MAUL FOSTER ALONGI
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November 6, 2024
Project No. M8006.63.001

Julia DeGagné
Oregon Department of Environmental Quality
700 NE Multnomah Street, Suite 600
Portland, Oregon 97232

Re: Response to DEQ request for information dated October 22, 2024

Dear Julia:

On behalf of Eagle Foundry Company (Eagle Foundry), Maul Foster & Alongi (MFA) is providing this response to your email dated October 22, 2024 (the Email) in which the Department of Environmental Quality (DEQ) requested additional information as well as changes to Eagle Foundry's air toxics emissions inventory. The Email states that Eagle Foundry must submit responses to the Email and an updated Cleaner Air Oregon (CAO) emissions inventory no later than November 6, 2024.

This response is organized in the same manner as the information was requested in the Email. The Email comments are shown in bold followed by the response. MFA has prepared a revised version of the CAO emissions inventory included as Attachment A. MFA has updated the AQ520 form and will provide it electronically to the DEQ. The Excel version of the emissions inventory will be provided electronically.

1. **Updated the following annual production-weighted average compositions to include all components (added and trace) of the alloys:**

    a. **GRIND NSS_C and GRIND NSS_F:**

        i. **Nickel = 0.80 percent;**

        ii. **Molybdenum trioxide = 0.74 percent (molybdenum = 0.49 percent);**

        iii. **Phosphorus = 0.09 percent;**

    b. **AIR ARC:**

        i. **Phosphorus = 0.059 percent;**

        ii. **Copper = 0.11 percent**

        iii. **Molybdenum trioxide = 0.70 percent (0.46 percent molybdenum)**

The annual production-weighted average compositions for the GRIND_NSS_C, GRIND_NSS_F, AND AIRARC have been updated in the emissions inventory as requested.

2. **Updated the following slag handling emission factors to be consistent with the analytical data:**

    a. **Chromium VI: Sample result was 15.5 mg/kg; percent of PM = 0.00155 percent.**

    b. **Nickel: Sample result was 38.6 mg/kg; percent of PM = 0.00386 percent.**

The slag handling percentage of PM for Chromium VI and Nickel have been updated as requested.

3. **Updated welding emissions for the Lincore M wire to use FCAW fume generation rate and fume correction factor for nickel and manganese (the formula was already corrected for Chromium VI).**

The welding nickel and manganese emission calculations for the Lincore M wire have been updated to use the FCAW fume generation rate and fume correction factor.

4. **Updated the annual throughput for the S_PALMER TEU from 14.8 to 14.948 tons of PM generated for consistency with the supporting calculations (the emissions are correct in AQ520).**

The annual throughput for the S_PALMER TEU has been updated to 14.948 tons of PM generated.

5. **Added "Velvacoat ST 803 – Mold Wash Z" to the AQ520 for the MOLD_SP TEU**

Velvacoat ST 803—Mold Wash Z has been added to the AQ520 for the MOLD_SP TEU.

6. **For exempt TEUs on Worksheet 2:**
    a. **Added TEU IDs**
    b. **Consolidated raw materials handling into a single exempt TEU**
    c. **Added one exempt diesel tank**

AQ520 has been updated with the requested information for exempt TEUs.

7. **For TEU D1_5, updated the "Reference/Notes" column to include that TAC speciation comes from the product SDS for crystalline silica.**

The reference for TEU D1_5, crystalline silica, has been updated as requested.

8. **Provide the number, size, and approximate annual throughput for the propane storage tanks and diesel storage tank.**

The information for the propane and diesel storage tanks has been updated in AQ520 as requested.

9. **Review and update the actual annual and daily throughputs for Coated Cerabead, G-29 sand, and Naigai Cerabead usage (TEUs MOLD_SP and MOLD_BP) to include recycled as well as purchased material, as appropriate (these cells are highlighted orange in the AQ520).**

The actual annual and daily throughputs for Coated Cerabead, G-29 sand, and Naigai Cerabead usage have been updated to include recycled as well as purchased materials.

10. **In Table D2 in the supporting calculations workbook, correct the missing references/values for RBCs in column I.**

The references in Table D2 have been updated as requested.

11. **Provide a redacted version of the slag analytical data that removes any "Attorney/Client Privilege" notes.**

The redacted version of the slag analytical data is provided in Attachment B.

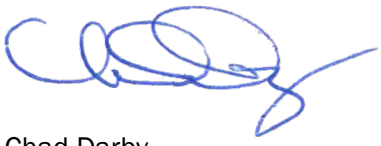
12. **Provide an updated version of the supporting calculations.**

A pdf of the supporting calculations is included as Attachment A. An Excel version of the emissions inventory will be provided electronically.

Thank you for working with us throughout this process. Please contact Chad Darby at CDarby@maulfoster.com or Leslie Riley at LRiley@maulfoster.com if there are any questions or comments about the information being provided.

Sincerely,

Maul Foster & Alongi, Inc.



Chad Darby
Principal Air Quality Specialist

Attachments

A— Emissions Inventory (REV 11.6.24) pdf

B—Slag Dust Report (Redacted)

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Attachment A

CAO Emissions Inventory REV11.6.2024

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Table 1
Input Process Rates and Parameters
Eagle Foundry Company

Source	Production or Throughput Rate									
	2021					PTE				
	Daily			Annual		Daily			Annual	
Facility										
Facility Hours of Operation	20.0	(hrs/day)	(1)	6,240	(hrs/yr) (a)	24.0	(hrs/day)	(2)	8,760	(hrs/yr) (2)
Foundry										
Total Metal Melted	23.6	(tons/day)	(b)	5,675	(tons/yr) (1)	31.0	(tons/day)	(4)	8,060	(tons/yr) (1)
Total White Iron Melted	18.9	(tons/day)	(c)	4,540	(tons/yr) (c)	0	(tons/day)	(5)	6,448	(tons/yr) (c)
Total Steel Melted	4.72	(tons/day)	(c)	1,135	(tons/yr) (c)	31.0	(tons/day)	(5)	1,612	(tons/yr) (c)
Total Metal Processed	14.5	(tons/day)	(d)	3,482	(tons/yr) (d)	19.0	(tons/day)	(d)	4,945	(tons/yr) (d)
Total Hot Top	92.3	(lb/day)	(b)	24,005	(lb/yr) (1)	142	(lb/day)	(b)	34,093	(lb/yr) (e)
Heat Treat										
Total Propane Usage	633	(gal/day)	(b)	151,830	(gal/yr) (1)	898	(gal/day)	(b)	215,639	(gal/yr) (e)
AirArc										
AirArc Process Hours of Operation	10.0	(hrs/day)	(1)	3,120	(hrs/yr) (a)	24.0	(hrs/day)	(b)	4,431	(hrs/yr) (e)
Cutting Torch Hours of Operation	2.80	(hrs/day)	(f)	859	(hrs/yr) (f)	6.60	(hrs/day)	(f)	1,220	(hrs/yr) (f)
Welding										
Percentage of Welding Wire to Waste	--			5	(%) (1)	--			5	(%) (1)
Total Wire - Excluding Waste	29.8	(lb/day)	(h)	7,150	(lb/yr) (h)	42.3	(lb/day)	(b)	10,155	(lb/yr) (h)
Lincore M WIRE HF LCM 1/16 25# SP	3.33	(lb/day)	(b)	800	(lb/yr) (1)	--			1,136	(lb/yr) (e)
Sandvik WIRE 309LSI .035 X 33 LB	0.14	(lb/day)	(b)	33.0	(lb/yr) (1)	--			46.9	(lb/yr) (e)
Avesta 2205 ELECTR SS E2209 1/8 10#	1.25	(lb/day)	(b)	300	(lb/yr) (1)	--			426	(lb/yr) (e)
Prostar S-6 WIRE MS 70S6 035 33# SP PRS	3.35	(lb/day)	(b)	803	(lb/yr) (1)	--			1,140	(lb/yr) (e)
Stoody WIRE HF 965-G 045 33# SP	3.71	(lb/day)	(b)	891	(lb/yr) (1)	--			1,265	(lb/yr) (e)
Hobart WIRE EXCELARC 71 .045 X 33 LB	0.41	(lb/day)	(b)	99.0	(lb/yr) (1)	--			141	(lb/yr) (e)
CARBONS 1/2X17 CTD DC JTD 100	19.2	(lb/day)	(b)	4,600	(lb/yr) (1)	--			6,533	(lb/yr) (e)
Pattern Production										
Urethane	0.25	(gal/day)	(b)	60.0	(gal/yr) (1)	0.36	(gal/day)	(b)	85.2	(gal/yr) (e)
Mar-Proof H/S Lacquer Sanding Sealer	0.021	(gal/day)	(b)	5.00	(gal/yr) (1)	0.030	(gal/day)	(b)	7.1	(gal/yr) (e)
Finishing										
Total Grinding (Metal Processed)	14.5	(tons/day)	(7)	3,482	(tons/yr) (7)	19.0	(tons/day)	(7)	4,945	(tons/yr) (7)
Grinding - Stainless Steel	--			--		2.5	(tons/day)	(1)	651	(tons/yr) (1)
Grinding - Non-stainless Steel	--			--		16.5	(tons/day)	(1)	4,294	(tons/yr) (1)

Table 1
Input Process Rates and Parameters
Eagle Foundry Company

Source	Production or Throughput Rate									
	2,021					PTE				
	Daily			Annual		Daily			Annual	
Abrasive Blasting										
Total Metal Finished by Abrasive Blasting	1.74	(tons/day)	(i)	418	(tons/yr) (i)	12.0	(tons/day)	(1)	593	(tons/yr) (i)
Mesh Blast (metal finished)	--		(8)	--	(8)	3.00	(tons/day)	(1)	59.3	(tons/yr) (1)
Shot Blast (metal finished)	1.74	(tons/day)	(1)	418	(tons/yr) (1)	9.00	(tons/day)	(1)	534	(tons/yr) (1)
Mold Production										
Total Sand Handled	--			6,583	(tons/yr) (10)	--			9,350	(tons/yr) (i)
Small Palmer Molding System										
Velvacoat St 803 - Mold Wash Z	49.2	(lb/day)	(b)	11,800	(lb/yr) (10)	41.7	(lb/day)	(b)	10,000	(lb/yr) (1)
Coated Cerabead	37.5	(lb/day)	(b)	87,485	(lb/yr) (j)	518	(lb/day)	(b)	124,257	(lb/yr) (k)
G-29 Sand	88.8	(lb/day)	(b)	207,165	(lb/yr) (j)	1,226	(lb/day)	(b)	294,241	(lb/yr) (k)
Naigai Cerabead	3,789	(lb/day)	(b)	7,980,234	(lb/yr) (j)	47,227	(lb/day)	(b)	11,334,527	(lb/yr) (k)
Unibond 1350 Core Paste	32.0	(lb/day)	(b)	6,925	(lb/yr) (1)	41.0	(lb/day)	(b)	9,835	(lb/yr) (e)
Small Palmer Molding Line (dust generated)	66.5	(lb/day)	(1)	10.4	(tons/yr) (o)	115	(lb/day)	(m)	14.948	(tons/yr) (e)
Big Palmer Molding System										
Velvacoat St 803 - Mold Wash Z	49.2	(lb/day)	(b)	11,800	(lb/yr) (1)	125	(lb/day)	(b)	30,000	(lb/yr) (1)
Isomol - Mold Wash M	15.0	(lb/day)	(b)	3,600	(lb/yr) (1)	21.3	(lb/day)	(b)	5,113	(lb/yr) (e)
Naigai Cerabead	2,097	(lb/day)	(b)	4,891,116	(lb/yr) (j)	28,946	(lb/day)	(b)	6,946,975	(lb/yr) (k)
Unibond 1350 Core Paste	17.7	(lb/day)	(b)	4,244	(lb/yr) (1)	25.1	(lb/day)	(b)	6,028	(lb/yr) (e)
Silo Operation										
Silos Hours of Operation	20.0	(hrs/day)	(11)	4,800	(hrs/yr) (11)	20.0	(hrs/day)	(11)	8,760	(hrs/yr) (11)
Slag Handling										
Slag Handling	0.50	(tons/day)	(1)	156	(tons/yr) (1)	0.90	(tons/day)	(b)	222	(tons/yr) (e)
Emergency Generator										
Hours of Operation	2.00	(hrs/day)	(1)	65.0	(hrs/yr) (1)	2.00	(hrs/day)	(1)	100	(hrs/yr) (12)
Diesel Usage	14.6	(gal/day)	(n)	475	(gal/yr) (n)	14.6	(gal/day)	(n)	730	(gal/yr) (n)

Filter	Control Efficiency (%)
Foundry Baghouse Control Efficiency for PM	90.0 (14)
Reclamation Baghouse Control Efficiency for PM	99.0 (1)
Baghouse Control Efficiency for $PM_{>10}$	100 (15)
Baghouse Control Efficiency for $PM_{2.5-10}$	99.5 (15)
Baghouse Control Efficiency for $PM_{2.5}$	99.0 (15)

Table 1
Input Process Rates and Parameters
Eagle Foundry Company

Notes

gal = gallon; PM = particulate matter.

(a) 2021 Annual hours of operation (hrs/yr) = (daily hours of operation [hrs/day]) x (operational days per week [days/week]) x (operational weeks per year [weeks/yr])

Operational days per week (days/week) =	6.00	(1)
Operational weeks per year [weeks/yr]) =	52.0	(1)

(b) Daily usage (unit/day) = (annual usage [unit/yr]) / (operational days per week [days/week]) / (operational weeks per year [weeks/yr]) x (1 + [short-term variability factor {%}]/100)

Short-term variability factor (%) =	30.0	(3)

(c) Metal poured (tons/unit) = (annual usage [tons/yr]) / (percentage of total metal poured [%]/100)

White Iron percentage of total metal poured (%) =	80.0	(1)
Steel percentage of total metal poured (%) =	20.0	(1)

(d) Total metal processed (tons metal processed) = (total metal poured [tons metal poured]) x (1 - [reject percentage {%}]/100) x (1 - [percentage of metal poured for riser {%}]/100)

Reject percentage (%) =	1.05	(1)
Percentage of metal poured for riser (%) =	38.0	(1)

(e) Annual parameter, PTE (units/yr) = (annual parameter, 2021 [units/yr]) x (total metal melt, PTE [tons melt/yr]) / (total metal melt, 2021 [tons melt/yr])

(f) Cutting torch hours of operation = (AirArc process hours of operation [hours/unit]) x (AirArc cutting time to total work time ratio)

AirArc cutting torch time to total work time ratio =	0.28	(g)

(g) AirArc cutting time to total work time ratio = (average minutes of cutting torch operation [minutes/unit]) / (average total minutes of operation [minutes/unit])

Average minutes of cutting torch operation (minutes) =	8.26	(6)
Average total minutes of operation (minutes) =	30.0	(6)

(h) Total welding wire - excluding waste (lb/unit) = (sum of welding wire usage [lb/unit]) x (1 - (percentage of welding wire waste [%] /100)

(i) Total metal finished by abrasive blasting (tons/unit) = (total metal processed [tons/unit]) x (percentage of metal processed finished by abrasive blasting [%]/100)

Percentage of metal processed finished by abrasive blasting (%) =	12.0	(1)

(j) Total sand handling (tons/yr) = (metal poured [tons/yr]) x (sand-to-metal ratio)

Sand-to-metal ratio (tons/ton) =	1.16	(9)

(j) Product usage (lb/yr) = (total sand handling [tons/yr]) x (2,000 lb/ton) x (2021 product purchase [lb/yr]) / (2021 total sand purchase [lb/yr])

2021 purchases Coated Cerabead (lb/year) =	9,000
2021 purchases G29 Sand (lb/year) =	21,312
2021 purchases Naigai Cerabead—Small Palmer (lb/year) =	820,964
2021 purchases Naigai Cerabead—Big Palmer (lb/year) =	503,172

(k) Product usage (lb/yr) = (2021 product purchase [lb/yr]) x (PTE total sand handling [tons/yr]) / (2021 total sand handling [tons/yr])

(m) Maximum daily parameter (lb/day) = (annual parameter [tons/yr]) x (2,000 lb/ton) / (operational days per week [days/week]) / (operational weeks per year [weeks/yr]) x (1 + [short-term variability factor {%}]/100)

Short-term variability factor (%) =	20.0	(3)

(n) Diesel usage (gal/unit) = (diesel usage [gal/hour]) x (hours of operation [hrs/unit])

Diesel usage (gal/hr) =	7.30	(13)

(o) Annual dust collected (tons/yr) = (daily dust collected [lb/day]) / (2,000 lb/ton) x (operational days per week [days/week]) x (operational weeks per year [weeks/yr])

Table 1
Input Process Rates and Parameters
Eagle Foundry Company

References

(1) Information provided by Eagle Foundry.

(2) Assumes continuous operation.

(3) Based on a 20 percent increase for short-term variability.

(4) Information provided by facility. Maximum daily production for PTE is based on the daily capacity of foundry operations.

(5) 100 percent of daily metal melted is allocated to HK steel alloy. Emissions from alloy HK results in the maximum predicted acute risk value.

(6) Based on an Eagle Foundry study of the time that cutting torches are in operation during AirArc process operations.

(7) Value represents the total metal processed. Total metal processed is equivalent to total metal melt minus reject percentage and metal poured for risers.

(8) The mesh blast unit was not used in 2021.

(9) Ratio of sand to total metal poured is based on facility operations. Value includes G-29 Sand, Naigai Cerabead, and Coated Cerabead.

(10) Information provided by Eagle Foundry. Values based on purchase records.

(11) Based on continuous operation for PTE estimates.

(12) See CFR 40 Ch. 1(C)(63). Emergency engines may only be operated for a maximum of 100 hours per calendar year.

(13) Based on a 100 kW emergency generator at 100 percent load.

(14) Assumed control efficiency provided by the Oregon DEQ by letter dated August 11, 2023.

(15) RTI International, 2012, Table F-1, Typical Collection Efficiencies of Various Particulate Control Devices. Assumes fabric filter—low temperature. RTI states that control efficiencies for PM larger that 10 micrometers in diameter are 100 percent.

Table 2
Foundry Emission Factors
Eagle Foundry Company

Toxic Air Contaminant	CAS/DEQ ID	Emission Factor											
		Steel						White Iron					
		Main Foundry Baghouse		Cooling Bunker Baghouse		Total		Main Foundry Baghouse		Cooling Bunker Baghouse		Total	
Aluminum and Compounds	7429-90-5	1.89E-03	(lb/ton melt) [1]	1.45E-03	(lb/ton melt) [1]	3.34E-03	(lb/ton melt)	1.94E-03	(lb/ton melt) [1]	1.72E-03	(lb/ton melt) [1]	3.66E-03	(lb/ton melt)
Antimony and Compounds	7440-36-0	< 1.60E-05	(lb/ton melt) [1]	< 1.48E-05	(lb/ton melt) [1]	< 3.08E-05	(lb/ton melt)	1.49E-05	(lb/ton melt) [1]	< 1.05E-05	(lb/ton melt) [1]	2.54E-05	(lb/ton melt)
Arsenic and Compounds	7440-38-2	< 6.01E-05	(lb/ton melt) [1]	< 5.43E-05	(lb/ton melt) [1]	< 1.14E-04	(lb/ton melt)	ND		< 4.42E-05	(lb/ton melt) [1]	< 4.42E-05	(lb/ton melt)
Barium and Compounds	7440-39-3	1.29E-04	(lb/ton melt) [1]	4.76E-05	(lb/ton melt) [1]	1.77E-04	(lb/ton melt)	7.42E-05	(lb/ton melt) [1]	3.70E-05	(lb/ton melt) [1]	1.11E-04	(lb/ton melt)
Beryllium and compounds	7440-41-7	ND		ND		ND		ND		ND		ND	
Cadmium and Compounds	7440-43-9	< 7.78E-06	(lb/ton melt) [1]	< 3.14E-06	(lb/ton melt) [1]	< 1.09E-05	(lb/ton melt)	< 3.71E-06	(lb/ton melt) [1]	ND		< 3.71E-06	(lb/ton melt)
Chromium	7440-47-3	3.43E-03	(lb/tons TAC in melt) [1]	9.38E-04	(lb/tons TAC in melt) [1]	4.37E-03	(lb/tons TAC in melt)	2.31E-04	(lb/tons TAC in melt) [1]	9.26E-05	(lb/tons TAC in melt) [1]	3.24E-04	(lb/tons TAC in melt)
Chromium VI	18540-29-9	1.32E-05	(lb/tons TAC in melt) [1]	1.87E-05	(lb/tons TAC in melt) [1]	3.19E-05	(lb/tons TAC in melt)	7.20E-07	(lb/tons TAC in melt) [1]	< 1.16E-06	(lb/tons TAC in melt) [1]	1.88E-06	(lb/tons TAC in melt)
Cobalt and Compounds	7440-48-4	< 2.43E-06	(lb/ton melt) [1]	< 1.98E-06	(lb/ton melt) [1]	< 4.41E-06	(lb/ton melt)	< 2.45E-06	(lb/ton melt) [1]	< 2.03E-06	(lb/ton melt) [1]	< 4.48E-06	(lb/ton melt)
Copper and Compounds	7440-50-8	< 7.96E-05	(lb/ton melt) [1]	< 7.42E-05	(lb/ton melt) [1]	< 1.54E-04	(lb/ton melt)	< 9.54E-05	(lb/ton melt) [1]	7.87E-05	(lb/ton melt) [1]	1.74E-04	(lb/ton melt)
Lead and Compounds	7439-92-1	ND		< 3.66E-05	(lb/ton melt) [1]	< 3.66E-05	(lb/ton melt)	< 5.49E-05	(lb/ton melt) [1]	< 4.43E-05	(lb/ton melt) [1]	< 9.92E-05	(lb/ton melt)
Manganese and Compounds	7439-96-5	4.11E-03	(lb/tons TAC in melt) [1]	2.20E-03	(lb/tons TAC in melt) [1]	6.31E-03	(lb/tons TAC in melt)	0.0345	(lb/tons TAC in melt) [1]	0.0122	(lb/tons TAC in melt) [1]	4.67E-02	(lb/tons TAC in melt)
Mercury	7439-97-6	< 4.16E-06	(lb/ton melt) [1]	< 2.92E-06	(lb/ton melt) [1]	< 7.08E-06	(lb/ton melt)	< 1.99E-06	(lb/ton melt) [1]	< 1.52E-06	(lb/ton melt) [1]	< 3.51E-06	(lb/ton melt)
Molybdenum Trioxide	1313-27-5	2.24E-06	(lb/ton melt) [a]	1.05E-05	(lb/ton melt) [a]	1.27E-05	(lb/ton melt)	2.24E-06	(lb/ton melt) [a]	1.05E-05	(lb/ton melt) [a]	1.27E-05	(lb/ton melt)
Nickel and Compounds	7440-02-0	< 0.0197	(lb/tons TAC in melt) [1]	5.98E-03	(lb/tons TAC in melt) [1]	0.0257	(lb/tons TAC in melt)	< 9.78E-05	(lb/ton melt) [1]	6.44E-05	(lb/ton melt) [1]	1.62E-04	(lb/ton melt)
Phosphorus and Compounds	504	< 2.14E-04	(lb/ton melt) [1]	< 1.74E-04	(lb/ton melt) [1]	< 3.88E-04	(lb/ton melt)	< 1.66E-04	(lb/ton melt) [1]	< 4.19E-05	(lb/ton melt) [1]	< 2.08E-04	(lb/ton melt)
Selenium and Compounds	7782-49-2	ND		ND		ND		ND		ND		ND	
Silver and Compounds	7440-22-4	< 1.49E-05	(lb/ton melt) [1]	ND		ND	1.49E-05	< 1.75E-05	(lb/ton melt) [1]	ND		< 1.75E-05	(lb/ton melt)
Thallium	7440-28-0	ND		ND		ND		ND		ND		ND	
Vanadium (fume or dust)	7440-62-2	ND		ND		ND		ND		ND		ND	
Zinc and Compounds	7440-66-6	2.17E-04	(lb/ton melt) [1]	2.17E-04	(lb/ton melt) [1]	4.34E-04	(lb/ton melt)	2.29E-04	(lb/ton melt) [1]	2.03E-04	(lb/ton melt) [1]	4.32E-04	(lb/ton melt)

Notes

< = Value calculated using the minimum detection limit for front half and/or back half results that were non-detect.

ND = Non-detect. Results were below the analytical detection limit for all sample train components in all source test runs; TAC = toxic air contaminant.

[a] Emission factor (lb/ton melt) = (PM emission factor [lb/ton]) x (1 - [control efficiency of the foundry baghouses {%}]/100) x (percent TAC in PM [%]) / 100

PM emission factor, melt (lb/ton) =	0.90	(2)
PM emission factor, pour/cool (lb/ton) =	4.20	(3)
Control efficiency of foundry baghouses (%) =	90.0	(4)
Molybdenum trioxide percentage of PM (%) =	2.49E-03	(b)

[b] Molybdenum trioxide emission factor (% of PM emitted) = (molybdenum emission factor [% of PM emitted]) x (molybdenum trioxide molecular weight [lb/lb-mole]) / (molybdenum molecular weight [lb/lb-mole]) (5)

Molybdenum and Compounds percentage of PM (%) =	1.66E-03	(6)
Molybdenum trioxide molecular weight (lb/lb-mole) =	143.94	
Molybdenum molecular weight (lb/lb-mole) =	95.95	

Table 2
Foundry Emission Factors
Eagle Foundry Company

References

(1) Values provided by the DEQ on November 20, 2023 in their source test review memorandum following review of the Main Foundry and Cooling Bunker Baghouses Emission Factor Determination and Main Foundry PTE Verification Source Test Report prepared by Bison Engineering, dated October 13, 2023.

(2) AP-42, Chapter 12.10, Table 12.10-3 "Particulate Emission Factors for Iron Furnaces". Uncontrolled particulate emission factor for melting in an electric induction furnace.

(3) AP-42, Chapter 12.10, Table 12.10-7 "Particulate Emission Factors for Ancillary Operations and Fugitive Sources at Gray Iron Foundries". Value for uncontrolled particulate emission factor for pouring and cooling in an electric induction furnace.

(4) See Table 1, Input Process Rates and Parameters. The foundry building has been approved as a permanent total enclosure. Fugitive emissions from the reclamation system are controlled by the main foundry baghouse.

(5) Conservatively assumes 100 percent of molybdenum is in the trioxide form.

(6) Based on baghouse dust analysis conducted by Apex Laboratories, March 2021.

Table 3
PTE Foundry White Iron TAC Emissions Estimate
Eagle Foundry Company

Toxic Air Contaminant	CAS/DEQ ID	White Iron Emission Factor [1]				Emissions Estimate				Total Emissions Estimate	
		Main Foundry		Cooling Bunker		Main Foundry		Cooling Bunker			
						Daily [2] (lb/day)	Annual (lb/yr)	Daily [2] (lb/day)	Annual (lb/yr)	Daily [2] (lb/day)	Annual [3] (lb/yr)
Aluminum and Compounds	7429-90-5	1.94E-03	(lb/ton melt)	1.72E-03	(lb/ton melt)	--	12.5 [a]	--	11.1 [a]	--	23.6
Antimony and Compounds	7440-36-0	1.49E-05	(lb/ton melt)	< 1.05E-05	(lb/ton melt)	--	0.096 [a]	--	0.068 [a]	--	0.16
Arsenic and Compounds	7440-38-2	ND		< 4.42E-05	(lb/ton melt)	--	--	--	0.29 [a]	--	0.29
Barium and Compounds	7440-39-3	7.42E-05	(lb/ton melt)	3.70E-05	(lb/ton melt)	--	0.48 [a]	--	0.24 [a]	--	0.72
Cadmium and Compounds	7440-43-9	< 3.71E-06	(lb/ton melt)	ND		--	0.024 [a]	--	--	--	0.024
Chromium	7440-47-3	2.31E-04	(lb/tons TAC in melt)	9.26E-05	(lb/tons TAC in melt)	--	0.39 [b]	--	0.16 [b]	--	0.54
Chromium VI	18540-29-9	7.20E-07	(lb/tons TAC in melt)	< 1.16E-06	(lb/tons TAC in melt)	--	1.2E-03 [b]	--	1.9E-03 [b]	--	3.2E-03
Cobalt and Compounds	7440-48-4	< 2.45E-06	(lb/ton melt)	< 2.03E-06	(lb/ton melt)	--	0.016 [a]	--	0.013 [a]	--	0.029
Copper and Compounds	7440-50-8	< 9.54E-05	(lb/ton melt)	7.87E-05	(lb/ton melt)	--	0.62 [a]	--	0.51 [a]	--	1.12
Lead and Compounds	7439-92-1	< 5.49E-05	(lb/ton melt)	< 4.43E-05	(lb/ton melt)	--	0.35 [a]	--	0.29 [a]	--	0.64
Mercury	7439-97-6	< 1.99E-06	(lb/ton melt)	< 1.52E-06	(lb/ton melt)	--	0.013 [a]	--	9.8E-03 [a]	--	0.023
Manganese and Compounds	7439-96-5	0.0345	(lb/tons TAC in melt)	0.0122	(lb/tons TAC in melt)	--	2.67 [b]	--	0.94 [b]	--	3.61
Molybdenum Trioxide	1313-27-5	2.24E-06	(lb/ton melt)	1.05E-05	(lb/ton melt)	--	0.014 [a]	--	0.067 [a]	--	0.082
Nickel and Compounds	7440-02-0	< 9.78E-05	(lb/ton melt)	6.44E-05	(lb/ton melt)	--	0.63 [a]	--	0.42 [a]	--	1.05
Phosphorus and Compounds	504	< 1.66E-04	(lb/ton melt)	< 4.19E-05	(lb/ton melt)	--	1.07 [a]	--	0.27 [a]	--	1.34
Silver and Compounds	7440-22-4	< 1.75E-05	(lb/ton melt)	ND		--	0.11 [a]	--	--	--	0.11
Zinc and Compounds	7440-66-6	2.29E-04	(lb/ton melt)	2.03E-04	(lb/ton melt)	--	1.48 [a]	--	1.31 [a]	--	2.79

Notes

ND = Non-detect. Results were below the analytical detection limit for all sample train components in all source test runs; TAC = toxic air contaminant.

[a] Annual emissions estimate (lb/yr) = (emission factor [lb/ton melt]) x (annual metal melted [tons/yr])

White Iron - total metal melted (tons/yr) = 6,448 (4)

[b] Annual emissions estimate (lb/yr) = (emission factor [lb/tons TAC in melt]) x (annual metal melt [tons/yr]) x (tons TAC/ton melt)

White Iron - Chromium in melt (ton TAC/ton melt) = 0.26 (5)

White Iron - Manganese in melt (ton TAC /ton melt) = 0.012 (5)

References

[1] See Table 2, Foundry Emission Factors.

[2] See Table 1, Input Process Rates and Parameters and Table D2, Alloy Toxicity Weighted Emission Rates . All daily production is attributed to HK steel alloy which will result in the maximum predicted acute hazard index. The daily emissions estimates for the main foundry and cooling bunker are shown in Table 4, PTE Foundry Steel TAC Emissions Estimate.

[3] Sum of main foundry and cooling bunker emission estimates.

[4] See Table 1, Input Process Rates and Parameters.

[5] See Table D1, Alloy Composition Data. Annual emissions estimate for the main foundry and cooling bunker are based on the maximum TAC content of all iron alloys.

