Received
January 3, 2023
WV DEP/Div of Air Quality

Division of Air Quality Permit Application Submittal

Please find attached a permit application for : CMC Steel US, LLC - Martinsburg
[Company Name; Facility Location]

- DAQ Facility ID (for existing facilities only): N/A
- Current 45CSR13 and 45CSR30 (Title V) permits associated with this process (for existing facilities only): N/A

- Type of NSR Application (check all that apply):
  - ☑ Construction
  - ☐ Modification
  - ☐ Class I Administrative Update
  - ☐ Class II Administrative Update
  - ☐ Relocation
  - ☐ Temporary
  - ☐ Permit Determination

- Type of 45CSR30 (TITLE V) Revision (if any)**:
  - ☐ Title V Initial
  - ☐ Title V Renewal
  - ☐ Administrative Update
  - ☐ Minor Modification
  - ☐ Significant Modification
  - ☐ Off Permit Change

****If any box above is checked, include the Title V revision information as ATTACHMENT S to this application.**

- Payment Type:
  - ☐ Credit Card (Instructions to pay by credit card will be sent in the Application Status email.)
  - ☑ Check (Make checks payable to: WVDEP – Division of Air Quality)
    Mail checks to:
    WVDEP – DAQ – Permitting
    Attn: NSR Permitting Secretary
    601 57th Street, SE
    Charleston, WV 25304

Please wait until DAQ emails you the Facility ID Number and Permit Application Number. Please add these identifiers to your check or cover letter with your check.

- If the permit writer has any questions, please contact (all that apply):
  - ☐ Responsible Official/Authorized Representative
    - Name:
    - Email:
    - Phone Number:
  - ☑ Company Contact
    - Name: Brad Bredesen
    - Email: Steven.Bredesen@cmc.com
    - Phone Number: 830-305-5250
  - ☑ Consultant
    - Name: Eddie Al-Rayes
    - Email: ealrayes@trinityconsultants.com
    - Phone Number: 602-663-3144

Trinity Consultants
4500 Brooktree Rd, Ste 310, Wexford, PA 15090 / P 724.935.2611 / **trinityconsultants.com**

January 3, 2023

Joe Kessler
Engineer
West Virginia Division of Air Quality
601-57th St., SE
Charleston, WV 25304
joseph.r.kessler@wv.gov

RE: Air Quality Permit Application
CMC Steel US, LLC, Martinsburg, WV

Dear Mr. Kessler:

CMC Steel US, LLC (CMC) is proposing to construct and operate a new micro mill and associated support operations in Berkeley County, West Virginia (the proposed Project). On behalf of CMC, Trinity Consultants (Trinity) is submitting the enclosed application for the development of a Prevention of Significant Deterioration (PSD) Permit to Construct for the proposed Project in accordance with West Virginia Code of State Rules (CSR), Title 45, Series 14 (45CSR14).

If you have any questions or comments about the information in the enclosed application, please do not hesitate to call me at 602-663-3144 or at ealrayes@trinityconsultants.com.

Sincerely,

TRINITY CONSULTANTS

Eddie Al-Rayes
Regional Manager

Enclosure

cc: Brad Bredesen, CMC
Alan Gillespie, CMC
Dave Flannery, Steptoe & Johnson PLLC

AIR QUALITY PERMIT APPLICATION

CMC Steel US, LLC / Martinsburg, WV

Prepared By:

TRINITY CONSULTANTS
4500 Brooktree Road, Suite 310
Wexford, PA 15090
(724) 935-2611

January 2023

Project 220506.0013

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1. EXECUTIVE SUMMARY

CMC Steel US, LLC (CMC) is proposing to construct and operate a new micro mill and associated support operations in Berkeley County, West Virginia (the proposed Project). With this application, CMC is seeking a Permit to Construct for the proposed Project in accordance with West Virginia Code of State Rules (CSR), Title 45, Series 14 (45CSR14).

Berkeley County is currently designated as "attainment" or "unclassified" for all regulated New Source Review (NSR) pollutants. The proposed Project will be a major source with respect to the Prevention of Significant Deterioration (PSD) and the Title V operating permit programs. With respect to the PSD program, the proposed Project will be a major source for the following pollutants:

- Filterable particulate matter (PM);
- Total particulate matter less than or equal to ten microns (PM_{10});
- Total particulate matter less than or equal to 2.5 microns ($PM_{2.5}$);
- Nitrogen oxides (NOx);
- Carbon monoxide (CO);
- Volatile organic compounds (VOC);
- Sulfur dioxide (SO_2)
- Fluoride (F) excluding hydrogen fluoride (HF); and
- Greenhouse gases (GHGs).

Pursuant to West Virginia Department of Environmental Protection (WVDEP) application form requirements, this application includes the following sections and attachments:

- Attachment A: Business Certificate
- Attachment B: Maps
- Attachment C: Installation and Start-up Schedule
- Attachment D: Regulatory Discussion (containing a state and federal regulatory applicability analysis for the proposed Project)
- Attachment E: Plot Plan
- Attachment F: Detailed Process Flow Diagrams
- Attachment G: Process Description
- Attachment H: Material Safety Data Sheets
- Attachment I: Emission Units Table
- Attachment J: Emission Points Data Summary Sheet
- Attachment K: Fugitive Emissions Data Summary Sheet
- Attachment L: Emission Unit Data Sheets
- Attachment M: Air Pollution Control Device Sheets
- Attachment N: Supporting Emission Calculations
- Attachment O: Monitoring/Recordkeeping/Reporting/Testing Plans
- Attachment P: Public Notice
- Attachment Q: Business Confidential Claims (Not Applicable)
- Attachment R: Authority Forms (Not Applicable)
- Attachment S: Title V Permit Revision Information (Not Applicable)
- Section 20: Application fees
- Section 23: Best Available Control Technology (BACT) (addressing the EPA recommended 5-step top-down approach to determining BACT for applicable emission units)

CMC will provide under separate cover, dispersion modeling analyses to demonstrate that the proposed Project will not:

1. Cause or significantly contribute to a violation of any applicable NAAQS;
2. Cause or significantly contribute to a violation of incremental standards; or
3. Cause any other adverse impacts to the surrounding area (i.e., impacts on soil and vegetation, visibility degradation, etc.).

2. WVDAQ APPLICATION FORM

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION **DIVISION OF AIR QUALITY** 601 57th Street, SE Charleston, WV 25304 (304) 926-0475 www.dep.wv.gov/daq	***APPLICATION FOR NSR PERMIT*** ***AND*** ***TITLE V PERMIT REVISION*** ***(OPTIONAL)***
PLEASE CHECK ALL THAT APPLY TO **NSR (45CSR13)** (IF KNOWN): ☒ **CONSTRUCTION** ☐ **MODIFICATION** ☐ **RELOCATION** ☐ **CLASS I ADMINISTRATIVE UPDATE** ☐ **TEMPORARY** ☐ **CLASS II ADMINISTRATIVE UPDATE** ☐ **AFTER-THE-FACT**	PLEASE CHECK TYPE OF **45CSR30 (TITLE V)** REVISION (IF ANY): ☐ **ADMINISTRATIVE AMENDMENT** ☐ **MINOR MODIFICATION** ☐ **SIGNIFICANT MODIFICATION** IF ANY BOX ABOVE IS CHECKED, INCLUDE TITLE V REVISION INFORMATION AS **ATTACHMENT S** TO THIS APPLICATION

FOR TITLE V FACILITIES ONLY: Please refer to "Title V Revision Guidance" in order to determine your Title V Revision options (Appendix A, "Title V Permit Revision Flowchart") and ability to operate with the changes requested in this Permit Application.

Section I. General

1. Name of applicant *(as registered with the WV Secretary of State's Office):* CMC Steel US, LLC	2. Federal Employer ID No. ***(FEIN):*** 824065247
3. Name of facility *(if different from above):* CMC Steel West Virginia	4. The applicant is the: ☐ **OWNER** ☐ **OPERATOR** ☒ **BOTH**
5A. Applicant's mailing address: 1 Steel Mill Dr Seguin, TX 78155	5B. Facility's present physical address:

6. **West Virginia Business Registration.** Is the applicant a resident of the State of West Virginia? ☐ **YES** ☒ **NO**

- If **YES,** provide a copy of the **Certificate of Incorporation/Organization/Limited Partnership** (one page) including any name change amendments or other Business Registration Certificate as **Attachment A.**
- If **NO,** provide a copy of the **Certificate of Authority/Authority of L.L.C./Registration** (one page) including any name change amendments or other Business Certificate as **Attachment A.**

7. If applicant is a subsidiary corporation, please provide the name of parent corporation: Commercial Metals Company

8. Does the applicant own, lease, have an option to buy or otherwise have control of the *proposed site?* ☒ **YES** ☐ **NO**

- If **YES,** please explain: CMC will own parcels of land for the proposed site.
- If **NO,** you are not eligible for a permit for this source.

9. Type of plant or facility (stationary source) to be **constructed, modified, relocated, administratively updated** or **temporarily permitted** (e.g., coal preparation plant, primary crusher, etc.): Steel Mill	10. North American Industry Classification System **(NAICS)** code for the facility: 331210
11A. DAQ Plant ID No. (for existing facilities only): –	11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (for existing facilities only):

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

12A. – For **Modifications, Administrative Updates** or **Temporary permits** at an existing facility, please provide directions to the *present location* of the facility from the nearest state road; – For **Construction** or **Relocation permits,** please provide directions to the *proposed new site location* from the nearest state road. Include a **MAP** as **Attachment B.** The proposed site will be located on the North side of state route 5 (Bedington Road), approximately 1 kilometer east of the Spring Mills Primary School (401 Campus Dr, Martinsburg, WV, 25404).		
12.B. New site address (if applicable): N/A	12C. Nearest city or town: Martinsburg	12D. County: Berkeley
12.E. UTM Northing (KM): 4,380.501	12F. UTM Easting (KM): 251.728	12G. UTM Zone: 18
13. Briefly describe the proposed change(s) at the facility: CMC is proposing to construct a new steel mill at this location.		
14A. Provide the date of anticipated installation or change: 06/01/2023 – If this is an **After-The-Fact** permit application, provide the date upon which the proposed change did happen: / /		14B. Date of anticipated Start-Up if a permit is granted: 12/01/2025
14C. Provide a **Schedule** of the planned **Installation of/Change** to and **Start-Up** of each of the units proposed in this permit application as **Attachment C** (if more than one unit is involved).		
15. Provide maximum projected **Operating Schedule** of activity/activities outlined in this application: Hours Per Day 24 Days Per Week 7 Weeks Per Year 52		
16. Is demolition or physical renovation at an existing facility involved? ☐ **YES** ☒ **NO**		
17. **Risk Management Plans.** If this facility is subject to 112(r) of the 1990 CAAA, or will become subject due to proposed changes (for applicability help see www.epa.gov/ceppo), submit your **Risk Management Plan (RMP)** to U. S. EPA Region III.		
18. **Regulatory Discussion.** List all Federal and State air pollution control regulations that you believe are applicable to the proposed process *(if known).* A list of possible applicable requirements is also included in Attachment S of this application (Title V Permit Revision Information). Discuss applicability and proposed demonstration(s) of compliance *(if known).* Provide this information as **Attachment D.**		

Section II. Additional attachments and supporting documents.

19. Include a check payable to WVDEP – Division of Air Quality with the appropriate **application fee** (per 45CSR22 and 45CSR13).
20. Include a **Table of Contents** as the first page of your application package.
21. Provide a **Plot Plan,** e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is or is to be located as **Attachment E** (Refer to ***Plot Plan Guidance***) . – Indicate the location of the nearest occupied structure (e.g. church, school, business, residence).
22. Provide a **Detailed Process Flow Diagram(s)** showing each proposed or modified emissions unit, emission point and control device as **Attachment F.**
23. Provide a **Process Description** as **Attachment G.** – Also describe and quantify to the extent possible all changes made to the facility since the last permit review (if applicable).
All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.
24. Provide **Material Safety Data Sheets (MSDS)** for all materials processed, used or produced as **Attachment H.** – For chemical processes, provide a MSDS for each compound emitted to the air.

25. Fill out the **Emission Units Table** and provide it as **Attachment I.**

26. Fill out the **Emission Points Data Summary Sheet (Table 1 and Table 2)** and provide it as **Attachment J.**

27. Fill out the **Fugitive Emissions Data Summary Sheet** and provide it as **Attachment K.**

28. Check all applicable **Emissions Unit Data Sheets** listed below:

☐ Bulk Liquid Transfer Operations
☒ Haul Road Emissions
☐ Quarry
☐ Chemical Processes
☐ Hot Mix Asphalt Plant
☐ Solid Materials Sizing, Handling and Storage Facilities
☐ Concrete Batch Plant
☐ Incinerator
☐ Grey Iron and Steel Foundry
☐ Indirect Heat Exchanger
☒ Storage Tanks
☒ General Emission Unit, specify Material Handling, Emergency Generator, Emergency Fire Pump

Fill out and provide the **Emissions Unit Data Sheet(s)** as **Attachment L.**

29. Check all applicable **Air Pollution Control Device Sheets** listed below:

☐ Absorption Systems
☒ Baghouse
☐ Flare
☐ Adsorption Systems
☐ Condenser
☐ Mechanical Collector
☐ Afterburner
☐ Electrostatic Precipitator
☐ Wet Collecting System

☐ Other Collectors, specify

Fill out and provide the **Air Pollution Control Device Sheet(s)** as **Attachment M.**

30. Provide all **Supporting Emissions Calculations** as **Attachment N,** or attach the calculations directly to the forms listed in Items 28 through 31.

31. **Monitoring, Recordkeeping, Reporting and Testing Plans.** Attach proposed monitoring, recordkeeping, reporting and testing plans in order to demonstrate compliance with the proposed emissions limits and operating parameters in this permit application. Provide this information as **Attachment O.**

➢ Please be aware that all permits must be practically enforceable whether or not the applicant chooses to propose such measures. Additionally, the DAQ may not be able to accept all measures proposed by the applicant. If none of these plans are proposed by the applicant, DAQ will develop such plans and include them in the permit.

32. **Public Notice.** At the time that the application is submitted, place a **Class I Legal Advertisement** in a newspaper of general circulation in the area where the source is or will be located (See 45CSR§13-8.3 through 45CSR§13-8.5 and ***Example Legal Advertisement*** for details). Please submit the **Affidavit of Publication** as **Attachment P** immediately upon receipt.

33. **Business Confidentiality Claims.** Does this application include confidential information (per 45CSR31)?

☐ **YES** ☒ **NO**

➢ If **YES,** identify each segment of information on each page that is submitted as confidential and provide justification for each segment claimed confidential, including the criteria under 45CSR§31-4.1, and in accordance with the DAQ's ***"Precautionary Notice – Claims of Confidentiality"*** guidance found in the ***General Instructions*** as **Attachment Q.**

Section III. Certification of Information

34. **Authority/Delegation of Authority.** Only required when someone other than the responsible official signs the application. Check applicable **Authority Form** below:

☐ Authority of Corporation or Other Business Entity
☐ Authority of Partnership
☐ Authority of Governmental Agency
☐ Authority of Limited Partnership

Submit completed and signed **Authority Form** as **Attachment R.**

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

35A. **Certification of Information.** To certify this permit application, a Responsible Official (per 45CSR§13-2.22 and 45CSR§30-2.28) or Authorized Representative shall check the appropriate box and sign below.

Certification of Truth, Accuracy, and Completeness

I, the undersigned ☒ **Responsible Official** / ☐ **Authorized Representative,** hereby certify that all information contained in this application and any supporting documents appended hereto, is true, accurate, and complete based on information and belief after reasonable inquiry I further agree to assume responsibility for the construction, modification and/or relocation and operation of the stationary source described herein in accordance with this application and any amendments thereto, as well as the Department of Environmental Protection, Division of Air Quality permit issued in accordance with this application, along with all applicable rules and regulations of the West Virginia Division of Air Quality and W.Va. Code § 22-5-1 et seq. (State Air Pollution Control Act). If the business or agency changes its Responsible Official or Authorized Representative, the Director of the Division of Air Quality will be notified in writing within 30 days of the official change.

Compliance Certification

Except for requirements identified in the Title V Application for which compliance is not achieved, I, the undersigned hereby certify that, based on information and belief formed after reasonable inquiry, all air contaminant sources identified in this application are in compliance with all applicable requirements.

SIGNATURE [signature] *(Please use blue ink)* DATE: 12/21/22 *(Please use blue ink)*

35B. Printed name of signee: Billy Milligan		35C. Title: Vice President, Sustainability, and Government Affairs
35D. E-mail: Billy.Milligan@cmc.com	36E. Phone: (972) 409-4799	36F. FAX:
36A. Printed name of contact person (if different from above): Brad Bredesen		**36B. Title:** Director of Environmental
36C. E-mail: Steven.Bredesen@cmc.com	36D. Phone: (830) 305-5250	36E. FAX:

PLEASE CHECK ALL APPLICABLE ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION:

- ☒ **Attachment A: Business Certificate**
- ☒ **Attachment B: Map(s)**
- ☒ **Attachment C: Installation and Start Up Schedule**
- ☒ **Attachment D: Regulatory Discussion**
- ☒ **Attachment E: Plot Plan**
- ☒ **Attachment F: Detailed Process Flow Diagram(s)**
- ☒ **Attachment G: Process Description**
- ☒ **Attachment H: Material Safety Data Sheets (MSDS)**
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- ☒ **Attachment K: Fugitive Emissions Data Summary Sheet**
- ☒ **Attachment L: Emissions Unit Data Sheet(s)**
- ☒ **Attachment M: Air Pollution Control Device Sheet(s)**
- ☒ **Attachment N: Supporting Emissions Calculations**
- ☒ **Attachment O: Monitoring/Recordkeeping/Reporting/Testing Plans**
- ☒ **Attachment P: Public Notice**
- ☒ **Attachment Q: Business Confidential Claims**
- ☐ **Attachment R: Authority Forms**
- ☐ **Attachment S: Title V Permit Revision Information**
- ☒ **Application Fee**

Please mail an original and three (3) copies of the complete permit application with the signature(s) to the DAQ, Permitting Section, at the address listed on the first page of this application. Please DO NOT fax permit applications.

FOR AGENCY USE ONLY – IF THIS IS A TITLE V SOURCE:

- ☐ ***Forward 1 copy of the application to the Title V Permitting Group and:***
- ☐ ***For Title V Administrative Amendments:***
  - ☐ ***NSR permit writer should notify Title V permit writer of draft permit,***
- ☐ ***For Title V Minor Modifications:***
  - ☐ ***Title V permit writer should send appropriate notification to EPA and affected states within 5 days of receipt,***
  - ☐ ***NSR permit writer should notify Title V permit writer of draft permit.***
- ☐ ***For Title V Significant Modifications processed in parallel with NSR Permit revision:***
  - ☐ ***NSR permit writer should notify a Title V permit writer of draft permit,***
  - ☐ ***Public notice should reference both 45CSR13 and Title V permits,***
  - ☐ ***EPA has 45 day review period of a draft permit.***

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

3. ATTACHMENT A: BUSINESS CERTIFICATE

State of West Virginia

Certificate

I, Mac Warner, Secretary of State,
of the State of West Virginia, hereby certify that

CMC STEEL US, LLC

has filed the appropriate registration documents in my office according to the provisions of the West Virginia Code and hereby declare the organization listed above as duly registered with the Secretary of State's Office.

Given under my hand and
the Great Seal of West Virginia
on this day of
November 30, 2022

Secretary of State

4. ATTACHMENT B: MAPS

Figure 4-1 depicts the area map of the proposed Project including roads, general boundaries of towns and other nearby municipalities, and proximity to major geographical features such as the Potomac River.

Figure 4-1. Area Map of Proposed Project

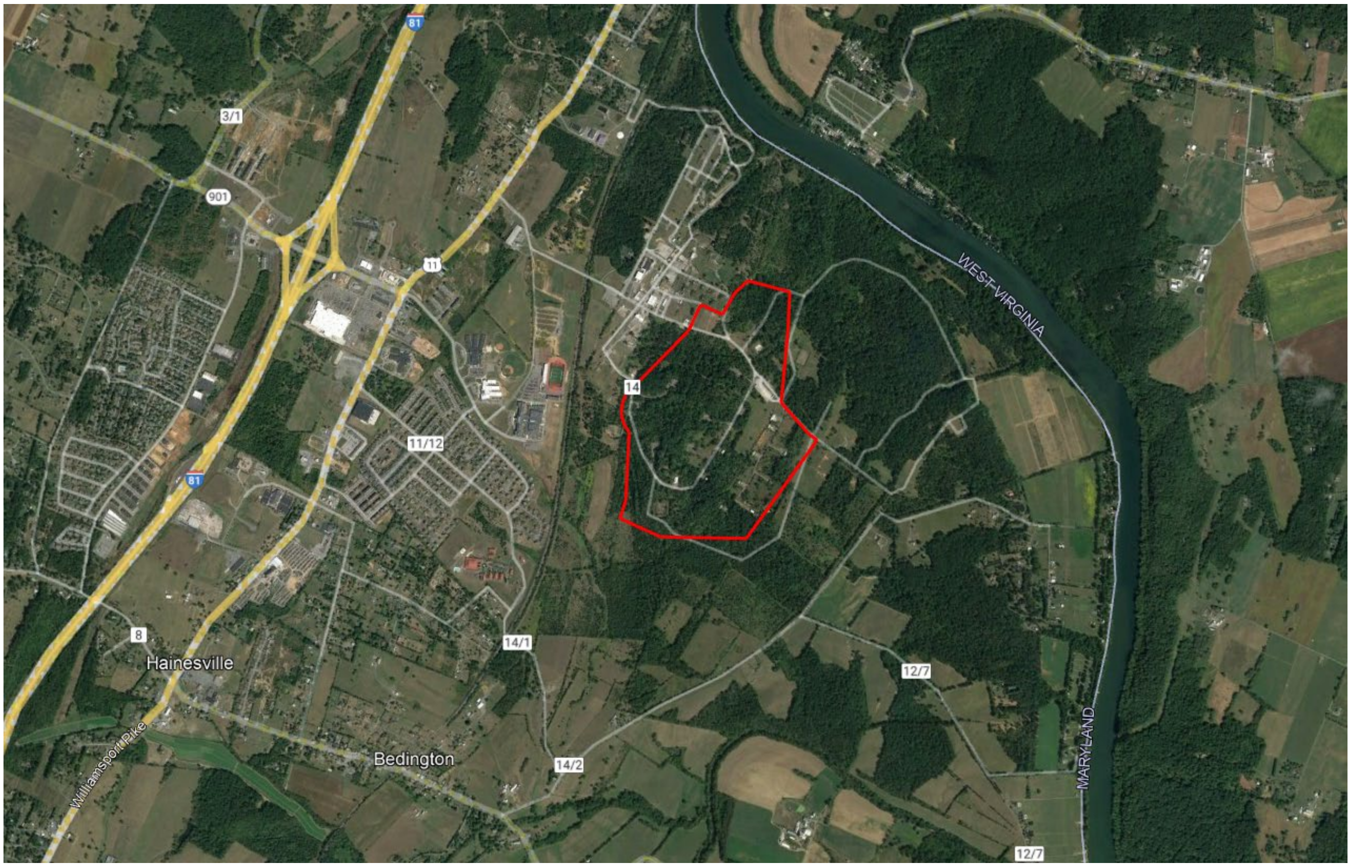
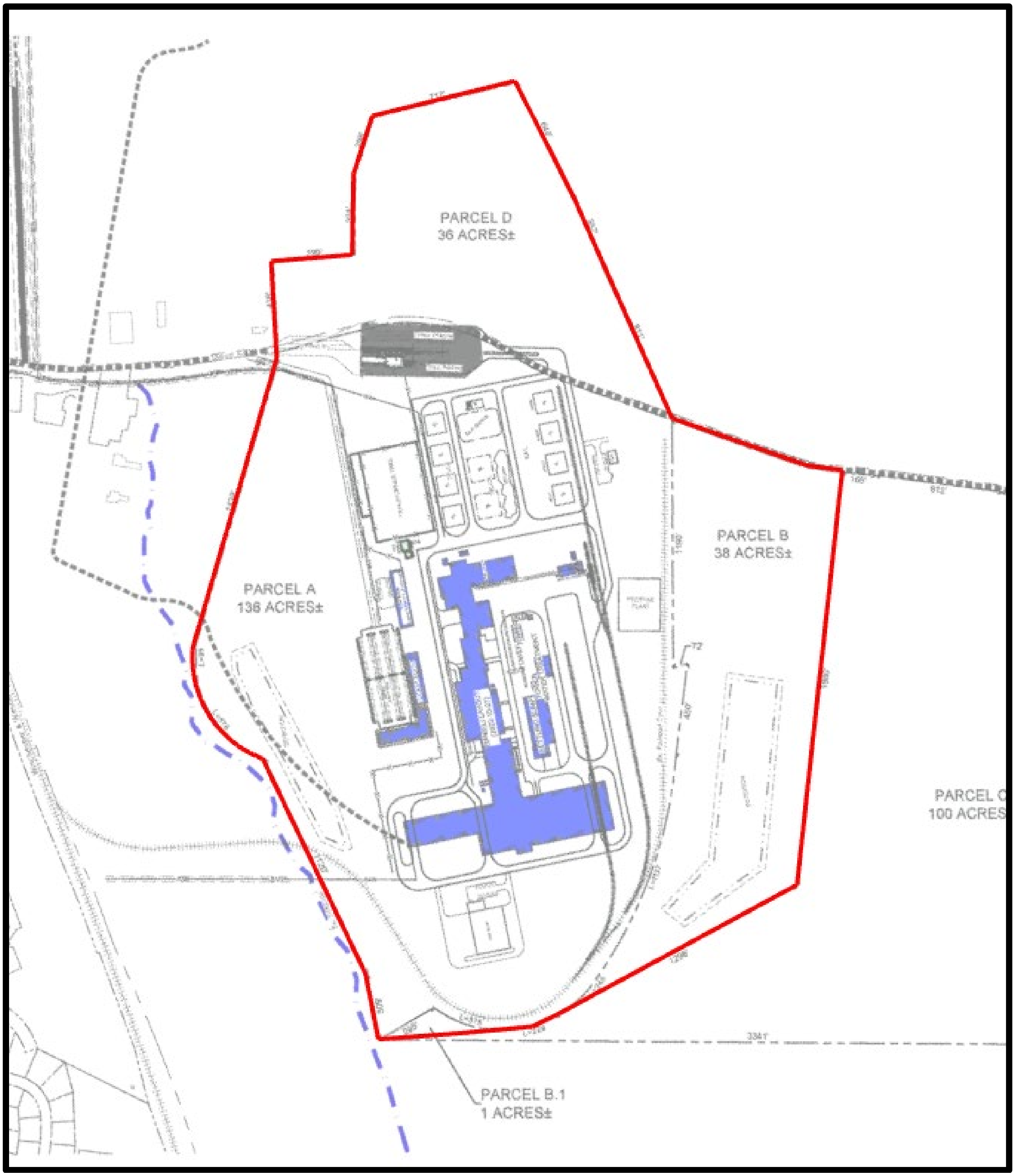


Figure 4-2 depicts the site map of the proposed Project including fenceline and anticipated locations of proposed Project features such as buildings.

Figure 4-2. Site Map of Proposed Project



5. ATTACHMENT C: INSTALLATION AND START UP SCHEDULE

As noted on the WVDAQ application form the date of anticipated installation is June 2023 and the date of anticipated start-up is December 2025.

6. ATTACHMENT D: REGULATORY DISCUSSION

This section discusses the air permitting requirements and key air quality regulations that potentially apply to the proposed Project, including major New Source Review (NSR), New Source Performance Standards (NSPS), National Emission Standards for Hazardous Air Pollutants (NESHAP), and West Virginia 45 Code of State Rules (CSR) regulations.

6.1 Federal Major New Source Review (NSR)

Two distinct major New Source Review (NSR) permitting programs potentially apply depending on whether a source is located in an "attainment/unclassifiable" or "nonattainment" area for a particular regulated NSR pollutant. The Prevention of Significant Deterioration (PSD) program provisions govern potential major NSR actions in areas which are designated to be in attainment or unclassifiable status. The Nonattainment NSR (NA-NSR) program governs potential major NSR actions in areas which are nonattainment for one or more regulated pollutants.

The proposed Project will be located near Martinsburg, West Virginia, that is currently designated as attainment or unclassified for all criteria pollutants (see 40 CFR 81.349). As a result, for purposes of federal major NSR applicability, all regulated attainment NSR pollutants are evaluated for applicability under the PSD program. Iron and steel mill plants are classified as one of the 28 listed source categories in Title 45, Legislative Rule of the Department of Environmental Protection, Series 14 (45CSR14) Section 2.43.a. with a 100 ton per year (tpy) "major" source PSD threshold. If the proposed Project Potential-to-Emit (PTE) is above the major source thresholds set for regulated NSR pollutants, PSD is triggered for that pollutant. Table 6-1 contains a summary of the proposed Project major NSR evaluation.

The proposed Project PTE exceeds the PSD major source thresholds for CO and is therefore subject to PSD requirements. For PSD purposes, if a source exceeds the major stationary source threshold for one regulated NSR pollutant, it is considered major for any other regulated NSR pollutant emitted above its corresponding significant emission rate (SER). The proposed Project PTE exceeds the SERs for PM, PM_{10}, $PM_{2.5}$, NOx, VOC, SO_2, Fluorides excluding hydrogen fluoride (HF), and greenhouse gases (GHGs). Per 40 CFR 52.21(b)(49)(iv), GHGs are a regulated NSR pollutant if the stationary source is a new major source for a regulated NSR pollutant which is not GHGs and will also have the potential to emit 75,000 tpy CO_2e or more. The proposed Project GHG PTE exceeds this threshold and therefore is subject to PSD review for GHGs. The proposed Project will be subject to PSD program requirements contained under 45CSR14.

Table 6-1. Summary of Emissions from Proposed Project and PSD Permitting Applicability

Parameter	Annual PTE (tpy)												
	Filterable PM	Total PM	Total PM_{10}	Total $PM_{2.5}$	NOx	CO	VOC	SO_2	Pb	Fluorides	Max Single HAP[4]	Total HAP	CO_2e
Site-Wide Emissions	77	188	179	174	99	1,309	98	98	0.52	3.25	1.22	2.33	120,600
Major NSR "Major Source" Threshold [1, 3]	100	-	100	100	100	100	100	100	100	100	-	-	-
Title V Threshold [3]	100	-	100	100	100	100	100	100	-	-	10	25	100,000
Project Exceeds Major NSR "Major Source" Threshold?	No	-	Yes	Yes	No	Yes	No	No	No	No	-	-	No
Project Exceeds Title V Thresholds?	No	-	Yes	Yes	No	Yes	No	No	-	-	No	No	Yes
PSD Significant Emission Rates (SERs) [2]	25	-	15	10	40	100	40	40	0.6	3	-	-	75,000
Project Meets or Exceeds PSD SER?	Yes	-	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	-	-	Yes

[1] Major source per 40 CFR 52.21(b). NOx is a regulated NSR pollutant for purposes of evaluating PSD applicability because NOx, as measured in the ambient air as nitrogen dioxide (NO_2), is a pollutant for which a national ambient air quality standard (NAAQS) has been promulgated (see 40 CFR 50.11).

[2] PSD Significant Emission Rates (SERs) as defined in 40 CFR 52.21.

[3] VOC is not a criteria pollutant but is considered to be a precursor to ozone. Stated value corresponds to the ozone threshold.

[4] Max Single HAP is Manganese.

6.2 Title V Operating Permit Program

The requirements of 40 CFR Part 70 establish the federal Title V operating permit program elements required for a state to accept delegation of authority from the U.S. EPA. West Virginia has promulgated the necessary provisions of this Title V operating permit program. Initially, U.S. EPA granted final full approval effective on November 19, 2001. Since then, West Virginia adopted the necessary revisions to remain the delegated authority for the Part 70 operating permit program. To date, West Virginia implements a fully approved Part 70 operating permit program under 45CSR30 (see 40 CFR 70, Appendix A).

The proposed Project is located near Martinsburg, West Virginia, which is classified as attainment or maintenance for all criteria pollutants. Therefore, the major source threshold for all criteria pollutants is 100 tpy; 10 tpy of any single hazardous air pollutant (HAP); 25 tpy of any combination of HAPs; and 100,000 tpy of GHGs.

As noted in Table 6-1, the site-wide potential emissions at the proposed Project trigger major source thresholds for PM_{10}, $PM_{2.5}$, and CO. As such, the proposed Project will be subject to Title V program requirements contained under 45CSR30.

6.3 Minor New Source Review

Section 110(a)(2)(C) of the Clean Air Act (CAA) requires State Implementation Plans (SIPs) to include a preconstruction permit program for both major and minor sources. Sources which do not constitute a major source subject to the requirements of 45CSR14, *Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution for the Prevention of Significant Deterioration*, are potentially subject to the requirements of 45CSR13, *Permits For Construction, Modification, Relocation and Operation Of Stationary Sources Of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, Permission To Commence Construction, And Procedures For Evaluation*.

A facility is subject to the requirements of 45CSR13 if any of the following criteria are met [1]:

- 6 lbs/hr and 10 tpy of any regulated air pollutant; or
- 144 lbs/day of any regulated air pollutant; or
- 2 lbs/hr or 5 tpy of aggregated HAP; or
- 45CSR27 TAP (10% increase if above BAT triggers an increase to BAT triggers); or
- Subject to applicable standard or rule.

As summarized in Table 6-1, the site-wide PTE is in excess of these levels and therefore the proposed Project must obtain a construction permit. This application is being filed to satisfy the requirements of 45CSR13 and 45CSR14.

6.4 New Source Performance Standards

New Source Performance Standards (NSPS), contained in 40 CFR 60, consist of technology-based standards developed by EPA that are applicable to certain types of equipment ("affected facilities") which are newly constructed, modified, or reconstructed after a given applicability date. A summary of NSPS applicability is provided below for the relevant emission units that are part of the proposed Project.

[1] Per Permit Levels for 45CSR13 (wv.gov)

6.4.1 NSPS Subpart A - General Provisions

All affected facilities subject to NSPS are also subject to the applicable General Provisions of NSPS Subpart A unless specifically excluded by a specific NSPS Subpart. For example, NSPS Subpart A addresses the following for affected facilities subject to a specific NSPS Subpart:

- Initial construction/reconstruction notification;
- Initial startup notification;
- Performance tests;
- Performance test date initial notification;
- General monitoring requirements;
- General recordkeeping requirements; and
- Semi-annual monitoring system and/or excess emission reports.

Because the proposed Project will include affected facilities subject to a specific NSPS Subpart, the NSPS Subpart A General Provisions will apply.

6.4.2 NSPS Subpart Dc - Standards of Performance for Small Industrial-Commercial Steam Generating Units

NSPS Subpart Dc, *Standards of Performance for Small Industrial-Commercial Steam Generating Units*, applies to each steam generating unit constructed after June 9, 1989 which has a heat input capacity greater than 10 MMBtu/hr, but less than or equal to 100 MMBtu/hr. A steam generating unit is defined under 40 CFR § 60.41c as "*a device that combusts any fuel and produces steam or heats water or heats any heat transfer medium. This term includes any duct burner that combusts fuel and is part of a combined cycle system. This term does not include process heaters as defined in this subpart.*"

The following proposed units do not fall under the definition of "steam generating unit" contained in 40 CFR §60.41c as they are direct-fired and do not utilize a transfer medium. Additionally, all units are rated less than 10 MMBtu/hr.

- Three (3) ladle preheaters (6 MMBtu/hr each);
- Two (2) ladle dryers (8 MMBtu/hr each);
- Two (2) tundish preheaters (6 MMBtu/hr each);
- One (1) tundish dryer (6 MMBtu/hr);
- One (1) tundish mandril dryer (1 MMBtu/hr);
- One (1) shroud heater (0.5 MMBtu/hr);
- Twenty (20) Meltshop comfort heaters (0.4 MMBtu/hr each);
- One (1) bit furnace (0.225 MMBtu/hr);
- Twenty (20) rolling mill comfort heaters (0.4 MMBtu/hr each); and
- Cutting torches (0.32 MMBtu/hr).

As such NSPS Subpart Dc does not apply to the proposed units. There are no other units that meet the definition of steam generating unit and therefore NSPS Subpart Dc does not apply to the proposed Project.

6.4.3 NSPS Subpart Kb

NSPS Subpart Kb, *Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984*, applies to each storage vessel with a capacity greater than or equal to 75 cubic meters

(m^3) that is used to store volatile organic liquids (VOLs) which commenced construction, modification, or reconstruction after July 23, 1984. The proposed Project includes storage vessels that will store a VOL. However, the vessel capacities are less than 75 m^3 (or approximately 19,800 gallons) each and will be storing diesel, a VOL with a low vapor pressure. Therefore, the proposed Project will not be subject to the requirements of NSPS Subpart Kb.

6.4.4 NSPS Subpart AA

NSPS Subpart AA, *Standards of Performance for Steel Plants: Electric Arc Furnaces constructed after October 21, 1974, and on or Before August 17, 1983*, applies to electric arc furnaces and dust-handling systems at steel plants that produce carbon, alloy, or specialty steels which commenced construction, modification, or reconstruction after October 21, 1974, and on or before August 17, 1983. The proposed Project will be constructed after August 17, 1983 and is not subject to NSPS Subpart AA.

6.4.5 NSPS Subparts AAa and AAb

NSPS Subpart AAa, *Standards of Performance for Steel Plants: Electric Arc Furnaces and Argon-Oxygen Decarburization Vessels constructed after August 17, 1983*, applies to Electric Arc Furnaces (EAFs), argon-oxygen decarburization vessels, and dust handling systems in the steel industry which commenced construction, modification, or reconstruction after August 17, 1983. The proposed Project will contain affected facilities that are considered new and potentially subject to the requirements of NSPS Subpart AAb[2] in which case NSPS Subpart AAa would not apply to the proposed Project.

CMC will comply with potentially applicable requirements by (a) monitoring the opacity from the meltshop baghouse stack on a daily basis following Test Method 9 and (b) installing a bag leak detection system (BLDS) according to the specifications and work practices (i.e., developing a site-specific monitoring plan for the BLDS).

6.4.6 NSPS Subpart IIII

NSPS Subpart IIII, *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines*, applies to owners/operators of stationary compression ignition (CI) internal combustion engines (ICE) for which construction commenced after July 11, 2005 and are manufactured as a certified National Fire Protection Association (NFPA) fire pump engine after July 1, 2006 [40 CFR §60.4200(a)(2)(ii)]. Fire pump engine is defined under 40 CFR §60.4219 as:

> *An emergency stationary internal combustion engine certified to NFPA requirements that is used to provide power to pump water for fire suppression or protection.*

The proposed emergency fire water pump will utilize an NFPA certified fire pump engine and will have a manufacturer date and construction date after 2006. Thus, the proposed emergency generator and emergency fire water pump (i.e., emergency units) are subject to NSPS Subpart IIII.

As a fire pump engine with a displacement of less than 30 liters per cylinder the engine will comply with the emission standards in Table 4 of NSPS IIII, per 40 CFR §60.4205(c). Per 40 CFR §60.4206, CMC will ensure the fire pump engine meets these emission standards over the entire life of the unit. Additionally, per 40 CFR §60.4207(b), such engines must also comply with the diesel fuel standards listed in 40 CFR

[2] The EPA has proposed new NSPS Subpart AAb, *Standards of Performance for Steel Plants: Electric Arc Furnaces and Argon-Oxygen Decarburization Vessels Constructed After May 16, 2022.*

§80.510(b), which requires the sulfur content of the diesel fuel to be less than or equal to 15 ppm. The engine will fire ULSD with a sulfur content of 0.0015%.

Per 40 CFR §60.4209(a), an emergency stationary CI internal combustion engine that does not meet the standards applicable to non-emergency engines must install a non-resettable hour meter prior to startup of the engine. Additionally, records of the engine's emergency and non-emergency operation would need to be maintained through this meter, per 40 CFR §60.4214(b). The proposed emergency units will be equipped with a non-resettable hour meter and comply with the recordkeeping requirements, as necessary.

Per 40 CFR §60.4211(a) and §60.4211(c), the engine must be operated and maintained in accordance with manufacturer's instructions and certified to the applicable emission standards. The proposed emergency units will utilize an EPA certified Tier 3 engine and will comply with these requirements. The emergency units will be limited to 50 hours of non-emergency use, which counts towards an overall limit of 100 hours per calendar year for testing and maintenance, as limited by 40 CFR §60.4211(f)(2) and 40 CFR §60.4211(f)(3). The emergency units will operate in accordance with the required operational limits.

CMC is subject to the aforementioned sections of NSPS Subpart IIII and will comply with all applicable requirements.

6.5 National Emission Standards for Hazardous Air Pollutants

National Emission Standards for Hazardous Air Pollutants (NESHAPs) have been established in 40 CFR Part 61 and Part 63 to control emissions of HAPs from stationary sources. A facility that is a major source of HAPs is defined as having PTE emissions greater than 25 tpy of total HAPs and/or 10 tpy of a single HAP. Facilities with a potential to emit HAPs at an amount less than these major source (i.e., Title V) thresholds are otherwise considered an "area source".

The NESHAP allowable emission limits are most often established on the basis of a maximum achievable control technology (MACT) determination for the particular source. The NESHAP apply to sources in specifically regulated industrial source categories (Clean Air Act [CAA] §112(d)) or on a case-by-case basis (CAA §112(g)) for facilities not regulated as a specific industrial source type.

The proposed Project will be area source of HAPs as it will have potential HAP emissions less than the major source thresholds. The NESHAP subparts potentially applicable to the proposed Project are discussed in the following sections.

6.5.1 NESHAP Subpart A

All "affected sources" subject to a NESHAP Subpart are also subject to the applicable General Provisions of NESHAP Subpart A unless specifically excluded by a specific NESHAP Subpart. NESHAP Subpart A includes the following requirements for affected sources subject to a specific NESHAP Subpart:

- Initial construction/reconstruction notification;
- Initial startup notification;
- Performance tests;
- Performance test date initial notification;
- General monitoring requirements;
- General recordkeeping requirements; and
- Semi-annual monitoring system and/or excess emission reports.

Because the proposed Project will include an affected source subject to a specific NESHAP Subpart, the NESHAP Subpart A General Provisions will apply.

6.5.2 NESHAP Subpart Q

NESHAP Subpart Q, *National Emissions Standards for Hazardous Air Pollutants for Industrial Process Cooling Towers*, applies to all new and existing industrial process cooling towers that are operated with chromium-based water treatment chemicals and are either major sources of HAPs or are integral parts of facilities that are major sources of HAP. The proposed Project will not use any chromium-based water treatment chemicals in the proposed cooling towers and is not expected to be a major source of HAPs. As such, NESHAP Subpart Q does not apply.

6.5.3 NESHSP Subpart CCC

NESHAP Subpart CCC, *National Emission Standards for Hazardous Air Pollutants for Steel Pickling - HCl Process Facilities and Hydrochloric Acid Regeneration Plants*, applies to (a) all new and existing steel pickling facilities that pickle carbon steel using hydrochloric acid solution that contains 6% or more by weight HCl and is at a temperature of 100 °F or higher and (b) all new or existing hydrochloric acid regeneration plants that are considered major sources for HAP. Because the proposed Project will not conduct pickling, and the proposed Project is an area source, NESHAP Subpart CCC is not applicable.

6.5.4 NESHAP Subpart ZZZZ

NESHAP Subpart ZZZZ, *National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*, applies to stationary reciprocating internal combustion engines (RICE) at major and area sources of HAPs. Per 40 CFR §63.6590(a)(2)(ii), a stationary RICE at an area source of HAPs is new if construction commenced after June 12, 2006. Thus, the proposed emergency units are considered a new stationary RICE under NESHAP Subpart ZZZZ. Per 40 CFR §63.6590(c), certain affected sources demonstrate compliance with NESHAP Subpart ZZZZ by satisfying the requirements of NSPS Subpart IIII. The proposed emergency units are new stationary RICE located at an area source, as described in 40 CFR §63.6590(c)(1). Thus, compliance with NESHAP Subpart ZZZZ is maintained by compliance with NSPS Subpart IIII.

6.5.5 NESHAP Subpart DDDDD

NESHAP Subpart DDDDD, *National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters*, applies to owners or operators of industrial, commercial, or institutional boilers or process heaters as defined in 40 CFR 63.7575 that are located at a major source of HAP. Because the proposed Project is an area source of HAPs, NESHAP Subpart DDDDD does not apply.

6.5.6 NESHAP Subpart EEEEE

NESHAP Subpart EEEEE, *National Emission Standards for Hazardous Air Pollutants for Iron and Steel Foundries*, applies to iron and steel foundries which are considered a major source for HAP. Because the proposed Project is in an area source of HAPs, NESHAP Subpart EEEEE does not apply.

6.5.7 NESHAP Subpart FFFFF

NESHAP Subpart FFFFF, *National Emission Standards for Hazardous Air Pollutants for Integrated Iron and Steel Manufacturing Facilities*, applies to integrated iron and steel manufacturing facilities which are considered a major source for HAP. As defined in 40 CFR 63.7852, an integrated iron and steel manufacturing facility means an establishment engaged in the production of steel from iron ore. The proposed Project will process scrap metal rather than iron ore and is not considered an integrated iron and steel manufacturing facility. Additionally, because the proposed Project is an area source of HAPs, NESHAP Subpart FFFFF does not apply.

6.5.8 NESHAP Subpart JJJJJJ

NESHAP Subpart JJJJJJ, *National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources*, applies to operators of industrial, commercial, and institutional boilers located at area sources of HAPs. Pursuant to 40 CFR 63.11237, a boiler is defined as an enclosed device using controlled flame combustion in which water is heated to recover thermal energy in the form of steam and/or hot water. CMC is not proposing installation of any boilers as a part of the proposed Project. As such, NESHAP Subpart JJJJJJ is not applicable to any units associated with the proposed Project.

6.5.9 NESHAP Subpart YYYYY

NESHAP Subpart YYYYY, *National Emission Standards for Hazardous Air Pollutants for Area Sources: Electric Arc Furnace Steelmaking Facilities*, applies to any owner or operator of an EAF steelmaking facility that is an area source for HAP emissions. Per 40 CFR 63.10692, an EAF steelmaking facility is defined as follows:

> ***Electric arc furnace (EAF) steelmaking facility*** *means a steel plant that produces carbon, alloy, or specialty steels using an EAF. The definition excludes EAF steelmaking facilities at steel foundries and EAF facilities used to produce nonferrous metals.*

The proposed Project will produce carbon, alloy, or specialty steels using an EAF and will not be located at a steel foundry. As a result, the proposed Project will be subject to NESHAP Subpart YYYYY requirements.

To reduce the amount of chlorinated plastics, lead, and free organic liquids entering the EAF, NESHAP Subpart YYYYY requires that CMC comply with one of two options listed below:

1. Prepare and implement a pollution prevention plan (PPP) meeting the requirements stipulated in 40 CFR 63.10685(a)(1) for materials that are charged to the furnace. The PPP must be submitted to and approved by WVDEP, OR
2. Restrict metallic scrap that authorized to be charged to the EAF per the requirements of 40 CFR 63.10685(a)(2).

To reduce the amount of mercury from motor vehicle scrap entering the EAF, NESHAP Subpart YYYYY requires that CMC comply with one of three options listed below:

1. Prepare and implement a site-specific plan for removing mercury switches from vehicle bodies meeting the requirements stipulated in 40 CFR 63.10685(b)(1). The plan must be submitted to and approved by WVDEP, OR

2. Participate in a program for removal of mercury switches (such as National Vehicle Mercury Switch Recovery Program or the Vehicle Switch Recovery Program) per the requirements of 40 CFR 63.10685(b)(2). It is acceptable for CMC to participate in the aforementioned programs or for CMC to contract with scrap providers or brokers that participate in the programs, OR
3. Accept only materials from material vehicles that is not reasonably expected to contain mercury switches.

Per 40 CFR 63.10685(b)(4), CMC will also document when scrap is accepted that is not from motor vehicles.

For facilities with a production capacity greater than or equal to 150,000 tons per year of stainless or specialty steel, the EAF control device (i.e., the Meltshop Baghouse) is prohibited from discharging to the atmosphere emissions in excess of 0.0052 gr/dscf.[3] Additionally, emissions that leave the Meltshop (i.e., via the Caster Vent), which are solely generated by the EAF, are limited to 6% opacity.[4]

CMC will comply with the monitoring, recordkeeping, and reporting requirements provided in 40 CFR 63.10685, 63.10686, and 63.10690.

6.5.10 NESHAP Subpart ZZZZZ

NESHAP Subpart ZZZZZ, *National Emission Standards for Hazardous Air Pollutants for Iron and Steel Foundries Area Sources,* applies to new and existing iron and steel foundries that are considered an area source for HAP. As defined in 40 CFR 63.10906, an iron or steel foundry is a facility or portion of a facility that melts scrap, ingot, and/or other forms of iron and/or steel and pours the resulting molten metal into molds to produce final or near final shape products for introduction into commerce. The proposed Project is not considered an iron or steel foundry and is not subject to NESHAP Subpart ZZZZZ.[5]

6.6 Compliance Assurance Monitoring

The Compliance Assurance Monitoring (CAM) Rule under 40 CFR Part 64 applies to each pollutant specific emission unit that satisfies all of the following criteria:

1. Is subject to an emission limitation or standard for the applicable regulated air pollutant;
2. Uses a control device to achieve compliance with any such emission limitation or standard;
3. Has potential pre-control emissions of the applicable regulated air pollutant that are equal to or greater than the applicable major source threshold; and
4. Is not otherwise exempt.

As defined in 40 CFR Part 64.1, control device means equipment, other than inherent process equipment, that is used to destroy or remove air pollutant(s) prior to discharge to the atmosphere. This does not include passive methods such as lids, seals, or inherent process equipment provided for safety or material recovery.

[3] 40 CFR 63.10686(b)(1)

[4] 40 CFR 63.10686(b)(2)

[5] Per Federal Register, Volume 73, Number 1, January 2, 2008. NESHAP ZZZZZ encompasses the following NAICS codes: 331511, 331512, 331513. The proposed facility will have a NAICS code of 331210. As such, it is not considered an iron or steel foundry.

The primary emission unit that is part of the proposed Project and that will have a control device installed is the EAF, controlled by the Meltshop Baghouse.

Per 40 CFR Part 64.5, owners or operators of pollutant-specific emission units (PSEUs) that meet the above criteria are required to submit information at different deadlines depending on the controlled potential to emit. Large PSEUs subject to the CAM Rule are required to submit the information required under this rule as a part of an initial application for a Title V Permit or a significant permit revision to a Title V Permit (but only for the PSEUs for which the proposed permit revision applies). As defined in 40 CFR 64.5, large PSEU means each PSEU with the PTE (taking into account control devices) of the applicable regulated air pollutant in an amount equal to or greater than 100% of the amount, in tons per year, required for a source to be classified as a major source. Other PSEUs subject to the CAM Rule are required to submit the information required under this rule as a part of an application for renewal of a Title V Permit. The meltshop baghouse (BH1) is considered a large PSEU as PM_{10} and $PM_{2.5}$ emissions exceed major source threshold post control, and is subject to the requirements of NESHAP Part 63, Subpart YYYYY (opacity standard of 3% and PM limit of 0.0052 gr/dscf).

Pursuant to EPA guidance[6], for "large PSEUs", CAM requires the collection of four or more data values equally spaced over each hour and average the values, as applicable, over the applicable averaging period. The proposed baghouse BLDS required as part of applicable requirements meets this data frequency requirement. Therefore, CMC proposes CAM elements consistent with the BLDS requirements in NSPS Subpart AAb.

6.7 Chemical Accident Prevention

Subpart B of 40 CFR Part 68 outlines requirements for risk management prevention (RMP) plans pursuant to CAA Section 112(r). Applicability of this subpart is determined based on the type and quantity of the chemicals stored at the proposed Project. The list of regulated substances does not include ultra-low sulfur diesel fuel, propane, kerosene or gasoline, which will be stored on-site. The proposed Project will not store any non-exempt RMP chemicals in quantities greater than the RMP trigger thresholds. Therefore, the requirements of 40 CFR Part 68 are not applicable. However, the proposed Project will be subject to the provisions of the CAA General Duty Clause, Section 112, as it pertains to accidental releases of hazardous materials.

6.8 Stratospheric Ozone Protection Regulations

The requirements originating from Title VI of the Clean Air Act, Protection of Stratospheric Ozone, are contained in 40 CFR Part 82. Subparts A through E, Subpart G, Subpart H, and Subpart and I of 40 CFR Part 82 will not be applicable to CMC. 40 CFR Part 82 Subpart F, Recycling and Emissions Reduction, potentially applies if the facility maintains, repairs, services, or disposes of appliances that utilize Class I or Class II ozone depleting substances. Subpart F generally requires persons completing the repairs, service, or disposal to be properly certified. An appropriately certified technician will complete all repairs, service, and disposal of ozone depleting substances from the comfort cooling components at the proposed Project.

6.9 West Virginia Administrative Code

The proposed Project will be subject to certain CSR regulations. Potentially applicable rules are discussed in the sections below.

[6] Per EPA Technical Guidance Document: Compliance Assurance Monitoring, dated August 1998, revised 2005.

6.9.1 45CSR2: To Prevent and Control Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers

45CSR2 "establishes emission limitations for smoke and particulate matter which are discharged from fuel burning units." A fuel burning unit is defined under 45CSR2 as any "furnace, boiler apparatus, device, mechanism, stack or structure used in the process of burning fuel or other combustible material for the primary purpose of producing heat or power by indirect heat transfer." Additionally, the definition of "indirect heat exchanger" specifically excludes process heaters, which are defined as "a device that is primarily used to heat a material to initiate or promote a chemical reaction in which the material participates as a reactant or catalyst." The proposed direct-fired combustion units associated with the proposed Project meet the definition of "process heater" and therefore 45CSR2 does not apply to the proposed Project.

6.9.2 45CSR7: To Prevent and Control Particulate Air Pollution from Manufacturing Process Operations

45CSR7 has requirements to prevent and control particulate matter air pollution from manufacturing processes and associated operations. Pursuant to §45-7-2.20, a "manufacturing process" means "any action, operation or treatment, embracing chemical, industrial or manufacturing efforts that may emit smoke, particulate matter or gaseous matter." 45CSR7 has three substantive requirements potentially applicable to the particulate matter-emitting operations at the proposed Project further discussed below.

6.9.2.1 45CSR7 Opacity Standards - Section 3

§45-7-3.1 sets an opacity limit of 20% on all "process source operations." Pursuant to §45-6-2.38, a "source operation" is defined as the "last operation in a manufacturing process preceding the emission of air contaminants [in] which [the] operation results in the separation of air contaminants from the process materials or in the conversion of the process materials into air contaminants and is not an air pollution abatement operation." This language would define all particulate matter emitting sources (excluding combustion exhaust sources and emergency engines) as "source operations" under 45CSR7 and, therefore, these sources would be subject to the opacity limit (after any applicable control device).

6.9.2.2 45CSR7 Weight Emission Standards - Section 4

§45-7-4.1 requires that each manufacturing process source operation or duplicate source operation meet a maximum allowable "stack" particulate matter limit based on the weight of material processed through the source operation. As the limit is defined as a "stack" limit (under Table 45-7A), the only applicable emission units (defined as a type 'a' sources) are those that can be defined as non-fugitive in nature. Pursuant to §45-7-4.1, any manufacturing process that has "a potential to emit less than one (1) pound per hour of particulate matter and an aggregate of less than one thousand (1000) pounds per year for all such sources of particulate matter located at the stationary source" is exempt from Section 4.1. For the purposes of Section 4.1, a source of particulate matter emissions that are solely the result of the combustion of a fuel source such as propane, natural gas, or diesel is not considered a "source operation" as defined under §45-7-2.38. This is based on the definition that states a source operation is one that "result in the separation of air contaminants from the process materials or in the conversion of the process materials into air contaminants." Propane, natural gas, or diesel when solely a fuel do not meet the reasonable definition of a process material. Additionally, the particulate matter limits given under 45CSR7 only address filterable particulate matter. Table 6-2 demonstrates 45CSR7 compliance.

Table 6-2. 45CSR7 Section 4.1 Compliance Demonstration

Emission Unit ID	Emission Point ID	Source Type	Aggregate PWR (lb/hr)	Table 45-7A Limit[1] (lb/hr)	PTE (lb/hr)
EAF1	BH1	B	234,000	19.01	13.42
EAF1	CV1	B	234,000	19.01	1.00

1. These sources, for a conservative compliance demonstration, are considered "duplicate sources "as defined in 45CSR7. As such, the PWR of all duplicate sources are aggregated and the resulting limit is distributed to each emission point relative to each source's contribution to total PWR.

6.9.2.3 45CSR7 Fugitive Emissions - Section 5

Pursuant to §45-7-5.1 and 5.2, each manufacturing process or storage structure generating fugitive particulate matter must include a system to minimize the emissions of fugitive particulate matter. The proposed Project will utilize BACT-level controls (where reasonable) on material transfer points, watering on the haul roads, and partial or full enclosure of some on-storage pile activity to minimize the emissions of fugitive particulate matter.

45CSR10: To Prevent and Control Air Pollution from the Emission of Sulfur Oxides

The purpose of 45CSR10 is to prevent and control air pollution from the emission of sulfur oxides from "fuel burning units" by limiting in-stack SO_2 concentrations of "manufacturing process source operations," and limiting H_2S concentrations in "process gas" streams that are combusted. Pursuant to §45-10-2.8, fuel burning units include "any furnace, boiler apparatus, device, mechanism, stack or structure used in the process of burning fuel or other combustible material for the primary purpose of producing heat or power by indirect heat transfer." The proposed Project units will be direct-fired and therefore do not meet the definition of fuel burning unit. As such, 45CSR10 is not applicable to the proposed Project.

6.9.3 45CSR13: Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation

The proposed Project site-wide potential to emit a regulated pollutant is in excess of six (6) lbs/hr and ten (10) tpy and, therefore, pursuant to §45-13-2.24, the proposed Project is defined as a "stationary source" under 45CSR13. The proposed Project is also defined as a "major stationary source" under 45CSR14. This permit application is being submitted to satisfy the requirements of both 45CSR13 and 45CSR14.

6.9.4 45CSR14: Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution for the Prevention of Significant Deterioration

This rule, which outlines PSD permitting processes, is applicable to the proposed Project. See Section 6.1 above for the detailed applicability determination for this rule. CMC is submitting this permit application to satisfy the requirements of 45CSR14. As summarized in Table 6-1, PSD review is required for all PSD pollutants contained in the table except lead. The substantive requirements of a PSD review includes a BACT analysis, an air dispersion modeling analysis (for applicable pollutants), a review of potential impacts on Federal Class I areas, and an additional impacts analysis.

6.9.5 45CSR16 – Standards of Performance for New Stationary Sources

The provisions of 45CSR16 incorporate by reference the NSPS standards contained in 40 CFR 60. Please see Section 6.4 above for a list of NSPS for which the proposed Project is potentially subject.

6.9.6 45CSR30 - Requirements for Operating Permits

As discussed in Section 6.3 of this application, the proposed Project will be subject to the requirements under 45CSR30. CMC will submit a Title V permit application within twelve (12) months after commencing operation to satisfy the requirements of 45CSR30.

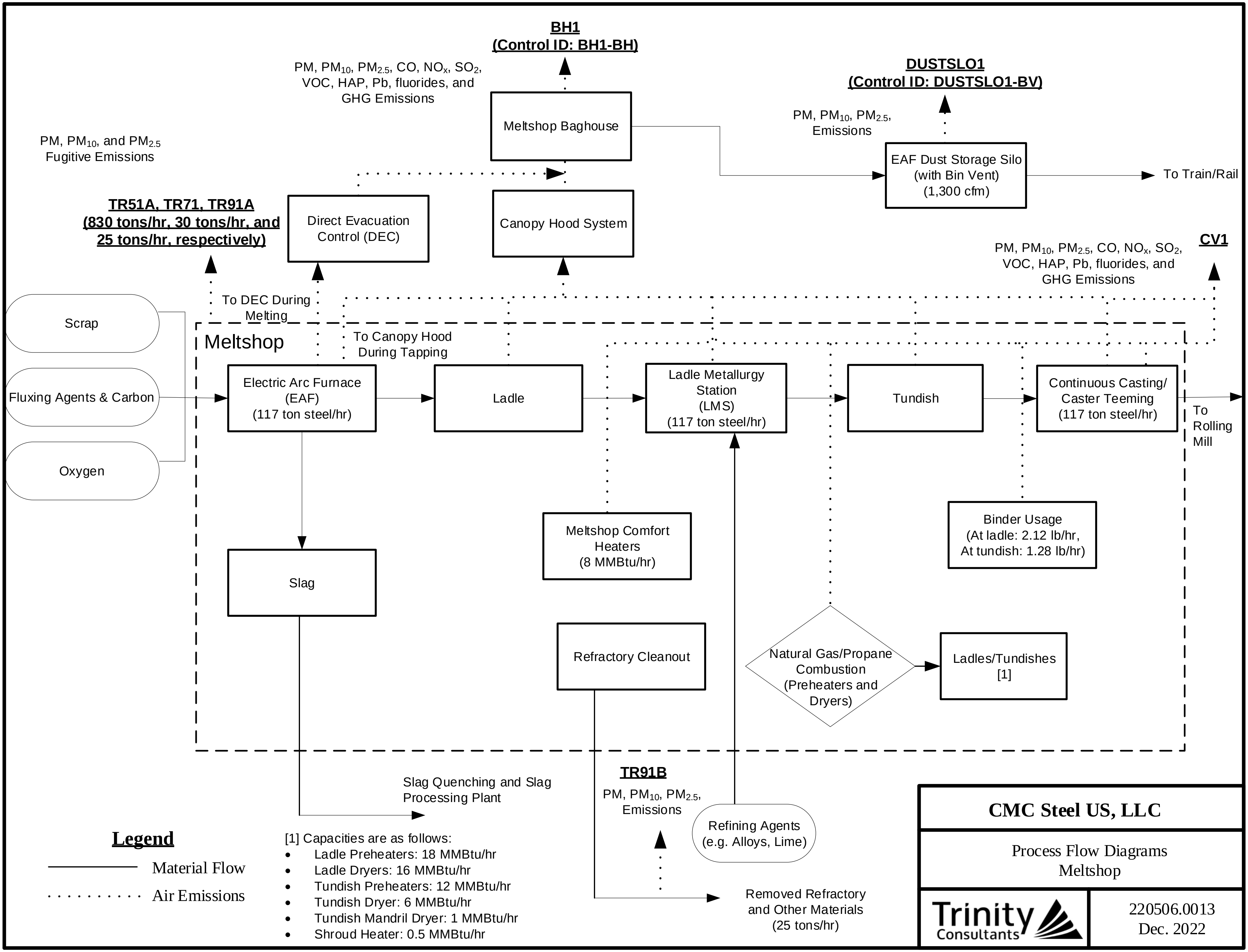
6.9.7 45CSR34 – Emission Standards for Hazardous Air Pollutants

The provisions of 45CSR34 incorporate by reference the MACT/GACT standards contained in 40 CFR 63. Please see Section 6.5 above for a list of MACT/GACT standards to which the proposed Project is potentially subject.

7. ATTACHMENT E: PLOT PLAN

CMC will submit detailed proposed Project plot plans as part of the PSD air dispersion modeling report to be provided under separate cover.

8. ATTACHMENT F: DETAILED PROCESS FLOW DIAGRAMS



[1] Capacities are as follows:

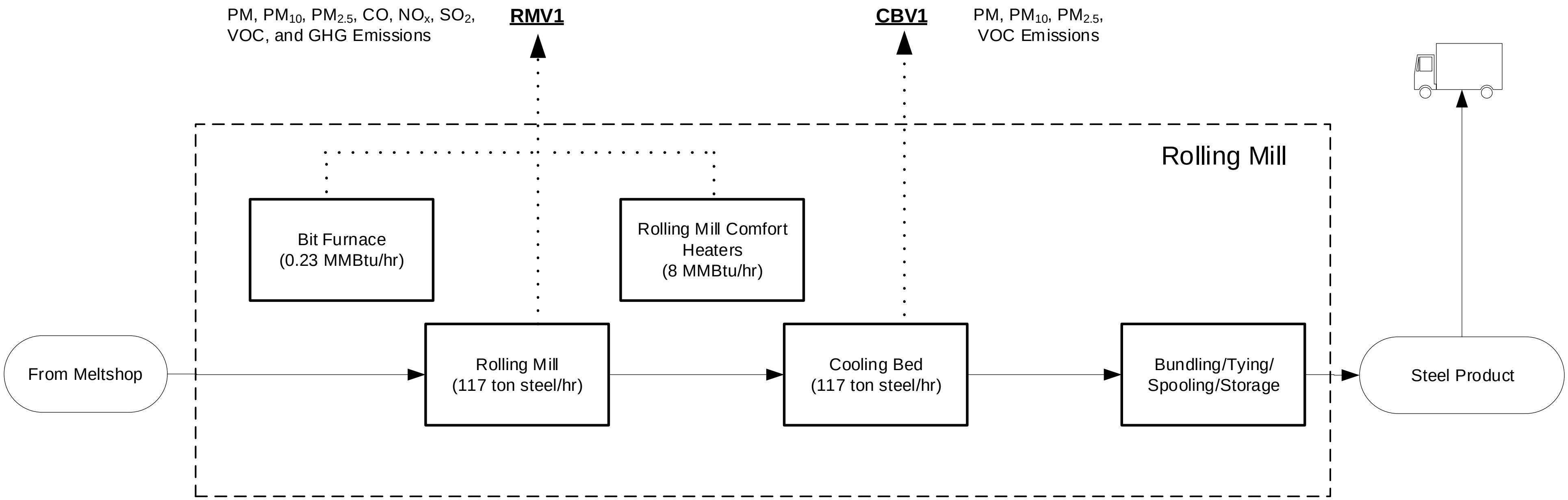
- Ladle Preheaters: 18 MMBtu/hr
- Ladle Dryers: 16 MMBtu/hr
- Tundish Preheaters: 12 MMBtu/hr
- Tundish Dryer: 6 MMBtu/hr
- Tundish Mandril Dryer: 1 MMBtu/hr
- Shroud Heater: 0.5 MMBtu/hr

CMC Steel US, LLC

Process Flow Diagrams
Meltshop

Trinity Consultants

220506.0013
Dec. 2022



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Material Flow

Air Emissions

CMC Steel US, LLC

Process Flow Diagrams
Rolling Mill

Trinity Consultants

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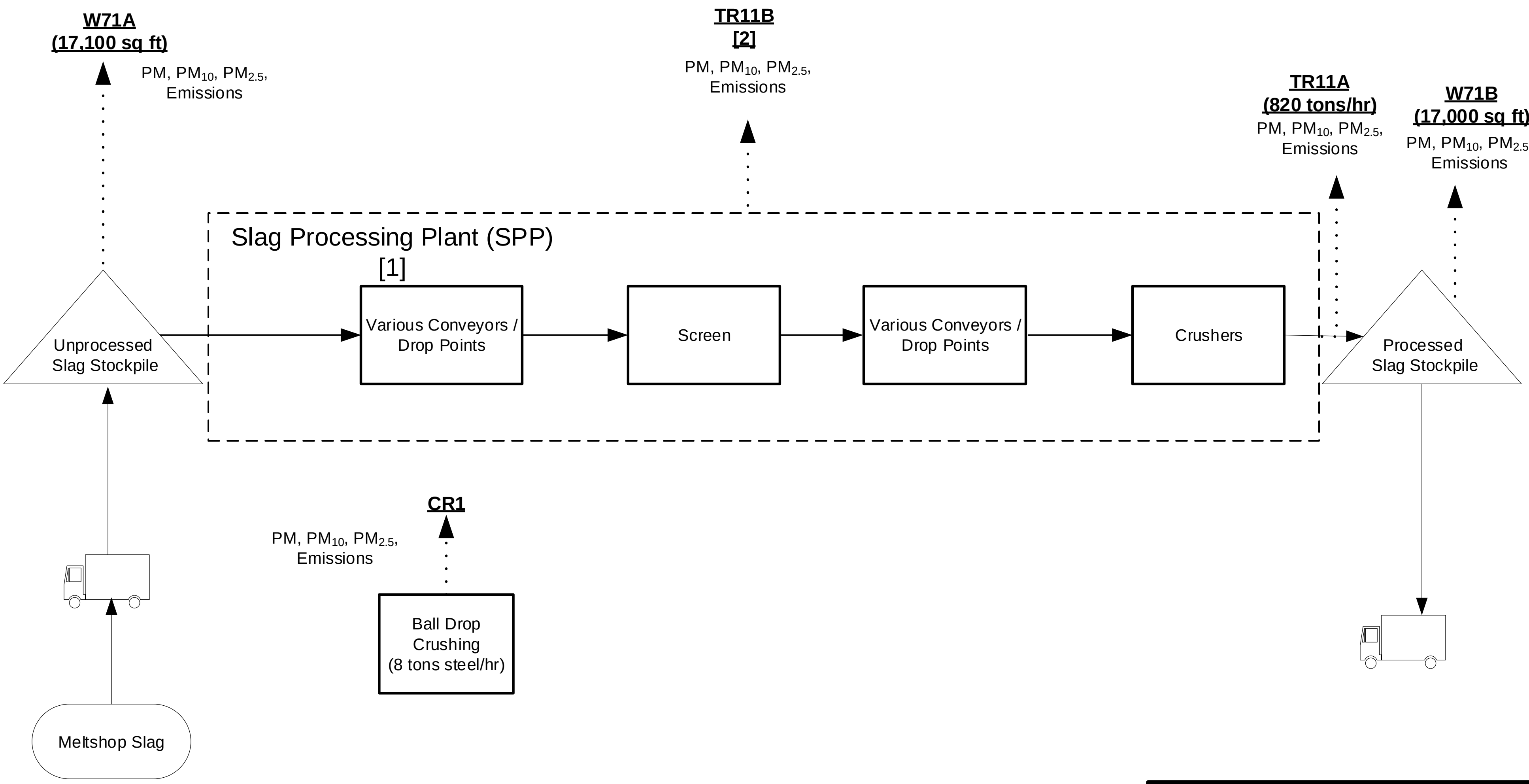

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Material Flow

Air Emissions

[1] Slag Processing Plant is outdoors with no physical enclosure

[2] TR11B is a combination of all of the drop points, crushers, and screening in the SPP. Capacities range from 1 ton/hr to 341 ton/hr.

