ALLEGHENY COUNTY HEALTH DEPARTMENT
AIR QUALITY PROGRAM

February 19, 2026

SUBJECT: **United States Steel Corporation**
13th Street and Braddock Avenue
Braddock, PA 15104

Allegheny County

Installation Permit No. 0051-I010

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FACILITY DESCRIPTION

The U.S. Steel Mon Valley Works - Edgar Thomson Plant is an iron and steel making facility, located at 13th Street and Braddock Avenue, that produces steel slabs. The source consists of two (2) blast furnaces, two (2) blast furnace stoves, blast furnace slag flare, basic oxygen process (BOP) shop, ladle metallurgy, dual strand continuous caster, vacuum degasser, three (3) boilers. Two (2) diesel emergency generators. Six (6) circulating cooling towers, and degreaser.

The facility is a major source of particulate matter, particulate matter < 10 microns in diameter (PM_{10}), nitrogen oxides (NO_X), carbon monoxide (CO), sulfur dioxide (SO_2), volatile organic compounds (VOCs) and hazardous air pollutants (HAPs) as defined in section 2101.20 of Article XXI. The facility is also a major source of greenhouse gas emissions (CO_2e) as defined in the U.S. EPA Greenhouse Gas Tailoring Rule.

INSTALLATION DESCRIPTION

This permit is for the installation and operation of a slag recycler system. The slag recycler system will be used to process molten slag discharge from the blast furnaces. The molten slag is cooled by water within the granulation system, forming a slag-water mixture. This mixture then flows into a dewatering drum, where water is separated from the granulated slag. The dried slag is subsequently conveyed via a material-handling system to newly installed granulated slag bins and storage piles. The installation will include the following equipment:

- Blast Furnace #1 granulating box
- Blast Furnace #3 granulating box
- Dewatering drum and hopper
- Granulated slag handling system (two (2) conveyors & three (3) 300-ton bins)

The installation resulted in the following potential emissions changes, in tons per year:

Pollutant	Slag Recycler (Future Emissions from New and Associated Units) (tons/year)	Baseline Actual Emissions (from existing open slag pit) (tons/year)	Net Emission Changes (tons/year)
PM	44.92	54.47	-9.55
PM_{10}	17.84	30.84	-13
$PM_{2.5}$	10.72	27.22	-16.50
NO_X	2.91	6.04	-3.13
SO_X	23.26	29.23	-5.97
CO	18.90	20.95	-2.02
VOC	0.29	0.57	-0.28

The current slag operation at the facility directs slag to an open slag pit. With the proposed slag recycler, slag will primarily be directed to the granulator, while the open slag pit will serve as a backup during malfunction or maintenance of the slag granulator system.

PERMIT APPLICATION COMPONENTS:

1. Installation Permit Application No. 0051-I010, dated September 25, 2025.

EMISSION SOURCES:

SOURCE DESCRIPTION	CONTROL DEVICE(S)	MAXIMUM CAPACITY	FUEL/RAW MATERIAL	STACK I.D.
Slag Recycler Granulator System	Watering	360 tons per hour	Blast Furnace Slag	-
Blast Furnace #1 granulating box				S001
Blast Furnace #3 granulating box				S002
Dewatering drum and hopper				S003
Granulated slag handling system ▪ *Two (2) conveyors* ▪ *Three (3) 300-ton bins*				-
Granulated slag pile and loadout area				
Paved Roadways	Sweeping, Watering	0.8 miles	--	--
Unpaved Roadways	Watering	0.1 miles	--	--

METHOD OF DEMONSTRATING COMPLIANCE:

Compliance with the emission standards set in this permit will be demonstrated by:

(a) Inspecting the granulated recycle operation, weekly.
(b) Inspecting the conveyor belts and storage bins, weekly.
(c) Conduct opacity monitoring.
(d) Sweeping the paved roadways on a weekly basis and keeping records of each sweeping.
(e) Apply water spray to control dust on unpaved roadway.

See Permit No. 0051-I010 for the specific conditions for determining compliance with the applicable requirements.

REGULATORY APPLICABILITY:

1. **Article XX1 Requirements for Issuance:**
   See Permit Application No. 0051-I010, Section 5: Applicable Requirements. The requirements of Article XXI, Parts B and C for the issuance of minor modification installation permits have been met for this facility. Article XXI, Part D, Part E & Part H will have the necessary sections addressed individually.