Table 4
PTE Foundry Steel TAC Emissions Estimate
Eagle Foundry Company

Toxic Air Contaminant	CAS/DEQ ID	Steel Emission Factor [1]		Emissions Estimate				Total Emissions Estimate [2]	
		Main Foundry	Cooling Bunker	Main Foundry		Cooling Bunker			
				Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)
Aluminum and Compounds	7429-90-5	1.89E-03 (lb/ton melt)	1.45E-03 (lb/ton melt)	0.059 [a]	3.05 [b]	0.045 [a]	2.34 [b]	0.10	5.38
Antimony and Compounds	7440-36-0	< 1.60E-05 (lb/ton melt)	< 1.48E-05 (lb/ton melt)	5.0E-04 [a]	0.026 [b]	4.6E-04 [a]	0.024 [b]	9.5E-04	0.050
Arsenic and Compounds	7440-38-2	< 6.01E-05 (lb/ton melt)	< 5.43E-05 (lb/ton melt)	1.9E-03 [a]	0.097 [b]	1.7E-03 [a]	0.088 [b]	3.5E-03	0.18
Barium and Compounds	7440-39-3	1.29E-04 (lb/ton melt)	4.76E-05 (lb/ton melt)	4.0E-03 [a]	0.21 [b]	1.5E-03 [a]	0.077 [b]	5.5E-03	0.28
Cadmium and Compounds	7440-43-9	< 7.78E-06 (lb/ton melt)	< 3.14E-06 (lb/ton melt)	2.4E-04 [a]	0.013 [b]	9.7E-05 [a]	5.1E-03 [b]	3.4E-04	0.018
Chromium	7440-47-3	3.43E-03 (lb/tons TAC in melt)	9.38E-04 (lb/tons TAC in melt)	0.028 [c]	0.097 [d]	7.6E-03 [c]	0.027 [d]	0.035	0.12
Chromium VI	18540-29-9	1.32E-05 (lb/tons TAC in melt)	1.87E-05 (lb/tons TAC in melt)	1.1E-04 [c]	3.7E-04 [d]	1.5E-04 [c]	5.3E-04 [d]	2.6E-04	9.1E-04
Cobalt and Compounds	7440-48-4	< 2.43E-06 (lb/ton melt)	< 1.98E-06 (lb/ton melt)	7.5E-05 [a]	3.9E-03 [b]	6.1E-05 [a]	3.2E-03 [b]	1.4E-04	7.1E-03
Copper and Compounds	7440-50-8	< 7.96E-05 (lb/ton melt)	< 7.42E-05 (lb/ton melt)	2.5E-03 [a]	0.13 [b]	2.3E-03 [a]	0.12 [b]	4.8E-03	0.25
Lead and Compounds	7439-92-1	ND	< 3.66E-05 (lb/ton melt)	--	--	1.1E-03 [a]	0.059 [b]	1.1E-03	0.059
Mercury	7439-97-6	< 4.16E-06 (lb/ton melt)	< 2.92E-06 (lb/ton melt)	1.3E-04 [a]	6.7E-03 [b]	9.1E-05 [a]	4.7E-03 [b]	2.2E-04	0.011
Manganese and Compounds	7439-96-5	4.11E-03 (lb/tons TAC in melt)	2.20E-03 (lb/tons TAC in melt)	1.3E-03 [c]	0.35 [d]	6.8E-04 [c]	0.19 [d]	2.0E-03	0.54
Molybdenum Trioxide	1313-27-5	2.24E-06 (lb/ton melt)	1.05E-05 (lb/ton melt)	6.9E-05 [a]	3.6E-03 [b]	3.2E-04 [a]	0.017 [b]	3.9E-04	0.020
Nickel and Compounds	7440-02-0	< 0.020 (lb/tons TAC in melt)	5.98E-03 (lb/tons TAC in melt)	0.12 [c]	0.35 [d]	0.037 [c]	0.11 [d]	0.16	0.46
Phosphorus and Compounds	504	< 2.14E-04 (lb/ton melt)	< 1.74E-04 (lb/ton melt)	6.6E-03 [a]	0.34 [b]	5.4E-03 [a]	0.28 [b]	0.012	0.63
Silver and Compounds	7440-22-4	< 1.49E-05 (lb/ton melt)	ND	4.6E-04 [a]	0.024 [b]	--	--	4.6E-04	0.024
Zinc and Compounds	7440-66-6	2.17E-04 (lb/ton melt)	2.17E-04 (lb/ton melt)	6.7E-03 [a]	0.35 [b]	6.7E-03 [a]	0.35 [b]	0.013	0.70

Notes

ND = Non-detect. Results were below the analytical detection limit for all sample train components in all source test runs; TAC = toxic air contaminant.

[a] Daily emissions estimate (lb/day) = (emission factor [lb/ton melt]) x (daily metal melt [tons/day])

Steel - total metal melt (tons/day) = 31.0 (3)

[b] Annual emissions estimate (lb/yr) = (emission factor [lb/ton melt]) x (annual metal melt [tons/yr])

Steel - total metal melt (tons/yr) = 1,612 (3)

[c] Daily emissions estimate (lb/day) = (emission factor [lb/tons TAC in melt]) x (daily metal melt [tons/day]) x (tons TAC/ton melt)

Steel - Chromium in melt (tons TAC/ton melt) = 0.26 (4)

Steel - Manganese in melt (tons TAC/ton melt) = 0.010 (4)

Steel - Nickel in melt (tons TAC/ton melt) = 0.20 (4)

[d] Annual emissions estimate (lb/yr) = (emission factor [lb/tons TAC in melt]) x (annual metal melt [tons/yr]) x (tons TAC/ton melt)

Steel - Chromium in melt (tons TAC/ton melt) = 0.018 (5)

Steel - Manganese in melt (tons TAC/ton melt) = 0.053 (5)

Steel - Nickel in melt (tons TAC/ton melt) = 0.011 (5)

Table 4
PTE Foundry Steel TAC Emissions Estimate
Eagle Foundry Company

References

(1) See Table 2, Foundry Emission Factors.

(2) Sum of main foundry and cooling bunker emission estimates.

(3) See Table 1, Input Process Rates and Parameters.

(4) See Table D1, Alloy Composition Data and Table D2, Alloy Toxicity Weighted Emission Rates. Daily emissions estimate for the main foundry and cooling bunker are based on alloy HK, which has the highest toxicity weighted emission rate of any melt and results in the maximum predicted acute hazard index.

(5) See Table D1, Alloy Composition Data. Annual emissions estimate for the main foundry and cooling bunker are based on the weighted average TAC content of all Steel alloys produced in 2022.

Table 5
PTE Hot Top TAC Emission Estimates
Eagle Foundry Company

Toxic Air Contaminant [1]	CAS	Emission Factor [a] (lb/lb hot top)	Emissions Estimate	
			Daily [b] (lb/day)	Annual [c] (lb/yr)
Silica, crystalline	7631-86-9 [4]	3.0E-04	4.3E-03	1.02

Notes

[a] Emission factor (lb/lb hot top used) = (percentage of TAC [%]/100) x (percentage airborne [%]/100)

Percentage of quartz (%) = 3.00 (1)

Percentage of product airborne (%) = 1.00 (2)

[b] Maximum daily emissions estimate (lb/day) = (emission factor [lb/lb hot top used])
x (maximum daily hot top usage [lb hot top used/day]) x (1 - control efficiency of baghouse [%]/100)

Maximum daily hot top usage (lb hot top used/day) = 142 (3)

Control efficiency of baghouse (%) = 90.0 (3)

[c] Annual emissions estimate (lb/yr) = (emission factor [lb/lb hot top used])
x (annual hot top usage [lb hot top used/yr]) x (1 - control efficiency of baghouse [%]/100)

Annual hot top usage (lb hot top used/yr) = 34,093 (3)

Control efficiency of baghouse (%) = 90.0 (3)

References

[1] Information from product SDS. Aluminum content of Hot Top is accounted for in foundry emissions.

[2] Hot top is the molten metal insulation applied after casting. Based on similar operations at other facilities, it is conservatively estimated that up to 1 percent of the total mass of the hot top used becomes airborne.

[3] See Table 1, Input Process Rates and Parameters.

[4] CAS 7631-86-9 (Silica, crystalline,-respirable) was substituted for CAS 14808-60-7 (crystalline silica—Quartz). Conservatively assumes all crystalline silica emitted is of respirable size.

Table 6
PTE Reclamation TAC Emission Estimates
Eagle Foundry Company

Toxic Air Contaminant	CAS/DEQ ID	Emission Factor		Emissions Estimate					
				To Main Foundry BH [1]		To Reclamation BH		Total	
				Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)
PM	--	3.20	(lb/ton metal poured) [2]	0.99 [a]	258 [b]	0.89 [c]	232 [d]	1.88	490
Aluminum and Compounds	7429-90-5	1.52	(% of PM emitted) [6]	0.015 [e]	3.92 [f]	0.014 [e]	3.53 [f]	0.029	7.45
Antimony and Compounds	7440-36-0	3.7E-04	(% of PM emitted) [6]	3.7E-06 [e]	9.6E-04 [f]	3.3E-06 [e]	8.6E-04 [f]	7.0E-06	1.8E-03
Arsenic and Compounds	7440-38-2	2.4E-04	(% of PM emitted) [6]	2.4E-06 [e]	6.2E-04 [f]	2.2E-06 [e]	5.6E-04 [f]	4.6E-06	1.2E-03
Barium and Compounds	7440-39-3	9.5E-03	(% of PM emitted) [6]	9.4E-05 [e]	0.024 [f]	8.4E-05 [e]	0.022 [f]	1.8E-04	0.046
Beryllium and compounds	7440-41-7	2.6E-05	(% of PM emitted) [6]	2.6E-07 [e]	6.8E-05 [f]	2.3E-07 [e]	6.1E-05 [f]	4.9E-07	1.3E-04
Cadmium and Compounds	7440-43-9	1.4E-04	(% of PM emitted) [6]	1.4E-06 [e]	3.7E-04 [f]	1.3E-06 [e]	3.3E-04 [f]	2.7E-06	7.0E-04
Chromium	7440-47-3	0.0454	(% of PM emitted) [6]	4.5E-04 [e]	0.12 [f]	4.1E-04 [e]	0.11 [f]	8.6E-04	0.22
Chromium VI	18540-29-9	1.4E-03	(% of PM emitted) [7]	1.4E-05 [e]	3.5E-03 [f]	1.2E-05 [e]	3.2E-03 [f]	2.6E-05	6.7E-03
Cobalt and Compounds	7440-48-4	3.6E-04	(% of PM emitted) [6]	3.6E-06 [e]	9.4E-04 [f]	3.2E-06 [e]	8.4E-04 [f]	6.8E-06	1.8E-03
Copper and Compounds	7440-50-8	0.031	(% of PM emitted) [6]	3.0E-04 [e]	0.079 [f]	2.7E-04 [e]	0.071 [f]	5.8E-04	0.15
Lead and Compounds	7439-92-1	0.011	(% of PM emitted) [6]	1.1E-04 [e]	0.029 [f]	1.0E-04 [e]	0.026 [f]	2.1E-04	0.056
Manganese and Compounds	7439-96-5	0.27	(% of PM emitted) [6]	2.6E-03 [e]	0.69 [f]	2.4E-03 [e]	0.62 [f]	5.0E-03	1.31
Molybdenum trioxide	1313-27-5	1.7E-03	(% of PM emitted) [g]	1.6E-05 [e]	4.3E-03 [f]	1.5E-05 [e]	3.8E-03 [f]	3.1E-05	8.1E-03
Nickel and Compounds	7440-02-0	5.8E-03	(% of PM emitted) [6]	5.7E-05 [e]	0.015 [f]	5.1E-05 [e]	0.013 [f]	1.1E-04	0.028
Selenium and Compounds	7782-49-2	2.3E-04	(% of PM emitted) [6]	2.3E-06 [e]	6.0E-04 [f]	2.1E-06 [e]	5.4E-04 [f]	4.4E-06	1.1E-03
Silica, crystalline	7631-86-9	36.1	(% of PM emitted) [9]	0.36 [e]	93.1 [f]	0.32 [e]	83.8 [f]	0.68	177
Silver and Compounds	7440-22-4	2.5E-04	(% of PM emitted) [6]	2.5E-06 [e]	6.5E-04 [f]	2.3E-06 [e]	5.9E-04 [f]	4.8E-06	1.2E-03
Thallium	7440-28-0	1.5E-05	(% of PM emitted) [6]	1.5E-07 [e]	3.9E-05 [f]	1.4E-07 [e]	3.5E-05 [f]	2.9E-07	7.4E-05
Vanadium (fume or dust)	7440-62-2	1.5E-03	(% of PM emitted) [6]	1.4E-05 [e]	3.7E-03 [f]	1.3E-05 [e]	3.4E-03 [f]	2.7E-05	7.1E-03
Zinc and Compounds	7440-66-6	5.9E-03	(% of PM emitted) [6]	5.9E-05 [e]	0.015 [f]	5.3E-05 [e]	0.014 [f]	1.1E-04	0.029

Notes

BH = baghouse; PM = particulate matter.

[a] Daily emissions estimate to Main Foundry Baghouse (lb/day) = (emission factor [lb/ton metal poured]) x (daily metal poured [tons/day]) x (1 - [capture efficiency of reclamation system {%}]/100) x (1 - [control efficiency of the main foundry baghouse {%}]/100)

Daily metal poured (tons/day) = 31.0 (3)

Capture efficiency of reclamation system (%) = 90.0 (4)

Control efficiency of main foundry baghouse (%) = 90.0 (5)

[b] Annual emissions estimate to Main Foundry Baghouse (lb/yr) = (emission factor [lb/ton metal poured]) x (annual metal poured [tons/yr]) x (1 - [capture efficiency of reclamation system {%}]/100) x (1 - [control efficiency of the main foundry baghouse {%}]/100)

Annual metal poured (tons/yr) = 8,060 (3)

Table 6
PTE Reclamation TAC Emission Estimates
Eagle Foundry Company

(c) Daily emissions estimate to Reclamation Baghouse (lb/day) = (emission factor [lb/ton metal poured]) x (daily metal poured [tons/day]) x (capture efficiency of reclamation system [%]/100) x (1 - [control efficiency of the reclamation baghouse {%}]/100)

Daily metal poured (tons/day) =	31.0	(3)
Control efficiency of the reclamation baghouse (%) =	99.0	(3)

(d) Annual emissions estimate to Reclamation Baghouse (lb/yr) = (emission factor [lb/ton metal poured]) x (annual metal poured [tons/yr]) x (capture efficiency of reclamation system [%]/100) x (1 - [control efficiency of the reclamation baghouse {%}]/100)

Annual metal poured (ton/yr) =	8,060	(3)

(e) Daily emissions estimate (lb/day) = (daily PM emissions [lb/day]) x (emission factor [% of PM emitted]/100)

(f) Annual emissions estimate (lb/yr) = (annual PM emissions [lb/yr]) x (emission factor [% of PM emitted]/100)

(g) Molybdenum trioxide emission factor (% of PM emitted) = (molybdenum emission factor [% of PM emitted]) x (molybdenum trioxide molecular weight [lb/lb-mole]) / (molybdenum molecular weight [lb/lb-mole])

		(8)
Molybdenum and Compounds percentage of PM (%) =	1.1E-03	(6)
Molybdenum trioxide molecular weight (lb/lb-mole) =	143.94	
Molybdenum molecular weight (lb/lb-mole) =	95.95	

References

(1) Fugitive emissions from the reclamation system are captured by the foundry permanent total enclosure and are controlled by the main foundry baghouse.

(2) AP-42, Chapter 12.10, Table 12.10-7 "Particulate Emission Factors for Ancillary Operations and Fugitive Sources at Gray Iron Foundries". Uncontrolled particulate emission factor for shakeout.

(3) See Table 1, Input Process Rates and Parameters.

(4) Capture efficiency provided by the DEQ based on equipment configuration of enclosed, rotary shakeout.

(5) See Table 1, Input Process Rates and Parameters. The foundry building has been approved as a permanent total enclosure. Fugitive emissions from the reclamation system are controlled by the main foundry baghouse.

(6) Based on baghouse dust analysis conducted by Apex Laboratories, March 2021.

(7) As a conservative estimate, Chromium VI is assumed to be 3 percent of total chromium. Eagle Foundry reserves the right to revise this assumption if site specific data becomes available.

(8) Conservatively assumes 100 percent of molybdenum is in the trioxide form.

(9) Value is the weighted average silica content of mold making materials.

Table 7
PTE Air Arc Cutting TAC Emission Estimates
Eagle Foundry Company

Toxic Air Contaminant	CAS/DEQ ID	Emission Factor				Emissions Estimate	
		Daily		Annual		Daily (lb/day)	Annual (lb/yr)
PM	--	0.060	(lb/hr) [1]	0.060	(lb/hr) [1]	4.0E-03 [a]	0.73 [b]
Chromium	7440-47-3	0.50	(% TAC in alloy) [3]	1.26	(% TAC in alloy) [4]	2.0E-05 [c]	9.3E-03 [d]
Chromium VI	18540-29-9	0.015	(% TAC in alloy) [5]	0.038	(% TAC in alloy) [5]	5.9E-07 [c]	2.8E-04 [d]
Copper and Compounds	7440-50-8	0	[3]	0.11	(% TAC in alloy) [4]	0	7.9E-04 [d]
Manganese and Compounds	7439-96-5	12.75	(% TAC in alloy) [3]	5.36	(% TAC in alloy) [4]	5.0E-04 [c]	0.039 [d]
Molybdenum trioxide	1313-27-5	0.75	(% TAC in alloy) [e]	0.70	(% TAC in alloy) [e]	3.0E-05 [c]	5.1E-03 [d]
Nickel and Compounds	7440-02-0	0.80	(% TAC in alloy) [3]	0.81	(% TAC in alloy) [4]	3.2E-05 [c]	5.9E-03 [d]
Phosphorus and Compounds	504	0.070	(% TAC in alloy) [3]	0.059	(% TAC in alloy) [4]	2.8E-06 [c]	4.3E-04 [d]

Notes

PM = particulate matter; TAC = toxic air contaminant.

[a] Daily emissions estimate (lb/day) = (emission factor [lb/hr]) x (torch hours of operation [hrs/day]) x (1 - [baghouse control efficiency {%}]/100)

Daily cutting torch hours of operation (hrs/day) =	6.60	(2)
Baghouse control efficiency (%) =	99.0	(2)

[b] Annual emissions estimate (lb/yr) = (emission factor [lb/hr]) x (annual hours of operation [hrs/yr]) x (1-[baghouse control efficiency {%}]/100)

Annual cutting torch hours of operation (hrs/yr) =	1,220	(2)
Baghouse control efficiency (%) =	99.0	(2)

[c] Daily emissions estimate (lb/day) = (daily PM emissions [lb/day]) x (emission factor [% TAC in alloy]/100)

[d] Annual emissions estimate (lb/yr) = (annual PM emissions [lb/yr]) x (emission factor [% TAC in alloy]/100)

[e] Molybdenum trioxide emission factor (% of PM emitted) = (molybdenum emission factor [% of PM emitted]) x (molybdenum trioxide molecular weight [lb/lb-mole]) / (molybdenum molecular weight [lb/lb-mole])

Daily Molybdenum and Compounds percentage of PM (%) =	0.50	(3)
Annual Molybdenum and Compounds percentage of PM (%) =	0.46	(4)
Molybdenum trioxide molecular weight (lb/lb-mole) =	143.94	
Molybdenum molecular weight (lb/lb-mole) =	95.95	

References

[1] Versar, Inc. Title V Applicability Workbook, prepared for the Institute of Scrap Recycling Industries, 1996, Table D-5, Torch Cutting Emission Factors.

[2] See Table 1, Input Process Rates and Parameters.

[3] See Table D1, Alloy Composition Data and Table D2, Alloy Toxicity Weighted Emission Rates. Daily emissions estimates for AirArc are based on alloy MNB2, which has the highest toxicity weighted emission rate for AirArc cut alloys and results in the maximum predicted acute risk value. MNB2 does not contain copper.

[4] See Table D1, Alloy Composition Data. Based on alloy composition data for manganese and low alloy steel. Value represents the weighted average TAC content for AirArc cut metals based on 2022 production.

[5] As a conservative estimate, Chromium VI is assumed to be 3 percent of total chromium. Eagle Foundry reserves the right to revise this assumption if site specific data becomes available.

Table 8
PTE Welding TAC Emission Estimates
Eagle Foundry Company

Product	Toxic Air Contaminant	CAS/DEQ ID	Weight Percentage (%)	Usage		Total Emissions Estimate	
				Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)
Total By Toxic Air Contaminant							
Total	Aluminum	7429-90-5	--	--	--	-- (2)	7.8E-03 (3)
	Arsenic	7440-38-2				-- (2)	1.9E-04 (3)
	Chromium and Compounds	7440-47-3				0.040 (2)	1.34 (3)
	Chromium VI	18540-29-9				2.0E-03 (2)	0.33 (3)
	Cobalt	7440-48-4				-- (2)	7.3E-03 (3)
	Copper	7440-50-8				4.6E-03 (2)	7.51 (3)
	Manganese	7439-96-5				0.013 (2)	1.10 (3)
	Molybdenum trioxide	1313-27-5				0.019 (2)	0.096 (3)
	Nickel	7440-02-0				0.042 (2)	0.32 (3)
	Phosphorus	504				-- (2)	5.6E-04 (3)
	Vanadium	7440-62-2				-- (2)	1.9E-04 (3)
Individual Products							
Sandvik WIRE 309LSI .035 X 33 LB	Chromium and Compounds	7440-47-3	17.5 (4)	42.3 (5)	46.9 (6)	0.040 (a)	0.045 (a)
	Chromium VI	18540-29-9	-- (4)			2.0E-03 (b)	2.2E-03 (b)
	Copper	7440-50-8	2.00 (4)			4.6E-03 (a)	5.1E-03 (a)
	Manganese	7439-96-5	5.50 (4)			0.013 (a)	0.014 (a)
	Molybdenum and Compounds	7439-98-7	5.50 (4)			0.013 (a)	0.014 (a)
	Molybdenum trioxide	1313-27-5	--			0.019 (d)	0.021 (d)
	Nickel	7440-02-0	18.0 (4)			0.042 (a)	0.046 (a)
Lincore M WIRE HF LCM 1/16 25# SP	Manganese	7439-96-5	13.0 (4)	(2)	1,136 (6)	(2)	0.85 (a)
	Chromium and Compounds	7440-47-3	4.90 (4)			(2)	0.32 (a)
	Chromium VI	18540-29-9	-- (4)			(2)	0.032 (e)
	Nickel	7440-02-0	0.50 (4)			(2)	0.033 (a)
Avesta 2205 ELECTR SS E2209 1/8 10#	Manganese	7439-96-5	1.70 (4)	(2)	426 (6)	(2)	0.042 (c)
	Molybdenum and Compounds	7439-98-7	0.30 (4)			(2)	7.3E-03 (c)
	Molybdenum trioxide	1313-27-5	--			(2)	0.011 (d)
	Chromium and Compounds	7440-47-3	20.0 (4)			(2)	0.49 (c)
	Chromium VI	18540-29-9	-- (4)			(2)	0.27 (e)
	Copper	7440-50-8	0.30 (4)			(2)	7.3E-03 (c)
	Nickel	7440-02-0	10.0 (4)			(2)	0.24 (c)
	Cobalt	7440-48-4	0.30 (4)			(2)	7.3E-03 (c)
CARBONS 1/2X17 CTD DC JTD 100	Copper	7440-50-8	20.0 (4)	(2)	6,533 (6)	(2)	7.49 (c)
Stoody WIRE HF 965-G 045 33# SP	Manganese	7439-96-5	1.10 (4)	(2)	1,265 (6)	(2)	0.076 (a)
	Molybdenum and Compounds	7439-98-7	0.55 (4)			(2)	0.038 (a)
	Molybdenum trioxide	1313-27-5	--			(2)	0.057 (d)
	Chromium and Compounds	7440-47-3	7.00 (4)			(2)	0.48 (a)
	Chromium VI	18540-29-9	-- (4)			(2)	0.024 (b)
Hobart WIRE EXCELARC 71 .045 X 33 LB	Aluminum	7429-90-5	1.00 (4)	(2)	141 (6)	(2)	7.7E-03 (a)
	Manganese	7439-96-5	2.50 (4)			(2)	0.019 (a)
	Molybdenum and Compounds	7439-98-7	0.50 (4)			(2)	3.8E-03 (a)
	Molybdenum trioxide	1313-27-5	--			(2)	5.8E-03 (d)
Prostar S-6 WIRE MS 70S6 035 33# SP PRS	Phosphorus	504	9.0E-03 (4)	(2)	1,140 (6)	(2)	5.6E-04 (a)
	Aluminum	7429-90-5	2.0E-03 (4)			(2)	1.2E-04 (a)
	Chromium and Compounds	7440-47-3	0.027 (4)			(2)	1.7E-03 (a)
	Chromium VI	18540-29-9	-- (4)			(2)	8.4E-05 (b)
	Copper	7440-50-8	0.14 (4)			(2)	8.9E-03 (a)
	Manganese	7439-96-5	1.63 (4)			(2)	0.10 (a)
	Molybdenum and Compounds	7439-98-7	8.0E-03 (4)			(2)	5.0E-04 (a)
	Molybdenum trioxide	1313-27-5	--			(2)	7.5E-04 (d)
	Nickel	7440-02-0	0.031 (4)			(2)	1.9E-03 (a)
	Vanadium	7440-62-2	3.0E-03 (4)			(2)	1.9E-04 (a)
	Arsenic	7440-38-2	3.0E-03 (4)			(2)	1.9E-04 (a)

Table 8
PTE Welding TAC Emission Estimates
Eagle Foundry Company

Notes

(a) Emissions estimate (lb/unit) = (fume generation rate—GMAW [lb fume/lb wire]) x (fume correction factor—GMAW) x (weight percentage [%]/100) x (usage [lb/unit])

Fume generation rate—GMAW (lb fume/lb wire) =	0.010	(7)
Fume correction factor—GMAW =	0.5464	(7)
Fume generation rate—SMAW/FCAW (lb fume/lb wire) =	0.020	(8)
Fume correction factor—SMAW/FCAW =	0.2865	(8)

(b) Emissions estimate (lb/unit) = (fume generation rate [lb fume/lb wire]) x (fume correction factor) x (chromium and compounds weight percentage [%]/100) x (usage [lb/unit]) x (chromium VI conversion rate [%]/100)

Fume generation rate—GMAW (lb fume/lb wire) =	0.010	(7)
Fume correction factor—GMAW =	0.5464	(7)
Chromium VI conversion rate—GMAW (%) =	5.00	(7)

(c) Emissions estimate (lb/unit) = (fume generation rate—SMAW [lb fume/lb wire]) x (fume correction factor—SMAW) x (weight percentage [%]/100) x (usage [lb/unit])

Fume generation rate—SMAW (lb fume/lb wire) =	0.020	(8)
Fume correction factor—SMAW =	0.2865	(8)

(d) Molybdenum trioxide emission estimate (lb/unit) = molybdenum emission estimate [lb/unit]) x (molybdenum trioxide molecular weight [lb/lb-mole]) / (molybdenum molecular weight [lb/lb-mole]) (9)

Molybdenum trioxide molecular weight (lb/lb-mole) =	143.94
Molybdenum molecular weight (lb/lb-mole) =	95.95

(e) Emissions estimate (lb/unit) = (fume generation rate [lb fume/lb wire]) x (fume correction factor) x (chromium and compounds weight percentage [%]/100) x (usage [lb/unit]) x (chromium VI conversion rate [%]/100)

Fume generation rate—SMAW/FCAW (lb fume/lb wire) =	0.020	(8)
Fume correction factor—SMAW/FCAW =	0.2865	(8)
Chromium VI conversion rate—SMAW (%) =	55.0	(8)
Chromium VI conversion rate—FCAW (%) =	10.0	(8)

References

(1) Information from product safety data sheets. Value represents maximum percentage in all wires/rods used at Eagle Foundry.

(2) Daily emissions calculated based on total daily product usage attributed to the welding wire that results in the highest predicted acute risk.

(3) Total annual emission estimates are the sum of individual product annual emission estimates (see below).

(4) Information from product safety data sheets.

(5) See Table 1, Input Process Rates and Parameters. Value represents total product usage excluding waste.

(6) See Table 1, Input Process Rates and Parameters.

(7) San Diego County Air Pollution Control District, Welding Operations, dated October 16, 1998. Based on American Welding Society information and the National Steel Shipbuilding Company (NASSCO) research. Assumes GMAW fume generation rate and correction factor. Hexavalent chromium accounts for 5 percent of total chromium emissions for GMAW welding.

(8) San Diego County Air Pollution Control District, Welding Operations, dated October 16, 1998 (revised July 11, 2022). Based on American Welding Society information and the NASSCO research. Assumes SMAW fume generation rate and correction factor. Hexavalent chromium accounts for 55 percent of total chromium emissions for SMAW welding.

(9) Conservatively assume 100 percent of molybdenum is in the trioxide form.

Table 9
PTE Grinding - Stainless Steel Controlled TAC Emission Estimates
Eagle Foundry Company

Toxic Air Contaminant	CAS/DEQ ID	Emission Factor				Controlled Emissions Estimate	
		Daily		Annual		Daily (lb/day)	Annual (lb/yr)
$PM_{>10}$	--	8.00	(lb/ton metal processed) [(a)]	8.00	(lb/ton metal processed) [(a)]	0 [(b)]	0 [(c)]
$PM_{2.5-10}$	--	4.80	(lb/ton metal processed) [(a)]	4.80	(lb/ton metal processed) [(a)]	0.057 [(b)]	14.8 [(c)]
$PM_{2.5}$	--	3.20	(lb/ton metal processed) [(a)]	3.20	(lb/ton metal processed) [(a)]	0.076 [(b)]	19.8 [(c)]
Total PM	--	*16.0*	*(lb/ton metal processed)* [(1)]	*16.0*	*(lb/ton metal processed)* [(1)]	*0.13*	*34.6*
Aluminum and Compounds	7429-90-5	0.48	(% of PM emitted) [(5)]	0.48	(% of PM emitted) [(5)]	6.4E-04 [(d)]	0.17 [(e)]
Antimony and Compounds	7440-36-0	2.6E-04	(% of PM emitted) [(5)]	2.6E-04	(% of PM emitted) [(5)]	3.5E-07 [(d)]	9.0E-05 [(e)]
Arsenic and Compounds	7440-38-2	1.6E-03	(% of PM emitted) [(5)]	1.6E-03	(% of PM emitted) [(5)]	2.1E-06 [(d)]	5.4E-04 [(e)]
Barium and Compounds	7440-39-3	0.014	(% of PM emitted) [(5)]	0.014	(% of PM emitted) [(5)]	1.9E-05 [(d)]	4.8E-03 [(e)]
Beryllium and Compounds	7440-41-7	5.2E-05	(% of PM emitted) [(5)]	5.2E-05	(% of PM emitted) [(5)]	6.9E-08 [(d)]	1.8E-05 [(e)]
Cadmium and Compounds	7440-43-9	4.1E-04	(% of PM emitted) [(5)]	4.1E-04	(% of PM emitted) [(5)]	5.4E-07 [(d)]	1.4E-04 [(e)]
Chromium and Compounds	7440-47-3	26.0	(% TAC in alloy) [(6)]	26.0	(% TAC in alloy) [(7)]	0.035 [(d)]	9.00 [(e)]
Chromium VI	18540-29-9	0.78	(% TAC in alloy) [(8)]	0.78	(% TAC in alloy) [(8)]	1.0E-03 [(d)]	0.27 [(e)]
Cobalt and Compounds	7440-48-4	7.6E-03	(% of PM emitted) [(5)]	7.6E-03	(% of PM emitted) [(5)]	1.0E-05 [(d)]	2.6E-03 [(e)]
Copper and Compounds	7440-50-8	0.075	(% of PM emitted) [(5)]	0.075	(% of PM emitted) [(5)]	1.0E-04 [(d)]	0.026 [(e)]
Lead and Compounds	7439-92-1	4.5E-04	(% of PM emitted) [(5)]	4.5E-04	(% of PM emitted) [(5)]	6.0E-07 [(d)]	1.6E-04 [(e)]
Manganese and Compounds	7439-96-5	1.00	(% TAC in alloy) [(6)]	1.00	(% TAC in alloy) [(7)]	1.3E-03 [(d)]	0.35 [(e)]
Molybdenum trioxide	1313-27-5	0.75	(% TAC in alloy) [(f)]	0.75	(% TAC in alloy) [(f)]	1.0E-03 [(d)]	0.26 [(e)]
Nickel and Compounds	7440-02-0	20.0	(% TAC in alloy) [(6)]	15.5	(% TAC in alloy) [(7)]	0.027 [(d)]	5.37 [(e)]
Phosphorus and Compounds	504	0.040	(% TAC in alloy) [(6)]	0.040	(% TAC in alloy) [(7)]	5.3E-05 [(d)]	0.014 [(e)]
Selenium and Compounds	7782-49-2	2.6E-04	(% of PM emitted) [(5)]	2.6E-04	(% of PM emitted) [(5)]	3.5E-07 [(d)]	9.0E-05 [(e)]
Silver and Compounds	7440-22-4	5.2E-05	(% of PM emitted) [(5)]	5.2E-05	(% of PM emitted) [(5)]	6.9E-08 [(d)]	1.8E-05 [(e)]
Thallium	7440-28-0	5.2E-05	(% of PM emitted) [(5)]	5.2E-05	(% of PM emitted) [(5)]	6.9E-08 [(d)]	1.8E-05 [(e)]
Vanadium (fume or dust)	7440-62-2	6.0E-03	(% of PM emitted) [(5)]	6.0E-03	(% of PM emitted) [(5)]	8.0E-06 [(d)]	2.1E-03 [(e)]
Zinc and Compounds	7440-66-6	3.4E-03	(% of PM emitted) [(5)]	3.4E-03	(% of PM emitted) [(5)]	4.5E-06 [(d)]	1.2E-03 [(e)]

Notes

PM = particulate matter; TAC = toxic air contaminant.

