3/27/2023	13:06:14	20.69	0.21	
3/27/2023	13:06:20	20.69	0.21	
3/27/2023	13:06:26	20.70	0.21	
3/27/2023	13:06:32	20.70	0.21	
3/27/2023	13:06:38	20.70	0.21	
3/27/2023	13:06:44	20.69	0.21	
3/27/2023	13:06:50	20.69	0.21	
3/27/2023	13:06:56	20.70	0.21	
3/27/2023	13:07:02	20.69	0.21	
3/27/2023	13:07:08	20.70	0.21	
3/27/2023	13:07:14	20.70	0.21	
3/27/2023	13:07:20	20.70	0.21	
3/27/2023	13:07:26	20.69	0.21	
3/27/2023	13:07:32	20.69	0.21	
3/27/2023	13:07:38	20.69	0.21	
3/27/2023	13:07:44	20.70	0.21	
3/27/2023	13:07:50	20.69	0.21	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	13:07:56	20.69	0.21	
3/27/2023	13:08:02	20.69	0.21	
3/27/2023	13:08:08	20.69	0.21	
3/27/2023	13:08:14	20.69	0.21	
3/27/2023	13:08:20	20.69	0.21	
3/27/2023	13:08:26	20.69	0.21	
3/27/2023	13:08:32	20.69	0.21	
3/27/2023	13:08:38	20.69	0.21	
3/27/2023	13:08:44	20.69	0.21	
3/27/2023	13:08:50	20.69	0.21	
3/27/2023	13:08:56	20.69	0.21	
3/27/2023	13:09:02	20.69	0.21	
3/27/2023	13:09:08	20.69	0.21	
3/27/2023	13:09:14	20.69	0.21	
3/27/2023	13:09:20	20.69	0.21	
3/27/2023	13:09:26	20.69	0.21	
3/27/2023	13:09:32	20.69	0.21	
3/27/2023	13:09:38	20.69	0.21	
3/27/2023	13:09:44	20.69	0.21	
3/27/2023	13:09:50	20.69	0.21	
3/27/2023	13:09:56	20.69	0.21	
3/27/2023	13:10:02	20.69	0.21	
3/27/2023	13:10:08	20.69	0.21	
3/27/2023	13:10:14	20.69	0.20	
3/27/2023	13:10:20	20.70	0.20	
3/27/2023	13:10:26	20.70	0.20	
3/27/2023	13:10:32	20.69	0.21	
3/27/2023	13:10:38	20.69	0.21	
3/27/2023	13:10:44	20.69	0.21	
3/27/2023	13:10:50	20.69	0.20	
3/27/2023	13:10:56	20.69	0.21	
3/27/2023	13:11:02	20.69	0.21	
3/27/2023	13:11:08	20.69	0.21	
3/27/2023	13:11:14	20.69	0.21	
3/27/2023	13:11:20	20.69	0.21	
3/27/2023	13:11:26	20.69	0.20	
3/27/2023	13:11:32	20.69	0.20	
3/27/2023	13:11:38	20.69	0.20	
3/27/2023	13:11:44	20.69	0.20	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	13:11:50	20.69	0.21	
3/27/2023	13:11:56	20.69	0.20	
3/27/2023	13:12:02	20.69	0.20	
3/27/2023	13:12:08	20.69	0.21	
3/27/2023	13:12:14	20.69	0.21	
3/27/2023	13:12:20	20.69	0.21	
3/27/2023	13:12:26	20.69	0.21	
3/27/2023	13:12:32	20.69	0.20	
3/27/2023	13:12:38	20.69	0.21	
3/27/2023	13:12:44	20.69	0.20	
3/27/2023	13:12:50	20.69	0.20	
3/27/2023	13:12:56	20.69	0.20	
3/27/2023	13:13:02	20.69	0.20	
3/27/2023	13:13:08	20.69	0.20	
3/27/2023	13:13:14	20.69	0.20	
3/27/2023	13:13:20	20.69	0.20	
3/27/2023	13:13:26	20.69	0.20	
3/27/2023	13:13:32	20.69	0.20	
3/27/2023	13:13:38	20.69	0.20	
3/27/2023	13:13:44	20.69	0.20	
3/27/2023	13:13:50	20.69	0.20	
3/27/2023	13:13:56	20.69	0.20	
3/27/2023	13:14:02	20.69	0.20	
3/27/2023	13:14:08	20.69	0.20	
3/27/2023	13:14:14	20.69	0.20	
3/27/2023	13:14:20	20.69	0.20	
3/27/2023	13:14:26	20.69	0.20	
3/27/2023	13:14:32	20.69	0.20	
3/27/2023	13:14:38	20.69	0.20	
3/27/2023	13:14:44	20.69	0.20	
3/27/2023	13:14:50	20.69	0.20	
3/27/2023	13:14:56	20.69	0.20	
3/27/2023	13:15:02	20.69	0.20	
3/27/2023	13:15:08	20.69	0.20	
3/27/2023	13:15:14	20.69	0.20	
3/27/2023	13:15:20	20.69	0.20	
3/27/2023	13:15:26	20.69	0.20	
3/27/2023	13:15:32	20.69	0.20	
3/27/2023	13:15:38	20.69	0.20	

Eagle Foundry Company
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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	13:15:44	20.69	0.20	
3/27/2023	13:15:50	20.69	0.20	
3/27/2023	13:15:56	20.69	0.20	
3/27/2023	13:16:02	20.69	0.20	
3/27/2023	13:16:08	20.69	0.20	
3/27/2023	13:16:14	20.69	0.20	
3/27/2023	13:16:20	20.69	0.20	
3/27/2023	13:16:26	20.69	0.20	
3/27/2023	13:16:32	20.69	0.20	
3/27/2023	13:16:38	20.69	0.20	
3/27/2023	13:16:44	20.69	0.20	
3/27/2023	13:16:50	20.69	0.20	
3/27/2023	13:16:56	20.69	0.20	
3/27/2023	13:17:02	20.69	0.20	
3/27/2023	13:17:08	20.69	0.20	
3/27/2023	13:17:14	20.69	0.20	
3/27/2023	13:17:20	20.69	0.20	
3/27/2023	13:17:26	20.69	0.20	
3/27/2023	13:17:32	20.69	0.20	
3/27/2023	13:17:38	20.69	0.20	
3/27/2023	13:17:44	20.69	0.20	
3/27/2023	13:17:50	20.69	0.20	
3/27/2023	13:17:56	20.69	0.20	
3/27/2023	13:18:02	20.69	0.20	
3/27/2023	13:18:08	20.69	0.20	
3/27/2023	13:18:14	20.69	0.20	
3/27/2023	13:18:20	20.69	0.20	
3/27/2023	13:18:26	20.69	0.20	
3/27/2023	13:18:32	20.69	0.20	
3/27/2023	13:18:38	20.69	0.20	
3/27/2023	13:18:44	20.69	0.20	
3/27/2023	13:18:50	20.69	0.20	
3/27/2023	13:18:56	20.69	0.20	
3/27/2023	13:19:02	20.69	0.20	
3/27/2023	13:19:08	20.69	0.20	
3/27/2023	13:19:14	20.69	0.20	
3/27/2023	13:19:20	20.69	0.20	
3/27/2023	13:19:26	20.69	0.20	
3/27/2023	13:19:32	20.69	0.20	

Eagle Foundry Company
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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	13:19:38	20.69	0.20	
3/27/2023	13:19:44	20.69	0.20	
3/27/2023	13:19:50	20.69	0.20	
3/27/2023	13:19:56	20.69	0.20	
3/27/2023	13:20:02	20.69	0.20	
3/27/2023	13:20:08	20.69	0.20	
3/27/2023	13:20:14	20.69	0.20	
3/27/2023	13:20:20	20.69	0.20	
3/27/2023	13:20:26	20.69	0.20	
3/27/2023	13:20:32	20.69	0.20	
3/27/2023	13:20:38	20.69	0.20	
3/27/2023	13:20:44	20.69	0.20	
3/27/2023	13:20:50	20.69	0.20	
3/27/2023	13:20:56	20.69	0.20	
3/27/2023	13:21:02	20.69	0.20	
3/27/2023	13:21:08	20.69	0.20	
3/27/2023	13:21:14	20.69	0.20	
3/27/2023	13:21:20	20.69	0.20	
3/27/2023	13:21:26	20.69	0.20	
3/27/2023	13:21:32	20.69	0.20	
3/27/2023	13:21:38	20.69	0.20	
3/27/2023	13:21:44	20.69	0.20	
3/27/2023	13:21:50	20.69	0.20	
3/27/2023	13:21:56	20.69	0.20	
3/27/2023	13:22:02	20.69	0.20	
3/27/2023	13:22:08	20.69	0.20	
3/27/2023	13:22:14	20.69	0.20	
3/27/2023	13:22:20	20.69	0.20	
3/27/2023	13:22:26	20.69	0.20	
3/27/2023	13:22:32	20.69	0.20	
3/27/2023	13:22:38	20.69	0.20	
3/27/2023	13:22:44	20.69	0.20	
3/27/2023	13:22:50	20.69	0.20	
3/27/2023	13:22:56	20.69	0.20	
3/27/2023	13:23:02	20.69	0.20	
3/27/2023	13:23:08	20.69	0.20	
3/27/2023	13:23:14	20.69	0.20	
3/27/2023	13:23:20	20.69	0.20	
3/27/2023	13:23:26	20.69	0.20	

Eagle Foundry Company
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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	13:23:32	20.69	0.20	
3/27/2023	13:23:38	20.68	0.20	
3/27/2023	13:23:44	20.69	0.20	
3/27/2023	13:23:50	20.69	0.20	
3/27/2023	13:23:56	20.68	0.20	
3/27/2023	13:24:02	20.69	0.20	
3/27/2023	13:24:08	20.68	0.20	
3/27/2023	13:24:14	20.69	0.20	
3/27/2023	13:24:20	20.69	0.20	
3/27/2023	13:24:26	20.69	0.20	
3/27/2023	13:24:32	20.69	0.20	
3/27/2023	13:24:38	20.69	0.20	
3/27/2023	13:24:44	20.69	0.20	
3/27/2023	13:24:50	20.69	0.20	
3/27/2023	13:24:56	20.69	0.20	
3/27/2023	13:25:02	20.68	0.20	
3/27/2023	13:25:08	20.68	0.20	
3/27/2023	13:25:14	20.69	0.20	
3/27/2023	13:25:20	20.68	0.20	
3/27/2023	13:25:26	20.68	0.20	
3/27/2023	13:25:32	20.68	0.20	
3/27/2023	13:25:38	20.68	0.20	
3/27/2023	13:25:44	20.68	0.20	
3/27/2023	13:25:50	20.68	0.20	
3/27/2023	13:25:56	20.68	0.20	
3/27/2023	13:26:02	20.68	0.20	
3/27/2023	13:26:08	20.68	0.20	
3/27/2023	13:26:14	20.68	0.20	
3/27/2023	13:26:20	20.68	0.20	
3/27/2023	13:26:26	20.68	0.20	
3/27/2023	13:26:32	20.68	0.20	
3/27/2023	13:26:38	20.68	0.20	
3/27/2023	13:26:44	20.68	0.20	
3/27/2023	13:26:50	20.68	0.20	
3/27/2023	13:26:56	20.68	0.20	
3/27/2023	13:27:02	20.68	0.20	
3/27/2023	13:27:08	20.68	0.20	
3/27/2023	13:27:14	20.68	0.20	
3/27/2023	13:27:20	20.68	0.20	

Eagle Foundry Company
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Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	13:27:26	20.68	0.20	
3/27/2023	13:27:32	20.68	0.20	
3/27/2023	13:27:38	20.68	0.20	
3/27/2023	13:27:44	20.68	0.20	
3/27/2023	13:27:50	20.68	0.20	
3/27/2023	13:27:56	20.68	0.20	
3/27/2023	13:28:02	20.68	0.20	
3/27/2023	13:28:08	20.68	0.20	
3/27/2023	13:28:14	20.68	0.20	
3/27/2023	13:28:20	20.68	0.20	
3/27/2023	13:28:26	20.68	0.20	
3/27/2023	13:28:32	20.68	0.20	
3/27/2023	13:28:38	20.68	0.20	
3/27/2023	13:28:44	20.68	0.20	
3/27/2023	13:28:50	20.68	0.20	
3/27/2023	13:28:56	20.68	0.20	
3/27/2023	13:29:02	20.68	0.20	
3/27/2023	13:29:08	20.68	0.20	
3/27/2023	13:29:14	20.68	0.20	
3/27/2023	13:29:20	20.68	0.20	
3/27/2023	13:29:26	20.68	0.20	
3/27/2023	13:29:32	20.68	0.20	
3/27/2023	13:29:38	20.68	0.20	
3/27/2023	13:29:44	20.68	0.20	
3/27/2023	13:29:50	20.68	0.20	
3/27/2023	13:29:56	20.68	0.21	
3/27/2023	13:30:02	20.68	0.20	
3/27/2023	13:30:08	20.68	0.20	
3/27/2023	13:30:14	20.68	0.20	
3/27/2023	13:30:20	20.68	0.20	
3/27/2023	13:30:26	20.68	0.20	
3/27/2023	13:30:32	20.68	0.21	
3/27/2023	13:30:38	20.68	0.20	
3/27/2023	13:30:44	20.68	0.20	
3/27/2023	13:30:50	20.68	0.20	
3/27/2023	13:30:56	20.68	0.20	
3/27/2023	13:31:02	20.68	0.20	
3/27/2023	13:31:08	20.68	0.20	
3/27/2023	13:31:14	20.68	0.20	

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Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	13:31:20	20.68	0.20	
3/27/2023	13:31:26	20.68	0.20	
3/27/2023	13:31:32	20.68	0.20	
3/27/2023	13:31:38	20.68	0.20	
3/27/2023	13:31:44	20.68	0.20	
3/27/2023	13:31:50	20.68	0.20	
3/27/2023	13:31:56	20.68	0.20	
3/27/2023	13:32:02	20.68	0.20	
3/27/2023	13:32:08	20.68	0.20	
3/27/2023	13:32:14	20.68	0.20	
3/27/2023	13:32:20	20.68	0.20	
3/27/2023	13:32:26	20.68	0.20	
3/27/2023	13:32:32	20.68	0.20	
3/27/2023	13:32:38	20.68	0.20	
3/27/2023	13:32:44	20.68	0.20	
3/27/2023	13:32:50	20.68	0.20	
3/27/2023	13:32:56	20.68	0.20	
3/27/2023	13:33:02	20.68	0.20	
3/27/2023	13:33:08	20.68	0.20	
3/27/2023	13:33:14	20.68	0.20	
3/27/2023	13:33:20	20.68	0.19	
3/27/2023	13:33:26	20.68	0.19	
3/27/2023	13:33:32	20.68	0.19	
3/27/2023	13:33:38	20.68	0.20	
3/27/2023	13:33:44	20.68	0.20	
3/27/2023	13:33:50	20.68	0.20	
3/27/2023	13:33:56	20.68	0.20	
3/27/2023	13:34:02	20.68	0.20	
3/27/2023	13:34:08	20.68	0.20	
3/27/2023	13:34:14	20.68	0.20	
3/27/2023	13:34:20	20.68	0.20	
3/27/2023	13:34:26	20.68	0.20	
3/27/2023	13:34:32	20.68	0.20	
3/27/2023	13:34:38	20.68	0.20	
3/27/2023	13:34:44	20.68	0.20	
3/27/2023	13:34:50	20.68	0.20	
3/27/2023	13:34:56	20.68	0.20	
3/27/2023	13:35:02	20.68	0.20	
3/27/2023	13:35:08	20.68	0.20	

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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	13:35:14	20.68	0.20	
3/27/2023	13:35:20	20.68	0.20	
3/27/2023	13:35:26	20.68	0.20	
3/27/2023	13:35:32	20.68	0.20	
3/27/2023	13:35:38	20.68	0.20	
3/27/2023	13:35:44	20.68	0.20	
3/27/2023	13:35:50	20.68	0.20	
3/27/2023	13:35:56	20.68	0.20	
3/27/2023	13:36:02	20.68	0.20	
3/27/2023	13:36:08	20.68	0.20	
3/27/2023	13:36:14	20.68	0.19	
3/27/2023	13:36:20	20.68	0.19	
3/27/2023	13:36:26	20.68	0.20	
3/27/2023	13:36:32	20.67	0.20	
3/27/2023	13:36:38	20.68	0.20	
3/27/2023	13:36:44	20.68	0.20	
3/27/2023	13:36:50	20.68	0.20	
3/27/2023	13:36:56	20.68	0.20	
3/27/2023	13:37:02	20.68	0.20	
3/27/2023	13:37:08	20.68	0.20	
3/27/2023	13:37:14	20.68	0.20	
3/27/2023	13:37:20	20.68	0.20	
3/27/2023	13:37:26	20.68	0.19	
3/27/2023	13:37:32	20.68	0.19	
3/27/2023	13:37:38	20.68	0.19	
3/27/2023	13:37:44	20.68	0.19	
3/27/2023	13:37:50	20.68	0.18	
3/27/2023	13:37:56	20.68	0.19	
3/27/2023	13:38:02	20.68	0.19	
3/27/2023	13:38:08	20.68	0.19	
3/27/2023	13:38:14	20.68	0.19	
3/27/2023	13:38:20	20.68	0.19	
3/27/2023	13:38:26	20.68	0.18	
3/27/2023	13:38:32	20.68	0.19	
3/27/2023	13:38:38	20.68	0.19	
3/27/2023	13:38:44	20.68	0.19	
3/27/2023	13:38:50	20.68	0.20	
3/27/2023	13:38:56	20.68	0.20	
3/27/2023	13:39:02	20.68	0.20	

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Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	13:39:08	20.68	0.20	
3/27/2023	13:39:14	20.68	0.20	
3/27/2023	13:39:20	20.68	0.20	
3/27/2023	13:39:26	20.68	0.20	
3/27/2023	13:39:32	20.68	0.20	
3/27/2023	13:39:38	20.68	0.20	
3/27/2023	13:39:44	20.68	0.20	
3/27/2023	13:39:50	20.68	0.20	
3/27/2023	13:39:56	20.68	0.20	
3/27/2023	13:40:02	20.68	0.20	
3/27/2023	13:40:08	20.68	0.20	
3/27/2023	13:40:14	20.68	0.20	
3/27/2023	13:40:20	20.68	0.20	
3/27/2023	13:40:26	20.68	0.20	
3/27/2023	13:40:32	20.68	0.20	
3/27/2023	13:40:38	20.68	0.19	
3/27/2023	13:40:44	20.68	0.20	
3/27/2023	13:40:50	20.68	0.20	
3/27/2023	13:40:56	20.68	0.20	
3/27/2023	13:41:02	20.68	0.20	
3/27/2023	13:41:08	20.68	0.20	
3/27/2023	13:41:14	20.68	0.20	
3/27/2023	13:41:20	20.68	0.19	
3/27/2023	13:41:26	20.68	0.20	
3/27/2023	13:41:32	20.68	0.20	
3/27/2023	13:41:38	20.68	0.20	
3/27/2023	13:41:44	20.68	0.19	
3/27/2023	13:41:50	20.68	0.20	
3/27/2023	13:41:56	20.68	0.20	
3/27/2023	13:42:02	20.68	0.20	
3/27/2023	13:42:08	20.68	0.20	
3/27/2023	13:42:14	20.68	0.20	
3/27/2023	13:42:20	20.68	0.20	
3/27/2023	13:42:26	20.68	0.20	
3/27/2023	13:42:32	20.68	0.20	
3/27/2023	13:42:38	20.68	0.20	
3/27/2023	13:42:44	20.68	0.20	
3/27/2023	13:42:50	20.68	0.20	
3/27/2023	13:42:56	20.68	0.20	

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Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	13:43:02	20.68	0.20	
3/27/2023	13:43:08	20.68	0.20	
3/27/2023	13:43:14	20.68	0.20	
3/27/2023	13:43:20	20.68	0.20	
3/27/2023	13:43:26	20.68	0.20	
3/27/2023	13:43:32	20.68	0.20	
3/27/2023	13:43:38	20.68	0.20	
3/27/2023	13:43:44	20.68	0.20	
3/27/2023	13:43:50	20.68	0.20	
3/27/2023	13:43:56	20.68	0.20	
3/27/2023	13:44:02	20.68	0.20	
3/27/2023	13:44:08	20.68	0.20	
3/27/2023	13:44:14	20.68	0.20	
3/27/2023	13:44:20	20.68	0.20	
3/27/2023	13:44:26	20.68	0.20	
3/27/2023	13:44:32	20.68	0.20	
3/27/2023	13:44:38	20.68	0.20	
3/27/2023	13:44:44	20.68	0.20	
3/27/2023	13:44:50	20.68	0.20	
3/27/2023	13:44:56	20.68	0.20	
3/27/2023	13:45:02	20.68	0.20	
3/27/2023	13:45:08	20.68	0.20	
3/27/2023	13:45:14	20.68	0.20	
3/27/2023	13:45:20	20.68	0.20	
3/27/2023	13:45:26	20.68	0.20	
3/27/2023	13:45:32	20.68	0.20	
3/27/2023	13:45:38	20.68	0.20	
3/27/2023	13:45:44	20.68	0.20	
3/27/2023	13:45:50	20.68	0.20	
3/27/2023	13:45:56	20.68	0.20	
3/27/2023	13:46:02	20.68	0.20	
3/27/2023	13:46:08	20.68	0.20	
3/27/2023	13:46:14	20.68	0.20	
3/27/2023	13:46:20	20.68	0.20	
3/27/2023	13:46:26	20.68	0.20	
3/27/2023	13:46:32	20.68	0.20	
3/27/2023	13:46:38	20.68	0.20	
3/27/2023	13:46:44	20.68	0.20	
3/27/2023	13:46:50	20.68	0.20	

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Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	13:46:56	20.68	0.20	
3/27/2023	13:47:02	20.68	0.20	
3/27/2023	13:47:08	20.68	0.20	
3/27/2023	13:47:14	20.68	0.20	
3/27/2023	13:47:20	20.68	0.20	
3/27/2023	13:47:26	20.68	0.20	
3/27/2023	13:47:32	20.68	0.20	
3/27/2023	13:47:38	20.68	0.20	
3/27/2023	13:47:44	20.68	0.20	
3/27/2023	13:47:50	20.68	0.20	
3/27/2023	13:47:56	20.68	0.20	
3/27/2023	13:48:02	20.68	0.20	
3/27/2023	13:48:08	20.68	0.20	
3/27/2023	13:48:14	20.68	0.20	
3/27/2023	13:48:20	20.68	0.20	
3/27/2023	13:48:26	20.68	0.20	
3/27/2023	13:48:32	20.68	0.20	
3/27/2023	13:48:38	20.68	0.20	
3/27/2023	13:48:44	20.68	0.20	
3/27/2023	13:48:50	20.68	0.20	
3/27/2023	13:48:56	20.68	0.20	
3/27/2023	13:49:02	20.68	0.20	
3/27/2023	13:49:08	20.68	0.20	
3/27/2023	13:49:14	20.68	0.20	
3/27/2023	13:49:20	20.68	0.20	
3/27/2023	13:49:26	20.68	0.20	
3/27/2023	13:49:32	20.68	0.20	
3/27/2023	13:49:38	20.68	0.20	
3/27/2023	13:49:44	20.68	0.20	
3/27/2023	13:49:50	20.68	0.20	
3/27/2023	13:49:56	20.68	0.20	
3/27/2023	13:50:02	20.68	0.20	
3/27/2023	13:50:08	20.68	0.20	
3/27/2023	13:50:14	20.68	0.20	
3/27/2023	13:50:20	20.68	0.20	
3/27/2023	13:50:26	20.68	0.20	
3/27/2023	13:50:32	20.68	0.20	
3/27/2023	13:50:38	20.68	0.20	
3/27/2023	13:50:44	20.68	0.20	

Eagle Foundry Company
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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	13:50:50	20.68	0.20	
3/27/2023	13:50:56	20.68	0.20	
3/27/2023	13:51:02	20.68	0.20	
3/27/2023	13:51:08	20.68	0.20	
3/27/2023	13:51:14	20.68	0.20	
3/27/2023	13:51:20	20.68	0.20	
3/27/2023	13:51:26	20.68	0.20	
3/27/2023	13:51:32	20.68	0.20	
3/27/2023	13:51:38	20.68	0.20	
3/27/2023	13:51:44	20.68	0.20	
3/27/2023	13:51:50	20.67	0.20	
3/27/2023	13:51:56	20.67	0.20	
3/27/2023	13:52:02	20.67	0.20	
3/27/2023	13:52:08	20.67	0.19	
3/27/2023	13:52:14	20.67	0.19	
3/27/2023	13:52:20	20.67	0.19	
3/27/2023	13:52:26	20.67	0.19	
3/27/2023	13:52:32	20.67	0.19	
3/27/2023	13:52:38	20.67	0.19	
3/27/2023	13:52:44	20.67	0.19	
3/27/2023	13:52:50	20.67	0.19	
3/27/2023	13:52:56	20.67	0.20	
3/27/2023	13:53:02	20.67	0.20	
3/27/2023	13:53:08	20.67	0.20	
3/27/2023	13:53:14	20.67	0.19	
3/27/2023	13:53:20	20.67	0.19	
3/27/2023	13:53:26	20.67	0.19	
3/27/2023	13:53:32	20.67	0.19	
3/27/2023	13:53:38	20.67	0.19	
3/27/2023	13:53:44	20.67	0.19	
3/27/2023	13:53:50	20.68	0.19	
3/27/2023	13:53:56	20.67	0.19	
3/27/2023	13:54:02	20.67	0.19	
3/27/2023	13:54:08	20.67	0.19	
3/27/2023	13:54:14	20.67	0.19	
3/27/2023	13:54:20	20.67	0.20	
3/27/2023	13:54:26	20.67	0.19	
3/27/2023	13:54:32	20.67	0.18	
3/27/2023	13:54:38	20.68	0.18	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	13:54:44	20.67	0.18	
3/27/2023	13:54:50	20.67	0.18	
3/27/2023	13:54:56	20.67	0.18	
3/27/2023	13:55:02	20.68	0.18	
3/27/2023	13:55:08	20.67	0.18	
3/27/2023	13:55:14	20.67	0.18	
3/27/2023	13:55:20	20.68	0.18	
3/27/2023	13:55:26	20.67	0.18	
3/27/2023	13:55:32	20.68	0.18	
3/27/2023	13:55:38	20.68	0.18	
3/27/2023	13:55:44	20.68	0.18	
3/27/2023	13:55:50	20.68	0.18	
3/27/2023	13:55:56	20.68	0.19	
3/27/2023	13:56:02	20.68	0.19	
3/27/2023	13:56:08	20.68	0.19	
3/27/2023	13:56:14	20.68	0.19	
3/27/2023	13:56:20	20.68	0.19	
3/27/2023	13:56:26	20.68	0.19	
3/27/2023	13:56:32	20.68	0.19	
3/27/2023	13:56:38	20.68	0.20	
3/27/2023	13:56:44	20.68	0.19	
3/27/2023	13:56:50	20.68	0.19	
3/27/2023	13:56:56	20.68	0.19	
3/27/2023	13:57:02	20.68	0.20	
3/27/2023	13:57:08	20.68	0.19	
3/27/2023	13:57:14	20.68	0.19	
3/27/2023	13:57:20	20.68	0.18	
3/27/2023	13:57:26	20.68	0.18	
3/27/2023	13:57:32	20.68	0.18	
3/27/2023	13:57:38	20.68	0.18	
3/27/2023	13:57:44	20.68	0.18	
3/27/2023	13:57:50	20.67	0.18	
3/27/2023	13:57:56	20.68	0.18	
3/27/2023	13:58:02	20.68	0.18	
3/27/2023	13:58:08	20.68	0.18	
3/27/2023	13:58:14	20.67	0.18	
3/27/2023	13:58:20	20.68	0.18	
3/27/2023	13:58:26	20.67	0.18	
3/27/2023	13:58:32	20.68	0.18	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	13:58:38	20.68	0.18	
3/27/2023	13:58:44	20.67	0.18	
3/27/2023	13:58:50	20.67	0.18	
3/27/2023	13:58:56	20.67	0.18	
3/27/2023	13:59:02	20.67	0.18	
3/27/2023	13:59:08	20.67	0.18	
3/27/2023	13:59:14	20.67	0.18	
3/27/2023	13:59:20	20.67	0.18	
3/27/2023	13:59:26	20.67	0.18	
3/27/2023	13:59:32	20.67	0.18	
3/27/2023	13:59:38	20.67	0.18	
3/27/2023	13:59:44	20.67	0.18	
3/27/2023	13:59:50	20.67	0.18	
3/27/2023	13:59:56	20.67	0.18	
3/27/2023	14:00:02	20.67	0.18	
3/27/2023	14:00:08	20.67	0.18	
3/27/2023	14:00:14	20.67	0.18	
3/27/2023	14:00:20	20.67	0.18	
3/27/2023	14:00:26	20.67	0.18	
3/27/2023	14:00:32	20.67	0.18	
3/27/2023	14:00:38	20.67	0.18	
3/27/2023	14:00:44	20.67	0.18	
3/27/2023	14:00:50	20.67	0.18	
3/27/2023	14:00:56	20.67	0.19	
3/27/2023	14:01:02	20.67	0.19	
3/27/2023	14:01:08	20.67	0.19	
3/27/2023	14:01:14	20.67	0.19	
3/27/2023	14:01:20	20.67	0.19	
3/27/2023	14:01:26	20.67	0.19	
3/27/2023	14:01:32	20.67	0.19	
3/27/2023	14:01:38	20.67	0.19	
3/27/2023	14:01:44	20.67	0.19	
3/27/2023	14:01:50	20.67	0.19	
3/27/2023	14:01:56	20.67	0.19	
3/27/2023	14:02:02	20.67	0.19	
3/27/2023	14:02:08	20.67	0.19	
3/27/2023	14:02:14	20.67	0.19	
3/27/2023	14:02:20	20.67	0.19	
3/27/2023	14:02:26	20.67	0.19	

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Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	14:02:32	20.67	0.19	
3/27/2023	14:02:38	20.67	0.19	
3/27/2023	14:02:44	20.67	0.19	
3/27/2023	14:02:50	20.67	0.19	
3/27/2023	14:02:56	20.66	0.18	
3/27/2023	14:03:02	20.66	0.18	
3/27/2023	14:03:08	20.66	0.18	
3/27/2023	14:03:14	20.66	0.18	
3/27/2023	14:03:20	20.66	0.18	
3/27/2023	14:03:26	20.66	0.18	
3/27/2023	14:03:32	20.66	0.18	
3/27/2023	14:03:38	20.66	0.18	
3/27/2023	14:03:44	20.66	0.18	
3/27/2023	14:03:50	20.66	0.18	
3/27/2023	14:03:56	20.66	0.18	
3/27/2023	14:04:02	20.66	0.18	
3/27/2023	14:04:08	20.66	0.18	
3/27/2023	14:04:14	20.66	0.18	
3/27/2023	14:04:20	20.66	0.18	
3/27/2023	14:04:26	20.66	0.18	
3/27/2023	14:04:32	20.66	0.18	
3/27/2023	14:04:38	20.66	0.18	
3/27/2023	14:04:44	20.66	0.18	
3/27/2023	14:04:50	20.66	0.18	
3/27/2023	14:04:56	20.66	0.18	
3/27/2023	14:05:02	20.66	0.18	
3/27/2023	14:05:08	20.67	0.18	
3/27/2023	14:05:14	20.67	0.18	
3/27/2023	14:05:20	20.67	0.18	
3/27/2023	14:05:26	20.67	0.18	
3/27/2023	14:05:32	20.67	0.18	
3/27/2023	14:05:38	20.67	0.18	
3/27/2023	14:05:44	20.67	0.18	
3/27/2023	14:05:50	20.67	0.18	
3/27/2023	14:05:56	20.67	0.18	
3/27/2023	14:06:02	20.67	0.18	
3/27/2023	14:06:08	20.67	0.18	
3/27/2023	14:06:14	20.67	0.18	
3/27/2023	14:06:20	20.67	0.18	

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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	14:06:26	20.67	0.18	
3/27/2023	14:06:32	20.67	0.19	
3/27/2023	14:06:38	20.67	0.19	
3/27/2023	14:06:44	20.67	0.19	
3/27/2023	14:06:50	20.67	0.19	
3/27/2023	14:06:56	20.67	0.19	
3/27/2023	14:07:02	20.67	0.19	
3/27/2023	14:07:08	20.67	0.19	
3/27/2023	14:07:14	20.67	0.19	
3/27/2023	14:07:20	20.66	0.19	
3/27/2023	14:07:26	20.66	0.18	
3/27/2023	14:07:32	20.66	0.18	
3/27/2023	14:07:38	20.66	0.18	
3/27/2023	14:07:44	20.66	0.18	
3/27/2023	14:07:50	20.66	0.18	
3/27/2023	14:07:56	20.66	0.18	
3/27/2023	14:08:02	20.66	0.18	
3/27/2023	14:08:08	20.66	0.18	
3/27/2023	14:08:14	20.66	0.18	
3/27/2023	14:08:20	20.66	0.19	
3/27/2023	14:08:26	20.66	0.19	
3/27/2023	14:08:32	20.66	0.19	
3/27/2023	14:08:38	20.66	0.19	
3/27/2023	14:08:44	20.66	0.19	
3/27/2023	14:08:50	20.66	0.19	
3/27/2023	14:08:56	20.66	0.20	
3/27/2023	14:09:02	20.66	0.20	
3/27/2023	14:09:08	20.66	0.20	
3/27/2023	14:09:14	20.66	0.20	
3/27/2023	14:09:20	20.66	0.20	
3/27/2023	14:09:26	20.66	0.20	
3/27/2023	14:09:32	20.66	0.19	
3/27/2023	14:09:38	20.66	0.19	
3/27/2023	14:09:44	20.66	0.19	
3/27/2023	14:09:50	20.66	0.19	
3/27/2023	14:09:56	20.66	0.19	
3/27/2023	14:10:02	20.66	0.19	
3/27/2023	14:10:08	20.66	0.19	
3/27/2023	14:10:14	20.66	0.20	

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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	14:10:20	20.66	0.20	
3/27/2023	14:10:26	20.66	0.20	
3/27/2023	14:10:32	20.65	0.20	
3/27/2023	14:10:38	20.65	0.19	
3/27/2023	14:10:44	20.65	0.19	
3/27/2023	14:10:50	20.65	0.19	
3/27/2023	14:10:56	20.66	0.19	
3/27/2023	14:11:02	20.66	0.19	
3/27/2023	14:11:08	20.66	0.18	
3/27/2023	14:11:14	20.66	0.18	
3/27/2023	14:11:20	20.66	0.18	
3/27/2023	14:11:26	20.66	0.18	
3/27/2023	14:11:32	20.66	0.19	
3/27/2023	14:11:38	20.66	0.18	
3/27/2023	14:11:44	20.66	0.18	
3/27/2023	14:11:50	20.66	0.18	
3/27/2023	14:11:56	20.66	0.18	
3/27/2023	14:12:02	20.66	0.19	
3/27/2023	14:12:08	20.66	0.19	
3/27/2023	14:12:14	20.66	0.19	
3/27/2023	14:12:20	20.66	0.20	
3/27/2023	14:12:26	20.66	0.20	
3/27/2023	14:12:32	20.65	0.20	
3/27/2023	14:12:38	20.65	0.20	
3/27/2023	14:12:44	20.65	0.20	
3/27/2023	14:12:50	20.65	0.20	
3/27/2023	14:12:56	20.65	0.20	
3/27/2023	14:13:02	20.65	0.20	
3/27/2023	14:13:08	20.65	0.20	
3/27/2023	14:13:14	20.65	0.20	
3/27/2023	14:13:20	20.65	0.20	
3/27/2023	14:13:26	20.65	0.20	
3/27/2023	14:13:32	20.65	0.20	
3/27/2023	14:13:38	20.65	0.19	
3/27/2023	14:13:44	20.65	0.19	
3/27/2023	14:13:50	20.65	0.19	
3/27/2023	14:13:56	20.65	0.19	
3/27/2023	14:14:02	20.65	0.19	
3/27/2023	14:14:08	20.65	0.19	

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Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	14:14:14	20.65	0.19	
3/27/2023	14:14:20	20.65	0.19	
3/27/2023	14:14:26	20.65	0.19	
3/27/2023	14:14:32	20.65	0.19	
3/27/2023	14:14:38	20.65	0.19	
3/27/2023	14:14:44	20.65	0.19	
3/27/2023	14:14:50	20.65	0.19	
3/27/2023	14:14:56	20.65	0.19	
3/27/2023	14:15:02	20.65	0.19	
3/27/2023	14:15:08	20.65	0.19	
3/27/2023	14:15:14	20.65	0.18	
3/27/2023	14:15:20	20.65	0.18	
3/27/2023	14:15:26	20.65	0.18	
3/27/2023	14:15:32	20.65	0.18	
3/27/2023	14:15:38	20.65	0.18	
3/27/2023	14:15:44	20.65	0.18	
3/27/2023	14:15:50	20.65	0.18	
3/27/2023	14:15:56	20.65	0.18	
3/27/2023	14:16:02	20.65	0.18	
3/27/2023	14:16:08	20.65	0.18	
3/27/2023	14:16:14	20.65	0.18	
3/27/2023	14:16:20	20.65	0.18	
3/27/2023	14:16:26	20.65	0.18	
3/27/2023	14:16:32	20.65	0.18	
3/27/2023	14:16:38	20.65	0.18	
3/27/2023	14:16:44	20.65	0.18	
3/27/2023	14:16:50	20.65	0.18	
3/27/2023	14:16:56	20.65	0.18	
3/27/2023	14:17:02	20.65	0.18	
3/27/2023	14:17:08	20.65	0.18	
3/27/2023	14:17:14	20.65	0.18	
3/27/2023	14:17:20	20.65	0.18	
3/27/2023	14:17:26	20.65	0.18	
3/27/2023	14:17:32	20.65	0.19	
3/27/2023	14:17:38	20.65	0.19	
3/27/2023	14:17:44	20.65	0.19	
3/27/2023	14:17:50	20.65	0.19	
3/27/2023	14:17:56	20.65	0.19	
3/27/2023	14:18:02	20.65	0.19	

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Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	14:18:08	20.65	0.19	
3/27/2023	14:18:14	20.65	0.19	
3/27/2023	14:18:20	20.65	0.19	
3/27/2023	14:18:26	20.65	0.19	
3/27/2023	14:18:32	20.65	0.19	
3/27/2023	14:18:38	20.65	0.19	
3/27/2023	14:18:44	20.65	0.19	
3/27/2023	14:18:50	20.65	0.19	
3/27/2023	14:18:56	20.65	0.19	
3/27/2023	14:19:02	20.65	0.19	
3/27/2023	14:19:08	20.65	0.19	
3/27/2023	14:19:14	20.65	0.19	
3/27/2023	14:19:20	20.65	0.19	
3/27/2023	14:19:26	20.65	0.19	
3/27/2023	14:19:32	20.65	0.19	
3/27/2023	14:19:38	20.65	0.19	
3/27/2023	14:19:44	20.65	0.19	
3/27/2023	14:19:50	20.65	0.19	
3/27/2023	14:19:56	20.65	0.19	
3/27/2023	14:20:02	20.65	0.19	
3/27/2023	14:20:08	20.65	0.19	
3/27/2023	14:20:14	20.65	0.19	
3/27/2023	14:20:20	20.65	0.19	
3/27/2023	14:20:26	20.65	0.19	
3/27/2023	14:20:32	20.65	0.19	
3/27/2023	14:20:38	20.65	0.19	
3/27/2023	14:20:44	20.65	0.19	
3/27/2023	14:20:50	20.65	0.19	
3/27/2023	14:20:56	20.65	0.18	
3/27/2023	14:21:02	20.65	0.18	
3/27/2023	14:21:08	20.65	0.18	
3/27/2023	14:21:14	20.65	0.18	
3/27/2023	14:21:20	20.65	0.18	
3/27/2023	14:21:26	20.66	0.18	
3/27/2023	14:21:32	20.65	0.18	
3/27/2023	14:21:38	20.66	0.18	
3/27/2023	14:21:44	20.65	0.18	
3/27/2023	14:21:50	20.66	0.18	
3/27/2023	14:21:56	20.66	0.18	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	14:22:02	20.66	0.18	
3/27/2023	14:22:08	20.66	0.18	
3/27/2023	14:22:14	20.66	0.18	
3/27/2023	14:22:20	20.66	0.18	
3/27/2023	14:22:26	20.66	0.18	
3/27/2023	14:22:32	20.66	0.18	
3/27/2023	14:22:38	20.65	0.18	
3/27/2023	14:22:44	20.65	0.18	
3/27/2023	14:22:50	20.65	0.18	
3/27/2023	14:22:56	20.65	0.18	
3/27/2023	14:23:02	20.65	0.18	
3/27/2023	14:23:08	20.65	0.18	
3/27/2023	14:23:14	20.65	0.18	
3/27/2023	14:23:20	20.65	0.18	
3/27/2023	14:23:26	20.65	0.18	
3/27/2023	14:23:32	20.65	0.18	
3/27/2023	14:23:38	20.65	0.18	
3/27/2023	14:23:44	20.65	0.18	
3/27/2023	14:23:50	20.65	0.18	
3/27/2023	14:23:56	20.65	0.18	
3/27/2023	14:24:02	20.65	0.18	
3/27/2023	14:24:08	20.65	0.18	
3/27/2023	14:24:14	20.65	0.18	
3/27/2023	14:24:20	20.65	0.18	
3/27/2023	14:24:26	20.65	0.18	
3/27/2023	14:24:32	20.65	0.18	
3/27/2023	14:24:38	20.65	0.18	
3/27/2023	14:24:44	20.65	0.18	
3/27/2023	14:24:50	20.65	0.18	
3/27/2023	14:24:56	20.65	0.18	
3/27/2023	14:25:02	20.65	0.18	
3/27/2023	14:25:08	20.65	0.18	
3/27/2023	14:25:14	20.65	0.18	
3/27/2023	14:25:20	20.65	0.19	
3/27/2023	14:25:26	20.65	0.19	
3/27/2023	14:25:32	20.65	0.18	
3/27/2023	14:25:38	20.65	0.19	
3/27/2023	14:25:44	20.65	0.18	
3/27/2023	14:25:50	20.65	0.19	

Eagle Foundry Company
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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	14:25:56	20.65	0.19	
3/27/2023	14:26:02	20.65	0.19	
3/27/2023	14:26:08	20.65	0.19	
3/27/2023	14:26:14	20.65	0.19	
3/27/2023	14:26:20	20.65	0.19	
3/27/2023	14:26:26	20.65	0.19	
3/27/2023	14:26:32	20.65	0.18	
3/27/2023	14:26:38	20.65	0.19	
3/27/2023	14:26:44	20.65	0.18	
3/27/2023	14:26:50	20.65	0.19	
3/27/2023	14:26:56	20.65	0.19	
3/27/2023	14:27:02	20.65	0.19	
3/27/2023	14:27:08	20.65	0.19	
3/27/2023	14:27:14	20.65	0.19	
3/27/2023	14:27:20	20.65	0.19	
3/27/2023	14:27:26	20.65	0.19	
3/27/2023	14:27:32	20.65	0.19	
3/27/2023	14:27:38	20.65	0.19	
3/27/2023	14:27:44	20.65	0.19	
3/27/2023	14:27:50	20.65	0.19	
3/27/2023	14:27:56	20.65	0.19	
3/27/2023	14:28:02	20.65	0.19	
3/27/2023	14:28:08	20.65	0.19	
3/27/2023	14:28:14	20.65	0.19	
3/27/2023	14:28:20	20.65	0.19	
3/27/2023	14:28:26	20.65	0.18	
3/27/2023	14:28:32	20.65	0.19	
3/27/2023	14:28:38	20.65	0.19	
3/27/2023	14:28:44	20.65	0.19	
3/27/2023	14:28:50	20.65	0.19	
3/27/2023	14:28:56	20.65	0.19	
3/27/2023	14:29:02	20.65	0.19	
3/27/2023	14:29:08	20.65	0.19	
3/27/2023	14:29:14	20.65	0.19	
3/27/2023	14:29:20	20.65	0.19	
3/27/2023	14:29:26	20.65	0.19	
3/27/2023	14:29:32	20.65	0.19	
3/27/2023	14:29:38	20.65	0.19	
3/27/2023	14:29:44	20.65	0.19	

Eagle Foundry Company
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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	14:29:50	20.65	0.19	
3/27/2023	14:29:56	20.65	0.19	
3/27/2023	14:30:02	20.65	0.19	
3/27/2023	14:30:08	20.65	0.19	
3/27/2023	14:30:14	20.65	0.19	
3/27/2023	14:30:20	20.65	0.19	
3/27/2023	14:30:26	20.65	0.19	
3/27/2023	14:30:32	20.65	0.19	
3/27/2023	14:30:38	20.65	0.19	
3/27/2023	14:30:44	20.65	0.19	
3/27/2023	14:30:50	20.65	0.19	
3/27/2023	14:30:56	20.65	0.19	
3/27/2023	14:31:02	20.65	0.19	
3/27/2023	14:31:08	20.65	0.19	
3/27/2023	14:31:14	20.65	0.19	
3/27/2023	14:31:20	20.65	0.19	
3/27/2023	14:31:26	20.65	0.19	
3/27/2023	14:31:32	20.65	0.19	
3/27/2023	14:31:38	20.65	0.19	
3/27/2023	14:31:44	20.65	0.19	
3/27/2023	14:31:50	20.65	0.19	
3/27/2023	14:31:56	20.65	0.19	
3/27/2023	14:32:02	20.64	0.19	
3/27/2023	14:32:08	20.64	0.19	
3/27/2023	14:32:14	20.64	0.19	
3/27/2023	14:32:20	20.64	0.19	
3/27/2023	14:32:26	20.64	0.19	
3/27/2023	14:32:32	20.64	0.19	
3/27/2023	14:32:38	20.64	0.19	
3/27/2023	14:32:44	20.64	0.19	
3/27/2023	14:32:50	20.64	0.19	
3/27/2023	14:32:56	20.64	0.19	
3/27/2023	14:33:02	20.64	0.19	
3/27/2023	14:33:08	20.64	0.19	
3/27/2023	14:33:14	20.64	0.19	
3/27/2023	14:33:20	20.64	0.19	
3/27/2023	14:33:26	20.64	0.19	
3/27/2023	14:33:32	20.64	0.19	
3/27/2023	14:33:38	20.64	0.19	

Eagle Foundry Company
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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	14:33:44	20.64	0.19	
3/27/2023	14:33:50	20.64	0.19	
3/27/2023	14:33:56	20.64	0.19	
3/27/2023	14:34:02	20.64	0.19	
3/27/2023	14:34:08	20.64	0.19	
3/27/2023	14:34:14	20.64	0.19	
3/27/2023	14:34:20	20.64	0.19	
3/27/2023	14:34:26	20.64	0.19	
3/27/2023	14:34:32	20.64	0.19	
3/27/2023	14:34:38	20.64	0.19	
3/27/2023	14:34:44	20.64	0.19	
3/27/2023	14:34:50	20.64	0.19	
3/27/2023	14:34:56	20.64	0.19	
3/27/2023	14:35:02	20.64	0.19	
3/27/2023	14:35:08	20.64	0.19	
3/27/2023	14:35:14	20.64	0.19	
3/27/2023	14:35:20	20.64	0.19	
3/27/2023	14:35:26	20.64	0.19	
3/27/2023	14:35:32	20.64	0.19	
3/27/2023	14:35:38	20.64	0.19	
3/27/2023	14:35:44	20.64	0.19	
3/27/2023	14:35:50	20.64	0.19	
3/27/2023	14:35:56	20.64	0.19	
3/27/2023	14:36:02	20.64	0.19	
3/27/2023	14:36:08	20.64	0.19	
3/27/2023	14:36:14	20.64	0.19	
3/27/2023	14:36:20	20.64	0.19	
3/27/2023	14:36:26	20.64	0.19	
3/27/2023	14:36:32	20.64	0.19	
3/27/2023	14:36:38	20.64	0.19	
3/27/2023	14:36:44	20.64	0.19	
3/27/2023	14:36:50	20.64	0.19	
3/27/2023	14:36:56	20.64	0.19	
3/27/2023	14:37:02	20.64	0.19	
3/27/2023	14:37:08	20.63	0.19	
3/27/2023	14:37:14	20.63	0.19	
3/27/2023	14:37:20	20.63	0.19	
3/27/2023	14:37:26	20.63	0.19	
3/27/2023	14:37:32	20.63	0.19	

Eagle Foundry Company
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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	14:37:38	20.63	0.19	
3/27/2023	14:37:44	20.63	0.19	
3/27/2023	14:37:50	20.63	0.19	
3/27/2023	14:37:56	20.63	0.19	
3/27/2023	14:38:02	20.63	0.19	
3/27/2023	14:38:08	20.63	0.19	
3/27/2023	14:38:14	20.63	0.19	
3/27/2023	14:38:20	20.63	0.19	
3/27/2023	14:38:26	20.63	0.19	
3/27/2023	14:38:32	20.63	0.19	
3/27/2023	14:38:38	20.63	0.19	
3/27/2023	14:38:44	20.63	0.19	
3/27/2023	14:38:50	20.63	0.19	
3/27/2023	14:38:56	20.63	0.19	
3/27/2023	14:39:02	20.63	0.19	
3/27/2023	14:39:08	20.63	0.19	
3/27/2023	14:39:14	20.63	0.19	
3/27/2023	14:39:20	20.63	0.19	
3/27/2023	14:39:26	20.63	0.19	
3/27/2023	14:39:32	20.63	0.19	
3/27/2023	14:39:38	20.63	0.19	
3/27/2023	14:39:44	20.63	0.19	
3/27/2023	14:39:50	20.63	0.19	
3/27/2023	14:39:56	20.63	0.19	
3/27/2023	14:40:02	20.63	0.19	
3/27/2023	14:40:08	20.63	0.19	
3/27/2023	14:40:14	20.63	0.19	
3/27/2023	14:40:20	20.63	0.19	
3/27/2023	14:40:26	20.63	0.19	
3/27/2023	14:40:32	20.63	0.19	
3/27/2023	14:40:38	20.63	0.19	
3/27/2023	14:40:44	20.63	0.19	
3/27/2023	14:40:50	20.63	0.19	
3/27/2023	14:40:56	20.63	0.19	
3/27/2023	14:41:02	20.63	0.19	
3/27/2023	14:41:08	20.63	0.19	
3/27/2023	14:41:14	20.63	0.19	
3/27/2023	14:41:20	20.63	0.19	
3/27/2023	14:41:26	20.63	0.19	

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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	14:41:32	20.63	0.19	
3/27/2023	14:41:38	20.63	0.19	
3/27/2023	14:41:44	20.63	0.19	
3/27/2023	14:41:50	20.63	0.19	
3/27/2023	14:41:56	20.63	0.19	
3/27/2023	14:42:02	20.63	0.19	
3/27/2023	14:42:08	20.63	0.19	
3/27/2023	14:42:14	20.63	0.19	
3/27/2023	14:42:20	20.63	0.19	
3/27/2023	14:42:26	20.63	0.19	
3/27/2023	14:42:32	20.63	0.19	
3/27/2023	14:42:38	20.63	0.19	
3/27/2023	14:42:44	20.64	0.19	
3/27/2023	14:42:50	20.63	0.19	
3/27/2023	14:42:56	20.63	0.19	
3/27/2023	14:43:02	20.63	0.19	
3/27/2023	14:43:08	20.63	0.19	
3/27/2023	14:43:14	20.63	0.19	
3/27/2023	14:43:20	20.63	0.19	
3/27/2023	14:43:26	20.63	0.19	
3/27/2023	14:43:32	20.63	0.19	
3/27/2023	14:43:38	20.63	0.19	
3/27/2023	14:43:44	20.63	0.19	
3/27/2023	14:43:50	20.63	0.19	
3/27/2023	14:43:56	20.63	0.19	
3/27/2023	14:44:02	20.63	0.19	
3/27/2023	14:44:08	20.63	0.19	
3/27/2023	14:44:14	20.63	0.19	
3/27/2023	14:44:20	20.63	0.19	
3/27/2023	14:44:26	20.63	0.19	
3/27/2023	14:44:32	20.63	0.19	
3/27/2023	14:44:38	20.63	0.19	
3/27/2023	14:44:44	20.63	0.19	
3/27/2023	14:44:50	20.63	0.19	
3/27/2023	14:44:56	20.63	0.19	
3/27/2023	14:45:02	20.63	0.19	
3/27/2023	14:45:08	20.63	0.19	
3/27/2023	14:45:14	20.63	0.19	
3/27/2023	14:45:20	20.63	0.19	

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Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	14:45:26	20.63	0.19	
3/27/2023	14:45:32	20.63	0.19	
3/27/2023	14:45:38	20.63	0.19	
3/27/2023	14:45:44	20.63	0.19	
3/27/2023	14:45:50	20.63	0.19	
3/27/2023	14:45:56	20.63	0.19	
3/27/2023	14:46:02	20.63	0.19	
3/27/2023	14:46:08	20.63	0.19	
3/27/2023	14:46:14	20.63	0.19	
3/27/2023	14:46:20	20.63	0.19	
3/27/2023	14:46:26	20.63	0.19	
3/27/2023	14:46:32	20.63	0.19	
3/27/2023	14:46:38	20.63	0.19	
3/27/2023	14:46:44	20.63	0.19	
3/27/2023	14:46:50	20.63	0.19	
3/27/2023	14:46:56	20.63	0.19	
3/27/2023	14:47:02	20.63	0.19	
3/27/2023	14:47:08	20.63	0.19	
3/27/2023	14:47:14	20.63	0.19	
3/27/2023	14:47:20	20.63	0.19	
3/27/2023	14:47:26	20.63	0.19	
3/27/2023	14:47:32	20.63	0.19	
3/27/2023	14:47:38	20.63	0.19	
3/27/2023	14:47:44	20.63	0.19	
3/27/2023	14:47:50	20.63	0.19	
3/27/2023	14:47:56	20.63	0.19	
3/27/2023	14:48:02	20.63	0.19	
3/27/2023	14:48:08	20.63	0.19	
3/27/2023	14:48:14	20.63	0.19	
3/27/2023	14:48:20	20.63	0.19	
3/27/2023	14:48:26	20.63	0.19	
3/27/2023	14:48:32	20.63	0.19	
3/27/2023	14:48:38	20.63	0.19	
3/27/2023	14:48:44	20.63	0.19	
3/27/2023	14:48:50	20.63	0.19	
3/27/2023	14:48:56	20.64	0.19	
3/27/2023	14:49:02	20.63	0.19	
3/27/2023	14:49:08	20.63	0.19	
3/27/2023	14:49:14	20.63	0.19	

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Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	14:49:20	20.63	0.19	
3/27/2023	14:49:26	20.64	0.19	
3/27/2023	14:49:32	20.64	0.19	
3/27/2023	14:49:38	20.64	0.18	
3/27/2023	14:49:44	20.64	0.19	
3/27/2023	14:49:50	20.63	0.19	
3/27/2023	14:49:56	20.64	0.19	
3/27/2023	14:50:02	20.64	0.19	
3/27/2023	14:50:08	20.63	0.19	
3/27/2023	14:50:14	20.63	0.18	
3/27/2023	14:50:20	20.63	0.19	
3/27/2023	14:50:26	20.64	0.19	
3/27/2023	14:50:32	20.64	0.19	
3/27/2023	14:50:38	20.64	0.19	
3/27/2023	14:50:44	20.63	0.19	
3/27/2023	14:50:50	20.63	0.19	
3/27/2023	14:50:56	20.63	0.19	
3/27/2023	14:51:02	20.63	0.19	
3/27/2023	14:51:08	20.63	0.19	
3/27/2023	14:51:14	20.63	0.19	
3/27/2023	14:51:20	20.64	0.19	
3/27/2023	14:51:26	20.64	0.19	
3/27/2023	14:51:32	20.64	0.18	
3/27/2023	14:51:38	20.64	0.19	
3/27/2023	14:51:44	20.64	0.18	
3/27/2023	14:51:50	20.64	0.18	
3/27/2023	14:51:56	20.64	0.19	
3/27/2023	14:52:02	20.64	0.18	
3/27/2023	14:52:08	20.64	0.18	
3/27/2023	14:52:14	20.64	0.18	
3/27/2023	14:52:20	20.64	0.18	
3/27/2023	14:52:26	20.64	0.18	
3/27/2023	14:52:32	20.64	0.18	
3/27/2023	14:52:38	20.64	0.18	
3/27/2023	14:52:44	20.64	0.18	
3/27/2023	14:52:50	20.64	0.18	
3/27/2023	14:52:56	20.64	0.18	
3/27/2023	14:53:02	20.63	0.18	
3/27/2023	14:53:08	20.64	0.18	

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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	14:53:14	20.64	0.18	
3/27/2023	14:53:20	20.64	0.18	
3/27/2023	14:53:26	20.64	0.18	
3/27/2023	14:53:32	20.64	0.18	
3/27/2023	14:53:38	20.64	0.18	
3/27/2023	14:53:44	20.64	0.18	
3/27/2023	14:53:50	20.64	0.18	
3/27/2023	14:53:56	20.64	0.18	
3/27/2023	14:54:02	20.63	0.18	
3/27/2023	14:54:08	20.63	0.18	
3/27/2023	14:54:14	20.63	0.18	
3/27/2023	14:54:20	20.64	0.18	
3/27/2023	14:54:26	20.64	0.18	
3/27/2023	14:54:32	20.63	0.18	
3/27/2023	14:54:38	20.63	0.18	
3/27/2023	14:54:44	20.63	0.18	
3/27/2023	14:54:50	20.63	0.18	
3/27/2023	14:54:56	20.63	0.18	
3/27/2023	14:55:02	20.63	0.18	
3/27/2023	14:55:08	20.63	0.18	
3/27/2023	14:55:14	20.63	0.18	
3/27/2023	14:55:20	20.63	0.18	
3/27/2023	14:55:26	20.63	0.18	
3/27/2023	14:55:32	20.64	0.18	
3/27/2023	14:55:38	20.64	0.18	
3/27/2023	14:55:44	20.64	0.18	
3/27/2023	14:55:50	20.63	0.18	
3/27/2023	14:55:56	20.64	0.18	
3/27/2023	14:56:02	20.64	0.18	
3/27/2023	14:56:08	20.64	0.18	
3/27/2023	14:56:14	20.63	0.18	
3/27/2023	14:56:20	20.63	0.18	
3/27/2023	14:56:26	20.63	0.18	
3/27/2023	14:56:32	20.64	0.18	
3/27/2023	14:56:38	20.64	0.18	
3/27/2023	14:56:44	20.64	0.18	
3/27/2023	14:56:50	20.64	0.18	
3/27/2023	14:56:56	20.64	0.18	
3/27/2023	14:57:02	20.64	0.18	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	14:57:08	20.63	0.18	
3/27/2023	14:57:14	20.63	0.18	
3/27/2023	14:57:20	20.63	0.18	
3/27/2023	14:57:26	20.64	0.18	
3/27/2023	14:57:32	20.63	0.18	
3/27/2023	14:57:38	20.63	0.18	
3/27/2023	14:57:44	20.63	0.18	
3/27/2023	14:57:50	20.63	0.18	
3/27/2023	14:57:56	20.63	0.18	
3/27/2023	14:58:02	20.63	0.18	
3/27/2023	14:58:08	20.63	0.18	
3/27/2023	14:58:14	20.63	0.18	
3/27/2023	14:58:20	20.64	0.18	
3/27/2023	14:58:26	20.63	0.18	
3/27/2023	14:58:32	20.63	0.18	
3/27/2023	14:58:38	20.63	0.18	
3/27/2023	14:58:44	20.63	0.18	
3/27/2023	14:58:50	20.63	0.18	
3/27/2023	14:58:56	20.63	0.18	
3/27/2023	14:59:02	20.63	0.18	
3/27/2023	14:59:08	20.63	0.18	
3/27/2023	14:59:14	20.63	0.18	
3/27/2023	14:59:20	20.63	0.18	
3/27/2023	14:59:26	20.63	0.18	
3/27/2023	14:59:32	20.63	0.18	
3/27/2023	14:59:38	20.63	0.18	
3/27/2023	14:59:44	20.63	0.18	
3/27/2023	14:59:50	20.63	0.18	
3/27/2023	14:59:56	20.63	0.18	
3/27/2023	15:00:02	20.63	0.18	
3/27/2023	15:00:08	20.63	0.18	
3/27/2023	15:00:14	20.63	0.18	
3/27/2023	15:00:20	20.63	0.18	
3/27/2023	15:00:26	20.63	0.18	
3/27/2023	15:00:32	20.63	0.18	
3/27/2023	15:00:38	20.63	0.18	
3/27/2023	15:00:44	20.63	0.18	
3/27/2023	15:00:50	20.63	0.18	
3/27/2023	15:00:56	20.63	0.18	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	15:01:02	20.63	0.18	
3/27/2023	15:01:08	20.63	0.18	
3/27/2023	15:01:14	20.63	0.18	
3/27/2023	15:01:20	20.63	0.18	
3/27/2023	15:01:26	20.63	0.18	
3/27/2023	15:01:32	20.63	0.18	
3/27/2023	15:01:38	20.63	0.18	
3/27/2023	15:01:44	20.63	0.18	
3/27/2023	15:01:50	20.63	0.18	
3/27/2023	15:01:56	20.63	0.18	
3/27/2023	15:02:02	20.63	0.18	
3/27/2023	15:02:08	20.63	0.18	
3/27/2023	15:02:14	20.63	0.18	
3/27/2023	15:02:20	20.63	0.18	
3/27/2023	15:02:26	20.63	0.18	
3/27/2023	15:02:32	20.63	0.18	
3/27/2023	15:02:38	20.63	0.18	
3/27/2023	15:02:44	20.63	0.18	
3/27/2023	15:02:50	20.63	0.18	
3/27/2023	15:02:56	20.63	0.18	
3/27/2023	15:03:02	20.63	0.18	
3/27/2023	15:03:08	20.63	0.18	
3/27/2023	15:03:14	20.63	0.18	
3/27/2023	15:03:20	20.63	0.18	
3/27/2023	15:03:26	20.63	0.18	
3/27/2023	15:03:32	20.63	0.18	
3/27/2023	15:03:38	20.63	0.18	
3/27/2023	15:03:44	20.63	0.18	
3/27/2023	15:03:50	20.63	0.18	
3/27/2023	15:03:56	20.63	0.18	
3/27/2023	15:04:02	20.63	0.18	
3/27/2023	15:04:08	20.63	0.18	
3/27/2023	15:04:14	20.63	0.18	
3/27/2023	15:04:20	20.63	0.18	
3/27/2023	15:04:26	20.63	0.18	
3/27/2023	15:04:32	20.63	0.18	
3/27/2023	15:04:38	20.63	0.18	
3/27/2023	15:04:44	20.63	0.18	
3/27/2023	15:04:50	20.63	0.18	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	15:04:56	20.63	0.18	
3/27/2023	15:05:02	20.63	0.18	
3/27/2023	15:05:08	20.63	0.18	
3/27/2023	15:05:14	20.63	0.18	
3/27/2023	15:05:20	20.63	0.18	
3/27/2023	15:05:26	20.63	0.18	
3/27/2023	15:05:32	20.63	0.18	
3/27/2023	15:05:38	20.63	0.18	
3/27/2023	15:05:44	20.63	0.18	
3/27/2023	15:05:50	20.63	0.18	
3/27/2023	15:05:56	20.63	0.18	
3/27/2023	15:06:02	20.63	0.18	
3/27/2023	15:06:08	20.63	0.18	
3/27/2023	15:06:14	20.63	0.18	
3/27/2023	15:06:20	20.63	0.18	
3/27/2023	15:06:26	20.63	0.18	
3/27/2023	15:06:32	20.63	0.18	
3/27/2023	15:06:38	20.63	0.19	
3/27/2023	15:06:44	20.63	0.19	
3/27/2023	15:06:50	20.63	0.18	
3/27/2023	15:06:56	20.63	0.19	
3/27/2023	15:07:02	20.63	0.19	
3/27/2023	15:07:08	20.63	0.19	
3/27/2023	15:07:14	20.63	0.19	
3/27/2023	15:07:20	20.63	0.19	
3/27/2023	15:07:26	20.63	0.19	
3/27/2023	15:07:32	20.63	0.18	
3/27/2023	15:07:38	20.63	0.19	
3/27/2023	15:07:44	20.63	0.18	
3/27/2023	15:07:50	20.63	0.19	
3/27/2023	15:07:56	20.63	0.19	
3/27/2023	15:08:02	20.63	0.19	
3/27/2023	15:08:08	20.63	0.18	
3/27/2023	15:08:14	20.63	0.19	
3/27/2023	15:08:20	20.63	0.18	
3/27/2023	15:08:26	20.63	0.18	
3/27/2023	15:08:32	20.63	0.19	
3/27/2023	15:08:38	20.63	0.18	
3/27/2023	15:08:44	20.63	0.18	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	15:08:50	20.63	0.18	
3/27/2023	15:08:56	20.63	0.19	
3/27/2023	15:09:02	20.63	0.19	
3/27/2023	15:09:08	20.63	0.19	
3/27/2023	15:09:14	20.63	0.19	
3/27/2023	15:09:20	20.63	0.19	
3/27/2023	15:09:26	20.63	0.19	
3/27/2023	15:09:32	20.63	0.19	
3/27/2023	15:09:38	20.63	0.19	
3/27/2023	15:09:44	20.63	0.19	
3/27/2023	15:09:50	20.63	0.19	
3/27/2023	15:09:56	20.63	0.19	
3/27/2023	15:10:02	20.63	0.19	
3/27/2023	15:10:08	20.63	0.19	
3/27/2023	15:10:14	20.63	0.18	
3/27/2023	15:10:20	20.63	0.18	
3/27/2023	15:10:26	20.63	0.18	
3/27/2023	15:10:32	20.63	0.18	
3/27/2023	15:10:38	20.63	0.18	
3/27/2023	15:10:44	20.63	0.18	
3/27/2023	15:10:50	20.63	0.18	
3/27/2023	15:10:56	20.63	0.18	
3/27/2023	15:11:02	20.63	0.18	
3/27/2023	15:11:08	20.63	0.18	
3/27/2023	15:11:14	20.63	0.18	
3/27/2023	15:11:20	20.63	0.18	
3/27/2023	15:11:26	20.63	0.18	
3/27/2023	15:11:32	20.63	0.18	
3/27/2023	15:11:38	20.63	0.18	
3/27/2023	15:11:44	20.63	0.18	
3/27/2023	15:11:50	20.63	0.19	
3/27/2023	15:11:56	20.63	0.18	
3/27/2023	15:12:02	20.63	0.19	
3/27/2023	15:12:08	20.63	0.19	
3/27/2023	15:12:14	20.63	0.18	
3/27/2023	15:12:20	20.63	0.19	
3/27/2023	15:12:26	20.63	0.19	
3/27/2023	15:12:32	20.63	0.19	
3/27/2023	15:12:38	20.63	0.19	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	15:12:44	20.63	0.19	
3/27/2023	15:12:50	20.63	0.19	
3/27/2023	15:12:56	20.63	0.19	
3/27/2023	15:13:02	20.63	0.19	
3/27/2023	15:13:08	20.63	0.18	
3/27/2023	15:13:14	20.63	0.19	
3/27/2023	15:13:20	20.63	0.19	
3/27/2023	15:13:26	20.63	0.18	
3/27/2023	15:13:32	20.63	0.18	
3/27/2023	15:13:38	20.63	0.19	
3/27/2023	15:13:44	20.63	0.18	
3/27/2023	15:13:50	20.63	0.18	
3/27/2023	15:13:56	20.62	0.19	
3/27/2023	15:14:02	20.62	0.18	
3/27/2023	15:14:08	20.62	0.18	
3/27/2023	15:14:14	20.63	0.19	
3/27/2023	15:14:20	20.62	0.19	
3/27/2023	15:14:26	20.62	0.19	
3/27/2023	15:14:32	20.62	0.19	
3/27/2023	15:14:38	20.63	0.18	
3/27/2023	15:14:44	20.63	0.18	
3/27/2023	15:14:50	20.62	0.19	
3/27/2023	15:14:56	20.63	0.19	
3/27/2023	15:15:02	20.63	0.19	
3/27/2023	15:15:08	20.63	0.19	
3/27/2023	15:15:14	20.63	0.19	
3/27/2023	15:15:20	20.63	0.19	
3/27/2023	15:15:26	20.63	0.19	
3/27/2023	15:15:32	20.63	0.18	
3/27/2023	15:15:38	20.63	0.18	
3/27/2023	15:15:44	20.63	0.18	
3/27/2023	15:15:50	20.63	0.18	
3/27/2023	15:15:56	20.63	0.18	
3/27/2023	15:16:02	20.63	0.18	
3/27/2023	15:16:08	20.63	0.18	
3/27/2023	15:16:14	20.62	0.18	
3/27/2023	15:16:20	20.62	0.18	
3/27/2023	15:16:26	20.62	0.18	
3/27/2023	15:16:32	20.62	0.18	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	15:16:38	20.62	0.18	
3/27/2023	15:16:44	20.62	0.18	
3/27/2023	15:16:50	20.62	0.18	
3/27/2023	15:16:56	20.62	0.18	
3/27/2023	15:17:02	20.62	0.18	
3/27/2023	15:17:08	20.62	0.18	
3/27/2023	15:17:14	20.62	0.18	
3/27/2023	15:17:20	20.62	0.18	
3/27/2023	15:17:26	20.62	0.18	
3/27/2023	15:17:32	20.62	0.18	
3/27/2023	15:17:38	20.62	0.18	
3/27/2023	15:17:44	20.62	0.18	
3/27/2023	15:17:50	20.62	0.18	
3/27/2023	15:17:56	20.62	0.18	
3/27/2023	15:18:02	20.62	0.18	
3/27/2023	15:18:08	20.62	0.18	
3/27/2023	15:18:14	20.62	0.18	
3/27/2023	15:18:20	20.62	0.19	
3/27/2023	15:18:26	20.62	0.18	
3/27/2023	15:18:32	20.62	0.18	
3/27/2023	15:18:38	20.62	0.18	
3/27/2023	15:18:44	20.62	0.18	
3/27/2023	15:18:50	20.62	0.18	
3/27/2023	15:18:56	20.62	0.18	
3/27/2023	15:19:02	20.62	0.18	
3/27/2023	15:19:08	20.62	0.18	
3/27/2023	15:19:14	20.62	0.18	
3/27/2023	15:19:20	20.62	0.18	
3/27/2023	15:19:26	20.62	0.18	
3/27/2023	15:19:32	20.62	0.19	
3/27/2023	15:19:38	20.62	0.18	
3/27/2023	15:19:44	20.62	0.80	
3/27/2023	15:19:50	20.62	0.19	
3/27/2023	15:19:56	20.62	0.18	
3/27/2023	15:20:02	20.62	0.18	
3/27/2023	15:20:08	20.62	0.18	
3/27/2023	15:20:14	20.62	0.18	
3/27/2023	15:20:20	20.62	0.18	
3/27/2023	15:20:26	20.62	0.18	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	15:20:32	20.62	0.18	
3/27/2023	15:20:38	20.62	0.18	
3/27/2023	15:20:44	20.62	0.18	
3/27/2023	15:20:50	20.62	0.18	
3/27/2023	15:20:56	20.62	0.18	
3/27/2023	15:21:02	20.62	0.18	
3/27/2023	15:21:08	20.62	0.18	
3/27/2023	15:21:14	20.62	0.18	
3/27/2023	15:21:20	20.62	0.18	
3/27/2023	15:21:26	20.62	0.18	
3/27/2023	15:21:32	20.62	0.18	
3/27/2023	15:21:38	20.62	0.18	
3/27/2023	15:21:44	20.62	0.18	
3/27/2023	15:21:50	20.62	0.18	
3/27/2023	15:21:56	20.62	0.18	
3/27/2023	15:22:02	20.62	0.18	
3/27/2023	15:22:08	20.62	0.18	
3/27/2023	15:22:14	20.62	0.18	
3/27/2023	15:22:20	20.62	0.18	
3/27/2023	15:22:26	20.62	0.18	
3/27/2023	15:22:32	20.62	0.18	
3/27/2023	15:22:38	20.62	0.18	
3/27/2023	15:22:44	20.62	0.18	
3/27/2023	15:22:50	20.61	0.18	
3/27/2023	15:22:56	20.61	0.18	
3/27/2023	15:23:02	20.61	0.18	
3/27/2023	15:23:08	20.61	0.18	
3/27/2023	15:23:14	20.61	0.18	
3/27/2023	15:23:20	20.61	0.18	
3/27/2023	15:23:26	20.61	0.18	
3/27/2023	15:23:32	20.61	0.18	
3/27/2023	15:23:38	20.61	0.18	
3/27/2023	15:23:44	20.61	0.18	
3/27/2023	15:23:50	20.61	0.18	
3/27/2023	15:23:56	20.61	0.18	
3/27/2023	15:24:02	20.61	0.18	
3/27/2023	15:24:08	20.61	0.18	
3/27/2023	15:24:14	20.61	0.18	
3/27/2023	15:24:20	20.61	0.18	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	15:24:26	20.61	0.18	
3/27/2023	15:24:32	20.61	0.18	
3/27/2023	15:24:38	20.61	0.18	
3/27/2023	15:24:44	20.61	0.18	
3/27/2023	15:24:50	20.61	0.18	
3/27/2023	15:24:56	20.61	0.18	
3/27/2023	15:25:02	20.61	0.18	
3/27/2023	15:25:08	20.61	0.18	
3/27/2023	15:25:14	20.61	0.18	
3/27/2023	15:25:20	20.61	0.18	
3/27/2023	15:25:26	20.61	0.18	
3/27/2023	15:25:32	20.61	0.18	
3/27/2023	15:25:38	20.61	0.18	
3/27/2023	15:25:44	20.61	0.18	
3/27/2023	15:25:50	20.61	0.18	
3/27/2023	15:25:56	20.61	0.18	
3/27/2023	15:26:02	20.61	0.18	
3/27/2023	15:26:08	20.61	0.18	
3/27/2023	15:26:14	20.61	0.18	
3/27/2023	15:26:20	20.61	0.18	
3/27/2023	15:26:26	20.61	0.18	
3/27/2023	15:26:32	20.61	0.18	
3/27/2023	15:26:38	20.61	0.18	
3/27/2023	15:26:44	20.61	0.18	
3/27/2023	15:26:50	20.61	0.18	
3/27/2023	15:26:56	20.61	0.18	
3/27/2023	15:27:02	20.61	0.18	
3/27/2023	15:27:08	20.61	0.18	
3/27/2023	15:27:14	20.61	0.18	
3/27/2023	15:27:20	20.61	0.18	
3/27/2023	15:27:26	20.61	0.18	
3/27/2023	15:27:32	20.61	0.18	
3/27/2023	15:27:38	20.61	0.18	
3/27/2023	15:27:44	20.61	0.18	
3/27/2023	15:27:50	20.61	0.18	
3/27/2023	15:27:56	20.61	0.18	
3/27/2023	15:28:02	20.61	0.18	
3/27/2023	15:28:08	20.61	0.18	
3/27/2023	15:28:14	20.61	0.18	

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Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	15:28:20	20.61	0.18	
3/27/2023	15:28:26	20.61	0.18	
3/27/2023	15:28:32	20.61	0.18	
3/27/2023	15:28:38	20.61	0.18	
3/27/2023	15:28:44	20.61	0.18	
3/27/2023	15:28:50	20.61	0.18	
3/27/2023	15:28:56	20.61	0.18	
3/27/2023	15:29:02	20.61	0.18	
3/27/2023	15:29:08	20.61	0.18	
3/27/2023	15:29:14	20.61	0.18	
3/27/2023	15:29:20	20.61	0.18	
3/27/2023	15:29:26	20.61	0.18	
3/27/2023	15:29:32	20.61	0.18	
3/27/2023	15:29:38	20.61	0.18	
3/27/2023	15:29:44	20.61	0.18	
3/27/2023	15:29:50	20.61	0.18	
3/27/2023	15:29:56	20.61	0.18	
3/27/2023	15:30:02	20.61	0.18	
3/27/2023	15:30:08	20.61	0.18	
3/27/2023	15:30:14	20.61	0.18	
3/27/2023	15:30:20	20.61	0.18	
3/27/2023	15:30:26	20.61	0.18	
3/27/2023	15:30:32	20.61	0.18	
3/27/2023	15:30:38	20.61	0.18	
3/27/2023	15:30:44	20.61	0.18	
3/27/2023	15:30:50	20.61	0.18	
3/27/2023	15:30:56	20.61	0.18	
3/27/2023	15:31:02	20.61	0.17	
3/27/2023	15:31:08	20.61	0.17	
3/27/2023	15:31:14	20.61	0.17	
3/27/2023	15:31:20	20.61	0.18	
3/27/2023	15:31:26	20.61	0.18	
3/27/2023	15:31:32	20.61	0.18	
3/27/2023	15:31:38	20.61	0.18	
3/27/2023	15:31:44	20.61	0.18	
3/27/2023	15:31:50	20.61	0.18	
3/27/2023	15:31:56	20.61	0.18	
3/27/2023	15:32:02	20.61	0.18	
3/27/2023	15:32:08	20.61	0.18	