   §2105.48 (Areas Subject to §2105.40 through §2105.47): United States Steel - Edgar Thomson Plant is located outside of the area specified in Article XXI, Section 2105.48.a. Therefore, the requirements of Article XXI, Sections §2105.40 through §2105.47, do not apply to this source.

2. **BACT Analysis:**
   The facility has conducted a BACT analysis for PM, NO_X, SO_X, CO and VOC emissions from the operation of slag granulators. The top-ranked option, engineering practices and good operating practices that include proper operation and maintenance in accordance with manufacturer's recommendations, has been selected as BACT.

3. **Testing Requirements:**
   No testing is required at this time. However, the Department reserves the right to require testing, if necessary, in the future, to ensure compliance with the terms and conditions of Installation Permit No. 0051-I010.

4. **New Source Review/Prevention of Significant Deterioration (NSR/PSD):**
   The facility is a major source of PM, NO_X, SO_X, CO, VOC, and H_2S as defined in §52.21(b)(1)(i)(A). Therefore, this installation must be evaluated for non-attainment NSR and PSD. NSR pollutants include ozone (NO_X and VOC) and $PM_{2.5}$; PSD pollutants are NO_2, SO_X (as SO_2), and CO.

   Based on the net emissions changes between the proposed granulators emission limits ("future emissions") and the decrease in emissions from the existing open slag pit shown in the Table 1 below, the projected emissions increase for all regulated PSD/NSR pollutants are below the applicable Significant Emission Rate (SER) thresholds as defined in 40 CFR §52.21(b)(23)(i). Therefore, the project does not constitute a significant emissions increase under Step 1 of the PSD applicability test.

   As a result, Step 2 (netting) which evaluates contemporaneous emissions increases and decreases at the source is not required for PSD pollutants. This is consistent with the two-step applicability process outlined in 40 CFR §52.21(a)(2)(iv)(F) & (G).

   According to 25 Pa. Code §127.203a(a)(2), Step 2 to account for contemporaneous period is still required for NSR pollutants even if the emissions increase from a project does not exceed the listed applicable emissions rate that is significant.

During the contemporaneous period (July 2015 - July 2025), an installation permit #0051-I009 was issued on May 25, 2021, for two (2) emergency generators with a potential NO_X emission rate of 22.6 tons per year. This represents a worst-case scenario, as actual emissions for an emergency unit are considerably lower. Even using the potential emissions, the net emissions increase is below the PSD/NSR significance thresholds. Therefore, no further analysis is required for PSD or NSR pollutants.

Table 1
PSD/NSR Step 1 Evaluation

Pollutant	Slag Recycler (Future Emissions from New and Associated Units) (tons/year)	Baseline Actual Emissions (from existing open slag pit) (tons/year)*	Net Emission Changes	PSD Significant Threshold/ NNSR	PSD/NSR Threshold (tpy)	Subject to PSD/NSR
PM	44.92	54.47	-9.55	PSD	25	NO
PM_{10}	17.84	30.84	-13.00	PSD	15	NO
$PM_{2.5}$	10.72	27.22	-16.50	NNSR	10	NO
NO_X/NO_2	2.91	6.04	-3.13	PSD/NNSR (precursor)	40	NO
SO_X	23.26	29.23	-5.97	PSD/NNSR	40	NO
CO	18.90	20.95	-2.05	PSD	100	NO
VOC	0.29	0.57	-0.28	NNSR	40	NO
H_2S	40.71	51.16	-10.45	PSD	10	NO

*A baseline period of December 2019 through November 2021 was used for this analysis

Table 2
NSR Step 2 Evaluation

Pollutant	Step 1 de minimis Change (tons/year)	Contemp. Increase (from IP #0051-I009) (tons/year)	Net Emission Changes	PSD Significant Threshold/ NNSR	PSD/NSR Threshold (tpy)	Subject to PSD/NSR
$PM_{2.5}$	-16.50	0.07	-16.43	NNSR	10	NO
NO_X/NO_2	-3.13	22.6	19.47	PSD/NNSR (precursor)	40	NO
VOC	-0.28	1.6	1.32	NNSR	40	NO

5. **New Source Performance Standards (NSPS):**
There are no NSPS requirements that apply to this installation.