CMC Steel US, LLC

Process Flow Diagrams
Slag Processing Plant (SPP)

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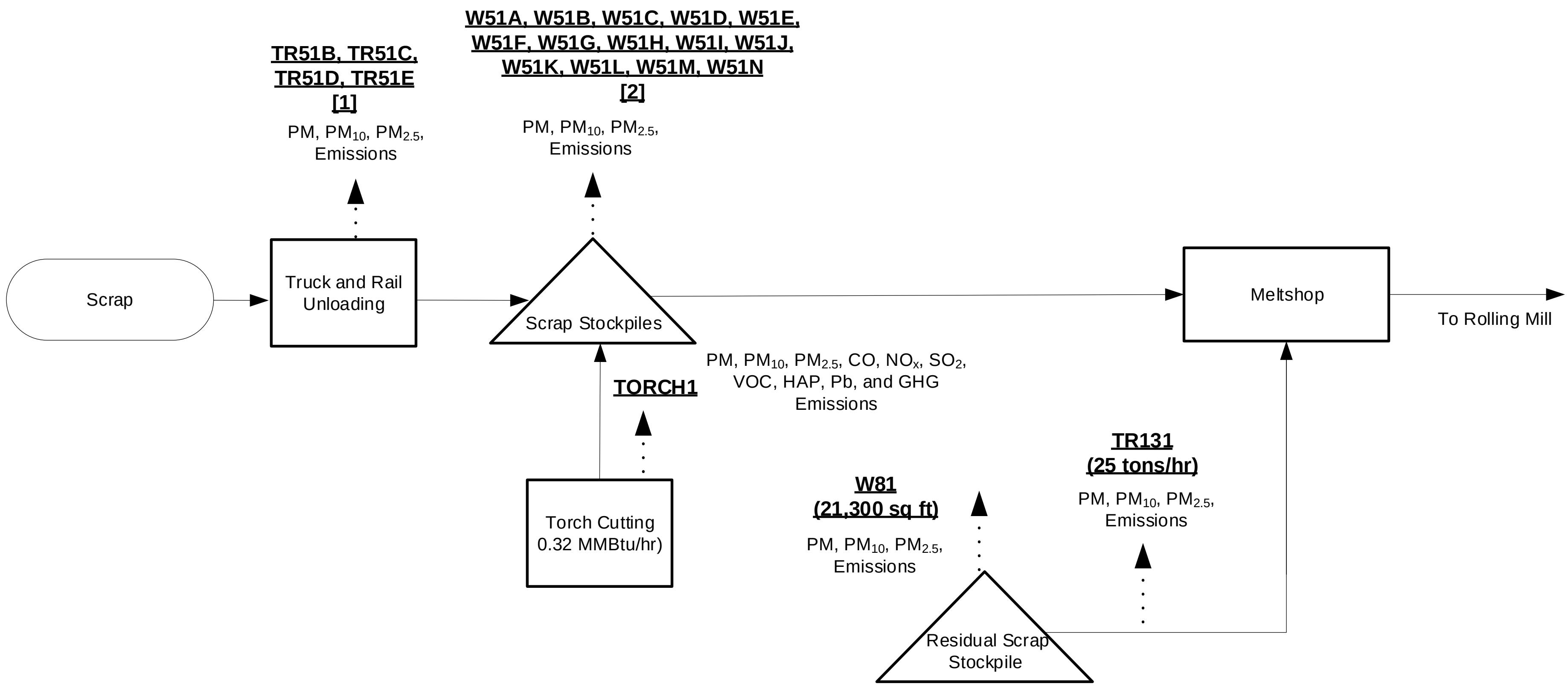
Scrap Storage & Handling



[1] Capacities are as follows:
- TR51B: 330 tons/hr
- TR51C, TR51D, TR51E: 110 tons/hr each

[2] Capacities are as follows:
- W51A: 6,000 sq ft
- W51B: 5,400 sq ft
- W51C: 5,300 sq ft
- W51D: 12,100 sq ft
- W51E, W51F, W51G, W51H: 11,000 sq ft each
- W51I: 13,600 sq ft
- W51J: 14,700 sq ft
- W51K, W51L, W51M, W51N: 11,000 sq ft each

Legend

——— Material Flow

· · · · · · · · · · Air Emissions

CMC Steel US, LLC

Process Flow Diagrams
Scrap Storage and Handling

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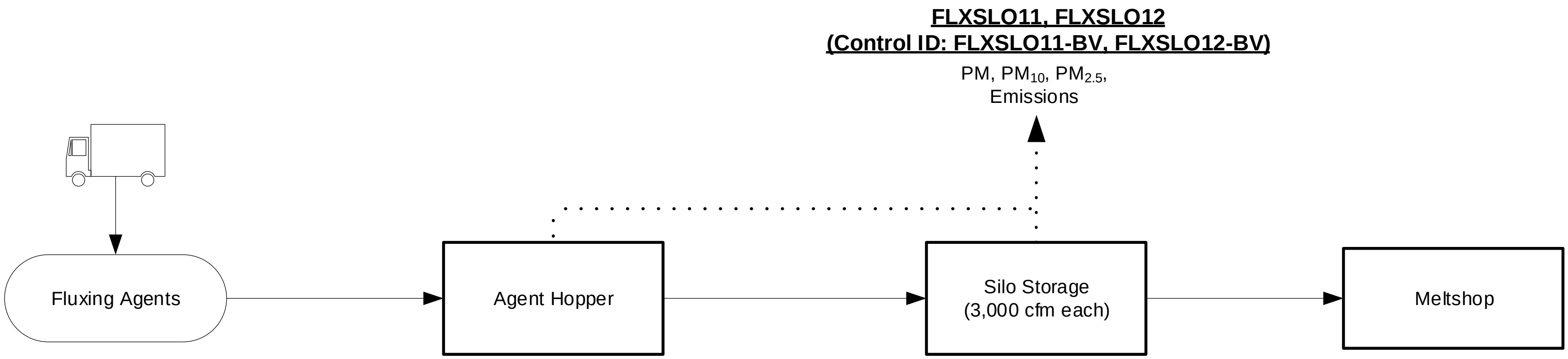
Fluxing Agents Storage & Handling



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Material Flow

Air Emissions

CMC Steel US, LLC

Process Flow Diagrams
Fluxing Agent Storage and Handling

Trinity Consultants

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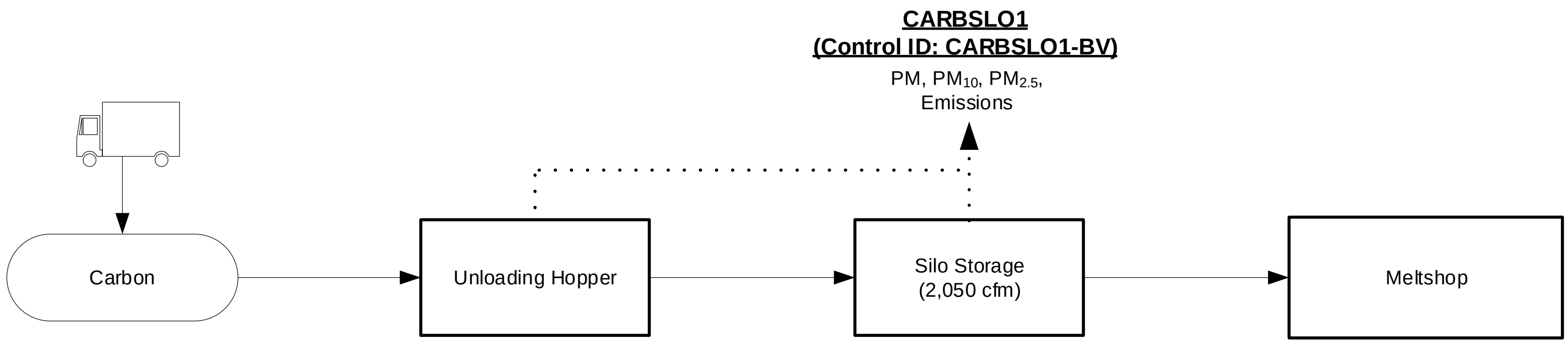
Dec. 2022

Carbon Storage & Handling



Legend

Material Flow

Air Emissions

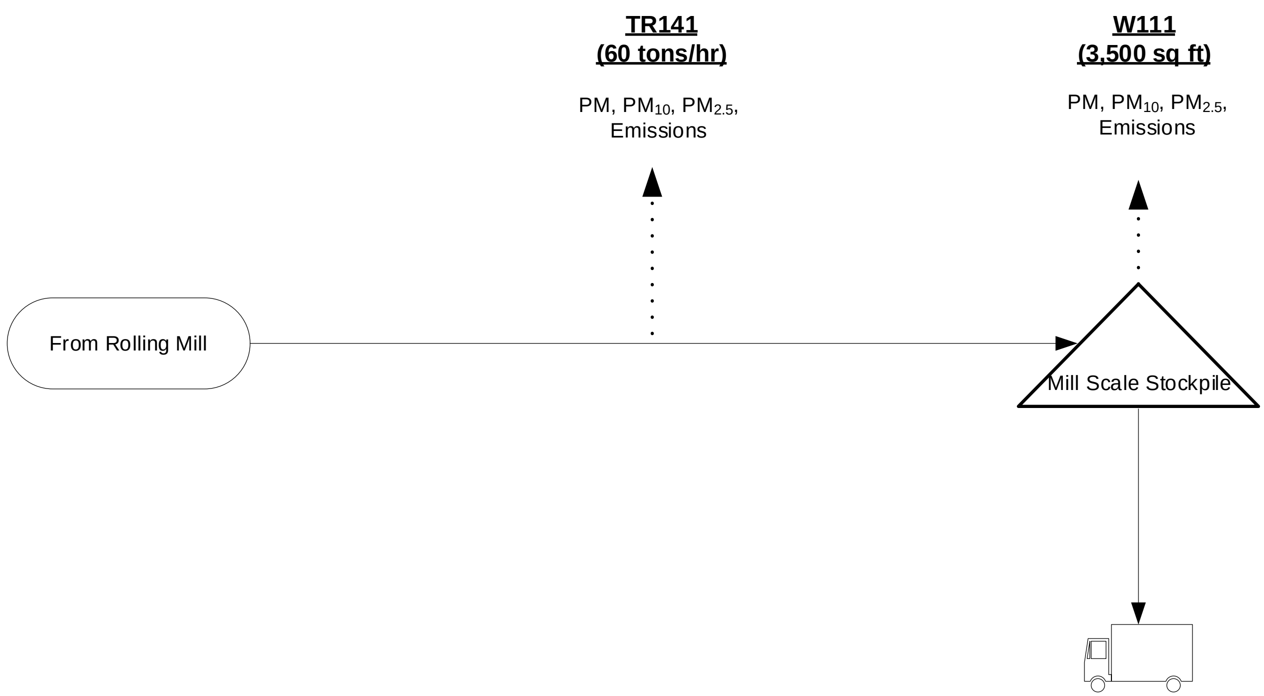
CMC Steel US, LLC

Process Flow Diagrams
Carbon Storage and Handling

Trinity Consultants

220506.0013
Dec. 2022

Mill Scale Storage & Handling



Legend

Material Flow

Air Emissions

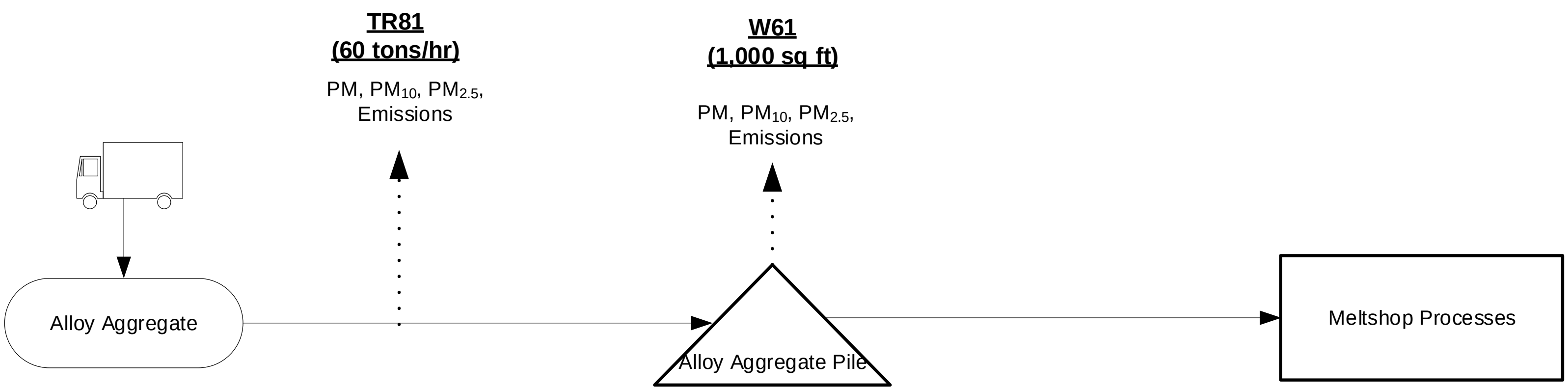
CMC Steel US, LLC

Process Flow Diagrams
Mill Scale Storage and Handling

Trinity Consultants

220506.0013
Dec. 2022

Alloy Aggregate Storage & Handling



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———— Material Flow

· · · · · · · · · · Air Emissions

CMC Steel US, LLC

Process Flow Diagrams
Alloy Aggregate Storage and Handling

Trinity Consultants

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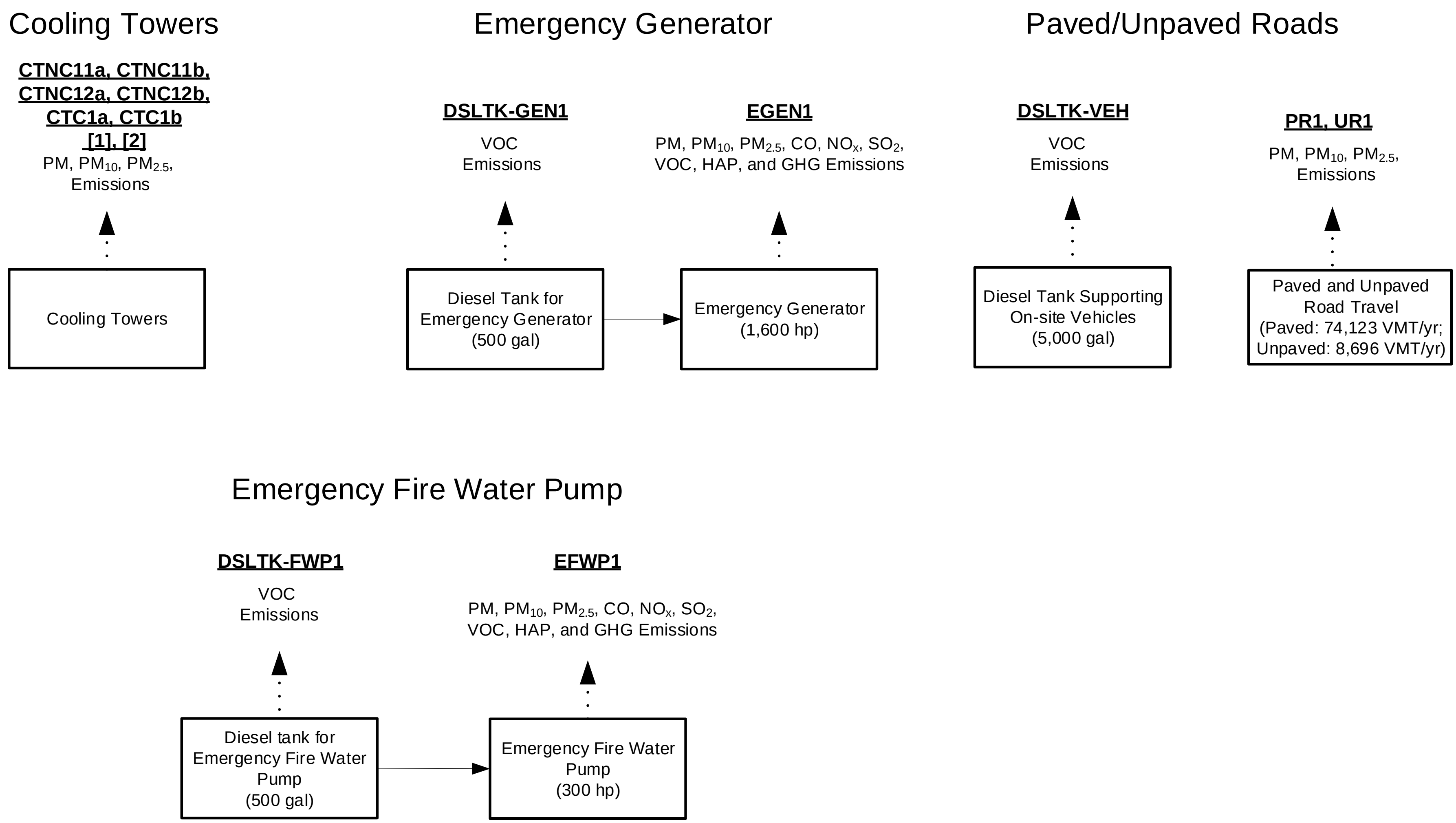

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———— Material Flow

· · · · · · · · · · Air Emissions

[1] Control IDs are CTNC11a-DE, CTNC11b-DE, CTNC12a-DE, CTNC12b-DE, CTC1a-DE, and CTC1b-DE, respectively.

[2] Capacities are as follows:

- CTNC11a, CTNC11b, CTNC12a, CTNC12b – 11,000 gpm each
- CTC1a, CTC1b – 5,500 gpm each

CMC Steel US, LLC

Process Flow Diagrams
Additional Operations

Trinity Consultants

220506.0013
Dec. 2022

9. ATTACHMENT G: PROCESS DESCRIPTION

CMC proposes to construct and operate a new micro mill with associated support operations to produce long steel products at a maximum production rate of 650,000 tpy and 117 tons per hour (tph) (the Project). CMC plans to begin construction of the Project as soon as possible after issuance of the requested permit. The following subsections provide additional detail on the equipment and emission units to be constructed and operated at the proposed micro mill.

9.1 Raw Material Storage and Handling

Recycled scrap metal for the new micro mill will be purchased from outside suppliers and transported into the Facility by trucks or railcars. Scrap metal to be received will include un-shredded and shredded scrap largely from crushed automobiles but also may include old appliances, machinery, sheet metal, rectangular bundles, and miscellaneous scrap metal. Un-shredded scrap metal will arrive in a form either suitable for direct use in the steelmaking process or in larger sizes that will require cutting by torch cutters prior to use in the process. The scrap metal will be either stored at the proposed scrap bay, or if the proposed scrap bay is full, it will be stored at the proposed overflow scrap storage piles and then moved into the proposed scrap bay. Once the scrap metal is inside the proposed scrap bay, cranes are used to load it onto the electric arc furnace (EAF) conveyor feed system (i.e., the endless charging system (ECS)).

In addition to the proposed recycled scrap metal, the new micro mill will use raw materials in the steelmaking process, including carbon (coal or coke) and fluxing agents (lime, dolomite, etc.). The carbon and fluxing agents will be delivered to the micro mill by truck or rail and moved into storage silos. The carbon and fluxing agents will be pneumatically transferred from these silos to the proposed EAF and proposed ladle metallurgy station (LMS), as needed. The carbon and fluxing agent silos will be equipped with a fabric filter bin vents.

Alloy aggregates will also be used in the proposed EAF and LMS for refining steel metallurgy. Alloys will be transported by truck or rail to the plant in aggregate form and unloaded into storage piles. The alloys will be transferred by front-end loaders or forklift to the meltshop for use in the proposed EAF or LMS as needed.

9.2 Meltshop

The proposed micro mill will include a meltshop that consists of the EAF; LMS; casting operations; ladle and tundish preheat burners; and refractory repair. Scrap metal is fed into the EAF where it is melted and transferred to the LMS via a ladle. The main emission control device for these proposed operations is the meltshop baghouse, which captures emissions primarily from the EAF and LMS, as well as some of the emissions from the casting operations; ladle and tundish preheat burners; and refractory repair via the canopy hood. Emissions not captured by the meltshop baghouse or canopy hood are emitted through the caster vent. The following subsections describe each process that occurs in the proposed meltshop. For purposes of this application, it is conservatively assumed that all fugitive EAF and LMS releases as well as all releases from the casting operations and ladle and tundish preheat burners are vented through the caster vent without the benefit of any baghouse control.

9.2.1 Electric Arc Furnace (EAF)

The steelmaking process begins with scrap metal being transported to the scrap bay to the EAF as discussed above. During the first use of the EAF after downtime, and at other times due to operational considerations, loading of scrap metal will be accomplished using charge buckets, which are transported into position over the EAF using overhead cranes. Once in position, the charge bucket bottom will open, allowing scrap to fill the EAF. After the first heat of molten steel is made, scrap for subsequent heats will be fed to the EAF using a continuous conveyor (i.e., ECS). The conveyor system will allow the continuous feeding of scrap metal to the EAF without opening the furnace, which will result in considerable energy savings. In addition, the section of the ECS closest to the EAF will be enclosed to allow for pre-heating of the scrap metal using the off-gas from the EAF.

Furnace electrodes and oxy-fuel burners are used to transfer energy to the scrap metal to raise the temperature to approximately 3,000 degrees Fahrenheit (°F). A direct evacuation control (DEC) system or a canopy hood will capture the EAF emissions and vent the emissions through a large duct to the meltshop baghouse. Off-gasses not captured by the DEC or canopy hood can be released from the meltshop openings and doors as well as the caster vent. Due to the elevated temperature of such fugitive releases, it is expected that the majority will be released from the caster vent and a de minims amount from the meltshop openings and doors. For purposes of this application, it is conservatively assumed that all fugitive releases will be vented from the caster vent.

During the melting and refining processes that will take place in the EAF and the LMS, raw materials such as fluxing agents, coal or coke, and oxygen will be added to the molten steel in order to achieve the desired product chemistry and properties and promote the formation of slag (a product of steelmaking, and is a complex solution of silicates and oxides that solidifies upon cooling). Once the desired steel properties are reached in the EAF, the molten steel is poured (i.e., "tapped") into a refractory-lined transport vessel referred to as a ladle. The molten steel is then transferred to the LMS via a ladle car.

The slag formed in the EAF will be emptied by tipping the EAF to the side and allowing the hot slag to be poured into a pile within the meltshop building. As the slag cools, some limited combustion of residual coke in the slag may occur. The slag will be subsequently removed from the pit using a front-end loader, cooled or quenched, and transported to an outdoor storage pile before being processed on-site.

9.2.2 Ladle Metallurgy Station (LMS)

The ladles filled with molten steel will be transferred from the EAF to the LMS via the ladle car. At the LMS, the steel will be subjected to additional heating by electrical energy in order to maintain its molten state. The molten steel will be further refined with the injection and mixing of raw materials such as fluxing agents, carbon, and alloys into the molten steel. Once the molten steel reaches the desired temperature and composition (dependent on the physical properties of the desired product), the ladle will transport the molten steel to the continuous casting machine.

Emissions from the LMS will be captured by the ladle hood connected to the meltshop baghouse. Emissions not captured by the ladle hood or meltshop canopy will be emitted through the caster vent.

9.2.3 Casting Operations

After reaching the desired temperature of approximately 3,000 °F and composition in the LMS, the ladle is transported to a continuous casting machine. During casting, steel flows out of the bottom of the ladle via a slide gate into a tundish. A tundish is a holding vessel used to ensure continuous casting while ladles are switched out. Emissions from the process will be emitted through the caster vent.

Hot slag will be dumped from the ladle into a pile within the meltshop building. As the slag cools, some limited combustion of residual coke in the slag may occur. The slag will be subsequently removed from the pit using a front-end loader, cooled or quenched, and transported to an outdoor storage pile before being processed on-site.

From the tundish, the steel flows into a single mold. In the mold, the steel is water-cooled and formed into bars, referred to as billets.

9.2.4 Ladle and Tundish Preheat Burners

Refractory materials will line the ladles and tundishes which must be dried completely prior to steel production. Additionally, the ladles and tundishes must be preheated prior to the transfer of molten steel in order to prevent heat losses. Nine natural gas or propane-fired burners[7] will be used to preheat the ladles and tundishes as follows:

- Three 6.0 MMBtu/hr each ladle preheaters;
- Two 8.0 MMBtu/hr each ladle dryers;
- Two 6.0 MMBtu/hr each tundish preheaters;
- One 6.0 MMBtu/hr tundish dryer;
- One 1.0 MMBtu/hr tundish mandril dryer; and
- One 0.5 MMBtu/hr shroud heater.

Combustion emissions generated during preheating and drying of the ladles and tundishes will be captured by the canopy hood and routed to the baghouse or released at the caster vent. For purposes of this application, it is conservatively assumed that all combustion emissions are vented through the caster vent without the benefit of any baghouse control.

9.2.5 Refractory Repair

Refractory is made up of a layer of bricks and will be used in the EAF, ladles, and tundishes. For the EAF, the refractory will be changed periodically. For the ladles and tundishes, occasional refractory repairs and replacements will also be required. This will involve the use of organic binding agents (binder) to hold the refractory bricks in place. Emissions from the binder will be routed to the caster vent. When the refractory is replaced or repaired, spent refractory will be recycled or disposed of, along with other various wastes generated in the steel production process.

9.2.6 Meltshop Baghouse

Emissions captured in the meltshop are vented to the meltshop baghouse. Dust collected by the meltshop baghouse will be transferred to a dust silo controlled with a bin vent filter. The dust will then be shipped off-site by either railcar or truck for recycling.

9.3 Rolling Mill

After continuous casting the steel is conveyed through a series of rolling stands that reduce the cross-sectional area and hot-form final rolled steel shapes such as reinforcing bar. A 0.225 MMBtu/hr natural gas or propane-fired "bit furnace"[8] is used to heat sample bars (or bits) and run them through a pass to check size prior to rolling. The rolled steel that exit the rolling mill is water quenched, or cooled on natural convection cooling beds, is then either spooled or sheared to length. Steel products are then bundled, and stored. Mill scale, which is a type of iron oxide that is formed on the surface of the steel during the rolling process, is removed using water.

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[7] Site combustion sources will utilize propane or natural gas.

[8] Ibid.

9.4 Spooler

Steel spools are one of the finished products to be manufactured at the proposed Project. The detailed activities associated with the spool processing are as follows:

- Rolling equipment further reduces the dimension of the steel rod into wires of different diameters.
- Instead of being cut into different lengths, the produced wire will be spooled into coils.
- The majority of the finished products will be moved with overhead cranes.
- Industrial forklift trucks move the finished spools from the rolling mill building to a nearby storage area.
- When the spools are ready to be shipped, forklifts load the spools into trucks/trailers for shipping.

9.5 Cooling Beds

The products that exit the rolling mill are directed to the cooling beds. The products will either first receive an initial water quench or be moved directly along the length of the bed, without this initial quench, allowing time and space to cool in the ambient air. Some of the products may be diverted to coil forming machines where the rolled steel is formed into a spool as it cools.

9.6 Finishing and Transportation

After the products have cooled, automated bundling systems will prepare un-spooled products. Overhead cranes or forklifts will transport materials to storage areas or directly to customer trucks or railcars.

9.7 Slag Processing Plant

After the slag is removed from the meltshop, quenched, and stored in an outdoor storage pile, the slag is processed by on-site Slag Processing Plant (SPP). At the SPP, large pieces of slag will be reduced in size by a ball drop crushing process. SPP slag will be processed through a system consisting of conveyors, hoppers, a jaw crusher, and a double deck screen in the following manner:

- Slag is transported to the crushers feed hoppers.
- Slag from the hoppers will be fed through the crushers.
- Slag from the crushers will either proceed in the process, drop onto an overs pile, or drop onto the metallic products pile.
- The slag in the process will be dropped onto a screen.
- Slag from the screen will either proceed in the process or drop onto a screen overs pile.
- The slag in the process will be dropped onto a second deck pile (material between 0.5 and 2 inches in size), or dropped onto a final pile (material less than 0.5 inches in size).

In addition to the transportation by the conveyor system, loaders will also transport slag to the various piles. The processed slag stored in the piles will be used onsite or transported off-site to be sold to consumers.

9.8 Paved/Unpaved Roads

Vehicle traffic will occur on paved and unpaved roads located throughout the Facility. Paved and unpaved roads will be used by various vehicles, including haul trucks, trailers, loader trucks, Euclid/roll-off trucks, inert gas trucks, and forklifts/loaders. Fugitive emissions can occur due to vehicle traffic and wind erosion.

9.9 Utilities

9.9.1 Cooling Towers

Two non-contact cooling towers and one contact cooling tower will be used at the proposed micro mill to remove heat from the cooling water used in the proposed operations. The contact cooling tower's water will come into direct contact with the steel during the rolling mill process to provide cooling which may increase the solid content in the water.

9.9.2 Fuel Storage Tanks

Three diesel fuel tanks will be used to supply fuel to the site as follows:

- 500-gallon diesel storage tank for Emergency Generator No. 1;
- 500-gallon diesel storage tank for Fire Water Pump No. 1; and
- 5,000-gallon diesel storage tank supporting on-site vehicles.

9.9.3 Emergency Generator & Fire Water Pump

A 1,600 hp diesel fired emergency generator will supply power to the meltshop and other critical infrastructure during power outages. Similarly, a 300 hp emergency fire water pump will be used in case of emergency fire events at the proposed mill.

9.9.4 Other Miscellaneous Equipment

Operations at the proposed Project will include additional pieces of equipment classified as "De minimis sources" pursuant to 45 CSR 13-2.2.6. These include the following:

- Air compressors and pneumatically-operated equipment, including hand tools; instrument air systems (excluding fuel-fired compressors); emissions from pneumatic starters on reciprocating engines, turbines or other equipment; and periodic use of air for cleanup (excluding all sandblasting activities).
- Bench-scale laboratory equipment used for physical or chemical analysis, excluding lab fume hoods or vents.
- Portable brazing, soldering, gas cutting or welding equipment used as an auxiliary to the principal equipment at the source.
- Comfort air conditioning or ventilation systems not used to remove air contaminants generated by or released from specific units of equipment.
- Hand-held equipment for buffing, polishing, cutting, drilling, sawing, grinding, turning or machining wood, metal or plastic.

10. ATTACHMENT H: MATERIAL SAFETY DATA SHEETS

Attachment N: Supporting Emission Calculations provides the specifications for materials that will be located at the proposed Project. A safety data sheet (SDS) for the diesel fuel to be utilized at the proposed Project is included in this section.

SAFETY DATA SHEET

Section 1. Identification

CHS Inc.
P.O. Box 64089
Mail station 525
St. Paul, MN 55164-0089

Transportation Emergency (CHEMTREC)	:	**1-800-424-9300**
Technical Information	:	**1-651-355-8443**
SDS Information	:	**1-651-355-8445**

Product name	:	No. 2 ULTRA LOW SULFUR DIESEL FUEL / DISTILLATE (sulfur<15ppm)	**SDS no.**	:	0201-M1A0.3.HL
Common name	:	#2 Diesel Fuel, #2 Distillate, Fuel Oil Fieldmaster XL Diesel Fuel, Roadmaster XL Diesel Fuel	**Revision date**	:	06/01/2021
Chemical name	:	Petroleum Distillate	**Chemical formula**	:	Mixture
Chemical family	:	A mixture of paraffinic, olefinic, naphthenic and aromatic hydrocarbons.			

Relevant identified uses of the substance or mixture and uses advised against

Not available.

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture : FLAMMABLE LIQUIDS - Category 3
CARCINOGENICITY - Category 2

GHS label elements

Hazard pictograms :

Signal word : Warning

Hazard statements : H226 - Flammable liquid and vapor.
H351 - Suspected of causing cancer.

Precautionary statements

General : Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand.

Prevention : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves. Wear eye or face protection. Wear protective clothing. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use explosion-proof electrical, ventilating, lighting and all material-handling equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Keep container tightly closed.

Response : IF exposed or concerned: Get medical attention. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.

Storage : Store locked up. Store in a well-ventilated place. Keep cool.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazards not otherwise classified : None known.

Hazardous Material Information System (U.S.A.)	**Health :**	* 0	**Flammability :**	2	**Physical hazards :**	0
National Fire Protection Association (U.S.A.)	**Health :**	1	**Flammability :**	2	**Instability :**	0

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

Chemical name : Petroleum Distillate

Other means of identification : #2 Diesel Fuel, #2 Distillate, Fuel Oil Fieldmaster XL Diesel Fuel, Roadmaster XL Diesel Fuel

Ingredient name	%	CAS number
Fuels, diesel, No 2	≥90	68476-34-6
Ethylbenzene	≤0.3	100-41-4
Naphthalene	<0.25	91-20-3

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : If material comes in contact with the eyes, immediately wash the eyes with large amounts of water for 15 minutes, occasionally lifting the lower and upper lids. Get medical attention.

Inhalation : If person breathes in large amounts of material, move the exposed person to fresh air at once. If breathing has stopped, perform artificial respiration. Keep the person warm and at rest. Get medical attention as soon as possible.

Skin contact : If the material comes in contact with the skin, wash the contaminated skin with soap and water promptly. If the material penetrates through clothing, remove the clothing and wash the skin with soap and water promptly. If irritation persists after washing, get medical attention immediately.

Ingestion : If material has been swallowed, do not induce vomiting. Get medical attention immediately.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

Skin contact : No known significant effects or critical hazards.

Ingestion : No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following: pain or irritation, watering, redness.

Inhalation : Adverse symptoms may include the following: respiratory tract irritation, coughing.

Skin contact : Adverse symptoms may include the following: irritation, redness.

Ingestion : No known significant effects or critical hazards.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use water spray to cool fire exposed surfaces and to protect personnel. Foam, dry chemical or water spray (fog) to extinguish fire.

Unsuitable extinguishing media : Do not use water jet or water-based fire extinguishers.

Specific hazards arising from the chemical : Vapors are heavier than air and may travel along the ground to a source of ignition (pilot light, heater, electric motor) some distance away. Containers, drums (even empty) can explode when heat (welding, cutting, etc.) is applied.

Hazardous thermal decomposition products : No specific data.

Special protective actions for fire-fighters : Water may be ineffective on flames, but should be used to keep fire-exposed containers cool. Water or foam sprayed into container of hot burning product could cause frothing and endanger fire fighters. Large fires, such as tank fires, should be fought with caution. If possible, pump the contents from the tank and keep adjoining structures cool with water. Avoid spreading burning liquid with water used for cooling purposes. Do not flush down public sewers. Avoid inhalation of vapors. Firefighters should wear self-contained breathing apparatus.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : Keep unnecessary and unprotected personnel from entering. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

Methods and materials for containment and cleaning up

Spill : Contain with dikes or absorbent to prevent migration to sewers/streams. Take up small spill with dry chemical absorbent; large spills may require pump or vacuum prior to absorbent. May require excavation of severely contaminated soil.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking.

Conditions for safe storage, including any incompatibilities : Do not store above the following temperature: 113°C (235.4°F). Odorous and toxic fumes may form from the decomposition of this product if stored at excessive temperatures for extended periods of time. Store in accordance with local regulations. Store in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Fuels, diesel, No 2	**ACGIH TLV (United States, 3/2017). Absorbed through skin.** TWA: 100 mg/m³, (measured as total hydrocarbons) 8 hours. Form: Inhalable fraction and vapor
Ethylbenzene	**ACGIH TLV (United States, 3/2017).** TWA: 20 ppm 8 hours. **NIOSH REL (United States, 10/2016).** TWA: 100 ppm 10 hours. TWA: 435 mg/m³ 10 hours. STEL: 125 ppm 15 minutes. STEL: 545 mg/m³ 15 minutes. **OSHA PEL (United States, 6/2016).** TWA: 100 ppm 8 hours. TWA: 435 mg/m³ 8 hours.
Naphthalene	**ACGIH TLV (United States, 3/2017). Absorbed through skin.** TWA: 10 ppm 8 hours. TWA: 52 mg/m³ 8 hours. **NIOSH REL (United States, 10/2016).** TWA: 10 ppm 10 hours. TWA: 50 mg/m³ 10 hours. STEL: 15 ppm 15 minutes. STEL: 75 mg/m³ 15 minutes. **OSHA PEL (United States, 6/2016).** TWA: 10 ppm 8 hours. TWA: 50 mg/m³ 8 hours.

Appropriate engineering controls : Use only with adequate ventilation.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Recommended: Splash goggles and a face shield, where splash hazard exists.

Skin protection

Hand protection : 4 - 8 hours (breakthrough time): Nitrile gloves.

Body protection : Recommended: Long sleeved coveralls.

Other skin protection : Recommended: Impervious boots.

Respiratory protection : If ventilation is inadequate, use a NIOSH-certified respirator with an organic vapor cartridge and P95 particulate filter.

Section 9. Physical and chemical properties

Appearance

Physical state : Liquid. [Mobile liquid.]

Color : Clear yellow. Red.

Odor : Characteristic. Hydrocarbon.

Odor threshold : Not available.

pH : Not available.

Melting point : Not available.

Boiling point : 157.22 to 343.33°C (315 to 650°F)

Flash point : Closed cup: 60°C (140°F) [Pensky-Martens.]

Flammability : Not available.

Lower and upper explosive (flammable) limits : Not available.

Relative density : 0.85

Evaporation rate : Not available.

Solubility : Insoluble in the following materials: cold water and hot water.

Solubility in water : Insoluble

Partition coefficient: n-octanol/water : Not available.

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

SADT : Not available.

Viscosity : Not available.

Vapor pressure : Not available.

Vapor density : >3 [Air = 1]

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas.

Incompatible materials : Reactive or incompatible with the following materials: Strong oxidizing agents.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Ethylbenzene	LD50 Dermal	Rabbit	>5000 mg/kg	-
	LD50 Oral	Rat	3500 mg/kg	-
Naphthalene	LD50 Dermal	Rabbit	>20 g/kg	-
	LD50 Oral	Rat	490 mg/kg	-

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Biphenyl	Eyes - Mild irritant	Rabbit	-	100 mg	-
	Skin - Severe irritant	Rabbit	-	24 hours 500 µL	-
Naphthalene	Skin - Mild irritant	Rabbit	-	495 mg	-
	Skin - Severe irritant	Rabbit	-	24 hours 0.05 mL	-

Sensitization

Skin : There is no data available.

Respiratory : There is no data available.

Mutagenicity

There is no data available.

Carcinogenicity

Classification

Product/ingredient name	OSHA	IARC	NTP
Ethylbenzene	-	2B	-
Naphthalene	-	2B	Reasonably anticipated to be a human carcinogen.

Reproductive toxicity

There is no data available.

Teratogenicity

There is no data available.

Specific target organ toxicity (single exposure)

There is no data available.

Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
Ethylbenzene	Category 2	Not determined	hearing organs

Aspiration hazard

Name	Result
Ethylbenzene	ASPIRATION HAZARD - Category 1

Information on the likely routes of exposure : Dermal contact. Eye contact. Inhalation. Ingestion.

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
Ethylbenzene	Acute EC50 13300 µg/L Fresh water	Crustaceans - Artemia sp. - Nauplii	48 hours
	Acute LC50 13900 µg/L Fresh water	Daphnia - Daphnia magna - Neonate	48 hours
Naphthalene	Acute EC50 1600 µg/L Fresh water	Daphnia - Daphnia magna - Neonate	48 hours
	Acute LC50 2350 µg/L Marine water	Crustaceans - Palaemonetes pugio	48 hours
	Acute LC50 213 µg/L Fresh water	Fish - Melanotaenia fluviatilis - Larvae	96 hours
	Chronic NOEC 0.5 mg/L Marine water	Crustaceans - Uca pugnax - Adult	3 weeks
	Chronic NOEC 1.5 mg/L Fresh water	Fish - Oreochromis mossambicus	60 days

Persistence and degradability

There is no data available.

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
Fuels, diesel, No 2	>3.3	-	low
Ethylbenzene	3.6	-	low
Naphthalene	3.4	36.5 to 168	low

Mobility in soil

Soil/water partition coefficient (K_{OC}) : There is no data available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : Disposal of this product, solutions and any by-products should comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.

Section 14. Transport information

DOT IDENTIFICATION NUMBER UN1202 **DOT proper shipping name** DIESEL FUEL

DOT Hazard Class(es) 3 **PG** III **DOT EMER. RESPONSE GUIDE NO.** 128

Section 15. Regulatory information

U.S. Federal regulations : **TSCA 8(a) PAIR**: Naphthalene
TSCA 8(a) CDR Exempt/Partial exemption: Not determined
United States inventory (TSCA 8b): All components are listed or exempted.
Clean Water Act (CWA) 307: Ethylbenzene; Naphthalene
Clean Water Act (CWA) 311: Ethylbenzene; Naphthalene

Clean Air Act Section 602 Class I Substances : Not listed
Clean Air Act Section 602 Class II Substances : Not listed
Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs) : Listed
DEA List I Chemicals (Precursor Chemicals) : Not listed
DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 304 RQ : Not applicable.

SARA 311/312

Hazard classifications : FLAMMABLE LIQUIDS - Category 3
CARCINOGENICITY - Category 2

Composition/information on ingredients

Name	Classification
Fuels, diesel, No 2	FLAMMABLE LIQUIDS - Category 3 CARCINOGENICITY - Category 2
Ethylbenzene	FLAMMABLE LIQUIDS - Category 2 ACUTE TOXICITY (inhalation) - Category 4 SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2A CARCINOGENICITY - Category 2 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (hearing organs) - Category 2 ASPIRATION HAZARD - Category 1
Naphthalene	FLAMMABLE SOLIDS - Category 2 ACUTE TOXICITY (oral) - Category 4 CARCINOGENICITY - Category 2

SARA 313 : This product (does/not) contain toxic chemicals subject to the reporting requirements of SARA Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and of 40 CFR 372.

Product name	CAS number	%
Ethylbenzene	100-41-4	0.1
Naphthalene	91-20-3	0.1

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

State regulations

Massachusetts : None of the components are listed.

New York : The following components are listed: Ethylbenzene; Naphthalene

New Jersey : The following components are listed: Ethylbenzene; Naphthalene

Pennsylvania : The following components are listed: Ethylbenzene; Naphthalene

California Prop. 65

WARNING: This product can expose you to chemicals including Ethylbenzene, Naphthalene, which are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

Ingredient name	No significant risk level	Maximum acceptable dosage level
Ethylbenzene	Yes.	-
Naphthalene	Yes.	-

Section 16. Other information

Review date	: 06/01/2021	**Supersedes**	: 10/17/2017
Revised Section(s)	: None.	**Prepared by**	: KMK Regulatory Services Inc.

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11. ATTACHMENT I: EMISSION UNITS TABLE

Attachment I
Emission Units Table
(includes all emission units and air pollution control devices that will be part of this permit application review, regardless of permitting status)

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed/ Modified	Design Capacity	Control Device ID	Control Description
Meltshop						
EAF1	BH1	Electric Arc Furnace 1	New/Proposed	117 ton steel/hr	BH1-BH	Pulse Jet Fabric Filter Baghouse 1
	CV1				N/A	None
LMS1	BH1	Ladle Metallurgical Station 1	New/Proposed	117 ton steel/hr	BH1-BH	Pulse Jet Fabric Filter Baghouse 1
	CV1				N/A	None
CAST1	CV1	Continuous Caster 1	New/Proposed	117 ton steel/hr	BH1-BH	Pulse Jet Fabric Filter Baghouse 1
LPH1	CV1	Ladle Preheaters	New/Proposed	18.00 MMBtu/hr	N/A	None
LD1	CV1	Ladle Dryers	New/Proposed	16.00 MMBtu/hr	N/A	None
TPH1	CV1	Tundish Preheaters	New/Proposed	12.00 MMBtu/hr	N/A	None
TD1	CV1	Tundish Dryer	New/Proposed	6.00 MMBtu/hr	N/A	None
TMD1	CV1	Tundish Mandril Dryer	New/Proposed	1.00 MMBtu/hr	N/A	None
SRDHTR1	CV1	Shroud Heater	New/Proposed	0.50 MMBtu/hr	N/A	None
MSAUXHT	CV1	Meltshop Comfort Heaters	New/Proposed	8.00 MMBtu/hr	N/A	None
Rolling Mill						
RMV1	RMV1	Rolling Mill Vent 1	New/Proposed	117 ton steel/hr	N/A	None
CBV1	CBV1	Cooling Beds Vent 1	New/Proposed	117 ton steel/hr	N/A	None
BF1	RMV1	Bit Furnace	New/Proposed	0.23 MMBtu/hr	N/A	None
RMAUXHT	RMV1	Rolling Mill Comfort Heaters	New/Proposed	8.00 MMBtu/hr	N/A	None
Material Storage Silos						
FLXSLO1	FLXSLO11	Fluxing Agent Storage Silo No. 1	New/Proposed	3,000 cfm	FLXSLO11-BV	Bin Vent
FLXSLO1	FLXSLO12	Fluxing Agent Storage Silo No. 2	New/Proposed	3,000 cfm	FLXSLO12-BV	Bin Vent
CARBSLO1	CARBSLO1	Carbon Storage Silo No. 1	New/Proposed	2,050 cfm	CARBSLO1-BV	Bin Vent
DUSTSLO1	DUSTSLO1	EAF Baghouse Dust Silo	New/Proposed	1,300 cfm	DUSTSLO1-BV	Bin Vent
Cooling Towers						
CTNC11	CTNC11a	Non-Contact Cooling Tower 1 - Cell 1	New/Proposed	11,000 gpm	CTNC11a-DE	Drift Eliminator
CTNC11	CTNC11b	Non-Contact Cooling Tower 1 - Cell 2	New/Proposed	11,000 gpm	CTNC11b-DE	Drift Eliminator
CTNC12	CTNC12a	Non-Contact Cooling Tower 2 - Cell 1	New/Proposed	11,000 gpm	CTNC12a-DE	Drift Eliminator
CTNC12	CTNC12b	Non-Contact Cooling Tower 2 - Cell 2	New/Proposed	11,000 gpm	CTNC12b-DE	Drift Eliminator
CTC1	CTC1a	Contact Cooling Tower - Cell 1	New/Proposed	5,500 gpm	CTC1a-DE	Drift Eliminator
CTC1	CTC1b	Contact Cooling Tower - Cell 2	New/Proposed	5,500 gpm	CTC1b-DE	Drift Eliminator
Material Handling						
DPEAF1	TR51A	Inside ECS Building Drop Points, Scrap	New/Proposed	830 tons/hr	N/A	Enclosed
DPEAF1	TR51B	Outside ECS Building Drop Points, Scrap, Storage Area	New/Proposed	330 tons/hr	N/A	None
DPEAF1	TR51C	Outside Rail Bins Drop Point, Scrap	New/Proposed	110 tons/hr	N/A	None
DPEAF1	TR51D	Outside Truck Mixed Bins Drop Point, Scrap	New/Proposed	110 tons/hr	N/A	None
DPEAF1	TR51E	Outside Truck Bins Drop Point, Scrap	New/Proposed	110 tons/hr	N/A	None
DPF1	TR71	Inside ECS Building Drop Points, Fluxing Agent	New/Proposed	30 tons/hr	N/A	Enclosed
DPAA1	TR81	Outside Drop Points, Alloy Aggregate	New/Proposed	60 tons/hr	N/A	Partial Enclosure
DPRW1	TR91A	Inside Drop Points, Removed Refractory and Other Materials	New/Proposed	25 tons/hr	N/A	Enclosed
DPRW1	TR91B	Outside Drop Points, Removed Refractory and Other Materials	New/Proposed	25 tons/hr	N/A	None
DPS1	TR11A	Outside SPP Pile Drop Points, Slag	New/Proposed	820 tons/hr	N/A	Enclosed / Water
DPS1	TR11B	Drop from Loader to Primary Crusher No. 1 Feed Hopper	New/Proposed	100 tons/hr	N/A	Moisture Content of Material
DPS1	TR11B	Drop from Loader to Primary Crusher No. 2 Feed Hopper	New/Proposed	250 tons/hr	N/A	Moisture Content of Material
DPS1	TR11B	Drop from Feed Hopper to Primary Crusher No. 1	New/Proposed	100 tons/hr	N/A	Moisture Content of Material
DPS1	TR11B	Drop from Feed Hopper to Primary Crusher No. 2	New/Proposed	250 tons/hr	N/A	Moisture Content of Material
DPS1	TR11B	Primary Crusher No. 1	New/Proposed	100 tons/hr	N/A	Moisture Content of Material
DPS1	TR11B	Primary Crusher No. 2	New/Proposed	250 tons/hr	N/A	Moisture Content of Material
DPS1	TR11B	Secondary Crusher No. 1	New/Proposed	250 tons/hr	N/A	Moisture Content of Material

Attachment I
Emission Units Table
(includes all emission units and air pollution control devices that will be part of this permit application review, regardless of permitting status)

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed/ Modified	Design Capacity	Control Device ID	Control Description
DPS1	TR11B	Drop onto Primary Crusher No. 1 Overs Pile	New/Proposed	1.0 tons/hr	N/A	Moisture Content of Material
DPS1	TR11B	Drop onto Primary Crusher No. 2 to Secondary Crusher No. 1	New/Proposed	250 tons/hr	N/A	Moisture Content of Material
DPS1	TR11B	Drop onto Secondary Crusher No. 1 Overs Pile	New/Proposed	2.5 tons/hr	N/A	Moisture Content of Material
DPS1	TR11B	Drop from Primary Crusher No. 1 to Hopper Feeder	New/Proposed	99 tons/hr	N/A	Moisture Content of Material
DPS1	TR11B	Drop from Secondary Crusher No. 1 to Hopper Feeder	New/Proposed	248 tons/hr	N/A	Moisture Content of Material
DPS1	TR11B	Drop from Hopper Feeder to Conveyor Belt No. 1	New/Proposed	341 tons/hr	N/A	Moisture Content of Material
DPS1	TR11B	Drop from Conveyor Belt No. 1 to Conveyor Belt No. 2	New/Proposed	341 tons/hr	N/A	Moisture Content of Material
DPS1	TR11B	Drop from Conveyor Belt No. 2 to Conveyor Belt No. 3	New/Proposed	5.2 tons/hr	N/A	Moisture Content of Material
DPS1	TR11B	Drop from Conveyor Belt No. 2 to Conveyor Belt No. 4	New/Proposed	336 tons/hr	N/A	Moisture Content of Material
DPS1	TR11B	Drop from Conveyor Belt No. 3 to Conveyor Belt No. 5	New/Proposed	5.2 tons/hr	N/A	Moisture Content of Material
DPS1	TR11B	Drop from Conveyor Belt No. 4 to Screen	New/Proposed	336 tons/hr	N/A	Moisture Content of Material
DPS1	TR11B	Screen - Screening	New/Proposed	336 tons/hr	N/A	Moisture Content of Material
DPS1	TR11B	Drop onto Screening Overs Pile	New/Proposed	3.5 tons/hr	N/A	Moisture Content of Material
DPS1	TR11B	Drop from Screen to Conveyor Belt No. 6	New/Proposed	100 tons/hr	N/A	Moisture Content of Material
DPS1	TR11B	Drop from Screen to Conveyor Belt No. 7	New/Proposed	233 tons/hr	N/A	Moisture Content of Material
DPS1	TR11B	Drop from Conveyor Belt No. 7 to Conveyor Belt No. 8	New/Proposed	233 tons/hr	N/A	Moisture Content of Material
DPS1	TR11B	Reject Pile to Trucks	New/Proposed	1.7 tons/hr	N/A	Moisture Content of Material
DPS1	TR11B	Metallic Product Pile to Trucks	New/Proposed	5.2 tons/hr	N/A	Moisture Content of Material
DPS1	TR11B	Thrus Product Pile to Trucks	New/Proposed	233 tons/hr	N/A	Moisture Content of Material
DPS1	TR11B	2nd Deck Product Pile to Trucks	New/Proposed	100 tons/hr	N/A	Moisture Content of Material
DPS1	TR11B	Jaw Crusher Overs Pile to Trucks	New/Proposed	3.5 tons/hr	N/A	Moisture Content of Material
DPS1	TR11B	Screening Overs Pile to Trucks	New/Proposed	3.5 tons/hr	N/A	Moisture Content of Material
DPS1	TR11B	Drop from Grizzly Hopper Feeder to Reject Pile	New/Proposed	1.7 tons/hr	N/A	Moisture Content of Material
DPS1	TR11B	Drop from Loader to Reject Pile	New/Proposed	1.7 tons/hr	N/A	Moisture Content of Material
DPS1	TR11B	Drop from Conveyor Belt No. 5 to Metal Pile	New/Proposed	5.2 tons/hr	N/A	Moisture Content of Material
DPS1	TR11B	Drop from Loader to Metal Pile	New/Proposed	5.2 tons/hr	N/A	Moisture Content of Material
DPS1	TR11B	Drop from Conveyor Belt No. 8 to Thrus Pile	New/Proposed	233 tons/hr	N/A	Moisture Content of Material
DPS1	TR11B	Drop from Loader to Thrus Pile	New/Proposed	233 tons/hr	N/A	Moisture Content of Material
DPS1	TR11B	Drop from Conveyor Belt No. 6 to 2nd Deck Pile	New/Proposed	100 tons/hr	N/A	Moisture Content of Material
DPS1	TR11B	Drop from Loader to 2nd Deck Pile	New/Proposed	100 tons/hr	N/A	Moisture Content of Material
DPRS1	TR131	Outside Drop Points, Residual Scrap Pile	New/Proposed	25 tons/hr	N/A	None
DPMS1	TR141	Outside Drop Points, Mill Scale Pile	New/Proposed	60 tons/hr	N/A	Partial Enclosure
CR1	CR1	Ball Drop Crushing	New/Proposed	8 tons steel/hr	N/A	None
Material Storage Piles						
EAF1P	W51A	ECS Scrap Building Storage Pile A	New/Proposed	6,000 sq ft	N/A	Partial Enclosure
EAF1P	W51B	ECS Scrap Building Storage Pile B	New/Proposed	5,400 sq ft	N/A	Partial Enclosure
EAF1P	W51C	ECS Scrap Building Storage Pile C	New/Proposed	5,300 sq ft	N/A	Partial Enclosure
EAF1P	W51D	ECS Scrap Building Overage Scrap Pile	New/Proposed	12,100 sq ft	N/A	None
EAF1P	W51E	Outside Rail Scrap 5k Pile A	New/Proposed	11,000 sq ft	N/A	None
EAF1P	W51F	Outside Rail Scrap 5k Pile B	New/Proposed	11,000 sq ft	N/A	None
EAF1P	W51G	Outside Rail Scrap 5k Pile C	New/Proposed	11,000 sq ft	N/A	None
EAF1P	W51H	Outside Rail Scrap 5k Pile D	New/Proposed	11,000 sq ft	N/A	None
EAF1P	W51I	Outside Truck Mixed 8k Pile A	New/Proposed	13,600 sq ft	N/A	None
EAF1P	W51J	Outside Truck Mixed 8k Pile B	New/Proposed	14,700 sq ft	N/A	None
EAF1P	W51K	Outside Truck Scrap 5k Pile A	New/Proposed	11,000 sq ft	N/A	None
EAF1P	W51L	Outside Truck Scrap 5k Pile B	New/Proposed	11,000 sq ft	N/A	None
EAF1P	W51M	Outside Truck Scrap 5k Pile C	New/Proposed	11,000 sq ft	N/A	None
EAF1P	W51N	Outside Truck Scrap 5k Pile D	New/Proposed	11,000 sq ft	N/A	None
AAP1	W61	Alloy Aggregate Storage Pile	New/Proposed	1,000 sq ft	N/A	Partial Enclosure

Attachment I
Emission Units Table
(includes all emission units and air pollution control devices that will be part of this permit application review, regardless of permitting status)

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed/ Modified	Design Capacity	Control Device ID	Control Description
SPP1	W71A	SPP Slag Storage Pile	New/Proposed	17,100 sq ft	N/A	None
SPP1	W71B	SPP Reject Pile	New/Proposed	17,000 sq ft	N/A	Water
RSP1	W81	Residual Scrap Storage Pile in Scrap Yard	New/Proposed	21,300 sq ft	N/A	None
MSP1	W111	Mill Scale Pile	New/Proposed	3,500 sq ft	N/A	Partial Enclosure
Haulroads						
PR1	PR1	Paved Roads	New/Proposed	74,123 VMT/ur	N/A	Watering + Sweeping
UR1	UR1	Unpaved Roads	New/Proposed	8,696 VMT/ur	N/A	Watering
Auxillary Equipment						
EGEN1	EGEN1	Emergency Generator 1	New/Proposed	1,600 hp	N/A	None
EFWP1	EFWP1	Emergency Fire Water Pump 1	New/Proposed	300 hp	N/A	None
TORCH1	TORCH1	Cutting Torches	New/Proposed	0.32 MMBtu/hr	N/A	None
DSLTK-GEN1	DSLTK-GEN1	Diesel Storage Tank for Emergency Generator No. 1	New/Proposed	500 gal	N/A	None
DSLTK-FWP1	DSLTK-FWP1	Diesel Storage Tank for Fire Water Pump No. 1	New/Proposed	500 gal	N/A	None
DSLTK-VEH	DSLTK-VEH	Diesel Storage Tank Supporting On-Site Vehicles	New/Proposed	5,000 gal	N/A	None

12. ATTACHMENT J: EMISSION POINTS DATA SUMMARY SHEET

REGULATED AIR POLLUTANT DATA									EMISSIONS INFORMATION			EMISSION POINT DISCHARGE PARAMETERS								
EMISSION POINT [1]		EMISSION UNITS VENTED THROUGH THIS POINT		AIR POLLUTION CONTROL DEVICE		CHEMICAL COMPOSITION OF TOTAL STREAM	MAXIMUM CONTROLLED EMISSIONS					UTM COORDINATES OF EMISSION POINT			STACK SOURCES					
																		EXIT DATA		
ID	TYPE	EMISSION UNIT ID	EMISSION UNIT DESCRIPTION	CONTROL DEVICE ID	CONTROL DEVICE TYPE	REGULATED AIR POLLUTANT NAME [2]	#/ HR. [3]	TONS/ YEAR [4]	EMISSION FORM OR PHASE (AT EXIT CONDITIONS)	EST. METHOD USED [5]	EMISSION CONCENTRATION (ppmv or mg/m3) [6]	ZONE	EAST (Mtrs)	NORTH (Mtrs)	ELEVATION: GROUND LEVEL (ft)	STACK HEIGHT ABOVE GROUND LEVEL. (ft) [7]	DIAMETER (ft)	VOL. FLOW (ACFM) [8]	VEL. (fps)	TEMP (°F)
BH1	Point	EAF1, LMS1	Meltshop Baghouse	BH1	Baghouse	Filterable PM	13.42	58.78	Solid	O (BACT)	TBD	18	251,899	4,380,477	N/A	164	16.40	713,483	56.26	143
						Total PM	38.77	169.82	Solid	O (BACT)	TBD									
						Total PM_{10}	38.77	169.82	Solid/Gas	O (BACT)	TBD									
						Total $PM_{2.5}$	38.77	169.82	Solid/Gas	O (BACT)	TBD									
						NO_X	35.10	97.50	Gas	O (BACT)	TBD									
						CO	468.00	1,300.00	Gas	O (BACT)	TBD									
						VOC	35.10	97.50	Gas	O (BACT)	TBD									
						SO_2	35.10	97.50	Gas	O (BACT)	TBD									
						Pb	0.19	0.52	Solid	EE	TBD									
						Max Single HAP	0.44	1.21	Solid/Gas	EE	TBD									
						Total HAP	0.83	2.31	Solid/Gas	EE	TBD									
						Fluorides	1.16	3.23	Gas	O (BACT)	TBD									
						CO_2e	-	119,513.37	Gas	EE	TBD									
CV1	Bouyant Line	EAF1, LMS1, CAST1	Caster Vent	N/A	N/A	Filterable PM	1.00	2.45	Solid	O (BACT)	TBD	18	251,691	4,380,314	N/A	121	N/A	N/A	10.37	136
						Total PM	1.36	2.57	Solid	O (BACT)	TBD									
						Total PM_{10}	1.36	2.57	Solid/Gas	O (BACT)	TBD									
						Total $PM_{2.5}$	1.36	2.57	Solid/Gas	O (BACT)	TBD									
						NO_X	8.91	0.49	Gas	O (BACT)	TBD									
						CO	7.93	8.34	Gas	O (BACT)	TBD									
						VOC	0.81	0.80	Gas	O (BACT)	TBD									
						SO_2	0.85	0.49	Gas	O (BACT)	TBD									
						Pb	9.71E-04	0.0026	Solid	EE	TBD									
						Max Single HAP	0.11	6.08E-03	Solid/Gas	EE	TBD									
						Total HAP	1.17E-01	0.0162	Solid/Gas	EE	TBD									
						Fluorides	5.85E-03	0.0163	Gas	O (BACT)	TBD									
						CO_2e	-	951.05	Gas	EE	TBD									
RMV1	Bouyant Line	RMV1	Rolling Mill Vent	N/A	N/A	Filterable PM	0.03	0.01	Solid	EE	TBD	18	251,722	4,380,411	N/A	69	N/A	N/A	2.00	122
						Total PM	0.07	0.01	Solid	EE	TBD									
						Total PM_{10}	0.07	0.01	Solid/Gas	EE	TBD									
						Total $PM_{2.5}$	0.07	0.01	Solid/Gas	EE	TBD									
						NO_X	1.17	0.00014	Gas	EE	TBD									
						CO	0.68	0.00008	Gas	EE	TBD									
						VOC	0.08	0.010	Gas	EE	TBD									
						SO_2	0.09	1.07E-05	Gas	EE	TBD									
						Max Single HAP	0.015	0.00033	Solid/Gas	EE	TBD									
						Total HAP	1.52E-02	0.00034	Solid/Gas	EE	TBD									
						CO_2e	-	25.75	Gas	EE	TBD									

REGULATED AIR POLLUTANT DATA									EMISSIONS INFORMATION			EMISSION POINT DISCHARGE PARAMETERS								
EMISSION POINT [1]		EMISSION UNITS VENTED THROUGH THIS POINT		AIR POLLUTION CONTROL DEVICE		CHEMICAL COMPOSITION OF TOTAL STREAM	MAXIMUM CONTROLLED EMISSIONS					UTM COORDINATES OF EMISSION POINT			STACK SOURCES					
																		EXIT DATA		
ID	TYPE	EMISSION UNIT ID	EMISSION UNIT DESCRIPTION	CONTROL DEVICE ID	CONTROL DEVICE TYPE	REGULATED AIR POLLUTANT NAME [2]	#/ HR. [3]	TONS/ YEAR [4]	EMISSION FORM OR PHASE (AT EXIT CONDITIONS)	EST. METHOD USED [5]	EMISSION CONCENTRATION (ppmv or mg/m3) [6]	ZONE	EAST (Mtrs)	NORTH (Mtrs)	ELEVATION: GROUND LEVEL (ft)	STACK HEIGHT ABOVE GROUND LEVEL. (ft) [7]	DIAMETER (ft)	VOL. FLOW (ACFM) [8]	VEL. (fps)	TEMP (°F)
CBV1	Bouyant Line	CBV1	Cooling Bed Vent	N/A	N/A	Filterable PM	0.01	0.01	Solid	EE	TBD	18	251,754	4,380,506	N/A	66	N/A	N/A	3.54	142
						Total PM	0.01	0.01	Solid	EE	TBD									
						Total PM_{10}	0.01	0.01	Solid/Gas	EE	TBD									
						Total $PM_{2.5}$	0.01	0.01	Solid/Gas	EE	TBD									
						VOC	0.01	0.01	Gas	EE	TBD									
FLXSLO11	Point	FLXSLO1	Fluxing Agent Storage Silo No. 1	FLXSLO11	Filter	Filterable PM	0.13	0.06	Solid	O (BACT)	TBD	18	251,790	4,380,563	N/A	95	0.50	50.00	4.24	Ambient
						Total PM	0.13	0.06	Solid	O (BACT)	TBD									
						Total PM_{10}	0.13	0.06	Solid	O (BACT)	TBD									
						Total $PM_{2.5}$	0.13	0.06	Solid	O (BACT)	TBD									
FLXSLO12	Point	FLXSLO1	Fluxing Agent Storage Silo No. 2	FLXSLO12	Filter	Filterable PM	0.13	0.06	Solid	O (BACT)	TBD	18	251,789	4,380,560	N/A	95	0.50	50.00	4.24	Ambient
						Total PM	0.13	0.06	Solid	O (BACT)	TBD									
						Total PM_{10}	0.13	0.06	Solid	O (BACT)	TBD									
						Total $PM_{2.5}$	0.13	0.06	Solid	O (BACT)	TBD									
CARBSLO1	Point	CARBSLO1	Carbon Storage Silo No. 1	CARBSLO1	Filter	Filterable PM	0.09	0.04	Solid	O (BACT)	TBD	18	251,789	4,380,557	N/A	95	0.50	50.00	4.24	Ambient
						Total PM	0.09	0.04	Solid	O (BACT)	TBD									
						Total PM_{10}	0.09	0.04	Solid	O (BACT)	TBD									
						Total $PM_{2.5}$	0.09	0.04	Solid	O (BACT)	TBD									
DUSTSLO1	Point	DUSTSLO1	EAF Baghouse Dust Silo	DUSTSLO1	Filter	Filterable PM	0.06	0.24	Solid	O (BACT)	TBD	18	251,860	4,380,478	N/A	95	0.50	50.00	4.24	Ambient
						Total PM	0.06	0.24	Solid	O (BACT)	TBD									
						Total PM_{10}	0.06	0.24	Solid	O (BACT)	TBD									
						Total $PM_{2.5}$	0.06	0.24	Solid	O (BACT)	TBD									
CTNC11a	Point	CTNC11	Non-Contact Cooling Tower 1 - Cell 1	N/A	N/A	Filterable PM	0.11	0.48	Solid	O (BACT)	TBD	18	251,786	4,380,405	N/A	13	18.01	514,120.35	33.63	Ambient
						Total PM	0.11	0.48	Solid	O (BACT)	TBD									
						Total PM_{10}	0.08	0.33	Solid	O (BACT)	TBD									
						Total $PM_{2.5}$	2.39E-04	1.05E-03	Solid	O (BACT)	TBD									
CTNC11b	Point	CTNC11	Non-Contact Cooling Tower 1 - Cell 2	N/A	N/A	Filterable PM	0.11	0.48	Solid	O (BACT)	TBD	18	251,784	4,380,398	N/A	13	18.01	514,120.35	33.63	Ambient
						Total PM	0.11	0.48	Solid	O (BACT)	TBD									
						Total PM_{10}	0.08	0.33	Solid	O (BACT)	TBD									
						Total $PM_{2.5}$	2.39E-04	1.05E-03	Solid	O (BACT)	TBD									
CTNC12a	Point	CTNC12	Non-Contact Cooling Tower 2 - Cell 1	N/A	N/A	Filterable PM	0.11	0.48	Solid	O (BACT)	TBD	18	251,781	4,380,352	N/A	13	18.01	514,120.35	33.63	Ambient
						Total PM	0.11	0.48	Solid	O (BACT)	TBD									
						Total PM_{10}	0.08	0.33	Solid	O (BACT)	TBD									
						Total $PM_{2.5}$	2.39E-04	1.05E-03	Solid	O (BACT)	TBD									
CTNC12b	Point	CTNC12	Non-Contact Cooling Tower 2 - Cell 2	N/A	N/A	Filterable PM	0.11	0.48	Solid	O (BACT)	TBD	18	251,783	4,380,359	N/A	13	18.01	514,120.35	33.63	Ambient
						Total PM	0.11	0.48	Solid	O (BACT)	TBD									
						Total PM_{10}	0.08	0.33	Solid	O (BACT)	TBD									
						Total $PM_{2.5}$	2.39E-04	1.05E-03	Solid	O (BACT)	TBD									
CTC1a	Point	CTC1	Contact Cooling Tower - Cell 1	N/A	N/A	Filterable PM	0.06	0.24	Solid	O (BACT)	TBD	18	251,797	4,380,428	N/A	30	8.01	138,510.62	45.87	Ambient
						Total PM	0.06	0.24	Solid	O (BACT)	TBD									
						Total PM_{10}	0.04	0.16	Solid	O (BACT)	TBD									
						Total $PM_{2.5}$	1.19E-04	5.23E-04	Solid	O (BACT)	TBD									
CTC1b	Point	CTC1	Contact Cooling Tower - Cell 2	N/A	N/A	Filterable PM	0.06	0.24	Solid	O (BACT)	TBD	18	251,801	4,380,440	N/A	30	8.01	138,510.62	45.87	Ambient
						Total PM	0.06	0.24	Solid	O (BACT)	TBD									
						Total PM_{10}	0.04	0.16	Solid	O (BACT)	TBD									
						Total $PM_{2.5}$	1.19E-04	5.23E-04	Solid	O (BACT)	TBD									

REGULATED AIR POLLUTANT DATA									EMISSIONS INFORMATION			EMISSION POINT DISCHARGE PARAMETERS								
EMISSION POINT [1]		EMISSION UNITS VENTED THROUGH THIS POINT		AIR POLLUTION CONTROL DEVICE		CHEMICAL COMPOSITION OF TOTAL STREAM	MAXIMUM CONTROLLED EMISSIONS					UTM COORDINATES OF EMISSION POINT			STACK SOURCES					
																		EXIT DATA		
ID	TYPE	EMISSION UNIT ID	EMISSION UNIT DESCRIPTION	CONTROL DEVICE ID	CONTROL DEVICE TYPE	REGULATED AIR POLLUTANT NAME [2]	#/ HR. [3]	TONS/ YEAR [4]	EMISSION FORM OR PHASE (AT EXIT CONDITIONS)	EST. METHOD USED [5]	EMISSION CONCENTRATION (ppmv or mg/m3) [6]	ZONE	EAST (Mtrs)	NORTH (Mtrs)	ELEVATION: GROUND LEVEL (ft)	STACK HEIGHT ABOVE GROUND LEVEL. (ft) [7]	DIAMETER (ft)	VOL. FLOW (ACFM) [8]	VEL. (fps)	TEMP (°F)
EGEN1	Point	EGEN1	Emergency Generator 1	N/A	N/A	Filterable PM	0.53	0.03	Solid	EE	TBD	18	251,758	4,380,560	N/A	30	0.75	784	29.58	600
						Total PM	0.53	0.03	Solid	EE	TBD									
						Total PM_{10}	0.53	0.03	Solid/Gas	EE	TBD									
						Total $PM_{2.5}$	0.53	0.03	Solid/Gas	EE	TBD									
						NO_X	9.82	0.49	Gas	EE	TBD									
						CO	9.21	0.46	Gas	EE	TBD									
						VOC	0.70	0.04	Gas	EE	TBD									
						SO_2	1.74E-02	8.70E-04	Gas	EE	TBD									
						Max Single HAP	1.32E-02	6.61E-04	Solid/Gas	EE	TBD									
						Total HAP	4.34E-02	2.17E-03	Solid/Gas	EE	TBD									
						CO_2e	-	91.62	Gas	EE	TBD									
EFWP1	Point	EFWP1	Emergency Fire Water Pump 1	N/A	N/A	Filterable PM	0.10	0.005	Solid	EE	TBD	18	251,781	4,380,389	N/A	12	0.50	1,500	127.95	848
						Total PM	0.10	0.005	Solid	EE	TBD									
						Total PM_{10}	0.10	0.005	Solid/Gas	EE	TBD									
						Total $PM_{2.5}$	0.10	0.005	Solid/Gas	EE	TBD									
						NO_X	1.84	0.09	Gas	EE	TBD									
						CO	1.73	0.09	Gas	EE	TBD									
						VOC	0.13	0.01	Gas	EE	TBD									
						SO_2	3.26E-03	1.63E-04	Gas	EE	TBD									
						Max Single HAP	2.48E-03	1.24E-04	Solid/Gas	EE	TBD									
						Total HAP	8.13E-03	4.07E-04	Solid/Gas	EE	TBD									
						CO_2e	-	17.18	Gas	EE	TBD									
DSLTK-GEN1	Point	DSLTK-GEN1	Diesel Storage Tank for Emergency Generator No. 1	N/A	N/A	VOC	0.02	1.38E-04	Gas	EE	TBD	18	TBD	TBD	N/A	N/A	TBD	TBD	Negligible	Ambient
						Max Single HAP	6.01E-03	5.46E-05	Solid/Gas	EE	TBD									
						Total HAP	7.85E-03	7.13E-05	Solid/Gas	EE	TBD									
DSLTK-FWP1	Point	DSLTK-FWP1	Diesel Storage Tank for Fire Water Pump No. 1	N/A	N/A	VOC	0.02	1.38E-04	Gas	EE	TBD	18	TBD	TBD	N/A	N/A	TBD	TBD	Negligible	Ambient
						Max Single HAP	6.01E-03	5.46E-05	Solid/Gas	EE	TBD									
						Total HAP	7.85E-03	7.13E-05	Solid/Gas	EE	TBD									
DSLTK-VEH	Point	DSLTK-VEH	Diesel Storage Tank Supporting On-Site Vehicles	N/A	N/A	VOC	0.15	1.34E-03	Gas	EE	TBD	18	TBD	TBD	N/A	N/A	TBD	TBD	Negligible	Ambient
						Max Single HAP	6.01E-03	5.46E-05	Solid/Gas	EE	TBD									
						Total HAP	7.85E-03	7.13E-05	Solid/Gas	EE	TBD									
TORCH1	Point	TORCH1	Cutting Torches	N/A	N/A	Filterable PM	0.20	0.19	Solid	EE	TBD	18	251,902	4,380,654	N/A	3	2.50	1	0.00	848
						Total PM	0.20	0.19	Solid	EE	TBD									
						Total PM_{10}	0.20	0.19	Solid/Gas	EE	TBD									
						Total $PM_{2.5}$	0.20	0.19	Solid/Gas	EE	TBD									
						NO_X	0.05	4.17E-06	Gas	EE	TBD									
						CO	2.64E-02	2.42E-06	Gas	EE	TBD									
						VOC	2.81E-03	2.56E-07	Gas	EE	TBD									
						SO_2	3.51E-03	3.21E-07	Gas	EE	TBD									
						Pb	1.57E-07	1.44E-11	Solid	EE	TBD									
						Max Single HAP	5.67E-04	1.13E-05	Solid/Gas	EE	TBD									
						Total HAP	5.95E-04	1.19E-05	Solid/Gas	EE	TBD									
						CO_2e	-	0.89	Gas	EE	TBD									

General Instructions:

1. Identify each emission point with a unique number for this plant site, consistent with emission point identification used on plot plan, previous permits, and Emissions Inventory Questionnaire. Include fugitive emissions. Limit emission point number to eight (8) character spaces. For each emission point use as many lines as necessary to list regulated air pollutant data. Typical emission point names are: heater, vent, boiler, tank, reactor, separator, baghouse, fugitive, etc. Abbreviations are O.K. Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.
2. List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS2, VOCs, H2S, Inorganics, Lead, Organics, O3, NO, NO2, SO2, SO3, all applicable Greenhouse Gases (including CO2 and methane), etc. DO NOT LIST H2, H2O, N2, O2, and Noble Gases
3. Pounds per hour (#/HR) is maximum potential emission rate expected by applicant.
4. Tons per year is annual maximum potential emission expected by applicant, which takes into account process operating schedule.
5. Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify)
6. Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric) use units of milligram per dry cubic meter (mg/m3) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO2, use units of ppmv (See 45CSR10).
7. Give at operating conditions. Including inerts.
8. Release height of emissions above ground level.

13. ATTACHMENT K: FUGITIVE EMISSIONS DATA SUMMARY SHEET

Attachment K - Fugitive Emissions Data Summary Sheet

The FUGITIVE EMISSIONS SUMMARY SHEET provides a summation of fugitive emissions. Fugitive emissions are those emissions which could not reasonably pass through a stack, chimney, vent or other functionally equivalent opening. Note that uncaptured process emissions are not typically considered to be fugitive, and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET.

Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions).

APPLICATION FORMS CHECKLIST - FUGITIVE EMISSIONS

1.) Will there be haul road activities?

[Yes] If YES, then complete the HAUL ROAD EMISSIONS UNIT DATA SHEET.

2.) Will there be Storage Piles?

[No*] If YES, complete Table 1 of the NONMETALLIC MINERALS PROCESSING EMISSIONS UNIT DATA SHEET.

** The storage piles for the CMC Plant will all be metalic materials (i.e., scrap metal and slag).*

3.) Will there be Liquid Loading/Unloading Operations?

[No] If YES, complete the BULK LIQUID TRANSFER OPERATIONS EMISSIONS UNIT DATA SHEET.

4.) Will there be emissions of air pollutants from Wastewater Treatment Evaporation?

[No] If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.

5.) Will there be Equipment Leaks (e.g. leaks from pumps, compressors, in-line process valves, pressure relief devices, open-ended valves, sampling connections, flanges, agitators, cooling towers, etc.)?

[No] If YES, complete the LEAK SOURCE DATA SHEET section of the CHEMICAL PROCESSES EMISSIONS UNIT DATA SHEET.

6.) Will there be General Clean-up VOC Operations?

[No] If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.

7.) Will there be any other activities that generate fugitive emissions?

[Yes] If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET or the most appropriate form.