Eagle Foundry Company
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Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	15:32:14	20.61	0.18	
3/27/2023	15:32:20	20.61	0.18	
3/27/2023	15:32:26	20.61	0.18	
3/27/2023	15:32:32	20.61	0.18	
3/27/2023	15:32:38	20.61	0.18	
3/27/2023	15:32:44	20.61	0.18	
3/27/2023	15:32:50	20.61	0.18	
3/27/2023	15:32:56	20.61	0.18	
3/27/2023	15:33:02	20.61	0.18	
3/27/2023	15:33:08	20.61	0.18	
3/27/2023	15:33:14	20.61	0.18	
3/27/2023	15:33:20	20.61	0.18	
3/27/2023	15:33:26	20.61	0.18	
3/27/2023	15:33:32	20.61	0.18	
3/27/2023	15:33:38	20.61	0.18	
3/27/2023	15:33:44	20.61	0.18	
3/27/2023	15:33:50	20.61	0.18	
3/27/2023	15:33:56	20.61	0.18	
3/27/2023	15:34:02	20.61	0.18	
3/27/2023	15:34:08	20.61	0.18	
3/27/2023	15:34:14	20.61	0.18	
3/27/2023	15:34:20	20.61	0.18	
3/27/2023	15:34:26	20.61	0.18	
3/27/2023	15:34:32	20.61	0.18	
3/27/2023	15:34:38	20.61	0.18	
3/27/2023	15:34:44	20.60	0.18	
3/27/2023	15:34:50	20.60	0.18	
3/27/2023	15:34:56	20.60	0.18	
3/27/2023	15:35:02	20.61	0.18	
3/27/2023	15:35:08	20.60	0.18	
3/27/2023	15:35:14	20.60	0.18	
3/27/2023	15:35:20	20.60	0.18	
3/27/2023	15:35:26	20.60	0.18	
3/27/2023	15:35:32	20.60	0.18	
3/27/2023	15:35:38	20.60	0.18	
3/27/2023	15:35:44	20.60	0.18	
3/27/2023	15:35:50	20.61	0.18	
3/27/2023	15:35:56	20.61	0.18	
3/27/2023	15:36:02	20.61	0.18	

Eagle Foundry Company
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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	15:36:08	20.61	0.18	
3/27/2023	15:36:14	20.61	0.18	
3/27/2023	15:36:20	20.61	0.18	
3/27/2023	15:36:26	20.61	0.18	
3/27/2023	15:36:32	20.61	0.18	
3/27/2023	15:36:38	20.61	0.18	
3/27/2023	15:36:44	20.61	0.18	
3/27/2023	15:36:50	20.61	0.18	
3/27/2023	15:36:56	20.61	0.18	
3/27/2023	15:37:02	20.61	0.18	
3/27/2023	15:37:08	20.61	0.18	
3/27/2023	15:37:14	20.61	0.18	
3/27/2023	15:37:20	20.60	0.18	
3/27/2023	15:37:26	20.60	0.17	
3/27/2023	15:37:32	20.60	0.18	
3/27/2023	15:37:38	20.60	0.18	
3/27/2023	15:37:44	20.60	0.18	
3/27/2023	15:37:50	20.60	0.17	
3/27/2023	15:37:56	20.60	0.18	
3/27/2023	15:38:02	20.60	0.18	
3/27/2023	15:38:08	20.60	0.18	
3/27/2023	15:38:14	20.60	0.18	
3/27/2023	15:38:20	20.60	0.18	
3/27/2023	15:38:26	20.60	0.18	
3/27/2023	15:38:32	20.60	0.18	
3/27/2023	15:38:38	20.60	0.18	
3/27/2023	15:38:44	20.60	0.18	
3/27/2023	15:38:50	20.60	0.18	
3/27/2023	15:38:56	20.60	0.18	
3/27/2023	15:39:02	20.60	0.18	
3/27/2023	15:39:08	20.61	0.18	
3/27/2023	15:39:14	20.61	0.18	
3/27/2023	15:39:20	20.61	0.18	
3/27/2023	15:39:26	20.61	0.18	
3/27/2023	15:39:32	20.60	0.18	
3/27/2023	15:39:38	20.61	0.18	
3/27/2023	15:39:44	20.61	0.18	
3/27/2023	15:39:50	20.61	0.18	
3/27/2023	15:39:56	20.61	0.18	

Eagle Foundry Company
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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	15:40:02	20.61	0.18	
3/27/2023	15:40:08	20.61	0.18	
3/27/2023	15:40:14	20.61	0.18	
3/27/2023	15:40:20	20.61	0.18	
3/27/2023	15:40:26	20.61	0.18	
3/27/2023	15:40:32	20.61	0.18	
3/27/2023	15:40:38	20.61	0.18	
3/27/2023	15:40:44	20.61	0.18	
3/27/2023	15:40:50	20.61	0.18	
3/27/2023	15:40:56	20.61	0.18	
3/27/2023	15:41:02	20.61	0.18	
3/27/2023	15:41:08	20.61	0.18	
3/27/2023	15:41:14	20.60	0.18	
3/27/2023	15:41:20	20.61	0.18	
3/27/2023	15:41:26	20.60	0.18	
3/27/2023	15:41:32	20.61	0.18	
3/27/2023	15:41:38	20.61	0.18	
3/27/2023	15:41:44	20.61	0.18	
3/27/2023	15:41:50	20.61	0.18	
3/27/2023	15:41:56	20.61	0.18	
3/27/2023	15:42:02	20.61	0.18	
3/27/2023	15:42:08	20.61	0.18	
3/27/2023	15:42:14	20.61	0.18	
3/27/2023	15:42:20	20.61	0.18	
3/27/2023	15:42:26	20.61	0.18	
3/27/2023	15:42:32	20.61	0.18	
3/27/2023	15:42:38	20.61	0.18	
3/27/2023	15:42:44	20.61	0.18	
3/27/2023	15:42:50	20.61	0.18	
3/27/2023	15:42:56	20.60	0.18	
3/27/2023	15:43:02	20.60	0.18	
3/27/2023	15:43:08	20.60	0.18	
3/27/2023	15:43:14	20.60	0.18	
3/27/2023	15:43:20	20.60	0.18	
3/27/2023	15:43:26	20.60	0.18	
3/27/2023	15:43:32	20.60	0.18	
3/27/2023	15:43:38	20.60	0.18	
3/27/2023	15:43:44	20.60	0.18	
3/27/2023	15:43:50	20.60	0.18	

Eagle Foundry Company
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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	15:43:56	20.60	0.18	
3/27/2023	15:44:02	20.60	0.18	
3/27/2023	15:44:08	20.60	0.18	
3/27/2023	15:44:14	20.60	0.18	
3/27/2023	15:44:20	20.60	0.18	
3/27/2023	15:44:26	20.60	0.18	
3/27/2023	15:44:32	20.60	0.18	
3/27/2023	15:44:38	20.60	0.18	
3/27/2023	15:44:44	20.60	0.18	
3/27/2023	15:44:50	20.60	0.18	
3/27/2023	15:44:56	20.60	0.18	
3/27/2023	15:45:02	20.60	0.18	
3/27/2023	15:45:08	20.60	0.18	
3/27/2023	15:45:14	20.60	0.18	
3/27/2023	15:45:20	20.60	0.18	
3/27/2023	15:45:26	20.60	0.18	
3/27/2023	15:45:32	20.60	0.18	
3/27/2023	15:45:38	20.60	0.18	
3/27/2023	15:45:44	20.60	0.18	
3/27/2023	15:45:50	20.60	0.18	
3/27/2023	15:45:56	20.60	0.18	
3/27/2023	15:46:02	20.60	0.18	
3/27/2023	15:46:08	20.60	0.18	
3/27/2023	15:46:14	20.60	0.18	
3/27/2023	15:46:20	20.60	0.18	
3/27/2023	15:46:26	20.60	0.18	
3/27/2023	15:46:32	20.60	0.18	
3/27/2023	15:46:38	20.60	0.18	
3/27/2023	15:46:44	20.60	0.18	
3/27/2023	15:46:50	20.60	0.18	
3/27/2023	15:46:56	20.60	0.18	
3/27/2023	15:47:02	20.60	0.18	
3/27/2023	15:47:08	20.60	0.18	
3/27/2023	15:47:14	20.60	0.18	
3/27/2023	15:47:20	20.60	0.18	
3/27/2023	15:47:26	20.60	0.18	
3/27/2023	15:47:32	20.60	0.18	
3/27/2023	15:47:38	20.60	0.18	
3/27/2023	15:47:44	20.60	0.18	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	15:47:50	20.60	0.18	
3/27/2023	15:47:56	20.60	0.18	
3/27/2023	15:48:02	20.60	0.18	
3/27/2023	15:48:08	20.60	0.18	
3/27/2023	15:48:14	20.60	0.18	
3/27/2023	15:48:20	20.60	0.18	
3/27/2023	15:48:26	20.60	0.18	
3/27/2023	15:48:32	20.60	0.18	
3/27/2023	15:48:38	20.60	0.18	
3/27/2023	15:48:44	20.60	0.18	
3/27/2023	15:48:50	20.60	0.18	
3/27/2023	15:48:56	20.60	0.18	
3/27/2023	15:49:02	20.60	0.18	
3/27/2023	15:49:08	20.60	0.18	
3/27/2023	15:49:14	20.60	0.18	
3/27/2023	15:49:20	20.60	0.18	
3/27/2023	15:49:26	20.60	0.18	
3/27/2023	15:49:32	20.60	0.18	
3/27/2023	15:49:38	20.60	0.18	
3/27/2023	15:49:44	20.60	0.18	
3/27/2023	15:49:50	20.60	0.18	
3/27/2023	15:49:56	20.60	0.18	
3/27/2023	15:50:02	20.60	0.18	
3/27/2023	15:50:08	20.60	0.18	
3/27/2023	15:50:14	20.60	0.18	
3/27/2023	15:50:20	20.60	0.18	
3/27/2023	15:50:26	20.60	0.18	
3/27/2023	15:50:32	20.60	0.17	
3/27/2023	15:50:38	20.60	0.17	
3/27/2023	15:50:44	20.60	0.17	
3/27/2023	15:50:50	20.60	0.17	
3/27/2023	15:50:56	20.60	0.17	
3/27/2023	15:51:02	20.60	0.17	
3/27/2023	15:51:08	20.60	0.17	
3/27/2023	15:51:14	20.60	0.17	
3/27/2023	15:51:20	20.60	0.17	
3/27/2023	15:51:26	20.60	0.17	
3/27/2023	15:51:32	20.60	0.17	
3/27/2023	15:51:38	20.60	0.17	

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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	15:51:44	20.60	0.17	
3/27/2023	15:51:50	20.60	0.17	
3/27/2023	15:51:56	20.60	0.17	
3/27/2023	15:52:02	20.60	0.17	
3/27/2023	15:52:08	20.60	0.17	
3/27/2023	15:52:14	20.60	0.17	
3/27/2023	15:52:20	20.60	0.17	
3/27/2023	15:52:26	20.60	0.17	
3/27/2023	15:52:32	20.60	0.17	
3/27/2023	15:52:38	20.60	0.17	
3/27/2023	15:52:44	20.60	0.17	
3/27/2023	15:52:50	20.60	0.17	
3/27/2023	15:52:56	20.60	0.17	
3/27/2023	15:53:02	20.60	0.17	
3/27/2023	15:53:08	20.60	0.17	
3/27/2023	15:53:14	20.60	0.17	
3/27/2023	15:53:20	20.60	0.17	
3/27/2023	15:53:26	20.60	0.17	
3/27/2023	15:53:32	20.60	0.17	
3/27/2023	15:53:38	20.60	0.17	
3/27/2023	15:53:44	20.60	0.17	
3/27/2023	15:53:50	20.60	0.17	
3/27/2023	15:53:56	20.60	0.17	
3/27/2023	15:54:02	20.60	0.17	
3/27/2023	15:54:08	20.60	0.17	
3/27/2023	15:54:14	20.60	0.17	
3/27/2023	15:54:20	20.60	0.17	
3/27/2023	15:54:26	20.60	0.17	
3/27/2023	15:54:32	20.60	0.17	
3/27/2023	15:54:38	20.60	0.17	
3/27/2023	15:54:44	20.60	0.17	
3/27/2023	15:54:50	20.60	0.17	
3/27/2023	15:54:56	20.60	0.17	
3/27/2023	15:55:02	20.60	0.16	
3/27/2023	15:55:08	20.60	0.17	
3/27/2023	15:55:14	20.60	0.17	
3/27/2023	15:55:20	20.60	0.17	
3/27/2023	15:55:26	20.60	0.17	
3/27/2023	15:55:32	20.60	0.17	

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Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	15:55:38	20.60	0.17	
3/27/2023	15:55:44	20.60	0.17	
3/27/2023	15:55:50	20.60	0.18	
3/27/2023	15:55:56	20.60	0.18	
3/27/2023	15:56:02	20.60	0.17	
3/27/2023	15:56:08	20.60	0.17	
3/27/2023	15:56:14	20.60	0.17	
3/27/2023	15:56:20	20.60	0.18	
3/27/2023	15:56:26	20.60	0.18	
3/27/2023	15:56:32	20.60	0.18	
3/27/2023	15:56:38	20.60	0.18	
3/27/2023	15:56:44	20.60	0.18	
3/27/2023	15:56:50	20.60	0.18	
3/27/2023	15:56:56	20.60	0.18	
3/27/2023	15:57:02	20.60	0.18	
3/27/2023	15:57:08	20.60	0.18	
3/27/2023	15:57:14	20.60	0.18	
3/27/2023	15:57:20	20.60	0.18	
3/27/2023	15:57:26	20.60	0.18	
3/27/2023	15:57:32	20.60	0.18	
3/27/2023	15:57:38	20.60	0.18	
3/27/2023	15:57:44	20.59	0.18	
3/27/2023	15:57:50	20.59	0.18	
3/27/2023	15:57:56	20.59	0.18	
3/27/2023	15:58:02	20.59	0.18	
3/27/2023	15:58:08	20.59	0.17	
3/27/2023	15:58:14	20.59	0.17	
3/27/2023	15:58:20	20.59	0.18	
3/27/2023	15:58:26	20.59	0.18	
3/27/2023	15:58:32	20.59	0.18	
3/27/2023	15:58:38	20.59	0.18	
3/27/2023	15:58:44	20.59	0.18	
3/27/2023	15:58:50	20.59	0.18	
3/27/2023	15:58:56	20.59	0.18	
3/27/2023	15:59:02	20.59	0.18	
3/27/2023	15:59:08	20.59	0.18	
3/27/2023	15:59:14	20.59	0.18	
3/27/2023	15:59:20	20.59	0.18	
3/27/2023	15:59:26	20.59	0.18	

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Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	15:59:32	20.59	0.18	
3/27/2023	15:59:38	20.59	0.18	
3/27/2023	15:59:44	20.59	0.18	
3/27/2023	15:59:50	20.59	0.18	
3/27/2023	15:59:56	20.59	0.18	
3/27/2023	16:00:02	20.59	0.18	
3/27/2023	16:00:08	20.59	0.18	
3/27/2023	16:00:14	20.59	0.18	
3/27/2023	16:00:20	20.59	0.18	
3/27/2023	16:00:26	20.59	0.18	
3/27/2023	16:00:32	20.59	0.18	
3/27/2023	16:00:38	20.59	0.18	
3/27/2023	16:00:44	20.59	0.18	
3/27/2023	16:00:50	20.59	0.18	
3/27/2023	16:00:56	20.59	0.18	
3/27/2023	16:01:02	20.59	0.18	
3/27/2023	16:01:08	20.59	0.18	
3/27/2023	16:01:14	20.59	0.18	
3/27/2023	16:01:20	20.59	0.18	
3/27/2023	16:01:26	20.59	0.18	
3/27/2023	16:01:32	20.59	0.18	
3/27/2023	16:01:38	20.59	0.18	
3/27/2023	16:01:44	20.59	0.18	
3/27/2023	16:01:50	20.59	0.18	
3/27/2023	16:01:56	20.59	0.18	
3/27/2023	16:02:02	20.59	0.18	
3/27/2023	16:02:08	20.59	0.18	
3/27/2023	16:02:14	20.59	0.18	
3/27/2023	16:02:20	20.59	0.18	
3/27/2023	16:02:26	20.59	0.18	
3/27/2023	16:02:32	20.59	0.18	
3/27/2023	16:02:38	20.59	0.18	
3/27/2023	16:02:44	20.59	0.18	
3/27/2023	16:02:50	20.59	0.18	
3/27/2023	16:02:56	20.59	0.18	
3/27/2023	16:03:02	20.59	0.18	
3/27/2023	16:03:08	20.59	0.18	
3/27/2023	16:03:14	20.59	0.18	
3/27/2023	16:03:20	20.59	0.18	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	16:03:26	20.59	0.18	
3/27/2023	16:03:32	20.59	0.18	
3/27/2023	16:03:38	20.59	0.18	
3/27/2023	16:03:44	20.59	0.18	
3/27/2023	16:03:50	20.59	0.18	
3/27/2023	16:03:56	20.59	0.18	
3/27/2023	16:04:02	20.59	0.18	
3/27/2023	16:04:08	20.59	0.18	
3/27/2023	16:04:14	20.59	0.18	
3/27/2023	16:04:20	20.59	0.18	
3/27/2023	16:04:26	20.59	0.18	
3/27/2023	16:04:32	20.59	0.18	
3/27/2023	16:04:38	20.59	0.18	
3/27/2023	16:04:44	20.59	0.18	
3/27/2023	16:04:50	20.59	0.18	
3/27/2023	16:04:56	20.59	0.18	
3/27/2023	16:05:02	20.59	0.18	
3/27/2023	16:05:08	20.59	0.18	
3/27/2023	16:05:14	20.59	0.18	
3/27/2023	16:05:20	20.59	0.18	
3/27/2023	16:05:26	20.59	0.18	
3/27/2023	16:05:32	20.59	0.18	
3/27/2023	16:05:38	20.59	0.18	
3/27/2023	16:05:44	20.59	0.18	
3/27/2023	16:05:50	20.59	0.18	
3/27/2023	16:05:56	20.59	0.18	
3/27/2023	16:06:02	20.59	0.18	
3/27/2023	16:06:08	20.59	0.18	
3/27/2023	16:06:14	20.59	0.18	
3/27/2023	16:06:20	20.59	0.18	
3/27/2023	16:06:26	20.59	0.18	
3/27/2023	16:06:32	20.59	0.18	
3/27/2023	16:06:38	20.59	0.18	
3/27/2023	16:06:44	20.59	0.18	
3/27/2023	16:06:50	20.59	0.18	
3/27/2023	16:06:56	20.59	0.18	
3/27/2023	16:07:02	20.59	0.18	
3/27/2023	16:07:08	20.59	0.18	
3/27/2023	16:07:14	20.59	0.18	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	16:07:20	20.59	0.18	
3/27/2023	16:07:26	20.59	0.18	
3/27/2023	16:07:32	20.59	0.18	
3/27/2023	16:07:38	20.59	0.18	
3/27/2023	16:07:44	20.59	0.18	
3/27/2023	16:07:50	20.59	0.18	
3/27/2023	16:07:56	20.59	0.18	
3/27/2023	16:08:02	20.59	0.18	
3/27/2023	16:08:08	20.59	0.18	
3/27/2023	16:08:14	20.59	0.18	
3/27/2023	16:08:20	20.59	0.18	
3/27/2023	16:08:26	20.59	0.18	
3/27/2023	16:08:32	20.59	0.18	
3/27/2023	16:08:38	20.60	0.18	
3/27/2023	16:08:44	20.60	0.18	
3/27/2023	16:08:50	20.60	0.18	
3/27/2023	16:08:56	20.60	0.18	
3/27/2023	16:09:02	20.60	0.18	
3/27/2023	16:09:08	20.60	0.18	
3/27/2023	16:09:14	20.60	0.18	
3/27/2023	16:09:20	20.60	0.18	
3/27/2023	16:09:26	20.60	0.18	
3/27/2023	16:09:32	20.60	0.18	
3/27/2023	16:09:38	20.60	0.18	
3/27/2023	16:09:44	20.60	0.18	
3/27/2023	16:09:50	20.60	0.18	
3/27/2023	16:09:56	20.60	0.18	
3/27/2023	16:10:02	20.60	0.18	
3/27/2023	16:10:08	20.60	0.18	
3/27/2023	16:10:14	20.60	0.18	
3/27/2023	16:10:20	20.60	0.18	
3/27/2023	16:10:26	20.60	0.18	
3/27/2023	16:10:32	20.60	0.18	
3/27/2023	16:10:38	20.60	0.18	
3/27/2023	16:10:44	20.60	0.18	
3/27/2023	16:10:50	20.60	0.18	
3/27/2023	16:10:56	20.60	0.18	
3/27/2023	16:11:02	20.60	0.18	
3/27/2023	16:11:08	20.60	0.18	

Eagle Foundry Company
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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	16:11:14	20.60	0.18	
3/27/2023	16:11:20	20.60	0.18	
3/27/2023	16:11:26	20.60	0.18	
3/27/2023	16:11:32	20.60	0.18	
3/27/2023	16:11:38	20.60	0.18	
3/27/2023	16:11:44	20.60	0.18	
3/27/2023	16:11:50	20.60	0.18	
3/27/2023	16:11:56	20.60	0.18	
3/27/2023	16:12:02	20.60	0.18	
3/27/2023	16:12:08	20.60	0.18	
3/27/2023	16:12:14	20.60	0.18	
3/27/2023	16:12:20	20.60	0.18	
3/27/2023	16:12:26	20.60	0.18	
3/27/2023	16:12:32	20.60	0.17	
3/27/2023	16:12:38	20.60	0.18	
3/27/2023	16:12:44	20.60	0.18	
3/27/2023	16:12:50	20.60	0.18	
3/27/2023	16:12:56	20.60	0.18	
3/27/2023	16:13:02	20.60	0.18	
3/27/2023	16:13:08	20.60	0.18	
3/27/2023	16:13:14	20.60	0.18	
3/27/2023	16:13:20	20.60	0.18	
3/27/2023	16:13:26	20.60	0.18	
3/27/2023	16:13:32	20.60	0.18	
3/27/2023	16:13:38	20.60	0.18	
3/27/2023	16:13:44	20.60	0.18	
3/27/2023	16:13:50	20.60	0.18	
3/27/2023	16:13:56	20.59	0.18	
3/27/2023	16:14:02	20.59	0.18	
3/27/2023	16:14:08	20.59	0.18	
3/27/2023	16:14:14	20.59	0.18	
3/27/2023	16:14:20	20.59	0.18	
3/27/2023	16:14:26	20.60	0.18	
3/27/2023	16:14:32	20.60	0.18	
3/27/2023	16:14:38	20.60	0.18	
3/27/2023	16:14:44	20.60	0.18	
3/27/2023	16:14:50	20.60	0.18	
3/27/2023	16:14:56	20.60	0.18	
3/27/2023	16:15:02	20.60	0.18	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	16:15:08	20.60	0.18	
3/27/2023	16:15:14	20.60	0.18	
3/27/2023	16:15:20	20.60	0.18	
3/27/2023	16:15:26	20.59	0.18	
3/27/2023	16:15:32	20.60	0.18	
3/27/2023	16:15:38	20.60	0.18	
3/27/2023	16:15:44	20.60	0.18	
3/27/2023	16:15:50	20.60	0.18	
3/27/2023	16:15:56	20.60	0.18	
3/27/2023	16:16:02	20.60	0.18	
3/27/2023	16:16:08	20.59	0.18	
3/27/2023	16:16:14	20.59	0.18	
3/27/2023	16:16:20	20.60	0.18	
3/27/2023	16:16:26	20.60	0.18	
3/27/2023	16:16:32	20.60	0.18	
3/27/2023	16:16:38	20.60	0.18	
3/27/2023	16:16:44	20.60	0.18	
3/27/2023	16:16:50	20.60	0.18	
3/27/2023	16:16:56	20.60	0.18	
3/27/2023	16:17:02	20.60	0.18	
3/27/2023	16:17:08	20.60	0.18	
3/27/2023	16:17:14	20.59	0.18	
3/27/2023	16:17:20	20.59	0.18	
3/27/2023	16:17:26	20.59	0.18	
3/27/2023	16:17:32	20.59	0.18	
3/27/2023	16:17:38	20.60	0.18	
3/27/2023	16:17:44	20.60	0.18	
3/27/2023	16:17:50	20.60	0.18	
3/27/2023	16:17:56	20.59	0.18	
3/27/2023	16:18:02	20.59	0.18	
3/27/2023	16:18:08	20.60	0.18	
3/27/2023	16:18:14	20.59	0.18	
3/27/2023	16:18:20	20.59	0.18	
3/27/2023	16:18:26	20.59	0.18	
3/27/2023	16:18:32	20.59	0.18	
3/27/2023	16:18:38	20.59	0.18	
3/27/2023	16:18:44	20.60	0.18	
3/27/2023	16:18:50	20.60	0.18	
3/27/2023	16:18:56	20.59	0.18	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	16:19:02	20.60	0.18	
3/27/2023	16:19:08	20.60	0.18	
3/27/2023	16:19:14	20.60	0.18	
3/27/2023	16:19:20	20.60	0.18	
3/27/2023	16:19:26	20.60	0.18	
3/27/2023	16:19:32	20.60	0.18	
3/27/2023	16:19:38	20.60	0.18	
3/27/2023	16:19:44	20.60	0.18	
3/27/2023	16:19:50	20.60	0.18	
3/27/2023	16:19:56	20.60	0.18	
3/27/2023	16:20:02	20.60	0.18	
3/27/2023	16:20:08	20.60	0.18	
3/27/2023	16:20:14	20.60	0.18	
3/27/2023	16:20:20	20.60	0.18	
3/27/2023	16:20:26	20.60	0.18	
3/27/2023	16:20:32	20.60	0.18	
3/27/2023	16:20:38	20.60	0.18	
3/27/2023	16:20:44	20.59	0.18	
3/27/2023	16:20:50	20.59	0.18	
3/27/2023	16:20:56	20.59	0.18	
3/27/2023	16:21:02	20.59	0.18	
3/27/2023	16:21:08	20.59	0.18	
3/27/2023	16:21:14	20.60	0.18	
3/27/2023	16:21:20	20.60	0.18	
3/27/2023	16:21:26	20.60	0.18	
3/27/2023	16:21:32	20.60	0.18	
3/27/2023	16:21:38	20.60	0.18	
3/27/2023	16:21:44	20.60	0.18	
3/27/2023	16:21:50	20.60	0.18	
3/27/2023	16:21:56	20.60	0.18	
3/27/2023	16:22:02	20.60	0.18	
3/27/2023	16:22:08	20.60	0.18	
3/27/2023	16:22:14	20.60	0.18	
3/27/2023	16:22:20	20.60	0.18	
3/27/2023	16:22:26	20.60	0.18	
3/27/2023	16:22:32	20.60	0.18	
3/27/2023	16:22:38	20.60	0.18	
3/27/2023	16:22:44	20.59	0.18	
3/27/2023	16:22:50	20.60	0.18	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	16:22:56	20.60	0.18	
3/27/2023	16:23:02	20.59	0.18	
3/27/2023	16:23:08	20.59	0.18	
3/27/2023	16:23:14	20.60	0.18	
3/27/2023	16:23:20	20.60	0.18	
3/27/2023	16:23:26	20.60	0.18	
3/27/2023	16:23:32	20.59	0.18	
3/27/2023	16:23:38	20.60	0.18	
3/27/2023	16:23:44	20.60	0.18	
3/27/2023	16:23:50	20.60	0.18	
3/27/2023	16:23:56	20.60	0.18	
3/27/2023	16:24:02	20.60	0.18	
3/27/2023	16:24:08	20.60	0.18	
3/27/2023	16:24:14	20.59	0.18	
3/27/2023	16:24:20	20.59	0.18	
3/27/2023	16:24:26	20.59	0.18	
3/27/2023	16:24:32	20.59	0.18	
3/27/2023	16:24:38	20.59	0.18	
3/27/2023	16:24:44	20.59	0.18	
3/27/2023	16:24:50	20.59	0.18	
3/27/2023	16:24:56	20.59	0.18	
3/27/2023	16:25:02	20.59	0.18	
3/27/2023	16:25:08	20.60	0.18	
3/27/2023	16:25:14	20.60	0.18	
3/27/2023	16:25:20	20.60	0.18	
3/27/2023	16:25:26	20.60	0.18	
3/27/2023	16:25:32	20.60	0.18	
3/27/2023	16:25:38	20.59	0.18	
3/27/2023	16:25:44	20.59	0.18	
3/27/2023	16:25:50	20.59	0.18	
3/27/2023	16:25:56	20.59	0.18	
3/27/2023	16:26:02	20.59	0.18	
3/27/2023	16:26:08	20.59	0.18	
3/27/2023	16:26:14	20.59	0.18	
3/27/2023	16:26:20	20.59	0.18	
3/27/2023	16:26:26	20.60	0.18	
3/27/2023	16:26:32	20.60	0.18	
3/27/2023	16:26:38	20.59	0.18	
3/27/2023	16:26:44	20.59	0.18	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	16:26:50	20.59	0.18	
3/27/2023	16:26:56	20.59	0.18	
3/27/2023	16:27:02	20.59	0.18	
3/27/2023	16:27:08	20.59	0.18	
3/27/2023	16:27:14	20.59	0.18	
3/27/2023	16:27:20	20.59	0.18	
3/27/2023	16:27:26	20.59	0.18	
3/27/2023	16:27:32	20.59	0.18	
3/27/2023	16:27:38	20.59	0.18	
3/27/2023	16:27:44	20.59	0.18	
3/27/2023	16:27:50	20.59	0.18	
3/27/2023	16:27:56	20.60	0.18	
3/27/2023	16:28:02	20.60	0.18	
3/27/2023	16:28:08	20.60	0.18	
3/27/2023	16:28:14	20.60	0.18	
3/27/2023	16:28:20	20.60	0.18	
3/27/2023	16:28:26	20.60	0.18	
3/27/2023	16:28:32	20.60	0.18	
3/27/2023	16:28:38	20.60	0.18	
3/27/2023	16:28:44	20.60	0.18	
3/27/2023	16:28:50	20.60	0.18	
3/27/2023	16:28:56	20.60	0.18	
3/27/2023	16:29:02	20.60	0.18	
3/27/2023	16:29:08	20.60	0.18	
3/27/2023	16:29:14	20.60	0.18	
3/27/2023	16:29:20	20.60	0.18	
3/27/2023	16:29:26	20.60	0.18	
3/27/2023	16:29:32	20.60	0.18	
3/27/2023	16:29:38	20.60	0.18	
3/27/2023	16:29:44	20.60	0.18	
3/27/2023	16:29:50	20.60	0.18	
3/27/2023	16:29:56	20.60	0.18	
3/27/2023	16:30:02	20.60	0.18	
3/27/2023	16:30:08	20.59	0.18	
3/27/2023	16:30:14	20.60	0.18	
3/27/2023	16:30:20	20.59	0.18	
3/27/2023	16:30:26	20.59	0.18	
3/27/2023	16:30:32	20.59	0.18	
3/27/2023	16:30:38	20.59	0.18	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	16:30:44	20.59	0.18	
3/27/2023	16:30:50	20.59	0.18	
3/27/2023	16:30:56	20.60	0.18	
3/27/2023	16:31:02	20.60	0.18	
3/27/2023	16:31:08	20.60	0.18	
3/27/2023	16:31:14	20.60	0.18	
3/27/2023	16:31:20	20.60	0.18	
3/27/2023	16:31:26	20.60	0.18	
3/27/2023	16:31:32	20.60	0.18	
3/27/2023	16:31:38	20.60	0.18	
3/27/2023	16:31:44	20.60	0.18	
3/27/2023	16:31:50	20.60	0.18	
3/27/2023	16:31:56	20.60	0.18	
3/27/2023	16:32:02	20.60	0.18	
3/27/2023	16:32:08	20.60	0.18	
3/27/2023	16:32:14	20.60	0.18	
3/27/2023	16:32:20	20.59	0.18	
3/27/2023	16:32:26	20.59	0.18	
3/27/2023	16:32:32	20.59	0.18	
3/27/2023	16:32:38	20.59	0.18	
3/27/2023	16:32:44	20.59	0.18	
3/27/2023	16:32:50	20.59	0.18	
3/27/2023	16:32:56	20.59	0.18	
3/27/2023	16:33:02	20.59	0.18	
3/27/2023	16:33:08	20.59	0.18	
3/27/2023	16:33:14	20.59	0.18	
3/27/2023	16:33:20	20.59	0.18	
3/27/2023	16:33:26	20.59	0.18	
3/27/2023	16:33:32	20.59	0.18	
3/27/2023	16:33:38	20.59	0.18	
3/27/2023	16:33:44	20.59	0.18	
3/27/2023	16:33:50	20.59	0.18	
3/27/2023	16:33:56	20.59	0.18	
3/27/2023	16:34:02	20.60	0.18	
3/27/2023	16:34:08	20.59	0.18	
3/27/2023	16:34:14	20.59	0.18	
3/27/2023	16:34:20	20.59	0.18	
3/27/2023	16:34:26	20.59	0.18	
3/27/2023	16:34:32	20.59	0.18	

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Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	16:34:38	20.59	0.18	
3/27/2023	16:34:44	20.59	0.18	
3/27/2023	16:34:50	20.59	0.18	
3/27/2023	16:34:56	20.59	0.18	
3/27/2023	16:35:02	20.59	0.18	
3/27/2023	16:35:08	20.59	0.18	
3/27/2023	16:35:14	20.59	0.18	
3/27/2023	16:35:20	20.59	0.18	
3/27/2023	16:35:26	20.60	0.18	
3/27/2023	16:35:32	20.59	0.18	
3/27/2023	16:35:38	20.59	0.18	
3/27/2023	16:35:44	20.59	0.18	
3/27/2023	16:35:50	20.60	0.18	
3/27/2023	16:35:56	20.60	0.18	
3/27/2023	16:36:02	20.60	0.18	
3/27/2023	16:36:08	20.59	0.18	
3/27/2023	16:36:14	20.59	0.18	
3/27/2023	16:36:20	20.59	0.18	
3/27/2023	16:36:26	20.59	0.18	
3/27/2023	16:36:32	20.60	0.18	
3/27/2023	16:36:38	20.59	0.18	
3/27/2023	16:36:44	20.59	0.18	
3/27/2023	16:36:50	20.59	0.18	
3/27/2023	16:36:56	20.59	0.18	
3/27/2023	16:37:02	20.59	0.18	
3/27/2023	16:37:08	20.59	0.18	
3/27/2023	16:37:14	20.59	0.18	
3/27/2023	16:37:20	20.59	0.18	
3/27/2023	16:37:26	20.59	0.18	
3/27/2023	16:37:32	20.59	0.18	
3/27/2023	16:37:38	20.59	0.18	
3/27/2023	16:37:44	20.59	0.18	
3/27/2023	16:37:50	20.59	0.18	
3/27/2023	16:37:56	20.59	0.18	
3/27/2023	16:38:02	20.59	0.18	
3/27/2023	16:38:08	20.59	0.18	
3/27/2023	16:38:14	20.59	0.18	
3/27/2023	16:38:20	20.59	0.18	
3/27/2023	16:38:26	20.59	0.18	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	16:38:32	20.59	0.18	
3/27/2023	16:38:38	20.59	0.18	
3/27/2023	16:38:44	20.59	0.18	
3/27/2023	16:38:50	20.59	0.18	
3/27/2023	16:38:56	20.59	0.18	
3/27/2023	16:39:02	20.59	0.18	
3/27/2023	16:39:08	20.59	0.18	
3/27/2023	16:39:14	20.59	0.18	
3/27/2023	16:39:20	20.59	0.18	
3/27/2023	16:39:26	20.59	0.18	
3/27/2023	16:39:32	20.59	0.18	
3/27/2023	16:39:38	20.59	0.18	
3/27/2023	16:39:44	20.59	0.18	
3/27/2023	16:39:50	20.59	0.18	
3/27/2023	16:39:56	20.59	0.18	
3/27/2023	16:40:02	20.59	0.18	
3/27/2023	16:40:08	20.59	0.18	
3/27/2023	16:40:14	20.59	0.18	
3/27/2023	16:40:20	20.59	0.18	
3/27/2023	16:40:26	20.59	0.18	
3/27/2023	16:40:32	20.59	0.18	
3/27/2023	16:40:38	20.59	0.18	
3/27/2023	16:40:44	20.59	0.18	
3/27/2023	16:40:50	20.59	0.18	
3/27/2023	16:40:56	20.59	0.18	
3/27/2023	16:41:02	20.59	0.18	
3/27/2023	16:41:08	20.59	0.18	
3/27/2023	16:41:14	20.59	0.18	
3/27/2023	16:41:20	20.59	0.18	
3/27/2023	16:41:26	20.59	0.18	
3/27/2023	16:41:32	20.59	0.18	
3/27/2023	16:41:38	20.59	0.18	
3/27/2023	16:41:44	20.59	0.18	
3/27/2023	16:41:50	20.59	0.18	
3/27/2023	16:41:56	20.59	0.18	
3/27/2023	16:42:02	20.59	0.18	
3/27/2023	16:42:08	20.59	0.18	
3/27/2023	16:42:14	20.59	0.18	
3/27/2023	16:42:20	20.59	0.18	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	16:42:26	20.59	0.18	
3/27/2023	16:42:32	20.59	0.18	
3/27/2023	16:42:38	20.59	0.18	
3/27/2023	16:42:44	20.59	0.18	
3/27/2023	16:42:50	20.59	0.18	
3/27/2023	16:42:56	20.59	0.18	
3/27/2023	16:43:02	20.59	0.18	
3/27/2023	16:43:08	20.59	0.18	
3/27/2023	16:43:14	20.59	0.18	
3/27/2023	16:43:20	20.59	0.18	
3/27/2023	16:43:26	20.59	0.18	
3/27/2023	16:43:32	20.59	0.18	
3/27/2023	16:43:38	20.59	0.18	
3/27/2023	16:43:44	20.59	0.18	
3/27/2023	16:43:50	20.59	0.18	
3/27/2023	16:43:56	20.59	0.18	
3/27/2023	16:44:02	20.59	0.18	
3/27/2023	16:44:08	20.59	0.18	
3/27/2023	16:44:14	20.59	0.18	
3/27/2023	16:44:20	20.59	0.18	
3/27/2023	16:44:26	20.59	0.18	
3/27/2023	16:44:32	20.59	0.18	
3/27/2023	16:44:38	20.59	0.18	
3/27/2023	16:44:44	20.59	0.18	
3/27/2023	16:44:50	20.59	0.18	
3/27/2023	16:44:56	20.59	0.18	
3/27/2023	16:45:02	20.59	0.18	
3/27/2023	16:45:08	20.59	0.18	
3/27/2023	16:45:14	20.59	0.18	
3/27/2023	16:45:20	20.59	0.18	
3/27/2023	16:45:26	20.59	0.18	
3/27/2023	16:45:32	20.59	0.18	
3/27/2023	16:45:38	20.59	0.18	
3/27/2023	16:45:44	20.59	0.18	
3/27/2023	16:45:50	20.59	0.18	
3/27/2023	16:45:56	20.59	0.18	
3/27/2023	16:46:02	20.59	0.18	
3/27/2023	16:46:08	20.59	0.18	
3/27/2023	16:46:14	20.59	0.18	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	16:46:20	20.59	0.18	
3/27/2023	16:46:26	20.59	0.18	
3/27/2023	16:46:32	20.59	0.18	
3/27/2023	16:46:38	20.59	0.18	
3/27/2023	16:46:44	20.59	0.18	
3/27/2023	16:46:50	20.59	0.18	
3/27/2023	16:46:56	20.59	0.18	
3/27/2023	16:47:02	20.59	0.18	
3/27/2023	16:47:08	20.59	0.18	
3/27/2023	16:47:14	20.59	0.18	
3/27/2023	16:47:20	20.59	0.18	
3/27/2023	16:47:26	20.59	0.18	
3/27/2023	16:47:32	20.59	0.18	
3/27/2023	16:47:38	20.59	0.18	
3/27/2023	16:47:44	20.59	0.18	
3/27/2023	16:47:50	20.59	0.18	
3/27/2023	16:47:56	20.59	0.18	
3/27/2023	16:48:02	20.59	0.18	
3/27/2023	16:48:08	20.59	0.17	
3/27/2023	16:48:14	20.59	0.18	
3/27/2023	16:48:20	20.59	0.18	
3/27/2023	16:48:26	20.59	0.17	
3/27/2023	16:48:32	20.59	0.18	
3/27/2023	16:48:38	20.59	0.18	
3/27/2023	16:48:44	20.59	0.18	
3/27/2023	16:48:50	20.59	0.18	
3/27/2023	16:48:56	20.59	0.18	
3/27/2023	16:49:02	20.59	0.18	
3/27/2023	16:49:08	20.59	0.18	
3/27/2023	16:49:14	20.59	0.18	
3/27/2023	16:49:20	20.59	0.18	
3/27/2023	16:49:26	20.59	0.18	
3/27/2023	16:49:32	20.59	0.18	
3/27/2023	16:49:38	20.59	0.18	
3/27/2023	16:49:44	20.59	0.18	
3/27/2023	16:49:50	20.59	0.18	
3/27/2023	16:49:56	20.59	0.18	
3/27/2023	16:50:02	20.59	0.18	
3/27/2023	16:50:08	20.59	0.18	

Eagle Foundry Company
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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	16:50:14	20.59	0.18	
3/27/2023	16:50:20	20.59	0.18	
3/27/2023	16:50:26	20.59	0.18	
3/27/2023	16:50:32	20.59	0.18	
3/27/2023	16:50:38	20.59	0.18	
3/27/2023	16:50:44	20.59	0.18	
3/27/2023	16:50:50	20.59	0.18	
3/27/2023	16:50:56	20.59	0.18	
3/27/2023	16:51:02	20.59	0.18	
3/27/2023	16:51:08	20.59	0.18	
3/27/2023	16:51:14	20.59	0.18	
3/27/2023	16:51:20	20.59	0.18	
3/27/2023	16:51:26	20.59	0.18	
3/27/2023	16:51:32	20.59	0.18	
3/27/2023	16:51:38	20.59	0.18	
3/27/2023	16:51:44	20.59	0.18	
3/27/2023	16:51:50	20.59	0.18	
3/27/2023	16:51:56	20.59	0.18	
3/27/2023	16:52:02	20.59	0.18	
3/27/2023	16:52:08	20.59	0.18	
3/27/2023	16:52:14	20.59	0.18	
3/27/2023	16:52:20	20.59	0.18	
3/27/2023	16:52:26	20.59	0.18	
3/27/2023	16:52:32	20.59	0.18	
3/27/2023	16:52:38	20.59	0.18	
3/27/2023	16:52:44	20.59	0.18	
3/27/2023	16:52:50	20.59	0.18	
3/27/2023	16:52:56	20.59	0.18	
3/27/2023	16:53:02	20.59	0.18	
3/27/2023	16:53:08	20.59	0.18	
3/27/2023	16:53:14	20.59	0.18	
3/27/2023	16:53:20	20.59	0.18	
3/27/2023	16:53:26	20.59	0.18	
3/27/2023	16:53:32	20.59	0.18	
3/27/2023	16:53:38	20.59	0.18	
3/27/2023	16:53:44	20.59	0.18	
3/27/2023	16:53:50	20.59	0.18	
3/27/2023	16:53:56	20.59	0.18	
3/27/2023	16:54:02	20.59	0.18	

Eagle Foundry Company
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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	16:54:08	20.59	0.18	
3/27/2023	16:54:14	20.59	0.18	
3/27/2023	16:54:20	20.59	0.18	
3/27/2023	16:54:26	20.59	0.18	
3/27/2023	16:54:32	20.59	0.18	
3/27/2023	16:54:38	20.59	0.18	
3/27/2023	16:54:44	20.59	0.18	
3/27/2023	16:54:50	20.59	0.18	
3/27/2023	16:54:56	20.59	0.18	
3/27/2023	16:55:02	20.59	0.18	
3/27/2023	16:55:08	20.59	0.18	
3/27/2023	16:55:14	20.59	0.18	
3/27/2023	16:55:20	20.59	0.18	
3/27/2023	16:55:26	20.59	0.18	
3/27/2023	16:55:32	20.59	0.18	
3/27/2023	16:55:38	20.59	0.18	
3/27/2023	16:55:44	20.59	0.18	
3/27/2023	16:55:50	20.59	0.18	
3/27/2023	16:55:56	20.59	0.18	
3/27/2023	16:56:02	20.59	0.18	
3/27/2023	16:56:08	20.59	0.18	
3/27/2023	16:56:14	20.59	0.18	
3/27/2023	16:56:20	20.59	0.18	
3/27/2023	16:56:26	20.59	0.18	
3/27/2023	16:56:32	20.59	0.18	
3/27/2023	16:56:38	20.59	0.18	
3/27/2023	16:56:44	20.59	0.18	
3/27/2023	16:56:50	20.59	0.18	
3/27/2023	16:56:56	20.59	0.18	
3/27/2023	16:57:02	20.59	0.18	
3/27/2023	16:57:08	20.59	0.18	
3/27/2023	16:57:14	20.59	0.18	
3/27/2023	16:57:20	20.59	0.18	
3/27/2023	16:57:26	20.59	0.18	
3/27/2023	16:57:32	20.59	0.18	
3/27/2023	16:57:38	20.59	0.18	
3/27/2023	16:57:44	20.59	0.18	
3/27/2023	16:57:50	20.59	0.18	
3/27/2023	16:57:56	20.59	0.18	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	16:58:02	20.59	0.18	
3/27/2023	16:58:08	20.59	0.18	
3/27/2023	16:58:14	20.59	0.18	
3/27/2023	16:58:20	20.59	0.18	
3/27/2023	16:58:26	20.59	0.18	
3/27/2023	16:58:32	20.59	0.18	
3/27/2023	16:58:38	20.59	0.18	
3/27/2023	16:58:44	20.59	0.18	
3/27/2023	16:58:50	20.59	0.18	
3/27/2023	16:58:56	20.59	0.18	
3/27/2023	16:59:02	20.59	0.18	
3/27/2023	16:59:08	20.59	0.18	
3/27/2023	16:59:14	20.59	0.18	
3/27/2023	16:59:20	20.59	0.18	
3/27/2023	16:59:26	20.59	0.18	
3/27/2023	16:59:32	20.59	0.18	
3/27/2023	16:59:38	20.59	0.18	
3/27/2023	16:59:44	20.59	0.18	
3/27/2023	16:59:50	20.59	0.18	
3/27/2023	16:59:56	20.59	0.18	
3/27/2023	17:00:02	20.59	0.18	
3/27/2023	17:00:08	20.59	0.18	
3/27/2023	17:00:14	20.59	0.18	
3/27/2023	17:00:20	20.59	0.18	
3/27/2023	17:00:26	20.59	0.18	
3/27/2023	17:00:32	20.59	0.18	
3/27/2023	17:00:38	20.59	0.18	
3/27/2023	17:00:44	20.59	0.18	
3/27/2023	17:00:50	20.59	0.18	
3/27/2023	17:00:56	20.59	0.18	
3/27/2023	17:01:02	20.59	0.18	
3/27/2023	17:01:08	20.59	0.18	
3/27/2023	17:01:14	20.59	0.18	
3/27/2023	17:01:20	20.59	0.18	
3/27/2023	17:01:26	20.59	0.18	
3/27/2023	17:01:32	20.59	0.18	
3/27/2023	17:01:38	20.59	0.18	
3/27/2023	17:01:44	20.59	0.18	
3/27/2023	17:01:50	20.59	0.18	

Eagle Foundry Company
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Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	17:01:56	20.59	0.18	
3/27/2023	17:02:02	20.59	0.18	
3/27/2023	17:02:08	20.59	0.18	
3/27/2023	17:02:14	20.59	0.18	
3/27/2023	17:02:20	20.59	0.18	
3/27/2023	17:02:26	20.59	0.18	
3/27/2023	17:02:32	20.59	0.18	
3/27/2023	17:02:38	20.59	0.18	
3/27/2023	17:02:44	20.59	0.18	
3/27/2023	17:02:50	20.59	0.18	
3/27/2023	17:02:56	20.59	0.18	
3/27/2023	17:03:02	20.59	0.18	
3/27/2023	17:03:08	20.59	0.18	
3/27/2023	17:03:14	20.59	0.18	
3/27/2023	17:03:20	20.59	0.18	
3/27/2023	17:03:26	20.59	0.18	
3/27/2023	17:03:32	20.59	0.18	
3/27/2023	17:03:38	20.59	0.18	
3/27/2023	17:03:44	20.59	0.18	
3/27/2023	17:03:50	20.59	0.18	
3/27/2023	17:03:56	20.59	0.18	
3/27/2023	17:04:02	20.59	0.18	
3/27/2023	17:04:08	20.59	0.18	
3/27/2023	17:04:14	20.59	0.18	
3/27/2023	17:04:20	20.59	0.18	
3/27/2023	17:04:26	20.59	0.18	
3/27/2023	17:04:32	20.59	0.18	
3/27/2023	17:04:38	20.59	0.18	
3/27/2023	17:04:44	20.59	0.18	
3/27/2023	17:04:50	20.59	0.18	
3/27/2023	17:04:56	20.59	0.18	
3/27/2023	17:05:02	20.59	0.18	
3/27/2023	17:05:08	20.59	0.18	
3/27/2023	17:05:14	20.59	0.18	
3/27/2023	17:05:20	20.59	0.18	
3/27/2023	17:05:26	20.59	0.18	
3/27/2023	17:05:32	20.59	0.18	
3/27/2023	17:05:38	20.59	0.18	
3/27/2023	17:05:44	20.59	0.18	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	17:05:50	20.59	0.18	
3/27/2023	17:05:56	20.59	0.18	
3/27/2023	17:06:02	20.59	0.18	
3/27/2023	17:06:08	20.59	0.18	
3/27/2023	17:06:14	20.59	0.18	
3/27/2023	17:06:20	20.59	0.18	
3/27/2023	17:06:26	20.59	0.18	
3/27/2023	17:06:32	20.59	0.18	
3/27/2023	17:06:38	20.59	0.18	
3/27/2023	17:06:44	20.59	0.18	
3/27/2023	17:06:50	20.59	0.18	
3/27/2023	17:06:56	20.59	0.18	
3/27/2023	17:07:02	20.59	0.18	
3/27/2023	17:07:08	20.59	0.18	
3/27/2023	17:07:14	20.59	0.18	
3/27/2023	17:07:20	20.59	0.18	
3/27/2023	17:07:26	20.59	0.18	
3/27/2023	17:07:32	20.59	0.18	
3/27/2023	17:07:38	20.59	0.18	
3/27/2023	17:07:44	20.59	0.18	
3/27/2023	17:07:50	20.59	0.18	
3/27/2023	17:07:56	20.59	0.18	
3/27/2023	17:08:02	20.59	0.18	
3/27/2023	17:08:08	20.59	0.18	
3/27/2023	17:08:14	20.59	0.18	
3/27/2023	17:08:20	20.59	0.18	
3/27/2023	17:08:26	20.59	0.18	
3/27/2023	17:08:32	20.59	0.18	
3/27/2023	17:08:38	20.59	0.18	
3/27/2023	17:08:44	20.59	0.18	
3/27/2023	17:08:50	20.59	0.18	
3/27/2023	17:08:56	20.59	0.18	
3/27/2023	17:09:02	20.59	0.18	
3/27/2023	17:09:08	20.59	0.18	
3/27/2023	17:09:14	20.59	0.18	
3/27/2023	17:09:20	20.59	0.18	
3/27/2023	17:09:26	20.59	0.18	
3/27/2023	17:09:32	20.59	0.18	
3/27/2023	17:09:38	20.58	0.18	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	17:09:44	20.59	0.18	
3/27/2023	17:09:50	20.59	0.18	
3/27/2023	17:09:56	20.59	0.18	
3/27/2023	17:10:02	20.59	0.18	
3/27/2023	17:10:08	20.59	0.18	
3/27/2023	17:10:14	20.59	0.18	
3/27/2023	17:10:20	20.59	0.18	
3/27/2023	17:10:26	20.59	0.18	
3/27/2023	17:10:32	20.59	0.18	
3/27/2023	17:10:38	20.59	0.18	
3/27/2023	17:10:44	20.59	0.18	
3/27/2023	17:10:50	20.59	0.18	
3/27/2023	17:10:56	20.59	0.18	End Run 1 Mn and CM40 Steel
		20.63	0.19	Average
3/27/2023	17:11:02	20.59	-0.02	
3/27/2023	17:11:08	20.59	-0.02	
3/27/2023	17:11:14	20.59	-0.02	
3/27/2023	17:11:20	20.59	-0.02	
3/27/2023	17:11:26	20.59	-0.02	
3/27/2023	17:11:32	20.59	-0.02	
3/27/2023	17:11:38	20.59	-0.02	
3/27/2023	17:11:44	20.59	-0.02	
3/27/2023	17:11:50	20.59	-0.02	
3/27/2023	17:11:56	20.59	-0.02	
3/27/2023	17:12:02	20.59	-0.02	
3/27/2023	17:12:08	20.59	-0.02	
3/27/2023	17:12:14	20.59	-0.02	
3/27/2023	17:12:20	20.59	-0.02	
3/27/2023	17:12:26	20.59	-0.02	
3/27/2023	17:12:32	20.59	-0.02	
3/27/2023	17:12:38	20.59	-0.02	
3/27/2023	17:12:44	20.59	-0.02	
3/27/2023	17:12:50	20.59	-0.02	
3/27/2023	17:12:56	20.59	-0.02	
3/27/2023	17:13:02	20.59	-0.02	
3/27/2023	17:13:08	20.59	-0.02	
3/27/2023	17:13:14	20.59	-0.02	
3/27/2023	17:13:20	20.59	-0.02	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	17:13:26	20.59	-0.02	
3/27/2023	17:13:32	20.59	-0.02	
3/27/2023	17:13:38	20.59	-0.02	
3/27/2023	17:13:44	20.59	-0.02	
3/27/2023	17:13:50	20.59	-0.02	
3/27/2023	17:13:56	20.59	-0.02	
3/27/2023	17:14:02	20.59	-0.02	
3/27/2023	17:14:08	20.59	-0.02	
3/27/2023	17:14:14	20.59	-0.02	
3/27/2023	17:14:20	20.59	-0.02	
3/27/2023	17:14:26	20.59	-0.02	
3/27/2023	17:14:32	20.59	-0.01	
3/27/2023	17:14:38	20.59	-0.02	
3/27/2023	17:14:44	20.59	-0.02	
3/27/2023	17:14:50	20.59	-0.02	
3/27/2023	17:14:56	20.59	-0.02	
3/27/2023	17:15:02	20.59	-0.01	
3/27/2023	17:15:08	20.58	-0.02	
3/27/2023	17:15:14	20.59	-0.02	
3/27/2023	17:15:20	20.59	-0.02	
3/27/2023	17:15:26	20.59	-0.02	
3/27/2023	17:15:32	20.59	-0.02	
3/27/2023	17:15:38	20.59	-0.02	
3/27/2023	17:15:44	20.59	-0.02	
3/27/2023	17:15:50	20.59	-0.02	
3/27/2023	17:15:56	20.59	-0.02	
3/27/2023	17:16:02	20.59	-0.02	
3/27/2023	17:16:08	20.59	-0.01	
3/27/2023	17:16:14	20.59	-0.01	
3/27/2023	17:16:20	20.59	-0.02	
3/27/2023	17:16:26	20.59	-0.01	
3/27/2023	17:16:32	20.59	-0.01	
3/27/2023	17:16:38	20.59	-0.01	
3/27/2023	17:16:44	20.59	-0.01	
3/27/2023	17:16:50	20.59	-0.01	
3/27/2023	17:16:56	20.59	-0.01	
3/27/2023	17:17:02	20.59	-0.01	
3/27/2023	17:17:08	20.59	-0.01	
3/27/2023	17:17:14	20.59	-0.01	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	17:17:20	20.59	-0.01	
3/27/2023	17:17:26	20.59	-0.01	
3/27/2023	17:17:32	20.59	-0.01	
3/27/2023	17:17:38	20.59	-0.01	
3/27/2023	17:17:44	20.59	-0.01	
3/27/2023	17:17:50	20.59	-0.01	
3/27/2023	17:17:56	20.59	-0.01	
3/27/2023	17:18:02	20.59	-0.02	
3/27/2023	17:18:08	20.59	-0.02	
3/27/2023	17:18:14	20.59	-0.02	
3/27/2023	17:18:20	20.59	-0.02	
3/27/2023	17:18:26	20.59	-0.02	
3/27/2023	17:18:32	20.59	-0.02	
3/27/2023	17:18:38	20.59	-0.02	
3/27/2023	17:18:44	20.59	-0.02	
3/27/2023	17:18:50	20.59	-0.02	
3/27/2023	17:18:56	20.59	-0.02	
3/27/2023	17:19:02	20.59	-0.02	
3/27/2023	17:19:08	20.59	-0.02	
3/27/2023	17:19:14	20.59	-0.01	
3/27/2023	17:19:20	20.60	-0.06	
3/27/2023	17:19:26	18.06	-0.07	
3/27/2023	17:19:32	8.95	-0.07	
3/27/2023	17:19:38	3.14	-0.07	
3/27/2023	17:19:44	1.06	-0.07	
3/27/2023	17:19:50	0.43	-0.07	
3/27/2023	17:19:56	0.24	-0.07	
3/27/2023	17:20:02	0.19	-0.07	
3/27/2023	17:20:08	0.17	-0.07	O2/CO2 System Zeros
3/27/2023	17:20:14	0.16	-0.07	0.14 -0.07
3/27/2023	17:20:20	0.15	-0.07	
3/27/2023	17:20:26	0.15	-0.07	
3/27/2023	17:20:32	0.15	-0.07	
3/27/2023	17:20:38	0.14	-0.06	
3/27/2023	17:20:44	0.14	-0.07	
3/27/2023	17:20:50	0.14	-0.07	
3/27/2023	17:20:56	0.14	-0.07	
3/27/2023	17:21:02	0.14	-0.07	
3/27/2023	17:21:08	0.13	-0.07	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	17:21:14	0.13	-0.06	
3/27/2023	17:21:20	0.13	-0.06	
3/27/2023	17:21:26	0.13	-0.06	
3/27/2023	17:21:32	0.13	-0.07	
3/27/2023	17:21:38	0.13	-0.06	
3/27/2023	17:21:44	0.12	-0.06	
3/27/2023	17:21:50	0.12	-0.06	
3/27/2023	17:21:56	0.12	-0.06	
3/27/2023	17:22:02	0.12	-0.06	
3/27/2023	17:22:08	0.12	-0.06	
3/27/2023	17:22:14	0.12	-0.06	
3/27/2023	17:22:20	0.12	-0.06	
3/27/2023	17:22:26	0.12	-0.06	
3/27/2023	17:22:32	0.12	-0.06	
3/27/2023	17:22:38	0.11	-0.06	
3/27/2023	17:22:44	0.11	-0.06	
3/27/2023	17:22:50	0.11	-0.06	
3/27/2023	17:22:56	0.11	-0.06	
3/27/2023	17:23:02	0.11	-0.06	
3/27/2023	17:23:08	0.11	-0.06	
3/27/2023	17:23:14	0.11	-0.06	
3/27/2023	17:23:20	0.11	-0.06	
3/27/2023	17:23:26	0.11	-0.07	
3/27/2023	17:23:32	0.11	-0.07	
3/27/2023	17:23:38	0.12	3.75	
3/27/2023	17:23:44	1.79	9.78	
3/27/2023	17:23:50	6.37	9.88	
3/27/2023	17:23:56	8.64	9.89	
3/27/2023	17:24:02	9.46	9.88	
3/27/2023	17:24:08	9.69	9.89	
3/27/2023	17:24:14	9.75	9.90	
3/27/2023	17:24:20	9.76	9.91	
3/27/2023	17:24:26	9.77	9.91	
3/27/2023	17:24:32	9.77	9.93	
3/27/2023	17:24:38	9.77	9.94	
3/27/2023	17:24:44	9.77	9.95	
3/27/2023	17:24:50	9.77	9.95	
3/27/2023	17:24:56	9.77	9.95	
3/27/2023	17:25:02	9.77	9.95	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	17:25:08	9.77	9.96	
3/27/2023	17:25:14	9.77	9.97	
3/27/2023	17:25:20	9.77	9.97	
3/27/2023	17:25:26	9.77	9.98	O2/CO2 System Upscales
3/27/2023	17:25:32	9.77	9.98	9.77 10.01
3/27/2023	17:25:38	9.77	9.99	
3/27/2023	17:25:44	9.77	9.99	
3/27/2023	17:25:50	9.77	10.00	
3/27/2023	17:25:56	9.77	10.01	
3/27/2023	17:26:02	9.77	10.01	
3/27/2023	17:26:08	9.77	10.03	
3/27/2023	17:26:14	9.77	10.03	
3/27/2023	17:26:20	9.77	10.04	
3/27/2023	17:26:26	9.77	10.02	
3/27/2023	17:26:32	9.77	10.04	
3/27/2023	17:26:38	9.77	10.06	
3/27/2023	17:26:44	9.77	10.07	
3/27/2023	17:26:50	9.77	10.07	
3/27/2023	17:26:56	9.77	10.09	
3/27/2023	17:27:02	9.77	10.08	
3/27/2023	17:27:08	9.77	10.08	
3/27/2023	17:27:14	9.77	10.09	
3/27/2023	17:27:20	9.77	10.10	
3/27/2023	17:27:26	9.77	10.09	
3/27/2023	17:27:32	9.77	10.11	
3/27/2023	17:27:38	9.77	10.12	
3/27/2023	17:27:44	9.77	10.12	
3/27/2023	17:27:50	9.77	10.13	
3/27/2023	17:27:56	9.77	10.15	
3/27/2023	17:28:02	9.77	10.16	
3/27/2023	17:28:08	9.77	10.17	
3/27/2023	17:28:14	9.77	10.20	
3/27/2023	17:28:20	9.77	10.20	
3/27/2023	17:28:26	9.77	10.19	
3/27/2023	17:28:32	9.77	10.20	
3/27/2023	17:28:38	9.77	10.21	
3/27/2023	17:28:44	9.77	10.20	
3/27/2023	17:28:50	9.77	10.22	
3/27/2023	17:28:56	9.77	10.24	

Bison Engineering, Inc.
Gaseous Testing Summary

Client: **Eagle Foundry Company**
Facility: **Eagle Foundry**
Location: **Eagle Creek, OR**

Source: **Main Foundry BH Outlet**
Test Date: **3/28/2023 - Day 2**

Environmental Conditions / Test Notes: See isokinetic field data sheets.

Testing Personnel: JMK

Run	White Iron Run 2	Steel Alloy Run 2
Date	3/28/2023	3/28/2023
Run Start Time	5:10	10:30
Run End Time	9:10	14:40
Duration, min.	240	250
CO ₂ , %vd	0.15	0.08
O ₂ , %vd	20.91	20.93

Note: Negative concentrations are reported as zero.

Bison Engineering, Inc.
Method 3A Oxygen
Calibration Error, System Bias and System Drift

Client:	Eagle Foundry Company	Source:	Main Foundry BH Outlet	Instrument Make:	Servomex
Facility:	Eagle Foundry	Date:	3/28/2023 - Day 2	Instrument Model:	1440
Location:	Eagle Creek, OR			Instrument Serial #:	01440C1STD/2919

		Initial Values				Final Values						Raw Avg Gas Conc	Corrected Gas Conc	Instrument Cal. Reference Gas
		Analyzer Cal. Response	System Cal Response	Pre test System Cal. Bias		System Cal Response	Post test System Cal. Bias		System Drift		Analyzer Span			
				% of span	pass/fail		% of span	pass/fail	% of span	pass/fail				
White Iron	zero	0.06	0.03	-0.14	pass	0.01	-0.23	pass	0.09	pass				
Run 2	upscale	9.93	9.91	-0.09	pass	9.86	-0.32	pass	0.23	pass	22.03	20.86	20.91	9.898
Mn and CM40 Steel	zero	0.06	0.01	-0.23	pass	0.04	-0.09	pass	0.14	pass				
Run 2	upscale	9.93	9.86	-0.32	pass	9.85	-0.36	pass	0.05	pass	22.03	20.81	20.93	9.898
				< 5%*		< 5%*		< 3%*						

Analyzer Calibration Error	Zero	Mid	High
Calibration Gas Standards	0	9.898	22.03
Cylinder Number		ALM026532	EB0155552
Calibration Gas Analyzer Response	0.06	9.93	22.1
Analyzer Calibration Error	0.27	0.15	0.32
Analyzer Calibration Error < 2%*	pass	pass	pass

System Response Time	
29	seconds

System Leak Check		
	Completed	Pass/Fail
Pre-test	Yes	Pass
Post-test	Yes	Pass

Note: All units are in %

*Or < 0.5 % absolute difference

Bison Engineering, Inc.

Method 3A CO₂

Calibration Error, System Bias and System Drift

Client:	Eagle Foundry Company	Source:	Main Foundry BH Outlet	Instrument Make:	Servomex
Facility:	Eagle Foundry	Date:	3/28/2023 - Day 2	Instrument Model:	1440
Location:	Eagle Creek, OR			Instrument Serial #:	01440C102-2927

		Initial Values				Final Values						Raw Avg Gas Conc	Corrected Gas Conc	Instrument Cal. Reference Gas
		Analyzer Cal. Response	System Cal Response	Pre test System Cal. Bias		System Cal Response	Post test System Cal. Bias		System Drift		Analyzer Span			
				% of span	pass/fail		% of span	pass/fail	% of span	pass/fail				
White Iron	zero	-0.04	0.03	0.32	pass	0.00	0.19	pass	0.14	pass				
Run 2	upscale	9.96	9.83	-0.60	pass	9.86	-0.46	pass	0.14	pass	21.61	0.16	0.15	9.85
Mn and CM40 Steel	zero	-0.04	0.00	0.19	pass	-0.01	0.14	pass	0.05	pass				
Run 2	upscale	9.96	9.86	-0.46	pass	9.88	-0.37	pass	0.09	pass	21.61	0.08	0.08	9.85
				< 5%*		< 5%*		< 3%*						

Analyzer Calibration Error	Zero	Mid	High
Calibration Gas Standards	0	9.85	21.61
Cylinder Number		ALM026532	EB0155552
Calibration Gas Analyzer Response	-0.04	9.96	21.64
Analyzer Calibration Error	-0.19	0.51	0.14
Analyzer Calibration Error < 2%*	pass	pass	pass