6. **NESHAP and MACT Standards:**
40 CFR Part 63, Subpart FFFFF- *National Emission Standards for Hazardous Air Pollutants for Integrated Iron and Steel:* This rule is applicable to the facility and specifically to the slag granulator process.

- **40 CFR §63.6977(a):** Requires the facility to restrict the opacity of the slag granulator process to 10 percent (6-minute average)
- **40 CFR §63.7823(g):** Requires the facility to monitor the opacity of the slag granulator process using

EPA Method 9 in appendix A-4 to 40 CFR Part 60

- **40 CFR §§63.7842(d):** Requires the facility to record the slag throughput

7. **Risk Management Plan; CAA Section 112(r):**
No materials stored at the facility meet the threshold for CAA §112(r). Therefore, the facility is not subject to CAA §112(r).

8. **Greenhouse Gas Reporting (40 CFR Part 98):**
United States Steel Corporation - Edgar Thomson Plant is a major source of greenhouse gas (CO_2) emissions. However, the Greenhouse Gas (GHG) reporting rules under 40 CFR Part 98 are not considered applicable requirements under the Title V regulations at this time. Therefore, there are presently no greenhouse gas requirements at the facility.

EMISSIONS CALCULATIONS:

Slag Recycler

Emission calculations for PM, PM_{10}, $PM_{2.5}$, NO_X, CO, and VOC are based on an emission factor for a slag granulator, as provided in a 2023 installation permit issued by the Indiana Department of Environmental Management to Ozinga Cement, Inc. Ozinga Cement, located at 250 W U.S. Hwy 12, Burns Harbor, IN 46304, is a contractor for Cleveland-Cliffs Burns Harbor, LLC. In 2023, Ozinga Cement installed the slag granulator on behalf of Cleveland-Cliffs, a fully integrated steelmaking facility.

The PM, SO_X and H_2S are emitted during the during the processes of water application, air cooling, and potential slag smoldering, along with small number of gaseous pollutants, such as NO_X, CO and VOC.

Table 2
Slag Granulators Emissions

Pollutant	Emissions Factor (lb/ton of slag)		Short-Term Emissions (lb/hr)	Long-Term Emissions (ton/yr)*
PM	0.050	Ozinga Cement Inc. Installation Permit	18.0	14.54
PM_{10}	0.034		12.24	9.89
$PM_{2.5}$	0.034		12.24	9.89
NO_X	0.010		3.60	2.91
CO	0.065		23.40	18.90
VOC	0.001		0.36	0.29
SO_X	0.08	Manufacturer Guarantee/ Engineering Judgment	28.80	23.26

*A year is defined as any consecutive 12-month period

Example Calculation

Annual Slag Throughput:	581,565 tons/yr
Daily Slag Throughput:	1,596 tons/day
Hourly Slag Throughput:	360 tons/hr

PM Emissions (using manufacturer guarantee):
PM = 0.05 lb/ton × 36 tons/hr = **18 lb/hr**

PM = 0.05 lb/ton × 581,565 tons/yr ÷ 2,000 lb/ton = **14.54 ton/yr**

Granulated Slag Handling

The material handling emissions originate from the transfer of materials to the drum belt conveyor, reversible belt conveyor, storage bins, or pile and loadout. These emissions are low due to the high moisture content of the dewatered granulated slag. The emission estimates are based on AP 42, Chapters 13.2.4 and are presented in Table 3 below and Appendix A, Table 2 in the emissions spreadsheet.

Table 3
Slag Handling Emissions

Pollutant	Emissions Factor (lb/ton)	Short-Term Emissions (lb/hr)	Long-Term Emissions (ton/yr)*
PM	0.000272	0.018	0.32
PM_{10}	0.000129	0.0086	0.15
$PM_{2.5}$	0.0000195	0.0013	0.02

*A year is defined as any consecutive 12-month period

Storage Pile

The fugitive particulate emissions from wind erosion of active storage piles is estimated using the equation AP-42, Section 13.2.5; the equation in EPA 450/3-88-008, Equation #4-9; or the *Air Pollution Engineering Manual*, Air and Waste Management Association, 1992 (page 136, Chapter 4, Fugitive Emissions). The emission is presented in table 4 below and Appendix A, Table 3 in the emissions spreadsheet.