FUGITIVE EMISSIONS SUMMARY	All Regulated Pollutants - Chemical Name/CAS[1]	Maximum Potential Uncontrolled Emissions[2] lb/hr	Maximum Potential Uncontrolled Emissions[2] ton/yr	Maximum Potential Controlled Emissions[3] lb/hr	Maximum Potential Controlled Emissions[3] ton/yr	Est. Method Used[4]
Haul Road/Road Dust Emissions Paved Haul Roads	Filterable PM	1.56	1.37	1.56	1.37	EE
	Total PM	1.56	1.37	1.56	1.37	EE
	Total PM_{10}	0.31	0.27	0.31	0.27	EE
	Total $PM_{2.5}$	0.08	0.07	0.08	0.07	EE
Unpaved Haul Roads	Filterable PM	4.35	4.49	4.35	4.49	EE
	Total PM	4.35	4.49	4.35	4.49	EE
	Total PM_{10}	1.16	1.20	1.16	1.20	EE
	Total $PM_{2.5}$	0.12	0.12	0.12	0.12	EE
Storage Pile Emissions	Form K specifically requests information for nonmetallic mineral storage piles. The storage piles for the CMC Plant will store metallic materials (i.e., scrap metal and slag). As such, the information for facility storage piles is presented in the R13-L (General) worksheet.					
Liquid Loading/Unloading Operations	N/A	N/A	N/A	N/A	N/A	N/A
Wastewater Treatment Evaporation & Operations	N/A	N/A	N/A	N/A	N/A	N/A
Equipment Leaks	N/A	N/A	N/A	N/A	N/A	N/A
General Clean-up VOC Emissions	N/A	N/A	N/A	N/A	N/A	N/A
Other: Uncontrolled Material Handling and Storage	Filterable PM	1.68	6.50	1.68	6.50	EE & O (BACT)
	Total PM	1.68	6.50	1.68	6.50	EE & O (BACT)
	Total PM_{10}	0.83	3.24	0.83	3.24	EE & O (BACT)
	Total $PM_{2.5}$	0.13	0.49	0.13	0.49	EE & O (BACT)

[1] *List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. DO NOT LIST H_2, H_2O, N_2, O_2, and Noble Gases.*

[2] *Give rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).*

[3] *Give rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).*

[4] *Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).*

14. ATTACHMENT L: EMISSIONS UNIT DATA SHEETS

Emission Unit Form Number:		1	3	4	6a	6g	7. Projected operating schedule:		
Emission Unit ID	Emission Point ID	Name or Type and Model	Name(s) and Maximum Process Materials Charged	Name(s) and Maximum Material Produced	Type and Amount of Fuel(s) Burned	Proposed Maximum Design Heat Input (10^6 BTU/hr)	Hours/Day	Days/Week	Weeks/Year
EAF1, LMS1	BH1	Meltshop Baghouse	Steel: 117 tons/hr	Steel: 117 tons/hr	N/A	N/A	24	7	52
EAF1, LMS1, CAST1	CV1	Caster Vent	Steel: 117 tons/hr	Steel: 117 tons/hr	Propane: 672 gal/hr Natural Gas: 60294 scf/hr	62	24	7	52
RMV1	RMV1	Rolling Mill Vent	Propane: 90 gal/hr Natural Gas: 8064 scf/hr Steel: 117 tons/hr	N/A	Propane: 90 gal/hr Natural Gas: 8064 scf/hr	8.23	24	7	52
CBV1	CBV1	Cooling Beds Vent	Steel: 117 tons/hr	N/A	N/A	N/A	24	7	52
FLXSLO1	FLXSLO11	Fluxing Agent Storage Silo No. 1	Fluxing Agent: 3000 scf/min	N/A	N/A	N/A	24	7	52
FLXSLO1	FLXSLO12	Fluxing Agent Storage Silo No. 2	Fluxing Agent: 3000 scf/min	N/A	N/A	N/A	24	7	52
CARBSLO1	CARBSLO1	Carbon Storage Silo No. 1	Coal/Coke: 2050 scf/min	N/A	N/A	N/A	24	7	52
DUSTSLO1	DUSTSLO1	EAF Baghouse Dust Silo	Baghouse Dust: 1300 scf/min	N/A	N/A	N/A	24	7	52
DPEAF1	TR51A	Inside ECS Building Drop Points, Scrap	Scrap: 830 ton/hr	N/A	N/A	N/A	24	7	52
DPEAF1	TR51B	Outside ECS Building Drop Points, Scrap, Storage Area	Scrap: 330 ton/hr	N/A	N/A	N/A	24	7	52
DPEAF1	TR51C	Outside Rail Bins Drop Point, Scrap	Scrap: 110 ton/hr	N/A	N/A	N/A	24	7	52
DPEAF1	TR51D	Outside Truck Mixed Bins Drop Point, Scrap	Scrap: 110 ton/hr	N/A	N/A	N/A	24	7	52
DPEAF1	TR51E	Outside Truck Bins Drop Point, Scrap	Scrap: 110 ton/hr	N/A	N/A	N/A	24	7	52
DPF1	TR71	Inside ECS Building Drop Points, Fluxing Agent	Fluxing Agent: 30 ton/hr	N/A	N/A	N/A	24	7	52
DPAA1	TR81	Outside Drop Points, Alloy Aggregate	Alloy Aggregate: 60 ton/hr	N/A	N/A	N/A	24	7	52
DPRW1	TR91A	Inside Drop Points, Removed Refractory and Other Materials	Removed Refractory / Other Materials: 25 ton/hr	N/A	N/A	N/A	24	7	52
DPRW1	TR91B	Outside Drop Points, Removed Refractory and Other Materials	Removed Refractory / Other Materials: 25 ton/hr	N/A	N/A	N/A	24	7	52
DPS1	TR11A	Outside SPP Pile Drop Points, Slag	Slag: 820 ton/hr	N/A	N/A	N/A	24	7	52
DPS1	TR11B	SPP Material Transfers, Crusher, and Screen	Slag: 5196 ton/hr	N/A	N/A	N/A	24	7	52
DPRS1	TR131	Outside Drop Points, Residual Scrap Pile	Residual Scrap: 25	N/A	N/A	N/A	24	7	52
DPMS1	TR141	Outside Drop Points, Mill Scale Pile	Mill Scale: 60 ton/hr	N/A	N/A	N/A	24	7	52
CR1	CR1	Ball Drop Crushing	Large Slag: 8 ton/hr	N/A	N/A	N/A	24	7	52
EAF1P	W51A	ECS Scrap Building Storage Pile A	Scrap: 6000 sq. ft	N/A	N/A	N/A	24	7	52
EAF1P	W51B	ECS Scrap Building Storage Pile B	Scrap: 5400 sq. ft	N/A	N/A	N/A	24	7	52
EAF1P	W51C	ECS Scrap Building Storage Pile C	Scrap: 5300 sq. ft	N/A	N/A	N/A	24	7	52
EAF1P	W51D	ECS Scrap Building Overage Scrap Pile	Scrap: 12100 sq. ft	N/A	N/A	N/A	24	7	52
EAF1P	W51E	Outside Rail Scrap 5k Pile A	Scrap: 11000 sq. ft	N/A	N/A	N/A	24	7	52
EAF1P	W51F	Outside Rail Scrap 5k Pile B	Scrap: 11000 sq. ft	N/A	N/A	N/A	24	7	52
EAF1P	W51G	Outside Rail Scrap 5k Pile C	Scrap: 11000 sq. ft	N/A	N/A	N/A	24	7	52
EAF1P	W51H	Outside Rail Scrap 5k Pile D	Scrap: 11000 sq. ft	N/A	N/A	N/A	24	7	52
EAF1P	W51I	Outside Truck Mixed 8k Pile A	Scrap: 13600 sq. ft	N/A	N/A	N/A	24	7	52
EAF1P	W51J	Outside Truck Mixed 8k Pile B	Scrap: 14700 sq. ft	N/A	N/A	N/A	24	7	52
EAF1P	W51K	Outside Truck Scrap 5k Pile A	Scrap: 11000 sq. ft	N/A	N/A	N/A	24	7	52
EAF1P	W51L	Outside Truck Scrap 5k Pile B	Scrap: 11000 sq. ft	N/A	N/A	N/A	24	7	52
EAF1P	W51M	Outside Truck Scrap 5k Pile C	Scrap: 11000 sq. ft	N/A	N/A	N/A	24	7	52

Attachment L - Emission Unit Data Sheet (General)

Emission Unit Form Number:		1	3	4	6a	6g	7. Projected operating schedule:		
Emission Unit ID	Emission Point ID	Name or Type and Model	Name(s) and Maximum Process Materials Charged	Name(s) and Maximum Material Produced	Type and Amount of Fuel(s) Burned	Proposed Maximum Design Heat Input (10^6 BTU/hr)	Hours/Day	Days/Week	Weeks/Year
EAF1P	W51N	Outside Truck Scrap 5k Pile D	Scrap: 11000 sq. ft	N/A	N/A	N/A	24	7	52
AAP1	W61	Alloy Aggregate Storage Pile	Alloy Aggregate: 1000 sq. ft	N/A	N/A	N/A	24	7	52
SPP1	W71A	SPP Slag Storage Pile	Slag: 17100 sq. ft	N/A	N/A	N/A	24	7	52
SPP1	W71B	SPP Piles	SPP Product: 17000 sq. ft	N/A	N/A	N/A	24	7	52
RSP1	W81	Residual Scrap Storage Pile in Scrap Yard	Residual Scrap: 21300 sq. ft	N/A	N/A	N/A	24	7	52
MSP1	W111	Mill Scale Pile	Mill Scale: 3500 sq. ft	N/A	N/A	N/A	24	7	52
CTNC11	CTNC11a	Non-Contact Cooling Tower 1 - Cell 1	Water: 11000 gpm	N/A	N/A	N/A	24	7	52
CTNC11	CTNC11b	Non-Contact Cooling Tower 1 - Cell 2	Water: 11000 gpm	N/A	N/A	N/A	24	7	52
CTNC12	CTNC12a	Non-Contact Cooling Tower 2 - Cell 1	Water: 11000 gpm	N/A	N/A	N/A	24	7	52
CTNC12	CTNC12b	Non-Contact Cooling Tower 2 - Cell 2	Water: 11000 gpm	N/A	N/A	N/A	24	7	52
CTC1	CTC1a	Contact Cooling Tower - Cell 1	Water: 5500 gpm	N/A	N/A	N/A	24	7	52
CTC1	CTC1b	Contact Cooling Tower - Cell 2	Water: 5500 gpm	N/A	N/A	N/A	24	7	52
EGEN1	EGEN1	Emergency Generator 1	Diesel - 580 lb/hr	N/A	Diesel - 580 lb/hr	11.2	24	7	52
EFWP1	EFWP1	Emergency Fire Water Pump 1	Diesel - 109 lb/hr	N/A	Diesel - 109 lb/hr	2.1	24	7	52
TORCH1	TORCH1	Cutting Torches	Propane: 3.51 gal/hr Natural Gas: 130 scf/hr	N/A	Propane: 3.51 gal/hr Natural Gas: 130 scf/hr	0.32	24	7	52

Emission Unit Form Number:		1	8. Projected amount of pollutants								
			Controlled Emission Rates (lb/hr)								
Emission Unit ID	Emission Point ID	Name or Type and Model	@ Temp and Pressure (°F & psia)	NO_X	SO_2	CO	PM_{10}	Hydrocarbons	VOC	Lead	Fluorides
EAF1, LMS1	BH1	Meltshop Baghouse	143 °F / Ambient Pressure	35.10	35.10	468.00	38.77	35.10	35.10	0.19	1.16
EAF1, LMS1, CAST1	CV1	Caster Vent	136 °F / Ambient Pressure	8.91	0.85	7.93	1.36	0.81	0.81	9.7E-04	5.9E-03
RMV1	RMV1	Rolling Mill Vent	122 °F / Ambient Pressure	1.17	9.0E-02	0.68	7.3E-02	8.2E-02	8.2E-02	-	-
CBV1	CBV1	Cooling Beds Vent	142 °F / Ambient Pressure	-	-	-	1.0E-02	1.0E-02	1.0E-02	-	-
FLXSLO1	FLXSLO11	Fluxing Agent Storage Silo No. 1	Ambient Temperature / Ambient Pressure	-	-	-	0.13	-	-	-	-
FLXSLO1	FLXSLO12	Fluxing Agent Storage Silo No. 2	Ambient Temperature / Ambient Pressure	-	-	-	0.13	-	-	-	-
CARBSLO1	CARBSLO1	Carbon Storage Silo No. 1	Ambient Temperature / Ambient Pressure	-	-	-	8.8E-02	-	-	-	-
DUSTSLO1	DUSTSLO1	EAF Baghouse Dust Silo	Ambient Temperature / Ambient Pressure	-	-	-	5.6E-02	-	-	-	-
DPEAF1	TR51A	Inside ECS Building Drop Points, Scrap	Ambient Temperature / Ambient Pressure	-	-	-	6.8E-03	-	-	-	-
DPEAF1	TR51B	Outside ECS Building Drop Points, Scrap, Storage Area	Ambient Temperature / Ambient Pressure	-	-	-	1.8E-02	-	-	-	-
DPEAF1	TR51C	Outside Rail Bins Drop Point, Scrap	Ambient Temperature / Ambient Pressure	-	-	-	6.0E-03	-	-	-	-
DPEAF1	TR51D	Outside Truck Mixed Bins Drop Point, Scrap	Ambient Temperature / Ambient Pressure	-	-	-	6.0E-03	-	-	-	-
DPEAF1	TR51E	Outside Truck Bins Drop Point, Scrap	Ambient Temperature / Ambient Pressure	-	-	-	6.0E-03	-	-	-	-
DPF1	TR71	Inside ECS Building Drop Points, Fluxing Agent	Ambient Temperature / Ambient Pressure	-	-	-	1.7E-03	-	-	-	-
DPAA1	TR81	Outside Drop Points, Alloy Aggregate	Ambient Temperature / Ambient Pressure	-	-	-	4.9E-04	-	-	-	-
DPRW1	TR91A	Inside Drop Points, Removed Refractory and Other Materials	Ambient Temperature / Ambient Pressure	-	-	-	2.0E-03	-	-	-	-
DPRW1	TR91B	Outside Drop Points, Removed Refractory and Other Materials	Ambient Temperature / Ambient Pressure	-	-	-	2.0E-03	-	-	-	-
DPS1	TR11A	Outside SPP Pile Drop Points, Slag	Ambient Temperature / Ambient Pressure	-	-	-	8.3E-04	-	-	-	-
DPS1	TR11B	SPP Material Transfers, Crusher, and Screen	Ambient Temperature / Ambient Pressure	-	-	-	8.1E-02	-	-	-	-
DPRS1	TR131	Outside Drop Points, Residual Scrap Pile	Ambient Temperature / Ambient Pressure	-	-	-	2.7E-03	-	-	-	-
DPMS1	TR141	Outside Drop Points, Mill Scale Pile	Ambient Temperature / Ambient Pressure	-	-	-	7.3E-03	-	-	-	-
CR1	CR1	Ball Drop Crushing	Ambient Temperature / Ambient Pressure	-	-	-	4.3E-03	-	-	-	-
EAF1P	W51A	ECS Scrap Building Storage Pile A	Ambient Temperature / Ambient Pressure	-	-	-	3.4E-03	-	-	-	-
EAF1P	W51B	ECS Scrap Building Storage Pile B	Ambient Temperature / Ambient Pressure	-	-	-	3.1E-03	-	-	-	-
EAF1P	W51C	ECS Scrap Building Storage Pile C	Ambient Temperature / Ambient Pressure	-	-	-	3.0E-03	-	-	-	-
EAF1P	W51D	ECS Scrap Building Overage Scrap Pile	Ambient Temperature / Ambient Pressure	-	-	-	4.6E-02	-	-	-	-
EAF1P	W51E	Outside Rail Scrap 5k Pile A	Ambient Temperature / Ambient Pressure	-	-	-	4.1E-02	-	-	-	-
EAF1P	W51F	Outside Rail Scrap 5k Pile B	Ambient Temperature / Ambient Pressure	-	-	-	4.1E-02	-	-	-	-
EAF1P	W51G	Outside Rail Scrap 5k Pile C	Ambient Temperature / Ambient Pressure	-	-	-	4.1E-02	-	-	-	-
EAF1P	W51H	Outside Rail Scrap 5k Pile D	Ambient Temperature / Ambient Pressure	-	-	-	4.1E-02	-	-	-	-
EAF1P	W51I	Outside Truck Mixed 8k Pile A	Ambient Temperature / Ambient Pressure	-	-	-	5.1E-02	-	-	-	-
EAF1P	W51J	Outside Truck Mixed 8k Pile B	Ambient Temperature / Ambient Pressure	-	-	-	5.5E-02	-	-	-	-
EAF1P	W51K	Outside Truck Scrap 5k Pile A	Ambient Temperature / Ambient Pressure	-	-	-	4.1E-02	-	-	-	-
EAF1P	W51L	Outside Truck Scrap 5k Pile B	Ambient Temperature / Ambient Pressure	-	-	-	4.1E-02	-	-	-	-
EAF1P	W51M	Outside Truck Scrap 5k Pile C	Ambient Temperature / Ambient Pressure	-	-	-	4.1E-02	-	-	-	-

Emission Unit Form Number:		1	8. Projected amount of pollutants								
			Controlled Emission Rates (lb/hr)								
Emission Unit ID	Emission Point ID	Name or Type and Model	@ Temp and Pressure (°F & psia)	NO_X	SO_2	CO	PM_{10}	Hydrocarbons	VOC	Lead	Fluorides
EAF1P	W51N	Outside Truck Scrap 5k Pile D	Ambient Temperature / Ambient Pressure	-	-	-	4.1E-02	-	-	-	-
AAP1	W61	Alloy Aggregate Storage Pile	Ambient Temperature / Ambient Pressure	-	-	-	3.0E-04	-	-	-	-
SPP1	W71A	SPP Slag Storage Pile	Ambient Temperature / Ambient Pressure	-	-	-	7.9E-02	-	-	-	-
SPP1	W71B	SPP Piles	Ambient Temperature / Ambient Pressure	-	-	-	1.3E-02	-	-	-	-
RSP1	W81	Residual Scrap Storage Pile in Scrap Yard	Ambient Temperature / Ambient Pressure	-	-	-	0.10	-	-	-	-
MSP1	W111	Mill Scale Pile	Ambient Temperature / Ambient Pressure	-	-	-	2.4E-03	-	-	-	-
CTNC11	CTNC11a	Non-Contact Cooling Tower 1 - Cell 1	Ambient Temperature / Ambient Pressure	-	-	-	7.5E-02	-	-	-	-
CTNC11	CTNC11b	Non-Contact Cooling Tower 1 - Cell 2	Ambient Temperature / Ambient Pressure	-	-	-	7.5E-02	-	-	-	-
CTNC12	CTNC12a	Non-Contact Cooling Tower 2 - Cell 1	Ambient Temperature / Ambient Pressure	-	-	-	7.5E-02	-	-	-	-
CTNC12	CTNC12b	Non-Contact Cooling Tower 2 - Cell 2	Ambient Temperature / Ambient Pressure	-	-	-	7.5E-02	-	-	-	-
CTC1	CTC1a	Contact Cooling Tower - Cell 1	Ambient Temperature / Ambient Pressure	-	-	-	3.8E-02	-	-	-	-
CTC1	CTC1b	Contact Cooling Tower - Cell 2	Ambient Temperature / Ambient Pressure	-	-	-	3.8E-02	-	-	-	-
EGEN1	EGEN1	Emergency Generator 1	600 °F / Ambient Pressure	9.82	1.7E-02	9.21	0.53	0.70	0.70	-	-
EFWP1	EFWP1	Emergency Fire Water Pump 1	848 °F / Ambient Pressure	1.84	3.3E-03	1.73	0.10	0.13	0.13	-	-
TORCH1	TORCH1	Cutting Torches	848 °F / Ambient Pressure	4.6E-02	3.5E-03	2.6E-02	0.20	2.8E-03	2.8E-03	1.6E-07	-

Emission Unit Form Number:		1	9. Proposed Monitoring, Recordkeeping, Reporting, and Testing			
Emission Unit ID	Emission Point ID	Name or Type and Model	Monitoring	Recordkeeping	Reporting	Testing
EAF1, LMS1	BH1	Meltshop Baghouse	See regulatory write-up in the application narrative			
EAF1, LMS1, CAST1	CV1	Caster Vent	See regulatory write-up in the application narrative			
RMV1	RMV1	Rolling Mill Vent	See regulatory write-up in the application narrative			
CBV1	CBV1	Cooling Beds Vent	See regulatory write-up in the application narrative			
FLXSLO1	FLXSLO11	Fluxing Agent Storage Silo No. 1	See regulatory write-up in the application narrative			
FLXSLO1	FLXSLO12	Fluxing Agent Storage Silo No. 2	See regulatory write-up in the application narrative			
CARBSLO1	CARBSLO1	Carbon Storage Silo No. 1	See regulatory write-up in the application narrative			
DUSTSLO1	DUSTSLO1	EAF Baghouse Dust Silo	See regulatory write-up in the application narrative			
DPEAF1	TR51A	Inside ECS Building Drop Points, Scrap	See regulatory write-up in the application narrative			
DPEAF1	TR51B	Outside ECS Building Drop Points, Scrap, Storage Area	See regulatory write-up in the application narrative			
DPEAF1	TR51C	Outside Rail Bins Drop Point, Scrap	See regulatory write-up in the application narrative			
DPEAF1	TR51D	Outside Truck Mixed Bins Drop Point, Scrap	See regulatory write-up in the application narrative			
DPEAF1	TR51E	Outside Truck Bins Drop Point, Scrap	See regulatory write-up in the application narrative			
DPF1	TR71	Inside ECS Building Drop Points, Fluxing Agent	See regulatory write-up in the application narrative			
DPAA1	TR81	Outside Drop Points, Alloy Aggregate	See regulatory write-up in the application narrative			
DPRW1	TR91A	Inside Drop Points, Removed Refractory and Other Materials	See regulatory write-up in the application narrative			
DPRW1	TR91B	Outside Drop Points, Removed Refractory and Other Materials	See regulatory write-up in the application narrative			
DPS1	TR11A	Outside SPP Pile Drop Points, Slag	See regulatory write-up in the application narrative			
DPS1	TR11B	SPP Material Transfers, Crusher, and Screen	See regulatory write-up in the application narrative			
DPRS1	TR131	Outside Drop Points, Residual Scrap Pile	See regulatory write-up in the application narrative			
DPMS1	TR141	Outside Drop Points, Mill Scale Pile	See regulatory write-up in the application narrative			
CR1	CR1	Ball Drop Crushing	See regulatory write-up in the application narrative			
EAF1P	W51A	ECS Scrap Building Storage Pile A	See regulatory write-up in the application narrative			
EAF1P	W51B	ECS Scrap Building Storage Pile B	See regulatory write-up in the application narrative			
EAF1P	W51C	ECS Scrap Building Storage Pile C	See regulatory write-up in the application narrative			
EAF1P	W51D	ECS Scrap Building Overage Scrap Pile	See regulatory write-up in the application narrative			
EAF1P	W51E	Outside Rail Scrap 5k Pile A	See regulatory write-up in the application narrative			
EAF1P	W51F	Outside Rail Scrap 5k Pile B	See regulatory write-up in the application narrative			
EAF1P	W51G	Outside Rail Scrap 5k Pile C	See regulatory write-up in the application narrative			
EAF1P	W51H	Outside Rail Scrap 5k Pile D	See regulatory write-up in the application narrative			
EAF1P	W51I	Outside Truck Mixed 8k Pile A	See regulatory write-up in the application narrative			
EAF1P	W51J	Outside Truck Mixed 8k Pile B	See regulatory write-up in the application narrative			
EAF1P	W51K	Outside Truck Scrap 5k Pile A	See regulatory write-up in the application narrative			
EAF1P	W51L	Outside Truck Scrap 5k Pile B	See regulatory write-up in the application narrative			
EAF1P	W51M	Outside Truck Scrap 5k Pile C	See regulatory write-up in the application narrative			

Attachment L - Emission Unit Data Sheet (General)

Emission Unit Form Number:		1	9. Proposed Monitoring, Recordkeeping, Reporting, and Testing			
Emission Unit ID	Emission Point ID	Name or Type and Model	Monitoring	Recordkeeping	Reporting	Testing
EAF1P	W51N	Outside Truck Scrap 5k Pile D	See regulatory write-up in the application narrative			
AAP1	W61	Alloy Aggregate Storage Pile	See regulatory write-up in the application narrative			
SPP1	W71A	SPP Slag Storage Pile	See regulatory write-up in the application narrative			
SPP1	W71B	SPP Piles	See regulatory write-up in the application narrative			
RSP1	W81	Residual Scrap Storage Pile in Scrap Yard	See regulatory write-up in the application narrative			
MSP1	W111	Mill Scale Pile	See regulatory write-up in the application narrative			
CTNC11	CTNC11a	Non-Contact Cooling Tower 1 - Cell 1	See regulatory write-up in the application narrative			
CTNC11	CTNC11b	Non-Contact Cooling Tower 1 - Cell 2	See regulatory write-up in the application narrative			
CTNC12	CTNC12a	Non-Contact Cooling Tower 2 - Cell 1	See regulatory write-up in the application narrative			
CTNC12	CTNC12b	Non-Contact Cooling Tower 2 - Cell 2	See regulatory write-up in the application narrative			
CTC1	CTC1a	Contact Cooling Tower - Cell 1	See regulatory write-up in the application narrative			
CTC1	CTC1b	Contact Cooling Tower - Cell 2	See regulatory write-up in the application narrative			
EGEN1	EGEN1	Emergency Generator 1	See regulatory write-up in the application narrative			
EFWP1	EFWP1	Emergency Fire Water Pump 1	See regulatory write-up in the application narrative			
TORCH1	TORCH1	Cutting Torches	See regulatory write-up in the application narrative			

UNPAVED HAULROADS & PARKING AREAS (including all equipment traffic involved in process, haul trucks, endloaders, etc.)

		PM	PM-10
k =	Particle Size Multiplier	4.90	1.5
s =	Silt content of road surface material (%)	6	6
p =	Number of days per year with precipitation > 0.01 in.	150	150

Truck ID	Description	Mean Vehicle Weight (tons)	Mean Vehicle Speed (mph)	Daily Miles Traveled (VMT/day)	Annual Miles Traveled (VMT/yr)	Control Device ID Number	Control Efficiency (%)
TRK3	Around Scrap Yard	31	<15 MPH	6.27	371	Watering	80
TRK4	Around Scrap Yard	27.5	<15 MPH	6.27	371	Watering	80
TRK14	Meltshop to Quench Building	31	<15 MPH	6.90	1780	Watering	80
TRK15	Quench Building to SPP Area	31	<15 MPH	1.36	352	Watering	80
TRK16	Within SPP Area	34.5	<15 MPH	1.18	305	Watering	80
TRK17	SPP Area to Off-Site	27.5	<15 MPH	5.24	1351	Watering	80
TRK19	General Support	34.5	<15 MPH	32.31	4166	Watering	80

Source: *AP-42 Fifth Edition – 13.2.2 Unpaved Roads*

[1] Please refer to details in calculations

$E = k \times 5.9 \times (s \div 12) \times (S \div 30) \times (W \div 3)^{0.7} \times (w \div 4)^{0.5} \times ((365 - p) \div 365)$ = lb/Vehicle Mile Traveled (VMT)

Where:

		PM	PM-10
k =	Particle Size Multiplier	4.90	1.5
s =	Silt content of road surface material (%)	6	6
S =	Mean vehicle speed (mph)	<15 MPH	<15 MPH
W =	Mean vehicle weight (tons)	32.29	32.29
p =	Number of days per year with precipitation > 0.01 in.	150	150

For lb/hr: [lb ÷ VMT] × [VMT ÷ trip] × [Trips ÷ Hour] = lb/hr

For TPY: [lb ÷ VMT] × [VMT ÷ trip] × [Trips ÷ Hour] × [Ton ÷ 2000 lb] = Tons/year

SUMMARY OF UNPAVED HAULROAD EMISSIONS

	PM				PM-10			
	Uncontrolled		Controlled		Uncontrolled		Controlled	
Truck ID	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
TRK3	2.25	0.94	0.45	0.19	0.60	0.25	0.12	0.05
TRK4	2.13	0.89	0.43	0.18	0.57	0.24	0.11	0.05
TRK14	2.48	4.52	0.50	0.90	0.66	1.21	0.13	0.24
TRK15	0.49	0.89	0.10	0.18	0.13	0.24	0.03	0.05
TRK16	0.45	0.81	0.09	0.16	0.12	0.22	0.02	0.04
TRK17	1.78	3.25	0.36	0.65	0.48	0.87	0.10	0.17
TRK19	12.19	11.11	2.44	2.22	3.25	2.96	0.65	0.59

Note: Extraneous information unrelated to regulatory requirements and air emissions has been excluded from the application form. Information labeled as "to be determined" (TBD) will be

Attachment L - Fugitive Emissions from Paved Haul Roads

INDUSTRIAL PAVED HAULROADS & PARKING AREAS (including all equipment traffic involved in process, haul trucks, endloaders, etc.)

s =	Surface material silt content (g/m^2)	3.34

Truck ID	Description	Mean Vehicle Weight (tons)	Daily Miles Traveled (VMT/day)	Annual Miles Traveled (VMT/yr)	Control Device ID Number	Control Efficiency (%)
TRK1	Off-Site to ECS Building Scrap Bay	27.5	23.87	3300	Watering + Sweeping	96
TRK2	Off-Site to Scrap Yard	28	31.52	1868	Watering + Sweeping	96
TRK3	Around Scrap Yard	31.0	12.43	736	Watering + Sweeping	96
TRK4	Around Scrap Yard	27.5	12.43	736	Watering + Sweeping	96
TRK5	Off-Site to Silos	28	101.62	688	Watering + Sweeping	96
TRK6	Off-Site to Storage	31	57.63	279	Watering + Sweeping	96
TRK7	Storage to Meltshop	6.0	3.13	15	Watering + Sweeping	96
TRK8	Off-Site to Silos	27.5	152.43	1529	Watering + Sweeping	96
TRK9	Off-Site to Alloy Pile	28	59.23	587	Watering + Sweeping	96
TRK10	Meltshop to Off-Site	27.5	30.98	15	Watering + Sweeping	96
TRK11	Finished Products Storage to Off-	27.5	134.78	26618	Watering + Sweeping	96
TRK12	Off-Site to Gas Storage Area	6.0	53.90	847	Watering + Sweeping	96
TRK13	Mill Scale Pile to Off-Site	28	34.15	17	Watering + Sweeping	96
TRK14	Meltshop to Quench Building	31.0	1.57	405	Watering + Sweeping	96
TRK17	SPP Area to Off-Site	27.5	21.55	5560	Watering + Sweeping	96
TRK18	Trailer Parking Area	15.0	20.71	4090	Watering + Sweeping	96
TRK19	General Support	35	208.07	26834	Watering + Sweeping	96

SUMMARY OF PAVED HAULROAD EMISSIONS

	PM				PM-10			
	Uncontrolled		Controlled		Uncontrolled		Controlled	
Truck ID	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
TRK1	0.96	1.43	0.04	0.06	0.19	0.29	0.01	0.01
TRK2	1.27	0.81	0.05	0.03	0.25	0.16	0.01	0.01
TRK3	0.57	0.36	0.02	0.01	0.11	0.07	0.00	0.00
TRK4	0.50	0.32	0.02	0.01	0.10	0.06	0.00	0.00
TRK5	4.10	0.30	0.16	0.01	0.82	0.06	0.03	0.00
TRK6	2.63	0.14	0.11	0.01	0.53	0.03	0.02	0.00
TRK7	0.03	0.00	0.00	0.00	0.01	0.00	0.00	0.00
TRK8	6.15	0.66	0.25	0.03	1.23	0.13	0.05	0.01
TRK9	2.39	0.26	0.10	0.01	0.48	0.05	0.02	0.00
TRK10	1.25	0.01	0.05	0.00	0.25	0.00	0.01	0.00
TRK11	5.44	11.57	0.22	0.46	1.09	2.31	0.04	0.09
TRK12	0.46	0.08	0.02	0.00	0.09	0.02	0.00	0.00
TRK13	1.38	0.01	0.06	0.00	0.28	0.00	0.01	0.00
TRK14	0.07	0.20	0.00	0.01	0.01	0.04	0.00	0.00
TRK17	0.87	2.42	0.03	0.10	0.17	0.48	0.01	0.02
TRK18	0.45	0.96	0.02	0.04	0.09	0.19	0.00	0.01
TRK19	10.58	14.69	0.42	0.59	2.12	2.94	0.08	0.12

Note: Extraneous information unrelated to regulatory requirements and air emissions has been excluded from the application form. Information labeled as "to be determined" (TBD) will be provided once specific equipment vendors have been selected.

Attachment L - Emission Unit Data Sheet (Storage Tanks)

Form Number:	2	3	4	5	6	7A	7B	7C	8	9A	9B	10A
	Tank Name	Tank Equipment Identification No. (As Assigned on Equipment List Form)	Emission Point Identification No. (As Assigned on Equipment List Form)	Date of Commencement of Construction (For Existing Tanks)	Type of Change	Does the Tank Have More Than One Mode of Operation? (e.g., Is There More Than One Product Stored in the Tank?)	If YES, Explain and Identify Which Mode is Covered by this Application (Note: A Separate Form Must be Completed for Each Mode).	Provide Any Limitations on Source Operation Affecting Emissions, Any Work Practice Standards (e.g. Production Variation, etc.)	Design Capacity (gal)	Tank Internal Diameter (ft)	Tank Internal Height (or Length) (ft)	Maximum Liquid Height (ft)
	Diesel Storage Tank for Emergency Generator No.	DSLTK-GEN1	DSLTK-GEN1	N/A	New Construction	No	N/A	N/A	500	4	6	5
	Diesel Storage Tank for Fire Water Pump No. 1	DSLTK-FWP1	DSLTK-FWP1	N/A	New Construction	No	N/A	N/A	500	4	6	5
	Diesel Storage Tank Supporting On-Site Vehicles	DSLTK-VEH	DSLTK-VEH	N/A	New Construction	No	N/A	N/A	5,000	8.5	12.6	11.6

Attachment L - Emission Unit Data Sheet (Storage Tanks)

Form Number:	2	3	4	10B	11A	11B	12	13A	13B	14	16	18	20A	20B
	Tank Name	Tank Equipment Identification No. (As Assigned on Equipment List Form)	Emission Point Identification No. (As Assigned on Equipment List Form)	Average Liquid Height (ft)	Maximum Vapor Space Height (ft)	Average Vapor Space Height (ft)	Nominal Capacity (gal)	Maximum Annual Throughput (gal/yr)	Maximum Daily Throughput (gal/day)	Turnovers per Year	Tank Fill Method	Type of Tanks (Select All that Apply)	Shell Color	Roof Color
	Diesel Storage Tank for Emergency Generator No.	DSLTK-GEN1	DSLTK-GEN1	3	6	3	500	5,000	500	10	TBD	Horizontal Fixed Roof	TBD	TBD
	Diesel Storage Tank for Fire Water Pump No. 1	DSLTK-FWP1	DSLTK-FWP1	3	6	3	500	5,000	500	10	TBD	Horizontal Fixed Roof	TBD	TBD
	Diesel Storage Tank Supporting On-Site Vehicles	DSLTK-VEH	DSLTK-VEH	6.3	12.6	6.3	5,000	50,000	5,000	10	TBD	Vertical Fixed Roof	TBD	TBD

Form Number:	2	3	4	20C	22A	22B	22C	24A	24B	27	28	29
	Tank Name	Tank Equipment Identification No. (As Assigned on Equipment List Form)	Emission Point Identification No. (As Assigned on Equipment List Form)	Year Last Painted	Is the tank heated?	If YES, Provide the Operating Temperature (°F)	If YES, Please Describe How Heat is Provided to Tank	For Domed Roof, Provide Roof Radius (ft)	For Cone Roof, Provide Slope (ft/ft)	Provide the City and State on Which the Data in this Section are Based	Daily Average Ambient Temperature (°F)	Annual Average Maximum Temperature (°F)
	Diesel Storage Tank for Emergency Generator No.	DSLTK-GEN1	DSLTK-GEN1	N/A	No	N/A	N/A	N/A	N/A	Martinsburg, West Virginia		
	Diesel Storage Tank for Fire Water Pump No. 1	DSLTK-FWP1	DSLTK-FWP1	N/A	No	N/A	N/A	N/A	N/A	Martinsburg, West Virginia		
	Diesel Storage Tank Supporting On-Site Vehicles	DSLTK-VEH	DSLTK-VEH	N/A	No	N/A	N/A	N/A	0.0625	Martinsburg, West Virginia		

Attachment L - Emission Unit Data Sheet (Storage Tanks)

Form Number:	2	3	4	30	31	32	33	34A	34B	35A	35B	36A	36B
	Tank Name	Tank Equipment Identification No. (As Assigned on Equipment List Form)	Emission Point Identification No. (As Assigned on Equipment List Form)	Annual Average Minimum Temperature (°F)	Average Wind Speed (miles/hr)	Annual Average Solar Insulation Factor (BTU/(ft^2·day))	Atmospheric Pressure (psia)	Minimum Average Daily Temperature Range of Bulk Liquid (°F)	Maximum Average Daily Temperature Range of Bulk Liquid (°F)	Minimum Average Operating Pressure Range of Tank (psig)	Maximum Average Operating Pressure Range of Tank (psig)	Minimum Liquid Surface Temperature (°F)	Corresponding Vapor Pressure (psia)
	Diesel Storage Tank for Emergency Generator No.	DSLTK-GEN1	DSLTK-GEN1	See Storage Tank Emissions Calculations Worksheets									
	Diesel Storage Tank for Fire Water Pump No. 1	DSLTK-FWP1	DSLTK-FWP1	See Storage Tank Emissions Calculations Worksheets									
	Diesel Storage Tank Supporting On-Site Vehicles	DSLTK-VEH	DSLTK-VEH	See Storage Tank Emissions Calculations Worksheets									

Attachment L - Emission Unit Data Sheet (Storage Tanks)

Form Number:	2	3	4	37A	37B	38A	38B	39. Provide the following for each liquid or gas to be stored in t				
	Tank Name	Tank Equipment Identification No. (As Assigned on Equipment List Form)	Emission Point Identification No. (As Assigned on Equipment List Form)	Average Liquid Surface Temperature (°F)	Corresponding Vapor Pressure (psia)	Maximum Liquid Surface Temperature (°F)	Corresponding Vapor Pressure (psia)	Material Name or Composition	Liquid Density (lb/gal)	Vapor Molecular Weight (lb/lb-mole)	Maximum True Vapor Pressure (psia)	Maximum Reid Vapor Pressure (psia)
	Diesel Storage Tank for Emergency Generator No.	DSLTK-GEN1	DSLTK-GEN1					Diesel	7.1	0	0.25	N/A
	Diesel Storage Tank for Fire Water Pump No. 1	DSLTK-FWP1	DSLTK-FWP1					Diesel	7.1	0	0.25	N/A
	Diesel Storage Tank Supporting On-Site Vehicles	DSLTK-VEH	DSLTK-VEH					Diesel	7.1	0	0.25	N/A

Attachment L - Emission Unit Data Sheet (Storage Tanks)

Form Number:	2	3	4	ank		40	41. Emission Rate (Remember to attach emissions calculations, including TANKS Summary Sheets if applicable.)				
	Tank Name	Tank Equipment Identification No. (As Assigned on Equipment List Form)	Emission Point Identification No. (As Assigned on Equipment List Form)	Months Storage per Year (Start)	Months Storage per Year (End)	Emission Control Devices (Select as Many as Apply)	Material Name & CAS No.	Breather Loss (lb/yr)	Working Loss (lb/yr)	Annual Loss (lb/yr)	Estimation Method
	Diesel Storage Tank for Emergency Generator No.	DSLTK-GEN1	DSLTK-GEN1	January	December	Does Not Apply	Diesel	0.11	188.00	0.28	EPA Emission Factor
	Diesel Storage Tank for Fire Water Pump No. 1	DSLTK-FWP1	DSLTK-FWP1	January	December	Does Not Apply	Diesel	0.11	188.00	0.28	EPA Emission Factor
	Diesel Storage Tank Supporting On-Site Vehicles	DSLTK-VEH	DSLTK-VEH	January	December	Does Not Apply	Diesel	1.07	188.00	2.69	EPA Emission Factor

15. ATTACHMENT M: AIR POLLUTION CONTROL DEVICE SHEETS

Attachment M - Air Pollution Control Device Sheet (Baghouse)

Form Number:		1	5	11	14. Operation Hours		16	21.	22	24		26	31	32. Proposed Monitoring, Recordkeeping, Reporting, and			
										Emission rate of pollutant (specify) into and out of collector at maximum design operating conditions							
Control Device ID	Emission Point ID	Manufacturer and Model No.	Baghouse Configuration	Baghouse Operation	Max. per Day	Max. per Year	Gas flow rate into the collector (dscfm)	Outlet (gr/scf)	Type of pollutant(s) to be collected (if particulate give specific type)	Pollutant	Outlet (gr/dscf)	How is filter monitored for indications of deterioration (e.g., broken bags)?	Have you included Baghouse Control Device in the Emissions Points Data Summary Sheet?	Monitoring	Recordkeeping	Reporting	Testing
BH1	BH1	TBD	TBD	Continuous	24	8,760	869,880	See Details	PM, PM_{10} & $PM_{2.5}$	Filterable PM Total PM Total PM_{10} Total $PM_{2.5}$	0.0018 0.0052 0.0052 0.0052	Other, specify: BLDS	Yes	See regulatory write-up in the application narrative.			

16. ATTACHMENT N: SUPPORTING EMISSIONS CALCULATIONS

The proposed micro mill and associated operations are expected to generate emissions of the following pollutants:

- Particulate matter (PM);
- Particulate matter with an aerodynamic diameter of less than 10 microns (PM_{10});
- Particulate matter with an aerodynamic diameter of less than 2.5 microns ($PM_{2.5}$);
- Nitrogen oxides (NOX);
- Carbon monoxide (CO);
- Volatile organic compounds (VOCs);
- Sulfur dioxide (SO_2);
- Lead (Pb);
- Fluorides excluding hydrogen fluoride (HF);
- Greenhouse gases (GHGs), including carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O); and
- Hazardous air pollutants (HAPs).

The following sections contain a detailed description of the methodology used to calculate emissions for the proposed emission units and processes at the Facility. Detailed emission calculations for the Project are included in Appendix A. Some of the parameters utilized in the calculations (e.g., surface material silt content, road surface silt loading, building capture efficiency, control efficiencies for drop point and storage pile enclosures and partial enclosures, and control efficiencies for road watering and sweeping) are based on the values of these parameters as accepted by the Maricopa County Air Quality Department (MCAQD) and EPA Region 9 for the PSD permit actions at the CMC operations in Arizona, which are substantially similar to the proposed project. A summary of the Project's proposed hourly and annual PTE is provided in Table 3-1 and Table 3-2 below.

Table 16-1. Summary of Application Proposed Hourly PTE

Emission Unit ID	Emission Point ID	Emission Point Description	Hourly PTE (lb/hr)											
			Filterable PM	Total PM	Total PM_{10}	Total $PM_{2.5}$	NO_x	CO	VOC	SO_2	Pb	Max Single HAP [2]	Total HAP	Fluorides
Meltshop														
EAF1, LMS1	BH1	Meltshop Baghouse	13.42	38.77	38.77	38.77	35.10	468.00	35.10	35.10	0.19	0.44	0.83	1.16
EAF1, LMS1, CAST1	CV1	Caster Vent	1.00	1.36	1.36	1.36	8.91	7.93	0.81	0.85	0.0010	0.11	0.12	0.0059
Rolling Mill														
RMV1	RMV1	Rolling Mill Vent [1]	0.028	0.073	0.073	0.073	1.17	0.68	0.082	0.090	-	0.015	0.015	-
CBV1	CBV1	Cooling Beds Vent [1]	0.010	0.010	0.010	0.010	-	-	0.010	-	-	-	-	-
Material Storage Silos														
FLXSLO1	FLXSLO11	Fluxing Agent Storage Silo No. 1	0.13	0.13	0.13	0.13	-	-	-	-	-	-	-	-
FLXSLO1	FLXSLO12	Fluxing Agent Storage Silo No. 2	0.13	0.13	0.13	0.13	-	-	-	-	-	-	-	-
CARBSLO1	CARBSLO1	Carbon Storage Silo No. 1	0.088	0.088	0.088	0.088	-	-	-	-	-	-	-	-
DUSTSLO1	DUSTSLO1	EAF Baghouse Dust Silo	0.056	0.056	0.056	0.056	-	-	-	-	-	-	-	-
Material Handling														
DPEAF1	TR51A	Inside ECS Building Drop Points, Scrap	0.014	0.014	0.0068	0.00103	-	-	-	-	-	-	-	-
DPEAF1	TR51B	Outside ECS Building Drop Points, Scrap, Storage Area	0.038	0.038	0.018	0.0027	-	-	-	-	-	-	-	-
DPEAF1	TR51C	Outside Rail Bins Drop Point, Scrap	0.013	0.013	0.006	0.0009	-	-	-	-	-	-	-	-
DPEAF1	TR51D	Outside Truck Mixed Bins Drop Point, Scrap	0.013	0.013	0.006	0.0009	-	-	-	-	-	-	-	-
DPEAF1	TR51E	Outside Truck Bins Drop Point, Scrap	0.013	0.013	0.006	0.0009	-	-	-	-	-	-	-	-
DPF1	TR71	Inside ECS Building Drop Points, Fluxing Agent	0.0036	0.0036	0.0017	0.00026	-	-	-	-	-	-	-	-
DPAA1	TR81	Outside Drop Points, Alloy Aggregate	0.0010	0.0010	0.0005	0.00007	-	-	-	-	-	-	-	-
DPRW1	TR91A	Inside Drop Points, Removed Refractory and Other Materials	0.0043	0.0043	0.0020	0.00031	-	-	-	-	-	-	-	-
DPRW1	TR91B	Outside Drop Points, Removed Refractory and Other Materials	0.0043	0.0043	0.002	0.0003	-	-	-	-	-	-	-	-
DPS1	TR11A	Outside SPP Pile Drop Points, Slag	0.0017	0.0017	0.00083	0.00012	-	-	-	-	-	-	-	-
DPS1	TR11B	SPP Material Transfers, Crusher, and Screen	0.17	0.17	0.081	0.012	-	-	-	-	-	-	-	-
DPRS1	TR131	Outside Drop Points, Residual Scrap Pile	0.0057	0.0057	0.0027	0.00041	-	-	-	-	-	-	-	-
DPMS1	TR141	Outside Drop Points, Mill Scale Pile	0.016	0.016	0.0073	0.00111	-	-	-	-	-	-	-	-
CR1	CR1	Ball Drop Crushing	0.0096	0.0096	0.0043	0.00080	-	-	-	-	-	-	-	-
Material Storage Piles														
EAF1P	W51A	ECS Scrap Building Storage Pile A	0.0068	0.0068	0.0034	0.00051	-	-	-	-	-	-	-	-
EAF1P	W51B	ECS Scrap Building Storage Pile B	0.0061	0.0061	0.0031	0.00046	-	-	-	-	-	-	-	-
EAF1P	W51C	ECS Scrap Building Storage Pile C	0.0060	0.0060	0.0030	0.00045	-	-	-	-	-	-	-	-
EAF1P	W51D	ECS Scrap Building Overage Scrap Pile	0.091	0.091	0.046	0.0069	-	-	-	-	-	-	-	-
EAF1P	W51E	Outside Rail Scrap 5k Pile A	0.083	0.083	0.041	0.0063	-	-	-	-	-	-	-	-
EAF1P	W51F	Outside Rail Scrap 5k Pile B	0.083	0.083	0.041	0.0063	-	-	-	-	-	-	-	-
EAF1P	W51G	Outside Rail Scrap 5k Pile C	0.083	0.083	0.041	0.0063	-	-	-	-	-	-	-	-
EAF1P	W51H	Outside Rail Scrap 5k Pile D	0.083	0.083	0.041	0.0063	-	-	-	-	-	-	-	-
EAF1P	W51I	Outside Truck Mixed 8k Pile A	0.10	0.10	0.051	0.0078	-	-	-	-	-	-	-	-
EAF1P	W51J	Outside Truck Mixed 8k Pile B	0.11	0.11	0.055	0.0084	-	-	-	-	-	-	-	-
EAF1P	W51K	Outside Truck Scrap 5k Pile A	0.083	0.083	0.041	0.0063	-	-	-	-	-	-	-	-
EAF1P	W51L	Outside Truck Scrap 5k Pile B	0.083	0.083	0.041	0.0063	-	-	-	-	-	-	-	-
EAF1P	W51M	Outside Truck Scrap 5k Pile C	0.083	0.083	0.041	0.0063	-	-	-	-	-	-	-	-
EAF1P	W51N	Outside Truck Scrap 5k Pile D	0.083	0.083	0.041	0.0063	-	-	-	-	-	-	-	-
AAP1	W61	Alloy Aggregate Storage Pile	0.00061	0.00061	0.00030	0.000046	-	-	-	-	-	-	-	-
SPP1	W71A	SPP Slag Storage Pile	0.16	0.16	0.079	0.0120	-	-	-	-	-	-	-	-

SPP1	W71B	SPP Piles	0.025	0.025	0.013	0.0019	-	-	-	-	-	-	-	-
RSP1	W81	Residual Scrap Storage Pile in Scrap Yard	0.20	0.20	0.099	0.015	-	-	-	-	-	-	-	-
MSP1	W111	Mill Scale Pile	0.0049	0.0049	0.0024	0.00037	-	-	-	-	-	-	-	-
Cooling Towers															
CTNC11	CTNC11a	Non-Contact Cooling Tower 1 - Cell 1	0.11	0.11	0.075	0.00024	-	-	-	-	-	-	-	-
CTNC11	CTNC11b	Non-Contact Cooling Tower 1 - Cell 2	0.11	0.11	0.075	0.00024	-	-	-	-	-	-	-	-
CTNC12	CTNC12a	Non-Contact Cooling Tower 2 - Cell 1	0.11	0.11	0.075	0.00024	-	-	-	-	-	-	-	-
CTNC12	CTNC12b	Non-Contact Cooling Tower 2 - Cell 2	0.11	0.11	0.075	0.00024	-	-	-	-	-	-	-	-
CTC1	CTC1a	Contact Cooling Tower - Cell 1	0.055	0.055	0.038	0.00012	-	-	-	-	-	-	-	-
CTC1	CTC1b	Contact Cooling Tower - Cell 2	0.055	0.055	0.038	0.00012	-	-	-	-	-	-	-	-
Haulroads															
PR1	PR1	Paved Roads	1.56	1.56	0.31	0.077	-	-	-	-	-	-	-	-
UR1	UR1	Unpaved Roads	4.35	4.35	1.16	0.12	-	-	-	-	-	-	-	-
Auxillary Equipment															
EGEN1	EGEN1	Emergency Generator 1	0.53	0.53	0.53	0.53	9.82	9.21	0.70	0.017	-	0.013	0.043	-
EFWP1	EFWP1	Emergency Fire Water Pump 1	0.10	0.10	0.10	0.10	1.84	1.73	0.13	0.0033	-	0.0025	0.0081	-
DSLTK-GEN1	DSLTK-GEN1	Diesel Storage Tank for Emergency Generator No. 1	-	-	-	-	-	-	0.015	-	-	0.0060	0.0078	-
DSLTK-FWP1	DSLTK-FWP1	Diesel Storage Tank for Fire Water Pump No. 1	-	-	-	-	-	-	0.015	-	-	0.0060	0.0078	-
DSLTK-VEH	DSLTK-VEH	Diesel Storage Tank Supporting On-Site Vehicles	-	-	-	-	-	-	0.15	-	-	0.060	0.078	-
TORCH1	TORCH1	Cutting Torches	0.20	0.20	0.20	0.20	0.046	0.026	0.0028	0.0035	1.57E-07	5.67E-04	5.95E-04	-
Total	***Total***		***23.83***	***49.59***	***44.12***	***41.76***	***56.89***	***487.56***	***37.02***	***36.06***	***0.19***	***0.65***	***1.11***	***1.17***

[1] Emissions from the rolling mill vent and the cooling bed vents are conservatively represented using de minimis values. Total rolling mill vent emissions include de minimis values and combustion emissions.

[2] Max Single HAP is: Manganese.

Table 16-2. Summary of Application Proposed Annual PTE

Emission Unit ID	Emission Point ID	Emission Point Description	Annual PTE (tpy)												
			Filterable PM	Total PM	Total PM_{10}	Total $PM_{2.5}$	NO_x	CO	VOC	SO_2	Pb	Fluorides	Max Single HAP [5]	Total HAP	CO_2e
Meltshop															
EAF1, LMS1	BH1	Meltshop Baghouse	58.78	169.82	169.82	169.82	97.50	1,300	97.50	97.50	0.52	3.23	1.21	2.31	119,513
EAF1, LMS1, CAST1	CV1	Caster Vent	2.45	2.57	2.57	2.57	0.49	8.34	0.80	0.49	0.0026	0.016	0.0061	0.016	951
Rolling Mill															
RMV1	RMV1	Rolling Mill Vent [1]	0.010	0.010	0.010	0.010	0.00014	0.00008	0.010	1.07E-05	-	-	0.00033	0.00034	25.75
CBV1	CBV1	Cooling Beds Vent [1]	0.010	0.010	0.010	0.010	-	-	0.010	-	-	-	-	-	-
Material Storage Silos															
FLXSLO1	FLXSLO11	Fluxing Agent Storage Silo No. 1	0.064	0.064	0.064	0.064	-	-	-	-	-	-	-	-	-
FLXSLO1	FLXSLO12	Fluxing Agent Storage Silo No. 2	0.064	0.064	0.064	0.064	-	-	-	-	-	-	-	-	-
CARBSLO1	CARBSLO1	Carbon Storage Silo No. 1	0.044	0.044	0.044	0.044	-	-	-	-	-	-	-	-	-
DUSTSLO1	DUSTSLO1	EAF Baghouse Dust Silo	0.24	0.24	0.24	0.24	-	-	-	-	-	-	-	-	-
Material Handling															
DPEAF1	TR51A	Inside ECS Building Drop Points, Scrap	0.029	0.029	0.014	0.0021	-	-	-	-	-	-	-	-	-
DPEAF1	TR51B	Outside ECS Building Drop Points, Scrap, Storage Area	0.12	0.12	0.058	0.0088	-	-	-	-	-	-	-	-	-
DPEAF1	TR51C	Outside Rail Bins Drop Point, Scrap	0.041	0.041	0.019	0.0029	-	-	-	-	-	-	-	-	-
DPEAF1	TR51D	Outside Truck Mixed Bins Drop Point, Scrap	0.041	0.041	0.019	0.0029	-	-	-	-	-	-	-	-	-
DPEAF1	TR51E	Outside Truck Bins Drop Point, Scrap	0.041	0.041	0.019	0.0029	-	-	-	-	-	-	-	-	-
DPF1	TR71	Inside ECS Building Drop Points, Fluxing Agent	0.0019	0.0019	0.00088	0.00013	-	-	-	-	-	-	-	-	-
DPAA1	TR81	Outside Drop Points, Alloy Aggregate	0.000085	0.000085	0.000040	0.0000061	-	-	-	-	-	-	-	-	-
DPRW1	TR91A	Inside Drop Points, Removed Refractory and Other Materials	0.00024	0.00024	0.00011	0.000017	-	-	-	-	-	-	-	-	-
DPRW1	TR91B	Outside Drop Points, Removed Refractory and Other Materials	0.00024	0.00024	0.00011	0.000017	-	-	-	-	-	-	-	-	-
DPS1	TR11A	Outside SPP Pile Drop Points, Slag	0.00036	0.00036	0.00017	0.000026	-	-	-	-	-	-	-	-	-
DPS1	TR11B	SPP Material Transfers, Crusher, and Screen	0.19	0.19	0.090	0.014	-	-	-	-	-	-	-	-	-
DPRS1	TR131	Outside Drop Points, Residual Scrap Pile	0.00032	0.00032	0.00015	0.000023	-	-	-	-	-	-	-	-	-
DPMS1	TR141	Outside Drop Points, Mill Scale Pile	0.0013	0.0013	0.00060	0.000091	-	-	-	-	-	-	-	-	-
CR1	CR1	Ball Drop Crushing	0.0049	0.0049	0.0022	0.00041	-	-	-	-	-	-	-	-	-
Material Storage Piles															
EAF1P	W51A	ECS Scrap Building Storage Pile A	0.030	0.030	0.015	0.0023	-	-	-	-	-	-	-	-	-
EAF1P	W51B	ECS Scrap Building Storage Pile B	0.027	0.027	0.013	0.0020	-	-	-	-	-	-	-	-	-
EAF1P	W51C	ECS Scrap Building Storage Pile C	0.026	0.026	0.013	0.0020	-	-	-	-	-	-	-	-	-
EAF1P	W51D	ECS Scrap Building Overage Scrap Pile	0.40	0.40	0.20	0.030	-	-	-	-	-	-	-	-	-
EAF1P	W51E	Outside Rail Scrap 5k Pile A	0.36	0.36	0.18	0.028	-	-	-	-	-	-	-	-	-
EAF1P	W51F	Outside Rail Scrap 5k Pile B	0.36	0.36	0.18	0.028	-	-	-	-	-	-	-	-	-
EAF1P	W51G	Outside Rail Scrap 5k Pile C	0.36	0.36	0.18	0.028	-	-	-	-	-	-	-	-	-
EAF1P	W51H	Outside Rail Scrap 5k Pile D	0.36	0.36	0.18	0.028	-	-	-	-	-	-	-	-	-
EAF1P	W51I	Outside Truck Mixed 8k Pile A	0.45	0.45	0.22	0.034	-	-	-	-	-	-	-	-	-
EAF1P	W51J	Outside Truck Mixed 8k Pile B	0.49	0.49	0.24	0.037	-	-	-	-	-	-	-	-	-
EAF1P	W51K	Outside Truck Scrap 5k Pile A	0.36	0.36	0.18	0.028	-	-	-	-	-	-	-	-	-
EAF1P	W51L	Outside Truck Scrap 5k Pile B	0.36	0.36	0.18	0.028	-	-	-	-	-	-	-	-	-
EAF1P	W51M	Outside Truck Scrap 5k Pile C	0.36	0.36	0.18	0.028	-	-	-	-	-	-	-	-	-

EAF1P	W51N	Outside Truck Scrap 5k Pile D	0.36	0.36	0.18	0.028	-	-	-	-	-	-	-	-	-
AAP1	W61	Alloy Aggregate Storage Pile	0.0027	0.0027	0.0013	0.00020	-	-	-	-	-	-	-	-	-
SPP1	W71A	SPP Slag Storage Pile	0.70	0.70	0.35	0.053	-	-	-	-	-	-	-	-	-
SPP1	W71B	SPP Piles	0.11	0.11	0.055	0.0083	-	-	-	-	-	-	-	-	-
RSP1	W81	Residual Scrap Storage Pile in Scrap Yard	0.87	0.87	0.43	0.066	-	-	-	-	-	-	-	-	-
MSP1	W111	Mill Scale Pile	0.021	0.021	0.011	0.0016	-	-	-	-	-	-	-	-	-
Cooling Towers															
CTNC11	CTNC11a	Non-Contact Cooling Tower 1 - Cell 1	0.48	0.48	0.33	0.0010	-	-	-	-	-	-	-	-	-
CTNC11	CTNC11b	Non-Contact Cooling Tower 1 - Cell 2	0.48	0.48	0.33	0.0010	-	-	-	-	-	-	-	-	-
CTNC12	CTNC12a	Non-Contact Cooling Tower 2 - Cell 1	0.48	0.48	0.33	0.0010	-	-	-	-	-	-	-	-	-
CTNC12	CTNC12b	Non-Contact Cooling Tower 2 - Cell 2	0.48	0.48	0.33	0.0010	-	-	-	-	-	-	-	-	-
CTC1	CTC1a	Contact Cooling Tower - Cell 1	0.24	0.24	0.16	0.0005	-	-	-	-	-	-	-	-	-
CTC1	CTC1b	Contact Cooling Tower - Cell 2	0.24	0.24	0.16	0.0005	-	-	-	-	-	-	-	-	-
Haulroads															
PR1	PR1	Paved Roads	1.37	1.37	0.27	0.067	-	-	-	-	-	-	-	-	-
UR1	UR1	Unpaved Roads	4.49	4.49	1.20	0.12	-	-	-	-	-	-	-	-	-
Auxillary Equipment															
EGEN1	EGEN1	Emergency Generator 1	0.026	0.026	0.026	0.026	0.49	0.460	0.035	0.00087	-	-	0.00066	0.0022	91.62
EFWP1	EFWP1	Emergency Fire Water Pump 1	0.0049	0.0049	0.0049	0.0049	0.09	0.086	0.007	0.00016	-	-	0.00012	0.00041	17.18
DSLTK-GEN1	DSLTK-GEN1	Diesel Storage Tank for Emergency Generator No. 1	-	-	-	-	-	-	0.00014	-	-	-	0.000055	0.000071	-
DSLTK-FWP1	DSLTK-FWP1	Diesel Storage Tank for Fire Water Pump No. 1	-	-	-	-	-	-	0.00014	-	-	-	0.000055	0.000071	-
DSLTK-VEH	DSLTK-VEH	Diesel Storage Tank Supporting On-Site Vehicles	-	-	-	-	-	-	0.0013	-	-	-	0.00053	0.00070	-
TORCH1	TORCH1	Cutting Torches	0.19	0.19	0.19	0.19	4.17E-06	2.42E-06	2.56E-07	3.21E-07	1.44E-11	-	1.13E-05	1.19E-05	0.89
Total	***Total***		***77***	***188***	***179***	***174***	***99***	***1,309***	***98***	***98***	***0.52***	***3.25***	***1.22***	***2.33***	***120,600***
Major NSR Applicability															
Pollutant Attainment Status			-	-	Attainment	Attainment	Attainment	Attainment	Attainment	Attainment	Attainment	-	-	-	-
Potentially Applicable Major NSR Program			PSD	-	PSD	PSD	PSD	PSD	PSD	PSD	PSD	PSD	-	-	PSD
Major NSR "Major Source" Threshold [2, 4]			100	-	100	100	100	100	100	100	100	100	-	-	-
Title V Threshold [4]			100	-	100	100	100	100	100	100	-	-	10	25	100,000
Project Exceeds Major NSR "Major Source" Threshold?			No	-	Yes	Yes	No	Yes	No	No	No	No	-	-	No
Project Exceeds Title V Thresholds?			No	-	Yes	Yes	No	Yes	No	No	-	-	No	No	Yes
PSD Significant Emission Rates (SERs) [3]			25	-	15	10	40	100	40	40	0.6	3	-	-	75,000
Project Meets or Exceeds PSD SER?			Yes	-	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	-	-	Yes

[1] Emissions from the rolling mill vent and the cooling bed vents are conservatively represented using de minimis values. Total rolling mill vent emissions include de minimis values and combustion emissions.
[2] Major source per 40 CFR 52.21(b). NOx is a regulated NSR pollutant for purposes of evaluating PSD applicability because NOx, as measured in the ambient air as nitrogen dioxide (NO2), is a pollutant for which a national ambient air quality standard (NAAQS) has been promulgated (see 40 CFR 50.11).
[3] PSD Significant Emission Rates (SERs) as defined in 40 CFR 52.21.
[4] VOC is not a criteria pollutant but is considered to be a precursor to ozone. Stated value corresponds to the ozone threshold.
[5] Max Single HAP is: Manganese.

16.1 Electric Arc Furnace (EAF) and Ladle Metallurgy Station (LMS)

The proposed EAF and LMS have the potential to emit criteria pollutants, fluorides excluding hydrogen fluoride (HF), GHGs, and HAPs. The majority of emissions from the EAF and the LMS are captured and vented to the meltshop baghouse. The meltshop baghouse will have a 99.5% capture efficiency; the remaining 0.5% of uncaptured emissions from the EAF, LMS, and canopy hood exhaust streams will be routed through the caster vent.

16.1.1 PM Emissions

Emissions of PM, PM_{10}, and $PM_{2.5}$ from the meltshop baghouse are calculated based on the outlet baghouse grain loading proposed as BACT and the anticipated air flow rate to the baghouse. The grain loading proposed as BACT is discussed in more detail in Section 23 of the application. Note that pursuant to 77 FR 65107, October 25, 2012, calculated PM emissions include filterable particulate emissions only whereas PM_{10} and $PM_{2.5}$ include both filterable and condensable fractions.

At the time of application, project engineering was still in progress and the flowrate has not been finalized. The flowrate presented in this application is the maximum anticipated and incorporates a conservative buffer. The final equipment flowrate will be at or under this flowrate representation.

Hourly and annual emissions of PM, PM_{10}, and $PM_{2.5}$ from the meltshop baghouse are calculated according to the following equations:

$$\text{Hourly Emissions}\left(\frac{\text{lb}}{\text{hr}}\right) = \text{Emission Factor}\left(\frac{\text{gr}}{\text{dscf}}\right) \text{x Flow Rate}\left(\frac{\text{dscf}}{\text{min}}\right) \text{ x } \frac{1}{7{,}000}\left(\frac{\text{lb}}{\text{gr}}\right) \text{ x } 60\left(\frac{\text{min}}{\text{hr}}\right)$$

$$\text{Annual Emissions}\left(\frac{\text{ton}}{\text{yr}}\right) = \text{Hourly Emissions}\left(\frac{\text{lb}}{\text{hr}}\right) \text{ x } 8{,}760\left(\frac{\text{hr}}{\text{yr}}\right) \text{ x } \frac{1}{2{,}000}\left(\frac{\text{ton}}{\text{lb}}\right)$$

The hourly and annual emission for uncaptured emissions from the EAF and LMS is back-calculated using the 99.5% capture efficiency, the 95% baghouse efficiency, and the 99% building capture efficiency according to the following equation:

$$\text{Fugitive Emissions}\left(\frac{\text{lb}}{\text{hr}} \text{ or tpy}\right) = \text{MBER}\left(\frac{\text{lb}}{\text{hr}} \text{ or tpy}\right) \text{ x } \frac{100}{100 - \text{BE}(\%)} \text{ x } \frac{100 - \text{DEC CE}(\%)}{\text{DEC CE}(\%)} * \frac{100 - \text{BCE}(\%)}{100}$$

Where,

MBER = Meltshop Baghouse Emission Rate
BE = Baghouse Efficiency (95%)
DEC CE = Direct Evacuation Control Capture Efficiency (99.5%)
BCE = Building Capture Efficiency (90%)[9]

[1] Pursuant to "Preliminary Determination/Fact Sheet for the Construction of Nucor Steel West Virginia LLC West Virginia Steel Mill, Permit Number: R14-0039" dated March 29, 2022.

16.1.2 Criteria Pollutants (Except for PM) and Fluoride Emissions

Emissions of NO_X, CO, VOC, SO_2, Pb, and fluorides excluding hydrogen fluoride (HF) from the proposed meltshop baghouse are calculated based on emission factors and proposed micro mill's anticipated steel production rate. The emission limits proposed as BACT for NO_X, CO, VOC, SO_2, and Pb are used as short-term emission factors to calculate hourly and annual emissions.[10] The emission limits proposed as BACT are discussed in more detail in Section 23 of this application. The fluorides emission factor is based on process knowledge and a review of the Reasonably Available Control Technology (RACT)/BACT/Lowest Achievable Emission Reduction (LAER) Clearinghouse (RBLC).

Hourly and annual emissions of NO_X, CO, VOC, SO_2, Pb, and fluorides from the proposed meltshop baghouse are calculated according to the following equations:

$$\text{Hourly Emissions}\left(\frac{\text{lb}}{\text{hr}}\right) = \text{Short Term EF}\left(\frac{\text{lb}}{\text{ton}}\right) \text{ x Hourly Steel Production}\left(\frac{\text{ton}}{\text{hr}}\right)$$

$$\text{Annual Emissions}\left(\frac{\text{ton}}{\text{yr}}\right) = \text{Long Term EF}\left(\frac{\text{lb}}{\text{ton}}\right) \text{ x Annual Steel Production}\left(\frac{\text{ton}}{\text{yr}}\right) \text{ x } \frac{1}{2{,}000}\left(\frac{\text{ton}}{\text{lb}}\right)$$

Where,

EF = Emission factor

Uncaptured short-term and long-term emission factors for emissions of NO_X, CO, VOC, SO_2, Pb, and fluorides from the proposed EAF and LMS and the uncaptured emission factors for emissions of fluorides from the EAF are back-calculated using the 99.5% capture efficiency and the meltshop baghouse emission factors using the following equations:

$$\text{Short Term EF}\left(\frac{\text{lb}}{\text{ton}}\right) = \text{Baghouse Short Term EF}\left(\frac{\text{lb}}{\text{ton}}\right) \text{ x } \frac{100 - \text{CE (\%)}}{\text{CE (\%)}}$$

$$\text{Long Term EF}\left(\frac{\text{lb}}{\text{ton}}\right) = \text{Baghouse Long Term EF}\left(\frac{\text{lb}}{\text{ton}}\right) \text{ x } \frac{100 - \text{CE (\%)}}{\text{CE (\%)}}$$

Where,

EF = Emission factor

CE = Capture efficiency

The hourly and annual uncaptured NO_X, CO, VOC, SO_2, Pb, and fluorides emissions from the proposed EAF and LMS and the hourly and annual uncaptured Fluorides emissions from the EAF and are calculated using the following equations:

$$\text{Hourly Emissions}\left(\frac{\text{lb}}{\text{hr}}\right) = \text{Short Term EF}\left(\frac{\text{lb}}{\text{ton}}\right) \text{x Hourly Steel Production}\left(\frac{\text{ton}}{\text{hr}}\right)$$

$$\text{Annual Emissions}\left(\frac{\text{ton}}{\text{yr}}\right) = \text{Long Term EF}\left(\frac{\text{lb}}{\text{ton}}\right) \text{x Annual Steel Production}\left(\frac{\text{ton}}{\text{yr}}\right) \text{ x } \frac{1}{2{,}000}\left(\frac{\text{ton}}{\text{lb}}\right)$$

[10] As noted in item 7c of the EPA letter to Colorado Department of Public Health and Environment, Ref: 8P-AR, concerning "Proposed Short Term Limits Policy."

Where,

EF = Emission factor

16.1.3 GHG Emissions

Emissions of GHGs are calculated as emissions of CO_2 and then converted to CO_2e. Annual CO_2e emissions from the proposed EAF and LMS are calculated using the CO_2 emission factor, annual proposed steel production rate, and the global warming potential (GWP) of CO_2 from Table A-1 of 40 CFR Part 98. The CO_2 emission factor is determined from stack tests performed on a similar baghouse at CMC's Durant, OK and Mesa, AZ facilities (other ECS micro-mills which are substantially similar to the proposed Project). The stack gas CO_2 concentration and moisture content measured during the source tests are used to develop the CO_2 emission rate using the following equation based on 40 CFR Part 98, Subpart Q, Equation Q-8 and 40 CFR §98.173(b)(2)(iii):

$$\text{SSER}\left(\frac{\text{metric ton}}{\text{hr}}\right) = 5.18 \text{ x } 10^{-7} \text{ x STC } (\%, \text{dry basis}) \text{ x Q}\left(\frac{\text{scf}}{\text{hr}}\right) \text{ x } \frac{100 - \text{ MC } (\%)}{100}$$

Where,

SSER = Site-specific CO_2 emission rate

STC = Concentration of CO_2 measured during the stack test

Q = Hourly stack gas volumetric flow rate measured during the stack test

MC = Moisture content measured during the stack test

The CO_2 emission factor is developed from the CO_2 emission rate and the hourly steel production rate at the time of the stack tests:

$$\text{Emission Factor}\left(\frac{\text{metric ton}}{\text{metric ton}}\right) = \text{SSER}\left(\frac{\text{metric ton}}{\text{hr}}\right) \text{ x } \frac{1}{\text{Hourly Steel Production}}\left(\frac{\text{hr}}{\text{metric ton}}\right)$$

Where,

SSER = Site-specific CO_2 emission rate

The maximum emission factor is then selected to account for possible variations in the carbon source at the proposed Project and its potential impact on emissions. Annual CO_2e emissions from the meltshop baghouse are calculated using the following equation:

$$\text{Annual Emissions (tpy)} = \text{Emission Factor}\left(\frac{\text{metric ton}}{\text{metric ton}}\right) \text{ x Annual Steel Production}\left(\frac{\text{ton}}{\text{yr}}\right) \text{ x } CO_2 \text{ GWP}$$

Uncaptured emissions from the EAF and LMS are back-calculated using the 99.5% capture efficiency and the calculated meltshop baghouse emissions. The annual uncaptured GHG emissions from the EAF and LMS are calculated using the following equation:

$$\text{Annual Emissions (tpy)} = \text{Baghouse Annual Emissions (tpy) x } \frac{100 - \text{CE } (\%)}{\text{CE } (\%)}$$

Where,

CE = Capture efficiency

16.1.4 HAP Emissions

Emissions of HAPs are based on emission factors and the anticipated steel production rate at the Facility. Emission factors for the EAF and LMS captured HAP emissions are based on process experience from other CMC micro mills. Emission factors for the EAF and LMS uncaptured emissions are back-calculated from the 99.5% capture efficiency and the meltshop baghouse HAP emission factors using the following equation:

$$\text{Uncaptured Emission Factor}\left(\frac{\text{lb}}{\text{ton}}\right) = \text{Baghouse Emission Factor}\left(\frac{\text{lb}}{\text{ton}}\right) \text{ x } \frac{100 - \text{CE (\%)}}{\text{CE (\%)}}$$

Hourly and annual emissions of HAPs from the EAF and LMS for captured and uncaptured emissions are calculated using the following equations:

$$\text{Hourly Emissions}\left(\frac{\text{lb}}{\text{hr}}\right) = \text{Emission Factor}\left(\frac{\text{lb}}{\text{ton}}\right) \text{x Hourly Steel Production}\left(\frac{\text{ton}}{\text{hr}}\right)$$

$$\text{Annual Emissions}\left(\frac{\text{ton}}{\text{yr}}\right) = \text{Emission Factor}\left(\frac{\text{lb}}{\text{ton}}\right) \text{ x Annual Steel Production}\left(\frac{\text{ton}}{\text{yr}}\right) \text{ x } \frac{1}{2{,}000}\left(\frac{\text{ton}}{\text{lb}}\right)$$

16.2 Rolling Mill and Cooling Beds Vents

The proposed micro mill's rolling mill and cooling beds will each have an associated building roof vent (i.e., the rolling mill vent and the cooling bed vent). The rolling mill has the potential to emit PM, PM_{10}, $PM_{2.5}$, and VOC via the rolling mill vent. The cooling beds have the potential to emit PM, PM_{10}, $PM_{2.5}$, and VOC via the cooling beds vent. Emissions from the rolling mill and cooling beds vents are expected to be negligible; as such, de minimis values are assumed as a conservative representation of the hourly and annual emission rates from the vents. Emissions from the bit furnaces are also vented from the rolling mill vents and are therefore also included in the rolling mill vent emissions.

16.3 Silos

The proposed silos have the potential to emit PM, PM_{10}, and $PM_{2.5}$. Emissions from the silos are each controlled by their own bin vent (the bin vents are primarily used for material recovery purposes). Emissions from the silos, via the bin vents, only occur when the silos are being loaded, which occurs at the base of the silo during truck deliveries (fluxing agent and carbon silos) and during the transfer of dust from the baghouse (baghouse dust silo). Loading the silo at the base forces air through the top of the silo through the bin vent and into the atmosphere. During the unloading of the silos, air is pulled into the silo through the bin vent. During the unloading of the baghouse dust from the silo, any resulting exhaust is routed back to the silo and the associated fabric filter.

Emissions of PM, PM_{10}, and $PM_{2.5}$ are calculated based on the fabric filter or baghouse outlet grain loading and the anticipated air flow rates. The grain loadings proposed as BACT are used to calculate emissions and are discussed in more detail in Section 23 of this application. Annual emission calculations are conservatively calculated using a reasonable upper bound for all silos other than the EAF Baghouse Dust silo, and 8,760 annual operating hours for the baghouse dust silo. The following equations are used to calculate hourly and annual PM, PM_{10}, and $PM_{2.5}$ emissions:

$$\text{Hourly Emissions}\left(\frac{\text{lb}}{\text{hr}}\right) = \text{Emission Factor}\left(\frac{\text{gr}}{\text{dscf}}\right) \text{ x Flow Rate}\left(\frac{\text{dscf}}{\text{min}}\right) \text{ x } \frac{1}{7{,}000}\left(\frac{\text{lb}}{\text{gr}}\right) \text{ x } 60\left(\frac{\text{min}}{\text{hr}}\right)$$

$$\text{Annual Emissions}\left(\frac{\text{ton}}{\text{yr}}\right)=\text{Hourly Emissions}\left(\frac{\text{lb}}{\text{hr}}\right)\text{ x Annual Operating Hours}\left(\frac{\text{hr}}{\text{yr}}\right)\text{ x }\frac{1}{2{,}000}\left(\frac{\text{ton}}{\text{lb}}\right)$$

16.4 Caster Teeming

Caster teeming operations have the potential to emit PM, PM_{10}, $PM_{2.5}$, and VOC. Emissions from caster teeming will be routed to the caster vent. Emissions are determined from emission factors and proposed micro mill and Facility's respective maximum steel production rates.

No emission factors are available for teeming associated with continuous casting so 10% of the factor for PM emissions from conventional ingot teeming of unleaded steel (uncontrolled) from AP-42 Section 12.5, Table 12.5-1, January 1995 and 10% of the factor for VOC emissions from conventional ingot teeming of unleaded steel (SCC 3-03-009) from the Point Sources Committee's *Emission Inventory Improvement Program: Uncontrolled Emission Factor Listing for Criteria Air Pollutants*, July 2001 are used. The 10% assumptions are used because (1) the transfer of steel from ladles to the tundish to the mold for continuous casting is more enclosed than the transfer for conventional ingot casting and (2) the continuous caster mold is water-cooled while conventional molds are not. The emission factors for PM_{10} and $PM_{2.5}$ are conservatively assumed to be equal to the emission factor for PM.

The following equations are used to calculate hourly and annual PM, PM_{10}, $PM_{2.5}$, and VOC emissions from caster teeming emitted through each of the caster vent:

$$\text{Hourly Emissions}\left(\frac{\text{lb}}{\text{hr}}\right)=\text{Emission Factor}\left(\frac{\text{lb}}{\text{ton}}\right)\text{x Hourly Steel Production}\left(\frac{\text{ton}}{\text{hr}}\right)$$

$$\text{Annual Emissions}\left(\frac{\text{ton}}{\text{yr}}\right)=\text{Emission Factor}\left(\frac{\text{lb}}{\text{ton}}\right)\text{x Annual Steel Production}\left(\frac{\text{ton}}{\text{yr}}\right)\text{ x }\frac{1}{2{,}000}\left(\frac{\text{ton}}{\text{lb}}\right)$$

16.5 Cooling Towers

The proposed cooling towers (two non-contact and one contact) have the potential to emit PM, PM_{10}, and $PM_{2.5}$. Each of the three cooling towers will be equipped with two individual cells. Some of the liquid will become entrained in the air stream and will be carried out of the towers as drift droplets. These droplets will contain dissolved solids that contribute to potential particulate emissions. Potential emissions from the proposed replacement cooling towers are based on the anticipated maximum cooling water flow rate, the anticipated maximum Total Dissolved Solids (TDS) content, and the drift loss percentage. The drift loss percentage proposed as BACT is used in the emission calculations. The drift loss percentage proposed as BACT is discussed in more detail in Section 23 of this application. All potential PM, PM_{10}, and $PM_{2.5}$ emissions from the cooling towers are determined using the Reisman and Frisbie method.[11] Annual emissions are based on 8,760 hours of normal operation for the cooling tower.

16.6 Fuel Combustion

The sources of fuel combustion emissions will be as follows.

- Three ladle preheaters;

[11] Per Calculating Realistic PM_{10} Emissions from Cooling Towers. Joel Reisman and Gordon Frisbie, 2003.

- Two ladle dryers;
- Two tundish preheaters;
- One tundish dryer;
- One tundish mandril dryer;
- One shroud heater;
- Twenty Melt Shop comfort heaters;
- Twenty Rolling Mill comfort heaters
- One bit furnace; and
- Cutting Torches.

The combustion sources will utilize propane fuel or natural gas. The proposed sources of propane and natural gas combustion have the potential to emit criteria pollutants, GHGs, and HAPs.