System Response Time	
30	seconds

System Leak Check		
	Completed	Pass/Fail
Pre-test	Yes	Pass
Post-test	Yes	Pass

Note: All units are in %

*Or < 0.5 % absolute difference

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 2 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/28/2023	4:35:14	18.30	-0.04	
3/28/2023	4:36:14	0.49	-0.14	
3/28/2023	4:37:14	0.06	-0.04	O2/CO2 Analyzer Zero
3/28/2023	4:38:14	0.13	0.08	
3/28/2023	4:39:14	16.84	19.80	
3/28/2023	4:40:14	22.10	21.64	O2/CO2 Analyzer Span
3/28/2023	4:41:14	22.11	21.87	
3/28/2023	4:42:14	17.85	16.22	
3/28/2023	4:43:14	9.93	10.27	
3/28/2023	4:44:14	9.93	9.96	O2/CO2 Analyzer Mid
3/28/2023	4:45:14	10.23	6.84	
3/28/2023	4:46:14	0.94	0.34	
3/28/2023	4:47:14	0.03	0.03	O2/CO2 System Zero
3/28/2023	4:48:14	6.03	7.06	
3/28/2023	4:49:14	9.91	9.83	O2/CO2 System Upscale
3/28/2023	4:50:14	9.90	4.00	
3/28/2023	4:51:14	14.15	0.42	
White Iron				
3/28/2023	5:10:14	20.91	0.30	Start Run 2
3/28/2023	5:11:14	20.90	0.29	
3/28/2023	5:12:14	20.90	0.30	
3/28/2023	5:13:14	20.90	0.29	
3/28/2023	5:14:14	20.89	0.29	
3/28/2023	5:15:14	20.90	0.28	
3/28/2023	5:16:14	20.90	0.28	
3/28/2023	5:17:14	20.89	0.28	
3/28/2023	5:18:14	20.89	0.28	
3/28/2023	5:19:14	20.89	0.28	
3/28/2023	5:20:14	20.90	0.27	
3/28/2023	5:21:14	20.90	0.27	
3/28/2023	5:22:14	20.90	0.26	
3/28/2023	5:23:14	20.90	0.26	
3/28/2023	5:24:14	20.90	0.25	
3/28/2023	5:25:14	20.89	0.26	
3/28/2023	5:26:14	20.89	0.25	
3/28/2023	5:27:14	20.89	0.26	
3/28/2023	5:28:14	20.89	0.28	
3/28/2023	5:29:14	20.86	0.28	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 2 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/28/2023	5:30:14	20.86	0.26	
3/28/2023	5:31:14	20.88	0.25	
3/28/2023	5:32:14	20.89	0.23	
3/28/2023	5:33:14	20.89	0.22	
3/28/2023	5:34:14	20.90	0.22	
3/28/2023	5:35:14	20.90	0.22	
3/28/2023	5:36:14	20.90	0.21	
3/28/2023	5:37:14	20.90	0.21	
3/28/2023	5:38:14	20.89	0.21	
3/28/2023	5:39:14	20.89	0.20	
3/28/2023	5:40:14	20.89	0.21	
3/28/2023	5:41:14	20.90	0.20	
3/28/2023	5:42:14	20.89	0.20	
3/28/2023	5:43:14	20.90	0.20	
3/28/2023	5:44:14	20.90	0.20	
3/28/2023	5:45:14	20.90	0.19	
3/28/2023	5:46:14	20.89	0.19	
3/28/2023	5:47:14	20.89	0.19	
3/28/2023	5:48:14	20.89	0.18	
3/28/2023	5:49:14	20.89	0.18	
3/28/2023	5:50:14	20.90	0.18	
3/28/2023	5:51:14	20.90	0.18	
3/28/2023	5:52:14	20.89	0.17	
3/28/2023	5:53:14	20.90	0.17	
3/28/2023	5:54:14	20.89	0.18	
3/28/2023	5:55:14	20.89	0.17	
3/28/2023	5:56:14	20.89	0.17	
3/28/2023	5:57:14	20.89	0.17	
3/28/2023	5:58:14	20.89	0.17	
3/28/2023	5:59:14	20.89	0.17	
3/28/2023	6:00:14	20.89	0.17	
3/28/2023	6:01:14	20.89	0.17	
3/28/2023	6:02:14	20.89	0.16	
3/28/2023	6:03:14	20.89	0.16	
3/28/2023	6:04:14	20.89	0.17	
3/28/2023	6:05:14	20.90	0.16	
3/28/2023	6:06:14	20.90	0.17	
3/28/2023	6:07:14	20.89	0.16	
3/28/2023	6:08:14	20.89	0.16	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 2 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/28/2023	6:09:14	20.89	0.15	
3/28/2023	6:10:14	20.89	0.16	
3/28/2023	6:11:14	20.89	0.16	
3/28/2023	6:12:14	20.89	0.16	
3/28/2023	6:13:14	20.89	0.15	
3/28/2023	6:14:14	20.88	0.15	
3/28/2023	6:15:14	20.89	0.15	
3/28/2023	6:16:14	20.89	0.15	
3/28/2023	6:17:14	20.89	0.15	
3/28/2023	6:18:14	20.89	0.14	
3/28/2023	6:19:14	20.89	0.14	
3/28/2023	6:20:14	20.89	0.14	
3/28/2023	6:21:14	20.89	0.14	
3/28/2023	6:22:14	20.89	0.14	
3/28/2023	6:23:14	20.89	0.14	
3/28/2023	6:24:14	20.88	0.14	
3/28/2023	6:25:14	20.88	0.15	
3/28/2023	6:26:14	20.88	0.14	
3/28/2023	6:27:14	20.88	0.14	
3/28/2023	6:28:14	20.88	0.14	
3/28/2023	6:29:14	20.88	0.13	
3/28/2023	6:30:14	20.88	0.16	
3/28/2023	6:31:14	20.88	0.16	
3/28/2023	6:32:14	20.88	0.15	
3/28/2023	6:33:14	20.88	0.15	
3/28/2023	6:34:14	20.88	0.15	
3/28/2023	6:35:14	20.88	0.15	
3/28/2023	6:36:14	20.88	0.15	
3/28/2023	6:37:14	20.87	0.14	
3/28/2023	6:38:14	20.87	0.15	
3/28/2023	6:39:14	20.87	0.15	
3/28/2023	6:40:14	20.87	0.16	
3/28/2023	6:41:14	20.87	0.18	
3/28/2023	6:42:14	20.87	0.19	
3/28/2023	6:43:14	20.87	0.20	
3/28/2023	6:44:14	20.87	0.22	
3/28/2023	6:45:14	20.87	0.23	
3/28/2023	6:46:14	20.87	0.24	
3/28/2023	6:47:14	20.86	0.24	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 2 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/28/2023	6:48:14	20.86	0.22	
3/28/2023	6:49:14	20.87	0.23	
3/28/2023	6:50:14	20.86	0.22	
3/28/2023	6:51:14	20.86	0.23	
3/28/2023	6:52:14	20.86	0.22	
3/28/2023	6:53:14	20.86	0.23	
3/28/2023	6:54:14	20.86	0.22	
3/28/2023	6:55:14	20.86	0.21	
3/28/2023	6:56:14	20.86	0.21	
3/28/2023	6:57:14	20.86	0.21	
3/28/2023	6:58:14	20.85	0.19	
3/28/2023	6:59:14	20.86	0.20	
3/28/2023	7:00:14	20.86	0.20	
3/28/2023	7:01:14	20.86	0.20	
3/28/2023	7:02:14	20.86	0.19	
3/28/2023	7:03:14	20.86	0.18	
3/28/2023	7:04:14	20.86	0.19	
3/28/2023	7:05:14	20.86	0.18	
3/28/2023	7:06:14	20.86	0.19	
3/28/2023	7:07:14	20.86	0.18	
3/28/2023	7:08:14	20.86	0.19	
3/28/2023	7:09:14	20.85	0.18	
3/28/2023	7:10:14	20.85	0.20	
3/28/2023	7:11:14	20.85	0.20	
3/28/2023	7:12:14	20.84	0.20	
3/28/2023	7:13:14	20.84	0.18	
3/28/2023	7:14:14	20.84	0.19	
3/28/2023	7:15:14	20.85	0.18	
3/28/2023	7:16:14	20.85	0.18	
3/28/2023	7:17:14	20.85	0.17	
3/28/2023	7:18:14	20.85	0.17	
3/28/2023	7:19:14	20.85	0.16	
3/28/2023	7:20:14	20.85	0.17	
3/28/2023	7:21:14	20.85	0.16	
3/28/2023	7:22:14	20.85	0.16	
3/28/2023	7:23:14	20.85	0.16	
3/28/2023	7:24:14	20.85	0.16	
3/28/2023	7:25:14	20.85	0.16	
3/28/2023	7:26:14	20.85	0.16	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 2 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/28/2023	7:27:14	20.85	0.16	
3/28/2023	7:28:14	20.85	0.15	
3/28/2023	7:29:14	20.85	0.15	
3/28/2023	7:30:14	20.84	0.13	
3/28/2023	7:31:14	20.84	0.14	
3/28/2023	7:32:14	20.84	0.14	
3/28/2023	7:33:14	20.84	0.15	
3/28/2023	7:34:14	20.84	0.14	
3/28/2023	7:35:14	20.84	0.14	
3/28/2023	7:36:14	20.84	0.13	
3/28/2023	7:37:14	20.84	0.13	
3/28/2023	7:38:14	20.84	0.13	
3/28/2023	7:39:14	20.84	0.14	
3/28/2023	7:40:14	20.84	0.13	
3/28/2023	7:41:14	20.84	0.13	
3/28/2023	7:42:14	20.84	0.13	
3/28/2023	7:43:14	20.84	0.14	
3/28/2023	7:44:14	20.85	0.14	
3/28/2023	7:45:14	20.85	0.14	
3/28/2023	7:46:14	20.85	0.14	
3/28/2023	7:47:14	20.85	0.15	
3/28/2023	7:48:14	20.85	0.15	
3/28/2023	7:49:14	20.84	0.16	
3/28/2023	7:50:14	20.84	0.14	
3/28/2023	7:51:14	20.84	0.15	
3/28/2023	7:52:14	20.84	0.14	
3/28/2023	7:53:14	20.84	0.14	
3/28/2023	7:54:14	20.84	0.13	
3/28/2023	7:55:14	20.84	0.14	
3/28/2023	7:56:14	20.84	0.13	
3/28/2023	7:57:14	20.84	0.13	
3/28/2023	7:58:14	20.84	0.12	
3/28/2023	7:59:14	20.84	0.12	
3/28/2023	8:00:14	20.84	0.12	
3/28/2023	8:01:14	20.84	0.12	
3/28/2023	8:02:14	20.84	0.12	
3/28/2023	8:03:14	20.84	0.12	
3/28/2023	8:04:14	20.84	0.10	
3/28/2023	8:05:14	20.84	0.11	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 2 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/28/2023	8:06:14	20.84	0.11	
3/28/2023	8:07:14	20.84	0.11	
3/28/2023	8:08:14	20.84	0.10	
3/28/2023	8:09:14	20.83	0.11	
3/28/2023	8:10:14	20.83	0.10	
3/28/2023	8:11:14	20.84	0.10	
3/28/2023	8:12:14	20.83	0.10	
3/28/2023	8:13:14	20.83	0.11	
3/28/2023	8:14:14	20.83	0.10	
3/28/2023	8:15:14	20.83	0.11	
3/28/2023	8:16:14	20.83	0.11	
3/28/2023	8:17:14	20.83	0.11	
3/28/2023	8:18:14	20.83	0.10	
3/28/2023	8:19:14	20.83	0.10	
3/28/2023	8:20:14	20.83	0.10	
3/28/2023	8:21:14	20.83	0.11	
3/28/2023	8:22:14	20.83	0.11	
3/28/2023	8:23:14	20.83	0.11	
3/28/2023	8:24:14	20.83	0.10	
3/28/2023	8:25:14	20.83	0.11	
3/28/2023	8:26:14	20.82	0.10	
3/28/2023	8:27:14	20.82	0.10	
3/28/2023	8:28:14	20.82	0.10	
3/28/2023	8:29:14	20.82	0.10	
3/28/2023	8:30:14	20.82	0.10	
3/28/2023	8:31:14	20.82	0.10	
3/28/2023	8:32:14	20.82	0.10	
3/28/2023	8:33:14	20.82	0.09	
3/28/2023	8:34:14	20.82	0.08	
3/28/2023	8:35:14	20.82	0.08	
3/28/2023	8:36:14	20.82	0.08	
3/28/2023	8:37:14	20.82	0.09	
3/28/2023	8:38:14	20.82	0.08	
3/28/2023	8:39:14	20.82	0.09	
3/28/2023	8:40:14	20.82	0.08	
3/28/2023	8:41:14	20.82	0.09	
3/28/2023	8:42:14	20.82	0.08	
3/28/2023	8:43:14	20.82	0.09	
3/28/2023	8:44:14	20.82	0.08	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 2 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/28/2023	8:45:14	20.83	0.09	
3/28/2023	8:46:14	20.82	0.08	
3/28/2023	8:47:14	20.83	0.09	
3/28/2023	8:48:14	20.83	0.09	
3/28/2023	8:49:14	20.82	0.09	
3/28/2023	8:50:14	20.83	0.08	
3/28/2023	8:51:14	20.83	0.10	
3/28/2023	8:52:14	20.83	0.09	
3/28/2023	8:53:14	20.83	0.09	
3/28/2023	8:54:14	20.83	0.09	
3/28/2023	8:55:14	20.83	0.09	
3/28/2023	8:56:14	20.83	0.09	
3/28/2023	8:57:14	20.82	0.09	
3/28/2023	8:58:14	20.83	0.08	
3/28/2023	8:59:14	20.82	0.09	
3/28/2023	9:00:14	20.82	0.08	
3/28/2023	9:01:14	20.83	0.08	
3/28/2023	9:02:14	20.83	0.08	
3/28/2023	9:03:14	20.82	0.08	
3/28/2023	9:04:14	20.82	0.08	
3/28/2023	9:05:14	20.82	0.08	
3/28/2023	9:06:14	20.82	0.07	
3/28/2023	9:07:14	20.82	0.08	
3/28/2023	9:08:14	20.82	0.07	
3/28/2023	9:09:14	20.82	0.08	
3/28/2023	9:10:14	20.82	0.08	End Run 2 White Iron
		20.86	0.16	Average
3/28/2023	9:11:14	20.82	0.08	
3/28/2023	9:12:14	20.82	0.08	
3/28/2023	9:13:14	20.82	0.09	
3/28/2023	9:14:14	15.13	0.04	
3/28/2023	9:15:14	0.01	0.00	O2/CO2 System Zero
3/28/2023	9:16:14	6.17	6.81	
3/28/2023	9:17:14	9.86	9.88	
3/28/2023	9:18:14	9.86	9.86	O2/CO2 System Upscale
3/28/2023	9:19:14	9.88	3.90	
3/28/2023	9:20:14	12.32	0.18	
3/28/2023	9:21:14	18.15	0.17	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 2 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/28/2023	10:29:14	20.87	0.16	
				Mn and CM40 Steel
3/28/2023	10:30:14	20.86	0.16	Start Run 2
3/28/2023	10:31:14	20.86	0.17	
3/28/2023	10:32:14	20.86	0.16	
3/28/2023	10:33:14	20.86	0.16	
3/28/2023	10:34:14	20.86	0.16	
3/28/2023	10:35:14	20.86	0.15	
3/28/2023	10:36:14	20.86	0.15	
3/28/2023	10:37:14	20.86	0.15	
3/28/2023	10:38:14	20.85	0.15	
3/28/2023	10:39:14	20.85	0.15	
3/28/2023	10:40:14	20.86	0.15	
3/28/2023	10:41:14	20.85	0.14	
3/28/2023	10:42:14	20.85	0.14	
3/28/2023	10:43:14	20.85	0.14	
3/28/2023	10:44:14	20.85	0.14	
3/28/2023	10:45:14	20.85	0.13	
3/28/2023	10:46:14	20.85	0.13	
3/28/2023	10:47:14	20.85	0.13	
3/28/2023	10:48:14	20.85	0.12	
3/28/2023	10:49:14	20.85	0.12	
3/28/2023	10:50:14	20.85	0.13	
3/28/2023	10:51:14	20.85	0.12	
3/28/2023	10:52:14	20.85	0.12	
3/28/2023	10:53:14	20.85	0.12	
3/28/2023	10:54:14	20.85	0.12	
3/28/2023	10:55:14	20.85	0.12	
3/28/2023	10:56:14	20.85	0.12	
3/28/2023	10:57:14	20.84	0.13	
3/28/2023	10:58:14	20.84	0.13	
3/28/2023	10:59:14	20.84	0.13	
3/28/2023	11:00:14	20.84	0.13	
3/28/2023	11:01:14	20.84	0.13	
3/28/2023	11:02:14	20.84	0.13	
3/28/2023	11:03:14	20.84	0.13	
3/28/2023	11:04:14	20.84	0.12	
3/28/2023	11:05:14	20.84	0.14	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 2 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/28/2023	11:06:14	20.84	0.12	
3/28/2023	11:07:14	20.84	0.13	
3/28/2023	11:08:14	20.84	0.13	
3/28/2023	11:09:14	20.84	0.13	
3/28/2023	11:10:14	20.83	0.12	
3/28/2023	11:11:14	20.84	0.12	
3/28/2023	11:12:14	20.83	0.12	
3/28/2023	11:13:14	20.84	0.11	
3/28/2023	11:14:14	20.84	0.11	
3/28/2023	11:15:14	20.84	0.11	
3/28/2023	11:16:14	20.84	0.11	
3/28/2023	11:17:14	20.84	0.10	
3/28/2023	11:18:14	20.84	0.10	
3/28/2023	11:19:14	20.84	0.10	
3/28/2023	11:20:14	20.84	0.10	
3/28/2023	11:21:14	20.84	0.10	
3/28/2023	11:22:14	20.84	0.09	
3/28/2023	11:23:14	20.84	0.09	
3/28/2023	11:24:14	20.84	0.09	
3/28/2023	11:25:14	20.84	0.10	
3/28/2023	11:26:14	20.84	0.09	
3/28/2023	11:27:14	20.84	0.10	
3/28/2023	11:28:14	20.84	0.09	
3/28/2023	11:29:14	20.84	0.09	
3/28/2023	11:30:14	20.84	0.09	
3/28/2023	11:31:14	20.84	0.10	
3/28/2023	11:32:14	20.84	0.09	
3/28/2023	11:33:14	20.84	0.09	
3/28/2023	11:34:14	20.84	0.09	
3/28/2023	11:35:14	20.84	0.10	
3/28/2023	11:36:14	20.83	0.09	
3/28/2023	11:37:14	20.84	0.10	
3/28/2023	11:38:14	20.83	0.09	
3/28/2023	11:39:14	20.83	0.10	
3/28/2023	11:40:14	20.83	0.09	
3/28/2023	11:41:14	20.83	0.10	
3/28/2023	11:42:14	20.83	0.09	
3/28/2023	11:43:14	20.83	0.09	
3/28/2023	11:44:14	20.83	0.08	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 2 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/28/2023	11:45:14	20.83	0.08	
3/28/2023	11:46:14	20.83	0.09	
3/28/2023	11:47:14	20.83	0.09	
3/28/2023	11:48:14	20.83	0.08	
3/28/2023	11:49:14	20.83	0.08	
3/28/2023	11:50:14	20.82	0.08	
3/28/2023	11:51:14	20.82	0.08	
3/28/2023	11:52:14	20.82	0.07	
3/28/2023	11:53:14	20.82	0.08	
3/28/2023	11:54:14	20.83	0.06	
3/28/2023	11:55:14	20.82	0.07	
3/28/2023	11:56:14	20.82	0.07	
3/28/2023	11:57:14	20.82	0.07	
3/28/2023	11:58:14	20.82	0.07	
3/28/2023	11:59:14	20.82	0.08	
3/28/2023	12:00:14	20.82	0.09	
3/28/2023	12:01:14	20.81	0.09	
3/28/2023	12:02:14	20.82	0.08	
3/28/2023	12:03:14	20.81	0.09	
3/28/2023	12:04:14	20.81	0.09	
3/28/2023	12:05:14	20.81	0.08	
3/28/2023	12:06:14	20.81	0.09	
3/28/2023	12:07:14	20.81	0.08	
3/28/2023	12:08:14	20.81	0.08	
3/28/2023	12:09:14	20.80	0.08	
3/28/2023	12:10:14	20.80	0.07	
3/28/2023	12:11:14	20.80	0.08	
3/28/2023	12:12:14	20.80	0.07	
3/28/2023	12:13:14	20.80	0.07	
3/28/2023	12:14:14	20.80	0.06	
3/28/2023	12:15:14	20.81	0.06	
3/28/2023	12:16:14	20.80	0.06	
3/28/2023	12:17:14	20.80	0.06	
3/28/2023	12:18:14	20.80	0.06	
3/28/2023	12:19:14	20.80	0.06	
3/28/2023	12:20:14	20.81	0.07	
3/28/2023	12:21:14	20.80	0.07	
3/28/2023	12:22:14	20.81	0.07	
3/28/2023	12:23:14	20.81	0.07	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 2 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/28/2023	12:24:14	20.81	0.06	
3/28/2023	12:25:14	20.80	0.06	
3/28/2023	12:26:14	20.80	0.05	
3/28/2023	12:27:14	20.80	0.06	
3/28/2023	12:28:14	20.80	0.06	
3/28/2023	12:29:14	20.80	0.06	
3/28/2023	12:30:14	20.80	0.05	
3/28/2023	12:31:14	20.80	0.04	
3/28/2023	12:32:14	20.80	0.05	
3/28/2023	12:33:14	20.80	0.05	
3/28/2023	12:34:14	20.80	0.05	
3/28/2023	12:35:14	20.80	0.05	
3/28/2023	12:36:14	20.80	0.06	
3/28/2023	12:37:14	20.80	0.06	
3/28/2023	12:38:14	20.80	0.06	
3/28/2023	12:39:14	20.79	0.06	
3/28/2023	12:40:14	20.80	0.06	
3/28/2023	12:41:14	20.79	0.05	
3/28/2023	12:42:14	20.80	0.06	
3/28/2023	12:43:14	20.79	0.05	
3/28/2023	12:44:14	20.79	0.05	
3/28/2023	12:45:14	20.79	0.04	
3/28/2023	12:46:14	20.79	0.05	
3/28/2023	12:47:14	20.80	0.05	
3/28/2023	12:48:14	20.79	0.05	
3/28/2023	12:49:14	20.80	0.04	
3/28/2023	12:50:14	20.79	0.04	
3/28/2023	12:51:14	20.79	0.04	
3/28/2023	12:52:14	20.80	0.03	
3/28/2023	12:53:14	20.80	0.04	
3/28/2023	12:54:14	20.80	0.05	
3/28/2023	12:55:14	20.80	0.04	
3/28/2023	12:56:14	20.80	0.03	
3/28/2023	12:57:14	20.80	0.03	
3/28/2023	12:58:14	20.80	0.03	
3/28/2023	12:59:14	20.80	0.03	
3/28/2023	13:00:14	20.80	0.03	
3/28/2023	13:01:14	20.79	0.04	
3/28/2023	13:02:14	20.79	0.04	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 2 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/28/2023	13:03:14	20.79	0.03	
3/28/2023	13:04:14	20.79	0.03	
3/28/2023	13:05:14	20.79	0.04	
3/28/2023	13:06:14	20.79	0.03	
3/28/2023	13:07:14	20.79	0.04	
3/28/2023	13:08:14	20.79	0.04	
3/28/2023	13:09:14	20.79	0.05	
3/28/2023	13:10:14	20.79	0.05	
3/28/2023	13:11:14	20.79	0.05	
3/28/2023	13:12:14	20.79	0.04	
3/28/2023	13:13:14	20.79	0.05	
3/28/2023	13:14:14	20.79	0.04	
3/28/2023	13:15:14	20.79	0.04	
3/28/2023	13:16:14	20.79	0.04	
3/28/2023	13:17:14	20.79	0.05	
3/28/2023	13:18:14	20.79	0.05	
3/28/2023	13:19:14	20.78	0.04	
3/28/2023	13:20:14	20.79	0.04	
3/28/2023	13:21:14	20.79	0.04	
3/28/2023	13:22:14	20.79	0.04	
3/28/2023	13:23:14	20.78	0.05	
3/28/2023	13:24:14	20.79	0.05	
3/28/2023	13:25:14	20.78	0.05	
3/28/2023	13:26:14	20.78	0.05	
3/28/2023	13:27:14	20.78	0.05	
3/28/2023	13:28:14	20.78	0.05	
3/28/2023	13:29:14	20.78	0.04	
3/28/2023	13:30:14	20.78	0.05	
3/28/2023	13:31:14	20.78	0.04	
3/28/2023	13:32:14	20.78	0.05	
3/28/2023	13:33:14	20.78	0.04	
3/28/2023	13:34:14	20.78	0.05	
3/28/2023	13:35:14	20.78	0.06	
3/28/2023	13:36:14	20.78	0.06	
3/28/2023	13:37:14	20.78	0.04	
3/28/2023	13:38:14	20.78	0.05	
3/28/2023	13:39:14	20.78	0.05	
3/28/2023	13:40:14	20.78	0.06	
3/28/2023	13:41:14	20.77	0.06	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 2 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/28/2023	13:42:14	20.77	0.06	
3/28/2023	13:43:14	20.78	0.06	
3/28/2023	13:44:14	20.78	0.06	
3/28/2023	13:45:14	20.78	0.07	
3/28/2023	13:46:14	20.78	0.06	
3/28/2023	13:47:14	20.78	0.07	
3/28/2023	13:48:14	20.78	0.07	
3/28/2023	13:49:14	20.78	0.08	
3/28/2023	13:50:14	20.78	0.07	
3/28/2023	13:51:14	20.78	0.08	
3/28/2023	13:52:14	20.78	0.07	
3/28/2023	13:53:14	20.78	0.08	
3/28/2023	13:54:14	20.78	0.07	
3/28/2023	13:55:14	20.78	0.07	
3/28/2023	13:56:14	20.78	0.07	
3/28/2023	13:57:14	20.78	0.07	
3/28/2023	13:58:14	20.77	0.08	
3/28/2023	13:59:14	20.77	0.08	
3/28/2023	14:00:14	20.77	0.07	
3/28/2023	14:01:14	20.78	0.08	
3/28/2023	14:02:14	20.78	0.08	
3/28/2023	14:03:14	20.78	0.08	
3/28/2023	14:04:14	20.78	0.08	
3/28/2023	14:05:14	20.78	0.08	
3/28/2023	14:06:14	20.78	0.08	
3/28/2023	14:07:14	20.78	0.10	
3/28/2023	14:08:14	20.78	0.09	
3/28/2023	14:09:14	20.78	0.09	
3/28/2023	14:10:14	20.78	0.09	
3/28/2023	14:11:14	20.78	0.10	
3/28/2023	14:12:14	20.78	0.09	
3/28/2023	14:13:14	20.78	0.10	
3/28/2023	14:14:14	20.78	0.09	
3/28/2023	14:15:14	20.78	0.09	
3/28/2023	14:16:14	20.79	0.09	
3/28/2023	14:17:14	20.78	0.10	
3/28/2023	14:18:14	20.78	0.08	
3/28/2023	14:19:14	20.79	0.08	
3/28/2023	14:20:14	20.79	0.08	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 2 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/28/2023	14:21:14	20.79	0.08	
3/28/2023	14:22:14	20.79	0.07	
3/28/2023	14:23:14	20.79	0.07	
3/28/2023	14:24:14	20.79	0.07	
3/28/2023	14:25:14	20.79	0.07	
3/28/2023	14:26:14	20.79	0.06	
3/28/2023	14:27:14	20.79	0.06	
3/28/2023	14:28:14	20.79	0.06	
3/28/2023	14:29:14	20.79	0.06	
3/28/2023	14:30:14	20.79	0.06	
3/28/2023	14:31:14	20.79	0.06	
3/28/2023	14:32:14	20.79	0.05	
3/28/2023	14:33:14	20.79	0.06	
3/28/2023	14:34:14	20.79	0.05	
3/28/2023	14:35:14	20.79	0.05	
3/28/2023	14:36:14	20.79	0.05	
3/28/2023	14:37:14	20.79	0.06	
3/28/2023	14:38:14	20.79	0.06	
3/28/2023	14:39:14	20.79	0.05	
3/28/2023	14:40:14	20.79	0.05	End Run 2 Mn and CM40 Steel
		20.81	0.08	Average
3/28/2023	14:41:14	16.29	0.03	
3/28/2023	14:42:14	0.04	-0.01	O2/CO2 System Zero
3/28/2023	14:43:14	3.65	4.30	
3/28/2023	14:44:14	9.85	9.88	O2/CO2 System Upscale
3/28/2023	14:45:14	9.87	5.15	

Bison Engineering, Inc.
Gaseous Testing Summary

Client: **Eagle Foundry Company**
Facility: **Eagle Foundry**
Location: **Eagle Creek, OR**

Source: **Main Foundry BH Outlet**
Test Date: **3/29/2023 - Day 3**

Environmental Conditions / Test Notes: See isokinetic field data sheets.
Testing Personnel: JMK

Run	White Iron Run 3	Steel Alloy Run 3
Date	3/29/2023	3/29/2023
Run Start Time	5:15	10:35
Run End Time	9:15	14:45
Duration, min.	240	250
CO ₂ , %vd	0.10	0.08
O ₂ , %vd	20.59	20.98

Note: Negative concentrations are reported as zero.

Bison Engineering, Inc.
Method 3A Oxygen
Calibration Error, System Bias and System Drift

Client:	Eagle Foundry Company	Source:	Main Foundry BH Outlet	Instrument Make:	Servomex
Facility:	Eagle Foundry	Date:	3/29/2023 - Day 3	Instrument Model:	1440
Location:	Eagle Creek, OR			Instrument Serial #:	01440C1STD/2919

		Initial Values				Final Values						Raw Avg Gas Conc	Corrected Gas Conc	Instrument Cal. Reference Gas
		Analyzer Cal. Response	System Cal Response	Pre test System Cal. Bias		System Cal Response	Post test System Cal. Bias		System Drift		Analyzer Span			
				% of span	pass/fail		% of span	pass/fail	% of span	pass/fail				
White Iron	zero	0.09	0.07	-0.09	pass	0.04	-0.23	pass	0.14	pass				
Run 3	upscale	9.87	9.89	0.09	pass	9.84	-0.14	pass	0.23	pass	22.03	20.46	20.59	9.898
Mn and CM40 Steel	zero	0.09	0.04	-0.23	pass	0.04	-0.23	pass	0.00	pass				
Run 3	upscale	9.87	9.84	-0.14	pass	9.88	0.05	pass	0.18	pass	22.03	20.85	20.98	9.898
				< 5%*				< 5%*		< 3%*				

Analyzer Calibration Error	Zero	Mid	High
Calibration Gas Standards	0	9.898	22.03
Cylinder Number		ALM026532	EB0155552
Calibration Gas Analyzer Response	0.09	9.87	22.08
Analyzer Calibration Error	0.41	-0.13	0.23
Analyzer Calibration Error < 2%*	pass	pass	pass

System Response Time	
30	seconds

System Leak Check		
	Completed	Pass/Fail
Pre-test	Yes	Pass
Post-test	Yes	Pass

Note: All units are in %

*Or < 0.5 % absolute difference

Bison Engineering, Inc.

Method 3A CO₂

Calibration Error, System Bias and System Drift

Client:	Eagle Foundry Company	Source:	Main Foundry BH Outlet	Instrument Make:	Servomex
Facility:	Eagle Foundry	Date:	3/29/2023 - Day 3	Instrument Model:	1440
Location:	Eagle Creek, OR			Instrument Serial #:	01440C102-2927

		Initial Values				Final Values						Raw Avg Gas Conc	Corrected Gas Conc	Instrument Cal. Reference Gas
		Analyzer Cal. Response	System Cal Response	Pre test System Cal. Bias		System Cal Response	Post test System Cal. Bias		System Drift		Analyzer Span			
				% of span	pass/fail		% of span	pass/fail	% of span	pass/fail				
White Iron	zero	0.02	0.06	0.19	pass	-0.01	-0.14	pass	0.32	pass				
Run 3	upscale	9.83	9.86	0.14	pass	9.84	0.05	pass	0.09	pass	21.61	0.12	0.10	9.85
Mn and CM40 Steel	zero	0.02	-0.01	-0.14	pass	0.03	0.05	pass	0.19	pass				
Run 3	upscale	9.83	9.84	0.05	pass	9.82	-0.05	pass	0.09	pass	21.61	0.09	0.08	9.85
				< 5%*		< 5%*		< 3%*						

Analyzer Calibration Error	Zero	Mid	High
Calibration Gas Standards	0	9.85	21.61
Cylinder Number		ALM026532	EB0155552
Calibration Gas Analyzer Response	0.02	9.83	21.59
Analyzer Calibration Error	0.09	-0.09	-0.09
Analyzer Calibration Error < 2%*	pass	pass	pass

System Response Time	
30	seconds

System Leak Check		
	Completed	Pass/Fail
Pre-test	Yes	Pass
Post-test	Yes	Pass

Note: All units are in %

*Or < 0.5 % absolute difference

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 3 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/29/2023	3:56:27	21.40	0.08	
3/29/2023	3:57:27	15.52	0.06	
3/29/2023	3:58:27	10.57	0.06	
3/29/2023	3:59:27	0.09	0.02	O2/CO2 Analyzer Zero
3/29/2023	4:00:27	10.12	12.02	
3/29/2023	4:01:27	22.08	21.59	O2/CO2 Analyzer Span
3/29/2023	4:02:27	13.74	11.66	
3/29/2023	4:03:27	9.87	9.83	O2/CO2 Analyzer Mid
3/29/2023	4:04:27	4.90	3.78	
3/29/2023	4:05:27	0.07	0.06	O2/CO2 System Zero
3/29/2023	4:06:27	3.98	5.27	
3/29/2023	4:07:27	9.89	9.86	O2/CO2 System Upscale
3/29/2023	4:08:27	20.80	0.26	
3/29/2023	4:09:27	20.87	0.26	
White Iron				
3/29/2023	5:15:27	20.49	0.19	Start Run 3
3/29/2023	5:16:27	20.49	0.20	
3/29/2023	5:17:27	20.49	0.20	
3/29/2023	5:18:27	20.48	0.20	
3/29/2023	5:19:27	20.48	0.20	
3/29/2023	5:20:27	20.48	0.20	
3/29/2023	5:21:27	20.48	0.19	
3/29/2023	5:22:27	20.48	0.20	
3/29/2023	5:23:27	20.48	0.19	
3/29/2023	5:24:27	20.47	0.20	
3/29/2023	5:25:27	20.47	0.19	
3/29/2023	5:26:27	20.48	0.19	
3/29/2023	5:27:27	20.48	0.19	
3/29/2023	5:28:27	20.48	0.18	
3/29/2023	5:29:27	20.48	0.19	
3/29/2023	5:30:27	20.48	0.18	
3/29/2023	5:31:27	20.48	0.18	
3/29/2023	5:32:27	20.48	0.17	
3/29/2023	5:33:27	20.47	0.17	
3/29/2023	5:34:27	20.47	0.17	
3/29/2023	5:35:27	20.47	0.16	
3/29/2023	5:36:27	20.47	0.15	
3/29/2023	5:37:27	20.47	0.15	
3/29/2023	5:38:27	20.47	0.14	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 3 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/29/2023	5:39:27	20.47	0.14	
3/29/2023	5:40:27	20.47	0.14	
3/29/2023	5:41:27	20.47	0.14	
3/29/2023	5:42:27	20.47	0.14	
3/29/2023	5:43:27	20.47	0.13	
3/29/2023	5:44:27	20.47	0.14	
3/29/2023	5:45:27	20.47	0.14	
3/29/2023	5:46:27	20.47	0.14	
3/29/2023	5:47:27	20.47	0.13	
3/29/2023	5:48:27	20.47	0.14	
3/29/2023	5:49:27	20.47	0.13	
3/29/2023	5:50:27	20.46	0.14	
3/29/2023	5:51:27	20.46	0.13	
3/29/2023	5:52:27	20.46	0.13	
3/29/2023	5:53:27	20.46	0.13	
3/29/2023	5:54:27	20.47	0.13	
3/29/2023	5:55:27	20.47	0.13	
3/29/2023	5:56:27	20.46	0.14	
3/29/2023	5:57:27	20.46	0.13	
3/29/2023	5:58:27	20.46	0.14	
3/29/2023	5:59:27	20.46	0.14	
3/29/2023	6:00:27	20.46	0.13	
3/29/2023	6:01:27	20.47	0.14	
3/29/2023	6:02:27	20.46	0.13	
3/29/2023	6:03:27	20.46	0.13	
3/29/2023	6:04:27	20.47	0.13	
3/29/2023	6:05:27	20.47	0.12	
3/29/2023	6:06:27	20.47	0.12	
3/29/2023	6:07:27	20.47	0.12	
3/29/2023	6:08:27	20.46	0.12	
3/29/2023	6:09:27	20.47	0.12	
3/29/2023	6:10:27	20.46	0.12	
3/29/2023	6:11:27	20.47	0.12	
3/29/2023	6:12:27	20.47	0.12	
3/29/2023	6:13:27	20.47	0.12	
3/29/2023	6:14:27	20.47	0.12	
3/29/2023	6:15:27	20.47	0.11	
3/29/2023	6:16:27	20.47	0.12	
3/29/2023	6:17:27	20.46	0.12	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 3 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/29/2023	6:18:27	20.46	0.12	
3/29/2023	6:19:27	20.46	0.12	
3/29/2023	6:20:27	20.46	0.12	
3/29/2023	6:21:27	20.46	0.12	
3/29/2023	6:22:27	20.46	0.12	
3/29/2023	6:23:27	20.46	0.12	
3/29/2023	6:24:27	20.46	0.12	
3/29/2023	6:25:27	20.46	0.12	
3/29/2023	6:26:27	20.46	0.12	
3/29/2023	6:27:27	20.46	0.11	
3/29/2023	6:28:27	20.46	0.12	
3/29/2023	6:29:27	20.46	0.12	
3/29/2023	6:30:27	20.46	0.13	
3/29/2023	6:31:27	20.46	0.13	
3/29/2023	6:32:27	20.46	0.13	
3/29/2023	6:33:27	20.46	0.14	
3/29/2023	6:34:27	20.45	0.13	
3/29/2023	6:35:27	20.45	0.13	
3/29/2023	6:36:27	20.45	0.13	
3/29/2023	6:37:27	20.45	0.13	
3/29/2023	6:38:27	20.45	0.13	
3/29/2023	6:39:27	20.45	0.13	
3/29/2023	6:40:27	20.45	0.13	
3/29/2023	6:41:27	20.45	0.14	
3/29/2023	6:42:27	20.45	0.13	
3/29/2023	6:43:27	20.45	0.13	
3/29/2023	6:44:27	20.45	0.13	
3/29/2023	6:45:27	20.45	0.13	
3/29/2023	6:46:27	20.45	0.12	
3/29/2023	6:47:27	20.45	0.12	
3/29/2023	6:48:27	20.45	0.11	
3/29/2023	6:49:27	20.46	0.11	
3/29/2023	6:50:27	20.46	0.11	
3/29/2023	6:51:27	20.46	0.11	
3/29/2023	6:52:27	20.46	0.11	
3/29/2023	6:53:27	20.46	0.11	
3/29/2023	6:54:27	20.46	0.11	
3/29/2023	6:55:27	20.45	0.11	
3/29/2023	6:56:27	20.45	0.12	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 3 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/29/2023	6:57:27	20.45	0.11	
3/29/2023	6:58:27	20.45	0.11	
3/29/2023	6:59:27	20.45	0.11	
3/29/2023	7:00:27	20.45	0.12	
3/29/2023	7:01:27	20.45	0.12	
3/29/2023	7:02:27	20.45	0.12	
3/29/2023	7:03:27	20.45	0.12	
3/29/2023	7:04:27	20.45	0.13	
3/29/2023	7:05:27	20.45	0.13	
3/29/2023	7:06:27	20.44	0.14	
3/29/2023	7:07:27	20.45	0.13	
3/29/2023	7:08:27	20.45	0.13	
3/29/2023	7:09:27	20.45	0.12	
3/29/2023	7:10:27	20.45	0.13	
3/29/2023	7:11:27	20.45	0.13	
3/29/2023	7:12:27	20.45	0.13	
3/29/2023	7:13:27	20.45	0.12	
3/29/2023	7:14:27	20.45	0.13	
3/29/2023	7:15:27	20.45	0.13	
3/29/2023	7:16:27	20.45	0.13	
3/29/2023	7:17:27	20.45	0.12	
3/29/2023	7:18:27	20.45	0.12	
3/29/2023	7:19:27	20.45	0.12	
3/29/2023	7:20:27	20.45	0.11	
3/29/2023	7:21:27	20.45	0.11	
3/29/2023	7:22:27	20.45	0.10	
3/29/2023	7:23:27	20.45	0.11	
3/29/2023	7:24:27	20.45	0.10	
3/29/2023	7:25:27	20.45	0.10	
3/29/2023	7:26:27	20.45	0.10	
3/29/2023	7:27:27	20.45	0.11	
3/29/2023	7:28:27	20.45	0.11	
3/29/2023	7:29:27	20.44	0.11	
3/29/2023	7:30:27	20.44	0.11	
3/29/2023	7:31:27	20.45	0.11	
3/29/2023	7:32:27	20.45	0.11	
3/29/2023	7:33:27	20.45	0.11	
3/29/2023	7:34:27	20.45	0.11	
3/29/2023	7:35:27	20.45	0.11	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 3 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/29/2023	7:36:27	20.45	0.11	
3/29/2023	7:37:27	20.45	0.12	
3/29/2023	7:38:27	20.45	0.12	
3/29/2023	7:39:27	20.45	0.13	
3/29/2023	7:40:27	20.45	0.13	
3/29/2023	7:41:27	20.45	0.13	
3/29/2023	7:42:27	20.45	0.13	
3/29/2023	7:43:27	20.44	0.13	
3/29/2023	7:44:27	20.45	0.12	
3/29/2023	7:45:27	20.45	0.11	
3/29/2023	7:46:27	20.45	0.11	
3/29/2023	7:47:27	20.45	0.12	
3/29/2023	7:48:27	20.45	0.12	
3/29/2023	7:49:27	20.45	0.11	
3/29/2023	7:50:27	20.45	0.12	
3/29/2023	7:51:27	20.44	0.12	
3/29/2023	7:52:27	20.45	0.12	
3/29/2023	7:53:27	20.45	0.11	
3/29/2023	7:54:27	20.45	0.11	
3/29/2023	7:55:27	20.45	0.10	
3/29/2023	7:56:27	20.45	0.10	
3/29/2023	7:57:27	20.45	0.10	
3/29/2023	7:58:27	20.45	0.11	
3/29/2023	7:59:27	20.45	0.11	
3/29/2023	8:00:27	20.45	0.12	
3/29/2023	8:01:27	20.45	0.11	
3/29/2023	8:02:27	20.45	0.11	
3/29/2023	8:03:27	20.45	0.11	
3/29/2023	8:04:27	20.45	0.11	
3/29/2023	8:05:27	20.45	0.11	
3/29/2023	8:06:27	20.45	0.11	
3/29/2023	8:07:27	20.45	0.10	
3/29/2023	8:08:27	20.46	0.11	
3/29/2023	8:09:27	20.45	0.10	
3/29/2023	8:10:27	20.45	0.11	
3/29/2023	8:11:27	20.45	0.10	
3/29/2023	8:12:27	20.46	0.11	
3/29/2023	8:13:27	20.45	0.10	
3/29/2023	8:14:27	20.45	0.11	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 3 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/29/2023	8:15:27	20.45	0.10	
3/29/2023	8:16:27	20.45	0.10	
3/29/2023	8:17:27	20.45	0.10	
3/29/2023	8:18:27	20.45	0.10	
3/29/2023	8:19:27	20.45	0.10	
3/29/2023	8:20:27	20.45	0.10	
3/29/2023	8:21:27	20.45	0.10	
3/29/2023	8:22:27	20.45	0.10	
3/29/2023	8:23:27	20.45	0.10	
3/29/2023	8:24:27	20.45	0.10	
3/29/2023	8:25:27	20.45	0.10	
3/29/2023	8:26:27	20.45	0.10	
3/29/2023	8:27:27	20.45	0.09	
3/29/2023	8:28:27	20.45	0.09	
3/29/2023	8:29:27	20.45	0.09	
3/29/2023	8:30:27	20.45	0.09	
3/29/2023	8:31:27	20.45	0.09	
3/29/2023	8:32:27	20.45	0.09	
3/29/2023	8:33:27	20.44	0.08	
3/29/2023	8:34:27	20.45	0.09	
3/29/2023	8:35:27	20.45	0.08	
3/29/2023	8:36:27	20.45	0.08	
3/29/2023	8:37:27	20.45	0.08	
3/29/2023	8:38:27	20.45	0.08	
3/29/2023	8:39:27	20.45	0.08	
3/29/2023	8:40:27	20.45	0.09	
3/29/2023	8:41:27	20.45	0.09	
3/29/2023	8:42:27	20.45	0.09	
3/29/2023	8:43:27	20.45	0.09	
3/29/2023	8:44:27	20.45	0.10	
3/29/2023	8:45:27	20.45	0.09	
3/29/2023	8:46:27	20.45	0.10	
3/29/2023	8:47:27	20.45	0.09	
3/29/2023	8:48:27	20.45	0.09	
3/29/2023	8:49:27	20.45	0.09	
3/29/2023	8:50:27	20.45	0.09	
3/29/2023	8:51:27	20.45	0.09	
3/29/2023	8:52:27	20.45	0.09	
3/29/2023	8:53:27	20.45	0.08	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 3 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/29/2023	8:54:27	20.45	0.09	
3/29/2023	8:55:27	20.46	0.08	
3/29/2023	8:56:27	20.45	0.09	
3/29/2023	8:57:27	20.45	0.08	
3/29/2023	8:58:27	20.45	0.08	
3/29/2023	8:59:27	20.46	0.07	
3/29/2023	9:00:27	20.46	0.08	
3/29/2023	9:01:27	20.46	0.07	
3/29/2023	9:02:27	20.46	0.08	
3/29/2023	9:03:27	20.46	0.07	
3/29/2023	9:04:27	20.46	0.08	
3/29/2023	9:05:27	20.46	0.07	
3/29/2023	9:06:27	20.45	0.08	
3/29/2023	9:07:27	20.46	0.07	
3/29/2023	9:08:27	20.45	0.07	
3/29/2023	9:09:27	20.46	0.07	
3/29/2023	9:10:27	20.45	0.07	
3/29/2023	9:11:27	20.45	0.07	
3/29/2023	9:12:27	20.45	0.07	
3/29/2023	9:13:27	20.45	0.07	
3/29/2023	9:14:27	20.45	0.08	
3/29/2023	9:15:27	20.45	0.08	End Run 3 White Iron
		20.46	0.12	Average
3/29/2023	9:16:27	3.44	0.00	
3/29/2023	9:17:27	0.04	-0.01	O2/CO2 System Zero
3/29/2023	9:18:27	5.67	7.26	
3/29/2023	9:19:27	9.84	9.84	O2/CO2 System Upscale
3/29/2023	9:20:27	9.89	4.89	
3/29/2023	9:21:27	11.59	0.14	
3/29/2023	9:22:27	17.53	0.14	
3/29/2023	10:34:27	20.88	0.14	
				Mn and CM40 Steel
3/29/2023	10:35:27	20.88	0.13	Start Run 3
3/29/2023	10:36:27	20.88	0.13	
3/29/2023	10:37:27	20.88	0.13	
3/29/2023	10:38:27	20.88	0.13	
3/29/2023	10:39:27	20.89	0.12	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 3 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/29/2023	10:40:27	20.88	0.12	
3/29/2023	10:41:27	20.88	0.12	
3/29/2023	10:42:27	20.88	0.12	
3/29/2023	10:43:27	20.88	0.12	
3/29/2023	10:44:27	20.88	0.12	
3/29/2023	10:45:27	20.88	0.11	
3/29/2023	10:46:27	20.88	0.12	
3/29/2023	10:47:27	20.88	0.11	
3/29/2023	10:48:27	20.88	0.11	
3/29/2023	10:49:27	20.88	0.12	
3/29/2023	10:50:27	20.88	0.11	
3/29/2023	10:51:27	20.88	0.11	
3/29/2023	10:52:27	20.88	0.11	
3/29/2023	10:53:27	20.88	0.12	
3/29/2023	10:54:27	20.88	0.11	
3/29/2023	10:55:27	20.88	0.12	
3/29/2023	10:56:27	20.88	0.13	
3/29/2023	10:57:27	20.88	0.13	
3/29/2023	10:58:27	20.87	0.12	
3/29/2023	10:59:27	20.87	0.12	
3/29/2023	11:00:27	20.87	0.12	
3/29/2023	11:01:27	20.87	0.12	
3/29/2023	11:02:27	20.87	0.12	
3/29/2023	11:03:27	20.87	0.12	
3/29/2023	11:04:27	20.87	0.11	
3/29/2023	11:05:27	20.87	0.11	
3/29/2023	11:06:27	20.87	0.11	
3/29/2023	11:07:27	20.87	0.11	
3/29/2023	11:08:27	20.87	0.11	
3/29/2023	11:09:27	20.87	0.11	
3/29/2023	11:10:27	20.86	0.10	
3/29/2023	11:11:27	20.86	0.10	
3/29/2023	11:12:27	20.87	0.09	
3/29/2023	11:13:27	20.86	0.09	
3/29/2023	11:14:27	20.86	0.09	
3/29/2023	11:15:27	20.87	0.09	
3/29/2023	11:16:27	20.86	0.09	
3/29/2023	11:17:27	20.86	0.09	
3/29/2023	11:18:27	20.86	0.08	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 3 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/29/2023	11:19:27	20.87	0.08	
3/29/2023	11:20:27	20.87	0.08	
3/29/2023	11:21:27	20.87	0.08	
3/29/2023	11:22:27	20.87	0.08	
3/29/2023	11:23:27	20.86	0.08	
3/29/2023	11:24:27	20.86	0.08	
3/29/2023	11:25:27	20.86	0.08	
3/29/2023	11:26:27	20.87	0.08	
3/29/2023	11:27:27	20.86	0.08	
3/29/2023	11:28:27	20.87	0.08	
3/29/2023	11:29:27	20.87	0.08	
3/29/2023	11:30:27	20.87	0.08	
3/29/2023	11:31:27	20.87	0.08	
3/29/2023	11:32:27	20.87	0.07	
3/29/2023	11:33:27	20.87	0.07	
3/29/2023	11:34:27	20.87	0.07	
3/29/2023	11:35:27	20.87	0.07	
3/29/2023	11:36:27	20.87	0.07	
3/29/2023	11:37:27	20.86	0.07	
3/29/2023	11:38:27	20.86	0.07	
3/29/2023	11:39:27	20.86	0.07	
3/29/2023	11:40:27	20.86	0.07	
3/29/2023	11:41:27	20.86	0.07	
3/29/2023	11:42:27	20.86	0.06	
3/29/2023	11:43:27	20.86	0.06	
3/29/2023	11:44:27	20.86	0.06	
3/29/2023	11:45:27	20.86	0.06	
3/29/2023	11:46:27	20.86	0.06	
3/29/2023	11:47:27	20.86	0.06	
3/29/2023	11:48:27	20.86	0.06	
3/29/2023	11:49:27	20.86	0.07	
3/29/2023	11:50:27	20.86	0.06	
3/29/2023	11:51:27	20.86	0.07	
3/29/2023	11:52:27	20.86	0.07	
3/29/2023	11:53:27	20.86	0.07	
3/29/2023	11:54:27	20.86	0.06	
3/29/2023	11:55:27	20.86	0.07	
3/29/2023	11:56:27	20.86	0.07	
3/29/2023	11:57:27	20.86	0.08	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 3 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/29/2023	11:58:27	20.86	0.07	
3/29/2023	11:59:27	20.86	0.08	
3/29/2023	12:00:27	20.86	0.08	
3/29/2023	12:01:27	20.86	0.08	
3/29/2023	12:02:27	20.86	0.08	
3/29/2023	12:03:27	20.86	0.07	
3/29/2023	12:04:27	20.86	0.07	
3/29/2023	12:05:27	20.86	0.07	
3/29/2023	12:06:27	20.86	0.06	
3/29/2023	12:07:27	20.86	0.07	
3/29/2023	12:08:27	20.86	0.07	
3/29/2023	12:09:27	20.86	0.06	
3/29/2023	12:10:27	20.85	0.07	
3/29/2023	12:11:27	20.85	0.06	
3/29/2023	12:12:27	20.85	0.05	
3/29/2023	12:13:27	20.85	0.05	
3/29/2023	12:14:27	20.85	0.05	
3/29/2023	12:15:27	20.85	0.05	
3/29/2023	12:16:27	20.85	0.04	
3/29/2023	12:17:27	20.85	0.04	
3/29/2023	12:18:27	20.85	0.04	
3/29/2023	12:19:27	20.85	0.04	
3/29/2023	12:20:27	20.85	0.04	
3/29/2023	12:21:27	20.85	0.04	
3/29/2023	12:22:27	20.86	0.04	
3/29/2023	12:23:27	20.85	0.04	
3/29/2023	12:24:27	20.85	0.05	
3/29/2023	12:25:27	20.85	0.05	
3/29/2023	12:26:27	20.85	0.05	
3/29/2023	12:27:27	20.85	0.04	
3/29/2023	12:28:27	20.85	0.04	
3/29/2023	12:29:27	20.85	0.04	
3/29/2023	12:30:27	20.85	0.05	
3/29/2023	12:31:27	20.85	0.05	
3/29/2023	12:32:27	20.85	0.05	
3/29/2023	12:33:27	20.85	0.05	
3/29/2023	12:34:27	20.85	0.05	
3/29/2023	12:35:27	20.85	0.05	
3/29/2023	12:36:27	20.85	0.06	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 3 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/29/2023	12:37:27	20.85	0.06	
3/29/2023	12:38:27	20.85	0.07	
3/29/2023	12:39:27	20.85	0.06	
3/29/2023	12:40:27	20.84	0.06	
3/29/2023	12:41:27	20.84	0.06	
3/29/2023	12:42:27	20.84	0.06	
3/29/2023	12:43:27	20.84	0.05	
3/29/2023	12:44:27	20.84	0.05	
3/29/2023	12:45:27	20.84	0.04	
3/29/2023	12:46:27	20.84	0.04	
3/29/2023	12:47:27	20.84	0.03	
3/29/2023	12:48:27	20.84	0.04	
3/29/2023	12:49:27	20.84	0.04	
3/29/2023	12:50:27	20.84	0.03	
3/29/2023	12:51:27	20.84	0.03	
3/29/2023	12:52:27	20.84	0.03	
3/29/2023	12:53:27	20.84	0.04	
3/29/2023	12:54:27	20.84	0.03	
3/29/2023	12:55:27	20.84	0.04	
3/29/2023	12:56:27	20.84	0.04	
3/29/2023	12:57:27	20.83	0.05	
3/29/2023	12:58:27	20.83	0.05	
3/29/2023	12:59:27	20.83	0.06	
3/29/2023	13:00:27	20.83	0.06	
3/29/2023	13:01:27	20.83	0.07	
3/29/2023	13:02:27	20.83	0.07	
3/29/2023	13:03:27	20.83	0.08	
3/29/2023	13:04:27	20.83	0.07	
3/29/2023	13:05:27	20.83	0.08	
3/29/2023	13:06:27	20.83	0.08	
3/29/2023	13:07:27	20.82	0.08	
3/29/2023	13:08:27	20.83	0.08	
3/29/2023	13:09:27	20.83	0.08	
3/29/2023	13:10:27	20.82	0.08	
3/29/2023	13:11:27	20.82	0.09	
3/29/2023	13:12:27	20.82	0.08	
3/29/2023	13:13:27	20.82	0.09	
3/29/2023	13:14:27	20.82	0.09	
3/29/2023	13:15:27	20.82	0.09	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 3 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/29/2023	13:16:27	20.82	0.08	
3/29/2023	13:17:27	20.82	0.09	
3/29/2023	13:18:27	20.82	0.08	
3/29/2023	13:19:27	20.82	0.09	
3/29/2023	13:20:27	20.82	0.09	
3/29/2023	13:21:27	20.82	0.09	
3/29/2023	13:22:27	20.82	0.09	
3/29/2023	13:23:27	20.82	0.09	
3/29/2023	13:24:27	20.83	0.09	
3/29/2023	13:25:27	20.83	0.10	
3/29/2023	13:26:27	20.83	0.10	
3/29/2023	13:27:27	20.83	0.10	
3/29/2023	13:28:27	20.82	0.11	
3/29/2023	13:29:27	20.82	0.10	
3/29/2023	13:30:27	20.83	0.11	
3/29/2023	13:31:27	20.83	0.11	
3/29/2023	13:32:27	20.83	0.11	
3/29/2023	13:33:27	20.83	0.12	
3/29/2023	13:34:27	20.83	0.12	
3/29/2023	13:35:27	20.83	0.12	
3/29/2023	13:36:27	20.83	0.12	
3/29/2023	13:37:27	20.83	0.12	
3/29/2023	13:38:27	20.84	0.12	
3/29/2023	13:39:27	20.84	0.12	
3/29/2023	13:40:27	20.84	0.13	
3/29/2023	13:41:27	20.84	0.13	
3/29/2023	13:42:27	20.84	0.13	
3/29/2023	13:43:27	20.84	0.14	
3/29/2023	13:44:27	20.84	0.14	
3/29/2023	13:45:27	20.84	0.14	
3/29/2023	13:46:27	20.84	0.13	
3/29/2023	13:47:27	20.84	0.13	
3/29/2023	13:48:27	20.85	0.12	
3/29/2023	13:49:27	20.85	0.13	
3/29/2023	13:50:27	20.85	0.13	
3/29/2023	13:51:27	20.85	0.13	
3/29/2023	13:52:27	20.85	0.13	
3/29/2023	13:53:27	20.85	0.13	
3/29/2023	13:54:27	20.85	0.13	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 3 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/29/2023	13:55:27	20.85	0.13	
3/29/2023	13:56:27	20.85	0.13	
3/29/2023	13:57:27	20.85	0.13	
3/29/2023	13:58:27	20.85	0.13	
3/29/2023	13:59:27	20.85	0.14	
3/29/2023	14:00:27	20.85	0.14	
3/29/2023	14:01:27	20.85	0.14	
3/29/2023	14:02:27	20.85	0.14	
3/29/2023	14:03:27	20.85	0.14	
3/29/2023	14:04:27	20.85	0.14	
3/29/2023	14:05:27	20.86	0.14	
3/29/2023	14:06:27	20.86	0.15	
3/29/2023	14:07:27	20.85	0.14	
3/29/2023	14:08:27	20.85	0.15	
3/29/2023	14:09:27	20.86	0.15	
3/29/2023	14:10:27	20.86	0.15	
3/29/2023	14:11:27	20.86	0.15	
3/29/2023	14:12:27	20.86	0.15	
3/29/2023	14:13:27	20.86	0.15	
3/29/2023	14:14:27	20.86	0.15	
3/29/2023	14:15:27	20.86	0.15	
3/29/2023	14:16:27	20.86	0.15	
3/29/2023	14:17:27	20.86	0.14	
3/29/2023	14:18:27	20.86	0.14	
3/29/2023	14:19:27	20.86	0.14	
3/29/2023	14:20:27	20.86	0.14	
3/29/2023	14:21:27	20.86	0.14	
3/29/2023	14:22:27	20.87	0.14	
3/29/2023	14:23:27	20.87	0.13	
3/29/2023	14:24:27	20.86	0.13	
3/29/2023	14:25:27	20.86	0.13	
3/29/2023	14:26:27	20.86	0.12	
3/29/2023	14:27:27	20.87	0.12	
3/29/2023	14:28:27	20.87	0.12	
3/29/2023	14:29:27	20.87	0.12	
3/29/2023	14:30:27	20.87	0.12	
3/29/2023	14:31:27	20.87	0.12	
3/29/2023	14:32:27	20.87	0.11	
3/29/2023	14:33:27	20.87	0.11	

Eagle Foundry Company
Main Foundry Baghouse Outlet
Day 3 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/29/2023	14:34:27	20.87	0.11	
3/29/2023	14:35:27	20.87	0.12	
3/29/2023	14:36:27	20.87	0.11	
3/29/2023	14:37:27	20.87	0.12	
3/29/2023	14:38:27	20.87	0.11	
3/29/2023	14:39:27	20.87	0.12	
3/29/2023	14:40:27	20.87	0.11	
3/29/2023	14:41:27	20.87	0.12	
3/29/2023	14:42:27	20.87	0.12	
3/29/2023	14:43:27	20.87	0.12	
3/29/2023	14:44:27	20.87	0.12	
3/29/2023	14:45:27	20.87	0.12	End Run 3 Mn and CM40 Steel
		20.85	0.09	Average
3/29/2023	14:46:27	12.16	0.07	
3/29/2023	14:47:27	0.04	0.03	O2/CO2 System Zero
3/29/2023	14:48:27	0.06	0.98	
3/29/2023	14:49:27	9.10	10.64	
3/29/2023	14:50:27	9.88	9.82	O2/CO2 System Upscale
3/29/2023	14:51:27	9.88	9.99	

Bison Engineering, Inc.
Gaseous Testing Summary

Client: **Eagle Foundry Company**
Facility: **Eagle Foundry**
Location: **Eagle Creek, OR**

Source: **Cooling Bunker BH Outlet**
Test Date: **3/27/2023 - Day 1**

Environmental Conditions / Test Notes: See isokinetic field data sheets.
Testing Personnel: JCR

Run	White Iron Run 1	Steel Alloy Run 1
Date	3/27/2023	3/27/2023
Run Start Time	6:40	13:00
Run End Time	10:40	17:10
Duration, min.	240	250
CO ₂ , %vd	0.07	0.09
O ₂ , %vd	20.79	20.64

Note: Negative concentrations are reported as zero.

Bison Engineering, Inc.
Method 3A Oxygen
Calibration Error, System Bias and System Drift

Client:	Eagle Foundry Company	Source:	Cooling Bunker BH Outlet	Instrument Make:	Servomex
Facility:	Eagle Foundry	Date:	3/27/2023 - Day 1	Instrument Model:	1440
Location:	Eagle Creek, OR			Instrument Serial #:	01440D1-5041

		Initial Values				Final Values						Raw Avg Gas Conc	Corrected Gas Conc	Instrument Cal. Reference Gas
		Analyzer Cal. Response	System Cal Response	Pre test System Cal. Bias		System Cal Response	Post test System Cal. Bias		System Drift		Analyzer Span			
				% of span	pass/fail		% of span	pass/fail	% of span	pass/fail				
White Iron	zero	0.02	0.03	0.05	pass	0.03	0.05	pass	0.00	pass				
Run 1	upscale	10.10	10.07	-0.14	pass	10.11	0.05	pass	0.18	pass	22.01	20.72	20.79	10.11
Mn and CM40 Steel	zero	0.02	0.03	0.05	pass	0.03	0.05	pass	0.00	pass				
Run 1	upscale	10.10	10.11	0.05	pass	10.09	-0.05	pass	0.09	pass	22.01	20.59	20.64	10.11
				< 5%*		< 5%*		< 3%*						

Analyzer Calibration Error	Zero	Mid	High
Calibration Gas Standards	0	10.11	22.01
Cylinder Number		ALM054560	EB0157290
Calibration Gas Analyzer Response	0.02	10.1	22.04
Analyzer Calibration Error	0.09	-0.05	0.14
Analyzer Calibration Error < 2%*	pass	pass	pass

System Response Time	
28	seconds

System Leak Check		
	Completed	Pass/Fail
Pre-test	Yes	Pass
Post-test	Yes	Pass

Note: All units are in %

*Or < 0.5 % absolute difference

Bison Engineering, Inc.

Method 3A CO₂

Calibration Error, System Bias and System Drift

Client:	Eagle Foundry Company	Source:	Cooling Bunker BH Outlet	Instrument Make:	Servomex
Facility:	Eagle Foundry	Date:	3/27/2023 - Day 1	Instrument Model:	1440
Location:	Eagle Creek, OR			Instrument Serial #:	01440D1-5041

		Initial Values				Final Values						Raw Avg Gas Conc	Corrected Gas Conc	Instrument Cal. Reference Gas
		Analyzer Cal. Response	System Cal Response	Pre test System Cal. Bias		System Cal Response	Post test System Cal. Bias		System Drift		Analyzer Span			
				% of span	pass/fail		% of span	pass/fail	% of span	pass/fail				
White Iron Run 1	zero	-0.01	0.06	0.32	pass	0.05	0.28	pass	0.05	pass				
	upscale	9.91	9.95	0.18	pass	9.92	0.05	pass	0.14	pass	21.66	0.12	0.07	9.924
Mn and CM40 Steel Run 1	zero	-0.01	0.05	0.28	pass	0.05	0.28	pass	0.00	pass				
	upscale	9.91	9.92	0.05	pass	9.94	0.14	pass	0.09	pass	21.66	0.14	0.09	9.924
				< 5%*		< 5%*		< 3%*						

Analyzer Calibration Error	Zero	Mid	High
Calibration Gas Standards	0	9.924	21.66
Cylinder Number		ALM054560	EB0157290
Calibration Gas Analyzer Response	-0.01	9.91	21.65
Analyzer Calibration Error	-0.05	-0.06	-0.05
Analyzer Calibration Error < 2%*	pass	pass	pass

System Response Time	
30	seconds

System Leak Check		
	Completed	Pass/Fail
Pre-test	Yes	Pass
Post-test	Yes	Pass

Note: All units are in %

*Or < 0.5 % absolute difference

Bison Engineering, Inc.
Stratification Check

Client:	Eagle Foundry Company	Source:	Cooling Bunker BH Outlet
Facility:	Eagle Foundry	Test Date:	3/27/2023 - Day 1
Location:	Eagle Creek, OR		

Stack Diameter: 55.75 inches

Port Depth: 6.5 inches

3 POINT METHOD						
<u>% of diameter</u>	<u>Pt</u>	<u>Pt location</u>	<u>O2%</u>	<u>Diff (+/- 5%)</u>	<u>Pass/Fail</u>	
16.7%	S1	15.81	20.76	0.06%	PASS	
50.0%	S2	34.38	20.74	-0.03%	PASS	
83.3%	S3	52.94	20.74	-0.03%	PASS	
AVERAGE:			20.75			

Bison Engineering, Inc.
EPA Method 3A (O₂)
Example Calculations

Client: **Eagle Foundry Company**
 Location: **Eagle Creek, OR**
 Source: **Cooling Bunker BH Outlet**

Run: **White Iron Run 1**
 Start Time: **6:40**
 End Time: **10:40**
 Date: **3/27/2023 - Day 1**

EPA Method 3A:

Analyzer Calibration Error (Mid)

$$1) \text{ ACE} = \left(\frac{C_{\text{Dir}} - C_V}{C_S} \right) \times 100 = -0.05 \%v$$

where C_{Dir} : 10.10 %
 C_V : 10.11 %
 C_S : 22.01 %

System Bias (Upscale)

$$2) \text{ SB} = \left(\frac{C_s - C_{\text{Dir}}}{C_S} \right) \times 100 = -0.14 \%v$$

where C_{Dir} : 10.10 %
 C_S : 10.07 %
 C_S : 22.01 %

Drift Assessment (Upscale)

$$3) \text{ D} = | \text{SB}_{\text{Final}} - \text{SB}_i | = 0.18 \%v$$

where SB_{Final} : 0.05 %
 SB_i : -0.14 %

Effluent Gas Concentration

$$4) \text{ C}_{\text{Gas}} = (C_{\text{Avg}} - C_O) \left(\frac{C_{\text{MA}}}{C_M - C_O} \right) = 20.79 \%v$$

where C_{Avg} : 20.72 %
 C_O : 0.03 %
 C_{MA} : 10.11 %
 C_M : 10.09 %

Bison Engineering, Inc.
EPA Method 3A (CO₂)
Example Calculations

Client: **Eagle Foundry Company**
 Location: **Eagle Creek, OR**
 Source: **Cooling Bunker BH Outlet**

Run: **White Iron Run 1**
 Start Time: **6:40**
 End Time: **10:40**
 Date: **3/27/2023 - Day 1**

EPA Method 3A:

Analyzer Calibration Error (Mid)

$$1) \text{ ACE} = \left(\frac{C_{\text{Dir}} - C_V}{C_S} \right) \times 100 = -0.06 \%v$$

where C_{Dir} : 9.91 %
 C_V : 9.92 %
 C_S : 21.66 %

System Bias (Upscale)

$$2) \text{ SB} = \left(\frac{C_S - C_{\text{Dir}}}{C_S} \right) \times 100 = 0.18 \%v$$

where C_{Dir} : 9.91 %
 C_S : 9.95 %
 C_S : 21.66 %

Drift Assessment (Upscale)

$$3) \text{ D} = | \text{SB}_{\text{Final}} - \text{SB}_i | = 0.14 \%v$$

where SB_{Final} : 0.05 %
 SB_i : 0.18 %

Effluent Gas Concentration

$$4) \text{ C}_{\text{Gas}} = (C_{\text{Avg}} - C_O) \left(\frac{C_{\text{MA}}}{C_M - C_O} \right) = 0.07 \%v$$

where C_{Avg} : 0.12 %
 C_O : 0.06 %
 C_{MA} : 9.92 %
 C_M : 9.94 %

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	3:52:28	0.04	-19.92	
3/27/2023	3:53:28	0.02	-0.01	O2/CO2 Analyzer Zero
3/27/2023	3:54:28	13.83	-8.61	
3/27/2023	3:55:28	25.95	24.75	
3/27/2023	3:56:28	24.23	21.27	
3/27/2023	3:57:28	24.65	21.56	
3/27/2023	3:58:28	21.97	21.65	
3/27/2023	3:59:28	22.04	21.65	O2/CO2 Analyzer Span
3/27/2023	4:00:28	15.79	14.21	
3/27/2023	4:01:28	18.28	18.04	
3/27/2023	4:02:28	23.66	22.05	
3/27/2023	4:03:28	19.98	19.35	
3/27/2023	4:04:28	10.03	9.91	
3/27/2023	4:05:28	10.10	9.91	O2/CO2 Analyer Mid
3/27/2023	4:06:28	10.08	9.91	
3/27/2023	4:29:28	-0.29	0.06	
3/27/2023	4:30:28	0.03	0.06	O2/CO2 System Zero
3/27/2023	4:31:28	3.90	3.57	
3/27/2023	4:32:28	10.94	9.63	
3/27/2023	4:33:28	11.10	9.81	
3/27/2023	4:34:28	10.49	9.83	
3/27/2023	4:35:28	10.07	9.95	O2/CO2 System Upscale
3/27/2023	4:36:28	9.87	9.86	
3/27/2023	4:37:28	18.38	2.70	
3/27/2023	4:38:28	21.11	0.18	
3/27/2023	4:39:28	20.77	0.14	
3/27/2023	6:25:28	20.77	0.13	
3/27/2023	6:26:28	20.78	0.13	
3/27/2023	6:27:28	20.78	0.13	Cooling Bunker Baghouse Outlet
3/27/2023	6:28:28	20.77	0.13	Stratification Check
3/27/2023	6:29:28	20.77	0.13	Point 1
3/27/2023	6:30:28	20.75	0.14	20.76
3/27/2023	6:31:28	20.76	0.13	
3/27/2023	6:32:28	20.75	0.12	
3/27/2023	6:33:28	20.74	0.13	Point 2
3/27/2023	6:34:28	20.74	0.13	20.74
3/27/2023	6:35:28	20.74	0.13	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	6:36:28	20.74	0.13	
3/27/2023	6:37:28	20.74	0.13	Point 3
3/27/2023	6:38:28	20.74	0.13	20.74
3/27/2023	6:39:28	20.73	0.12	
				White Iron
3/27/2023	6:40:28	20.73	0.13	Start Run 1
3/27/2023	6:41:28	20.73	0.13	
3/27/2023	6:42:28	20.73	0.12	
3/27/2023	6:43:28	20.73	0.12	
3/27/2023	6:44:28	20.73	0.12	
3/27/2023	6:45:28	20.73	0.11	
3/27/2023	6:46:28	20.73	0.12	
3/27/2023	6:47:28	20.73	0.12	
3/27/2023	6:48:28	20.73	0.12	
3/27/2023	6:49:28	20.72	0.12	
3/27/2023	6:50:28	20.72	0.12	
3/27/2023	6:51:28	20.72	0.12	
3/27/2023	6:52:28	20.72	0.12	
3/27/2023	6:53:28	20.71	0.12	
3/27/2023	6:54:28	20.71	0.12	
3/27/2023	6:55:28	20.71	0.12	
3/27/2023	6:56:28	20.71	0.12	
3/27/2023	6:57:28	20.71	0.12	
3/27/2023	6:58:28	20.71	0.12	
3/27/2023	6:59:28	20.70	0.12	
3/27/2023	7:00:28	20.70	0.13	
3/27/2023	7:01:28	20.70	0.13	
3/27/2023	7:02:28	20.69	0.13	
3/27/2023	7:03:28	20.66	0.13	
3/27/2023	7:04:28	20.65	0.13	
3/27/2023	7:05:28	20.65	0.13	
3/27/2023	7:06:28	20.65	0.12	
3/27/2023	7:07:28	20.67	0.13	
3/27/2023	7:08:28	20.69	0.12	
3/27/2023	7:09:28	20.71	0.12	
3/27/2023	7:10:28	20.71	0.12	
3/27/2023	7:11:28	20.71	0.12	
3/27/2023	7:12:28	20.72	0.12	
3/27/2023	7:13:28	20.72	0.12	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	7:14:28	20.72	0.11	
3/27/2023	7:15:28	20.72	0.11	
3/27/2023	7:16:28	20.72	0.11	
3/27/2023	7:17:28	20.72	0.11	
3/27/2023	7:18:28	20.72	0.11	
3/27/2023	7:19:28	20.72	0.11	
3/27/2023	7:20:28	20.72	0.11	
3/27/2023	7:21:28	20.72	0.11	
3/27/2023	7:22:28	20.71	0.11	
3/27/2023	7:23:28	20.71	0.11	
3/27/2023	7:24:28	20.71	0.11	
3/27/2023	7:25:28	20.72	0.11	
3/27/2023	7:26:28	20.72	0.11	
3/27/2023	7:27:28	20.73	0.11	
3/27/2023	7:28:28	20.72	0.11	
3/27/2023	7:29:28	20.72	0.12	
3/27/2023	7:30:28	20.71	0.12	
3/27/2023	7:31:28	20.72	0.12	
3/27/2023	7:32:28	20.71	0.12	
3/27/2023	7:33:28	20.76	0.13	
3/27/2023	7:34:28	20.76	0.13	
3/27/2023	7:35:28	20.76	0.13	
3/27/2023	7:36:28	20.76	0.13	
3/27/2023	7:37:28	20.76	0.13	
3/27/2023	7:38:28	20.76	0.13	
3/27/2023	7:39:28	20.76	0.12	
3/27/2023	7:40:28	20.76	0.12	
3/27/2023	7:41:28	20.76	0.12	
3/27/2023	7:42:28	20.76	0.12	
3/27/2023	7:43:28	20.76	0.12	
3/27/2023	7:44:28	20.76	0.12	
3/27/2023	7:45:28	20.76	0.12	
3/27/2023	7:46:28	20.77	0.12	
3/27/2023	7:47:28	20.77	0.12	
3/27/2023	7:48:28	20.79	0.11	
3/27/2023	7:49:28	20.79	0.11	
3/27/2023	7:50:28	20.79	0.11	
3/27/2023	7:51:28	20.80	0.12	
3/27/2023	7:52:28	20.80	0.12	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	7:53:28	20.80	0.11	
3/27/2023	7:54:28	20.80	0.12	
3/27/2023	7:55:28	20.80	0.12	
3/27/2023	7:56:28	20.80	0.12	
3/27/2023	7:57:28	20.80	0.12	
3/27/2023	7:58:28	20.80	0.12	
3/27/2023	7:59:28	20.80	0.12	
3/27/2023	8:00:28	20.80	0.12	
3/27/2023	8:01:28	20.79	0.12	
3/27/2023	8:02:28	20.79	0.13	
3/27/2023	8:03:28	20.79	0.13	
3/27/2023	8:04:28	20.79	0.13	
3/27/2023	8:05:28	20.79	0.13	
3/27/2023	8:06:28	20.79	0.13	
3/27/2023	8:07:28	20.79	0.13	
3/27/2023	8:08:28	20.78	0.13	
3/27/2023	8:09:28	20.79	0.13	
3/27/2023	8:10:28	20.79	0.13	
3/27/2023	8:11:28	20.78	0.12	
3/27/2023	8:12:28	20.78	0.12	
3/27/2023	8:13:28	20.78	0.12	
3/27/2023	8:14:28	20.78	0.12	
3/27/2023	8:15:28	20.78	0.12	
3/27/2023	8:16:28	20.77	0.12	
3/27/2023	8:17:28	20.77	0.11	
3/27/2023	8:18:28	20.77	0.11	
3/27/2023	8:19:28	20.77	0.11	
3/27/2023	8:20:28	20.77	0.11	
3/27/2023	8:21:28	20.77	0.11	
3/27/2023	8:22:28	20.76	0.11	
3/27/2023	8:23:28	20.76	0.11	
3/27/2023	8:24:28	20.76	0.11	
3/27/2023	8:25:28	20.76	0.11	
3/27/2023	8:26:28	20.76	0.11	
3/27/2023	8:27:28	20.76	0.11	
3/27/2023	8:28:28	20.75	0.11	
3/27/2023	8:29:28	20.75	0.11	
3/27/2023	8:30:28	20.75	0.11	
3/27/2023	8:31:28	20.74	0.11	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	8:32:28	20.74	0.12	
3/27/2023	8:33:28	20.74	0.12	
3/27/2023	8:34:28	20.74	0.12	
3/27/2023	8:35:28	20.73	0.13	
3/27/2023	8:36:28	20.73	0.13	
3/27/2023	8:37:28	20.73	0.12	
3/27/2023	8:38:28	20.73	0.12	
3/27/2023	8:39:28	20.73	0.12	
3/27/2023	8:40:28	20.73	0.12	
3/27/2023	8:41:28	20.73	0.12	
3/27/2023	8:42:28	20.72	0.12	
3/27/2023	8:43:28	20.72	0.13	
3/27/2023	8:44:28	20.71	0.12	
3/27/2023	8:45:28	20.72	0.12	
3/27/2023	8:46:28	20.72	0.12	
3/27/2023	8:47:28	20.72	0.12	
3/27/2023	8:48:28	20.72	0.11	
3/27/2023	8:49:28	20.72	0.11	
3/27/2023	8:50:28	20.71	0.11	
3/27/2023	8:51:28	20.71	0.11	
3/27/2023	8:52:28	20.71	0.11	
3/27/2023	8:53:28	20.71	0.11	
3/27/2023	8:54:28	20.71	0.11	
3/27/2023	8:55:28	20.70	0.11	
3/27/2023	8:56:28	20.70	0.11	
3/27/2023	8:57:28	20.70	0.11	
3/27/2023	8:58:28	20.69	0.12	
3/27/2023	8:59:28	20.70	0.11	
3/27/2023	9:00:28	20.67	0.12	
3/27/2023	9:01:28	20.66	0.12	
3/27/2023	9:02:28	20.66	0.12	
3/27/2023	9:03:28	20.66	0.12	
3/27/2023	9:04:28	20.67	0.12	
3/27/2023	9:05:28	20.66	0.13	
3/27/2023	9:06:28	20.68	0.13	
3/27/2023	9:07:28	20.67	0.13	
3/27/2023	9:08:28	20.66	0.13	
3/27/2023	9:09:28	20.66	0.13	
3/27/2023	9:10:28	20.66	0.13	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	9:11:28	20.66	0.13	
3/27/2023	9:12:28	20.66	0.13	
3/27/2023	9:13:28	20.66	0.12	
3/27/2023	9:14:28	20.66	0.12	
3/27/2023	9:15:28	20.67	0.12	
3/27/2023	9:16:28	20.67	0.12	
3/27/2023	9:17:28	20.67	0.12	
3/27/2023	9:18:28	20.67	0.12	
3/27/2023	9:19:28	20.67	0.12	
3/27/2023	9:20:28	20.67	0.12	
3/27/2023	9:21:28	20.69	0.12	
3/27/2023	9:22:28	20.68	0.12	
3/27/2023	9:23:28	20.68	0.12	
3/27/2023	9:24:28	20.68	0.12	
3/27/2023	9:25:28	20.67	0.12	
3/27/2023	9:26:28	20.67	0.12	
3/27/2023	9:27:28	20.67	0.13	
3/27/2023	9:28:28	20.68	0.12	
3/27/2023	9:29:28	20.68	0.13	
3/27/2023	9:30:28	20.68	0.13	
3/27/2023	9:31:28	20.68	0.13	
3/27/2023	9:32:28	20.68	0.13	
3/27/2023	9:33:28	20.69	0.13	
3/27/2023	9:34:28	20.69	0.14	
3/27/2023	9:35:28	20.69	0.14	
3/27/2023	9:36:28	20.70	0.14	
3/27/2023	9:37:28	20.69	0.13	
3/27/2023	9:38:28	20.69	0.14	
3/27/2023	9:39:28	20.70	0.14	
3/27/2023	9:40:28	20.70	0.13	
3/27/2023	9:41:28	20.70	0.13	
3/27/2023	9:42:28	20.70	0.14	
3/27/2023	9:43:28	20.71	0.13	
3/27/2023	9:44:28	20.71	0.13	
3/27/2023	9:45:28	20.71	0.13	
3/27/2023	9:46:28	20.70	0.13	
3/27/2023	9:47:28	20.71	0.13	
3/27/2023	9:48:28	20.71	0.13	
3/27/2023	9:49:28	20.71	0.12	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	9:50:28	20.71	0.13	
3/27/2023	9:51:28	20.72	0.12	
3/27/2023	9:52:28	20.71	0.13	
3/27/2023	9:53:28	20.71	0.13	
3/27/2023	9:54:28	20.71	0.12	
3/27/2023	9:55:28	20.71	0.13	
3/27/2023	9:56:28	20.71	0.13	
3/27/2023	9:57:28	20.71	0.13	
3/27/2023	9:58:28	20.72	0.13	
3/27/2023	9:59:28	20.72	0.13	
3/27/2023	10:00:28	20.72	0.13	
3/27/2023	10:01:28	20.73	0.13	
3/27/2023	10:02:28	20.72	0.14	
3/27/2023	10:03:28	20.73	0.14	
3/27/2023	10:04:28	20.72	0.14	
3/27/2023	10:05:28	20.72	0.14	
3/27/2023	10:06:28	20.72	0.14	
3/27/2023	10:07:28	20.72	0.14	
3/27/2023	10:08:28	20.72	0.14	
3/27/2023	10:09:28	20.72	0.14	
3/27/2023	10:10:28	20.72	0.14	
3/27/2023	10:11:28	20.72	0.14	
3/27/2023	10:12:28	20.72	0.14	
3/27/2023	10:13:28	20.72	0.14	
3/27/2023	10:14:28	20.72	0.14	
3/27/2023	10:15:28	20.73	0.14	
3/27/2023	10:16:28	20.73	0.14	
3/27/2023	10:17:28	20.69	0.15	
3/27/2023	10:18:28	20.69	0.15	
3/27/2023	10:19:28	20.69	0.15	
3/27/2023	10:20:28	20.69	0.14	
3/27/2023	10:21:28	20.70	0.14	
3/27/2023	10:22:28	20.70	0.14	
3/27/2023	10:23:28	20.69	0.14	
3/27/2023	10:24:28	20.69	0.14	
3/27/2023	10:25:28	20.70	0.14	
3/27/2023	10:26:28	20.69	0.15	
3/27/2023	10:27:28	20.69	0.14	
3/27/2023	10:28:28	20.68	0.15	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	10:29:28	20.71	0.15	
3/27/2023	10:30:28	20.68	0.15	
3/27/2023	10:31:28	20.71	0.15	
3/27/2023	10:32:28	20.70	0.14	
3/27/2023	10:33:28	20.70	0.14	
3/27/2023	10:34:28	20.71	0.14	
3/27/2023	10:35:28	20.70	0.14	
3/27/2023	10:36:28	20.70	0.15	
3/27/2023	10:37:28	20.72	0.14	
3/27/2023	10:38:28	20.73	0.15	
3/27/2023	10:39:28	20.73	0.15	
3/27/2023	10:40:28	20.73	0.15	End Run 1
		20.72	0.12	Average
3/27/2023	10:55:28	20.71	0.13	
3/27/2023	10:56:28	11.17	0.18	
3/27/2023	10:57:28	0.07	0.05	
3/27/2023	10:58:28	0.03	0.05	O2/CO2 System Zero
3/27/2023	10:59:28	1.55	1.57	
3/27/2023	11:00:28	9.67	9.35	
3/27/2023	11:01:28	10.11	9.92	O2/CO2 System Upscale
3/27/2023	11:02:28	11.44	7.65	
3/27/2023	11:03:28	20.43	0.33	
3/27/2023	11:04:28	20.68	0.17	
				Mn and CM40 Steel
3/27/2023	13:00:28	20.67	0.13	Start Run 1
3/27/2023	13:01:28	20.67	0.13	
3/27/2023	13:02:28	20.67	0.13	
3/27/2023	13:03:28	20.68	0.13	
3/27/2023	13:04:28	20.67	0.13	
3/27/2023	13:05:28	20.67	0.14	
3/27/2023	13:06:28	20.67	0.14	
3/27/2023	13:07:28	20.67	0.14	
3/27/2023	13:08:28	20.68	0.14	
3/27/2023	13:09:28	20.68	0.14	
3/27/2023	13:10:28	20.68	0.14	
3/27/2023	13:11:28	20.68	0.14	
3/27/2023	13:12:28	20.65	0.14	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	13:13:28	20.65	0.14	
3/27/2023	13:14:28	20.65	0.14	
3/27/2023	13:15:28	20.64	0.14	
3/27/2023	13:16:28	20.63	0.14	
3/27/2023	13:17:28	20.63	0.14	
3/27/2023	13:18:28	20.62	0.15	
3/27/2023	13:19:28	20.61	0.15	
3/27/2023	13:20:28	20.61	0.15	
3/27/2023	13:21:28	20.60	0.15	
3/27/2023	13:22:28	20.60	0.15	
3/27/2023	13:23:28	20.60	0.15	
3/27/2023	13:24:28	20.60	0.15	
3/27/2023	13:25:28	20.61	0.14	
3/27/2023	13:26:28	20.62	0.13	
3/27/2023	13:27:28	20.62	0.13	
3/27/2023	13:28:28	20.61	0.14	
3/27/2023	13:29:28	20.63	0.13	
3/27/2023	13:30:28	20.61	0.13	
3/27/2023	13:31:28	20.61	0.13	
3/27/2023	13:32:28	20.61	0.13	
3/27/2023	13:33:28	20.61	0.13	
3/27/2023	13:34:28	20.61	0.13	
3/27/2023	13:35:28	20.61	0.14	
3/27/2023	13:36:28	20.61	0.14	
3/27/2023	13:37:28	20.61	0.14	
3/27/2023	13:38:28	20.61	0.14	
3/27/2023	13:39:28	20.61	0.14	
3/27/2023	13:40:28	20.61	0.14	
3/27/2023	13:41:28	20.61	0.14	
3/27/2023	13:42:28	20.61	0.14	
3/27/2023	13:43:28	20.61	0.14	
3/27/2023	13:44:28	20.61	0.14	
3/27/2023	13:45:28	20.61	0.14	
3/27/2023	13:46:28	20.61	0.14	
3/27/2023	13:47:28	20.63	0.14	
3/27/2023	13:48:28	20.62	0.14	
3/27/2023	13:49:28	20.63	0.14	
3/27/2023	13:50:28	20.60	0.14	
3/27/2023	13:51:28	20.61	0.14	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	13:52:28	20.60	0.14	
3/27/2023	13:53:28	20.60	0.14	
3/27/2023	13:54:28	20.60	0.13	
3/27/2023	13:55:28	20.60	0.13	
3/27/2023	13:56:28	20.60	0.13	
3/27/2023	13:57:28	20.60	0.13	
3/27/2023	13:58:28	20.61	0.13	
3/27/2023	13:59:28	20.60	0.13	
3/27/2023	14:00:28	20.60	0.13	
3/27/2023	14:01:28	20.60	0.13	
3/27/2023	14:02:28	20.60	0.13	
3/27/2023	14:03:28	20.60	0.13	
3/27/2023	14:04:28	20.60	0.13	
3/27/2023	14:05:28	20.60	0.13	
3/27/2023	14:06:28	20.60	0.14	
3/27/2023	14:07:28	20.60	0.14	
3/27/2023	14:08:28	20.60	0.14	
3/27/2023	14:09:28	20.60	0.14	
3/27/2023	14:10:28	20.60	0.14	
3/27/2023	14:11:28	20.60	0.15	
3/27/2023	14:12:28	20.60	0.14	
3/27/2023	14:13:28	20.60	0.14	
3/27/2023	14:14:28	20.60	0.14	
3/27/2023	14:15:28	20.60	0.15	
3/27/2023	14:16:28	20.60	0.14	
3/27/2023	14:17:28	20.60	0.14	
3/27/2023	14:18:28	20.59	0.14	
3/27/2023	14:19:28	20.59	0.14	
3/27/2023	14:20:28	20.61	0.14	
3/27/2023	14:21:28	20.61	0.14	
3/27/2023	14:22:28	20.61	0.14	
3/27/2023	14:23:28	20.61	0.14	
3/27/2023	14:24:28	20.61	0.13	
3/27/2023	14:25:28	20.61	0.13	
3/27/2023	14:26:28	20.61	0.13	
3/27/2023	14:27:28	20.60	0.13	
3/27/2023	14:28:28	20.61	0.13	
3/27/2023	14:29:28	20.60	0.13	
3/27/2023	14:30:28	20.60	0.13	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	14:31:28	20.60	0.14	
3/27/2023	14:32:28	20.60	0.14	
3/27/2023	14:33:28	20.59	0.13	
3/27/2023	14:34:28	20.59	0.14	
3/27/2023	14:35:28	20.58	0.13	
3/27/2023	14:36:28	20.59	0.14	
3/27/2023	14:37:28	20.59	0.14	
3/27/2023	14:38:28	20.59	0.14	
3/27/2023	14:39:28	20.59	0.14	
3/27/2023	14:40:28	20.60	0.14	
3/27/2023	14:41:28	20.61	0.15	
3/27/2023	14:42:28	20.61	0.15	
3/27/2023	14:43:28	20.61	0.15	
3/27/2023	14:44:28	20.60	0.15	
3/27/2023	14:45:28	20.61	0.15	
3/27/2023	14:46:28	20.60	0.14	
3/27/2023	14:47:28	20.60	0.14	
3/27/2023	14:48:28	20.60	0.15	
3/27/2023	14:49:28	20.59	0.14	
3/27/2023	14:50:28	20.59	0.14	
3/27/2023	14:51:28	20.59	0.14	
3/27/2023	14:52:28	20.59	0.14	
3/27/2023	14:53:28	20.60	0.14	
3/27/2023	14:54:28	20.60	0.14	
3/27/2023	14:55:28	20.59	0.14	
3/27/2023	14:56:28	20.59	0.13	
3/27/2023	14:57:28	20.59	0.13	
3/27/2023	14:58:28	20.61	0.13	
3/27/2023	14:59:28	20.61	0.13	
3/27/2023	15:00:28	20.61	0.13	
3/27/2023	15:01:28	20.61	0.13	
3/27/2023	15:02:28	20.60	0.14	
3/27/2023	15:03:28	20.60	0.13	
3/27/2023	15:04:28	20.58	0.14	
3/27/2023	15:05:28	20.58	0.14	
3/27/2023	15:06:28	20.59	0.13	
3/27/2023	15:07:28	20.59	0.14	
3/27/2023	15:08:28	20.59	0.14	
3/27/2023	15:09:28	20.59	0.14	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	15:10:28	20.59	0.14	
3/27/2023	15:11:28	20.59	0.14	
3/27/2023	15:12:28	20.59	0.15	
3/27/2023	15:13:28	20.59	0.15	
3/27/2023	15:14:28	20.59	0.15	
3/27/2023	15:15:28	20.59	0.15	
3/27/2023	15:16:28	20.59	0.15	
3/27/2023	15:17:28	20.59	0.14	
3/27/2023	15:18:28	20.59	0.14	
3/27/2023	15:19:28	20.58	0.14	
3/27/2023	15:20:28	20.58	0.14	
3/27/2023	15:21:28	20.58	0.14	
3/27/2023	15:22:28	20.58	0.14	
3/27/2023	15:23:28	20.58	0.14	
3/27/2023	15:24:28	20.58	0.14	
3/27/2023	15:25:28	20.58	0.14	
3/27/2023	15:26:28	20.57	0.13	
3/27/2023	15:27:28	20.57	0.13	
3/27/2023	15:28:28	20.57	0.13	
3/27/2023	15:29:28	20.58	0.13	
3/27/2023	15:30:28	20.57	0.13	
3/27/2023	15:31:28	20.57	0.14	
3/27/2023	15:32:28	20.57	0.13	
3/27/2023	15:33:28	20.57	0.14	
3/27/2023	15:34:28	20.57	0.13	
3/27/2023	15:35:28	20.58	0.14	
3/27/2023	15:36:28	20.57	0.14	
3/27/2023	15:37:28	20.58	0.14	
3/27/2023	15:38:28	20.57	0.14	
3/27/2023	15:39:28	20.54	0.16	
3/27/2023	15:40:28	20.53	0.17	
3/27/2023	15:41:28	20.54	0.17	
3/27/2023	15:42:28	20.56	0.16	
3/27/2023	15:43:28	20.55	0.17	
3/27/2023	15:44:28	20.56	0.16	
3/27/2023	15:45:28	20.55	0.17	
3/27/2023	15:46:28	20.55	0.17	
3/27/2023	15:47:28	20.57	0.15	
3/27/2023	15:48:28	20.57	0.15	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	15:49:28	20.55	0.15	
3/27/2023	15:50:28	20.58	0.15	
3/27/2023	15:51:28	20.58	0.15	
3/27/2023	15:52:28	20.58	0.15	
3/27/2023	15:53:28	20.58	0.14	
3/27/2023	15:54:28	20.58	0.14	
3/27/2023	15:55:28	20.58	0.14	
3/27/2023	15:56:28	20.58	0.14	
3/27/2023	15:57:28	20.58	0.14	
3/27/2023	15:58:28	20.58	0.14	
3/27/2023	15:59:28	20.58	0.14	
3/27/2023	16:00:28	20.58	0.14	
3/27/2023	16:01:28	20.58	0.14	
3/27/2023	16:02:28	20.58	0.14	
3/27/2023	16:03:28	20.57	0.14	
3/27/2023	16:04:28	20.56	0.14	
3/27/2023	16:05:28	20.56	0.14	
3/27/2023	16:06:28	20.56	0.14	
3/27/2023	16:07:28	20.58	0.14	
3/27/2023	16:08:28	20.59	0.14	
3/27/2023	16:09:28	20.58	0.14	
3/27/2023	16:10:28	20.59	0.14	
3/27/2023	16:11:28	20.58	0.15	
3/27/2023	16:12:28	20.58	0.15	
3/27/2023	16:13:28	20.58	0.15	
3/27/2023	16:14:28	20.59	0.15	
3/27/2023	16:15:28	20.59	0.15	
3/27/2023	16:16:28	20.59	0.15	
3/27/2023	16:17:28	20.59	0.15	
3/27/2023	16:18:28	20.57	0.15	
3/27/2023	16:19:28	20.57	0.15	
3/27/2023	16:20:28	20.57	0.15	
3/27/2023	16:21:28	20.57	0.15	
3/27/2023	16:22:28	20.59	0.15	
3/27/2023	16:23:28	20.60	0.14	
3/27/2023	16:24:28	20.60	0.14	
3/27/2023	16:25:28	20.60	0.14	
3/27/2023	16:26:28	20.59	0.14	
3/27/2023	16:27:28	20.58	0.14	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	16:28:28	20.58	0.14	
3/27/2023	16:29:28	20.58	0.14	
3/27/2023	16:30:28	20.58	0.14	
3/27/2023	16:31:28	20.58	0.14	
3/27/2023	16:32:28	20.56	0.13	
3/27/2023	16:33:28	20.56	0.14	
3/27/2023	16:34:28	20.57	0.14	
3/27/2023	16:35:28	20.60	0.14	
3/27/2023	16:36:28	20.59	0.14	
3/27/2023	16:37:28	20.60	0.14	
3/27/2023	16:38:28	20.60	0.14	
3/27/2023	16:39:28	20.60	0.15	
3/27/2023	16:40:28	20.60	0.14	
3/27/2023	16:41:28	20.60	0.14	
3/27/2023	16:42:28	20.60	0.15	
3/27/2023	16:43:28	20.60	0.15	
3/27/2023	16:44:28	20.60	0.15	
3/27/2023	16:45:28	20.60	0.15	
3/27/2023	16:46:28	20.60	0.15	
3/27/2023	16:47:28	20.60	0.15	
3/27/2023	16:48:28	20.59	0.15	
3/27/2023	16:49:28	20.59	0.15	
3/27/2023	16:50:28	20.59	0.15	
3/27/2023	16:51:28	20.59	0.14	
3/27/2023	16:52:28	20.59	0.14	
3/27/2023	16:53:28	20.58	0.14	
3/27/2023	16:54:28	20.58	0.14	
3/27/2023	16:55:28	20.58	0.14	
3/27/2023	16:56:28	20.58	0.14	
3/27/2023	16:57:28	20.58	0.13	
3/27/2023	16:58:28	20.57	0.13	
3/27/2023	16:59:28	20.57	0.13	
3/27/2023	17:00:28	20.57	0.13	
3/27/2023	17:01:28	20.57	0.13	
3/27/2023	17:02:28	20.56	0.13	
3/27/2023	17:03:28	20.56	0.13	
3/27/2023	17:04:28	20.56	0.13	
3/27/2023	17:05:28	20.56	0.13	
3/27/2023	17:06:28	20.56	0.13	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 1 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/27/2023	17:07:28	20.55	0.13	
3/27/2023	17:08:28	20.55	0.13	
3/27/2023	17:09:28	20.54	0.13	
3/27/2023	17:10:28	20.54	0.13	End Run 1
		20.59	0.14	Average
3/27/2023	17:42:28	20.49	0.15	
3/27/2023	17:43:28	9.74	0.20	
3/27/2023	17:44:28	0.03	0.05	O2/CO2 System Zero
3/27/2023	17:45:28	8.37	9.02	
3/27/2023	17:46:28	10.09	9.94	O2/CO2 System Upscale
3/27/2023	17:47:28	18.84	9.12	
3/27/2023	17:48:28	19.14	1.01	
3/27/2023	17:49:28	20.48	0.18	

Bison Engineering, Inc.
Gaseous Testing Summary

Client: **Eagle Foundry Company**
Facility: **Eagle Foundry**
Location: **Eagle Creek, OR**

Source: **Cooling Bunker BH Outlet**
Test Date: **3/28/2023 - Day 2**

Environmental Conditions / Test Notes: See isokinetic field data sheets.
Testing Personnel: JCR

Run	White Iron Run 2	Steel Alloy Run 2
Date	3/28/2023	3/28/2023
Run Start Time	5:10	10:30
Run End Time	9:10	14:40
Duration, min.	240	250
CO ₂ , %vd	0.06	0.09
O ₂ , %vd	20.73	20.84

Note: Negative concentrations are reported as zero.