Table 4
Storage Piles Erosion Emissions

Pollutant	Long-Term Emissions (ton/yr)*
PM	0.132
PM_{10}	0.062
$PM_{2.5}$	0.02

*A year is defined as any consecutive 12-month period

Paved and Unpaved Roads:

The permittee operates paved roads and unpaved roads. Emissions from both paved and unpaved roadways consist of fugitive particulate matter, which are controlled through watering and the application of road dust suppressants. Particulate emission estimates are based on AP-42, Chapters 13.2.1 and 13.2.2 – *Paved and Unpaved Roads and* are presented in the Table 5 below and Appendix A, Tables 4 and 4a for the emissions spreadsheet.

Table 5
Roadway Emissions (Fugitive)

Pollutant	Long-Term Emissions (ton/yr)*
PM	29.94
PM_{10}	7.74
$PM_{2.5}$	0.79

*A year is defined as any consecutive 12-month period

EMISSIONS SUMMARY:

Slag Granulator System
Emission Limitations Summary

POLLUTANT	ANNUAL EMISSION LIMIT (tons/year)*
PM	44.92
PM_{10}	17.84
$PM_{2.5}$	10.72
Nitrogen Oxides (NO_X)	2.91
Sulfur Oxides (SO_X)	23.26
Carbon Monoxide (CO)	18.90
Volatile Organic Compounds (VOC)	0.29
Hydrogen Sulfide (H_2S)	40.71

* A year is defined as any consecutive 12-month period.

RECOMMENDATION:

All applicable Federal, State, and County regulations have been addressed in the permit application. The facility is subject to the restrictions of §2102.04.k of Article XXI due to the Notices of Violation (Notice of Violation #240801) issued for this facility in Allegheny County during the last 18 months for noncompliance with Conditions V.B.1.e. and V.D.1.l of the Title V Operating Permit. However, the cited conditions and limits are currently under appeal and subject to a stay; and the violations are currently under review, and the facility is working with ACHD to resolve the violation. The installation permit for the U.S. Steel - Edgar Thomson should be approved with the emission limitations and terms & conditions in Installation Permit No. 0051-I010.

APPENDIX

Table 1
Slag Granulator System

Company Name:	**U. S. Steel**				
Facility Name:	**Edgar Thomson Plant**				
Project Description:	**Slag Recycler Project**				
Granulator Stack (Granulating Spray Boxes, Dewatering Drum, Slurry Basin; New Equipment-Future Emissions)					
Process Section:	Granulating Spray Boxes				
Slag Throughput:	1,593	tons/day; avg.			
Slag Throughput:	360	ton/hr; avg.			
Slag Throughput:	581,565	tons/year	`		
Granulation Rate:	100%				
Daily Production:	1,593	tons/day			
Annual Production:	581,565	tons/year			
Emissions					

Pollutant[1]	**Potential Emissions**	**Potential Emissions**	**Emission Factor**	**Emission Factor Units**	**Emission Factor Source**
Criteria Pollutants:					
Particulate Matter (PM)	18.0	14.54	0.050	lb/ton slag	Permit limit for similar operation - see attached permit excerpt for Ozinga Cement, Inc.
Particulate Matter <10 microns (PM_1	12.2	9.89	0.034	lb/ton slag	
Particulate Matter < 2.5 microns (PM	12.2	9.89	0.034	lb/ton slag	
Nitrogen Oxides (NO_x)	3.60	2.91	0.010	lb/ton slag	Factor for slag granulator at Ozinga Cement, Inc.
Carbon Monoxide (CO)	23.40	18.90	0.065	lb/ton slag	
Volatile Organic Compounds (VOC)	0.36	0.29	1.00E-03	lb/ton slag	
Sulfur Dioxide (SO_2)	28.8	23.26	0.08	lb/ton slag	Project Engineering Estimate
Ammonia (NH_3)	24.5	19.81	0.07	lb/ton slag	See foonote 1
Hazardous Air Pollutants:					
Total HAPs	0.05	0.04			

1. Ammonia emissions are tied to blast furnace operation (blast furnace gas and contact water flowrate) only. The project does not impact blast furnace operation, gas generation or the amount of water in contact with the gas. Also since the slag granulation process will use more river water make-up, which contains no ammonia emissions, there is no expected no change in NH_3. As such, the same NH3 emission factor (lb/ton slag) from baseline period was assumed for future emissions as a conservative measure. NH_3 emissions increase due to differences in baseline versus projected actual throughputs. See Table 4a.