16.6.1 Criteria Pollutant Emissions

Emissions of PM, PM_{10}, $PM_{2.5}$, NO_X, CO, VOC, and SO_2 from each combustion emission source type are calculated based on the anticipated total heat input rating, the annual utilization percentage, and emission factors. Emission factors for PM, PM_{10}, $PM_{2.5}$, NOx, CO, VOC, SO_2, and lead are based on the proposed BACT as described in Section 23 of this application and are generally equivalent to the factors in AP-42 Section 1.5, dated July 2008 for propane combustion or AP-42 Section 1.4, dated July 1998 for natural gas combustion. All emission factors are converted to a lb/MMBtu basis and the maximum factor from propane or natural ga combustion is used to complete the calculations.

Hourly and annual emissions are calculated using the following two equations, respectively:

$$\text{Hourly Emissions}\left(\frac{\text{lb}}{\text{hr}}\right) = \text{Maximum EF}\left(\frac{\text{lb}}{\text{MMBtu}}\right) \text{ x Hourly THIR}\left(\frac{\text{MMBtu}}{\text{hr}}\right)$$

$$\text{Annual Emissions}\left(\frac{\text{ton}}{\text{yr}}\right) = \text{Maximum EF}\left(\frac{\text{lb}}{\text{MMBtu}}\right) \text{ x Hourly THIR}\left(\frac{\text{MMBtu}}{\text{hr}}\right) \text{ x } 8{,}760\left(\frac{\text{hr}}{\text{yr}}\right) \text{ x } \frac{\text{AU }(\%)}{100} \text{ x } \frac{1}{2{,}000}\left(\frac{\text{ton}}{\text{lb}}\right)$$

Where,

Maximum EF = Maximum emission factor between propane and natural gas
THIR = Total heat input rate
AU = Annual utilization

16.6.2 GHG Emissions

Emissions of the GHGs CO_2, CH_4, and N_2O are calculated from the anticipated total heat rating for each combustion source type and emission factors. The emission factors for CO_2 are obtained from 40 CFR Part 98, Table C–1 to Subpart C, December 2016, for natural gas and propane. Emission factors for CH_4 and N_2O are obtained from 40 CFR Part 98, Table C–2 to Subpart C, December 2016, for natural gas and propane. The following equation is used to calculate annual GHG specie emissions:

$$\text{Annual Emissions}\left(\frac{\text{ton}}{\text{yr}}\right) = \text{Maximum EF}\left(\frac{\text{lb}}{\text{MMBtu}}\right) \text{ x Hourly THIR}\left(\frac{\text{MMBtu}}{\text{hr}}\right) \text{ x } 8{,}760\left(\frac{\text{hr}}{\text{yr}}\right) \text{ x } \frac{\text{AU }(\%)}{100} \text{ x } \frac{1}{2{,}000}\left(\frac{\text{ton}}{\text{lb}}\right)$$

Where,

Maximum EF = Maximum emission factor between propane and natural gas
THIR = Total heat input rate
AU = Annual utilization

The emissions of CO_2, CH_4, and N_2O along with each respective global warming potential are used to calculate the emissions of CO_2e. The global warming potentials for the GHGs are obtained from 40 CFR Part 98, Table A-1, December 2014. The following equation is used to calculate annual CO_2e emissions:

$$\text{Annual Emissions}\left(\frac{\text{ton}}{\text{yr}}\right) = \sum_{i}\left[\text{GWP}_i \text{ x Annual Emissions}_i\left(\frac{\text{ton}}{\text{yr}}\right)\right]$$

Where,

GWP = Global warming potential
i = CO_2, CH_4, N_2O

16.6.3 HAP Emissions

No HAP emissions are contained in AP-42 for propane combustion. Therefore, emissions of HAPs are calculated from the anticipated total heat input rating, the annual utilization, and natural gas combustion emission factors. Natural gas combustion HAP emission factors are from AP-42 Section 1.4, Tables 1.4-3 and 1.4-4, July 1998. The following two equations are used to calculate the hourly and annual HAP emissions from natural gas combustion sources:

$$\text{Hourly Emissions}\left(\frac{\text{lb}}{\text{hr}}\right) = \text{EF}\left(\frac{\text{lb}}{\text{MMscf}}\right) \text{ x Hourly THIR}\left(\frac{\text{MMBtu}}{\text{hr}}\right) \text{ x } \frac{1}{1{,}020}\left(\frac{\text{scf}}{\text{Btu}}\right)$$

$$\text{AE}\left(\frac{\text{ton}}{\text{yr}}\right) = \text{EF}\left(\frac{\text{lb}}{\text{MMscf}}\right) \text{ x Hourly THIR}\left(\frac{\text{MMBtu}}{\text{hr}}\right) \text{ x } 8{,}760\left(\frac{\text{hr}}{\text{yr}}\right) \text{ x } \frac{\text{AU }(\%)}{100} \text{ x } \frac{1}{1{,}020}\left(\frac{\text{scf}}{\text{Btu}}\right) \text{ x } \frac{1}{2{,}000}\left(\frac{\text{ton}}{\text{lb}}\right)$$

Where,

EF = Emission Factor
THIR = Total heat input rate
AE = Annual Emissions

16.7 Binder Usage

The proposed usage of binder for tundish and ladle refractory repair and replacement has the potential to emit PM, PM_{10}, $PM_{2.5}$, CO, and VOC. Emissions from the binder usage will enter the atmosphere through the caster vent. Emissions are calculated using emission factors and the proposed rate of binder usage.

The binder usage emission factors for PM, PM_{10}, $PM_{2.5}$, and CO emissions are based on process experience from other CMC micro mills. The binder usage emission factors for VOC emissions are based on an estimated percent of binder resin pyrolyzed/oxidized. The percent of binder resin pyrolyzed/oxidized is estimated based on safety data sheets and an emission report from the vendor. The following equations are used to calculate hourly and annual emissions from binder usage, respectively:

$$\text{Hourly Emissions}\left(\frac{\text{lb}}{\text{hr}}\right) = \text{Emission Factor}\left(\frac{\text{lb}}{\text{lb}}\right) \text{x Hourly Binder Usage}\left(\frac{\text{lb}}{\text{hr}}\right)$$

$$\text{Annual Emissions}\left(\frac{\text{ton}}{\text{yr}}\right) = \text{Emission Factor}\left(\frac{\text{lb}}{\text{lb}}\right) \text{ x Annual Binder Usage}\left(\frac{\text{ton}}{\text{yr}}\right)$$

16.8 Material Transfers

Emissions from material transfers are expected to occur when transferring the following types of materials:

- Scrap;
- Fluxing agent;
- Alloy aggregate;
- Spent refractory/other waste;
- Slag;
- Residual scrap; and
- Mill scale.

The proposed material transfers have the potential to emit PM, PM_{10}, and $PM_{2.5}$. Emissions of PM, PM_{10}, and $PM_{2.5}$ from material transfers are calculated based on emission factors, the maximum throughput of material, the fine content of the material, and control efficiencies from partial enclosures, if applicable. Emission factors for PM, PM_{10}, and $PM_{2.5}$ from material transfers (i.e., drop points) are calculated based on the material's moisture content, the mean wind speed, and a particle size multiplier and by using the following equation from AP-42 Section 13.2.4, November 2006:

$$\text{Emission Factor}\left(\frac{\text{lb}}{\text{ton}}\right) = \frac{\text{FC (\%)}}{100} \text{x k x 0.0032 x} \frac{\left[\frac{\text{U (mph)}}{5}\right]^{1.3}}{\left[\frac{\text{M (\%)}}{2}\right]^{1.4}} \text{x} \left(1 - \frac{\text{CE (\%)}}{100}\right)$$

Where,

k = Particle size multiplier
U = Mean wind speed
M = Material moisture content
FC = Fine content of material
CE = Control efficiency from partial enclosure (if applicable)

A proposed crushing operation and a proposed screening operation will be used as a part of the material handling of slag. Emission factors for the crushing operation are obtained from AP-42 Section 11.19.2, Table 11.19.2-2, August 2004. The emission factors listed for controlled tertiary crushing are conservatively used to represent emissions from the controlled crushing operation. Emission factors for the controlled double deck screening operation are obtained from AP-42 Section 11.19.2, Table 11.19.2-2, August 2004 as well.

The PM, PM_{10}, and $PM_{2.5}$ emissions from material transfers, including intermingled slag crushing and screening operations, are calculated by using the following equations:

$$\text{Hourly Emissions}\left(\frac{\text{lb}}{\text{hr}}\right) = \text{EF}\left(\frac{\text{lb}}{\text{ton}}\right) \text{ x Hourly MT}\left(\frac{\text{ton}}{\text{hr}}\right) \text{ x}$$

$$\text{Annual Emissions}\left(\frac{\text{ton}}{\text{yr}}\right) = \text{EF}\left(\frac{\text{lb}}{\text{ton}}\right) \text{ x Annual MT}\left(\frac{\text{ton}}{\text{yr}}\right) \text{ x } \frac{1}{2{,}000}\left(\frac{\text{ton}}{\text{lb}}\right)$$

Where,

EF = Emission Factor

MT = Maximum throughput rate of material

16.9 Ball Drop Crushing

The ball drop crushing of large slag has the potential to emit PM, PM_{10}, and $PM_{2.5}$. Emissions of PM, PM_{10}, and $PM_{2.5}$ from the ball drop crushing of large slag are calculated based on emission factors and the maximum throughput rates of large slag. Emission factors for the crushing operation are obtained from AP-42 Section 11.19.2, Table 11.19.2-2, August 2004. The emission factors listed for controlled tertiary crushing are conservatively used to represent emissions from the ball drop crushing operations. The hourly and annual PM, PM_{10}, and $PM_{2.5}$ emissions from the ball drop crushing of large slag are calculated using the following equations:

$$\text{Hourly Emissions}\left(\frac{\text{lb}}{\text{hr}}\right) = \text{Emission Factor}\left(\frac{\text{lb}}{\text{ton}}\right) \text{ x Hourly MT}\left(\frac{\text{ton}}{\text{hr}}\right)$$

$$\text{Annual Emissions}\left(\frac{\text{ton}}{\text{yr}}\right) = \text{Emission Factor}\left(\frac{\text{lb}}{\text{ton}}\right) \text{ x Annual MT}\left(\frac{\text{ton}}{\text{hr}}\right) \text{ x } \frac{1}{2{,}000}\left(\frac{\text{ton}}{\text{lb}}\right)$$

Where,

MT = Maximum Throughput Rate of Material Storage Piles

16.10 Storage Piles

Emissions from storage piles are expected to occur from the storage of the following types of materials:

- Scrap;
- Alloy aggregate;
- Slag;
- Residual scrap; and
- Mill scale.

The proposed storage piles have the potential to emit PM, PM_{10}, and $PM_{2.5}$. Emissions of PM, PM_{10}, and $PM_{2.5}$ from storage piles are calculated based on the anticipated maximum pile area and an emission factor. PM emission factors for storage pile emissions are based on the following equation from the *Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures*, EPA-450/2-92-004, September 1992:

$$\text{Emission Factor}\left(\frac{\frac{\text{lb}}{\text{day}}}{\text{acre}}\right) = 1.7 \text{ x } \frac{\text{s (\%)}}{1.5} \text{ x } \frac{365 - \text{P (days)}}{235} \text{ x } \frac{\text{f (\%)}}{15} \text{ x } (1 - \frac{\text{CE (\%)}}{100})$$

Where,

- s = Silt content
- P = Days per year with at least 0.01 inches of precipitation, based on AP-42 Section 13.2, Figure 13.2.2-1, November 2006
- f = Percentage of time the unobstructed wind speed exceeds 12 miles per meteorological data collected at Hagerstown Richard Henson (KHGR) Airport station for period between 2017 to 2021
- CE = Control efficiency from partial enclosure (if applicable)

Per the Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, EPA-450/2-92-004, September 1992, the following ratio is used to convert the PM emission factors to PM_{10} emission factors:

$$\text{Emission Factor}_{PM_{10}}\left(\frac{\frac{\text{lb}}{\text{day}}}{\text{acre}}\right) = 0.5 \text{ x Emission Factor}_{PM}\left(\frac{\frac{\text{lb}}{\text{day}}}{\text{acre}}\right)$$

Per AP-42 Section 13.2.4, November 2006, the following ratio is used to convert PM emission factors to $PM_{2.5}$ emission factors:

$$\text{Emission Factor}_{PM_{2.5}}\left(\frac{\frac{\text{lb}}{\text{day}}}{\text{acre}}\right) = 0.053 \text{ x Emission Factor}_{PM}\left(\frac{\frac{\text{lb}}{\text{day}}}{\text{acre}}\right)$$

The following equations are used to calculate hourly and annual PM, PM_{10}, and $PM_{2.5}$ emissions from storage piles:

$$\text{Hourly Emissions}\left(\frac{\text{lb}}{\text{hr}}\right) = \text{EF}\left(\frac{\frac{\text{lb}}{\text{day}}}{\text{acre}}\right) \text{ x MPA (ft}^2\text{) x } \frac{1}{43{,}560}\left(\frac{\text{acre}}{\text{ft}^2}\right) \text{ x } \frac{1}{24}\left(\frac{\text{day}}{\text{hr}}\right)$$

$$\text{Annual Emissions}\left(\frac{\text{ton}}{\text{yr}}\right) = \text{EF}\left(\frac{\frac{\text{lb}}{\text{day}}}{\text{acre}}\right) \text{ x MPA (ft}^2\text{) x } \frac{1}{43{,}560}\left(\frac{\text{acre}}{\text{ft}^2}\right) \text{ x 365 }\left(\frac{\text{day}}{\text{yr}}\right) \text{ x } \frac{1}{2{,}000}\left(\frac{\text{ton}}{\text{lb}}\right)$$

Where,

EF = Emission factor
MPA = Maximum pile area

16.11 Roads

Emissions of PM, PM_{10}, and $PM_{2.5}$ are generated from vehicular traffic on roads. Road emissions are calculated based on vehicle miles travelled (VMT), emission factors, and control efficiencies. The vehicular VMT is calculated by multiplying number of trips and round-trip distance. The number of trips was estimated based on process knowledge or material throughput with vehicle capacity.

16.11.1 Emissions from Unpaved Roads

Uncontrolled PM, PM_{10}, and $PM_{2.5}$ emission factors for vehicles traveling on unpaved roads are calculated using the following equations from AP-42, Section 13.2.2 (November 2006):

$$E = (k)\left(\frac{s}{12}\right)^{a}\left(\frac{W}{3}\right)^{b}$$

$$E_{ext} = E[(365 - P)/365]$$

Where,

- E = size-specific hourly emission factor (lb/VMT)
- E_{ext} = size-specific annual emission factor (lb/VMT)
- k = particle size multiplier, per AP-42 Table 13.2.2-2 (November 2006)
- s = surface material silt content (%), 6% as accepted by MCAQD and EPA Region 9 for the PSD permit actions at the CMC operations in Arizona, which are substantially similar to the proposed project.
- W = mean vehicle weight (tons)
- a, b = constant, per AP-42 Table 13.2.2-2 (November 2006)
- P = days per year with at least 0.01 inch precipitation, per AP-42 Figure 13.2.2-1, November 2006

The following equations are used to calculate hourly and annual emissions from vehicle traffic on unpaved roads:

$$\text{Hourly Emissions}\left(\frac{\text{lb}}{\text{hr}}\right) = \text{Emission Factor}\left(\frac{\text{lb}}{\text{VMT}}\right) \text{ x Hourly Vehicle Miles }\left(\frac{\text{VMT}}{\text{hr}}\right)$$

$$\text{Annual Emissions}\left(\frac{\text{ton}}{\text{yr}}\right) = \text{Emission Factor}\left(\frac{\text{lb}}{\text{VMT}}\right) \text{ x Annual Vehicle Miles }\left(\frac{\text{VMT}}{\text{yr}}\right) \text{ x } \frac{1}{2{,}000}\left(\frac{\text{ton}}{\text{lb}}\right)$$

Unpaved roads associated with the slag quench operations will be watered only as all other emission reduction techniques are infeasible. These unpaved roads are subject to watering based on the results of the top-down BACT. Per Table 6 of Preliminary Determination/Fact Sheet for the Construction of Nucor Steel West Virginia LLC, dated March 29, 2022, watering is expected to provide a 90% control efficiency. Unpaved roads not associated with the slag quench operations will deploy work practices (e.g., watering, etc.) consistent with the BACT proposal in Section 23 of this application. These unpaved roads are subject to a 95% control efficiency per U.S. EPA AP-42 Section 13.2.2, November 2006.

16.11.2 Emissions from Paved Roads

PM, PM_{10}, and $PM_{2.5}$ emission factors for vehicles traveling on paved roads are calculated using the following equations from AP-42, Section 13.2.1 (January 2011):

$$E = k(sL)^{0.91} \times (W)^{1.02}$$

$$E_{ext} = [k(sL)^{0.91} \times (W)^{1.02}](1 - P/4N)$$

Where,

- E = size-specific hourly emission factor (lb/VMT)
- E_{ext} = size-specific annual emission factor (lb/VMT)
- k = constant for equation, 0.011 for PM, 0.0022 for PM_{10}, 0.00054 for $PM_{2.5}$, per AP-42 Table 13.2.1-1 (January 2011)
- sL = road surface silt loading (g/m^2), 3.34 g/m^2 as accepted by MCAQD and EPA Region 9 for the PSD permit actions at the CMC operations in Arizona, which are substantially similar to the proposed project.
- W = mean vehicle weight (tons)
- P = days per year with at least 0.01 inches of precipitation, per AP-42 Figure 13.2.1-2, January 2011
- N = number of days in the averaging period, 365 for annual averaging period

Control efficiency of 90% is applied to account for control measures to be implemented on the paved roads, consistent with the work practices proposed as BACT in Section 23 of this application.

16.12 Diesel Combustion

The proposed Tier 3 diesel combustion emergency generator and emergency fire water pump have the potential to emit criteria pollutants, GHGs, and HAPs. Emissions from these emergency units will enter the atmosphere via the unit's stack.

16.12.1 Criteria Pollutant Emissions

Emissions of PM, PM_{10}, $PM_{2.5}$, NO_X, CO, and VOC, and SO_2 are calculated based on the unit's rating, hours of operation (which are 100 hours/year and inclusive of testing and maintenance consistent with the requirements of 40 CFR Part 60, Subpart IIII), and emission factors.

The emission factors for emissions of PM, PM_{10}, $PM_{2.5}$, NO_X, CO, and VOC are based on the requirements of 40 CFR Part 60, Subpart IIII, referencing Table 1 to 40 CFR 89.112 with the emission factors of VOC and NO_X speciated based Table 6 of the EPA publication "*Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling – Compression Ignition*", EPA420-P-02-016. The emission factor for SO_2 is based on the utilization of ultra-low sulfur diesel (ULSD) which contains no more than 15 ppmv sulfur. The sulfur content of diesel is converted to an emission factor using an average brake specific fuel consumption of 7,000 Btu/hp-hr, and the diesel heating value of 19,300 Btu/lb.

Hourly and annual emissions of PM, PM_{10}, $PM_{2.5}$, NO_X, CO, VOC, and SO_2 from the diesel combustion are calculated using the following two equations, respectively:

$$\text{Hourly Emissions}\left(\frac{\text{lb}}{\text{hr}}\right) = \text{EF}\left(\frac{\text{g}}{\text{hp}-\text{hr}}\right)\ \text{x}\ \text{x}\ (\text{hp})\ \text{x}\left(\frac{\text{lb}}{453.6\ \text{g}}\right)$$

$$\text{Annual Emissions} \left(\frac{\text{ton}}{\text{yr}}\right) = \text{Hourly Emissions} \left(\frac{\text{lb}}{\text{hr}}\right) \text{ x } 100 \left(\frac{\text{hr}}{\text{yr}}\right) \text{ x } \left(\frac{\text{ton}}{2{,}000 \text{ lb}}\right)$$

Where,
EF = Emission factor

16.12.2 GHG Emissions

Emissions of the GHGs CO_2, CH_4, and N_2O are calculated from the unit's rating and emission factors. The emission factors for CO_2 are obtained from 40 CFR Part 98, Table C–1 to Subpart C, December 2016, for distillate fuel oil No. 2. Emission factors for CH_4 and N_2O are obtained from 40 CFR Part 98, Table C–2 to Subpart C, December 2016, for natural gas. The following equation is used to calculate annual GHG specie emissions:

$$\text{Annual Emissions} \left(\frac{\text{ton}}{\text{yr}}\right) = \text{EF} \left(\frac{\text{kg}}{\text{MMBtu}}\right) \text{ x } \left(\frac{7{,}000 \text{ Btu}}{10^6 \text{hp} - \text{hr}}\right) \text{ x } 1.341 \left(\frac{\text{hp}}{\text{kW}}\right) \text{ x } \left(\frac{1{,}000 \text{ g}}{\text{kg}}\right) \text{ x (hp) x } \left(\frac{\text{lb}}{453.6 \text{ g}}\right) \text{ x } 100 \left(\frac{\text{hr}}{\text{yr}}\right) \text{ x } \left(\frac{\text{ton}}{2{,}000 \text{ lb}}\right)$$

Where,
EF = Emission factor

The emissions of CO_2, CH_4, and N_2O along with each respective global warming potential are used to calculate the emissions of CO_2e. The global warming potentials for the GHGs are obtained from 40 CFR Part 98, Table A-1, December 2014. The following equation is used to calculate annual CO_2e emissions:

$$\text{Annual Emissions} \left(\frac{\text{ton}}{\text{yr}}\right) = \sum_{i} \left[\text{GWP}_i \text{ x Annual Emissions}_i \left(\frac{\text{ton}}{\text{yr}}\right)\right]$$

Where,
GWP = Global warming potential
i = CO_2, CH_4, N_2O

16.12.3 HAP Emissions

Emissions of HAPs are calculated from the unit's rating and emission factors. HAP emission factors are from AP-42 Section 3.3, Table 3.3-2. The following two equations are used to calculate the hourly and annual HAP emissions from diesel combustion:

$$\text{Hourly Emissions} \left(\frac{\text{lb}}{\text{hr}}\right) = \text{EF} \left(\frac{\text{lb}}{\text{MMBtu}}\right) \text{ x } \left(\frac{7{,}000 \text{ Btu}}{10^6 \text{hp} - \text{hr}}\right) \text{ x (hp)}$$

$$\text{Annual Emissions} \left(\frac{\text{ton}}{\text{yr}}\right) = \text{Hourly Emissions} \left(\frac{\text{lb}}{\text{hr}}\right) \text{ x } 100 \left(\frac{\text{hr}}{\text{yr}}\right) \text{ x } \left(\frac{\text{ton}}{2{,}000 \text{ lb}}\right)$$

Where,
EF = Emission Factor

16.13 Torch Cutting

Emissions of PM, PM_{10}, and $PM_{2.5}$ from the cutting torches are estimated based on the amount of scrap to be cut, the scrap removal rate per cut (approximately 1 inch of material per cut), the maximum cutting rate (approximately 0.4 cuts/ft of material to be cut), maximum daily operation, and emission factor. The emission factor of 0.00016 lb/inch cut is for oxyacetylene cutting per the American Welding Society (AWS).[12] It is assumed that the emission rate from propane or natural gas cutting is similar to that of oxyacetylene cutting.[13]

16.14 Storage Tanks

Emissions of VOC from the diesel storage tanks located at the Facility were estimated using the equations for horizontal and vertical fixed roof storage tanks located in AP-42 Section 7.1, dated June 2020.

16.15 De Minimis Sources

Pursuant to 45 CSR 13-2.2.6

> *"De minimis source" means any emissions unit listed in Table 45-13B below, whether individual or a part of a common plan (i.e., a common set of new sources or physical changes in or changes in the method of operation of any existing stationary source). A "de minimis source" is deemed to have insignificant emissions and/or is not usually a source of quantifiable emissions which can be practically regulated in determining potential to emit or actual emissions for the purpose of determining whether a permit is required under this rule. Emissions to the extent quantifiable from emissions units listed in Table 45-13B do not need to be added together by the source unless otherwise required by the Secretary.*

No emission calculations were performed for the following list of proposed equipment types because each is considered a De minimis source.

- Air compressors and pneumatically-operated equipment, including hand tools; instrument air systems (excluding fuel-fired compressors); emissions from pneumatic starters on reciprocating engines, turbines or other equipment; and periodic use of air for cleanup (excluding all sandblasting activities).
- Bench-scale laboratory equipment used for physical or chemical analysis, excluding lab fume hoods or vents.
- Portable brazing, soldering, gas cutting or welding equipment used as an auxiliary to the principal equipment at the source.
- Comfort air conditioning or ventilation systems not used to remove air contaminants generated by or released from specific units of equipment.
- Hand-held equipment for buffing, polishing, cutting, drilling, sawing, grinding, turning or machining wood, metal or plastic.

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[12] Pursuant to "EUG 2 Torch Cutting's Parameters" in the Okhahoma Department of Environmental Quality Evaluation of Permit Application No. 2021-0086-O for CMC Recycling Tulsa Recycling Plant, dated March 10, 2022.

[13] Ibid.

17. ATTACHMENT O: MONITORING/RECORDKEEPING/REPORTING/TESTING PLANS

Attachment D: Regulatory Discussion provides details on the state and federal regulatory applicability analysis as well as all proposed monitoring/recordkeeping/reporting/testing plan.

18. ATTACHMENT P: PUBLIC NOTICE

AIR QUALITY PERMIT NOTICE
Notice of Application

Notice is given that CMC Steel US, LLC has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a new Prevention of Significant Deterioration (PSD) Construction Permit for a steel micro mill to be located off Dupont Road near Martinsburg, Berkeley County, West Virginia. The site latitude and longitude coordinates are: 39.538133 °N, -77.888409°W.

CMC is proposing to construct a new micro mill and associated support operations. Specifically, the proposed project will include the installation of a meltshop (including an Electric Arc Furnace and Ladle Metallurgy Station), casting operations, heaters and dryers, rolling mill, and finishing operations. The project also involves installation of a slag processing plant, and ancillary equipment related to the production process.

The applicant estimates the potential to discharge the following Regulated Air Pollutants associated with the project after the installation of the proposed equipment:

Pollutant	Emissions in tpy (tons per year)
NO_X	99
CO	1,309
VOC	98
SO_2	98
Filterable PM	77
Total PM[1]	188
Total PM_{10}	179
Total $PM_{2.5}$	174
Total HAPs	2.33
Carbon Dioxide Equivalents (CO_2e)	120,600

[1] Total PM includes filterable and condensable PM fractions.

Start of project will begin in June 2023. Anticipated start-up is December 2025. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice. Written comments will also be received via email at DEPAirQualityPermitting@VW.gov. Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499 extension 41281 during normal business hours.

Dated this the 3rd day of January, 2023.

By: CMC Steel US, LLC
Billy Milligan
Vice President, Sustainability and Government Affairs
6565 North MacArthur Blvd.
Suite 800
Irving, TX 75039

19. ATTACHMENT Q: BUSINESS CONFIDENTIAL CLAIMS (NOT APPLICABLE)

20. ATTACHMENT R: AUTHORITY FORMS (NOT APPLICABLE)

21. ATTACHMENT S: TITLE V PERMIT REVISION INFORMATION (NOT APPLICABLE)

22. APPLICATION FEES

Pursuant to the requirements of 45CSR22 Section 3.4, CMC will submitting an initial permit application fee of $14,500 based on the following:

- Base application fee = $1,000
- NSPS applicability fee = $1,000
- NESHAP applicability fee = $2,500
- PSD permit application fee = $10,000

23. BEST AVAILABLE CONTROL TECHNOLOGY (BACT)

The requirement to use the best available control technology (BACT) applies to each new or modified emission unit from which there are emissions increases of pollutants subject to PSD review. The proposed Project is subject to PSD review for NO_X, CO, SO_2, PM, PM_{10}, $PM_{2.5}$, Fluorides excluding Hydrogen Fluoride (HF), VOC, and GHG measured as CO_2e, and is therefore subject to BACT for these pollutants. The estimated site-wide lead (Pb) emissions are below the PSD significant emission rate (SER) and as such, Pb is not subject to PSD and not included in this BACT analysis. Because this is a proposed Project, all project emission units are considered new for purposes of the BACT review. The top-down BACT analysis is presented in tabular format for each emission unit and respective pollutant.

23.1 PSD BACT Top-Down Approach

The following sections contain a description of the five (5) basic steps of U.S. EPA's preferred "top-down" approach for selecting BACT.

23.1.1 Step 1 – Identify Air Pollution Control Technologies

Available control technologies with the practical potential for application to the emission unit and regulated air pollutant in question are identified. The selected control technologies vary widely depending on the process technology and pollutant being controlled. The application of demonstrated control technologies in other similar source categories to the emission unit in question may also be considered in this step.

23.1.2 Step 2 – Eliminate Technically Infeasible Options

"Technically infeasible" control options from the list of "potentially available" control options are eliminated. A control option is "technically feasible" if it has been "demonstrated" or if it is both "available" and "applicable."

23.1.3 Step 3 – Rank Remaining Control Technologies

All remaining technically feasible control options are ranked based on their overall control effectiveness for the pollutant under review. If there is only one remaining option or if all remaining technologies could achieve equivalent control efficiencies, ranking based on control efficiency is not required. Collateral effects are usually not considered until step four of the five step top-down BACT analysis.

23.1.4 Step 4 – Evaluate and Document Most Effective Controls

After identifying and ranking available and technically feasible control technologies, the economic, environmental, and energy impacts are evaluated to select the best control option. In the judgment of the permitting agency, if inappropriate economic, environmental, or energy impacts are associated with the top control option, the next most stringent option is evaluated. This process continues until a control technology is identified. This step validates the suitability of the top identified control option or provides a clear justification as to why the top option should not be selected as BACT.

23.1.5 Step 5 – Select BACT

The BACT emission limit is determined for each emission unit under review based on evaluations from the previous step.

Although the first four steps of the top-down BACT process involve technical and economic evaluations of potential control options (i.e., defining the appropriate technology), the selection of BACT in the fifth step involves an evaluation of emission rates achievable with the selected control technology.

The most effective control alternative not eliminated in Step 4 is selected with a corresponding emission limit as BACT. BACT is a numeric emissions limit (along with appropriate averaging times and a compliance determination method) unless technological or economic limitations of the measurement methodology would make the imposition of a numeric emissions standard infeasible, in which case a work practice or operating standard can be imposed. Selected BACT can be no less stringent than an applicable NSPS or NESHAP.

23.2 Steel Mill Types

Steel production has evolved over the last century, from integrated steel mills with production capacities in excess of 2,000,000 tons of steel per year to mini mills typically producing around 1,000,000 tons of steel per year. Integrated steel mills have slowly been phased out as start-up costs are prohibitive when compared with a mini mill. A mini mill relies solely on the EAF to melt recycled scrap metal and produce a variety of steel products (rebar, sheets, bars, plates, etc.). There are roughly less than 100 mini mills within the United States. These mini mills are the largest recyclers in the United States. The next generation of technology for steel production from recycled scrap is referred to as a "micro mill." This micro mill technology is being proposed for the Project.

23.2.1 Steel Micro Mills and Endless Charging System (ECS)

A micro mill is similar to a mini mill except smaller in size producing up to approximately 650,000 tons of steel per year. Micro mills use the heat in the waste gas from the EAF to preheat the scrap that is charged to the EAF which results in recovering some energy to offset the additional energy required to melt the scrap. Mini mills typically do not use such heat recovery. Techniques for scrap preheating have been applied world-wide, primarily in countries with high electricity costs, with varying success. The two types of scrap preheating techniques that have been applied in the United States are (1) the Fuchs shaft furnace, which is a batch type preheater, and (2) the ECS preheating system, which is a continuous charge feeding, preheating, and melting process. ECS is proposed for the Project. The Fuchs shaft furnace has been used on mini mills while the ECS has been used on both mini mills and micro mills in the United States.

For an EAF that uses a heat recovery process (i.e., Fuchs shaft furnace or ECS) and depending on the meltshop's overall operations, about two-thirds of the total additional energy requirement is electrical, and the balance is chemical energy from the oxidation of elements such as carbon, iron, and silicon and the combustion of propane/natural gas, typically using specially designed oxy-fuel burners. A little over 50% of the total energy leaves the furnace with the liquid steel, while the remainder is lost to the slag, waste gas, and cooling water. Approximately 20% of the total energy normally leaves the furnace via the waste gas. In an ECS process, this waste gas is used to preheat the scrap being charged to the EAF which results in recovering some of this otherwise wasted thermal energy, thus offsetting some of the electrical energy required to melt the scrap.

In the ECS process, the recycled scrap metal is loaded on a conveyor and passes through a dynamic seal into the preheating conveyor section. After moving through the preheating section, the scrap is discharged onto a connecting conveyor that enters the EAF and drops the scrap into the molten steel bath.[14] Heat transferred to the scrap metal is provided by heat and chemical energy from the EAF exhaust gas. The

[14] Per The State-of-the-Art Clean Technologies (SOACT) for Steelmaking Handbook - Raw materials through Steelmaking, including recycling technologies, Common Systems, and General Energy Saving Measures. The Asia Pacific Partnership for Clean Development and Climate, December 2010.

EAF gases exit the furnace through the charge conveyor opening and travel through the preheater countercurrent to the scrap charge direction. The ECS provides many benefits including:

- Reduced energy consumption;
- Reduced electrode consumption;
- Reduced refractory consumption;
- Reduced noise and electrical disturbances; and
- Reduced maintenance.

CMC's proposed micro mill will utilize the ECS process which is considered a material part of the Project scope.

23.2.2 Scrap Metal Quality

Recycled scrap metal is the primary raw material used in the steel production process. The quality of the scrap metal used can impact the quality of the steel produced and associated air emissions. Steel mills producing long steel products such as rebar, T-Post, and rebar spools, are able to utilize scrap that mills producing flat steel products, such as flat-rolled steel or sheet metal, are not. Mills producing flat steel require scrap that has a higher density, and often incorporate higher-quality scrap along with other metallic raw materials such as hot-briquetted iron (HBI) and direct-reduced iron (DRI) to meet the required finished steel quality standards. These characteristics, in addition to being essential to flat steel production, typically result in lower levels of CO, SO_2, and VOC emissions from the EAF as compared to the production of long products. The proposed Project is a micro mill for long products (i.e., rebar) production.

A list of EAF and LMS facilities, as well as review of the EPA RACT/BACT/LAER Clearinghouse (RBLC) database, is provided in Appendix B.

23.3 EAF and LMS Emissions Routed to Meltshop Baghouse

The proposed EAF (EAF1) and LMS (LMS1) will be routed to discharge from the meltshop baghouse (BH1). Any emissions from the EAF and LMS not captured by the baghouse will be vented to the caster vent. The BACT controls and emission limits are proposed for the combined EAF and LMS emissions that exhaust from the baghouse stack. The emission limits are provided as a 30-day rolling average as opposed to averages over a shorter time periods to account for process variabilities that may affect the emissions from the EAF and LMS as well as furnace delays where there may not be any active production but there will still be emissions during that time. Table 23-1 provides a summary of the selected BACT controls and emission limits for pollutants emitted by the EAF and LMS system through the meltshop baghouse.

Table 23-1. Summary of Selected BACT for EAF/LMS

Pollutant	Selected BACT Control	Selected BACT Limit (lb/ton, on a 30-day rolling average)
CO	Direct Evacuation Control (DEC)/Good Combustion Practices (GCP)	4
NO_X	Direct Evacuation Control (DEC)/Oxy-Fired Burners	0.3
SO_2	Good Process Operation (Scrap Management Plan)	0.3
$PM/PM_{2.5}/PM_{10}$	Baghouse/Fabric Filter	0.0018 gr/dscf (PM Filterable) 0.0052 gr/dscf (total $PM_{10}/PM_{2.5}$ Filterable + Condensable)
VOC	Good Process Control	0.3
GHG as measured in CO_2e	Various Technologies and Work Practices	119,513 tons per year (tpy)
Fluorides excluding Hydrogen Fluoride	Baghouse/Fabric Filter	0.01

It should be noted that the U.S. EPA RBLC database contains separate BACT limits for the EAF and LMS at steel mills in the United States and other facilities may use natural gas combustion as a part of their LMS operations. In many cases, the exhaust from the EAF and LMS are combined into a single stream for the highest levels of emission reductions. As a result, it is unclear in some cases whether the limits presented in the RBLC apply to the EAF and LMS separately or to the combined exhaust stream. With this uncertainty, CMC has chosen to compare the proposed BACT limits for the combined EAF and LMS exhaust streams with the assumed EAF limits for facilities listed in the RBLC. This is a conservative approach as the individual EAF BACT limit is expected to be lower than the combined BACT limit for the EAF and LMS exhaust.

As discussed in Sections 23.2 and 23.3, many of the mills listed in the RBLC do not produce comparable products or may produce comparable products using a different raw material mix and melting process. Variability in raw material mix, raw material supplier, and melting processes will ultimately determine the amount of emissions emitted from the EAF and LMS. The following sections will provide a brief explanation behind the selected BACT limits.

23.3.1 CO BACT Limit

The proposed Project is not comparable to the recent Nucor West Virginia facility from a raw material, process, and product perspective. Furthermore, the Nucor West Virginia facility utilizes charge buckets to load the EAF which requires the roof of the EAF to open during the loading process. The excess oxygen during the charge bucket loading of the EAF would reduce any CO emissions significantly. The proposed Project utilizes the more energy efficient ECS technology which does not open the EAF roof to conserve and capture heat energy. This method of operation reduces the introduction of excess oxygen. Therefore, the CO emissions profile from the proposed Project is expected to be very different than that of the Nucor West Virginia facility.

Only the Gerdau Ameristeel, CMC Mesa, Nucor Frostproof, Nucor Sedalia, and CMC Oklahoma facilities utilize similar ECS technologies to the proposed Project. The 4 lb/ton emission limit from the CMC Mesa and CMC Durant facilities is more stringent than the 4.4 lb/ton emission limit from the Gerdau Ameristeel facility. Actual CEMs data from the CMC Mesa facility, a facility very similar to the proposed facility, demonstrates that a lower emission limit of 3.5 lb/ton of Nucor Frostproof and Nucor Sedalia facilities is not achievable in practice due to process and scrap variability.

23.3.2 NO_X BACT Limit

While only the Gerdau Ameristeel, CMC Mesa, Nucor Frostproof, Nucor Sedalia, and CMC Oklahoma facilities utilize similar technologies to the proposed EAF/LMS (i.e., ECS Process and Micro Mill), CMC has provided comparisons to other, recent, mini-mill NOx BACT limits as well. NOx generation in both mini- and micro-mills is driven predominantly by thermal NOx, in which atmospheric nitrogen is oxidized at very high temperatures (in both mini- and micro-mills) to form NOx. CMC cautions that simply comparing the numerical value of the BACT limit among various mills is inappropriate because the overall stringency of the BACT limit depends not only on the numerical value but also the averaging time and the method of compliance, in addition to factors such as the product type, among others. An additional critical aspect is the form of the standard itself, expressed as lb/ton. Because mill operations often result in unanticipated delays (i.e., when the EAF's heat cycle is extended in order to address other shop-related problems such as downstream equipment including the LMS, caster, etc.), the NOx formation and generation at the EAF (i.e., the numerator in the lb/ton form of the standard) continues to increase with the delay but the production (i.e., the denominator) of steel does not, making the lb/ton ratio greater as the delay progresses. Even otherwise, NOx generation in steel production is highly variable within a single heat cycle given the highly stochastic nature of the underlying thermal NOx chemistry. Given these factors, most of which (i.e., NOx generation chemistry to a large extent and unexpected delays not just at the EAF but in the shop as a whole) are not under the control of the operator and given the form of the standard expressed as lb/ton, an averaging time of 30-days is appropriate for the proposed 0.3 numerical value of the standard. As the comparison to recent BACT determinations shows, this proposed NOx BACT limit, using a 30-day rolling average is appropriate. CMC notes that any downward deviations from the 0.3 lb/ton values will likely necessitate extending the 30-day average to even longer time periods for the reasons noted.

23.3.3 SO_2 BACT Limit

The generation and emissions of SO_2 from the EAF/LMS are stoichiometric (i.e., depend on the totality of the sulfur inputs to the production process from all required inputs including scrap, limestone, and other additives). Because SO_2 generation and emissions are mainly driven by EAF inputs and chemistry, and because the inputs are inherently site-specific and depend on the availability of the various raw materials such as scrap (appropriate for the desired product-mix), limestone, carbon, etc., comparing numerical limits established for other mills can result in inappropriate determinations for BACT. The proposed BACT limit of 0.3 lb/ton steel was developed via a reasonable balancing of site-specific inputs consistent with the product mix and availability of local inputs that are proposed for the Project along with a reasonable compliance margin.

23.3.4 PM BACT Limit

Filterable PM generation in an EAF (whether a micro- or mini-mill) is due to the complex and vigorous physical and chemical processes that occur during the charging, melting, and tapping of the EAF. This can be inherently variable (i.e., with no ability of the operator to control these processes) over time in a single heat. Regardless of the generation mechanisms, however, the filterable PM emissions depend largely on the air pollution control device, which, in the case of both mini- and micro-mills is universally a baghouse. The proposed Project will utilize a baghouse, therefore, CMC has summarized recent BACT determinations for both mini- and micro-mills. While the analysis shows that there is one lower determination of 0.0015 grains/dscf, CMC believes a BACT limit of 0.0018 grains/dscf is more appropriate considering a proper compliance margin as well as accounting for measurement aspects at these low levels.

In contrast to filterable PM, whose generation in the EAF is highly variable, condensable PM generation can vary even more because it can be created not just in the EAF (and survive the high-temperature environment of the EAF) but also in the exhaust gas path from the EAF to the baghouse and more, importantly, after the baghouse, as the gases cool and certain types of compounds such as sulfur-compounds and semi-volatile organics form via condensation. Due to the myriad formation mechanisms, condensable PM formation after the baghouse is inherently variable with little to no control of the operator other than managing proper scrap mix and additive injections. The proposed Project will use the best scrap quality consistent with its product mix. Based on these considerations, setting the BACT limit is largely a matter of determining the inherent variability of the condensable PM that is determined at the exist of the baghouse and using a reasonable compliance margin such that inherent, uncontrollable variability during a test (with its own set of measurement challenges) does not result in non-compliance that is no fault of the operator. The proposed BACT limit for total PM (i.e., 0.0052 grains/dscf, including both filterable and condensable components) is based on CMC's review of test data from baghouse-equipped mini- and micro-mills in the US that have been reported by various operators and, specifically, the large variability observed in such tests, even on a run-to-run basis under close to identical EAF and test conditions.

23.3.5 VOC BACT Limit

The lowest VOC emission limit identified in the RBLC database for comparable facilities is 0.3 lb/ton and CMC proposes an emission limit of 0.3 lb VOC/ton for the combined EAF and LMS exhaust.

23.3.6 GHGs (CO_2e) BACT Limit

GHG emissions, measured in CO_2e, are affected by the individual processes at every facility and are not comparable between different steel mills. Utilizing similar technologies and work practices other similar ECS facilities, CMC proposes an annual emission limit of 119,513 tpy for the combined EAF and LMS exhaust as reported to EPA pursuant to the requirements of 40 CFR Part 98.

23.3.7 Fluorides (excluding Hydrogen Fluoride) BACT Limit

Emissions of fluorides (excluding Hydrogen Fluoride) depend on additives used for fluidization and the maintenance of bath temperatures during tapping and refining, which depends on EAF design and product considerations. The lowest emission limit for fluorides (excluding hydrogen fluoride) in the RBLC database for comparable ECS facilities is 0.01 lb/ton and CMC proposes an emission limit of 0.01 lb/ton for the combined EAF and LMS exhaust.

Table 23-2 to Table 23-8 contain the top-down BACT analyses for each pollutant emitted from the meltshop baghouse.

Table 23-2. CO Top-Down BACT Analysis for EAF and LMS

Process	Pollutant
EAF/LMS	CO

Step		Control Technology	Thermal Oxidation[1]	Catalytic Oxidation[2]	Oxygen Injection	Operating Practice Modification	Direct Evacuation Control (DEC)/ Good Combustion Practices (GCP)
		Control Technology Description	Thermal Oxidation oxidizes combustible materials by raising the temperature of the material above its auto-ignition point in the presence of oxygen and maintaining the high temperature for sufficient time to ensure complete combustion. Thermal Oxidation has been a proven technology in controlling Carbon Monoxide (CO) emissions from Portland Cement Kilns, Petroleum Refining, and Polymer Manufacturing but not Electric Arc Furnaces (EAFs).	Catalytic oxidation allows oxidation to take place at a faster rate and at a lower temperature than is possible with thermal oxidation. CO emissions can be controlled via catalytic oxidation. The oxidation is facilitated by the presence of the catalyst and carried out by the same basic chemical reaction as thermal oxidation: $CO + ½O_2 \rightarrow CO_2$	This technology aims to increase the oxidation of CO to CO_2 by injecting oxygen at a location where conditions for this reaction are favorable. The increased availability of oxygen increases the rate of destruction of CO. Ideally, oxygen would be injected at the entrance to the DEC ductwork.	Operating practice modifications refers to the use of less carbon in the raw materials fed to the EAF, in order to reduce the formation of CO. An example of a modification would be using clean scrap or using a different feedstock.	The proposed BACT methods for the EAF/LMS include good combustion/process operation and operation of a direct evacuation control (DEC) system on the EAF. The DEC system maximizes thermal oxidation of CO by regulating the amount of air introduced into the ductwork downstream of the furnace. Air injectors are employed in the Consteel Process to optimize the amount of oxygen available for CO combustion in the scrap preheating conveyor. CO combustion is progressively carried out through air injection in the preheater section. This technology is similar to oxygen injection, however oxidation is optimized throughout the ductwork.

Table 23-2. CO Top-Down BACT Analysis for EAF and LMS

Process	Pollutant
EAF/LMS	CO

Step		Control Technology	Thermal Oxidation[1]	Catalytic Oxidation[2]	Oxygen Injection	Operating Practice Modification	Direct Evacuation Control (DEC)/ Good Combustion Practices (GCP)
Step 1.	**IDENTIFY AIR POLLUTION CONTROL TECHNOLOGIES**	**Other Considerations**	Additional fuel would be required to reach the ignition temperature of the waste gas stream as the typical operating temperatures are between 1,300 °F and 2,000 °F. Oxidizers are not recommended for controlling gases with halogen or sulfur containing compounds due to the formation of highly corrosive acid gases.	Several noble metal-enriched catalysts at high temperatures promote this reaction. Prior to entering the catalyst bed where the oxidation reaction occurs, the temperature of the exhaust gas must be between 400 °F to 800 °F. Below this temperature range, the reaction rate drops sharply and effective oxidation of CO is no longer feasible. Above this temperature, conventional oxidation catalysts break down and are unable to perform their desired functions. Dust and compounds in the exhaust gas may foul the catalyst, leading to decreased activity. Catalyst fouling occurs slowly under normal operating conditions and may be accelerated by even moderate sulfur concentrations in the exhaust gas. The catalyst can be chemically washed to restore its effectiveness, but eventually irreversible degradation occurs. In order to slow the fouling and deterioration of the catalyst due to the contaminants in the exhaust stream from the EAF/LMS, catalytic oxidation controls would need to be located downstream of a particulate emission control technology.	Increased oxygen concentration would lead to increases in NO_X emissions due to the high temperature of the EAF exhaust gas stream causing thermal NO_X formation.	As used in the proposed process, carbon serves as an ingredient that alters the properties of the product that affects its final characteristics, and carbon content is part of the specifications for many steel products. Carbon is not simply being used as a fuel or substitutable reagent. The intended products cannot be manufactured in a way that satisfies market demand for product specifications and characteristics with reduced carbon input to the manufacturing process.	Similar to oxygen injection, the increased oxygen concentration would lead to increases in NO_X emissions due to the high temperature of the EAF exhaust gas stream causing thermal NO_X formation. The key difference is in a DEC system the oxygen is injected downstream of the furnace where the EAF exhaust is allowed to cool and preheat the scrap resulting in the optimization of CO combustion, rather than thermal NO_X formation.
		RBLC Database Information	Not included in the RBLC database as a form of control of CO from Electric Arc Furnaces/Ladle Metallurgy Stations.	Not included in the RBLC database as a form of control of CO from Electric Arc Furnaces/Ladle Metallurgy Stations.	Not included in the RBLC database as a form of control of CO from Electric Arc Furnaces/Ladle Metallurgy Stations.	Not included in the RBLC database as a form of control of CO from Electric Arc Furnaces/Ladle Metallurgy Stations.	Included in the RBLC database as a form of control of CO from Electric Arc Furnaces/Ladle Metallurgy Stations.

Table 23-2. CO Top-Down BACT Analysis for EAF and LMS

Process	Pollutant
EAF/LMS	CO

Step		Control Technology	Thermal Oxidation[1]	Catalytic Oxidation[2]	Oxygen Injection	Operating Practice Modification	Direct Evacuation Control (DEC)/ Good Combustion Practices (GCP)
Step 2.	**ELIMINATE TECHNICALLY INFEASIBLE OPTIONS**	**Feasibility Discussion**	In order to prevent excess deterioration of controls due to the particulate loading of the exhaust stream from the EAF/LMS, thermal oxidation controls would need to be located downstream of a particulate emission control technology (i.e., the baghouse). Thermal oxidization would require raising the exhaust gas temperature to at least a temperature of 1,300 °F at a residence time of 0.5 seconds. Below this temperature the reaction rate drops significantly and the oxidation of CO to CO_2 is no longer feasible. Since the exhaust temperature of the process is less than 150 °F, which is well below the typical operating range of thermal oxidizers and based on the high volume of airflow, large amounts of auxiliary fuel would be required to heat the stream to the required temperature for thermal oxidation. This will create additional combustion emissions. The high temperatures involved in thermal oxidation will also result in additional NO_x emissions. This control technology has not been demonstrated in practice for control of CO emissions from the EAF/LMS. As a result, thermal oxidation of CO emissions is considered infeasible for the control of CO emissions from the EAF/LMS.	In order to prevent excess deterioration of controls due to the particulate loading of the exhaust stream from the EAF/LMS, catalytic oxidation controls would need to be located downstream of a particulate emission control technology (i.e., the baghouse). Catalytic oxidization of emissions for CO destruction would require raising the exhaust gas temperature to at least a temperature of 400 °F. Below this temperature the reaction rate drops significantly and the oxidation of CO is no longer feasible. Since the exhaust temperature of the process after the particulate control device is less than 150 °F, which is well below the typical operating range of catalytic oxidizers and based on the high volume of airflow, large amounts of auxiliary fuel would be required to heat the stream to the required temperature for catalytic oxidation. This will create additional combustion emissions. This control technology has not been demonstrated in practice for control of CO emissions from the EAF/LMS. As a result, catalytic oxidation of CO emissions is considered infeasible for the control of CO emissions from the EAF/LMS.	The CMC Mesa facility currently operates a DEC system for the EAF, which maximizes thermal oxidation. It is unclear if additional oxygen injection will lead to a significant reduction in CO emissions, but it will increase NO_X emission. This control technology has not been demonstrated in practice for control of CO emissions from the EAF/LMS. As a result, Oxygen Injection is considered infeasible for the control of CO emissions from the EAF/LMS.	Due to marketplace demands on the type of products produced and the required product quality, any additional operating practice modifications that will alter CO emissions from the proposed EAF is technically infeasible. Additionally, this control option would constitute a "re-defining the source" that is not allowable under PSD BACT.	Technically feasible. DEC systems are widely demonstrated in practice.
Step 3.	**RANK REMAINING CONTROL TECHNOLOGIES**	**Overall Control Efficiency**					Base Case
Step 4.	**EVALUATE AND DOCUMENT MOST EFFECTIVE CONTROLS**	**Cost Effectiveness ($/ton)**					Base Case

Table 23-2. CO Top-Down BACT Analysis for EAF and LMS

Process	Pollutant
EAF/LMS	CO

Step		Control Technology	Thermal Oxidation[1]	Catalytic Oxidation[2]	Oxygen Injection	Operating Practice Modification	Direct Evacuation Control (DEC)/ Good Combustion Practices (GCP)	
Step 5.	**SELECT BACT**						**Facility**	**CO Emission Limit (lb/ton)**
							Comparable Facilities[3,4]	
							Gerdau Ameristeel, NC	4.4
							CMC Mesa, AZ	**4**
							CMC Durant, OK	**4**
							Nucor Frostproof, FL	3.5
							Nucor Sedalia, MO	3.5
							Proposed BACT:	**4 lb CO/ton steel produced, on a 30-day rolling average basis, using DEC and GCP.**

[1] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Regenerative Incinerator)," EPA-452/F-03-021. U.S. EPA, Office of Air Quality Planning and Standards, "Draft CAM Technical Guidance Document - Thermal Oxidizers", dated April 2002

[2] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Catalytic Incinerator)," EPA-452/F-03-018

[3] A list of non-comparable facilities, as well as review of the EPA RACT/BACT/LAER Clearinghouse (RBLC) database, is provided in Appendix B. Because CO emissions will depend to a greater extent on the type of furnace, CMC has appropriately included comparable facilities accordingly.

[4] Only the Gerdau Ameristeel, CMC Mesa, Nucor Frostproof, Nucor Sedalia, and CMC Oklahoma facilities utilize similar ECS technologies to the proposed Project. The 4.0 lb/ton emission limit from the CMC Mesa and CMC Durant facilities is more stringent than the 4.4 lb/ton emission limit from the Gerdau Ameristeel facility. Actual CEMs data from the CMC Mesa facility, a facility very similar to the proposed facility, demonstrates that a lower emission limit of 3.5 lb/ton of Nucor Frostproof and Nucor Sedalia facilities is not achievable in practice due to process and scrap variability.

Table 23-3. NO_X Top-Down BACT Analysis for EAF and LMS

Process	Pollutant
EAF/LMS	NO_X

Step		Control Technology	Selective Catalytic Reduction (SCR)[1]	Selective Non-Catalytic Reduction (SNCR)[2]	Non-Selective Catalytic Reduction[3]	Low NO_X Controls	SCONOx Control[4]	Direct Evacuation Control (DEC)/ Oxy-Fired Burners
Step 1.	**IDENTIFY AIR POLLUTION CONTROL TECHNOLOGIES**	**Control Technology Description**	Selective Catalytic Reduction (SCR) is an exhaust gas treatment technology where ammonia (NH_3) is injected into exhaust gas upstream of a catalyst bed. SCR utilizes a catalytic reaction of Nitrogen Oxide (NO) or Nitrogen Dioxide (NO_2) with ammonia to form diatomic nitrogen and water. The chemical reaction is shown below: Ammonia Injection $4NO + 4NH_3 + O_2 \rightarrow 4N_2 + 6H_2O$ $2NO_2 + 4NH_3 + O_2 \rightarrow 3N_2 + 6H_2O$ Relative to SNCR, the purpose of the catalyst in SCR is to reduce the temperature required for the reduction reaction to occur.	Selective Non-Catalytic Reduction (SNCR) is an exhaust gas treatment technology based on the reaction of urea or ammonia (NH_3) and NO or NO_2. The urea or ammonia is injected into the exhaust gas to reduce NO to diatomic nitrogen and water. There are two basic designs for the application of SNCR: an ammonia based system and a urea-based process. The chemical reaction involving ammonia is the same as in SCR. The chemical reaction involving urea is shown below: Urea Injection $4NO + 2NH_2CONH_2 + O_2 \rightarrow 4N_2 + 2CO_2 + 4H_2O$ $4NO_2 + 2NH_2CONH_2 + O_2 \rightarrow 3N_2 + 2CO_2 + 4H_2O$ SNCR is "selective" in that the reagent reacts primarily with NO rather than other chemicals at the optimum operating temperature of the control device.	Nonselective catalytic reduction (NSCR) is an add-on NO_X control technology for exhaust streams with low O_2 content. Nonselective catalytic reduction uses a catalyst reaction to simultaneously reduce NO_X, CO, and hydrocarbons (HC) to water, carbon dioxide, and nitrogen. The catalyst is usually a noble metal, and relies on the addition of hydrogen or a hydrogen-donating material such as natural gas in order to convert NO_X to N_2 and water. The conversion occurs in two sequential steps, as shown in the following equations: Step 1 Reactions: $2CO + O_2 \rightarrow 2CO_2$ $2H_2 + O_2 \rightarrow 2H_2O$ $HC + O_2 \rightarrow CO_2 + H_2O$ Step 2 Reactions: $NO_X + CO \rightarrow CO_2 + N_2$ $NO_X + H_2 \rightarrow H_2O + N_2$ $NO_X + HC \rightarrow CO_2 + H_2O + N_2$ The step 1 reactions remove excess O_2 from the exhaust gas because CO and HC will more readily react with O_2 than with NO_X. The O_2 content of the stream must be kept below approximately 0.5 percent to ensure NO_X reduction.	Low NO_X Combustion Controls include strategies to reduce the formation of NO_X by reducing the flame temperature or limiting the availability of oxygen. This includes overfire air, low excess air, and flue gas recirculation. These methods of control are commonly used on boilers that have a steady-state exhaust flow, controllable fuel/air flows, and a generally consistent temperature range. Unlike boilers, EAF exhaust has wide fluctuations in temperature, fuel/air flow rates, and exhaust flow rates. Additionally, most of the NO_x from this process is from the steel-making itself and not fuel combustion.	SCONOx uses potassium carbonate coated with catalyst to reduce NO_X emissions. SCONOx control has been demonstrated in use on gas turbines for the control of NO_X emissions. Gas turbines have relatively stable exhaust temperatures and flow rates during operation. An EAF exhaust temperature and flow rate can vary substantially during the process.	Direct Evacuation Control (DEC) includes Oxy-Fired Burners to achieve combustion using oxygen rather than air, which reduces nitrogen levels in the furnace. The lower nitrogen levels result in a reduction in NO_X emissions generated in the furnace.

Table 23-3. NO_X Top-Down BACT Analysis for EAF and LMS

Process	Pollutant
EAF/LMS	NO_X

Step		Control Technology	Selective Catalytic Reduction (SCR)[1]	Selective Non-Catalytic Reduction (SNCR)[2]	Non-Selective Catalytic Reduction[3]	Low NO_X Controls	SCONOx Control[4]	Direct Evacuation Control (DEC)/ Oxy-Fired Burners
		Other Considerations	For the SCR system to operate properly, the exhaust gas must be within an optimum temperature range of approximately 500 to 800 °F with relatively stable exhaust temperatures. This temperature range is dictated by the catalyst, which is typically made from noble metals, base metal oxides such as vanadium and titanium, and zeolite-based material. These catalysts are susceptible to fouling over time, and generally have an active life of between two and five years. Exhaust gas temperatures greater than the upper limit of the catalyst will allow unreacted oxides of nitrogen (NO_X) and ammonia to pass through the system. The reaction must be held at stoichiometry on a continuous basis to avoid emitting either unreacted NO_x or unreacted ammonia.	SNCR does not utilize a catalyst but relies on the use of ammonia at a proper stoichiometric ratio to react with the exhaust stream. As a result, SNCR has a lower tolerance to fluctuations in inlet NO_X concentrations than an SCR. The optimum exhaust gas temperature range for implementation of SNCR is 1,600 °F to 2,100 °F. For NH_3 systems, operation at temperatures below this range results in unreacted ammonia, while operation above this temperature range results in oxidation of ammonia, forming additional NO_2. The reaction must be held at stoichiometry on a continuous basis to avoid emitting either unreacted NO_X or unreacted ammonia.	One type of NSCR system injects a reducing agent into the exhaust gas stream prior to the catalyst reactor to reduce the NO_X. Another type of NSCR system has an afterburner and two catalytic reactors (one reduction catalyst and one oxidation catalyst). In this system, natural gas is injected into the afterburner to combust unburned HC (at a minimum temperature of 1700°F). The gas stream is cooled prior to entering the first catalytic reactor where CO and NO_X are reduced. A second heat exchanger cools the gas stream (to reduce any NO_X reformation) before entering the second catalytic reactor where remaining CO is converted to CO_2. The operating temperatures for NSCR system range from approximately 700° to 1500°F, depending on the catalyst. For NO_X reductions of 90 percent, the temperature must be between 800° to 1200°F.	None	None	None
		RBLC Database Information	Not included in the RBLC database as a form of control of NO_X from Electric Arc Furnaces/Ladle Metallurgy Stations.	Not included in the RBLC database as a form of control of NO_X from Electric Arc Furnaces/Ladle Metallurgy Stations.	Not included in the RBLC database as a form of control of NO_X from Electric Arc Furnaces/Ladle Metallurgy Stations.	One facility listed in the RBLC search results refers to the use of "low- NO_X burners" for their EAF (GA-0142). Further review shows this facility utilizes fundamentally different technology then the proposed CMC facility.	Not included in the RBLC database as a form of control of NO_X from Electric Arc Furnaces/Ladle Metallurgy Stations.	Included in the RBLC database as a form of control of NO_X from Electric Arc Furnaces/Ladle Metallurgy Stations.

Table 23-3. NO_X Top-Down BACT Analysis for EAF and LMS

Process	Pollutant
EAF/LMS	NO_X

Step		Control Technology	Selective Catalytic Reduction (SCR)[1]	Selective Non-Catalytic Reduction (SNCR)[2]	Non-Selective Catalytic Reduction[3]	Low NO_X Controls	SCONOx Control[4]	Direct Evacuation Control (DEC)/ Oxy-Fired Burners
Step 2.	**ELIMINATE TECHNICALLY INFEASIBLE OPTIONS**	**Feasibility Discussion**	In order to prevent excess deterioration of catalyst due to the particulate loading of the exhaust stream from the EAF/LMS, SCR controls would need to be located downstream of a particulate emission control technology (i.e., the baghouse). SCR would require raising the exhaust gas temperature to at least 500 °F. Below this temperature, the reaction rate drops significantly and the control of NO_X is no longer feasible. Since the exhaust temperature of the process is less than 150 °F, which is below the typical operating range of SCR, and based on the high volume of airflow, large amounts of auxiliary fuel would be required to heat the stream to the required temperature. This will create additional combustion emissions. This control technology has not been demonstrated in practice for control of NO_X emissions from the EAF/LMS. As a result, SCR is considered infeasible for the control of NO_X emissions from the EAF/LMS.	The EAF/LMS exhaust temperature is well below the operating range of SNCR and the reaction rate drops significantly such that the control of NO_X is no longer feasible. If SCNR was employed further upstream in the EAF and LMS exhaust, significant variations in the exhaust temperature and NO_X concentration would make the implementation of SCNR technically infeasible. This control technology has not been demonstrated in practice for control of NO_X emissions from the EAF/LMS. As a result, SNCR is considered infeasible for the control of NO_X emissions from the EAF/LMS.	In order to prevent excess deterioration of catalyst due to the particulate loading of the exhaust stream from the EAF/LMS, NSCR controls would need to be located downstream of a particulate emission control technology (i.e., the baghouse). NSCR would require raising the exhaust gas temperature to at least 700 °F. Below this temperature, the reaction rate drops significantly and the control of NO_X is no longer feasible. Since the exhaust temperature of the process is less than 150 °F, which is below the typical operating range of NSCR, and based on the high volume of airflow, large amounts of auxiliary fuel would be required to heat the stream to the required temperature. This will create additional combustion emissions. This control technology has not been demonstrated in practice for control of NO_X emissions from the EAF/LMS. As a result, NSCR is considered infeasible for the control of NO_X emissions from the EAF/LMS.	This control strategy requires relatively precise control of fuel flow rate and air/fuel ratio in order to reduce NO_X emissions. These controls are not readily available on an EAF. Additionally, an EAF requires high temperatures of approximately 3000 °F to melt the steel scraps and a lance to inject oxygen into the molten bath. A low NO_X burner would not be able to fulfill either of these requirements. The general concept of a low NO_X burner is to reduce the flame temperature below the peak temperature that favors the formation of NO_X. An EAF operates above the peak temperature for NO_X formation. This control technology has not been demonstrated in practice for control of NO_X emissions from the EAF/LMS, and Meltshop. As a result, Low NO_X Combustion Control is considered infeasible for the control of NO_X emissions from the EAF/LMS.	This control technology has only been demonstrated for turbines and has not been demonstrated in practice for control of NO_X emissions from the EAF/LMS. As a result $SCONO_x$ is considered infeasible for the control of NO_X emissions from the EAF/LMS.	Technically feasible. Oxy-Fired Burners are widely demonstrated in practice.
Step 3.	**RANK REMAINING CONTROL TECHNOLOGIES**	**Overall Control Efficiency**						Base Case
Step 4.	**EVALUATE AND DOCUMENT MOST EFFECTIVE CONTROLS**	**Cost Effectiveness ($/ton)**						Base Case

Table 23-3. NO_X Top-Down BACT Analysis for EAF and LMS

Process	Pollutant
EAF/LMS	NO_X

Step		Control Technology	Selective Catalytic Reduction (SCR)[1]	Selective Non-Catalytic Reduction (SNCR)[2]	Non-Selective Catalytic Reduction[3]	Low NO_X Controls	SCONOx Control[4]	Direct Evacuation Control (DEC)/ Oxy-Fired Burners	
Step 5.	**SELECT BACT**							**Facility**	**NO_X Emission Limit (lb/ton)**
								Comparable Facilities[5, 6]	
								Nucor Decatur, AL	0.42
								Nucor Norfolk, NE	0.42
								Nucor Tuscaloosa, AL	0.35
								Gerdau Ameristeel, NC	0.34
								CMC Mesa, AZ	**0.3**
								Nucor Frostproof, FL	**0.3**
								CMC Durant, OK	**0.3**
								Nucor Sedalia, MO	**0.3**
								Gerdau Macsteel, MI	0.27
								Proposed BACT:	**0.3 lb NO_X/ ton steel produced using DEC and Oxy-Fired Burners.**

1 U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Selective Catalytic Reduction (SCR))," EPA-452/F-03-032

2 U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Selective Non-Catalytic Reduction (SNCR))," EPA-452/F-03-031 U.S. EPA, Air Economics Group, "Selective Noncatalytic Reduction", John Sorrels, et. al., dated April 2019.

3 U.S. EPA, Office of Air Quality Planning and Standards, "CAM Technical Guidance Document - Nonselective Catalytic Reduction", dated April 2002.

4 December 20, 1999 Letter from John Devillars, Regional Administrator to Arthur Rocque, Jr., Commissioner of the EPA Department of Environmental Protection, titled "Recent SCONOx Pollution Prevention Control System Development".

5 A list of non-comparable facilities, as well as review of the EPA RACT/BACT/LAER Clearinghouse (RBLC) database, is provided in Appendix B. CMC has selected comparable facilities taking into account not just the type of furnace and product but also the pollutant's generation factors.

6 While only the Gerdau Ameristeel, CMC Mesa, Nucor Frostproof, Nucor Sedalia, and CMC Oklahoma facilities utilize similar technologies to the proposed EAF/LMS (i.e., ECS Process and Micro Mill), CMC has provided comparisons to other, recent, mini-mill NOx BACT limits as well. NOx generation in both mini- and micro-mills is driven predominantly by thermal NOx, in which atmospheric nitrogen is oxidized at very high temperatures (in both mini- and micro-mills) to form NOx. CMC cautions that simply comparing the numerical value of the BACT limit among various mills, however, is inappropriate because the overall stringency of the BACT limit depends not only on the numerical value but also the averaging time and the method of compliance, in addition to factors such as the product type, among others. An additional critical aspect is the form of the standard itself - i.e., expressed as lb/ton. Because mill operations often result in unanticipated delays - i.e., when the EAF's heat cycle is extended in order to address other shop-related problems such as downstream equipment including the LMS, caster, etc., the NOx formation and generation at the EAF (i.e., the numerator in the lb/ton form of the standard) continues to increase with the delay but the production (i.e., the denominator) of steel does not - making the lb/ton ratio greater as the delay progresses. Even otherwise, NOx generation in steel production is highly variable even within a single heat cycle given the highly stochastic nature of the underlying thermal NOx chemistry. Given these factors, most of which (i.e., NOx generation chemistry to a large extent and unexpected delays not just at the EAF but in the shop as a whole) are not under the control of the operator and given the form of the standard expressed as lb/ton, an averaging time of 30-days is appropriate for the proposed 0.3 numerical value of the standard. As the comparison to recent BACT determinations shows, this proposed NOx BACT limit, using a 30-day rolling average is appropriate. CMC notes that any downward deviations from the 0.3 lb/ton values will likely necessitate extending the 30-day average to even longer time periods for the reasons noted.

Table 23-4. SO_2 Top-Down BACT Analysis for EAF and LMS

Process	Pollutant
EAF/LMS	SO_2

Step		Control Technology	Impingement-Plate/Tray-Tower Scrubber[1]	Packed-Bed/Packed-Tower Wet Scrubber[2]	Spray-Chamber/Spray-Tower Wet Scrubber[3]	Flue Gas Desulfurization (FGD)[4]	Good Process Operation
Step 1.	**IDENTIFY AIR POLLUTION CONTROL TECHNOLOGIES**	**Control Technology Description**	An impingement-plate scrubber promotes contact between the flue gas and a sorbent slurry in a vertical column with transversely mounted perforated trays. Absorption of SO_2 is accomplished by countercurrent contact between the flue gas and reagent slurry	Scrubbing liquid (e.g., NaOH), which is introduced above layers of variously shaped packing material, flows concurrently against the flue gas stream. The acid gases are absorbed into the scrubbing solution and react with alkaline compounds to produce neutral salts.	Spray tower scrubbers introduce a reagent slurry as atomized droplets through an array of spray nozzles within the scrubbing chamber. The waste gas enters the bottom of the column and travels upward in a countercurrent flow. Absorption of SO_2 is accomplished by the contact between the gas and reagent slurry, which reacts in the formation of neutral salts.	Flue Gas Desulfurization (FGD) is a broad category of control technologies that can include spray dry, dry, a form of dry scrubbing known as a lime coated baghouse, and wet scrubbing. FGD is a similar process as wet scrubbing but it uses an alkaline reagent to react with SO_2 to produce a solid compound, either calcium or sodium sulfate. These compounds are then removed by a particulate control device. The alkaline reagent is typically sodium carbonate or slaked lime. The reagent in FGD is typically injected in the flue gas utilizing a spray tower or injection directly into the duct.	Sulfur enters the EAF steelmaking process as a component of scrap metal and carbon sources. The carbon products and scrap metals are combined in the EAF for steelmaking chemistry and the foamy slag process. A small amount of sulfur may be present as extraneous materials (i.e., oil, grease, plastics, etc.) in the scrap metal. Sulfur in the feed materials tends to collect in the slag. Sulfur reacts in the molten metal to form calcium and magnesium sulfides in the slag, with excess principally in the form of calcium sulfide, since there is free calcium residual in the slag from the added lime. Some of the sulfur may react with injected oxygen or oxidize at the slag surface or in the furnace head space to form SO_2 and be exhausted from the furnace.
		Other Considerations	The ideal temperature range for SO_2 removal in a wet gas scrubber is 40 to 100 °F. Waste slurry formed in the bottom of the scrubber requires disposal.	The ideal temperature range for SO_2 removal in a wet gas scrubber is 40 to 100 °F. To avoid clogging, packed bed wet scrubbers are generally limited to applications in which PM concentrations are less than 0.20 gr/dscf.	The ideal temperature range for SO_2 removal in a wet gas scrubber is 40 to 100 °F. Waste slurry formed in the bottom of the scrubber requires disposal.	The ideal temperature range for SO_2 removal in Flue Gas Desulfurization is 100 to 1,830 °F, depending on the type of system used (wet, spray dry, dry, or lime coated baghouse).	It is estimated that most of the input sulfur is retained in the steel and reaction compounds in the slag and baghouse dust. Thus, the nature of the EAF process results in good control of potential SO_2 emissions.
Step 2.	**ELIMINATE TECHNICALLY INFEASIBLE OPTIONS**	**RBLC Database Information**	Not included in the RBLC database as a form of control of SO_2 from Electric Arc Furnaces/Ladle Metallurgy Stations.	Not included in the RBLC database as a form of control of SO_2 from Electric Arc Furnaces/Ladle Metallurgy Stations.	Not included in the RBLC database as a form of control of SO_2 from Electric Arc Furnaces/Ladle Metallurgy Stations.	Not included in the RBLC database as a form of control of SO_2 from Electric Arc Furnaces/Ladle Metallurgy Stations.	Included in the RBLC database as a form of control of SO_2 from Electric Arc Furnaces/Ladle Metallurgy Stations.
		Feasibility Discussion	Furnace outlet temperature is above the normal operating range. This control technology has not been demonstrated in practice for control of SO_2 emissions from the EAF/LMS. As a result, Impingement-Plate/Tray-Tower Scrubber is considered infeasible for the control of SO_2 emissions from the EAF/LMS.	Furnace outlet temperature is above the normal operating range. This control technology has not been demonstrated in practice for control of SO_2 emissions from the EAF/LMS. As a result, Impingement-Plate/Tray-Tower Scrubber is considered infeasible for the control of SO_2 emissions from the EAF/LMS.	Furnace outlet temperature is above the normal operating range. This control technology has not been demonstrated in practice for control of SO_2 emissions from the EAF/LMS. As a result, Impingement-Plate/Tray-Tower Scrubber is considered infeasible for the control of SO_2 emissions from the EAF/LMS.	The high volumetric flow rate associated with EAF exhaust and the low SO_2 concentrations of the exhaust stream would make efficient operation of the Flue Gas Desulfurization infeasible. This control technology has not been demonstrated in practice, for a facility with similar technology (i.e., an ECS and Micro Mill Process), for control of SO_2 emissions from an EAF/LMS. As a result, Flue Gas Desulfurization is considered infeasible for the control of SO_2 emissions from the EAF/LMS.	In order to ensure that low amounts of sulfur enter the process, CMC maintains a scrap management plan to ensure minimal addition of sulfur from unwanted non-process materials. This option is considered technically feasible. Good Process Operation is widely demonstrated in practice.
Step 3.	**RANK REMAINING CONTROL TECHNOLOGIES**	**Overall Control Efficiency**					Base Case
Step 4.	**EVALUATE AND DOCUMENT MOST EFFECTIVE CONTROLS**	**Cost Effectiveness ($/ton)**					Base Case

Table 23-4. SO_2 Top-Down BACT Analysis for EAF and LMS

Process	Pollutant
EAF/LMS	SO_2

Step		Control Technology	Impingement-Plate/Tray-Tower Scrubber[1]	Packed-Bed/Packed-Tower Wet Scrubber[2]	Spray-Chamber/Spray-Tower Wet Scrubber[3]	Flue Gas Desulfurization (FGD)[4]	Good Process Operation	
Step 5.	**SELECT BACT**						**Facility**	**SO_2 Emission Limit (lb/ton)**
							Comparable Facilities[4,5]	
							Nucor Frostproof, FL	0.6
							CMC Durant, OK	0.6
							Nucor Sedalia, MO	0.5
							Nucor Tuscaloosa, AL	0.44
							Outokumpu Stainless, AL	0.38
							Nucor Decatur, AL	0.35
							CMC Mesa, AZ	**0.3**
							SDSW STEEL MILL	0.24
							Nucor Blytheville, AR	0.2
							Big River Steel, AR	0.2
							Gerdau Ameristeel, NC	0.16
							Proposed BACT:	**0.3 lb SO_2/ ton steel produced using Good Process Operation.**

[1] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Impingement-Plate/Tray-Tower Scrubber)," EPA-452/F-03-012

[2] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Packed-Bed/Packed-Tower Wet Scrubbers)," EPA-452/F-03-015

[3] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Spray-Chamber/Spray-Tower Wet Scrubber)," EPA-452/F-03-016

[4] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Flue Gas Desulfurization)," EPA-452/F-03-034

[5] A list of non-comparable facilities, as well as review of the EPA RACT/BACT/LAER Clearinghouse (RBLC) database, is provided in Appendix B. CMC has selected a broad list of comparable facilities because SO_2 generation and emissions are stoichiometric, i.e., depend on the totality of the sulfur inputs to the production process from all requirement inputs including scrap, limestone, and other additives.

[6] Because SO2 generation and emissions are mainly driven by furnace inputs and chemistry, and because the inputs are inherently site-specific and depend on the availability of the various raw materials such as scrap (appropriate for the desired product-mix), limestone, and carbon, etc., comparing numerical limits established for other mills can result in inappropriate determinations for BACT. The proposed BACT limit of 0.3 lb/ton steel was developed via a reasonable balancing of site-specific inputs consistent with the product mix and availability of local inputs that are proposed for the Project along with a reasonable compliance margin.