[(a)] PM emission factor (lb/ton metal processed) = (total PM emission factor [lb/ton metal processed]) x (percentage of total PM [%]/100)

$PM_{>10}$ percentage of total PM (%) =	50.0	(1)
$PM_{2.5-10}$ percentage of total PM (%) =	30.0	(1)
$PM_{2.5}$ percentage of total PM (%) =	20.0	(1)

Table 9
PTE Grinding - Stainless Steel Controlled TAC Emission Estimates
Eagle Foundry Company

[b] Daily controlled emissions estimate (lb/day) = (emission factor [lb/ton metal processed]) x (daily stainless steel processed for grinding [tons/day]) x (capture efficiency of building enclosure [%]/100) x (1 - [control efficiency of baghouse {%}]/100)

Daily stainless steel processed for grinding (tons/day) =	2.50	(2)
Capture efficiency of building enclosure (%) =	95.0	(3)
Control efficiency of baghouse for $PM_{>10}$ (%) =	100	(4)
Control efficiency of baghouse for $PM_{2.5-10}$ (%) =	99.5	(4)
Control efficiency of baghouse for $PM_{2.5}$ (%) =	99.0	(4)

[c] Annual controlled emissions estimate (lb/yr) = (emission factor [lb/ton metal processed]) x (annual stainless steel processed for grinding [tons/yr]) x (capture efficiency of building enclosure [%]/100) x (1 - [control efficiency of baghouse {%}]/100)

Annual stainless steel processed for grinding (tons/yr) =	651	(2)

[d] Daily emissions estimate (lb/day) = (daily PM emissions [lb/day]) x (emission factor [% TAC in alloy]/100)

[e] Annual emissions estimate (lb/yr) = (annual PM emissions [lb/yr]) x (emission factor [% TAC in alloy]/100)

[f] Molybdenum trioxide emission factor (% of PM emitted) = (molybdenum emission factor [% of PM emitted]) x (molybdenum trioxide molecular weight [lb/lb-mole]) / (molybdenum molecular weight [lb/lb-mole])

Daily Molybdenum and Compounds percentage of PM (%) =	0.50	(6)
Annual Molybdenum and Compounds percentage of PM (%) =	0.50	(7)
Molybdenum trioxide molecular weight (lb/lb-mole) =	143.94	
Molybdenum molecular weight (lb/lb-mole) =	95.95	

References

[1] RTI International, Emission Estimation Protocol for Iron and Steel Foundries (December, 2012), Table 6-2, PM Emission Factors for Finishing Operations. Value represents grinding, captured and uncontrolled.

[2] See Table 1, Input Process Rates and Parameters.

[3] Based on EPA methodology enclosure testing conducted on April 18, 2023.

[4] RTI International, Emission Estimation Protocol for Iron and Steel Foundries (December, 2012), Table 3-4, Typical Collection Efficiencies of Various Particulate Control Devices. Section 3.1.4.1 notes that it can be assumed that PM collection efficiencies for PM greater than 10 µm are 100 percent.

[5] Based on baghouse dust analysis for the finishing baghouse conducted by Apex Laboratories, March 2021.

[6] See Table D1, Alloy Composition Data and Table D2, Alloy Toxicity Weighted Emission Rates. Daily emissions estimates for stainless steel grinding are based on alloy HK, which has the highest toxicity weighted emission rate for stainless steel alloys and results in the maximum predicted acute risk value.

[7] Information provided by facility. Value represents the weighted average TAC content for stainless steel alloys produced in 2022.

[8] As a conservative estimate, Chromium VI is assumed to be 3 percent of total chromium. Eagle Foundry reserves the right to revise this assumption if site specific data becomes available.

Table 10
PTE Grinding - Stainless Steel Fugitive TAC Emission Estimates
Eagle Foundry Company

Toxic Air Contaminant	CAS/DEQ ID	Emission Factor				Fugitive Emissions Estimate	
		Daily		Annual		Daily (lb/day)	Annual (lb/yr)
$PM_{>10}$	--	0.016	(lb/ton metal processed) [a]	0.016	(lb/ton metal processed) [a]	2.0E-03 [b]	0.52 [c]
$PM_{2.5-10}$	--	0.016	(lb/ton metal processed) [a]	0.016	(lb/ton metal processed) [a]	2.0E-03 [b]	0.52 [c]
$PM_{2.5}$	--	0.13	(lb/ton metal processed) [a]	0.13	(lb/ton metal processed) [a]	0.016 [b]	4.17 [c]
Total PM	--	*0.16*	*(lb/ton metal processed)* [1]	*0.16*	*(lb/ton metal processed)* [1]	*0.020*	*5.21*
Aluminum and Compounds	7429-90-5	0.48	(% of PM emitted) [4]	0.48	(% of PM emitted) [4]	9.6E-05 [d]	0.025 [e]
Antimony and Compounds	7440-36-0	2.6E-04	(% of PM emitted) [4]	2.6E-04	(% of PM emitted) [4]	5.2E-08 [d]	1.4E-05 [e]
Arsenic and Compounds	7440-38-2	1.6E-03	(% of PM emitted) [4]	1.6E-03	(% of PM emitted) [4]	3.1E-07 [d]	8.2E-05 [e]
Barium and Compounds	7440-39-3	0.014	(% of PM emitted) [4]	0.014	(% of PM emitted) [4]	2.8E-06 [d]	7.3E-04 [e]
Beryllium and Compounds	7440-41-7	5.2E-05	(% of PM emitted) [4]	5.2E-05	(% of PM emitted) [4]	1.0E-08 [d]	2.7E-06 [e]
Cadmium and Compounds	7440-43-9	4.1E-04	(% of PM emitted) [4]	4.1E-04	(% of PM emitted) [4]	8.1E-08 [d]	2.1E-05 [e]
Chromium and Compounds	7440-47-3	26.0	(% TAC in alloy) [5]	26.0	(% TAC in alloy) [6]	5.2E-03 [d]	1.35 [e]
Chromium VI	18540-29-9	0.78	(% TAC in alloy) [7]	0.78	(% TAC in alloy) [7]	1.6E-04 [d]	0.041 [e]
Cobalt and Compounds	7440-48-4	7.6E-03	(% of PM emitted) [4]	7.6E-03	(% of PM emitted) [4]	1.5E-06 [d]	4.0E-04 [e]
Copper and Compounds	7440-50-8	0.075	(% of PM emitted) [4]	0.075	(% of PM emitted) [4]	1.5E-05 [d]	3.9E-03 [e]
Lead and Compounds	7439-92-1	4.5E-04	(% of PM emitted) [4]	4.5E-04	(% of PM emitted) [4]	9.0E-08 [d]	2.3E-05 [e]
Manganese and Compounds	7439-96-5	1.00	(% TAC in alloy) [5]	1.00	(% TAC in alloy) [6]	2.0E-04 [d]	0.052 [e]
Molybdenum trioxide	1313-27-5	0.75	(% TAC in alloy) [f]	0.75	(% TAC in alloy) [f]	1.5E-04 [d]	0.039 [e]
Nickel and Compounds	7440-02-0	20.0	(% TAC in alloy) [5]	15.5	(% TAC in alloy) [6]	4.0E-03 [d]	0.81 [e]
Phosphorus and Compounds	504	0.040	(% TAC in alloy) [5]	0.040	(% TAC in alloy) [6]	8.0E-06 [d]	2.1E-03 [e]
Selenium and Compounds	7782-49-2	2.6E-04	(% of PM emitted) [4]	2.6E-04	(% of PM emitted) [4]	5.2E-08 [d]	1.4E-05 [e]
Silver and Compounds	7440-22-4	5.2E-05	(% of PM emitted) [4]	5.2E-05	(% of PM emitted) [4]	1.0E-08 [d]	2.7E-06 [e]
Thallium	7440-28-0	5.2E-05	(% of PM emitted) [4]	5.2E-05	(% of PM emitted) [4]	1.0E-08 [d]	2.7E-06 [e]
Vanadium (fume or dust)	7440-62-2	6.0E-03	(% of PM emitted) [4]	6.0E-03	(% of PM emitted) [4]	1.2E-06 [d]	3.1E-04 [e]
Zinc and Compounds	7440-66-6	3.4E-03	(% of PM emitted) [4]	3.4E-03	(% of PM emitted) [4]	6.7E-07 [d]	1.7E-04 [e]

Notes

PM = particulate matter; TAC = toxic air contaminant.

[a] PM emission factor (lb/ton metal processed) = (total PM emission factor [lb/ton metal processed]) x (percentage of total PM [%]/100)

$PM_{>10}$ percentage of total PM (%) = 10.0 (1)

$PM_{2.5-10}$ percentage of total PM (%) = 10.0 (1)

$PM_{2.5}$ percentage of total PM (%) = 80.0 (1)

[b] Daily fugitive emissions estimate (lb/day) = (emission factor [lb/ton metal processed]) x (daily stainless steel processed for grinding [tons/day]) x (1 - [capture efficiency of building enclosure {%}]/100)

Daily stainless steel processed for grinding (tons/day) = 2.50 (2)

Capture efficiency of building enclosure (%) = 95.0 (3)

Table 10
PTE Grinding - Stainless Steel Fugitive TAC Emission Estimates
Eagle Foundry Company

[c] Annual fugitive emissions estimate (lb/yr) = (emission factor [lb/ton metal processed]) x (annual stainless steel processed for grinding [tons/yr]) x (1 - [capture efficiency of building enclosure {%}]/100)

Annual stainless steel processed for grinding (tons/yr) =	651	(2)

[d] Daily emissions estimate (lb/day) = (daily PM emissions [lb/day]) x (emission factor [% TAC in alloy]/100)

[e] Annual emissions estimate (lb/yr) = (annual PM emissions [lb/yr]) x (emission factor [% TAC in alloy]/100)

[f] Molybdenum trioxide emission factor (% of PM emitted) = (molybdenum emission factor [% of PM emitted]) x (molybdenum trioxide molecular weight [lb/lb-mole]) / (molybdenum molecular weight [lb/lb-mole])

Daily Molybdenum and Compounds percentage of PM (%) =	0.50	(5)
Annual Molybdenum and Compounds percentage of PM (%) =	0.50	(6)
Molybdenum trioxide molecular weight (lb/lb-mole) =	143.94	
Molybdenum molecular weight (lb/lb-mole) =	95.95	

References

[1] RTI International, Emission Estimation Protocol for Iron and Steel Foundries (December, 2012), Table 6-2, PM Emission Factors for Finishing Operations. Value represents grinding, uncaptured and uncontrolled.

[2] See Table 1, Input Process Rates and Parameters.

[3] Based on EPA methodology enclosure testing conducted on April 18, 2023.

[4] Based on baghouse dust analysis for the finishing baghouse conducted by Apex Laboratories, March 2021.

[5] See Table D1, Alloy Composition Data and Table D2, Alloy Toxicity Weighted Emission Rates. Daily emissions estimates for stainless steel grinding are based on alloy HK, which has the highest toxicity weighted emission rate for stainless steel alloys and results in the maximum predicted acute risk value.

[6] Information provided by facility. Value represents the weighted average TAC content for stainless steel alloys produced in 2022.

[7] As a conservative estimate, Chromium VI is assumed to be 3 percent of total chromium. Eagle Foundry reserves the right to revise this assumption if site specific data becomes available.

Table 11
PTE Grinding - Non-stainless Steel Controlled TAC Emission Estimates
Eagle Foundry Company

Toxic Air Contaminant	CAS/DEQ ID	Emission Factor				Controlled Emissions Estimate	
		Daily		Annual		Daily (lb/day)	Annual (lb/yr)
$PM_{>10}$	--	8.00	(lb/ton metal processed) [(a)]	8.00	(lb/ton metal processed) [(a)]	0 [(b)]	0 [(c)]
$PM_{2.5-10}$	--	4.80	(lb/ton metal processed) [(a)]	4.80	(lb/ton metal processed) [(a)]	0.38 [(b)]	97.9 [(c)]
$PM_{2.5}$	--	3.20	(lb/ton metal processed) [(a)]	3.20	(lb/ton metal processed) [(a)]	0.50 [(b)]	131 [(c)]
Total PM	--	*16.0*	*(lb/ton metal processed)* [(1)]	*16.0*	*(lb/ton metal processed)* [(1)]	*0.88*	*228*
Aluminum and Compounds	7429-90-5	0.48	(% of PM emitted) [(5)]	0.48	(% of PM emitted) [(5)]	4.2E-03 [(d)]	1.09 [(e)]
Antimony and Compounds	7440-36-0	2.6E-04	(% of PM emitted) [(5)]	2.6E-04	(% of PM emitted) [(5)]	2.3E-06 [(d)]	6.0E-04 [(e)]
Arsenic and Compounds	7440-38-2	1.6E-03	(% of PM emitted) [(5)]	1.6E-03	(% of PM emitted) [(5)]	1.4E-05 [(d)]	3.6E-03 [(e)]
Barium and Compounds	7440-39-3	0.014	(% of PM emitted) [(5)]	0.014	(% of PM emitted) [(5)]	1.2E-04 [(d)]	0.032 [(e)]
Beryllium and Compounds	7440-41-7	5.2E-05	(% of PM emitted) [(5)]	5.2E-05	(% of PM emitted) [(5)]	4.6E-07 [(d)]	1.2E-04 [(e)]
Cadmium and Compounds	7440-43-9	4.1E-04	(% of PM emitted) [(5)]	4.1E-04	(% of PM emitted) [(5)]	3.6E-06 [(d)]	9.3E-04 [(e)]
Chromium and Compounds	7440-47-3	0.50	(% TAC in alloy) [(6)]	19.7	(% TAC in alloy) [(7)]	4.4E-03 [(d)]	45.0 [(e)]
Chromium VI	18540-29-9	0.015	(% TAC in alloy) [(8)]	0.59	(% TAC in alloy) [(8)]	1.3E-04 [(d)]	1.35 [(e)]
Cobalt and Compounds	7440-48-4	7.6E-03	(% of PM emitted) [(5)]	7.6E-03	(% of PM emitted) [(5)]	6.7E-05 [(d)]	0.017 [(e)]
Copper and Compounds	7440-50-8		-- [(6)]	0.045	(% TAC in alloy) [(7)]	--	0.10 [(e)]
Lead and Compounds	7439-92-1	4.5E-04	(% of PM emitted) [(5)]	4.5E-04	(% of PM emitted) [(5)]	4.0E-06 [(d)]	1.0E-03 [(e)]
Manganese and Compounds	7439-96-5	12.8	(% TAC in alloy) [(6)]	1.90	(% TAC in alloy) [(7)]	0.11 [(d)]	4.35 [(e)]
Molybdenum trioxide	1313-27-5	0.75	(% TAC in alloy) [(f)]	0.74	(% TAC in alloy) [(f)]	6.6E-03 [(d)]	1.68 [(e)]
Nickel and Compounds	7440-02-0	0.80	(% TAC in alloy) [(6)]	0.80	(% TAC in alloy) [(7)]	7.0E-03 [(d)]	1.83 [(e)]
Phosphorus and Compounds	504	0.070	(% TAC in alloy) [(6)]	0.090	(% TAC in alloy) [(7)]	6.1E-04 [(d)]	0.21 [(e)]
Selenium and Compounds	7782-49-2	2.6E-04	(% of PM emitted) [(5)]	2.6E-04	(% of PM emitted) [(5)]	2.3E-06 [(d)]	6.0E-04 [(e)]
Silver and Compounds	7440-22-4	5.2E-05	(% of PM emitted) [(5)]	5.2E-05	(% of PM emitted) [(5)]	4.6E-07 [(d)]	1.2E-04 [(e)]
Thallium	7440-28-0	5.2E-05	(% of PM emitted) [(5)]	5.2E-05	(% of PM emitted) [(5)]	4.6E-07 [(d)]	1.2E-04 [(e)]
Vanadium (fume or dust)	7440-62-2	6.0E-03	(% of PM emitted) [(5)]	6.0E-03	(% of PM emitted) [(5)]	5.3E-05 [(d)]	0.014 [(e)]
Zinc and Compounds	7440-66-6	3.4E-03	(% of PM emitted) [(5)]	3.4E-03	(% of PM emitted) [(5)]	2.9E-05 [(d)]	7.7E-03 [(e)]

Notes

PM = particulate matter; TAC = toxic air contaminant.

[(a)] PM emission factor (lb/ton metal processed) = (total PM emission factor [lb/ton metal processed]) x (percentage of total PM [%]/100)

$PM_{>10}$ percentage of total PM (%) =	50.0	(1)
$PM_{2.5-10}$ percentage of total PM (%) =	30.0	(1)
$PM_{2.5}$ percentage of total PM (%) =	20.0	(1)

Table 11
PTE Grinding - Non-stainless Steel Controlled TAC Emission Estimates
Eagle Foundry Company

[b] Daily controlled emissions estimate (lb/day) = (emission factor [lb/ton metal processed]) x (daily non-stainless steel processed for grinding [tons/day]) x (capture efficiency of building enclosure [%]/100) x (1 - [control efficiency of baghouse {%}]/100)

Daily non-stainless steel processed for grinding (tons/day) =	16.5	(2)
Capture efficiency of building enclosure (%) =	95.0	(3)
Control efficiency of baghouse for $PM_{>10}$ (%) =	100	(4)
Control efficiency of baghouse for $PM_{2.5-10}$ (%) =	99.5	(4)
Control efficiency of baghouse for $PM_{2.5}$ (%) =	99.0	(4)

[c] Annual controlled emissions estimate (lb/yr) = (emission factor [lb/ton metal processed]) x (annual non-stainless steel processed for grinding [tons/yr]) x (capture efficiency of building enclosure [%]/100) x (1 - [control efficiency of baghouse {%}]/100)

Annual non-stainless steel processed for grinding (tons/yr) =	4,294	(2)

[d] Daily emissions estimate (lb/day) = (daily PM emissions [lb/day]) x (emission factor [% TAC in alloy]/100)

[e] Annual emissions estimate (lb/yr) = (annual PM emissions [lb/yr]) x (emission factor [% TAC in alloy]/100)

[f] Molybdenum trioxide emission factor (% of PM emitted) = (molybdenum emission factor [% of PM emitted]) x (molybdenum trioxide molecular weight [lb/lb-mole]) / (molybdenum molecular weight [lb/lb-mole])

Daily Molybdenum and Compounds percentage of PM (%) =	0.50	(6)
Annual Molybdenum and Compounds percentage of PM (%) =	0.49	(7)
Molybdenum trioxide molecular weight (lb/lb-mole) =	143.94	
Molybdenum molecular weight (lb/lb-mole) =	95.95	

References

[1] RTI International, Emission Estimation Protocol for Iron and Steel Foundries (December, 2012), Table 6-2, PM Emission Factors for Finishing Operations. Value represents grinding, captured and uncontrolled.

[2] See Table 1, Input Process Rates and Parameters.

[3] Based on EPA methodology enclosure testing conducted on April 18, 2023.

[4] RTI International, Emission Estimation Protocol for Iron and Steel Foundries (December, 2012), Table 3-4, Typical Collection Efficiencies of Various Particulate Control Devices. Section 3.1.4.1 notes that it can be assumed that PM collection efficiencies for PM greater than 10 µm are 100 percent.

[5] Based on baghouse dust analysis for the finishing baghouse conducted by Apex Laboratories, March 2021.

[6] See Table D1, Alloy Composition Data and Table D2, Alloy Toxicity Weighted Emission Rates. Daily emissions estimates for non-stainless steel grinding are based on alloy MNB2, which has the highest toxicity weighted emission rate for non-stainless steel alloys and results in the maximum predicted acute risk value.

[7] Information provided by facility. Value represents the weighted average TAC content for non-stainless steel alloys produced in 2022.

[8] As a conservative estimate, Chromium VI is assumed to be 3 percent of total chromium. Eagle Foundry reserves the right to revise this assumption if site specific data becomes available.

Table 12
PTE Grinding - Non-stainless Steel Fugitive TAC Emission Estimates
Eagle Foundry Company

Toxic Air Contaminant	CAS/DEQ ID	Emission Factor				Fugitive Emissions Estimate	
		Daily		Annual		Daily (lb/day)	Annual (lb/yr)
$PM_{>10}$	--	0.016	(lb/ton metal processed) [a]	0.016	(lb/ton metal processed) [a]	0.013 [b]	3.44 [c]
$PM_{2.5-10}$	--	0.016	(lb/ton metal processed) [a]	0.016	(lb/ton metal processed) [a]	0.013 [b]	3.44 [c]
$PM_{2.5}$	--	0.13	(lb/ton metal processed) [a]	0.13	(lb/ton metal processed) [a]	0.11 [b]	27.5 [c]
Total PM	--	*0.16*	*(lb/ton metal processed)* [1]	*0.16*	*(lb/ton metal processed)* [1]	*0.13*	*34.4*
Aluminum and Compounds	7429-90-5	0.48	(% of PM emitted) [5]	0.48	(% of PM emitted) [5]	6.3E-04 [d]	0.16 [e]
Antimony and Compounds	7440-36-0	2.6E-04	(% of PM emitted) [5]	2.6E-04	(% of PM emitted) [5]	3.4E-07 [d]	8.9E-05 [e]
Arsenic and Compounds	7440-38-2	1.6E-03	(% of PM emitted) [5]	1.6E-03	(% of PM emitted) [5]	2.1E-06 [d]	5.4E-04 [e]
Barium and Compounds	7440-39-3	0.014	(% of PM emitted) [5]	0.014	(% of PM emitted) [5]	1.8E-05 [d]	4.8E-03 [e]
Beryllium and Compounds	7440-41-7	5.2E-05	(% of PM emitted) [5]	5.2E-05	(% of PM emitted) [5]	6.9E-08 [d]	1.8E-05 [e]
Cadmium and Compounds	7440-43-9	4.1E-04	(% of PM emitted) [5]	4.1E-04	(% of PM emitted) [5]	5.3E-07 [d]	1.4E-04 [e]
Chromium and Compounds	7440-47-3	0.50	(% TAC in alloy) [6]	19.7	(% TAC in alloy) [7]	6.6E-04 [d]	6.77 [e]
Chromium VI	18540-29-9	0.015	(% TAC in alloy) [8]	0.59	(% TAC in alloy) [8]	2.0E-05 [d]	0.20 [e]
Cobalt and Compounds	7440-48-4	7.6E-03	(% of PM emitted) [5]	7.6E-03	(% of PM emitted) [5]	1.0E-05 [d]	2.6E-03 [e]
Copper and Compounds	7440-50-8		-- [6]	0.045	(% TAC in alloy) [7]	--	0.016 [e]
Lead and Compounds	7439-92-1	4.5E-04	(% of PM emitted) [5]	4.5E-04	(% of PM emitted) [5]	6.0E-07 [d]	1.5E-04 [e]
Manganese and Compounds	7439-96-5	12.8	(% TAC in alloy) [6]	1.90	(% TAC in alloy) [7]	0.017 [d]	0.65 [e]
Molybdenum trioxide	1313-27-5	0.75	(% TAC in alloy) [f]	0.74	(% TAC in alloy) [f]	9.9E-04 [d]	0.25 [e]
Nickel and Compounds	7440-02-0	0.80	(% TAC in alloy) [6]	0.80	(% TAC in alloy) [7]	1.1E-03 [d]	0.28 [e]
Phosphorus and Compounds	504	0.070	(% TAC in alloy) [6]	0.090	(% TAC in alloy) [7]	9.2E-05 [d]	0.031 [e]
Selenium and Compounds	7782-49-2	2.6E-04	(% of PM emitted) [5]	2.6E-04	(% of PM emitted) [5]	3.4E-07 [d]	8.9E-05 [e]
Silver and Compounds	7440-22-4	5.2E-05	(% of PM emitted) [5]	5.2E-05	(% of PM emitted) [5]	6.9E-08 [d]	1.8E-05 [e]
Thallium	7440-28-0	5.2E-05	(% of PM emitted) [5]	5.2E-05	(% of PM emitted) [5]	6.9E-08 [d]	1.8E-05 [e]
Vanadium (fume or dust)	7440-62-2	6.0E-03	(% of PM emitted) [5]	6.0E-03	(% of PM emitted) [5]	7.9E-06 [d]	2.1E-03 [e]
Zinc and Compounds	7440-66-6	3.4E-03	(% of PM emitted) [5]	3.4E-03	(% of PM emitted) [5]	4.4E-06 [d]	1.2E-03 [e]

Notes

PM = particulate matter; TAC = toxic air contaminant.

[a] PM emission factor (lb/ton metal processed) = (total PM emission factor [lb/ton metal processed]) x (percentage of total PM [%]/100)

$PM_{>10}$ percentage of total PM (%) =	10.0	(1)
$PM_{2.5-10}$ percentage of total PM (%) =	10.0	(1)
$PM_{2.5}$ percentage of total PM (%) =	80.0	(1)

[b] Daily fugitive emissions estimate (lb/day) = (emission factor [lb/ton metal processed]) x (daily non-stainless steel processed for grinding [tons/day]) x (1 - [capture efficiency of building enclosure {%}]/100)

Daily non-stainless steel processed for grinding (tons/day) =	16.5	(2)
Capture efficiency of building enclosure (%) =	95.0	(3)

Table 12
PTE Grinding - Non-stainless Steel Fugitive TAC Emission Estimates
Eagle Foundry Company

(c) Annual fugitive emissions estimate (lb/yr) = (emission factor [lb/ton metal processed]) x (annual non-stainless steel processed for grinding [tons/yr]) x (1 - [capture efficiency of building enclosure {%}]/100)

Annual non-stainless steel processed for grinding (tons/yr) =	4,294	(2)

(d) Daily emissions estimate (lb/day) = (daily PM emissions [lb/day]) x (emission factor [% TAC in alloy]/100)

(e) Annual emissions estimate (lb/yr) = (annual PM emissions [lb/yr]) x (emission factor [% TAC in alloy]/100)

(f) Molybdenum trioxide emission factor (% of PM emitted) = (molybdenum emission factor [% of PM emitted]) x (molybdenum trioxide molecular weight [lb/lb-mole]) / (molybdenum molecular weight [lb/lb-mole])

Daily Molybdenum and Compounds percentage of PM (%) =	0.50	(6)
Annual Molybdenum and Compounds percentage of PM (%) =	0.49	(7)
Molybdenum trioxide molecular weight (lb/lb-mole) =	143.94	
Molybdenum molecular weight (lb/lb-mole) =	95.95	

References

(1) RTI International, Emission Estimation Protocol for Iron and Steel Foundries (December, 2012), Table 6-2, PM Emission Factors for Finishing Operations. Value represents grinding, uncaptured and uncontrolled.

(2) See Table 1, Input Process Rates and Parameters.

(3) Based on EPA methodology enclosure testing conducted on April 18, 2023.

(4) RTI International, Emission Estimation Protocol for Iron and Steel Foundries (December, 2012), Table 3-4, Typical Collection Efficiencies of Various Particulate Control Devices. Section 3.1.4.1 notes that it can be assumed that PM collection efficiencies for PM greater than 10 µm are 100 percent.

(5) Based on baghouse dust analysis for the finishing baghouse conducted by Apex Laboratories, March 2021.

(6) See Table D1, Alloy Composition Data and Table D2, Alloy Toxicity Weighted Emission Rates. Daily emissions estimates for non-stainless steel grinding are based on alloy MNB2, which has the highest toxicity weighted emission rate for non-stainless steel alloys and results in the maximum predicted acute risk value.

(7) Information provided by facility. Value represents the weighted average TAC content for non-stainless steel alloys produced in 2022.

(8) As a conservative estimate, Chromium VI is assumed to be 3 percent of total chromium. Eagle Foundry reserves the right to revise this assumption if site specific data becomes available.

Table 13
PTE Mesh Blast TAC Emission Estimates
Eagle Foundry Company

Toxic Air Contaminant	CAS/DEQ ID	Emission Factor		Total Emissions Estimate	
				Daily (lb/day)	Annual (lb/yr)
$PM_{>10}$	--	8.00	(lb/ton metal processed) [a]	0 [b]	0 [c]
$PM_{2.5-10}$	--	4.80	(lb/ton metal processed) [a]	0.29 [b]	5.69 [c]
$PM_{2.5}$	--	3.20	(lb/ton metal processed) [a]	0.19 [b]	3.80 [c]
Total PM	--	*16.0*	*(lb/ton metal processed)* [1]	*0.48*	*9.49*
Aluminum and Compounds	7429-90-5	0.064	(% of PM emitted) [5]	3.1E-04 [d]	6.1E-03 [e]
Antimony and Compounds	7440-36-0	1.6E-03	(% of PM emitted) [5]	7.7E-06 [d]	1.5E-04 [e]
Arsenic and Compounds	7440-38-2	4.9E-03	(% of PM emitted) [5]	2.3E-05 [d]	4.6E-04 [e]
Barium and Compounds	7440-39-3	5.1E-04	(% of PM emitted) [5]	2.4E-06 [d]	4.8E-05 [e]
Beryllium and compounds	7440-41-7	1.0E-04	(% of PM emitted) [5]	4.9E-07 [d]	9.7E-06 [e]
Cadmium and Compounds	7440-43-9	1.0E-04	(% of PM emitted) [5]	4.9E-07 [d]	9.7E-06 [e]
Chromium	7440-47-3	0.24	(% of PM emitted) [5]	1.2E-03 [d]	0.023 [e]
Chromium VI	18540-29-9	7.3E-03	(% of PM emitted) [6]	3.5E-05 [d]	6.9E-04 [e]
Cobalt and Compounds	7440-48-4	7.0E-03	(% of PM emitted) [5]	3.4E-05 [d]	6.7E-04 [e]
Copper and Compounds	7440-50-8	0.27	(% of PM emitted) [5]	1.3E-03 [d]	0.025 [e]
Lead and Compounds	7439-92-1	7.9E-04	(% of PM emitted) [5]	3.8E-06 [d]	7.5E-05 [e]
Manganese and Compounds	7439-96-5	0.65	(% of PM emitted) [5]	3.1E-03 [d]	0.062 [e]
Molybdenum trioxide	1313-27-5	0.056	(% of PM emitted) [f]	2.7E-04 [d]	5.3E-03 [e]
Nickel and Compounds	7440-02-0	0.10	(% of PM emitted) [5]	4.9E-04 [d]	9.7E-03 [e]
Selenium and Compounds	7782-49-2	5.1E-05	(% of PM emitted) [5]	2.4E-07 [d]	4.8E-06 [e]
Silver and Compounds	7440-22-4	1.0E-04	(% of PM emitted) [5]	4.9E-07 [d]	9.7E-06 [e]
Thallium	7440-28-0	1.0E-04	(% of PM emitted) [5]	4.9E-07 [d]	9.7E-06 [e]
Vanadium (fume or dust)	7440-62-2	9.1E-03	(% of PM emitted) [5]	4.4E-05 [d]	8.6E-04 [e]
Zinc and Compounds	7440-66-6	8.9E-03	(% of PM emitted) [5]	4.3E-05 [d]	8.5E-04 [e]

Notes

PM = particulate matter.

[a] Emission factor (lb/ton metal produced) = (total PM emission factor [lb/ton metal processed])
x (percentage of total PM [%]/100)

$PM_{>10}$ percentage of total PM (%) =	50.0	(1)
$PM_{2.5-10}$ percentage of total PM (%) =	30.0	(1)
$PM_{2.5}$ percentage of total PM (%) =	20.0	(1)

[b] Daily emissions estimate (lb/day) = (emission factor [lb/ton metal processed])
x (daily metal finished by mesh blasting [tons/day]) x (1 - [control efficiency of filters {%}]/100)

Daily metal finished by mesh blasting (tons/day) =	3.00	(2)
Control efficiency of filters for $PM_{>10}$ (%) =	100	(3)
Control efficiency of filters for $PM_{2.5-10}$ (%) =	98.0	(4)
Control efficiency of filters for $PM_{2.5}$ (%) =	98.0	(4)

[c] Annual emissions estimate (lb/yr) = (emission factor [lb/ton metal processed])
x (annual metal finished by mesh blasting [tons/yr]) x (1 - [control efficiency of filters {%}]/100)

Annual metal finished by mesh blasting (tons/yr) =	59.3	(2)

[d] Daily emissions estimate (lb/day) = (daily PM emissions [lb/day]) x (emission factor [% of PM emitted]/100)

[e] Annual emissions estimate (lb/yr) = (annual PM emissions [lb/yr]) x (emission factor [% of PM emitted]/100)

[f] Molybdenum trioxide percentage of PM (% of PM emitted) = (molybdenum percentage of PM [%])
x (molybdenum trioxide molecular weight [lb/lb-mole]) / (molybdenum molecular weight [lb/lb-mole]) (7)

Molybdenum percentage of PM (%) =	0.037	(5)
Molybdenum trioxide molecular weight (lb/lb-mole) =	143.94	
Molybdenum molecular weight (lb/lb-mole) =	95.95	

References

[1] RTI International, Emission Estimation Protocol for Iron and Steel Foundries (December, 2012), Table 6-2. Value for shot blasting, captured and uncontrolled.

[2] See Table 1, Input Process Rates and Parameters.

[3] RTI International, Emission Estimation Protocol for Iron and Steel Foundries (December, 2012), Table 3-4, Typical Collection Efficiencies of Various Particulate Control Devices. Section 3.1.4.1 notes that it can be assumed that PM collection efficiencies for PM greater than 10 µm are 100 percent.

[4] Based on filter specifications.

[5] Based on dust analysis conducted by Apex Laboratories, March 2021.