Table 2
Granulated Slag Handling System

Company Name:	U. S. Steel	
Facility Name:	Edgar Thomson Plant	
Project Description:	Slag Recycler Project	
Granulated Slag Handling (New Equipment, Future Emissions)		
Process Section:	Granulated Slag Handling (New Equipment)	
Daily Production:	1,593	tons/day
Annual Production:	581,565	tons/year
# of Transfers (post drums):	4	(transfer to drum belt conveyor, to reversible belt converyor, to storage bins or pile, loadout)

Emissions

Pollutant	Potential Emissions per Transfer	Potential Emissions per Transfer	Potential Emissions Total	Emission Factor[2]	Emission Factor Units	Emission Factor Source
Criteria Pollutants:						
Particulate Matter (PM)	1.81E-02	0.08	0.32	2.72E-04	lb/ton	AP-42 Section 13.2.4
Particulate Matter <10 microns (PM_{10})	8.55E-03	0.04	0.15	1.29E-04	lb/ton	AP-42 Section 13.2.4
Particulate Matter < 2.5 microns ($PM_{2.5}$)	1.30E-03	0.01	0.02	1.95E-05	lb/ton	AP-42 Section 13.2.4
Hazardous Air Pollutants:						
Total HAPs	4.88E-05	2.14E-04	8.56E-04			

Emission Factor for Drop Equation

$$E = k\,(0.0032)\,\frac{(U/5)^{1.3}}{(M/2)^{1.4}}$$

k =	0.74	PM - (AP-42, Section 13.2.4, for Particle Size < 30 um)
	0.35	PM_{10} - (AP-42, Section 13.2.4, for Particle Size < 10 um)
	0.053	$PM_{2.5}$ - (AP-42, Section 13.2.4, for Particle Size < 2.5 um)

Type of Material	Wind Speed (mph)[1]	Moisture (%)	Emission Factor PM Uncontrolled (lb/ton)	Emission Factor PM_{10} Uncontrolled (lb/ton)	Emission Factor $PM_{2.5}$ Uncontrolled (lb/ton)
Slag	6.525	12	0.00027	0.00013	0.00002

1. Wind speed data obtained from National Climatic Data Center for Pittsburgh/Allegheny County region for 2012 (consistent with EI reporting
2. Moisture content is based on engineering estimates per project design.

Table 3
Storage Pile Emissions

Company Name:	**U. S. Steel**
Facility Name:	**Edgar Thomson Plant**
Project Description:	**Slag Recycler Project**

Granulated Slag Storage Piles (New Pile, Future Emissions)

Area		Emission Factor	TSP Emissions			PM_{10} Fraction	PM_{10} Emissions	$PM_{2.5}$ Fraction	$PM_{2.5}$ Emissions
(ft^2)	(acre)	(lb/day/acre)	(lb/day)	(lb/yr)	(tons/yr)	(wt%)	(tons/yr)	(wt%)	(tons/yr)
A	B	C	D	E	F	G	H	I	J
4,500	0.10	6.99	0.72	263.44	0.1317	47.30	0.0623	14.86	0.0196

Notes (Method consistent with Emissions Inventory Practices):

A: Approximate area covered by storage piles; per project engineering

B = A / (43,560 sq.ft/acre)

C: E = 1.7 * (s / 1.5) * ((365 - p) / 235) * (f / 15)

where E = uncontrolled emission factor (lb/day/acre)

s = % silt = 5.3% for slag.

p = number of days when precipitation greater than or equal to 0.01" = 160 days (AP-42, 5th Ed., Fig. 13.2.2-1).

f = % time when wind speed exceeds 12 mph = 20 (West Virginia Office of Air Quality; EI reporting practices).