Table 23-5. PM Top-Down BACT Analysis for EAF and LMS

Process	Pollutant
EAF/LMS	$PM/PM_{10}/PM_{2.5}$

Step		Control Technology	Electrostatic Precipitator (ESP)[1,2]	Inertial Collection Systems (Cyclones)[3]	Wet Scrubber[4]	Incinerators[5]	Baghouse/Fabric Filter[6]
		Control Technology Description	An ESP uses electrical forces to move particles entrained within a exhaust stream onto a collection surfaces (i.e., an electrode). A wet ESP can be used in this application to reduce condensable and filterable particulate matter (PM) emissions formed due to SO_2; a dry ESP would reduce filterable particulate matter only. ESPs have been used on solid fuel combustion devices and in non-ferrous metal processing facilities.	Consists of one or more conically shaped vessels in which the exhaust gas stream follows a circular motion prior to the outlet. PM enters the cyclone suspended in the gas stream, which is forced into a vortex by the shape of the cyclone. The inertia of the PM resists the directional change of the gas, resulting in an outward movement under the influence of centrifugal forces until they strike the cyclone wall. The PM is caught in a thin laminar layer of air next to the cyclone wall and is carried downward by gravity to the collection hopper.	Wet Scrubbers remove particulates through the impact of particles with water droplets. Wet Scrubbers can have high removal efficiency for streams with a steady state exhaust. The scrubber operates with a high pressure drop to maintain high removal efficiency.	Thermal Incinerators are also referred to as direct flame incinerators, thermal oxidizers, or afterburners. They are primary used for volatile organic compounds (VOC) but some particulate matter commonly described as soot will be destroyed to various degrees. Soot are particles formed from the incomplete combustion of hydrocarbons, coke, or carbon residue.	Process exhaust gasses are collected and passed through a tightly woven or felted fabric arranged in sheets, cartridges, or bags that collect PM via sieving and other mechanisms. The dust cake that accumulates on the filters increases collection efficiency, and eventually falls into a hopper for removal. Various cleaning techniques include pulse-jet, reverse-air, and shaker technologies.

Table 23-5. PM Top-Down BACT Analysis for EAF and LMS

Process	Pollutant
EAF/LMS	$PM/PM_{10}/PM_{2.5}$

Step		Control Technology	Electrostatic Precipitator (ESP)[1,2]	Inertial Collection Systems (Cyclones)[3]	Wet Scrubber[4]	Incinerators[5]	Baghouse/Fabric Filter[6]
Step 1.	**IDENTIFY AIR POLLUTION CONTROL TECHNOLOGIES**	**Other Considerations**	Rappers or other mechanical mechanisms are used periodically to impart a vibration or shock to dislodge the deposited PM on dry ESP electrodes. The dislodged PM is collected in hoppers. In wet ESP, the collected particles are washed off of the collection plates by a small flow of trickling water. ESP systems are typically only used on continuous combustion sources. When used on an intermittent basis, the actual collection efficiency can range from 80-98 percent.	In some cases, thermal insulation is used to reduce heat loss and cold air from entering the system. Cold air can cause gas quenching and condensation which leads to corrosion, dust buildup, and plugging of the hopper or dust removal system. Inertial collection systems have been operated with inlet gas temperatures as high as 1000°F.	Wet scrubbing uses a significant amount of water and produces a wastewater stream that must be properly disposed.	Depending on the chemical composition of the particulate, the control efficiency for an incinerator can vary from to 99% for particulate matter 10 microns or less aerodynamic diameter (PM_{10}). This control technology has been demonstrated in the petroleum and coal, chemical products, primary metal, electronics, electric and gas, food, mining, and lumber industries.	Fabric filters are susceptible to corrosion and blinding by moisture. Appropriate fabrics must be selected for specific process conditions. Accumulations of dust may present fire or explosion hazards.
		RBLC Database Information	Not included in RBLC for the control of particulate emissions from the Electric Arc Furnaces/Ladle Metallurgy Stations.	Not included in RBLC for the control of particulate emissions from the Electric Arc Furnace/Ladle Metallurgy Stations.	Not included in RBLC for the control of particulate emissions from the Electric Arc Furnace/Ladle Metallurgy Stations.	Not included in RBLC for the control of particulate emissions from the Electric Arc Furnace/Ladle Metallurgy Stations.	Baghouses are included in the RBLC as a common form of control for particulate emissions from the Electric Arc Furnace/Ladle Metallurgy Stations.

Table 23-5. PM Top-Down BACT Analysis for EAF and LMS

Process	Pollutant
EAF/LMS	$PM/PM_{10}/PM_{2.5}$

Step		Control Technology	Electrostatic Precipitator (ESP)[1,2]	Inertial Collection Systems (Cyclones)[3]	Wet Scrubber[4]	Incinerators[5]	Baghouse/Fabric Filter[6]
Step 2.	**ELIMINATE TECHNICALLY INFEASIBLE OPTIONS**	**Feasibility Discussion**	The proposed control train employs a baghouse for control of PM, PM_{10} and $PM_{2.5}$ emissions. Additional particulate removal is not practical; moreover, the ESP would create adverse energy and environmental impacts (due to the power needed to generate the high voltage electrostatic fields, and with wet ESP, to dispose of the wastewater stream). This control technology has not been demonstrated in practice for control of PM emissions from the EAF/LMS. As a result, an ESP is considered infeasible for the control of PM emissions from the EAF/LMS.	The proposed control train employs a baghouse for control of PM, PM_{10} and $PM_{2.5}$ emissions. Additional particulate removal is not practical and a cyclone would be less efficient than a baghouse. This control technology has not been demonstrated in practice for control of PM emissions from the EAF/LMS. As a result, a cyclone is considered infeasible for the control of PM emissions from the EAF/LMS.	The proposed control train employs a baghouse for control of PM, PM_{10} and $PM_{2.5}$ emissions. Additional particulate removal is not practical; moreover, the Wet Scrubber would create adverse energy impacts (due to the increase in pressure drop across the system). This control technology has not been demonstrated in practice for control of PM emissions from the EAF/LMS. As a result, a Wet Scrubber is considered infeasible for the control of PM emissions from the EAF/LMS.	The proposed control train employs a baghouse for control of PM, PM_{10} and $PM_{2.5}$ emissions. Additional particulate removal is not practical; moreover, the Incinerator would create adverse environmental impacts (by creating additional combustion emissions). This control technology has not been demonstrated in practice for control of PM emissions from the EAF/LMS. As a result, an Incinerator is considered infeasible for the control of PM emissions from the EAF/LMS.	Technically feasible. The proposed control train employs a baghouse and baghouses are widely demonstrated in practice.
Step 3.	**RANK REMAINING CONTROL TECHNOLOGIES**	**Overall Control Efficiency**					Base Case
Step 4.	**EVALUATE AND DOCUMENT MOST EFFECTIVE CONTROLS**	**Cost Effectiveness ($/ton)**					Base Case

Table 23-5. PM Top-Down BACT Analysis for EAF and LMS

Process	Pollutant
EAF/LMS	$PM/PM_{10}/PM_{2.5}$

Step		Control Technology	Electrostatic Precipitator (ESP)[1,2]	Inertial Collection Systems (Cyclones)[3]	Wet Scrubber[4]	Incinerators[5]	Baghouse/Fabric Filter[6]		
							Facility	**PM Type**	**PM Emission Limit (gr/dscf)**
							Comparable Facilities[7,8,9]		
Step 5.	**SELECT BACT**						**Nucor Steel, WV**	**Particulate matter, total < 10 μ (TPM10)**	**0.0052**
								Particulate matter, total < 2.5 μ (TPM2.5)	**0.0052**
								Particulate matter, filterable (FPM)	**0.0018**
							Nucor Decatur, AL	**Particulate matter, total (TPM)**	**0.0052**
								Particulate matter, filterable (FPM)	**0.0018**
							Nucor Tuscaloosa, AL	Particulate matter, total < 10 μ (TPM10)	0.0052
								Particulate matter, total < 2.5 μ (TPM2.5)	0.0049
								Particulate matter, filterable (FPM)	0.0018
							CMC Durant, OK	Particulate matter, total < 10 μ (TPM10)	0.0024
								Particulate matter, total < 2.5 μ (TPM2.5)	0.0024
							CMC Mesa, AZ	PM10 Filterable and Condensable	0.0024
								PM2.5 Filterable and Condensable	0.0024
								PM filterable	0.0018
							Nucor Frostproof, FL	Particulate matter, total (TPM)	0.0024
								Particulate matter, filterable (FPM)	0.0018
							Nucor Sedalia, MO	Total PM10, PM2.5, and PM	0.0024
								Filterable PM	0.0015
							Proposed BACT:	**0.0052 gr/dscf (total $PM_{10}/PM_{2.5}$) 0.0018 gr/dscf (PM filterable) using a Baghouse/Fabric Filter**	

Table 23-5. PM Top-Down BACT Analysis for EAF and LMS

Process	Pollutant
EAF/LMS	$PM/PM_{10}/PM_{2.5}$

Step	Control Technology	Electrostatic Precipitator (ESP)[1,2]	Inertial Collection Systems (Cyclones)[3]	Wet Scrubber[4]	Incinerators[5]	Baghouse/Fabric Filter[6]

[1] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Wet Electrostatic Precipitator (ESP) - Wire Pipe Type)," EPA-452/F-03-029.
[2] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Wet Electrostatic Precipitator (ESP) - Wire Plate Type)," EPA-452/F-03-030.
[3] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Momentum Separators)," EPA-452/F-03-008
[4] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Flue Gas Desulfurization (FGD) - Wet, Spray Dry, and Dry Scrubbers)," EPA-452/F-03-034.
[5] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Thermal Incinerator)," EPA-452/F-03-022.
[6] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Fabric Filter - Pulse-Jet Cleaned Type)," EPA-452/F-03-025.
[7] A list of non-comparable facilities, as well as review of the EPA RACT/BACT/LAER Clearinghouse (RBLC) database, is provided in Appendix B. CMC has selected comparable facilities taking into account not just the type of furnace and product but also the pollutant's generation and control aspects.

[8] Filterable PM generation in an EAF (whether a micro- or mini-mill) is due to the complex and vigorous physical and chemical processes that occur during the charging, melting, and tapping of the furnace. This can be inherently variable (i.e., with no ability of the operator to control these processes) over time in a single heat. Regardless of the generation mechanisms, however, the filterable PM emissions depend largely on the air pollution control device, which, in the case of both mini- and micro-mills is universally a baghouse. The proposed Project will utilize a baghouse, therefore, CMC has summarized recent BACT determinations for both mini- and micro-mills. While the analysis shows that there is one lower determination of 0.0015 grains/dscf, CMC believes a BACT limit of 0.0018 grains/dscf is more appropriate considering a proper compliance margin as well as accounting for measurement aspects at these low levels.

[9] In contrast to filterable PM, whose generation in the EAF is highly variable, condensable PM generation can vary even more variable because it can be created not just in the EAF (and survive the high-temperature environment of the EAF) but also in the exhaust gas path from the EAF to the baghouse and more, importantly, after the baghouse, as the gases cool and certain types of compounds such as sulfur-compounds and semi-volatile organics can form via condensation. Due to the myriad formation mechanisms, condensable PM formation after the baghouse is inherently variable with little to no control of the operator other than managing proper scrap mix and additive injections. The proposed Project will use the best scrap quality consistent with its product mix. Based on these considerations, setting the BACT limit is largely a matter of determining the inherent variability of the condensable PM that is determined at the exist of the baghouse and using a reasonable compliance margin such that inherent, uncontrollable variability during a test (with its own set of measurement challenges) does not result in non-compliance that is no fault of the operator. The proposed BACT limit for total PM, i.e., 0.0052 grains/dscf, including both filterable and condensable components is based on CMC's review of test data from baghouse-equipped mini- and micro-mills in the US that have been reported by various operators - and, specifically, the large variability observed in such tests, even on a run-to-run basis under close to identical EAF and test conditions.

Table 23-6. VOC Top-Down BACT Analysis for EAF and LMS

Process	Pollutant
EAF/LMS	VOC

Step		Control Technology	Thermal Oxidation[1]	Catalytic Oxidation[2]	Carbon Adsorption[3]	Biofiltration[4]	Condenser[5]	Good Process Control
Step 1.	**IDENTIFY AIR POLLUTION CONTROL TECHNOLOGIES**	**Control Technology Description**	Utilizes an open flame or combustion within an enclosed chamber to oxidize pollutants. Thermal Oxidation has been a proven technology in controlling Volatile Organic Compounds (VOC) emissions from processes with high VOC usage (i.e., painting, polymer manufacturing, cleaning, etc.) but not EAFs.	Catalytic oxidation allows oxidation to take place at a faster rate and at a lower temperature than is possible with thermal oxidation. VOC emissions can be controlled via catalytic oxidation. The oxidation is facilitated by the presence of the catalyst and carried out by the same basic chemical reaction as thermal oxidation.	Carbon Adsorption utilizes a highly porous solid with a large surface area to selectively adsorb VOC. Adsorption collects VOC on the surface of the porous solid instead of destroying the compound through a chemical reaction. The most common porous solid used is activated carbon which is a relatively low cost adsorbent. The adsorption capacity is affected by factors such as organic compound concentration in exhaust, temperature, and humidity.	Biofiltration utilizes a bed of microorganisms to decompose biodegradable organic compounds. This technology has been successfully applied in full-scale applications to control VOC from a range of industrial and public-sector sources. Biofiltration also requires large land areas to house the microorganisms. The land required is proportional to the amount of exhaust gas that needs to be treated. Particulate matter in the exhaust stream can clog the biofilter.	Condensers convert gas or vapors into liquids through condensation. This allows VOC within a exhaust stream to be recovered before the stream is exhausted to the atmosphere. Condensers typically use water or air to cool and condense the vapor stream. Condensers are designed for a specified throughput of fluid and cannot deviate sustainably from its designed capacity.	The scrap metal used in the steelmaking process can contain plastics and organic liquids (i.e., oils) that may emit VOC during processing. In order to reduce the amount of VOC containing material introduced in the process a scrap management plan is used. The scrap management plan outlines procedures for sorting scrap and removing unwanted materials that may emit VOC. The operating temperature of the EAF is approximately 3,000 °F which is high enough to oxidize any VOC in the system. Thus, the nature of the EAF process results in good control of potential VOC emissions.
		Other Considerations	Thermal Oxidization of VOC occurs at temperatures between 1,100 and 1,200 °F. Below this temperature range, the rate of oxidation of VOC drops significantly and the effective control of VOC is no longer feasible.	Several noble metal-enriched catalysts at high temperatures promote this reaction. Prior to entering the catalyst bed where the oxidation reaction occurs, the temperature of the exhaust gas must be between 400 °F to 800 °F. Below this temperature range, the reaction rate drops sharply and effective oxidation of VOC is no longer feasible. Above this temperature, conventional oxidation catalysts break down and are unable to perform their desired functions. Dust and compounds in the exhaust gas may foul the catalyst, leading to decreased activity. Catalyst fouling occurs slowly under normal operating conditions and may be accelerated by even moderate sulfur concentrations in the exhaust gas. The catalyst can be chemically washed to restore its effectiveness, but eventually irreversible degradation occurs. In order to slow the fouling and deterioration of the catalyst due to the contaminants in the exhaust stream from the EAF/LMS, catalytic oxidation controls would need to be located downstream of a particulate emission control	Carbon adsorption streams are designed for specific inlet concentrations of VOC. For example, if a carbon adsorption system was designed for streams with greater than 1,000 parts per million (PPM) of VOC, it may not operate effectively below this concentration. The ideal temperature range for physical adsorption is 130 °F. Above this temperature, the adsorption capacity of the adsorbent decreases. Particulates in the exhaust stream can clog the porous material decreasing the lifespan of the process.	The optimum temperature range of biofiltration is approximately 100 °F in order to keep a viable population of microorganisms. Biofilters are also limited to organic compound concentrations of approximately 1,000 ppm or less. Biofilters are best suited to steady-state processes that do not have significant outages; the microorganisms tend to die off during extended process downtimes that tend to result in changes to the temperature, humidity, or nutrient levels in their habitat.	A typical condenser cannot reach temperatures below 100 °F and as a result high VOC removal rates are not possible unless the VOC condenses at high temperatures. Particulates in the exhaust stream can cause fouling leading to excessive maintenance and decreased efficiency. Additionally, low VOC concentrations in the exhaust streams cause the partial pressures of the VOC to be too low for condensation to occur resulting in a low removal rate.	None
		RBLC Database Information	Not included in the RBLC database as a form of control of VOC emissions from Electric Arc Furnaces/Ladle Metallurgy Stations.	Not included in the RBLC database as a form of control of VOC emissions from Electric Arc Furnaces/Ladle Metallurgy Stations.	Not included in the RBLC database as a form of control of VOC emissions from Electric Arc Furnaces/Ladle Metallurgy Stations.	Not included in the RBLC database as a form of control of VOC emissions from Electric Arc Furnaces/Ladle Metallurgy Stations.	Not included in the RBLC database as a form of control of VOC emissions from Electric Arc Furnaces/Ladle Metallurgy Stations.	Included in RBLC. Good Combustion and/or Process Control are included in the RBLC as a common form of control for VOC emissions from the Electric Arc Furnace/Ladle Metallurgy Stations.

Table 23-6. VOC Top-Down BACT Analysis for EAF and LMS

Process	Pollutant
EAF/LMS	VOC

Step		Control Technology	Thermal Oxidation[1]	Catalytic Oxidation[2]	Carbon Adsorption[3]	Biofiltration[4]	Condenser[5]	Good Process Control
Step 2.	**ELIMINATE TECHNICALLY INFEASIBLE OPTIONS**	**Feasibility Discussion**	In order to prevent excess deterioration of controls due to the particulate loading of the exhaust stream from the EAF/LMS, thermal oxidation controls would need to be located downstream of a particulate emission control technology (i.e., the baghouse). Thermal Oxidization of emissions for VOC destruction would require raising the exhaust gas temperature to at least a temperature of 1,100 °F. Below this temperature, the reaction rate drops significantly and the oxidation of VOC is no longer feasible. Since the exhaust temperature of the process after the particulate control device is less than 150 °F, which is well below the typical operating range of thermal oxidizers, and based on the high volume of airflow, large amounts of auxiliary fuel would be required to heat the stream to the required temperature for thermal oxidation. This will create additional combustion emissions. The high temperatures involved in thermal oxidation will also result in additional NO_X emissions. This control technology has not been demonstrated in practice for control of VOC emissions from the EAF/LMS. As a result, thermal oxidation of VOC emissions is considered infeasible for the control of VOC emissions from the EAF/LMS.	In order to prevent excess deterioration of controls due to the particulate loading of the exhaust stream from the EAF/LMS, catalytic oxidation controls would need to be located downstream of a particulate emission control technology (i.e., the baghouse). Catalytic oxidization of emissions for VOC destruction would require raising the exhaust gas temperature to at least a temperature of 400 °F. Below this temperature, the reaction rate drops significantly and the oxidation of VOC is no longer feasible. Since the exhaust temperature of the process after the particulate control device is less than 150 °F, which is well below the typical operating range of catalytic oxidizers, and based on the high volume of airflow, large amounts of auxiliary fuel would be required to heat the stream to the required temperature for catalytic oxidation. This will create additional combustion emissions. This control technology has not been demonstrated in practice for control of VOC emissions from the EAF/LMS. As a result, catalytic oxidation of VOC emissions is considered infeasible for the control of VOC emissions from the EAF/LMS.	Carbon Adsorption would create adverse environmental impacts by potentially increasing the amount of solid waste disposal. The high volumetric flow rate associated with EAF exhaust and the low VOC concentrations of the exhaust stream would make efficient operation of Carbon Adsorption infeasible. This control technology has not been demonstrated in practice for control of VOC emissions from the EAF/LMS. As a result, Carbon Adsorption is considered infeasible for the control of VOC emissions from the EAF/LMS.	Biofiltration would create adverse environmental impacts by potentially increasing the amount of solid waste disposal. A Biofilter must be located downstream of the particulate control device and the exhaust is at approximately 150 °F at that point. This is above the operational temperature of a biofilter. The high volumetric flow rate associated with EAF exhaust and the low VOC concentrations of the exhaust stream would make efficient operation of Biofiltration infeasible. This control technology has not been demonstrated in practice for control of VOC emissions from the EAF/LMS. As a result, Biofiltration is considered infeasible for the control of VOC emissions from the EAF/LMS.	A Condenser would create adverse environmental impacts (by potentially increasing the amount of liquid waste disposal). The high volumetric flow rate associated with EAF exhaust and the low VOC concentrations of the exhaust stream would make efficient operation of a Condenser infeasible. This control technology has not been demonstrated in practice for control of VOC emissions from the EAF/LMS. As a result, a Condenser is considered infeasible for the control of VOC emissions from the EAF/LMS.	In order to ensure that low amounts of VOC enter the process, CMC maintains a scrap management plan to ensure minimal addition of VOC from unwanted non-process materials. Technically feasible. Good Process Control is widely demonstrated in practice.
Step 3.	**RANK REMAINING CONTROL TECHNOLOGIES**	**Overall Control Efficiency**						Base Case
Step 4.	**EVALUATE AND DOCUMENT MOST EFFECTIVE**	**Cost Effectiveness ($/ton)**						Base Case

Table 23-6. VOC Top-Down BACT Analysis for EAF and LMS

Process	Pollutant
EAF/LMS	VOC

Step		Control Technology	Thermal Oxidation[1]	Catalytic Oxidation[2]	Carbon Adsorption[3]	Biofiltration[4]	Condenser[5]	Good Process Control	
Step 5.	**SELECT BACT**							**Facility**	**VOC Emission Limit (lb/ton)**
								Comparable Facilities[6,7]	
								Gerdau Ameristeel, NC	0.34
								CMC Mesa, AZ	**0.3**
								Nucor Frostproof, FL	**0.3**
								CMC Durant, OK	**0.3**
								Nucor Sedalia, MO	**0.3**
								Proposed BACT:	**0.3 lb VOC/ ton steel produced using Good Combustion and/or Process Control.**

[1] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Regenerative Incinerator)," EPA-452/F-03-021. U.S. EPA, Office of Air Quality Planning and Standards, "Draft CAM Technical Guidance Document - Thermal Oxidizers", dated April 2002
[2] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Catalytic Incinerator)," EPA-452/F-03-018
[3] U.S. EPA, Air Economics Group, "Carbon Adsorbers", dated October 2018.
[4] U.S. EPA, Office of Air Quality Planning and Standards, "Using Bioreactors to Control Air Pollution" EPA-456/R-03-003.
[5] U.S. EPA, Office of Air Quality Planning and Standards, "Refrigerated Condensers" EPA-452/B-02-001.
[6] A list of non-comparable facilities, as well as review of the EPA RACT/BACT/LAER Clearinghouse (RBLC) database, is provided in Appendix B. Because VOC emissions will depend to a greater extent on the type of furnace, CMC has appropriately included comparable facilities accordingly.
[7] Only the Gerdau Ameristeel, CMC Mesa, Nucor Frostproof, Nucor Sedalia and CMC Oklahoma facilities utilize similar technologies for the EAF/LMS (i.e., ECS Process and Micro Mill). The 0.30 lb/ton emission limit from the CMC Mesa, Nucor Frostproof, Nucor Sedalia, and CMC Oklahoma facilities is more stringent than the emission limit from the Gerdau Ameristeel facility.

Table 23-7. GHG Top-Down BACT Analysis for EAF and LMS

Process	Pollutant
EAF/LMS	GHG as measured in CO_2e

Step		Control Technology	DC Arc Furnace[1]	Scrap Preheating, Post-Combustion—Shaft Furnace[1]	Airtight Operation[1]	CONTIARC® Furnace[1]	Twin-Shell Furnace with Scrap Heating (CONARC®)[1]	Carbon Capture and Sequestration
Step 1.	**IDENTIFY AIR POLLUTION CONTROL TECHNOLOGIES**	**Control Technology Description**	The DC Arc Furnace technology replaces the normal three electrodes (one for each phase) with one large electrode that uses direct current instead of alternating current for heating the scrap in the EAF. Based on the distinctive feature of using the heat and magnetic force generated by the current in melting, this arc furnace achieves an energy saving of approximately 5 percent in terms of power unit consumption in comparison to the 3-phase alternating current arc furnace.	Shaft furnace design can preheat the scrap prior to it being introduced into the EAF for melting. This design was developed as a method of reducing power consumption during the heating process.	During a heating cycle of the EAF, large quantities of ambient air enters the EAF. This air is heated in the furnace and exits with the fumes at high temperature (around 1,800°F); heating the air results in significant thermal losses. Of the associated cost savings that can be attributed to this technology, 80 percent can be attributed to the reduction in the heat losses from the flue gases and 20 percent can be attributed to the reduced thermal losses due to reduced tap-to-tap time.	The CONTIARC® furnace is fed continuously with material in a ring between the CONTIARC shaft and the outer furnace vessel; where the charged material is continuously preheated by the rising process gas in a counter-current flow, while the material continuously moves down.	A twin-shell furnace includes two EAF vessels with a common arc and power supply. In the two furnace shells, blowing lance and electrodes are used in turns. This makes it possible to process the charge materials of steel scrap, crude iron and direct-reduced iron (DRI) in various mixing ratios. This system increases productivity by decreasing tap-to-tap times, reducing refractory and electrode consumption, and improved ladle life.	These emerging carbon capture and sequestration (CCS) technologies generally consist of processes that separate CO_2 from combustion process flue gas, compress, transport and then inject it into geologic formations such as oil and gas reservoirs, unmineable coal seams, and underground saline formations. Of the emerging CO_2 capture technologies that have been identified, only amine absorption is currently commercially used for state-of the art CO_2 separation processes.
		Other Considerations	This technology is limited to new installations because of the prohibitive scale of the retrofit costs. As of 2007 there are eight DC powered EAF operating in the U.S.	Since 2005, the VAI Fuchs furnace has been known as SIMETALCIS EAF. With the single shaft furnace, up to 70 kWh/ton (0.28 GJ/tonne) liquid steel of electric power can be saved. The finger shaft furnace allows energy savings up to 100 kWh/ton (0.40 GJ/tonne) liquid steel, which is about 25 percent of the overall electricity input into the furnace.	The primary reason for failure to operate an airtight EAF is the need to evaluate the material within the EAF continuously while charging the EAF with scrap, and then also balancing the requirement to control emissions from the EAF. This operational complexity is compounded by the fact that the scrap metal is highly variable. Airtight operations have only been demonstrated in pilot plants with a seven ton EAF.	The CONTIARC® design does not have a method for removing slag from the melted steel and thus limits its application to steel processes where slag removal is not required.	The Twin Shell Furnace design is very effective at improving productivity and reducing the energy required for the melting process but it represents a significantly larger capital expenditure and would therefore be typically utilized for facilities that produce over 1 million tpy of steel.	Amine absorption has been applied to processes in the petroleum refining and natural gas processing industries and for exhausts from gas-fired industrial boilers. Other potential absorption and membrane technologies are currently considered developmental.
		RBLC Database Information	Not included in RBLC for the control of GHG emissions from the Electric Arc Furnace/Ladle Metallurgy Stations at an ECS Micro Mill.	Not included in RBLC for the control of GHG emissions from the Electric Arc Furnace/Ladle Metallurgy Stations.	Not included in RBLC for the control of GHG emissions from the Electric Arc Furnace/Ladle Metallurgy Stations.	Not included in RBLC for the control of GHG emissions from the Electric Arc Furnace/Ladle Metallurgy Stations.	Not included in RBLC for the control of GHG emissions from the Electric Arc Furnace/Ladle Metallurgy Stations.	Not included in RBLC for the control of GHG emissions from the Electric Arc Furnace/Ladle Metallurgy Stations.

Table 23-7. GHG Top-Down BACT Analysis for EAF and LMS

Process	Pollutant
EAF/LMS	GHG as measured in CO_2e

Step		Control Technology	DC Arc Furnace[1]	Scrap Preheating, Post-Combustion—Shaft Furnace[1]	Airtight Operation[1]	CONTIARC® Furnace[1]	Twin-Shell Furnace with Scrap Heating (CONARC®)[1]	Carbon Capture and Sequestration
Step 2.	**ELIMINATE TECHNICALLY INFEASIBLE OPTIONS**	**Feasibility Discussion**	This option may reduce GHG emissions but may also increase the emission of other pollutants. Per the Section IV.A.3 of the New Source Review Workshop Manual, the use of a DC Arc Furnace would be classified as "redefining the source" and as a result, is not a feasible option for the control of GHG emissions.	This option may reduce GHG emissions but has the propensity to emit high levels of CO. The use of Scrap Preheating, Post Combustion - Shaf Furnace would be classified as "redefining the source" and as a result, is not a feasible option for the control of GHG emissions.	This control technology has not been demonstrated in practice for control of GHG emissions from the EAF/LMS in a ECS Micro Mill process. As a result, Airtight Operation is not a feasible option for the control of GHG emissions.	Slag removal is a key requirement for the process and the CONTIARC® furnace would not be appropriate. This option may reduce GHG emissions but may also increase the emission of other pollutants. As a result, a CONTIARC® furnace is not a feasible option for the control of GHG emissions.	This option may reduce GHG emissions but may increase emissions of other pollutants. This control technology has not been demonstrated in practice for control of GHG emissions from the EAF/LMS in a ECS Micro Mill process. As a result, a Twin-Shell Furnace is not a feasible option for the control of GHG emissions.	The EAF/LMS exhaust has significantly lower volumes and concentrations of GHGs then petroleum refining and natural gas processing facilities which makes Carbon Capture and Sequestration infeasible. Also, this control technology has not been demonstrated in practice for control of GHG emissions from the EAF/LMS. As a result, Carbon Capture and Sequestration is not a feasible option for the control of GHG emissions.
Step 3.	**RANK REMAINING CONTROL TECHNOLOGIES**	**Overall Control Efficiency**						
Step 4.	**EVALUATE AND DOCUMENT MOST EFFECTIVE CONTROLS**	**Cost Effectiveness ($/ton)**						
Step 5.	**SELECT BACT**							

[1] U.S. EPA, Office of Air and Radiation, "Available and Emerging Technologies for Reducing Greenhouse Gas Emissions from the Iron and Steel Industry", Sept. 2012.

Table 23-7. GHG Top-Down BACT Analysis for EAF and L

Process	Pollutant
EAF/LMS	GHG as measured in CO_2e

Step		Control Technology	Foamy Slag Practice[1]	Oxy-Fuel Burners[1]	Post Combustion of the Flue Gases[1]	Engineered Refractories[1]	Eccentric Bottom Tapping on Furnace[1]
Step 1.	**IDENTIFY AIR POLLUTION CONTROL TECHNOLOGIES**	**Control Technology Description**	Foamy slag covers the arc and melt surface to reduce radiation heat losses. Foamy slag can be obtained by injecting carbonaceous material and oxygen or by lancing of oxygen only. Slag foaming increases the electric power efficiency by at least 20 percent in spite of a higher arc voltage. The use of the foamy slag process may also increase productivity through reduced tap-to-tap times.	Oxy-fuel burners are used on most EAFs in the U.S. These burners increase the effective capacity of the furnace by increasing the speed of the melt and reducing the consumption of electricity and electrode material, both which reduce emissions of greenhouse gases. The use of oxyfuels also increases heat transfer, reduces heat losses, reduces electrode consumption, and reduces tap-to-tap time. It also helps to remove different elements from the steel bath like phosphorous, silicon and carbon.	Post-combustion is a process that utilizes the chemical energy in the CO and hydrogen evolving from the steel bath to heat the steel in the EAF ladle or to preheat scrap. Post combustion helps to optimize the benefits of oxygen and fuel injection.	Refractories in the EAF have to withstand extreme temperatures, oxidation, thermal shock, erosion, and corrosion. These conditions generally lead to an undesired wear of refractories. Through the use of controlled microstructure of the refractories, these factors can be controlled, which results in reduce ladle leakages and formation of slag during transfer operations.	Eccentric bottom tapping leads to slag-free tapping, shorter tap-to-tap times, reduced refractory and electrode consumption, and improved ladle life.
		Other Considerations	None	None	None	None	None
		RBLC Database Information	Included in RBLC for the control of GHG emissions from the Electric Arc Furnace/Ladle Metallurgy Stations.	Included in RBLC for the control of GHG emissions from the Electric Arc Furnace/Ladle Metallurgy Stations.	Included in RBLC for the control of GHG emissions from the Electric Arc Furnace/Ladle Metallurgy Stations.	Included in RBLC for the control of GHG emissions from the Electric Arc Furnace/Ladle Metallurgy Stations.	Included in RBLC for the control of GHG emissions from the Electric Arc Furnace/Ladle Metallurgy Stations.

Table 23-7. GHG Top-Down BACT Analysis for EAF and L

Process	Pollutant
EAF/LMS	GHG as measured in CO_2e

Step		Control Technology	Foamy Slag Practice[1]	Oxy-Fuel Burners[1]	Post Combustion of the Flue Gases[1]	Engineered Refractories[1]	Eccentric Bottom Tapping on Furnace[1]
Step 2.	ELIMINATE TECHNICALLY INFEASIBLE OPTIONS	Feasibility Discussion	Technically feasible. These technologies and work practices are widely demonstrated in practice.				
Step 3.	RANK REMAINING CONTROL TECHNOLOGIES	Overall Control Efficiency	Base Case				
Step 4.	EVALUATE AND DOCUMENT MOST EFFECTIVE CONTROLS	Cost Effectiveness ($/ton)	Base Case				
Step 5.	SELECT BACT		**Emission Limit Evaluation** *Comparable Facilities*[2,3] *(see end of table)*				

Table 23-7. GHG Top-Down BACT Analysis for EAF and L

Process	Pollutant
EAF/LMS	GHG as measured in CO_2e

Step		Control Technology	Bottom Stirring/Stirring Gas Injection[1]	Transformer Efficiency-Ultra-High Power Transformers[1]	Adjustable Speed Drives[1]	Improved Process Control[1]	Scrap Preheating Using the ECS Process[1]
Step 1.	IDENTIFY AIR POLLUTION CONTROL TECHNOLOGIES	Control Technology Description	Bottom stirring is accomplished by injecting an inert gas into the bottom of the EAF to increase the heat transfer in a melt.	Ultra-high-power (UHP) transformers help to reduce energy loss and increase productivity through modem design.	As the flue gas flow rates vary from the EAF/LMS, there are opportunities to lower the speed of the dust collection fans by using adjustable speed drives to match the demand for these fans. Although there may be a slight reduction in total dust collection amounts, there is a significant power consumption savings to be had from the use of this technology.	Involves the use of a modem control and monitoring system which integrates real-time monitoring of the process variables such as steel bath temperature, carbon levels along with real-time control systems for graphite injection and lance oxygen practice. The improved process control include energy monitoring and management system.	Preheating the scrap reduces power consumption to the EAF by using the waste heat of the EAF as the energy source for the preheat operation. The ECS process consists of a conveyer belt that transports the scrap through a tunnel to the EAF. In addition to energy savings, the ECS process can increase productivity by 33 percent, decrease electrode consumption by 40 percent, and can reduce dust emissions.
		Other Considerations	Increased interaction between slag and melt leads to an increased liquid metal yield of 0.5 percent. Furnaces with oxygen injection are sufficiently turbulent, reducing the need for inert gas stirring.	UHP operations may lead to heat fluxes and increased refractory wear, making cooling of the furnace panels necessary. The additional heat loss partially offsets the power savings.	None	None	None
		RBLC Database Information	Included in RBLC for the control of GHG emissions from the Electric Arc Furnace/Ladle Metallurgy Stations.	Included in RBLC for the control of GHG emissions from the Electric Arc Furnace/Ladle Metallurgy Stations.	Included in RBLC for the control of GHG emissions from the Electric Arc Furnace/Ladle Metallurgy Stations.	Included in RBLC for the control of GHG emissions from the Electric Arc Furnace/Ladle Metallurgy Stations.	Included in RBLC for the control of GHG emissions from the Electric Arc Furnace/Ladle Metallurgy Stations.

Table 23-7. GHG Top-Down BACT Analysis for EAF and L

Process	Pollutant
EAF/LMS	GHG as measured in CO_2e

Step		Control Technology	Bottom Stirring/Stirring Gas Injection[1]	Transformer Efficiency-Ultra-High Power Transformers[1]	Adjustable Speed Drives[1]	Improved Process Control[1]	Scrap Preheating Using the ECS Process[1]
Step 2.	**ELIMINATE TECHNICALLY INFEASIBLE OPTIONS**	**Feasibility Discussion**	Technically feasible. These technologies and work practices are widely demonstrated in practice.				
Step 3.	**RANK REMAINING CONTROL TECHNOLOGIES**	**Overall Control Efficiency**	Base Case				
Step 4.	**EVALUATE AND DOCUMENT MOST EFFECTIVE CONTROLS**	**Cost Effectiveness ($/ton)**	Base Case				
Step 5.	**SELECT BACT**		**Facility**	**GHG Emission Limit (lb/ton)**			
			Comparable Facilities[2,3]				
			Gerdau Ameristeel, NC	-			
			CMC Mesa, AZ	-			
			Nucor Frostproof, FL	438			
			CMC Durant, OK	535			
			Nucor Sedalia, MO	438			
			Proposed BACT:	**Annual limit of 119,513 tpy using the technologies and work practices described above.**			

[2] See Appendix B for a list of non-comparable facilities from the RBLC database.
[3] Only the Gerdau Ameristeel, CMC Mesa, Nucor Frostproof, Nucor Sedalia, and CMC Oklahoma facilities utilize similar technologies for the EAF/LMS (i.e., ECS Process and Micro Mill). All these facilities utilize one or more of the above feasible technologies/work practices.

Table 23-8. Fluoride Top-Down BACT Analysis for EAF and LMS

Process	Pollutant
EAF/LMS	Fluoride excluding Hydrogen Fluoride

Step		Control Technology	Electrostatic Precipitator (ESP)[1,2]	Inertial Collection Systems (Cyclones)[3]	Wet Scrubber[4]	Baghouse/Fabric Filter[5]
Step 1	IDENTIFY AIR	**Control Technology Description**	An ESP uses electrical forces to move particles entrained within a exhaust stream onto a collection surfaces (i.e., an electrode). A wet ESP can be used in this application to reduce condensable and filterable fluoride containing particulate matter (PM) emissions formed; a dry ESP would reduce filterable PM only. ESPs have been used on solid fuel combustion devices and in non-ferrous metal processing facilities.	Consists of one or more conically shaped vessels in which the exhaust gas stream follows a circular motion prior to the outlet. Fluoride containing PM enters the cyclone suspended in the gas stream, which is forced into a vortex by the shape of the cyclone. The inertia of the PM resists the directional change of the gas, resulting in an outward movement under the influence of centrifugal forces until they strike the cyclone wall. The PM is caught in a thin laminar layer of air next to the cyclone wall and is carried downward by gravity to the collection hopper.	Wet Scrubbers removes fluoride containing particulates through the impact of particles with water droplets. Wet Scrubbers can have high removal efficiency for streams with a steady state exhaust. The scrubber operates with a high pressure drop to maintain high removal efficiency.	Process exhaust gasses are collected and passed through a tightly woven or felted fabric arranged in sheets, cartridges, or bags that collect fluoride containing PM via sieving and other mechanisms. The dust cake that accumulates on the filters increases collection efficiency and eventually falls into a hopper for removal. Various cleaning techniques include pulse-jet, reverse-air, and shaker technologies.

Table 23-8. Fluoride Top-Down BACT Analysis for EAF and LMS

Process	Pollutant
EAF/LMS	Fluoride excluding Hydrogen Fluoride

Step		Control Technology	Electrostatic Precipitator (ESP)[1,2]	Inertial Collection Systems (Cyclones)[3]	Wet Scrubber[4]	Baghouse/Fabric Filter[5]
Step 1:	POLLUTION CONTROL TECHNOLOGIES	Other Considerations	Rappers or other mechanical mechanisms are used periodically to impart a vibration or shock to dislodge the deposited fluoride containing PM on dry ESP electrodes. The dislodged PM is collected in hoppers. In wet ESP, the collected particles are washed off of the collection plates by a small flow of trickling water. ESP systems are typically only used on continuous combustion sources. When used on an intermittent basis, the actual collection efficiency can range from 80-98 percent	In some cases, thermal insulation is used to reduce heat loss and cold air from entering the system. Cold air can cause gas quenching and condensation which leads to corrosion, dust buildup, and plugging of the hopper or dust removal system. Inertial collection systems have been operated with inlet gas temperatures as high as 1000°F.	Wet scrubbing uses a significant amount of water and produces a wastewater stream that must be properly disposed.	Fabric filters are susceptible to corrosion and blinding by moisture. Appropriate fabrics must be selected for specific process conditions. Accumulations of dust may present fire or explosion hazards.
		RBLC Database Information	Not included in RBLC for the control of fluoride emissions from the Electric Arc Furnaces/Ladle Metallurgy Stations.	Not included in RBLC for the control of fluoride emissions from the Electric Arc Furnace/Ladle Metallurgy Stations.	Not included in RBLC for the control of fluoride emissions from the Electric Arc Furnace/Ladle Metallurgy Stations.	Baghouses are included in the RBLC as a common form of control for fluoride emissions from the Electric Arc Furnace/Ladle Metallurgy Stations.

Table 23-8. Fluoride Top-Down BACT Analysis for EAF and LMS

Process	Pollutant
EAF/LMS	Fluoride excluding Hydrogen Fluoride

Step		Control Technology	Electrostatic Precipitator (ESP)[1,2]	Inertial Collection Systems (Cyclones)[3]	Wet Scrubber[4]	Baghouse/Fabric Filter[5]
Step 2.	**ELIMINATE TECHNICALLY INFEASIBLE OPTIONS**	**Feasibility Discussion**	The proposed control train employs a baghouse for control of Fluoride containing PM emissions. Additional Fluoride removal is not practical; moreover, the ESP would create adverse energy and environmental impacts (due to the power needed to generate the high voltage electrostatic fields, and with wet ESP, to dispose of the wastewater stream). This control technology has not been demonstrated in practice for control of Fluoride emissions from the EAF/LMS. As a result, an ESP is considered infeasible for the control of Fluoride emissions from the EAF/LMS.	The proposed control train employs a baghouse for control of Fluoride containing PM emissions. Additional Fluoride removal is not practical and a cyclone would be less efficient than a baghouse. This control technology has not been demonstrated in practice for control of Fluoride emissions from the EAF/LMS. As a result, a cyclone is considered infeasible for the control of Fluoride emissions from the EAF/LMS.	The proposed control train employs a baghouse for control of Fluoride containing PM emissions. Additional Fluoride removal is not practical; moreover, the Wet Scrubber would create adverse energy impacts (due to the increase in pressure drop across the system). This control technology has not been demonstrated in practice for control of Fluoride emissions from the EAF/LMS. As a result, a Wet Scrubber is considered infeasible for the control of Fluoride emissions from the EAF/LMS.	Technically feasible. The proposed control train employs a baghouse and baghouses are widely demonstrated in practice.
Step 3.	**RANK REMAINING CONTROL TECHNOLOGIES**	**Overall Control Efficiency**				Base Case
Step 4.	**EVALUATE AND DOCUMENT MOST EFFECTIVE CONTROLS**	**Cost Effectiveness ($/ton)**				Base Case

Table 23-8. Fluoride Top-Down BACT Analysis for EAF and LMS

Process	Pollutant
EAF/LMS	Fluoride excluding Hydrogen Fluoride

Step		Control Technology	Electrostatic Precipitator (ESP)[1,2]	Inertial Collection Systems (Cyclones)[3]	Wet Scrubber[4]	Baghouse/Fabric Filter[5]	
Step 5.	**SELECT BACT**					**Facility**	**Fluoride Emission Limit (lb/ton)**
						Comparable Facilities[6,7]	
						Nucor Frostproof, FL	0.059
						Nucor Sedalia, FL	0.059
						SDSW Steel, TX	**0.01**
						SDSW Steel, TX	**0.01**
						CMC Mesa, AZ	**0.01**
						Nucor Norfolk, NE	0.0059
						Steel Mini Mill	0.0035
						Proposed BACT:	**0.01 lb/ton for fluorides produced using a Baghouse/Fabric Filter.**

[1] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Wet Electrostatic Precipitator (ESP) - Wire Pipe Type)," EPA-452/F-03-029.
[2] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Wet Electrostatic Precipitator (ESP) - Wire Plate Type)," EPA-452/F-03-030.
[3] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Momentum Separators)," EPA-452/F-03-008
[4] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Flue Gas Desulfurization (FGD) - Wet, Spray Dry, and Dry Scrubbers)," EPA-452/F-03-034.
[5] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Fabric Filter - Pulse-Jet Cleaned Type)," EPA-452/F-03-025.
[6] A list of non-comparable facilities, as well as review of the EPA RACT/BACT/LAER Clearinghouse (RBLC) database, is provided in Appendix B. Because fluoride emissions depend on additives used for fluidization and the maintenance of bath temperatures during tapping and refining, which depends on EAF design and product considerations, CMC has included an appropriate list of comparable facilities accordingly.

[7] Only the Gerdau Ameristeel, CMC Mesa, Nucor Frostproof, Nucor Sedalia, and CMC Oklahoma facilities utilize similar technologies for the EAF/LMS (i.e., ECS Process and Micro Mill), but only CMC Mesa, Nucor Frostproof, and Nucor Sedalia have BACT determinations for fluoride. The 0.01 lb/ton emission limit for fluorides excluding hydrogen fluoride is in line with the emission limit at the CMC Mesa facility and more conservative than the emission limits at the Nucor Frostproof and Nucor Sedalia facilities.

23.4 Emission Sources Routed to Caster Vent

Emission Units routed to the Caster Vent (CV1) are listed below:

- Uncaptured emissions from the EAF and LMS
- One Continuous Caster (CAST1)
- Three Ladle Preheaters (LPH1)
- Two Ladle Dryers (LD1)
- Two Tundish Preheaters (TPH1)
- One Tundish Dryer (TD1)
- One Tundish Mandril Dryer (TMD1)
- One shroud heater (SRDHTR1)
- 20 Meltshop Comfort Heaters (MSAUXHT)
- Binder Usage associated with Ladle Refractory Repair (LB1)
- Binder Usage associated with Tundish Refractory Repair (TB1)
- Cutting Torches (TORCH1)

The EAF and LMS emission streams will be routed to and discharged from the meltshop baghouse which has a 99.5% capture efficiency. The remaining 0.5% of uncaptured emissions will be routed through the caster vent.

After the steel reaches the desired temperature in the LMS, the ladle will be transported to the continuous caster where the molten steel will flow into a tundish and then into a single mold to be formed into product. During the steel making process, the ladles and tundishes first will be dried and then preheated prior to the molten steel entering the respective vessel. A total of nine propane/natural gas-fired burners will be used to dry and heat the ladles and tundishes. Combustion emissions from the ladle/tundish preheaters and dryers will be routed through the caster vent.

The ladles and tundishes will be coated with a protective refractory lining. The refractory lining will need to be regularly repaired and/or rebuilt. Emissions from the binder usage associated with the ladle and tundish refractory repair will be routed through the caster vent.

Typically, a BACT analysis would be performed for each individual emission unit. However, it is conservative to group emission units that are routed to a single exhaust point (i.e., the caster vent) because the higher the magnitude of emissions, the more cost effective a potential control would be. The majority of the combustion equipment listed above have similar MMBtu/hr values ranging from 6 to 8 MMBtu/hr for one burner meaning that the BACT analysis based on RBLC review for the burners would be fairly similar. CMC has performed this BACT analysis assuming all of the above emission units are a single source for simplicity. Table 23-9 provides a summary of the selected BACT controls and emission limits for pollutants emitted by the caster vent, and Table 23-10 to Table 23-15 contain the top-down BACT analyses for the pollutants listed in Table 23-9.

Table 23-9. Summary of Selected BACT for Caster Vent

Pollutant	Selected BACT Control	Selected BACT Limit (tpy)
CO	Good Operating Practices	8.34
NO_x	Low-NO_x Burners, as applicable, and Good Operating Practices	0.49
SO_2	Good Operating Practices	0.49
PM/$PM_{2.5}$/PM_{10}	Good Operating Practices	2.45 (PM Filterable) 2.57 (PM_{10}/$PM_{2.5}$ Filterable + Condensable)
VOC	Good Operating Practices	0.80
GHG as measured in CO_2e	Good Operating Practices	951

Table 23-10. CO Top-Down BACT Analysis for Emission Sources Routed to Caster Vent

Process	Pollutant
Emission Sources Routed to Caster Vent	CO

Step 1.	**IDENTIFY AIR POLLUTION CONTROL TECHNOLOGIES**	**Control Technology**	**Thermal Oxidation[1]**	**Catalytic Oxidation[2]**	**Good Operating Practices**
		Control Technology Description	Utilizes an open flame or combustion within an enclosed chamber to oxidize pollutants. Thermal Oxidation has been a proven technology in controlling Carbon Monoxide (CO) emissions from Portland Cement Kilns, Petroleum Refining, and Polymer Manufacturing but not the emission sources from a steel mill routed to the Caster Vent.	Catalytic oxidation allows oxidation to take place at a faster rate and at a lower temperature than is possible with thermal oxidation. CO emissions can be controlled via catalytic oxidation. The oxidation is facilitated by the presence of the catalyst and carried out by the same basic chemical reaction as thermal oxidation: $CO + ½ O_2 \rightarrow CO_2$	Good Operating Practices for the emission sources routed to the Caster Vent includes good combustion practices and the use of natural gas in the Ladle/Tundish Preheaters and Dryers and air injectors in the EAF/LMS. Operation of the Ladle/Tundish burners at the appropriate oxygen range and temperature promotes complete combustion.
		Other Considerations	Additional fuel would be required to reach the ignition temperature of the waste gas stream as the typical operating temperatures are between 1,300 °F and 2,000 °F. Oxidizers are not recommended for controlling gases with halogen or sulfur containing compounds due to the formation of highly corrosive acid gases.	Several noble metal-enriched catalysts at high temperatures promote this reaction. Prior to entering the catalyst bed where the oxidation reaction occurs, the temperature of the exhaust gas must be between 400 °F to 800 °F. Below this temperature range, the reaction rate drops sharply and effective oxidation of CO is no longer feasible. Above this temperature, conventional oxidation catalysts break down and are unable to perform their desired functions.	None.

Table 23-10. CO Top-Down BACT Analysis for Emission Sources Routed to Caster Vent

Process	Pollutant
Emission Sources Routed to Caster Vent	CO

Step 2.	**ELIMINATE TECHNICALLY INFEASIBLE OPTIONS**	**RBLC Database Information**	Not included in the RBLC databases as a form of control for CO from the emission sources associated with a steel mill routed to the Caster Vent.	Not included in the RBLC databases as a form of control for CO from the emission sources associated with a steel mill routed to the Caster Vent.	Included in the RBLC database (i.e., good combustion practices) as a common form of control for CO from the emission sources routed to the Caster Vent.
		Feasibility Discussion	Thermal oxidation of emissions for CO destruction would require raising the exhaust gas temperature to at least a temperature of 1,300 °F at a residence time of 0.5 seconds. Below this temperature the reaction rate drops significantly and the oxidation of CO to CO_2 is no longer feasible. Since the exhaust temperature of the Caster Vent is below the typical operating range of thermal oxidizers, large amounts of auxiliary fuel would be required to heat the stream to the required temperature for thermal oxidation. This will create additional combustion emissions. The high temperatures involved in thermal oxidation will also result in additional NO_X emissions. This control technology has not been demonstrated in practice for control of CO emissions from the emission sources located at a steel mill routed to the Caster Vent. As a result, thermal oxidation of CO emissions is considered infeasible for the control of CO emissions from the emission sources routed to the Caster Vent.	Catalytic oxidization of emissions for CO destruction would require raising the exhaust gas temperature to at least a temperature of 400 °F. Below this temperature the reaction rate drops significantly and the oxidation of CO is no longer feasible. Since the exhaust temperature of the Caster Vent are below the typical operating range of catalytic oxidizers, large amounts of auxiliary fuel would be required to heat the stream to the required temperature for catalytic oxidation. This will create additional combustion emissions. This control technology has not been demonstrated in practice for control of CO emissions from the emission sources located at a steel mill routed to the Caster Vent. As a result, catalytic oxidation of CO emissions is considered infeasible for the control of CO emissions from the emission sources routed to the Caster Vent.	Technically feasible. Good Operating Practices including good combustion practices and the use of pipeline quality natural gas has been widely selected as BACT for CO control from the emission sources located at a steel mill routed to the Caster Vent.
Step 3.	**RANK REMAINING CONTROL TECHNOLOGIES**	**Overall Control Efficiency**			Base Case
Step 4.	**EVALUATE AND DOCUMENT MOST EFFECTIVE CONTROLS**	**Cost Effectiveness ($/ton)**			Base Case
Step 5.	**SELECT BACT[3]**				**8.34 tpy CO using Good Operating Practices**

[1] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Regenerative Incinerator)," EPA-452/F-03-021. U.S. EPA, Office of Air Quality Planning and Standards, "Draft CAM Technical Guidance Document - Thermal Oxidizers", dated April 2002

[2] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Catalytic Incinerator)," EPA-452/F-03-018

[3] RBLC Results were reviewed for CO from all emission sources located at a steel mill routed to the Caster Vent. Only the RBLC Results for Ladle/Tundish Preheaters and Dryers included comparable technologies. Results for EAF/LMS emissions did not include emissions routed through a Caster Vent. Results for Casting Operation emissions were the result of oil combustion, a process which will not be utilized at the proposed CMC Facility.

Table 23-11. NO_X Top-Down BACT Analysis for Emission Sources Routed to Caster Vent

Process	Pollutant
Emission Sources Routed to Caster Vent	NO_X

		Control Technology	Selective Catalytic Reduction (SCR)[1]	Selective Non-Catalytic Reduction (SNCR)[2]	Non-Selective Catalytic Reduction[3]	$SCONO_X$ Control[4]	Low-NO_X Burners	Good Operating Practices
Step 1.	**IDENTIFY AIR POLLUTION CONTROL TECHNOLOGIES**	**Control Technology Description**	Selective Catalytic Reduction (SCR) is an exhaust gas treatment technology where ammonia (NH_3) is injected into exhaust gas upstream of a catalyst bed. SCR utilizes a catalytic reaction of Nitrogen Oxide (NO) or Nitrogen Dioxide (NO_2) with ammonia to form diatomic nitrogen and water. The chemical reaction is shown below: Ammonia Injection $4NO + 4NH_3 + O_2 \rightarrow 4N_2 + 6H_2O$ $2NO_2 + 4NH_3 + O_2 \rightarrow 3N_2 + 6H_2O$ Relative to SNCR, the purpose of the catalyst in SCR is to reduce the temperature required for the reduction reaction to occur.	Selective Non-Catalytic Reduction (SNCR) is an exhaust gas treatment technology based on the reaction of urea (CH_4N_2O) or ammonia (NH_3) and NO or NO_2. The urea or ammonia is injected into the exhaust gas to reduce NO to diatomic nitrogen and water. There are two basic designs for the application of SNCR: an ammonia based system and a urea-based process. The chemical reaction involving ammonia is the same as SCR. The chemical reaction involving urea is shown below: Urea Injection $4NO + 2NH_2CONH_2 + O_2 \rightarrow 4N_2 + 2CO_2 + 4H_2O$ $4NO_2 + 2NH_2CONH_2 + O_2 \rightarrow 3N_2 + 2CO_2 + 4H_2O$ SNCR is "selective" in that the reagent reacts primarily with NO rather than other chemicals at the optimum operating temperature of the control device.	Nonselective catalytic reduction (NSCR) is an add-on NO_X control technology for exhaust streams with low O_2 content. Nonselective catalytic reduction uses a catalyst reaction to simultaneously reduce NO_X, CO, and hydrocarbons (HC) to water, carbon dioxide, and nitrogen. The catalyst is usually a noble metal, and relies on addition of hydrogen or a hydrogen-donating material such as natural gas in order to convert NO_X to N_2 and water. The conversion occurs in two sequential steps, as shown in the following equations: Step 1 Reactions: $2CO + O_2 \rightarrow 2CO_2$ $2H_2 + O_2 \rightarrow 2H_2O$ $HC + O_2 \rightarrow CO_2 + H_2O$ Step 2 Reactions: $NO_X + CO \rightarrow CO_2 + N_2$ $NO_X + H_2 \rightarrow H_2O + N_2$ $NO_X + HC \rightarrow CO_2 + H_2O + N_2$ The step 1 reactions remove excess O_2 from the exhaust gas because CO and HC will more readily react with O_2 than with NO_X. The O_2 content of the stream must be kept below approximately 0.5 percent to ensure NO_X reduction.	$SCONO_X$ uses potassium carbonate coated with catalyst to reduce NO_X emissions. $SCONO_X$ control has been demonstrated in use on gas turbines for the control of NO_X emissions. Gas turbines have relatively stable exhaust temperatures and flow rates during operation.	The main principle of low-NO_X burners is stepwise or staged combustion and localized exhaust gas recirculation (i.e., at the flame). Low-NO_X burners are designed to reduce flame turbulence, delay fuel/air mixing, and establish fuel-rich zones for initial combustion. The longer, less intense flames resulting from the staged combustion lower flame temperatures and reduce thermal NO_X formation.	Good Operating Practices for the emission sources routed to the Caster Vent includes good combustion practices and the use of natural gas in the Ladle/Tundish Preheaters and Dryers. Operation of the Ladle/Tundish burners at the appropriate oxygen range and temperature promotes complete combustion.
		Other Considerations	For the SCR system to operate properly, the exhaust gas must be within an optimum temperature range of approximately 500 °F to 800 °F with relatively stable exhaust temperatures. This temperature range is dictated by the catalyst, which is typically made from noble metals, base metal oxides such as vanadium and titanium, and zeolite-based material. These catalysts are susceptible to fouling over time, and generally have an active life of between two and five years. Exhaust gas temperatures greater than the upper limit of the catalyst will allow unreacted oxides of nitrogen (NO_X) and ammonia to pass through the system. The reaction must be held at stoichiometry on a continuous basis to avoid emitting either unreacted NO_x or unreacted ammonia.	SNCR does not utilize a catalyst but relies on the use of ammonia at a proper stoichiometric ratio to react with the exhaust stream. As a result, SNCR has a lower tolerance to fluctuations in inlet NO_X concentrations than SCR. The optimum exhaust gas temperature range for implementation of SNCR is 1,600 °F to 2,100 °F. For NH_3 systems, operation at temperatures below this range results in unreacted ammonia, while operation above this temperature range results in oxidation of ammonia, forming additional NO_2. The reaction must be held at stoichiometry on a continuous basis to avoid emitting either unreacted NO_X or unreacted ammonia.	One type of NSCR system injects a reducing agent into the exhaust gas stream prior to the catalyst reactor to reduce the NO_X. Another type of NSCR system has an afterburner and two catalytic reactors (one reduction catalyst and one oxidation catalyst). In this system, natural gas is injected into the afterburner to combust unburned HC (at a minimum temperature of 1,700 °F). The gas stream is cooled prior to entering the first catalytic reactor where CO and NO_X are reduced. A second heat exchanger cools the gas stream (to reduce any NO_X reformation) before the second catalytic reactor where remaining CO is converted to CO_2. The operating temperatures for NSCR system range from approximately 700 °F to 1500 °F, depending on the catalyst. For NO_X reductions of 90 percent, the temperature must be between 800 °F to 1200 °F.	None.	None.	None.

Table 23-11. NO_X Top-Down BACT Analysis for Emission Sources Routed to Caster Vent

Process	Pollutant
Emission Sources Routed to Caster Vent	NO_X

Step 2.	**ELIMINATE TECHNICALLY INFEASIBLE OPTIONS**	**RBLC Database Information**	Not included in the RBLC database as a form of control of NO_X from the emission sources at a steel mill routed to the Caster Vent.	Not included in the RBLC database as a form of control of NO_X from the emission sources at a steel mill routed to the Caster Vent.	Not included in the RBLC database as a form of control of NO_X from the emission sources at a steel mill routed to the Caster Vent.	Not included in the RBLC database as a form of control of NO_X from the emission sources at a steel mill routed to the Caster Vent.	Included in the RBLC database as a form of control of NO_X from the combustion emission sources routed to the Caster Vent.	Included in the RBLC database as a form of control for NO_X from the combustion emission sources routed to the Caster Vent.
		Feasibility Discussion	SCR would require raising the exhaust gas temperature to at least 500 °F. Below this temperature the reaction rate drops significantly and the control of NO_X is no longer feasible. Since the exhaust temperature of the Caster Vent is below the typical operating range of SCRs, additional auxiliary fuel would be required to heat the stream to the required temperature. This will create additional combustion emissions. This control technology has not been demonstrated in practice for control of NO_X emissions from the emission sources at a steel mill routed to the Caster Vent. As a result, SCR is considered infeasible for the control of NO_X emissions from the emission sources routed to the Caster Vent.	The Caster Vent exhaust temperature is well below the operating range of an SNCR and the reaction rate drops significantly such that the control of NO_X is no longer feasible. This control technology has not been demonstrated in practice for control of NO_X emissions from the emission sources at a steel mill routed to the Caster Vent. As a result, SNCR is considered infeasible for the control of NO_X emissions from the emission sources routed to the Caster Vent.	NSCR would require raising the exhaust gas temperature to at least a temperature of 700 °F. Below this temperature the reaction rate drops significantly and the control of NO_X is no longer feasible. Since the exhaust temperature of the Caster Vent is below the typical operating range of NSCR, additional auxiliary fuel would be required to heat the stream to the required temperature. This will create additional combustion emissions. This control technology has not been demonstrated in practice for control of NO_X emissions from the emission sources at a steel mill routed to the Caster Vent. As a result, NSCR is considered infeasible for the control of NO_X emissions from the emission sources routed to the Caster Vent.	This control technology has only been demonstrated for turbines and has not been demonstrated in practice for control of NO_X emissions from the emission sources at a steel mill routed to the Caster Vent. As a result $SCONO_x$ is considered infeasible for the control of NO_X emissions from the emission sources routed to the Caster Vent.	Technically feasible. The use of low-NO_X burners has been demonstrated in practice for Ladle/Tundish Preheaters and Dryers which is one of the emission sources routed to the Caster Vent.	Technically feasible. Good combustion practices and the use of pipeline quality natural gas has been demonstrated in practice.
Step 3.	**RANK REMAINING CONTROL TECHNOLOGIES**	**Overall Control Efficiency**					Base Case	
Step 4.	**EVALUATE AND DOCUMENT MOST EFFECTIVE CONTROLS**	**Cost Effectiveness ($/ton)**					Base Case	
Step 5.	**SELECT BACT[5]**						**0.49 tpy NO_X utilizing low-NO_X burners and Good Operating Practices**	

1 U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Selective Catalytic Reduction (SCR))," EPA-452/F-03-032

2 U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Selective Non-Catalytic Reduction (SNCR))," EPA-452/F-03-031· U.S. EPA, Air Economics Group, "Selective Noncatalytic Reduction", John Sorrels, et. al., dated April 2019.

3 U.S. EPA, Office of Air Quality Planning and Standards, "CAM Technical Guidance Document - Nonselective Catalytic Reduction", dated April 2002.

4 December 20, 1999 Letter from John Devillars, Regional Administrator to Arthur Rocque, Jr., Commissioner of the EPA Department of Environmental Protection, titled "Recent SCONOx Pollution Prevention Control System Development".

5 RBLC Results were reviewed for NO_X from all emission sources located at a steel mill routed to the Caster Vent. Only the RBLC Results for Ladle/Tundish Preheaters and Dryers included comparable technologies. Results for EAF/LMS emissions did not include emissions routed through a Caster Vent. Results for Casting Operation emissions were the result of oil combustion, a process which will not be utilized at the proposed CMC Facility.

Table 23-12. SO_2 Top-Down BACT Analysis for Emission Sources Routed to Caster Vent

Process	Pollutant
Emission Sources Routed to Caster Vent	SO_2

		Control Technology	Impingement-Plate/Tray-Tower Scrubber[1]	Packed-Bed/Packed-Tower Wet Scrubber[2]	Spray-Chamber/Spray-Tower Wet Scrubber[3]	Flue Gas Desulfurization (FGD)[4]	Fuel Sulfur Removal	Good Operating Practices
Step 1.	**IDENTIFY AIR POLLUTION CONTROL TECHNOLOGIES**	**Control Technology Description**	An impingement-plate scrubber promotes contact between the flue gas and a sorbent slurry in a vertical column with transversely mounted perforated trays. Absorption of SO_2 is accomplished by countercurrent contact between the flue gas and reagent slurry	Scrubbing liquid (e.g., NaOH), which is introduced above layers of variously shaped packing material, flows concurrently against the flue gas stream. The acid gases are absorbed into the scrubbing solution and react with alkaline compounds to produce neutral salts.	Spray tower scrubbers introduce a reagent slurry as atomized droplets through an array of spray nozzles within the scrubbing chamber. The waste gas enters the bottom of the column and travels upward in a countercurrent flow. Absorption of SO_2 is accomplished by the contact between the gas and reagent slurry, which results in the formation of neutral salts.	Flue Gas Desulfurization (FGD) can include spray dry, dry, and wet scrubbing. FGD is a similar process as wet scrubbing but it uses an alkaline reagent to react with SO_2 to produce a solid compound, either calcium or sodium sulfate. These compounds are then removed by a particulate control device. The alkaline reagent is typically sodium carbonate or slaked lime. The reagent in FGD is typically injected in the flue gas utilizing a	Fuel Sulfur Removal is a chemical process by which sulfur compounds are removed from a fuel prior to combustion. Several methods exist including hydrodesulfurization and biodesulfurization. These technologies are commonly employed by oil refineries in order to decrease fuel sulfur content to meet regulatory standards.	Good Operating Practices for the emission sources from a steel mill routed to the Caster Vent includes good combustion practices and the use of natural gas in the Ladle/Tundish Preheaters and Dryers. The sulfur content in pipeline quality natural gas is less than 0.5 grains per dry standard cubic foot, resulting in minimal SO_2 emissions.
		Other Considerations	The ideal temperature range for SO_2 removal in a wet gas scrubber is 40 to 100 °F. Waste slurry formed in the bottom of the scrubber requires disposal.	The ideal temperature range for SO_2 removal in a wet gas scrubber is 40 to 100 °F. To avoid clogging, packed bed wet scrubbers are generally limited to applications in which PM concentrations are less than 0.20 gr/dscf.	The ideal temperature range for SO_2 removal in a wet gas scrubber is 40 to 100 °F. Waste slurry formed in the bottom of the scrubber requires disposal.	The ideal temperature range for SO_2 removal in Flue Gas Desulfurization is 100 °F to 1,830 °F, depending on the type of system used (wet, spray dry, or dry).	Due to natural gas pipeline requirements and tariffs, the sulfur content in pipeline quality natural gas is less than 0.5 grains per dry standard cubic foot. It is not technically feasible to remove additional sulfur from this fuel prior to combustion.	None.
Step 2.	**ELIMINATE TECHNICALLY INFEASIBLE OPTIONS**	**RBLC Database Information**	Not included in the RBLC database as a form of control of SO_2 from the emission sources associated with a steel mill routed to the Caster Vent.	Not included in the RBLC database as a form of control of SO_2 from the emission sources associated with a steel mill routed to the Caster Vent.	Not included in the RBLC database as a form of control of SO_2 from the emission sources associated with a steel mill routed to the Caster Vent.	Not included in the RBLC database as a form of control of SO_2 from the emission sources associated with a steel mill routed to the Caster Vent.	Not included in the RBLC database as a form of control of SO_2 from the emission sources associated with a steel mill routed to the Caster Vent.	Included in the RBLC database as a form of control of SO_2 from the emission sources associated with a steel mill routed to the Caster Vent.
		Feasibility Discussion	The low SO_2 concentrations of the exhaust stream would make efficient operation of the Impingement-Plate/Tray-Tower Scrubber infeasible. This control technology has not been demonstrated in practice for control of SO_2 emissions from the emission sources located at a steel mill routed to the Caster Vent. As a result, a Impingement-Plate/Tray-Tower Scrubber is considered infeasible for the control of SO_2 emissions from the emission sources routed to the Caster Vent.	The low SO_2 concentrations of the exhaust stream would make efficient operation of the Packed-Bed/Packed-Tower Wet Scrubber infeasible. This control technology has not been demonstrated in practice for control of SO_2 emissions from the emission sources located at a steel mill routed to the Caster Vent. As a result, a Packed-Bed/Packed-Tower Wet Scrubber is considered infeasible for the control of SO_2 emissions from the emission sources routed to the Caster Vent.	The low SO_2 concentrations of the exhaust stream would make efficient operation of the Spray-Chamber/Spray-Tower Wet Scrubber infeasible. This control technology has not been demonstrated in practice for control of SO_2 emissions from the emission sources located at a steel mill routed to the Caster Vent. As a result, a Spray-Chamber/Spray-Tower Wet Scrubber is considered infeasible for the control of SO_2 emissions from the emission sources routed to the Caster Vent.	The low SO_2 concentrations of the exhaust stream would make efficient operation of the Flue Gas Desulfurization infeasible. This control technology has not been demonstrated in practice for control of SO_2 emissions from the emission sources located at a steel mill routed to the Caster Vent. As a result, Flue Gas Desulfurization is considered infeasible for the control of SO_2 emissions from the emission sources routed to the Caster Vent.	Due to natural gas pipeline requirements and tariffs, the sulfur content in pipeline quality natural gas is less than 0.5 grains per dry standard cubic foot. It is not technically feasible to remove additional sulfur from this fuel prior to combustion. This control technology has not been demonstrated in practice for control of SO_2 emissions from the emission sources located at a steel mill routed to the Caster Vent. As a result, Fuel Sulfur Removal is considered infeasible for control of SO_2 emissions from the emission sources routed to the Caster Vent.	Technically feasible. Good combustion practices and the use of pipeline quality natural gas has been widely selected as BACT for SO_2 control from the emission sources located at a steel mill routed to the Caster Vent.
Step 3.	**RANK REMAINING CONTROL TECHNOLOGIES**	**Overall Control Efficiency**						Base Case
Step 4.	**EVALUATE AND DOCUMENT MOST EFFECTIVE CONTROLS**	**Cost Effectiveness ($/ton)**						Base Case
Step 5.	**SELECT BACT[5]**							**0.49 tpy SO_2 using Good Operating Practices**

[1] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Impingement-Plate/Tray-Tower Scrubber)," EPA-452/F-03-012
[2] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Packed-Bed/Packed-Tower Wet Scrubbers)," EPA-452/F-03-015
[3] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Spray-Chamber/Spray-Tower Wet Scrubber)," EPA-452/F-03-016
[4] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Flue Gas Desulfurization)," EPA-452/F-03-034
[5] RBLC Results were reviewed for SO_2 from all emission sources located at a steel mill routed to the Caster Vent. Only the RBLC Results for Ladle/Tundish Preheaters and Dryers included comparable technologies. Results for EAF/LMS emissions did not include emissions routed through a Caster Vent . Results for Casting Operation emissions were the result of oil combustion, a process which will not be utilized at the proposed CMC Facility.

Table 23-13. PM Top-Down BACT Analysis for Emission Sources Routed to Caster Vent

Process	Pollutant
Emission Sources Routed to Caster Vent	PM, PM_{10}, $PM_{2.5}$

		Control Technology	Electrostatic Precipitator (ESP) [1,2]	Inertial Collection Systems (Cyclones)[3]	Baghouse/Fabric Filter [4]	Wet Scrubber [5]	Incinerators[6]	Good Operating Practices
Step 1.	IDENTIFY AIR POLLUTION CONTROL TECHNOLOGIES	**Control Technology Description**	An ESP uses electrical forces to move particles entrained within an exhaust stream onto collection surfaces. A wet ESP can be used in this application to reduce condensable particulate matter (PM) emissions formed due to SO_2.	Consists of one or more conically shaped vessels in which the exhaust gas stream follows a circular motion prior to the outlet. PM enters the cyclone suspended in the gas stream, which is forced into a vortex by the shape of the cyclone. The inertia of the PM resists the directional change of the gas, resulting in an outward movement under the influence of centrifugal forces until they strike the cyclone wall. The PM is caught in a thin laminar layer of air next to the cyclone wall and are carried downward by gravity to the collection hopper to be reintroduced to the process.	Process exhaust gasses are collected and passed through a tightly woven or felted fabric arranged in sheets, cartridges, or bags that collect PM via sieving and other mechanisms. The dust cake that accumulates on the filters increases collection efficiency. Various cleaning techniques include pulse-jet, reverse-air, and shaker technologies.	Wet Scrubbers removes particulates through the impact of particles with water droplets. Wet Scrubbers can have high removal efficiency for streams with a steady state exhaust. The scrubber operates with a high pressure drop to maintain high removal efficiency.	Thermal Incinerators are also referred to as direct flame incinerator, thermal oxidizer, or afterburner. They are primary used for volatile organic compounds (VOC) but some particulate matter commonly described as soot will be destroyed to various degrees. Soot are particles formed from the incomplete combustion of hydrocarbons, coke, or carbon residue.	The use of natural gas leads to low emissions of particulates.
		Other Considerations	Rappers or other mechanical mechanisms are used periodically to impart a vibration or shock to dislodge the deposited PM on dry ESP electrodes. The dislodged PM is collected in hoppers. In wet ESP, the collected particles are washed off of the collection plates by a small flow of trickling water. ESP systems are typically only used on continuous combustion sources. When used on an intermittent basis, the actual collection efficiency can range from 80-98 percent	In some cases, thermal insulation is used to reduce heat loss and cold air from entering the system. Cold air can cause gas quenching and condensation which leads to corrosion, dust buildup, and plugging of the hopper or dust removal system. Inertial collection systems have been operated with inlet gas temperatures as high as 1,000 °F.	Fabric filters are susceptible to corrosion and blinding by moisture. Appropriate fabrics must be selected for specific process conditions. Accumulations of dust may present fire or explosion hazards.	Wet scrubbing uses a significant amount of water and produces a wastewater stream that must be properly disposed.	Depending on the chemical composition of the particulate, the control efficiency for an incinerator can vary from to 99% for particulate matter 10 microns or less-aerodynamic diameter (PM_{10}). This control technology has been demonstrated in the petroleum and coal, chemical products, primary metal, electronics, electric and gas, food, mining, and lumber industries.	None.