[6] As a conservative estimate, Chromium VI is assumed to be 3 percent of total chromium. Eagle Foundry reserves the right to revise this assumption if site specific data becomes available.

[7] Conservatively assume 100 percent of molybdenum is in the trioxide form.

Table 14
PTE Shot Blast TAC Emission Estimates
Eagle Foundry Company

Toxic Air Contaminant	CAS/DEQ ID	Emission Factor			Total Emissions Estimate			
					Daily (lb/day)		Annual (lb/yr)	
$PM_{>10}$	--	8.00	(lb/ton metal processed)	(a)	0	(b)	0	(c)
$PM_{2.5-10}$	--	4.80	(lb/ton metal processed)	(a)	0.22	(b)	12.8	(c)
$PM_{2.5}$	--	3.20	(lb/ton metal processed)	(a)	0.29	(b)	17.1	(c)
Total PM	--	*16.0*	*(lb/ton metal processed)*	*(1)*	*0.50*		*29.9*	
Aluminum and Compounds	7429-90-5	0.064	(% of PM emitted)	(4)	3.2E-04	(d)	0.019	(e)
Antimony and Compounds	7440-36-0	1.6E-03	(% of PM emitted)	(4)	8.1E-06	(d)	4.8E-04	(e)
Arsenic and Compounds	7440-38-2	4.9E-03	(% of PM emitted)	(4)	2.5E-05	(d)	1.5E-03	(e)
Barium and Compounds	7440-39-3	5.1E-04	(% of PM emitted)	(4)	2.6E-06	(d)	1.5E-04	(e)
Beryllium and compounds	7440-41-7	1.0E-04	(% of PM emitted)	(4)	5.2E-07	(d)	3.1E-05	(e)
Cadmium and Compounds	7440-43-9	1.0E-04	(% of PM emitted)	(4)	5.2E-07	(d)	3.1E-05	(e)
Chromium	7440-47-3	0.24	(% of PM emitted)	(4)	1.2E-03	(d)	0.073	(e)
Chromium VI	18540-29-9	7.3E-03	(% of PM emitted)	(5)	3.7E-05	(d)	2.2E-03	(e)
Cobalt and Compounds	7440-48-4	7.0E-03	(% of PM emitted)	(4)	3.5E-05	(d)	2.1E-03	(e)
Copper and Compounds	7440-50-8	0.27	(% of PM emitted)	(4)	1.3E-03	(d)	0.079	(e)
Lead and Compounds	7439-92-1	7.9E-04	(% of PM emitted)	(4)	4.0E-06	(d)	2.3E-04	(e)
Manganese and Compounds	7439-96-5	0.65	(% of PM emitted)	(4)	3.3E-03	(d)	0.19	(e)
Molybdenum trioxide	1313-27-5	0.056	(% of PM emitted)	(f)	2.8E-04	(d)	0.017	(e)
Nickel and Compounds	7440-02-0	0.10	(% of PM emitted)	(4)	5.1E-04	(d)	0.030	(e)
Selenium and Compounds	7782-49-2	5.1E-05	(% of PM emitted)	(4)	2.6E-07	(d)	1.5E-05	(e)
Silver and Compounds	7440-22-4	1.0E-04	(% of PM emitted)	(4)	5.2E-07	(d)	3.1E-05	(e)
Thallium	7440-28-0	1.0E-04	(% of PM emitted)	(4)	5.2E-07	(d)	3.1E-05	(e)
Vanadium (fume or dust)	7440-62-2	9.1E-03	(% of PM emitted)	(4)	4.6E-05	(d)	2.7E-03	(e)
Zinc and Compounds	7440-66-6	8.9E-03	(% of PM emitted)	(4)	4.5E-05	(d)	2.7E-03	(e)

Notes

PM = particulate matter.

(a) Emission factor (lb/ton metal produced) = (total PM emission factor [lb/ton metal processed])
x (percentage of total PM [%]/100)

$PM_{>10}$ percentage of total PM (%) =	50.0	(1)
$PM_{2.5-10}$ percentage of total PM (%) =	30.0	(1)
$PM_{2.5}$ percentage of total PM (%) =	20.0	(1)

(b) Daily emissions estimate (lb/day) = (emission factor [lb/ton metal produced]) x (daily metal finished by abrasive blasting [tons/day])
x (percentage of total PM [%]/100) x (1 - [control efficiency of baghouse {%}]/100)

Daily metal finished by abrasive blasting (tons/day) =	9.00	(2)
Control efficiency of filters for $PM_{>10}$ (%) =	100	(3)
Control efficiency of filters for $PM_{2.5-10}$ (%) =	99.5	(3)
Control efficiency of filters for $PM_{2.5}$ (%) =	99.0	(3)

(c) Annual emissions estimate (lb/yr) = (emission factor [lb/ton metal produced]) x (annual metal finished by abrasive blasting [tons/yr])
x (percentage of total PM [%]/100) x (1 - [control efficiency of baghouse {%}]/100)

Annual metal finished by abrasive blasting (tons/yr) =	534	(2)

(d) Daily emissions estimate (lb/day) = (daily PM emissions [lb/day]) x (emission factor [% of PM emitted]/100)

(e) Annual emissions estimate (lb/yr) = (annual PM emissions [lb/yr]) x (emission factor [% of PM emitted]/100)

(f) Molybdenum trioxide percentage of PM (% of PM emitted) = (molybdenum percentage of PM [%])
x (molybdenum trioxide molecular weight [lb/lb-mole]) / (molybdenum molecular weight [lb/lb-mole]) (6)

Molybdenum percentage of PM (%) =	0.037	(4)
Molybdenum trioxide molecular weight (lb/lb-mole) =	143.94	
Molybdenum molecular weight (lb/lb-mole) =	95.95	

References

(1) RTI International, Emission Estimation Protocol for Iron and Steel Foundries (December, 2012), Table 6-2. Value for shot blasting, captured and uncontrolled.

(2) See Table 1, Input Process Rates and Parameters.

(3) RTI International, Emission Estimation Protocol for Iron and Steel Foundries (December, 2012), Table 3-4, Typical Collection Efficiencies of Various Particulate Control Devices. Section 3.1.4.1 notes that it can be assumed that PM collection efficiencies for PM greater than 10 µm are 100 percent.

(4) Based on a dust analysis conducted by Apex Laboratories, March 2021. Dust speciation for the mesh blast hopper is assumed to be representative of shotblast speciation.

(5) As a conservative estimate, Chromium VI is assumed to be 3 percent of total chromium. Eagle Foundry reserves the right to revise this assumption if site specific data becomes available.

(6) Conservatively assume 100 percent of molybdenum is in the trioxide form.

Table 15
PTE Small Palmer TAC Emission Estimates
Eagle Foundry Company

Toxic Air Contaminant	CAS/DEQ ID	Emission Factor (lb/ton PM generated)		Total Emissions Estimate	
				Daily [a] (lb/day)	Annual [b] (lb/yr)
Aluminum and Compounds	7429-90-5	10.3	(1)	5.9E-03	1.55
Antimony and Compounds	7440-36-0	1.5E-03	(1)	8.4E-07	2.2E-04
Arsenic and Compounds	7440-38-2	1.2E-03	(1)	6.9E-07	1.8E-04
Barium and Compounds	7440-39-3	0.060	(1)	3.5E-05	9.0E-03
Beryllium and compounds	7440-41-7	9.9E-05	(1)	5.7E-08	1.5E-05
Cadmium and Compounds	7440-43-9	2.3E-04	(1)	1.3E-07	3.4E-05
Chromium	7440-47-3	0.098	(1)	5.6E-05	0.015
Chromium VI	18540-29-9	2.9E-03	(3)	1.7E-06	4.4E-04
Cobalt and Compounds	7440-48-4	1.7E-03	(1)	9.5E-07	2.5E-04
Copper and Compounds	7440-50-8	0.26	(1)	1.5E-04	0.039
Lead and Compounds	7439-92-1	0.031	(1)	1.8E-05	4.7E-03
Manganese and Compounds	7439-96-5	0.78	(1)	4.5E-04	0.12
Molybdenum trioxide	1313-27-5	0.024	(c)	1.4E-05	3.5E-03
Nickel and Compounds	7440-02-0	0.037	(1)	2.1E-05	5.6E-03
Selenium and Compounds	7782-49-2	4.9E-04	(1)	2.8E-07	7.4E-05
Silver and Compounds	7440-22-4	6.2E-04	(1)	3.6E-07	9.2E-05
Thallium	7440-28-0	9.9E-05	(1)	5.7E-08	1.5E-05
Vanadium (fume or dust)	7440-62-2	6.7E-03	(1)	3.9E-06	1.0E-03
Zinc and Compounds	7440-66-6	0.17	(1)	9.6E-05	0.025

Notes

PM = particulate matter.

[a] Daily emissions estimate (lb/day) = (daily PM generated [lb/day])
x (emission factor [lb/ton PM generated]) x (ton/2,000 lb) x (1 - [baghouse control efficiency {%}]/100)

Daily PM generated (lb PM generated/day) = 115 (1)
Baghouse control efficiency (%) = 99.0 (2)

[b] Annual emissions estimate (lb/yr) = (annual PM generated [ton/yr]) x (emission factor [lb/ton PM generated])
x (1 - [baghouse control efficiency {%}]/100)

Annual PM generated (tons PM generated/yr) = 14.948 (1)
Baghouse control efficiency (%) = 99.0 (2)

[c] Molybdenum trioxide emission factor (lb/ton PM generated) = (molybdenum emission factor [lb/ton PM generated])
x (molybdenum trioxide molecular weight [lb/lb-mole]) / (molybdenum molecular weight [lb/lb-mole])

Molybdenum emission factor (lb/ton PM generated) = 0.016 (4)
Molybdenum trioxide molecular weight (lb/lb-mole) = 143.94
Molybdenum molecular weight (lb/lb-mole) = 95.95

References

(1) Information provided by Eagle Foundry

(2) See Table 1, Input Process Rates and Parameters.

(3) As a conservative estimate, Chromium VI is assumed to be 3 percent of total chromium. Eagle Foundry reserves the right to revise this assumption if site specific data becomes available.

(4) Based on a dust analysis conducted by Apex Laboratories, March 2021.

Table 16
PTE Small Palmer Material Handling TAC Emission Estimates
Eagle Foundry Company

Product	Toxic Air Contaminant	CAS	Weight Percentage (%)	Product Usage [1]		Total Emissions Estimate	
				Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)
Velvacoat ST 803 (Mold Wash Z)	Isopropanol	67-63-0	25.0 [2]	41.7	10,000	10.4 [a]	2,500 [b]
	Silica, crystalline	7631-86-9 [3]	0.55 [2]			2.3E-05 [c]	5.5E-03 [d]
	Silica, crystalline	7631-86-9 [3]	0.55 [2]			2.3E-05 [c]	5.5E-03 [d]
Coated Cerabead	Phenol	108-95-2	0.010 [2]	517.7	124,257	0.052 [a]	12.4 [b]
	Silica, crystalline	7631-86-9	25.4 [5]			0.013 [c]	3.15 [d]
	Aluminum and Compounds	7429-90-5	34.2 [5]			0.018 [c]	4.25 [d]
G-29 Sand	Silica, crystalline	7631-86-9 [3]	95.0 [2]	1,226.0	294,241	0.12 [c]	28.0 [d]
Unibond 1350 Core Paste	Silica, crystalline	7631-86-9 [3]	27.1 [5]	41.0	9,835	1.1E-03 [c]	0.27 [d]
Naigai Cerabead	Silica, crystalline	7631-86-9	25.4 [5]	47,227	11,334,527	1.20 [c]	288 [d]
	Aluminum and Compounds	7429-90-5	34.2 [5]			1.62 [c]	388 [d]

Notes

PM = particulate matter.

[a] Daily emissions estimate (lb/day) = (weight percentage [%]/100) x (daily product usage [lb/day])

[b] Annual emissions estimate (lb/yr) =(weight percentage [%]/100) x (annual product usage [lb/yr])

[c] Daily emissions estimate (lb/day) = (PM emission factor [lb/ton]) x (daily product usage [lb/day]) x (ton/2,000 lb) x (weight percent [%])/100

PM emission factor (lb/ton sand handled) = 0.20 (4)

[d] Annual emissions estimate (lb/yr) = (PM emission factor [lb/ton]) x (annual product usage [lb/yr]) x (ton/2,000 lb) x (weight percent [%])/100

PM emission factor (lb/ton sand handled) = 0.20 (4)

References

[1] See Table 1, Input Process Rates and Parameters.

[2] Information from product SDS. Value is midpoint of the range.

[3] CAS numbers have been updated to the CAS for silica, crystalline- respirable. Not all crystalline silica in the product is of a respirable size.

[4] AP-42 Chapter 12.10, Table 12.10-7, Particulate Emission factors for Ancillary Operations and Fugitive Sources at Gray Iron Foundries. Value for sand handling, baghouse controlled.

[5] See Table D3, Silica Data.

Table 17
PTE Big Palmer Material Handling TAC Emission Estimates
Eagle Foundry Company

Product	Toxic Air Contaminant	CAS	Weight Percentage [1] (%)	Product Usage [2]		Total Emissions Estimate	
				Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)
Velvacoat ST 803 (Mold Wash Z)	Isopropanol	67-63-0	25.0	125	30,000	31.3 [a]	7,500 [b]
	Silica, crystalline	7631-86-9 [3]	0.55			1.2E-04 [c]	0.030 [d]
	Silica, crystalline	7631-86-9 [3]	0.55			1.2E-04 [c]	0.030 [d]
Isomol 780 (Mold Wash M)	Isopropanol	67-63-0	27.5	21.3	5,113	5.86 [a]	1,406 [b]
	Silica, crystalline	7631-86-9 [3]	0.55			2.1E-05 [c]	5.1E-03 [d]
Unibond 1350 Core Paste	Silica, crystalline	7631-86-9 [3]	27.1 [5]	25.1	6,028	1.2E-03 [c]	0.29 [d]
Naigai Cerabead	Silica, crystalline	7631-86-9 [3]	25.4 [5]	28,946	6,946,975	1.32 [c]	317 [d]
	Aluminum and Compounds	7429-90-5	34.2			1.78 [c]	428 [d]

Notes

PM = particulate matter.

[a] Daily emissions estimate (lb/day) = (weight percentage [%]/100) x (daily product usage [lb/day])

[b] Annual emissions estimate (lb/yr) =(weight percentage [%]/100) x (annual product usage [lb/yr])

[c] Daily emissions estimate (lb/day) = (PM emission factor [lb/ton]) x (daily product usage [lb/day]) x (ton/2,000 lb) x (weight percent [%])/100 x (1 - [baghouse control efficiency {%}]/100)

PM emission factor (lb/ton sand handled) =	3.60	(4)
Main Foundry baghouse control efficiency (%) =	90.0	(2)

[d] Annual emissions estimate (lb/yr) = (PM emission factor [lb/ton]) x (annual product usage [lb/yr]) x (ton/2,000 lb) x (weight percent [%])/100 x (1 - [baghouse control efficiency {%}]/100)

PM emission factor (lb/ton sand handled) =	3.60	(4)
Main Foundry baghouse control efficiency (%) =	90.0	(2)

References

[1] Information from product SDS. Value is midpoint of the range.

[2] See Table 1, Input Process Rates and Parameters.

[3] CAS numbers have been updated to the CAS for silica, crystalline- respirable. Not all crystalline silica in the product is of a respirable size.

[4] AP-42 Chapter 12.10, Table 12.10-7, Particulate Emission factors for Ancillary Operations and Fugitive Sources at Gray Iron Foundries. Value for sand handling, uncontrolled.

[5] See Table D3, Silica Data.

Table 18
PTE Screening Station TAC Emission Estimates
Eagle Foundry Company

Toxic Air Contaminant	CAS/DEQ ID	Emission Factor		Total Emissions Estimate	
				Daily (lb/day)	Annual (lb/yr)
PM	--	0.20	(lb PM/ton sand handled) (1)	7.19 (a)	1,870 (c)
Aluminum and Compounds	7429-90-5	0.50	(% of PM emitted) (4)	0.036 (d)	9.31 (e)
Antimony and Compounds	7440-36-0	7.0E-05	(% of PM emitted) (4)	5.0E-06 (d)	1.3E-03 (e)
Arsenic and Compounds	7440-38-2	2.7E-05	(% of PM emitted) (4)	1.9E-06 (d)	5.0E-04 (e)
Barium and Compounds	7440-39-3	2.4E-03	(% of PM emitted) (4)	1.8E-04 (d)	0.046 (e)
Beryllium and compounds	7440-41-7	5.3E-06	(% of PM emitted) (4)	3.8E-07 (d)	9.9E-05 (e)
Cadmium and Compounds	7440-43-9	5.3E-06	(% of PM emitted) (4)	3.8E-07 (d)	9.9E-05 (e)
Chromium	7440-47-3	5.8E-03	(% of PM emitted) (4)	4.2E-04 (d)	0.11 (e)
Chromium VI	18540-29-9	1.7E-04	(% of PM emitted) (5)	1.3E-05 (d)	3.3E-03 (e)
Cobalt and Compounds	7440-48-4	9.2E-05	(% of PM emitted) (4)	6.6E-06 (d)	1.7E-03 (e)
Copper and Compounds	7440-50-8	0.017	(% of PM emitted) (4)	1.3E-03 (d)	0.33 (e)
Lead and Compounds	7439-92-1	1.2E-03	(% of PM emitted) (4)	8.6E-05 (d)	0.022 (e)
Manganese and Compounds	7439-96-5	0.046	(% of PM emitted) (4)	3.3E-03 (d)	0.87 (e)
Molybdenum trioxide	1313-27-5	1.7E-03	(% of PM emitted) (f)	1.2E-04 (d)	0.031 (e)
Nickel and Compounds	7440-02-0	3.0E-03	(% of PM emitted) (4)	2.1E-04 (d)	0.056 (e)
Selenium and Compounds	7782-49-2	2.7E-05	(% of PM emitted) (4)	1.9E-06 (d)	5.0E-04 (e)
Silica, crystalline	7631-86-9	36.1	(% of PM emitted) (7)	2.60 (d)	675 (e)
Silver and Compounds	7440-22-4	3.1E-05	(% of PM emitted) (4)	2.2E-06 (d)	5.7E-04 (e)
Thallium	7440-28-0	5.3E-06	(% of PM emitted) (4)	3.8E-07 (d)	9.9E-05 (e)
Vanadium (fume or dust)	7440-62-2	2.8E-04	(% of PM emitted) (4)	2.0E-05 (d)	5.2E-03 (e)
Zinc and Compounds	7440-66-6	5.7E-03	(% of PM emitted) (4)	4.1E-04 (d)	0.11 (e)

Notes

PM = particulate matter.

(a) Daily emissions estimate (lb/day) = (emission factor [lb/ton sand handled]) x (daily sand handled [tons/day])

Daily sand handled (tons/day) = 36.0 (b)

(b) Total sand handling (lb/unit) = (metal poured [tons/unit]) x (sand-to-metal ratio)

Daily total metal poured (tons/day) = 31.0 (2)

Annual total metal poured (tons/yr) = 8,060 (2)

Sand-to-metal ratio (tons/ton) = 1.16 (3)

(c) Annual emissions estimate (lb/yr) = (emission factor [lb/ton sand handled]) x (annual sand used [tons/yr])

Annual sand handled (tons/yr) = 9,350 (b)

(d) Daily emissions estimate (lb/day) = (daily PM emissions [lb/day]) x (emission factor [% of PM emitted]/100)

(e) Annual emissions estimate (lb/yr) = (annual PM emissions [lb/yr]) x (emission factor [% of PM emitted]/100)

(f) Molybdenum trioxide emission factor (% of PM emitted) = (molybdenum emission factor [% of PM emitted])
x (molybdenum trioxide molecular weight [lb/lb-mole]) / (molybdenum molecular weight [lb/lb-mole]) (6)

Molybdenum percentage of PM (%) = 1.1E-03 (4)

Molybdenum trioxide molecular weight (lb/lb-mole) = 143.94

Molybdenum molecular weight (lb/lb-mole) = 95.95

References

(1) AP-42 Chapter 12.10, Table 12.10-7. Assumes value for baghouse-controlled sand handling.

(2) See Table 1, Input Process Rates and Parameters.

(3) Ratio of sand to total metal poured is based on facility operations. Value includes G-29 Sand, Naigai Cerabead, and Coated Cerabead.

(4) Based on a dust analysis conducted by Apex Laboratories, March 2021.

(5) As a conservative estimate, Chromium VI is assumed to be 3 percent of total chromium. Eagle Foundry reserves the right to revise this assumption if site specific data becomes available.

(6) Conservatively assume 100 percent of molybdenum is in the trioxide form.

(7) Value is the weighted average silica content of mold making materials.

Table 19
PTE Slag Handling TAC Emission Estimates
Eagle Foundry Company

Pollutant	CAS/DEQ ID	Emission Factor		Total Emissions Estimate	
				Daily (lb/day)	Annual (lb/yr)
PM_{10}	--	0.018	(lb PM/ton slag) [a]	0.016 [b]	4.06 [c]
Aluminum and Compounds	7429-90-5	0.46	(% of PM emitted) [5]	7.6E-05 [d]	0.019 [e]
Antimony and Compounds	7440-36-0	5.35E-05	(% of PM emitted) [5]	8.8E-09 [d]	2.2E-06 [e]
Arsenic and Compounds	7440-38-2	5.35E-05	(% of PM emitted) [5]	8.8E-09 [d]	2.2E-06 [e]
Barium and Compounds	7440-39-3	1.03E-03	(% of PM emitted) [5]	1.7E-07 [d]	4.2E-05 [e]
Beryllium and compounds	7440-41-7	1.07E-05	(% of PM emitted) [5]	1.8E-09 [d]	4.3E-07 [e]
Cadmium and Compounds	7440-43-9	1.07E-05	(% of PM emitted) [5]	1.8E-09 [d]	4.3E-07 [e]
Chromium	7440-47-3	0.26	(% of PM emitted) [5]	4.3E-05 [d]	0.010 [e]
Chromium VI	18540-29-9	1.55E-03	(% of PM emitted) [5]	2.6E-07 [d]	6.3E-05 [e]
Cobalt and Compounds	7440-48-4	3.56E-04	(% of PM emitted) [5]	5.9E-08 [d]	1.4E-05 [e]
Copper and Compounds	7440-50-8	2.42E-03	(% of PM emitted) [5]	4.0E-07 [d]	9.8E-05 [e]
Lead and Compounds	7439-92-1	4.06E-05	(% of PM emitted) [5]	6.7E-09 [d]	1.6E-06 [e]
Manganese and Compounds	7439-96-5	0.77	(% of PM emitted) [5]	1.3E-04 [d]	0.031 [e]
Mercury	7439-97-6	4.29E-06	(% of PM emitted) [5]	7.1E-10 [d]	1.7E-07 [e]
Molybdenum trioxide	1313-27-5	0.012	(% of PM emitted) [5]	2.0E-06 [d]	4.9E-04 [e]
Nickel and Compounds	7440-02-0	3.86E-03	(% of PM emitted) [5]	6.4E-07 [d]	1.6E-04 [e]
Phosphorus and Compounds	504	5.35E-03	(% of PM emitted) [5]	8.8E-07 [d]	2.2E-04 [e]
Selenium and Compounds	7782-49-2	5.35E-05	(% of PM emitted) [5]	8.8E-09 [d]	2.2E-06 [e]
Silver and Compounds	7440-22-4	1.07E-05	(% of PM emitted) [5]	1.8E-09 [d]	4.3E-07 [e]
Thallium	7440-28-0	1.07E-05	(% of PM emitted) [5]	1.8E-09 [d]	4.3E-07 [e]
Vanadium (fume or dust)	7440-62-2	5.68E-04	(% of PM emitted) [5]	9.4E-08 [d]	2.3E-05 [e]
Zinc and Compounds	7440-66-6	2.14E-04	(% of PM emitted) [5]	3.5E-08 [d]	8.7E-06 [e]

Notes

PM = particulate matter.

[a] Emission factor (lb/ton) = (0.0032) x (particulate size multiplier) x ([wind speed {mph}] / 5)$^{1.3}$ / ([material moisture content {%}] / 2)$^{1.4}$

Particulate size multiplier for PM_{10} = 0.35 (1)

Wind speed (mph) = 18.6 (2)

Moisture content of slag (%) = 0.92 (3)

[b] Daily emissions estimate (lb/day) = (emission factor [lb/ton slag]) x (daily slag handled [tons/day])

Daily slag handled (tons/day) = 0.90 (4)

[c] Annual emissions estimate (lb/yr) = (emission factor [lb/ton slag]) x (annual slag handled [tons/yr])

Annual slag handled (tons/yr) = 222 (4)

[d] Daily emissions estimate (lb/day) = (daily PM emissions [lb/day]) x (emission factor [% of PM emitted]/100)

[e] Annual emissions estimate (lb/yr) = (annual PM emissions [lb/yr]) x (emission factor [% of PM emitted]/100)

[e] Molybdenum trioxide emission factor (lb/ton PM generated) = (molybdenum emission factor [lb/ton PM generated]) x (molybdenum trioxide molecular weight [lb/lb-mole]) / (molybdenum molecular weight [lb/lb-mole]) (6)

Molybdenum emission factor (lb/ton PM generated) = 8.0E-03 (5)

Molybdenum trioxide molecular weight (lb/lb-mole) = 143.94

Molybdenum molecular weight (lb/lb-mole) = 95.95

References

[1] AP-42, Chapter 13.2.4 "Aggregate Handling and Storage Piles" (November 2006). Equation for quantity of particulate emissions generated by drop operations.

[2] Value represents the highest average daily wind speed, 2018 - 2022, from the Carus-Spangler monitoring station (DEQ).

[3] Based on operations at similar facility.

[4] See Table 1, Input Process Rates and Parameters.

[5] Based on facility dust collection records and the dust analysis conducted by Apex Laboratories, September 2023.

[6] Conservatively assume 100 percent of molybdenum is in the trioxide form.

Table 20
PTE Pattern Making TAC Emission Estimates
Eagle Foundry Company

Product	Toxic Air Contaminant	CAS	Weight Percentage (%)	Specific Gravity	Product Density (lb/gal)	Product Usage [1]		Total Emissions Estimate	
						Maximum Daily (gal/day)	Annual (gal/yr)	Daily [a] (lb/day)	Annual [b] (lb/yr)
Urethane	Toluene	108-88-3	5.50 [2]	0.907 [3]	7.56 [c]	0.36	85.2	0.15	35.4
	1,2,4-Trimethylbenzene	95-63-6	5.50 [5]					0.15	35.4
Mar-Proof H/S Lacquer Sanding Sealer	Methyl Ethyl Ketone	78-93-3	17.5 [2]	--	7.56 [3]	0.030	7.10	0.039	9.40
	Toluene	108-88-3	17.5 [2]					0.039	9.40
	Isopropanol	67-63-0	5.00 [2]					0.011	2.68
	n-Butyl Alcohol	71-36-3	5.00 [2]					0.011	2.68

Notes

gal = gallon; lb = pound.

[a] Daily emissions estimate (lb/day) = (weight percentage [%]/100) x (product density [lb/gal]) x (daily product usage [gal/day])

[b] Annual emissions estimate (lb/yr) =(weight percentage [%]/100) x (product density [lb/gal]) x (maximum annual product usage [gal/yr])

[c] Product density (lb/gal) = (specific gravity) x (density of water [lb/gal])

Density of water (lb/gal) = 8.331 (4)

References

[1] See Table 1, Input Process Rates and Parameters.

[2] Information from product SDS. Value is midpoint of the range.

[3] Information from product SDS.

[4] Density of water at 20 degrees Celsius.

[5] Information from product SDS. CAS 95-63-6 (1,2,4-trimethylbenzene) was substituted for CAS 25551-13-7 (trimethylbenzene).

Table 21
PTE Heat Treat—Propane Combustion TAC Emission Estimates
Eagle Foundry Company

Toxic Air Contaminant	CAS	Emission Factor [1] (lb/Mgal)	Total Emissions Estimate	
			Daily [a] (lb/day)	Annual [b] (lb/yr)
Benzene	71-43-2	7.1E-04	6.4E-04	0.15
Formaldehyde	50-00-0	1.5E-03	1.4E-03	0.33
PAHs (excluding Naphthalene)	401	1.0E-05	9.0E-06	2.2E-03
Naphthalene	91-20-3	3.0E-05	2.7E-05	6.5E-03
Acetaldehyde	75-07-0	3.8E-04	3.4E-04	0.082
Acrolein	107-02-8	2.4E-04	2.2E-04	0.052
Ammonia	7664-41-7	0.30	0.27	64.7
Ethylbenzene	100-41-4	8.4E-04	7.5E-04	0.18
Hexane	110-54-3	5.6E-04	5.0E-04	0.12
Toluene	108-88-3	3.3E-03	2.9E-03	0.70
Xylene (mixed isomers)	1330-20-7	2.4E-03	2.2E-03	0.52

Notes

Mgal = thousand gallons.

[a] Daily emissions estimate (lb/day) = (emission factor [lb/Mgal]) x (daily propane usage [gal/day]) x (Mgal/1,000 gal)

Daily propane usage (gal/day) = 898 (2)

[b] Annual emissions estimate (lb/yr) = (emission factor [lb/Mgal]) x (annual propane usage [gal/yr]) x (Mgal/1,000 gal)

Annual propane usage (gal/yr) = 215,639 (2)

References

[1] Emission factors provided by Oregon Department of Environmental Quality for Propane External Combustion Sources. Emission factors for sources <10 MMBtu/hr were used.

[2] See Table 1, Input Process Rates and Parameters.

Table 22
PTE Diesel Emergency Generator TAC Emission Estimates
Eagle Foundry Company

Toxic Air Contaminant	CAS	Emission Factor (lb/Mgal)		Emissions Estimates	
				Daily [a] (lb/day)	Annual [b] (lb/yr)
Arsenic	7440-38-2	1.6E-03	[2]	2.3E-05	1.2E-03
Cadmium	7440-43-9	1.5E-03	[2]	2.2E-05	1.1E-03
Chromium VI	18540-29-9	1.0E-04	[2]	1.5E-06	7.3E-05
Copper	7440-50-8	4.1E-03	[2]	6.0E-05	3.0E-03
Lead	7439-92-1	8.3E-03	[2]	1.2E-04	6.1E-03
Manganese	7439-96-5	3.1E-03	[2]	4.5E-05	2.3E-03
Mercury	7439-97-6	2.0E-03	[2]	2.9E-05	1.5E-03
Nickel	7440-02-0	3.9E-03	[2]	5.7E-05	2.8E-03
Selenium	7782-49-2	2.2E-03	[2]	3.2E-05	1.6E-03
Acetaldehyde	75-07-0	0.78	[2]	0.011	0.57
Acrolein	107-02-8	0.034	[2]	4.9E-04	0.025
Benzene	71-43-2	0.19	[2]	2.7E-03	0.14
1,3-Butadiene	106-99-0	0.217	[2]	3.2E-03	0.16
Ethylbenzene	100-41-4	0.011	[2]	1.6E-04	8.0E-03
Formaldehyde	50-00-0	1.73	[2]	0.025	1.26
Hexane	110-54-3	0.027	[2]	3.9E-04	0.020
Toluene	108-88-3	0.11	[2]	1.5E-03	0.077
Xylenes (mixed isomers)	1330-20-7	0.042	[2]	6.2E-04	0.031
Ammonia	7664-41-7	0.80	[4]	0.012	0.58
Hydrochloric Acid	7647-01-0	0.19	[2]	2.7E-03	0.14
PAHs	401	0.036	[2]	5.3E-04	0.026
Benzo(a)pyrene	50-32-8	3.52E-05	[3]	5.1E-07	2.6E-05
Naphthalene	91-20-3	0.020	[2]	2.9E-04	0.014
DPM	200	33.5	[2]	0.49	24.5

Notes

DPM = Diesel particulate matter; Mgal = thousand gallons.

[a] Daily emissions estimate (lb/day) = (emission factor [lb/Mgal]) x (Mgal/1,000 gal) x (daily fuel consumption [gal/day])

Daily fuel consumption (gal/day) = 14.6 (1)

[b] Annual emissions estimate (lb/yr) = (emission factor [lb/Mgal]) x (Mgal/1,000 gal) x (annual fuel consumption [gal/yr])

Annual fuel consumption (gal/yr) = 730 (1)

References

[1] See Table 1, Input Process Rates and Parameters.

[2] DEQ approved diesel combustion emission factors for stationary and portable internal combustion engines.

[3] AP-42 Section 3.4, Table 3.4-4, converted to lb/Mgal using a heating value of 137,000 Btu/gal (Appendix A)

[4] Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory published by the South Coast Air Quality Management District (SCAQMD) in December 2016. See Appendix B, Table B-2 "Default EF for Diesel/Distillate Oil Fuel Combustion (lb/1,000 gal)" for stationary and portable internal combustion engines (ICE). Assumes no control.