Bison Engineering, Inc.
Method 3A Oxygen
Calibration Error, System Bias and System Drift

Client:	Eagle Foundry Company	Source:	Cooling Bunker BH Outlet	Instrument Make:	Servomex
Facility:	Eagle Foundry	Date:	3/28/2023 - Day 2	Instrument Model:	1440
Location:	Eagle Creek, OR			Instrument Serial #:	01440D1-5041

		Initial Values				Final Values								
		Analyzer Cal. Response	System Cal Response	Pre test		System Cal Response	Post test		System Drift		Analyzer Span	Raw Avg Gas Conc	Corrected Gas Conc	Instrument Cal. Reference
				System Cal. Bias			System Cal. Bias							
				% of span	pass/fail		% of span	pass/fail	% of span	pass/fail				Gas
White Iron	zero	0.00	0.01	0.05	pass	0.02	0.09	pass	0.05	pass				
Run 2	upscale	10.02	10.05	0.14	pass	10.09	0.32	pass	0.18	pass	22.01	20.63	20.73	10.11
Mn and CM40 Steel	zero	0.00	0.02	0.09	pass	0.04	0.18	pass	0.09	pass				
Run 2	upscale	10.02	10.09	0.32	pass	10.09	0.32	pass	0.00	pass	22.01	20.77	20.84	10.11
				< 5%*			< 5%*		< 3%*					

Analyzer Calibration Error	Zero	Mid	High
Calibration Gas Standards	0	10.11	22.01
Cylinder Number		ALM054560	EB0157290
Calibration Gas Analyzer Response	0.00	10.02	22.04
Analyzer Calibration Error	0.00	-0.41	0.14
Analyzer Calibration Error < 2%*	pass	pass	pass

System Response Time
29 seconds

System Leak Check		
	Completed	Pass/Fail
Pre-test	Yes	Pass
Post-test	Yes	Pass

Note: All units are in %

*Or < 0.5 % absolute difference

Bison Engineering, Inc.

Method 3A CO₂

Calibration Error, System Bias and System Drift

Client:	Eagle Foundry Company	Source:	Cooling Bunker BH Outlet	Instrument Make:	Servomex
Facility:	Eagle Foundry	Date:	3/28/2023 - Day 2	Instrument Model:	1440
Location:	Eagle Creek, OR			Instrument Serial #:	01440D1-5041

		Initial Values				Final Values						Raw Avg Gas Conc	Corrected Gas Conc	Instrument Cal. Reference Gas
		Analyzer Cal. Response	System Cal Response	Pre test System Cal. Bias		System Cal Response	Post test System Cal. Bias		System Drift		Analyzer Span			
				% of span	pass/fail		% of span	pass/fail	% of span	pass/fail				
White Iron	zero	0.02	0.07	0.23	pass	0.05	0.14	pass	0.09	pass				
Run 2	upscale	9.92	9.92	0.00	pass	9.94	0.09	pass	0.09	pass	21.66	0.12	0.06	9.924
Mn and CM40 Steel	zero	0.02	0.05	0.14	pass	0.05	0.14	pass	0.00	pass				
Run 2	upscale	9.92	9.94	0.09	pass	9.90	-0.09	pass	0.18	pass	21.66	0.14	0.09	9.924
				< 5%*		< 5%*		< 3%*						

Analyzer Calibration Error	Zero	Mid	High
Calibration Gas Standards	0	9.924	21.66
Cylinder Number		ALM054560	EB0157290
Calibration Gas Analyzer Response	0.02	9.92	21.64
Analyzer Calibration Error	0.09	-0.02	-0.09
Analyzer Calibration Error < 2%*	pass	pass	pass

System Response Time	
30	seconds

System Leak Check		
	Completed	Pass/Fail
Pre-test	Yes	Pass
Post-test	Yes	Pass

Note: All units are in %

*Or < 0.5 % absolute difference

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 2 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/28/2023	3:19:35	2.23	-41.29	
3/28/2023	3:20:35	-1.07	-28.31	
3/28/2023	3:21:35	0.00	0.02	O2/CO2 Analyzer Zero
3/28/2023	3:22:35	-0.01	0.02	
3/28/2023	3:23:35	15.05	9.32	
3/28/2023	3:24:35	27.16	19.11	
3/28/2023	3:25:35	24.12	21.75	
3/28/2023	3:26:35	34.28	21.61	
3/28/2023	3:27:35	22.21	21.63	
3/28/2023	3:28:35	22.04	21.64	O2/CO2 Analyzer Span
3/28/2023	3:29:35	11.29	12.70	
3/28/2023	3:30:35	9.06	9.82	
3/28/2023	3:31:35	10.02	9.92	O2/CO2 Analyzer Mid
3/28/2023	3:32:35	15.46	6.53	
3/28/2023	3:33:35	3.95	0.32	
3/28/2023	3:34:35	0.01	0.07	O2/CO2 System Zero
3/28/2023	3:35:35	4.93	4.40	
3/28/2023	3:36:35	9.91	9.84	
3/28/2023	3:37:35	10.05	9.92	O2/CO2 System Upscale
3/28/2023	3:38:35	16.02	5.42	
3/28/2023	3:39:35	22.92	0.18	
3/28/2023	3:40:35	20.95	0.13	
				White Iron
3/28/2023	5:10:35	20.74	0.11	Start Run 2
3/28/2023	5:11:35	20.74	0.11	
3/28/2023	5:12:35	20.74	0.11	
3/28/2023	5:13:35	20.73	0.11	
3/28/2023	5:14:35	20.73	0.11	
3/28/2023	5:15:35	20.72	0.11	
3/28/2023	5:16:35	20.72	0.11	
3/28/2023	5:17:35	20.72	0.11	
3/28/2023	5:18:35	20.66	0.11	
3/28/2023	5:19:35	20.64	0.11	
3/28/2023	5:20:35	20.68	0.11	
3/28/2023	5:21:35	20.66	0.11	
3/28/2023	5:22:35	20.63	0.12	
3/28/2023	5:23:35	20.63	0.12	
3/28/2023	5:24:35	20.63	0.12	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 2 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/28/2023	5:25:35	20.63	0.12	
3/28/2023	5:26:35	20.62	0.12	
3/28/2023	5:27:35	20.62	0.12	
3/28/2023	5:28:35	20.62	0.12	
3/28/2023	5:29:35	20.62	0.12	
3/28/2023	5:30:35	20.62	0.12	
3/28/2023	5:31:35	20.62	0.12	
3/28/2023	5:32:35	20.62	0.12	
3/28/2023	5:33:35	20.62	0.12	
3/28/2023	5:34:35	20.62	0.12	
3/28/2023	5:35:35	20.62	0.12	
3/28/2023	5:36:35	20.62	0.11	
3/28/2023	5:37:35	20.62	0.11	
3/28/2023	5:38:35	20.62	0.11	
3/28/2023	5:39:35	20.62	0.11	
3/28/2023	5:40:35	20.62	0.11	
3/28/2023	5:41:35	20.62	0.11	
3/28/2023	5:42:35	20.62	0.11	
3/28/2023	5:43:35	20.62	0.12	
3/28/2023	5:44:35	20.63	0.12	
3/28/2023	5:45:35	20.63	0.12	
3/28/2023	5:46:35	20.63	0.12	
3/28/2023	5:47:35	20.63	0.12	
3/28/2023	5:48:35	20.63	0.12	
3/28/2023	5:49:35	20.63	0.12	
3/28/2023	5:50:35	20.62	0.13	
3/28/2023	5:51:35	20.62	0.13	
3/28/2023	5:52:35	20.63	0.13	
3/28/2023	5:53:35	20.61	0.13	
3/28/2023	5:54:35	20.60	0.13	
3/28/2023	5:55:35	20.61	0.13	
3/28/2023	5:56:35	20.61	0.13	
3/28/2023	5:57:35	20.61	0.13	
3/28/2023	5:58:35	20.61	0.13	
3/28/2023	5:59:35	20.62	0.13	
3/28/2023	6:00:35	20.62	0.13	
3/28/2023	6:01:35	20.62	0.13	
3/28/2023	6:02:35	20.62	0.13	
3/28/2023	6:03:35	20.63	0.13	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 2 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/28/2023	6:04:35	20.63	0.13	
3/28/2023	6:05:35	20.63	0.12	
3/28/2023	6:06:35	20.63	0.12	
3/28/2023	6:07:35	20.63	0.12	
3/28/2023	6:08:35	20.63	0.12	
3/28/2023	6:09:35	20.63	0.11	
3/28/2023	6:10:35	20.63	0.12	
3/28/2023	6:11:35	20.63	0.11	
3/28/2023	6:12:35	20.63	0.12	
3/28/2023	6:13:35	20.63	0.12	
3/28/2023	6:14:35	20.62	0.11	
3/28/2023	6:15:35	20.62	0.12	
3/28/2023	6:16:35	20.62	0.12	
3/28/2023	6:17:35	20.62	0.12	
3/28/2023	6:18:35	20.62	0.12	
3/28/2023	6:19:35	20.62	0.12	
3/28/2023	6:20:35	20.62	0.12	
3/28/2023	6:21:35	20.62	0.12	
3/28/2023	6:22:35	20.61	0.12	
3/28/2023	6:23:35	20.62	0.13	
3/28/2023	6:24:35	20.61	0.13	
3/28/2023	6:25:35	20.61	0.13	
3/28/2023	6:26:35	20.61	0.13	
3/28/2023	6:27:35	20.61	0.13	
3/28/2023	6:28:35	20.61	0.14	
3/28/2023	6:29:35	20.60	0.13	
3/28/2023	6:30:35	20.60	0.13	
3/28/2023	6:31:35	20.60	0.13	
3/28/2023	6:32:35	20.60	0.13	
3/28/2023	6:33:35	20.60	0.13	
3/28/2023	6:34:35	20.60	0.13	
3/28/2023	6:35:35	20.60	0.12	
3/28/2023	6:36:35	20.59	0.13	
3/28/2023	6:37:35	20.60	0.12	
3/28/2023	6:38:35	20.57	0.13	
3/28/2023	6:39:35	20.56	0.14	
3/28/2023	6:40:35	20.57	0.13	
3/28/2023	6:41:35	20.56	0.13	
3/28/2023	6:42:35	20.57	0.13	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 2 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/28/2023	6:43:35	20.57	0.13	
3/28/2023	6:44:35	20.59	0.12	
3/28/2023	6:45:35	20.59	0.12	
3/28/2023	6:46:35	20.59	0.12	
3/28/2023	6:47:35	20.59	0.12	
3/28/2023	6:48:35	20.60	0.12	
3/28/2023	6:49:35	20.59	0.12	
3/28/2023	6:50:35	20.59	0.12	
3/28/2023	6:51:35	20.59	0.13	
3/28/2023	6:52:35	20.59	0.13	
3/28/2023	6:53:35	20.59	0.13	
3/28/2023	6:54:35	20.58	0.13	
3/28/2023	6:55:35	20.58	0.13	
3/28/2023	6:56:35	20.58	0.13	
3/28/2023	6:57:35	20.58	0.14	
3/28/2023	6:58:35	20.58	0.13	
3/28/2023	6:59:35	20.58	0.13	
3/28/2023	7:00:35	20.59	0.13	
3/28/2023	7:01:35	20.58	0.13	
3/28/2023	7:02:35	20.56	0.15	
3/28/2023	7:03:35	20.55	0.15	
3/28/2023	7:04:35	20.54	0.15	
3/28/2023	7:05:35	20.55	0.15	
3/28/2023	7:06:35	20.55	0.15	
3/28/2023	7:07:35	20.54	0.15	
3/28/2023	7:08:35	20.57	0.13	
3/28/2023	7:09:35	20.58	0.12	
3/28/2023	7:10:35	20.58	0.12	
3/28/2023	7:11:35	20.58	0.12	
3/28/2023	7:12:35	20.58	0.12	
3/28/2023	7:13:35	20.58	0.12	
3/28/2023	7:14:35	20.58	0.12	
3/28/2023	7:15:35	20.58	0.12	
3/28/2023	7:16:35	20.59	0.12	
3/28/2023	7:17:35	20.58	0.12	
3/28/2023	7:18:35	20.59	0.12	
3/28/2023	7:19:35	20.58	0.12	
3/28/2023	7:20:35	20.58	0.13	
3/28/2023	7:21:35	20.58	0.13	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 2 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/28/2023	7:22:35	20.57	0.14	
3/28/2023	7:23:35	20.57	0.14	
3/28/2023	7:24:35	20.57	0.15	
3/28/2023	7:25:35	20.57	0.15	
3/28/2023	7:26:35	20.58	0.14	
3/28/2023	7:27:35	20.59	0.14	
3/28/2023	7:28:35	20.59	0.13	
3/28/2023	7:29:35	20.59	0.13	
3/28/2023	7:30:35	20.59	0.13	
3/28/2023	7:31:35	20.59	0.13	
3/28/2023	7:32:35	20.59	0.12	
3/28/2023	7:33:35	20.60	0.13	
3/28/2023	7:34:35	20.60	0.12	
3/28/2023	7:35:35	20.60	0.12	
3/28/2023	7:36:35	20.60	0.12	
3/28/2023	7:37:35	20.60	0.12	
3/28/2023	7:38:35	20.60	0.12	
3/28/2023	7:39:35	20.60	0.11	
3/28/2023	7:40:35	20.60	0.11	
3/28/2023	7:41:35	20.60	0.11	
3/28/2023	7:42:35	20.60	0.12	
3/28/2023	7:43:35	20.60	0.12	
3/28/2023	7:44:35	20.60	0.12	
3/28/2023	7:45:35	20.60	0.12	
3/28/2023	7:46:35	20.60	0.12	
3/28/2023	7:47:35	20.60	0.12	
3/28/2023	7:48:35	20.60	0.12	
3/28/2023	7:49:35	20.60	0.12	
3/28/2023	7:50:35	20.60	0.12	
3/28/2023	7:51:35	20.61	0.12	
3/28/2023	7:52:35	20.60	0.12	
3/28/2023	7:53:35	20.60	0.13	
3/28/2023	7:54:35	20.61	0.13	
3/28/2023	7:55:35	20.62	0.13	
3/28/2023	7:56:35	20.61	0.13	
3/28/2023	7:57:35	20.60	0.13	
3/28/2023	7:58:35	20.60	0.13	
3/28/2023	7:59:35	20.60	0.13	
3/28/2023	8:00:35	20.60	0.13	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 2 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/28/2023	8:01:35	20.60	0.13	
3/28/2023	8:02:35	20.60	0.12	
3/28/2023	8:03:35	20.60	0.13	
3/28/2023	8:04:35	20.60	0.12	
3/28/2023	8:05:35	20.60	0.12	
3/28/2023	8:06:35	20.60	0.12	
3/28/2023	8:07:35	20.60	0.12	
3/28/2023	8:08:35	20.59	0.11	
3/28/2023	8:09:35	20.61	0.11	
3/28/2023	8:10:35	20.61	0.11	
3/28/2023	8:11:35	20.61	0.11	
3/28/2023	8:12:35	20.61	0.11	
3/28/2023	8:13:35	20.60	0.11	
3/28/2023	8:14:35	20.60	0.11	
3/28/2023	8:15:35	20.60	0.12	
3/28/2023	8:16:35	20.60	0.12	
3/28/2023	8:17:35	20.60	0.12	
3/28/2023	8:18:35	20.60	0.12	
3/28/2023	8:19:35	20.59	0.12	
3/28/2023	8:20:35	20.59	0.12	
3/28/2023	8:21:35	20.59	0.12	
3/28/2023	8:22:35	20.59	0.13	
3/28/2023	8:23:35	20.59	0.13	
3/28/2023	8:24:35	20.59	0.13	
3/28/2023	8:25:35	20.59	0.13	
3/28/2023	8:26:35	20.59	0.13	
3/28/2023	8:27:35	20.58	0.13	
3/28/2023	8:28:35	20.58	0.13	
3/28/2023	8:29:35	20.59	0.13	
3/28/2023	8:30:35	20.58	0.13	
3/28/2023	8:31:35	20.58	0.13	
3/28/2023	8:32:35	20.58	0.12	
3/28/2023	8:33:35	20.58	0.12	
3/28/2023	8:34:35	20.58	0.12	
3/28/2023	8:35:35	20.69	0.12	
3/28/2023	8:36:35	20.95	0.12	
3/28/2023	8:37:35	20.95	0.12	
3/28/2023	8:38:35	20.96	0.11	
3/28/2023	8:39:35	20.97	0.11	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 2 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/28/2023	8:40:35	20.95	0.12	
3/28/2023	8:41:35	20.95	0.11	
3/28/2023	8:42:35	20.95	0.12	
3/28/2023	8:43:35	20.86	0.11	
3/28/2023	8:44:35	20.71	0.12	
3/28/2023	8:45:35	20.70	0.12	
3/28/2023	8:46:35	20.71	0.12	
3/28/2023	8:47:35	20.71	0.12	
3/28/2023	8:48:35	20.71	0.12	
3/28/2023	8:49:35	20.71	0.12	
3/28/2023	8:50:35	20.71	0.12	
3/28/2023	8:51:35	20.72	0.12	
3/28/2023	8:52:35	20.71	0.13	
3/28/2023	8:53:35	20.72	0.13	
3/28/2023	8:54:35	20.72	0.13	
3/28/2023	8:55:35	20.72	0.13	
3/28/2023	8:56:35	20.72	0.13	
3/28/2023	8:57:35	20.72	0.13	
3/28/2023	8:58:35	20.72	0.13	
3/28/2023	8:59:35	20.72	0.13	
3/28/2023	9:00:35	20.72	0.13	
3/28/2023	9:01:35	20.72	0.13	
3/28/2023	9:02:35	20.72	0.13	
3/28/2023	9:03:35	20.72	0.12	
3/28/2023	9:04:35	20.73	0.12	
3/28/2023	9:05:35	20.72	0.12	
3/28/2023	9:06:35	20.71	0.12	
3/28/2023	9:07:35	20.72	0.12	
3/28/2023	9:08:35	20.73	0.11	
3/28/2023	9:09:35	20.71	0.11	
3/28/2023	9:10:35	20.71	0.11	End Run 2 White Iron
		20.63	0.12	Average
3/28/2023	9:31:35	0.07	0.05	
3/28/2023	9:32:35	0.02	0.05	O2/CO2 System Zero
3/28/2023	9:33:35	7.54	9.89	
3/28/2023	9:34:35	10.09	9.94	O2/CO2 System Upscale
3/28/2023	9:35:35	13.78	5.29	
3/28/2023	9:36:35	20.61	0.21	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 2 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
Mn and CM40 Steel				
3/28/2023	10:30:35	20.74	0.14	Start Run 2
3/28/2023	10:31:35	20.74	0.14	
3/28/2023	10:32:35	20.74	0.14	
3/28/2023	10:33:35	20.74	0.14	
3/28/2023	10:34:35	20.74	0.13	
3/28/2023	10:35:35	20.74	0.13	
3/28/2023	10:36:35	20.74	0.13	
3/28/2023	10:37:35	20.74	0.13	
3/28/2023	10:38:35	20.74	0.13	
3/28/2023	10:39:35	20.74	0.12	
3/28/2023	10:40:35	20.75	0.12	
3/28/2023	10:41:35	20.74	0.13	
3/28/2023	10:42:35	20.74	0.13	
3/28/2023	10:43:35	20.74	0.13	
3/28/2023	10:44:35	20.74	0.13	
3/28/2023	10:45:35	20.72	0.13	
3/28/2023	10:46:35	20.72	0.13	
3/28/2023	10:47:35	20.72	0.13	
3/28/2023	10:48:35	20.71	0.13	
3/28/2023	10:49:35	20.71	0.13	
3/28/2023	10:50:35	20.71	0.13	
3/28/2023	10:51:35	20.71	0.13	
3/28/2023	10:52:35	20.71	0.13	
3/28/2023	10:53:35	20.71	0.14	
3/28/2023	10:54:35	20.69	0.15	
3/28/2023	10:55:35	20.68	0.15	
3/28/2023	10:56:35	20.68	0.16	
3/28/2023	10:57:35	20.67	0.16	
3/28/2023	10:58:35	20.67	0.16	
3/28/2023	10:59:35	20.67	0.16	
3/28/2023	11:00:35	20.67	0.16	
3/28/2023	11:01:35	20.67	0.16	
3/28/2023	11:02:35	20.66	0.16	
3/28/2023	11:03:35	20.67	0.16	
3/28/2023	11:04:35	20.87	0.16	
3/28/2023	11:05:35	20.86	0.16	
3/28/2023	11:06:35	20.87	0.15	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 2 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/28/2023	11:07:35	20.87	0.15	
3/28/2023	11:08:35	20.88	0.14	
3/28/2023	11:09:35	20.89	0.13	
3/28/2023	11:10:35	20.89	0.13	
3/28/2023	11:11:35	20.90	0.13	
3/28/2023	11:12:35	20.90	0.13	
3/28/2023	11:13:35	20.90	0.13	
3/28/2023	11:14:35	20.90	0.13	
3/28/2023	11:15:35	20.90	0.13	
3/28/2023	11:16:35	20.90	0.13	
3/28/2023	11:17:35	20.90	0.13	
3/28/2023	11:18:35	20.90	0.13	
3/28/2023	11:19:35	20.85	0.13	
3/28/2023	11:20:35	20.79	0.13	
3/28/2023	11:21:35	20.79	0.13	
3/28/2023	11:22:35	20.80	0.13	
3/28/2023	11:23:35	20.79	0.14	
3/28/2023	11:24:35	20.79	0.14	
3/28/2023	11:25:35	20.80	0.14	
3/28/2023	11:26:35	20.81	0.14	
3/28/2023	11:27:35	20.80	0.14	
3/28/2023	11:28:35	20.80	0.14	
3/28/2023	11:29:35	20.80	0.14	
3/28/2023	11:30:35	20.80	0.14	
3/28/2023	11:31:35	20.81	0.14	
3/28/2023	11:32:35	20.81	0.14	
3/28/2023	11:33:35	20.81	0.13	
3/28/2023	11:34:35	20.81	0.13	
3/28/2023	11:35:35	20.81	0.13	
3/28/2023	11:36:35	20.81	0.13	
3/28/2023	11:37:35	20.81	0.12	
3/28/2023	11:38:35	20.81	0.13	
3/28/2023	11:39:35	20.81	0.13	
3/28/2023	11:40:35	20.80	0.12	
3/28/2023	11:41:35	20.80	0.13	
3/28/2023	11:42:35	20.79	0.13	
3/28/2023	11:43:35	20.80	0.13	
3/28/2023	11:44:35	20.79	0.13	
3/28/2023	11:45:35	20.81	0.13	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 2 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/28/2023	11:46:35	20.80	0.13	
3/28/2023	11:47:35	20.80	0.13	
3/28/2023	11:48:35	20.81	0.13	
3/28/2023	11:49:35	20.80	0.13	
3/28/2023	11:50:35	20.80	0.14	
3/28/2023	11:51:35	20.80	0.14	
3/28/2023	11:52:35	20.80	0.14	
3/28/2023	11:53:35	20.81	0.14	
3/28/2023	11:54:35	20.80	0.14	
3/28/2023	11:55:35	20.80	0.15	
3/28/2023	11:56:35	20.80	0.15	
3/28/2023	11:57:35	20.80	0.15	
3/28/2023	11:58:35	20.80	0.14	
3/28/2023	11:59:35	20.80	0.15	
3/28/2023	12:00:35	20.80	0.14	
3/28/2023	12:01:35	20.80	0.14	
3/28/2023	12:02:35	20.80	0.14	
3/28/2023	12:03:35	20.80	0.14	
3/28/2023	12:04:35	20.80	0.14	
3/28/2023	12:05:35	20.80	0.14	
3/28/2023	12:06:35	20.80	0.14	
3/28/2023	12:07:35	20.82	0.14	
3/28/2023	12:08:35	20.80	0.13	
3/28/2023	12:09:35	20.80	0.13	
3/28/2023	12:10:35	20.80	0.13	
3/28/2023	12:11:35	20.82	0.13	
3/28/2023	12:12:35	20.82	0.13	
3/28/2023	12:13:35	20.82	0.13	
3/28/2023	12:14:35	20.82	0.13	
3/28/2023	12:15:35	20.82	0.13	
3/28/2023	12:16:35	20.81	0.13	
3/28/2023	12:17:35	20.81	0.13	
3/28/2023	12:18:35	20.81	0.13	
3/28/2023	12:19:35	20.81	0.13	
3/28/2023	12:20:35	20.80	0.14	
3/28/2023	12:21:35	20.79	0.14	
3/28/2023	12:22:35	20.78	0.14	
3/28/2023	12:23:35	20.78	0.14	
3/28/2023	12:24:35	20.78	0.14	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 2 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/28/2023	12:25:35	20.78	0.15	
3/28/2023	12:26:35	20.78	0.14	
3/28/2023	12:27:35	20.78	0.15	
3/28/2023	12:28:35	20.78	0.14	
3/28/2023	12:29:35	20.78	0.15	
3/28/2023	12:30:35	20.78	0.14	
3/28/2023	12:31:35	20.78	0.14	
3/28/2023	12:32:35	20.79	0.14	
3/28/2023	12:33:35	20.79	0.14	
3/28/2023	12:34:35	20.79	0.14	
3/28/2023	12:35:35	20.79	0.14	
3/28/2023	12:36:35	20.79	0.14	
3/28/2023	12:37:35	20.79	0.13	
3/28/2023	12:38:35	20.79	0.13	
3/28/2023	12:39:35	20.79	0.13	
3/28/2023	12:40:35	20.79	0.13	
3/28/2023	12:41:35	20.79	0.13	
3/28/2023	12:42:35	20.82	0.13	
3/28/2023	12:43:35	20.82	0.13	
3/28/2023	12:44:35	20.81	0.13	
3/28/2023	12:45:35	20.81	0.13	
3/28/2023	12:46:35	20.80	0.13	
3/28/2023	12:47:35	20.80	0.13	
3/28/2023	12:48:35	20.80	0.13	
3/28/2023	12:49:35	20.80	0.13	
3/28/2023	12:50:35	20.80	0.13	
3/28/2023	12:51:35	20.78	0.13	
3/28/2023	12:52:35	20.77	0.13	
3/28/2023	12:53:35	20.78	0.14	
3/28/2023	12:54:35	20.78	0.14	
3/28/2023	12:55:35	20.78	0.14	
3/28/2023	12:56:35	20.78	0.14	
3/28/2023	12:57:35	20.79	0.15	
3/28/2023	12:58:35	20.79	0.14	
3/28/2023	12:59:35	20.79	0.14	
3/28/2023	13:00:35	20.78	0.14	
3/28/2023	13:01:35	20.79	0.14	
3/28/2023	13:02:35	20.78	0.14	
3/28/2023	13:03:35	20.78	0.14	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 2 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/28/2023	13:04:35	20.79	0.14	
3/28/2023	13:05:35	20.78	0.14	
3/28/2023	13:06:35	20.78	0.14	
3/28/2023	13:07:35	20.79	0.14	
3/28/2023	13:08:35	20.78	0.13	
3/28/2023	13:09:35	20.78	0.13	
3/28/2023	13:10:35	20.79	0.13	
3/28/2023	13:11:35	20.78	0.13	
3/28/2023	13:12:35	20.78	0.13	
3/28/2023	13:13:35	20.78	0.13	
3/28/2023	13:14:35	20.78	0.13	
3/28/2023	13:15:35	20.78	0.13	
3/28/2023	13:16:35	20.78	0.13	
3/28/2023	13:17:35	20.78	0.13	
3/28/2023	13:18:35	20.78	0.13	
3/28/2023	13:19:35	20.78	0.13	
3/28/2023	13:20:35	20.78	0.13	
3/28/2023	13:21:35	20.79	0.13	
3/28/2023	13:22:35	20.79	0.13	
3/28/2023	13:23:35	20.79	0.14	
3/28/2023	13:24:35	20.79	0.14	
3/28/2023	13:25:35	20.79	0.14	
3/28/2023	13:26:35	20.79	0.14	
3/28/2023	13:27:35	20.78	0.14	
3/28/2023	13:28:35	20.78	0.14	
3/28/2023	13:29:35	20.78	0.14	
3/28/2023	13:30:35	20.78	0.14	
3/28/2023	13:31:35	20.78	0.14	
3/28/2023	13:32:35	20.78	0.14	
3/28/2023	13:33:35	20.78	0.14	
3/28/2023	13:34:35	20.78	0.14	
3/28/2023	13:35:35	20.78	0.14	
3/28/2023	13:36:35	20.78	0.14	
3/28/2023	13:37:35	20.78	0.14	
3/28/2023	13:38:35	20.77	0.14	
3/28/2023	13:39:35	20.77	0.13	
3/28/2023	13:40:35	20.77	0.13	
3/28/2023	13:41:35	20.77	0.13	
3/28/2023	13:42:35	20.77	0.13	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 2 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/28/2023	13:43:35	20.77	0.13	
3/28/2023	13:44:35	20.77	0.13	
3/28/2023	13:45:35	20.76	0.13	
3/28/2023	13:46:35	20.76	0.14	
3/28/2023	13:47:35	20.75	0.15	
3/28/2023	13:48:35	20.75	0.15	
3/28/2023	13:49:35	20.74	0.15	
3/28/2023	13:50:35	20.74	0.15	
3/28/2023	13:51:35	20.73	0.15	
3/28/2023	13:52:35	20.73	0.15	
3/28/2023	13:53:35	20.73	0.16	
3/28/2023	13:54:35	20.73	0.16	
3/28/2023	13:55:35	20.74	0.16	
3/28/2023	13:56:35	20.74	0.16	
3/28/2023	13:57:35	20.72	0.17	
3/28/2023	13:58:35	20.71	0.17	
3/28/2023	13:59:35	20.72	0.17	
3/28/2023	14:00:35	20.73	0.16	
3/28/2023	14:01:35	20.74	0.16	
3/28/2023	14:02:35	20.73	0.16	
3/28/2023	14:03:35	20.73	0.16	
3/28/2023	14:04:35	20.73	0.16	
3/28/2023	14:05:35	20.72	0.15	
3/28/2023	14:06:35	20.70	0.16	
3/28/2023	14:07:35	20.70	0.15	
3/28/2023	14:08:35	20.70	0.15	
3/28/2023	14:09:35	20.70	0.15	
3/28/2023	14:10:35	20.71	0.15	
3/28/2023	14:11:35	20.70	0.15	
3/28/2023	14:12:35	20.71	0.15	
3/28/2023	14:13:35	20.71	0.14	
3/28/2023	14:14:35	20.70	0.14	
3/28/2023	14:15:35	20.71	0.14	
3/28/2023	14:16:35	20.73	0.14	
3/28/2023	14:17:35	20.73	0.14	
3/28/2023	14:18:35	20.74	0.14	
3/28/2023	14:19:35	20.74	0.13	
3/28/2023	14:20:35	20.74	0.13	
3/28/2023	14:21:35	20.74	0.13	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 2 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/28/2023	14:22:35	20.74	0.14	
3/28/2023	14:23:35	20.74	0.14	
3/28/2023	14:24:35	20.74	0.14	
3/28/2023	14:25:35	20.74	0.14	
3/28/2023	14:26:35	20.74	0.14	
3/28/2023	14:27:35	20.73	0.14	
3/28/2023	14:28:35	20.74	0.14	
3/28/2023	14:29:35	20.74	0.15	
3/28/2023	14:30:35	20.74	0.14	
3/28/2023	14:31:35	20.74	0.14	
3/28/2023	14:32:35	20.74	0.14	
3/28/2023	14:33:35	20.74	0.14	
3/28/2023	14:34:35	20.74	0.14	
3/28/2023	14:35:35	20.74	0.14	
3/28/2023	14:36:35	20.74	0.13	
3/28/2023	14:37:35	20.74	0.14	
3/28/2023	14:38:35	20.74	0.13	
3/28/2023	14:39:35	20.74	0.13	
3/28/2023	14:40:35	20.74	0.13	End Run 2 Mn and CM40 Steel
		20.77	0.14	Average
3/28/2023	14:41:35	20.74	0.13	
3/28/2023	14:42:35	20.74	0.13	
3/28/2023	14:43:35	20.73	0.13	
3/28/2023	14:44:35	20.74	0.13	
3/28/2023	14:45:35	0.41	0.20	
3/28/2023	14:46:35	0.04	0.05	O2/CO2 System Zero
3/28/2023	14:47:35	0.07	0.81	
3/28/2023	14:48:35	7.45	9.76	
3/28/2023	14:49:35	10.09	9.90	O2/CO2 System Upscale

Bison Engineering, Inc.
Gaseous Testing Summary

Client: **Eagle Foundry Company**
Facility: **Eagle Foundry**
Location: **Eagle Creek, OR**

Source: **Cooling Bunker BH Outlet**
Test Date: **3/29/2023 - Day 3**

Environmental Conditions / Test Notes: See isokinetic field data sheets.
Testing Personnel: JCR

Run	White Iron Run 3	Steel Alloy Run 3
Date	3/29/2023	3/29/2023
Run Start Time	5:15	10:35
Run End Time	9:15	14:45
Duration, min.	240	250
CO ₂ , %vd	0.07	0.06
O ₂ , %vd	20.92	20.90

Note: Negative concentrations are reported as zero.

Bison Engineering, Inc.
Method 3A Oxygen
Calibration Error, System Bias and System Drift

Client:	Eagle Foundry Company	Source:	Cooling Bunker BH Outlet	Instrument Make:	Servomex
Facility:	Eagle Foundry	Date:	3/29/2023 - Day 3	Instrument Model:	1440
Location:	Eagle Creek, OR			Instrument Serial #:	01440D1-5041

		Initial Values				Final Values						Raw Avg Gas Conc	Corrected Gas Conc	Instrument Cal. Reference Gas
		Analyzer Cal. Response	System Cal Response	Pre test System Cal. Bias		System Cal Response	Post test System Cal. Bias		System Drift		Analyzer Span			
				% of span	pass/fail		% of span	pass/fail	% of span	pass/fail				
White Iron	zero	-0.07	0.00	0.32	pass	-0.05	0.09	pass	0.23	pass				
Run 3	upscale	10.08	10.08	0.00	pass	10.04	-0.18	pass	0.18	pass	22.01	20.84	20.92	10.11
Mn and CM40 Steel	zero	-0.07	-0.05	0.09	pass	-0.01	0.27	pass	0.18	pass				
Run 3	upscale	10.08	10.04	-0.18	pass	10.06	-0.09	pass	0.09	pass	22.01	20.81	20.90	10.11
				< 5%*		< 5%*		< 3%*						

Analyzer Calibration Error	Zero	Mid	High
Calibration Gas Standards	0	10.11	22.01
Cylinder Number		ALM054560	EB0157290
Calibration Gas Analyzer Response	-0.07	10.08	22.07
Analyzer Calibration Error	-0.32	-0.14	0.27
Analyzer Calibration Error < 2%*	pass	pass	pass

System Response Time	
30	seconds

System Leak Check		
	Completed	Pass/Fail
Pre-test	Yes	Pass
Post-test	Yes	Pass

Note: All units are in %

*Or < 0.5 % absolute difference

Bison Engineering, Inc.

Method 3A CO₂

Calibration Error, System Bias and System Drift

Client:	Eagle Foundry Company	Source:	Cooling Bunker BH Outlet	Instrument Make:	Servomex
Facility:	Eagle Foundry	Date:	3/29/2023 - Day 3	Instrument Model:	1440
Location:	Eagle Creek, OR			Instrument Serial #:	01440D1-5041

		Initial Values				Final Values						Raw Avg Gas Conc	Corrected Gas Conc	Instrument Cal. Reference Gas
		Analyzer Cal. Response	System Cal Response	Pre test System Cal. Bias		System Cal Response	Post test System Cal. Bias		System Drift		Analyzer Span			
				% of span	pass/fail		% of span	pass/fail	% of span	pass/fail				
White Iron	zero	-0.02	0.02	0.18	pass	0.02	0.18	pass	0.00	pass				
Run 3	upscale	9.92	9.96	0.18	pass	9.93	0.05	pass	0.14	pass	21.66	0.09	0.07	9.924
Mn and CM40 Steel	zero	-0.02	0.02	0.18	pass	0.03	0.23	pass	0.05	pass				
Run 3	upscale	9.92	9.93	0.05	pass	9.98	0.28	pass	0.23	pass	21.66	0.09	0.06	9.924
				< 5%*		< 5%*		< 3%*						

Analyzer Calibration Error	Zero	Mid	High
Calibration Gas Standards	0	9.924	21.66
Cylinder Number		ALM054560	EB0157290
Calibration Gas Analyzer Response	-0.02	9.92	21.65
Analyzer Calibration Error	-0.09	-0.02	-0.05
Analyzer Calibration Error < 2%*	pass	pass	pass

System Response Time	
29	seconds

System Leak Check		
	Completed	Pass/Fail
Pre-test	Yes	Pass
Post-test	Yes	Pass

Note: All units are in %

*Or < 0.5 % absolute difference

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 3 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/29/2023	3:27:01	-2.05	0.02	
3/29/2023	3:28:01	-0.07	-0.02	O2/CO2 Analyzer Zero
3/29/2023	3:29:01	13.54	11.39	
3/29/2023	3:30:01	25.69	22.48	
3/29/2023	3:31:01	22.07	22.63	
3/29/2023	3:32:01	22.10	22.72	
3/29/2023	3:33:01	22.14	22.02	
3/29/2023	3:34:01	22.07	21.65	O2/CO2 Analyzer Span
3/29/2023	3:35:01	13.60	14.38	
3/29/2023	3:36:01	10.05	9.76	
3/29/2023	3:37:01	10.06	9.92	
3/29/2023	3:38:01	10.08	9.92	O2/CO2 Analyzer Mid
3/29/2023	3:39:01	10.02	9.92	
3/29/2023	3:40:01	10.22	8.32	
3/29/2023	3:41:01	17.84	0.46	
3/29/2023	3:42:01	-0.05	0.07	
3/29/2023	3:43:01	0.00	0.02	O2/CO2 System Zero
3/29/2023	3:44:01	-0.03	0.06	
3/29/2023	3:45:01	6.39	8.61	
3/29/2023	3:46:01	10.08	9.96	O2/CO2 System Upscale
3/29/2023	3:47:01	13.42	5.94	
3/29/2023	3:48:01	20.81	0.16	
3/29/2023	3:49:01	20.88	0.09	

White Iron			
3/29/2023	5:15:01	20.84	0.07
3/29/2023	5:16:01	20.83	0.08
3/29/2023	5:17:01	20.84	0.07
3/29/2023	5:18:01	20.83	0.08
3/29/2023	5:19:01	20.84	0.08
3/29/2023	5:20:01	20.84	0.08
3/29/2023	5:21:01	20.84	0.08
3/29/2023	5:22:01	20.84	0.07
3/29/2023	5:23:01	20.84	0.07
3/29/2023	5:24:01	20.84	0.07
3/29/2023	5:25:01	20.84	0.07
3/29/2023	5:26:01	20.84	0.08
3/29/2023	5:27:01	20.84	0.08
3/29/2023	5:28:01	20.84	0.08

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 3 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/29/2023	5:29:01	20.84	0.08	
3/29/2023	5:30:01	20.84	0.08	
3/29/2023	5:31:01	20.84	0.08	
3/29/2023	5:32:01	20.83	0.09	
3/29/2023	5:33:01	20.83	0.08	
3/29/2023	5:34:01	20.83	0.08	
3/29/2023	5:35:01	20.83	0.08	
3/29/2023	5:36:01	20.83	0.08	
3/29/2023	5:37:01	20.83	0.08	
3/29/2023	5:38:01	20.83	0.08	
3/29/2023	5:39:01	20.83	0.08	
3/29/2023	5:40:01	20.83	0.08	
3/29/2023	5:41:01	20.83	0.08	
3/29/2023	5:42:01	20.83	0.07	
3/29/2023	5:43:01	20.83	0.07	
3/29/2023	5:44:01	20.83	0.07	
3/29/2023	5:45:01	20.83	0.07	
3/29/2023	5:46:01	20.83	0.06	
3/29/2023	5:47:01	20.83	0.06	
3/29/2023	5:48:01	20.80	0.06	
3/29/2023	5:49:01	20.79	0.07	
3/29/2023	5:50:01	20.79	0.06	
3/29/2023	5:51:01	20.79	0.07	
3/29/2023	5:52:01	20.79	0.07	
3/29/2023	5:53:01	20.81	0.06	
3/29/2023	5:54:01	20.83	0.07	
3/29/2023	5:55:01	20.83	0.07	
3/29/2023	5:56:01	20.83	0.07	
3/29/2023	5:57:01	20.84	0.07	
3/29/2023	5:58:01	20.84	0.08	
3/29/2023	5:59:01	20.84	0.07	
3/29/2023	6:00:01	20.83	0.08	
3/29/2023	6:01:01	20.84	0.08	
3/29/2023	6:02:01	20.83	0.08	
3/29/2023	6:03:01	20.83	0.08	
3/29/2023	6:04:01	20.83	0.09	
3/29/2023	6:05:01	20.83	0.09	
3/29/2023	6:06:01	20.83	0.08	
3/29/2023	6:07:01	20.83	0.08	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 3 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/29/2023	6:08:01	20.84	0.08	
3/29/2023	6:09:01	20.84	0.08	
3/29/2023	6:10:01	20.83	0.08	
3/29/2023	6:11:01	20.82	0.08	
3/29/2023	6:12:01	20.82	0.08	
3/29/2023	6:13:01	20.83	0.08	
3/29/2023	6:14:01	20.83	0.08	
3/29/2023	6:15:01	20.83	0.08	
3/29/2023	6:16:01	20.84	0.07	
3/29/2023	6:17:01	20.83	0.08	
3/29/2023	6:18:01	20.83	0.08	
3/29/2023	6:19:01	20.83	0.08	
3/29/2023	6:20:01	20.84	0.08	
3/29/2023	6:21:01	20.84	0.08	
3/29/2023	6:22:01	20.84	0.08	
3/29/2023	6:23:01	20.84	0.08	
3/29/2023	6:24:01	20.84	0.08	
3/29/2023	6:25:01	20.85	0.08	
3/29/2023	6:26:01	20.87	0.08	
3/29/2023	6:27:01	20.86	0.08	
3/29/2023	6:28:01	20.84	0.09	
3/29/2023	6:29:01	20.84	0.09	
3/29/2023	6:30:01	20.84	0.09	
3/29/2023	6:31:01	20.84	0.09	
3/29/2023	6:32:01	20.84	0.10	
3/29/2023	6:33:01	20.85	0.10	
3/29/2023	6:34:01	20.85	0.10	
3/29/2023	6:35:01	20.85	0.09	
3/29/2023	6:36:01	20.84	0.10	
3/29/2023	6:37:01	20.85	0.10	
3/29/2023	6:38:01	20.86	0.10	
3/29/2023	6:39:01	20.85	0.10	
3/29/2023	6:40:01	20.85	0.10	
3/29/2023	6:41:01	20.86	0.10	
3/29/2023	6:42:01	20.86	0.10	
3/29/2023	6:43:01	20.86	0.09	
3/29/2023	6:44:01	20.86	0.09	
3/29/2023	6:45:01	20.86	0.09	
3/29/2023	6:46:01	20.86	0.09	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 3 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/29/2023	6:47:01	20.86	0.08	
3/29/2023	6:48:01	20.86	0.08	
3/29/2023	6:49:01	20.87	0.08	
3/29/2023	6:50:01	20.87	0.08	
3/29/2023	6:51:01	20.88	0.08	
3/29/2023	6:52:01	20.87	0.09	
3/29/2023	6:53:01	20.87	0.09	
3/29/2023	6:54:01	20.85	0.09	
3/29/2023	6:55:01	20.85	0.09	
3/29/2023	6:56:01	20.86	0.09	
3/29/2023	6:57:01	20.87	0.09	
3/29/2023	6:58:01	20.86	0.09	
3/29/2023	6:59:01	20.87	0.09	
3/29/2023	7:00:01	20.86	0.10	
3/29/2023	7:01:01	20.86	0.10	
3/29/2023	7:02:01	20.86	0.10	
3/29/2023	7:03:01	20.85	0.11	
3/29/2023	7:04:01	20.84	0.11	
3/29/2023	7:05:01	20.84	0.11	
3/29/2023	7:06:01	20.84	0.11	
3/29/2023	7:07:01	20.85	0.11	
3/29/2023	7:08:01	20.85	0.11	
3/29/2023	7:09:01	20.85	0.10	
3/29/2023	7:10:01	20.85	0.11	
3/29/2023	7:11:01	20.85	0.10	
3/29/2023	7:12:01	20.85	0.10	
3/29/2023	7:13:01	20.85	0.10	
3/29/2023	7:14:01	20.85	0.10	
3/29/2023	7:15:01	20.85	0.10	
3/29/2023	7:16:01	20.86	0.10	
3/29/2023	7:17:01	20.86	0.10	
3/29/2023	7:18:01	20.86	0.09	
3/29/2023	7:19:01	20.86	0.09	
3/29/2023	7:20:01	20.86	0.09	
3/29/2023	7:21:01	20.87	0.09	
3/29/2023	7:22:01	20.86	0.09	
3/29/2023	7:23:01	20.85	0.10	
3/29/2023	7:24:01	20.85	0.10	
3/29/2023	7:25:01	20.84	0.11	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 3 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/29/2023	7:26:01	20.85	0.11	
3/29/2023	7:27:01	20.86	0.11	
3/29/2023	7:28:01	20.86	0.11	
3/29/2023	7:29:01	20.83	0.12	
3/29/2023	7:30:01	20.84	0.12	
3/29/2023	7:31:01	20.84	0.11	
3/29/2023	7:32:01	20.84	0.11	
3/29/2023	7:33:01	20.84	0.12	
3/29/2023	7:34:01	20.84	0.12	
3/29/2023	7:35:01	20.85	0.12	
3/29/2023	7:36:01	20.85	0.12	
3/29/2023	7:37:01	20.85	0.12	
3/29/2023	7:38:01	20.85	0.12	
3/29/2023	7:39:01	20.84	0.13	
3/29/2023	7:40:01	20.85	0.12	
3/29/2023	7:41:01	20.85	0.12	
3/29/2023	7:42:01	20.85	0.11	
3/29/2023	7:43:01	20.86	0.11	
3/29/2023	7:44:01	20.86	0.10	
3/29/2023	7:45:01	20.86	0.11	
3/29/2023	7:46:01	20.86	0.10	
3/29/2023	7:47:01	20.86	0.10	
3/29/2023	7:48:01	20.86	0.10	
3/29/2023	7:49:01	20.86	0.10	
3/29/2023	7:50:01	20.87	0.09	
3/29/2023	7:51:01	20.87	0.09	
3/29/2023	7:52:01	20.87	0.09	
3/29/2023	7:53:01	20.87	0.09	
3/29/2023	7:54:01	20.88	0.09	
3/29/2023	7:55:01	20.88	0.09	
3/29/2023	7:56:01	20.88	0.09	
3/29/2023	7:57:01	20.88	0.10	
3/29/2023	7:58:01	20.87	0.10	
3/29/2023	7:59:01	20.89	0.10	
3/29/2023	8:00:01	20.91	0.10	
3/29/2023	8:01:01	20.91	0.10	
3/29/2023	8:02:01	20.91	0.10	
3/29/2023	8:03:01	20.91	0.10	
3/29/2023	8:04:01	20.91	0.11	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 3 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/29/2023	8:05:01	20.91	0.11	
3/29/2023	8:06:01	20.91	0.11	
3/29/2023	8:07:01	20.85	0.11	
3/29/2023	8:08:01	20.83	0.11	
3/29/2023	8:09:01	20.83	0.11	
3/29/2023	8:10:01	20.83	0.11	
3/29/2023	8:11:01	20.83	0.10	
3/29/2023	8:12:01	20.83	0.11	
3/29/2023	8:13:01	20.82	0.11	
3/29/2023	8:14:01	20.82	0.10	
3/29/2023	8:15:01	20.82	0.11	
3/29/2023	8:16:01	20.82	0.10	
3/29/2023	8:17:01	20.82	0.10	
3/29/2023	8:18:01	20.82	0.10	
3/29/2023	8:19:01	20.82	0.10	
3/29/2023	8:20:01	20.82	0.10	
3/29/2023	8:21:01	20.82	0.09	
3/29/2023	8:22:01	20.82	0.09	
3/29/2023	8:23:01	20.82	0.09	
3/29/2023	8:24:01	20.82	0.09	
3/29/2023	8:25:01	20.82	0.09	
3/29/2023	8:26:01	20.81	0.09	
3/29/2023	8:27:01	20.81	0.09	
3/29/2023	8:28:01	20.81	0.09	
3/29/2023	8:29:01	20.82	0.09	
3/29/2023	8:30:01	20.81	0.09	
3/29/2023	8:31:01	20.80	0.09	
3/29/2023	8:32:01	20.80	0.09	
3/29/2023	8:33:01	20.80	0.09	
3/29/2023	8:34:01	20.79	0.09	
3/29/2023	8:35:01	20.79	0.09	
3/29/2023	8:36:01	20.79	0.10	
3/29/2023	8:37:01	20.79	0.10	
3/29/2023	8:38:01	20.79	0.10	
3/29/2023	8:39:01	20.79	0.10	
3/29/2023	8:40:01	20.79	0.10	
3/29/2023	8:41:01	20.79	0.10	
3/29/2023	8:42:01	20.79	0.10	
3/29/2023	8:43:01	20.80	0.10	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 3 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/29/2023	8:44:01	20.80	0.10	
3/29/2023	8:45:01	20.80	0.10	
3/29/2023	8:46:01	20.80	0.09	
3/29/2023	8:47:01	20.80	0.09	
3/29/2023	8:48:01	20.81	0.09	
3/29/2023	8:49:01	20.81	0.09	
3/29/2023	8:50:01	20.81	0.09	
3/29/2023	8:51:01	20.81	0.09	
3/29/2023	8:52:01	20.81	0.08	
3/29/2023	8:53:01	20.81	0.08	
3/29/2023	8:54:01	20.81	0.08	
3/29/2023	8:55:01	20.81	0.08	
3/29/2023	8:56:01	20.81	0.08	
3/29/2023	8:57:01	20.82	0.08	
3/29/2023	8:58:01	20.82	0.08	
3/29/2023	8:59:01	20.82	0.08	
3/29/2023	9:00:01	20.82	0.07	
3/29/2023	9:01:01	20.82	0.08	
3/29/2023	9:02:01	20.82	0.08	
3/29/2023	9:03:01	20.82	0.08	
3/29/2023	9:04:01	20.82	0.08	
3/29/2023	9:05:01	20.82	0.08	
3/29/2023	9:06:01	20.82	0.08	
3/29/2023	9:07:01	20.82	0.09	
3/29/2023	9:08:01	20.80	0.09	
3/29/2023	9:09:01	20.79	0.09	
3/29/2023	9:10:01	20.79	0.09	
3/29/2023	9:11:01	20.79	0.09	
3/29/2023	9:12:01	20.79	0.09	
3/29/2023	9:13:01	20.78	0.09	
3/29/2023	9:14:01	20.78	0.08	
3/29/2023	9:15:01	20.78	0.08	End Run 3 White Iron
		20.84	0.09	Average
3/29/2023	9:22:01	20.80	0.07	
3/29/2023	9:23:01	11.58	0.20	
3/29/2023	9:24:01	-0.01	0.02	
3/29/2023	9:25:01	-0.05	0.02	O2/CO2 System Zero
3/29/2023	9:26:01	1.35	4.45	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 3 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/29/2023	9:27:01	10.04	9.93	O2/CO2 System Upscale
3/29/2023	9:28:01	13.37	5.85	
3/29/2023	9:29:01	20.70	0.16	

Mn and CM40 Steel				
3/29/2023	10:35:01	20.81	0.09	Start Run 3
3/29/2023	10:36:01	20.82	0.10	
3/29/2023	10:37:01	20.82	0.10	
3/29/2023	10:38:01	20.82	0.10	
3/29/2023	10:39:01	20.82	0.10	
3/29/2023	10:40:01	20.82	0.10	
3/29/2023	10:41:01	20.82	0.10	
3/29/2023	10:42:01	20.82	0.10	
3/29/2023	10:43:01	20.82	0.10	
3/29/2023	10:44:01	20.82	0.10	
3/29/2023	10:45:01	20.82	0.10	
3/29/2023	10:46:01	20.82	0.10	
3/29/2023	10:47:01	20.82	0.10	
3/29/2023	10:48:01	20.82	0.10	
3/29/2023	10:49:01	20.82	0.10	
3/29/2023	10:50:01	20.82	0.10	
3/29/2023	10:51:01	20.82	0.10	
3/29/2023	10:52:01	20.82	0.09	
3/29/2023	10:53:01	20.82	0.09	
3/29/2023	10:54:01	20.82	0.09	
3/29/2023	10:55:01	20.81	0.10	
3/29/2023	10:56:01	20.80	0.10	
3/29/2023	10:57:01	20.80	0.10	
3/29/2023	10:58:01	20.80	0.10	
3/29/2023	10:59:01	20.79	0.11	
3/29/2023	11:00:01	20.80	0.10	
3/29/2023	11:01:01	20.80	0.11	
3/29/2023	11:02:01	20.80	0.11	
3/29/2023	11:03:01	20.79	0.11	
3/29/2023	11:04:01	20.81	0.10	
3/29/2023	11:05:01	20.82	0.10	
3/29/2023	11:06:01	20.82	0.10	
3/29/2023	11:07:01	20.82	0.10	
3/29/2023	11:08:01	20.82	0.10	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 3 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/29/2023	11:09:01	20.83	0.10	
3/29/2023	11:10:01	20.81	0.10	
3/29/2023	11:11:01	20.82	0.11	
3/29/2023	11:12:01	20.82	0.11	
3/29/2023	11:13:01	20.82	0.10	
3/29/2023	11:14:01	20.82	0.10	
3/29/2023	11:15:01	20.82	0.10	
3/29/2023	11:16:01	20.82	0.10	
3/29/2023	11:17:01	20.82	0.10	
3/29/2023	11:18:01	20.82	0.10	
3/29/2023	11:19:01	20.82	0.10	
3/29/2023	11:20:01	20.82	0.10	
3/29/2023	11:21:01	20.82	0.09	
3/29/2023	11:22:01	20.82	0.09	
3/29/2023	11:23:01	20.82	0.09	
3/29/2023	11:24:01	20.82	0.09	
3/29/2023	11:25:01	20.82	0.08	
3/29/2023	11:26:01	20.82	0.08	
3/29/2023	11:27:01	20.82	0.08	
3/29/2023	11:28:01	20.82	0.08	
3/29/2023	11:29:01	20.81	0.08	
3/29/2023	11:30:01	20.83	0.09	
3/29/2023	11:31:01	20.84	0.08	
3/29/2023	11:32:01	20.83	0.08	
3/29/2023	11:33:01	20.83	0.09	
3/29/2023	11:34:01	20.84	0.08	
3/29/2023	11:35:01	20.83	0.09	
3/29/2023	11:36:01	20.83	0.09	
3/29/2023	11:37:01	20.82	0.09	
3/29/2023	11:38:01	20.81	0.09	
3/29/2023	11:39:01	20.81	0.10	
3/29/2023	11:40:01	20.81	0.10	
3/29/2023	11:41:01	20.81	0.10	
3/29/2023	11:42:01	20.81	0.10	
3/29/2023	11:43:01	20.81	0.10	
3/29/2023	11:44:01	20.81	0.10	
3/29/2023	11:45:01	20.81	0.10	
3/29/2023	11:46:01	20.81	0.10	
3/29/2023	11:47:01	20.81	0.10	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 3 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/29/2023	11:48:01	20.81	0.10	
3/29/2023	11:49:01	20.81	0.10	
3/29/2023	11:50:01	20.81	0.09	
3/29/2023	11:51:01	20.81	0.09	
3/29/2023	11:52:01	20.81	0.09	
3/29/2023	11:53:01	20.81	0.09	
3/29/2023	11:54:01	20.81	0.09	
3/29/2023	11:55:01	20.81	0.08	
3/29/2023	11:56:01	20.81	0.08	
3/29/2023	11:57:01	20.81	0.08	
3/29/2023	11:58:01	20.82	0.09	
3/29/2023	11:59:01	20.81	0.08	
3/29/2023	12:00:01	20.82	0.08	
3/29/2023	12:01:01	20.81	0.09	
3/29/2023	12:02:01	20.81	0.09	
3/29/2023	12:03:01	20.81	0.08	
3/29/2023	12:04:01	20.81	0.09	
3/29/2023	12:05:01	20.81	0.09	
3/29/2023	12:06:01	20.82	0.09	
3/29/2023	12:07:01	20.81	0.09	
3/29/2023	12:08:01	20.82	0.10	
3/29/2023	12:09:01	20.81	0.09	
3/29/2023	12:10:01	20.81	0.10	
3/29/2023	12:11:01	20.81	0.10	
3/29/2023	12:12:01	20.82	0.10	
3/29/2023	12:13:01	20.81	0.10	
3/29/2023	12:14:01	20.81	0.10	
3/29/2023	12:15:01	20.81	0.10	
3/29/2023	12:16:01	20.82	0.10	
3/29/2023	12:17:01	20.82	0.10	
3/29/2023	12:18:01	20.81	0.10	
3/29/2023	12:19:01	20.82	0.09	
3/29/2023	12:20:01	20.81	0.09	
3/29/2023	12:21:01	20.81	0.09	
3/29/2023	12:22:01	20.81	0.09	
3/29/2023	12:23:01	20.81	0.09	
3/29/2023	12:24:01	20.81	0.09	
3/29/2023	12:25:01	20.81	0.08	
3/29/2023	12:26:01	20.81	0.08	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 3 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/29/2023	12:27:01	20.81	0.08	
3/29/2023	12:28:01	20.81	0.08	
3/29/2023	12:29:01	20.81	0.08	
3/29/2023	12:30:01	20.81	0.08	
3/29/2023	12:31:01	20.81	0.08	
3/29/2023	12:32:01	20.81	0.08	
3/29/2023	12:33:01	20.81	0.08	
3/29/2023	12:34:01	20.81	0.08	
3/29/2023	12:35:01	20.81	0.08	
3/29/2023	12:36:01	20.81	0.08	
3/29/2023	12:37:01	20.81	0.09	
3/29/2023	12:38:01	20.81	0.09	
3/29/2023	12:39:01	20.81	0.09	
3/29/2023	12:40:01	20.81	0.09	
3/29/2023	12:41:01	20.82	0.10	
3/29/2023	12:42:01	20.82	0.09	
3/29/2023	12:43:01	20.82	0.10	
3/29/2023	12:44:01	20.82	0.09	
3/29/2023	12:45:01	20.82	0.10	
3/29/2023	12:46:01	20.82	0.10	
3/29/2023	12:47:01	20.82	0.09	
3/29/2023	12:48:01	20.82	0.09	
3/29/2023	12:49:01	20.82	0.09	
3/29/2023	12:50:01	20.83	0.09	
3/29/2023	12:51:01	20.83	0.09	
3/29/2023	12:52:01	20.83	0.09	
3/29/2023	12:53:01	20.83	0.08	
3/29/2023	12:54:01	20.83	0.08	
3/29/2023	12:55:01	20.83	0.08	
3/29/2023	12:56:01	20.83	0.08	
3/29/2023	12:57:01	20.82	0.08	
3/29/2023	12:58:01	20.82	0.08	
3/29/2023	12:59:01	20.82	0.08	
3/29/2023	13:00:01	20.82	0.08	
3/29/2023	13:01:01	20.82	0.08	
3/29/2023	13:02:01	20.82	0.08	
3/29/2023	13:03:01	20.83	0.08	
3/29/2023	13:04:01	20.83	0.08	
3/29/2023	13:05:01	20.83	0.08	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 3 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/29/2023	13:06:01	20.83	0.09	
3/29/2023	13:07:01	20.83	0.09	
3/29/2023	13:08:01	20.82	0.09	
3/29/2023	13:09:01	20.82	0.09	
3/29/2023	13:10:01	20.82	0.09	
3/29/2023	13:11:01	20.82	0.10	
3/29/2023	13:12:01	20.82	0.10	
3/29/2023	13:13:01	20.82	0.09	
3/29/2023	13:14:01	20.83	0.10	
3/29/2023	13:15:01	20.82	0.10	
3/29/2023	13:16:01	20.83	0.10	
3/29/2023	13:17:01	20.83	0.10	
3/29/2023	13:18:01	20.83	0.10	
3/29/2023	13:19:01	20.83	0.09	
3/29/2023	13:20:01	20.82	0.09	
3/29/2023	13:21:01	20.82	0.09	
3/29/2023	13:22:01	20.82	0.09	
3/29/2023	13:23:01	20.82	0.09	
3/29/2023	13:24:01	20.82	0.09	
3/29/2023	13:25:01	20.82	0.09	
3/29/2023	13:26:01	20.82	0.08	
3/29/2023	13:27:01	20.82	0.08	
3/29/2023	13:28:01	20.82	0.08	
3/29/2023	13:29:01	20.82	0.08	
3/29/2023	13:30:01	20.82	0.08	
3/29/2023	13:31:01	20.82	0.08	
3/29/2023	13:32:01	20.82	0.08	
3/29/2023	13:33:01	20.81	0.09	
3/29/2023	13:34:01	20.81	0.09	
3/29/2023	13:35:01	20.82	0.09	
3/29/2023	13:36:01	20.82	0.09	
3/29/2023	13:37:01	20.82	0.09	
3/29/2023	13:38:01	20.80	0.09	
3/29/2023	13:39:01	20.79	0.10	
3/29/2023	13:40:01	20.77	0.12	
3/29/2023	13:41:01	20.77	0.12	
3/29/2023	13:42:01	20.78	0.12	
3/29/2023	13:43:01	20.81	0.11	
3/29/2023	13:44:01	20.82	0.10	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 3 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/29/2023	13:45:01	20.82	0.10	
3/29/2023	13:46:01	20.82	0.10	
3/29/2023	13:47:01	20.82	0.10	
3/29/2023	13:48:01	20.80	0.11	
3/29/2023	13:49:01	20.81	0.11	
3/29/2023	13:50:01	20.80	0.11	
3/29/2023	13:51:01	20.80	0.10	
3/29/2023	13:52:01	20.79	0.11	
3/29/2023	13:53:01	20.79	0.10	
3/29/2023	13:54:01	20.78	0.11	
3/29/2023	13:55:01	20.78	0.10	
3/29/2023	13:56:01	20.77	0.10	
3/29/2023	13:57:01	20.77	0.10	
3/29/2023	13:58:01	20.75	0.11	
3/29/2023	13:59:01	20.76	0.10	
3/29/2023	14:00:01	20.77	0.09	
3/29/2023	14:01:01	20.77	0.09	
3/29/2023	14:02:01	20.76	0.11	
3/29/2023	14:03:01	20.76	0.10	
3/29/2023	14:04:01	20.76	0.11	
3/29/2023	14:05:01	20.76	0.10	
3/29/2023	14:06:01	20.78	0.09	
3/29/2023	14:07:01	20.78	0.10	
3/29/2023	14:08:01	20.77	0.10	
3/29/2023	14:09:01	20.77	0.11	
3/29/2023	14:10:01	20.77	0.10	
3/29/2023	14:11:01	20.75	0.11	
3/29/2023	14:12:01	20.77	0.10	
3/29/2023	14:13:01	20.78	0.10	
3/29/2023	14:14:01	20.78	0.10	
3/29/2023	14:15:01	20.78	0.10	
3/29/2023	14:16:01	20.78	0.10	
3/29/2023	14:17:01	20.78	0.09	
3/29/2023	14:18:01	20.78	0.09	
3/29/2023	14:19:01	20.79	0.09	
3/29/2023	14:20:01	20.79	0.09	
3/29/2023	14:21:01	20.79	0.09	
3/29/2023	14:22:01	20.79	0.09	
3/29/2023	14:23:01	20.79	0.08	

Eagle Foundry Company
Cooling Bunker Baghouse Outlet
Day 3 Calibrations and Test Runs

Date	Time	O2 [%]	CO2 [%]	NOTES
3/29/2023	14:24:01	20.79	0.08	
3/29/2023	14:25:01	20.79	0.07	
3/29/2023	14:26:01	20.79	0.07	
3/29/2023	14:27:01	20.79	0.07	
3/29/2023	14:28:01	20.79	0.07	
3/29/2023	14:29:01	20.79	0.07	
3/29/2023	14:30:01	20.79	0.07	
3/29/2023	14:31:01	20.80	0.07	
3/29/2023	14:32:01	20.80	0.07	
3/29/2023	14:33:01	20.81	0.07	
3/29/2023	14:34:01	20.81	0.07	
3/29/2023	14:35:01	20.81	0.08	
3/29/2023	14:36:01	20.81	0.08	
3/29/2023	14:37:01	20.81	0.08	
3/29/2023	14:38:01	20.81	0.08	
3/29/2023	14:39:01	20.80	0.08	
3/29/2023	14:40:01	20.80	0.09	
3/29/2023	14:41:01	20.80	0.08	
3/29/2023	14:42:01	20.80	0.08	
3/29/2023	14:43:01	20.80	0.08	
3/29/2023	14:44:01	20.80	0.08	
3/29/2023	14:45:01	20.80	0.08	End Run 3 Mn and CM40 Steel
		20.81	0.09	Average
3/29/2023	14:46:01	20.80	0.08	
3/29/2023	14:47:01	20.79	0.08	
3/29/2023	14:48:01	20.77	0.07	
3/29/2023	14:49:01	20.54	0.12	
3/29/2023	14:50:01	-0.83	0.13	
3/29/2023	14:51:01	-0.01	0.03	O2/CO2 System Zero
3/29/2023	14:52:01	-0.06	0.07	
3/29/2023	14:53:01	7.11	9.33	
3/29/2023	14:54:01	10.06	9.98	O2/CO2 System Upscale
3/29/2023	14:55:01	10.07	10.00	
3/29/2023	14:56:01	10.08	10.10	
3/29/2023	14:57:01	11.52	7.32	

APPENDIX D: PTE VERIFICATION DOCUMENTATION



COMPANY	Eagle Foundry Company
FACILITY	Eagle Foundry
LOCATION	Eagle Creek, Oregon
SOURCE	Main Foundry
DATE	03/24/23
METHOD	204
PARAMETER	PTE Verification



BISON

ENGINEERING, INC.