Table 23-13. PM Top-Down BACT Analysis for Emission Sources Routed to Caster Vent

Process	Pollutant
Emission Sources Routed to Caster Vent	PM, PM_{10}, $PM_{2.5}$

Step 2.	**ELIMINATE TECHNICALLY INFEASIBLE OPTIONS**	**RBLC Database Information**	Not included in RBLC for the control of particulate emissions from the emission sources associated with a steel mill routed to the Caster Vent.	Not included in RBLC for the control of particulate emissions from the emission sources associated with a steel mill routed to the Caster Vent.	The use of a baghouse/fabric filter is included in the RBLC for the control of particulate emissions from an EAF/LMS; however, the emissions from the EAF/LMS routed through the Caster Vent represent what was uncaptured from the baghouse. The use of a baghouse/fabric filter is not included in RBLC for the control of particulate emissions from the other emission sources associated with a steel mill routed to the Caster Vent.	Not included in RBLC for the control of particulate emissions from the emission sources associated with a steel mill routed to the Caster Vent.	Not included in RBLC for the control of particulate emissions from the emission sources associated with a steel mill routed to the Caster Vent.	Included in the RBLC database for the control of particulate emissions from the emission sources associated with a steel mill routed to the Caster Vent.
		Feasibility Discussion	This control technology has not been demonstrated in practice for control of PM emissions from the emission sources located at a steel mill routed to the Caster Vent. As a result, a Electrostatic Precipitator is considered infeasible for the control of PM emissions from the emission sources routed to the Caster Vent.	This control technology has not been demonstrated in practice for control of PM emissions from the emission sources located at a steel mill routed to the Caster Vent. As a result, an Inertial Collection System is considered infeasible for the control of PM emissions from the emission sources routed to the Caster Vent.	This control technology has not been demonstrated in practice for control of PM emissions from the emission sources located at a steel mill routed to the Caster Vent. As a result, a Baghouse/Fabric Filter is considered infeasible for the control of PM emissions from the emission sources routed to the Caster Vent.	This control technology has not been demonstrated in practice for control of PM emissions the emission sources located at a steel mill routed to the Caster Vent. As a result, a Wet Scrubber is considered infeasible for the control of PM emissions from the emission sources routed to the Caster Vent.	The use of an Incinerator would create adverse environmental impacts by creating additional combustion emissions. This control technology has not been demonstrated in practice for control of PM emissions from the emission sources located at a steel mill routed to the Caster Vent. As a result, an Incinerator is considered infeasible for the control of PM emissions from the emission sources routed to the Caster Vent.	Technically feasible. Good combustion practices and the use of pipeline quality natural gas has been widely selected as BACT for PM control from the emission sources located at a steel mill routed to the Caster Vent.
Step 3.	**RANK REMAINING CONTROL TECHNOLOGIES**	**Overall Control Efficiency**						Base Case
Step 4.	**EVALUATE AND DOCUMENT MOST EFFECTIVE CONTROLS**	**Cost Effectiveness ($/ton)**						Base Case
Step 5.	**SELECT BACT[7]**							**2.45 tpy for filterable PM 2.57 filterable plus condensable $PM_{10}/PM_{2.5}$ using Good Operating Practices**

[1] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Wet Electrostatic Precipitator (ESP) - Wire Pipe Type)," EPA-452/F-03-029.
[2] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Wet Electrostatic Precipitator (ESP) - Wire Plate Type)," EPA-452/F-03-030.
[3] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Momentum Separators)," EPA-452/F-03-008
[4] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Fabric Filter - Pulse-Jet Cleaned Type)," EPA-452/F-03-025.
[5] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Flue Gas Desulfurization (FGD) - Wet, Spray Dry, and Dry Scrubbers)," EPA-452/F-03-034.
[6] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Thermal Incinerator)," EPA-452/F-03-022.
[7] RBLC Results were reviewed for PM from all emission sources located at a steel mill routed to the Caster Vent. Only the RBLC Results for Ladle/Tundish Preheaters and Dryers included comparable technologies. Results for EAF/LMS emissions did not include emissions routed through a Caster Vent. Results for Casting Operation emissions were the result of oil combustion, a process which will not be utilized at the proposed CMC Facility.

Table 23-14. VOC Top-Down BACT Analysis for Emission Sources Routed to Caster Vent

Process	Pollutant
Emission Sources Routed to Caster Vent	VOC

		Control Technology	Thermal Oxidation[1]	Catalytic Oxidation[2]	Carbon Adsorption[3]	Biofiltration[4]	Condenser[5]	Good Operating Practices
Step 1.	**IDENTIFY AIR POLLUTION CONTROL TECHNOLOGIES**	**Control Technology Description**	Utilizes an open flame or combustion within an enclosed chamber to oxidize pollutants. Thermal Oxidation has been a proven technology in controlling Volatile Organic Compounds (VOC) emissions from processes with high VOC usage (i.e., painting, polymer manufacturing, cleaning, etc.) but not the emission sources from a steel mill routed to the Caster Vent.	Catalytic oxidation allows oxidation to take place at a faster rate and at a lower temperature than is possible with thermal oxidation. VOC emissions can be controlled via catalytic oxidation. The oxidation is facilitated by the presence of the catalyst and carried out by the same basic chemical reaction as thermal oxidation.	Carbon Adsorption utilizes a highly porous solid with a large surface area to selectively adsorb VOC. Adsorption collects VOC on the surface of the porous solid instead of destroying the compound through a chemical reaction. The most common porous solid used in activated carbon which is a relatively low cost adsorbent. The adsorption capacity is affected by factors such as organic compound concentration in exhaust, temperature, and humidity.	Biofiltration utilizes a bed of microorganisms to decompose biodegradable organic compounds. This technology has been successfully applied in full-scale applications to control VOC from a range of industrial and public-sector sources. Biofiltration also requires large land areas to house the microorganisms. The land required is proportional to the amount of exhaust gas that needs to be treated. Particulate matter in the exhaust stream can clog the biofilter.	Condensers convert gas or vapors into liquids through condensation. This allows VOC within a exhaust stream to be recovered before the stream is exhausted to the atmosphere. Condensers typically use water or air to cool and condense the vapor stream. Condensers are designed for a specified throughput of fluid and cannot deviate sustainably from its designed capacity.	Good Operating Practices for the emission sources from a steel mill routed to the Caster Vent includes good combustion practices and the use of natural gas in the Ladle/Tundish Preheaters and Dryers and using a scrap management plan to reduce the VOC containing material introduced to the EAF/LMS. Operation of the Ladle/Tundish burners at the appropriate oxygen range and temperature promotes complete combustion.
		Other Considerations	Thermal Oxidization of VOC occurs at temperatures between 1,100 °F and 1,200 °F. Below this temperature range the rate of oxidation of VOC drops significantly and the effective control of VOC is no longer feasible.	Several noble metal-enriched catalysts at high temperatures promote this reaction. Prior to entering the catalyst bed where the oxidation reaction occurs, the temperature of the exhaust gas must be between 400 °F to 800 °F. Below this temperature range, the reaction rate drops sharply and effective oxidation of VOC is no longer feasible. Above this temperature, conventional oxidation catalysts break down and are unable to perform their desired functions.	Carbon adsorption streams are designed for specific inlet concentrations of VOC. For example, if a carbon adsorption system was designed for streams with greater than 1,000 parts per million (PPM) of VOC it may not operate effectively below this concentration. The ideal temperature range for physical adsorption is 130 °F. Above this temperature the adsorption capacity of the adsorbent decreases. Particulates in the exhaust stream can clog the porous material decreasing the lifespan of the process.	The optimum temperature range of biofiltration is approximately 100 °F in order to keep a viable population of microorganisms. Biofilters are also limited to organic compound concentrations of approximately 1,000 ppm or less. Biofilters are best suited to steady-state processes that do not have significant outages; the microorganisms tend to die off during extended process downtimes that tend to result in changes to the temperature, humidity, or nutrient levels in their habitat.	A typical condenser cannot reach temperatures below 100 °F and as a result high VOC removal rates are not possible unless the VOC condenses at high temperatures. Particulates in the exhaust stream can cause fouling leading to excessive maintenance and decreased efficiency. Additionally, low VOC concentrations in the exhaust streams cause the partial pressures of the VOC to be to low for condensation to occur resulting in a low removal rate.	None.

Table 23-14. VOC Top-Down BACT Analysis for Emission Sources Routed to Caster Vent

Process	Pollutant
Emission Sources Routed to Caster Vent	VOC

Step 2.	**ELIMINATE TECHNICALLY INFEASIBLE OPTIONS**	**RBLC Database Information**	Not included in RBLC for the control of VOC from the emission sources associated with a steel mill routed to the Caster Vent.	Not included in RBLC for the control of VOC from the emission sources associated with a steel mill routed to the Caster Vent.	Not included in RBLC for the control of VOC from the emission sources associated with a steel mill routed to the Caster Vent.	Not included in RBLC for the control of VOC from the emission sources associated with a steel mill routed to the Caster Vent.	Not included in RBLC for the control of VOC from the emission sources associated with a steel mill routed to the Caster Vent.	Included in the RBLC database as a form of control for VOC from the emission sources associated with a steel mill routed to the Caster Vent.
		Feasibility Discussion	Thermal Oxidization of emissions for VOC destruction would require raising the exhaust gas temperature to at least a temperature of 1,100 °F. Below this temperature the reaction rate drops significantly and the oxidation of VOC is no longer feasible. Since the exhaust temperature of the Caster Vent is below the typical operating range of thermal oxidizers, large amounts of auxiliary fuel would be required to heat the stream to the required temperature for thermal oxidation. This will create additional combustion emissions. The high temperatures involved in thermal oxidation will also result in additional NO_X emissions. This control technology has not been demonstrated in practice for control of VOC emissions from the emission sources located at a steel mill routed to the Caster Vent. As a result, thermal oxidation of VOC emissions is considered infeasible for the control of VOC emissions from the emission sources routed to the Caster Vent.	Catalytic oxidization of emissions for VOC destruction would require raising the exhaust gas temperature to at least a temperature of 400 °F. Below this temperature the reaction rate drops significantly and the oxidation of VOC is no longer feasible. Since the exhaust temperature of the Caster Vent is below the typical operating range of catalytic oxidizers, additional auxiliary fuel would be required to heat the stream to the required temperature for catalytic oxidation. This will create additional combustion emissions. This control technology has not been demonstrated in practice for control of VOC emissions from the emission sources located at a steel mill routed to the Caster Vent. As a result, catalytic oxidation of VOC emissions is considered infeasible for the control of VOC emissions from the emission sources routed to the Caster Vent.	Carbon Adsorption would create adverse environmental impacts by potentially increasing the amount of solid waste disposal. The low VOC concentrations of the exhaust stream would make efficient operation of Carbon Adsorption infeasible. This control technology has not been demonstrated in practice for control of VOC emissions from the emission sources located at a steel mill routed to the Caster Vent. As a result, Carbon Adsorption is considered infeasible for the control of VOC emissions from the emission sources routed to the Caster Vent.	Biofiltration would create adverse environmental impacts by potentially increasing the amount of solid waste disposal. The exhaust temperature of the process is approximately 331 °F. This is above the operational temperature of a biofilter. The low VOC concentrations of the exhaust stream would make efficient operation of Biofiltration infeasible. This control technology has not been demonstrated in practice for control of VOC emissions from the emission sources located at a steel mill routed to the Caster Vent. As a result, Biofiltration is considered infeasible for the control of VOC emissions from the emission sources routed to the Caster Vent.	A Condenser would create adverse environmental impacts (by potentially increasing the amount of liquid waste disposal). The low VOC concentrations of the exhaust stream would make efficient operation of a Condenser infeasible. This control technology has not been demonstrated in practice for control of VOC emissions from the emission sources located at a steel mill routed to the Caster Vent. As a result, a Condenser is considered infeasible for the control of VOC emissions from the emission sources routed to the Caster Vent.	Technically feasible. Good combustion practices and the use of pipeline quality natural gas has been widely selected as BACT for VOC control from the emission sources located at a steel mill routed to the Caster Vent.
Step 3.	**RANK REMAINING CONTROL TECHNOLOGIES**	**Overall Control Efficiency**						Base Case
Step 4.	**EVALUATE AND DOCUMENT MOST EFFECTIVE**	**Cost Effectiveness ($/ton)**						Base Case
Step 5.	**SELECT BACT[6]**							**0.80 tpy VOC using Good Operating Practices**

[1] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Regenerative Incinerator)," EPA-452/F-03-021. U.S. EPA, Office of Air Quality Planning and Standards, "Draft CAM Technical Guidance Document - Thermal Oxidizers", dated April 2002

[2] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Catalytic Incinerator)," EPA-452/F-03-018
[3] U.S. EPA, Air Economics Group, "Carbon Adsorbers", dated October 2018.
[4] U.S. EPA, Office of Air Quality Planning and Standards, "Using Bioreactors to Control Air Pollution" EPA-456/R-03-003.
[5] U.S. EPA, Office of Air Quality Planning and Standards, "Refrigerated Condensers" EPA-452/B-02-001.
[6] RBLC Results were reviewed for VOC from all emission sources located at a steel mill routed to the Caster Vent. Only the RBLC Results for Ladle/Tundish Preheaters and Dryers included comparable technologies. Results for EAF/LMS emissions did not include emissions routed through a Caster Vent. Results for Casting Operation emissions were the result of oil combustion, a process which will not be utilized at the proposed CMC Facility.

Table 23-15. GHG Top-Down BACT Analysis for Emission Sources Routed to Caster Vent

Process	Pollutant
Emission Sources Routed to Caster Vent	GHGs as measured in CO_2e

		Control Technology	Carbon Capture and Sequestration	Good Operating Practices
Step 1.	IDENTIFY AIR POLLUTION CONTROL TECHNOLOGIES	Control Technology Description	Emerging carbon capture and sequestration (CCS) technologies generally consist of processes that separate CO_2 from combustion process flue gas, compress, transport and then inject it into geologic formations such as oil and gas reservoirs, unmineable coal seams, and underground saline formations. Of the emerging CO_2 capture technologies that have been identified, only amine absorption is currently commercially used for state-of the art CO_2 separation processes.	Good Operating Practices for the emission sources from a steel mill routed to the Caster Vent includes good combustion practices and the use of natural gas in the Ladle/Tundish Preheaters and Dryers, and the use of all selected BACT technologies for the EAF/LMS.
		Other Considerations	Amine absorption has been applied to processes in the petroleum refining and natural gas processing industries and for exhausts from gas-fired industrial boilers. Other potential absorption and membrane technologies are currently considered developmental.	None.
Step 2.	ELIMINATE TECHNICALLY INFEASIBLE OPTIONS	RBLC Database Information	Not included in RBLC for the control of GHG emissions from the emission sources associated with a steel mill routed to the Caster Vent.	Included in the RBLC database for the control of GHG emissions from the emission sources associated with a steel mill routed to the Caster Vent.
		Feasibility Discussion	This control technology has not been demonstrated in practice for control of GHG emissions from the emission sources located at a steel mill routed to the Caster Vent. As a result, Carbon Capture and Sequestration is not a feasible option for the control of GHG emissions.	Technically feasible. Good Operating Practices have been demonstrated in practice for GHG control from the emission sources located at a steel mill routed to the Caster Vent.
Step 3.	RANK REMAINING CONTROL TECHNOLOGIES	Overall Control Efficiency		Base Case
Step 4.	EVALUATE AND DOCUMENT MOST EFFECTIVE CONTROLS	Cost Effectiveness ($/ton)		Base Case
Step 5.	SELECT BACT[1]			**951 tpy GHG (CO_2e) using Good Operating Practices**

[1] RBLC Results were reviewed for GHGs from all emission sources located at a steel mill routed to the Caster Vent. Only the RBLC Results for Ladle/Tundish Preheaters and Dryers included comparable technologies. Results for EAF/LMS emissions did not include emissions routed through a Caster Vent. Results for Casting Operation emissions were the result of oil combustion, a process which will not be utilized at the proposed CMC Facility.

23.5 Rolling Mill & Cooling Beds

After continuous casting, the steel is conveyed through the rolling mill which is a series of rolling stands that reduce the cross-sectional area and form the final rolled steel shapes. A 0.225 MMBtu/hr propane/natural gas-fired bit furnace (BF1) is used to heat sample bars to verify sizing prior to rolling and 20 0.4 MMBtu/hr rolling mill comfort heaters (RMAUXHT) are used in the rolling mill system. Particulate and VOC emissions generated by the rolling mill will be routed through the rolling mill vent (RMV1). The products that exit the rolling mill are sent to the cooling beds where they will either receive a water quench or be allowed to cool in ambient air. Particulate and VOC emissions generated at the cooling beds will be routed through the cooling mill vent (CBV1). Table 23-16 provides a summary of the selected BACT controls and emission limits for pollutants emitted by the rolling mill and cooling beds, and Table 23-17 and Table 23-18 contain the top-down BACT analyses for emissions shown in Table 23-16.

Table 23-16. Summary of Selected BACT for Rolling Mill & Cooling Beds

Pollutant	Selected BACT Control	Selected BACT Limit (lb/hr)
$PM/PM_{2.5}/PM_{10}$	Good Process Operation	0.01 per source (PM Filterable, excluding Bit Furnace) 0.01 per source (PM_{10} Filterable + Condensable, excluding Bit Furnace) 0.01 per source ($PM_{2.5}$ Filterable + Condensable, excluding Bit Furnace)
VOC	Good Operating Practices	0.01 per source (excluding Bit Furnace)

Table 23-17. PM Top-Down BACT Analysis for Emission Sources Routed to Rolling Mill/Cooling Beds

Process	Pollutant
Rolling Mill & Cooling Beds	$PM/PM_{10}/PM_{2.5}$

Step		Control Technology	Electrostatic Precipitator (ESP)[1,2]	Inertial Collection Systems (Cyclones)[3]	Wet Scrubber[4]	Incinerators[5]	Baghouse/Fabric Filter[6]	Good Process Operation
Step 1.	**IDENTIFY AIR POLLUTION CONTROL TECHNOLOGIES**	**Control Technology Description**	An ESP uses electrical forces to move particles entrained within a exhaust stream onto a collection surfaces (i.e., an electrode). A wet ESP can be used in this application to reduce condensable and filterable particulate matter (PM) emissions formed due to SO_2; a dry ESP would reduce filterable particulate matter only. ESPs have been used on solid fuel combustion devices and in non-ferrous metal processing facilities.	Consists of one or more conically shaped vessels in which the exhaust gas stream follows a circular motion prior to the outlet. PM enters the cyclone suspended in the gas stream, which is forced into a vortex by the shape of the cyclone. The inertia of the PM resists the directional change of the gas, resulting in an outward movement under the influence of centrifugal forces until they strike the cyclone wall. The PM is caught in a thin laminar layer of air next to the cyclone wall and is carried downward by gravity to the collection hopper.	Wet Scrubbers remove particulates through the impact of particles with water droplets. Wet Scrubbers can have high removal efficiency for streams with a steady state exhaust. The scrubber operates with a high pressure drop to maintain high removal efficiency.	Thermal Incinerators are also referred to as direct flame incinerators, thermal oxidizers, or afterburners. They are primary used for volatile organic compounds (VOC) but some particulate matter commonly described as soot will be destroyed to various degrees. Soot are particles formed from the incomplete combustion of hydrocarbons, coke, or carbon residue.	Process exhaust gasses are collected and passed through a tightly woven or felted fabric arranged in sheets, cartridges, or bags that collect PM via sieving and other mechanisms. The dust cake that accumulates on the filters increases collection efficiency, and eventually falls into a hopper for removal. Various cleaning techniques include pulse-jet, reverse-air, and shaker technologies.	Operate and maintain the equipment in accordance with good air pollution control practices.
		Other Considerations	Rappers or other mechanical mechanisms are used periodically to impart a vibration or shock to dislodge the deposited PM on dry ESP electrodes. The dislodged PM is collected in hoppers. In wet ESP, the collected particles are washed off of the collection plates by a small flow of trickling water. ESP systems are typically only used on continuous combustion sources. When used on an intermittent basis, the actual collection efficiency can range from 80-98 percent.	In some cases, thermal insulation is used to reduce heat loss and cold air from entering the system. Cold air can cause gas quenching and condensation which leads to corrosion, dust buildup, and plugging of the hopper or dust removal system. Inertial collection systems have been operated with inlet gas temperatures as high as 1000°F.	Wet scrubbing uses a significant amount of water and produces a wastewater stream that must be properly disposed.	Depending on the chemical composition of the particulate, the control efficiency for an incinerator can vary from to 99% for particulate matter 10 microns or less aerodynamic diameter (PM_{10}). This control technology has been demonstrated in the petroleum and coal, chemical products, primary metal, electronics, electric and gas, food, mining, and lumber industries.	Fabric filters are susceptible to corrosion and blinding by moisture. Appropriate fabrics must be selected for specific process conditions. Accumulations of dust may present fire or explosion hazards.	No other considerations

Table 23-17. PM Top-Down BACT Analysis for Emission Sources Routed to Rolling Mill/Cooling Beds

Process	Pollutant
Rolling Mill & Cooling Beds	$PM/PM_{10}/PM_{2.5}$

Step		Control Technology	Electrostatic Precipitator (ESP)[1,2]	Inertial Collection Systems (Cyclones)[3]	Wet Scrubber[4]	Incinerators[5]	Baghouse/Fabric Filter[6]	Good Process Operation
Step 2.	**ELIMINATE TECHNICALLY INFEASIBLE OPTIONS**	**RBLC Database Information**	Not included in RBLC for the control of particulate emissions from Rolling Mills.	Not included in RBLC for the control of particulate emissions from Rolling Mills.	Not included in RBLC for the control of particulate emissions from Rolling Mills.	Not included in RBLC for the control of particulate emissions from Rolling Mills.	Not included in RBLC for the control of particulate emissions from Rolling Mills.	Included in the RBLC as a common form of control for particulate emissions from Rolling Mills.
		Feasibility Discussion	The ESP would create adverse energy and environmental impacts (due to the power needed to generate the high voltage electrostatic fields, and with wet ESP, to dispose of the wastewater stream). This control technology has not been demonstrated in practice for control of PM emissions from Rolling Mills. As a result, an ESP is considered infeasible for the control of PM emissions from Rolling Mills.	This control technology has not been demonstrated in practice for control of PM emissions from Rolling Mills. As a result, a cyclone is considered infeasible for the control of PM emissions from Rolling Mills.	The Wet Scrubber would create adverse energy impacts (due to the increase in pressure drop across the system). This control technology has not been demonstrated in practice for control of PM emissions from Rolling Mills. As a result, a Wet Scrubber is considered infeasible for the control of PM emissions from Rolling Mills.	The Incinerator would create adverse environmental impacts (by creating additional combustion emissions). This control technology has not been demonstrated in practice for control of PM emissions from Rolling Mills. As a result, an Incinerator is considered infeasible for the control of PM emissions from Rolling Mills.	This control technology has not been demonstrated in practice for control PM emissions from Rolling Mills. As a result, a Baghouse/Fabric Filter is considered infeasible for the control of PM emissions from Rolling Mills.	Technically feasible. Good Process Operation is widely demonstrated in practice.

Table 23-17. PM Top-Down BACT Analysis for Emission Sources Routed to Rolling Mill/Cooling Beds

Process	Pollutant
Rolling Mill & Cooling Beds	$PM/PM_{10}/PM_{2.5}$

Step		Control Technology	Electrostatic Precipitator (ESP)[1,2]	Inertial Collection Systems (Cyclones)[3]	Wet Scrubber[4]	Incinerators[5]	Baghouse/Fabric Filter[6]	Good Process Operation	
Step 3.	**RANK REMAINING CONTROL TECHNOLOGIES**	**Overall Control Efficiency**						Base Case	
Step 4.	**EVALUATE AND DOCUMENT MOST EFFECTIVE CONTROLS**	**Cost Effectiveness ($/ton)**						Base Case	
Step 5.	**SELECT BACT**							**Facility**	**Emission Limit (lb/hr)**
								Comparable Facilities	
								Nucor Steel Kankakee, IL	0.027 lb/hr (PM filterable) 0.027 lb/hr (PM_{10} filterable + condensable) 0.01 lb/hr ($PM_{2.5}$ filterable + condensable)
								Proposed BACT:	**0.01 lb/hr per source (PM filterable, excluding Bit Furnace) 0.01 lb/hr per source (PM_{10} filterable + condensable, excluding Bit Furnace) 0.01 lb/hr per source ($PM_{2.5}$ filterable + condensable, excluding Bit Furnace) using Good Process Operation**

[1] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Wet Electrostatic Precipitator (ESP) - Wire Pipe Type)," EPA-452/F-03-029.
[2] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Wet Electrostatic Precipitator (ESP) - Wire Plate Type)," EPA-452/F-03-030.
[3] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Momentum Separators)," EPA-452/F-03-008
[4] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Flue Gas Desulfurization (FGD) - Wet, Spray Dry, and Dry Scrubbers)," EPA-452/F-03-034.
[5] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Thermal Incinerator)," EPA-452/F-03-022.
[6] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Fabric Filter - Pulse-Jet Cleaned Type)," EPA-452/F-03-025.

Table 23-18. VOC Top-Down BACT Analysis for Emission Sources Routed to Rolling Mill/Cooling Beds

Process	Pollutant
Rolling Mill & Cooling Beds	VOC

		Control Technology	Thermal Oxidation[1]	Catalytic Oxidation[2]	Carbon Adsorption[3]	Biofiltration[4]	Condenser[5]	Good Operating Practices
Step 1.	**IDENTIFY AIR POLLUTION CONTROL TECHNOLOGIES**	**Control Technology Description**	Utilizes an open flame or combustion within an enclosed chamber to oxidize pollutants. Thermal Oxidation has been a proven technology in controlling Volatile Organic Compounds (VOC) emissions from processes with high VOC usage (i.e., painting, polymer manufacturing, cleaning, etc.) but not the emission sources from a steel mill routed to the Caster Vent.	Catalytic oxidation allows oxidation to take place at a faster rate and at a lower temperature than is possible with thermal oxidation. VOC emissions can be controlled via catalytic oxidation. The oxidation is facilitated by the presence of the catalyst and carried out by the same basic chemical reaction as thermal oxidation.	Carbon Adsorption utilizes a highly porous solid with a large surface area to selectively adsorb VOC. Adsorption collects VOC on the surface of the porous solid instead of destroying the compound through a chemical reaction. The most common porous solid used in activated carbon which is a relatively low cost adsorbent. The adsorption capacity is affected by factors such as organic compound concentration in exhaust,	Biofiltration utilizes a bed of microorganisms to decompose biodegradable organic compounds. This technology has been successfully applied in full-scale applications to control VOC from a range of industrial and public-sector sources. Biofiltration also requires large land areas to house the microorganisms. The land required is proportional to the amount of exhaust gas that needs to be treated. Particulate matter in the exhaust stream can clog the	Condensers convert gas or vapors into liquids through condensation. This allows VOC within a exhaust stream to be recovered before the stream is exhausted to the atmosphere. Condensers typically use water or air to cool and condense the vapor stream. Condensers are designed for a specified throughput of fluid and cannot deviate sustainably from its designed capacity.	Good Operating Practices for the emission sources from a steel mill routed to the Caster Vent includes good combustion practices and the use of natural gas in the auxiliary heaters. Operation of the auxiliary heaters at the appropriate oxygen range and temperature promotes complete combustion.
		Other Considerations	Thermal Oxidization of VOC occurs at temperatures between 1,100 °F and 1,200 °F. Below this temperature range the rate of oxidation of VOC drops significantly and the effective control of VOC is no longer feasible.	Several noble metal-enriched catalysts at high temperatures promote this reaction. Prior to entering the catalyst bed where the oxidation reaction occurs, the temperature of the exhaust gas must be between 400 °F to 800 °F. Below this temperature range, the reaction rate drops sharply and effective oxidation of VOC is no longer feasible. Above this temperature, conventional oxidation catalysts break down and are unable to perform their desired functions.	Carbon adsorption streams are designed for specific inlet concentrations of VOC. For example, if a carbon adsorption system was designed for streams with greater than 1,000 parts per million (PPM) of VOC it may not operate effectively below this concentration. The ideal temperature range for physical adsorption is 130 °F. Above this temperature the adsorption capacity of the adsorbent decreases. Particulates in the exhaust stream can clog the porous material decreasing the lifespan of the process.	The optimum temperature range of biofiltration is approximately 100 °F in order to keep a viable population of microorganisms. Biofilters are also limited to organic compound concentrations of approximately 1,000 ppm or less. Biofilters are best suited to steady-state processes that do not have significant outages; the microorganisms tend to die off during extended process downtimes that tend to result in changes to the temperature, humidity, or nutrient levels in their habitat.	A typical condenser cannot reach temperatures below 100 °F and as a result high VOC removal rates are not possible unless the VOC condenses at high temperatures. Particulates in the exhaust stream can cause fouling leading to excessive maintenance and decreased efficiency. Additionally, low VOC concentrations in the exhaust streams cause the partial pressures of the VOC to be to low for condensation to occur resulting in a low removal rate.	None.

Table 23-18. VOC Top-Down BACT Analysis for Emission Sources Routed to Rolling Mill/Cooling Beds

Process	Pollutant
Rolling Mill & Cooling Beds	VOC

Step 2.	**ELIMINATE TECHNICALLY INFEASIBLE OPTIONS**	**RBLC Database Information**	Not included in RBLC for the control of VOC from the emission sources associated with a steel rolling mill	Not included in RBLC for the control of VOC from the emission sources associated with a steel rolling mill	Not included in RBLC for the control of VOC from the emission sources associated with a steel rolling mill	Not included in RBLC for the control of VOC from the emission sources associated with a steel rolling mill	Not included in RBLC for the control of VOC from the emission sources associated with a steel rolling mill	Included in the RBLC database as a form of control for VOC from the emission sources associated with a steel rolling mill.
		Feasibility Discussion	Thermal Oxidization of emissions for VOC destruction would require raising the exhaust gas temperature to at least a temperature of 1,100 °F. Below this temperature the reaction rate drops significantly and the oxidation of VOC is no longer feasible. Since the exhaust temperature of the rolling mill is below the typical operating range of thermal oxidizers, large amounts of auxiliary fuel would be required to heat the stream to the required temperature for thermal oxidation. This will create additional combustion emissions. The high temperatures involved in thermal oxidation will also result in additional NO_X emissions. This control technology has not been demonstrated in practice for control of VOC emissions from the emission sources located at a steel rolling mill, thermal oxidation of VOC emissions is considered infeasible for the control of VOC emissions from the	Catalytic oxidization of emissions for VOC destruction would require raising the exhaust gas temperature to at least a temperature of 400 °F. Below this temperature the reaction rate drops significantly and the oxidation of VOC is no longer feasible. Since the exhaust temperature of the rolling mill is below the typical operating range of catalytic oxidizers, additional auxiliary fuel would be required to heat the stream to the required temperature for catalytic oxidation. This will create additional combustion emissions. This control technology has not been demonstrated in practice for control of VOC emissions from the emission sources located at a steel rolling mill. As a result, catalytic oxidation of VOC emissions is considered infeasible for the control of VOC emissions from the rolling mill.	Carbon Adsorption would create adverse environmental impacts by potentially increasing the amount of solid waste disposal. The low VOC concentrations of the exhaust stream would make efficient operation of Carbon Adsorption infeasible. This control technology has not been demonstrated in practice for control of VOC emissions from the emission sources located at a steel rolling mill As a result, Carbon Adsorption is considered infeasible for the control of VOC emissions from the rolling mill.	Biofiltration would create adverse environmental impacts by potentially increasing the amount of solid waste disposal. The low VOC concentrations of the exhaust stream would make efficient operation of Biofiltration infeasible. This control technology has not been demonstrated in practice for control of VOC emissions from the emission sources located at a steel rolling mill. As a result, Biofiltration is considered infeasible for the control of VOC emissions from the rolling mill.	A Condenser would create adverse environmental impacts (by potentially increasing the amount of liquid waste disposal). The low VOC concentrations of the exhaust stream would make efficient operation of a Condenser infeasible. This control technology has not been demonstrated in practice for control of VOC emissions from the emission sources located at a steel rolling mill. As a result, a Condenser is considered infeasible for the control of VOC emissions from the rolling mill.	Technically feasible. Good combustion practices and the use of pipeline quality natural gas has been widely selected as BACT for VOC control from the rolling mill.
Step 3.	**RANK REMAINING CONTROL TECHNOLOGIES**	**Overall Control Efficiency**						Base Case
Step 4.	**EVALUATE AND DOCUMENT MOST EFFECTIVE CONTROLS**	**Cost Effectiveness ($/ton)**						Base Case
Step 5.	**SELECT BACT[6]**							**0.01 lb/hr per source (excluding Bit Furnace) using Good Operating Practices**

[1] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Regenerative Incinerator)," EPA-452/F-03-021. U.S. EPA, Office of Air Quality Planning and Standards, "Draft CAM Technical Guidance Document - Thermal Oxidizers", dated April 2002
[2] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Catalytic Incinerator)," EPA-452/F-03-018
[3] U.S. EPA, Air Economics Group, "Carbon Adsorbers", dated October 2018.
[4] U.S. EPA, Office of Air Quality Planning and Standards, "Using Bioreactors to Control Air Pollution" EPA-456/R-03-003.
[5] U.S. EPA, Office of Air Quality Planning and Standards, "Refrigerated Condensers" EPA-452/B-02-001.

23.6 Storage Silos

Emission Units included under Storage Silos are listed below:

- Two Fluxing Agent Storage Silos (FLXSLO1)
- Fluxing Agent Transfer Hopper at Silo Loadout (FLXHOPPER)
- One Carbon Storage Silo (CARBSLO1)
- Carbon Unloading Hopper (CARBHOPPER)
- One EAF Baghouse Dust Silo (DUSTSLO1)

The materials stored in these silos will be used in the steelmaking process or collected from the meltshop baghouse. When the material is loaded into the silo, fine particles in the displaced air will be forced out of the silo contributing to $PM_{2.5}$, PM_{10}, and PM emissions. The particulate emissions generated by material loading of the silos will be routed through bin vents. Table 23-19 below contains the selected BACT controls and emission limits for PM emissions emitted by storage silos and Table 23-20 provides the top-down BACT analysis for PM emissions.

Table 23-19. Summary of Selected BACT for Storage Silos

Pollutant	Selected BACT Control	Selected BACT Limit
PM/$PM_{2.5}$/PM_{10}	Bin Vent	0.005 gr/dscf (PM Filterable)

Table 23-20. PM Top-Down BACT Analysis for Storage Silos

Process	Pollutant
Storage Silos	$PM/PM_{10}/PM_{2.5}$

Step		Control Technology	Electrostatic Precipitator (ESP)[1,2]	Inertial Collection Systems (Cyclones)[3]	Wet Scrubber[4]	Bin Vent/Fabric Filter[5]
Step 1.	**IDENTIFY AIR POLLUTION CONTROL TECHNOLOGIES**	**Control Technology Description**	An ESP uses electrical forces to move particles entrained within a exhaust stream onto a collection surfaces (i.e., an electrode). ESPs have been used on solid fuel combustion devices and in non-ferrous metal processing facilities.	Consists of one or more conically shaped vessels in which the exhaust gas stream follows a circular motion prior to the outlet. PM enters the cyclone suspended in the gas stream, which is forced into a vortex by the shape of the cyclone. The inertia of the PM resists the directional change of the gas, resulting in an outward movement under the influence of centrifugal forces until they strike the cyclone wall. The PM is caught in a thin laminar layer of air next to the cyclone wall and is carried downward by gravity to the collection hopper.	Wet Scrubbers remove particulates through the impact of particles with water droplets. Wet Scrubbers can have high removal efficiency for streams with a steady state exhaust. The scrubber operates with a high pressure drop to maintain high removal efficiency.	When material is loaded into a silo the displaced air is emitted to the atmosphere. The air can contain fine dust particles that contribute to PM emissions.
		Other Considerations	Rappers or other mechanical mechanisms are used periodically to impart a vibration or shock to dislodge the deposited PM on dry ESP electrodes. The dislodged PM is collected in hoppers. In wet ESP, the collected particles are washed off of the collection plates by a small flow of trickling water.	In some cases, thermal insulation is used to reduce heat loss and cold air from entering the system. Cold air can cause gas quenching and condensation which leads to corrosion, dust buildup, and plugging of the hopper or dust removal system.	Wet scrubbing uses a significant amount of water and produces a wastewater stream that must be properly disposed.	Bin Vent dust collectors are specifically designed to capture PM emissions from the top of a storage silo for loading and unloading operations.
Step 2.	**ELIMINATE TECHNICALLY INFEASIBLE OPTIONS**	**RBLC Database Information**	Not included in RBLC for the control of particulate emissions from Storage Silos.	Not included in RBLC for the control of particulate emissions from Storage Silos.	Not included in RBLC for the control of particulate emissions from Storage Silos.	Bin Vents/Fabric Filters are included in the RBLC as a common form of control for particulate emissions from Storage Silos.
		Feasibility Discussion	The proposed control train employs a bin vent for control of PM, PM_{10} and $PM_{2.5}$ emissions. Additional particulate removal is not practical. This control technology has not been used in practice for control of PM emissions from the Storage Silos. As a result, an ESP is considered infeasible for the control of PM emissions from the Storage Silos.	The proposed control train employs a Bin Vent for control of PM, PM_{10} and $PM_{2.5}$ emissions. Additional particulate removal is not practical. This control technology has not been used in practice for control of PM emissions from the Storage Silos. As a result, a Cyclone is considered infeasible for the control of PM emissions from the Storage Silos.	The proposed control train employs a Bin Vent for control of PM, PM_{10} and $PM_{2.5}$ emissions. Additional particulate removal is not practical. This control technology has not been used in practice for control of PM emissions from the Storage Silos. As a result, a Wet Scrubber is considered infeasible for the control of PM emissions from the Storage Silos.	Technically feasible. The proposed control train employs a Bin Vent and Bin Vents are widely demonstrated in practice.

Table 23-20. PM Top-Down BACT Analysis for Storage Silos

Process	Pollutant
Storage Silos	$PM/PM_{10}/PM_{2.5}$

Step		Control Technology	Electrostatic Precipitator (ESP)[1,2]	Inertial Collection Systems (Cyclones)[3]	Wet Scrubber[4]	Bin Vent/Fabric Filter[5]	
Step 3.	**RANK REMAINING CONTROL TECHNOLOGIES**	**Overall Control Efficiency**				Base Case	
Step 4.	**EVALUATE AND DOCUMENT MOST EFFECTIVE CONTROLS**	**Cost Effectiveness ($/ton)**				Base Case	
Step 5.	**SELECT BACT**					**Facility**	**PM Emission Limit (gr/dscf)**
						Comparable Facilities[6,7]	
						Gerdau Ameristeel, NC	-
						CMC Mesa, AZ	-
						Nucor Frostproof, FL	**0.005**
						CMC Durant, OK	0.01
						Nucor Sedalia, MO	0.01
						Nucor Brandenburg, KY	0.001
						Proposed BACT:	**0.005 gr/dscf for filterable PM produced using a Bin Vent.**

[1] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Wet Electrostatic Precipitator (ESP) - Wire Pipe Type)," EPA-452/F-03-029.
[2] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Wet Electrostatic Precipitator (ESP) - Wire Plate Type)," EPA-452/F-03-030.
[3] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Momentum Separators)," EPA-452/F-03-008
[4] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Flue Gas Desulfurization (FGD) - Wet, Spray Dry, and Dry Scrubbers)," EPA-452/F-03-034.
[5] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Fabric Filter - Pulse-Jet Cleaned Type)," EPA-452/F-03-025.
[6] A list of non-comparable facilities, as well as review of the EPA RACT/BACT/LAER Clearinghouse (RBLC) database, is provided in Appendix B.

[7] Only the Gerdau Ameristeel, CMC Mesa, Nucor Frostproof, Nucor Sedalia, and CMC Oklahoma facilities utilize similar technologies for the EAF/LMS (i.e., ECS Process and Micro Mill). The proposed 0.005 gr/dscf from the Nucor Frostproof facility is more conservative than the 0.01 gr/dscf emission limit from the CMC Durant and Nucor Sedalia facilities. The Nucor Brandenburg facility has not yet demonstrated compliance with the emission limit for PM and as a result it is not feasible as a BACT limit.

23.7 Storage Piles & Material Transfer

Emission Units included under Storage Piles and Material Transfer are listed below:

- Five Scrap Storage Piles (EAF1P)
- One Alloy Aggregate Storage Pile (AAP1)
- One Slag Storage Pile (SP1)
- Piles associated with the Slag Processing Plant (SPP1), which consist of six smaller piles: Reject Pile, Metallic Product Pile, Thrus Product Pile, 2^{nd} Deck Product Pile, Jaw Crusher Overs Pile, and Screening Overs Pile
- One Residual Scrap Storage Pile (RSP1)
- One Mill Scale Pile (MSP1)
- Various material transfer points (DPEAF1, DPSLC1, DPF1, DPAA1, DPRW1, DPS1, DPRS1, and DPMS1)

The material transfer points include both indoor and outdoor transfer where materials are moved from equipment to equipment by being dropped. Particulate matter emissions will be generated due to wind erosion at the piles or wind activity around the material transfer points. Table 23-21 contains the selected BACT controls and emission limits for pollutants emitted by storage piles and material transfers and Table 23-22 provides the top-down BACT analysis for PM emissions.

Table 23-21. Summary of Selected BACT for Storage Piles

Pollutant	Selected BACT Control	Selected BACT Limit
PM/$PM_{2.5}$/PM_{10}	Work Practices (Enclosures, Wetting/Watering as needed [1, 2], Minimizing Drop Heights for Drop Points)	-

[1] Note that moisture should not be introduced to the scrap being processed at the proposed Project due to safety considerations. Specifically wet scrap will cause violent explosions in the EAF when electricity from the melting electrodes is introduced, as documented by many catastrophic explosion event logs, videos, etc.

[2] CMC proposes to apply wetting/watering, as needed, pursuant to other environmental conditions. For example, no wetting/watering will be applied during rain event, when there is sufficient moisture on the piles following a rain/snow event, etc.

Table 23-22. Top-Down BACT Analysis for Storage Piles & Material Transfers - $PM/PM_{10}/PM_{2.5}$

Process	Pollutant
Storage Piles & Material Transfers	$PM/PM_{10}/PM_{2.5}$

Step		Control Technology	Enclosures	Wetting/Watering
Step 1.	**IDENTIFY AIR POLLUTION CONTROL TECHNOLOGIES**	**Control Technology Description**	Enclosure or covering of inactive piles can be utilized to minimize wind erosion and therefore reduce emissions. Partial enclosures include wind fences or barriers that reduce windblown dust from storage piles or large exposed areas. The wind fence or barrier creates an area of reduced wind velocity and emissions.	As a supplement to natural precipitation, when needed, wetting/watering - the spraying storage piles with water or chemical agents such as surfactants - can be used to reduce wind erosion emissions. Water sprays are known to have a more temporary effect on total emissions while chemical agents offer a more extensive wetting and therefore more effect control of emissions.
		Other Considerations	No other considerations.	Wetting/watering should not be applied to the EAF Feedstock, Alloy Aggregate or Residual Scrap storage piles, as these storage piles include feed material for the EAF and water will violently react with molten steel in the EAF. Additionally, wetting/watering should not be used on storage piles where it may result in unacceptable solidification of slag or other materials discharged from high-temperature operations.
Step 2.	**ELIMINATE TECHNICALLY INFEASIBLE OPTIONS**	**RBLC Database Information**	Included in RBLC. Enclosures such as wind breaks are used as a form of control for particulate emissions from storage piles.	Included in RBLC. Water sprays are included in the RBLC as a common form of control for particulate emissions from storage piles.
		Feasibility Discussion	Technically feasible. Enclosures can be used, as practicable, to reduce wind-erosion PM emissions.	Wetting/watering is feasible as a supplement to natural precipitation for controlling wind erosion PM emissions except where it would create safety hazards or unacceptable changes in material properties.

Table 23-22. Top-Down BACT Analysis for Storage Piles & Material Transfers - $PM/PM_{10}/PM_{2.5}$

Process	Pollutant
Storage Piles & Material Transfers	$PM/PM_{10}/PM_{2.5}$

Step		Control Technology	Enclosures	Wetting/Watering
Step 3.	**RANK REMAINING CONTROL TECHNOLOGIES**	**Overall Control Efficiency[1,2]**	85% for partial enclosures	80-90%
Step 4.	**EVALUATE AND DOCUMENT MOST EFFECTIVE CONTROLS**	**Cost Effectiveness ($/ton)**	Base Case	Base Case
Step 5.	**SELECT BACT**		**Facility**	**Control Technology**
			Comparable Facilities[3,4,5]	
			Nucor Steel Frostproof, FL	Enclosures, Wetting/Watering, Minimizing Drop Height
			Nucor Steel Sedalia, MO	Wetting/Watering, Minimizing Drop Height
			Gerdau Ameristeel Charlotte, NC	None
			CMC Steel Oklahoma City, OK	**Enclosures, Wetting/Watering, Minimizing Drop Height**
			CMC Steel Mesa, AZ	**Enclosures, Wetting/Watering, Material Moisture Content**
			PROPOSED BACT:	**Work Practices: As applicable, Enclosures and Wetting/Watering. Additionally, the drop heights associated with the Drop Points for the piles will be minimized to the extent practicable.**

[1] Partial enclosure control efficiency per Table 7 of TCEQ Technical Guidance for Rock Crushing Plants.

[2] Wetting/watering control efficiency per AP-42 Chapter 11.19.1 Sand and Gravel Processing (11/95). https://www3.epa.gov/ttn/chief/ap42/ch11/final/c11s19-1.pdf, Accessed March 2020.

[3] A list of non-comparable facilities, as well as review of the EPA RACT/BACT/LAER Clearinghouse (RBLC) database, is provided in Appendix B.

[4] CMC Steel notes that watering may result in unacceptable solidification of slag or other materials discharged from high-temperature operations and that most of the materials in the outdoor piles are scrap steel which have very little brittle materials that are susceptible to becoming fugitive dust.

23.8 Diesel-Fired Engines Associated with Emergency Generators

The proposed Project will utilize two diesel-fired engines associated with emergency generators and fire pumps. The emergency generator (EGEN1) will be powered by a 1,600 hp engine and the emergency fire water pump (EFWP1) will be powered by a 300 hp engine. Table 23-23 provides a summary of the selected BACT controls and limits and Table 23-24 to Table 23-29 contain the top-down BACT analyses for the two engines.

Table 23-23. Summary of Selected BACT for Emergency Engines

Pollutant	Selected BACT Control	Selected BACT Limit
CO	Purchase an engine that is certified to comply with emission limitations of 40 CFR 60, Subpart IIII	As specified in 40 CFR 60, Subpart IIII
NO_x	Purchase an engine that is certified to comply with emission limitations of 40 CFR 60, Subpart IIII	As specified in 40 CFR 60, Subpart IIII
SO_2	Ultra-low sulfur diesel fuel	Fuel composition of ≤0.0015% sulfur by weight
$PM/PM_{2.5}/PM_{10}$	Purchase an engine that is certified to comply with emission limitations of 40 CFR 60, Subpart IIII	As specified in 40 CFR 60, Subpart IIII
GHG as measured in CO_2e	Good Combustion Practices	108.8 tpy

Table 23-24. CO Top-Down BACT Analysis for Emergency Engines

Process	Pollutant
Emergency Engines	CO

Step 1.	**IDENTIFY AIR POLLUTION CONTROL TECHNOLOGIES**	**Control Technology**	**Tier Certification**	
		Control Technology Description	Certified to comply with Tier Emission Standards as outlined in 40 CFR Part 60 Subpart IIII for stationary CI internal combustion emergency engine or stationary fire pump engines, per the maximum engine power and model year.	
		Other Considerations	No other considerations.	
Step 2.	**ELIMINATE TECHNICALLY INFEASIBLE OPTIONS**	**RBLC Database Information**	Included in the RBLC database as an emission standard.	
		Feasibility Discussion	Technically feasible. Using an EPA Tier certified engine has been demonstrated in practice for emergency engines.	
Step 3.	**RANK REMAINING CONTROL TECHNOLOGIES**	**Overall Control Efficiency**	Base Case	
Step 4.	**EVALUATE AND DOCUMENT MOST EFFECTIVE CONTROLS**	**Cost Effectiveness ($/ton)**	In its 2010 Maximum Achievable Control Technology (MACT)/Generally Available Control Technology (GACT) evaluation for Reciprocating Internal Combustion Engines (RICE), EPA concluded for emergency RICE: "Because these engines are typically used only a few number of hours per year, the costs of emission control are not warranted when compared to the emission reductions that would be achieved."[1] Based on EPA's assessment and the fact that the RBLC contains no records of DOC installation on emergency-use RICE, DOC is eliminated from consideration as BACT. This conclusion is substantiated by multiple state and local regulatory authorities, including the San Joaquin Valley Air Pollution Control District (APCD) (see Guideline 3.1.1. and Guideline 3.1.4 at the San Joaquin Valley Unified APCD BACT Clearinghouse).	
Step 5.	**SELECT BACT**		**Specifications**	**CO Emission Standard**
			Applicable Emission Standards	
			PROPOSED BACT:	**Purchase an engine that is certified to comply with emission limitations of 40 CFR 60, Subpart IIII.**

[1] U.S. EPA, Memorandum: Response to Public Comments on Proposed National Emission Standards for Hazardous Air Pollutants for Existing Stationary Reciprocating Internal Combustion Engines Located at Area Sources of Hazardous Air Pollutant Emissions or Have a Site Rating Less Than or Equal to 500 Brake HP Located at Major Sources of Hazardous Air Pollutant Emissions, August 10, 2010, p. 172-173. (EPA-HQ-OAR-2008-0708).

Table 23-25. NO_X Top-Down BACT Analysis for Emergency Engines

Process	Pollutant
Emergency Engines	NO_X

Step 1.	**IDENTIFY AIR POLLUTION CONTROL TECHNOLOGIES**	**Control Technology**	**Tier Certification**
		Control Technology Description	Certified to comply with Tier Emission Standards as outlined in 40 CFR Part 60 Subpart IIII for stationary CI internal combustion emergency engine or stationary fire pump engines, per the maximum engine power and model year.
		Other Considerations	No other considerations.
Step 2.	**ELIMINATE TECHNICALLY INFEASIBLE OPTIONS**	**RBLC Database Information**	Included in the RBLC database as an emission standard.
		Feasibility Discussion	Technically feasible. Using an EPA Tier certified engine has been demonstrated in practice for emergency engines.
Step 3.	**RANK REMAINING CONTROL TECHNOLOGIES**	**Overall Control Efficiency**	Base Case
Step 4.	**EVALUATE AND DOCUMENT MOST EFFECTIVE CONTROLS**	**Cost Effectiveness ($/ton)**	In its 2010 Maximum Achievable Control Technology (MACT)/Generally Available Control Technology (GACT) evaluation for Reciprocating Internal Combustion Engines (RICE), EPA concluded for emergency RICE: "Because these engines are typically used only a few number of hours per year, the costs of emission control are not warranted when compared to the emission reductions that would be achieved."[1] Based on EPA's assessment and the fact that the RBLC contains no records of DOC installation on emergency-use RICE, DOC is eliminated from consideration as BACT. This conclusion is substantiated by multiple state and local regulatory authorities, including the San Joaquin Valley Air Pollution Control District (APCD) (see Guideline 3.1.1. and Guideline 3.1.4 at the San Joaquin Valley Unified APCD BACT Clearinghouse).
Step 5.	**SELECT BACT**	**Specifications**	**NO_X Emission Standard**
		Applicable Emission Standards	
		PROPOSED BACT:	**Purchase an engine that is certified to comply with emission limitations of 40 CFR 60, Subpart IIII.**

[1] U.S. EPA, Memorandum: Response to Public Comments on Proposed National Emission Standards for Hazardous Air Pollutants for Existing Stationary Reciprocating Internal Combustion Engines Located at Area Sources of Hazardous Air Pollutant Emissions or Have a Site Rating Less Than or Equal to 500 Brake HP Located at Major Sources of Hazardous Air Pollutant Emissions, August 10, 2010, p. 172-173. (EPA-HQ-OAR-2008-0708).

Table 23-26. SO_2 Top-Down BACT Analysis for Emergency Engines

Process	Pollutant
Emergency Engines	SO_2

Step 1.	**IDENTIFY AIR POLLUTION CONTROL TECHNOLOGIES**	**Control Technology**	**Ultra-Low Sulfur Diesel**	
		Control Technology Description	Ultra-low sulfur diesel (ULSD) contains less than 0.0015% sulfur by weight. The reduced sulfur content reduces the potential for SO_2 emissions.	
		Other Considerations	No other considerations.	
Step 2.	**ELIMINATE TECHNICALLY INFEASIBLE OPTIONS**	**RBLC Database Information**	Included in the RBLC database as a common form of control for SO_2 from emergency, diesel-fired RICE.	
		Feasibility Discussion	Technically feasible. The use of ULSD has been demonstrated in practice.	
Step 3.	**RANK REMAINING CONTROL TECHNOLOGIES**	**Overall Control Efficiency**	Base Case	
Step 4.	**EVALUATE AND DOCUMENT MOST EFFECTIVE CONTROLS**	**Cost Effectiveness ($/ton)**	Base Case	
Step 5.	**SELECT BACT**		**Specifications**	**SO_2 Emission Standard**
			Applicable Emission Standards	
			PROPOSED BACT:	**Ultra-low sulfur diesel fuel.**

Table 23-27. PM Top-Down BACT Analysis for Emergency Engines

Process	Pollutant
Emergency Engines	$PM/PM_{10}/PM_{2.5}$

Step 1.	**IDENTIFY AIR POLLUTION CONTROL TECHNOLOGIES**	**Control Technology**	**Ultra-Low Sulfur Diesel**	**Diesel Particulate Filter[1]**	**Tier Certification**
		Control Technology Description	Ultra-low sulfur diesel (ULSD) contains less than 0.0015% sulfur by weight. The reduced sulfur content reduces the potential for aggregation of sulfur containing compounds and thus reduces PM2.5 emissions	A diesel particulate filter (DPF) is placed in the exhaust pathway to prevent the release of PM. A DPF uses a porous ceramic or cordierite substrate or metallic filter to physically trap particulate matter and remove it from the exhaust stream	Certified to comply with Tier Emission Standards as outlined in 40 CFR Part 60 Subpart IIII for stationary CI internal combustion emergency engine or stationary fire pump engines, per the maximum engine power and model year.
		Other Considerations	No other considerations.	No other considerations.	No other considerations.
Step 2.	**ELIMINATE TECHNICALLY INFEASIBLE OPTIONS**	**RBLC Database Information**	Included in the RBLC database as a common form of control for PM from emergency, diesel-fired RICE.	Not included in the RBLC database as a control technology for emergency, diesel-fired RICE. DPF is nonetheless carried forward in this BACT analysis.	Included in the RBLC database as an emission standard.
		Feasibility Discussion	Technically feasible. The use of ULSD has been demonstrated in practice.	Technically feasible. The use of DPF has been demonstrated in practice for engines.	Technically feasible. Using an EPA Tier certified engine has been demonstrated in practice for emergency engines.
Step 3.	**RANK REMAINING CONTROL TECHNOLOGIES**	**Overall Control Efficiency**	Base Case	85-90%	Base Case
Step 4.	**EVALUATE AND DOCUMENT MOST EFFECTIVE CONTROLS**	**Cost Effectiveness ($/ton)**	In its 2010 Maximum Achievable Control Technology (MACT)/Generally Available Control Technology (GACT) evaluation for Reciprocating Internal Combustion Engines (RICE), EPA concluded for emergency RICE: "Because these engines are typically used only a few number of hours per year, the costs of emission control are not warranted when compared to the emission reductions that would be achieved."2 Based on EPA's assessment and the fact that the RBLC contains no records of DOC installation on emergency-use RICE, DOC is eliminated from consideration as BACT. This conclusion is substantiated by multiple state and local regulatory authorities, including the San Joaquin Valley Air Pollution Control District (APCD) (see Guideline 3.1.1. and Guideline 3.1.4 at the San Joaquin Valley Unified APCD BACT Clearinghouse).		Base Case
Step 5.	**SELECT BACT**				**Specifications** / **PM Emission Standard** *Applicable Emission Standards* **PROPOSED BACT:** **Purchase an engine that is certified to comply with emission limitations of 40 CFR 60, Subpart IIII.**

[1] Technical Bulletin, Diesel Particulate Filter General Information, EPA-420-F-10-029, May 2010.

[2] U.S. EPA, Memorandum: Response to Public Comments on Proposed National Emission Standards for Hazardous Air Pollutants for Existing Stationary Reciprocating Internal Combustion Engines Located at Area Sources of Hazardous Air Pollutant Emissions or Have a Site Rating Less Than or Equal to 500 Brake HP Located at Major Sources of Hazardous Air Pollutant Emissions, August 10, 2010, p. 172-173. (EPA-HQ-OAR-2008-0708).

Table 23-28. VOC Top-Down BACT Analysis for Emergency Engines

Process	Pollutant
Emergency Engines	VOC

Step 1.	IDENTIFY AIR POLLUTION CONTROL TECHNOLOGIES	**Control Technology**	**Tier Certification**	
		Control Technology Description	Certified to comply with Tier Emission Standards as outlined in 40 CFR Part 60 Subpart IIII for stationary CI internal combustion emergency engine or stationary fire pump engines, per the maximum engine power and model year.	
		Other Considerations	No other considerations.	
Step 2.	ELIMINATE TECHNICALLY INFEASIBLE OPTIONS	**RBLC Database Information**	Included in the RBLC database as an emission standard.	
		Feasibility Discussion	Technically feasible. Using an EPA Tier certified engine has been demonstrated in practice for emergency engines.	
Step 3.	RANK REMAINING CONTROL TECHNOLOGIES	**Overall Control Efficiency**	Base Case	
Step 4.	EVALUATE AND DOCUMENT MOST EFFECTIVE CONTROLS	**Cost Effectiveness ($/ton)**	In its 2010 Maximum Achievable Control Technology (MACT)/Generally Available Control Technology (GACT) evaluation for Reciprocating Internal Combustion Engines (RICE), EPA concluded for emergency RICE: "Because these engines are typically used only a few number of hours per year, the costs of emission control are not warranted when compared to the emission reductions that would be achieved."[1] Based on EPA's assessment and the fact that the RBLC contains no records of DOC installation on emergency-use RICE, DOC is eliminated from consideration as BACT. This conclusion is substantiated by multiple state and local regulatory authorities, including the San Joaquin Valley Air Pollution Control District (APCD) (see Guideline 3.1.1. and Guideline 3.1.4 at the San Joaquin Valley Unified APCD BACT Clearinghouse).	
Step 5.	SELECT BACT		**Specifications**	**VOC Emission Standard**
			Applicable Emission Standards	
			PROPOSED BACT:	**Purchase an engine that is certified to comply with emission limitations of 40 CFR 60, Subpart IIII.**

[1] U.S. EPA, Memorandum: Response to Public Comments on Proposed National Emission Standards for Hazardous Air Pollutants for Existing Stationary Reciprocating Internal Combustion Engines Located at Area Sources of Hazardous Air Pollutant Emissions or Have a Site Rating Less Than or Equal to 500 Brake HP Located at Major Sources of Hazardous Air Pollutant Emissions, August 10, 2010, p. 172-173. (EPA-HQ-OAR-2008-0708).

Table 23-29. GHGs Top-Down BACT Analysis for Emergency Engines

Process	Pollutant
Emergency Engines	GHGs as measured in CO_2e

Step 1.	**IDENTIFY AIR POLLUTION CONTROL TECHNOLOGIES**	**Control Technology**	**Good Combustion Practices**	
		Control Technology Description	Operation of the engines at high combustion efficiency to reduce the products of incomplete combustion.	
		Other Considerations	No other considerations	
Step 2.	**ELIMINATE TECHNICALLY INFEASIBLE OPTIONS**	**RBLC Database Information**	Included in the RBLC database as a common form of control for GHGs from emergency, diesel-fired RICE.	
		Feasibility Discussion	Technically feasible. Good combustion practices have been widely selected as BACT for GHG control from emergency engines.	
Step 3.	**RANK REMAINING CONTROL TECHNOLOGIES**	**Overall Control Efficiency**	Base Case	
Step 4.	**EVALUATE AND DOCUMENT MOST EFFECTIVE CONTROLS**	**Cost Effectiveness ($/ton)**	Base Case	
Step 5.	**SELECT BACT**		**Specifications**	**GHG BACT**
			Applicable Work Practices	
			PROPOSED BACT:	**91.65 tpy of GHG (CO_2e) using Good combustion practices.**

23.9 Cooling Towers

Emission Units under Cooling Towers are listed below:

- One Contact Cooling Tower (CTC1)
- Two Non-Contact Cooling Towers (CTNC11, CTNC12)

Each of the cooling towers have two individual cells. Cooling towers have the potential to emit $PM_{2.5}$, PM_{10}, and PM emissions. The contact cooling towers will provide direct contact between cooling water and air passing through the tower. Some of the liquid will become entrained in the air stream and will be carried out of the tower as drift droplets. These droplets will contain either dissolved or suspended solid particles that contribute to particulate emissions. Table 23-30 below provides a summary of the selected BACT controls and limits for cooling towers and Table 23-31 contains the top down BACT analysis for PM emissions.

Table 23-30. Summary of Selected BACT for Cooling Towers

Pollutant	Selected BACT Control	Selected BACT Limit
PM/$PM_{2.5}$/PM_{10}	High Efficiency Drift Eliminators	0.001% Drift Loss

Table 23-31. PM Top-Down BACT Analysis for Non-Contact Cooling Towers

Process	Pollutant
Non-Contact Cooling Towers	$PM/PM_{10}/PM_{2.5}$

Step		Control Technology	Dry Cooling Towers[1]	Limitations on TDS Concentrations in the Circulating Water[2]	Drift Eliminators[2]
Step 1.	**IDENTIFY AIR POLLUTION CONTROL TECHNOLOGIES**	**Control Technology Description**	Unlike traditional wet cooling towers, dry cooling towers operate by heat transmission through tubes or fins that separate the cooling water from ambient air. Dry cooling towers rely on convection to dissipate heat from the cooling water rather than evaporation. Since there is no contact between the cooling water and outside air, there is no drift loss and thus zero emissions. However, performance of dry cooling towers is limited by the ambient dry-bulb temperature.	The total dissolved solids (TDS) in the circulating water can be limited to lower the amount of dissolved salts entrained in the air stream before exiting the tower. This results in lower particulate emissions because less salts can precipitate from the "drift" droplets.	Wet cooling towers provide direct contact between the cooling water and air passing through the tower. Some of the liquid water may become entrained in the air stream and carried out of the tower as "drift" droplets. The TDS in the water contributes to particulate emissions. To reduce these particulate emissions drift eliminators are usually incorporated into the tower design to remove water droplets in the air stream. This is accomplished through inertial separation caused by directional changes in the fluid while passing through the eliminator.
		Other Considerations	None	In order to reduce TDS higher volumetric flow rates of make-up water must be introduced into the tower.	The use of high-efficiency drift eliminating media to de-entrain particulate droplets from the air flow exiting the cooling tower is commercially proven technique to reduce $PM/PM_{10}/PM_{2.5}$ emissions. Compared to "conventional" drift eliminators, high-efficiency drift eliminators can reduce the $PM/PM_{10}/PM_{2.5}$ emission rate by more than 90 % with a drift loss as low as 0.0005%.

Table 23-31. PM Top-Down BACT Analysis for Non-Contact Cooling Towers

Process	Pollutant
Non-Contact Cooling Towers	$PM/PM_{10}/PM_{2.5}$

Step		Control Technology	Dry Cooling Towers[1]	Limitations on TDS Concentrations in the Circulating Water[2]	Drift Eliminators[2]
Step 2.	**ELIMINATE TECHNICALLY INFEASIBLE OPTIONS**	**RBLC Database Information**	Not included in RBLC for the control of particulate emissions from cooling towers.	Not included in RBLC for the control of particulate emissions from cooling towers for a similar facility (i.e., Micro mill and ECS process).	Drift Eliminators are included in the RBLC as a common form of control for particulate emissions from cooling towers.
		Feasibility Discussion	Technically infeasible. Dry Cooling Towers have not been demonstrated for use at steel micro-mills.	The TDS content of the make up water is dependent on fluctuations in the water supply. Additionally, this control technology has not been demonstrated in practice, for a facility with similar technology (i.e., an ECS and Micro Mill Process), for control of PM emissions from cooling towers. As a result, limitations on TDS concentrations in circulating water is considered infeasible for the control of PM emissions from cooling towers.	Technically feasible. The proposed cooling towers employ high efficiency drift eliminators and high efficiency drift eliminators are widely demonstrated in practice.
Step 3.	**RANK REMAINING CONTROL TECHNOLOGIES**	**Overall Control Efficiency**			Base Case
Step 4.	**EVALUATE AND DOCUMENT MOST EFFECTIVE CONTROLS**	**Cost Effectiveness ($/ton)**			Base Case

Table 23-31. PM Top-Down BACT Analysis for Non-Contact Cooling Towers

Process	Pollutant
Non-Contact Cooling Towers	$PM/PM_{10}/PM_{2.5}$

Step		Control Technology	Dry Cooling Towers[1]	Limitations on TDS Concentrations in the Circulating Water[2]	Drift Eliminators[2]	
Step 5.	**SELECT BACT**				**Facility**	**Drift Loss (%)**
					Comparable Facilities[3, 4]	
					CMC Mesa, AZ	0.0005
					Nucor Frostproof, FL	**0.0010**
					CMC Durant, OK	**0.0010**
					Nucor Sedalia, MO	**0.0010 2,500 TDS**
					Proposed BACT:	**0.001% drift loss using a high-efficiency drift eliminators.**

[1] California Energy Commission, "Comparison of Alternate Cooling Technologies for California Power Plants Economic, Environmental and Other Tradeoffs", EPA 500-02-079F.

[2] U.S. EPA, AP-42 Section 13.4, "Wet Cooling Towers", January 1995.

[3] A list of non-comparable facilities, as well as review of the EPA RACT/BACT/LAER Clearinghouse (RBLC) database, is provided in Appendix B.

[4] Only the Nucor Frostproof, Nucor Sedalia, CMC Durant, and CMC Mesa facilities utilize a similar process (i.e., ECS Process and Micro Mill). The 0.001% drift loss is consistent with Nucor Frostproof, Nucor Sedalia, and CMC Durant. The CMC Mesa operations are located in a PM10 non-atttainment area and the 0.0005% drift loss is reflective of PM10 requirements in that non-attainment area which are not applicable to the proposed Project attainment areas.

23.10 Ball Drop Crushing

Ball drop crushing (CR1) is used to reduce the size of large pieces of slag so that it may continue in the slag processing process. The proposed ball drop crushing of large slag has the potential to emit PM, PM_{10}, $PM_{2.5}$ as fine particulates will rise into the air as the slag is being crushed. Table 23-32 below provides a summary of the selected BACT controls for ball drop crushing and Table 23-33 contains the top down BACT analysis for PM emissions.

Table 23-32. Summary of Selected BACT for Ball Drop Crushing

Pollutant	Selected BACT Control	Selected BACT Limit
PM/$PM_{2.5}$/PM_{10}	Work Practices: Wetting/Watering, Material Moisture Content, Good Process Operations	-

Table 23-33. Top-Down BACT Analysis for Ball Drop Crushing

Process	Pollutant
Ball Drop Crushing	PM, PM_{10}, $PM_{2.5}$

		Control Technology	Baghouse/Fabric Filter [1]	Cyclone[2]	Enclosures[3,4]	Wetting/Watering/Material Moisture Content[3,4]	Good Process Operations
Step 1.	**IDENTIFY AIR POLLUTION CONTROL TECHNOLOGIES**	**Control Technology Description**	Process exhaust gasses are collected and passed through a tightly woven or felted fabric arranged in sheets, cartridges, or bags that collect PM via sieving and other mechanisms. The dust cake that accumulates on the filters increases collection efficiency. Various cleaning techniques include pulse-jet, reverse-air, and shaker technologies.	Centrifugal forces drive particles in the gas stream toward the cyclone walls as the waste gas flows through the conical unit. The captured particles are collected in a material hopper below the unit.	Enclosure or covering of inactive piles can be utilized to minimize wind erosion and therefore reduce emissions. Partial enclosures include wind fences or barriers that reduce windblown dust from storage piles or large exposed areas. The wind fence or barrier creates an area of reduced wind velocity and emissions.	The inherent moisture content of certain materials may limit the generation and dispersion of fugitive dust. For dry materials, spray bars or spray nozzles may be utilized to apply water as necessary throughout the process.	Operate and maintain the equipment in accordance with good air pollution control practices
		Other Considerations	Fabric filters are susceptible to corrosion and blinding by moisture. Appropriate fabrics must be selected for specific process conditions. Accumulations of dust may present fire or explosion hazards.	Cyclones typically exhibit lower efficiencies when collecting smaller particles. High-efficiency units may require substantial pressure drop.	No other considerations.	No other considerations.	No other considerations.
Step 2.	**ELIMINATE TECHNICALLY INFEASIBLE OPTIONS**	**RBLC Database Information**	Not included in RBLC for the control of PM emissions from ball drop crushing.	Not included in RBLC for the control of PM emissions from ball drop crushing.	Not included in RBLC for the control of PM emissions from ball drop crushing.	Included in RBLC for the control of PM emissions from ball drop crushing.	Included in RBLC for the control of PM emissions from ball drop crushing.
		Feasibility Discussion	Technically infeasible. Emissions are fugitive in nature and equipment is moved within the slag handling area to meet processing needs.Capture/control systems may not be feasibly utilized.	Technically infeasible. Emissions are fugitive in nature and equipment is moved within the slag handling area to meet processing needs.Capture/control systems may not be feasibly utilized.	Technically infeasible. Emissions are fugitive in nature and equipment is moved within the slag handling area to meet processing needs.Enclosures may not be feasibly utilized.	Feasible. Water sprays are applied as needed to prevent emissions of fugitive dust.	Feasible. Good Process Operations are widely demonstrated in practice
Step 3.	**RANK REMAINING CONTROL TECHNOLOGIES**	**Overall Control Efficiency**				70%	Base Case
Step 4.	**EVALUATE AND DOCUMENT MOST EFFECTIVE CONTROLS**	**Cost Effectiveness[8] ($/ton)**				Base Case	Base Case
Step 5.	**SELECT BACT**					**Facility**	**Control Technology Used**
						Comparable Facilities[5]	
						Nucor Frostproof, FL	Equipment Enclosures, Watering, Minimizing Wind Erosion and Drop Points
						Nucor Sedalia, MO	Dust Suppressant Emission Control System, Minimize Drop Heights
						Proposed BACT:	**Work Practices: Wetting/Watering, Material Moisture Content, Good Process Operations**

[1] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Fabric Filter - Pulse-Jet Cleaned Type)," EPA-452/F-03-025.
[2] U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Cyclone)," EPA-452/F-03-005.
[3] Ohio EPA, "Reasonably Available Control Measures for Fugitive Dust Sources," Section 2.1 - General Fugitive Dust Sources.
[4] Texas Commission on Environmental Quality, "Technical Guidance for Rock Crushing Plants", Draft RG058.
[5] A list of non-comparable facilities, as well as review of the EPA RACT/BACT/LAER Clearinghouse (RBLC) database, is provided in Appendix B.

23.11 Roads

As part of the chosen BACT control, where practicable, roads (PR1) will be paved to reduce emissions of PM. Resurfacing is impracticable in two specific scenarios: in areas of road utilized by the slag haul truck and in areas of road where vehicle traffic takes place near accumulated piles. The slag haul truck's chains, which are necessary to prevent its tires from melting in the meltshop, would destroy pavement as well as pulverize and disperse gravel or recycled asphalt, rendering its use impracticable. Additionally, while vehicle traffic is necessary in areas where piles accumulate, resurfacing is impracticable due to the accumulation of dust and other materials. Unpaved roads (UR1) associated with such scenarios will have an engineered surface in place of pavement, gravel, or recycled asphalt. Sweeping dust from roads and mimicking precipitation by spraying roads with water or surfactants can aid in reducing particulate emissions. Vehicle restrictions may also be used to restrict vehicle weight, vehicle speed, and number of vehicles on the road to reduce particulate emissions from vehicle traffic. Table 23-34 provides a summary of the selected BACT controls and limits for roads and Table 23-35 contains the top down BACT analysis.

Table 23-34. Summary of Selected BACT for Roads

Pollutant	Selected BACT Control	Selected BACT Limit
$PM/PM_{2.5}/PM_{10}$	Work Practices (Fugitive Dust Control Plan including, as practicable: Vacuuming/Sweeping, Vehicle Restrictions, and/or Wetting/Watering)	-

Table 23-35. PM Top-Down BACT Analysis for Roads

Process	Pollutant
Roads	$PM/PM_{10}/PM_{2.5}$

Step		Control Technology	Vacuuming/Sweeping[1]	Vehicle Restrictions[2]	Resurfacing	Wetting/Watering
Step 1.	**IDENTIFY AIR POLLUTION CONTROL TECHNOLOGIES**	**Control Technology Description**	Vacuuming or sweeping dust from roads can reduce particulate emissions by collecting loose materials.	Vehicle restrictions include limiting vehicle speed, vehicle weight, or number of vehicles on the road to reduce emissions of particulate matter from roads due to vehicle traffic. Speed limits may vary, however 15 miles per hour is a conservative speed limit for reducing emissions.	Resurfacing the roads with pavement, gravel, recycled asphalt, or other suitable material to reduce emissions by reducing silt content.	As a supplement to natural precipitation, when needed, wetting/watering - spraying roads with water or chemical agents such as surfactants - can be used to reduce wind erosion emissions. Water sprays are known to have a more temporary effect on total emissions while chemical agents offer a more extensive wetting and therefore more effect control of emissions.
		Other Considerations	Vacuuming/sweeping is most effective on paved roads.	No other considerations.	No other considerations.	Wetting/watering is most effective on unpaved roads. Use of chemical surfactants on roads may have adverse effects on plant and animal life. [3]
Step 2.	**ELIMINATE TECHNICALLY INFEASIBLE OPTIONS**	**RBLC Database Information**	Included in RBLC. Vacuuming and sweeping are included in the RBLC as common forms of control for particulate emissions from roads.	Included in RBLC. Setting speed limits is included in the RBLC as a common form of control for particulate emissions from roads.	Included in RBLC. Resurfacing is included in the RBLC as a common form of control for particulate emissions from roads.	Included in RBLC. Road watering is included in the RBLC as a common form of control for particulate emissions from roads.
		Feasibility Discussion	Technically feasible. Vacuuming and/or sweeping can be used, as practicable, to reduce PM emissions.	Technically feasible. Speed limits can be used, as practicable, to reduce PM emissions.	Technically feasible. Resurfacing can be used, as practicable, to reduce PM emissions. Resurfacing is not practicable in two scenarios: (1) in areas of road utilized by the slag haul truck, and (2) in areas of road where vehicle traffic takes place near accumulated piles. The slag haul truck has chains which are necessary to prevent the tires from melting in the meltshop, but which would also destroy pavement, and pulverize and disperse gravel or recycled asphalt. In areas where piles are accumulated, an allowance for vehicle traffic is necessary, but resurfacing is impracticable due to the accumulation of dust and other materials. Unpaved roads associated with such scenarios will have an engineered surface in place of	Wetting/watering is feasible as a supplement to natural precipitation for controlling wind erosion and vehicle traffic PM emissions.

Table 23-35. PM Top-Down BACT Analysis for Roads

Process	Pollutant
Roads	$PM/PM_{10}/PM_{2.5}$

Step		Control Technology	Vacuuming/Sweeping[1]	Vehicle Restrictions[2]	Resurfacing	Wetting/Watering
Step 3.	**RANK REMAINING CONTROL TECHNOLOGIES**	**Overall Control Efficiency[4]**	Highly Variable	Reduction of speed is linearly related to control of emissions.	~95%	80-90%
Step 4.	**EVALUATE AND DOCUMENT MOST EFFECTIVE CONTROLS**	**Cost Effectiveness ($/ton)**	Base Case	Base Case	Base Case	Base Case
Step 5.	**SELECT BACT**		**Facility**		**Control Technology**	
			Comparable Facilities[5]			
			Nucor Steel Frostproof, FL		**Fugitive Dust Control Plan**	
			Nucor Steel Sedalia, MO		**Fugitive Dust Control Plan, including Vacuuming/Sweeping, Vehicle Restrictions, Resurfacing, and/or Wetting/Watering**	
			CMC Steel Durant, OK		**Paving, Sweeping, Vehicle Restrictions (Speed Limit)**	
			CMC Steel Mesa, AZ		**Watering/Wetting or Vacuuming or Resurfacing or Vehicle Restrictions**	
			PROPOSED BACT:		**Work Practices: Fugitive Dust Control Plan including, as practicable, Vacuuming/Sweeping, Vehicle Restrictions, Resurfacing, and/or Wetting/Watering.**	

[1] AP-42 Chapter 13.2.1 Paved Roads (10/02), https://www3.epa.gov/ttn/chief/old/ap42/ch13/s021/final/c13s02-1_2002.pdf.
[2] AP-42 Chapter 13.2.2 Unpaved Roads (9/98), https://www3.epa.gov/ttn/chief/old/ap42/ch13/s022/final/c13s02-2.pdf.
[3] AP-42 Chapter 13.2 Fugitive Dust Sources (1/95), https://www3.epa.gov/ttn/chief/ap42/ch13/final/c13s02.pdf.
[4] Wetting/watering control efficiency per AP-42 Chapter 11.19.1 Sand and Gravel Processing (11/95). https://www3.epa.gov/ttn/chief/ap42/ch11/final/c11s19-1.pdf, Accessed March 2020.
[5] A list of non-comparable facilities, as well as review of the EPA RACT/BACT/LAER Clearinghouse (RBLC) database, is provided in Appendix B.

APPENDIX A. EMISSION CALULATIONS DETAILS

Table A-1a. Throughput - Steel Production

Material	Material Throughput	
	Hourly (ton/hr)	Annual (tpy)
Production	117	650,000

Table A-1b. Throughput - Baghouse Flowrate

Emission Unit ID	Emission Point ID	Description	Flow Rate (scfm) 30-day rolling [1]
EAF1 LMS1	BH1	Meltshop Baghouse	880,000

[1] At the time of application, project engineering was still in progress and the flowrate has not been finalized.
The flowrate presented is the maximum anticipated and incorporates a conservative buffer.
The final equipment flowrate will be at or under this flowrate.