Table 23
PTE Reclaimed Bead Silo TAC Emission Estimates
Eagle Foundry Company

Toxic Air Contaminant	CAS/DEQ ID	Emission Factor			Total Emissions Estimate			
					Daily (lb/day)		Annual (lb/yr)	
PM	--	2.1E-04	(lb/hr)	(a)	4.2E-03	(b)	1.84	(c)
Aluminum and Compounds	7429-90-5	0.50	(% of PM emitted)	(3)	2.1E-05	(d)	9.2E-03	(e)
Antimony and Compounds	7440-36-0	7.0E-05	(% of PM emitted)	(3)	2.9E-09	(d)	1.3E-06	(e)
Arsenic and Compounds	7440-38-2	2.7E-05	(% of PM emitted)	(3)	1.1E-09	(d)	4.9E-07	(e)
Barium and Compounds	7440-39-3	2.4E-03	(% of PM emitted)	(3)	1.0E-07	(d)	4.5E-05	(e)
Beryllium and compounds	7440-41-7	5.3E-06	(% of PM emitted)	(3)	2.2E-10	(d)	9.7E-08	(e)
Cadmium and Compounds	7440-43-9	5.3E-06	(% of PM emitted)	(3)	2.2E-10	(d)	9.7E-08	(e)
Chromium	7440-47-3	5.8E-03	(% of PM emitted)	(3)	2.4E-07	(d)	1.1E-04	(e)
Chromium VI	18540-29-9	1.7E-04	(% of PM emitted)	(4)	7.3E-09	(d)	3.2E-06	(e)
Cobalt and Compounds	7440-48-4	9.2E-05	(% of PM emitted)	(3)	3.9E-09	(d)	1.7E-06	(e)
Copper and Compounds	7440-50-8	0.017	(% of PM emitted)	(3)	7.3E-07	(d)	3.2E-04	(e)
Lead and Compounds	7439-92-1	1.2E-03	(% of PM emitted)	(3)	5.0E-08	(d)	2.2E-05	(e)
Manganese and Compounds	7439-96-5	0.046	(% of PM emitted)	(3)	1.9E-06	(d)	8.5E-04	(e)
Nickel and Compounds	7440-02-0	3.0E-03	(% of PM emitted)	(3)	1.2E-07	(d)	5.5E-05	(e)
Silica, crystalline	7631-86-9	36.1	(% of PM emitted)	(5)	1.5E-03	(d)	0.66	(e)
Selenium and Compounds	7782-49-2	2.7E-05	(% of PM emitted)	(3)	1.1E-09	(d)	4.9E-07	(e)
Silver and Compounds	7440-22-4	3.1E-05	(% of PM emitted)	(3)	1.3E-09	(d)	5.6E-07	(e)
Thallium	7440-28-0	5.3E-06	(% of PM emitted)	(3)	2.2E-10	(d)	9.7E-08	(e)
Vanadium (fume or dust)	7440-62-2	2.8E-04	(% of PM emitted)	(3)	1.2E-08	(d)	5.1E-06	(e)
Zinc and Compounds	7440-66-6	5.7E-03	(% of PM emitted)	(3)	2.4E-07	(d)	1.0E-04	(e)

Notes

PM = particulate matter.

(a) Emission factor (lb/hr) = (PM discharge rate [lb/10^6 ft^3]) x (bin vent airflow rate [ft^3/hr]) x (10^6)
x (1 - [baghouse control efficiency {%}]/100)

Bin vent airflow rate (ft^3/hr) =	30,000	(1)
PM discharge rate (lb/10^6 ft^3) =	0.70	(1)
Baghouse control efficiency (%) =	99.0	(2)

(b) Daily emissions estimate (lb/day) = (emission factor [lb/hr]) x (daily hours of operation [hrs/day])

Daily hours of operation (hrs/day) =	20.0	(2)

(c) Annual emissions estimate (lb/yr) = (emission factor [lb/hr]) x (annual hours of operation [hrs/yr])

Annual hours of operation (hrs/yr) =	8,760	(2)

(d) Daily emissions estimate (lb/day) = (daily PM emissions [lb/day]) x (emission factor [% of PM emitted]/100)

(e) Annual emissions estimate (lb/yr) = (annual PM emissions [lb/yr]) x (emission factor [% of PM emitted]/100)

References

(1) Draft Review Report 03-2631, Application no. 016656, October 29, 1998.

(2) See Table 1, Input Process Rates and Parameters.

(3) Based on a dust analysis conducted by Apex Laboratories, March 2021.

(4) As a conservative estimate, Chromium VI is assumed to be 3 percent of total chromium. Eagle Foundry reserves the right to revise this assumption if site-specific data becomes available.

(5) Value is the weighted average silica content of mold making materials.

Table 24
PTE Reclaimed Bead Overflow Silo TAC Emission Estimates
Eagle Foundry Company

Toxic Air Contaminant	CAS/DEQ ID	Emission Factor			Total Emissions Estimate		Daily (lb/day)		Annual (lb/yr)	
PM	--	2.1E-04	(lb/hr)	(a)	4.2E-03	(b)	1.84	(c)		
Aluminum and Compounds	7429-90-5	0.50	(% of PM emitted)	(3)	2.1E-05	(d)	9.2E-03	(e)		
Antimony and Compounds	7440-36-0	7.0E-05	(% of PM emitted)	(3)	2.9E-09	(d)	1.3E-06	(e)		
Arsenic and Compounds	7440-38-2	2.7E-05	(% of PM emitted)	(3)	1.1E-09	(d)	4.9E-07	(e)		
Barium and Compounds	7440-39-3	2.4E-03	(% of PM emitted)	(3)	1.0E-07	(d)	4.5E-05	(e)		
Beryllium and compounds	7440-41-7	5.3E-06	(% of PM emitted)	(3)	2.2E-10	(d)	9.7E-08	(e)		
Cadmium and Compounds	7440-43-9	5.3E-06	(% of PM emitted)	(3)	2.2E-10	(d)	9.7E-08	(e)		
Chromium	7440-47-3	5.8E-03	(% of PM emitted)	(3)	2.4E-07	(d)	1.1E-04	(e)		
Chromium VI	18540-29-9	1.7E-04	(% of PM emitted)	(4)	7.3E-09	(d)	3.2E-06	(e)		
Cobalt and Compounds	7440-48-4	9.2E-05	(% of PM emitted)	(3)	3.9E-09	(d)	1.7E-06	(e)		
Copper and Compounds	7440-50-8	0.017	(% of PM emitted)	(3)	7.3E-07	(d)	3.2E-04	(e)		
Lead and Compounds	7439-92-1	1.2E-03	(% of PM emitted)	(3)	5.0E-08	(d)	2.2E-05	(e)		
Manganese and Compounds	7439-96-5	0.046	(% of PM emitted)	(3)	1.9E-06	(d)	8.5E-04	(e)		
Nickel and Compounds	7440-02-0	3.0E-03	(% of PM emitted)	(3)	1.2E-07	(d)	5.5E-05	(e)		
Silica, crystalline	7631-86-9	36.1	(% of PM emitted)	(5)	1.5E-03	(d)	0.66	(e)		
Selenium and Compounds	7782-49-2	2.7E-05	(% of PM emitted)	(3)	1.1E-09	(d)	4.9E-07	(e)		
Silver and Compounds	7440-22-4	3.1E-05	(% of PM emitted)	(3)	1.3E-09	(d)	5.6E-07	(e)		
Thallium	7440-28-0	5.3E-06	(% of PM emitted)	(3)	2.2E-10	(d)	9.7E-08	(e)		
Vanadium (fume or dust)	7440-62-2	2.8E-04	(% of PM emitted)	(3)	1.2E-08	(d)	5.1E-06	(e)		
Zinc and Compounds	7440-66-6	5.7E-03	(% of PM emitted)	(3)	2.4E-07	(d)	1.0E-04	(e)		

Notes

PM = particulate matter.

(a) Emission factor (lb/hr) = (PM discharge rate [lb/10^6 ft^3]) x (bin vent airflow rate [ft^3/hr]) x (10^6) x (1 - [baghouse control efficiency {%}]/100)

Bin vent airflow rate (ft^3/hr) =	30,000	(1)
PM discharge rate (lb/10^6 ft^3) =	0.70	(1)
Baghouse control efficiency (%) =	99.0	(2)

(b) Daily emissions estimate (lb/day) = (emission factor [lb/hr]) x (daily hours of operation [hrs/day])

Daily hours of operation (hrs/day) =	20.0	(2)

(c) Annual emissions estimate (lb/yr) = (emission factor [lb/hr]) x (annual hours of operation [hrs/yr])

Annual hours of operation (hrs/yr) =	8,760	(2)

(d) Daily emissions estimate (lb/day) = (daily PM emissions [lb/day]) x (emission factor [% of PM emitted]/100)

(e) Annual emissions estimate (lb/yr) = (annual PM emissions [lb/yr]) x (emission factor [% of PM emitted]/100)

References

(1) Draft Review Report 03-2631, Application no. 016656, October 29, 1998.

(2) See Table 1, Input Process Rates and Parameters.

(3) Based on a dust analysis conducted by Apex Laboratories, March 2021.

(4) As a conservative estimate, Chromium VI is assumed to be 3 percent of total chromium. Eagle Foundry reserves the right to revise this assumption if site-specific data becomes available.

(5) Value is the weighted average silica content of mold making materials.

Table 25
PTE Small Palmer Silo TAC Emission Estimates
Eagle Foundry Company

Toxic Air Contaminant	CAS/DEQ ID	Emission Factor			Total Emissions Estimate			
					Daily (lb/day)		Annual (lb/yr)	
PM	--	2.1E-04	(lb/hr)	(a)	4.2E-03	(b)	1.84	(c)
Aluminum and Compounds	7429-90-5	0.50	(% of PM emitted)	(3)	2.1E-05	(d)	9.2E-03	(e)
Antimony and Compounds	7440-36-0	7.0E-05	(% of PM emitted)	(3)	2.9E-09	(d)	1.3E-06	(e)
Arsenic and Compounds	7440-38-2	2.7E-05	(% of PM emitted)	(3)	1.1E-09	(d)	4.9E-07	(e)
Barium and Compounds	7440-39-3	2.4E-03	(% of PM emitted)	(3)	1.0E-07	(d)	4.5E-05	(e)
Beryllium and compounds	7440-41-7	5.3E-06	(% of PM emitted)	(3)	2.2E-10	(d)	9.7E-08	(e)
Cadmium and Compounds	7440-43-9	5.3E-06	(% of PM emitted)	(3)	2.2E-10	(d)	9.7E-08	(e)
Chromium	7440-47-3	5.8E-03	(% of PM emitted)	(3)	2.4E-07	(d)	1.1E-04	(e)
Chromium VI	18540-29-9	1.7E-04	(% of PM emitted)	(4)	7.3E-09	(d)	3.2E-06	(e)
Cobalt and Compounds	7440-48-4	9.2E-05	(% of PM emitted)	(3)	3.9E-09	(d)	1.7E-06	(e)
Copper and Compounds	7440-50-8	0.017	(% of PM emitted)	(3)	7.3E-07	(d)	3.2E-04	(e)
Lead and Compounds	7439-92-1	1.2E-03	(% of PM emitted)	(3)	5.0E-08	(d)	2.2E-05	(e)
Manganese and Compounds	7439-96-5	0.046	(% of PM emitted)	(3)	1.9E-06	(d)	8.5E-04	(e)
Nickel and Compounds	7440-02-0	3.0E-03	(% of PM emitted)	(3)	1.2E-07	(d)	5.5E-05	(e)
Silica, crystalline	7631-86-9	36.1	(% of PM emitted)	(5)	1.5E-03	(d)	0.66	(e)
Selenium and Compounds	7782-49-2	2.7E-05	(% of PM emitted)	(3)	1.1E-09	(d)	4.9E-07	(e)
Silver and Compounds	7440-22-4	3.1E-05	(% of PM emitted)	(3)	1.3E-09	(d)	5.6E-07	(e)
Thallium	7440-28-0	5.3E-06	(% of PM emitted)	(3)	2.2E-10	(d)	9.7E-08	(e)
Vanadium (fume or dust)	7440-62-2	2.8E-04	(% of PM emitted)	(3)	1.2E-08	(d)	5.1E-06	(e)
Zinc and Compounds	7440-66-6	5.7E-03	(% of PM emitted)	(3)	2.4E-07	(d)	1.0E-04	(e)

Notes

PM = particulate matter.

(a) Emission factor (lb/hr) = (PM discharge rate [lb/10^6 ft^3]) x (bin vent airflow rate [ft^3/hr]) x (10^6) x (1 - [baghouse control efficiency {%}]/100)

Bin vent airflow rate (ft^3/hr) =	30,000	(1)
PM discharge rate (lb/10^6 ft^3) =	0.70	(1)
Baghouse control efficiency (%) =	99.0	(2)

(b) Daily emissions estimate (lb/day) = (emission factor [lb/hr]) x (daily hours of operation [hrs/day])

Daily hours of operation (hrs/day) =	20.0	(2)

(c) Annual emissions estimate (lb/yr) = (emission factor [lb/hr]) x (annual hours of operation [hrs/yr])

Annual hours of operation (hrs/yr) =	8,760	(2)

(d) Daily emissions estimate (lb/day) = (daily PM emissions [lb/day]) x (emission factor [% of PM emitted]/100)

(e) Annual emissions estimate (lb/yr) = (annual PM emissions [lb/yr]) x (emission factor [% of PM emitted]/100)

References

(1) Draft Review Report 03-2631, Application no. 016656, October 29, 1998.

(2) See Table 1, Input Process Rates and Parameters.

(3) Based on a dust analysis conducted by Apex Laboratories, March 2021.

(4) As a conservative estimate, Chromium VI is assumed to be 3 percent of total chromium. Eagle Foundry reserves the right to revise this assumption if site-specific data becomes available.

(5) Value is the weighted average silica content of mold making materials.

Table 26
PTE New Bead Silo TAC Emission Estimates
Eagle Foundry Company

Toxic Air Contaminant	CAS/DEQ ID	Emission Factor			Total Emissions Estimate			
					Daily (lb/day)		Annual (lb/yr)	
PM	--	2.1E-04	(lb/hr)	(a)	4.2E-03	(b)	1.84	(c)
Aluminum and Compounds	7429-90-5	34.21	(% of PM emitted)	(2)	1.4E-03	(d)	0.63	(e)
Silica, crystalline	7631-86-9	25.38	(% of PM emitted)	(2)	1.1E-03	(d)	0.47	(e)

Notes

PM = particulate matter.

(a) Emission factor (lb/hr) = (PM discharge rate [lb/10^6 ft^3]) x (bin vent airflow rate [ft^3/hr]) x (10^6) x (1 - [baghouse control efficiency {%}]/100)

Bin vent airflow rate (ft^3/hr) =	30,000	(1)
PM discharge rate (lb/10^6 ft^3) =	0.70	(1)
Baghouse control efficiency (%) =	99.0	(3)

(b) Daily emissions estimate (lb/day) = (emission factor [lb/hr]) x (daily hours of operation [hrs/day])

Daily hours of operation (hrs/day) =	20.0	(3)

(c) Annual emissions estimate (lb/yr) = (emission factor [lb/hr]) x (annual hours of operation [hrs/yr])

Annual hours of operation (hrs/yr) =	8,760	(3)

(d) Daily emissions estimate (lb/day) = (daily PM emissions [lb/day]) x (emission factor [% of PM emitted]/100)

(e) Annual emissions estimate (lb/yr) = (annual PM emissions [lb/yr]) x (emission factor [% of PM emitted]/100)

References

(1) Draft Review Report 03-2631, Application no. 016656, October 29, 1998.

(2) See Table D3, Silica Data.

(3) See Table 1, Input Process Rates and Parameters.

Table 27
PTE TAC Emissions Summary
Eagle Foundry Company

Toxic Air Contaminant	CAS/DEQ ID	HAP? (Yes/No)	RBC? (Yes/No)	Emissions Estimate							
				Foundry White Iron		Foundry Steel		Hot Top		Reclamation	
				(lb/day)	(lb/yr)	(lb/day)	(lb/yr)	(lb/day)	(lb/yr)	(lb/day)	(lb/yr)
ORGANIC COMPOUNDS											
Acetaldehyde	75-07-0	Yes	Yes	--	--	--	--	--	--	--	--
Acrolein	107-02-8	Yes	Yes	--	--	--	--	--	--	--	--
Benzene	71-43-2	Yes	Yes	--	--	--	--	--	--	--	--
1,3-Butadiene	106-99-0	Yes	Yes	--	--	--	--	--	--	--	--
Ethylbenzene	100-41-4	Yes	Yes	--	--	--	--	--	--	--	--
Formaldehyde	50-00-0	Yes	Yes	--	--	--	--	--	--	--	--
Hexane	110-54-3	Yes	Yes	--	--	--	--	--	--	--	--
Isopropanol	67-63-0	No	Yes	--	--	--	--	--	--	--	--
Methyl Ethyl Ketone	78-93-3	No	Yes	--	--	--	--	--	--	--	--
n-Butyl Alcohol	71-36-3	No	No	--	--	--	--	--	--	--	--
Phenol	108-95-2	Yes	Yes	--	--	--	--	--	--	--	--
Toluene	108-88-3	Yes	Yes	--	--	--	--	--	--	--	--
1,2,4-Trimethylbenzene	95-63-6	No	Yes	--	--	--	--	--	--	--	--
Xylene (mixed)	1330-20-7	Yes	Yes	--	--	--	--	--	--	--	--
INORGANIC COMPOUNDS											
Ammonia	7664-41-7	No	Yes	--	--	--	--	--	--	--	--
Hydrochloric Acid	7647-01-0	Yes	Yes	--	--	--	--	--	--	--	--
Molybdenum trioxide	1313-27-5	No	No	--	0.082	3.9E-04	0.020	--	--	3.1E-05	8.1E-03
Silicon dioxide (respirable)	7631-86-9	No	Yes	--	--	--	--	4.3E-03	1.02	0.68	177
POLYCYCLIC AROMATIC HYDROCARBONS (PAH)											
Benzo(a)pyrene	50-32-8	Yes	Yes	--	--	--	--	--	--	--	--
Naphthalene	91-20-3	Yes	Yes	--	--	--	--	--	--	--	--
PAHs (excluding Naphthalene)*	401	Yes	Yes	--	--	--	--	--	--	--	--
METALS											
Aluminum and Compounds	7429-90-5	No	Yes	--	23.6	0.10	5.38	--	--	0.029	7.45
Antimony and Compounds	7440-36-0	Yes	Yes	--	0.16	9.5E-04	0.050	--	--	7.0E-06	1.8E-03
Arsenic and Compounds	7440-38-2	Yes	Yes	--	0.29	3.5E-03	0.18	--	--	4.6E-06	1.2E-03
Barium and Compounds	7440-39-3	No	No	--	0.72	5.5E-03	0.28	--	--	1.8E-04	0.046
Beryllium and compounds	7440-41-7	Yes	Yes	--	--	--	--	--	--	4.9E-07	1.3E-04
Cadmium and Compounds	7440-43-9	Yes	Yes	--	0.024	3.4E-04	0.018	--	--	2.7E-06	7.0E-04
Chromium	7440-47-3	Yes	No	--	0.54	0.035	0.12	--	--	8.6E-04	0.22
Chromium VI	18540-29-9	Yes	Yes	--	3.2E-03	2.6E-04	9.1E-04	--	--	2.6E-05	6.7E-03
Cobalt and Compounds	7440-48-4	Yes	Yes	--	0.029	1.4E-04	7.1E-03	--	--	6.8E-06	1.8E-03
Copper and Compounds	7440-50-8	No	Yes	--	1.12	4.8E-03	0.25	--	--	5.8E-04	0.15
Lead and Compounds	7439-92-1	Yes	Yes	--	0.64	1.1E-03	0.059	--	--	2.1E-04	0.056
Manganese and Compounds	7439-96-5	Yes	Yes	--	3.61	2.0E-03	0.54	--	--	5.0E-03	1.31
Mercury	7439-97-6	Yes	Yes	--	0.023	2.2E-04	0.011	--	--	--	--
Nickel and Compounds	7440-02-0	Yes	Yes	--	1.05	0.16	0.46	--	--	1.1E-04	0.028
Phosphorus and Compounds	504	Yes	No	--	1.34	0.012	0.63	--	--	--	--
Selenium and Compounds	7782-49-2	Yes	Yes	--	--	--	--	--	--	4.4E-06	1.1E-03
Silver and Compounds	7440-22-4	No	No	--	0.11	4.6E-04	0.024	--	--	4.8E-06	1.2E-03
Thallium	7440-28-0	No	No	--	--	--	--	--	--	2.9E-07	7.4E-05
Vanadium (fume or dust)	7440-62-2	No	Yes	--	--	--	--	--	--	2.7E-05	7.1E-03
Zinc and Compounds	7440-66-6	No	No	--	2.79	0.013	0.70	--	--	1.1E-04	0.029
DIESEL PARTICULATE MATTER (DPM)											
DPM	200	No	Yes	--	--	--	--	--	--	--	--
Total TAC Emissions Estimate				**0**	**36.1**	**0.34**	**8.73**	**4.3E-03**	**1.02**	**0.72**	**186**
Total HAP Emissions Estimate				**0**	**7.71**	**0.21**	**2.07**	**0**	**0**	**6.3E-03**	**1.63**

Table 27
PTE TAC Emissions Summary
Eagle Foundry Company

Toxic Air Contaminant	CAS/DEQ ID	Emissions Estimate									
		Air Arc		Welding		Grinding SS (Controlled)		Grinding SS (Fugitive)		Grinding NSS (Controlled)	
		(lb/day)	(lb/yr)	(lb/day)	(lb/yr)	(lb/day)	(lb/yr)	(lb/day)	(lb/yr)	(lb/day)	(lb/yr)
ORGANIC COMPOUNDS											
Acetaldehyde	75-07-0	--	--	--	--	--	--	--	--	--	--
Acrolein	107-02-8	--	--	--	--	--	--	--	--	--	--
Benzene	71-43-2	--	--	--	--	--	--	--	--	--	--
1,3-Butadiene	106-99-0	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	100-41-4	--	--	--	--	--	--	--	--	--	--
Formaldehyde	50-00-0	--	--	--	--	--	--	--	--	--	--
Hexane	110-54-3	--	--	--	--	--	--	--	--	--	--
Isopropanol	67-63-0	--	--	--	--	--	--	--	--	--	--
Methyl Ethyl Ketone	78-93-3	--	--	--	--	--	--	--	--	--	--
n-Butyl Alcohol	71-36-3	--	--	--	--	--	--	--	--	--	--
Phenol	108-95-2	--	--	--	--	--	--	--	--	--	--
Toluene	108-88-3	--	--	--	--	--	--	--	--	--	--
1,2,4-Trimethylbenzene	95-63-6	--	--	--	--	--	--	--	--	--	--
Xylene (mixed)	1330-20-7	--	--	--	--	--	--	--	--	--	--
INORGANIC COMPOUNDS											
Ammonia	7664-41-7	--	--	--	--	--	--	--	--	--	--
Hydrochloric Acid	7647-01-0	--	--	--	--	--	--	--	--	--	--
Molybdenum trioxide	1313-27-5	3.0E-05	5.1E-03	0.019	0.096	1.0E-03	0.26	1.5E-04	0.039	6.6E-03	1.68
Silicon dioxide (respirable)	7631-86-9	--	--	--	--	--	--	--	--	--	--
POLYCYCLIC AROMATIC HYDROCARBONS (PAI											
Benzo(a)pyrene	50-32-8	--	--	--	--	--	--	--	--	--	--
Naphthalene	91-20-3	--	--	--	--	--	--	--	--	--	--
PAHs (excluding Naphthalene)*	401	--	--	--	--	--	--	--	--	--	--
METALS											
Aluminum and Compounds	7429-90-5	--	--	--	7.8E-03	6.4E-04	0.17	9.6E-05	0.025	4.2E-03	1.09
Antimony and Compounds	7440-36-0	--	--	--	--	3.5E-07	9.0E-05	5.2E-08	1.4E-05	2.3E-06	6.0E-04
Arsenic and Compounds	7440-38-2	--	--	--	1.9E-04	2.1E-06	5.4E-04	3.1E-07	8.2E-05	1.4E-05	3.6E-03
Barium and Compounds	7440-39-3	--	--	--	--	1.9E-05	4.8E-03	2.8E-06	7.3E-04	1.2E-04	0.032
Beryllium and compounds	7440-41-7	--	--	--	--	6.9E-08	1.8E-05	1.0E-08	2.7E-06	4.6E-07	1.2E-04
Cadmium and Compounds	7440-43-9	--	--	--	--	5.4E-07	1.4E-04	8.1E-08	2.1E-05	3.6E-06	9.3E-04
Chromium	7440-47-3	2.0E-05	9.3E-03	0.040	1.34	0.035	9.00	5.2E-03	1.35	4.4E-03	45.0
Chromium VI	18540-29-9	5.9E-07	2.8E-04	2.0E-03	0.33	1.0E-03	0.27	1.6E-04	0.041	1.3E-04	1.35
Cobalt and Compounds	7440-48-4	--	--	--	7.3E-03	1.0E-05	2.6E-03	1.5E-06	4.0E-04	6.7E-05	0.017
Copper and Compounds	7440-50-8	0	7.9E-04	4.6E-03	7.51	1.0E-04	0.026	1.5E-05	3.9E-03	--	0.10
Lead and Compounds	7439-92-1	--	--	--	--	6.0E-07	1.6E-04	9.0E-08	2.3E-05	4.0E-06	1.0E-03
Manganese and Compounds	7439-96-5	5.0E-04	0.039	0.013	1.10	1.3E-03	0.35	2.0E-04	0.052	0.11	4.35
Mercury	7439-97-6	--	--	--	--	--	--	--	--	--	--
Nickel and Compounds	7440-02-0	3.2E-05	5.9E-03	0.042	0.32	0.027	5.37	4.0E-03	0.81	7.0E-03	1.83
Phosphorus and Compounds	504	2.8E-06	4.3E-04	--	5.6E-04	5.3E-05	0.014	8.0E-06	2.1E-03	6.1E-04	0.21
Selenium and Compounds	7782-49-2	--	--	--	--	3.5E-07	9.0E-05	5.2E-08	1.4E-05	2.3E-06	6.0E-04
Silver and Compounds	7440-22-4	--	--	--	--	6.9E-08	1.8E-05	1.0E-08	2.7E-06	4.6E-07	1.2E-04
Thallium	7440-28-0	--	--	--	--	6.9E-08	1.8E-05	1.0E-08	2.7E-06	4.6E-07	1.2E-04
Vanadium (fume or dust)	7440-62-2	--	--	--	1.9E-04	8.0E-06	2.1E-03	1.2E-06	3.1E-04	5.3E-05	0.014
Zinc and Compounds	7440-66-6	--	--	--	--	4.5E-06	1.2E-03	6.7E-07	1.7E-04	2.9E-05	7.7E-03
DIESEL PARTICULATE MATTER (DPM)											
DPM	200	--	--	--	--	--	--	--	--	--	--
Total TAC Emissions Estimate		**5.9E-04**	**0.061**	**0.12**	**10.7**	**0.065**	**15.5**	**9.8E-03**	**2.33**	**0.14**	**55.7**
Total HAP Emissions Estimate		**5.6E-04**	**0.055**	**0.097**	**3.10**	**0.064**	**15.0**	**9.6E-03**	**2.26**	**0.12**	**52.8**

Table 27
PTE TAC Emissions Summary
Eagle Foundry Company

Toxic Air Contaminant	CAS/DEQ ID	Emissions Estimate									
		Grinding NSS (Fugitive)		Mesh Blast		Shotblast		Small Palmer		Small Palmer Material Handling	
		(lb/day)	(lb/yr)	(lb/day)	(lb/yr)	(lb/day)	(lb/yr)	(lb/day)	(lb/yr)	(lb/day)	(lb/yr)
ORGANIC COMPOUNDS											
Acetaldehyde	75-07-0	--	--	--	--	--	--	--	--	--	--
Acrolein	107-02-8	--	--	--	--	--	--	--	--	--	--
Benzene	71-43-2	--	--	--	--	--	--	--	--	--	--
1,3-Butadiene	106-99-0	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	100-41-4	--	--	--	--	--	--	--	--	--	--
Formaldehyde	50-00-0	--	--	--	--	--	--	--	--	--	--
Hexane	110-54-3	--	--	--	--	--	--	--	--	--	--
Isopropanol	67-63-0	--	--	--	--	--	--	--	--	10.4	2,500
Methyl Ethyl Ketone	78-93-3	--	--	--	--	--	--	--	--	--	--
n-Butyl Alcohol	71-36-3	--	--	--	--	--	--	--	--	--	--
Phenol	108-95-2	--	--	--	--	--	--	--	--	0.052	12.4
Toluene	108-88-3	--	--	--	--	--	--	--	--	--	--
1,2,4-Trimethylbenzene	95-63-6	--	--	--	--	--	--	--	--	--	--
Xylene (mixed)	1330-20-7	--	--	--	--	--	--	--	--	--	--
INORGANIC COMPOUNDS											
Ammonia	7664-41-7	--	--	--	--	--	--	--	--	--	--
Hydrochloric Acid	7647-01-0	--	--	--	--	--	--	--	--	--	--
Molybdenum trioxide	1313-27-5	9.9E-04	0.25	2.7E-04	5.3E-03	2.8E-04	0.017	1.4E-05	3.5E-03	--	--
Silicon dioxide (respirable)	7631-86-9	--	--	--	--	--	--	--	--	1.33	319
POLYCYCLIC AROMATIC HYDROCARBONS (PAI											
Benzo(a)pyrene	50-32-8	--	--	--	--	--	--	--	--	--	--
Naphthalene	91-20-3	--	--	--	--	--	--	--	--	--	--
PAHs (excluding Naphthalene)*	401	--	--	--	--	--	--	--	--	--	--
METALS											
Aluminum and Compounds	7429-90-5	6.3E-04	0.16	3.1E-04	6.1E-03	3.2E-04	0.019	5.9E-03	1.55	1.63	392
Antimony and Compounds	7440-36-0	3.4E-07	8.9E-05	7.7E-06	1.5E-04	8.1E-06	4.8E-04	8.4E-07	2.2E-04	--	--
Arsenic and Compounds	7440-38-2	2.1E-06	5.4E-04	2.3E-05	4.6E-04	2.5E-05	1.5E-03	6.9E-07	1.8E-04	--	--
Barium and Compounds	7440-39-3	1.8E-05	4.8E-03	2.4E-06	4.8E-05	2.6E-06	1.5E-04	3.5E-05	9.0E-03	--	--
Beryllium and compounds	7440-41-7	6.9E-08	1.8E-05	4.9E-07	9.7E-06	5.2E-07	3.1E-05	5.7E-08	1.5E-05	--	--
Cadmium and Compounds	7440-43-9	5.3E-07	1.4E-04	4.9E-07	9.7E-06	5.2E-07	3.1E-05	1.3E-07	3.4E-05	--	--
Chromium	7440-47-3	6.6E-04	6.77	1.2E-03	0.023	1.2E-03	0.073	5.6E-05	0.015	--	--
Chromium VI	18540-29-9	2.0E-05	0.20	3.5E-05	6.9E-04	3.7E-05	2.2E-03	1.7E-06	4.4E-04	--	--
Cobalt and Compounds	7440-48-4	1.0E-05	2.6E-03	3.4E-05	6.7E-04	3.5E-05	2.1E-03	9.5E-07	2.5E-04	--	--
Copper and Compounds	7440-50-8	--	0.016	1.3E-03	0.025	1.3E-03	0.079	1.5E-04	0.039	--	--
Lead and Compounds	7439-92-1	6.0E-07	1.5E-04	3.8E-06	7.5E-05	4.0E-06	2.3E-04	1.8E-05	4.7E-03	--	--
Manganese and Compounds	7439-96-5	0.017	0.65	3.1E-03	0.062	3.3E-03	0.19	4.5E-04	0.12	--	--
Mercury	7439-97-6	--	--	--	--	--	--	--	--	--	--
Nickel and Compounds	7440-02-0	1.1E-03	0.28	4.9E-04	9.7E-03	5.1E-04	0.030	2.1E-05	5.6E-03	--	--
Phosphorus and Compounds	504	9.2E-05	0.031	--	--	--	--	--	--	--	--
Selenium and Compounds	7782-49-2	3.4E-07	8.9E-05	2.4E-07	4.8E-06	2.6E-07	1.5E-05	2.8E-07	7.4E-05	--	--
Silver and Compounds	7440-22-4	6.9E-08	1.8E-05	4.9E-07	9.7E-06	5.2E-07	3.1E-05	3.6E-07	9.2E-05	--	--
Thallium	7440-28-0	6.9E-08	1.8E-05	4.9E-07	9.7E-06	5.2E-07	3.1E-05	5.7E-08	1.5E-05	--	--
Vanadium (fume or dust)	7440-62-2	7.9E-06	2.1E-03	4.4E-05	8.6E-04	4.6E-05	2.7E-03	3.9E-06	1.0E-03	--	--
Zinc and Compounds	7440-66-6	4.4E-06	1.2E-03	4.3E-05	8.5E-04	4.5E-05	2.7E-03	9.6E-05	0.025	--	--
DIESEL PARTICULATE MATTER (DPM)											
DPM	200	--	--	--	--	--	--	--	--	--	--
Total TAC Emissions Estimate		**0.020**	**8.38**	**6.8E-03**	**0.14**	**7.2E-03**	**0.43**	**6.8E-03**	**1.77**	**13.4**	**3,224**
Total HAP Emissions Estimate		**0.019**	**7.93**	**4.9E-03**	**0.097**	**5.1E-03**	**0.30**	**5.5E-04**	**0.14**	**0.052**	**12.4**