Equation is from 'Air Pollution Engineering Manual', Air and Waste Management Association, 1992 (page 136, Chapter 4, Fugitive Emissions).

D = B * C

E = D * 365 days/yr

F = E / (2000 lb/ton)

G: Information obtained from particle size distribution for aggregate handling (AP-42 Section 13.2.4), November 2006.

H = F * (G / 100)

I: Information obtained from particle size distribution for aggregate handling (AP-42 Section 13.2.4), November 2006.

J = F * (I / 100)

Table 4
Paved Roadway Emissions

Company Name:	U. S. Steel
Facility Name:	Edgar Thomson Plant
Project Description:	Slag Recycler Project

Paved Roads Emissions (Post Project Future Emissions)

TSP

Vehicle Type	k	sL	W	E (lb/VMT)	Road Traffic (VMT/yr) A	Uncontrolled Emissions (lb/yr) B	Uncontrolled Emissions (ton/yr) C	Control Efficiency (%) D	Controlled Emissions (ton/yr) E
Slagaway Haulers (Loaded)	0.011	0.30	100	0.41	18,610.08	7,542	3.77	90	0.38
Slagaway Haulers (Unloaded)	0.011	0.30	75	0.30	18,610.08	5,624	2.81	90	0.28
Total					37,220.16	13,167	6.58		**0.6583**

PM10

Vehicle Type	k	sL	W	E (lb/VMT)	Road Traffic (VMT/yr) A	Uncontrolled Emissions (lb/yr) B	Uncontrolled Emissions (ton/yr) C	Control Efficiency (%) D	Controlled Emissions (ton/yr) E
Slagaway Haulers (Loaded)	0.0022	0.30	100	0.081	18,610.08	1,508	0.75	90	0.075
Slagaway Haulers (Unloaded)	0.0022	0.30	75	0.060	18,610.08	1,125	0.56	90	0.056
Total					37,220.16	2,633	1.32		**0.1317**

PM2.5

Vehicle Type	k	sL	W	E (lb/VMT)	Road Traffic (VMT/yr) A	Uncontrolled Emissions (lb/yr) B	Uncontrolled Emissions (ton/yr) C	Control Efficiency (%) D	Controlled Emissions (ton/yr) E
Slagaway Haulers (Loaded)	0.00054	0.30	100	0.020	18,610.08	370	0.19	90	0.019
Slagaway Haulers (Unloaded)	0.00054	0.30	75	0.015	18,610.08	276	0.14	90	0.014
Total					37,220.16	646	0.32		**0.0323**

Table 4a
Unpaved Road Emission Summary

Unpaved Roads Emissions (Post Project Future Emissions)

TSP

Vehicle Type	k	s	W	a	b	E	Road Traffic (VMT/yr) A	Uncontrolled Emissions (lb/yr) B	Uncontrolled Emissions (ton/yr) C	Control Efficiency (%) D	Controlled Emissions (ton/yr) E
Slagaway Haulers (Loaded)	4.9	5.3	100	0.7	0.45	13.40	2,326.26	31,169	15.58	0	15.5843
Slagaway Haulers (Unloaded)	4.9	5.3	75	0.7	0.45	11.77	2,326.26	27,384	13.69	0	13.6919
Total							4,652.52	58,552	29		**29.2761**

PM10

Vehicle Type	k	s	W	a	b	E	Road Traffic (VMT/yr) A	Uncontrolled Emissions (lb/yr) B	Uncontrolled Emissions (ton/yr) C	Control Efficiency (%) D	Controlled Emissions (ton/yr) E
Slagaway Haulers (Loaded)	1.5	5.3	100	0.9	0.45	3.48	2,326.26	8,103	4.05	0	4.0514
Slagaway Haulers (Unloaded)	1.5	5.3	75	0.9	0.45	3.06	2,326.26	7,119	3.56	0	3.5594
Total							4,652.52	15,222	8		**7.6108**

PM2.5

Vehicle Type	k	s	W	a	b	E	Road Traffic (VMT/yr) A	Uncontrolled Emissions (lb/yr) B	Uncontrolled Emissions (ton/yr) C	Control Efficiency (%) D	Controlled Emissions (ton/yr) E
Slagaway Haulers (Loaded)	0.15	5.3	100	0.9	0.45	0.35	2,326.26	810	0.41	0	0.4051
Slagaway Haulers (Unloaded)	0.15	5.3	75	0.9	0.45	0.31	2,326.26	712	0.36	0	0.3559
Total							4,652.52	1,522	1		**0.7611**

Notes:

For paved roads, emission estimation equation is from AP-42, Fifth Edition, Section 13.2.1 (January 2011) for industrial paved roads.