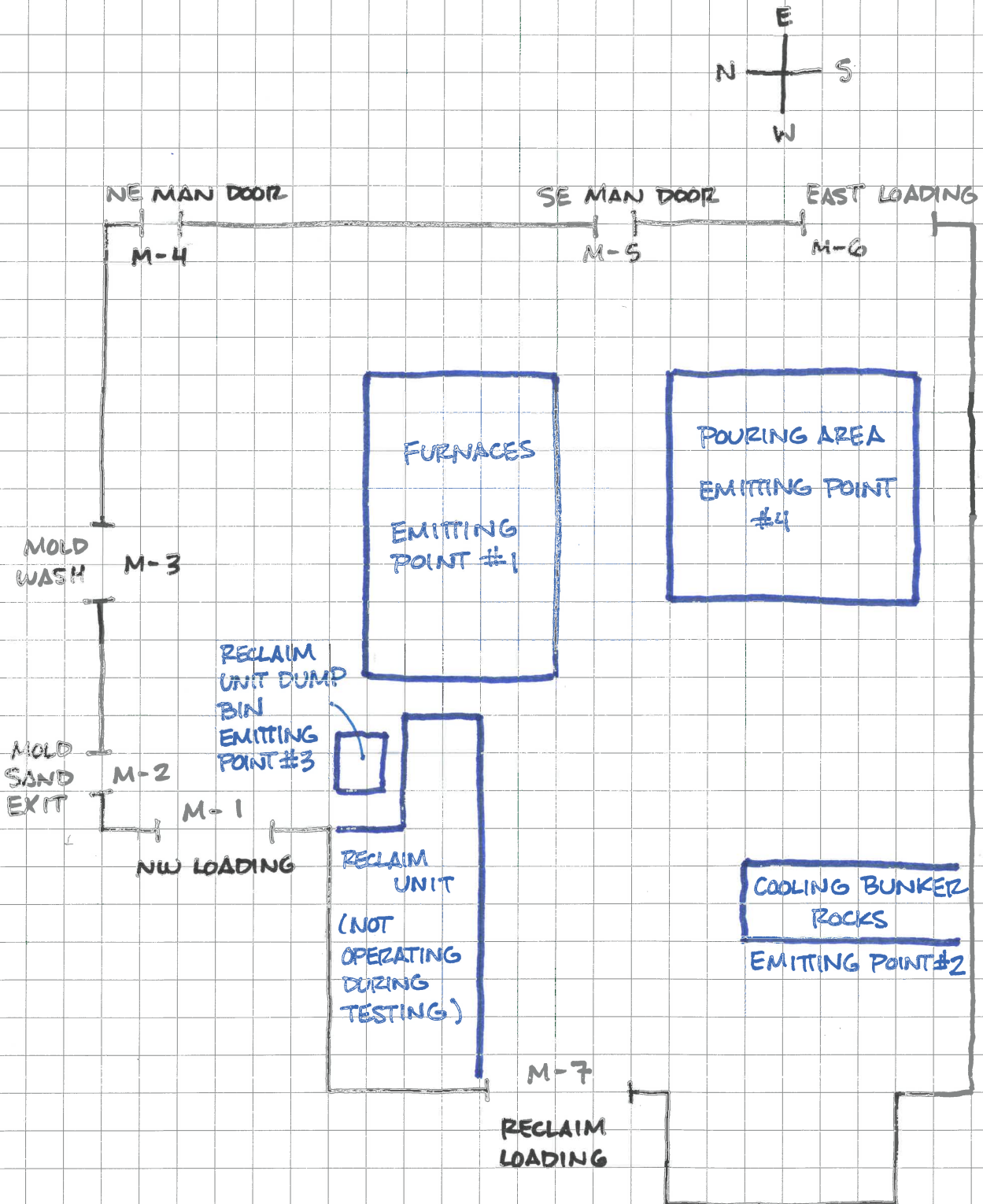
An Employee Owned Company

Prj. No.: EFC223119

Location: MAIN FOUNDRY

By: JACOB RANKIN

Date: 8/3/23 Sheet: _____ of _____



Bison Engineering, Inc.
Method 204 Area Calculations

Enclosure Interior Dimensions

Location Description	Length (ft)	Width (ft)	Area (ft ²)
E Wall	130.33	26.83	3,497
S Wall	146.58	22.00	3,225
W Wall	79.75	26.83	2,140
N Wall	50.58	19.33	978
	120.25	19.33	2,325
	26.33	19.33	509
Floor Area 1	146.58	79.75	11,690
Floor Area 2	120.25	50.58	6,083
Ceiling Area 1	146.58	79.75	11,690
Ceiling Area 2	120.25	50.58	6,083
Total enclosure area:			48,219 ft ²

NEAR Calculation

Total area of NDOs (A_N): 197 ft²
 Total enclosure area (A_T): 48,219 ft²
 0.004 ≤ 0.05 **PASS**

NEAR - NDO to enclosure area ratio

Note: The ceiling is assumed to have the same surface area as the floor.

NDO Dimensions

NDO #	NDO Location Description	Height (in)	Width (in)	Area (in ²)
M-6	East Loading	84	121	10,164
M-5	SE Man Door	1	35	35
M-4	NE Man Door	1	35	35
M-3	Mold Wash	1	93	93
M-2	Waste Sand Exit	36	54	1,944
M-1	NW Loading	91	103	9,373
M-7	Reclaim Loading	91	74	6,734

Total area of all NDOs: 197.1 ft²

Total area of Normal Operation Draft Openings

Equivalent Diameters

NDO #	NDO Location Description	ED	Distance to emitting point (in)	# of Diameters
M-6	East Loading	99.16	420	4.2
M-5	SE Man Door	1.94	660	339.4
M-4	NE Man Door	1.94	720	370.3
M-3	Mold Wash	1.98	840	424.5
M-2	Waste Sand Exit	43.20	900	20.8
M-1	NW Loading	96.63	426	4.4
M-7	Reclaim Loading	81.62	465	5.7

Example Calculations:

$$NEAR = A_N / A_T = 0.004$$

Where A_N = 197 ft²

Where A_T = 48,219 ft²

$$ED = (2 * Length * Width) / (Length + Width) = 99.16 \text{ in}$$

Where Length = 84 in

Where Width = 121 in

(M-6, East Loading)

Bison Engineering, Inc.
Method 204 Field Data

Client: Eagle Foundry Company
Source: Main Foundry
Location: Eagle Creek, Oregon
Date: 3/24/2023

NDO Description		East Loading			SE Man Door			NE Man Door			Mold Wash		
Time (hh:mm)		12:42	12:55	13:10	12:39	12:53	13:09	12:36	12:51	13:08	12:34	12:49	13:07
Units		Inches of H ₂ O			Inches of H ₂ O			Inches of H ₂ O			Inches of H ₂ O		
Readings	#1	-0.0082	-0.0106	-0.0080	-0.0103	-0.0194	-0.0091	-0.0182	-0.0128	-0.0233	-0.0097	-0.0215	-0.0237
	#2	-0.0200	-0.0134	-0.0093	-0.0121	-0.0166	-0.0104	-0.0114	-0.0155	-0.0102	-0.0159	-0.0192	-0.0263
	#3	-0.0071	-0.0073	-0.0074	-0.0091	-0.0155	-0.0082	-0.0077	-0.0090	-0.0119	-0.0319	-0.0228	-0.0258
	#4	-0.0083	-0.0072	-0.0080	-0.0094	-0.0215	-0.0079	-0.0121	-0.0075	-0.0073	-0.0162	-0.0170	-0.0294
	#5	-0.0115	-0.0126	-0.0086	-0.0084	-0.0217	-0.0085	-0.0095	-0.0122	-0.0103	-0.0099	-0.0287	-0.0180
Average		-0.0110	-0.0102	-0.0083	-0.0099	-0.0189	-0.0088	-0.0118	-0.0114	-0.0126	-0.0167	-0.0218	-0.0246
Overall			-0.0098			-0.0125			-0.0119			-0.0211	

NDO Description		Mold Sand Exit			NW Loading			Reclaim Loading		
Time (hh:mm)		12:31	12:48	13:06	12:27	12:47	13:04	12:45	13:02	13:12
Units		Inches of H ₂ O			Inches of H ₂ O			Inches of H ₂ O		
Readings	#1	-0.0089	-0.0113	-0.0125	-0.0108	-0.1160	-0.0146	-0.0078	-0.0114	-0.0100
	#2	-0.0091	-0.0173	-0.0078	-0.0090	-0.0135	-0.0108	-0.0071	-0.0083	-0.0102
	#3	-0.0127	-0.0315	-0.0097	-0.0092	-0.0121	-0.0128	-0.0083	-0.0081	-0.0085
	#4	-0.0075	-0.0361	-0.0087	-0.1100	-0.0257	-0.0221	-0.0089	-0.0096	-0.0080
	#5	-0.0078	-0.0240	-0.0173	-0.0890	-0.0107	-0.0090	-0.0108	-0.0111	-0.0097
Average		-0.0092	-0.0240	-0.0112	-0.0456	-0.0356	-0.0139	-0.0086	-0.0097	-0.0093
Overall			-0.0148			-0.0317			-0.0092	

Bison Engineering, Inc.
EPA Method 204
Documentation of Inward Flow Direction

Client: Eagle Foundry Company
Location: Eagle Creek, Oregon
Enclosure: Main Foundry Building
Date: March 24, 2023

The following photographs document inward flow direction at NDOs M-1, NW Loading door; M-2, Mold Sand Exit door; M-3, Mold Wash door; M-4, NE Man door; M-5, SE Man door; M-6, East Loading door; and M-7, Reclaim Loading door.

NW Loading (M-1)

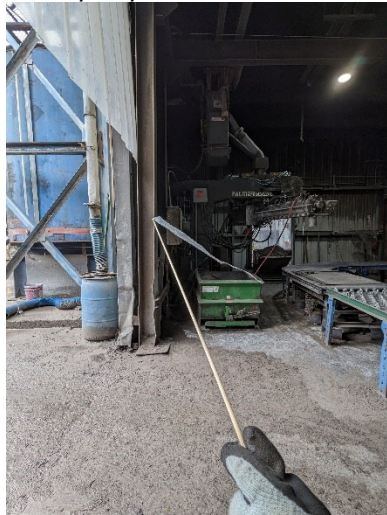
Inside Doorway



Outside Doorway



3/24/2023 13:20



3/24/2023 13:40



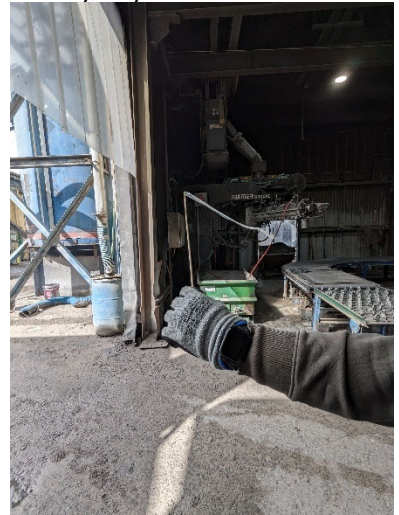
3/24/2023 13:50



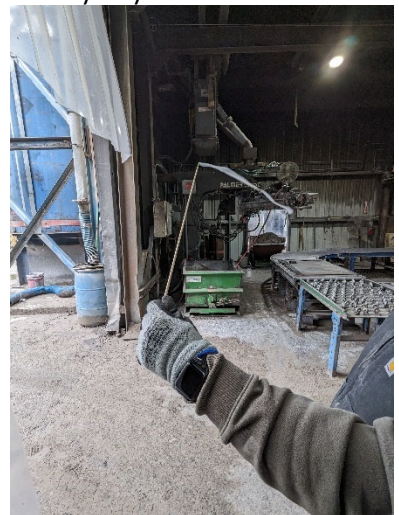
3/24/2023 14:00



3/24/2023 14:10



3/24/2023 14:20



Mold Sand Exit (M-2)

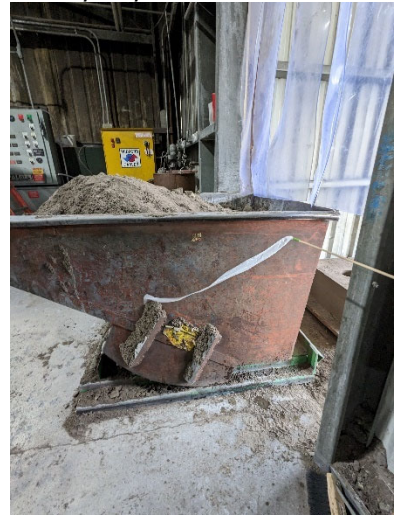
Inside Doorway



3/24/2023 13:30



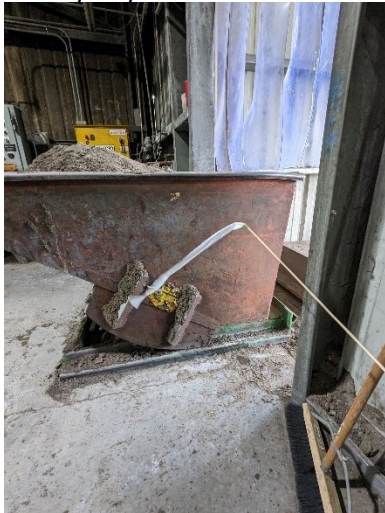
3/24/2023 14:00



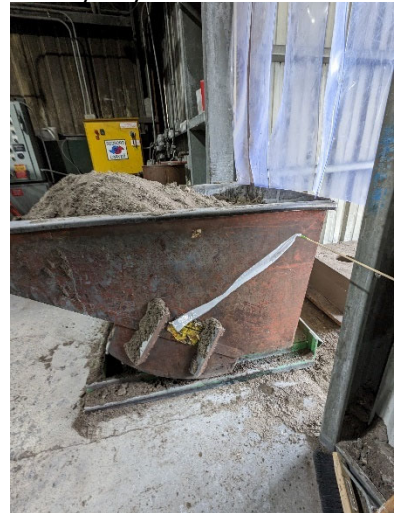
Outside Doorway



3/24/2023 13:40



3/24/2023 14:10



3/24/2023 13:20



3/24/2023 13:50



3/24/2023 14:20



Mold Wash (M-3)

Outside Doorway



3/24/2023 13:21



3/24/2023 13:31



3/24/2023 13:40



3/24/2023 13:50



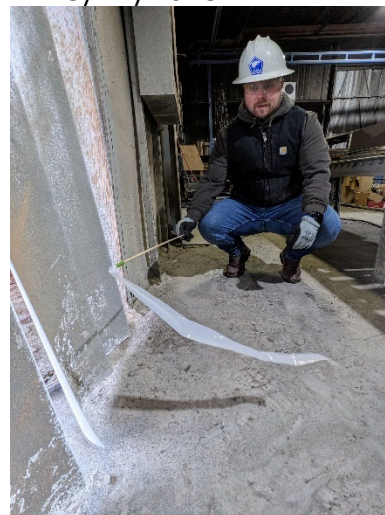
3/24/2023 14:01



3/24/2023 14:11



3/24/2023 14:21



NE Man Door (M-4)

Outside Doorway



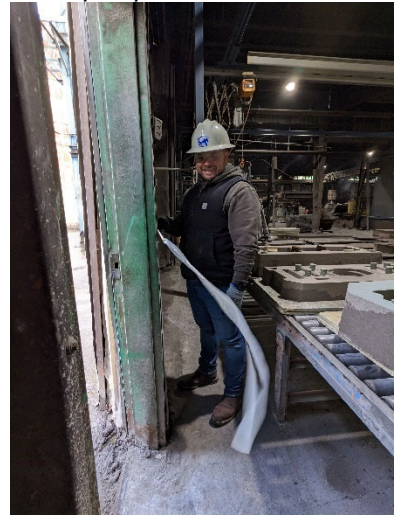
3/24/2023 13:21

3/24/2023 13:41



3/24/2023 13:51

3/24/2023 14:11



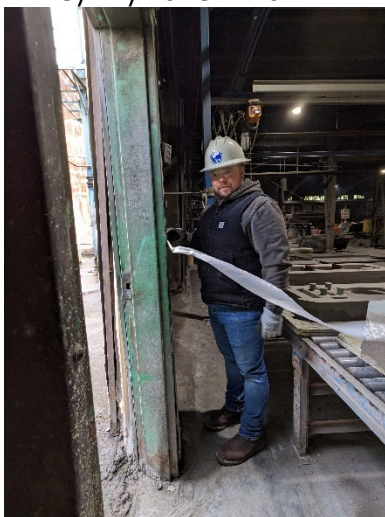
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3/24/2023 13:31

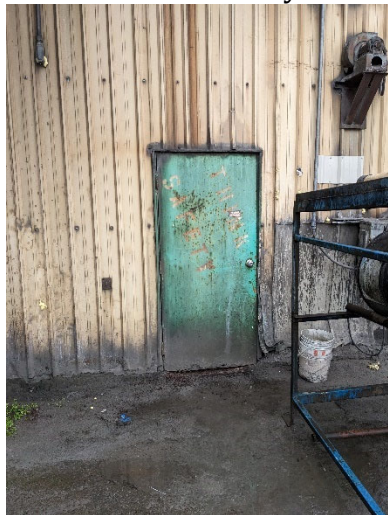


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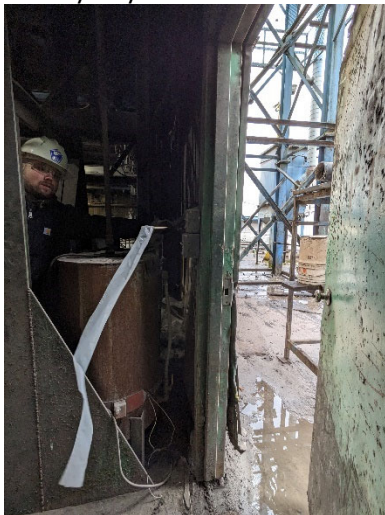


SE Man Door (M-5)

Outside Doorway



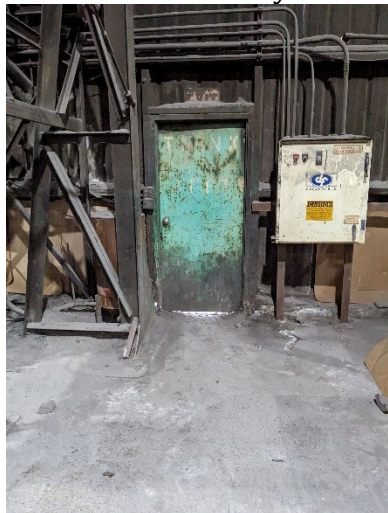
3/24/2023 13:33



3/24/2023 14:02



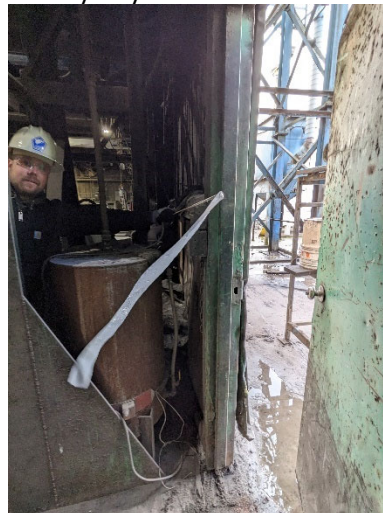
Inside Doorway



3/24/2023 13:41



3/24/2023 14:12



3/24/2023 13:22



3/24/2023 13:52



3/24/2023 14:22



East Loading (M-6)

Inside Doorway



3/24/2023 13:33



3/24/2023 14:02



Outside Doorway



3/24/2023 13:42



3/24/2023 14:12



3/24/2023 13:23



3/24/2023 13:52



3/24/2023 14:23



Reclaim Loading (M-7)

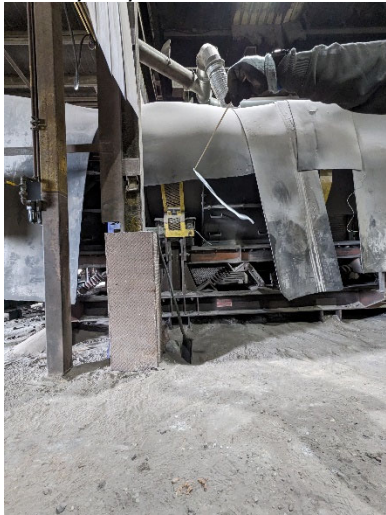
Inside Doorway



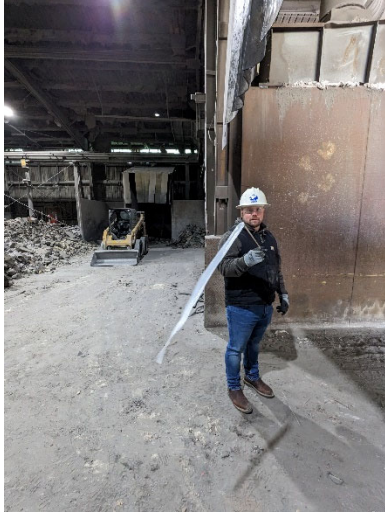
Outside Doorway



3/24/2023 13:24



3/24/2023 13:34



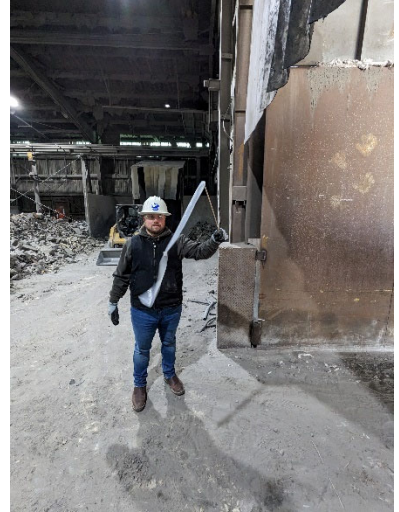
3/24/2023 13:43



3/24/2023 13:53



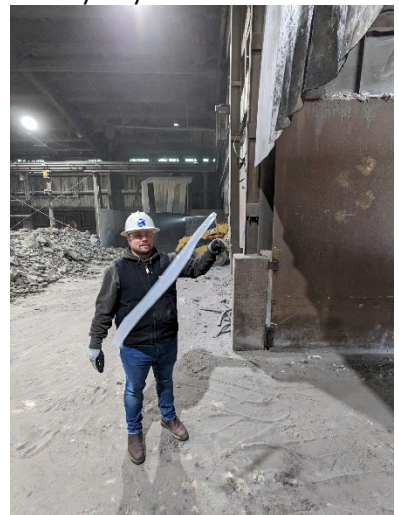
3/24/2023 14:03



3/24/2023 14:13



3/24/2023 14:24



APPENDIX E: LABORATORY REPORTS

BISON ENGINEERING

PROJECT: EFC223119

CLIENT # B020
REPORT # 23-174

SUBMITTED BY:

CHESTER LabNet

12242 S.W. GARDEN PLACE

TIGARD, OR 97223

(503)624-2183/FAX (503)624-2653

www.ChesterLab.Net

CHESTER LabNet

12242 SW Garden Place ❖ Tigard, OR 97223-8246 ❖ USA
Telephone 503-624-2183 ❖ Fax 503-624-2653 ❖ www.chesterlab.net

Case Narrative

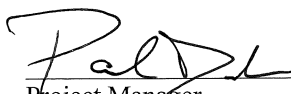
Date: April 14, 2023

General Information

Client: Bison Engineering
Client Number: B020
Report Number: 23-174
Sample Description: Impinger Solutions
Sample Numbers: 23-S595 – 23-S608

Analysis

Analytes: Hexavalent Chromium
Analytical Protocols: SW-846 Method 0061 (revision 0, December 1996)
Analytical Notes: No problems were encountered during the analyses. The results are not blank corrected.
QA/QC Review: All the data have been reviewed by the analysts performing the analyses and the project manager. All of the quality control and sample-specific information in this package is complete and meets or exceeds the minimum requirements for acceptability.
Comments: If you have any questions or concerns regarding this analysis, please feel free to contact the project manager.
Disclaimer: This report shall not be reproduced, except in full, without the written approval of the laboratory. The results only represent those of the samples as received into the laboratory. All data are reported to the detection limit. Results <5x DL must be considered to have a higher degree of uncertainty associated with them. Due to the statistical process of detection limit determination, data in this report should not be used for statistical analysis as the data has been censored in such a manner as to bias statistical analyses high.

 4/14/23
Project Manager Date
Paul Duda

Client: B020 - Bison Engineering
Report Number: 23-174

Lab ID: 23-S595
Client ID: 0061 Cont. 1 WI Run 1
Site: White Iron
Source: BH 1 Out
Sample Date: 3/27/23
Sample Volume: 500. mL

Analyte	$\mu\text{g/L}$		$\mu\text{g/sample}$	
	Conc.	DL	Conc.	DL
Cr VI	0.0150	0.010	0.0075	0.0050

Lab ID: 23-S596
Client ID: 0061 Cont. 1 WI Run 2
Site: White Iron
Source: BH 1 Out
Sample Date: 3/28/23
Sample Volume: 445. mL

Analyte	$\mu\text{g/L}$		$\mu\text{g/sample}$	
	Conc.	DL	Conc.	DL
Cr VI	0.0400	0.010	0.0178	0.0044

Lab ID: 23-S597
Client ID: 0061 Cont. 1 WI Run 3
Site: White Iron
Source: BH 1 Out
Sample Date: 3/29/23
Sample Volume: 590. mL

Analyte	$\mu\text{g/L}$		$\mu\text{g/sample}$	
	Conc.	DL	Conc.	DL
Cr VI	0.0330	0.010	0.0195	0.0059

Lab ID: 23-S598
Client ID: 0061 Cont. 1 WI Run 1
Site: White Iron
Source: BH 2 Out
Sample Date: 3/27/23
Sample Volume: 555. mL

Analyte	$\mu\text{g/L}$		$\mu\text{g/sample}$	
	Conc.	DL	Conc.	DL
Cr VI	< DL	0.010	< DL	0.0056

Lab ID: 23-S599
Client ID: 0061 Cont. 1 WI Run 2
Site: White Iron
Source: BH 2 Out
Sample Date: 3/28/23
Sample Volume: 480. mL

Analyte	$\mu\text{g/L}$		$\mu\text{g/sample}$	
	Conc.	DL	Conc.	DL
Cr VI	0.0330	0.010	0.0158	0.0048

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Client: B020 - Bison Engineering
Report Number: 23-174

Lab ID: 23-S600
Client ID: 0061 Cont. 1 WI Run 3
Site: White Iron
Source: BH 2 Out
Sample Date: 3/29/23
Sample Volume: 600. mL

Analyte	$\mu\text{g/L}$		$\mu\text{g/sample}$	
	Conc.	DL	Conc.	DL
Cr VI	0.0740	0.010	0.0444	0.0060

Lab ID: 23-S601
Client ID: 0061 Cont. 1 MS Run 1
Site: Mn Steel
Source: BH 1 Out
Sample Date: 3/27/23
Sample Volume: 440. mL

Analyte	$\mu\text{g/L}$		$\mu\text{g/sample}$	
	Conc.	DL	Conc.	DL
Cr VI	0.0420	0.010	0.0185	0.0044

Lab ID: 23-S602
Client ID: 0061 Cont. 1 MS Run 2
Site: Mn Steel
Source: BH 1 Out
Sample Date: 3/28/23
Sample Volume: 400. mL

Analyte	$\mu\text{g/L}$		$\mu\text{g/sample}$	
	Conc.	DL	Conc.	DL
Cr VI	0.0240	0.010	0.0096	0.0040

Lab ID: 23-S603
Client ID: 0061 Cont. 1 MS Run 3
Site: Mn Steel
Source: BH 1 Out
Sample Date: 3/29/23
Sample Volume: 510. mL

Analyte	$\mu\text{g/L}$		$\mu\text{g/sample}$	
	Conc.	DL	Conc.	DL
Cr VI	0.0380	0.010	0.0194	0.0051

Lab ID: 23-S604
Client ID: 0061 Cont. 1 MS Run 1
Site: Mn Steel
Source: BH 2 Out
Sample Date: 3/27/23
Sample Volume: 450. mL

Analyte	$\mu\text{g/L}$		$\mu\text{g/sample}$	
	Conc.	DL	Conc.	DL
Cr VI	0.0740	0.010	0.0333	0.0045

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Client: B020 - Bison Engineering
Report Number: 23-174

Lab ID: 23-S605
Client ID: 0061 Cont. 1 MS Run 2
Site: Mn Steel
Source: BH 2 Out
Sample Date: 3/28/23
Sample Volume: 465. mL

Analyte	$\mu\text{g/L}$		$\mu\text{g/sample}$	
	Conc.	DL	Conc.	DL
Cr VI	0.0580	0.010	0.0270	0.0046

Lab ID: 23-S606
Client ID: 0061 Cont. 1 MS Run 3
Site: Mn Steel
Source: BH 2 Out
Sample Date: 3/29/23
Sample Volume: 515. mL

Analyte	$\mu\text{g/L}$		$\mu\text{g/sample}$	
	Conc.	DL	Conc.	DL
Cr VI	0.0210	0.010	0.0108	0.0052

Lab ID: 23-S607
Client ID: 0061 Cont. 4
Sample Date: 3/29/23
Sample Volume: 300. mL

Analyte	$\mu\text{g/L}$		$\mu\text{g/sample}$	
	Conc.	DL	Conc.	DL
Cr VI	< DL	0.010	< DL	0.0030

Lab ID: 23-S608
Client ID: 0061 Cont. 5
Sample Date: 3/29/23
Sample Volume: 200. mL

Analyte	$\mu\text{g/L}$		$\mu\text{g/sample}$	
	Conc.	DL	Conc.	DL
Cr VI	0.0240	0.010	0.0048	0.0020

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2023 Eagle Foundry Emission Factor Determination and PTE Verification Test Report, Rev 02

QA/QC Report

Client Name: Bison Engineering
Project Number: B020
Analytical Technique: Ion Chromatography-PCR
Instrument: Aquion Cr VI IC (1)
Sample Description: SW846 0061
Report Number: 23-174

Blank Data

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Cr VI	ICB	< DL	0.010
Cr VI	CCB	< DL	0.010
Cr VI	CCB	< DL	0.010

ICB: Initial Calibration Blank CCB: Continuing Calibration Blank

Calibration QC

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Cr VI	ICV	0.500	0.511	102.2
Cr VI	LL-LCS	0.030	0.037	123.3
Cr VI	CCV	0.500	0.514	102.8
Cr VI	CCV	0.500	0.514	102.8

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification

Calibration Verification Limits: 90% - 110% Recovery

Low Level-LCS Limits: 50% - 150% Recovery

LL-LCS results are insignificant if sample results are >10x LL-LCS concentration

Duplicate Data

Analyte	Sample ID	Sample Conc. µg/L	Duplicate Conc. µg/L	RPD
Cr VI	23-S595	0.015	0.016	6.45 *
Cr VI	23-S601	0.042	0.039	7.41 *

$RPD = \frac{(\text{sample} - \text{duplicate})}{[(\text{sample} + \text{duplicate})/2]} \times 100$

Duplicate Limit: 20% RPD

N/C: RPD is not calculated when sample or duplicate is below detection limit

*: per EPA CLP protocol, control limits do not apply if sample and/or duplicate concentration is less than 5x the detection limit

Laboratory Control Sample/Matrix Spike Analysis

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
Cr VI	23-S596	0.040	0.537	0.500	99.4
Cr VI	23-S602	0.024	0.532	0.500	102.

LCS Limit: 80% - 120% Recovery

Spike Limit: 75% - 125% Recovery

*: per EPA CLP protocol, control limits do not apply if spike concentration is less than 25% of the sample concentration

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SOURCE SAMPLE RECEIPT CHECKLIST

Client	Bison Engineering	Date	3/30/23
# Runs	12 + Blanks	Report #	23-174

Package intact?	hand delivered
Chain-of-Custody form inspected	✓
CoC present with samples?	✓
CoC indicates analytical methodology to be used? (eg M29, etc.)	SW846 0061 !!
Has CoC been signed by client?	✓
Custody release date and time noted on CoC?	✓
All sample containers inspected	✓
Does number of samples match number on CoC form?	✓ !!
Do all sample ID numbers match those on the CoC form?	✓ !!
Did client mark sample volumes prior to shipment?	✓
Sample temperature recorded?	< 4 °C
Are the sample containers intact?	✓ !!
If present, Audit Sample intact?	n/a !!
Are signs of leakage present?	✓ *
Chain-of-Custody form signed and dated by CLN	✓
Corrective actions	/
Client contacted due to mismatching sample ID numbers	/
Client contacted due to broken sample container(s)	/
Client contacted due to leaking sample container(s)	/
Client contacted for verification of methodology?	/
Corrective actions documented?	/
Corrective actions accomplished?	/

Items marked !! shall be addressed **prior to any analytical work being started**.

Items marked * shall be **noted in case narrative** upon reporting of results to client.

Signed *Pat DL*

Notes _____

23-174

CHESTER LabNet

12242 SW Garden Place
Tigard, OR 97223
(503) 624-2183
Fax (503) 624-2653
cln@chesterlab.net

CHAIN-OF-CUSTODY RECORDPage 1 of 2

Company Name BISON ENGINEERING		Phone (208) 954-7138	
Contact JACOB RANKIN		Fax 	
E-Mail Address jrankin@bison-eng.com		Report Address 3143 E LYNDALE AVE.	
City HELENA	State MT	Zip 59601	
Billing Address 3143 E LYNDALE AVE.			
City HELENA	State MT	Zip 59601	
PO # EFC223119	Project EFC223119		

LabNet ID	Field Sample ID	Site	Sample Date	Volume (m³)	Particle Size	Analysis Requested										Turn Around Time ☐ Standard ☐ Rush _____ Specify _____	Remarks
23-5595	CONT. #1 WI	BH 1 OUT.	3/27/23	RUN 1												X	
23-5598	CONT. #1 WI	BH 2 OUT.	3/27/23	RUN 1												X	
23-5601	CONT. #1 MS	BH 1 OUT.	3/27/23	RUN 1												X	
23-5604	CONT. #1 MS	BH 2 OUT.	3/27/23	RUN 1												X	
23-5596	CONT. #1 WI	BH 1 OUT.	3/28/23	RUN 2												X	
23-5599	CONT. #1 WI	BH 2 OUT.	3/28/23													X	
23-5602	CONT. #1 MS	BH 1 OUT.	3/28/23													X	
23-5605	CONT. #1 MS	BH 2 OUT.	3/28/23													X	
23-5597	CONT. #1 WI	BH 1 OUT.	3/29/23	RUN 3												X	
23-5600	CONT. #1 WI	BH 2 OUT.	3/29/23													X	
23-5603	CONT. #1 MS	BH 1 OUT.	3/29/23													X	
23-5606	CONT. #1 MS	BH 2 OUT.	3/29/23													X	

Notes:
NO TOTAL CHROME ANALYSIS, JUST CRG
WI - WHITE IRON MS - MR STEEL

12242 SW Garden Place
Tigard, OR 97223
(503) 624-2183
Fax (503) 624-2653
cln@chesterlab.net

CHAIN-OF-CUSTODY RECORD

Page 2 of 2

Company Name BISON ENGINEERING		Phone (208) 954-7138	
Contact JACOB RANKIN	Fax		
E-Mail Address jrankin@bison-eng.com			
Report Address 3143 E LYNDALE AVE.			
City HELENA	State MT	Zip 59601	
Billing Address 3143 E LYNDALE AVE.			
City HELENA	State MT	Zip 59601	
PO # EFC223119	Project EFC223119		

[illegible]

RAW DATA

Available upon request

BISON ENGINEERING

PROJECT: EFC223119

CLIENT # B020
REPORT # 23-175

SUBMITTED BY:

CHESTER LabNet

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TIGARD, OR 97223

(503)624-2183/FAX (503)624-2653

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12242 SW Garden Place ♦ Tigard, OR 97223-8246 ♦ USA
Telephone 503-624-2183 ♦ Fax 503-624-2653 ♦ www.chesterlab.net

Case Narrative

Date: May 31, 2023

General Information

Client: Bison Engineering
Client Number: B020
Report Number: 23-175
Sample Description: Impinger Trains
Sample Numbers: 23-S609 – 23-S734

Analysis

Analytes: Al, Sb, As, Ba, Be, Cd, Cr, Co, Cu, Pb, Mn, Hg, Ni, P, Se, Ag, Tl, V, Zn

Analytical Protocols: EPA Method 29 (8/2/17 version)

Analytical Notes: Some of the front half fractions had large peaks that interfered with As. Those samples were diluted by a factor of five. The detection limits were raised to account for the dilution.

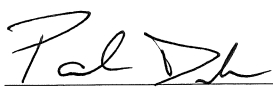
The Hg result for sample 23-S641 is taken from an invalid run because there wasn't enough sample to redigest. The reported result is likely biased high based on the results for the other samples from the failed run that were redigested and reanalyzed.

The bottle for HCl rinse sample was empty. The lab is guessing that that rinse was poured into 23-S727 based on the smell of that sample. Results have not been blank corrected.

QA/QC Review: All the data have been reviewed by the analysts performing the analyses and the project manager. All of the quality control and sample-specific information in this package is complete and meets or exceeds the minimum requirements for acceptability.

Comments: If you have any questions or concerns regarding this analysis, please feel free to contact the project manager.

Disclaimer: This report shall not be reproduced, except in full, without the written approval of the laboratory. The results only represent those of the samples as received into the laboratory. All data are reported to the detection limit. Results <5x DL must be considered to have a higher degree of uncertainty associated with them. Due to the statistical process of detection limit determination, data in this report should not be used for statistical analysis as the data has been censored in such a manner as to bias statistical analyses high.



Project Manager

5/31/23

Date

EFC223119

Client: B020 - Bison Engineering
Report Number: 23-175

Lab ID: 23-S609
Client ID: M29 Cont. 1&3 WI Run 1
Site: White Iron
Source: BH 1 In
Sample Date: 3/27/23

Analyte	Result	DL	Units
Aluminum, ICP	520.	7.50	µg/sample
Antimony, ICP	3.57	1.25	µg/sample
Arsenic, ICP	< DL	1.75	µg/sample
Barium, ICP	5.38	0.125	µg/sample
Beryllium, ICP	< DL	0.050	µg/sample
Cadmium, ICP	0.488	0.100	µg/sample
Chromium, ICP	41.4	0.200	µg/sample
Cobalt, ICP	0.196	0.125	µg/sample
Copper, ICP	18.5	1.25	µg/sample
Lead, ICP	39.8	1.25	µg/sample
Manganese, ICP	284.	0.075	µg/sample
Mercury, CVAA	0.0406	0.0219	µg/sample
Nickel, ICP	13.1	0.750	µg/sample
Phosphorus, ICP	21.2	5.00	µg/sample
Selenium, ICP	< DL	3.75	µg/sample
Silver, ICP	2.03	0.500	µg/sample
Thallium, ICP	< DL	2.50	µg/sample
Vanadium, ICP	0.638	0.250	µg/sample
Zinc, ICP	460.	0.750	µg/sample

Lab ID: 23-S610
Client ID: M29 Cont. 4 WI Run 1
Site: White Iron
Source: BH 1 In
Sample Date: 3/27/23

Analyte	Result	DL	Units
Aluminum, ICP	28.8	4.14	µg/sample
Antimony, ICP	< DL	0.690	µg/sample
Arsenic, ICP	< DL	0.966	µg/sample
Barium, ICP	2.06	0.069	µg/sample
Beryllium, ICP	< DL	0.028	µg/sample
Cadmium, ICP	0.182	0.055	µg/sample
Chromium, ICP	0.473	0.110	µg/sample
Cobalt, ICP	0.249	0.069	µg/sample
Copper, ICP	0.865	0.690	µg/sample
Lead, ICP	3.01	0.690	µg/sample
Manganese, ICP	1.59	0.041	µg/sample
Mercury, CVAA	0.0981	0.0191	µg/sample
Nickel, ICP	< DL	0.414	µg/sample
Phosphorus, ICP	< DL	2.76	µg/sample
Selenium, ICP	< DL	2.07	µg/sample
Silver, ICP	< DL	0.276	µg/sample
Thallium, ICP	< DL	1.38	µg/sample
Vanadium, ICP	< DL	0.138	µg/sample
Zinc, ICP	5.18	0.414	µg/sample

Analysis performed by: **CHESTER LabNet**

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2023 Eagle Foundry Emission Factor Determination and PTE Verification Test Report, Rev 02

Client: B020 - Bison Engineering
Report Number: 23-175

Lab ID: 23-S611
Client ID: M29 Cont. 5A WI Run 1
Site: White Iron
Source: BH 1 In
Sample Date: 3/27/23

Analyte	Result	DL	Units
Mercury, CVAA	0.00928	0.00928	µg/sample

Lab ID: 23-S612
Client ID: M29 Cont. 5B WI Run 1
Site: White Iron
Source: BH 1 In
Sample Date: 3/27/23

Analyte	Result	DL	Units
Mercury, CVAA	0.126	0.0368	µg/sample

Lab ID: 23-S613
Client ID: M29 Cont. 5C WI Run 1
Site: White Iron
Source: BH 1 In
Sample Date: 3/27/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0198	µg/sample

Lab ID: 23-S614
Client ID: M29 Cont. 1&3 WI Run 2
Site: White Iron
Source: BH 1 In
Sample Date: 3/28/23

Analyte	Result	DL	Units
Aluminum, ICP	746.	7.50	µg/sample
Antimony, ICP	3.92	1.25	µg/sample
Arsenic, ICP	< DL	1.75	µg/sample
Barium, ICP	6.79	0.125	µg/sample
Beryllium, ICP	< DL	0.050	µg/sample
Cadmium, ICP	0.377	0.100	µg/sample
Chromium, ICP	41.5	0.200	µg/sample
Cobalt, ICP	0.287	0.125	µg/sample
Copper, ICP	24.9	1.25	µg/sample
Lead, ICP	41.2	1.25	µg/sample
Manganese, ICP	519.	0.075	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	10.1	0.750	µg/sample
Phosphorus, ICP	26.1	5.00	µg/sample
Selenium, ICP	< DL	3.75	µg/sample
Silver, ICP	2.22	0.500	µg/sample
Thallium, ICP	< DL	2.50	µg/sample
Vanadium, ICP	0.515	0.250	µg/sample
Zinc, ICP	397.	0.750	µg/sample

Analysis performed by: **CHESTER LabNet**

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2023 Eagle Foundry Emission Factor Determination and PTE Verification Test Report, Rev 02

Client: B020 - Bison Engineering
Report Number: 23-175

Lab ID: 23-S615
Client ID: M29 Cont. 4 WI Run 2
Site: White Iron
Source: BH 1 In
Sample Date: 3/28/23

Analyte	Result	DL	Units
Aluminum, ICP	33.9	3.66	µg/sample
Antimony, ICP	0.661	0.610	µg/sample
Arsenic, ICP	< DL	0.854	µg/sample
Barium, ICP	1.96	0.061	µg/sample
Beryllium, ICP	< DL	0.024	µg/sample
Cadmium, ICP	< DL	0.049	µg/sample
Chromium, ICP	0.511	0.098	µg/sample
Cobalt, ICP	< DL	0.061	µg/sample
Copper, ICP	1.49	0.610	µg/sample
Lead, ICP	< DL	0.610	µg/sample
Manganese, ICP	3.32	0.037	µg/sample
Mercury, CVAA	0.0924	0.0196	µg/sample
Nickel, ICP	< DL	0.366	µg/sample
Phosphorus, ICP	< DL	2.44	µg/sample
Selenium, ICP	< DL	1.83	µg/sample
Silver, ICP	< DL	0.244	µg/sample
Thallium, ICP	< DL	1.22	µg/sample
Vanadium, ICP	< DL	0.122	µg/sample
Zinc, ICP	2.61	0.366	µg/sample

Lab ID: 23-S616
Client ID: M29 Cont. 5A WI Run 2
Site: White Iron
Source: BH 1 In
Sample Date: 3/28/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0121	µg/sample

Lab ID: 23-S617
Client ID: M29 Cont. 5B WI Run 2
Site: White Iron
Source: BH 1 In
Sample Date: 3/28/23

Analyte	Result	DL	Units
Mercury, CVAA	0.120	0.0350	µg/sample

Lab ID: 23-S618
Client ID: M29 Cont. 5C WI Run 2
Site: White Iron
Source: BH 1 In
Sample Date: 3/28/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0196	µg/sample

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Lab ID: 23-S619
Client ID: M29 Cont. 1&3 WI Run 3
Site: White Iron
Source: BH 1 In
Sample Date: 3/29/23

Analyte	Result	DL	Units
Aluminum, ICP	489.	7.50	µg/sample
Antimony, ICP	3.10	1.25	µg/sample
Arsenic, ICP	< DL	1.75	µg/sample
Barium, ICP	5.02	0.125	µg/sample
Beryllium, ICP	< DL	0.050	µg/sample
Cadmium, ICP	0.327	0.100	µg/sample
Chromium, ICP	29.7	0.200	µg/sample
Cobalt, ICP	0.212	0.125	µg/sample
Copper, ICP	28.5	1.25	µg/sample
Lead, ICP	41.0	1.25	µg/sample
Manganese, ICP	464.	0.075	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	14.5	0.750	µg/sample
Phosphorus, ICP	19.3	5.00	µg/sample
Selenium, ICP	< DL	3.75	µg/sample
Silver, ICP	2.46	0.500	µg/sample
Thallium, ICP	< DL	2.50	µg/sample
Vanadium, ICP	0.422	0.250	µg/sample
Zinc, ICP	579.	0.750	µg/sample

Lab ID: 23-S620
Client ID: M29 Cont. 4 WI Run 3
Site: White Iron
Source: BH 1 In
Sample Date: 3/29/23

Analyte	Result	DL	Units
Aluminum, ICP	29.5	3.63	µg/sample
Antimony, ICP	< DL	0.605	µg/sample
Arsenic, ICP	< DL	0.847	µg/sample
Barium, ICP	1.58	0.060	µg/sample
Beryllium, ICP	< DL	0.024	µg/sample
Cadmium, ICP	0.135	0.048	µg/sample
Chromium, ICP	0.597	0.097	µg/sample
Cobalt, ICP	0.123	0.060	µg/sample
Copper, ICP	2.01	0.605	µg/sample
Lead, ICP	1.82	0.605	µg/sample
Manganese, ICP	2.43	0.036	µg/sample
Mercury, CVAA	0.112	0.0201	µg/sample
Nickel, ICP	< DL	0.363	µg/sample
Phosphorus, ICP	< DL	2.42	µg/sample
Selenium, ICP	< DL	1.82	µg/sample
Silver, ICP	< DL	0.242	µg/sample
Thallium, ICP	< DL	1.21	µg/sample
Vanadium, ICP	< DL	0.121	µg/sample
Zinc, ICP	1.81	0.363	µg/sample

Client: B020 - Bison Engineering
Report Number: 23-175

Lab ID: 23-S621
Client ID: M29 Cont. 5A WI Run 3
Site: White Iron
Source: BH 1 In
Sample Date: 3/29/23

Analyte	Result	DL	Units
Mercury, CVAA	0.00942	0.00824	µg/sample

Lab ID: 23-S622
Client ID: M29 Cont. 5B WI Run 3
Site: White Iron
Source: BH 1 In
Sample Date: 3/29/23

Analyte	Result	DL	Units
Mercury, CVAA	0.0914	0.0376	µg/sample

Lab ID: 23-S623
Client ID: M29 Cont. 5C WI Run 3
Site: White Iron
Source: BH 1 In
Sample Date: 3/29/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0194	µg/sample

Lab ID: 23-S624
Client ID: M29 Cont. 1&3 WI Run 1
Site: White Iron
Source: BH 2 In
Sample Date: 3/27/23

Analyte	Result	DL	Units
Aluminum, ICP	584.	7.50	µg/sample
Antimony, ICP	2.17	1.25	µg/sample
Arsenic, ICP	< DL	1.75	µg/sample
Barium, ICP	6.20	0.125	µg/sample
Beryllium, ICP	< DL	0.050	µg/sample
Cadmium, ICP	1.86	0.100	µg/sample
Chromium, ICP	28.5	0.200	µg/sample
Cobalt, ICP	0.212	0.125	µg/sample
Copper, ICP	12.5	1.25	µg/sample
Lead, ICP	24.0	1.25	µg/sample
Manganese, ICP	134.	0.075	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	6.85	0.750	µg/sample
Phosphorus, ICP	19.1	5.00	µg/sample
Selenium, ICP	< DL	3.75	µg/sample
Silver, ICP	1.16	0.500	µg/sample
Thallium, ICP	< DL	2.50	µg/sample
Vanadium, ICP	0.352	0.250	µg/sample
Zinc, ICP	189.	0.750	µg/sample

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Client: B020 - Bison Engineering
Report Number: 23-175

Lab ID: 23-S625
Client ID: M29 Cont. 4 WI Run 1
Site: White Iron
Source: BH 2 In
Sample Date: 3/27/23

Analyte	Result	DL	Units
Aluminum, ICP	34.5	3.57	µg/sample
Antimony, ICP	< DL	0.595	µg/sample
Arsenic, ICP	< DL	0.833	µg/sample
Barium, ICP	1.87	0.060	µg/sample
Beryllium, ICP	< DL	0.024	µg/sample
Cadmium, ICP	0.064	0.048	µg/sample
Chromium, ICP	2.59	0.095	µg/sample
Cobalt, ICP	0.120	0.060	µg/sample
Copper, ICP	1.79	0.595	µg/sample
Lead, ICP	0.680	0.595	µg/sample
Manganese, ICP	0.894	0.036	µg/sample
Mercury, CVAA	0.134	0.0219	µg/sample
Nickel, ICP	1.70	0.357	µg/sample
Phosphorus, ICP	< DL	2.38	µg/sample
Selenium, ICP	< DL	1.78	µg/sample
Silver, ICP	< DL	0.238	µg/sample
Thallium, ICP	< DL	1.19	µg/sample
Vanadium, ICP	< DL	0.119	µg/sample
Zinc, ICP	5.33	0.357	µg/sample

Lab ID: 23-S626
Client ID: M29 Cont. 5A WI Run 1
Site: White Iron
Source: BH 2 In
Sample Date: 3/27/23

Analyte	Result	DL	Units
Mercury, CVAA	0.00664	0.00516	µg/sample

Lab ID: 23-S627
Client ID: M29 Cont. 5B WI Run 1
Site: White Iron
Source: BH 2 In
Sample Date: 3/27/23

Analyte	Result	DL	Units
Mercury, CVAA	0.141	0.0341	µg/sample

Lab ID: 23-S628
Client ID: M29 Cont. 5C WI Run 1
Site: White Iron
Source: BH 2 In
Sample Date: 3/27/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0198	µg/sample

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Lab ID: 23-S629
Client ID: M29 Cont. 1&3 WI Run 2
Site: White Iron
Source: BH 2 In
Sample Date: 3/28/23

Analyte	Result	DL	Units
Aluminum, ICP	3,460	7.50	µg/sample
Antimony, ICP	2.69	1.25	µg/sample
Arsenic, ICP	< DL	1.75	µg/sample
Barium, ICP	16.8	0.125	µg/sample
Beryllium, ICP	0.074	0.050	µg/sample
Cadmium, ICP	0.338	0.100	µg/sample
Chromium, ICP	37.4	0.200	µg/sample
Cobalt, ICP	0.455	0.125	µg/sample
Copper, ICP	25.6	1.25	µg/sample
Lead, ICP	19.1	1.25	µg/sample
Manganese, ICP	432.	0.075	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	14.3	0.750	µg/sample
Phosphorus, ICP	47.8	5.00	µg/sample
Selenium, ICP	< DL	3.75	µg/sample
Silver, ICP	1.02	0.500	µg/sample
Thallium, ICP	< DL	2.50	µg/sample
Vanadium, ICP	2.08	0.250	µg/sample
Zinc, ICP	194.	0.750	µg/sample

Lab ID: 23-S630
Client ID: M29 Cont. 4 WI Run 2
Site: White Iron
Source: BH 2 In
Sample Date: 3/28/23

Analyte	Result	DL	Units
Aluminum, ICP	19.4	4.35	µg/sample
Antimony, ICP	< DL	0.725	µg/sample
Arsenic, ICP	< DL	1.02	µg/sample
Barium, ICP	1.31	0.072	µg/sample
Beryllium, ICP	< DL	0.029	µg/sample
Cadmium, ICP	< DL	0.058	µg/sample
Chromium, ICP	1.31	0.116	µg/sample
Cobalt, ICP	0.084	0.072	µg/sample
Copper, ICP	0.836	0.725	µg/sample
Lead, ICP	< DL	0.725	µg/sample
Manganese, ICP	1.51	0.044	µg/sample
Mercury, CVAA	0.176	0.0224	µg/sample
Nickel, ICP	0.563	0.435	µg/sample
Phosphorus, ICP	< DL	2.90	µg/sample
Selenium, ICP	< DL	2.18	µg/sample
Silver, ICP	0.433	0.290	µg/sample
Thallium, ICP	< DL	1.45	µg/sample
Vanadium, ICP	< DL	0.145	µg/sample
Zinc, ICP	2.05	0.435	µg/sample

Client: B020 - Bison Engineering
Report Number: 23-175

Lab ID: 23-S631
Client ID: M29 Cont. 5A WI Run 2
Site: White Iron
Source: BH 2 In
Sample Date: 3/28/23

Analyte	Result	DL	Units
Mercury, CVAA	0.00735	0.00643	µg/sample

Lab ID: 23-S632
Client ID: M29 Cont. 5B WI Run 2
Site: White Iron
Source: BH 2 In
Sample Date: 3/28/23

Analyte	Result	DL	Units
Mercury, CVAA	0.131	0.0368	µg/sample

Lab ID: 23-S633
Client ID: M29 Cont. 5C WI Run 2
Site: White Iron
Source: BH 2 In
Sample Date: 3/28/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0198	µg/sample

Lab ID: 23-S634
Client ID: M29 Cont. 1&3 WI Run 3
Site: White Iron
Source: BH 2 In
Sample Date: 3/29/23

Analyte	Result	DL	Units
Aluminum, ICP	1,900	7.50	µg/sample
Antimony, ICP	2.36	1.25	µg/sample
Arsenic, ICP	< DL	1.75	µg/sample
Barium, ICP	11.6	0.125	µg/sample
Beryllium, ICP	< DL	0.050	µg/sample
Cadmium, ICP	0.359	0.100	µg/sample
Chromium, ICP	26.2	0.200	µg/sample
Cobalt, ICP	0.294	0.125	µg/sample
Copper, ICP	24.2	1.25	µg/sample
Lead, ICP	17.7	1.25	µg/sample
Manganese, ICP	414.	0.075	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	10.7	0.750	µg/sample
Phosphorus, ICP	38.0	5.00	µg/sample
Selenium, ICP	< DL	3.75	µg/sample
Silver, ICP	1.10	0.500	µg/sample
Thallium, ICP	< DL	2.50	µg/sample
Vanadium, ICP	1.37	0.250	µg/sample
Zinc, ICP	265.	0.750	µg/sample

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Client: B020 - Bison Engineering
Report Number: 23-175

Lab ID: 23-S635
Client ID: M29 Cont. 4 WI Run 3
Site: White Iron
Source: BH 2 In
Sample Date: 3/29/23

Analyte	Result	DL	Units
Aluminum, ICP	25.4	3.81	µg/sample
Antimony, ICP	< DL	0.635	µg/sample
Arsenic, ICP	< DL	0.889	µg/sample
Barium, ICP	1.26	0.064	µg/sample
Beryllium, ICP	< DL	0.025	µg/sample
Cadmium, ICP	< DL	0.051	µg/sample
Chromium, ICP	0.959	0.102	µg/sample
Cobalt, ICP	< DL	0.064	µg/sample
Copper, ICP	1.81	0.635	µg/sample
Lead, ICP	< DL	0.635	µg/sample
Manganese, ICP	4.13	0.038	µg/sample
Mercury, CVAA	0.169	0.0164	µg/sample
Nickel, ICP	0.488	0.381	µg/sample
Phosphorus, ICP	< DL	2.54	µg/sample
Selenium, ICP	< DL	1.90	µg/sample
Silver, ICP	< DL	0.254	µg/sample
Thallium, ICP	< DL	1.27	µg/sample
Vanadium, ICP	< DL	0.127	µg/sample
Zinc, ICP	2.03	0.381	µg/sample

Lab ID: 23-S636
Client ID: M29 Cont. 5A WI Run 3
Site: White Iron
Source: BH 2 In
Sample Date: 3/29/23

Analyte	Result	DL	Units
Mercury, CVAA	0.00910	0.00796	µg/sample

Lab ID: 23-S637
Client ID: M29 Cont. 5B WI Run 3
Site: White Iron
Source: BH 2 In
Sample Date: 3/29/23

Analyte	Result	DL	Units
Mercury, CVAA	0.117	0.0389	µg/sample

Lab ID: 23-S638
Client ID: M29 Cont. 5C WI Run 3
Site: White Iron
Source: BH 2 In
Sample Date: 3/29/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0196	µg/sample

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Client: B020 - Bison Engineering
Report Number: 23-175

Lab ID: 23-S639
Client ID: M29 Cont. 1&3 WI Run 1
Site: White Iron
Source: BH 1 Out
Sample Date: 3/27/23

Analyte	Result	DL	Units
Aluminum, ICP	78.7	7.50	µg/sample
Antimony, ICP	1.71	1.25	µg/sample
Arsenic, ICP	< DL	1.75	µg/sample
Barium, ICP	2.23	0.125	µg/sample
Beryllium, ICP	< DL	0.050	µg/sample
Cadmium, ICP	< DL	0.100	µg/sample
Chromium, ICP	3.35	0.200	µg/sample
Cobalt, ICP	< DL	0.125	µg/sample
Copper, ICP	< DL	1.25	µg/sample
Lead, ICP	2.20	1.25	µg/sample
Manganese, ICP	21.9	0.075	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	4.58	0.750	µg/sample
Phosphorus, ICP	29.8	5.00	µg/sample
Selenium, ICP	< DL	3.75	µg/sample
Silver, ICP	< DL	0.500	µg/sample
Thallium, ICP	< DL	2.50	µg/sample
Vanadium, ICP	< DL	0.250	µg/sample
Zinc, ICP	18.3	0.750	µg/sample

Lab ID: 23-S640
Client ID: M29 Cont. 4 WI Run 1
Site: White Iron
Source: BH 1 Out
Sample Date: 3/27/23

Analyte	Result	DL	Units
Aluminum, ICP	22.9	3.72	µg/sample
Antimony, ICP	0.903	0.620	µg/sample
Arsenic, ICP	< DL	0.868	µg/sample
Barium, ICP	3.68	0.062	µg/sample
Beryllium, ICP	< DL	0.025	µg/sample
Cadmium, ICP	0.175	0.050	µg/sample
Chromium, ICP	0.615	0.099	µg/sample
Cobalt, ICP	0.134	0.062	µg/sample
Copper, ICP	3.03	0.620	µg/sample
Lead, ICP	2.53	0.620	µg/sample
Manganese, ICP	0.610	0.037	µg/sample
Mercury, CVAA	0.169	0.0182	µg/sample
Nickel, ICP	0.460	0.372	µg/sample
Phosphorus, ICP	< DL	2.48	µg/sample
Selenium, ICP	< DL	1.86	µg/sample
Silver, ICP	< DL	0.248	µg/sample
Thallium, ICP	< DL	1.24	µg/sample
Vanadium, ICP	< DL	0.124	µg/sample
Zinc, ICP	3.55	0.372	µg/sample

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Client: B020 - Bison Engineering
Report Number: 23-175

Lab ID: 23-S641
Client ID: M29 Cont. 5A WI Run 1
Site: White Iron
Source: BH 1 Out
Sample Date: 3/27/23
Comments: Concentration estimated, bad CAL

Analyte	Result	DL	Units
Mercury, CVAA	0.0242	0.00892	µg/sample

Lab ID: 23-S642
Client ID: M29 Cont. 5B WI Run 1
Site: White Iron
Source: BH 1 Out
Sample Date: 3/27/23

Analyte	Result	DL	Units
Mercury, CVAA	0.121	0.0385	µg/sample

Lab ID: 23-S643
Client ID: M29 Cont. 5C WI Run 1
Site: White Iron
Source: BH 1 Out
Sample Date: 3/27/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0198	µg/sample

Lab ID: 23-S644
Client ID: M29 Cont. 1&3 WI Run 2
Site: White Iron
Source: BH 1 Out
Sample Date: 3/28/23

Analyte	Result	DL	Units
Aluminum, ICP	105.	7.50	µg/sample
Antimony, ICP	1.77	1.25	µg/sample
Arsenic, ICP	< DL	1.75	µg/sample
Barium, ICP	6.18	0.125	µg/sample
Beryllium, ICP	< DL	0.050	µg/sample
Cadmium, ICP	< DL	0.100	µg/sample
Chromium, ICP	3.54	0.200	µg/sample
Cobalt, ICP	< DL	0.125	µg/sample
Copper, ICP	3.84	1.25	µg/sample
Lead, ICP	< DL	1.25	µg/sample
Manganese, ICP	5.92	0.075	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	8.74	0.750	µg/sample
Phosphorus, ICP	9.34	5.00	µg/sample
Selenium, ICP	< DL	3.75	µg/sample
Silver, ICP	< DL	0.500	µg/sample
Thallium, ICP	< DL	2.50	µg/sample
Vanadium, ICP	< DL	0.250	µg/sample
Zinc, ICP	11.0	0.750	µg/sample

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Client: B020 - Bison Engineering
Report Number: 23-175

Lab ID: 23-S645
Client ID: M29 Cont. 4 WI Run 2
Site: White Iron
Source: BH 1 Out
Sample Date: 3/28/23

Analyte	Result	DL	Units
Aluminum, ICP	20.6	3.45	µg/sample
Antimony, ICP	0.743	0.575	µg/sample
Arsenic, ICP	< DL	0.805	µg/sample
Barium, ICP	1.97	0.058	µg/sample
Beryllium, ICP	< DL	0.023	µg/sample
Cadmium, ICP	< DL	0.046	µg/sample
Chromium, ICP	0.526	0.092	µg/sample
Cobalt, ICP	0.088	0.058	µg/sample
Copper, ICP	2.32	0.575	µg/sample
Lead, ICP	< DL	0.575	µg/sample
Manganese, ICP	8.57	0.034	µg/sample
Mercury, CVAA	0.192	0.0274	µg/sample
Nickel, ICP	0.383	0.345	µg/sample
Phosphorus, ICP	< DL	2.30	µg/sample
Selenium, ICP	< DL	1.72	µg/sample
Silver, ICP	< DL	0.230	µg/sample
Thallium, ICP	< DL	1.15	µg/sample
Vanadium, ICP	< DL	0.115	µg/sample
Zinc, ICP	1.33	0.345	µg/sample

Lab ID: 23-S646
Client ID: M29 Cont. 5A WI Run 2
Site: White Iron
Source: BH 1 Out
Sample Date: 3/28/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.00586	µg/sample

Lab ID: 23-S647
Client ID: M29 Cont. 5B WI Run 2
Site: White Iron
Source: BH 1 Out
Sample Date: 3/28/23

Analyte	Result	DL	Units
Mercury, CVAA	0.146	0.0341	µg/sample

Lab ID: 23-S648
Client ID: M29 Cont. 5C WI Run 2
Site: White Iron
Source: BH 1 Out
Sample Date: 3/28/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0200	µg/sample

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Client: B020 - Bison Engineering
Report Number: 23-175

Lab ID: 23-S649
Client ID: M29 Cont. 1&3 WI Run 3
Site: White Iron
Source: BH 1 Out
Sample Date: 3/29/23

Analyte	Result	DL	Units
Aluminum, ICP	81.5	7.50	µg/sample
Antimony, ICP	2.04	1.25	µg/sample
Arsenic, ICP	< DL	1.75	µg/sample
Barium, ICP	2.81	0.125	µg/sample
Beryllium, ICP	< DL	0.050	µg/sample
Cadmium, ICP	< DL	0.100	µg/sample
Chromium, ICP	4.66	0.200	µg/sample
Cobalt, ICP	< DL	0.125	µg/sample
Copper, ICP	3.28	1.25	µg/sample
Lead, ICP	< DL	1.25	µg/sample
Manganese, ICP	10.2	0.075	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	12.4	0.750	µg/sample
Phosphorus, ICP	6.20	5.00	µg/sample
Selenium, ICP	< DL	3.75	µg/sample
Silver, ICP	0.974	0.500	µg/sample
Thallium, ICP	< DL	2.50	µg/sample
Vanadium, ICP	< DL	0.250	µg/sample
Zinc, ICP	5.84	0.750	µg/sample

Lab ID: 23-S650
Client ID: M29 Cont. 4 WI Run 3
Site: White Iron
Source: BH 1 Out
Sample Date: 3/29/23

Analyte	Result	DL	Units
Aluminum, ICP	27.8	3.42	µg/sample
Antimony, ICP	0.634	0.570	µg/sample
Arsenic, ICP	< DL	0.798	µg/sample
Barium, ICP	1.45	0.057	µg/sample
Beryllium, ICP	< DL	0.023	µg/sample
Cadmium, ICP	< DL	0.046	µg/sample
Chromium, ICP	0.455	0.091	µg/sample
Cobalt, ICP	0.112	0.057	µg/sample
Copper, ICP	0.923	0.570	µg/sample
Lead, ICP	< DL	0.570	µg/sample
Manganese, ICP	11.1	0.034	µg/sample
Mercury, CVAA	0.186	0.0284	µg/sample
Nickel, ICP	< DL	0.342	µg/sample
Phosphorus, ICP	< DL	2.28	µg/sample
Selenium, ICP	< DL	1.71	µg/sample
Silver, ICP	< DL	0.228	µg/sample
Thallium, ICP	< DL	1.14	µg/sample
Vanadium, ICP	< DL	0.114	µg/sample
Zinc, ICP	0.737	0.342	µg/sample

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2023 Eagle Foundry Emission Factor Determination and PTE Verification Test Report, Rev 02

Client: B020 - Bison Engineering
Report Number: 23-175

Lab ID: 23-S651
Client ID: M29 Cont. 5A WI Run 3
Site: White Iron
Source: BH 1 Out
Sample Date: 3/29/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.00542	µg/sample

Lab ID: 23-S652
Client ID: M29 Cont. 5B WI Run 3
Site: White Iron
Source: BH 1 Out
Sample Date: 3/29/23

Analyte	Result	DL	Units
Mercury, CVAA	0.117	0.0341	µg/sample

Lab ID: 23-S653
Client ID: M29 Cont. 5C WI Run 3
Site: White Iron
Source: BH 1 Out
Sample Date: 3/29/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0196	µg/sample

Lab ID: 23-S654
Client ID: M29 Cont. 1&3 WI Run 1
Site: White Iron
Source: BH 2 Out
Sample Date: 3/27/23

Analyte	Result	DL	Units
Aluminum, ICP	102.	7.50	µg/sample
Antimony, ICP	2.00	1.25	µg/sample
Arsenic, ICP	< DL	1.75	µg/sample
Barium, ICP	3.87	0.125	µg/sample
Beryllium, ICP	< DL	0.050	µg/sample
Cadmium, ICP	< DL	0.100	µg/sample
Chromium, ICP	2.48	0.200	µg/sample
Cobalt, ICP	< DL	0.125	µg/sample
Copper, ICP	5.14	1.25	µg/sample
Lead, ICP	3.05	1.25	µg/sample
Manganese, ICP	5.96	0.075	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	8.33	0.750	µg/sample
Phosphorus, ICP	10.4	5.00	µg/sample
Selenium, ICP	< DL	3.75	µg/sample
Silver, ICP	< DL	0.500	µg/sample
Thallium, ICP	< DL	2.50	µg/sample
Vanadium, ICP	< DL	0.250	µg/sample
Zinc, ICP	19.2	0.750	µg/sample

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Client: B020 - Bison Engineering
Report Number: 23-175

Lab ID: 23-S655
Client ID: M29 Cont. 4 WI Run 1
Site: White Iron
Source: BH 2 Out
Sample Date: 3/27/23

Analyte	Result	DL	Units
Aluminum, ICP	31.7	4.59	µg/sample
Antimony, ICP	< DL	0.765	µg/sample
Arsenic, ICP	< DL	1.07	µg/sample
Barium, ICP	0.902	0.076	µg/sample
Beryllium, ICP	< DL	0.031	µg/sample
Cadmium, ICP	< DL	0.061	µg/sample
Chromium, ICP	0.858	0.122	µg/sample
Cobalt, ICP	0.122	0.076	µg/sample
Copper, ICP	1.17	0.765	µg/sample
Lead, ICP	< DL	0.765	µg/sample
Manganese, ICP	0.665	0.046	µg/sample
Mercury, CVAA	0.152	0.0201	µg/sample
Nickel, ICP	1.53	0.459	µg/sample
Phosphorus, ICP	< DL	3.06	µg/sample
Selenium, ICP	< DL	2.30	µg/sample
Silver, ICP	< DL	0.306	µg/sample
Thallium, ICP	< DL	1.53	µg/sample
Vanadium, ICP	< DL	0.153	µg/sample
Zinc, ICP	4.04	0.459	µg/sample

Lab ID: 23-S656
Client ID: M29 Cont. 5A WI Run 1
Site: White Iron
Source: BH 2 Out
Sample Date: 3/27/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0103	µg/sample

Lab ID: 23-S657
Client ID: M29 Cont. 5B WI Run 1
Site: White Iron
Source: BH 2 Out
Sample Date: 3/27/23

Analyte	Result	DL	Units
Mercury, CVAA	0.150	0.0363	µg/sample

Lab ID: 23-S658
Client ID: M29 Cont. 5C WI Run 1
Site: White Iron
Source: BH 2 Out
Sample Date: 3/27/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0196	µg/sample

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2023 Eagle Foundry Emission Factor Determination and PTE Verification Test Report, Rev 02

Client: B020 - Bison Engineering
Report Number: 23-175

Lab ID: 23-S659
Client ID: M29 Cont. 1&3 WI Run 2
Site: White Iron
Source: BH 2 Out
Sample Date: 3/28/23

Analyte	Result	DL	Units
Aluminum, ICP	96.2	7.50	µg/sample
Antimony, ICP	2.00	1.25	µg/sample
Arsenic, ICP	1.96	1.75	µg/sample
Barium, ICP	4.70	0.125	µg/sample
Beryllium, ICP	< DL	0.050	µg/sample
Cadmium, ICP	< DL	0.100	µg/sample
Chromium, ICP	2.20	0.200	µg/sample
Cobalt, ICP	< DL	0.125	µg/sample
Copper, ICP	4.76	1.25	µg/sample
Lead, ICP	1.93	1.25	µg/sample
Manganese, ICP	5.32	0.075	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	7.70	0.750	µg/sample
Phosphorus, ICP	6.11	5.00	µg/sample
Selenium, ICP	< DL	3.75	µg/sample
Silver, ICP	< DL	0.500	µg/sample
Thallium, ICP	< DL	2.50	µg/sample
Vanadium, ICP	< DL	0.250	µg/sample
Zinc, ICP	12.6	0.750	µg/sample

Lab ID: 23-S660
Client ID: M29 Cont. 4 WI Run 2
Site: White Iron
Source: BH 2 Out
Sample Date: 3/28/23

Analyte	Result	DL	Units
Aluminum, ICP	17.8	3.45	µg/sample
Antimony, ICP	< DL	0.575	µg/sample
Arsenic, ICP	< DL	0.805	µg/sample
Barium, ICP	0.656	0.058	µg/sample
Beryllium, ICP	< DL	0.023	µg/sample
Cadmium, ICP	< DL	0.046	µg/sample
Chromium, ICP	1.03	0.092	µg/sample
Cobalt, ICP	0.072	0.058	µg/sample
Copper, ICP	0.674	0.575	µg/sample
Lead, ICP	< DL	0.575	µg/sample
Manganese, ICP	1.24	0.034	µg/sample
Mercury, CVAA	0.162	0.0219	µg/sample
Nickel, ICP	0.921	0.345	µg/sample
Phosphorus, ICP	< DL	2.30	µg/sample
Selenium, ICP	< DL	1.72	µg/sample
Silver, ICP	< DL	0.230	µg/sample
Thallium, ICP	< DL	1.15	µg/sample
Vanadium, ICP	< DL	0.115	µg/sample
Zinc, ICP	1.57	0.345	µg/sample

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Client: B020 - Bison Engineering
Report Number: 23-175

Lab ID: 23-S661
Client ID: M29 Cont. 5A WI Run 2
Site: White Iron
Source: BH 2 Out
Sample Date: 3/28/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.00884	µg/sample

Lab ID: 23-S662
Client ID: M29 Cont. 5B WI Run 2
Site: White Iron
Source: BH 2 Out
Sample Date: 3/28/23

Analyte	Result	DL	Units
Mercury, CVAA	0.144	0.0337	µg/sample

Lab ID: 23-S663
Client ID: M29 Cont. 5C WI Run 2
Site: White Iron
Source: BH 2 Out
Sample Date: 3/28/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0194	µg/sample

Lab ID: 23-S664
Client ID: M29 Cont. 1&3 WI Run 3
Site: White Iron
Source: BH 2 Out
Sample Date: 3/29/23

Analyte	Result	DL	Units
Aluminum, ICP	85.9	7.50	µg/sample
Antimony, ICP	1.76	1.25	µg/sample
Arsenic, ICP	< DL	1.75	µg/sample
Barium, ICP	2.65	0.125	µg/sample
Beryllium, ICP	< DL	0.050	µg/sample
Cadmium, ICP	< DL	0.100	µg/sample
Chromium, ICP	1.36	0.200	µg/sample
Cobalt, ICP	< DL	0.125	µg/sample
Copper, ICP	1.96	1.25	µg/sample
Lead, ICP	< DL	1.25	µg/sample
Manganese, ICP	2.70	0.075	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	4.85	0.750	µg/sample
Phosphorus, ICP	6.98	5.00	µg/sample
Selenium, ICP	< DL	3.75	µg/sample
Silver, ICP	< DL	0.500	µg/sample
Thallium, ICP	< DL	2.50	µg/sample
Vanadium, ICP	< DL	0.250	µg/sample
Zinc, ICP	4.69	0.750	µg/sample

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2023 Eagle Foundry Emission Factor Determination and PTE Verification Test Report, Rev 02

Client: B020 - Bison Engineering
Report Number: 23-175

Lab ID: 23-S665
Client ID: M29 Cont. 4 WI Run 3
Site: White Iron
Source: BH 2 Out
Sample Date: 3/29/23

Analyte	Result	DL	Units
Aluminum, ICP	22.9	3.57	µg/sample
Antimony, ICP	< DL	0.595	µg/sample
Arsenic, ICP	< DL	0.833	µg/sample
Barium, ICP	0.742	0.060	µg/sample
Beryllium, ICP	< DL	0.024	µg/sample
Cadmium, ICP	< DL	0.048	µg/sample
Chromium, ICP	0.524	0.095	µg/sample
Cobalt, ICP	< DL	0.060	µg/sample
Copper, ICP	0.846	0.595	µg/sample
Lead, ICP	< DL	0.595	µg/sample
Manganese, ICP	11.6	0.036	µg/sample
Mercury, CVAA	0.176	0.0224	µg/sample
Nickel, ICP	0.454	0.357	µg/sample
Phosphorus, ICP	< DL	2.38	µg/sample
Selenium, ICP	< DL	1.78	µg/sample
Silver, ICP	< DL	0.238	µg/sample
Thallium, ICP	< DL	1.19	µg/sample
Vanadium, ICP	< DL	0.119	µg/sample
Zinc, ICP	1.06	0.357	µg/sample

Lab ID: 23-S666
Client ID: M29 Cont. 5A WI Run 3
Site: White Iron
Source: BH 2 Out
Sample Date: 3/29/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0137	µg/sample

Lab ID: 23-S667
Client ID: M29 Cont. 5B WI Run 3
Site: White Iron
Source: BH 2 Out
Sample Date: 3/29/23

Analyte	Result	DL	Units
Mercury, CVAA	0.127	0.0354	µg/sample

Lab ID: 23-S668
Client ID: M29 Cont. 5C WI Run 3
Site: White Iron
Source: BH 2 Out
Sample Date: 3/29/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0198	µg/sample

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2023 Eagle Foundry Emission Factor Determination and PTE Verification Test Report, Rev 02

Lab ID: 23-S669
Client ID: M29 Cont. 1&3 MS Run 1
Site: Mn Steel
Source: BH 1 In
Sample Date: 3/27/23
Comments: 5x dilution for As

Analyte	Result	DL	Units
Aluminum, ICP	1,680	7.50	µg/sample
Antimony, ICP	5.77	1.25	µg/sample
Arsenic, ICP	< DL	8.75	µg/sample
Barium, ICP	13.5	0.125	µg/sample
Beryllium, ICP	0.069	0.050	µg/sample
Cadmium, ICP	1.05	0.100	µg/sample
Chromium, ICP	109.	0.200	µg/sample
Cobalt, ICP	0.440	0.125	µg/sample
Copper, ICP	59.4	1.25	µg/sample
Lead, ICP	135.	1.25	µg/sample
Manganese, ICP	5,800	0.075	µg/sample
Mercury, CVAA	0.0438	0.0219	µg/sample
Nickel, ICP	11.7	0.750	µg/sample
Phosphorus, ICP	46.7	5.00	µg/sample
Selenium, ICP	< DL	3.75	µg/sample
Silver, ICP	2.43	0.500	µg/sample
Thallium, ICP	< DL	2.50	µg/sample
Vanadium, ICP	0.653	0.250	µg/sample
Zinc, ICP	1,120	0.750	µg/sample

Lab ID: 23-S670
Client ID: M29 Cont. 4 MS Run 1
Site: Mn Steel
Source: BH 1 In
Sample Date: 3/27/23

Analyte	Result	DL	Units
Aluminum, ICP	51.5	4.08	µg/sample
Antimony, ICP	< DL	0.680	µg/sample
Arsenic, ICP	< DL	0.952	µg/sample
Barium, ICP	1.63	0.068	µg/sample
Beryllium, ICP	< DL	0.027	µg/sample
Cadmium, ICP	0.803	0.054	µg/sample
Chromium, ICP	0.689	0.109	µg/sample
Cobalt, ICP	0.127	0.068	µg/sample
Copper, ICP	< DL	0.680	µg/sample
Lead, ICP	< DL	0.680	µg/sample
Manganese, ICP	1.08	0.041	µg/sample
Mercury, CVAA	0.229	0.0200	µg/sample
Nickel, ICP	< DL	0.408	µg/sample
Phosphorus, ICP	< DL	2.72	µg/sample
Selenium, ICP	< DL	2.04	µg/sample
Silver, ICP	< DL	0.272	µg/sample
Thallium, ICP	< DL	1.36	µg/sample
Vanadium, ICP	< DL	0.136	µg/sample
Zinc, ICP	7.24	0.408	µg/sample

Client: B020 - Bison Engineering
Report Number: 23-175

Lab ID: 23-S671
Client ID: M29 Cont. 5A MS Run 1
Site: Mn Steel
Source: BH 1 In
Sample Date: 3/27/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0268	µg/sample

Lab ID: 23-S672
Client ID: M29 Cont. 5B MS Run 1
Site: Mn Steel
Source: BH 1 In
Sample Date: 3/27/23

Analyte	Result	DL	Units
Mercury, CVAA	0.195	0.0350	µg/sample

Lab ID: 23-S673
Client ID: M29 Cont. 5C MS Run 1
Site: Mn Steel
Source: BH 1 In
Sample Date: 3/27/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0192	µg/sample