Table 27
PTE TAC Emissions Summary
Eagle Foundry Company

Toxic Air Contaminant	CAS/DEQ ID	Emissions Estimate									
		Big Palmer Material Handling		Screening Station		Slag Handling		Pattern Making		Reclaimed Bead Silo	
		(lb/day)	(lb/yr)	(lb/day)	(lb/yr)	(lb/day)	(lb/yr)	(lb/day)	(lb/yr)	(lb/day)	(lb/yr)
ORGANIC COMPOUNDS											
Acetaldehyde	75-07-0	--	--	--	--	--	--	--	--	--	--
Acrolein	107-02-8	--	--	--	--	--	--	--	--	--	--
Benzene	71-43-2	--	--	--	--	--	--	--	--	--	--
1,3-Butadiene	106-99-0	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	100-41-4	--	--	--	--	--	--	--	--	--	--
Formaldehyde	50-00-0	--	--	--	--	--	--	--	--	--	--
Hexane	110-54-3	--	--	--	--	--	--	--	--	--	--
Isopropanol	67-63-0	37.1	8,906	--	--	--	--	0.011	2.68	--	--
Methyl Ethyl Ketone	78-93-3	--	--	--	--	--	--	0.039	9.40	--	--
n-Butyl Alcohol	71-36-3	--	--	--	--	--	--	0.011	2.68	--	--
Phenol	108-95-2	--	--	--	--	--	--	--	--	--	--
Toluene	108-88-3	--	--	--	--	--	--	0.19	44.8	--	--
1,2,4-Trimethylbenzene	95-63-6	--	--	--	--	--	--	0.15	35.4	--	--
Xylene (mixed)	1330-20-7	--	--	--	--	--	--	--	--	--	--
INORGANIC COMPOUNDS											
Ammonia	7664-41-7	--	--	--	--	--	--	--	--	--	--
Hydrochloric Acid	7647-01-0	--	--	--	--	--	--	--	--	--	--
Molybdenum trioxide	1313-27-5	--	--	1.2E-04	0.031	2.0E-06	4.9E-04	--	--	--	--
Silicon dioxide (respirable)	7631-86-9	1.32	318	2.60	675	--	--	--	--	1.5E-03	0.66
POLYCYCLIC AROMATIC HYDROCARBONS (PAI											
Benzo(a)pyrene	50-32-8	--	--	--	--	--	--	--	--	--	--
Naphthalene	91-20-3	--	--	--	--	--	--	--	--	--	--
PAHs (excluding Naphthalene)*	401	--	--	--	--	--	--	--	--	--	--
METALS											
Aluminum and Compounds	7429-90-5	1.78	428	0.036	9.31	7.6E-05	0.019	--	--	2.1E-05	9.2E-03
Antimony and Compounds	7440-36-0	--	--	5.0E-06	1.3E-03	8.8E-09	2.2E-06	--	--	2.9E-09	1.3E-06
Arsenic and Compounds	7440-38-2	--	--	1.9E-06	5.0E-04	8.8E-09	2.2E-06	--	--	1.1E-09	4.9E-07
Barium and Compounds	7440-39-3	--	--	1.8E-04	0.046	1.7E-07	4.2E-05	--	--	1.0E-07	4.5E-05
Beryllium and compounds	7440-41-7	--	--	3.8E-07	9.9E-05	1.8E-09	4.3E-07	--	--	2.2E-10	9.7E-08
Cadmium and Compounds	7440-43-9	--	--	3.8E-07	9.9E-05	1.8E-09	4.3E-07	--	--	2.2E-10	9.7E-08
Chromium	7440-47-3	--	--	4.2E-04	0.11	4.3E-05	0.010	--	--	2.4E-07	1.1E-04
Chromium VI	18540-29-9	--	--	1.3E-05	3.3E-03	2.6E-07	6.3E-05	--	--	7.3E-09	3.2E-06
Cobalt and Compounds	7440-48-4	--	--	6.6E-06	1.7E-03	5.9E-08	1.4E-05	--	--	3.9E-09	1.7E-06
Copper and Compounds	7440-50-8	--	--	1.3E-03	0.33	4.0E-07	9.8E-05	--	--	7.3E-07	3.2E-04
Lead and Compounds	7439-92-1	--	--	8.6E-05	0.022	6.7E-09	1.6E-06	--	--	5.0E-08	2.2E-05
Manganese and Compounds	7439-96-5	--	--	3.3E-03	0.87	1.3E-04	0.031	--	--	1.9E-06	8.5E-04
Mercury	7439-97-6	--	--	--	--	7.1E-10	1.7E-07	--	--	--	--
Nickel and Compounds	7440-02-0	--	--	2.1E-04	0.056	6.4E-07	1.6E-04	--	--	1.2E-07	5.5E-05
Phosphorus and Compounds	504	--	--	--	--	8.8E-07	2.2E-04	--	--	--	--
Selenium and Compounds	7782-49-2	--	--	1.9E-06	5.0E-04	8.8E-09	2.2E-06	--	--	1.1E-09	4.9E-07
Silver and Compounds	7440-22-4	--	--	2.2E-06	5.7E-04	1.8E-09	4.3E-07	--	--	1.3E-09	5.6E-07
Thallium	7440-28-0	--	--	3.8E-07	9.9E-05	1.8E-09	4.3E-07	--	--	2.2E-10	9.7E-08
Vanadium (fume or dust)	7440-62-2	--	--	2.0E-05	5.2E-03	9.4E-08	2.3E-05	--	--	1.2E-08	5.1E-06
Zinc and Compounds	7440-66-6	--	--	4.1E-04	0.11	3.5E-08	8.7E-06	--	--	2.4E-07	1.0E-04
DIESEL PARTICULATE MATTER (DPM)											
DPM	200	--	--	--	--	--	--	--	--	--	--
Total TAC Emissions Estimate		**40.2**	**9,652**	**2.64**	**686**	**2.5E-04**	**0.062**	**0.40**	**95.0**	**1.5E-03**	**0.67**
Total HAP Emissions Estimate		**0**	**0**	**4.1E-03**	**1.06**	**1.7E-04**	**0.042**	**0.19**	**44.8**	**2.4E-06**	**1.0E-03**

Table 27
PTE TAC Emissions Summary
Eagle Foundry Company

Toxic Air Contaminant	CAS/DEQ ID	Emissions Estimate					
		Reclaimed Bead Overflow Silo		Small Palmer Silo		New Bead Silo	
		(lb/day)	(lb/yr)	(lb/day)	(lb/yr)	(lb/day)	(lb/yr)
ORGANIC COMPOUNDS							
Acetaldehyde	75-07-0	--	--	--	--	--	--
Acrolein	107-02-8	--	--	--	--	--	--
Benzene	71-43-2	--	--	--	--	--	--
1,3-Butadiene	106-99-0	--	--	--	--	--	--
Ethylbenzene	100-41-4	--	--	--	--	--	--
Formaldehyde	50-00-0	--	--	--	--	--	--
Hexane	110-54-3	--	--	--	--	--	--
Isopropanol	67-63-0	--	--	--	--	--	--
Methyl Ethyl Ketone	78-93-3	--	--	--	--	--	--
n-Butyl Alcohol	71-36-3	--	--	--	--	--	--
Phenol	108-95-2	--	--	--	--	--	--
Toluene	108-88-3	--	--	--	--	--	--
1,2,4-Trimethylbenzene	95-63-6	--	--	--	--	--	--
Xylene (mixed)	1330-20-7	--	--	--	--	--	--
INORGANIC COMPOUNDS							
Ammonia	7664-41-7	--	--	--	--	--	--
Hydrochloric Acid	7647-01-0	--	--	--	--	--	--
Molybdenum trioxide	1313-27-5	--	--	--	--	--	--
Silicon dioxide (respirable)	7631-86-9	1.5E-03	0.66	1.5E-03	0.66	1.1E-03	0.47
POLYCYCLIC AROMATIC HYDROCARBONS (PAI							
Benzo(a)pyrene	50-32-8	--	--	--	--	--	--
Naphthalene	91-20-3	--	--	--	--	--	--
PAHs (excluding Naphthalene)*	401	--	--	--	--	--	--
METALS							
Aluminum and Compounds	7429-90-5	2.1E-05	9.2E-03	2.1E-05	9.2E-03	--	--
Antimony and Compounds	7440-36-0	2.9E-09	1.3E-06	2.9E-09	1.3E-06	--	--
Arsenic and Compounds	7440-38-2	1.1E-09	4.9E-07	1.1E-09	4.9E-07	--	--
Barium and Compounds	7440-39-3	1.0E-07	4.5E-05	1.0E-07	4.5E-05	--	--
Beryllium and compounds	7440-41-7	2.2E-10	9.7E-08	2.2E-10	9.7E-08	--	--
Cadmium and Compounds	7440-43-9	2.2E-10	9.7E-08	2.2E-10	9.7E-08	--	--
Chromium	7440-47-3	2.4E-07	1.1E-04	2.4E-07	1.1E-04	--	--
Chromium VI	18540-29-9	7.3E-09	3.2E-06	7.3E-09	3.2E-06	--	--
Cobalt and Compounds	7440-48-4	3.9E-09	1.7E-06	3.9E-09	1.7E-06	--	--
Copper and Compounds	7440-50-8	7.3E-07	3.2E-04	7.3E-07	3.2E-04	--	--
Lead and Compounds	7439-92-1	5.0E-08	2.2E-05	5.0E-08	2.2E-05	--	--
Manganese and Compounds	7439-96-5	1.9E-06	8.5E-04	1.9E-06	8.5E-04	--	--
Mercury	7439-97-6	--	--	--	--	--	--
Nickel and Compounds	7440-02-0	1.2E-07	5.5E-05	1.2E-07	5.5E-05	--	--
Phosphorus and Compounds	504	--	--	--	--	--	--
Selenium and Compounds	7782-49-2	1.1E-09	4.9E-07	1.1E-09	4.9E-07	--	--
Silver and Compounds	7440-22-4	1.3E-09	5.6E-07	1.3E-09	5.6E-07	--	--
Thallium	7440-28-0	2.2E-10	9.7E-08	2.2E-10	9.7E-08	--	--
Vanadium (fume or dust)	7440-62-2	1.2E-08	5.1E-06	1.2E-08	5.1E-06	--	--
Zinc and Compounds	7440-66-6	2.4E-07	1.0E-04	2.4E-07	1.0E-04	--	--
DIESEL PARTICULATE MATTER (DPM)							
DPM	200	--	--	--	--	--	--
Total TAC Emissions Estimate		**1.5E-03**	**0.67**	**1.5E-03**	**0.67**	**1.1E-03**	**0.47**
Total HAP Emissions Estimate		**2.4E-06**	**1.0E-03**	**2.4E-06**	**1.0E-03**	**0**	**0**

Table 27
PTE TAC Emissions Summary
Eagle Foundry Company

Toxic Air Contaminant	CAS/DEQ ID	Emissions Estimate					
		Emergency Generator		Heat Treat Propane Combustion		Facility Total	
		(lb/day)	(lb/yr)	(lb/day)	(lb/yr)	(lb/day)	(lb/yr)
ORGANIC COMPOUNDS							
Acetaldehyde	75-07-0	0.011	0.57	3.4E-04	0.082	0.012	0.65
Acrolein	107-02-8	4.9E-04	0.025	2.2E-04	0.052	7.1E-04	0.077
Benzene	71-43-2	2.7E-03	0.14	6.4E-04	0.15	3.4E-03	0.29
1,3-Butadiene	106-99-0	3.2E-03	0.16	--	--	3.2E-03	0.16
Ethylbenzene	100-41-4	1.6E-04	8.0E-03	7.5E-04	0.18	9.1E-04	0.19
Formaldehyde	50-00-0	0.025	1.26	1.4E-03	0.33	0.027	1.59
Hexane	110-54-3	3.9E-04	0.020	5.0E-04	0.12	9.0E-04	0.14
Isopropanol	67-63-0	--	--	--	--	47.5	11,409
Methyl Ethyl Ketone	78-93-3	--	--	--	--	0.039	9.40
n-Butyl Alcohol	71-36-3	--	--	--	--	0.011	2.68
Phenol	108-95-2	--	--	--	--	0.052	12.4
Toluene	108-88-3	1.5E-03	0.077	2.9E-03	0.70	0.19	45.6
1,2,4-Trimethylbenzene	95-63-6	--	--	--	--	0.15	35.4
Xylene (mixed)	1330-20-7	6.2E-04	0.031	2.2E-03	0.52	2.8E-03	0.55
INORGANIC COMPOUNDS							
Ammonia	7664-41-7	0.012	0.58	0.27	64.7	0.28	65.3
Hydrochloric Acid	7647-01-0	2.7E-03	0.14	--	--	2.7E-03	0.14
Molybdenum trioxide	1313-27-5	--	--	--	--	0.029	2.50
Silicon dioxide (respirable)	7631-86-9	--	--	--	--	5.94	1,492
POLYCYCLIC AROMATIC HYDROCARBONS (PAI							
Benzo(a)pyrene	50-32-8	5.1E-07	2.6E-05	--	--	5.1E-07	2.6E-05
Naphthalene	91-20-3	2.9E-04	0.014	2.7E-05	6.5E-03	3.1E-04	0.021
PAHs (excluding Naphthalene)*	401	5.3E-04	0.026	9.0E-06	2.2E-03	5.4E-04	0.029
METALS							
Aluminum and Compounds	7429-90-5	--	--	--	--	3.60	869
Antimony and Compounds	7440-36-0	--	--	--	--	9.9E-04	0.22
Arsenic and Compounds	7440-38-2	2.3E-05	1.2E-03	--	--	3.6E-03	0.48
Barium and Compounds	7440-39-3	--	--	--	--	6.0E-03	1.15
Beryllium and compounds	7440-41-7	--	--	--	--	2.5E-06	4.4E-04
Cadmium and Compounds	7440-43-9	2.2E-05	1.1E-03	--	--	3.7E-04	0.045
Chromium	7440-47-3	--	--	--	--	0.12	64.6
Chromium VI	18540-29-9	1.5E-06	7.3E-05	--	--	3.7E-03	2.21
Cobalt and Compounds	7440-48-4	--	--	--	--	3.1E-04	0.073
Copper and Compounds	7440-50-8	6.0E-05	3.0E-03	--	--	0.014	9.65
Lead and Compounds	7439-92-1	1.2E-04	6.1E-03	--	--	1.6E-03	0.79
Manganese and Compounds	7439-96-5	4.5E-05	2.3E-03	--	--	0.16	13.3
Mercury	7439-97-6	2.9E-05	1.5E-03	--	--	2.5E-04	0.036
Nickel and Compounds	7440-02-0	5.7E-05	2.8E-03	--	--	0.24	10.2
Phosphorus and Compounds	504	--	--	--	--	0.013	2.22
Selenium and Compounds	7782-49-2	3.2E-05	1.6E-03	--	--	4.2E-05	4.1E-03
Silver and Compounds	7440-22-4	--	--	--	--	4.7E-04	0.14
Thallium	7440-28-0	--	--	--	--	2.3E-06	3.9E-04
Vanadium (fume or dust)	7440-62-2	--	--	--	--	2.1E-04	0.035
Zinc and Compounds	7440-66-6	--	--	--	--	0.014	3.66
DIESEL PARTICULATE MATTER (DPM)							
DPM	200	0.49	24.5	--	--	0.49	24.5
Total TAC Emissions Estimate		**0.55**	**27.5**	**0.28**	**66.8**	**59.0**	**14,080**
Total HAP Emissions Estimate		**0.050**	**2.48**	**8.9E-03**	**2.14**	**0.85**	**156**

Table D1
Alloy Composition Data
Eagle Foundry Company

ALLOY	TAC Percentage of Alloy [1] (%)						TAC Fraction of Alloy [a] (ton TAC/ton melt)		
	Mn	Cr	P	Ni	Cu	Mo	Mn	Cr	Ni
	7439-96-5	7440-47-3	504	7440-02-0	7440-50-8	7439-98-7	7439-96-5	7440-47-3	7440-02-0
High Chrome Alloy									
HC25	1.05	26.0 [2]	0.10 [2]	0.80 [2]	0	0.50	0.011	0.26	8.0E-03
LC25	1.05	24.5 [2]	0.10 [2]	0.80 [2]	0	0.50	0.011	0.25	8.0E-03
CR20	0.90	19.0 [2]	0.10 [2]	0.80 [2]	0	0.70	9.0E-03	0.19	8.0E-03
CR12	1.20	13.0 [2]	0.10 [2]	0.80 [2]	0	0.50	0.012	0.13	8.0E-03
F3	1.00	15.0 [2]	0.030 [2]	0.80 [2]	0	0.325	0.010	0.15	8.0E-03
Manganese Alloy									
MNB2	12.75	0.50 [2]	0.070 [2]	0.80 [2]	0	0.50	0.13	5.0E-03	8.0E-03
121L	12.75	0.50 [2]	0.070 [2]	0.80 [2]	0	0.95	0.13	5.0E-03	8.0E-03
Low Alloy									
1025	0.70	0.30 [2]	0.060 [2]	0.50 [2]	0.5	0.25	7.0E-03	3.0E-03	5.0E-03
8630	0.80	0.50 [2]	0.040 [2]	0.55	0	0.20	8.0E-03	5.0E-03	5.5E-03
4330	0.70	0.80 [2]	0.040 [2]	1.83	0	0.25	7.0E-03	8.0E-03	0.018
CM40	0.75	3.10 [2]	0.050 [2]	1.00	0	0.475	7.5E-03	0.031	0.010
Stainless Alloy									
HH	1.00	26.0 [2]	0.040 [2]	12.5	0	0.50 [2]	0.010	0.26	0.125
HK	1.00	26.0 [2]	0.040 [2]	20.0	0	0.50 [2]	0.010	0.26	0.20
HC	0.75	28.0 [2]	0.040 [2]	4.00 [2]	0	0.50 [2]	7.5E-03	0.28	0.040
All Non-Stainless Steel Alloys [3]									
Average Annual	**3.06**	**9.38**	**0.069**	**0.86**	**0.045**	**0.47**	**--**	**--**	**--**
Stainless Steel Alloy [4]									
Average Annual	**0.92**	**26.67**	**0.04**	**12.17**	**--**	**0.50**	**--**	**--**	**--**
Maximum Daily	**1.00**	**28.00**	**0.04**	**20.00**	**--**	**0.50**	**--**	**--**	**--**
MN & Low Alloy [5]									
Average Annual	**4.74**	**0.95**	**0.055**	**0.91**	**0.083**	**0.44**	**--**	**--**	**--**
Maximum Daily	**12.75**	**3.10**	**0.070**	**1.83**	**0.50**	**0.95**	**--**	**--**	**--**
Ton TAC/Ton Melt [6]									
White Iron (Maximum)	**--**	**--**	**--**	**--**	**--**	**--**	**0.012**	**0.26**	**--**
Steel (Weighted Average)	**--**	**--**	**--**	**--**	**--**	**--**	**0.053**	**0.018**	**0.011**
Stainless Steel (Weighted Average)	**--**	**--**	**--**	**--**	**--**	**--**	**0.010**	**0.26**	**0.155**
Non-Stainless Steel (Weighted Average)	**--**	**--**	**--**	**--**	**--**	**--**	**0.019**	**0.20**	**0.008**
Mn & Low Alloy (Weighted Average)	**--**	**--**	**--**	**--**	**--**	**--**	**0.054**	**0.013**	**0.008**

Notes

[a] TAC fraction of alloy (ton TAC/ton melt) = (TAC percentage of alloy [%]/100) x (1 ton melt)

References

[1] Alloy data provided by Eagle Foundry.

[2] This is not added element to the alloy. Value is the maximum trace quantity that may be in raw materials.

[3] See Table 11, PTE Grinding - Non-stainless Steel Controlled TAC Emission Estimates and Table D2, Alloy Toxicity Weighted Emission Rates. Annual emissions for non-stainless steel grinding are based on the average composition of non-stainless steel alloys. Daily emissions estimates are based on alloy MNB2, which has the highest acute toxicity weighted emission rate for non-stainless steel alloys and will result in the maximum predicted acute hazard index.

[4] See Table 9, PTE Grinding - Stainless Steel Controlled TAC Emission Estimates and Table D2, Alloy Toxicity Weighted Emission Rates. Annual emissions for stainless steel grinding are based on the average composition of stainless steel alloys. Daily emissions estimates are based on alloy HK, which has the highest acute toxicity weighted emission rate for stainless steel alloys and will result in the maximum predicted acute hazard index.

[5] See Table 7, PTE Air Arc Cutting TAC Emission Estimates and Table D2, Alloy Toxicity Weighted Emission Rates. Annual emissions for Air Arc are based on the average composition of Air Arc alloys. Daily emissions estimates are based on alloy MNB2, which has the highest acute toxicity weighted emission rate for Air Arc cut alloys and will result in the maximum predicted acute hazard index.

[6] White Iron TAC fractions of alloy are based on the maximum TAC fraction of all White Iron alloys as a conservative estimate. Steel TAC fractions of alloy are the weighted average TAC fractions of all steel alloys based on 2022 production.

Table D2
Alloy Toxicity Weighted Emission Rates
Eagle Foundry Company

Toxic Air Contaminant	CAS/DEQ ID	Emission Factor [1]		Emissions (lb)	Acute RBC [2] (ug/m^3)	Toxicity Weighted Emissions Rate [a]
Maximum WER (HK-Steel) =						**0.027**
Maximum WER for Manganese and Low Alloy Steel (MNB2) =						**4.93E-03**
Maximum WER for Non-Stainless Steel (MNB2) =						**4.93E-03**
HC25 - White Iron						
Total WER						**3.49E-03**
Aluminum and Compounds	7429-90-5	3.66E-03	(lb/ton melt)	3.66E-03 [b]	--	--
Antimony and Compounds	7440-36-0	2.54E-05	(lb/ton melt)	2.54E-05 [b]	1	2.54E-05
Arsenic and Compounds	7440-38-2	< 4.42E-05	(lb/ton melt)	4.42E-05 [b]	0.2	2.21E-04
Barium and Compounds	7440-39-3	1.11E-04	(lb/ton melt)	1.11E-04 [b]	--	--
Beryllium and compounds	7440-41-7	ND		--	0.02	--
Cadmium and Compounds	7440-43-9	< 3.71E-06	(lb/ton melt)	3.71E-06 [b]	0.03	1.24E-04
Chromium	7440-47-3	3.24E-04	(lb/tons TAC in melt)	8.41E-05 [c]	--	--
Chromium VI	18540-29-9	1.88E-06	(lb/tons TAC in melt)	4.89E-07 [c]	0.3	1.63E-06
Cobalt and Compounds	7440-48-4	< 4.48E-06	(lb/ton melt)	4.48E-06 [b]	--	--
Copper and Compounds	7440-50-8	1.74E-04	(lb/ton melt)	1.74E-04 [b]	100	1.74E-06
Lead and Compounds	7439-92-1	< 9.92E-05	(lb/ton melt)	9.92E-05 [b]	0.15	6.61E-04
Manganese and Compounds	7439-96-5	4.67E-02	(lb/tons TAC in melt)	4.90E-04 [c]	0.3	1.63E-03
Mercury	7439-97-6	< 3.51E-06	(lb/ton melt)	3.51E-06 [b]	0.6	5.85E-06
Molybdenum Trioxide	1313-27-5	1.27E-05	(lb/ton melt)	1.27E-05 [b]	--	--
Nickel and Compounds	7440-02-0	1.62E-04	(lb/ton melt)	1.62E-04 [b]	0.2	8.11E-04
Phosphorus and Compounds	504	< 2.08E-04	(lb/ton melt)	2.08E-04 [b]	--	--
Selenium and Compounds	7782-49-2	ND		--	2	--
Silver and Compounds	7440-22-4	< 1.75E-05	(lb/ton melt)	1.75E-05 [b]	--	--
Thallium	7440-28-0	ND		--	--	--
Vanadium (fume or dust)	7440-62-2	ND		--	0.8	--
Zinc and Compounds	7440-66-6	4.32E-04	(lb/ton melt)	4.32E-04 [b]	--	--
LC25 - White Iron						
Total WER						**3.49E-03**
Aluminum and Compounds	7429-90-5	3.66E-03	(lb/ton melt)	3.66E-03 [b]	--	--
Antimony and Compounds	7440-36-0	2.54E-05	(lb/ton melt)	2.54E-05 [b]	1	2.54E-05
Arsenic and Compounds	7440-38-2	< 4.42E-05	(lb/ton melt)	4.42E-05 [b]	0.2	2.21E-04
Barium and Compounds	7440-39-3	1.11E-04	(lb/ton melt)	1.11E-04 [b]	--	--
Beryllium and compounds	7440-41-7	ND		--	0.02	--
Cadmium and Compounds	7440-43-9	< 3.71E-06	(lb/ton melt)	3.71E-06 [b]	0.03	1.24E-04
Chromium	7440-47-3	3.24E-04	(lb/tons TAC in melt)	7.93E-05 [c]	--	--
Chromium VI	18540-29-9	1.88E-06	(lb/tons TAC in melt)	4.61E-07 [c]	0.3	1.54E-06
Cobalt and Compounds	7440-48-4	< 4.48E-06	(lb/ton melt)	4.48E-06 [b]	--	--
Copper and Compounds	7440-50-8	1.74E-04	(lb/ton melt)	1.74E-04 [b]	100	1.74E-06
Lead and Compounds	7439-92-1	< 9.92E-05	(lb/ton melt)	9.92E-05 [b]	0.15	6.61E-04
Manganese and Compounds	7439-96-5	0.047	(lb/tons TAC in melt)	4.90E-04 [c]	0.3	1.63E-03
Mercury	7439-97-6	< 3.51E-06	(lb/ton melt)	3.51E-06 [b]	0.6	5.85E-06
Molybdenum Trioxide	1313-27-5	1.27E-05	(lb/ton melt)	1.27E-05 [b]	--	--
Nickel and Compounds	7440-02-0	1.62E-04	(lb/ton melt)	1.62E-04 [b]	0.2	8.11E-04
Phosphorus and Compounds	504	< 2.08E-04	(lb/ton melt)	2.08E-04 [b]	--	--
Selenium and Compounds	7782-49-2	ND		--	2	--
Silver and Compounds	7440-22-4	< 1.75E-05	(lb/ton melt)	1.75E-05 [b]	--	--
Thallium	7440-28-0	ND		--	--	--
Vanadium (fume or dust)	7440-62-2	ND		--	0.8	--
Zinc and Compounds	7440-66-6	4.32E-04	(lb/ton melt)	4.32E-04 [b]	--	--

Table D2
Alloy Toxicity Weighted Emission Rates
Eagle Foundry Company

Toxic Air Contaminant	CAS/DEQ ID	Emission Factor [1]		Emissions (lb)	Acute RBC [2] (ug/m^3)	Toxicity Weighted Emissions Rate [a]
CR20 - White Iron						
Total WER						**3.25E-03**
Aluminum and Compounds	7429-90-5	3.66E-03	(lb/ton melt)	3.66E-03 [b]	--	--
Antimony and Compounds	7440-36-0	2.54E-05	(lb/ton melt)	2.54E-05 [b]	1	2.54E-05
Arsenic and Compounds	7440-38-2	< 4.42E-05	(lb/ton melt)	4.42E-05 [b]	0.2	2.21E-04
Barium and Compounds	7440-39-3	1.11E-04	(lb/ton melt)	1.11E-04 [b]	--	--
Beryllium and compounds	7440-41-7	ND		--	0.02	--
Cadmium and Compounds	7440-43-9	< 3.71E-06	(lb/ton melt)	3.71E-06 [b]	0.03	1.24E-04
Chromium	7440-47-3	3.24E-04	(lb/tons TAC in melt)	6.15E-05 [c]	--	--
Chromium VI	18540-29-9	1.88E-06	(lb/tons TAC in melt)	3.57E-07 [c]	0.3	1.19E-06
Cobalt and Compounds	7440-48-4	< 4.48E-06	(lb/ton melt)	4.48E-06 [b]	--	--
Copper and Compounds	7440-50-8	1.74E-04	(lb/ton melt)	1.74E-04 [b]	100	1.74E-06
Lead and Compounds	7439-92-1	< 9.92E-05	(lb/ton melt)	9.92E-05 [b]	0.15	6.61E-04
Manganese and Compounds	7439-96-5	0.047	(lb/tons TAC in melt)	4.20E-04 [c]	0.3	1.40E-03
Mercury	7439-97-6	< 3.51E-06	(lb/ton melt)	3.51E-06 [b]	0.6	5.85E-06
Molybdenum Trioxide	1313-27-5	1.27E-05	(lb/ton melt)	1.27E-05 [b]	--	--
Nickel and Compounds	7440-02-0	1.62E-04	(lb/ton melt)	1.62E-04 [b]	0.2	8.11E-04
Phosphorus and Compounds	504	< 2.08E-04	(lb/ton melt)	2.08E-04 [b]	--	--
Selenium and Compounds	7782-49-2	ND		--	2	--
Silver and Compounds	7440-22-4	< 1.75E-05	(lb/ton melt)	1.75E-05 [b]	--	--
Thallium	7440-28-0	ND		--	--	--
Vanadium (fume or dust)	7440-62-2	ND		--	0.8	--
Zinc and Compounds	7440-66-6	4.32E-04	(lb/ton melt)	4.32E-04 [b]	--	--
CR12 - White Iron						
Total WER						**3.72E-03**
Aluminum and Compounds	7429-90-5	3.66E-03	(lb/ton melt)	3.66E-03 [b]	--	--
Antimony and Compounds	7440-36-0	2.54E-05	(lb/ton melt)	2.54E-05 [b]	1	2.54E-05
Arsenic and Compounds	7440-38-2	< 4.42E-05	(lb/ton melt)	4.42E-05 [b]	0.2	2.21E-04
Barium and Compounds	7440-39-3	1.11E-04	(lb/ton melt)	1.11E-04 [b]	--	--
Beryllium and compounds	7440-41-7	ND		--	0.02	--
Cadmium and Compounds	7440-43-9	< 3.71E-06	(lb/ton melt)	3.71E-06 [b]	0.03	1.24E-04
Chromium	7440-47-3	3.24E-04	(lb/tons TAC in melt)	4.21E-05 [c]	--	--
Chromium VI	18540-29-9	1.88E-06	(lb/tons TAC in melt)	2.44E-07 [c]	0.3	8.15E-07
Cobalt and Compounds	7440-48-4	< 4.48E-06	(lb/ton melt)	4.48E-06 [b]	--	--
Copper and Compounds	7440-50-8	1.74E-04	(lb/ton melt)	1.74E-04 [b]	100	1.74E-06
Lead and Compounds	7439-92-1	< 9.92E-05	(lb/ton melt)	9.92E-05 [b]	0.15	6.61E-04
Manganese and Compounds	7439-96-5	0.047	(lb/tons TAC in melt)	5.60E-04 [c]	0.3	1.87E-03
Mercury	7439-97-6	< 3.51E-06	(lb/ton melt)	3.51E-06 [b]	0.6	5.85E-06
Molybdenum Trioxide	1313-27-5	1.27E-05	(lb/ton melt)	1.27E-05 [b]	--	--
Nickel and Compounds	7440-02-0	1.62E-04	(lb/ton melt)	1.62E-04 [b]	0.2	8.11E-04
Phosphorus and Compounds	504	< 2.08E-04	(lb/ton melt)	2.08E-04 [b]	--	--
Selenium and Compounds	7782-49-2	ND		--	2	--
Silver and Compounds	7440-22-4	< 1.75E-05	(lb/ton melt)	1.75E-05 [b]	--	--
Thallium	7440-28-0	ND		--	--	--
Vanadium (fume or dust)	7440-62-2	ND		--	0.8	--
Zinc and Compounds	7440-66-6	4.32E-04	(lb/ton melt)	4.32E-04 [b]	--	--