Table A-1c. Throughput - Fabric Filters

Emission Unit ID	Emission Point ID	Emission Unit Description	Material	Exhaust Flow (ft^3/min)	Annual Operation (hr/yr)
FLXSLO1	FLXSLO11	Fluxing Agent Storage Silo No. 1	Fluxing Agent	3,000	1,000
FLXSLO1	FLXSLO12	Fluxing Agent Storage Silo No. 2	Fluxing Agent	3,000	1,000
CARBSLO1	CARBSLO1	Carbon Storage Silo No. 1	Coal/Coke	2,050	1,000
DUSTSLO1	DUSTSLO1	EAF Baghouse Dust Silo	Baghouse Dust	1,300	8,760

Table A-1d. Throughput - Cooling Towers

Emission Unit ID	Emission Point ID	Emission Unit Description	Cooling Water Flow Rate			TDS Content (ppmw)	Drift Loss (%)
			Per Minute (gpm)	Hourly (10^3 gal/hr)	Annual (10^3 gal/yr)		
CTNC11	CTNC11a	Non-Contact Cooling Tower 1 - Cell 1	11,000	660	5,781,600	2,000	0.001%
CTNC11	CTNC11b	Non-Contact Cooling Tower 1 - Cell 2	11,000	660	5,781,600	2,000	0.001%
CTNC12	CTNC12a	Non-Contact Cooling Tower 2 - Cell 1	11,000	660	5,781,600	2,000	0.001%
CTNC12	CTNC12b	Non-Contact Cooling Tower 2 - Cell 2	11,000	660	5,781,600	2,000	0.001%
CTC1	CTC1a	Contact Cooling Tower - Cell 1	5,500	330	2,890,800	2,000	0.001%
CTC1	CTC1b	Contact Cooling Tower - Cell 2	5,500	330	2,890,800	2,000	0.001%

Table A-1e. Throughput - Fuel Combustion

Emission Unit ID	Emission Point ID	Emission Unit Description	Number of Units	Single Unit Rating (MMBtu/hr)	Annual Utilization Rate (%)	Fuel
LPH1	CV1	Ladle Preheaters	3	6	100%	Propane/ Natural Gas
LD1	CV1	Ladle Dryers	2	8	100%	Propane/ Natural Gas
TPH1	CV1	Tundish Preheaters	2	6	100%	Propane/ Natural Gas
TD1	CV1	Tundish Dryer	1	6	100%	Propane/ Natural Gas
TMD1	CV1	Tundish Mandril Dryer	1	1	100%	Propane/ Natural Gas
SRDHTR1	CV1	Shroud Heater	1	0.5	100%	Propane/ Natural Gas
MSAUXHT	CV1	Meltshop Comfort Heaters	20	0.4	50%	Propane/ Natural Gas
BF1	RMV1	Bit Furnace	1	0.225	100%	Propane/ Natural Gas
RMAUXHT	RMV1	Rolling Mill Comfort Heaters	20	0.4	50%	Propane/ Natural Gas

Table A-1f. Throughput - Torch Cutting

Emission Unit ID	Emission Point ID	Emission Unit Description	Steel Throughput		Max. Fuel Usage (scf/hr)	Heat Rating (MMBtu/hr)		Annual Operation (hr/yr)	Fuel
			(lb/hr)	(tpy)		Propane [1]	Natural Gas [2]		
TORCH1	TORCH1	Cutting Torches	10,000	10,000	130	0.32	0.13	4,000	Propane/ Natural Gas

[1] Per propane heating value of 91.5 MBtu/gal
and conversion of 0.027 gal/scf
(per Technical Data for Propane, Butane and LPG Mixtures: http://www.altenergy.com/Downloads/PDF_Public/PropDataPDF.pdf, page 2)
[2] Per natural gas heating value of 1,020 Btu/scf

Table A-1g. Throughput - Refractory Binder

Emission Unit ID	Emission Point ID	Description	Binder Usage	
			Hourly (lb/hr)	Annual (ton/yr)
LB1	CV1	Refractory Binder Usage - Ladle	2.12	7.52
TB1	CV1	Refractory Binder Usage - Tundish	1.28	4.51

Table A-1h. Throughput - Material Transfers

Emission Unit ID	Emission Point ID	Transfer Description	Throughput Hourly (ton/hr)	Throughput Annual (tpy)
DPEAF1	TR51A	Inside ECS Building Drop Points, Scrap	830	3,380,000
DPEAF1	TR51B	Outside ECS Building Drop Points, Scrap, Storage Area	330	2,145,000
DPEAF1	TR51C	Outside Rail Bins Drop Point, Scrap	110	715,000
DPEAF1	TR51D	Outside Truck Mixed Bins Drop Point, Scrap	110	715,000
DPEAF1	TR51E	Outside Truck Bins Drop Point, Scrap	110	715,000
DPF1	TR71	Inside ECS Building Drop Points, Fluxing Agent	30	30,695
DPAA1	TR81	Outside Drop Points, Alloy Aggregate	60	9,800
DPRW1	TR91A	Inside Drop Points, Removed Refractory and Other Materials	25	2,800
DPRW1	TR91B	Outside Drop Points, Removed Refractory and Other Materials	25	2,800
DPS1	TR11A	Outside SPP Pile Drop Points, Slag	820	338,542
DPS1	TR11B	Outside Drop from Loader to SPP Feed Hopper, Slag	100	223,029
DPRS1	TR131	Outside Drop Points, Residual Scrap Pile	25	2,800
DPMS1	TR141	Outside Drop Points, Mill Scale Pile	60	9,800

Table A-1i. Throughput - Ball Drop Crushing

Emission Unit ID	Emission Point ID	Drop Description	Moisture Content (%)	Throughput (tph)	Throughput (tpy)
CR1	CR1	Ball Drop Crushing	1	8	8,200

Table A-1j. Throughput - Storage Piles

Emission Unit ID	Emission Point ID	Pile Description	Material	Maximum Pile Area (ft^2)
EAF1P	W51A	ECS Scrap Building Storage Pile A	Scrap	6,000
EAF1P	W51B	ECS Scrap Building Storage Pile B	Scrap	5,400
EAF1P	W51C	ECS Scrap Building Storage Pile C	Scrap	5,300
EAF1P	W51D	ECS Scrap Building Overage Scrap Pile	Scrap	12,100
EAF1P	W51E	Outside Rail Scrap 5k Pile A	Scrap	11,000
EAF1P	W51F	Outside Rail Scrap 5k Pile B	Scrap	11,000
EAF1P	W51G	Outside Rail Scrap 5k Pile C	Scrap	11,000
EAF1P	W51H	Outside Rail Scrap 5k Pile D	Scrap	11,000
EAF1P	W51I	Outside Truck Mixed 8k Pile A	Scrap	13,600
EAF1P	W51J	Outside Truck Mixed 8k Pile B	Scrap	14,700
EAF1P	W51K	Outside Truck Scrap 5k Pile A	Scrap	11,000
EAF1P	W51L	Outside Truck Scrap 5k Pile B	Scrap	11,000
EAF1P	W51M	Outside Truck Scrap 5k Pile C	Scrap	11,000
EAF1P	W51N	Outside Truck Scrap 5k Pile D	Scrap	11,000
AAP1	W61	Alloy Aggregate Storage Pile	Alloy Aggregate	1,000
SPP1	W71A	SPP Slag Storage Pile	Slag	17,100
SPP1	W71B	SPP Reject Pile	SPP Product	170
		SPP Metallic Product Pile	SPP Product	170
		SPP Thrus Product Pile	SPP Product	11,390
		SPP 2nd Deck Product Pile	SPP Product	4,930
		SPP Jaw Crusher Overs Pile	SPP Product	170
		SPP Screening Overs Pile	SPP Product	170
RSP1	W81	Residual Scrap Storage Pile in Scrap	Residual Scrap	21,300
MSP1	W111	Mill Scale Pile	Mill Scale	3,500

Table A-1k. Emergency Generators

Emission Unit ID	Emission Point ID	Emission Unit Description	Engine Tier	Rating (hp)
EGEN1	EGEN1	Emergency Generator 1	Model Year 2006+, Tier 3 Engine	1,600
EFWP1	EFWP1	Emergency Fire Water Pump 1	Model Year 2006+, Tier 3 Engine	300

Table A-1l. Diesel Storage Tanks

Emission Unit ID	Emission Point ID	Emission Unit Description	Tank Type	Maximum Fill Rate (gal/hr)	Tank Capacity (gal)	Annual Throughput (gal/yr)	Maximum Annual Turnovers	Tank Diameter (ft)	Tank Length/ Height (ft)
DSLTK-GEN1	DSLTK-GEN1	Diesel Storage Tank for Emergency Generator No. 1	Horizontal Fixed Roof	500	500	5,000	10	4	6
DSLTK-FWP1	DSLTK-FWP1	Diesel Storage Tank for Fire Water Pump No. 1	Horizontal Fixed Roof	500	500	5,000	10	4	6
DSLTK-VEH	DSLTK-VEH	Diesel Storage Tank Supporting On-Site Vehicles	Vertical Fixed Roof	5,000	5,000	50,000	10	8.5	12.6

Table A-2. Road Traffic

Origin	Destination	Material	Vehicle Type	Number of Trips		Trip Distance (one-		Trip Type	Vehicle Miles Travelled	
				(hr^{-1})	(yr^{-1})	(ft)	(mile)		(VMT/hr)	(VMT/yr)
Off-Site	ECS Building Scrap Bay	Scrap	Haul Truck	1	3,318	2,626	0.50	Round	0.99	3,300
Off-Site	Scrap Yard	Scrap	Haul Truck	1	1,422	3,468	0.66	Round	1.31	1,868
Around Scrap Yard	Around Scrap Yard	Scrap	Euclid/Roll-Off Truck	1	1,422	4,113	0.78	One-Way	0.78	1,107
Around Scrap Yard	Around Scrap Yard	Scrap	Haul Truck	1	1,422	4,113	0.78	One-Way	0.78	1,107
Off-Site	Silos	Coal/Coke	Haul Truck	4	650	2,795	0.53	Round	4.23	688
Off-Site	Storage	Raw Materials / Supplies	Euclid/Roll-off Truck	2	232	3,170	0.60	Round	2.40	279
Storage	Meltshop	Raw Materials / Supplies	Forklift/Loader	2	232	172	0.03	Round	0.13	15
Off-Site	Silos	Fluxing Agent	Haul Truck	6	1,444	2,795	0.53	Round	6.35	1,529
Off-Site	Alloy Pile	Alloy Aggregate	Haul Truck	2	476	3,258	0.62	Round	2.47	587
Meltshop	Off-Site	Removed Refractory / Other Materials	Haul Truck	1	12	3,408	0.65	Round	1.29	15
Finished Products Storage	Off-Site	Finished Product	Haul Truck	4	18,959	7,413	1.40	One-Way	5.62	26,618
Off-Site	Gas Storage Area	Gas Cylinders	Gas Cylinders Truck	2	754	2,965	0.56	Round	2.25	847
Mill Scale Pile	Off-Site	Mill Scale	Haul Truck	1	12	3,757	0.71	Round	1.42	17
Meltshop	Quench Building	Slag	Euclid/Roll-off Truck	1	6,190	932	0.18	Round	0.35	2,184
Quench Building	SPP Area	Slag	Euclid/Roll-off Truck	1	6,190	150	0.03	Round	0.06	352
Within SPP Area	Within SPP Area	Slag	Loader	1	6,190	260	0.05	One-Way	0.05	305
SPP Area	Off-Site	Slag	Haul Truck	1	6,190	2,947	0.56	Round	1.12	6,910
Trailer Parking Area	Trailer Parking Area	-	Trailer	4	18,959	1,139	0.22	One-Way	0.86	4,090
General Support	General Support	-	Loader	2	6,190	13,220	2.50	Round	10.02	31,000

Table A-3a. Controls - Material Transfers

Emission Unit ID	Emission Point ID	Transfer Description	Material	Fine Content (%)	Moisture Content (%)	Control Application		
						Control	Efficiency (%)	Basis
DPEAF1	TR51A	Inside ECS Building Drop Points, Scrap	Scrap	1	1	Enclosed	85	2008 TSD of CMC AZ MCAQD Permit V07-001 contained in Appendix C
DPEAF1	TR51B	Outside ECS Building Drop Points, Scrap, Storage Area	Scrap	1	1	None	0	
DPEAF1	TR51C	Outside Rail Bins Drop Point, Scrap	Scrap	1	1	None	0	
DPEAF1	TR51D	Outside Truck Mixed Bins Drop Point, Scrap	Scrap	1	1	None	0	
DPEAF1	TR51E	Outside Truck Bins Drop Point, Scrap	Scrap	1	1	None	0	
DPF1	TR71	Inside ECS Building Drop Points, Fluxing Agent	Fluxing Agent	7	1	Enclosed	85	2008 TSD of CMC AZ MCAQD Permit V07-001 contained in Appendix C
DPAA1	TR81	Outside Drop Points, Alloy Aggregate	Alloy Aggregate	1	1	Partial Enclosure	85	2008 TSD of CMC AZ MCAQD Permit V07-001 contained in Appendix C
DPRW1	TR91A	Inside Drop Points, Removed Refractory and Other Materials	Removed Refractory / Other Materials	10	1	Enclosed	85	2008 TSD of CMC AZ MCAQD Permit V07-001 contained in Appendix C
DPRW1	TR91B	Outside Drop Points, Removed Refractory and Other Materials	Removed Refractory / Other Materials	10	1	None	85	
DPS1	TR11A	Outside SPP Pile Drop Points, Slag	Slag	2	12	Enclosed / Water	70	2008 TSD of CMC AZ MCAQD Permit V07-001 contained in Appendix C
DPS1	TR11B	Proposed Drop Points, Metallic Materials	Metallic Materials	1	4	Moisture Content of Material	-	
		Proposed Drop Points, Non-Metallic Materials	Non-Metallic Materials	2				
DPRS1	TR131	Outside Drop Points, Residual Scrap Pile	Residual Scrap	2	1	None	0	
DPMS1	TR141	Outside Drop Points, Mill Scale Pile	Mill Scale	15	1	Partial Enclosure	85	2008 TSD of CMC AZ MCAQD Permit V07-001 contained in Appendix C

Table A-3b. Controls - Storage Piles

Emission Unit ID	Emission Point ID	Pile Description	Material	Silt Content		Control Application		
				(%)	Basis	Control	Efficiency (%)	Basis
EAF1P	W51A	ECS Scrap Building Storage Pile A	Scrap	4.3	Per U.S. EPA AP-42 Section 13.2.4, November 2006	Partial Enclosure	85	2008 TSD of CMC AZ MCAQD Permit V07-001 contained in Appendix C
EAF1P	W51B	ECS Scrap Building Storage Pile B	Scrap	4.3	Per U.S. EPA AP-42 Section 13.2.4, November 2006	Partial Enclosure	85	2008 TSD of CMC AZ MCAQD Permit V07-001 contained in Appendix C
EAF1P	W51C	ECS Scrap Building Storage Pile C	Scrap	4.3	Per U.S. EPA AP-42 Section 13.2.4, November 2006	Partial Enclosure	85	2008 TSD of CMC AZ MCAQD Permit V07-001 contained in Appendix C
EAF1P	W51D	ECS Scrap Building Overage Scrap Pile	Scrap	4.3	Per U.S. EPA AP-42 Section 13.2.4, November 2006	None	-	
EAF1P	W51E	Outside Rail Scrap 5k Pile A	Scrap	4.3	Per U.S. EPA AP-42 Section 13.2.4, November 2006	None	-	
EAF1P	W51F	Outside Rail Scrap 5k Pile B	Scrap	4.3	Per U.S. EPA AP-42 Section 13.2.4, November 2006	None	-	
EAF1P	W51G	Outside Rail Scrap 5k Pile C	Scrap	4.3	Per U.S. EPA AP-42 Section 13.2.4, November 2006	None	-	
EAF1P	W51H	Outside Rail Scrap 5k Pile D	Scrap	4.3	Per U.S. EPA AP-42 Section 13.2.4, November 2006	None	-	
EAF1P	W51I	Outside Truck Mixed 8k Pile A	Scrap	4.3	Per U.S. EPA AP-42 Section 13.2.4, November 2006	None	-	
EAF1P	W51J	Outside Truck Mixed 8k Pile B	Scrap	4.3	Per U.S. EPA AP-42 Section 13.2.4, November 2006	None	-	
EAF1P	W51K	Outside Truck Scrap 5k Pile A	Scrap	4.3	Per U.S. EPA AP-42 Section 13.2.4, November 2006	None	-	
EAF1P	W51L	Outside Truck Scrap 5k Pile B	Scrap	4.3	Per U.S. EPA AP-42 Section 13.2.4, November 2006	None	-	
EAF1P	W51M	Outside Truck Scrap 5k Pile C	Scrap	4.3	Per U.S. EPA AP-42 Section 13.2.4, November 2006	None	-	
EAF1P	W51N	Outside Truck Scrap 5k Pile D	Scrap	4.3	Per U.S. EPA AP-42 Section 13.2.4, November 2006	None	-	
AAP1	W61	Alloy Aggregate Storage Pile	Alloy Aggregate	2.3	Per U.S. EPA AP-42 Section 13.2.4, November 2006	Partial Enclosure	85	2008 TSD of CMC AZ MCAQD Permit V07-001 contained in Appendix C

SPP1	W71A	SPP Slag Storage Pile	Slag	5.3	Per U.S. EPA AP-42 Section 13.2.4, November 2006	None	-	
SPP1	W71B	SPP Reject Pile	Slag	5.3	Per U.S. EPA AP-42 Section 13.2.4, November 2006	Water	85	2008 TSD of CMC AZ MCAQD Permit V07-001 contained in Appendix C
		SPP Metallic Product Pile	Slag	5.3	Per U.S. EPA AP-42 Section 13.2.4, November 2006	None	-	
		SPP Thrus Product Pile	Slag	5.3	Per U.S. EPA AP-42 Section 13.2.4, November 2006	Water	85	2008 TSD of CMC AZ MCAQD Permit V07-001 contained in Appendix C
		SPP 2nd Deck Product Pile	Slag	5.3	Per U.S. EPA AP-42 Section 13.2.4, November 2006	Water	85	2008 TSD of CMC AZ MCAQD Permit V07-001 contained in Appendix C
		SPP Jaw Crusher Overs Pile	Slag	5.3	Per U.S. EPA AP-42 Section 13.2.4, November 2006	Water	85	2008 TSD of CMC AZ MCAQD Permit V07-001 contained in Appendix C
		SPP Screening Overs Pile	Slag	5.3	Per U.S. EPA AP-42 Section 13.2.4, November 2006	Water	85	2008 TSD of CMC AZ MCAQD Permit V07-001 contained in Appendix C
RSP1	W81	Residual Scrap Storage Pile in Scrap Yard	Residual Scrap	5.3	Per U.S. EPA AP-42 Section 13.2.4, November 2006	None	-	
MSP1	W111	Mill Scale Pile	Mill Scale	5.3	Per U.S. EPA AP-42 Section 13.2.4, November 2006	Partial Enclosure	85	2008 TSD of CMC AZ MCAQD Permit V07-001 contained in Appendix C

Table A-3c. Controls - Roads

Emission Unit ID	Emission Point ID	Description	Silt Loading			Control Application		
			Value	Unit	Basis	Control	Efficiency (%)	Basis
PR1	PR1	Paved Roads	3.34	g/m^2	2008 TSD of CMC AZ MCAQD Permit V07-001 contained in Appendix C	Watering + Sweeping	96	2008 TSD of CMC AZ MCAQD Permit V07-001 contained in Appendix C
UR1	UR1	Unpaved Roads - Slag Quench Operations	6	%	Per U.S. EPA AP-42 Section 13.2.2, November 2006	Watering	80	2008 TSD of CMC AZ MCAQD Permit V07-001 contained in Appendix C

Table A-4a. Emissions - Baghouse - EAF and LMS

Emission Unit ID	Emission Point ID	Emission Unit Description	Steel Production Rate Hourly (ton/hr)	Steel Production Rate Annual (tpy)	Flow Rate Standard (scfm)	Flow Rate Dry Standard [1, 2] (dscfm)	Filterable PM	Total PM	Total PM_{10}	Total $PM_{2.5}$	NO_x	CO	VOC	SO_2	Pb	Fluorides
							Emission Factor [3]									
							(gr/dscf)	(gr/dscf)	(gr/dscf)	(gr/dscf)	(lb/ton)	(lb/ton)	(lb/ton)	(lb/ton)	(lb/ton)	(lb/ton)
EAF1, LMS1	BH1	Meltshop Baghouse	117	650,000	880,000	869,880	0.0018	0.0052	0.0052	0.0052	0.3	4	0.3	0.3	0.0016	0.01
							Hourly Emissions (lb/hr) [4, 5]									
							13.42	38.77	38.77	38.77	35.10	468	35.10	35.10	0.19	1.16
							Annual Emissions [6, 7] (tpy)									
							58.78	169.82	169.82	169.82	97.50	1,300	97.50	97.50	0.52	3.23

1 Dry Standard Flow Rate (dscfm) = Standard (scfm) x (1 - Moisture Content (%) / 100).

2 The following moisture content was determined from average measurements during the February 25-26, 2014 performance testing conducted on the CMC steel micro-mill in Mesa, AZ for a substantially similar process and bagho 1.15%

3 Emission factors for PM, PM_{10}, $PM_{2.5}$, NO_X, CO, VOC, SO_2, and Fluorides per BACT determination; Pb emission factors is based on process knowledge and a review of the RBLC; and the following capture efficiency of DEC and canopy hood estimated based on process experience from other CMC micro-mills. 99.5%

4 PM, PM_{10}, $PM_{2.5}$ Hourly Emissions lb/hr) = Short-Term Emission Factor (gr/dscf x Flow Rate (dscfm) / 7,000 (gr/lb) x 60 (min/hr).

5 NOx, CO, VOC, SO_2, Pb, Fluorides Hourly Emissions lb/hr) = Short-Term Emission Factor lb/ton) x Hourly Proposed Steel Production (ton/hr)

6 PM, PM_{10}, $PM_{2.5}$ Annual Emissions (tpy) = Short-Term Emission Factor (gr/dscf x Flow Rate (dscfm) / 7,000 (gr/lb) x 60 (min/hr) x 8,760 (hr/yr) / 2,000 lb/ton).
Pursuant to 77 FR 65107, October 25, 2012, PM emissions include filterable particulate emissions only whereas PM_{10} and $PM_{2.5}$ include both filterable and condensable fractions.
"By contrast, "particulate matter emissions" is regulated as a non-criteria pollutant under the portion of the definition that refers to "[a]ny pollutant that is subject to any standard promulgated under section 111 of the Act," where the condensable PM fraction generally is not required to be included in measurements to determine compliance with standards performance for PM. See 40 CFR 51.166(b)(49)(ii) and 52.21(b)(50)(ii)."

7 NOx, CO, VOC, SO_2, Pb, Fluorides Annual Emissions (tpy) = Emission Factor lb/ton) x Annual Proposed Steel Production (tpy) / 2,000 lb/ton)

Table A-4b. Emissions - Uncaptured - EAF and LMS

Emission Unit ID	Emission Point ID	Emission Unit Description	Steel Production Rate (ton/hr)	Steel Production Rate (tpy)	Filterable PM	Total PM	Total PM_{10}	Total $PM_{2.5}$	NO_x	CO	VOC	SO_2	Pb	Fluorides
					Emission Factor (lb/ton) [1]									
EAF1, LMS1, CAST1	CV1	Caster Vent	117	650,000	1.15E-04	3.33E-04	3.33E-04	3.33E-04	1.51E-03	2.01E-02	1.51E-03	1.51E-03	8.04E-06	5.00E-05
					Hourly Emissions (lb/hr) [2, 4]									
					0.013	0.039	0.039	0.039	0.18	2.35	0.18	0.18	9.41E-04	0.0059
					Annual Emissions (tpy) [3, 4]									
					0.059	0.17	0.17	0.17	0.49	6.53	0.49	0.49	2.61E-03	0.016

1 Emission factors per BACT determination and the following % capture efficiency of DEC canopy hood estimated based on process experience from other CMC micro-mills. 99.5%

2 Hourly Emissions lb/hr) = Hourly Proposed Steel Production (ton/hr) x Emission Factor lb/ton).

3 Annual Emissions (tpy) = Annual Proposed Steel Production (tpy) x Emission Factor lb/ton) / 2,000 lb/ton)

4 Fugitive $PM/PM_{10}/PM_{2.5}$ emissions, associated with the EAF/LMS, are calculated by based on the following:
DEC Capture Efficiency 99.5%
Building Capture Efficiency 99.0% pursuant to MCAQD guidance from Todd Martin, MCAQD, to Eddie Al-Rayes, Trinity on February 13, 2018, which states that MCAQD expects indoor releases to be greatly reduced by the building enclosure and any remaining ambient releases are minimal and do not need to be considered in the site-wide emission profile. However, the 99% building capture efficiency was conservatively used to estimate fugitive PM emissions from the EAF/LMS.
Baghouse Control Efficiency 95.0%
Fugitive $PM/PM_{10}/PM_{2.5}$ emissions = BH1 Emission Rate / (1 - BH1 Control Efficiency) / DEC Canopy Hood Capture Efficiency * (1 - DEC Canopy Hood Capture Efficiency) * (1-Building Capture Efficiency)

Table A-4c. GHG Emissions - EAF and LMS

Emission Unit ID	Emission Point ID	Emission Unit Description	Production Rate (tpy)	CO_2 Emission Factor [4] (metric ton/metric ton)	Annual Emissions [1, 2, 3, 4] (tpy)	
					CO_2	CO_2e
EAF1, LMS1	BH1	Meltshop Baghouse	650,000	0.18	119,513	119,513
EAF1, LMS1, CAST1	CV1	Caster Vent		-	601	601

[1] Emissions of CO_2 calculated per 40 CFR Part 98, Subpart Q, Equation Q-8 and 40 CFR §98.173(b)(2)(iii).

$$CO_2 = 5.18x10^{-7} x C_{CO2} x Q x \left(\frac{100 - \%H2O}{100}\right)$$

Calculation paramaters based on the following.

Location	Test Date	Run No.	C_{CO2} (% dry)	Q (SCFH)	$\%H_2O$	CO_2 (metric tons/hr)	Process Rate (tons/hr)	Process Rate (metric tons/hr)	CO2 Emission Factor (metric ton/metric ton)
CMC Durant, OK	6/26/2018	1	0.91	15,200,000	3.90	6.89	58.64	53.20	0.129
		2	0.91	18,200,000	3.50	8.28	59.89	54.33	0.152
		3	0.60	18,900,000	3.10	5.69	54.45	49.40	0.115
	9/21/2021	1	0.75	16,922,105	2.28	6.42	67.85	61.55	0.104
		2	0.78	17,023,242	2.68	6.69	65.34	59.28	0.113
		3	0.81	17,105,437	2.63	6.99	67.36	61.11	0.114
	7/28/2022	1	0.57	22,827,480	2.64	6.56	67.24	61.00	0.108
		2	0.59	23,052,900	2.3	6.88	67.98	61.67	0.112
	7/29/2022	3	0.57	23,246,940	2.68	6.68	67.88	61.58	0.108
CMC Mesa, AZ	2/12/2019	1	0.74	15,520,000	1.6	5.85	60.19	54.6	0.107
		2	0.84	15,520,000	1.6	6.65	63.60	57.7	0.115
		3	0.79	16,610,000	1.7	6.68	71.54	64.9	0.103
		4	0.73	16,610,000	1.7	6.17	62.83	57.0	0.108
	2/18/2020	1	0.88	18,700,000	2.8	8.29	57.98	52.6	0.158
		2	1.05	18,700,000	2.8	9.89	65.37	59.3	0.167
		3	0.79	18,370,000	2.9	7.30	59.41	53.9	0.135
		4	1.00	18,370,000	2.9	9.24	66.25	60.1	0.154
	2/23/2021	1	0.81	19,020,000	1.5	7.86	58.09	52.7	0.149
		2	0.73	19,020,000	1.5	7.08	45.53	41.3	0.172
		3	0.83	19,590,000	2.2	8.24	49.38	44.8	0.184
		4	0.63	19,590,000	2.2	6.25	47.40	43.0	0.145
		5	0.79	19,590,000	2.2	7.84	56.66	51.4	0.153
		6	0.78	19,590,000	2.2	7.74	56.66	51.4	0.151
Max									**0.184**

The operations at CMC Durant, OK and CMC Mesa, AZ are associated with an ECS micro-mill and are substantially similar to the proposed Project.
The maximum emission factor is used to account for possible variations in the carbon source at the proposed Project and its potential impact on emissions.
CO_2 Emission Factor (metric ton/metric ton) = CO_2 Emission Rate (metric ton/hr) / Hourly Steel Production Rate (metric ton/hr).

[2] CO_2e calculated using Global Warming Potentials (GWPs) from Table A-1 of 40 CFR Part 98, December 2014.
CO_2 GWP = 1

[3] CO_2 Annual Emissions (tpy) = Annual Steel Production Rate (tpy) x CO_2 Emission Factor (metric ton/metric ton).
CO_2e Annual Emissions (tpy) = CO_2 GWP x CO_2 Annual Emissions (tpy).

[4] Capture efficiency (%) of DEC and canopy hood estimated based on process experience from other (99.5%

Table A-4d. HAP Emissions - EAF and LMS

Emission Unit ID	Emission Point ID	Emission Unit Description	Steel Production Rate		Species	Emission Factors [1] (lb/ton)	Hourly Emissions [2] (lb/hr)	Annual Emissions [3] (tpy)
			Hourly (tph)	Annual (tpy)				
EAF1, LMS1	BH1	Meltshop Baghouse	117	650,000	Lead Compounds	1.60E-03	1.87E-01	5.20E-01
					Arsenic	1.10E-05	1.28E-03	3.56E-03
					Beryllium	1.29E-05	1.51E-03	4.19E-03
					Cadmium	2.10E-04	2.46E-02	6.83E-02
					Chromium	7.53E-04	8.80E-02	2.45E-01
					Manganese	3.72E-03	4.36E-01	1.21E+00
					Mercury	6.20E-04	7.25E-02	2.02E-01
					Nickel	4.36E-05	5.10E-03	1.42E-02
					2,3,7,8-Tetrachlorodibenzo-p-dioxin	6.63E-08	7.75E-06	2.15E-05
					Cobalt	4.53E-05	5.30E-03	1.47E-02
					Antimony	4.98E-05	5.83E-03	1.62E-02
					Selenium	2.74E-05	3.21E-03	8.91E-03
EAF1, LMS1, CAST1	CV1	Caster Vent	117	650,000	Lead Compounds	8.04E-06	9.41E-04	2.61E-03
					Arsenic	5.50E-08	6.44E-06	1.79E-05
					Beryllium	6.47E-08	7.57E-06	2.10E-05
					Cadmium	1.06E-06	1.23E-04	3.43E-04
					Chromium	3.78E-06	4.42E-04	1.23E-03
					Manganese	1.87E-05	2.19E-03	6.08E-03
					Mercury	3.12E-06	3.65E-04	1.01E-03
					Nickel	2.19E-07	2.56E-05	7.12E-05
					2,3,7,8-Tetrachlorodibenzo-p-dioxin	3.33E-10	3.90E-08	1.08E-07
					Cobalt	2.27E-07	2.66E-05	7.39E-05
					Antimony	2.50E-07	2.93E-05	8.13E-05
					Selenium	1.38E-07	1.61E-05	4.48E-05

[1] Emission factors based on process experience from other CMC micro-mills and capture efficiency (%) of DEC and canopy hood estimated based on process 99.5%

2 Hourly Emissions lb/hr) = Hourly Steel Production Rate (ton/hr) x Emission Factor lb/ton).

3 Annual Emissions (tpy) = Annual Steel Production Rate (tpy) x Emission Factor lb/ton) / 2,000 lb/ton).

Table A-5. Emissions - Fabric Filters

Emission Unit ID	Emission Point ID	Emission Unit Description	Material	Flow Rate (dscfm)	Annual Operation (hr/yr)	Emission Factor [1] (gr/dscf)			Hourly Emissions [2,4] (lb/hr)			Annual Emissions [3] (tpy)		
						Total PM	Total PM_{10}	Total $PM_{2.5}$	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total PM	Total PM_{10}	Total $PM_{2.5}$
FLXSLO1	FLXSLO11	Fluxing Agent Storage Silo No. 1	Fluxing Agent	3,000	1,000	0.005	0.005	0.005	0.13	0.13	0.13	0.064	0.064	0.064
FLXSLO1	FLXSLO12	Fluxing Agent Storage Silo No. 2	Fluxing Agent	3,000	1,000	0.005	0.005	0.005	0.13	0.13	0.13	0.064	0.064	0.064
CARBSLO1	CARBSLO1	Carbon Storage Silo No. 1	Coal/Coke	2,050	1,000	0.005	0.005	0.005	0.088	0.088	0.088	0.044	0.044	0.044
DUSTSLO1	DUSTSLO1	EAF Baghouse Dust Silo	Baghouse Dust	1,300	8,760	0.005	0.005	0.005	0.056	0.056	0.056	0.24	0.24	0.24

1 Emission factors per BACT determination.

2 Hourly Emissions lb/hr) = Emission Factor (gr/dscf x Flow Rate (dscfm) / 7,000 (gr/lb) x 60 (min/hr).

3 Annual Emissions (tpy) = Hourly Emissions lb/hr) x (hr/yr) / 2,000 lb/ton).

Emissions through the filter vents only occur when the silo is being loaded which occurs at the base of the silo during truck deliveries and transfer of dust from the meltshop baghouse.

Table A-6. Emissions - Caster Teeming

Emission Unit ID	Emission Point ID	Emission Unit Description	Steel Production Rate		Emission Factor [1] (lb/ton)				Hourly Emissions [2] (lb/hr)				Annual Emissions [3] (tpy)			
			Hourly (ton/hr)	Annual (tpy)	Total PM	Total PM_{10}	Total $PM_{2.5}$	VOC	Total PM	Total PM_{10}	Total $PM_{2.5}$	VOC	Total PM	Total PM_{10}	Total $PM_{2.5}$	VOC
CAST1	CV1	Caster Teeming	117	650,000	0.007	0.007	0.007	0.0002	0.82	0.82	0.82	0.023	2.28	2.28	2.28	0.065

[1] No emission factors are available for teeming associated with continuous casting so 10% of the factor for PM emissions from conventional ingot teeming of unleaded steel (uncontrolled) from AP-42 Section 12.5, Table 12.5-1, January 1995 and 10% of the factor for VOC emissions from conventional ingot teeming of unleaded steel (SCC 3-03-009) from Point Sources Committee's Emission Inventory Improvement Program: Uncontrolled Emission Factor Listing for Criteria Air Pollutants, July 2001 were used. The 10% assumption was made because (1) the transfer of steel from ladles to the tundish to the mold for the continuous caster is more enclosed than the transfer for conventional ingot casting and (2) the continuous caster mold is water-cooled while conventional molds are not. The emission factors for PM_{10} and $PM_{2.5}$ are conservatively assumed to be equal to the emission factor for PM.

[2] Hourly Emissions lb/hr) = Hourly Steel Production Rate (ton/hr) x Emission Factor lb/ton).

[3] Annual Emissions (tpy) = Annual Steel Production Rate (tpy) x Emission Factor lb/ton) / 2,000 lb/ton).

Table A-7a. Emissions - Cooling Towers

Emission Unit ID	Emission Point ID	Emission Unit Description	Water Flow (gal/min)	Drift Loss (%)	Drift Loss (gal/hr)	TDS (mg/l)	TDS Density (mg/l)	Hourly Emissions [1] (lb/hr)			Annual Emissions [2] (tpy)		
								Total PM	Total PM_{10}	Total $PM_{2.5}$	Total PM	Total PM_{10}	Total $PM_{2.5}$
CTNC11	CTNC11a	Non-Contact Cooling Tower 1 - Cell 1	11,000	0.001%	7	2,000	2.5	0.11	0.08	0.0002	0.48	0.33	0.0010
CTNC11	CTNC11b	Non-Contact Cooling Tower 1 - Cell 2	11,000	0.001%	7	2,000	2.5	0.11	0.08	0.0002	0.48	0.33	0.0010
CTNC12	CTNC12a	Non-Contact Cooling Tower 2 - Cell 1	11,000	0.001%	7	2,000	2.5	0.11	0.08	0.0002	0.48	0.33	0.0010
CTNC12	CTNC12b	Non-Contact Cooling Tower 2 - Cell 2	11,000	0.001%	7	2,000	2.5	0.11	0.08	0.0002	0.48	0.33	0.0010
CTC1	CTC1a	Contact Cooling Tower - Cell 1	5,500	0.001%	3	2,000	2.5	0.06	0.04	0.00012	0.24	0.16	0.0005
CTC1	CTC1b	Contact Cooling Tower - Cell 2	5,500	0.001%	3	2,000	2.5	0.06	0.04	0.00012	0.24	0.16	0.0005

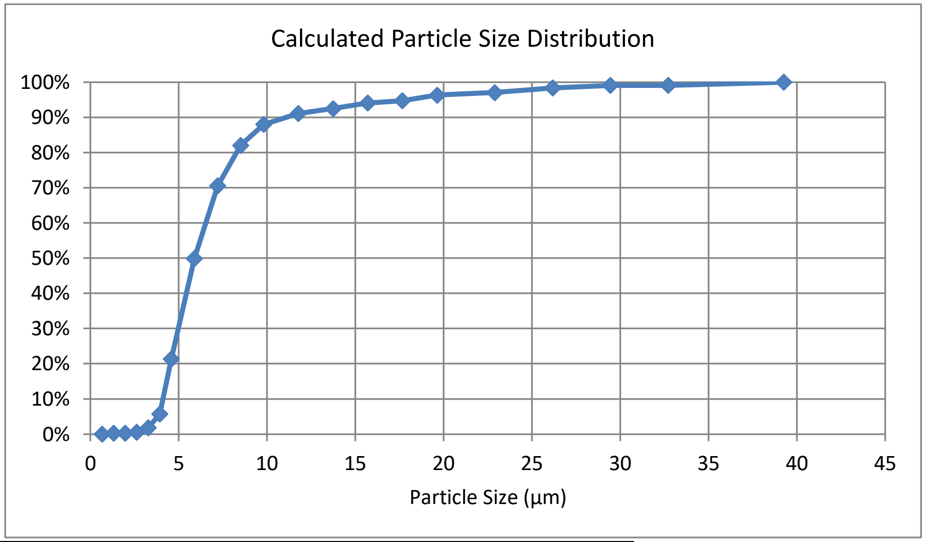
[1] PM Hourly Emissions lb/hr) = Hourly Cooling Water Flow Rate (thou gal/hr) x 1,000 (gal/thou gal) x Drift Loss (%) / 100 x 8.34 lb/gal) x TDS Content (ppmw) / 1,000,000 (ppm).

[2] Annual emissions (tpy) calculated based on: 8,760 hr/yr hr/yr

Table A-7b. Emissions - Cooling Towers - Particulate Matter Emissions - Short-Term

Data Entry	
Emission Unit ID	CTNC11
Emission Point ID	CTNC11a
Emission Unit Description	Non-Contact Cooling Tower 1 - Cell 1
Water Circulation Rate	11,000 gal/min
PM Drift Rate	0.0010%
TDS	2,000 ppmw
Droplet Density	1 g/cm^3
Solids Density	2.5 g/cm^3

Calculations	
PM_{10} Fraction	68.15%
$PM_{2.5}$ Fraction	0.22%
PM Emissions	0.11 lb/hr
PM_{10} Emissions	0.08 lb/hr
$PM_{2.5}$ Emissions	0.0002 lb/hr

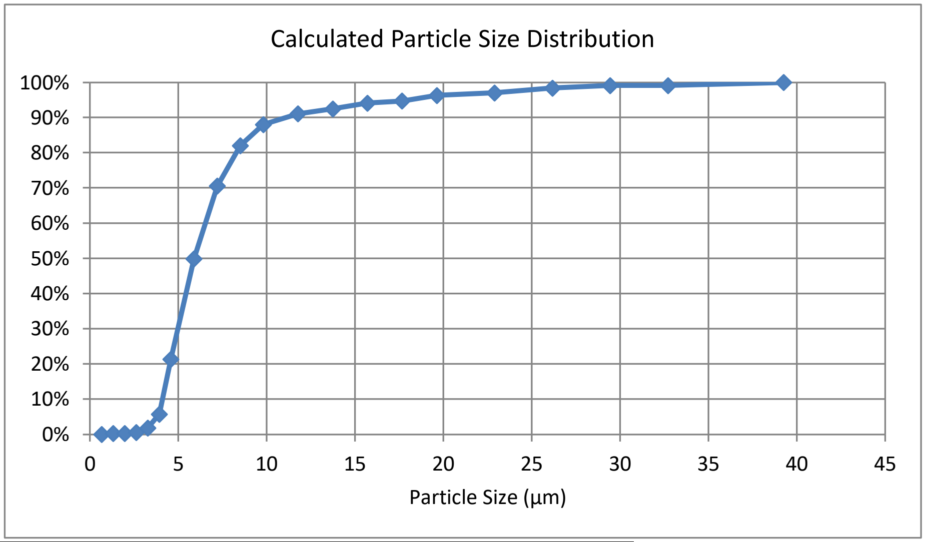


Droplet Diameter (µm)	Droplet Volume (µm^3)	Droplet Mass (µg)	Solid Particle Mass (µg)	Solid Particle Volume (µm^3)	Solid Particle Diameter (µm)	Mass Size Distribution CDF (%)	PM_{10} Fraction (%)	$PM_{2.5}$ Fraction (%)
10	524	1.31E-03	1.05E-06	0.42	0.93	0.00%	0.00%	0.00%
20	4,189	1.05E-02	8.38E-06	3.35	1.86	0.20%	0.00%	0.00%
30	14,137	3.53E-02	2.83E-05	11.31	2.78	0.23%	0.00%	0.22%
40	33,510	8.38E-02	6.70E-05	26.81	3.71	0.51%	0.00%	0.00%
50	65,450	1.64E-01	1.31E-04	52.36	4.64	1.82%	0.00%	0.00%
60	113,097	2.83E-01	2.26E-04	90.48	5.57	5.70%	0.00%	0.00%
70	179,594	4.49E-01	3.59E-04	143.68	6.50	21.35%	0.00%	0.00%
90	381,704	9.54E-01	7.63E-04	305.36	8.35	49.81%	0.00%	0.00%
110	696,910	1.74E+00	1.39E-03	557.53	10.21	70.51%	68.15%	0.00%
130	1,150,347	2.88E+00	2.30E-03	920.28	12.07	82.02%	0.00%	0.00%
150	1,767,146	4.42E+00	3.53E-03	1,413.72	13.92	88.01%	0.00%	0.00%
180	3,053,628	7.63E+00	6.11E-03	2,442.90	16.71	91.03%	0.00%	0.00%
210	4,849,048	1.21E+01	9.70E-03	3,879.24	19.49	92.47%	0.00%	0.00%
240	7,238,229	1.81E+01	1.45E-02	5,790.58	22.28	94.09%	0.00%	0.00%
270	10,305,995	2.58E+01	2.06E-02	8,244.80	25.06	94.69%	0.00%	0.00%
300	14,137,167	3.53E+01	2.83E-02	11,309.73	27.85	96.29%	0.00%	0.00%
350	22,449,298	5.61E+01	4.49E-02	17,959.44	32.49	97.01%	0.00%	0.00%
400	33,510,322	8.38E+01	6.70E-02	26,808.26	37.13	98.34%	0.00%	0.00%
450	47,712,938	1.19E+02	9.54E-02	38,170.35	41.77	99.07%	0.00%	0.00%
500	65,449,847	1.64E+02	1.31E-01	52,359.88	46.42	99.07%	0.00%	0.00%
600	113,097,336	2.83E+02	2.26E-01	90,477.87	55.70	100.00%	0.00%	0.00%

Table A-7c. Emissions - Cooling Towers - Particulate Matter Emissions - Short-Term

Data Entry	
Emission Unit ID	CTNC11
Emission Point ID	CTNC11b
Emission Unit Description	Non-Contact Cooling Tower 1 - Cell 2
Water Circulation Rate	11,000 gal/min
PM Drift Rate	0.0010%
TDS	2,000 ppmw
Droplet Density	1 g/cm^3
Solids Density	2.5 g/cm^3

Calculations	
PM_{10} Fraction	68.15%
$PM_{2.5}$ Fraction	0.22%
PM Emissions	0.11 lb/hr
PM_{10} Emissions	0.08 lb/hr
$PM_{2.5}$ Emissions	0.0002 lb/hr

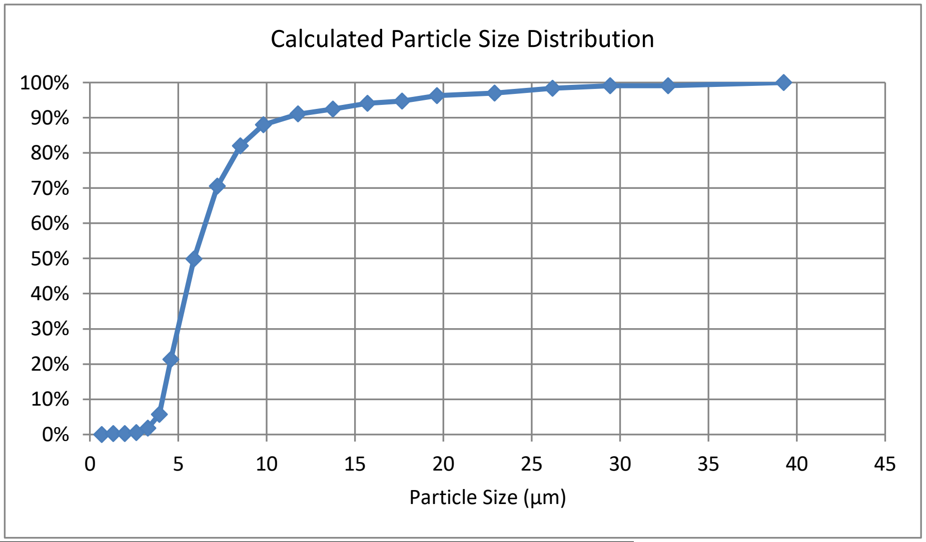


Droplet Diameter (µm)	Droplet Volume (µm^3)	Droplet Mass (µg)	Solid Particle Mass (µg)	Solid Particle Volume (µm^3)	Solid Particle Diameter (µm)	Mass Size Distribution CDF (%)	PM_{10} Fraction (%)	$PM_{2.5}$ Fraction (%)
10	524	1.31E-03	1.05E-06	0.42	0.93	0.00%	0.00%	0.00%
20	4,189	1.05E-02	8.38E-06	3.35	1.86	0.20%	0.00%	0.00%
30	14,137	3.53E-02	2.83E-05	11.31	2.78	0.23%	0.00%	0.22%
40	33,510	8.38E-02	6.70E-05	26.81	3.71	0.51%	0.00%	0.00%
50	65,450	1.64E-01	1.31E-04	52.36	4.64	1.82%	0.00%	0.00%
60	113,097	2.83E-01	2.26E-04	90.48	5.57	5.70%	0.00%	0.00%
70	179,594	4.49E-01	3.59E-04	143.68	6.50	21.35%	0.00%	0.00%
90	381,704	9.54E-01	7.63E-04	305.36	8.35	49.81%	0.00%	0.00%
110	696,910	1.74E+00	1.39E-03	557.53	10.21	70.51%	68.15%	0.00%
130	1,150,347	2.88E+00	2.30E-03	920.28	12.07	82.02%	0.00%	0.00%
150	1,767,146	4.42E+00	3.53E-03	1,413.72	13.92	88.01%	0.00%	0.00%
180	3,053,628	7.63E+00	6.11E-03	2,442.90	16.71	91.03%	0.00%	0.00%
210	4,849,048	1.21E+01	9.70E-03	3,879.24	19.49	92.47%	0.00%	0.00%
240	7,238,229	1.81E+01	1.45E-02	5,790.58	22.28	94.09%	0.00%	0.00%
270	10,305,995	2.58E+01	2.06E-02	8,244.80	25.06	94.69%	0.00%	0.00%
300	14,137,167	3.53E+01	2.83E-02	11,309.73	27.85	96.29%	0.00%	0.00%
350	22,449,298	5.61E+01	4.49E-02	17,959.44	32.49	97.01%	0.00%	0.00%
400	33,510,322	8.38E+01	6.70E-02	26,808.26	37.13	98.34%	0.00%	0.00%
450	47,712,938	1.19E+02	9.54E-02	38,170.35	41.77	99.07%	0.00%	0.00%
500	65,449,847	1.64E+02	1.31E-01	52,359.88	46.42	99.07%	0.00%	0.00%
600	113,097,336	2.83E+02	2.26E-01	90,477.87	55.70	100.00%	0.00%	0.00%

Table A-7d. Emissions - Cooling Towers - Particulate Matter Emissions - Short-Term

Data Entry	
Emission Unit ID	CTNC12
Emission Point ID	CTNC12a
Emission Unit Description	Non-Contact Cooling Tower 2 - Cell 1
Water Circulation Rate	11,000 gal/min
PM Drift Rate	0.0010%
TDS	2,000 ppmw
Droplet Density	1 g/cm^3
Solids Density	2.5 g/cm^3

Calculations	
PM_{10} Fraction	68.15%
$PM_{2.5}$ Fraction	0.22%
PM Emissions	0.11 lb/hr
PM_{10} Emissions	0.08 lb/hr
$PM_{2.5}$ Emissions	0.0002 lb/hr

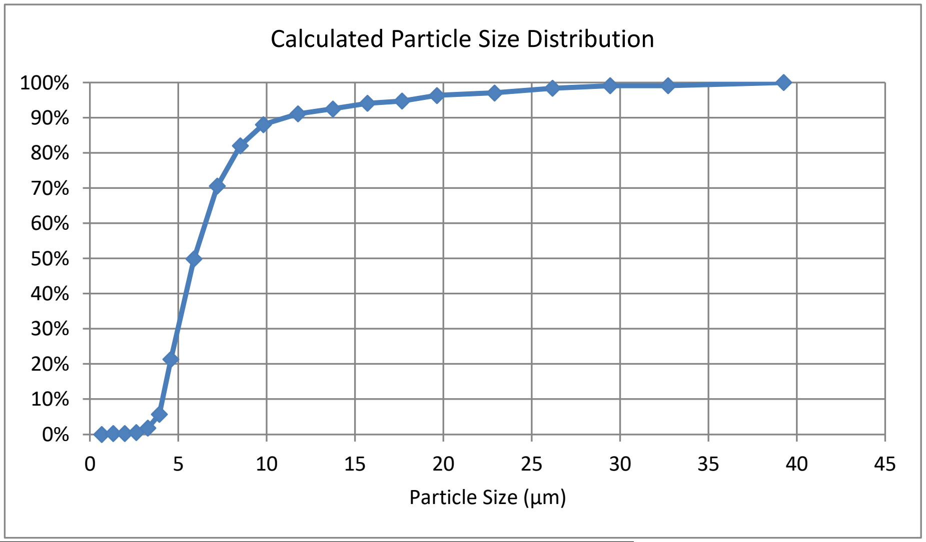


Droplet Diameter (µm)	Droplet Volume (µm^3)	Droplet Mass (µg)	Solid Particle Mass (µg)	Solid Particle Volume (µm^3)	Solid Particle Diameter (µm)	Mass Size Distribution CDF (%)	PM_{10} Fraction (%)	$PM_{2.5}$ Fraction (%)
10	524	1.31E-03	1.05E-06	0.42	0.93	0.00%	0.00%	0.00%
20	4,189	1.05E-02	8.38E-06	3.35	1.86	0.20%	0.00%	0.00%
30	14,137	3.53E-02	2.83E-05	11.31	2.78	0.23%	0.00%	0.22%
40	33,510	8.38E-02	6.70E-05	26.81	3.71	0.51%	0.00%	0.00%
50	65,450	1.64E-01	1.31E-04	52.36	4.64	1.82%	0.00%	0.00%
60	113,097	2.83E-01	2.26E-04	90.48	5.57	5.70%	0.00%	0.00%
70	179,594	4.49E-01	3.59E-04	143.68	6.50	21.35%	0.00%	0.00%
90	381,704	9.54E-01	7.63E-04	305.36	8.35	49.81%	0.00%	0.00%
110	696,910	1.74E+00	1.39E-03	557.53	10.21	70.51%	68.15%	0.00%
130	1,150,347	2.88E+00	2.30E-03	920.28	12.07	82.02%	0.00%	0.00%
150	1,767,146	4.42E+00	3.53E-03	1,413.72	13.92	88.01%	0.00%	0.00%
180	3,053,628	7.63E+00	6.11E-03	2,442.90	16.71	91.03%	0.00%	0.00%
210	4,849,048	1.21E+01	9.70E-03	3,879.24	19.49	92.47%	0.00%	0.00%
240	7,238,229	1.81E+01	1.45E-02	5,790.58	22.28	94.09%	0.00%	0.00%
270	10,305,995	2.58E+01	2.06E-02	8,244.80	25.06	94.69%	0.00%	0.00%
300	14,137,167	3.53E+01	2.83E-02	11,309.73	27.85	96.29%	0.00%	0.00%
350	22,449,298	5.61E+01	4.49E-02	17,959.44	32.49	97.01%	0.00%	0.00%
400	33,510,322	8.38E+01	6.70E-02	26,808.26	37.13	98.34%	0.00%	0.00%
450	47,712,938	1.19E+02	9.54E-02	38,170.35	41.77	99.07%	0.00%	0.00%
500	65,449,847	1.64E+02	1.31E-01	52,359.88	46.42	99.07%	0.00%	0.00%
600	113,097,336	2.83E+02	2.26E-01	90,477.87	55.70	100.00%	0.00%	0.00%

Table A-7e. Emissions - Cooling Towers - Particulate Matter Emissions - Short-Term

Data Entry	
Emission Unit ID	CTNC12
Emission Point ID	CTNC12b
Emission Unit Description	Non-Contact Cooling Tower 2 - Cell 2
Water Circulation Rate	11,000 gal/min
PM Drift Rate	0.0010%
TDS	2,000 ppmw
Droplet Density	1.0 g/cm^3
Solids Density	2.5 g/cm^3

Calculations	
PM_{10} Fraction	68.15%
$PM_{2.5}$ Fraction	0.22%
PM Emissions	0.11 lb/hr
PM_{10} Emissions	0.08 lb/hr
$PM_{2.5}$ Emissions	0.0002 lb/hr

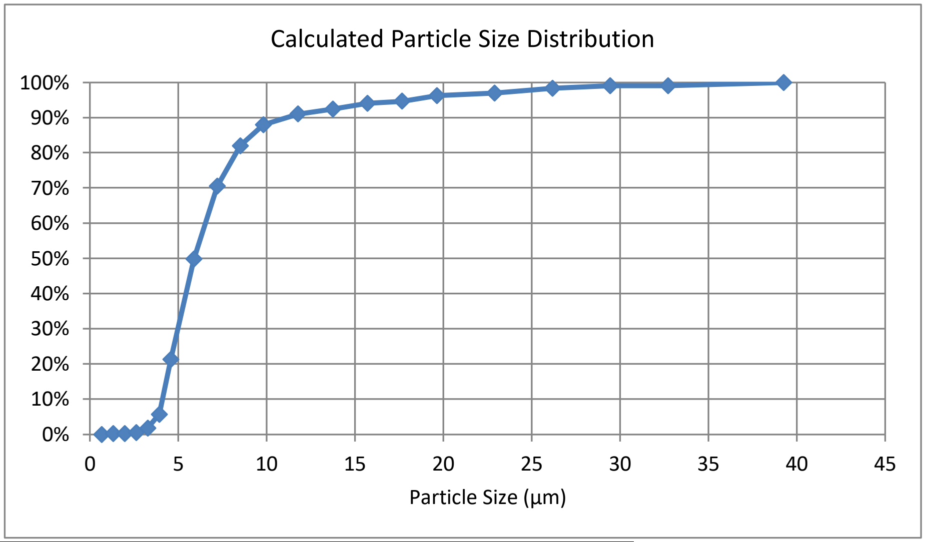


Droplet Diameter (µm)	Droplet Volume (µm^3)	Droplet Mass (µg)	Solid Particle Mass (µg)	Solid Particle Volume (µm^3)	Solid Particle Diameter (µm)	Mass Size Distribution CDF (%)	PM_{10} Fraction (%)	$PM_{2.5}$ Fraction (%)
10	524	1.31E-03	1.05E-06	0.42	0.93	0.00%	0.00%	0.00%
20	4,189	1.05E-02	8.38E-06	3.35	1.86	0.20%	0.00%	0.00%
30	14,137	3.53E-02	2.83E-05	11.31	2.78	0.23%	0.00%	0.22%
40	33,510	8.38E-02	6.70E-05	26.81	3.71	0.51%	0.00%	0.00%
50	65,450	1.64E-01	1.31E-04	52.36	4.64	1.82%	0.00%	0.00%
60	113,097	2.83E-01	2.26E-04	90.48	5.57	5.70%	0.00%	0.00%
70	179,594	4.49E-01	3.59E-04	143.68	6.50	21.35%	0.00%	0.00%
90	381,704	9.54E-01	7.63E-04	305.36	8.35	49.81%	0.00%	0.00%
110	696,910	1.74E+00	1.39E-03	557.53	10.21	70.51%	68.15%	0.00%
130	1,150,347	2.88E+00	2.30E-03	920.28	12.07	82.02%	0.00%	0.00%
150	1,767,146	4.42E+00	3.53E-03	1,413.72	13.92	88.01%	0.00%	0.00%
180	3,053,628	7.63E+00	6.11E-03	2,442.90	16.71	91.03%	0.00%	0.00%
210	4,849,048	1.21E+01	9.70E-03	3,879.24	19.49	92.47%	0.00%	0.00%
240	7,238,229	1.81E+01	1.45E-02	5,790.58	22.28	94.09%	0.00%	0.00%
270	10,305,995	2.58E+01	2.06E-02	8,244.80	25.06	94.69%	0.00%	0.00%
300	14,137,167	3.53E+01	2.83E-02	11,309.73	27.85	96.29%	0.00%	0.00%
350	22,449,298	5.61E+01	4.49E-02	17,959.44	32.49	97.01%	0.00%	0.00%
400	33,510,322	8.38E+01	6.70E-02	26,808.26	37.13	98.34%	0.00%	0.00%
450	47,712,938	1.19E+02	9.54E-02	38,170.35	41.77	99.07%	0.00%	0.00%
500	65,449,847	1.64E+02	1.31E-01	52,359.88	46.42	99.07%	0.00%	0.00%
600	113,097,336	2.83E+02	2.26E-01	90,477.87	55.70	100.00%	0.00%	0.00%

Table A-7f. Emissions - Cooling Towers - Particulate Matter Emissions - Short-Term

Data Entry	
Emission Unit ID	CTC1
Emission Point ID	CTC1a
Emission Unit Description	Contact Cooling Tower - Cell 1
Water Circulation Rate	5,500 gal/min
PM Drift Rate	0.0010%
TDS	2,000 ppmw
Droplet Density	1.0 g/cm^3
Solids Density	2.5 g/cm^3

Calculations	
PM_{10} Fraction	68.15%
$PM_{2.5}$ Fraction	0.22%
PM Emissions	0.06 lb/hr
PM_{10} Emissions	0.04 lb/hr
$PM_{2.5}$ Emissions	0.00012 lb/hr

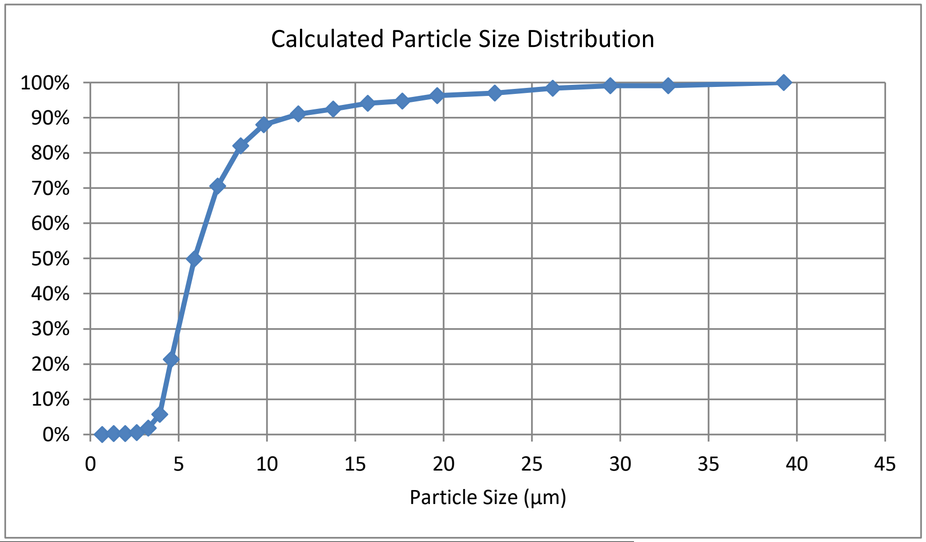


Droplet Diameter (µm)	Droplet Volume ($µm^3$)	Droplet Mass (µg)	Solid Particle Mass (µg)	Solid Particle Volume ($µm^3$)	Solid Particle Diameter (µm)	Mass Size Distribution CDF (%)	PM_{10} Fraction (%)	$PM_{2.5}$ Fraction (%)
10	524	1.31E-03	1.05E-06	0.42	0.93	0.00%	0.00%	0.00%
20	4,189	1.05E-02	8.38E-06	3.35	1.86	0.20%	0.00%	0.00%
30	14,137	3.53E-02	2.83E-05	11.31	2.78	0.23%	0.00%	0.22%
40	33,510	8.38E-02	6.70E-05	26.81	3.71	0.51%	0.00%	0.00%
50	65,450	1.64E-01	1.31E-04	52.36	4.64	1.82%	0.00%	0.00%
60	113,097	2.83E-01	2.26E-04	90.48	5.57	5.70%	0.00%	0.00%
70	179,594	4.49E-01	3.59E-04	143.68	6.50	21.35%	0.00%	0.00%
90	381,704	9.54E-01	7.63E-04	305.36	8.35	49.81%	0.00%	0.00%
110	696,910	1.74E+00	1.39E-03	557.53	10.21	70.51%	68.15%	0.00%
130	1,150,347	2.88E+00	2.30E-03	920.28	12.07	82.02%	0.00%	0.00%
150	1,767,146	4.42E+00	3.53E-03	1,413.72	13.92	88.01%	0.00%	0.00%
180	3,053,628	7.63E+00	6.11E-03	2,442.90	16.71	91.03%	0.00%	0.00%
210	4,849,048	1.21E+01	9.70E-03	3,879.24	19.49	92.47%	0.00%	0.00%
240	7,238,229	1.81E+01	1.45E-02	5,790.58	22.28	94.09%	0.00%	0.00%
270	10,305,995	2.58E+01	2.06E-02	8,244.80	25.06	94.69%	0.00%	0.00%
300	14,137,167	3.53E+01	2.83E-02	11,309.73	27.85	96.29%	0.00%	0.00%
350	22,449,298	5.61E+01	4.49E-02	17,959.44	32.49	97.01%	0.00%	0.00%
400	33,510,322	8.38E+01	6.70E-02	26,808.26	37.13	98.34%	0.00%	0.00%
450	47,712,938	1.19E+02	9.54E-02	38,170.35	41.77	99.07%	0.00%	0.00%
500	65,449,847	1.64E+02	1.31E-01	52,359.88	46.42	99.07%	0.00%	0.00%
600	113,097,336	2.83E+02	2.26E-01	90,477.87	55.70	100.00%	0.00%	0.00%

Table A-7g. Emissions - Cooling Towers - Particulate Matter Emissions - Short-Term

Data Entry	
Emission Unit ID	CTC1
Emission Point ID	CTC1b
Emission Unit Description	Contact Cooling Tower - Cell 2
Water Circulation Rate	5,500 gal/min
PM Drift Rate	0.0010%
TDS	2,000 ppmw
Droplet Density	1.0 g/cm^3
Solids Density	2.5 g/cm^3

Calculations	
PM_{10} Fraction	68.15%
$PM_{2.5}$ Fraction	0.22%
PM Emissions	0.06 lb/hr
PM_{10} Emissions	0.04 lb/hr
$PM_{2.5}$ Emissions	0.00012 lb/hr



Droplet Diameter (µm)	Droplet Volume (µm^3)	Droplet Mass (µg)	Solid Particle Mass (µg)	Solid Particle Volume (µm^3)	Solid Particle Diameter (µm)	Mass Size Distribution CDF (%)	PM_{10} Fraction (%)	$PM_{2.5}$ Fraction (%)
10	524	1.31E-03	1.05E-06	0.42	0.93	0.00%	0.00%	0.00%
20	4,189	1.05E-02	8.38E-06	3.35	1.86	0.20%	0.00%	0.00%
30	14,137	3.53E-02	2.83E-05	11.31	2.78	0.23%	0.00%	0.22%
40	33,510	8.38E-02	6.70E-05	26.81	3.71	0.51%	0.00%	0.00%
50	65,450	1.64E-01	1.31E-04	52.36	4.64	1.82%	0.00%	0.00%
60	113,097	2.83E-01	2.26E-04	90.48	5.57	5.70%	0.00%	0.00%
70	179,594	4.49E-01	3.59E-04	143.68	6.50	21.35%	0.00%	0.00%
90	381,704	9.54E-01	7.63E-04	305.36	8.35	49.81%	0.00%	0.00%
110	696,910	1.74E+00	1.39E-03	557.53	10.21	70.51%	68.15%	0.00%
130	1,150,347	2.88E+00	2.30E-03	920.28	12.07	82.02%	0.00%	0.00%
150	1,767,146	4.42E+00	3.53E-03	1,413.72	13.92	88.01%	0.00%	0.00%
180	3,053,628	7.63E+00	6.11E-03	2,442.90	16.71	91.03%	0.00%	0.00%
210	4,849,048	1.21E+01	9.70E-03	3,879.24	19.49	92.47%	0.00%	0.00%
240	7,238,229	1.81E+01	1.45E-02	5,790.58	22.28	94.09%	0.00%	0.00%
270	10,305,995	2.58E+01	2.06E-02	8,244.80	25.06	94.69%	0.00%	0.00%
300	14,137,167	3.53E+01	2.83E-02	11,309.73	27.85	96.29%	0.00%	0.00%
350	22,449,298	5.61E+01	4.49E-02	17,959.44	32.49	97.01%	0.00%	0.00%
400	33,510,322	8.38E+01	6.70E-02	26,808.26	37.13	98.34%	0.00%	0.00%
450	47,712,938	1.19E+02	9.54E-02	38,170.35	41.77	99.07%	0.00%	0.00%
500	65,449,847	1.64E+02	1.31E-01	52,359.88	46.42	99.07%	0.00%	0.00%
600	113,097,336	2.83E+02	2.26E-01	90,477.87	55.70	100.00%	0.00%	0.00%

Table A-8a. Emissions - Fuel Combustion

Emission Factor (lb/MMBtu) [2] — Propane

Emission Unit ID	Emission Point ID	Emission Unit Description	Number of Units	Single Unit Rating (MMBtu/hr)	Annual Utilization (%)	Total Heat Input Rating [1] (MMBtu/hr)	Total Heat Input Rating [1] (MMBtu/yr)	Filterable PM	Total PM	Total PM_{10}	Total $PM_{2.5}$	NO_x	CO	VOC	SO_2	Pb
LPH1	CV1	Ladle Preheaters	3	6	100%	18	1,577	0.0022	0.0077	0.0077	0.0077	0.14	0.082	0.0087	0.011	-
LD1	CV1	Ladle Dryers	2	8	100%	16	1,402	0.0022	0.0077	0.0077	0.0077	0.14	0.082	0.0087	0.011	-
TPH1	CV1	Tundish Preheaters	2	6	100%	12	1,051	0.0022	0.0077	0.0077	0.0077	0.14	0.082	0.0087	0.011	-
TD1	CV1	Tundish Dryer	1	6	100%	6	526	0.0022	0.0077	0.0077	0.0077	0.14	0.082	0.0087	0.011	-
TMD1	CV1	Tundish Mandril Dryer	1	1	100%	1	88	0.0022	0.0077	0.0077	0.0077	0.14	0.082	0.0087	0.011	-
SRDHTR1	CV1	Shroud Heater	1	1	100%	0.5	44	0.0022	0.0077	0.0077	0.0077	0.14	0.082	0.0087	0.011	-
MSAUXHT	CV1	Meltshop Comfort Heaters	20	0.4	50%	8	350	0.0022	0.0077	0.0077	0.0077	0.14	0.082	0.0087	0.011	-
BF1	RMV1	Bit Furnace	1	0.225	100%	0.23	20	0.0022	0.0077	0.0077	0.0077	0.14	0.082	0.0087	0.011	-
RMAUXHT	RMV1	Rolling Mill Comfort Heaters	20	0.4	50%	8	350	0.0022	0.0077	0.0077	0.0077	0.14	0.082	0.0087	0.011	-
TORCH1	TORCH1	Cutting Torches	-	0.32	46%	0.32	12.85	0.0022	0.0077	0.0077	0.0077	0.14	0.082	0.0087	0.011	-

Emission Factor (lb/MMBtu) [2] — Natural Gas

Emission Unit ID	Filterable PM	Total PM	Total PM_{10}	Total $PM_{2.5}$	NO_x	CO	VOC	SO_2	Pb
LPH1	0.0019	0.0075	0.0075	0.0075	0.098	0.082	0.0054	0.00059	4.90E-07
LD1	0.0019	0.0075	0.0075	0.0075	0.098	0.082	0.0054	0.00059	4.90E-07
TPH1	0.0019	0.0075	0.0075	0.0075	0.098	0.082	0.0054	0.00059	4.90E-07
TD1	0.0019	0.0075	0.0075	0.0075	0.098	0.082	0.0054	0.00059	4.90E-07
TMD1	0.0019	0.0075	0.0075	0.0075	0.098	0.082	0.0054	0.00059	4.90E-07
SRDHTR1	0.0019	0.0075	0.0075	0.0075	0.098	0.082	0.0054	0.00059	4.90E-07
MSAUXHT	0.0019	0.0075	0.0075	0.0075	0.098	0.082	0.0054	0.00059	4.90E-07
BF1	0.0019	0.0075	0.0075	0.0075	0.098	0.082	0.0054	0.00059	4.90E-07
RMAUXHT	0.0019	0.0075	0.0075	0.0075	0.098	0.082	0.0054	0.00059	4.90E-07
TORCH1	0.0019	0.0075	0.0075	0.0075	0.098	0.082	0.0054	0.00059	4.90E-07

Emission Factor (lb/MMBtu) [2] — Maximum

Emission Unit ID	Filterable PM	Total PM	Total PM_{10}	Total $PM_{2.5}$	NO_x	CO	VOC	SO_2	Pb
LPH1	0.0022	0.0077	0.0077	0.0077	0.14	0.082	0.0087	0.011	4.90E-07
LD1	0.0022	0.0077	0.0077	0.0077	0.14	0.082	0.0087	0.011	4.90E-07
TPH1	0.0022	0.0077	0.0077	0.0077	0.14	0.082	0.0087	0.011	4.90E-07
TD1	0.0022	0.0077	0.0077	0.0077	0.14	0.082	0.0087	0.011	4.90E-07
TMD1	0.0022	0.0077	0.0077	0.0077	0.14	0.082	0.0087	0.011	4.90E-07
SRDHTR1	0.0022	0.0077	0.0077	0.0077	0.14	0.082	0.0087	0.011	4.90E-07
MSAUXHT	0.0022	0.0077	0.0077	0.0077	0.14	0.082	0.0087	0.011	4.90E-07
BF1	0.0022	0.0077	0.0077	0.0077	0.14	0.082	0.0087	0.011	4.90E-07
RMAUXHT	0.0022	0.0077	0.0077	0.0077	0.14	0.082	0.0087	0.011	4.90E-07
TORCH1	0.0022	0.0077	0.0077	0.0077	0.14	0.082	0.0087	0.011	4.90E-07

Emission Unit ID	Emission Point ID	Emission Unit Description	Number of Units	Hourly Emissions [3] (lb/hr) Filterable PM	Total PM	Total PM_{10}	Total $PM_{2.5}$	NO_x	CO	VOC	SO_2	Pb	Annual Emissions [4] (tpy) Filterable PM	Total PM	Total PM_{10}	Total $PM_{2.5}$	NO_x	CO	VOC	SO_2	Pb
LPH1	CV1	Ladle Preheaters	3	0.039	0.14	0.14	0.14	2.56	1.48	0.16	0.20	8.82E-06	1.72E-05	6.03E-05	6.03E-05	6.03E-05	1.12E-03	6.49E-04	6.89E-05	8.62E-05	3.86E-09
LD1	CV1	Ladle Dryers	2	0.035	0.12	0.12	0.12	2.27	1.32	0.14	0.17	7.84E-06	1.53E-05	5.36E-05	5.36E-05	5.36E-05	9.96E-04	5.77E-04	6.13E-05	7.66E-05	3.44E-09
TPH1	CV1	Tundish Preheaters	2	0.026	0.092	0.092	0.092	1.70	0.99	0.10	0.13	5.88E-06	1.15E-05	4.02E-05	4.02E-05	4.02E-05	7.47E-04	4.33E-04	4.60E-05	5.74E-05	2.58E-09
TD1	CV1	Tundish Dryer	1	0.013	0.046	0.046	0.046	0.85	0.49	0.052	0.066	2.94E-06	5.74E-06	2.01E-05	2.01E-05	2.01E-05	3.73E-04	2.16E-04	2.30E-05	2.87E-05	1.29E-09
TMD1	CV1	Tundish Mandril Dryer	1	0.0022	0.0077	0.0077	0.0077	0.14	0.082	0.0087	0.011	4.90E-07	9.57E-07	3.35E-06	3.35E-06	3.35E-06	6.22E-05	3.61E-05	3.83E-06	4.79E-06	2.15E-10
SRDHTR1	CV1	Shroud Heater	1	0.0011	0.0038	0.0038	0.0038	0.071	0.041	0.0044	0.0055	2.45E-07	4.79E-07	1.68E-06	1.68E-06	1.68E-06	3.11E-05	1.80E-05	1.91E-06	2.39E-06	1.07E-10
MSAUXHT	CV1	Meltshop Comfort Heaters	20	0.017	0.061	0.061	0.061	1.14	0.66	0.070	0.087	3.92E-06	1.91E-06	6.70E-06	6.70E-06	6.70E-06	1.24E-04	7.21E-05	7.66E-06	9.57E-06	4.29E-10
BF1	RMV1	Bit Furnace	1	0.00049	0.0017	0.0017	0.0017	0.032	0.019	0.0020	0.0025	1.10E-07	2.15E-07	7.54E-07	7.54E-07	7.54E-07	1.40E-05	8.12E-06	8.62E-07	1.08E-06	4.83E-11
RMAUXHT	RMV1	Rolling Mill Comfort Heaters	20	0.017	0.061	0.061	0.061	1.14	0.66	0.070	0.087	3.92E-06	1.91E-06	6.70E-06	6.70E-06	6.70E-06	1.24E-04	7.21E-05	7.66E-06	9.57E-06	4.29E-10
TORCH1	TORCH1	Cutting Torches	-	0.00070	0.0025	0.0025	0.0025	0.046	0.026	0.0028	0.0035	1.57E-07	6.41E-08	2.24E-07	2.24E-07	2.24E-07	4.17E-06	2.42E-06	2.56E-07	3.21E-07	1.44E-11
	CV1	***Proposed Caster Vent***	***-***	***0.13***	***0.47***	***0.47***	***0.47***	***8.74***	***5.06***	***0.54***	***0.67***	***3.01E-05***	***5.31E-05***	***1.86E-04***	***1.86E-04***	***1.86E-04***	***3.45E-03***	***2.00E-03***	***2.13E-04***	***2.66E-04***	***1.19E-08***
	RMV1	***Proposed Rolling Mill Vent***	***-***	***0.018***	***0.063***	***0.063***	***0.063***	***1.17***	***0.68***	***0.072***	***0.090***	***4.03E-06***	***2.13E-06***	***7.46E-06***	***7.46E-06***	***7.46E-06***	***1.38E-04***	***8.03E-05***	***8.52E-06***	***1.07E-05***	***4.78E-10***
	TORCH1	***Cutting Torches***	***-***	***0.00070***	***0.0025***	***0.0025***	***0.0025***	***0.046***	***0.026***	***0.0028***	***0.0035***	***1.57E-07***	***6.41E-08***	***2.24E-07***	***2.24E-07***	***2.24E-07***	***4.17E-06***	***2.42E-06***	***2.56E-07***	***3.21E-07***	***1.44E-11***

[1] Hourly Total Heat Input Rating (MMBtu/hr) = Single Burner Rating (MMBtu/hr) x Number of Burners.
Annual Total Heat Input Rating (MMBtu/yr) = Hourly Total Heat Input Rating (MMBtu/hr) x 8,760 (hr/yr) x Annual Utilization (%) / 100.