$E = k\ (sL)^{0.91}\ (W)^{1.02}$, where:

E = particulate emission factor (lb/VMT)

k = base emission factor for particle size range and units of interest. From Table 13.2.1-1, the base emission factors are 0.011 lb/VMT (TSP), 0.0022 lb/VMT (PM10), and 0.00054 lb VMT for PM2.5.

sL = road surface silt loading (g/m^2), value obtained from AP-42 Background Information Document.

W = average weight (tons) of the vehicles traveling the road

For unpaved roads, emission estimation equation is from AP-42, Fifth Edition, Section 13.2.2 for industrial unpaved roads (November 2006).

$E = k\ (s/12)^a\ (W/3)^b$, where:

E = particulate emission factor (lb/VMT)

k, a, b = empirical constants from Table 13.2.2-2

s = silt content of road surface material (%)[slag silt content used in inventories for site]

W = mean vehicle weight (ton)

A: Information obtained from USS personnel.

Note that this takes into account 0% of slag being hauled out by rail.

B = (Particulate Emission Factor E) * A

C = B / (2000 lb/ton)

D: Control efficiency attributed to sweeping and chemical suppression, per ACHD.

E = C * ((100 - D) / 100)

Slag Material Moved:	581,565	tons/year	
Miles Per Trip:	0.9	miles each way/trip	
Load per Trip:	25	tons/truck	
# Trips:	23262.6	trips/year	
% Truck	100%	(conservatively set at all out via truck)	
% Rail	0%		
Paved per Trip:	0.8	miles/trip	distances provided by U. S. Steel
Unpaved per Trip:	0.1	miles/trip	distances provided by U. S. Steel
Paved miles per year:	18610.08	miles/year	(each way)
Unpaved miles per year:	2326.26	miles/year	(each way)

TABLE 5
SLAG RECYCLER
STEP 1 NSR EVALUATION SUMMARY

Table 1. Slag Recycler Project Emissions Summary (Step 1 NSR Evaluation Summary)

Pollutant[1]	PSD/NA NSR	Future Emissions (tpy)	Baseline Actual Emissions [2,3] (tpy)	Total Project Emissions Increase (tpy)	Significant Emission Rate (tpy)	Increase > SER?
PM (Filterable)	PSD	44.92	54.47	-9.55	25	**NO**
PM_{10} (Filterable + Condensable)	PSD	17.84	30.84	-13.00	15	**NO**
$PM_{2.5}$ (Filterable + Condensable)	NA NSR	10.72	27.22	-16.50	10	**NO**
NO_x	PSD / NA NSR (precursor)	2.91	6.04	-3.13	40	**NO**
CO	PSD	18.90	20.95	-2.05	100	**NO**
VOC	NA NSR (precursor)	0.29	0.57	-0.28	40	**NO**
Lead	PSD	0.00	0.04	-0.04	0.6	**NO**
H_2S	PSD	40.71	51.16	-10.45	10	**NO**
SO_2	PSD / NA NSR (precursor)	23.26	29.23	-5.97	40	**NO**

NOTES:

1. PSD also has established SERs for total reduced sulfur, fluorides, CO_2e and sulfuric acid mist. However, such emissions are not reasonably quantifiable or expected.

2. Baseline emissions are based on emissions reported by U. S. Steel as part of annual emissions inventories, except where recomputed based on recently uncovered, more representative factors (e.g., PM species, CO, VOC, NO_x, H_2S and SO_2 from existing slag pit operations).

3. Baseline Period End Date: 11/30/21

4. Ammonia emissions are tied to operations at the blast furnace (blast furnace gas and contact water flowrate) only. The project does not impact blast furnace operations, gas generation, or the amount of water in contact with the gas. Also, since the slag granulation process will use more river water make-up, which contains no ammonia emissions, there is no expected change in NH_3.