Table D2
Alloy Toxicity Weighted Emission Rates
Eagle Foundry Company

Toxic Air Contaminant	CAS/DEQ ID	Emission Factor [1]		Emissions (lb)	Acute RBC [2] (ug/m^3)	Toxicity Weighted Emissions Rate [a]
F3 - White Iron						
Total WER						**3.41E-03**
Aluminum and Compounds	7429-90-5	3.66E-03	(lb/ton melt)	3.66E-03 [b]	--	--
Antimony and Compounds	7440-36-0	2.54E-05	(lb/ton melt)	2.54E-05 [b]	1	2.54E-05
Arsenic and Compounds	7440-38-2	< 4.42E-05	(lb/ton melt)	4.42E-05 [b]	0.2	2.21E-04
Barium and Compounds	7440-39-3	1.11E-04	(lb/ton melt)	1.11E-04 [b]	--	--
Beryllium and compounds	7440-41-7	ND		--	0.02	--
Cadmium and Compounds	7440-43-9	< 3.71E-06	(lb/ton melt)	3.71E-06 [b]	0.03	1.24E-04
Chromium	7440-47-3	3.24E-04	(lb/tons TAC in melt)	4.85E-05 [c]	--	--
Chromium VI	18540-29-9	1.88E-06	(lb/tons TAC in melt)	2.82E-07 [c]	0.3	9.40E-07
Cobalt and Compounds	7440-48-4	< 4.48E-06	(lb/ton melt)	4.48E-06 [b]	--	--
Copper and Compounds	7440-50-8	1.74E-04	(lb/ton melt)	1.74E-04 [b]	100	1.74E-06
Lead and Compounds	7439-92-1	< 9.92E-05	(lb/ton melt)	9.92E-05 [b]	0.15	6.61E-04
Manganese and Compounds	7439-96-5	0.047	(lb/tons TAC in melt)	4.67E-04 [c]	0.3	1.56E-03
Mercury	7439-97-6	< 3.51E-06	(lb/ton melt)	3.51E-06 [b]	0.6	5.85E-06
Molybdenum Trioxide	1313-27-5	1.27E-05	(lb/ton melt)	1.27E-05 [b]	--	--
Nickel and Compounds	7440-02-0	1.62E-04	(lb/ton melt)	1.62E-04 [b]	0.2	8.11E-04
Phosphorus and Compounds	504	< 2.08E-04	(lb/ton melt)	2.08E-04 [b]	--	--
Selenium and Compounds	7782-49-2	ND		--	2	--
Silver and Compounds	7440-22-4	< 1.75E-05	(lb/ton melt)	1.75E-05 [b]	--	--
Thallium	7440-28-0	ND		--	--	--
Vanadium (fume or dust)	7440-62-2	ND		--	0.8	--
Zinc and Compounds	7440-66-6	4.32E-04	(lb/ton melt)	4.32E-04 [b]	--	--
CM40 - Steel						
Total WER						**2.67E-03**
Aluminum and Compounds	7429-90-5	3.34E-03	(lb/ton melt)	3.34E-03 [b]	--	--
Antimony and Compounds	7440-36-0	< 3.08E-05	(lb/ton melt)	3.08E-05 [b]	1	3.08E-05
Arsenic and Compounds	7440-38-2	< 1.14E-04	(lb/ton melt)	1.14E-04 [b]	0.2	5.72E-04
Barium and Compounds	7440-39-3	1.77E-04	(lb/ton melt)	1.77E-04 [b]	--	--
Beryllium and compounds	7440-41-7	ND		--	0.02	--
Cadmium and Compounds	7440-43-9	< 1.09E-05	(lb/ton melt)	1.09E-05 [b]	0.03	3.64E-04
Chromium	7440-47-3	4.37E-03	(lb/tons TAC in melt)	1.35E-04 [c]	--	--
Chromium VI	18540-29-9	3.19E-05	(lb/tons TAC in melt)	9.89E-07 [c]	0.3	3.30E-06
Cobalt and Compounds	7440-48-4	< 4.41E-06	(lb/ton melt)	4.41E-06 [b]	--	--
Copper and Compounds	7440-50-8	< 1.54E-04	(lb/ton melt)	1.54E-04 [b]	100	1.54E-06
Lead and Compounds	7439-92-1	< 3.66E-05	(lb/ton melt)	3.66E-05 [b]	0.15	2.44E-04
Manganese and Compounds	7439-96-5	6.31E-03	(lb/tons TAC in melt)	4.73E-05 [c]	0.3	1.58E-04
Mercury	7439-97-6	< 7.08E-06	(lb/ton melt)	7.08E-06 [b]	0.6	1.18E-05
Molybdenum Trioxide	1313-27-5	1.27E-05	(lb/ton melt)	1.27E-05 [b]	--	--
Nickel and Compounds	7440-02-0	0.026	(lb/tons TAC in melt)	2.57E-04 [c]	0.2	1.28E-03
Phosphorus and Compounds	504	< 3.88E-04	(lb/ton melt)	3.88E-04 [b]	--	--
Selenium and Compounds	7782-49-2	ND		--	2	--
Silver and Compounds	7440-22-4	ND		--	--	--
Thallium	7440-28-0	ND		--	--	--
Vanadium (fume or dust)	7440-62-2	ND		--	0.8	--
Zinc and Compounds	7440-66-6	4.34E-04	(lb/ton melt)	4.34E-04 [b]	--	--

Table D2
Alloy Toxicity Weighted Emission Rates
Eagle Foundry Company

Toxic Air Contaminant	CAS/DEQ ID	Emission Factor [1]	Emissions (lb)	Acute RBC [2] (ug/m^3)	Toxicity Weighted Emissions Rate [a]
MNB2 - Steel					
Total WER					**4.93E-03**
Aluminum and Compounds	7429-90-5	3.34E-03 (lb/ton melt)	3.34E-03 [b]	--	--
Antimony and Compounds	7440-36-0	< 3.08E-05 (lb/ton melt)	3.08E-05 [b]	1	3.08E-05
Arsenic and Compounds	7440-38-2	< 1.14E-04 (lb/ton melt)	1.14E-04 [b]	0.2	5.72E-04
Barium and Compounds	7440-39-3	1.77E-04 (lb/ton melt)	1.77E-04 [b]	--	--
Beryllium and compounds	7440-41-7	ND	--	0.02	--
Cadmium and Compounds	7440-43-9	< 1.09E-05 (lb/ton melt)	1.09E-05 [b]	0.03	3.64E-04
Chromium	7440-47-3	4.37E-03 (lb/tons TAC in melt)	2.18E-05 [c]	--	--
Chromium VI	18540-29-9	3.19E-05 (lb/tons TAC in melt)	1.60E-07 [c]	0.3	5.32E-07
Cobalt and Compounds	7440-48-4	< 4.41E-06 (lb/ton melt)	4.41E-06 [b]	--	--
Copper and Compounds	7440-50-8	< 1.54E-04 (lb/ton melt)	1.54E-04 [b]	100	1.54E-06
Lead and Compounds	7439-92-1	< 3.66E-05 (lb/ton melt)	3.66E-05 [b]	0.15	2.44E-04
Manganese and Compounds	7439-96-5	6.31E-03 (lb/tons TAC in melt)	8.05E-04 [c]	0.3	2.68E-03
Mercury	7439-97-6	< 7.08E-06 (lb/ton melt)	7.08E-06 [b]	0.6	1.18E-05
Molybdenum Trioxide	1313-27-5	1.27E-05 (lb/ton melt)	1.27E-05 [b]	--	--
Nickel and Compounds	7440-02-0	0.026 (lb/tons TAC in melt)	2.05E-04 [c]	0.2	1.03E-03
Phosphorus and Compounds	504	< 3.88E-04 (lb/ton melt)	3.88E-04 [b]	--	--
Selenium and Compounds	7782-49-2	ND	--	2	--
Silver and Compounds	7440-22-4	ND	--	--	--
Thallium	7440-28-0	ND	--	--	--
Vanadium (fume or dust)	7440-62-2	ND	--	0.8	--
Zinc and Compounds	7440-66-6	4.34E-04 (lb/ton melt)	4.34E-04 [b]	--	--
121L - Steel					
Total WER					**4.93E-03**
Aluminum and Compounds	7429-90-5	3.34E-03 (lb/ton melt)	3.34E-03 [b]	--	--
Antimony and Compounds	7440-36-0	< 3.08E-05 (lb/ton melt)	3.08E-05 [b]	1	3.08E-05
Arsenic and Compounds	7440-38-2	< 1.14E-04 (lb/ton melt)	1.14E-04 [b]	0.2	5.72E-04
Barium and Compounds	7440-39-3	1.77E-04 (lb/ton melt)	1.77E-04 [b]	--	--
Beryllium and compounds	7440-41-7	ND	--	0.02	--
Cadmium and Compounds	7440-43-9	< 1.09E-05 (lb/ton melt)	1.09E-05 [b]	0.03	3.64E-04
Chromium	7440-47-3	4.37E-03 (lb/tons TAC in melt)	2.18E-05 [c]	--	--
Chromium VI	18540-29-9	3.19E-05 (lb/tons TAC in melt)	1.60E-07 [c]	0.3	5.32E-07
Cobalt and Compounds	7440-48-4	< 4.41E-06 (lb/ton melt)	4.41E-06 [b]	--	--
Copper and Compounds	7440-50-8	< 1.54E-04 (lb/ton melt)	1.54E-04 [b]	100	1.54E-06
Lead and Compounds	7439-92-1	< 3.66E-05 (lb/ton melt)	3.66E-05 [b]	0.15	2.44E-04
Manganese and Compounds	7439-96-5	6.31E-03 (lb/tons TAC in melt)	8.05E-04 [c]	0.3	2.68E-03
Mercury	7439-97-6	< 7.08E-06 (lb/ton melt)	7.08E-06 [b]	0.6	1.18E-05
Molybdenum Trioxide	1313-27-5	1.27E-05 (lb/ton melt)	1.27E-05 [b]	--	--
Nickel and Compounds	7440-02-0	0.026 (lb/tons TAC in melt)	2.05E-04 [c]	0.2	1.03E-03
Phosphorus and Compounds	504	< 3.88E-04 (lb/ton melt)	3.88E-04 [b]	--	--
Selenium and Compounds	7782-49-2	ND	--	2	--
Silver and Compounds	7440-22-4	ND	--	--	--
Thallium	7440-28-0	ND	--	--	--
Vanadium (fume or dust)	7440-62-2	ND	--	0.8	--
Zinc and Compounds	7440-66-6	4.34E-04 (lb/ton melt)	4.34E-04 [b]	--	--

Table D2
Alloy Toxicity Weighted Emission Rates
Eagle Foundry Company

Toxic Air Contaminant	CAS/DEQ ID	Emission Factor [1]		Emissions (lb)	Acute RBC [2] (ug/m^3)	Toxicity Weighted Emissions Rate [a]
1025 - Steel						
Total WER						**2.01E-03**
Aluminum and Compounds	7429-90-5	3.34E-03	(lb/ton melt)	3.34E-03 [b]	--	--
Antimony and Compounds	7440-36-0	< 3.08E-05	(lb/ton melt)	3.08E-05 [b]	1	3.08E-05
Arsenic and Compounds	7440-38-2	< 1.14E-04	(lb/ton melt)	1.14E-04 [b]	0.2	5.72E-04
Barium and Compounds	7440-39-3	1.77E-04	(lb/ton melt)	1.77E-04 [b]	--	--
Beryllium and compounds	7440-41-7	ND		--	0.02	--
Cadmium and Compounds	7440-43-9	< 1.09E-05	(lb/ton melt)	1.09E-05 [b]	0.03	3.64E-04
Chromium	7440-47-3	4.37E-03	(lb/tons TAC in melt)	1.31E-05 [c]	--	--
Chromium VI	18540-29-9	3.19E-05	(lb/tons TAC in melt)	9.57E-08 [c]	0.3	3.19E-07
Cobalt and Compounds	7440-48-4	< 4.41E-06	(lb/ton melt)	4.41E-06 [b]	--	--
Copper and Compounds	7440-50-8	< 1.54E-04	(lb/ton melt)	1.54E-04 [b]	100	1.54E-06
Lead and Compounds	7439-92-1	< 3.66E-05	(lb/ton melt)	3.66E-05 [b]	0.15	2.44E-04
Manganese and Compounds	7439-96-5	6.31E-03	(lb/tons TAC in melt)	4.42E-05 [c]	0.3	1.47E-04
Mercury	7439-97-6	< 7.08E-06	(lb/ton melt)	7.08E-06 [b]	0.6	1.18E-05
Molybdenum Trioxide	1313-27-5	1.27E-05	(lb/ton melt)	1.27E-05 [b]	--	--
Nickel and Compounds	7440-02-0	0.026	(lb/tons TAC in melt)	1.28E-04 [c]	0.2	6.42E-04
Phosphorus and Compounds	504	< 3.88E-04	(lb/ton melt)	3.88E-04 [b]	--	--
Selenium and Compounds	7782-49-2	ND		--	2	--
Silver and Compounds	7440-22-4	ND		--	--	--
Thallium	7440-28-0	ND		--	--	--
Vanadium (fume or dust)	7440-62-2	ND		--	0.8	--
Zinc and Compounds	7440-66-6	4.34E-04	(lb/ton melt)	4.34E-04 [b]	--	--
8630 - Steel						
Total WER						**2.10E-03**
Aluminum and Compounds	7429-90-5	3.34E-03	(lb/ton melt)	3.34E-03 [b]	--	--
Antimony and Compounds	7440-36-0	< 3.08E-05	(lb/ton melt)	3.08E-05 [b]	1	3.08E-05
Arsenic and Compounds	7440-38-2	< 1.14E-04	(lb/ton melt)	1.14E-04 [b]	0.2	5.72E-04
Barium and Compounds	7440-39-3	1.77E-04	(lb/ton melt)	1.77E-04 [b]	--	--
Beryllium and compounds	7440-41-7	ND		--	0.02	--
Cadmium and Compounds	7440-43-9	< 1.09E-05	(lb/ton melt)	1.09E-05 [b]	0.03	3.64E-04
Chromium	7440-47-3	4.37E-03	(lb/tons TAC in melt)	2.18E-05 [c]	--	--
Chromium VI	18540-29-9	3.19E-05	(lb/tons TAC in melt)	1.60E-07 [c]	0.3	5.32E-07
Cobalt and Compounds	7440-48-4	< 4.41E-06	(lb/ton melt)	4.41E-06 [b]	--	--
Copper and Compounds	7440-50-8	< 1.54E-04	(lb/ton melt)	1.54E-04 [b]	100	1.54E-06
Lead and Compounds	7439-92-1	< 3.66E-05	(lb/ton melt)	3.66E-05 [b]	0.15	2.44E-04
Manganese and Compounds	7439-96-5	6.31E-03	(lb/tons TAC in melt)	5.05E-05 [c]	0.3	1.68E-04
Mercury	7439-97-6	< 7.08E-06	(lb/ton melt)	7.08E-06 [b]	0.6	1.18E-05
Molybdenum Trioxide	1313-27-5	1.27E-05	(lb/ton melt)	1.27E-05 [b]	--	--
Nickel and Compounds	7440-02-0	0.026	(lb/tons TAC in melt)	1.41E-04 [c]	0.2	7.06E-04
Phosphorus and Compounds	504	< 3.88E-04	(lb/ton melt)	3.88E-04 [b]	--	--
Selenium and Compounds	7782-49-2	ND		--	2	--
Silver and Compounds	7440-22-4	ND		--	--	--
Thallium	7440-28-0	ND		--	--	--
Vanadium (fume or dust)	7440-62-2	ND		--	0.8	--
Zinc and Compounds	7440-66-6	4.34E-04	(lb/ton melt)	4.34E-04 [b]	--	--

Table D2
Alloy Toxicity Weighted Emission Rates
Eagle Foundry Company

Toxic Air Contaminant	CAS/DEQ ID	Emission Factor [1]		Emissions (lb)	Acute RBC [2] (ug/m^3)	Toxicity Weighted Emissions Rate [a]
4330 - Steel						
Total WER						**3.72E-03**
Aluminum and Compounds	7429-90-5	3.34E-03	(lb/ton melt)	3.34E-03 [b]	--	--
Antimony and Compounds	7440-36-0	< 3.08E-05	(lb/ton melt)	3.08E-05 [b]	1	3.08E-05
Arsenic and Compounds	7440-38-2	< 1.14E-04	(lb/ton melt)	1.14E-04 [b]	0.2	5.72E-04
Barium and Compounds	7440-39-3	1.77E-04	(lb/ton melt)	1.77E-04 [b]	--	--
Beryllium and compounds	7440-41-7	ND		--	0.02	--
Cadmium and Compounds	7440-43-9	< 1.09E-05	(lb/ton melt)	1.09E-05 [b]	0.03	3.64E-04
Chromium	7440-47-3	4.37E-03	(lb/tons TAC in melt)	3.49E-05 [c]	--	--
Chromium VI	18540-29-9	3.19E-05	(lb/tons TAC in melt)	2.55E-07 [c]	0.3	8.51E-07
Cobalt and Compounds	7440-48-4	< 4.41E-06	(lb/ton melt)	4.41E-06 [b]	--	--
Copper and Compounds	7440-50-8	< 1.54E-04	(lb/ton melt)	1.54E-04 [b]	100	1.54E-06
Lead and Compounds	7439-92-1	< 3.66E-05	(lb/ton melt)	3.66E-05 [b]	0.15	2.44E-04
Manganese and Compounds	7439-96-5	6.31E-03	(lb/tons TAC in melt)	4.42E-05 [c]	0.3	1.47E-04
Mercury	7439-97-6	< 7.08E-06	(lb/ton melt)	7.08E-06 [b]	0.6	1.18E-05
Molybdenum Trioxide	1313-27-5	1.27E-05	(lb/ton melt)	1.27E-05 [b]	--	--
Nickel and Compounds	7440-02-0	0.026	(lb/tons TAC in melt)	4.69E-04 [c]	0.2	2.34E-03
Phosphorus and Compounds	504	< 3.88E-04	(lb/ton melt)	3.88E-04 [b]	--	--
Selenium and Compounds	7782-49-2	ND		--	2	--
Silver and Compounds	7440-22-4	ND		--	--	--
Thallium	7440-28-0	ND		--	--	--
Vanadium (fume or dust)	7440-62-2	ND		--	0.8	--
Zinc and Compounds	7440-66-6	4.34E-04	(lb/ton melt)	4.34E-04 [b]	--	--
HC - Steel						
Total WER						**6.55E-03**
Aluminum and Compounds	7429-90-5	3.34E-03	(lb/ton melt)	3.34E-03 [b]	--	--
Antimony and Compounds	7440-36-0	< 3.08E-05	(lb/ton melt)	3.08E-05 [b]	1	3.08E-05
Arsenic and Compounds	7440-38-2	< 1.14E-04	(lb/ton melt)	1.14E-04 [b]	0.2	5.72E-04
Barium and Compounds	7440-39-3	1.77E-04	(lb/ton melt)	1.77E-04 [b]	--	--
Beryllium and compounds	7440-41-7	ND		--	0.02	--
Cadmium and Compounds	7440-43-9	< 1.09E-05	(lb/ton melt)	1.09E-05 [b]	0.03	3.64E-04
Chromium	7440-47-3	4.37E-03	(lb/tons TAC in melt)	1.22E-03 [c]	--	--
Chromium VI	18540-29-9	3.19E-05	(lb/tons TAC in melt)	8.93E-06 [c]	0.3	2.98E-05
Cobalt and Compounds	7440-48-4	< 4.41E-06	(lb/ton melt)	4.41E-06 [b]	--	--
Copper and Compounds	7440-50-8	< 1.54E-04	(lb/ton melt)	1.54E-04 [b]	100	1.54E-06
Lead and Compounds	7439-92-1	< 3.66E-05	(lb/ton melt)	3.66E-05 [b]	0.15	2.44E-04
Manganese and Compounds	7439-96-5	6.31E-03	(lb/tons TAC in melt)	4.73E-05 [c]	0.3	1.58E-04
Mercury	7439-97-6	< 7.08E-06	(lb/ton melt)	7.08E-06 [b]	0.6	1.18E-05
Molybdenum Trioxide	1313-27-5	1.27E-05	(lb/ton melt)	1.27E-05 [b]	--	--
Nickel and Compounds	7440-02-0	0.026	(lb/tons TAC in melt)	1.03E-03 [c]	0.2	5.14E-03
Phosphorus and Compounds	504	< 3.88E-04	(lb/ton melt)	3.88E-04 [b]	--	--
Selenium and Compounds	7782-49-2	ND		--	2	--
Silver and Compounds	7440-22-4	ND		--	--	--
Thallium	7440-28-0	ND		--	--	--
Vanadium (fume or dust)	7440-62-2	ND		--	0.8	--
Zinc and Compounds	7440-66-6	4.34E-04	(lb/ton melt)	4.34E-04 [b]	--	--

Table D2
Alloy Toxicity Weighted Emission Rates
Eagle Foundry Company

Toxic Air Contaminant	CAS/DEQ ID	Emission Factor [1]		Emissions (lb)	Acute RBC [2] (ug/m^3)	Toxicity Weighted Emissions Rate [a]
HH - Steel						
Total WER						**0.018**
Aluminum and Compounds	7429-90-5	3.34E-03	(lb/ton melt)	3.34E-03 [b]	--	--
Antimony and Compounds	7440-36-0	< 3.08E-05	(lb/ton melt)	3.08E-05 [b]	1	3.08E-05
Arsenic and Compounds	7440-38-2	< 1.14E-04	(lb/ton melt)	1.14E-04 [b]	0.2	5.72E-04
Barium and Compounds	7440-39-3	1.77E-04	(lb/ton melt)	1.77E-04 [b]	--	--
Beryllium and compounds	7440-41-7	ND		--	0.02	--
Cadmium and Compounds	7440-43-9	< 1.09E-05	(lb/ton melt)	1.09E-05 [b]	0.03	3.64E-04
Chromium	7440-47-3	4.37E-03	(lb/tons TAC in melt)	1.14E-03 [c]	--	--
Chromium VI	18540-29-9	3.19E-05	(lb/tons TAC in melt)	8.29E-06 [c]	0.3	2.76E-05
Cobalt and Compounds	7440-48-4	< 4.41E-06	(lb/ton melt)	4.41E-06 [b]	--	--
Copper and Compounds	7440-50-8	< 1.54E-04	(lb/ton melt)	1.54E-04 [b]	100	1.54E-06
Lead and Compounds	7439-92-1	< 3.66E-05	(lb/ton melt)	3.66E-05 [b]	0.15	2.44E-04
Manganese and Compounds	7439-96-5	6.31E-03	(lb/tons TAC in melt)	6.31E-05 [c]	0.3	2.10E-04
Mercury	7439-97-6	< 7.08E-06	(lb/ton melt)	7.08E-06 [b]	0.6	1.18E-05
Molybdenum Trioxide	1313-27-5	1.27E-05	(lb/ton melt)	1.27E-05 [b]	--	--
Nickel and Compounds	7440-02-0	0.026	(lb/tons TAC in melt)	3.21E-03 [c]	0.2	1.61E-02
Phosphorus and Compounds	504	< 3.88E-04	(lb/ton melt)	3.88E-04 [b]	--	--
Selenium and Compounds	7782-49-2	ND		--	2	--
Silver and Compounds	7440-22-4	ND		--	--	--
Thallium	7440-28-0	ND		--	--	--
Vanadium (fume or dust)	7440-62-2	ND		--	0.8	--
Zinc and Compounds	7440-66-6	4.34E-04	(lb/ton melt)	4.34E-04 [b]	--	--
HK - Steel						
Total WER						**0.027**
Aluminum and Compounds	7429-90-5	3.34E-03	(lb/ton melt)	3.34E-03 [b]	--	--
Antimony and Compounds	7440-36-0	< 3.08E-05	(lb/ton melt)	3.08E-05 [b]	1.00	3.08E-05
Arsenic and Compounds	7440-38-2	< 1.14E-04	(lb/ton melt)	1.14E-04 [b]	0.2	5.72E-04
Barium and Compounds	7440-39-3	1.77E-04	(lb/ton melt)	1.77E-04 [b]	--	--
Beryllium and compounds	7440-41-7	ND		--	0.02	--
Cadmium and Compounds	7440-43-9	< 1.09E-05	(lb/ton melt)	1.09E-05 [b]	0.03	3.64E-04
Chromium	7440-47-3	4.37E-03	(lb/tons TAC in melt)	1.14E-03 [c]	--	--
Chromium VI	18540-29-9	3.19E-05	(lb/tons TAC in melt)	8.29E-06 [c]	0.3	2.76E-05
Cobalt and Compounds	7440-48-4	< 4.41E-06	(lb/ton melt)	4.41E-06 [b]	--	--
Copper and Compounds	7440-50-8	< 1.54E-04	(lb/ton melt)	1.54E-04 [b]	100	1.54E-06
Lead and Compounds	7439-92-1	< 3.66E-05	(lb/ton melt)	3.66E-05 [b]	0.15	2.44E-04
Manganese and Compounds	7439-96-5	6.31E-03	(lb/tons TAC in melt)	6.31E-05 [c]	0.3	2.10E-04
Mercury	7439-97-6	< 7.08E-06	(lb/ton melt)	7.08E-06 [b]	0.6	1.18E-05
Molybdenum Trioxide	1313-27-5	1.27E-05	(lb/ton melt)	1.27E-05 [b]	--	--
Nickel and Compounds	7440-02-0	0.026	(lb/tons TAC in melt)	5.14E-03 [c]	0.2	2.57E-02
Phosphorus and Compounds	504	< 3.88E-04	(lb/ton melt)	3.88E-04 [b]	--	--
Selenium and Compounds	7782-49-2	ND		--	2	--

Table D2
Alloy Toxicity Weighted Emission Rates
Eagle Foundry Company

Toxic Air Contaminant	CAS/DEQ ID	Emission Factor [1]	Emissions (lb)	Acute RBC [2] (ug/m^3)	Toxicity Weighted Emissions Rate [a]
Silver and Compounds	7440-22-4	ND	--	--	--
Thallium	7440-28-0	ND	--	--	--
Vanadium (fume or dust)	7440-62-2	ND	--	0.8	--
Zinc and Compounds	7440-66-6	4.34E-04 (lb/ton melt)	4.34E-04 [b]	--	--

Notes

ND = non-detect

[a] Toxicity weighted emission rate = (emissions [lb]) / (acute RBC [ug/m^3])

[b] Emissions estimate (lb) = (emission factor [lb/tons melt]) x (metal melted [tons])

Metal melted (tons) = 1

[c] Emissions estimate (lb) = (emission factor [lb/tons TAC in melt]) x (metal melted [tons]) x (tons TAC/tons metal melted)

ALLOY	TAC in Melt [3] (tons TAC/ton melt)		
	Mn	Cr	Ni
HC25	0.011	0.26	8.0E-03
LC25	0.011	0.245	8.0E-03
CR20	9.0E-03	0.19	8.0E-03
CR12	0.012	0.13	8.0E-03
F3	0.010	0.15	8.0E-03
CM40	7.5E-03	0.031	0.010
MNB2	0.128	5.0E-03	8.0E-03
121L	0.128	5.0E-03	8.0E-03
1025	7.0E-03	3.0E-03	5.0E-03
8630	8.0E-03	5.0E-03	5.5E-03
4330	7.0E-03	8.0E-03	0.018
HC	7.5E-03	0.28	0.04
HH	0.010	0.26	0.13
HK	0.010	0.26	0.20

References

[1] See Table 2, Foundry Emission Factors. Value assumes the sum of the Main Foundry and Cooling Bunker emission factors.

[2] Risk-based Concentrations are from OAR 340-245-8010, Table 2.

[3] See Table D1, Alloy Composition Data.

Table D3
Silica Data
Eagle Foundry Company

Product	Product Constituent [1]	CAS	Product Constituent Weight Percent (%)	Constituent Molecular Formula	Constituent Molecular Weight (g/mol)	TAC	CAS	TAC Compound Molecular Weight (g/mol)	TAC Compound Count	TAC Percentage (%)	Total TAC Percentage in Product [b] (%)
Naigai Cerabead Coated Cerabead	Mullite	1302-93-8	90	$3Al_2O_3 \cdot 2SiO_2$	426.2	Aluminum	7429-90-5	54	3	38.0 [a]	34.21
						Silica, crystalline	7631-86-9	60.1	2	28.2 [a]	25.38
Total crystalline silica percentage in product (%) =											**25.38**
Unibond Core Paste	Sodium Silicate	1344-09-8	55	NA_2SiO_3	122.1	Silica, crystalline	7631-86-9	60.1	1	49.2 [a]	27.08
Total crystalline silica percentage in product (%) =											**27.08**

Element	MW (g/mol)
Oxygen (O)	16.0
Silica (Si)	28.1
Aluminum (Al)	27.0
Sodium	23.0

Notes

[a] TAC percentage (%) = (TAC compound molecular weight [g/mol]) x (TAC compound count) /(constituent molecular weight [g/mol]) x 100

[b] Total TAC percentage in product (%) = (TAC percentage [%]) x (product constituent weight percentage [%]/100)

References

[1] Solid constituent as identified in the product SDS.

Attachment B

Slag Dust Report

MAUL FOSTER ALONGI

ANALYTICAL REPORT

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

Tuesday, September 5, 2023

Geoffrey Tichenor
Stoel Rives
900 SW 5th Ave # 2600
Portland, OR 97204

RE: A3H1166 - EF-Slag Dust - 8006.63.001

Thank you for using Apex Laboratories. We greatly appreciate your business and strive to provide the highest quality services to the environmental industry.

Enclosed are the results of analyses for work order A3H1166, which was received by the laboratory on 8/17/2023 at 11:30:00AM.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: pnerenberg@apex-labs.com, or by phone at 503-718-2323.

Please note: All samples will be disposed of within 30 days of sample receipt, unless prior arrangements have been made.

Cooler Receipt Information
Acceptable Receipt Temperature is less than, or equal to, 6 degC (not frozen), or received on ice the same day as sampling.
(See Cooler Receipt Form for details)
Default Cooler 1.1 degC

This Final Report is the official version of the data results for this sample submission, unless superseded by a subsequent, labeled amended report.
All other deliverables derived from this data, including Electronic Data Deliverables (EDDs), CLP-like forms, client requested summary sheets, and all other products are considered secondary to this report.

Apex Laboratories

Philip Nerenberg

Philip Nerenberg, Lab Director

The results in this report apply to the samples analyzed in accordance with the chain of custody document(s) and updated by any subsequent written communications. This analytical report must be reproduced in its entirety.