Lab ID: 23-S674
Client ID: M29 Cont. 1&3 MS Run 2
Site: Mn Steel
Source: BH 1 In
Sample Date: 3/28/23
Comments: 5x dilution for As

Analyte	Result	DL	Units
Aluminum, ICP	1,320	7.50	µg/sample
Antimony, ICP	3.06	1.25	µg/sample
Arsenic, ICP	< DL	8.75	µg/sample
Barium, ICP	12.3	0.125	µg/sample
Beryllium, ICP	0.052	0.050	µg/sample
Cadmium, ICP	1.36	0.100	µg/sample
Chromium, ICP	92.6	0.200	µg/sample
Cobalt, ICP	0.355	0.125	µg/sample
Copper, ICP	51.9	1.25	µg/sample
Lead, ICP	145.	1.25	µg/sample
Manganese, ICP	6,670	0.075	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	13.1	0.750	µg/sample
Phosphorus, ICP	48.4	5.00	µg/sample
Selenium, ICP	3.88	3.75	µg/sample
Silver, ICP	1.57	0.500	µg/sample
Thallium, ICP	< DL	2.50	µg/sample
Vanadium, ICP	0.471	0.250	µg/sample
Zinc, ICP	1,040	0.750	µg/sample

Analysis performed by: **CHESTER LabNet**

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Client: B020 - Bison Engineering
Report Number: 23-175

Lab ID: 23-S675
Client ID: M29 Cont. 4 MS Run 2
Site: Mn Steel
Source: BH 1 In
Sample Date: 3/28/23

Analyte	Result	DL	Units
Aluminum, ICP	24.7	3.72	µg/sample
Antimony, ICP	< DL	0.620	µg/sample
Arsenic, ICP	< DL	0.868	µg/sample
Barium, ICP	1.43	0.062	µg/sample
Beryllium, ICP	< DL	0.025	µg/sample
Cadmium, ICP	0.210	0.050	µg/sample
Chromium, ICP	0.429	0.099	µg/sample
Cobalt, ICP	0.071	0.062	µg/sample
Copper, ICP	0.815	0.620	µg/sample
Lead, ICP	< DL	0.620	µg/sample
Manganese, ICP	3.61	0.037	µg/sample
Mercury, CVAA	0.173	0.0180	µg/sample
Nickel, ICP	0.501	0.372	µg/sample
Phosphorus, ICP	< DL	2.48	µg/sample
Selenium, ICP	< DL	1.86	µg/sample
Silver, ICP	< DL	0.248	µg/sample
Thallium, ICP	< DL	1.24	µg/sample
Vanadium, ICP	< DL	0.124	µg/sample
Zinc, ICP	3.40	0.372	µg/sample

Lab ID: 23-S676
Client ID: M29 Cont. 5A MS Run 2
Site: Mn Steel
Source: BH 1 In
Sample Date: 3/28/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0116	µg/sample

Lab ID: 23-S677
Client ID: M29 Cont. 5B MS Run 2
Site: Mn Steel
Source: BH 1 In
Sample Date: 3/28/23

Analyte	Result	DL	Units
Mercury, CVAA	0.176	0.0363	µg/sample

Lab ID: 23-S678
Client ID: M29 Cont. 5C MS Run 2
Site: Mn Steel
Source: BH 1 In
Sample Date: 3/28/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0159	µg/sample

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Lab ID: 23-S679
Client ID: M29 Cont. 1&3 MS Run 3
Site: Mn Steel
Source: BH 1 In
Sample Date: 3/29/23
Comments: 5x dilution for As

Analyte	Result	DL	Units
Aluminum, ICP	1,300	7.50	µg/sample
Antimony, ICP	4.58	1.25	µg/sample
Arsenic, ICP	< DL	8.75	µg/sample
Barium, ICP	12.1	0.125	µg/sample
Beryllium, ICP	< DL	0.050	µg/sample
Cadmium, ICP	1.85	0.100	µg/sample
Chromium, ICP	83.0	0.200	µg/sample
Cobalt, ICP	0.420	0.125	µg/sample
Copper, ICP	56.3	1.25	µg/sample
Lead, ICP	125.	1.25	µg/sample
Manganese, ICP	5,340	0.075	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	14.4	0.750	µg/sample
Phosphorus, ICP	48.2	5.00	µg/sample
Selenium, ICP	< DL	3.75	µg/sample
Silver, ICP	1.82	0.500	µg/sample
Thallium, ICP	< DL	2.50	µg/sample
Vanadium, ICP	0.337	0.250	µg/sample
Zinc, ICP	879.	0.750	µg/sample

Lab ID: 23-S680
Client ID: M29 Cont. 4 MS Run 3
Site: Mn Steel
Source: BH 1 In
Sample Date: 3/29/23

Analyte	Result	DL	Units
Aluminum, ICP	20.6	3.54	µg/sample
Antimony, ICP	1.49	0.590	µg/sample
Arsenic, ICP	< DL	0.826	µg/sample
Barium, ICP	1.26	0.059	µg/sample
Beryllium, ICP	< DL	0.024	µg/sample
Cadmium, ICP	0.079	0.047	µg/sample
Chromium, ICP	0.357	0.094	µg/sample
Cobalt, ICP	< DL	0.059	µg/sample
Copper, ICP	0.681	0.590	µg/sample
Lead, ICP	< DL	0.590	µg/sample
Manganese, ICP	4.79	0.035	µg/sample
Mercury, CVAA	0.179	0.0228	µg/sample
Nickel, ICP	0.509	0.354	µg/sample
Phosphorus, ICP	< DL	2.36	µg/sample
Selenium, ICP	< DL	1.77	µg/sample
Silver, ICP	< DL	0.236	µg/sample
Thallium, ICP	< DL	1.18	µg/sample
Vanadium, ICP	< DL	0.118	µg/sample
Zinc, ICP	2.06	0.354	µg/sample

Client: B020 - Bison Engineering
Report Number: 23-175

Lab ID: 23-S681
Client ID: M29 Cont. 5A MS Run 3
Site: Mn Steel
Source: BH 1 In
Sample Date: 3/29/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0108	µg/sample

Lab ID: 23-S682
Client ID: M29 Cont. 5B MS Run 3
Site: Mn Steel
Source: BH 1 In
Sample Date: 3/29/23

Analyte	Result	DL	Units
Mercury, CVAA	0.194	0.0376	µg/sample

Lab ID: 23-S683
Client ID: M29 Cont. 5C MS Run 3
Site: Mn Steel
Source: BH 1 In
Sample Date: 3/29/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0194	µg/sample

Lab ID: 23-S684
Client ID: M29 Cont. 1&3 MS Run 1
Site: Mn Steel
Source: BH 2 In
Sample Date: 3/27/23
Comments: 5x dilution for As

Analyte	Result	DL	Units
Aluminum, ICP	3,170	7.50	µg/sample
Antimony, ICP	3.28	1.25	µg/sample
Arsenic, ICP	9.26	8.75	µg/sample
Barium, ICP	17.9	0.125	µg/sample
Beryllium, ICP	0.074	0.050	µg/sample
Cadmium, ICP	0.339	0.100	µg/sample
Chromium, ICP	75.1	0.200	µg/sample
Cobalt, ICP	0.404	0.125	µg/sample
Copper, ICP	29.8	1.25	µg/sample
Lead, ICP	37.0	1.25	µg/sample
Manganese, ICP	2,580	0.075	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	9.92	0.750	µg/sample
Phosphorus, ICP	49.5	5.00	µg/sample
Selenium, ICP	< DL	3.75	µg/sample
Silver, ICP	3.32	0.500	µg/sample
Thallium, ICP	< DL	2.50	µg/sample
Vanadium, ICP	1.12	0.250	µg/sample
Zinc, ICP	360.	0.750	µg/sample

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Client: B020 - Bison Engineering
Report Number: 23-175

Lab ID: 23-S685
Client ID: M29 Cont. 4 MS Run 1
Site: Mn Steel
Source: BH 2 In
Sample Date: 3/27/23

Analyte	Result	DL	Units
Aluminum, ICP	28.5	3.57	µg/sample
Antimony, ICP	< DL	0.595	µg/sample
Arsenic, ICP	< DL	0.833	µg/sample
Barium, ICP	1.54	0.060	µg/sample
Beryllium, ICP	< DL	0.024	µg/sample
Cadmium, ICP	3.35	0.048	µg/sample
Chromium, ICP	0.879	0.095	µg/sample
Cobalt, ICP	0.121	0.060	µg/sample
Copper, ICP	1.04	0.595	µg/sample
Lead, ICP	0.633	0.595	µg/sample
Manganese, ICP	1.66	0.036	µg/sample
Mercury, CVAA	0.135	0.0215	µg/sample
Nickel, ICP	0.610	0.357	µg/sample
Phosphorus, ICP	4.26	2.38	µg/sample
Selenium, ICP	< DL	1.78	µg/sample
Silver, ICP	< DL	0.238	µg/sample
Thallium, ICP	< DL	1.19	µg/sample
Vanadium, ICP	< DL	0.119	µg/sample
Zinc, ICP	4.44	0.357	µg/sample

Lab ID: 23-S686
Client ID: M29 Cont. 5A MS Run 1
Site: Mn Steel
Source: BH 2 In
Sample Date: 3/27/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.00928	µg/sample

Lab ID: 23-S687
Client ID: M29 Cont. 5B MS Run 1
Site: Mn Steel
Source: BH 2 In
Sample Date: 3/27/23

Analyte	Result	DL	Units
Mercury, CVAA	0.213	0.0354	µg/sample

Lab ID: 23-S688
Client ID: M29 Cont. 5C MS Run 1
Site: Mn Steel
Source: BH 2 In
Sample Date: 3/27/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0201	µg/sample

Analysis performed by: **CHESTER LabNet**

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EFC223119

2023 Eagle Foundry Emission Factor Determination and PTE Verification Test Report, Rev 02

Client: B020 - Bison Engineering
Report Number: 23-175

Lab ID: 23-S689
Client ID: M29 Cont. 1&3 MS Run 2
Site: Mn Steel
Source: BH 2 In
Sample Date: 3/28/23
Comments: 5x dilution for As

Analyte	Result	DL	Units
Aluminum, ICP	5,480	7.50	µg/sample
Antimony, ICP	4.52	1.25	µg/sample
Arsenic, ICP	12.7	8.75	µg/sample
Barium, ICP	27.8	0.125	µg/sample
Beryllium, ICP	0.110	0.050	µg/sample
Cadmium, ICP	0.630	0.100	µg/sample
Chromium, ICP	53.3	0.200	µg/sample
Cobalt, ICP	0.571	0.125	µg/sample
Copper, ICP	46.2	1.25	µg/sample
Lead, ICP	44.0	1.25	µg/sample
Manganese, ICP	2,150	0.075	µg/sample
Mercury, CVAA	0.0250	0.0219	µg/sample
Nickel, ICP	10.8	0.750	µg/sample
Phosphorus, ICP	64.8	5.00	µg/sample
Selenium, ICP	< DL	3.75	µg/sample
Silver, ICP	2.01	0.500	µg/sample
Thallium, ICP	< DL	2.50	µg/sample
Vanadium, ICP	1.99	0.250	µg/sample
Zinc, ICP	364.	0.750	µg/sample

Lab ID: 23-S690
Client ID: M29 Cont. 4 MS Run 2
Site: Mn Steel
Source: BH 2 In
Sample Date: 3/28/23

Analyte	Result	DL	Units
Aluminum, ICP	28.6	3.57	µg/sample
Antimony, ICP	< DL	0.595	µg/sample
Arsenic, ICP	< DL	0.833	µg/sample
Barium, ICP	4.69	0.060	µg/sample
Beryllium, ICP	< DL	0.024	µg/sample
Cadmium, ICP	1.02	0.048	µg/sample
Chromium, ICP	0.946	0.095	µg/sample
Cobalt, ICP	0.123	0.060	µg/sample
Copper, ICP	0.953	0.595	µg/sample
Lead, ICP	< DL	0.595	µg/sample
Manganese, ICP	3.96	0.036	µg/sample
Mercury, CVAA	0.196	0.0221	µg/sample
Nickel, ICP	1.22	0.357	µg/sample
Phosphorus, ICP	< DL	2.38	µg/sample
Selenium, ICP	< DL	1.78	µg/sample
Silver, ICP	< DL	0.238	µg/sample
Thallium, ICP	< DL	1.19	µg/sample
Vanadium, ICP	< DL	0.119	µg/sample
Zinc, ICP	3.90	0.357	µg/sample

Analysis performed by: **CHESTER LabNet**

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2023 Eagle Foundry Emission Factor Determination and PTE Verification Test Report, Rev 02

Client: B020 - Bison Engineering
Report Number: 23-175

Lab ID: 23-S691
Client ID: M29 Cont. 5A MS Run 2
Site: Mn Steel
Source: BH 2 In
Sample Date: 3/28/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.00998	µg/sample

Lab ID: 23-S692
Client ID: M29 Cont. 5B MS Run 2
Site: Mn Steel
Source: BH 2 In
Sample Date: 3/28/23

Analyte	Result	DL	Units
Mercury, CVAA	0.124	0.0363	µg/sample

Lab ID: 23-S693
Client ID: M29 Cont. 5C MS Run 2
Site: Mn Steel
Source: BH 2 In
Sample Date: 3/28/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0196	µg/sample

Lab ID: 23-S694
Client ID: M29 Cont. 1&3 MS Run 3
Site: Mn Steel
Source: BH 2 In
Sample Date: 3/29/23
Comments: 5x dilution for As

Analyte	Result	DL	Units
Aluminum, ICP	5,680	7.50	µg/sample
Antimony, ICP	4.63	1.25	µg/sample
Arsenic, ICP	16.2	8.75	µg/sample
Barium, ICP	26.4	0.125	µg/sample
Beryllium, ICP	0.105	0.050	µg/sample
Cadmium, ICP	0.686	0.100	µg/sample
Chromium, ICP	49.1	0.200	µg/sample
Cobalt, ICP	0.481	0.125	µg/sample
Copper, ICP	51.1	1.25	µg/sample
Lead, ICP	46.0	1.25	µg/sample
Manganese, ICP	2,090	0.075	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	11.1	0.750	µg/sample
Phosphorus, ICP	81.1	5.00	µg/sample
Selenium, ICP	< DL	3.75	µg/sample
Silver, ICP	1.81	0.500	µg/sample
Thallium, ICP	< DL	2.50	µg/sample
Vanadium, ICP	1.89	0.250	µg/sample
Zinc, ICP	428.	0.750	µg/sample

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2023 Eagle Foundry Emission Factor Determination and PTE Verification Test Report, Rev 02

Client: B020 - Bison Engineering
Report Number: 23-175

Lab ID: 23-S695
Client ID: M29 Cont. 4 MS Run 3
Site: Mn Steel
Source: BH 2 In
Sample Date: 3/29/23

Analyte	Result	DL	Units
Aluminum, ICP	30.6	3.48	µg/sample
Antimony, ICP	< DL	0.580	µg/sample
Arsenic, ICP	< DL	0.812	µg/sample
Barium, ICP	4.41	0.058	µg/sample
Beryllium, ICP	< DL	0.023	µg/sample
Cadmium, ICP	0.281	0.046	µg/sample
Chromium, ICP	0.504	0.093	µg/sample
Cobalt, ICP	0.071	0.058	µg/sample
Copper, ICP	< DL	0.580	µg/sample
Lead, ICP	0.905	0.580	µg/sample
Manganese, ICP	14.3	0.035	µg/sample
Mercury, CVAA	0.215	0.0251	µg/sample
Nickel, ICP	0.552	0.348	µg/sample
Phosphorus, ICP	< DL	2.32	µg/sample
Selenium, ICP	< DL	1.74	µg/sample
Silver, ICP	< DL	0.232	µg/sample
Thallium, ICP	< DL	1.16	µg/sample
Vanadium, ICP	< DL	0.116	µg/sample
Zinc, ICP	1.75	0.348	µg/sample

Lab ID: 23-S696
Client ID: M29 Cont. 5A MS Run 3
Site: Mn Steel
Source: BH 2 In
Sample Date: 3/29/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.00998	µg/sample

Lab ID: 23-S697
Client ID: M29 Cont. 5B MS Run 3
Site: Mn Steel
Source: BH 2 In
Sample Date: 3/29/23

Analyte	Result	DL	Units
Mercury, CVAA	0.175	0.0350	µg/sample

Lab ID: 23-S698
Client ID: M29 Cont. 5C MS Run 3
Site: Mn Steel
Source: BH 2 In
Sample Date: 3/29/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0196	µg/sample

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2023 Eagle Foundry Emission Factor Determination and PTE Verification Test Report, Rev 02

Client: B020 - Bison Engineering
Report Number: 23-175

Lab ID: 23-S699
Client ID: M29 Cont. 1&3 MS Run 1
Site: Mn Steel
Source: BH 1 Out
Sample Date: 3/27/23

Analyte	Result	DL	Units
Aluminum, ICP	99.0	7.50	µg/sample
Antimony, ICP	2.91	1.25	µg/sample
Arsenic, ICP	2.29	1.75	µg/sample
Barium, ICP	6.75	0.125	µg/sample
Beryllium, ICP	< DL	0.050	µg/sample
Cadmium, ICP	< DL	0.100	µg/sample
Chromium, ICP	4.97	0.200	µg/sample
Cobalt, ICP	< DL	0.125	µg/sample
Copper, ICP	4.18	1.25	µg/sample
Lead, ICP	< DL	1.25	µg/sample
Manganese, ICP	13.4	0.075	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	10.4	0.750	µg/sample
Phosphorus, ICP	22.1	5.00	µg/sample
Selenium, ICP	< DL	3.75	µg/sample
Silver, ICP	0.608	0.500	µg/sample
Thallium, ICP	< DL	2.50	µg/sample
Vanadium, ICP	< DL	0.250	µg/sample
Zinc, ICP	12.0	0.750	µg/sample

Lab ID: 23-S700
Client ID: M29 Cont. 4 MS Run 1
Site: Mn Steel
Source: BH 1 Out
Sample Date: 3/27/23

Analyte	Result	DL	Units
Aluminum, ICP	20.4	3.60	µg/sample
Antimony, ICP	< DL	0.600	µg/sample
Arsenic, ICP	< DL	0.840	µg/sample
Barium, ICP	2.37	0.060	µg/sample
Beryllium, ICP	< DL	0.024	µg/sample
Cadmium, ICP	0.514	0.048	µg/sample
Chromium, ICP	0.481	0.096	µg/sample
Cobalt, ICP	0.067	0.060	µg/sample
Copper, ICP	< DL	0.600	µg/sample
Lead, ICP	< DL	0.600	µg/sample
Manganese, ICP	1.73	0.036	µg/sample
Mercury, CVAA	0.183	0.0206	µg/sample
Nickel, ICP	< DL	0.360	µg/sample
Phosphorus, ICP	< DL	2.40	µg/sample
Selenium, ICP	< DL	1.80	µg/sample
Silver, ICP	< DL	0.240	µg/sample
Thallium, ICP	< DL	1.20	µg/sample
Vanadium, ICP	< DL	0.120	µg/sample
Zinc, ICP	6.09	0.360	µg/sample

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2023 Eagle Foundry Emission Factor Determination and PTE Verification Test Report, Rev 02

Client: B020 - Bison Engineering
Report Number: 23-175

Lab ID: 23-S701
Client ID: M29 Cont. 5A MS Run 1
Site: Mn Steel
Source: BH 1 Out
Sample Date: 3/27/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.00910	µg/sample

Lab ID: 23-S702
Client ID: M29 Cont. 5B MS Run 1
Site: Mn Steel
Source: BH 1 Out
Sample Date: 3/27/23

Analyte	Result	DL	Units
Mercury, CVAA	0.215	0.0350	µg/sample

Lab ID: 23-S703
Client ID: M29 Cont. 5C MS Run 1
Site: Mn Steel
Source: BH 1 Out
Sample Date: 3/27/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0203	µg/sample

Lab ID: 23-S704
Client ID: M29 Cont. 1&3 MS Run 2
Site: Mn Steel
Source: BH 1 Out
Sample Date: 3/28/23

Analyte	Result	DL	Units
Aluminum, ICP	87.8	7.50	µg/sample
Antimony, ICP	3.24	1.25	µg/sample
Arsenic, ICP	2.04	1.75	µg/sample
Barium, ICP	6.14	0.125	µg/sample
Beryllium, ICP	< DL	0.050	µg/sample
Cadmium, ICP	< DL	0.100	µg/sample
Chromium, ICP	4.11	0.200	µg/sample
Cobalt, ICP	< DL	0.125	µg/sample
Copper, ICP	3.74	1.25	µg/sample
Lead, ICP	< DL	1.25	µg/sample
Manganese, ICP	15.5	0.075	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	12.4	0.750	µg/sample
Phosphorus, ICP	18.2	5.00	µg/sample
Selenium, ICP	< DL	3.75	µg/sample
Silver, ICP	< DL	0.500	µg/sample
Thallium, ICP	< DL	2.50	µg/sample
Vanadium, ICP	< DL	0.250	µg/sample
Zinc, ICP	7.35	0.750	µg/sample

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2023 Eagle Foundry Emission Factor Determination and PTE Verification Test Report, Rev 02

Client: B020 - Bison Engineering
Report Number: 23-175

Lab ID: 23-S705
Client ID: M29 Cont. 4 MS Run 2
Site: Mn Steel
Source: BH 1 Out
Sample Date: 3/28/23

Analyte	Result	DL	Units
Aluminum, ICP	20.0	3.45	µg/sample
Antimony, ICP	< DL	0.575	µg/sample
Arsenic, ICP	< DL	0.805	µg/sample
Barium, ICP	2.62	0.058	µg/sample
Beryllium, ICP	< DL	0.023	µg/sample
Cadmium, ICP	0.298	0.046	µg/sample
Chromium, ICP	0.333	0.092	µg/sample
Cobalt, ICP	< DL	0.058	µg/sample
Copper, ICP	1.31	0.575	µg/sample
Lead, ICP	< DL	0.575	µg/sample
Manganese, ICP	3.26	0.034	µg/sample
Mercury, CVAA	0.244	0.0262	µg/sample
Nickel, ICP	0.946	0.345	µg/sample
Phosphorus, ICP	< DL	2.30	µg/sample
Selenium, ICP	< DL	1.72	µg/sample
Silver, ICP	< DL	0.230	µg/sample
Thallium, ICP	< DL	1.15	µg/sample
Vanadium, ICP	< DL	0.115	µg/sample
Zinc, ICP	3.69	0.345	µg/sample

Lab ID: 23-S706
Client ID: M29 Cont. 5A MS Run 2
Site: Mn Steel
Source: BH 1 Out
Sample Date: 3/28/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.00827	µg/sample

Lab ID: 23-S707
Client ID: M29 Cont. 5B MS Run 2
Site: Mn Steel
Source: BH 1 Out
Sample Date: 3/28/23

Analyte	Result	DL	Units
Mercury, CVAA	0.231	0.0359	µg/sample

Lab ID: 23-S708
Client ID: M29 Cont. 5C MS Run 2
Site: Mn Steel
Source: BH 1 Out
Sample Date: 3/28/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0201	µg/sample

Analysis performed by: **CHESTER LabNet**

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2023 Eagle Foundry Emission Factor Determination and PTE Verification Test Report, Rev 02

Lab ID: 23-S709
Client ID: M29 Cont. 1&3 MS Run 3
Site: Mn Steel
Source: BH 1 Out
Sample Date: 3/29/23

Analyte	Result	DL	Units
Aluminum, ICP	84.5	7.50	µg/sample
Antimony, ICP	3.16	1.25	µg/sample
Arsenic, ICP	2.51	1.75	µg/sample
Barium, ICP	7.06	0.125	µg/sample
Beryllium, ICP	< DL	0.050	µg/sample
Cadmium, ICP	< DL	0.100	µg/sample
Chromium, ICP	2.75	0.200	µg/sample
Cobalt, ICP	< DL	0.125	µg/sample
Copper, ICP	< DL	1.25	µg/sample
Lead, ICP	< DL	1.25	µg/sample
Manganese, ICP	12.5	0.075	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	5.35	0.750	µg/sample
Phosphorus, ICP	20.6	5.00	µg/sample
Selenium, ICP	< DL	3.75	µg/sample
Silver, ICP	< DL	0.500	µg/sample
Thallium, ICP	< DL	2.50	µg/sample
Vanadium, ICP	< DL	0.250	µg/sample
Zinc, ICP	8.84	0.750	µg/sample

Lab ID: 23-S710
Client ID: M29 Cont. 4 MS Run 3
Site: Mn Steel
Source: BH 1 Out
Sample Date: 3/29/23

Analyte	Result	DL	Units
Aluminum, ICP	18.5	3.45	µg/sample
Antimony, ICP	< DL	0.575	µg/sample
Arsenic, ICP	< DL	0.805	µg/sample
Barium, ICP	1.83	0.058	µg/sample
Beryllium, ICP	< DL	0.023	µg/sample
Cadmium, ICP	0.091	0.046	µg/sample
Chromium, ICP	0.328	0.092	µg/sample
Cobalt, ICP	< DL	0.058	µg/sample
Copper, ICP	1.22	0.575	µg/sample
Lead, ICP	< DL	0.575	µg/sample
Manganese, ICP	1.50	0.034	µg/sample
Mercury, CVAA	0.183	0.0262	µg/sample
Nickel, ICP	< DL	0.345	µg/sample
Phosphorus, ICP	< DL	2.30	µg/sample
Selenium, ICP	< DL	1.72	µg/sample
Silver, ICP	< DL	0.230	µg/sample
Thallium, ICP	< DL	1.15	µg/sample
Vanadium, ICP	< DL	0.115	µg/sample
Zinc, ICP	1.35	0.345	µg/sample

Client: B020 - Bison Engineering
Report Number: 23-175

Lab ID: 23-S711
Client ID: M29 Cont. 5A MS Run 3
Site: Mn Steel
Source: BH 1 Out
Sample Date: 3/29/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.00838	µg/sample

Lab ID: 23-S712
Client ID: M29 Cont. 5B MS Run 3
Site: Mn Steel
Source: BH 1 Out
Sample Date: 3/29/23

Analyte	Result	DL	Units
Mercury, CVAA	0.223	0.0363	µg/sample

Lab ID: 23-S713
Client ID: M29 Cont. 5C MS Run 3
Site: Mn Steel
Source: BH 1 Out
Sample Date: 3/29/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0196	µg/sample

Lab ID: 23-S714
Client ID: M29 Cont. 1&3 MS Run 1
Site: Mn Steel
Source: BH 2 Out
Sample Date: 3/27/23

Analyte	Result	DL	Units
Aluminum, ICP	74.2	7.50	µg/sample
Antimony, ICP	3.54	1.25	µg/sample
Arsenic, ICP	2.63	1.75	µg/sample
Barium, ICP	3.30	0.125	µg/sample
Beryllium, ICP	< DL	0.050	µg/sample
Cadmium, ICP	< DL	0.100	µg/sample
Chromium, ICP	1.90	0.200	µg/sample
Cobalt, ICP	< DL	0.125	µg/sample
Copper, ICP	1.48	1.25	µg/sample
Lead, ICP	< DL	1.25	µg/sample
Manganese, ICP	5.53	0.075	µg/sample
Mercury, CVAA	0.0438	0.0219	µg/sample
Nickel, ICP	4.60	0.750	µg/sample
Phosphorus, ICP	20.2	5.00	µg/sample
Selenium, ICP	< DL	3.75	µg/sample
Silver, ICP	< DL	0.500	µg/sample
Thallium, ICP	< DL	2.50	µg/sample
Vanadium, ICP	< DL	0.250	µg/sample
Zinc, ICP	8.16	0.750	µg/sample

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Client: B020 - Bison Engineering
Report Number: 23-175

Lab ID: 23-S715
Client ID: M29 Cont. 4 MS Run 1
Site: Mn Steel
Source: BH 2 Out
Sample Date: 3/27/23

Analyte	Result	DL	Units
Aluminum, ICP	12.1	3.39	µg/sample
Antimony, ICP	< DL	0.565	µg/sample
Arsenic, ICP	< DL	0.791	µg/sample
Barium, ICP	0.703	0.056	µg/sample
Beryllium, ICP	< DL	0.023	µg/sample
Cadmium, ICP	0.095	0.045	µg/sample
Chromium, ICP	0.778	0.090	µg/sample
Cobalt, ICP	< DL	0.056	µg/sample
Copper, ICP	< DL	0.565	µg/sample
Lead, ICP	0.687	0.565	µg/sample
Manganese, ICP	1.15	0.034	µg/sample
Mercury, CVAA	0.231	0.0312	µg/sample
Nickel, ICP	0.536	0.339	µg/sample
Phosphorus, ICP	< DL	2.26	µg/sample
Selenium, ICP	< DL	1.70	µg/sample
Silver, ICP	< DL	0.226	µg/sample
Thallium, ICP	< DL	1.13	µg/sample
Vanadium, ICP	< DL	0.113	µg/sample
Zinc, ICP	8.71	0.339	µg/sample

Lab ID: 23-S716
Client ID: M29 Cont. 5A MS Run 1
Site: Mn Steel
Source: BH 2 Out
Sample Date: 3/27/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.00796	µg/sample

Lab ID: 23-S717
Client ID: M29 Cont. 5B MS Run 1
Site: Mn Steel
Source: BH 2 Out
Sample Date: 3/27/23

Analyte	Result	DL	Units
Mercury, CVAA	0.207	0.0315	µg/sample

Lab ID: 23-S718
Client ID: M29 Cont. 5C MS Run 1
Site: Mn Steel
Source: BH 2 Out
Sample Date: 3/27/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0201	µg/sample

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2023 Eagle Foundry Emission Factor Determination and PTE Verification Test Report, Rev 02

Client: B020 - Bison Engineering
Report Number: 23-175

Lab ID: 23-S719
Client ID: M29 Cont. 1&3 MS Run 2
Site: Mn Steel
Source: BH 2 Out
Sample Date: 3/28/23

Analyte	Result	DL	Units
Aluminum, ICP	89.0	7.50	µg/sample
Antimony, ICP	3.27	1.25	µg/sample
Arsenic, ICP	2.61	1.75	µg/sample
Barium, ICP	5.00	0.125	µg/sample
Beryllium, ICP	< DL	0.050	µg/sample
Cadmium, ICP	< DL	0.100	µg/sample
Chromium, ICP	1.57	0.200	µg/sample
Cobalt, ICP	< DL	0.125	µg/sample
Copper, ICP	2.60	1.25	µg/sample
Lead, ICP	1.56	1.25	µg/sample
Manganese, ICP	5.54	0.075	µg/sample
Mercury, CVAA	0.0438	0.0219	µg/sample
Nickel, ICP	5.68	0.750	µg/sample
Phosphorus, ICP	20.5	5.00	µg/sample
Selenium, ICP	< DL	3.75	µg/sample
Silver, ICP	< DL	0.500	µg/sample
Thallium, ICP	< DL	2.50	µg/sample
Vanadium, ICP	< DL	0.250	µg/sample
Zinc, ICP	7.78	0.750	µg/sample

Lab ID: 23-S720
Client ID: M29 Cont. 4 MS Run 2
Site: Mn Steel
Source: BH 2 Out
Sample Date: 3/28/23

Analyte	Result	DL	Units
Aluminum, ICP	26.9	3.45	µg/sample
Antimony, ICP	< DL	0.575	µg/sample
Arsenic, ICP	< DL	0.805	µg/sample
Barium, ICP	1.35	0.058	µg/sample
Beryllium, ICP	< DL	0.023	µg/sample
Cadmium, ICP	0.141	0.046	µg/sample
Chromium, ICP	0.725	0.092	µg/sample
Cobalt, ICP	0.106	0.058	µg/sample
Copper, ICP	1.74	0.575	µg/sample
Lead, ICP	1.37	0.575	µg/sample
Manganese, ICP	2.07	0.034	µg/sample
Mercury, CVAA	0.181	0.0264	µg/sample
Nickel, ICP	1.91	0.345	µg/sample
Phosphorus, ICP	< DL	2.30	µg/sample
Selenium, ICP	< DL	1.72	µg/sample
Silver, ICP	< DL	0.230	µg/sample
Thallium, ICP	< DL	1.15	µg/sample
Vanadium, ICP	< DL	0.115	µg/sample
Zinc, ICP	9.40	0.345	µg/sample

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2023 Eagle Foundry Emission Factor Determination and PTE Verification Test Report, Rev 02

Client: B020 - Bison Engineering
Report Number: 23-175

Lab ID: 23-S721
Client ID: M29 Cont. 5A MS Run 2
Site: Mn Steel
Source: BH 2 Out
Sample Date: 3/28/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.00945	µg/sample

Lab ID: 23-S722
Client ID: M29 Cont. 5B MS Run 2
Site: Mn Steel
Source: BH 2 Out
Sample Date: 3/28/23

Analyte	Result	DL	Units
Mercury, CVAA	0.133	0.0311	µg/sample

Lab ID: 23-S723
Client ID: M29 Cont. 5C MS Run 2
Site: Mn Steel
Source: BH 2 Out
Sample Date: 3/28/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0189	µg/sample

Lab ID: 23-S724
Client ID: M29 Cont. 1&3 MS Run 3
Site: Mn Steel
Source: BH 2 Out
Sample Date: 3/29/23

Analyte	Result	DL	Units
Aluminum, ICP	79.8	7.50	µg/sample
Antimony, ICP	2.36	1.25	µg/sample
Arsenic, ICP	2.64	1.75	µg/sample
Barium, ICP	3.59	0.125	µg/sample
Beryllium, ICP	< DL	0.050	µg/sample
Cadmium, ICP	< DL	0.100	µg/sample
Chromium, ICP	1.35	0.200	µg/sample
Cobalt, ICP	< DL	0.125	µg/sample
Copper, ICP	< DL	1.25	µg/sample
Lead, ICP	< DL	1.25	µg/sample
Manganese, ICP	5.81	0.075	µg/sample
Mercury, CVAA	0.0438	0.0219	µg/sample
Nickel, ICP	4.40	0.750	µg/sample
Phosphorus, ICP	20.3	5.00	µg/sample
Selenium, ICP	< DL	3.75	µg/sample
Silver, ICP	< DL	0.500	µg/sample
Thallium, ICP	< DL	2.50	µg/sample
Vanadium, ICP	< DL	0.250	µg/sample
Zinc, ICP	4.20	0.750	µg/sample

Analysis performed by: **CHESTER LabNet**

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EFC223119

2023 Eagle Foundry Emission Factor Determination and PTE Verification Test Report, Rev 02

Client: B020 - Bison Engineering
Report Number: 23-175

Lab ID: 23-S725
Client ID: M29 Cont. 4 MS Run 3
Site: Mn Steel
Source: BH 2 Out
Sample Date: 3/29/23

Analyte	Result	DL	Units
Aluminum, ICP	30.7	3.45	µg/sample
Antimony, ICP	< DL	0.575	µg/sample
Arsenic, ICP	< DL	0.805	µg/sample
Barium, ICP	1.85	0.058	µg/sample
Beryllium, ICP	< DL	0.023	µg/sample
Cadmium, ICP	0.059	0.046	µg/sample
Chromium, ICP	0.698	0.092	µg/sample
Cobalt, ICP	0.114	0.058	µg/sample
Copper, ICP	6.39	0.575	µg/sample
Lead, ICP	0.821	0.575	µg/sample
Manganese, ICP	12.7	0.034	µg/sample
Mercury, CVAA	0.194	0.0271	µg/sample
Nickel, ICP	1.35	0.345	µg/sample
Phosphorus, ICP	< DL	2.30	µg/sample
Selenium, ICP	< DL	1.72	µg/sample
Silver, ICP	< DL	0.230	µg/sample
Thallium, ICP	< DL	1.15	µg/sample
Vanadium, ICP	< DL	0.115	µg/sample
Zinc, ICP	8.61	0.345	µg/sample

Lab ID: 23-S726
Client ID: M29 Cont. 5A MS Run 3
Site: Mn Steel
Source: BH 2 Out
Sample Date: 3/29/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.00870	µg/sample

Lab ID: 23-S727
Client ID: M29 Cont. 5B MS Run 3
Site: Mn Steel
Source: BH 2 Out
Sample Date: 3/29/23

Analyte	Result	DL	Units
Mercury, CVAA	0.197	0.0306	µg/sample

Lab ID: 23-S728
Client ID: M29 Cont. 5C MS Run 3
Site: Mn Steel
Source: BH 2 Out
Sample Date: 3/29/23
Comments: No sample

Analyte	Result	DL	Units

Analysis performed by: **CHESTER LabNet**

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EFC223119

2023 Eagle Foundry Emission Factor Determination and PTE Verification Test Report, Rev 02

Lab ID: 23-S729
Client ID: M29 Cont. 12
Sample Date: 3/29/23
Comments: Filter Blank

Analyte	Result	DL	Units
Aluminum, ICP	58.8	7.50	µg/sample
Antimony, ICP	2.86	1.25	µg/sample
Arsenic, ICP	< DL	1.75	µg/sample
Barium, ICP	1.40	0.125	µg/sample
Beryllium, ICP	< DL	0.050	µg/sample
Cadmium, ICP	< DL	0.100	µg/sample
Chromium, ICP	1.03	0.200	µg/sample
Cobalt, ICP	< DL	0.125	µg/sample
Copper, ICP	< DL	1.25	µg/sample
Lead, ICP	< DL	1.25	µg/sample
Manganese, ICP	0.741	0.075	µg/sample
Mercury, CVAA	0.0406	0.0219	µg/sample
Nickel, ICP	3.96	0.750	µg/sample
Phosphorus, ICP	17.0	5.00	µg/sample
Selenium, ICP	< DL	3.75	µg/sample
Silver, ICP	< DL	0.500	µg/sample
Thallium, ICP	< DL	2.50	µg/sample
Vanadium, ICP	< DL	0.250	µg/sample
Zinc, ICP	1.52	0.750	µg/sample

Lab ID: 23-S730
Client ID: M29 Cont. 8A
Sample Date: 3/29/23
Comments: HNO3 Blank

Analyte	Result	DL	Units
Aluminum, ICP	< DL	7.50	µg/sample
Antimony, ICP	< DL	1.25	µg/sample
Arsenic, ICP	< DL	1.75	µg/sample
Barium, ICP	0.193	0.125	µg/sample
Beryllium, ICP	< DL	0.050	µg/sample
Cadmium, ICP	< DL	0.100	µg/sample
Chromium, ICP	< DL	0.200	µg/sample
Cobalt, ICP	< DL	0.125	µg/sample
Copper, ICP	< DL	1.25	µg/sample
Lead, ICP	< DL	1.25	µg/sample
Manganese, ICP	< DL	0.375	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	< DL	0.750	µg/sample
Phosphorus, ICP	< DL	5.00	µg/sample
Selenium, ICP	< DL	3.75	µg/sample
Silver, ICP	< DL	0.500	µg/sample
Thallium, ICP	< DL	2.50	µg/sample
Vanadium, ICP	< DL	0.250	µg/sample
Zinc, ICP	< DL	0.750	µg/sample

Client: B020 - Bison Engineering
Report Number: 23-175

Lab ID: 23-S731
Client ID: M29 Cont. 9
Sample Date: 3/29/23
Comments: HNO3/H2O2 Blank

Analyte	Result	DL	Units
Aluminum, ICP	16.3	3.78	µg/sample
Antimony, ICP	< DL	0.630	µg/sample
Arsenic, ICP	< DL	0.882	µg/sample
Barium, ICP	0.718	0.063	µg/sample
Beryllium, ICP	< DL	0.025	µg/sample
Cadmium, ICP	< DL	0.050	µg/sample
Chromium, ICP	0.306	0.101	µg/sample
Cobalt, ICP	0.153	0.063	µg/sample
Copper, ICP	< DL	0.630	µg/sample
Lead, ICP	< DL	0.630	µg/sample
Manganese, ICP	0.742	0.038	µg/sample
Mercury, CVAA	0.118	0.0172	µg/sample
Nickel, ICP	< DL	0.378	µg/sample
Phosphorus, ICP	< DL	2.52	µg/sample
Selenium, ICP	< DL	1.89	µg/sample
Silver, ICP	< DL	0.252	µg/sample
Thallium, ICP	< DL	1.26	µg/sample
Vanadium, ICP	< DL	0.126	µg/sample
Zinc, ICP	0.415	0.378	µg/sample

Lab ID: 23-S732
Client ID: M29 Cont. 8B
Sample Date: 3/30/23
Comments: H2O Blank

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0295	µg/sample

Lab ID: 23-S733
Client ID: M29 Cont. 10
Sample Date: 3/30/23
Comments: KMnO4 Blank

Analyte	Result	DL	Units
Mercury, CVAA	0.0628	0.0163	µg/sample

Lab ID: 23-S734
Client ID: M29 Cont. 11
Sample Date: 3/29/23
Comments: HCl Blank

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0108	µg/sample

Analysis performed by: **CHESTER LabNet**

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EFC223119

2023 Eagle Foundry Emission Factor Determination and PTE Verification Test Report, Rev 02

QA/QC Report

Client Name: Bison Engineering
 Project Number: B020
 Analytical Technique: ICP-OES
 Instrument: Perkin Elmer Optima 8300
 Sample Description: EPA Method 29
 Report Number: 23-175

Blank Data

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Ag	ICB	< DL	2.00
Ag	Meth_Blk	< DL	2.00
Ag	CCB	< DL	2.00
Ag	CCB	< DL	2.00
Al	ICB	< DL	30.0
Al	Meth_Blk	< DL	30.0
Al	CCB	< DL	30.0
Al	CCB	< DL	30.0
Al	CCB	< DL	30.0
As	ICB	< DL	7.00
As	Meth_Blk	< DL	7.00
As	CCB	< DL	7.00
As	CCB	< DL	7.00
Ba	ICB	< DL	0.500
Ba	Meth_Blk	1.51	0.500
Ba	CCB	< DL	0.500
Ba	CCB	< DL	0.500
Be	ICB	< DL	0.200
Be	Meth_Blk	< DL	0.200
Be	CCB	< DL	0.200
Be	CCB	< DL	0.200
Cd	ICB	< DL	0.400
Cd	Meth_Blk	< DL	0.400
Cd	CCB	< DL	0.400
Cd	CCB	< DL	0.400
Co	ICB	< DL	0.500
Co	Meth_Blk	< DL	0.500
Co	CCB	< DL	0.500
Co	CCB	< DL	0.500
Cr	ICB	< DL	0.800
Cr	Meth_Blk	< DL	0.800
Cr	CCB	< DL	0.800
Cr	CCB	< DL	0.800
Cu	ICB	< DL	5.00
Cu	Meth_Blk	< DL	5.00
Cu	CCB	< DL	5.00
Cu	CCB	< DL	5.00
Mn	ICB	< DL	0.300
Mn	Meth_Blk	< DL	0.300

QA/QC Report

Client Name: Bison Engineering
Project Number: B020
Analytical Technique: ICP-OES
Instrument: Perkin Elmer Optima 8300
Sample Description: EPA Method 29
Report Number: 23-175

Blank Data (continued)

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Mn	CCB	< DL	0.300
Mn	CCB	< DL	0.300
Ni	ICB	< DL	3.00
Ni	Meth_Blk	< DL	3.00
Ni	CCB	< DL	3.00
Ni	CCB	< DL	3.00
P	ICB	< DL	20.0
P	Meth_Blk	< DL	20.0
P	CCB	< DL	20.0
P	CCB	< DL	20.0
Pb	ICB	< DL	5.00
Pb	Meth_Blk	< DL	5.00
Pb	CCB	< DL	5.00
Pb	CCB	< DL	5.00
Sb	ICB	< DL	5.00
Sb	Meth_Blk	< DL	5.00
Sb	CCB	< DL	5.00
Sb	CCB	< DL	5.00
Se	ICB	< DL	15.0
Se	Meth_Blk	< DL	15.0
Se	CCB	< DL	15.0
Se	CCB	< DL	15.0
Tl	ICB	< DL	10.0
Tl	Meth_Blk	< DL	10.0
Tl	CCB	< DL	10.0
Tl	CCB	< DL	10.0
V	ICB	< DL	1.00
V	Meth_Blk	< DL	1.00
V	CCB	< DL	1.00
V	CCB	< DL	1.00
Zn	ICB	< DL	3.00
Zn	Meth_Blk	< DL	3.00
Zn	CCB	< DL	3.00
Zn	CCB	< DL	3.00

ICB: Initial Calibration Blank CCB: Continuing Calibration Blank
*: Sample Media Blank (SM_Blk) concentration in µg/filter
Method Blank is in control if Method Blank results are <10% of sample results

QA/QC Report

Client Name: Bison Engineering
 Project Number: B020
 Analytical Technique: ICP-OES
 Instrument: Perkin Elmer Optima 8300
 Sample Description: EPA Method 29
 Report Number: 23-175

Calibration QC

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Ag	ICV	2500.	2429.	97.2
Ag	LL-CCV	10.00	8.935	89.4
Ag	LL-LCS	9.000	8.650	96.1
Ag	CCV	2500.	2302.	92.1
Ag	CCV	2500.	2341.	93.6
Al	ICV	2500.	2411.	96.4
Al	LL-CCV	150.0	143.5	95.7
Al	LL-LCS	75.00	98.37	131.2
Al	CCV	2500.	2403.	96.1
Al	CCV	2500.	2349.	94.0
Al	CCV	2500.	2415.	96.6
As	ICV	2500.	2456.	98.2
As	LL-CCV	35.00	33.62	96.1
As	LL-LCS	20.00	21.17	105.8
As	CCV	2500.	2400.	96.0
As	CCV	2500.	2383.	95.3
Ba	ICV	2500.	2367.	94.7
Ba	LL-CCV	2.500	2.547	101.9
Ba	LL-LCS	1.500	1.570	104.7
Ba	CCV	2500.	2354.	94.2
Ba	CCV	2500.	2299.	92.0
Be	ICV	2500.	2499.	100.0
Be	LL-CCV	1.000	1.010	101.0
Be	LL-LCS	0.500	0.521	104.2
Be	CCV	2500.	2458.	98.3
Be	CCV	2500.	2483.	99.3
Cd	ICV	2500.	2544.	101.8
Cd	LL-CCV	2.000	2.460	123.0
Cd	LL-LCS	1.500	1.845	123.0
Cd	CCV	2500.	2518.	100.7
Cd	CCV	2500.	2564.	102.6
Co	ICV	2500.	2490.	99.6
Co	LL-CCV	2.500	2.636	105.4
Co	LL-LCS	1.500	1.809	120.6
Co	CCV	2500.	2391.	95.6
Co	CCV	2500.	2360.	94.4
Cr	ICV	2500.	2473.	98.9

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification

Calibration Verification Limits: 90% - 110% Recovery

Low Level-CCV Limits: 60% - 140% Recovery

Low Level-LCS Limits: 50% - 150% Recovery

23-175 results are insignificant if sample results are >10x LL-LCS concentration

QA/QC Report

Client Name: Bison Engineering
 Project Number: B020
 Analytical Technique: ICP-OES
 Instrument: Perkin Elmer Optima 8300
 Sample Description: EPA Method 29
 Report Number: 23-175

Calibration QC (continued)

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Cr	LL-CCV	4.000	4.264	106.6
Cr	LL-LCS	2.000	2.193	109.6
Cr	CCV	2500.	2459.	98.4
Cr	CCV	2500.	2471.	98.8
Cu	ICV	2500.	2361.	94.4
Cu	LL-CCV	25.00	26.39	105.6
Cu	LL-LCS	15.00	15.03	100.2
Cu	CCV	2500.	2350.	94.0
Cu	CCV	2500.	2356.	94.2
Mn	ICV	2500.	2512.	100.5
Mn	LL-CCV	1.500	1.542	102.8
Mn	LL-LCS	1.000	1.045	104.5
Mn	CCV	2500.	2506.	100.2
Mn	CCV	2500.	2519.	100.8
Ni	ICV	2500.	2423.	96.9
Ni	LL-CCV	15.00	16.15	107.7
Ni	LL-LCS	6.000	5.643	94.0
Ni	CCV	2500.	2406.	96.2
Ni	CCV	2500.	2525.	101.0
P	ICV	2500.	2561.	102.4
P	LL-CCV	100.0	97.85	97.8
P	LL-LCS	75.00	64.66	86.2
P	CCV	2500.	2510.	100.4
P	CCV	2500.	2505.	100.2
Pb	ICV	2500.	2500.	100.0
Pb	LL-CCV	25.00	29.42	117.7
Pb	LL-LCS	15.00	17.63	117.5
Pb	CCV	2500.	2423.	96.9
Pb	CCV	2500.	2397.	95.9
Sb	ICV	2500.	2397.	95.9
Sb	LL-CCV	25.00	28.81	115.2
Sb	LL-LCS	15.00	11.60	77.3
Sb	CCV	2500.	2352.	94.1
Sb	CCV	2500.	2352.	94.1
Se	ICV	2500.	2549.	102.0
Se	LL-CCV	75.00	84.81	113.1
Se	LL-LCS	30.00	32.92	109.7

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification

Calibration Verification Limits: 90% - 110% Recovery

Low Level-CCV Limits: 60% - 140% Recovery

Low Level-LCS Limits: 50% - 150% Recovery

Results are insignificant if sample results are >10x LL-LCS concentration

QA/QC Report

Client Name: Bison Engineering
 Project Number: B020
 Analytical Technique: ICP-OES
 Instrument: Perkin Elmer Optima 8300
 Sample Description: EPA Method 29
 Report Number: 23-175

Calibration QC (continued)

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Se	CCV	2500.	2456.	98.2
Se	CCV	2500.	2460.	98.4
Tl	ICV	2500.	2479.	99.2
Tl	LL-CCV	50.00	51.70	103.4
Tl	LL-LCS	30.00	42.79	142.6
Tl	CCV	2500.	2430.	97.2
Tl	CCV	2500.	2433.	97.3
V	ICV	2500.	2491.	99.6
V	LL-CCV	5.000	5.272	105.4
V	LL-LCS	3.000	3.062	102.1
V	CCV	2500.	2491.	99.6
V	CCV	2500.	2514.	100.6
Zn	ICV	2500.	2500.	100.0
Zn	LL-CCV	15.00	17.06	113.7
Zn	LL-LCS	6.000	6.044	100.7
Zn	CCV	2500.	2478.	99.1
Zn	CCV	2500.	2495.	99.8

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification
 Calibration Verification Limits: 90% - 110% Recovery
 Low Level-CCV Limits: 60% - 140% Recovery
 Low Level-LCS Limits: 50% - 150% Recovery
 LL-LCS results are insignificant if sample results are >10x LL-LCS concentration

Replicate Data

Analyte	Sample ID	Sample Conc. µg/L	Replicate Conc. µg/L	RPD
Ag	23-S609	8.13	7.15	12.9 *
Al	23-S609	2080	2060	1.16
As	23-S609	< 7	< 7	N/C *
Ba	23-S609	21.5	21.1	1.97
Be	23-S609	< 0.2	< 0.2	N/C *
Cd	23-S609	1.95	1.97	1.17 *
Co	23-S609	0.782	0.843	7.51 *
Cr	23-S609	166.	166.	0.06
Cu	23-S609	74.2	73.8	0.41
Mn	23-S609	1140	1120	1.42
Ni	23-S609	52.5	52.0	0.96
P	23-S609	84.6	69.8	19.3 *

RPD = $\frac{(\text{sample} - \text{replicate})}{[(\text{sample} + \text{replicate})/2]} \times 100$

N/C: RPD is not calculated when sample or replicate is below detection limit

Replicate Limit: 20% RPD

*: per EPA CLP protocol, control limits do not apply if sample and/or replicate concentration is less than 5x the detection limit

QA/QC Report

Client Name: Bison Engineering
 Project Number: B020
 Analytical Technique: ICP-OES
 Instrument: Perkin Elmer Optima 8300
 Sample Description: EPA Method 29
 Report Number: 23-175

Replicate Data (continued)

Analyte	Sample ID	Sample Conc. µg/L	Replicate Conc. µg/L	RPD
Pb	23-S609	159.	161.	1.25
Sb	23-S609	14.3	13.9	2.70 *
Se	23-S609	< 15	< 15	N/C *
Tl	23-S609	< 10	< 10	N/C *
V	23-S609	2.55	2.62	2.55 *
Zn	23-S609	1840	1840	0.05

RPD = $\frac{(\text{sample} - \text{replicate})}{[(\text{sample} + \text{replicate})/2]} \times 100$

N/C: RPD is not calculated when sample or replicate is below detection limit

Replicate Limit: 20% RPD

*: per EPA CLP protocol, control limits do not apply if sample and/or replicate concentration is less than 5x the detection limit

Laboratory Control Sample/Matrix Post Spike Analysis

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
Ag	LCS	< 2	2345.	2500	93.8
Ag	LCS-Duplicate	< 2	2472.	2500	98.9
Ag	23-S614	8.868	2359.	2500	94.0
Al	LCS	< 30	2614.	2500	105.
Al	LCS-Duplicate	< 30	2519.	2500	101.
Al	23-S614	2982.	7721.	2500	190.
As	LCS	< 7	2459.	2500	98.4
As	LCS-Duplicate	< 7	2474.	2500	99.0
As	23-S614	< 7	2318.	2500	92.7
Ba	LCS	1.507	2419.	2500	96.7
Ba	LCS-Duplicate	1.507	2348.	2500	93.9
Ba	23-S614	27.17	2327.	2500	92.0
Be	LCS	< 0.2	2481.	2500	99.2
Be	LCS-Duplicate	< 0.2	2535.	2500	101.
Be	23-S614	< 0.2	2395.	2500	95.8
Cd	LCS	< 0.4	2578.	2500	103.
Cd	LCS-Duplicate	< 0.4	2599.	2500	104.
Cd	23-S614	1.507	2443.	2500	97.7
Co	LCS	< 0.5	2419.	2500	96.8
Co	LCS-Duplicate	< 0.5	2416.	2500	96.6
Co	23-S614	1.148	2267.	2500	90.6
Cr	LCS	< 0.8	2442.	2500	97.7

LCS Limit: 80% - 120% Recovery

Spike Limit: 75% - 125% Recovery

QA/QC Report

Client Name: Bison Engineering
 Project Number: B020
 Analytical Technique: ICP-OES
 Instrument: Perkin Elmer Optima 8300
 Sample Description: EPA Method 29
 Report Number: 23-175

Laboratory Control Sample/Matrix Post Spike Analysis (continued)

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
Cr	LCS-Duplicate	< 0.8	2454.	2500	98.2
Cr	23-S614	166.0	2560.	2500	95.8
Cu	LCS	< 5	2405.	2500	96.2
Cu	LCS-Duplicate	< 5	2408.	2500	96.3
Cu	23-S614	99.52	2479.	2500	95.2
Mn	LCS	< 0.3	2492.	2500	99.7
Mn	LCS-Duplicate	< 0.3	2503.	2500	100.
Mn	23-S614	2076.	4364.	2500	91.5
Ni	LCS	< 3	2444.	2500	97.8
Ni	LCS-Duplicate	< 3	2456.	2500	98.2
Ni	23-S614	40.36	2330.	2500	91.6
P	LCS	< 20	2555.	2500	102.
P	LCS-Duplicate	< 20	2573.	2500	103.
P	23-S614	104.4	2612.	2500	100.
Pb	LCS	< 5	2470.	2500	98.8
Pb	LCS-Duplicate	< 5	2469.	2500	98.8
Pb	23-S614	164.8	2455.	2500	91.6
Sb	LCS	< 5	2402.	2500	96.1
Sb	LCS-Duplicate	< 5	2400.	2500	96.0
Sb	23-S614	15.68	2302.	2500	91.5
Se	LCS	< 15	2563.	2500	103.
Se	LCS-Duplicate	< 15	2571.	2500	103.
Se	23-S614	< 15	2410.	2500	96.4
Tl	LCS	< 10	2473.	2500	98.9
Tl	LCS-Duplicate	< 10	2486.	2500	99.4
Tl	23-S614	< 10	2296.	2500	91.8
V	LCS	< 1	2453.	2500	98.1
V	LCS-Duplicate	< 1	2474.	2500	99.0
V	23-S614	2.061	2447.	2500	97.8
Zn	LCS	< 3	2578.	2500	103.
Zn	LCS-Duplicate	< 3	2588.	2500	104.
Zn	23-S614	1588.	3994.	2500	96.2

LCS Limit: 80% - 120% Recovery

Spike Limit: 75% - 125% Recovery

LCS Duplicate Data

Analyte	Sample ID	Original Conc. µg/L	Replicate Conc. µg/L	RPD
Ag	LCS-Duplicate	2345.	2472.	5.27
Al	LCS-Duplicate	2614.	2519.	3.70

RPD = $\frac{(\text{sample} - \text{duplicate})}{[(\text{sample} + \text{duplicate})/2]} \times 100$

Duplicate Limit: 20% RPD

QA/QC Report

Client Name: Bison Engineering
Project Number: B020
Analytical Technique: ICP-OES
Instrument: Perkin Elmer Optima 8300
Sample Description: EPA Method 29
Report Number: 23-175

LCS Duplicate Data (continued)

Analyte	Sample ID	Original Conc. µg/L	Replicate Conc. µg/L	RPD
As	LCS-Duplicate	2459.	2474.	0.61
Ba	LCS-Duplicate	2419.	2348.	2.98
Be	LCS-Duplicate	2481.	2535.	2.15
Cd	LCS-Duplicate	2578.	2599.	0.81
Co	LCS-Duplicate	2419.	2416.	0.12
Cr	LCS-Duplicate	2442.	2454.	0.49
Cu	LCS-Duplicate	2405.	2408.	0.12
Mn	LCS-Duplicate	2492.	2503.	0.44
Ni	LCS-Duplicate	2444.	2456.	0.49
P	LCS-Duplicate	2555.	2573.	0.70
Pb	LCS-Duplicate	2470.	2469.	0.04
Sb	LCS-Duplicate	2402.	2400.	0.08
Se	LCS-Duplicate	2563.	2571.	0.31
Tl	LCS-Duplicate	2473.	2486.	0.52
V	LCS-Duplicate	2453.	2474.	0.85
Zn	LCS-Duplicate	2578.	2588.	0.39

RPD = $\frac{(\text{sample} - \text{duplicate})}{[(\text{sample} + \text{duplicate})/2]} \times 100$

Duplicate Limit: 20% RPD

QA/QC Report

Client Name: Bison Engineering
 Project Number: B020
 Analytical Technique: ICP-OES
 Instrument: Perkin Elmer Optima 8300
 Sample Description: EPA Method 29
 Report Number: 23-175

Blank Data

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Ag	ICB	< DL	2.00
Ag	Meth_Blk	< DL	2.00
Ag	CCB	< DL	2.00
Ag	CCB	< DL	2.00
Al	ICB	< DL	30.0
Al	Meth_Blk	34.4	30.0
Al	CCB	< DL	30.0
Al	CCB	< DL	30.0
As	ICB	< DL	7.00
As	Meth_Blk	< DL	7.00
As	CCB	< DL	7.00
As	CCB	< DL	7.00
Ba	ICB	< DL	0.500
Ba	Meth_Blk	< DL	0.500
Ba	CCB	< DL	0.500
Ba	CCB	< DL	0.500
Be	ICB	< DL	0.200
Be	Meth_Blk	< DL	0.200
Be	CCB	< DL	0.200
Be	CCB	< DL	0.200
Cd	ICB	< DL	0.400
Cd	Meth_Blk	< DL	0.400
Cd	CCB	< DL	0.400
Cd	CCB	< DL	0.400
Co	ICB	< DL	0.500
Co	Meth_Blk	< DL	0.500
Co	CCB	< DL	0.500
Co	CCB	< DL	0.500
Cr	ICB	< DL	0.800
Cr	Meth_Blk	< DL	0.800
Cr	CCB	< DL	0.800
Cr	CCB	< DL	0.800
Cu	ICB	< DL	5.00
Cu	Meth_Blk	< DL	5.00
Cu	CCB	< DL	5.00
Cu	CCB	< DL	5.00
Mn	ICB	< DL	0.300
Mn	Meth_Blk	< DL	0.300
Mn	CCB	< DL	0.300

QA/QC Report

Client Name: Bison Engineering
Project Number: B020
Analytical Technique: ICP-OES
Instrument: Perkin Elmer Optima 8300
Sample Description: EPA Method 29
Report Number: 23-175

Blank Data (continued)

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Mn	CCB	< DL	0.300
Ni	ICB	< DL	3.00
Ni	Meth_Blk	< DL	3.00
Ni	CCB	< DL	3.00
Ni	CCB	< DL	3.00
P	ICB	< DL	20.0
P	Meth_Blk	< DL	20.0
P	CCB	< DL	20.0
P	CCB	< DL	20.0
Pb	ICB	< DL	5.00
Pb	Meth_Blk	< DL	5.00
Pb	CCB	< DL	5.00
Pb	CCB	< DL	5.00
Sb	ICB	< DL	5.00
Sb	Meth_Blk	< DL	5.00
Sb	CCB	< DL	5.00
Sb	CCB	< DL	5.00
Se	ICB	< DL	15.0
Se	Meth_Blk	< DL	15.0
Se	CCB	< DL	15.0
Se	CCB	< DL	15.0
Tl	ICB	< DL	10.0
Tl	Meth_Blk	< DL	10.0
Tl	CCB	< DL	10.0
Tl	CCB	< DL	10.0
V	ICB	< DL	1.00
V	Meth_Blk	< DL	1.00
V	CCB	< DL	1.00
V	CCB	< DL	1.00
Zn	ICB	< DL	3.00
Zn	Meth_Blk	< DL	3.00
Zn	CCB	< DL	3.00
Zn	CCB	< DL	3.00

ICB: Initial Calibration Blank CCB: Continuing Calibration Blank
*: Sample Media Blank (SM_Blk) concentration in µg/filter
Method Blank is in control if Method Blank results are <10% of sample results

QA/QC Report

Client Name: Bison Engineering
 Project Number: B020
 Analytical Technique: ICP-OES
 Instrument: Perkin Elmer Optima 8300
 Sample Description: EPA Method 29
 Report Number: 23-175

Calibration QC

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Ag	ICV	2500.	2746.	109.8
Ag	LL-CCV	10.00	10.76	107.6
Ag	LL-LCS	9.000	9.405	104.5
Ag	CCV	2500.	2681.	107.2
Ag	CCV	2500.	2559.	102.4
Al	ICV	2500.	2551.	102.0
Al	LL-CCV	150.0	141.2	94.1
Al	LL-LCS	75.00	110.2	146.9
Al	CCV	2500.	2547.	101.9
Al	CCV	2500.	2516.	100.6
As	ICV	2500.	2438.	97.5
As	LL-CCV	35.00	38.52	110.1
As	LL-LCS	20.00	25.48	127.4
As	CCV	2500.	2428.	97.1
As	CCV	2500.	2429.	97.2
Ba	ICV	2500.	2425.	97.0
Ba	LL-CCV	2.500	2.390	95.6
Ba	LL-LCS	1.500	1.807	120.5
Ba	CCV	2500.	2474.	99.0
Ba	CCV	2500.	2521.	100.8
Be	ICV	2500.	2410.	96.4
Be	LL-CCV	1.000	1.035	103.5
Be	LL-LCS	0.500	0.488	97.6
Be	CCV	2500.	2411.	96.4
Be	CCV	2500.	2418.	96.7
Cd	ICV	2500.	2502.	100.1
Cd	LL-CCV	2.000	2.280	114.0
Cd	LL-LCS	1.500	1.644	109.6
Cd	CCV	2500.	2530.	101.2
Cd	CCV	2500.	2506.	100.2
Co	ICV	2500.	2438.	97.5
Co	LL-CCV	2.500	2.772	110.9
Co	LL-LCS	1.500	1.641	109.4
Co	CCV	2500.	2463.	98.5
Co	CCV	2500.	2427.	97.1
Cr	ICV	2500.	2427.	97.1
Cr	LL-CCV	4.000	4.272	106.8

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification

Calibration Verification Limits: 90% - 110% Recovery

Low Level-CCV Limits: 60% - 140% Recovery

Low Level-LCS Limits: 50% - 150% Recovery

Results are insignificant if sample results are >10x LL-LCS concentration

QA/QC Report

Client Name: Bison Engineering
 Project Number: B020
 Analytical Technique: ICP-OES
 Instrument: Perkin Elmer Optima 8300
 Sample Description: EPA Method 29
 Report Number: 23-175

Calibration QC (continued)

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Cr	LL-LCS	2.000	1.931	96.6
Cr	CCV	2500.	2438.	97.5
Cr	CCV	2500.	2414.	96.6
Cu	ICV	2500.	2325.	93.0
Cu	LL-CCV	25.00	25.72	102.9
Cu	LL-LCS	15.00	14.11	94.1
Cu	CCV	2500.	2330.	93.2
Cu	CCV	2500.	2293.	91.7
Mn	ICV	2500.	2461.	98.4
Mn	LL-CCV	1.500	1.719	114.6
Mn	LL-LCS	1.000	1.222	122.2
Mn	CCV	2500.	2470.	98.8
Mn	CCV	2500.	2443.	97.7
Ni	ICV	2500.	2378.	95.1
Ni	LL-CCV	15.00	15.63	104.2
Ni	LL-LCS	6.000	6.493	108.2
Ni	CCV	2500.	2383.	95.3
Ni	CCV	2500.	2355.	94.2
P	ICV	2500.	2422.	96.9
P	LL-CCV	100.0	106.4	106.4
P	LL-LCS	75.00	68.18	90.9
P	CCV	2500.	2449.	98.0
P	CCV	2500.	2404.	96.2
Pb	ICV	2500.	2397.	95.9
Pb	LL-CCV	25.00	30.76	123.0
Pb	LL-LCS	15.00	14.31	95.4
Pb	CCV	2500.	2377.	95.1
Pb	CCV	2500.	2387.	95.5
Sb	ICV	2500.	2317.	92.7
Sb	LL-CCV	25.00	21.71	86.8
Sb	LL-LCS	15.00	16.67	111.1
Sb	CCV	2500.	2322.	92.9
Sb	CCV	2500.	2343.	93.7
Se	ICV	2500.	2438.	97.5
Se	LL-CCV	75.00	72.69	96.9
Se	LL-LCS	30.00	35.75	119.2
Se	CCV	2500.	2421.	96.8

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification

Calibration Verification Limits: 90% - 110% Recovery

Low Level-CCV Limits: 60% - 140% Recovery

Low Level-LCS Limits: 50% - 150% Recovery

Results are insignificant if sample results are >10x LL-LCS concentration

QA/QC Report

Client Name: Bison Engineering
 Project Number: B020
 Analytical Technique: ICP-OES
 Instrument: Perkin Elmer Optima 8300
 Sample Description: EPA Method 29
 Report Number: 23-175

Calibration QC (continued)

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Se	CCV	2500.	2430.	97.2
Tl	ICV	2500.	2416.	96.6
Tl	LL-CCV	50.00	56.91	113.8
Tl	LL-LCS	30.00	28.84	96.1
Tl	CCV	2500.	2365.	94.6
Tl	CCV	2500.	2306.	92.2
V	ICV	2500.	2429.	97.2
V	LL-CCV	5.000	4.609	92.2
V	LL-LCS	3.000	2.863	95.4
V	CCV	2500.	2468.	98.7
V	CCV	2500.	2456.	98.2
Zn	ICV	2500.	2519.	100.8
Zn	LL-CCV	15.00	17.34	115.6
Zn	LL-LCS	6.000	7.408	123.5
Zn	CCV	2500.	2542.	101.7
Zn	CCV	2500.	2507.	100.3

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification

Calibration Verification Limits: 90% - 110% Recovery

Low Level-CCV Limits: 60% - 140% Recovery

Low Level-LCS Limits: 50% - 150% Recovery

LL-LCS results are insignificant if sample results are >10x LL-LCS concentration

Replicate Data

Analyte	Sample ID	Sample Conc. µg/L	Replicate Conc. µg/L	RPD
Ag	23-S610	< 2	< 2	N/C *
Al	msd:-1	2520	209.	169.
As	23-S610	< 7	< 7	N/C *
Ba	23-S610	14.9	15.2	2.25
Be	23-S610	< 0.2	< 0.2	N/C *
Cd	23-S610	1.32	1.15	13.7 *
Co	23-S610	1.80	1.30	32.1 *
Cr	23-S610	3.43	3.88	12.3 *
Cu	23-S610	6.27	6.24	0.51 *
Mn	23-S610	11.5	11.4	0.70
Ni	23-S610	< 3	< 3	N/C *
P	23-S610	< 20	< 20	N/C *
Pb	23-S610	21.8	24.1	9.95 *

RPD = $\frac{(\text{sample} - \text{replicate})}{[(\text{sample} + \text{replicate})/2]} \times 100$

N/C: RPD is not calculated when sample or replicate is below detection limit

Replicate Limit: 20% RPD

*: per EPA CLP protocol, control limits do not apply if sample and/or replicate concentration is less than 5x the detection limit

QA/QC Report

Client Name: Bison Engineering
 Project Number: B020
 Analytical Technique: ICP-OES
 Instrument: Perkin Elmer Optima 8300
 Sample Description: EPA Method 29
 Report Number: 23-175

Replicate Data (continued)

Analyte	Sample ID	Sample Conc. µg/L	Replicate Conc. µg/L	RPD
Sb	23-S610	< 5	< 5	N/C *
Se	23-S610	< 15	< 15	N/C *
Tl	23-S610	< 10	< 10	N/C *
V	23-S610	< 1	< 1	N/C *
Zn	23-S610	37.5	37.9	0.96

RPD = $\frac{(\text{sample} - \text{replicate})}{[(\text{sample} + \text{replicate})/2]} \times 100$

N/C: RPD is not calculated when sample or replicate is below detection limit

Replicate Limit: 20% RPD

*: per EPA CLP protocol, control limits do not apply if sample and/or replicate concentration is less than 5x the detection limit

Laboratory Control Sample/Matrix Post Spike Analysis

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
Ag	LCS	< 2	2327.	2500	93.1
Ag	LCS-Duplicate	< 2	2385.	2500	95.4
Ag	23-S615	< 2	2406.	2500	96.2
Al	kv:LL-CCV	141.2	2472.	2500	93.2
Al	Duplicate	208.9	2590.	2500	95.2
As	LCS	< 7	2332.	2500	93.3
As	LCS-Duplicate	< 7	2342.	2500	93.7
As	23-S615	< 7	2268.	2500	90.7
Ba	LCS	< 0.5	2363.	2500	94.5
Ba	LCS-Duplicate	< 0.5	2395.	2500	95.8
Ba	23-S615	16.03	2322.	2500	92.2
Be	LCS	< 0.2	2329.	2500	93.2
Be	LCS-Duplicate	< 0.2	2346.	2500	93.8
Be	23-S615	< 0.2	2243.	2500	89.7
Cd	LCS	< 0.4	2403.	2500	96.1
Cd	LCS-Duplicate	< 0.4	2383.	2500	95.3
Cd	23-S615	< 0.4	2355.	2500	94.2
Co	LCS	< 0.5	2338.	2500	93.5
Co	LCS-Duplicate	< 0.5	2329.	2500	93.2
Co	23-S615	< 0.5	2301.	2500	92.0
Cr	LCS	< 0.8	2330.	2500	93.2
Cr	LCS-Duplicate	< 0.8	2370.	2500	94.8
Cr	23-S615	4.185	2284.	2500	91.2

LCS Limit: 80% - 120% Recovery

Spike Limit: 75% - 125% Recovery

QA/QC Report

Client Name: Bison Engineering
 Project Number: B020
 Analytical Technique: ICP-OES
 Instrument: Perkin Elmer Optima 8300
 Sample Description: EPA Method 29
 Report Number: 23-175

Laboratory Control Sample/Matrix Post Spike Analysis (continued)

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
Cu	LCS	< 5	2214.	2500	88.6
Cu	LCS-Duplicate	< 5	2242.	2500	89.7
Cu	23-S615	12.18	2152.	2500	85.6
Mn	LCS	< 0.3	2361.	2500	94.4
Mn	LCS-Duplicate	< 0.3	2400.	2500	96.0
Mn	23-S615	27.25	2330.	2500	92.1
Ni	LCS	< 3	2266.	2500	90.6
Ni	LCS-Duplicate	< 3	2289.	2500	91.6
Ni	23-S615	< 3	2198.	2500	87.9
P	LCS	< 20	2279.	2500	91.2
P	LCS-Duplicate	< 20	2303.	2500	92.1
P	23-S615	< 20	2293.	2500	91.7
Pb	LCS	< 5	2294.	2500	91.8
Pb	LCS-Duplicate	< 5	2296.	2500	91.8
Pb	23-S615	< 5	2191.	2500	87.6
Sb	LCS	< 5	2177.	2500	87.1
Sb	LCS-Duplicate	< 5	2273.	2500	90.9
Sb	23-S615	5.415	2181.	2500	87.0
Se	LCS	< 15	2335.	2500	93.4
Se	LCS-Duplicate	< 15	2344.	2500	93.8
Se	23-S615	< 15	2258.	2500	90.3
Tl	LCS	< 10	2296.	2500	91.8
Tl	LCS-Duplicate	< 10	2274.	2500	91.0
Tl	23-S615	< 10	2181.	2500	87.2
V	LCS	< 1	2343.	2500	93.7
V	LCS-Duplicate	< 1	2381.	2500	95.2
V	23-S615	< 1	2308.	2500	92.3
Zn	LCS	< 3	2415.	2500	96.6
Zn	LCS-Duplicate	< 3	2381.	2500	95.2
Zn	23-S615	21.43	2361.	2500	93.6

LCS Limit: 80% - 120% Recovery

Spike Limit: 75% - 125% Recovery

LCS Duplicate Data

Analyte	Sample ID	Original Conc. µg/L	Replicate Conc. µg/L	RPD
Ag	LCS-Duplicate	2327.	2385.	2.46
Al	LCS-Duplicate	110.2	2524.	183.
As	LCS-Duplicate	2332.	2342.	0.43
Ba	LCS-Duplicate	2363.	2395.	1.35

RPD = $\frac{(\text{sample} - \text{duplicate})}{[(\text{sample} + \text{duplicate})/2]} \times 100$

Duplicate Limit: 20% RPD

QA/QC Report

Client Name: Bison Engineering
Project Number: B020
Analytical Technique: ICP-OES
Instrument: Perkin Elmer Optima 8300
Sample Description: EPA Method 29
Report Number: 23-175

LCS Duplicate Data (continued)

Analyte	Sample ID	Original Conc. µg/L	Replicate Conc. µg/L	RPD
Be	LCS-Duplicate	2329.	2346.	0.73
Cd	LCS-Duplicate	2403.	2383.	0.84
Co	LCS-Duplicate	2338.	2329.	0.39
Cr	LCS-Duplicate	2330.	2370.	1.70
Cu	LCS-Duplicate	2214.	2242.	1.26
Mn	LCS-Duplicate	2361.	2400.	1.64
Ni	LCS-Duplicate	2266.	2289.	1.01
P	LCS-Duplicate	2279.	2303.	1.05
Pb	LCS-Duplicate	2294.	2296.	0.09
Sb	LCS-Duplicate	2177.	2273.	4.31
Se	LCS-Duplicate	2335.	2344.	0.38
Tl	LCS-Duplicate	2296.	2274.	0.96
V	LCS-Duplicate	2343.	2381.	1.61
Zn	LCS-Duplicate	2415.	2381.	1.42

RPD = $\frac{(\text{sample} - \text{duplicate})}{[(\text{sample} + \text{duplicate})/2]} \times 100$

Duplicate Limit: 20% RPD

QA/QC Report

Client Name: Bison Engineering
 Project Number: B020
 Analytical Technique: ICP-OES
 Instrument: Perkin Elmer Optima 8300
 Sample Description: EPA Method 29
 Report Number: 23-175

Blank Data

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Ag	ICB	< DL	2.00
Ag	Meth_Blk	< DL	2.00
Ag	CCB	< DL	2.00
Ag	CCB	< DL	2.00
Ag	CCB	< DL	2.00
Al	ICB	< DL	30.0
Al	Meth_Blk	< DL	30.0
Al	CCB	< DL	30.0
Al	CCB	< DL	30.0
Al	CCB	< DL	30.0
Al	ICB	< DL	30.0
Al	CCB	< DL	30.0
Al	CCB	< DL	30.0
As	ICB	< DL	35.0
As	Meth_Blk	< DL	35.0
As	CCB	< DL	35.0
As	CCB	< DL	35.0
As	CCB	< DL	35.0
As	ICB	< DL	35.0
As	Meth_Blk	< DL	35.0
As	CCB	< DL	35.0
As	CCB	< DL	35.0
Ba	ICB	< DL	0.500
Ba	Meth_Blk	< DL	0.500
Ba	CCB	< DL	0.500
Ba	CCB	< DL	0.500
Ba	CCB	< DL	0.500
Be	ICB	< DL	0.200
Be	Meth_Blk	< DL	0.200
Be	CCB	< DL	0.200
Be	CCB	< DL	0.200
Be	CCB	< DL	0.200
Cd	ICB	< DL	0.400
Cd	Meth_Blk	< DL	0.400
Cd	CCB	< DL	0.400
Cd	CCB	< DL	0.400
Cd	CCB	< DL	0.400
Co	ICB	< DL	0.500
Co	Meth_Blk	< DL	0.500

QA/QC Report

Client Name: Bison Engineering
 Project Number: B020
 Analytical Technique: ICP-OES
 Instrument: Perkin Elmer Optima 8300
 Sample Description: EPA Method 29
 Report Number: 23-175

Blank Data (continued)

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Co	CCB	< DL	0.500
Co	CCB	< DL	0.500
Co	CCB	< DL	0.500
Cr	ICB	< DL	0.800
Cr	Meth_Blk	< DL	0.800
Cr	CCB	< DL	0.800
Cr	CCB	< DL	0.800
Cu	ICB	< DL	5.00
Cu	Meth_Blk	< DL	5.00
Cu	CCB	< DL	5.00
Cu	CCB	< DL	5.00
Cu	CCB	< DL	5.00
Mn	ICB	< DL	0.300
Mn	Meth_Blk	< DL	0.300
Mn	CCB	< DL	0.300
Mn	CCB	< DL	0.300
Mn	CCB	< DL	0.300
Ni	ICB	< DL	3.00
Ni	Meth_Blk	< DL	3.00
Ni	CCB	< DL	3.00
Ni	CCB	< DL	3.00
Ni	CCB	< DL	3.00
P	ICB	< DL	20.0
P	Meth_Blk	< DL	20.0
P	CCB	< DL	20.0
P	CCB	< DL	20.0
P	CCB	< DL	20.0
Pb	ICB	< DL	5.00
Pb	Meth_Blk	< DL	5.00
Pb	CCB	< DL	5.00
Pb	CCB	< DL	5.00
Pb	CCB	< DL	5.00
Sb	ICB	< DL	5.00
Sb	Meth_Blk	< DL	5.00
Sb	CCB	< DL	5.00
Sb	CCB	< DL	5.00
Sb	CCB	< DL	5.00
Se	ICB	< DL	15.0

QA/QC Report

Client Name: Bison Engineering
Project Number: B020
Analytical Technique: ICP-OES
Instrument: Perkin Elmer Optima 8300
Sample Description: EPA Method 29
Report Number: 23-175

Blank Data (continued)

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Se	Meth_Blkl	< DL	15.0
Se	CCB	< DL	15.0
Se	CCB	< DL	15.0
Se	CCB	< DL	15.0
TI	ICB	< DL	10.0
TI	Meth_Blkl	< DL	10.0
TI	CCB	< DL	10.0
TI	CCB	< DL	10.0
TI	CCB	< DL	10.0
TI	CCB	< DL	10.0
V	ICB	< DL	1.00
V	Meth_Blkl	< DL	1.00
V	CCB	< DL	1.00
V	CCB	< DL	1.00
V	CCB	< DL	1.00
Zn	ICB	< DL	3.00
Zn	Meth_Blkl	< DL	3.00
Zn	CCB	< DL	3.00
Zn	CCB	< DL	3.00
Zn	CCB	< DL	3.00
Zn	ICB	< DL	3.00
Zn	CCB	< DL	3.00
Zn	CCB	< DL	3.00

ICB: Initial Calibration Blank CCB: Continuing Calibration Blank

*: Sample Media Blank (SM_Blkl) concentration in µg/filter

Method Blank is in control if Method Blank results are <10% of sample results

Calibration QC

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Ag	ICV	2500.	2265.	90.6
Ag	LL-CCV	10.00	7.289	72.9
Ag	LL-LCS	9.000	6.987	77.6
Ag	CCV	2500.	2325.	93.0
Ag	CCV	2500.	2450.	98.0
Ag	CCV	2500.	2434.	97.4
Al	ICV	2500.	2382.	95.3

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification

Calibration Verification Limits: 90% - 110% Recovery

Low Level-CCV Limits: 60% - 140% Recovery

Low Level-LCS Limits: 50% - 150% Recovery

LL-LCS results are insignificant if sample results are >10x LL-LCS concentration

QA/QC Report

Client Name: Bison Engineering
 Project Number: B020
 Analytical Technique: ICP-OES
 Instrument: Perkin Elmer Optima 8300
 Sample Description: EPA Method 29
 Report Number: 23-175

Calibration QC (continued)

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Al	LL-CCV	150.0	144.0	96.0
Al	LL-LCS	75.00	89.21	118.9
Al	CCV	2500.	2412.	96.5
Al	CCV	2500.	2369.	94.8
Al	CCV	2500.	2374.	95.0
Al	ICV	2500.	2435.	97.4
Al	LL-CCV	150.0	147.1	98.1
Al	CCV	2500.	2403.	96.1
Al	CCV	2500.	2459.	98.4
As	ICV	2500.	2432.	97.3
As	LL-CCV	35.00	38.30	109.4
As	LL-LCS	20.00	16.54	82.7
As	CCV	2500.	2459.	98.4
As	CCV	2500.	2490.	99.6
As	CCV	2500.	2503.	100.1
As	ICV	2500.	2484.	99.4
As	LL-CCV	35.00	39.64	113.3
As	LL-LCS	20.00	22.13	110.6
As	CCV	2500.	2465.	98.6
As	CCV	2500.	2407.	96.3
Ba	ICV	2500.	2447.	97.9
Ba	LL-CCV	2.500	2.634	105.4
Ba	LL-LCS	1.500	1.805	120.3
Ba	CCV	2500.	2365.	94.6
Ba	CCV	2500.	2344.	93.8
Ba	CCV	2500.	2369.	94.8
Be	ICV	2500.	2421.	96.8
Be	LL-CCV	1.000	1.048	104.8
Be	LL-LCS	0.500	0.501	100.2
Be	CCV	2500.	2518.	100.7
Be	CCV	2500.	2580.	103.2
Be	CCV	2500.	2582.	103.3
Cd	ICV	2500.	2362.	94.5
Cd	LL-CCV	2.000	2.369	118.4
Cd	LL-LCS	1.500	1.749	116.6
Cd	CCV	2500.	2395.	95.8
Cd	CCV	2500.	2378.	95.1

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification

Calibration Verification Limits: 90% - 110% Recovery

Low Level-CCV Limits: 60% - 140% Recovery

Low Level-LCS Limits: 50% - 150% Recovery

Results are insignificant if sample results are >10x LL-LCS concentration

QA/QC Report

Client Name: Bison Engineering
 Project Number: B020
 Analytical Technique: ICP-OES
 Instrument: Perkin Elmer Optima 8300
 Sample Description: EPA Method 29
 Report Number: 23-175

Calibration QC (continued)

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Cd	CCV	2500.	2394.	95.8
Co	ICV	2500.	2321.	92.8
Co	LL-CCV	2.500	2.530	101.2
Co	LL-LCS	1.500	1.501	100.1
Co	CCV	2500.	2353.	94.1
Co	CCV	2500.	2355.	94.2
Co	CCV	2500.	2371.	94.8
Cr	ICV	2500.	2442.	97.7
Cr	LL-CCV	4.000	4.442	111.0
Cr	LL-LCS	2.000	2.198	109.9
Cr	CCV	2500.	2439.	97.6
Cr	CCV	2500.	2417.	96.7
Cr	CCV	2500.	2400.	96.0
Cu	ICV	2500.	2289.	91.6
Cu	LL-CCV	25.00	26.67	106.7
Cu	LL-LCS	15.00	14.83	98.9
Cu	CCV	2500.	2292.	91.7
Cu	CCV	2500.	2278.	91.1
Cu	CCV	2500.	2292.	91.7
Mn	ICV	2500.	2540.	101.6
Mn	LL-CCV	1.500	1.576	105.1
Mn	LL-LCS	1.000	1.063	106.3
Mn	CCV	2500.	2573.	102.9
Mn	CCV	2500.	2525.	101.0
Mn	CCV	2500.	2557.	102.3
Ni	ICV	2500.	2356.	94.2
Ni	LL-CCV	15.00	15.18	101.2
Ni	LL-LCS	6.000	5.949	99.2
Ni	CCV	2500.	2381.	95.2
Ni	CCV	2500.	2399.	96.0
Ni	CCV	2500.	2417.	96.7
P	ICV	2500.	2440.	97.6
P	LL-CCV	100.0	104.5	104.5
P	LL-LCS	75.00	70.77	94.4
P	CCV	2500.	2399.	96.0
P	CCV	2500.	2446.	97.8
P	CCV	2500.	2435.	97.4

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification

Calibration Verification Limits: 90% - 110% Recovery

Low Level-CCV Limits: 60% - 140% Recovery

Low Level-LCS Limits: 50% - 150% Recovery

EFCD-19 results are insignificant if sample results are >10x LL-LCS concentration

QA/QC Report

Client Name: Bison Engineering
 Project Number: B020
 Analytical Technique: ICP-OES
 Instrument: Perkin Elmer Optima 8300
 Sample Description: EPA Method 29
 Report Number: 23-175

Calibration QC (continued)

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Pb	ICV	2500.	2366.	94.6
Pb	LL-CCV	25.00	27.95	111.8
Pb	LL-LCS	15.00	20.37	135.8
Pb	CCV	2500.	2380.	95.2
Pb	CCV	2500.	2455.	98.2
Pb	CCV	2500.	2488.	99.5
Sb	ICV	2500.	2301.	92.0
Sb	LL-CCV	25.00	25.54	102.2
Sb	LL-LCS	15.00	13.90	92.7
Sb	CCV	2500.	2324.	93.0
Sb	CCV	2500.	2291.	91.6
Sb	CCV	2500.	2273.	90.9
Se	ICV	2500.	2400.	96.0
Se	LL-CCV	75.00	90.46	120.6
Se	LL-LCS	30.00	33.65	112.2
Se	CCV	2500.	2422.	96.9
Se	CCV	2500.	2488.	99.5
Se	CCV	2500.	2524.	101.0
Tl	ICV	2500.	2405.	96.2
Tl	LL-CCV	50.00	52.22	104.4
Tl	LL-LCS	30.00	29.43	98.1
Tl	CCV	2500.	2510.	100.4
Tl	CCV	2500.	2639.	105.6
Tl	CCV	2500.	2629.	105.2
V	ICV	2500.	2379.	95.2
V	LL-CCV	5.000	5.210	104.2
V	LL-LCS	3.000	3.025	100.8
V	CCV	2500.	2405.	96.2
V	CCV	2500.	2391.	95.6
V	CCV	2500.	2402.	96.1
Zn	ICV	2500.	2402.	96.1
Zn	LL-CCV	15.00	17.65	117.7
Zn	LL-LCS	6.000	5.763	96.0
Zn	CCV	2500.	2430.	97.2
Zn	CCV	2500.	2425.	97.0
Zn	CCV	2500.	2446.	97.8
Zn	ICV	2500.	2523.	100.9

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification

Calibration Verification Limits: 90% - 110% Recovery

Low Level-CCV Limits: 60% - 140% Recovery

Low Level-LCS Limits: 50% - 150% Recovery

23-175 results are insignificant if sample results are >10x LL-LCS concentration

QA/QC Report

Client Name: Bison Engineering
 Project Number: B020
 Analytical Technique: ICP-OES
 Instrument: Perkin Elmer Optima 8300
 Sample Description: EPA Method 29
 Report Number: 23-175

Calibration QC (continued)

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Zn	CCV	2500.	2485.	99.4
Zn	CCV	2500.	2506.	100.2

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification
 Calibration Verification Limits: 90% - 110% Recovery
 Low Level-CCV Limits: 60% - 140% Recovery
 Low Level-LCS Limits: 50% - 150% Recovery
 LL-LCS results are insignificant if sample results are >10x LL-LCS concentration

Replicate Data

Analyte	Sample ID	Sample Conc. µg/L	Replicate Conc. µg/L	RPD
Ag	23-S669	9.70	9.86	1.53 *
Al	23-S669	6730	6630	1.44
As	23-S669	< 35	< 35	N/C *
Ba	23-S669	54.2	54.5	0.55
Be	23-S669	0.276	0.226	19.9 *
Cd	23-S669	4.22	4.63	9.30
Co	23-S669	1.76	1.84	4.78 *
Cr	23-S669	436.	438.	0.23
Cu	23-S669	238.	239.	0.67
Mn	23-S669	23200	22900	1.08
Ni	23-S669	46.6	47.2	1.32
P	23-S669	187.	183.	2.22
Pb	23-S669	540.	545.	0.87
Sb	23-S669	23.1	20.4	12.2 *
Se	23-S669	< 15	< 15	N/C *
Tl	23-S669	< 10	< 10	N/C *
V	23-S669	2.61	2.41	7.96 *
Zn	23-S669	4490	4530	0.89

RPD = $\frac{(\text{sample} - \text{replicate})}{[(\text{sample} + \text{replicate})/2]} \times 100$

N/C: RPD is not calculated when sample or replicate is below detection limit

Replicate Limit: 20% RPD

*: per EPA CLP protocol, control limits do not apply if sample and/or replicate concentration is less than 5x the detection limit

Laboratory Control Sample/Matrix Post Spike Analysis

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
Ag	LCS	< 2	2598.	2500	104.

LCS Limit: 80% - 120% Recovery

Spike Limit: 75% - 125% Recovery

QA/QC Report

Client Name: Bison Engineering
 Project Number: B020
 Analytical Technique: ICP-OES
 Instrument: Perkin Elmer Optima 8300
 Sample Description: EPA Method 29
 Report Number: 23-175

Laboratory Control Sample/Matrix Post Spike Analysis (continued)

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
Ag	LCS-Duplicate	< 2	2647.	2500	106.
Ag	23-S674	6.281	2013.	2500	80.3
Al	kv:LL-CCV	144.0	2488.	2500	93.8
Al	kv:LL-CCV	144.0	2588.	2500	97.8
Al	23-S674	5287.	18700	12500	107.
As	LCS	< 7	2560.	2500	102.
As	LCS-Duplicate	< 7	2524.	2500	101.
As	LCS-Duplicate	< 7	2501.	2500	100.
As	LCS-Duplicate	< 7	2505.	2500	100.
As	23-S674	< 35	11660	12500	93.3
Ba	LCS	< 0.5	2328.	2500	93.1
Ba	LCS-Duplicate	< 0.5	2412.	2500	96.5
Ba	23-S674	49.31	2327.	2500	91.1
Be	LCS	< 0.2	2486.	2500	99.4
Be	LCS-Duplicate	< 0.2	2539.	2500	102.
Be	23-S674	0.209	2378.	2500	95.1
Cd	LCS	< 0.4	2497.	2500	99.9
Cd	LCS-Duplicate	< 0.4	2492.	2500	99.7
Cd	23-S674	5.458	2257.	2500	90.1
Co	LCS	< 0.5	2388.	2500	95.5
Co	LCS-Duplicate	< 0.5	2388.	2500	95.5
Co	23-S674	1.421	2209.	2500	88.3
Cr	LCS	< 0.8	2399.	2500	96.0
Cr	LCS-Duplicate	< 0.8	2419.	2500	96.8
Cr	23-S674	370.4	2701.	2500	93.2
Cu	LCS	< 5	2394.	2500	95.8
Cu	LCS-Duplicate	< 5	2399.	2500	96.0
Cu	23-S674	207.6	2597.	2500	95.6
Mn	LCS	< 0.3	2536.	2500	101.
Mn	LCS-Duplicate	< 0.3	2514.	2500	101.
Mn	23-S674	26690	49730	2500	922. *
Ni	LCS	< 3	2460.	2500	98.4
Ni	LCS-Duplicate	< 3	2428.	2500	97.1
Ni	23-S674	52.27	2303.	2500	90.0
P	LCS	< 20	2527.	2500	101.
P	LCS-Duplicate	< 20	2539.	2500	102.

LCS Limit: 80% - 120% Recovery

Spike Limit: 75% - 125% Recovery

QA/QC Report

Client Name: Bison Engineering
 Project Number: B020
 Analytical Technique: ICP-OES
 Instrument: Perkin Elmer Optima 8300
 Sample Description: EPA Method 29
 Report Number: 23-175

Laboratory Control Sample/Matrix Post Spike Analysis (continued)

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
P	23-S674	193.5	2605.	2500	96.5
Pb	LCS	< 5	2466.	2500	98.6
Pb	LCS-Duplicate	< 5	2449.	2500	98.0
Pb	23-S674	580.0	2756.	2500	87.0
Sb	LCS	< 5	2439.	2500	97.6
Sb	LCS-Duplicate	< 5	2403.	2500	96.1
Sb	23-S674	12.25	2233.	2500	88.8
Se	LCS	< 15	2595.	2500	104.
Se	LCS-Duplicate	< 15	2586.	2500	103.
Se	23-S674	15.54	2337.	2500	92.9
Tl	LCS	< 10	2526.	2500	101.
Tl	LCS-Duplicate	< 10	2569.	2500	103.
Tl	23-S674	< 10	2360.	2500	94.4
V	LCS	< 1	2405.	2500	96.2
V	LCS-Duplicate	< 1	2399.	2500	96.0
V	23-S674	1.883	2297.	2500	91.8
Zn	LCS	< 3	2566.	2500	103.
Zn	LCS-Duplicate	< 3	2579.	2500	103.
Zn	23-S674	4163.	27510	25000	93.4

LCS Limit: 80% - 120% Recovery

Spike Limit: 75% - 125% Recovery

LCS Duplicate Data

Analyte	Sample ID	Original Conc. µg/L	Replicate Conc. µg/L	RPD
Ag	LCS-Duplicate	2598.	2647.	1.87
Al	LCS-Duplicate	2488.	2588.	3.94
As	LCS-Duplicate	2560.	2524.	1.42
As	LCS-Duplicate	2501.	2505.	0.16
Ba	LCS-Duplicate	2328.	2412.	3.54
Be	LCS-Duplicate	2486.	2539.	2.11
Cd	LCS-Duplicate	2497.	2492.	0.20
Co	LCS-Duplicate	2388.	2388.	0.00
Cr	LCS-Duplicate	2399.	2419.	0.83
Cu	LCS-Duplicate	2394.	2399.	0.21
Mn	LCS-Duplicate	2536.	2514.	0.87
Ni	LCS-Duplicate	2460.	2428.	1.31
P	LCS-Duplicate	2527.	2539.	0.47
Pb	LCS-Duplicate	2466.	2449.	0.69
Sb	LCS-Duplicate	2439.	2403.	1.49

RPD = $\frac{(\text{sample} - \text{duplicate})}{[(\text{sample} + \text{duplicate})/2]} \times 100$

Duplicate Limit: 20% RPD

QA/QC Report

Client Name: Bison Engineering
Project Number: B020
Analytical Technique: ICP-OES
Instrument: Perkin Elmer Optima 8300
Sample Description: EPA Method 29
Report Number: 23-175

LCS Duplicate Data (continued)

Analyte	Sample ID	Original Conc. µg/L	Replicate Conc. µg/L	RPD
Se	LCS-Duplicate	2595.	2586.	0.35
Tl	LCS-Duplicate	2526.	2569.	1.69
V	LCS-Duplicate	2405.	2399.	0.25
Zn	LCS-Duplicate	2566.	2579.	0.51

RPD = $\frac{(\text{sample} - \text{duplicate})}{[(\text{sample} + \text{duplicate})/2]} \times 100$

Duplicate Limit: 20% RPD

QA/QC Report

Client Name: Bison Engineering
 Project Number: B020
 Analytical Technique: ICP-OES
 Instrument: Perkin Elmer Optima 8300
 Sample Description: EPA Method 29
 Report Number: 23-175

Blank Data

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Ag	ICB	< DL	2.00
Ag	Meth_Blk	< DL	2.00
Ag	CCB	< DL	2.00
Ag	CCB	< DL	2.00
Al	ICB	< DL	30.0
Al	Meth_Blk	< DL	30.0
Al	CCB	< DL	30.0
Al	CCB	< DL	30.0
As	ICB	< DL	7.00
As	Meth_Blk	< DL	7.00
As	CCB	< DL	7.00
As	CCB	< DL	7.00
Ba	ICB	< DL	0.500
Ba	Meth_Blk	< DL	0.500
Ba	CCB	< DL	0.500
Ba	CCB	< DL	0.500
Be	ICB	< DL	0.200
Be	Meth_Blk	< DL	0.200
Be	CCB	< DL	0.200
Be	CCB	< DL	0.200
Cd	ICB	< DL	0.400
Cd	Meth_Blk	< DL	0.400
Cd	CCB	< DL	0.400
Cd	CCB	< DL	0.400
Co	ICB	< DL	0.500
Co	Meth_Blk	< DL	0.500
Co	CCB	< DL	0.500
Co	CCB	< DL	0.500
Cr	ICB	< DL	0.800
Cr	Meth_Blk	< DL	0.800
Cr	CCB	< DL	0.800
Cr	CCB	< DL	0.800
Cu	ICB	< DL	5.00
Cu	Meth_Blk	< DL	5.00
Cu	CCB	< DL	5.00
Cu	CCB	< DL	5.00
Mn	ICB	< DL	0.300
Mn	Meth_Blk	< DL	0.300
Mn	CCB	< DL	0.300

QA/QC Report

Client Name: Bison Engineering
 Project Number: B020
 Analytical Technique: ICP-OES
 Instrument: Perkin Elmer Optima 8300
 Sample Description: EPA Method 29
 Report Number: 23-175

Blank Data (continued)

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Mn	CCB	< DL	0.300
Ni	ICB	< DL	3.00
Ni	Meth_Blk	< DL	3.00
Ni	CCB	< DL	3.00
Ni	CCB	< DL	3.00
P	ICB	< DL	20.0
P	Meth_Blk	< DL	20.0
P	CCB	< DL	20.0
P	CCB	< DL	20.0
Pb	ICB	< DL	5.00
Pb	Meth_Blk	< DL	5.00
Pb	CCB	< DL	5.00
Pb	CCB	< DL	5.00
Sb	ICB	< DL	5.00
Sb	Meth_Blk	12.2	5.00
Sb	CCB	< DL	5.00
Sb	CCB	< DL	5.00
Se	ICB	< DL	15.0
Se	Meth_Blk	< DL	15.0
Se	CCB	< DL	15.0
Se	CCB	< DL	15.0
Tl	ICB	< DL	10.0
Tl	Meth_Blk	< DL	10.0
Tl	CCB	< DL	10.0
Tl	CCB	< DL	10.0
V	ICB	< DL	1.00
V	Meth_Blk	< DL	1.00
V	CCB	< DL	1.00
V	CCB	< DL	1.00
Zn	ICB	< DL	3.00
Zn	Meth_Blk	< DL	3.00
Zn	CCB	< DL	3.00
Zn	CCB	< DL	3.00

ICB: Initial Calibration Blank CCB: Continuing Calibration Blank
 *: Sample Media Blank (SM_Bl) concentration in µg/filter
 Method Blank is in control if Method Blank results are <10% of sample results

QA/QC Report

Client Name: Bison Engineering
 Project Number: B020
 Analytical Technique: ICP-OES
 Instrument: Perkin Elmer Optima 8300
 Sample Description: EPA Method 29
 Report Number: 23-175

Calibration QC

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Ag	ICV	2500.	2493.	99.7
Ag	LL-CCV	10.00	9.103	91.0
Ag	LL-LCS	9.000	7.634	84.8
Ag	CCV	2500.	2458.	98.3
Ag	CCV	2500.	2442.	97.7
Al	ICV	2500.	2383.	95.3
Al	LL-CCV	150.0	136.7	91.1
Al	LL-LCS	75.00	149.0	198.7
Al	CCV	2500.	2441.	97.6
Al	CCV	2500.	2439.	97.6
As	ICV	2500.	2493.	99.7
As	LL-CCV	35.00	33.97	97.1
As	LL-LCS	20.00	17.35	86.8
As	CCV	2500.	2526.	101.0
As	CCV	2500.	2530.	101.2
Ba	ICV	2500.	2392.	95.7
Ba	LL-CCV	2.500	2.720	108.8
Ba	LL-LCS	2.000	2.014	100.7
Ba	CCV	2500.	2440.	97.6
Ba	CCV	2500.	2432.	97.3
Be	ICV	2500.	2482.	99.3
Be	LL-CCV	1.000	0.973	97.3
Be	LL-LCS	0.500	0.547	109.4
Be	CCV	2500.	2496.	99.8
Be	CCV	2500.	2519.	100.8
Cd	ICV	2500.	2476.	99.0
Cd	LL-CCV	2.000	2.279	114.0
Cd	LL-LCS	1.500	1.327	88.5
Cd	CCV	2500.	2531.	101.2
Cd	CCV	2500.	2511.	100.4
Co	ICV	2500.	2421.	96.8
Co	LL-CCV	2.500	2.374	95.0
Co	LL-LCS	1.500	1.734	115.6
Co	CCV	2500.	2471.	98.8
Co	CCV	2500.	2472.	98.9
Cr	ICV	2500.	2471.	98.8
Cr	LL-CCV	4.000	4.222	105.6

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification

Calibration Verification Limits: 90% - 110% Recovery

Low Level-CCV Limits: 60% - 140% Recovery

Low Level-LCS Limits: 50% - 150% Recovery

Results are insignificant if sample results are >10x LL-LCS concentration

QA/QC Report

Client Name: Bison Engineering
 Project Number: B020
 Analytical Technique: ICP-OES
 Instrument: Perkin Elmer Optima 8300
 Sample Description: EPA Method 29
 Report Number: 23-175

Calibration QC (continued)

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Cr	LL-LCS	2.000	2.229	111.4
Cr	CCV	2500.	2523.	100.9
Cr	CCV	2500.	2499.	100.0
Cu	ICV	2500.	2370.	94.8
Cu	LL-CCV	25.00	25.48	101.9
Cu	LL-LCS	15.00	15.26	101.7
Cu	CCV	2500.	2415.	96.6
Cu	CCV	2500.	2396.	95.8
Mn	ICV	2500.	2511.	100.4
Mn	LL-CCV	1.500	1.513	100.9
Mn	LL-LCS	1.000	1.212	121.2
Mn	CCV	2500.	2561.	102.4
Mn	CCV	2500.	2546.	101.8
Ni	ICV	2500.	2429.	97.2
Ni	LL-CCV	15.00	15.17	101.1
Ni	LL-LCS	6.000	5.913	98.6
Ni	CCV	2500.	2451.	98.0
Ni	CCV	2500.	2451.	98.0
P	ICV	2500.	2492.	99.7
P	LL-CCV	100.0	106.3	106.3
P	LL-LCS	75.00	76.17	101.6
P	CCV	2500.	2462.	98.5
P	CCV	2500.	2470.	98.8
Pb	ICV	2500.	2441.	97.6
Pb	LL-CCV	25.00	28.07	112.3
Pb	LL-LCS	15.00	18.05	120.3
Pb	CCV	2500.	2436.	97.4
Pb	CCV	2500.	2459.	98.4
Sb	ICV	2500.	2363.	94.5
Sb	LL-CCV	25.00	25.52	102.1
Sb	LL-LCS	15.00	23.40	156.0
Sb	CCV	2500.	2455.	98.2
Sb	CCV	2500.	2494.	99.8
Se	ICV	2500.	2488.	99.5
Se	LL-CCV	75.00	78.31	104.4
Se	LL-LCS	30.00	30.06	100.2
Se	CCV	2500.	2477.	99.1

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification

Calibration Verification Limits: 90% - 110% Recovery

Low Level-CCV Limits: 60% - 140% Recovery

Low Level-LCS Limits: 50% - 150% Recovery

Results are insignificant if sample results are >10x LL-LCS concentration

QA/QC Report

Client Name: Bison Engineering
 Project Number: B020
 Analytical Technique: ICP-OES
 Instrument: Perkin Elmer Optima 8300
 Sample Description: EPA Method 29
 Report Number: 23-175

Calibration QC (continued)

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Se	CCV	2500.	2477.	99.1
Tl	ICV	2500.	2431.	97.2
Tl	LL-CCV	50.00	55.85	111.7
Tl	LL-LCS	30.00	38.46	128.2
Tl	CCV	2500.	2386.	95.4
Tl	CCV	2500.	2373.	94.9
V	ICV	2500.	2483.	99.3
V	LL-CCV	5.000	4.556	91.1
V	LL-LCS	3.000	2.612	87.1
V	CCV	2500.	2530.	101.2
V	CCV	2500.	2502.	100.1
Zn	ICV	2500.	2503.	100.1
Zn	LL-CCV	15.00	15.93	106.2
Zn	LL-LCS	6.000	7.430	123.8
Zn	CCV	2500.	2556.	102.2
Zn	CCV	2500.	2547.	101.9

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification

Calibration Verification Limits: 90% - 110% Recovery

Low Level-CCV Limits: 60% - 140% Recovery

Low Level-LCS Limits: 50% - 150% Recovery

LL-LCS results are insignificant if sample results are >10x LL-LCS concentration

Replicate Data

Analyte	Sample ID	Sample Conc. µg/L	Replicate Conc. µg/L	RPD
Ag	23-S670	< 2	< 2	N/C *
Al	23-S670	379.	379.	0.05
As	23-S670	< 7	< 7	N/C *
Ba	23-S670	12.0	11.8	1.60
Be	23-S670	< 0.2	< 0.2	N/C *
Cd	23-S670	5.90	5.90	0.02
Co	23-S670	0.933	0.749	21.9 *
Cr	23-S670	5.07	5.11	0.90
Cu	23-S670	< 5	< 5	N/C *
Mn	23-S670	7.94	7.90	0.57
Ni	23-S670	< 3	< 3	N/C *
P	23-S670	< 20	< 20	N/C *
Pb	23-S670	< 5	< 5	N/C *

RPD = $\frac{(\text{sample} - \text{replicate})}{[(\text{sample} + \text{replicate})/2]} \times 100$

N/C: RPD is not calculated when sample or replicate is below detection limit

Replicate Limit: 20% RPD

*: per EPA CLP protocol, control limits do not apply if sample and/or replicate concentration is less than 5x the detection limit

QA/QC Report

Client Name: Bison Engineering
 Project Number: B020
 Analytical Technique: ICP-OES
 Instrument: Perkin Elmer Optima 8300
 Sample Description: EPA Method 29
 Report Number: 23-175

Replicate Data (continued)

Analyte	Sample ID	Sample Conc. µg/L	Replicate Conc. µg/L	RPD
Sb	23-S670	< 5	< 5	N/C *
Se	23-S670	< 15	< 15	N/C *
Tl	23-S670	< 10	< 10	N/C *
V	23-S670	< 1	< 1	N/C *
Zn	23-S670	53.2	52.6	1.23

RPD = $\frac{(\text{sample} - \text{replicate})}{[(\text{sample} + \text{replicate})/2]} \times 100$

N/C: RPD is not calculated when sample or replicate is below detection limit

Replicate Limit: 20% RPD

*: per EPA CLP protocol, control limits do not apply if sample and/or replicate concentration is less than 5x the detection limit

Laboratory Control Sample/Matrix Post Spike Analysis

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
Ag	LCS	< 2	2403.	2500	96.1
Ag	LCS-Duplicate	< 2	2430.	2500	97.2
Ag	23-S675	< 2	2263.	2500	90.5
Al	kv:LL-CCV	136.7	2397.	2500	90.4
Al	kv:LL-CCV	136.7	2534.	2500	95.9
Al	23-S675	199.2	2459.	2500	90.4
As	LCS	< 7	2266.	2500	90.6
As	LCS-Duplicate	< 7	2422.	2500	96.9
As	23-S675	< 7	2314.	2500	92.6
Ba	LCS	< 0.5	2327.	2500	93.1
Ba	LCS-Duplicate	< 0.5	2381.	2500	95.2
Ba	23-S675	11.55	2323.	2500	92.5
Be	LCS	< 0.2	2261.	2500	90.4
Be	LCS-Duplicate	< 0.2	2396.	2500	95.8
Be	23-S675	< 0.2	2307.	2500	92.3
Cd	LCS	< 0.4	2274.	2500	91.0
Cd	LCS-Duplicate	< 0.4	2400.	2500	96.0
Cd	23-S675	1.693	2304.	2500	92.1
Co	LCS	< 0.5	2340.	2500	93.6
Co	LCS-Duplicate	< 0.5	2357.	2500	94.3
Co	23-S675	0.572	2265.	2500	90.6
Cr	LCS	< 0.8	2310.	2500	92.4
Cr	LCS-Duplicate	< 0.8	2439.	2500	97.6

LCS Limit: 80% - 120% Recovery

Spike Limit: 75% - 125% Recovery

QA/QC Report

Client Name: Bison Engineering
 Project Number: B020
 Analytical Technique: ICP-OES
 Instrument: Perkin Elmer Optima 8300
 Sample Description: EPA Method 29
 Report Number: 23-175

Laboratory Control Sample/Matrix Post Spike Analysis (continued)

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
Cr	23-S675	3.462	2348.	2500	93.8
Cu	LCS	< 5	2217.	2500	88.7
Cu	LCS-Duplicate	< 5	2331.	2500	93.2
Cu	23-S675	6.576	2236.	2500	89.2
Mn	LCS	< 0.3	2339.	2500	93.6
Mn	LCS-Duplicate	< 0.3	2481.	2500	99.2
Mn	23-S675	29.09	2404.	2500	95.0
Ni	LCS	< 3	2198.	2500	87.9
Ni	LCS-Duplicate	< 3	2355.	2500	94.2
Ni	23-S675	4.037	2248.	2500	89.8
P	LCS	< 20	2206.	2500	88.2
P	LCS-Duplicate	< 20	2327.	2500	93.1
P	23-S675	< 20	2269.	2500	90.8
Pb	LCS	< 5	2202.	2500	88.1
Pb	LCS-Duplicate	< 5	2322.	2500	92.9
Pb	23-S675	< 5	2256.	2500	90.2
Sb	LCS	12.21	2139.	2500	85.1
Sb	LCS-Duplicate	12.21	2283.	2500	90.8
Sb	23-S675	< 5	2224.	2500	89.0
Se	LCS	< 15	2223.	2500	88.9
Se	LCS-Duplicate	< 15	2339.	2500	93.6
Se	23-S675	< 15	2268.	2500	90.7
Tl	LCS	< 10	2152.	2500	86.1
Tl	LCS-Duplicate	< 10	2268.	2500	90.7
Tl	23-S675	< 10	2180.	2500	87.2
V	kv:LL-LCS	2.612	2311.	2500	92.3
V	kv:LL-LCS	2.612	2441.	2500	97.5
V	23-S675	< 1	2364.	2500	94.6
Zn	kv:LL-LCS	7.430	2287.	2500	91.2
Zn	kv:LL-LCS	7.430	2413.	2500	96.2
Zn	23-S675	27.44	2325.	2500	91.9

LCS Limit: 80% - 120% Recovery

Spike Limit: 75% - 125% Recovery

LCS Duplicate Data

Analyte	Sample ID	Original Conc. µg/L	Replicate Conc. µg/L	RPD
Ag	LCS-Duplicate	2403.	2430.	1.12
Al	LCS-Duplicate	2397.	2534.	5.56
As	LCS-Duplicate	2266.	2422.	6.66

RPD = $\frac{(\text{sample} - \text{duplicate})}{[(\text{sample} + \text{duplicate})/2]} \times 100$

Duplicate Limit: 20% RPD

QA/QC Report

Client Name: Bison Engineering
Project Number: B020
Analytical Technique: ICP-OES
Instrument: Perkin Elmer Optima 8300
Sample Description: EPA Method 29
Report Number: 23-175

LCS Duplicate Data (continued)

Analyte	Sample ID	Original Conc. µg/L	Replicate Conc. µg/L	RPD
Ba	LCS-Duplicate	2327.	2381.	2.29
Be	LCS-Duplicate	2261.	2396.	5.80
Cd	LCS-Duplicate	2274.	2400.	5.39
Co	LCS-Duplicate	2340.	2357.	0.72
Cr	LCS-Duplicate	2310.	2439.	5.43
Cu	LCS-Duplicate	2217.	2331.	5.01
Mn	LCS-Duplicate	2339.	2481.	5.89
Ni	LCS-Duplicate	2198.	2355.	6.90
P	LCS-Duplicate	2206.	2327.	5.34
Pb	LCS-Duplicate	2202.	2322.	5.31
Sb	LCS-Duplicate	2139.	2283.	6.51
Se	LCS-Duplicate	2223.	2339.	5.09
Tl	LCS-Duplicate	2152.	2268.	5.25
V	LCS-Duplicate	2311.	2441.	5.47
Zn	LCS-Duplicate	2287.	2413.	5.36

$RPD = \frac{(\text{sample} - \text{duplicate})}{[(\text{sample} + \text{duplicate})/2]} \times 100$

Duplicate Limit: 20% RPD

QA/QC Report

Client Name: Bison Engineering
Project Number: B020
Analytical Technique: Cold Vapor Atomic Absorption
Instrument: Nippon 3320A CVAA
Sample Description: EPA Method 29
Report Number: 23-175

Blank Data

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Hg	ICB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007

ICB: Initial Calibration Blank CCB: Continuing Calibration Blank

*: Sample Media Blank (SM_Blk) concentration in µg/filter

Method Blank is in control if Method Blank results are <10% of sample results

Calibration QC

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Hg	ICV	5.00	5.20	104.0
Hg	LL-LCS	0.020	0.022	110.0
Hg	CCV	5.00	5.09	101.8
Hg	CCV	5.00	5.06	101.1
Hg	CCV	5.00	5.03	100.6

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification

Calibration Verification Limits: 90% - 110% Recovery

Low Level-LCS Limits: 50% - 150% Recovery

LL-LCS results are insignificant if sample results are >10x LL-LCS concentration

Duplicate Data

All samples analyzed in duplicate. The reported concentrations are the average of the two measurements.

Laboratory Control Sample/Matrix Spike Analysis

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
Hg	23-S609	0.013	5.04	5.00	101.

LCS Limit: 80% - 120% Recovery

Spike Limit: 75% - 125% Recovery

QA/QC Report

Client Name: Bison Engineering
Project Number: B020
Analytical Technique: Cold Vapor Atomic Absorption
Instrument: Nippon 3320A CVAA
Sample Description: EPA Method 29
Report Number: 23-175

Blank Data

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Hg	ICB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007

ICB: Initial Calibration Blank CCB: Continuing Calibration Blank

*: Sample Media Blank (SM_Blk) concentration in µg/filter

Method Blank is in control if Method Blank results are <10% of sample results

Calibration QC

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Hg	ICV	5.00	5.07	101.5
Hg	LL-LCS	0.020	0.016	80.0
Hg	CCV	5.00	5.04	100.8
Hg	CCV	5.00	5.07	101.4
Hg	CCV	5.00	5.00	100.1

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification

Calibration Verification Limits: 90% - 110% Recovery

Low Level-LCS Limits: 50% - 150% Recovery

LL-LCS results are insignificant if sample results are >10x LL-LCS concentration

Duplicate Data

All samples analyzed in duplicate. The reported concentrations are the average of the two measurements.

Laboratory Control Sample/Matrix Spike Analysis

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
Hg	23-S610	0.036	5.00	5.00	99.3

LCS Limit: 80% - 120% Recovery

Spike Limit: 75% - 125% Recovery

QA/QC Report

Client Name: Bison Engineering
Project Number: B020
Analytical Technique: Cold Vapor Atomic Absorption
Instrument: Nippon 3320A CVAA
Sample Description: EPA Method 29
Report Number: 23-175

Blank Data

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Hg	ICB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007

ICB: Initial Calibration Blank CCB: Continuing Calibration Blank

*: Sample Media Blank (SM_Blk) concentration in µg/filter

Method Blank is in control if Method Blank results are <10% of sample results

Calibration QC

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Hg	ICV	5.00	5.19	103.7
Hg	LL-LCS	0.020	0.026	130.0
Hg	CCV	5.00	5.04	100.8
Hg	CCV	5.00	5.03	100.6
Hg	CCV	5.00	5.00	100.1

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification

Calibration Verification Limits: 90% - 110% Recovery

Low Level-LCS Limits: 50% - 150% Recovery

LL-LCS results are insignificant if sample results are >10x LL-LCS concentration

Duplicate Data

All samples analyzed in duplicate. The reported concentrations are the average of the two measurements.

Laboratory Control Sample/Matrix Spike Analysis

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
Hg	23-S616	< 0.007	5.00	5.00	100.

LCS Limit: 80% - 120% Recovery

Spike Limit: 75% - 125% Recovery

QA/QC Report

Client Name: Bison Engineering
Project Number: B020
Analytical Technique: Cold Vapor Atomic Absorption
Instrument: Nippon 3320A CVAA
Sample Description: EPA Method 29
Report Number: 23-175

Blank Data

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Hg	ICB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007

ICB: Initial Calibration Blank CCB: Continuing Calibration Blank

*: Sample Media Blank (SM_Blk) concentration in µg/filter

Method Blank is in control if Method Blank results are <10% of sample results

Calibration QC

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Hg	ICV	5.00	5.19	103.7
Hg	LL-LCS	0.020	0.026	130.0
Hg	CCV	5.00	5.04	100.8
Hg	CCV	5.00	5.03	100.6
Hg	CCV	5.00	5.00	100.1

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification

Calibration Verification Limits: 90% - 110% Recovery

Low Level-LCS Limits: 50% - 150% Recovery

LL-LCS results are insignificant if sample results are >10x LL-LCS concentration

Duplicate Data

All samples analyzed in duplicate. The reported concentrations are the average of the two measurements.

Laboratory Control Sample/Matrix Spike Analysis

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
Hg	23-S616	< 0.007	5.00	5.00	100.

LCS Limit: 80% - 120% Recovery

Spike Limit: 75% - 125% Recovery

QA/QC Report

Client Name: Bison Engineering
Project Number: B020
Analytical Technique: Cold Vapor Atomic Absorption
Instrument: Nippon 3320A CVAA
Sample Description: EPA Method 29
Report Number: 23-175

Blank Data

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Hg	ICB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007

ICB: Initial Calibration Blank CCB: Continuing Calibration Blank

*: Sample Media Blank (SM_Blk) concentration in µg/filter

Method Blank is in control if Method Blank results are <10% of sample results

Calibration QC

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Hg	ICV	5.00	5.11	102.2
Hg	LL-LCS	0.020	0.018	90.0
Hg	CCV	5.00	5.06	101.1
Hg	CCV	5.00	5.06	101.3
Hg	CCV	5.00	5.01	100.1

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification

Calibration Verification Limits: 90% - 110% Recovery

Low Level-LCS Limits: 50% - 150% Recovery

LL-LCS results are insignificant if sample results are >10x LL-LCS concentration

Duplicate Data

All samples analyzed in duplicate. The reported concentrations are the average of the two measurements.

Laboratory Control Sample/Matrix Spike Analysis

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
Hg	23-S612	0.024	5.10	5.00	101.

LCS Limit: 80% - 120% Recovery

Spike Limit: 75% - 125% Recovery

QA/QC Report

Client Name: Bison Engineering
Project Number: B020
Analytical Technique: Cold Vapor Atomic Absorption
Instrument: Nippon 3320A CVAA
Sample Description: EPA Method 29
Report Number: 23-175

Blank Data

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Hg	ICB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007

ICB: Initial Calibration Blank CCB: Continuing Calibration Blank

*: Sample Media Blank (SM_Blk) concentration in µg/filter

Method Blank is in control if Method Blank results are <10% of sample results

Calibration QC

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Hg	ICV	5.00	5.34	106.7
Hg	LL-LCS	0.020	0.023	115.0
Hg	CCV	5.00	5.05	101.1
Hg	CCV	5.00	5.06	101.2
Hg	CCV	5.00	5.07	101.5

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification

Calibration Verification Limits: 90% - 110% Recovery

Low Level-LCS Limits: 50% - 150% Recovery

LL-LCS results are insignificant if sample results are >10x LL-LCS concentration

Duplicate Data

All samples analyzed in duplicate. The reported concentrations are the average of the two measurements.

Laboratory Control Sample/Matrix Spike Analysis

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
Hg	23-S613	< 0.007	5.10	5.00	102.

LCS Limit: 80% - 120% Recovery

Spike Limit: 75% - 125% Recovery

QA/QC Report

Client Name: Bison Engineering
Project Number: B020
Analytical Technique: Cold Vapor Atomic Absorption
Instrument: Nippon 3320A CVAA
Sample Description: EPA Method 29
Report Number: 23-175

Blank Data

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Hg	ICB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007

ICB: Initial Calibration Blank CCB: Continuing Calibration Blank

*: Sample Media Blank (SM_Blk) concentration in µg/filter

Method Blank is in control if Method Blank results are <10% of sample results

Calibration QC

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Hg	ICV	5.00	5.08	101.6
Hg	LL-LCS	0.020	0.022	110.0
Hg	CCV	5.00	5.01	100.1
Hg	CCV	5.00	5.11	102.3
Hg	CCV	5.00	5.16	103.2
Hg	CCV	5.00	5.23	104.6

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification

Calibration Verification Limits: 90% - 110% Recovery

Low Level-LCS Limits: 50% - 150% Recovery

LL-LCS results are insignificant if sample results are >10x LL-LCS concentration

Duplicate Data

All samples analyzed in duplicate. The reported concentrations are the average of the two measurements.

Laboratory Control Sample/Matrix Spike Analysis

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
Hg	23-S669	0.014	5.05	5.00	101.

LCS Limit: 80% - 120% Recovery

Spike Limit: 75% - 125% Recovery

QA/QC Report

Client Name: Bison Engineering
Project Number: B020
Analytical Technique: Cold Vapor Atomic Absorption
Instrument: Nippon 3320A CVAA
Sample Description: EPA Method 29
Report Number: 23-175

Blank Data

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Hg	ICB	< DL	0.007
Hg	ccb	< DL	0.007
Hg	ccb	< DL	0.007
Hg	ccb	< DL	0.007
Hg	ccb	< DL	0.007

ICB: Initial Calibration Blank CCB: Continuing Calibration Blank

*: Sample Media Blank (SM_Blk) concentration in µg/filter

Method Blank is in control if Method Blank results are <10% of sample results

Calibration QC

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Hg	ICV	5.00	5.01	100.2
Hg	LL-LCS	0.020	0.023	115.0
Hg	ccv	5.00	5.01	100.2
Hg	ccv	5.00	4.92	98.4
Hg	ccv	5.00	4.93	98.6
Hg	ccv	5.00	4.96	99.3

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification

Calibration Verification Limits: 90% - 110% Recovery

Low Level-LCS Limits: 50% - 150% Recovery

LL-LCS results are insignificant if sample results are >10x LL-LCS concentration

Duplicate Data

All samples analyzed in duplicate. The reported concentrations are the average of the two measurements.

Laboratory Control Sample/Matrix Spike Analysis

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
Hg	23-S670	0.080	4.86	5.00	95.6

LCS Limit: 80% - 120% Recovery

Spike Limit: 75% - 125% Recovery

QA/QC Report

Client Name: Bison Engineering
Project Number: B020
Analytical Technique: Cold Vapor Atomic Absorption
Instrument: Nippon 3320A CVAA
Sample Description: EPA Method 29
Report Number: 23-175

Blank Data

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Hg	ICB	< DL	0.007
Hg	CCB	< DL	0.007

ICB: Initial Calibration Blank CCB: Continuing Calibration Blank
*: Sample Media Blank (SM_Blk) concentration in µg/filter
Method Blank is in control if Method Blank results are <10% of sample results

Calibration QC

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Hg	ICV	5.00	5.10	102.0
Hg	LL-LCS	0.020	0.021	105.0
Hg	CCV	5.00	5.04	100.8

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification
Calibration Verification Limits: 90% - 110% Recovery
Low Level-LCS Limits: 50% - 150% Recovery
LL-LCS results are insignificant if sample results are >10x LL-LCS concentration

Duplicate Data

All samples analyzed in duplicate. The reported concentrations are the average of the two measurements.

Laboratory Control Sample/Matrix Spike Analysis

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
Hg	23-S676	< 0.007	5.05	5.00	101.

LCS Limit: 80% - 120% Recovery

Spike Limit: 75% - 125% Recovery

QA/QC Report

Client Name: Bison Engineering
Project Number: B020
Analytical Technique: Cold Vapor Atomic Absorption
Instrument: Nippon 3320A CVAA
Sample Description: EPA Method 29
Report Number: 23-175

Blank Data

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Hg	ICB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007

ICB: Initial Calibration Blank CCB: Continuing Calibration Blank

*: Sample Media Blank (SM_Blk) concentration in µg/filter

Method Blank is in control if Method Blank results are <10% of sample results

Calibration QC

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Hg	ICV	5.00	5.07	101.4
Hg	LL-LCS	0.020	0.031	155.0
Hg	CCV	5.00	5.01	100.2
Hg	CCV	5.00	5.10	101.9
Hg	CCV	5.00	5.11	102.2

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification

Calibration Verification Limits: 90% - 110% Recovery

Low Level-LCS Limits: 50% - 150% Recovery

LL-LCS results are insignificant if sample results are >10x LL-LCS concentration

Duplicate Data

All samples analyzed in duplicate. The reported concentrations are the average of the two measurements.

Laboratory Control Sample/Matrix Spike Analysis

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
Hg	23-S677	0.034	5.07	5.00	101.

LCS Limit: 80% - 120% Recovery

Spike Limit: 75% - 125% Recovery

QA/QC Report

Client Name: Bison Engineering
Project Number: B020
Analytical Technique: Cold Vapor Atomic Absorption
Instrument: Nippon 3320A CVAA
Sample Description: EPA Method 29
Report Number: 23-175

Blank Data

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Hg	ICB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007

ICB: Initial Calibration Blank CCB: Continuing Calibration Blank

*: Sample Media Blank (SM_Blk) concentration in µg/filter

Method Blank is in control if Method Blank results are <10% of sample results

Calibration QC

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Hg	ICV	5.00	5.16	103.1
Hg	LL-LCS	0.020	0.021	105.0
Hg	CCV	5.00	4.96	99.2
Hg	CCV	5.00	4.93	98.7
Hg	CCV	5.00	4.92	98.5

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification

Calibration Verification Limits: 90% - 110% Recovery

Low Level-LCS Limits: 50% - 150% Recovery

LL-LCS results are insignificant if sample results are >10x LL-LCS concentration

Duplicate Data

All samples analyzed in duplicate. The reported concentrations are the average of the two measurements.

Laboratory Control Sample/Matrix Spike Analysis

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
Hg	23-S678	< 0.007	4.99	5.00	99.8

LCS Limit: 80% - 120% Recovery

Spike Limit: 75% - 125% Recovery

QA/QC Report

Client Name: Bison Engineering
Project Number: B020
Analytical Technique: Cold Vapor Atomic Absorption
Instrument: Nippon 3320A CVAA
Sample Description: EPA Method 29
Report Number: 23-175

Blank Data

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Hg	ICB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007

ICB: Initial Calibration Blank CCB: Continuing Calibration Blank

*: Sample Media Blank (SM_Blk) concentration in µg/filter

Method Blank is in control if Method Blank results are <10% of sample results

Calibration QC

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Hg	ICV	5.00	5.05	100.9
Hg	LL-LCS	0.020	0.019	95.0
Hg	CCV	5.00	5.02	100.4
Hg	CCV	5.00	5.02	100.3

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification

Calibration Verification Limits: 90% - 110% Recovery

Low Level-LCS Limits: 50% - 150% Recovery

LL-LCS results are insignificant if sample results are >10x LL-LCS concentration

Duplicate Data

All samples analyzed in duplicate. The reported concentrations are the average of the two measurements.

Laboratory Control Sample/Matrix Spike Analysis

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
Hg	23-S696	< 0.007	5.01	5.00	100.

LCS Limit: 80% - 120% Recovery

Spike Limit: 75% - 125% Recovery

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SOURCE SAMPLE RECEIPT CHECKLIST

Client	Bison Engineering	Date	3/30/23
# Runs	24 + Blanks	Report #	23-175

Package intact?	hand delivered
Chain-of-Custody form inspected	
CoC present with samples?	✓
CoC indicates analytical methodology to be used? (eg M29, etc.)	✓
Has CoC been signed by client?	EPA 29 !!
Custody release date and time noted on CoC?	✓
All sample containers inspected	
Does number of samples match number on CoC form?	✓
Do all sample ID numbers match those on the CoC form?	✓ !!
Did client mark sample volumes prior to shipment?	✓ !!
Sample temperature recorded?	✓
Are the sample containers intact?	ambient
If present, Audit Sample intact?	✓ !!
Are signs of leakage present?	n/a !!
	No *
Chain-of-Custody form signed and dated by CLN	✓
Corrective actions	
Client contacted due to mismatching sample ID numbers	/
Client contacted due to broken sample container(s)	
Client contacted due to leaking sample container(s)	
Client contacted for verification of methodology?	
Corrective actions documented?	
Corrective actions accomplished?	

Items marked !! shall be addressed **prior to any analytical work being started**.

Items marked * shall be **noted in case narrative** upon reporting of results to client.

Signed 

Notes _____

Company Name BISON ENGINEERING			
Contact	Phone (208) 954-7138		
E-Mail Address	Fax		
Report Address irankin@bison-eng.com			
Report Address 3143 E LYNDALE AVE.			
City	State	Zip	
HELENA	MT	59601	
Billing Address 3143 E LYNDALE AVE.			
City	State	Zip	
HELENA	MT	59601	
PO #	Project		
EFC223119	EFC223119		

CHESTER LabNet

12242 SW Garden Place
Tigard, OR 97223
(503) 624-2183
Fax (503) 624-2653
cln@chesterlab.net

23-175

CHAIN-OF-CUSTODY RECORD

Page 1 of 13

LabNet ID	Field Sample ID	Site	Sample Date	Volume (m³)	Particle Size	Analysis Requested										Turn Around Time		Remarks
						Standard	Rush	Specify										
23-5609	CONT. #1 WI	BH 1 IN.	3/27/23	RUN 1														
	CONT. #3 WI																	
23-5610	CONT. #4 WI																	
23-5611	CONT. #5A WI																	
23-5612	CONT. #5B WI																	
23-5613	CONT. #5C WI																	
23-5624	CONT. #1 WI	BH 2 IN.																
	CONT. #3 WI																	
23-5625	CONT. #4 WI																	
23-5626	CONT. #5A WI																	
23-5627	CONT. #5B WI																	
23-5628	CONT. #5C WI																	

Notes:
WI - WHITE IRON
MS - Mn STEEL
IN. - INLET
OUT. - OUTLET
BH - BAGHOUSE
METALS TO ANALYZE -
Al, Sb, As, Ba, Be, Cd, Cr, Co, Cu,
Pb, Mn, Hg, Ni, P, Se, Ag, Ti, V, Zn

Company Name		SAME AS PAGE 1	
Contact		Phone	
E-Mail Address		Fax	
Report Address			
City		State	Zip
Billing Address			
City		State	Zip
PO #		Project	

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12242 SW Garden Place

Tigard, OR 97223

(503) 624-2183

Fax (503) 624-2653

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CHAIN-OF-CUSTODY RECORD

Page 6 of 13

PO #		Project													
Analysis Requested		Turn Around Time													
		☒ Standard ☐ Rush _____ Specify													
LabNet ID	Field Sample ID	Site	Sample Date	Volume (m³)	Particle Size	Remarks									
23-5614	CONT. #1 WI	BH 1 IN.	3/28/23	RUN 2		EPA M29									
	CONT. #3 WI														
23-5615	CONT. #4 WI														
23-5616	CONT. #5A WI														
23-5617	CONT. #5B WI														
23-5618	CONT. #5C WI														
23-5619	CONT. #1 WI	BH 2 IN.													
	CONT. #3 WI														
23-5630	CONT. #4 WI														
23-5631	CONT. #5A WI														
23-5632	CONT. #5B WI														
23-5633	CONT. #5C WI														

Notes:

Relinquished By: (Signature) <i>[Signature]</i>	Date/Time 3/30/23 11:38	Received By: (Signature) <i>[Signature]</i>	Date/Time 3/30/23 11:38
Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Date/Time

Company Name SAME AS PAGE 1	
Contact	Phone
E-Mail Address	Fax
Report Address	
City	State Zip
Billing Address	
City	State Zip
PO #	Project

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12242 SW Garden Place
Tigard, OR 97223
(503) 624-2183
Fax (503) 624-2653
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CHAIN-OF-CUSTODY RECORD

Page 10 of 13

LabNet ID	Field Sample ID	Site	Sample Date	Volume (m³)	Particle Size	Analysis Requested										Turn Around Time		Remarks
23-S619	CONT. #1 WJI	BH 1 IN.	3/29/23	RUN 3		X												
	CONT. #3 WJI					X												
23-S620	CONT. #4 WJI					X												
23-S621	CONT. #5A WJI					X												
23-S622	CONT. #5B WJI					X												
23-S623	CONT. #5C WJI					X												
23-S634	CONT. #1 WJI	BH 2 IN.	3/29/23	RUN 3		X												
	CONT. #3 WJI					X												
23-S635	CONT. #4 WJI					X												
23-S636	CONT. #5A WJI					X												
23-S637	CONT. #5B WJI					X												
23-S638	CONT. #5C WJI					X												

Notes:

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(503) 624-2183
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CHAIN-OF-CUSTODY RECORD

Page 2 of 13

Company Name SAME AS PAGE 1		Phone	
Contact			
E-Mail Address		Fax	
Report Address			
City	State	Zip	
Billing Address			
City	State	Zip	
PO #	Project		

LabNet ID	Field Sample ID	Site	Sample Date	Volume (m³)	Particle Size	Analysis Requested										Turn Around Time		Remarks	
																			☒ Standard
23-S614	CONT. #1 WI	BH 1 OUT.	3/22/23	RUN 1													☒ Standard	☐ Rush	23-S639
23-S615	CONT. #3 WI																		23-S640
23-S616	CONT. #4 WI																		23-S641
23-S617	CONT. #5A WI																		23-S642
23-S618	CONT. #5B WI																		23-S643
23-S619	CONT. #5C WI																		23-S654
23-S630	CONT. #1 WI	BH 2 OUT.																	23-S 655
23-S631	CONT. #3 WI																		23-S 656
23-S632	CONT. #4 WI																		23-S 657
23-S633	CONT. #5A WI																		23-S 658
23-S634	CONT. #5B WI																		
23-S635	CONT. #5C WI																		

Notes:

Received By: (Signature) Date/Time
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Company Name SAME AS PAGE 1	
Contact	Phone
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12242 SW Garden Place
Tigard, OR 97223
(503) 624-2183
Fax (503) 624-2653
cln@chesterlab.net

CHAIN-OF-CUSTODY RECORD

Page 7 of 13

LabNet ID	Field Sample ID	Site	Sample Date	Volume (m³)	Particle Size	Analysis Requested										Turn Around Time		Remarks
23-S644	CONT. #1 WI	BH 1 OUT.	3/28/23	RUN 2														
	CONT. #3 WI																	
23-S645	CONT. #4 WI																	
23-S646	CONT. #5A WI																	
23-S647	CONT. #5B WI																	
23-S648	CONT. #5C WI																	
23-S659	CONT. #1 WI	BH 2 OUT.																
	CONT. #3 WI																	
23-S660	CONT. #4 WI																	
23-S661	CONT. #5A WI																	
23-S662	CONT. #5B WI																	
23-S663	CONT. #5C WI																	

Notes:

Received By: (Signature) Date/Time

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[Signature] 3/30/23 11:38

Company Name		SAME AS PAGE 1	
Contact		Phone	
E-Mail Address		Fax	
Report Address			
City		State	Zip
Billing Address			
City		State	Zip
PO #		Project	

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12242 SW Garden Place
Tigard, OR 97223
(503) 624-2183
Fax (503) 624-2653
cln@chesterlab.net

CHAIN-OF-CUSTODY RECORD

Page 11 of 13

PO #		Project																
LabNet ID	Field Sample ID	Site	Sample Date	Volume (m³)	Particle Size	Analysis Requested										Turn Around Time ☒ Standard ☐ Rush _____ Specify _____	Remarks	
23-S649	CONT. #1 WI	BH 1 OUT.	3/29/23	RUN 3														
	CONT. #3 WI																	
23-S650	CONT. #4 WI																	
23-S651	CONT. #5A WI																	
23-S652	CONT. #5B WI																	
23-S653	CONT. #5C WI																	
23-S664	CONT. #1 WI	BH 2 OUT.																
	CONT. #3 WI																	
23-S665	CONT. #4 WI																	
23-S666	CONT. #5A WI																	
23-S668	CONT. #5B WI																	
23-S668	CONT. #5C WI																	
Relinquished By: (Signature) Date/Time						Notes:												
Relinquished By: (Signature) Date/Time						Received By: (Signature) Date/Time												

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Tigard, OR 97223
(503) 624-2183
Fax (503) 624-2653
cln@chesterlab.net

CHAIN-OF-CUSTODY RECORD

Page 3 of 13

Company Name SAME AS PAGE 1		Phone	
Contact			
E-Mail Address		Fax	
Report Address			
City	State	Zip	
Billing Address			
City	State	Zip	
PO #	Project		

Analysis Requested				Turn Around Time ☒ Standard ☐ Rush _____ Specify _____	
LabNet ID	Field Sample ID	Site	Sample Date	Volume (m ³)	Particle Size
23-5619	CONT. #1 MS	BH 1 IN.	3/27/23	RUN 1	
23-5620	CONT. #3 MS				
23-5621	CONT. #4 MS				
23-5622	CONT. #5A MS				
23-5623	CONT. #5B MS				
	CONT. #5C MS				
	CONT. #1 MS	BH 2 IN.			
	CONT. #3 MS				
	CONT. #4 MS				
	CONT. #5A MS				
	CONT. #5B MS				
	CONT. #5C MS				

Relinquished By: (Signature) <i>CLM</i>	Date/Time	Received By: (Signature) <i>RED</i>	Date/Time
	3/30/23 11:38		3/30/23 11:38
Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Date/Time

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12242 SW Garden Place
Tigard, OR 97223
(503) 624-2183
Fax (503) 624-2653
cln@chesterlab.net

CHAIN-OF-CUSTODY RECORD

Page 8 of 13

Company Name SAME AS PAGE 1	
Contact	Phone
E-Mail Address	Fax
Report Address	
City	State Zip
Billing Address	
City	State Zip
PO # Project	

LabNet ID	Field Sample ID	Site	Sample Date	Volume (m³)	Particle Size	Analysis Requested										Turn Around Time ☒ Standard ☐ Rush _____ Specify _____	Remarks
23-S674	CONT. #1 MS	BH 1 IN.	3/28/23	RUN 2		X											
	CONT. #3 MS					X											
23-S675	CONT. #4 MS					X											
23-S676	CONT. #5A MS					X											
23-S677	CONT. #5B MS					X											
23-S678	CONT. #5C MS					X											
23-S689	CONT. #1 MS	BH 2 IN.				X											
	CONT. #3 MS					X											
23-S690	CONT. #4 MS					X											
23-S691	CONT. #5A MS					X											
23-S692	CONT. #5B MS					X											
23-S693	CONT. #5C MS					X											

Notes:

Relinquished By: (Signature) <i>[Signature]</i> Date/Time 3/30/23 11:38	Received By: (Signature) <i>[Signature]</i> Date/Time 3/30/23 11:38
Relinquished By: (Signature) _____ Date/Time _____	Received By: (Signature) _____ Date/Time _____

Company Name SAME AS PAGE 1	
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Billing Address	
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PO #	Project

CHESTER LabNet

12242 SW Garden Place
Tigard, OR 97223
(503) 624-2183
Fax (503) 624-2653
cln@chesterlab.net

CHAIN-OF-CUSTODY RECORD

Page 4 of 13

LabNet ID	Field Sample ID	Site	Sample Date	Volume (m³)	Particle Size	Analysis Requested										Turn Around Time		Remarks
23-S699	CONT. #1 MS	BH 1 OUT.	3/27/23	RUN 1		X												
	CONT. #3 MS					X												
23-S700	CONT. #4 MS					X												
23-S701	CONT. #5A MS					X												
23-S702	CONT. #5B MS					X												
23-S703	CONT. #5C MS					X												
23-S714	CONT. #1 MS	BH 2 OUT.				X												
	CONT. #3 MS					X												
23-S715	CONT. #4 MS					X												
23-S716	CONT. #5A MS					X												
23-S717	CONT. #5B MS					X												
23-S718	CONT. #5C MS					X												

Relinquished By: (Signature) <i>[Signature]</i> Date/Time 3/30/23 11:38	Received By: (Signature) <i>[Signature]</i> Date/Time 3/30/23 11:38	Notes:
Relinquished By: (Signature) _____ Date/Time _____	Received By: (Signature) _____ Date/Time _____	

Company Name SAME AS PAGE 1	
Contact	Phone
E-Mail Address	Fax
Report Address	
City	State Zip
Billing Address	
City	State Zip
PO #	Project

CHESTER LabNet
 12242 SW Garden Place
 Tigard, OR 97223
 (503) 624-2183
 Fax (503) 624-2653
 cln@chesterlab.net

CHAIN-OF-CUSTODY RECORD

LabNet ID	Field Sample ID	Site	Sample Date	Volume (m³)	Particle Size	Analysis Requested										Turn Around Time		Remarks
23-S704	CONT. #1 MS	BH 1 OUT.	3/28/23	2000													☒ Standard	
	CONT. #3 MS																☒ Standard	
23-S705	CONT. #4 MS																☒ Standard	
23-S706	CONT. #5A MS																☒ Standard	
23-S707	CONT. #5B MS																☒ Standard	
23-S708	CONT. #5C MS																☒ Standard	
23-S719	CONT. #1 MS	BH 2 OUT.															☒ Standard	
	CONT. #3 MS																☒ Standard	
23-S720	CONT. #4 MS																☒ Standard	
23-S721	CONT. #5A MS																☒ Standard	
23-S722	CONT. #5B MS																☒ Standard	
23-S723	CONT. #5C MS																☒ Standard	

Notes:

Relinquished By: (Signature) <i>Paul DL</i> Date/Time 3/30/23 11:38	Received By: (Signature) <i>Paul DL</i> Date/Time 3/30/23 11:38
Relinquished By: (Signature) <i>Paul DL</i> Date/Time 3/30/23 11:38	Received By: (Signature) <i>Paul DL</i> Date/Time 3/30/23 11:38

Company Name SAME AS PAGE 1	
Contact	Phone
E-Mail Address	Fax
Report Address	
City	State Zip
Billing Address	
City	State Zip
PO #	Project

CHESTER LabNet

12242 SW Garden Place
Tigard, OR 97223
(503) 624-2183
Fax (503) 624-2653
cln@chesterlab.net

CHAIN-OF-CUSTODY RECORD

Page 13 of 13

LabNet ID	Field Sample ID	Site	Sample Date	Volume (m³)	Particle Size	Analysis Requested										Turn Around Time		Remarks
23-S709	CONT. #1 MS	BH 1 OUT.	3/29/23	PUN 3													☒ Standard	
	CONT. #3 MS																☒ Standard	
23-S710	CONT. #4 MS																☒ Standard	
23-S711	CONT. #5A MS																☒ Standard	
23-S712	CONT. #5B MS																☒ Standard	
23-S713	CONT. #5C MS																☒ Standard	
23-S724	CONT. #1 MS	BH 2 OUT.															☒ Standard	
	CONT. #3 MS																☒ Standard	
23-S725	CONT. #4 MS																☒ Standard	
23-S726	CONT. #5A MS																☒ Standard	
23-S727	CONT. #5B MS																☒ Standard	
23-S728	CONT. #5C MS																☒ Standard	

Notes:	
Relinquished By: (Signature) Date/Time	Received By: (Signature) Date/Time
Relinquished By: (Signature) Date/Time	Received By: (Signature) Date/Time

Company Name		SAME AS PAGE 1	
Contact	Phone		
E-Mail Address	Fax		
Report Address			
City	State	Zip	
Billing Address			
City	State	Zip	
PO #	Project		

CHESTER LabNet

12242 SW Garden Place

Tigard, OR 97223

(503) 624-2183

Fax (503) 624-2653

cln@chesterlab.net

CHAIN-OF-CUSTODY RECORD

PO #		Project															
LabNet ID 23-S732 23-S733 23-S730 23-S731 23-S734 23-S729	Field Sample ID	Site	Sample Date	Volume (m³)	Particle Size	Analysis Requested										Turn Around Time ☒ Standard ☐ Rush _____ Specify	
	CONT. #8B	ALL	3/27/23	3/30/23		EPA M29											Water
	CONT. #10	ALL	3/27/23	3/30/23		X											KMnO ₄
	CONT. #8A	ALL	3/29/23			X											HNO ₃
	CONT. #9	ALL	3/29/23			X											HNO ₃ / H ₂ O ₂
	CONT. #11	ALL	3/29/23			X											HCl
	CONT. #12	ALL	3/29/23			X											Filter
Relinquished By: (Signature)		Date/Time	Received By: (Signature)		Date/Time	Notes:											
S.M.		3/30/23 11:38	S.M.		3/30/23 11:38												
Relinquished By: (Signature)		Date/Time	Received By: (Signature)		Date/Time												

RAW DATA

Available upon request

Bison Engineering Inc.
Method 0061 Nitrogen Purge Log

Company: EAGLE FOUNDRY

Facility: EAGLE FOUNDRY

WHITE IRON

Source	Run	Date mm/dd/yyyy	Start hh:mm	Stop hh:mm	Flow LPM
MAIN FOUNDRY BH OUTLET	1	3/27/2023	11:26	11:58	10
↓	2	3/28/2023	9:44	10:26	10
↓	3	3/29/2023	9:34	10:09	10
COOLING BUNKER BH OUTLET	1	3/27/2023	11:26	11:58	10
↓	2	3/28/2023	9:44	10:26	10
↓	3	3/29/2023	9:34	10:09	10

Technician: JCR

Revision No.: 0
Date: January 11, 2018

Y:\SOURCE\MASTER SPREADSHEETS\Field Datasheets\N2 Purge Log

Bison Engineering Inc.
Method 0061 Nitrogen Purge Log

Company: EAGLE FOUNDRY

Facility: EAGLE FOUNDRY

STEEL ALLOY COMBINATION

Source	Run	Date mm/dd/yyyy	Start hh:mm	Stop hh:mm	Flow LPM
MAIN FOUNDRY BH OUTLET	1	3/27/2023	17:44	18:16	10
COOLING BUNKER BH OUTLET	1	3/27/2023	17:44	18:16	10
MAIN FOUNDRY BH OUTLET	2	3/28/2023	15:08	15:39	16
COOLING BUNKER BH OUTLET	2	3/28/2023	15:08	15:39	10
MAIN FOUNDRY BH OUTLET	3	3/29/2023	15:11	15:41	10
COOLING BUNKER BH OUTLET	3	3/29/23	15:11	15:41	10

Technician: JCR

Revision No.: 0
Date: January 11, 2018

Y:\SOURCE\MASTER SPREADSHEETS\Field Datasheets\N2 Purge Log

APPENDIX F: PLANT OPERATING RECORDS

Eagle Foundry Company
Process Data

White Iron

Eagle Foundry Co. Stack Testing March 27 - 29, 2023

Prepared By: Jack Scott, EFC

HC-25	C	Mn	Si	P	S	Cr	Ni	Mo	Ti	Fe	Total Pounds Melt/Pour	Charge Wt.	Diff
1 Day 1 HT 1	89.949	30.884	10.747	0.449	0.399	771.919	7.261	12.079	0.307	2,029.992	2,953.985	2,954	-0.015
2 Day 1 HT 2	91.392	30.539	10.983	0.492	0.435	782.160	7.452	13.150	0.249	2,102.152	3,039.003	3,039	0.003
3 Day 1 HT 3	90.436	28.637	9.892	0.464	0.393	768.660	7.420	12.648	0.286	2,055.162	2,973.997	2,974	-0.003
4 Day 1 HT 4	90.558	30.625	10.958	0.457	0.427	784.203	7.233	12.252	0.287	2,051.999	2,989.000	2,989	0.000
Day 1/Run 1 (Total lbs)		120.685				3,106.941					11,955.985		
5 Day 2 HT 1	88.972	32.358	11.579	0.496	0.410	791.248	7.913	12.725	0.347	2,093.949	3,039.997	3,040	-0.003
6 Day 2 HT 2	89.309	31.090	10.357	0.465	0.395	793.400	7.971	12.218	0.304	2,094.487	3,039.997	3,040	-0.003
7 Day 2 HT 3	89.846	30.630	14.056	0.429	0.463	768.604	8.368	13.352	0.362	2,118.894	3,045.003	3,045	0.003
8 Day 2 HT 4	88.885	32.831	14.001	0.426	0.487	771.359	8.487	13.177	0.341	2,111.007	3,041.000	3,041	0.000
Day 2/Run 2 (Total lbs)		126.908				3,124.611					12,165.997		
9 Day 3 HT 1	90.459	30.316	10.994	0.428	0.529	768.547	8.826	12.591	0.353	2,066.960	2,990.003	2,990	0.003
10 Day 3 HT 2	88.337	31.216	12.160	0.407	0.449	764.660	7.610	12.758	0.296	2,072.112	2,990.003	2,990	0.003
11 Day 3 HT 3	88.636	30.337	14.173	0.434	0.463	776.123	7.935	12.986	0.332	2,058.579	2,989.997	2,990	-0.003
12 Day 3 HT 4	88.127	30.932	13.075	0.404	0.466	761.810	8.004	13.036	0.347	2,073.801	2,990.003	2,990	0.003
Day 3/Run 3 (Total lbs)		122.799				3,071.140					11,960.006		
Total Pounds	1,074.906	370.392	142.974	5.350	5.316	9,302.692	94.481	152.972	3.810	24,929.095	36,081.988	36,082	-0.012

- Notes:
1. CrVI emission results also should be divided by the Cr processed in each run to develop emission factor as lbs CrVI/ton Cr present in the alloy.
 2. Mn and Cr emission results should be divided by the lbs or tons of the metal element processed to develop emission factors of lbs emitted/ lb (or ton) present in the alloy.
 3. Al, Sb, As, Ba, Be, Cd, Co, Cu, Ni, P, Pb, Hg, Se, Ag, Tl, V, Zn are all trace TAC metals not expected to be in or added to alloys. Emission factors should be developed as lbs emitted/total tons of metal processed from Column M above because these could be trace elements in any batch and are not part of a specific recipe.
- Mn, Cr, and CrVi may change with changing recipes and therefore, need a specific emission rate depending upon the amount present.

Eagle Foundry Company
Process Data

Steel

Eagle Foundry Co. Stack Testing March 27 - 29, 2023

Prepared By: Jack Scott, EFC

CM40	C	Mn	Si	P	S	Cr	Ni	Mo	V	Fe	Total Pounds Melt/Pour	Charge Wt.	Diff
1 Day 1 HT 5	12.127	32.929	8.245	0.273	0.214	98.384	34.974	15.012	0.282	2,890.448	3,092.887	3,103	-10.113
2 Day 1 HT 6	11.992	26.138	7.639	0.294	0.220	99.850	32.601	14.399	0.251	2,891.074	3,084.458	3,094	-9.542
Day 1/Run 1		59.067		0.567		198.233	67.575		0.533		6,177.345		
3 Day 2 HT 5	12.393	24.359	7.765	0.390	0.229	95.029	31.570	14.418	0.279	2,902.324	3,088.755	3,096	-7.245
4 Day 2 HT 6	12.059	28.446	6.407	0.272	0.226	94.287	31.585	14.087	0.340	2,895.349	3,083.058	3,092	-8.942
Day 2/Run 2		52.806		0.662		189.316	63.155		0.619		6,171.813		
5 Day 3 HT 5	12.094	23.911	7.652	0.382	0.225	93.195	31.029	14.129	0.273	2,843.896	3,026.785	3,034	-7.215
6 Day 3 HT 6	12.527	27.534	7.397	0.300	0.228	95.538	30.003	14.536	0.367	2,837.649	3,026.078	3,034	-7.922
Day 3/Run 3		51.445		0.683		188.733	61.032		0.640		6,052.863		
MNB2													
7 Day 1 HT 7	34.098	388.863	20.809	0.517	0.523	6.148	3.347	14.138		2,543.848	3,012.290	3,021	-8.710
8 Day 1 HT 8	33.397	386.129	20.519	0.514	0.565	5.383	3.405	13.477		2,548.555	3,011.943	3,021	-9.057
Day 1/Run 1		774.992		1.030		11.531	6.752				6,024.233		
9 Day 2 HT 7	37.037	381.054	19.733	0.571	0.607	5.362	4.278	15.365		2,552.231	3,016.239	3,021	-4.761
10 Day 2 HT 8	34.225	400.222	21.642	0.520	0.562	6.716	3.027	15.292		2,530.861	3,013.067	3,021	-7.933
Day 2/Run 2		781.276		1.091		12.078	7.305				6,029.306		
11 Day 3 HT 7	32.050	379.129	21.081	0.483	0.535	5.770	3.667	13.712		2,555.044	3,011.472	3,021	-9.528
12 Day 3 HT 8	33.346	392.165	20.573	0.495	0.535	6.991	4.873	15.782		2,538.441	3,013.200	3,021	-7.800
Day 3/Run 3		771.295		0.979		12.761	8.540				6,024.672		

	Mn	P	Cr	Ni	V	Total lbs Metal Melt/Pour per Run
Day 1/Run 1 Total lbs	834.059	1.597	209.764	74.327	0.533	12,201.579
Day 2/Run 2 Total lbs	834.082	1.753	201.394	70.459	0.619	12,201.119
Day 3/Run 3 Total lbs	822.739	1.661	201.494	69.572	0.640	12,077.535

- Notes:
1. CrVI emission results should be also be divided by the Cr processed in each run to develop emission factor as lbs CrVI/ton Cr present in the alloy.
 2. Mn, Cr, and Ni emission results should be divided by the lbs or tons of the metal element processed to develop emission factors of lbs emitted/ lb (or ton) present in the alloy.
 3. Al, Sb, As, Ba, Be, Cd, Co, Cu, P, Pb, Hg, Se, Ag, Tl, Zn, and V are all trace TAC metals not expected to be in or added to alloys. Emission factors should be developed as lbs emitted/total tons of metal processed from Column M above because these could be trace elements in any batch and are not part of a specific recipe.

EFC223119 Mn, P, Cr, CrVi, Ni, and V may change with changing recipes and therefore, need a specific emission rate depending upon the amount present.

2023 Eagle Foundry Emission Factor Determination and PTE Verification Test Report, Rev 02

APPENDIX G: CALIBRATIONS AND CERTIFICATIONS

Accredited Air Emission Testing Body

A2LA has accredited

BISON ENGINEERING, INC.

In recognition of the successful completion of the joint A2LA and Stack Testing Accreditation Council (STAC) evaluation process, this laboratory is accredited to perform testing activities in compliance with ASTM D7036:2004 - Standard Practice for Competence of Air Emission Testing Bodies.



Presented this 27th day of January 2022 .

A blue ink signature of a person, likely the Vice President of Accreditation Services, written over a horizontal line.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 4675.01
Valid to November 30, 2023

This accreditation program is not included under the A2LA ILAC Mutual Recognition Arrangement.