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

Stoel Rives	Project: **EF-Slag Dust**	
900 SW 5th Ave # 2600	Project Number: **8006.63.001**	**Report ID:**
Portland, OR 97204	Project Manager: **Geoffrey Tichenor**	**A3H1166 - 09 05 23 1421**

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SLG-1	A3H1166-01	Solid	08/17/23 09:00	08/17/23 11:30
SLG-1	A3H1166-02	Solid	08/17/23 09:00	08/17/23 11:30

Apex Laboratories

Philip Nerenberg, Lab Director

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ANALYTICAL REPORT

Stoel Rives	Project: **EF-Slag Dust**	
900 SW 5th Ave # 2600	Project Number: **8006.63.001**	**Report ID:**
Portland, OR 97204	Project Manager: **Geoffrey Tichenor**	**A3H1166 - 09 05 23 1421**

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
SLG-1 (A3H1166-02)				**Matrix: Solid**				
Batch: 23H0901								
Aluminum	**4590**	---	53.5	mg/kg	10	08/24/23 20:39	EPA 6020B	**CONT, PRO**
Antimony	ND	---	1.07	mg/kg	10	08/24/23 20:39	EPA 6020B	CONT, PRO
Arsenic	ND	---	1.07	mg/kg	10	08/24/23 20:39	EPA 6020B	CONT, PRO
Barium	**10.3**	---	1.07	mg/kg	10	08/24/23 20:39	EPA 6020B	**CONT, PRO**
Beryllium	ND	---	0.214	mg/kg	10	08/24/23 20:39	EPA 6020B	CONT, PRO
Cadmium	ND	---	0.214	mg/kg	10	08/24/23 20:39	EPA 6020B	CONT, PRO
Cobalt	**3.56**	---	1.07	mg/kg	10	08/24/23 20:39	EPA 6020B	**CONT, PRO**
Copper	**24.2**	---	2.14	mg/kg	10	08/24/23 20:39	EPA 6020B	**CONT, PRO**
Lead	**0.406**	---	0.214	mg/kg	10	08/24/23 20:39	EPA 6020B	**CONT, PRO**
Mercury	ND	---	0.0857	mg/kg	10	08/24/23 20:39	EPA 6020B	CONT, PRO
Molybdenum	**80.4**	---	1.07	mg/kg	10	08/24/23 20:39	EPA 6020B	**CONT, PRO**
Nickel	**38.6**	---	2.14	mg/kg	10	08/24/23 20:39	EPA 6020B	**CONT, PRO**
Selenium	ND	---	1.07	mg/kg	10	08/24/23 20:39	EPA 6020B	CONT, PRO
Silver	ND	---	0.214	mg/kg	10	08/24/23 20:39	EPA 6020B	CONT, PRO
Thallium	ND	---	0.214	mg/kg	10	08/24/23 20:39	EPA 6020B	CONT, PRO
Vanadium	**5.68**	---	2.14	mg/kg	10	08/24/23 20:39	EPA 6020B	**CONT, PRO**
Zinc	ND	---	4.28	mg/kg	10	08/24/23 20:39	EPA 6020B	CONT, PRO
SLG-1 (A3H1166-02RE1)				**Matrix: Solid**				
Batch: 23H0901								
Chromium	**2580**	---	10.7	mg/kg	100	08/25/23 15:55	EPA 6020B	**CONT, PRO**
Manganese	**7710**	---	10.7	mg/kg	100	08/25/23 15:55	EPA 6020B	**CONT, PRO**
Phosphorus	ND	---	107	mg/kg	10	08/30/23 16:23	EPA 6020B	CONT, PRO

Apex Laboratories

Philip Nerenberg

Philip Nerenberg, Lab Director

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Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

Stoel Rives	Project: **EF-Slag Dust**	
900 SW 5th Ave # 2600	Project Number: **8006.63.001**	**Report ID:**
Portland, OR 97204	Project Manager: **Geoffrey Tichenor**	**A3H1166 - 09 05 23 1421**

ANALYTICAL SAMPLE RESULTS

Total Hexavalent Chromium by Colorimetric Spectrophotometry

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
SLG-1 (A3H1166-02)				**Matrix: Solid**		**Batch: 23H1045**		**PRO**
Chromium (VI)	**15.5**	---	0.450	mg/kg	1	08/30/23 17:08	EPA 7196A	

Apex Laboratories

Philip Nerenberg

Philip Nerenberg, Lab Director

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ORELAP ID: OR100062

ANALYTICAL REPORT

Stoel Rives	Project: **EF-Slag Dust**	
900 SW 5th Ave # 2600	Project Number: **8006.63.001**	**Report ID:**
Portland, OR 97204	Project Manager: **Geoffrey Tichenor**	**A3H1166 - 09 05 23 1421**

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23H0901 - EPA 3051A							**Solid**					
Blank (23H0901-BLK1)			Prepared: 08/24/23 12:04 Analyzed: 08/24/23 20:29									
EPA 6020B												
Aluminum	ND	---	50.0	mg/kg	10	---	---	---	---	---	---	
Antimony	ND	---	1.00	mg/kg	10	---	---	---	---	---	---	
Arsenic	ND	---	1.00	mg/kg	10	---	---	---	---	---	---	
Barium	ND	---	1.00	mg/kg	10	---	---	---	---	---	---	
Beryllium	ND	---	0.200	mg/kg	10	---	---	---	---	---	---	
Cadmium	ND	---	0.200	mg/kg	10	---	---	---	---	---	---	
Chromium	ND	---	1.00	mg/kg	10	---	---	---	---	---	---	
Cobalt	ND	---	1.00	mg/kg	10	---	---	---	---	---	---	
Copper	ND	---	2.00	mg/kg	10	---	---	---	---	---	---	
Lead	ND	---	0.200	mg/kg	10	---	---	---	---	---	---	
Manganese	ND	---	1.00	mg/kg	10	---	---	---	---	---	---	
Mercury	ND	---	0.0800	mg/kg	10	---	---	---	---	---	---	
Molybdenum	ND	---	1.00	mg/kg	10	---	---	---	---	---	---	
Nickel	ND	---	2.00	mg/kg	10	---	---	---	---	---	---	
Selenium	ND	---	1.00	mg/kg	10	---	---	---	---	---	---	
Silver	ND	---	0.200	mg/kg	10	---	---	---	---	---	---	
Thallium	ND	---	0.200	mg/kg	10	---	---	---	---	---	---	
Vanadium	ND	---	2.00	mg/kg	10	---	---	---	---	---	---	
Zinc	ND	---	4.00	mg/kg	10	---	---	---	---	---	---	
Blank (23H0901-BLK2)			Prepared: 08/24/23 12:04 Analyzed: 08/29/23 19:02									
EPA 6020B												
Phosphorus	ND	---	100	mg/kg	10	---	---	---	---	---	---	
LCS (23H0901-BS1)			Prepared: 08/24/23 12:04 Analyzed: 08/24/23 20:34									
EPA 6020B												
Aluminum	2440	---	50.0	mg/kg	10	2500	---	98	80-120%	---	---	
Antimony	25.1	---	1.00	mg/kg	10	25.0	---	100	80-120%	---	---	
Arsenic	45.7	---	1.00	mg/kg	10	50.0	---	91	80-120%	---	---	
Barium	48.7	---	1.00	mg/kg	10	50.0	---	97	80-120%	---	---	
Beryllium	23.6	---	0.200	mg/kg	10	25.0	---	94	80-120%	---	---	
Cadmium	48.9	---	0.200	mg/kg	10	50.0	---	98	80-120%	---	---	
Chromium	48.2	---	1.00	mg/kg	10	50.0	---	96	80-120%	---	---	

Apex Laboratories

Philip Nerenberg, Lab Director

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6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

ANALYTICAL REPORT

Stoel Rives	Project: **EF-Slag Dust**	
900 SW 5th Ave # 2600	Project Number: **8006.63.001**	**Report ID:**
Portland, OR 97204	Project Manager: **Geoffrey Tichenor**	**A3H1166 - 09 05 23 1421**

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23H0901 - EPA 3051A							**Solid**					
LCS (23H0901-BS1)			Prepared: 08/24/23 12:04 Analyzed: 08/24/23 20:34									
Cobalt	47.2	---	1.00	mg/kg	10	50.0	---	94	80-120%	---	---	
Copper	48.0	---	2.00	mg/kg	10	50.0	---	96	80-120%	---	---	
Lead	50.3	---	0.200	mg/kg	10	50.0	---	101	80-120%	---	---	
Manganese	47.7	---	1.00	mg/kg	10	50.0	---	95	80-120%	---	---	
Mercury	1.00	---	0.0800	mg/kg	10	1.00	---	100	80-120%	---	---	
Molybdenum	22.9	---	1.00	mg/kg	10	25.0	---	92	80-120%	---	---	
Nickel	47.2	---	2.00	mg/kg	10	50.0	---	94	80-120%	---	---	
Selenium	22.5	---	1.00	mg/kg	10	25.0	---	90	80-120%	---	---	
Silver	26.3	---	0.200	mg/kg	10	25.0	---	105	80-120%	---	---	
Thallium	23.9	---	0.200	mg/kg	10	25.0	---	96	80-120%	---	---	
Vanadium	47.5	---	2.00	mg/kg	10	50.0	---	95	80-120%	---	---	
Zinc	46.7	---	4.00	mg/kg	10	50.0	---	93	80-120%	---	---	
LCS (23H0901-BS2)			Prepared: 08/24/23 12:04 Analyzed: 08/29/23 19:08									
EPA 6020B												
Phosphorus	2650	---	100	mg/kg	10	2500	---	106	80-120%	---	---	
Duplicate (23H0901-DUP1)			Prepared: 08/24/23 12:04 Analyzed: 08/24/23 20:59									
QC Source Sample: Non-SDG (A3H1263-01)												
Aluminum	**8620**	---	51.8	mg/kg	10	---	3440	---	---	**86**	**20%**	Q-04, Q-39
Antimony	**18.6**	---	1.04	mg/kg	10	---	10.5	---	---	**56**	**20%**	Q-04, Q-39
Arsenic	**2.92**	---	1.04	mg/kg	10	---	0.986	---	---	**99**	**20%**	Q-05
Barium	**296**	---	1.04	mg/kg	10	---	434	---	---	**38**	**20%**	Q-04
Beryllium	ND	---	0.207	mg/kg	10	---	ND	---	---	**---**	**20%**	
Cadmium	**4.77**	---	0.207	mg/kg	10	---	1.09	---	---	**126**	**20%**	Q-04, Q-39
Chromium	**60.9**	---	1.04	mg/kg	10	---	25.1	---	---	**83**	**20%**	Q-04, Q-39
Cobalt	**7.23**	---	1.04	mg/kg	10	---	3.63	---	---	**66**	**20%**	Q-04, Q-39
Copper	**513**	---	2.07	mg/kg	10	---	91.7	---	---	**139**	**20%**	Q-04
Lead	**184**	---	0.207	mg/kg	10	---	113	---	---	**48**	**20%**	Q-04, Q-39
Manganese	**252**	---	1.04	mg/kg	10	---	92.3	---	---	**93**	**20%**	Q-04, Q-39
Mercury	**0.188**	---	0.0828	mg/kg	10	---	0.0714	---	---	**90**	**20%**	Q-05
Molybdenum	**22.3**	---	1.04	mg/kg	10	---	9.25	---	---	**83**	**20%**	Q-04
Nickel	**34.6**	---	2.07	mg/kg	10	---	12.9	---	---	**91**	**20%**	Q-04, Q-39
Selenium	ND	---	1.04	mg/kg	10	---	ND	---	---	---	20%	

Apex Laboratories

Philip Nerenberg, Lab Director

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Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

ANALYTICAL REPORT

Stoel Rives	Project: EF-Slag Dust	
900 SW 5th Ave # 2600	Project Number: 8006.63.001	Report ID:
Portland, OR 97204	Project Manager: Geoffrey Tichenor	A3H1166 - 09 05 23 1421

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23H0901 - EPA 3051A							**Solid**					
Duplicate (23H0901-DUP1)			Prepared: 08/24/23 12:04 Analyzed: 08/24/23 20:59									
QC Source Sample: Non-SDG (A3H1263-01)												
Silver	**18.3**	---	0.207	mg/kg	10	---	12.6	---	---	**37**	**20%**	Q-04, Q-39
Thallium	ND	---	0.207	mg/kg	10	---	ND	---	---	---	20%	
Vanadium	**33.6**	---	2.07	mg/kg	10	---	11.8	---	---	**96**	**20%**	Q-04, Q-39
Zinc	**849**	---	4.14	mg/kg	10	---	372	---	---	**78**	**20%**	Q-04
Duplicate (23H0901-DUP2)			Prepared: 08/24/23 12:04 Analyzed: 08/29/23 19:24									
QC Source Sample: Non-SDG (A3H1263-01)												
Phosphorus	**746**	---	104	mg/kg	10	---	273	---	---	**93**	**20%**	Q-04
Matrix Spike (23H0901-MS1)			Prepared: 08/24/23 12:04 Analyzed: 08/24/23 21:04									
QC Source Sample: Non-SDG (A3H1263-01)												
EPA 6020B												
Aluminum	10500	---	53.6	mg/kg	10	2580	3440	**274**	**75-125%**	---	---	Q-65
Antimony	32.0	---	1.07	mg/kg	10	25.8	10.5	83	75-125%	---	---	
Arsenic	50.9	---	1.07	mg/kg	10	51.5	0.986	97	75-125%	---	---	
Barium	314	---	1.07	mg/kg	10	51.5	434	**-231**	**75-125%**	---	---	Q-65
Beryllium	24.5	---	0.214	mg/kg	10	25.8	ND	95	75-125%	---	---	
Cadmium	53.9	---	0.214	mg/kg	10	51.5	1.09	102	75-125%	---	---	
Chromium	90.5	---	1.07	mg/kg	10	51.5	25.1	**127**	**75-125%**	---	---	Q-04
Cobalt	55.4	---	1.07	mg/kg	10	51.5	3.63	100	75-125%	---	---	
Copper	281	---	2.14	mg/kg	10	51.5	91.7	**367**	**75-125%**	---	---	Q-04
Lead	167	---	0.214	mg/kg	10	51.5	113	105	75-125%	---	---	
Manganese	241	---	1.07	mg/kg	10	51.5	92.3	**289**	**75-125%**	---	---	Q-04
Mercury	1.09	---	0.0858	mg/kg	10	1.03	0.0714	99	75-125%	---	---	
Molybdenum	41.1	---	1.07	mg/kg	10	25.8	9.25	124	75-125%	---	---	
Nickel	77.6	---	2.14	mg/kg	10	51.5	12.9	**126**	**75-125%**	---	---	Q-04
Selenium	24.6	---	1.07	mg/kg	10	25.8	ND	96	75-125%	---	---	
Silver	38.7	---	0.214	mg/kg	10	25.8	12.6	101	75-125%	---	---	
Thallium	23.8	---	0.214	mg/kg	10	25.8	ND	92	75-125%	---	---	
Vanadium	75.6	---	2.14	mg/kg	10	51.5	11.8	124	75-125%	---	---	
Zinc	710	---	4.29	mg/kg	10	51.5	372	**655**	**75-125%**	---	---	Q-04

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Philip Nerenberg, Lab Director

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Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

Stoel Rives	Project: **EF-Slag Dust**	
900 SW 5th Ave # 2600	Project Number: **8006.63.001**	**Report ID:**
Portland, OR 97204	Project Manager: **Geoffrey Tichenor**	**A3H1166 - 09 05 23 1421**

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23H0901 - EPA 3051A							**Solid**					
Matrix Spike (23H0901-MS2)			Prepared: 08/24/23 12:04		Analyzed: 08/29/23 19:30							
QC Source Sample: Non-SDG (A3H1263-01)												
EPA 6020B												
Phosphorus	3150	---	107	mg/kg	10	2580	273	112	75-125%	---	---	

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900 SW 5th Ave # 2600	Project Number: **8006.63.001**	**Report ID:**
Portland, OR 97204	Project Manager: **Geoffrey Tichenor**	**A3H1166 - 09 05 23 1421**

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Hexavalent Chromium by Colorimetric Spectrophotometry

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23H1045 - EPA 3060A							**Solid**					
Blank (23H1045-BLK1)			Prepared: 08/29/23 08:32		Analyzed: 08/30/23 17:03							
EPA 7196A												
Chromium (VI)	ND	---	0.450	mg/kg	1	---	---	---	---	---	---	
LCS (23H1045-BS1)			Prepared: 08/29/23 08:32		Analyzed: 08/30/23 17:03							
EPA 7196A												
Chromium (VI)	16.5	---	0.450	mg/kg	1	20.0	---	82	80-120%	---	---	
Matrix Spike (23H1045-MS1)			Prepared: 08/29/23 08:32		Analyzed: 08/30/23 17:06							
QC Source Sample: Non-SDG (A3H1135-05)												
EPA 7196A												
Chromium (VI)	0.528	---	0.437	mg/kg	1	19.4	ND	**3**	**75-125%**	---	---	Cr6-01
Matrix Spike (23H1045-MS2)			Prepared: 08/29/23 08:32		Analyzed: 08/30/23 17:13							**COMP**
QC Source Sample: Non-SDG (A3H1207-36)												
EPA 7196A												
Chromium (VI)	ND	---	4.03	mg/kg	10	19.9	ND	**18**	**75-125%**	---	---	Cr6-01, R-04, Q-57
Matrix Spike (23H1045-MS3)			Prepared: 08/29/23 08:32		Analyzed: 08/30/23 17:07							
QC Source Sample: Non-SDG (A3H1135-05)												
EPA 7196A												
Chromium (VI)	693	---	40.3	mg/kg	100	942	ND	**74**	**75-125%**	---	---	Cr6-01
Matrix Spike (23H1045-MS4)			Prepared: 08/29/23 08:32		Analyzed: 08/30/23 17:15							**COMP**
QC Source Sample: Non-SDG (A3H1207-36)												
EPA 7196A												
Chromium (VI)	561	---	39.5	mg/kg	100	885	ND	**63**	**75-125%**	---	---	Cr6-01
Matrix Spike Dup (23H1045-MSD1)			Prepared: 08/29/23 08:32		Analyzed: 08/30/23 17:07							
QC Source Sample: Non-SDG (A3H1135-05)												
Chromium (VI)	2.15	---	0.445	mg/kg	1	19.8	ND	**11**	**75-125%**	**121**	**20%**	Cr6-01

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900 SW 5th Ave # 2600	Project Number: **8006.63.001**	**Report ID:**
Portland, OR 97204	Project Manager: **Geoffrey Tichenor**	**A3H1166 - 09 05 23 1421**

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Hexavalent Chromium by Colorimetric Spectrophotometry

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23H1045 - EPA 3060A							**Solid**					
Matrix Spike Dup (23H1045-MSD2)			Prepared: 08/29/23 08:32		Analyzed: 08/30/23 17:14							**COMP**
QC Source Sample: Non-SDG (A3H1207-36)												
Chromium (VI)	7.00	---	4.00	mg/kg	10	19.7	ND	**35**	**75-125%**	**65**	**20%**	Cr6-01, Q-57, R-04
Post Spike (23H1045-PS1)			Prepared: 08/29/23 08:32		Analyzed: 08/30/23 17:11							
QC Source Sample: Post Spike (A3H1135-05)												
EPA 7196A												
Chromium (VI)	17.2	---	0.436	mg/kg	1	17.1	ND	101	85-115%		---	
Post Spike (23H1045-PS2)			Prepared: 08/29/23 08:32		Analyzed: 08/30/23 17:18							**COMP**
QC Source Sample: Post Spike (A3H1207-36)												
EPA 7196A												
Chromium (VI)	147	---	4.04	mg/kg	10	159	ND	92	85-115%		---	Q-57, R-04

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ANALYTICAL REPORT

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900 SW 5th Ave # 2600	Project Number: **8006.63.001**	**Report ID:**
Portland, OR 97204	Project Manager: **Geoffrey Tichenor**	**A3H1166 - 09 05 23 1421**

SAMPLE PREPARATION INFORMATION

Total Metals by EPA 6020B (ICPMS)

Prep: EPA 3051A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 23H0901							
A3H1166-02	Solid	EPA 6020B	08/17/23 09:00	08/24/23 12:04	0.467g/50mL	0.5g/50mL	1.07
A3H1166-02RE1	Solid	EPA 6020B	08/17/23 09:00	08/24/23 12:04	0.467g/50mL	0.5g/50mL	1.07

Total Hexavalent Chromium by Colorimetric Spectrophotometry

Prep: EPA 3060A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 23H1045							
A3H1166-02	Solid	EPA 7196A	08/17/23 09:00	08/29/23 08:32	2.502g/111mL	2.5g/111mL	1.00

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Portland, OR 97204	Project Manager: **Geoffrey Tichenor**	**A3H1166 - 09 05 23 1421**

QUALIFIER DEFINITIONS

Client Sample and Quality Control (QC) Sample Qualifier Definitions:

Apex Laboratories

COMP	Analyzed sample is a composite of discrete samples that was performed in the laboratory.
CONT	The Sample Container provided for this analysis was not provided by Apex Laboratories, and has not been verified as part of the Apex Quality System.
Cr6-01	Matrix Spike fails due to probable reducing conditions present in the sample. Sample is ND. Data quality is not affected because any hexavalent chromium present in the sample is likely to have been reduced to chromium three.
PRO	Sample has undergone sample processing prior to extraction and analysis.
Q-04	Spike recovery and/or RPD is outside control limits due to a non-homogeneous sample matrix.
Q-05	Analyses are not controlled on RPD values from sample and duplicate concentrations that are below 5 times the reporting level.
Q-39	Results for sample duplicate are higher than the sample results. See duplicate results in QC section of the report.
Q-57	Compensation for background color and/or turbidity has been made by subtracting the absorbance of a second aliquot of sample to which all reagents except the color producing reagent have been added, in accordance with the method.
Q-65	Spike recovery is estimated due to the high analyte concentration of the source sample.
R-04	Reporting levels elevated due to preparation and/or analytical dilution necessary for analysis.

Apex Laboratories

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ANALYTICAL REPORT

Stoel Rives	Project: **EF-Slag Dust**	
900 SW 5th Ave # 2600	Project Number: **8006.63.001**	**Report ID:**
Portland, OR 97204	Project Manager: **Geoffrey Tichenor**	**A3H1166 - 09 05 23 1421**

REPORTING NOTES AND CONVENTIONS:

Abbreviations:

DET Analyte DETECTED at or above the detection or reporting limit.

ND Analyte NOT DETECTED at or above the detection or reporting limit.

NR Result Not Reported

RPD Relative Percent Difference. RPDs for Matrix Spikes and Matrix Spike Duplicates are based on concentration, not recovery.

Detection Limits: Limit of Detection (LOD)

Limits of Detection (LODs) are normally set at a level of one half the validated Limit of Quantitation (LOQ).
If no value is listed ('-----'), then the data has not been evaluated below the Reporting Limit.

Reporting Limits: Limit of Quantitation (LOQ)

Validated Limits of Quantitation (LOQs) are reported as the Reporting Limits for all analyses where the LOQ, MRL, PQL or CRL are requested. The LOQ represents a level at or above the low point of the calibration curve, that has been validated according to Apex Laboratories' comprehensive LOQ policies and procedures.

Reporting Conventions:

Basis: Results for soil samples are generally reported on a 100% dry weight basis.
The Result Basis is listed following the units as " dry", " wet", or " " (blank) designation.

" dry" Sample results and Reporting Limits are reported on a dry weight basis. (i.e. "ug/kg dry")
See Percent Solids section for details of dry weight analysis.

" wet" Sample results and Reporting Limits for this analysis are normally dry weight corrected, but have not been modified in this case.

" " Results without 'wet' or 'dry' designation are not normally dry weight corrected. These results are considered 'As Received'.

Results for Volatiles analyses on soils and sediments that are reported on a “dry weight” basis include the water miscible solvent (WMS) correction referenced in the EPA 8000 Method guidance documents. Solid and Liquid samples reported on an “As Received” basis do not have the WMS correction applied, as dry weight was not performed.

QC Source:

In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) may be analyzed to demonstrate accuracy and precision of the extraction batch.

Non-Client Batch QC Samples (Duplicates and Matrix Spike/Duplicates) may not be included in this report. Please request a Full QC report if this data is required.

Miscellaneous Notes:

" --- " QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.

" *** " Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

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Portland, OR 97204	Project Manager: **Geoffrey Tichenor**	**A3H1166 - 09 05 23 1421**

REPORTING NOTES AND CONVENTIONS (Cont.):

Blanks:

Standard practice is to evaluate the results from Blank QC Samples down to a level equal to ½ the Reporting Limit (RL).

-For Blank hits falling between ½ the RL and the RL (J flagged hits), the associated sample and QC data will receive a 'B-02' qualifier.

-For Blank hits above the RL, the associated sample and QC data will receive a 'B' qualifier, per Apex Laboratories' Blank Policy.
For further details, please request a copy of this document.

-Sample results flagged with a 'B' or 'B-02' qualifier are potentially biased high if the sample results are less than ten times the level found in the blank for inorganic analyses, or less than five times the level found in the blank for organic analyses.

'B' and 'B-02' qualifications are only applied to sample results detected above the Reporting Level, if results are not reported to the MDL.

Preparation Notes:

Mixed Matrix Samples:

Water Samples:

Water samples containing significant amounts of sediment are decanted or separated prior to extraction, and only the water portion analyzed, unless otherwise directed by the client.

Soil and Sediment Samples:

Soil and Sediment samples containing significant amounts of water are decanted prior to extraction, and only the solid portion analyzed, unless otherwise directed by the client.

Sampling and Preservation Notes:

Certain regulatory programs, such as National Pollutant Discharge Elimination System (NPDES), require that activities such as sample filtration (for dissolved metals, orthophosphate, hexavalent chromium, etc.) and testing of short hold analytes (pH, Dissolved Oxygen, etc.) be performed in the field (on-site) within a short time window. In addition, sample matrix spikes are required for some analyses, and sufficient volume must be provided, and billable site specific QC requested, if this is required. All regulatory permits should be reviewed to ensure that these requirements are being met.

Data users should be aware of which regulations pertain to the samples they submit for testing. If related sample collection activities are not approved for a particular regulatory program, results should be considered estimates. Apex Laboratories will qualify these analytes according to the most stringent requirements, however results for samples that are for non-regulatory purposes may be acceptable.

Samples that have been filtered and preserved at Apex Laboratories per client request are listed in the preparation section of the report with the date and time of filtration listed.

Apex Laboratories maintains detailed records on sample receipt, including client label verification, cooler temperature, sample preservation, hold time compliance and field filtration. Data is qualified as necessary, and the lack of qualification indicates compliance with required parameters.

Apex Laboratories

Philip Nerenberg

Philip Nerenberg, Lab Director

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Portland, OR 97204	Project Manager: **Geoffrey Tichenor**	**A3H1166 - 09 05 23 1421**

LABORATORY ACCREDITATION INFORMATION

ORELAP Certification ID: OR100062 (Primary Accreditation) - EPA ID: OR01039

All methods and analytes reported from work performed at Apex Laboratories are included on Apex Laboratories' ORELAP Scope of Certification, with the exception of any analyte(s) listed below:

Apex Laboratories

Matrix	Analysis	TNI_ID	Analyte	TNI_ID	Accreditation

All reported analytes are included in Apex Laboratories' current ORELAP scope.

Secondary Accreditations

Apex Laboratories also maintains reciprocal accreditation with non-TNI states (Washington DOE), as well as other state specific accreditations not listed here.

Subcontract Laboratory Accreditations

Subcontracted data falls outside of Apex Laboratories' Scope of Accreditation.
Please see the Subcontract Laboratory report for full details, or contact your Project Manager for more information.

Field Testing Parameters

Results for Field Tested data are provded by the client or sampler, and fall outside of Apex Laboratories' Scope of Accreditation.

Apex Laboratories

Philip Nerenberg

Philip Nerenberg, Lab Director

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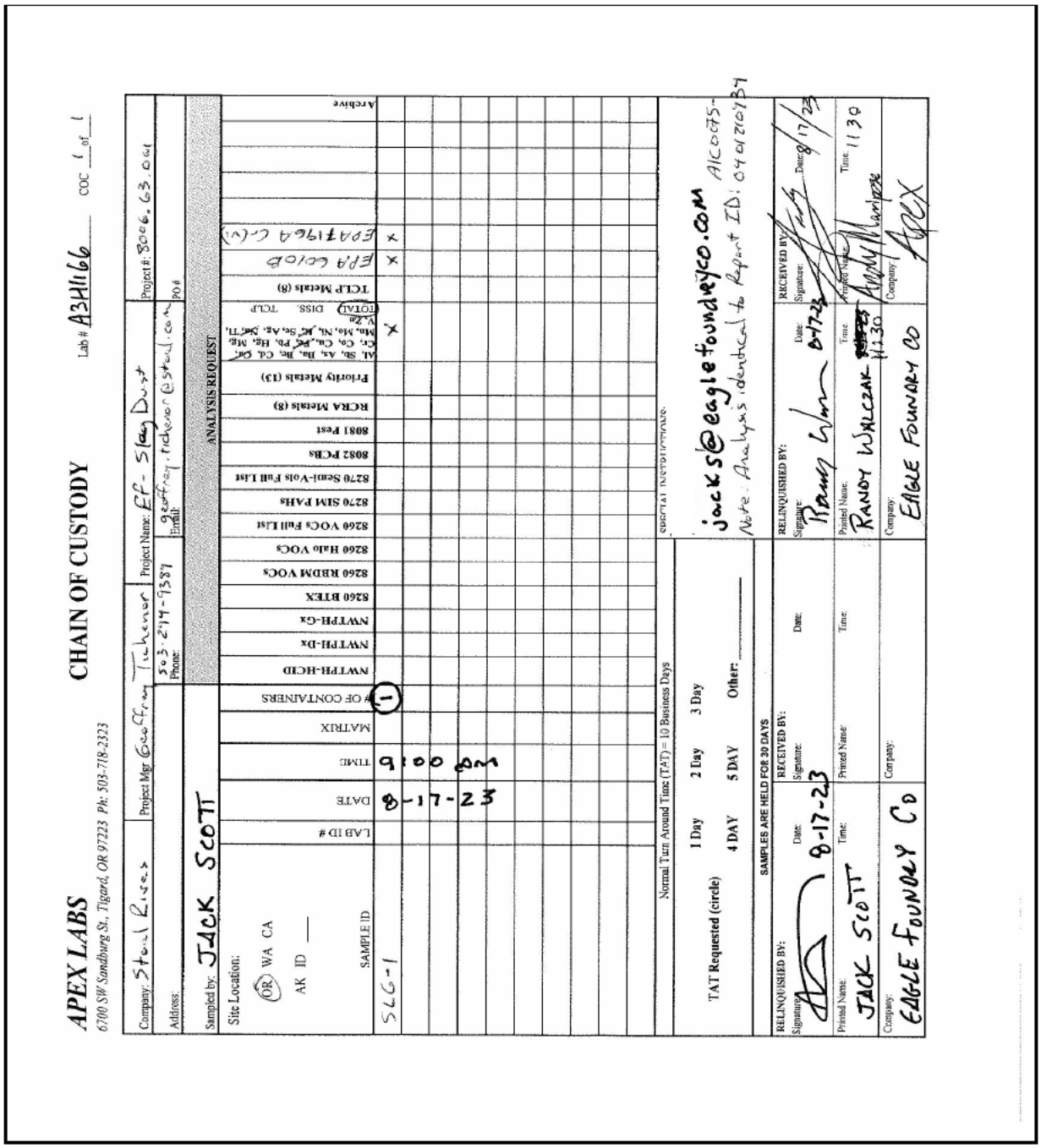

APEX LABS — CHAIN OF CUSTODY

6700 SW Sandburg St., Tigard, OR 97223 Ph: 503-718-2323

Lab # A3H1166 COC 1 of 1

Company: Stoel Rives | Project Mgr: Geoffrey Tichenor | Project Name: EF-Slag Dust | Project #: 8006.63.001

Address: | Phone: 503-241-9387 | Email: geoffrey.tichenor@stoel.com | PO #

Sampled by: JACK SCOTT

Site Location: (OR) WA CA AK ID ___

SAMPLE ID	LAB ID #	DATE	TIME	MATRIX	# OF CONTAINERS	NWTPH-HCID	NWTPH-Dx	NWTPH-Gx	8260 BTEX	8260 RBDM VOCs	8260 Halo VOCs	8260 VOCs Full List	8270 SIM PAHs	8270 Semi-Vols Full List	8082 PCBs	8081 Pest	RCRA Metals (8)	Priority Metals (13)	Al, Sb, As, Ba, Be, Cd, Cr, Co, Cu, Pb, Mg, Mn, Ni, Ag, Se, Ag, Tl, V, Zn (TOTAL) DISS. TCLP	TCLP Metals (8)	EPA 6010B	EPA 1964A (V)	Archive
SLG-1		8-17-23	9:00		1														X		X		

Normal Turn Around Time (TAT) = 10 Business Days

TAT Requested (circle): 1 Day 2 Day 3 Day 4 DAY 5 DAY Other: ___

SPECIAL INSTRUCTIONS: jacks@eaglefoundryco.com ALCO675- Note: Analysis identical to Report ID: 04 01 21 01 B7

SAMPLES ARE HELD FOR 30 DAYS

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature:	Signature:	Signature: Randy Wilson	Signature:
Printed Name: JACK SCOTT	Printed Name:	Printed Name: RANDY WILCZAK	Printed Name: Andy Mamone
Company: EAGLE FOUNDRY CO	Company:	Company: EAGLE FOUNDRY CO	Company: APEX
Date: 8-17-23	Date:	Date: 8-17-23	Date: 8/17/23
Time:	Time:	Time: 1130	Time: 1130

Apex Laboratories

Philip Nerenberg

Philip Nerenberg, Lab Director

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900 SW 5th Ave # 2600	Project Number: **8006.63.001**	**Report ID:**
Portland, OR 97204	Project Manager: **Geoffrey Tichenor**	**A3H1166 - 09 05 23 1421**

APEX LABS COOLER RECEIPT FORM

Client: ~~Stoel Rives~~ apex 8/18/23 Element WO#: A3H1166

Project/Project #: EF- Slag Dust / 8006.63.001

Delivery Info:

Date/time received: 8/17/23@1130 By: AJM

Delivered by: Apex__Client✓ESS__FedEx__UPS__Radio__Morgan__SDS__Evergreen__Other__

Cooler Inspection Date/time inspected: 8/17/23@1137 By: AJM

Chain of Custody included? Yes ✓ No ___

Signed/dated by client? Yes ✓ No ___

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (°C)	1.1						
Custody seals? (Y/N)	N						
Received on ice? (Y/N)	Y						
Temp. blanks? (Y/N)	N						
Ice type: (Gel/Real/Other)	Real						
Condition (In/Out):	In						

Cooler out of temp? (Y/N) Possible reason why: ___

Green dots applied to out of temperature samples? Yes/No

Out of temperature samples form initiated? Yes/No

Sample Inspection: Date/time inspected: ~~8/17/23~~ 8/18/23 @ ~~11:30~~ 14:31 By: KAM

All samples intact? Yes X No ___ Comments: ___

Bottle labels/COCs agree? Yes X No ___ Comments: No information on Containers. Matched by bag.

COC/container discrepancies form initiated? Yes ___ No X

Containers/volumes received appropriate for analysis? Yes X No ___ Comments: ___

Do VOA vials have visible headspace? Yes ___ No ___ NA X

Comments ___

Water samples: pH checked: Yes___No___NA X pH appropriate? Yes___No___NA X

Comments: ___

Additional information: ___

Labeled by: KAM Witness: DJS Cooler Inspected by: AJM

Form Y-003 R-00

Apex Laboratories

Philip Nerenberg

Philip Nerenberg, Lab Director

The results in this report apply to the samples analyzed in accordance with the chain of custody document(s) and updated by any subsequent written communications. This analytical report must be reproduced in its entirety.