APEX INSTRUMENTS

METERBOX CALIBRATION USING REFERENCE DGM

Meter Console Information	
Console Model Number	Box 10
Console Serial Number	0028-052711-1
DGM Model Number	SK25R-Q58
DGM Serial Number	A2003246

Calibration Conditions			
Date	Time	2-Mar-23	17:00
Barometric Pressure		26.59	in Hg
Calibration Technician		RTM	
Calibration Meter Gamma		1.0000	

Standardized Factors/Conversions		
Temperature	528	R
Pressure	29.92	in Hg
K ₁	17.647	R/in Hg

<<<<<<<Your reference meter here

Calibration Data											
Run Time	Metering Console						Reference Meter				
	Manometer	Volume	Volume	Sample	Outlet Temp	Outlet Temp	Volume	Volume	Sample	Outlet Temp	Outlet Temp
Elapsed	ΔH	Initial	Final	Volume	Initial	Final	Initial	Final	Volume	Initial	Final
Θ minutes	P _m in H ₂ O	V _{mi} cubic feet	V _{mfi} cubic feet	V _m cubic feet	t _{oi} °F	t _{of} °F	V _{wi} cubic feet	V _{wfi} cubic feet	V _w cubic feet	t _{wi} °F	t _{wfi} °F
11.00	5.00	290.189	305.395	15.206	66	67	0.000	15.064	15.064	68	68
11.00	3.00	305.395	317.295	11.900	67	67	0.000	11.677	11.677	68	68
10.00	2.00	317.295	326.050	8.755	68	69	0.000	8.642	8.642	68	69
10.00	1.00	326.050	332.310	6.260	70	71	0.000	6.086	6.086	70	71
10.00	0.50	332.310	336.630	4.320	71	71	0.000	4.207	4.207	71	72

Results								
Standardized Data				Dry Gas Meter				
Dry Gas Meter		Calibration Meter		Calibration Factor		Flowrate	ΔH _@	
				Value	Variation	Std & Corr	0.75 SCFM	Variation
V _{m(std)} cubic feet	Q _{m(std)} ft ³ /min	V _{w(std)} cubic feet	Q _{w(std)} ft ³ /min	Y	ΔY	Q _{m(std)(corr)} ft ³ /min	ΔH _@ in H ₂ O	ΔΔH _@
13.739	1.249	13.388	1.217	0.9744	0.001	1.217	1.694	-0.027
10.684	0.971	10.378	0.943	0.9714	-0.002	0.943	1.689	-0.031
7.816	0.782	7.673	0.767	0.9817	0.008	0.767	1.698	-0.022
5.552	0.555	5.383	0.538	0.9696	-0.004	0.538	1.718	-0.002
3.823	0.382	3.714	0.371	0.9716	-0.002	0.371	1.803	0.083
Pre-test Y	0.9647	% Deviation	PASS	0.9737	Y Average		1.720	ΔH _@ Average

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +/-0.02.

Note: For ΔH_@, orifice pressure differential that equates to 0.75cfm (0.0212m³/min) at standard temperature and pressure, acceptable tolerance of individual values from the average is +/-0.2inches (5.1mm) H₂O.Initials _____ RTM
RTM

Date _____ 2-Mar-23

APEX INSTRUMENTS

METERBOX CALIBRATION USING REFERENCE DGM

Meter Console Information	
Console Model Number	Box 10
Console Serial Number	0028-052711-1
DGM Model Number	SK25R-Q58
DGM Serial Number	A2003246

Calibration Conditions			
Date	Time	31-Mar-23	12:18
Barometric Pressure		26.69	in Hg
Calibration Technician		KAD	
Calibration Meter Gamma		1.0000	

Standardized Factors/Conversions		
Temperature	528	R
Pressure	29.92	in Hg
K ₁	17.647	R/in Hg

<<<<<<<Your reference meter here

Calibration Data											
Run Time	Metering Console						Reference Meter				
	Manometer	Volume	Volume	Sample	Outlet Temp	Outlet Temp	Volume	Volume	Sample	Outlet Temp	Outlet Temp
Elapsed	ΔH	Initial	Final	Volume	Initial	Final	Initial	Final	Volume	Initial	Final
Θ minutes	P _m in H ₂ O	V _{mi} cubic feet	V _{mfi} cubic feet	V _m cubic feet	t _{oi} °F	t _{of} °F	V _{wi} cubic feet	V _{wfi} cubic feet	V _w cubic feet	t _{wi} °F	t _{wfi} °F
10.00	6.00	881.700	896.985	15.285	74	77	0.000	15.041	15.041	76	76
22.00	3.00	897.400	921.238	23.838	77	80	0.000	23.165	23.165	76	77
21.50	2.00	921.600	940.484	18.884	80	81	0.000	18.252	18.252	77	77
10.00	1.00	940.800	947.045	6.245	81	81	0.000	6.026	6.026	77	77
10.00	0.50	852.900	857.180	4.280	81	81	0.000	4.144	4.144	78	78

Results								
Standardized Data				Dry Gas Meter				
Dry Gas Meter		Calibration Meter		Calibration Factor		Flowrate	ΔH _@	
				Value	Variation	Std & Corr	0.75 SCFM	Variation
V _{m(std)} cubic feet	Q _{m(std)} ft ³ /min	V _{w(std)} cubic feet	Q _{w(std)} ft ³ /min	Y	ΔY	Q _{m(std)(corr)} ft ³ /min	ΔH _@ in H ₂ O	ΔΔH _@
13.666	1.367	13.217	1.322	0.9671	-0.002	1.322	1.701	-0.062
21.022	0.956	20.337	0.924	0.9674	-0.001	0.924	1.729	-0.034
16.546	0.770	16.009	0.745	0.9675	-0.001	0.745	1.770	0.007
5.452	0.545	5.285	0.529	0.9694	0.001	0.529	1.755	-0.009
3.731	0.373	3.628	0.363	0.9723	0.004	0.363	1.862	0.099
Pre-test Y	0.9737	% Deviation	PASS	0.9687	Y Average		1.763	ΔH _@ Average

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +/-0.02.

Note: For ΔH_@, orifice pressure differential that equates to 0.75cfm (0.0212m³/min) at standard temperature and pressure, acceptable tolerance of individual values from the average is +/-0.2inches (5.1mm) H₂O.

Initials _____ KAD

KAD

Date _____ 31-Mar-23

APEX INSTRUMENTS

METERBOX CALIBRATION USING REFERENCE DGM

Meter Console Information	
Console Model Number	Box 11
Console Serial Number	2029
DGM Model Number	
DGM Serial Number	13966757

Calibration Conditions			
Date	Time	7-Apr-23	9:40
Barometric Pressure		26.92	in Hg
Calibration Technician		MTK	
Calibration Meter Gamma		1.0000	

Standardized Factors/Conversions		
Temperature	528	R
Pressure	29.92	in Hg
K ₁	17.647	R/in Hg

<<<<<<<Your reference meter here

Calibration Data											
Run Time	Metering Console						Reference Meter				
	Manometer	Volume	Volume	Sample	Outlet Temp	Outlet Temp	Volume	Volume	Sample	Outlet Temp	Outlet Temp
Elapsed	ΔH	Initial	Final	Volume	Initial	Final	Initial	Final	Volume	Initial	Final
Θ minutes	P _m in H ₂ O	V _{mi} cubic feet	V _{mf} cubic feet	V _m cubic feet	t _{oi} °F	t _{of} °F	V _{wi} cubic feet	V _{wf} cubic feet	V _w cubic feet	t _{wi} °F	t _{wf} °F
12.00	8.00	966.215	986.221	20.006	72	72	0.000	20.005	20.005	67	73
10.00	6.00	986.389	1000.943	14.554	72	72	0.000	14.393	14.393	73	76
12.00	4.00	1.299	15.502	14.203	72	72	0.000	13.908	13.908	76	78
10.00	2.00	15.876	24.211	8.335	72	72	0.000	8.093	8.093	77	80
10.00	1.00	24.429	30.632	6.203	72	72	0.000	6.026	6.026	78	80

Results								
Standardized Data				Dry Gas Meter				
Dry Gas Meter		Calibration Meter		Calibration Factor		Flowrate	ΔH _@	
				Value	Variation	Std & Corr	0.75 SCFM	Variation
V _{m(std)} cubic feet	Q _{m(std)} ft ³ /min	V _{w(std)} cubic feet	Q _{w(std)} ft ³ /min	Y	ΔY	Q _{m(std)(corr)} ft ³ /min	ΔH _@ in H ₂ O	ΔΔH _@
18.255	1.521	17.931	1.494	0.9822	0.018	1.494	1.801	-0.061
13.209	1.321	12.792	1.279	0.9684	0.004	1.279	1.843	-0.019
12.821	1.068	12.303	1.025	0.9596	-0.005	1.025	1.913	0.051
7.484	0.748	7.140	0.714	0.9540	-0.010	0.714	1.972	0.110
5.554	0.555	5.311	0.531	0.9563	-0.008	0.531	1.782	-0.080
Pre-test Y	0.9708	% Deviation	PASS	0.9641	Y Average		1.862	ΔH _@ Average

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +0.02.

Note: For ΔH_@, orifice pressure differential that equates to 0.75cfm (0.0212m³/min) at standard temperature and pressure, acceptable tolerance of individual values from the average is +0.2inches (5.1mm) H₂O.Initials AJVDate 7-Apr-23

APEX INSTRUMENTS

METERBOX CALIBRATION USING REFERENCE DGM

Meter Console Information	
Console Model Number	Box 11
Console Serial Number	2029
DGM Model Number	
DGM Serial Number	13966757

Calibration Conditions			
Date	Time	17-Dec-22	12:51
Barometric Pressure		25.92	in Hg
Calibration Technician		MTK	
Calibration Meter Gamma		1.0000	

Standardized Factors/Conversions		
Temperature	528	R
Pressure	29.92	in Hg
K ₁	17.647	R/in Hg

<<<<<<<Your reference meter here

Calibration Data											
Run Time	Metering Console						Reference Meter				
	Manometer	Volume	Volume	Sample	Outlet Temp	Outlet Temp	Volume	Volume	Sample	Outlet Temp	Outlet Temp
Elapsed	ΔH	Initial	Final	Volume	Initial	Final	Initial	Final	Volume	Initial	Final
Θ minutes	P _m in H ₂ O	V _{mi} cubic feet	V _{mf} cubic feet	V _m cubic feet	t _{oi} °F	t _{of} °F	V _{wi} cubic feet	V _{wf} cubic feet	V _w cubic feet	t _{wi} °F	t _{wf} °F
10.00	6.00	83.005	97.750	14.745	62	65	0.000	14.602	14.602	65	65
14.00	3.00	97.940	112.630	14.690	65	68	0.000	14.335	14.335	65	67
15.00	2.00	113.100	125.770	12.670	68	70	0.000	12.289	12.289	67	67
10.00	1.00	126.100	132.190	6.090	70	71	0.000	5.880	5.880	67	68
10.00	0.50	132.500	136.830	4.330	71	72	0.000	4.163	4.163	68	67

Results								
Standardized Data				Dry Gas Meter				
Dry Gas Meter		Calibration Meter		Calibration Factor		Flowrate	ΔH _@	
				Value	Variation	Std & Corr	0.75 SCFM	Variation
V _{m(std)} cubic feet	Q _{m(std)} ft ³ /min	V _{w(std)} cubic feet	Q _{w(std)} ft ³ /min	Y	ΔY	Q _{m(std)(corr)} ft ³ /min	ΔH _@ in H ₂ O	ΔΔH _@
13.103	1.310	12.722	1.272	0.9710	0.002	1.272	1.823	-0.042
12.871	0.919	12.465	0.890	0.9685	0.000	0.890	1.851	-0.014
11.018	0.735	10.666	0.711	0.9681	-0.001	0.711	1.925	0.060
5.266	0.527	5.099	0.510	0.9682	0.000	0.510	1.867	0.002
3.732	0.373	3.610	0.361	0.9674	-0.001	0.361	1.859	-0.006
Pre-test Y	0.9690	% Deviation	PASS	0.9686	Y Average		1.865	ΔH _@ Average

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +0.02.

Note: For ΔH_@, orifice pressure differential that equates to 0.75cfm (0.0212m³/min) at standard temperature and pressure, acceptable tolerance of individual values from the average is +0.2inches (5.1mm) H₂O.Initials _____ MTK
MTK

Date _____ 17-Dec-22

APEX INSTRUMENTS

METERBOX CALIBRATION USING REFERENCE DGM

Meter Console Information	
Console Model Number	Box 12
Console Serial Number	2199-D
DGM Model Number	ltron
DGM Serial Number	481

Calibration Conditions			
Date	Time	20-Apr-23	9:10
Barometric Pressure		26.23	in Hg
Calibration Technician		JCR	
Calibration Meter Gamma		1.0000	

Standardized Factors/Conversions		
Temperature	528	R
Pressure	29.92	in Hg
K ₁	17.647	R/in Hg

<<<<<<<Your reference meter here

Calibration Data											
Run Time	Metering Console						Reference Meter				
	Manometer	Volume	Volume	Sample	Outlet Temp	Outlet Temp	Volume	Volume	Sample	Outlet Temp	Outlet Temp
Elapsed	ΔH	Initial	Final	Volume	Initial	Final	Initial	Final	Volume	Initial	Final
Θ minutes	P _m in H ₂ O	V _{mi} cubic feet	V _{mf} cubic feet	V _m cubic feet	t _{oi} °F	t _{of} °F	V _{wi} cubic feet	V _{wf} cubic feet	V _w cubic feet	t _{wi} °F	t _{wf} °F
15.00	6.00	0.000	20.346	20.346	67	68	0.000	21.671	21.671	70	70
10.00	3.00	0.000	9.810	9.810	68	71	0.000	10.212	10.212	70	70
10.00	2.00	0.000	8.042	8.042	71	73	0.000	8.306	8.306	70	71
10.00	1.00	0.000	5.759	5.759	73	74	0.000	5.900	5.900	71	71
10.00	0.50	0.000	4.085	4.085	74	75	0.000	4.180	4.180	71	72

Results								
Standardized Data				Dry Gas Meter				
Dry Gas Meter		Calibration Meter		Calibration Factor		Flowrate	ΔH _@	
				Value	Variation	Std & Corr	0.75 SCFM	Variation
V _{m(std)} cubic feet	Q _{m(std)} ft ³ /min	V _{w(std)} cubic feet	Q _{w(std)} ft ³ /min	Y	ΔY	Q _{m(std)(corr)} ft ³ /min	ΔH _@ in H ₂ O	ΔΔH _@
18.154	1.210	18.927	1.262	1.0426	0.011	1.262	1.862	0.008
8.648	0.865	8.918	0.892	1.0313	0.000	0.892	1.856	0.002
7.036	0.704	7.247	0.725	1.0300	-0.002	0.725	1.865	0.011
5.011	0.501	5.143	0.514	1.0264	-0.005	0.514	1.846	-0.007
3.543	0.354	3.640	0.364	1.0275	-0.004	0.364	1.840	-0.014
Pre-test Y	1.0267	% Deviation	PASS	1.0316	Y Average		1.854	ΔH _@ Average

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +/-0.02.

Note: For DH_@, orifice pressure differential that equates to 0.75cfm (0.0212m³/min) at standard temperature and pressure, acceptable tolerance of individual values from the average is +/-0.2inches (5.1mm) H₂O.

Initials JCR

Date 20-Apr-23

APEX INSTRUMENTS

METERBOX CALIBRATION USING REFERENCE DGM

Meter Console Information	
Console Model Number	Box 12
Console Serial Number	2199-D
DGM Model Number	ltron
DGM Serial Number	481

Calibration Conditions			
Date	Time	24-Feb-23	15:18
Barometric Pressure		26.02	in Hg
Calibration Technician		ARB	
Calibration Meter Gamma		1.0000	

Standardized Factors/Conversions		
Temperature	528	R
Pressure	29.92	in Hg
K ₁	17.647	R/in Hg

<<<<<<<Your reference meter here

Calibration Data											
Run Time	Metering Console						Reference Meter				
	Manometer	Volume	Volume	Sample	Outlet Temp	Outlet Temp	Volume	Volume	Sample	Outlet Temp	Outlet Temp
Elapsed	ΔH	Initial	Final	Volume	Initial	Final	Initial	Final	Volume	Initial	Final
Θ minutes	P _m in H ₂ O	V _{mi} cubic feet	V _{mf} cubic feet	V _m cubic feet	t _{oi} °F	t _{of} °F	V _{wi} cubic feet	V _{wf} cubic feet	V _w cubic feet	t _{wi} °F	t _{wf} °F
10.00	6.00	0.000	13.956	13.956	70	70	0.000	14.638	14.638	75	74
10.00	3.00	0.000	10.054	10.054	72	74	0.000	10.508	10.508	74	74
10.00	2.00	0.000	8.112	8.112	74	73	0.000	8.406	8.406	74	73
10.00	1.00	0.000	5.917	5.917	73	73	0.000	6.087	6.087	73	73
10.00	0.50	0.000	4.226	4.226	70	74	0.000	4.329	4.329	74	73

Results								
Standardized Data				Dry Gas Meter				
Dry Gas Meter		Calibration Meter		Calibration Factor		Flowrate	ΔH _@	
				Value	Variation	Std & Corr	0.75 SCFM	Variation
V _{m(std)} cubic feet	Q _{m(std)} ft ³ /min	V _{w(std)} cubic feet	Q _{w(std)} ft ³ /min	Y	ΔY	Q _{m(std)(corr)} ft ³ /min	ΔH _@ in H ₂ O	ΔΔH _@
12.296	1.230	12.575	1.258	1.0227	-0.004	1.258	1.851	0.051
8.735	0.873	9.036	0.904	1.0344	0.008	0.904	1.782	-0.018
7.021	0.702	7.235	0.724	1.0304	0.004	0.724	1.851	0.052
5.112	0.511	5.244	0.524	1.0258	-0.001	0.524	1.764	-0.036
3.653	0.365	3.726	0.373	1.0200	-0.007	0.373	1.750	-0.049
Pre-test Y	1.0343	% Deviation	PASS	1.0267	Y Average		1.800	ΔH _@ Average

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +/-0.02.

Note: For DH_@, orifice pressure differential that equates to 0.75cfm (0.0212m³/min) at standard temperature and pressure, acceptable tolerance of individual values from the average is +/-0.2inches (5.1mm) H₂O.Initials _____ ARB
ARB

Date _____ 24-Feb-23

APEX INSTRUMENTS

METERBOX CALIBRATION USING REFERENCE DGM

Meter Console Information	
Console Model Number	Box 13
Console Serial Number	2200-D
DGM Model Number	ltron
DGM Serial Number	343

Calibration Conditions			
Date	Time	6-Mar-23	15:09
Barometric Pressure		26.06	in Hg
Calibration Technician		ARB	
Calibration Meter Gamma		1.0000	

Standardized Factors/Conversions		
Temperature	528	R
Pressure	29.92	in Hg
K ₁	17.647	R/in Hg

<<<<<<<Your reference meter here

Calibration Data											
Run Time	Metering Console						Reference Meter				
	Manometer	Volume	Volume	Sample	Outlet Temp	Outlet Temp	Volume	Volume	Sample	Outlet Temp	Outlet Temp
Elapsed	ΔH	Initial	Final	Volume	Initial	Final	Initial	Final	Volume	Initial	Final
Θ minutes	P _m in H ₂ O	V _{mi} cubic feet	V _{mf} cubic feet	V _m cubic feet	t _{oi} °F	t _{of} °F	V _{wi} cubic feet	V _{wf} cubic feet	V _w cubic feet	t _{wi} °F	t _{wf} °F
10.00	6.00	0.000	14.023	14.023	51	52	0.000	14.651	14.651	54	53
10.00	3.00	0.000	10.111	10.111	52	53	0.000	10.356	10.356	53	53
10.00	2.00	0.000	8.333	8.333	53	54	0.000	8.473	8.473	53	54
10.00	1.00	0.000	5.985	5.985	54	55	0.000	6.042	6.042	54	55
13.00	0.50	0.000	5.539	5.539	55	56	0.000	5.569	5.569	55	55

Results								
Standardized Data				Dry Gas Meter				
Dry Gas Meter		Calibration Meter		Calibration Factor		Flowrate	ΔH _@	
				Value	Variation	Std & Corr	0.75 SCFM	Variation
V _{m(std)} cubic feet	Q _{m(std)} ft ³ /min	V _{w(std)} cubic feet	Q _{w(std)} ft ³ /min	Y	ΔY	Q _{m(std)(corr)} ft ³ /min	ΔH _@ in H ₂ O	ΔΔH _@
12.821	1.282	13.121	1.312	1.0234	0.011	1.312	1.764	0.021
9.150	0.915	9.284	0.928	1.0147	0.002	0.928	1.758	0.015
7.505	0.751	7.588	0.759	1.0110	-0.001	0.759	1.751	0.008
5.365	0.536	5.401	0.540	1.0068	-0.005	0.540	1.725	-0.018
4.948	0.381	4.973	0.383	1.0050	-0.007	0.383	1.716	-0.027
Pre-test Y	1.0106	% Deviation	PASS	1.0122	Y Average		1.743	ΔH _@ Average

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +/-0.02.

Note: For DH_@, orifice pressure differential that equates to 0.75cfm (0.0212m³/min) at standard temperature and pressure, acceptable tolerance of individual values from the average is +/-0.2inches (5.1mm) H₂O.Initials _____ ARB
ARB

Date _____ 6-Mar-23

APEX INSTRUMENTS

METERBOX CALIBRATION USING REFERENCE DGM

Meter Console Information	
Console Model Number	Box 13
Console Serial Number	2200-D
DGM Model Number	ltron
DGM Serial Number	343

Calibration Conditions			
Date	Time	6-Apr-23	15:40
Barometric Pressure		26.06	in Hg
Calibration Technician		AJV	
Calibration Meter Gamma		1.0000	

Standardized Factors/Conversions		
Temperature	528	R
Pressure	29.92	in Hg
K ₁	17.647	R/in Hg

<<<<<<<Your reference meter here

Calibration Data											
Run Time	Metering Console						Reference Meter				
	Manometer	Volume	Volume	Sample	Outlet Temp	Outlet Temp	Volume	Volume	Sample	Outlet Temp	Outlet Temp
Elapsed	ΔH	Initial	Final	Volume	Initial	Final	Initial	Final	Volume	Initial	Final
Θ minutes	P _m in H ₂ O	V _{mi} cubic feet	V _{mf} cubic feet	V _m cubic feet	t _{oi} °F	t _{of} °F	V _{wi} cubic feet	V _{wf} cubic feet	V _w cubic feet	t _{wi} °F	t _{wf} °F
10.00	6.00	0.000	13.894	13.894	71	71	0.000	14.493	14.493	68	69
10.00	3.00	0.000	9.762	9.762	71	71	0.000	9.998	9.998	69	69
10.00	2.00	0.000	7.836	7.836	71	70	0.000	7.970	7.970	69	70
10.00	1.00	0.000	5.899	5.899	70	70	0.000	5.958	5.958	70	71
10.00	0.50	0.000	4.258	4.258	70	70	0.000	4.276	4.276	71	71

Results								
Standardized Data				Dry Gas Meter				
Dry Gas Meter		Calibration Meter		Calibration Factor		Flowrate	ΔH _@	
				Value	Variation	Std & Corr	0.75 SCFM	Variation
V _{m(std)} cubic feet	Q _{m(std)} ft ³ /min	V _{w(std)} cubic feet	Q _{w(std)} ft ³ /min	Y	ΔY	Q _{m(std)(corr)} ft ³ /min	ΔH _@ in H ₂ O	ΔΔH _@
12.237	1.224	12.611	1.261	1.0306	0.017	1.261	1.839	-0.046
8.526	0.853	8.692	0.869	1.0194	0.005	0.869	1.936	0.051
6.831	0.683	6.922	0.692	1.0133	-0.001	0.692	2.037	0.152
5.133	0.513	5.165	0.516	1.0061	-0.008	0.516	1.831	-0.054
3.700	0.370	3.704	0.370	1.0010	-0.013	0.370	1.781	-0.104
Pre-test Y	1.0122	% Deviation	PASS	1.0141	Y Average		1.885	ΔH _@ Average

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +0.02.

Note: For ΔH_@, orifice pressure differential that equates to 0.75cfm (0.0212m³/min) at standard temperature and pressure, acceptable tolerance of individual values from the average is +0.2inches (5.1mm) H₂O.Initials AJV
AJVDate 6-Apr-23

APEX INSTRUMENTS

METERBOX CALIBRATION USING REFERENCE DGM

Meter Console Information	
Console Model Number	BOX 15
Console Serial Number	6688
DGM Model Number	SK25R
DGM Serial Number	A2003246

Calibration Conditions			
Date	Time	17-Mar-23	16:00
Barometric Pressure		27.04	in Hg
Calibration Technician		JCA	
Calibration Meter Gamma		1.0000	

Standardized Factors/Conversions		
Temperature	528	R
Pressure	29.92	in Hg
K ₁	17.647	R/in Hg

<<<<<<<Your reference meter here

Calibration Data											
Run Time	Metering Console						Reference Meter				
	Manometer	Volume	Volume	Sample	Outlet Temp	Outlet Temp	Volume	Volume	Sample	Outlet Temp	Outlet Temp
Elapsed	ΔH	Initial	Final	Volume	Initial	Final	Initial	Final	Volume	Initial	Final
Θ minutes	P _m in H ₂ O	V _{mi} cubic feet	V _{mf} cubic feet	V _m cubic feet	t _{oi} °F	t _{of} °F	V _{wi} cubic feet	V _{wf} cubic feet	V _w cubic feet	t _{wi} °F	t _{wf} °F
11.00	6.00	0.000	14.982	14.982	64	65	0.000	15.283	15.283	62	63
10.00	3.00	0.000	9.693	9.693	65	66	0.000	9.786	9.786	63	64
10.00	2.00	0.000	7.876	7.876	66	67	0.000	7.926	7.926	64	64
10.50	1.00	0.000	5.739	5.739	67	67	0.000	5.758	5.758	64	65
10.00	0.50	0.000	4.184	4.184	67	67	0.000	4.193	4.193	65	65

Results								
Standardized Data				Dry Gas Meter				
Dry Gas Meter		Calibration Meter		Calibration Factor		Flowrate	ΔH _@	
				Value	Variation	Std & Corr	0.75 SCFM	Variation
V _{m(std)} cubic feet	Q _{m(std)} ft ³ /min	V _{w(std)} cubic feet	Q _{w(std)} ft ³ /min	Y	ΔY	Q _{m(std)(corr)} ft ³ /min	ΔH _@ in H ₂ O	ΔΔH _@
13.853	1.259	13.957	1.269	1.0076	0.002	1.269	1.909	-0.011
8.873	0.887	8.920	0.892	1.0052	0.000	0.892	1.927	0.008
7.177	0.718	7.218	0.722	1.0057	0.000	0.722	1.959	0.039
5.211	0.496	5.238	0.499	1.0053	0.000	0.499	2.048	0.129
3.794	0.379	3.811	0.381	1.0047	-0.001	0.381	1.754	-0.165
Pre-test Y	1.0040	% Deviation	PASS	1.0057	Y Average		1.919	ΔH _@ Average

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +0.02.

Note: For ΔH_@, orifice pressure differential that equates to 0.75cfm (0.0212m³/min) at standard temperature and pressure, acceptable tolerance of individual values from the average is +0.2inches (5.1mm) H₂O.Initials _____ JCA
JCA

Date _____ 17-Mar-23

APEX INSTRUMENTS

METERBOX CALIBRATION USING REFERENCE DGM

Meter Console Information	
Console Model Number	BOX 15
Console Serial Number	6688
DGM Model Number	SK25R
DGM Serial Number	A2003246

Calibration Conditions			
Date	Time	31-Mar-23	10:37
Barometric Pressure		26.61	in Hg
Calibration Technician		KAD	
Calibration Meter Gamma		1.0000	

Standardized Factors/Conversions		
Temperature	528	R
Pressure	29.92	in Hg
K ₁	17.647	R/in Hg

<<<<<<<Your reference meter here

Calibration Data											
Run Time	Metering Console						Reference Meter				
	Manometer	Volume	Volume	Sample	Outlet Temp	Outlet Temp	Volume	Volume	Sample	Outlet Temp	Outlet Temp
Elapsed	ΔH	Initial	Final	Volume	Initial	Final	Initial	Final	Volume	Initial	Final
Θ minutes	P _m in H ₂ O	V _{mi} cubic feet	V _{mfi} cubic feet	V _m cubic feet	t _{oi} °F	t _{of} °F	V _{wi} cubic feet	V _{wfi} cubic feet	V _w cubic feet	t _{wi} °F	t _{wfi} °F
10.00	6.00	0.000	13.715	13.715	64	69	0.000	13.996	13.996	66	67
10.00	3.00	0.000	9.892	9.892	69	71	0.000	9.957	9.957	67	68
10.00	2.00	0.000	8.065	8.065	71	72	0.000	8.018	8.018	68	69
11.00	1.00	0.000	6.457	6.457	72	73	0.000	6.444	6.444	69	70
23.50	0.50	0.000	9.887	9.887	73	74	0.000	9.858	9.858	70	71

Results								
Standardized Data				Dry Gas Meter				
Dry Gas Meter		Calibration Meter		Calibration Factor		Flowrate	ΔH _@	
				Value	Variation	Std & Corr	0.75 SCFM	Variation
V _{m(std)} cubic feet	Q _{m(std)} ft ³ /min	V _{w(std)} cubic feet	Q _{w(std)} ft ³ /min	Y	ΔY	Q _{m(std)(corr)} ft ³ /min	ΔH _@ in H ₂ O	ΔΔH _@
12.435	1.244	12.483	1.248	1.0039	0.003	1.248	1.933	0.046
8.837	0.884	8.864	0.886	1.0030	0.002	0.886	1.904	0.018
7.165	0.716	7.124	0.712	0.9943	-0.006	0.712	1.960	0.073
5.710	0.519	5.715	0.520	1.0009	0.000	0.520	1.839	-0.048
8.715	0.371	8.726	0.371	1.0013	0.001	0.371	1.797	-0.090
Pre-test Y	1.0057	% Deviation	PASS	1.0007	Y Average		1.887	ΔH _@ Average

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +/-0.02.

Note: For ΔH_@, orifice pressure differential that equates to 0.75cfm (0.0212m³/min) at standard temperature and pressure, acceptable tolerance of individual values from the average is +/-0.2inches (5.1mm) H₂O.

Initials _____ KAD

KAD

Date _____ 31-Mar-23

APEX INSTRUMENTS

METERBOX CALIBRATION USING REFERENCE DGM

Meter Console Information	
Console Model Number	SB -2
Console Serial Number	1602002
DGM Model Number	S-110
DGM Serial Number	234728

Calibration Conditions			
Date	Time	10-Jan-23	9:00
Barometric Pressure		28.84	in Hg
Calibration Technician		MTK	
Calibration Meter Gamma		1.0000	

Standardized Factors/Conversions		
Temperature	528	R
Pressure	29.92	in Hg
K ₁	17.647	R/in Hg

<<<<<<<Your reference meter here

Calibration Data											
Run Time	Metering Console						Reference Meter				
	Manometer	Volume	Volume	Sample	Outlet Temp	Outlet Temp	Volume	Volume	Sample	Outlet Temp	Outlet Temp
Elapsed	ΔH	Initial	Final	Volume	Initial	Final	Initial	Final	Volume	Initial	Final
Θ minutes	P _m in H ₂ O	V _{mi} cubic feet	V _{mf} cubic feet	V _m cubic feet	t _{oi} °F	t _{of} °F	V _{wi} cubic feet	V _{wf} cubic feet	V _w cubic feet	t _{wi} °F	t _{wf} °F
10.00	6.00	956.305	971.170	14.865	79	80	0.000	14.972	14.972	72	73
12.00	3.00	971.415	983.990	12.575	80	80	0.000	12.522	12.522	73	73
12.00	2.00	984.180	994.450	10.270	80	81	0.000	10.204	10.204	73	73
10.00	1.00	995.000	1001.100	6.100	81	80	0.000	6.044	6.044	73	73
10.00	0.50	1.300	5.535	4.235	80	79	0.000	4.204	4.204	73	73

Results								
Standardized Data				Dry Gas Meter				
Dry Gas Meter		Calibration Meter		Calibration Factor		Flowrate	ΔH _@	
				Value	Variation	Std & Corr	0.75 SCFM	Variation
V _{m(std)} cubic feet	Q _{m(std)} ft ³ /min	V _{w(std)} cubic feet	Q _{w(std)} ft ³ /min	Y	ΔY	Q _{m(std)(corr)} ft ³ /min	ΔH _@ in H ₂ O	ΔΔH _@
14.238	1.424	14.310	1.431	1.0051	0.002	1.431	1.556	-0.045
11.942	0.995	11.956	0.996	1.0012	-0.002	0.996	1.603	0.002
9.720	0.810	9.743	0.812	1.0024	0.000	0.812	1.608	0.007
5.758	0.576	5.771	0.577	1.0022	-0.001	0.577	1.592	-0.010
4.000	0.400	4.014	0.401	1.0034	0.001	0.401	1.648	0.047
Pre-test Y	1.0010	% Deviation	PASS	1.0028	Y Average		1.601	ΔH _@ Average

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +0.02.

Note: For ΔH_@, orifice pressure differential that equates to 0.75cfm (0.0212m³/min) at standard temperature and pressure, acceptable tolerance of individual values from the average is +0.2inches (5.1mm) H₂O.Initials _____ MTK
MTK

Date _____ 10-Jan-23

APEX INSTRUMENTS
METERBOX CALIBRATION USING REFERENCE DGM

Meter Console Information		Calibration Conditions				Standardized Factors/Conversions		
Console Model Number	SB - 2	Date	Time	7-Apr-23	11:00	Temperature	528	R
Console Serial Number	1602002	Barometric Pressure		28.84	in Hg	Pressure	29.92	in Hg
DGM Model Number	S-110	Calibration Technician		AJV	<<<<<<<<Your reference meter here	K ₁	17.647	R/in Hg
DGM Serial Number	234728	Calibration Meter Gamma		1.0000				

Calibration Data											
Run Time	Metering Console						Reference Meter				
	Manometer	Volume	Volume	Sample	Outlet Temp	Outlet Temp	Volume	Volume	Sample Volume	Outlet Temp	Outlet Temp
Elapsed	ΔH	Initial	Final	Volume	Initial	Final	Initial	Final	V _w cubic feet	Initial	Final
Θ minutes	P _m in H ₂ O	V _{mi} cubic feet	V _{mf} cubic feet	V _m cubic feet	t _{oi} °F	t _{of} °F	V _{wi} cubic feet	V _{wf} cubic feet		t _{wi} °F	t _{wf} °F
10.00	8.00	71.905	88.882	16.977	72	72	0.000	17.323	17.323	71	75
10.00	6.00	89.398	104.125	14.727	72	72	0.000	14.829	14.829	73	76
10.00	4.00	104.405	116.420	12.015	72	72	0.000	11.9827	11.983	76	78
11.00	2.00	144.810	154.382	9.572	70	70	0.000	9.636	9.636	67	70
10.00	1.00	128.735	134.777	6.042	72	72	0.000	6.004	6.004	76	76

Results								
Standardized Data				Dry Gas Meter				
Dry Gas Meter		Calibration Meter		Calibration Factor		Flowrate	ΔH _@	
				Value	Variation	Std & Corr	0.75 SCFM	Variation
V _{m(std)} cubic feet	Q _{m(std)} ft ³ /min	V _{w(std)} cubic feet	Q _{w(std)} ft ³ /min	Y	ΔY	Q _{m(std)(corr)} ft ³ /min	ΔH _@ in H ₂ O	ΔΔH _@
16.572	1.657	16.541	1.654	0.9981	0.008	1.654	1.575	-0.034
14.304	1.430	14.120	1.412	0.9871	-0.003	1.412	1.621	0.012
11.611	1.161	11.357	1.136	0.9781	-0.012	1.136	1.670	0.062
9.239	0.840	9.280	0.844	1.0045	0.014	0.844	1.519	-0.089
5.795	0.579	5.701	0.570	0.9838	-0.007	0.570	1.657	0.049
Pre-test Y	1.0028	% Deviation	PASS	0.9903	Y Average		1.608	ΔH _@ Average

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +/-0.02.
Note: For DH _@ , orifice pressure differential that equates to 0.75cfm (0.0212m ³ /min) at standard temperature and pressure, acceptable tolerance of individual values from the average is +/-0.2inches (5.1mm) H ₂ O.
Initials <u>AJV</u> Date <u>7-Apr-23</u>
AJV



Field Barometer Calibration Form

Project #: EFC223119

IN OFFICE PRE-TEST CALIBRATION

Reference Standard Used:

Standard ID	Serial number	Adjusted on:	Calibration due:
Helena mercury barometer	BIS01	3/24/2023	Must be properly adjusted prior to every use

Field Barometer Verification:

Barometer ID: TS1

Reference Value (in Hg)	Observed (in Hg)	Correction*	Tolerance (+/- 0.1 in Hg)**
25.90	25.85	-0.05	PASS

*Correction is the difference between the observed and reference values

**EPA Method 5, Section 6.1.2 and EPA Method 2, Section 6.5.

Technician: AJV

Date: 3/24/2023



Field Balance and Weights Calibration Form

Project #: EFC223119

IN OFFICE PRE-TEST CHECKS

Date: 3/21/2023
Performed by: A. Van Sickle

Environmental conditions in the lab:

Temperature °F	Pressure "Hg
70	25.85

Reference Standard(s) Used:

Standard ID	Serial number(s)	Calibrated on:	Calibration due:
500g weight	10696	3/20/2023	3/20/2024
1kg and 2kg weight set	11078/11072	3/20/2023	3/20/2024

Verification of Field Balance Against Reference Standard Weights:

Field Balance ID: HLN FB-1

Nominal Value (g)	Observed (g)	Correction*	Tolerance (+/- 0.5g)**
500	500.0	0.0	PASS
1000	1000.3	0.3	PASS
2000	2000.4	0.4	PASS

Verification of Field Standard Weights :

Field Weights ID: HLN FW-1

Nominal Value (g)	Observed (g)	Correction*	Tolerance (+/- 0.5g)**
500	500.0	0.0	PASS
1000	999.7	0.3	PASS
2000	2000.0	0.0	PASS

*Correction is the difference between the observed and nominal mass values

**EPA Method 5, Section 6.3.4

ONSITE BALANCE VERIFICATION

Date: 3/27/2023**Performed by:** ARB**Environmental conditions onsite:**

Temperature °F	Pressure "Hg
~30	29.88

Field Balance Verification:**Balance ID:** HLN FB-1**Weights ID:** HLN FW-1

Nominal Value (g)	Observed (g)	Correction*	PASS/FAIL Tolerance (+/- 0.5g)
500	500.0	0.0	PASS
1000	1000.2	0.2	PASS
2000	2000.2	0.2	PASS

*Correction is the difference between the observed and nominal mass values

ONSITE BALANCE VERIFICATION**Date:** 3/28/2023**Performed by:** ARB**Environmental conditions onsite:**

Temperature °F	Pressure "Hg
~35	29.41

Field Balance Verification:**Balance ID:** HLN FB-1**Weights ID:** HLN FW-1

Nominal Value (g)	Observed (g)	Correction*	PASS/FAIL Tolerance (+/- 0.5g)
500	500.0	0.0	PASS
1000	1000.0	0.0	PASS
2000	2000.1	0.1	PASS

*Correction is the difference between the observed and nominal mass values

ONSITE BALANCE VERIFICATION**Date:** 3/29/2023**Performed by:** ARB**Environmental conditions onsite:**

Temperature °F	Pressure "Hg
~34	29.41

Field Balance Verification:**Balance ID:** HLN FB-1**Weights ID:** HLN FW-1

Nominal Value (g)	Observed (g)	Correction*	PASS/FAIL Tolerance (+/- 0.5g)
500	500.1	0.1	PASS
1000	1000.2	0.2	PASS
2000	2000.2	0.2	PASS

*Correction is the difference between the observed and nominal mass values



Field Caliper Calibration Form

Project #: EFC223119

IN OFFICE PRE-TEST CHECKS

Date: 3/21/2023
Performed by: A. Van Sickle

Reference Standard Used:

Standard ID	Serial number	Calibrated on:	Calibration due:
HLN1 Aurora	77160806226	3/30/2022	3/30/2023

Caliper Verification:

Field Caliper ID: WS2

Inside Diameter

Reference Value (inches)	Observed (inches)	Correction*	Tolerance (+/- 0.0050 inch)
2.620	2.620	0.000	PASS

*Correction is the difference between the observed and reference values

Outside Diameter

Reference Value (inches)	Observed (inches)	Correction*	Tolerance (+/- 0.0050 inch)
4.790	4.790	0.000	PASS

Field Caliper ID: WS1

Inside Diameter

Reference Value (inches)	Observed (inches)	Correction*	Tolerance (+/- 0.0050 inch)
2.620	2.620	0.000	PASS

*Correction is the difference between the observed and reference values

Outside Diameter

Reference Value (inches)	Observed (inches)	Correction*	Tolerance (+/- 0.0050 inch)
4.790	4.790	0.000	PASS

*Correction is the difference between the observed and reference values



Thermocouple Calibration Form

Project #: EFC223119

POST-TEST CHECKS

Reference Standard Used:

Standard ID	Serial number(s)	Calibrated on:	Calibration due:
Omega	T-318009	10/13/2022	10/13/2023

Temperature Meter Mode:

Thermocouple ID	Continuity (x = pass)	Observed Temp (°F)	Reference Temp (°F)	Correction*	Tolerance (+/- 2°F)**
Stack Temp (Bison 1)	x	71.0	70.5	0.5	PASS
Stack Temp (7C)	x	71.0	70.6	0.4	PASS
Stack Temp (8A)	x	70.0	70.7	0.7	PASS
Stack Temp (5B)	x	71.0	70.6	0.4	PASS
Stack Temp (7D)	x	71.0	72.0	1.0	PASS
Stack Temp (B5C)	x	72.0	71.6	0.4	PASS
Probe Liner (Bison 1)	x	71.0	70.5	0.5	PASS
Probe Liner (7C)	x	68.9	70.0	1.1	PASS
Probe Liner (8A)	x	68.8	70.1	1.3	PASS
Probe Liner (5B)	x	68.8	70.0	1.2	PASS
Probe Liner (7D)	x	72.0	72.0	0.0	PASS
Probe Liner (B5C)	x	72.0	71.6	0.4	PASS
Hot Box (HHB1)	x	71.0	70.8	0.2	PASS
Hot Box (HHB4)	x	72.0	70.8	1.2	PASS
Hot Box (HHB2)	x	71.0	70.8	0.2	PASS
Hot Box (HHB7)	x	71.0	70.8	0.2	PASS
GN2	x	70.0	70.8	0.8	PASS
GN4	x	70.0	70.8	0.8	PASS
GN6	x	70.0	70.8	0.8	PASS
GN8	x	71.0	70.8	0.2	PASS
GN3	x	71.0	70.8	0.2	PASS
GN5	x	71.0	70.8	0.2	PASS
DGM Outlet (Box 11)	x	71.0	72.0	1.0	PASS
DGM Outlet (Box 12)	x	70.0	72.0	2.0	PASS
DGM Outlet (Box 13)	x	70.0	72.0	2.0	PASS
DGM Outlet (SB-2)	x	71.0	72.0	1.0	PASS
DGM Outlet (Box 10)	x	71	71.6	0.6	PASS
DGM Outlet (Box 15)	x	72		0.4	PASS

Calibration Output Mode:

Switch the Omega from 'Meter Input' to 'Calibration Output' mode. Test the meter box temperature readout by sending a voltage output equivalent to a temperature similar to stack temperature.

Meter Box ID	Reference Temp Output (°F)	Meter Box Readout (°F)	Correction*	Tolerance (+/- 2°F)**
11	60.0	59	1.0	PASS
12		60	0.0	PASS
13		58	2.0	PASS
SB-2		59	1.0	PASS
10	60.0	59	1.0	PASS
15		60	0.0	PASS

*Correction is the difference between the observed and reference values

**Alt-011 6/21/94 Alternative Method 2 Thermocouple Calibration Procedure:

Continuity Check - confirm the thermocouple is reading at the tip by subjecting it to a change in temperature (e.g. removing it from the stack, or touching it with your hand).
Single-point temperature check at ambient temperature, or any temperature, within the range specified by the manufacturer.

Technician: KAD, ARB, JMK

Date: 5/5/2023, 5/19/2023, 5/31/2023

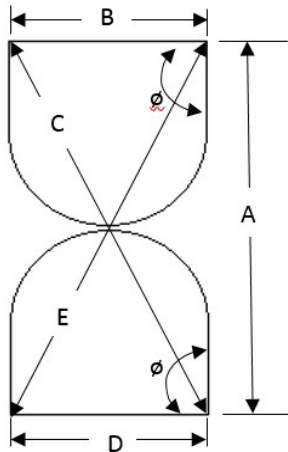


S-Type Pitot Tube Geometric Calibration

Pitot ID: B5C

Date of Geometric Calibration (< 6 months): 12/20/2022

Effective Length (ft.) 5



A	0.85
B	0.39
C	0.95
D	0.39
E	0.93

$$\frac{a^2 + b^2 - c^2}{2ab} = \cos \phi$$

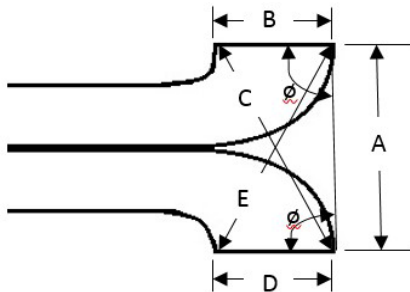
$$\frac{a^2 + d^2 - e^2}{2ad} = \cos \phi$$

ϕ	92.52

(80° < ϕ < 100°)

ϕ	89.49

(80° < ϕ < 100°)



A	0.85
B	0.65
C	1.04
D	0.63
E	1.05

$$\frac{a^2 + b^2 - c^2}{2ab} = \cos \phi$$

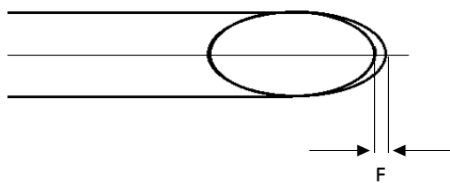
$$\frac{a^2 + d^2 - e^2}{2ad} = \cos \phi$$

ϕ	86.40

(85° < ϕ < 95°)

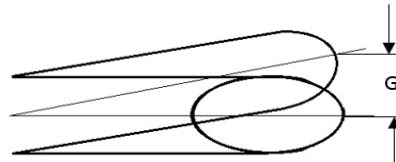
ϕ	88.27

(85° < ϕ < 95°)



F=	0.000

(F < 0.125)



G=	0.000

(G < 0.032)

Results of the Post-Test Pitot Inspection (mark with x below):

No change x

Damaged _____

New Calibration _____

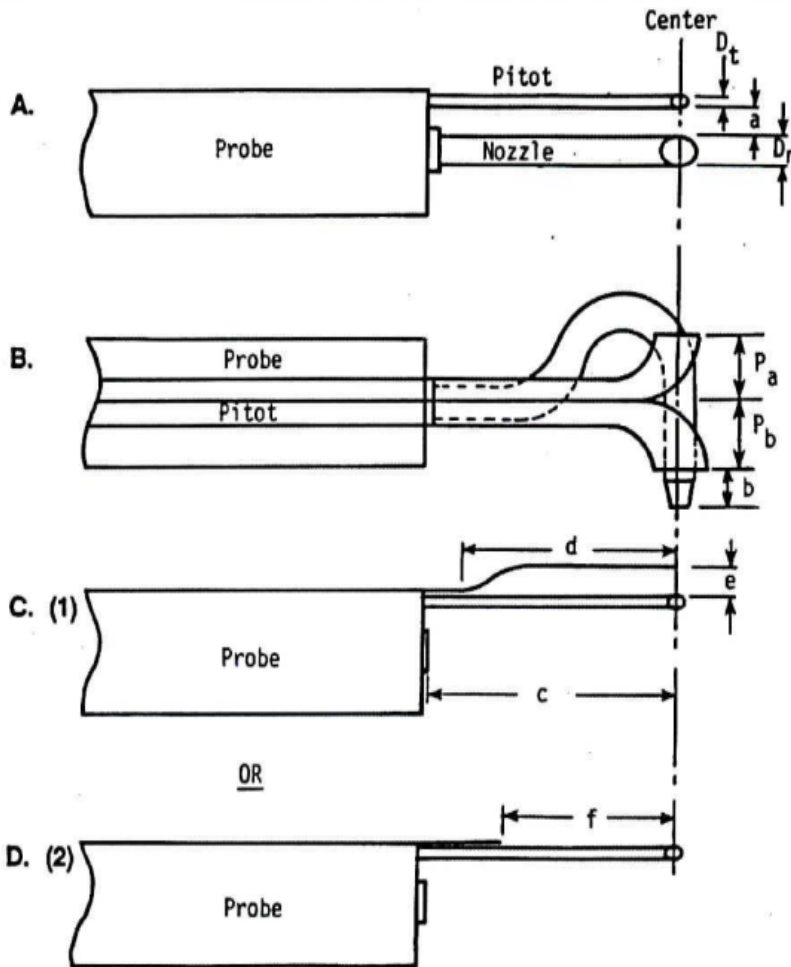
Technician: KAD

Date: 5/5/2023



Probe Calibration

Probe ID and Length: B5C
 Date of calibration (< 6 months): 12/20/2022
 Effective Length (ft.): 5



Measure (Inch)

Dt:	0.38
Dn:	0.50
a:	0.83

Dt = 0.187 to 0.375
Dn = 0.5
a ≥ 0.750

Pa:	0.44
Pb:	0.44
b:	0.50

Pa = Pb
B ≥ 0

c:	3.00
d:	5.75
e:	1.50

c ≥ 3.0
d ≥ 3.0
e ≥ 0.750

or

f:	N/A

f ≥ 2.0

R

No change x

Damaged

New Calibration

Technician: KAD

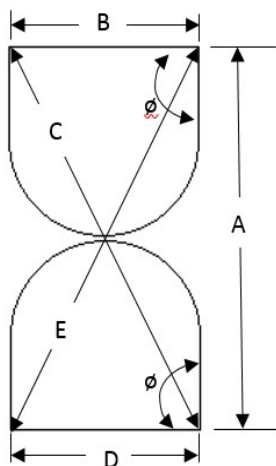
Date: 5/5/2023

S-Type Pitot Tube Geometric Calibration

Pitot ID: 5B

Date of Geometric Calibration (< 6 months): 5/26/2023

Effective Length (ft.) 5ft



A	0.89
B	0.37
C	0.97
D	0.37
E	0.96

$$\frac{a^2 + b^2 - c^2}{2ab} = \cos \phi$$

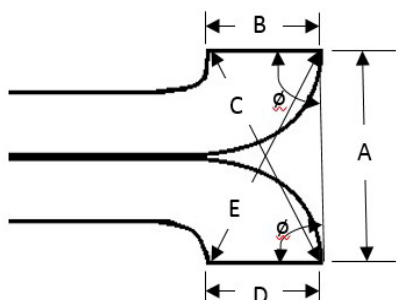
$$\frac{a^2 + d^2 - e^2}{2ad} = \cos \phi$$

ϕ	91.05

(80° < ϕ < 100°)

ϕ	90.51

(80° < ϕ < 100°)



A	0.88
B	0.75
C	1.19
D	0.75
E	1.18

$$\frac{a^2 + b^2 - c^2}{2ab} = \cos \phi$$

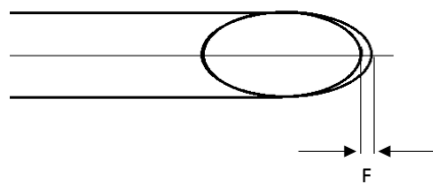
$$\frac{a^2 + d^2 - e^2}{2ad} = \cos \phi$$

ϕ	93.41

(85° < ϕ < 95°)

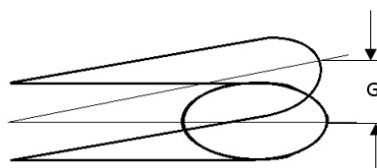
ϕ	92.17

(85° < ϕ < 95°)



F= 0.081

(F < 0.125)



G= 0.000

(G < 0.032)

Results of the Post-Test Pitot Inspection (mark with x below):

No change _____

Damaged _____

New Calibration x

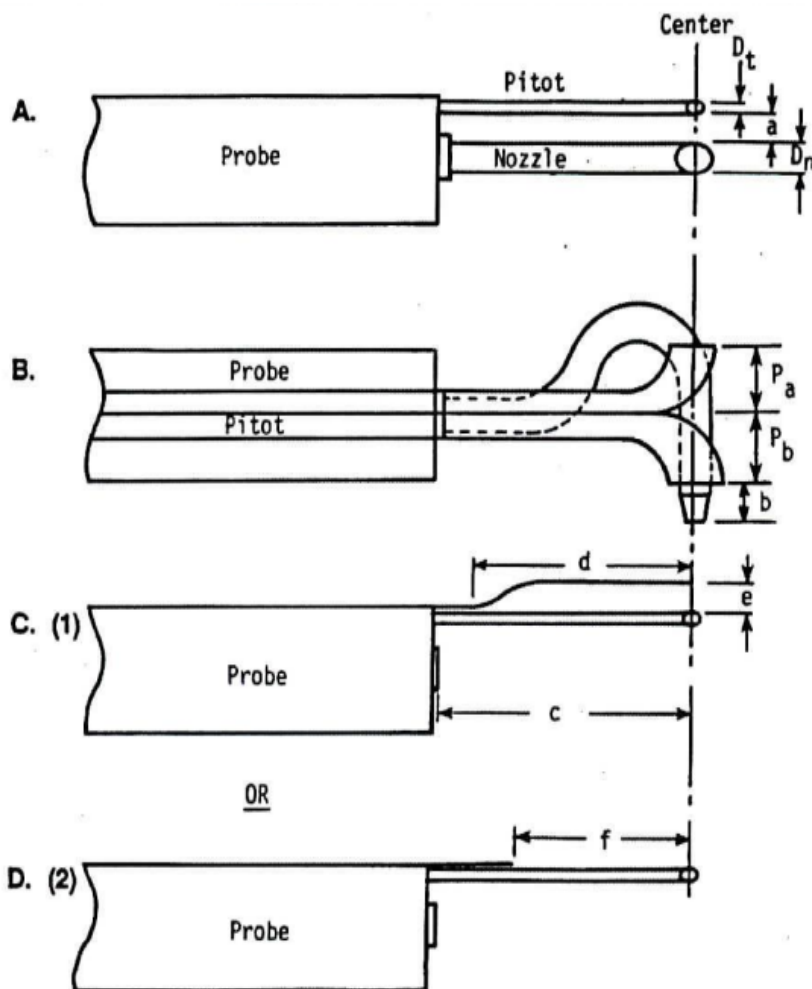
Technician: ARB

Date: 5/26/2023



Probe Calibration

Probe ID and Length: 5B
 Date of calibration (< 6 months): 5/26/2023
 Effective Length (ft.) 5ft



Measure (Inch)

Dt:	0.38
Dn:	0.50
a:	0.77

Dt = 0.187 to 0.375
 Dn = 0.5
 a ≥ 0.750

Pa:	0.42
Pb:	0.42
b:	0.18

Pa = Pb
 B ≥ 0

c:	4.58
d:	6.08
e:	0.77

c ≥ 3.0
 d ≥ 3.0
 e ≥ 0.750

or

f:	

f ≥ 2.0

R

No change _____

Damaged _____

New Calibration x

Technician: ARB

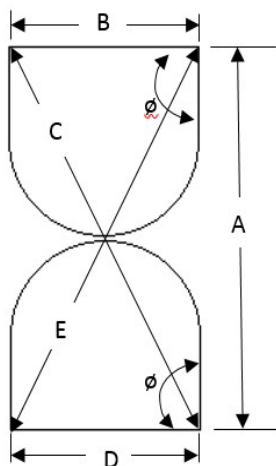
Date: 5/26/2023

S-Type Pitot Tube Geometric Calibration

Pitot ID: 7C

Date of Geometric Calibration (< 6 months): 5/26/2023

Effective Length (ft.) 7ft



A	0.88
B	0.38
C	0.95
D	0.38
E	0.95

$$\frac{a^2 + b^2 - c^2}{2ab} = \cos \phi$$

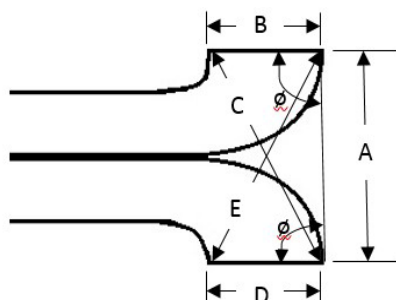
$$\frac{a^2 + d^2 - e^2}{2ad} = \cos \phi$$

ϕ	87.92

(80° < ϕ < 100°)

ϕ	88.18

(80° < ϕ < 100°)



A	0.88
B	0.61
C	1.11
D	0.61
E	1.09

$$\frac{a^2 + b^2 - c^2}{2ab} = \cos \phi$$

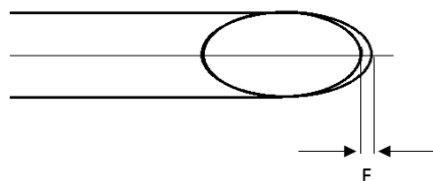
$$\frac{a^2 + d^2 - e^2}{2ad} = \cos \phi$$

ϕ	94.72

(85° < ϕ < 95°)

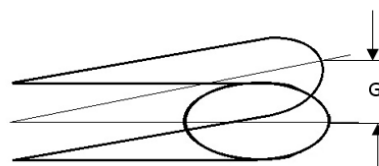
ϕ	92.08

(85° < ϕ < 95°)



F= 0.062

(F < 0.125)



G= 0.000

(G < 0.032)

Results of the Post-Test Pitot Inspection (mark with x below):

No change _____

Damaged _____

New Calibration x

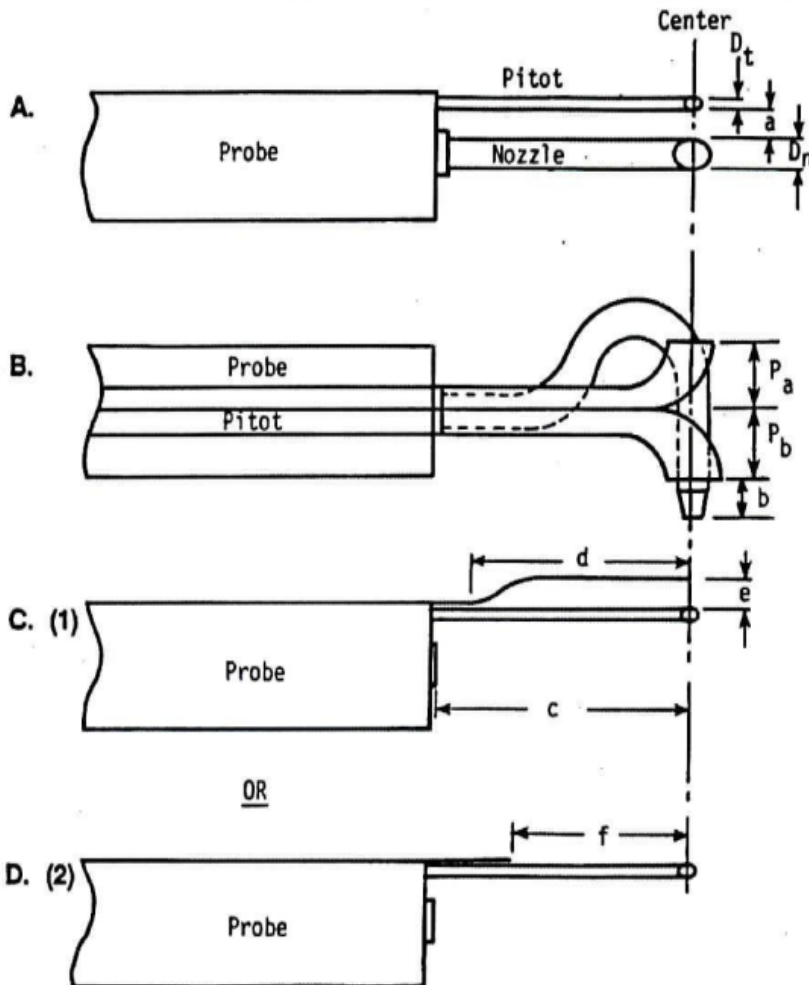
Technician: ARB

Date: 5/26/2023



Probe Calibration

Probe ID and Length: 7C
 Date of calibration (< 6 months): 5/26/2023
 Effective Length (ft.) 7ft



Measure (Inch)

Dt:	0.38
Dn:	0.50
a:	0.89

Dt = 0.187 to 0.375
 Dn = 0.5
 a ≥ 0.750

Pa:	0.44
Pb:	0.44
b:	0.15

Pa = Pb
 B ≥ 0

c:	4.08
d:	6.14
e:	1.28

c ≥ 3.0
 d ≥ 3.0
 e ≥ 0.750

or

f:	

f ≥ 2.0

R

No change _____

Damaged _____

New Calibration x

Technician: ARB

Date: 5/26/2023

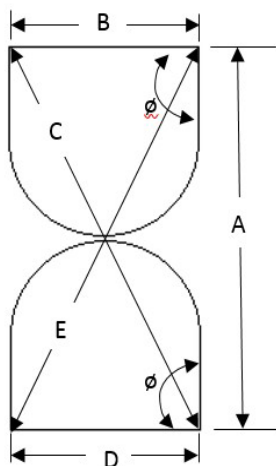


S-Type Pitot Tube Geometric Calibration

Pitot ID: 8A

Date of Geometric Calibration (< 6 months): 5/26/2023

Effective Length (ft.) 8ft



A	0.91
B	0.39
C	0.97
D	0.39
E	0.97

$$\frac{a^2 + b^2 - c^2}{2ab} = \cos \phi$$

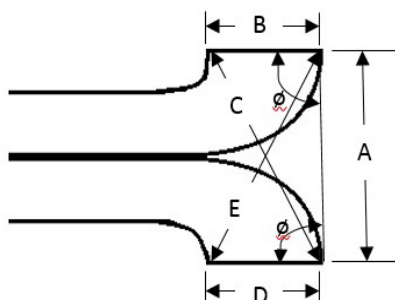
$$\frac{a^2 + d^2 - e^2}{2ad} = \cos \phi$$

ϕ	87.23

(80° < ϕ < 100°)

ϕ	86.87

(80° < ϕ < 100°)



A	0.90
B	0.59
C	1.04
D	0.58
E	1.06

$$\frac{a^2 + b^2 - c^2}{2ab} = \cos \phi$$

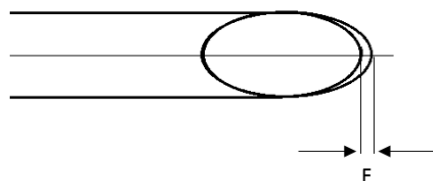
$$\frac{a^2 + d^2 - e^2}{2ad} = \cos \phi$$

ϕ	86.24

(85° < ϕ < 95°)

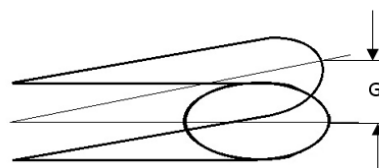
ϕ	89.26

(85° < ϕ < 95°)



F= 0.058

(F < 0.125)



G= 0.000

(G < 0.032)

Results of the Post-Test Pitot Inspection (mark with x below):

No change _____

Damaged _____

New Calibration x

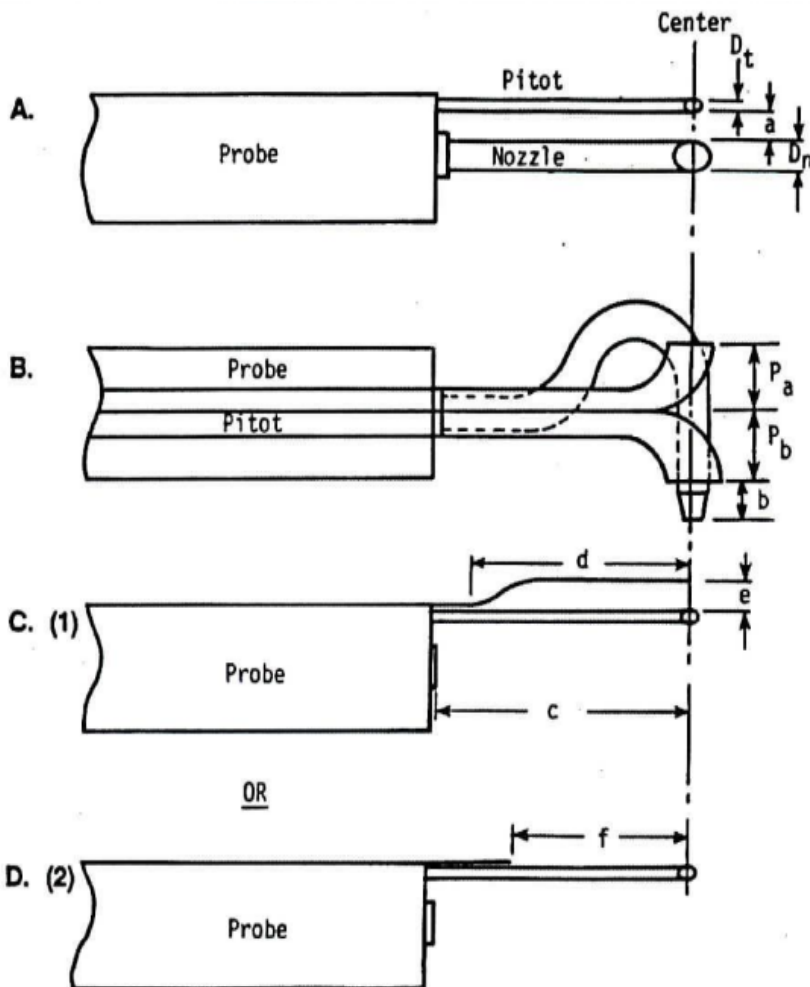
Technician: ARB

Date: 5/26/2023



Probe Calibration

Probe ID and Length: 8A
 Date of calibration (< 6 months): 5/26/2023
 Effective Length (ft.) 8ft



Measure (Inch)

Dt:	0.37
Dn:	0.50
a:	1.15

Dt = 0.187 to 0.375
 Dn = 0.5
 a ≥ 0.750

Pa:	0.46
Pb:	0.46
b:	0.97

Pa = Pb
 B ≥ 0

c:	5.54
d:	13.52
e:	0.70

c ≥ 3.0
 d ≥ 3.0
 e ≥ 0.750

or

f:	

f ≥ 2.0

R

No change _____

Damaged _____

New Calibration x

Technician: ARB

Date: 5/26/2023

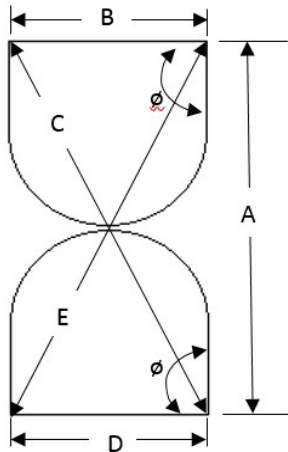


S-Type Pitot Tube Geometric Calibration

Pitot ID: 7D

Date of Geometric Calibration (< 6 months): 5/31/2023

Effective Length (ft.) 7



A	0.89
B	0.38
C	0.94
D	0.39
E	0.95

$$\frac{a^2 + b^2 - c^2}{2ab} = \cos \phi$$

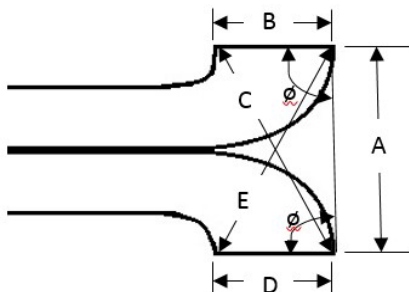
$$\frac{a^2 + d^2 - e^2}{2ad} = \cos \phi$$

ϕ	84.85

(80° < ϕ < 100°)

ϕ	87.61

(80° < ϕ < 100°)



A	0.88
B	0.51
C	1.04
D	0.49
E	1.02

$$\frac{a^2 + b^2 - c^2}{2ab} = \cos \phi$$

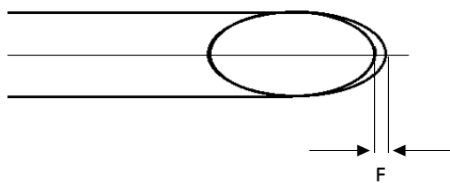
$$\frac{a^2 + d^2 - e^2}{2ad} = \cos \phi$$

ϕ	92

(85° < ϕ < 95°)

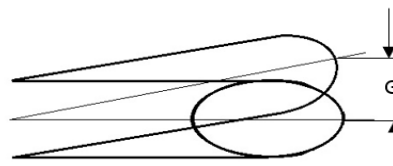
ϕ	91

(85° < ϕ < 95°)



F= -0.020

(F < 0.125)



G= 0.000

(G < 0.032)

Results of the Post-Test Pitot Inspection (mark with x below):

No change _____

Damaged _____

New Calibration x

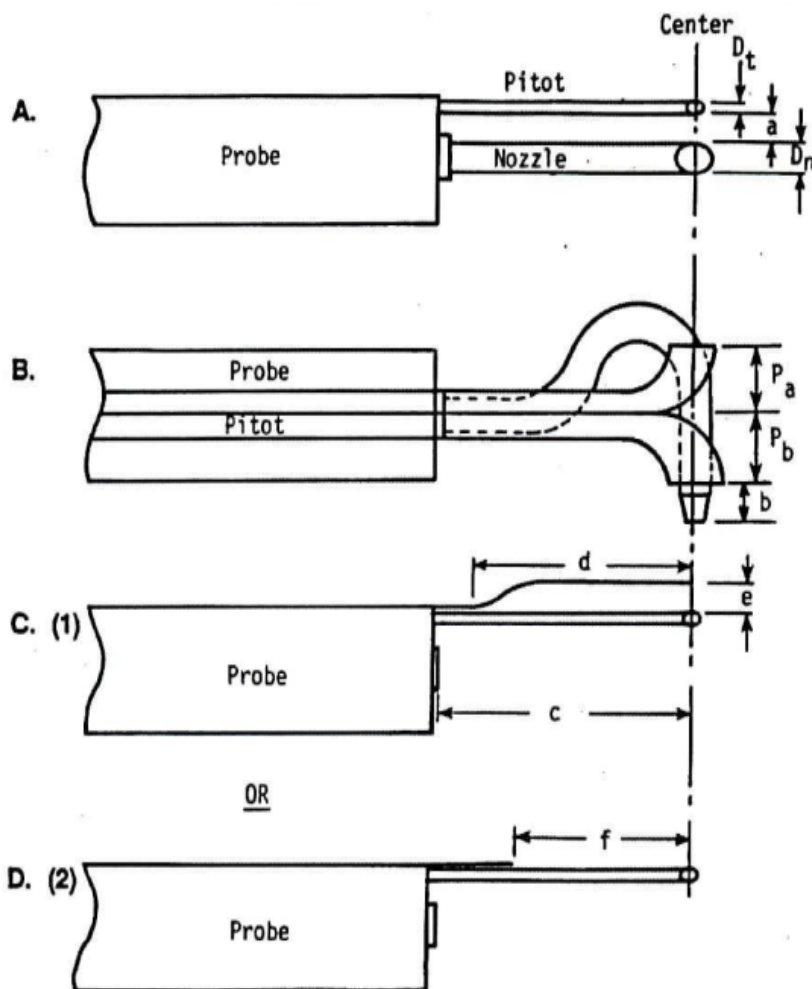
Technician: JMK

Date: 5/31/2023



Probe Calibration

Probe ID and Length: 7D
 Date of calibration (< 6 months): 5/31/2023
 Effective Length (ft.) 7



Measure (Inch)

Dt:	0.38
Dn:	0.50
a:	0.75

$D_t = 0.187 \text{ to } 0.375$

$D_n = 0.5$

$a \geq 0.750$

Pa:	0.50
Pb:	0.50
b:	0.50

$P_a = P_b$

$B \geq 0$

c:	7.50
d:	4.50
e:	1.50

$c \geq 3.0$

$d \geq 3.0$

$e \geq 0.750$

or

f:	

$f \geq 2.0$

R

No change _____

Damaged _____

New Calibration x

Technician: JMK

Date: 5/31/2023

CERTIFICATE OF ANALYSIS

Grade of Product: EPA PROTOCOL STANDARD

Part Number:	E03NI80E15A0138	Reference Number:	153-402665182-1
Cylinder Number:	ALM026532	Cylinder Volume:	141.0 CF
Laboratory:	124 - Tooele (SAP) - UT	Cylinder Pressure:	2015 PSIG
PGVP Number:	B72023	Valve Outlet:	590
Gas Code:	CO2,O2,BALN	Certification Date:	Feb 13, 2023

Expiration Date: Feb 13, 2031

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted. The results relate only to the items tested. The report shall not be reproduced except in full without approval of the laboratory. Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	10.00 %	9.850 %	G1	+/- 0.8% NIST Traceable	02/13/2023
OXYGEN	10.00 %	9.898 %	G1	+/- 0.7% NIST Traceable	02/13/2023
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	13060405	CC411744	7.489 % CARBON DIOXIDE/NITROGEN	0.6%	May 14, 2025
NTRM	98051010	SG9161286BAL	12.05 % OXYGEN/NITROGEN	0.7%	Dec 14, 2023

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba VIA-510 SV4MEUTJ CO2	CO2 NDIR (Dixon)	Feb 09, 2023
Horiba MPA-510 W603MM58 O2	O2 Paramagnetic (Mason)	Feb 09, 2023

Triad Data Available Upon Request



Signature on file

EFC223119 Approved for Release

2023 Eagle Foundry Emission Factor Determination and PTE Verification Test Report, Rev 02

Page 1 of 1

CERTIFICATE OF ANALYSIS

Grade of Product: EPA PROTOCOL STANDARD

Part Number:	E03NI80E15A0138	Reference Number:	153-402667044-1
Cylinder Number:	ALM054560	Cylinder Volume:	141.0 CF
Laboratory:	124 - Tooele (SAP) - UT	Cylinder Pressure:	2015 PSIG
PGVP Number:	B72023	Valve Outlet:	590
Gas Code:	CO2,O2,BALN	Certification Date:	Feb 14, 2023

Expiration Date: Feb 14, 2031

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted. The results relate only to the items tested. The report shall not be reproduced except in full without approval of the laboratory. Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	10.00 %	9.924 %	G1	+/- 0.8% NIST Traceable	02/14/2023
OXYGEN	10.00 %	10.11 %	G1	+/- 0.9% NIST Traceable	02/14/2023
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	13060405	CC411744	7.489 % CARBON DIOXIDE/NITROGEN	0.6%	May 14, 2025
NTRM	98051010	SG9161286BAL	12.05 % OXYGEN/NITROGEN	0.7%	Dec 14, 2023

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba VIA-510 SV4MEUTJ CO2	CO2 NDIR (Dixon)	Feb 09, 2023
Horiba MPA-510 W603MM58 O2	O2 Paramagnetic (Mason)	Feb 09, 2023

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CERTIFICATE OF ANALYSIS

Grade of Product: EPA PROTOCOL STANDARD

Part Number:	E03NI56E15A1055	Reference Number:	153-402665181-1
Cylinder Number:	EB0155552	Cylinder Volume:	162.0 CF
Laboratory:	124 - Tooele (SAP) - UT	Cylinder Pressure:	2015 PSIG
PGVP Number:	B72023	Valve Outlet:	590
Gas Code:	CO2,O2,BALN	Certification Date:	Feb 13, 2023

Expiration Date: Feb 13, 2031

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted. The results relate only to the items tested. The report shall not be reproduced except in full without approval of the laboratory. Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	22.00 %	21.61 %	G1	+/- 0.8% NIST Traceable	02/13/2023
OXYGEN	22.00 %	22.03 %	G1	+/- 0.5% NIST Traceable	02/13/2023
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	13060802	CC415397	24.04 % CARBON DIOXIDE/NITROGEN	0.6%	Dec 11, 2025
NTRM	09061434	CC282492	22.53 % OXYGEN/NITROGEN	0.4%	May 13, 2025

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba VIA-510 SV4MEUTJ CO2	CO2 NDIR (Dixon)	Feb 09, 2023
Horiba MPA-510 W603MM58 O2	O2 Paramagnetic (Mason)	Feb 09, 2023

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CERTIFICATE OF ANALYSIS

Grade of Product: EPA PROTOCOL STANDARD

Part Number:	E03NI56E15A1055	Reference Number:	153-402665181-1
Cylinder Number:	EB0157290	Cylinder Volume:	162.0 CF
Laboratory:	124 - Tooele (SAP) - UT	Cylinder Pressure:	2015 PSIG
PGVP Number:	B72023	Valve Outlet:	590
Gas Code:	CO2,O2,BALN	Certification Date:	Feb 13, 2023

Expiration Date: Feb 13, 2031

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted. The results relate only to the items tested. The report shall not be reproduced except in full without approval of the laboratory. Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	22.00 %	21.66 %	G1	+/- 0.8% NIST Traceable	02/13/2023
OXYGEN	22.00 %	22.01 %	G1	+/- 0.5% NIST Traceable	02/13/2023
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	13060802	CC415397	24.04 % CARBON DIOXIDE/NITROGEN	0.6%	Dec 11, 2025
NTRM	09061434	CC282492	22.53 % OXYGEN/NITROGEN	0.4%	May 13, 2025

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba VIA-510 SV4MEUTJ CO2	CO2 NDIR (Dixon)	Feb 09, 2023
Horiba MPA-510 W603MM58 O2	O2 Paramagnetic (Mason)	Feb 09, 2023

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