[2] Emission factors for per
For Propane
AP-42 Section 1.5, Table 1.5-1 for Commercial Boilers (heat input capacities between 0.3 and 10 MMBtu/hr), dated July 2008
Converted from lb/kgal to lb/MMBtu based on the propane heating value of 91.5 MMBtu/kgal
Sulfur content of propane per Table 4 of FR Vol 86 No. 24, February 8, 2021 10 gr/100 scf
For Natural Gas
AP-42 Section 1.4, Table 1.4-2, July 1998 for Small Boilers (< 100 MMBtu/hr) and converted from lb/MMscf to lb/MMBtu based on the natural gas heating value of 1,020 Btu/scf.

[3] Hourly Emissions lb/hr) = Emission Factor lb/MMBtu x Hourly Total Heat Input Rating (MMBtu/hr).

[4] Annual Emissions (tpy) = Emission Factor lb/MMBtu x Annual Total Heat Input Rating (MMBtu/yr) / 2,000 lb/ton).

Table A-8b. GHG Emissions - Fuel Combustion

Emission Unit ID	Emission Point ID	Emission Unit Description	Number of Units	Single Unit Rating	Annual Utilization	Total Heat Input Rating [1]		Emission Factors (lb/MMBtu) [2]									Annual Emissions (tpy) [3,4]			
								Propane			Natural Gas			Maximum						
				(MMBtu/hr)	(%)	(MMBtu/hr)	(MMBtu/yr)	CO_2	CH_4	N_2O	CO_2	CH_4	N_2O	CO_2	CH_4	N_2O	CO_2	CH_4	N_2O	CO_2e
LPH1	CV1	Ladle Preheaters	3	6	100%	18	1,577	138.60	6.61E-03	1.32E-03	116.98	2.20E-03	2.20E-04	138.60	6.61E-03	1.32E-03	109	5.21E-03	1.04E-03	110
LD1	CV1	Ladle Dryers	2	8	100%	16	1,402	138.60	6.61E-03	1.32E-03	116.98	2.20E-03	2.20E-04	138.60	6.61E-03	1.32E-03	97	4.63E-03	9.27E-04	98
TPH1	CV1	Tundish Preheaters	2	6	100%	12	1,051	138.60	6.61E-03	1.32E-03	116.98	2.20E-03	2.20E-04	138.60	6.61E-03	1.32E-03	73	3.48E-03	6.95E-04	73
TD1	CV1	Tundish Dryer	1	6	100%	6	526	138.60	6.61E-03	1.32E-03	116.98	2.20E-03	2.20E-04	138.60	6.61E-03	1.32E-03	36	1.74E-03	3.48E-04	37
TMD1	CV1	Tundish Mandril Dryer	1	1	100%	1	88	138.60	6.61E-03	1.32E-03	116.98	2.20E-03	2.20E-04	138.60	6.61E-03	1.32E-03	6	2.90E-04	5.79E-05	6
SRDHTR1	CV1	Shroud Heater	1	1	100%	1	44	138.60	6.61E-03	1.32E-03	116.98	2.20E-03	2.20E-04	138.60	6.61E-03	1.32E-03	3	1.45E-04	2.90E-05	3
MSAUXHT	CV1	Meltshop Comfort Heaters	20	0.4	50%	8	350	138.60	6.61E-03	1.32E-03	116.98	2.20E-03	2.20E-04	138.60	6.61E-03	1.32E-03	24	1.16E-03	2.32E-04	24
BF1	RMV1	Bit Furnace	1	0.225	100%	0.225	20	138.60	6.61E-03	1.32E-03	116.98	2.20E-03	2.20E-04	138.60	6.61E-03	1.32E-03	1	6.52E-05	1.30E-05	1
RMAUXHT	RMV1	Rolling Mill Comfort Heaters	20	0.4	50%	8	350	138.60	6.61E-03	1.32E-03	116.98	2.20E-03	2.20E-04	138.60	6.61E-03	1.32E-03	24	1.16E-03	2.32E-04	24
TORCH1	TORCH1	Cutting Torches	-	0.32	46%	0.32	12.85	138.60	6.61E-03	1.32E-03	116.98	2.20E-03	2.20E-04	138.60	6.61E-03	1.32E-03	1	4.25E-05	8.50E-06	1
	CV1	***Proposed Caster Vent***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	***350***
	RMV1	***Proposed Rolling Mill Vent***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	***26***
	TORCH1	***Cutting Torches***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	***1***

[1] Hourly Total Heat Input Rating (MMBtu/hr) = Single Burner Rating (MMBtu/hr) x Number of Burners.
Annual Total Heat Input Rating (MMBtu/yr) = Hourly Total Heat Input Rating (MMBtu/hr) x 8,760 (hr/yr) x Annual Utilization (%) / 100.

[2] Emission factor for CO_2 is obtained from 40 CFR Part 98, Table C–1 to Subpart C, December 2016, for Natural Gas and Propane. Emission factors for CH_4 and N_2O are obtained from 40 CFR Part 98, Table C–2 to Subpart C, December 2016, for Natural Gas and Petroleum Products (All fuel types in Table C-1).

[3] CO_2e calculated using Global Warming Potentials (GWPs) from of 40 CFR Part 98, Table A-1, December 2014.
CO_2 GWP = 1
CH_4 GWP = 25
N_2O GWP = 298

4 CO_2, CH_4, N_2O Annual Emissions (tpy) = Annual Total Heat Input Rating (MMBtu/yr) x Emission Factor lb/MMBtu / 2,000 lb/ton).
CO_2e Annual Emissions (tpy) = CO_2 GWP x CO_2 Annual Emissions (tpy) + CH_4 GWP x CH_4 Annual Emissions (tpy) + N_2O GWP x N_2O Annual Emissions (tpy).

Table A-8c. HAP Emissions - Natural Gas Combustion

Emission Unit ID	Emission Point ID	Emission Unit Description	Number of Units	Single Unit Rating (MMBtu/hr)	Annual Utilization (%)	Total Heat Input Rating [1] (MMBtu/hr)	Total Heat Input Rating [1] (MMBtu/yr)	Species	Emission Factors [2] (lb/MMscf)	Hourly Emissions [3] (lb/hr)	Annual Emissions [4] (tpy)
LPH1	CV1	Ladle Preheaters	3	6	100%	18	1,577	2-Methylnaphthalene	2.40E-05	4.24E-07	1.86E-08
								3-Methylcholanthrene	1.80E-06	3.18E-08	1.39E-09
								7,12-Dimethylbenz(a)anthracene	1.60E-05	2.82E-07	1.24E-08
								Acenaphthene	1.80E-06	3.18E-08	1.39E-09
								Acenaphthylene	1.80E-06	3.18E-08	1.39E-09
								Anthracene	2.40E-06	4.24E-08	1.86E-09
								Benz(a)anthracene	1.80E-06	3.18E-08	1.39E-09
								Benzene	0.0021	3.71E-05	1.62E-06
								Benzo(a)pyrene	1.20E-06	2.12E-08	9.28E-10
								Benzo(b)fluoranthene	1.80E-06	3.18E-08	1.39E-09
								Benzo(g,h,i)perylene	1.20E-06	2.12E-08	9.28E-10
								Benzo(k)fluoranthene	1.80E-06	3.18E-08	1.39E-09
								Chrysene	1.80E-06	3.18E-08	1.39E-09
								Dibenzo(a,h)anthracene	1.20E-06	2.12E-08	9.28E-10
								Dichlorobenzene	1.20E-03	2.12E-05	9.28E-07
								Fluoranthene	3.00E-06	5.29E-08	2.32E-09
								Fluorene	2.80E-06	4.94E-08	2.16E-09
								Formaldehyde	0.075	1.32E-03	5.80E-05
								Hexane	1.8	3.18E-02	1.39E-03
								Indeno(1,2,3-cd)pyrene	1.80E-06	3.18E-08	1.39E-09
								Naphthalene	6.10E-04	1.08E-05	4.71E-07
								Phenanthrene	0.000017	3.00E-07	1.31E-08
								Pyrene	5.00E-06	8.82E-08	3.86E-09
								Toluene	0.0034	6.00E-05	2.63E-06
								Arsenic	2.00E-04	3.53E-06	1.55E-07
								Beryllium	1.20E-05	2.12E-07	9.28E-09
								Cadmium	1.10E-03	1.94E-05	8.50E-07
								Chromium	1.40E-03	2.47E-05	1.08E-06
								Cobalt	8.40E-05	1.48E-06	6.49E-08
								Manganese	3.80E-04	6.71E-06	2.94E-07
								Mercury	2.60E-04	4.59E-06	2.01E-07
								Molybdenum	1.10E-03	1.94E-05	8.50E-07
								Nickel	0.0021	3.71E-05	1.62E-06
								Selenium	2.40E-05	4.24E-07	1.86E-08

Table A-8c. HAP Emissions - Natural Gas Combustion

Emission Unit ID	Emission Point ID	Emission Unit Description	Number of Units	Single Unit Rating (MMBtu/hr)	Annual Utilization (%)	Total Heat Input Rating [1] (MMBtu/hr)	Total Heat Input Rating [1] (MMBtu/yr)	Species	Emission Factors [2] (lb/MMscf)	Hourly Emissions [3] (lb/hr)	Annual Emissions [4] (tpy)
LD1	CV1	Ladle Dryers	2	8	100%	16	1,402	2-Methylnaphthalene	2.40E-05	3.76E-07	1.65E-08
								3-Methylcholanthrene	1.80E-06	2.82E-08	1.24E-09
								7,12-Dimethylbenz(a)anthracene	1.60E-05	2.51E-07	1.10E-08
								Acenaphthene	1.80E-06	2.82E-08	1.24E-09
								Acenaphthylene	1.80E-06	2.82E-08	1.24E-09
								Anthracene	2.40E-06	3.76E-08	1.65E-09
								Benz(a)anthracene	1.80E-06	2.82E-08	1.24E-09
								Benzene	0.0021	3.29E-05	1.44E-06
								Benzo(a)pyrene	1.20E-06	1.88E-08	8.24E-10
								Benzo(b)fluoranthene	1.80E-06	2.82E-08	1.24E-09
								Benzo(g,h,i)perylene	1.20E-06	1.88E-08	8.24E-10
								Benzo(k)fluoranthene	1.80E-06	2.82E-08	1.24E-09
								Chrysene	1.80E-06	2.82E-08	1.24E-09
								Dibenzo(a,h)anthracene	1.20E-06	1.88E-08	8.24E-10
								Dichlorobenzene	1.20E-03	1.88E-05	8.24E-07
								Fluoranthene	3.00E-06	4.71E-08	2.06E-09
								Fluorene	2.80E-06	4.39E-08	1.92E-09
								Formaldehyde	0.08	1.18E-03	5.15E-05
								Hexane	1.8	2.82E-02	1.24E-03
								Indeno(1,2,3-cd)pyrene	1.80E-06	2.82E-08	1.24E-09
								Naphthalene	6.10E-04	9.57E-06	4.19E-07
								Phenanthrene	1.70E-05	2.67E-07	1.17E-08
								Pyrene	5.00E-06	7.84E-08	3.44E-09
								Toluene	0.0034	5.33E-05	2.34E-06
								Arsenic	2.00E-04	3.14E-06	1.37E-07
								Beryllium	1.20E-05	1.88E-07	8.24E-09
								Cadmium	0.0011	1.73E-05	7.56E-07
								Chromium	0.0014	2.20E-05	9.62E-07
								Cobalt	8.40E-05	1.32E-06	5.77E-08
								Manganese	3.80E-04	5.96E-06	2.61E-07
								Mercury	2.60E-04	4.08E-06	1.79E-07
								Molybdenum	0.0011	1.73E-05	7.56E-07
								Nickel	0.0021	3.29E-05	1.44E-06
								Selenium	2.40E-05	3.76E-07	1.65E-08

Table A-8c. HAP Emissions - Natural Gas Combustion

Emission Unit ID	Emission Point ID	Emission Unit Description	Number of Units	Single Unit Rating (MMBtu/hr)	Annual Utilization (%)	Total Heat Input Rating [1] (MMBtu/hr)	Total Heat Input Rating [1] (MMBtu/yr)	Species	Emission Factors [2] (lb/MMscf)	Hourly Emissions [3] (lb/hr)	Annual Emissions [4] (tpy)
TPH1	CV1	Tundish Preheaters	2	6	100%	12	1,051	2-Methylnaphthalene	2.40E-05	2.82E-07	1.24E-08
								3-Methylcholanthrene	1.80E-06	2.12E-08	9.28E-10
								7,12-Dimethylbenz(a)anthracene	1.60E-05	1.88E-07	8.24E-09
								Acenaphthene	1.80E-06	2.12E-08	9.28E-10
								Acenaphthylene	1.80E-06	2.12E-08	9.28E-10
								Anthracene	2.40E-06	2.82E-08	1.24E-09
								Benz(a)anthracene	1.80E-06	2.12E-08	9.28E-10
								Benzene	0.0021	2.47E-05	1.08E-06
								Benzo(a)pyrene	1.20E-06	1.41E-08	6.18E-10
								Benzo(b)fluoranthene	1.80E-06	2.12E-08	9.28E-10
								Benzo(g,h,i)perylene	1.20E-06	1.41E-08	6.18E-10
								Benzo(k)fluoranthene	1.80E-06	2.12E-08	9.28E-10
								Chrysene	1.80E-06	2.12E-08	9.28E-10
								Dibenzo(a,h)anthracene	1.20E-06	1.41E-08	6.18E-10
								Dichlorobenzene	1.20E-03	1.41E-05	6.18E-07
								Fluoranthene	3.00E-06	3.53E-08	1.55E-09
								Fluorene	2.80E-06	3.29E-08	1.44E-09
								Formaldehyde	0.08	8.82E-04	3.86E-05
								Hexane	1.8	2.12E-02	9.28E-04
								Indeno(1,2,3-cd)pyrene	1.80E-06	2.12E-08	9.28E-10
								Naphthalene	6.10E-04	7.18E-06	3.14E-07
								Phenanthrene	1.70E-05	2.00E-07	8.76E-09
								Pyrene	5.00E-06	5.88E-08	2.58E-09
								Toluene	0.0034	4.00E-05	1.75E-06
								Arsenic	2.00E-04	2.35E-06	1.03E-07
								Beryllium	1.20E-05	1.41E-07	6.18E-09
								Cadmium	0.0011	1.29E-05	5.67E-07
								Chromium	0.0014	1.65E-05	7.21E-07
								Cobalt	8.40E-05	9.88E-07	4.33E-08
								Manganese	3.80E-04	4.47E-06	1.96E-07
								Mercury	2.60E-04	3.06E-06	1.34E-07
								Molybdenum	0.0011	1.29E-05	5.67E-07
								Nickel	0.0021	2.47E-05	1.08E-06
								Selenium	2.40E-05	2.82E-07	1.24E-08

Table A-8c. HAP Emissions - Natural Gas Combustion

Emission Unit ID	Emission Point ID	Emission Unit Description	Number of Units	Single Unit Rating (MMBtu/hr)	Annual Utilization (%)	Total Heat Input Rating [1] (MMBtu/hr)	Total Heat Input Rating [1] (MMBtu/yr)	Species	Emission Factors [2] (lb/MMscf)	Hourly Emissions [3] (lb/hr)	Annual Emissions [4] (tpy)
TD1	CV1	Tundish Dryer	1	6	100%	6	526	2-Methylnaphthalene	2.40E-05	1.41E-07	6.18E-09
								3-Methylcholanthrene	1.80E-06	1.06E-08	4.64E-10
								7,12-Dimethylbenz(a)anthracene	1.60E-05	9.41E-08	4.12E-09
								Acenaphthene	1.80E-06	1.06E-08	4.64E-10
								Acenaphthylene	1.80E-06	1.06E-08	4.64E-10
								Anthracene	2.40E-06	1.41E-08	6.18E-10
								Benz(a)anthracene	1.80E-06	1.06E-08	4.64E-10
								Benzene	0.0021	1.24E-05	5.41E-07
								Benzo(a)pyrene	1.20E-06	7.06E-09	3.09E-10
								Benzo(b)fluoranthene	1.80E-06	1.06E-08	4.64E-10
								Benzo(g,h,i)perylene	1.20E-06	7.06E-09	3.09E-10
								Benzo(k)fluoranthene	1.80E-06	1.06E-08	4.64E-10
								Chrysene	1.80E-06	1.06E-08	4.64E-10
								Dibenzo(a,h)anthracene	1.20E-06	7.06E-09	3.09E-10
								Dichlorobenzene	1.20E-03	7.06E-06	3.09E-07
								Fluoranthene	3.00E-06	1.76E-08	7.73E-10
								Fluorene	2.80E-06	1.65E-08	7.21E-10
								Formaldehyde	0.08	4.41E-04	1.93E-05
								Hexane	1.8	1.06E-02	4.64E-04
								Indeno(1,2,3-cd)pyrene	1.80E-06	1.06E-08	4.64E-10
								Naphthalene	6.10E-04	3.59E-06	1.57E-07
								Phenanthrene	1.70E-05	1.00E-07	4.38E-09
								Pyrene	5.00E-06	2.94E-08	1.29E-09
								Toluene	0.0034	2.00E-05	8.76E-07
								Arsenic	2.00E-04	1.18E-06	5.15E-08
								Beryllium	1.20E-05	7.06E-08	3.09E-09
								Cadmium	0.0011	6.47E-06	2.83E-07
								Chromium	0.0014	8.24E-06	3.61E-07
								Cobalt	8.40E-05	4.94E-07	2.16E-08
								Manganese	3.80E-04	2.24E-06	9.79E-08
								Mercury	2.60E-04	1.53E-06	6.70E-08
								Molybdenum	0.0011	6.47E-06	2.83E-07
								Nickel	0.0021	1.24E-05	5.41E-07
								Selenium	2.40E-05	1.41E-07	6.18E-09

Table A-8c. HAP Emissions - Natural Gas Combustion

Emission Unit ID	Emission Point ID	Emission Unit Description	Number of Units	Single Unit Rating (MMBtu/hr)	Annual Utilization (%)	Total Heat Input Rating [1] (MMBtu/hr)	Total Heat Input Rating [1] (MMBtu/yr)	Species	Emission Factors [2] (lb/MMscf)	Hourly Emissions [3] (lb/hr)	Annual Emissions [4] (tpy)
TMD1	CV1	Tundish Mandril Dryer	1	1	100%	1	88	2-Methylnaphthalene	2.40E-05	2.35E-08	1.03E-09
								3-Methylcholanthrene	1.80E-06	1.76E-09	7.73E-11
								7,12-Dimethylbenz(a)anthracene	1.60E-05	1.57E-08	6.87E-10
								Acenaphthene	1.80E-06	1.76E-09	7.73E-11
								Acenaphthylene	1.80E-06	1.76E-09	7.73E-11
								Anthracene	2.40E-06	2.35E-09	1.03E-10
								Benz(a)anthracene	1.80E-06	1.76E-09	7.73E-11
								Benzene	0.0021	2.06E-06	9.02E-08
								Benzo(a)pyrene	1.20E-06	1.18E-09	5.15E-11
								Benzo(b)fluoranthene	1.80E-06	1.76E-09	7.73E-11
								Benzo(g,h,i)perylene	1.20E-06	1.18E-09	5.15E-11
								Benzo(k)fluoranthene	1.80E-06	1.76E-09	7.73E-11
								Chrysene	1.80E-06	1.76E-09	7.73E-11
								Dibenzo(a,h)anthracene	1.20E-06	1.18E-09	5.15E-11
								Dichlorobenzene	1.20E-03	1.18E-06	5.15E-08
								Fluoranthene	3.00E-06	2.94E-09	1.29E-10
								Fluorene	2.80E-06	2.75E-09	1.20E-10
								Formaldehyde	0.08	7.35E-05	3.22E-06
								Hexane	1.8	1.76E-03	7.73E-05
								Indeno(1,2,3-cd)pyrene	1.80E-06	1.76E-09	7.73E-11
								Naphthalene	6.10E-04	5.98E-07	2.62E-08
								Phenanthrene	1.70E-05	1.67E-08	7.30E-10
								Pyrene	5.00E-06	4.90E-09	2.15E-10
								Toluene	0.0034	3.33E-06	1.46E-07
								Arsenic	2.00E-04	1.96E-07	8.59E-09
								Beryllium	1.20E-05	1.18E-08	5.15E-10
								Cadmium	0.0011	1.08E-06	4.72E-08
								Chromium	0.0014	1.37E-06	6.01E-08
								Cobalt	8.40E-05	8.24E-08	3.61E-09
								Manganese	3.80E-04	3.73E-07	1.63E-08
								Mercury	2.60E-04	2.55E-07	1.12E-08
								Molybdenum	0.0011	1.08E-06	4.72E-08
								Nickel	0.0021	2.06E-06	9.02E-08
								Selenium	2.40E-05	2.35E-08	1.03E-09

Table A-8c. HAP Emissions - Natural Gas Combustion

Emission Unit ID	Emission Point ID	Emission Unit Description	Number of Units	Single Unit Rating (MMBtu/hr)	Annual Utilization (%)	Total Heat Input Rating [1]		Species	Emission Factors [2] (lb/MMscf)	Hourly Emissions [3] (lb/hr)	Annual Emissions [4] (tpy)
						(MMBtu/hr)	(MMBtu/yr)				
SRDHTR1	CV1	Shroud Heater	1	1	100%	0.5	44	2-Methylnaphthalene	2.40E-05	1.18E-08	5.15E-10
								3-Methylcholanthrene	1.80E-06	8.82E-10	3.86E-11
								7,12-Dimethylbenz(a)anthracene	1.60E-05	7.84E-09	3.44E-10
								Acenaphthene	1.80E-06	8.82E-10	3.86E-11
								Acenaphthylene	1.80E-06	8.82E-10	3.86E-11
								Anthracene	2.40E-06	1.18E-09	5.15E-11
								Benz(a)anthracene	1.80E-06	8.82E-10	3.86E-11
								Benzene	0.0021	1.03E-06	4.51E-08
								Benzo(a)pyrene	1.20E-06	5.88E-10	2.58E-11
								Benzo(b)fluoranthene	1.80E-06	8.82E-10	3.86E-11
								Benzo(g,h,i)perylene	1.20E-06	5.88E-10	2.58E-11
								Benzo(k)fluoranthene	1.80E-06	8.82E-10	3.86E-11
								Chrysene	1.80E-06	8.82E-10	3.86E-11
								Dibenzo(a,h)anthracene	1.20E-06	5.88E-10	2.58E-11
								Dichlorobenzene	1.20E-03	5.88E-07	2.58E-08
								Fluoranthene	3.00E-06	1.47E-09	6.44E-11
								Fluorene	2.80E-06	1.37E-09	6.01E-11
								Formaldehyde	0.08	3.68E-05	1.61E-06
								Hexane	1.8	8.82E-04	3.86E-05
								Indeno(1,2,3-cd)pyrene	1.80E-06	8.82E-10	3.86E-11
								Naphthalene	6.10E-04	2.99E-07	1.31E-08
								Phenanthrene	1.70E-05	8.33E-09	3.65E-10
								Pyrene	5.00E-06	2.45E-09	1.07E-10
								Toluene	0.0034	1.67E-06	7.30E-08
								Arsenic	2.00E-04	9.80E-08	4.29E-09
								Beryllium	1.20E-05	5.88E-09	2.58E-10
								Cadmium	0.0011	5.39E-07	2.36E-08
								Chromium	0.0014	6.86E-07	3.01E-08
								Cobalt	8.40E-05	4.12E-08	1.80E-09
								Manganese	3.80E-04	1.86E-07	8.16E-09
								Mercury	2.60E-04	1.27E-07	5.58E-09
								Molybdenum	0.0011	5.39E-07	2.36E-08
								Nickel	0.0021	1.03E-06	4.51E-08
								Selenium	2.40E-05	1.18E-08	5.15E-10

Table A-8c. HAP Emissions - Natural Gas Combustion

Emission Unit ID	Emission Point ID	Emission Unit Description	Number of Units	Single Unit Rating (MMBtu/hr)	Annual Utilization (%)	Total Heat Input Rating [1]		Species	Emission Factors [2] (lb/MMscf)	Hourly Emissions [3] (lb/hr)	Annual Emissions [4] (tpy)
						(MMBtu/hr)	(MMBtu/yr)				
MSAUXHT	CV1	Meltshop Comfort Heaters	20	0.4	50%	8	350	2-Methylnaphthalene	2.40E-05	1.88E-07	4.12E-09
								3-Methylcholanthrene	1.80E-06	1.41E-08	3.09E-10
								7,12-Dimethylbenz(a)anthracene	1.60E-05	1.25E-07	2.75E-09
								Acenaphthene	1.80E-06	1.41E-08	3.09E-10
								Acenaphthylene	1.80E-06	1.41E-08	3.09E-10
								Anthracene	2.40E-06	1.88E-08	4.12E-10
								Benz(a)anthracene	1.80E-06	1.41E-08	3.09E-10
								Benzene	0.0021	1.65E-05	3.61E-07
								Benzo(a)pyrene	1.20E-06	9.41E-09	2.06E-10
								Benzo(b)fluoranthene	1.80E-06	1.41E-08	3.09E-10
								Benzo(g,h,i)perylene	1.20E-06	9.41E-09	2.06E-10
								Benzo(k)fluoranthene	1.80E-06	1.41E-08	3.09E-10
								Chrysene	1.80E-06	1.41E-08	3.09E-10
								Dibenzo(a,h)anthracene	1.20E-06	9.41E-09	2.06E-10
								Dichlorobenzene	1.20E-03	9.41E-06	2.06E-07
								Fluoranthene	3.00E-06	2.35E-08	5.15E-10
								Fluorene	2.80E-06	2.20E-08	4.81E-10
								Formaldehyde	0.08	5.88E-04	1.29E-05
								Hexane	1.8	1.41E-02	3.09E-04
								Indeno(1,2,3-cd)pyrene	1.80E-06	1.41E-08	3.09E-10
								Naphthalene	6.10E-04	4.78E-06	1.05E-07
								Phenanthrene	1.70E-05	1.33E-07	2.92E-09
								Pyrene	5.00E-06	3.92E-08	8.59E-10
								Toluene	0.0034	2.67E-05	5.84E-07
								Arsenic	2.00E-04	1.57E-06	3.44E-08
								Beryllium	1.20E-05	9.41E-08	2.06E-09
								Cadmium	0.0011	8.63E-06	1.89E-07
								Chromium	0.0014	1.10E-05	2.40E-07
								Cobalt	8.40E-05	6.59E-07	1.44E-08
								Manganese	3.80E-04	2.98E-06	6.53E-08
								Mercury	2.60E-04	2.04E-06	4.47E-08
								Molybdenum	0.0011	8.63E-06	1.89E-07
								Nickel	0.0021	1.65E-05	3.61E-07
								Selenium	2.40E-05	1.88E-07	4.12E-09

Table A-8c. HAP Emissions - Natural Gas Combustion

Emission Unit ID	Emission Point ID	Emission Unit Description	Number of Units	Single Unit Rating (MMBtu/hr)	Annual Utilization (%)	Total Heat Input Rating [1]		Species	Emission Factors [2] (lb/MMscf)	Hourly Emissions [3] (lb/hr)	Annual Emissions [4] (tpy)
						(MMBtu/hr)	(MMBtu/yr)				
BF1	RMV1	Bit Furnace	1	0.225	100%	0	20	2-Methylnaphthalene	2.40E-05	5.29E-09	2.32E-10
								3-Methylcholanthrene	1.80E-06	3.97E-10	1.74E-11
								7,12-Dimethylbenz(a)anthracene	1.60E-05	3.53E-09	1.55E-10
								Acenaphthene	1.80E-06	3.97E-10	1.74E-11
								Acenaphthylene	1.80E-06	3.97E-10	1.74E-11
								Anthracene	2.40E-06	5.29E-10	2.32E-11
								Benz(a)anthracene	1.80E-06	3.97E-10	1.74E-11
								Benzene	0.0021	4.63E-07	2.03E-08
								Benzo(a)pyrene	1.20E-06	2.65E-10	1.16E-11
								Benzo(b)fluoranthene	1.80E-06	3.97E-10	1.74E-11
								Benzo(g,h,i)perylene	1.20E-06	2.65E-10	1.16E-11
								Benzo(k)fluoranthene	1.80E-06	3.97E-10	1.74E-11
								Chrysene	1.80E-06	3.97E-10	1.74E-11
								Dibenzo(a,h)anthracene	1.20E-06	2.65E-10	1.16E-11
								Dichlorobenzene	1.20E-03	2.65E-07	1.16E-08
								Fluoranthene	3.00E-06	6.62E-10	2.90E-11
								Fluorene	2.80E-06	6.18E-10	2.71E-11
								Formaldehyde	0.08	1.65E-05	7.25E-07
								Hexane	1.8	3.97E-04	1.74E-05
								Indeno(1,2,3-cd)pyrene	1.80E-06	3.97E-10	1.74E-11
								Naphthalene	6.10E-04	1.35E-07	5.89E-09
								Phenanthrene	1.70E-05	3.75E-09	1.64E-10
								Pyrene	5.00E-06	1.10E-09	4.83E-11
								Toluene	0.0034	7.50E-07	3.29E-08
								Arsenic	2.00E-04	4.41E-08	1.93E-09
								Beryllium	1.20E-05	2.65E-09	1.16E-10
								Cadmium	0.0011	2.43E-07	1.06E-08
								Chromium	0.0014	3.09E-07	1.35E-08
								Cobalt	8.40E-05	1.85E-08	8.12E-10
								Manganese	3.80E-04	8.38E-08	3.67E-09
								Mercury	2.60E-04	5.74E-08	2.51E-09
								Molybdenum	0.0011	2.43E-07	1.06E-08
								Nickel	0.0021	4.63E-07	2.03E-08
								Selenium	2.40E-05	5.29E-09	2.32E-10

Table A-8c. HAP Emissions - Natural Gas Combustion

Emission Unit ID	Emission Point ID	Emission Unit Description	Number of Units	Single Unit Rating (MMBtu/hr)	Annual Utilization (%)	Total Heat Input Rating [1] (MMBtu/hr)	Total Heat Input Rating [1] (MMBtu/yr)	Species	Emission Factors [2] (lb/MMscf)	Hourly Emissions [3] (lb/hr)	Annual Emissions [4] (tpy)
RMAUXHT	RMV1	Rolling Mill Comfort Heaters	20	0.4	50%	8	350	2-Methylnaphthalene	2.40E-05	1.88E-07	4.12E-09
								3-Methylcholanthrene	1.80E-06	1.41E-08	3.09E-10
								7,12-Dimethylbenz(a)anthracene	1.60E-05	1.25E-07	2.75E-09
								Acenaphthene	1.80E-06	1.41E-08	3.09E-10
								Acenaphthylene	1.80E-06	1.41E-08	3.09E-10
								Anthracene	2.40E-06	1.88E-08	4.12E-10
								Benz(a)anthracene	1.80E-06	1.41E-08	3.09E-10
								Benzene	0.0021	1.65E-05	3.61E-07
								Benzo(a)pyrene	1.20E-06	9.41E-09	2.06E-10
								Benzo(b)fluoranthene	1.80E-06	1.41E-08	3.09E-10
								Benzo(g,h,i)perylene	1.20E-06	9.41E-09	2.06E-10
								Benzo(k)fluoranthene	1.80E-06	1.41E-08	3.09E-10
								Chrysene	1.80E-06	1.41E-08	3.09E-10
								Dibenzo(a,h)anthracene	1.20E-06	9.41E-09	2.06E-10
								Dichlorobenzene	1.20E-03	9.41E-06	2.06E-07
								Fluoranthene	3.00E-06	2.35E-08	5.15E-10
								Fluorene	2.80E-06	2.20E-08	4.81E-10
								Formaldehyde	0.08	5.88E-04	1.29E-05
								Hexane	1.8	1.41E-02	3.09E-04
								Indeno(1,2,3-cd)pyrene	1.80E-06	1.41E-08	3.09E-10
								Naphthalene	6.10E-04	4.78E-06	1.05E-07
								Phenanthrene	1.70E-05	1.33E-07	2.92E-09
								Pyrene	5.00E-06	3.92E-08	8.59E-10
								Toluene	0.0034	2.67E-05	5.84E-07
								Arsenic	2.00E-04	1.57E-06	3.44E-08
								Beryllium	1.20E-05	9.41E-08	2.06E-09
								Cadmium	0.0011	8.63E-06	1.89E-07
								Chromium	0.0014	1.10E-05	2.40E-07
								Cobalt	8.40E-05	6.59E-07	1.44E-08
								Manganese	3.80E-04	2.98E-06	6.53E-08
								Mercury	2.60E-04	2.04E-06	4.47E-08
								Molybdenum	0.0011	8.63E-06	1.89E-07
								Nickel	0.0021	1.65E-05	3.61E-07
								Selenium	2.40E-05	1.88E-07	4.12E-09

Table A-8c. HAP Emissions - Natural Gas Combustion

Emission Unit ID	Emission Point ID	Emission Unit Description	Number of Units	Single Unit Rating (MMBtu/hr)	Annual Utilization (%)	Total Heat Input Rating [1]		Species	Emission Factors [2] (lb/MMscf)	Hourly Emissions [3] (lb/hr)	Annual Emissions [4] (tpy)
						(MMBtu/hr)	(MMBtu/yr)				
TORCH1	TORCH1	Cutting Torches	-	0.32	46%	0.32	12.85	2-Methylnaphthalene	2.40E-05	7.56E-09	1.51E-10
								3-Methylcholanthrene	1.80E-06	5.67E-10	1.13E-11
								7,12-Dimethylbenz(a)anthracene	1.60E-05	5.04E-09	1.01E-10
								Acenaphthene	1.80E-06	5.67E-10	1.13E-11
								Acenaphthylene	1.80E-06	5.67E-10	1.13E-11
								Anthracene	2.40E-06	7.56E-10	1.51E-11
								Benz(a)anthracene	1.80E-06	5.67E-10	1.13E-11
								Benzene	0.0021	6.61E-07	1.32E-08
								Benzo(a)pyrene	1.20E-06	3.78E-10	7.56E-12
								Benzo(b)fluoranthene	1.80E-06	5.67E-10	1.13E-11
								Benzo(g,h,i)perylene	1.20E-06	3.78E-10	7.56E-12
								Benzo(k)fluoranthene	1.80E-06	5.67E-10	1.13E-11
								Chrysene	1.80E-06	5.67E-10	1.13E-11
								Dibenzo(a,h)anthracene	1.20E-06	3.78E-10	7.56E-12
								Dichlorobenzene	1.20E-03	3.78E-07	7.56E-09
								Fluoranthene	3.00E-06	9.45E-10	1.89E-11
								Fluorene	2.80E-06	8.82E-10	1.76E-11
								Formaldehyde	0.08	2.36E-05	4.72E-07
								Hexane	1.8	5.67E-04	1.13E-05
								Indeno(1,2,3-cd)pyrene	1.80E-06	5.67E-10	1.13E-11
								Naphthalene	6.10E-04	1.92E-07	3.84E-09
								Phenanthrene	1.70E-05	5.35E-09	1.07E-10
								Pyrene	5.00E-06	1.57E-09	3.15E-11
								Toluene	0.0034	1.07E-06	2.14E-08
								Arsenic	2.00E-04	6.30E-08	1.26E-09
								Beryllium	1.20E-05	3.78E-09	7.56E-11
								Cadmium	0.0011	3.46E-07	6.93E-09
								Chromium	0.0014	4.41E-07	8.82E-09
								Cobalt	8.40E-05	2.64E-08	5.29E-10
								Manganese	3.80E-04	1.20E-07	2.39E-09
								Mercury	2.60E-04	8.19E-08	1.64E-09
								Molybdenum	0.0011	3.46E-07	6.93E-09
								Nickel	0.0021	6.61E-07	1.32E-08
								Selenium	2.40E-05	7.56E-09	1.51E-10

Table A-8c. HAP Emissions - Natural Gas Combustion

Emission Unit ID	Emission Point ID	Emission Unit Description	Number of Units	Single Unit Rating (MMBtu/hr)	Annual Utilization (%)	Total Heat Input Rating [1]		Species	Emission Factors [2] (lb/MMscf)	Hourly Emissions [3] (lb/hr)	Annual Emissions [4] (tpy)
						(MMBtu/hr)	(MMBtu/yr)				
-	CV1	Proposed Caster Vent	-	-	-	-	-	2-Methylnaphthalene	-	1.44E-06	5.87E-08
								3-Methylcholanthrene	-	1.08E-07	4.41E-09
								7,12-Dimethylbenz(a)anthracene	-	9.57E-07	3.92E-08
								Acenaphthene	-	1.08E-07	4.41E-09
								Acenaphthylene	-	1.08E-07	4.41E-09
								Anthracene	-	1.44E-07	5.87E-09
								Benz(a)anthracene	-	1.08E-07	4.41E-09
								Benzene	-	1.26E-04	5.14E-06
								Benzo(a)pyrene	-	7.18E-08	2.94E-09
								Benzo(b)fluoranthene	-	1.08E-07	4.41E-09
								Benzo(g,h,i)perylene	-	7.18E-08	2.94E-09
								Benzo(k)fluoranthene	-	1.08E-07	4.41E-09
								Chrysene	-	1.08E-07	4.41E-09
								Dibenzo(a,h)anthracene	-	7.18E-08	2.94E-09
								Dichlorobenzene	-	7.18E-05	2.94E-06
								Fluoranthene	-	1.79E-07	7.34E-09
								Fluorene	-	1.67E-07	6.85E-09
								Formaldehyde	-	4.49E-03	1.84E-04
								Hexane	-	1.08E-01	4.41E-03
								Indeno(1,2,3-cd)pyrene	-	1.08E-07	4.41E-09
								Naphthalene	-	3.65E-05	1.49E-06
								Phenanthrene	-	1.02E-06	4.16E-08
								Pyrene	-	2.99E-07	1.22E-08
								Toluene	-	2.03E-04	8.32E-06
								Arsenic	-	1.20E-05	4.90E-07
								Beryllium	-	7.18E-07	2.94E-08
								Cadmium	-	6.58E-05	2.69E-06
								Chromium	-	8.37E-05	3.43E-06
								Cobalt	-	5.02E-06	2.06E-07
								Manganese	-	2.27E-05	9.30E-07
								Mercury	-	1.55E-05	6.36E-07
								Molybdenum	-	6.58E-05	2.69E-06
								Nickel	-	1.26E-04	5.14E-06
								Selenium	-	1.44E-06	5.87E-08

Table A-8c. HAP Emissions - Natural Gas Combustion

Emission Unit ID	Emission Point ID	Emission Unit Description	Number of Units	Single Unit Rating (MMBtu/hr)	Annual Utilization (%)	Total Heat Input Rating [1]		Species	Emission Factors [2] (lb/MMscf)	Hourly Emissions [3] (lb/hr)	Annual Emissions [4] (tpy)
						(MMBtu/hr)	(MMBtu/yr)				
-	RMV1	Proposed Rolling Mill Vent	-	-	-	-	-	2-Methylnaphthalene	-	1.94E-07	4.35E-09
								3-Methylcholanthrene	-	1.45E-08	3.27E-10
								7,12-Dimethylbenz(a)anthracene	-	1.29E-07	2.90E-09
								Acenaphthene	-	1.45E-08	3.27E-10
								Acenaphthylene	-	1.45E-08	3.27E-10
								Anthracene	-	1.94E-08	4.35E-10
								Benz(a)anthracene	-	1.45E-08	3.27E-10
								Benzene	-	1.69E-05	3.81E-07
								Benzo(a)pyrene	-	9.68E-09	2.18E-10
								Benzo(b)fluoranthene	-	1.45E-08	3.27E-10
								Benzo(g,h,i)perylene	-	9.68E-09	2.18E-10
								Benzo(k)fluoranthene	-	1.45E-08	3.27E-10
								Chrysene	-	1.45E-08	3.27E-10
								Dibenzo(a,h)anthracene	-	9.68E-09	2.18E-10
								Dichlorobenzene	-	9.68E-06	2.18E-07
								Fluoranthene	-	2.42E-08	5.44E-10
								Fluorene	-	2.26E-08	5.08E-10
								Formaldehyde	-	6.05E-04	1.36E-05
								Hexane	-	1.45E-02	3.27E-04
								Indeno(1,2,3-cd)pyrene	-	1.45E-08	3.27E-10
								Naphthalene	-	4.92E-06	1.11E-07
								Phenanthrene	-	1.37E-07	3.08E-09
								Pyrene	-	4.03E-08	9.07E-10
								Toluene	-	2.74E-05	6.17E-07
								Arsenic	-	1.61E-06	3.63E-08
								Beryllium	-	9.68E-08	2.18E-09
								Cadmium	-	8.87E-06	2.00E-07
								Chromium	-	1.13E-05	2.54E-07
								Cobalt	-	6.77E-07	1.52E-08
								Manganese	-	3.06E-06	6.89E-08
								Mercury	-	2.10E-06	4.72E-08
								Molybdenum	-	8.87E-06	2.00E-07
								Nickel	-	1.69E-05	3.81E-07
								Selenium	-	1.94E-07	4.35E-09

Table A-8c. HAP Emissions - Natural Gas Combustion

Emission Unit ID	Emission Point ID	Emission Unit Description	Number of Units	Single Unit Rating (MMBtu/hr)	Annual Utilization (%)	Total Heat Input Rating [1]		Species	Emission Factors [2] (lb/MMscf)	Hourly Emissions [3] (lb/hr)	Annual Emissions [4] (tpy)
						(MMBtu/hr)	(MMBtu/yr)				
-	TORCH1	Cutting Torches	-	-	-	-	-	2-Methylnaphthalene	-	7.56E-09	1.51E-10
								3-Methylcholanthrene	-	5.67E-10	1.13E-11
								7,12-Dimethylbenz(a)anthracene	-	5.04E-09	1.01E-10
								Acenaphthene	-	5.67E-10	1.13E-11
								Acenaphthylene	-	5.67E-10	1.13E-11
								Anthracene	-	7.56E-10	1.51E-11
								Benz(a)anthracene	-	5.67E-10	1.13E-11
								Benzene	-	6.61E-07	1.32E-08
								Benzo(a)pyrene	-	3.78E-10	7.56E-12
								Benzo(b)fluoranthene	-	5.67E-10	1.13E-11
								Benzo(g,h,i)perylene	-	3.78E-10	7.56E-12
								Benzo(k)fluoranthene	-	5.67E-10	1.13E-11
								Chrysene	-	5.67E-10	1.13E-11
								Dibenzo(a,h)anthracene	-	3.78E-10	7.56E-12
								Dichlorobenzene	-	3.78E-07	7.56E-09
								Fluoranthene	-	9.45E-10	1.89E-11
								Fluorene	-	8.82E-10	1.76E-11
								Formaldehyde	-	2.36E-05	4.72E-07
								Hexane	-	5.67E-04	1.13E-05
								Indeno(1,2,3-cd)pyrene	-	5.67E-10	1.13E-11
								Naphthalene	-	1.92E-07	3.84E-09
								Phenanthrene	-	5.35E-09	1.07E-10
								Pyrene	-	1.57E-09	3.15E-11
								Toluene	-	1.07E-06	2.14E-08
								Arsenic	-	6.30E-08	1.26E-09
								Beryllium	-	3.78E-09	7.56E-11
								Cadmium	-	3.46E-07	6.93E-09
								Chromium	-	4.41E-07	8.82E-09
								Cobalt	-	2.64E-08	5.29E-10
								Manganese	-	1.20E-07	2.39E-09
								Mercury	-	8.19E-08	1.64E-09
								Molybdenum	-	3.46E-07	6.93E-09
								Nickel	-	6.61E-07	1.32E-08
								Selenium	-	7.56E-09	1.51E-10

[1] Hourly Total Heat Input Rating (MMBtu/hr) = Single Burner Rating (MMBtu/hr) x Number of Burners.
Annual Total Heat Input Rating (MMBtu/yr) = Hourly Total Heat Input Rating (MMBtu/hr) x 8,760 (hr/yr) x Annual Utilization (%) / 100.

[2] Emission factors are from AP-42 Section 1.4, Tables 1.4-3 and 1.4-4, July 1998.

[3] Hourly Emissions (lb/hr) = Hourly Total Heat Input Rating (MMBtu/hr) x Emission Factor (lb/MMscf) / 1,020 (Btu/scf).

[4] Annual Emissions (tpy) =Annual Total Heat Input Rating (MMBtu/yr) x Emission Factor (lb/MMscf) / 1,020 (Btu/scf) / 2,000 (lb/ton).

Table A-9. Emissions - Binder Usage

Emission Unit ID	Emission Point ID	Emission Unit Description	Binder Usage		Emission Factor [1, 2] (lb/lb binder)					Hourly Emissions [3] (lb/hr)					Annual Emissions [4] (tpy)				
			Hourly (lb/hr)	Annual (ton/yr)	Total PM	Total PM_{10}	Total $PM_{2.5}$	CO	VOC	Total PM	Total PM_{10}	Total $PM_{2.5}$	CO	VOC	Total PM	Total PM_{10}	Total $PM_{2.5}$	CO	VOC
LB1	CV1	Refractory Binder Usage - Ladle	2.12	7.52	0.010	0.010	0.010	0.15	0.02	0.021	0.021	0.021	0.32	0.042	0.075	0.075	0.075	1.13	0.15
TB1	CV1	Refractory Binder Usage - Tundish	1.28	4.51	0.010	0.010	0.010	0.15	0.02	0.013	0.013	0.013	0.19	0.026	0.045	0.045	0.045	0.68	0.090
CV1	***CV1***	***Caster Vent***	-	-	-	-	-	-	-	***0.034***	***0.034***	***0.034***	***0.51***	***0.068***	***0.12***	***0.12***	***0.12***	***1.80***	***0.24***

[1] Emission factors for PM, PM_{10}, $PM_{2.5}$, and CO based on process experience from other CMC micro-mills.
[2] Emission factors for VOC per estimated percent of binder resin pyrolyzed/oxidized.
[3] Hourly Emissions lb/hr) = Hourly Binder Usage lb/hr) x Emission Factor lb/lb binder).
[4] Annual Emissions (tpy) = Annual Binder Usage (tpy) x Emission Factor lb/lb binder).

Table A-10. Emissions - Material Handling

Emission Unit ID	Emission Point ID	Transfer Description	Material	Fine Content (%)	Throughput			Moisture Content (%)	Control Application	Control Efficiency (%)	Emission Factor [1] (lb/ton)			Hourly Emissions [2] (lb/hr)			Annual Emissions [3] (tpy)		
					(%)	(ton/hr)	(tpy)				Total PM	Total PM_{10}	Total $PM_{2.5}$	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total PM	Total PM_{10}	Total $PM_{2.5}$
DPEAF1	TR51A	Inside ECS Building Drop Points, Scrap	Scrap	1	-	830	3,380,000	1	Enclosed	85	1.72E-05	8.16E-06	1.24E-06	1.43E-02	6.77E-03	1.03E-03	2.92E-02	1.38E-02	2.09E-03
DPEAF1	TR51B	Outside ECS Building Drop Points, Scrap, Storage Area	Scrap	1	-	330	2,145,000	1	None	0	1.15E-04	5.44E-05	8.24E-06	3.79E-02	1.79E-02	2.72E-03	1.23E-01	5.83E-02	8.83E-03
DPEAF1	TR51C	Outside Rail Bins Drop Point, Scrap	Scrap	1	-	110	715,000	1	None	0	1.15E-04	5.44E-05	8.24E-06	1.26E-02	5.98E-03	9.06E-04	4.11E-02	1.94E-02	2.94E-03
DPEAF1	TR51D	Outside Truck Mixed Bins Drop Point, Scrap	Scrap	1	-	110	715,000	1	None	0	1.15E-04	5.44E-05	8.24E-06	1.26E-02	5.98E-03	9.06E-04	4.11E-02	1.94E-02	2.94E-03
DPEAF1	TR51E	Outside Truck Bins Drop Point, Scrap	Scrap	1	-	110	715,000	1	None	0	1.15E-04	5.44E-05	8.24E-06	1.26E-02	5.98E-03	9.06E-04	4.11E-02	1.94E-02	2.94E-03
DPF1	TR71	Inside ECS Building Drop Points, Fluxing Agent	Fluxing Agent	7	-	30	30,695	1	Enclosed	85	1.21E-04	5.71E-05	8.65E-06	3.62E-03	1.71E-03	2.59E-04	1.85E-03	8.76E-04	1.33E-04
DPAA1	TR81	Outside Drop Points, Alloy Aggregate	Alloy Aggregate	1	-	60	9,800	1	Partial Enclosure	85	1.72E-05	8.16E-06	1.24E-06	1.03E-03	4.90E-04	7.41E-05	8.45E-05	4.00E-05	6.05E-06
DPRW1	TR91A	Inside Drop Points, Removed Refractory and Other Materials	Removed Refractory / Other Materials	10	-	25	2,800	1	Enclosed	85	1.72E-04	8.16E-05	1.24E-05	4.31E-03	2.04E-03	3.09E-04	2.41E-04	1.14E-04	1.73E-05
DPRW1	TR91B	Outside Drop Points, Removed Refractory and Other Materials	Removed Refractory / Other Materials	10	-	25	2,800	1	None	85	1.72E-04	8.16E-05	1.24E-05	4.31E-03	2.04E-03	3.09E-04	2.41E-04	1.14E-04	1.73E-05
DPS1	TR11A	Outside SPP Pile Drop Points, Slag	Slag	2	-	820	338,542	12	Enclosed / Water	70	2.13E-06	1.01E-06	1.52E-07	1.74E-03	8.25E-04	1.25E-04	3.60E-04	1.70E-04	2.58E-05
		Drop from Loader to Primary Crusher No. 1 Feed Hopper	Slag	2	100%	100	223,029	4	Moisture Content of Material	-	3.30E-05	1.56E-05	2.37E-06	3.30E-03	1.56E-03	2.37E-04	3.68E-03	1.74E-03	2.64E-04
		Drop from Loader to Primary Crusher No. 2 Feed Hopper	Slag	2	-	250	557,572	4	Moisture Content of Material	-	3.30E-05	1.56E-05	2.37E-06	8.26E-03	3.90E-03	5.91E-04	9.21E-03	4.35E-03	6.59E-04
		Drop from Feed Hopper to Primary Crusher No. 1	Slag	2	100%	100	223,029	4	Moisture Content of Material	-	3.30E-05	1.56E-05	2.37E-06	3.30E-03	1.56E-03	2.37E-04	3.68E-03	1.74E-03	2.64E-04
		Drop from Feed Hopper to Primary Crusher No. 2	Slag	2	-	250	557,572	4	Moisture Content of Material	-	3.30E-05	1.56E-05	2.37E-06	8.26E-03	3.90E-03	5.91E-04	9.21E-03	4.35E-03	6.59E-04
		Primary Crusher No. 1	Slag	2	100%	100	223,029	4	Moisture Content of Material	-	3.30E-05	1.56E-05	2.37E-06	3.30E-03	1.56E-03	2.37E-04	3.68E-03	1.74E-03	2.64E-04
		Primary Crusher No. 2	Slag	2	-	250	557,572	4	Moisture Content of Material	-	3.30E-05	1.56E-05	2.37E-06	8.26E-03	3.90E-03	5.91E-04	9.21E-03	4.35E-03	6.59E-04
		Secondary Crusher No. 1	Slag	2	-	250	557,572	4	Moisture Content of Material	-	3.30E-05	1.56E-05	2.37E-06	8.26E-03	3.90E-03	5.91E-04	9.21E-03	4.35E-03	6.59E-04
		Drop onto Primary Crusher No. 1 Overs Pile	Slag	2	1%	1.0	2,230	4	Moisture Content of Material	-	3.30E-05	1.56E-05	2.37E-06	3.30E-05	1.56E-05	2.37E-06	3.68E-05	1.74E-05	2.64E-06
		Drop onto Primary Crusher No. 2 to Secondary Crusher No. 1	Slag	2	-	250	557,572	4	Moisture Content of Material	-	3.30E-05	1.56E-05	2.37E-06	8.26E-03	3.90E-03	5.91E-04	9.21E-03	4.35E-03	6.59E-04

Table A-10. Emissions - Material Handling

Emission Unit ID	Emission Point ID	Transfer Description	Material	Fine Content (%)	Throughput			Moisture Content (%)	Control Application	Control Efficiency (%)	Emission Factor [1] (lb/ton)			Hourly Emissions [2] (lb/hr)			Annual Emissions [3] (tpy)		
					(%)	(ton/hr)	(tpy)				Total PM	Total PM_{10}	Total $PM_{2.5}$	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total PM	Total PM_{10}	Total $PM_{2.5}$
DPS1	TR11B	Drop onto Secondary Crusher No. 1 Overs Pile	Slag	2	-	2.5	5,576	4	Moisture Content of Material	-	3.30E-05	1.56E-05	2.37E-06	8.26E-05	3.90E-05	5.91E-06	9.21E-05	4.35E-05	6.59E-06
		Drop from Primary Crusher No. 1 to Hopper Feeder	Slag	2	99%	99	220,798	4	Moisture Content of Material	-	3.30E-05	1.56E-05	2.37E-06	3.27E-03	1.55E-03	2.34E-04	3.65E-03	1.72E-03	2.61E-04
		Drop from Secondary Crusher No. 1 to Hopper Feeder	Slag	2	-	248	551,996	4	Moisture Content of Material	-	3.30E-05	1.56E-05	2.37E-06	8.17E-03	3.87E-03	5.85E-04	9.11E-03	4.31E-03	6.53E-04
		Drop from Hopper Feeder to Conveyor Belt No. 1	Slag	2	98.5%	341	761,202	4	Moisture Content of Material	-	3.30E-05	1.56E-05	2.37E-06	1.13E-02	5.33E-03	8.07E-04	1.26E-02	5.94E-03	9.00E-04
		Drop from Conveyor Belt No. 1 to Conveyor Belt No. 2	Slag	2	98.5%	341	761,202	4	Moisture Content of Material	-	3.30E-05	1.56E-05	2.37E-06	1.13E-02	5.33E-03	8.07E-04	1.26E-02	5.94E-03	9.00E-04
		Drop from Conveyor Belt No. 2 to Conveyor Belt No. 3	Slag	1	1.5%	5.2	11,592	4	Moisture Content of Material	-	1.65E-05	7.81E-06	1.18E-06	8.58E-05	4.06E-05	6.15E-06	9.57E-05	4.53E-05	6.85E-06
		Drop from Conveyor Belt No. 2 to Conveyor Belt No. 4	Slag	2	97%	336	749,610	4	Moisture Content of Material	-	3.30E-05	1.56E-05	2.37E-06	1.11E-02	5.25E-03	7.95E-04	1.24E-02	5.85E-03	8.86E-04
		Drop from Conveyor Belt No. 3 to Conveyor Belt No. 5	Slag	1	1.5%	5.2	11,592	4	Moisture Content of Material	-	1.65E-05	7.81E-06	1.18E-06	8.58E-05	4.06E-05	6.15E-06	9.57E-05	4.53E-05	6.85E-06
		Drop from Conveyor Belt No. 4 to Screen	Slag	2	97%	336	749,610	4	Moisture Content of Material	-	3.30E-05	1.56E-05	2.37E-06	1.11E-02	5.25E-03	7.95E-04	1.24E-02	5.85E-03	8.86E-04
		Screen - Screening	Slag	2	97%	336	749,610	4	Moisture Content of Material	-	3.30E-05	1.56E-05	2.37E-06	1.11E-02	5.25E-03	7.95E-04	1.24E-02	5.85E-03	8.86E-04
		Drop onto Screening Overs Pile	Slag	2	1%	3	7,728	4	Moisture Content of Material	-	3.30E-05	1.56E-05	2.37E-06	1.14E-04	5.41E-05	8.20E-06	1.28E-04	6.04E-05	9.14E-06
		Drop from Screen to Conveyor Belt No. 6	Slag	2	28.8%	100	222,565	4	Moisture Content of Material	-	3.30E-05	1.56E-05	2.37E-06	3.30E-03	1.56E-03	2.36E-04	3.67E-03	1.74E-03	2.63E-04
		Drop from Screen to Conveyor Belt No. 7	Slag	2	67.2%	233	519,318	4	Moisture Content of Material	-	3.30E-05	1.56E-05	2.37E-06	7.69E-03	3.64E-03	5.51E-04	8.57E-03	4.06E-03	6.14E-04
		Drop from Conveyor Belt No. 7 to Conveyor Belt No. 8	Slag	2	67.2%	233	519,318	4	Moisture Content of Material	-	3.30E-05	1.56E-05	2.37E-06	7.69E-03	3.64E-03	5.51E-04	8.57E-03	4.06E-03	6.14E-04
		Reject Pile to Trucks	Slag	2	-	2	3,864	4	Moisture Content of Material	-	3.30E-05	1.56E-05	2.37E-06	5.72E-05	2.71E-05	4.10E-06	6.38E-05	3.02E-05	4.57E-06
		Metallic Product Pile to Trucks	Slag	1	-	5.2	11,592	4	Moisture Content of Material	-	1.65E-05	7.81E-06	1.18E-06	8.58E-05	4.06E-05	6.15E-06	9.57E-05	4.53E-05	6.85E-06
		Thrus Product Pile to Trucks	Slag	2	-	233	519,318	4	Moisture Content of Material	-	3.30E-05	1.56E-05	2.37E-06	7.69E-03	3.64E-03	5.51E-04	8.57E-03	4.06E-03	6.14E-04
		2nd Deck Product Pile to Trucks	Slag	2	-	100	222,565	4	Moisture Content of Material	-	3.30E-05	1.56E-05	2.37E-06	3.30E-03	1.56E-03	2.36E-04	3.67E-03	1.74E-03	2.63E-04
		Jaw Crusher Overs Pile to Trucks	Slag	2	-	4	7,806	4	Moisture Content of Material	-	3.30E-05	1.56E-05	2.37E-06	1.16E-04	5.47E-05	8.28E-06	1.29E-04	6.10E-05	9.23E-06

Table A-10. Emissions - Material Handling

Emission Unit ID	Emission Point ID	Transfer Description	Material	Fine Content (%)	Throughput			Moisture Content (%)	Control Application	Control Efficiency (%)	Emission Factor [1] (lb/ton)			Hourly Emissions [2] (lb/hr)			Annual Emissions [3] (tpy)		
					(%)	(ton/hr)	(tpy)				Total PM	Total PM_{10}	Total $PM_{2.5}$	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total PM	Total PM_{10}	Total $PM_{2.5}$
		Screening Overs Pile to Trucks	Slag	2	-	3	7,728	4	Moisture Content of Material	-	3.30E-05	1.56E-05	2.37E-06	1.14E-04	5.41E-05	8.20E-06	1.28E-04	6.04E-05	9.14E-06
		Drop from Grizzly Hopper Feeder to Reject Pile	Slag	2	0.5%	1.7	3,864	4	Moisture Content of Material	-	3.30E-05	1.56E-05	2.37E-06	5.72E-05	2.71E-05	4.10E-06	6.38E-05	3.02E-05	4.57E-06
		Drop from Loader to Reject Pile	Slag	2	0.5%	1.7	3,864	4	Moisture Content of Material	-	3.30E-05	1.56E-05	2.37E-06	5.72E-05	2.71E-05	4.10E-06	6.38E-05	3.02E-05	4.57E-06
		Drop from Conveyor Belt No. 5 to Metal Pile	Slag	1	-	5.2	11,592	4	Moisture Content of Material	-	1.65E-05	7.81E-06	1.18E-06	8.58E-05	4.06E-05	6.15E-06	9.57E-05	4.53E-05	6.85E-06
		Drop from Loader to Metal Pile	Slag	1	-	5.2	11,592	4	Moisture Content of Material	-	1.65E-05	7.81E-06	1.18E-06	8.58E-05	4.06E-05	6.15E-06	9.57E-05	4.53E-05	6.85E-06
		Drop from Conveyor Belt No. 8 to Thrus Pile	Slag	2	-	233	519,318	4	Moisture Content of Material	-	3.30E-05	1.56E-05	2.37E-06	7.69E-03	3.64E-03	5.51E-04	8.57E-03	4.06E-03	6.14E-04
		Drop from Loader to Thrus Pile	Slag	2	-	233	519,318	4	Moisture Content of Material	-	3.30E-05	1.56E-05	2.37E-06	7.69E-03	3.64E-03	5.51E-04	8.57E-03	4.06E-03	6.14E-04
		Drop from Conveyor Belt No. 6 to 2nd Deck Pile	Slag	2	-	100	222,565	4	Moisture Content of Material	-	3.30E-05	1.56E-05	2.37E-06	3.30E-03	1.56E-03	2.36E-04	3.67E-03	1.74E-03	2.63E-04
		Drop from Loader to 2nd Deck Pile	Slag	2	-	100	222,565	4	Moisture Content of Material	-	3.30E-05	1.56E-05	2.37E-06	3.30E-03	1.56E-03	2.36E-04	3.67E-03	1.74E-03	2.63E-04
DPRS1	TR131	Outside Drop Points, Residual Scrap Pile	Residual Scrap	2	-	25	2,800	1	None	0	2.30E-04	1.09E-04	1.65E-05	5.75E-03	2.72E-03	4.12E-04	3.22E-04	1.52E-04	2.31E-05
DPMS1	TR141	Outside Drop Points, Mill Scale Pile	Mill Scale	15	-	60	9,800	1	Partial Enclosure	85	2.59E-04	1.22E-04	1.85E-05	1.55E-02	7.34E-03	1.11E-03	1.27E-03	6.00E-04	9.08E-05
		Total															**0.47**	**0.22**	**0.034**

[1] Emission factors for material handling per AP-42, Section 13.2.4, November 2006.

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

where k = Particle size multiplier (dimensionless)

PM	PM_{10}	$PM_{2.5}$
0.74	0.35	0.053

U = Mean wind speed (mph)
7.99
Per meteorological data collected at Hagerstown Airport station for period between 2017 and 2021.
M = Material moisture content (%)

Emission factors for controlled tertiary crushing per AP-42 Section 11.19.2, Table 11.19.2-2, August 2004 conservatively used for primary crushing operation.
Emission factors for controlled screen per AP-42 Section 11.19.2, Table 11.19.2-2, August 2004.

[2] Hourly Emissions lb/hr) = Max Hourly Throughput (ton/hr) x Fine Content (%) / 100 x Emission Factor lb/ton) x (1 - Control Efficiency (%) / 100).

[3] Annual Emissions (tpy) = Annual Throughput (tpy) x Fine Content (%) / 100 x Emission Factor lb/ton) x (1 - Control Efficiency (%) / 100) / 2,000 lb/ton).

Table A-11. Emissions - Ball Drop Crushing

Emission Unit ID	Emission Point ID	Transfer Description	Material	Moisture Content (%)	Max Hourly Throughput (ton/hr)		Emission Factor [2] (lb/ton)			Hourly Emissions [3] (lb/hr)			Annual Emissions [4] (tpy)		
					(ton/hr)	(tpy)	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total PM	Total PM_{10}	Total $PM_{2.5}$
CR1	CR1	Ball Drop Crushing	Large Slag	1	8	8,200	0.0012	0.00054	0.00010	0.0096	0.0043	0.00080	0.0049	0.0022	0.00041

[1] Ball drop throughput is nominal maximum capacity based on CMC's operational experience.

[2] Emission factor for controlled tertiary crushing per AP-42 Section 11.19.2, Table 11.19.2-2, August 2004.

[3] Hourly Emissions Increase lb/hr) = Max Hourly Throughput Increase (ton/hr) x Emission Factor (lb/ton)

[4] Annual Emissions Increase (tpy) = Annual Throughput Increase (tpy) x Emission Factor lb/ton) / 2,000 (lb/ton)

Table A-12. Emissions - Storage Piles

Emission Unit ID	Emission Point ID	Pile Description	Material	Max. Pile Area (ft^2)	Approx Pile Side Length (ft)	Silt Content (%)	Control Application	Control Efficiency (%)	Emission Factor [1, 2] (lb/day/acre)			Hourly Emissions [3, 4] (lb/hr)			Annual Emissions [3, 5] (tpy)		
									Total PM	Total PM_{10}	Total $PM_{2.5}$	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total PM	Total PM_{10}	Total $PM_{2.5}$
EAF1P	W51A	ECS Scrap Building Storage Pile A	Scrap	6,000	77	4.3	Partial Enclosure	85	1.18	0.59	0.09	0.0068	0.0034	0.00051	0.030	0.015	0.0023
EAF1P	W51B	ECS Scrap Building Storage Pile B	Scrap	5,400	73	4.3	Partial Enclosure	85	1.18	0.59	0.09	0.0061	0.0031	0.00046	0.027	0.013	0.0020
EAF1P	W51C	ECS Scrap Building Storage Pile C	Scrap	5,300	73	4.3	Partial Enclosure	85	1.18	0.59	0.09	0.0060	0.0030	0.00045	0.026	0.013	0.0020
EAF1P	W51D	ECS Scrap Building Overage Scrap Pile	Scrap	12,100	110	4.3	None	-	7.89	3.94	0.60	0.091	0.046	0.0069	0.40	0.20	0.030
EAF1P	W51E	Outside Rail Scrap 5k Pile A	Scrap	11,000	105	4.3	None	-	7.89	3.94	0.60	0.083	0.041	0.0063	0.36	0.18	0.028
EAF1P	W51F	Outside Rail Scrap 5k Pile B	Scrap	11,000	105	4.3	None	-	7.89	3.94	0.60	0.083	0.041	0.0063	0.36	0.18	0.028
EAF1P	W51G	Outside Rail Scrap 5k Pile C	Scrap	11,000	105	4.3	None	-	7.89	3.94	0.60	0.083	0.041	0.0063	0.36	0.18	0.028
EAF1P	W51H	Outside Rail Scrap 5k Pile D	Scrap	11,000	105	4.3	None	-	7.89	3.94	0.60	0.083	0.041	0.0063	0.36	0.18	0.028
EAF1P	W51I	Outside Truck Mixed 8k Pile A	Scrap	13,600	117	4.3	None	-	7.89	3.94	0.60	0.10	0.051	0.0078	0.45	0.22	0.034
EAF1P	W51J	Outside Truck Mixed 8k Pile B	Scrap	14,700	121	4.3	None	-	7.89	3.94	0.60	0.11	0.055	0.0084	0.49	0.24	0.037
EAF1P	W51K	Outside Truck Scrap 5k Pile A	Scrap	11,000	105	4.3	None	-	7.89	3.94	0.60	0.083	0.041	0.0063	0.36	0.18	0.028
EAF1P	W51L	Outside Truck Scrap 5k Pile B	Scrap	11,000	105	4.3	None	-	7.89	3.94	0.60	0.083	0.041	0.0063	0.36	0.18	0.028
EAF1P	W51M	Outside Truck Scrap 5k Pile C	Scrap	11,000	105	4.3	None	-	7.89	3.94	0.60	0.083	0.041	0.0063	0.36	0.18	0.028
EAF1P	W51N	Outside Truck Scrap 5k Pile D	Scrap	11,000	105	4.3	None	-	7.89	3.94	0.60	0.083	0.041	0.0063	0.36	0.18	0.028
AAP1	W61	Alloy Aggregate Storage Pile	Alloy Aggregate	1,000	32	2.3	Partial Enclosure	85	0.63	0.32	0.05	0.00061	0.00030	0.000046	0.0027	0.0013	0.00020
SPP1	W71A	SPP Slag Storage Pile	Slag	17,100	131	5.3	None	-	9.72	4.86	0.74	0.16	0.079	0.012	0.70	0.35	0.053
		SPP Reject Pile	Slag	170	13	5.3	Water	85	1.46	0.73	0.11	0.00024	0.00012	0.000018	0.0010	0.00052	0.000079

Table A-12. Emissions - Storage Piles

Emission Unit ID	Emission Point ID	Pile Description	Material	Max. Pile Area (ft^2)	Approx Pile Side Length (ft)	Silt Content (%)	Control Application	Control Efficiency (%)	Emission Factor [1, 2] (lb/day/acre)			Hourly Emissions [3, 4] (lb/hr)			Annual Emissions [3, 5] (tpy)		
									Total PM	Total PM_{10}	Total $PM_{2.5}$	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total PM	Total PM_{10}	Total $PM_{2.5}$
SPP1	W71B	SPP Metallic Product Pile	Slag	170	13	5.3	None	-	9.72	4.86	0.74	0.0016	0.00079	0.00012	0.0069	0.0035	0.00052
		SPP Thrus Product Pile	Slag	11,390	107	5.3	Water	85	1.46	0.73	0.11	0.016	0.0079	0.0012	0.070	0.035	0.0053
		SPP 2nd Deck Product Pile	Slag	4,930	70	5.3	Water	85	1.46	0.73	0.11	0.0069	0.0034	0.00052	0.030	0.015	0.0023
		SPP Jaw Crusher Overs Pile	Slag	170	13	5.3	Water	85	1.46	0.73	0.11	0.00024	0.00012	0.000018	0.0010	0.00052	0.000079
		SPP Screening Overs Pile	Slag	170	13	5.3	Water	85	1.46	0.73	0.11	0.00024	0.00012	0.000018	0.0010	0.00052	0.000079
RSP1	W81	Residual Scrap Storage Pile in Scrap Yard	Residual Scrap	21,300	146	5.3	None	-	9.72	4.86	0.74	0.20	0.099	0.015	0.87	0.43	0.066
MSP1	W111	Mill Scale Pile	Mill Scale	3,500	59	5.3	Partial Enclosure	85	1.46	0.73	0.11	0.0049	0.0024	0.00037	0.021	0.011	0.0016

1 Emission factors for storage piles per Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, EPA-450/2-92-004, September 1992.
The PM_{10} emission factor is half the PM emission.

$$EF = 1.7\left(\frac{s}{1.5}\right)\left(\frac{365-P}{235}\right)\left(\frac{f}{15}\right)$$

where
EF = PM Emission factor lb/day/acre)
s = Silt Content (%)
f = % of time the unobstructed wind speed exceeds 12 mph at the pile height
17
Per meteorological data collected at Hagertown Airport station for period between 2017 to 2021.
P = Days per year with at least 0.01 inch precipitation (days)
30
Per AP-42 figure 13.2.2-1, November 2006.

2 Per AP-42, Section 13.2.4, November 2006, the particle size multiplier used for calculating emission factors is as follows:
PM_{10} = 0.35
$PM_{2.5}$ = 0.053

3 The conversion from acre to ft^2 is 43,560 ft^2/acre

4 Hourly Emissions lb/hr) = Emission Factor (lb/day/acre) x Max. Pile Area (ft^2) / 43,560 (ft^2/acre) / 24 (hr/day).

5 Annual Emissions (tpy) = Emission Factor (lb/day/acre) x Max. Pile Area (ft^2) / 43,560 (ft^2/acre) x 365 (day/yr) / 2,000 lb/ton).

Table A-13a. Emission Factors - Paved Road

Emission Point ID	Description	Truck Type	Silt Loading	Vehicle Weight (tons)				Control Efficiency (%)	Paved Hourly Emission Factor (lb/Paved VMT) [1]			Paved Annual Emission Factor (lb/Paved VMT) [1]		
				Empty	Full	Average	Capacity		Total PM	Total PM_{10}	Total $PM_{2.5}$	Total PM	Total PM_{10}	Total $PM_{2.5}$
PR1	Paved Roads	Haul Truck	3.34	15	40	27.5	25	96	0.039	0.0077	0.0019	0.035	0.0070	0.0017
		Trailer	3.34	15	-	15	2	96	0.021	0.0042	0.0010	0.019	0.0037	0.00092
		Loader	3.34	26	43	34.5	17	96	0.049	0.010	0.0024	0.044	0.0088	0.0022
		Euclid/Roll-Off Truck	3.34	26	36	31	10	96	0.044	0.0088	0.0021	0.039	0.0079	0.0019
		Gas Cylinders Truck	3.34	4	8	6	4	96	0.0082	0.0016	0.00040	0.0074	0.0015	0.00036
		Forklift/Loader	3.34	4	8	6	4	96	0.0082	0.0016	0.00040	0.0074	0.0015	0.00036

[1] Emission factors for vehicular traffic on paved roads per U.S. EPA AP-42, Section 13.2.1 (Paved Roads), January 2011.

Short-Term

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

Annual

$$E_{ext} = [\,k\,(sL)^{0.91} \times (W)^{1.02}\,]\,(1 - P/4N)$$

E = size-specific emission factor lb/VMT)

k = Constant for equation

	PM	PM_{10}	$PM_{2.5}$
k =	0.011	0.0022	0.00054

Per AP-42 Table 13.2.1-1, January 2011

sL = road surface silt loading (g/m^2)

3.34

as accepted by MCAQD and EPA Region 9 for the PSD permit actions at the CMC operations in Arizona, which are substantially similar to the proposed project.

W = mean vehicle weight (tons)

P = Days per year with at least 0.01 inch precipitation

150

Per AP-42 Figure 13.2.1-2, January 2011, for West Virginia

N = Number of days in the averaging period

365

Table A-13b. Emission Factors - Unpaved Roads

Emission Point ID	Description	Truck Type	Silt Content	Vehicle Weight [3] (tons)				Control Efficiency (%)	Unpaved Hourly Emission Factor (lb/Unpaved VMT) [1]			Unpaved Annual Emission Factor (lb/Unpaved VMT) [1]		
				Empty	Full	Average	Capacity		Total PM	Total PM_{10}	Total $PM_{2.5}$	Total PM	Total PM_{10}	Total $PM_{2.5}$
UR1	Unpaved Roads	Haul Truck	6.0	15	40	27.5	25	80	1.63	0.44	0.044	0.96	0.257	0.0257
		Trailer	6.0	15	-	15	2	80	1.24	0.332	0.0332	0.73	0.195	0.0195
		Loader	6.0	26	43	34.5	17	80	1.81	0.48	0.048	1.07	0.284	0.0284
		Euclid/Roll-Off Truck	6.0	26	36	31	10	80	1.73	0.46	0.046	1.02	0.271	0.0271
		Gas Cylinders Truck	6.0	4	8	6	4	80	0.82	0.220	0.0220	0.49	0.129	0.0129
		Forklift/Loader	6.0	4	8	6	4	80	0.82	0.22	0.022	0.49	0.13	0.013

[1] Emission factors for vehicular traffic on unpaved roads per U.S. EPA AP-42, Section 13.2.2 (Unpaved Roads), November 2006.

Short-Term

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

Annual

$$E_{ext} = E\,[(365 - P)/365]$$

E = size-specific emission factor lb/VMT)

k, a, b = Constants for equation 1a

	PM	PM_{10}	$PM_{2.5}$
k =	4.9	1.5	0.15
a =	0.7	0.9	0.9
b =	0.45	0.45	0.45

Per AP-42 Table 13.2.2-2, November 2006

s = surface material silt content (%)

6

Per U.S. EPA AP-42 Section 13.2.2, November 2006

W = mean vehicle weight (tons)

P = Days per year with at least 0.01 inch precipitation

150

Per AP-42 Figure 13.2.1-2, January 2011, for West Virginia

Table A-14. Roads Post-Project PTE

Truck ID	**Road Type (%)**		**Truck Type**	**Origin**	**Destination**	**Material**	**Vehicle Miles Travelled**					
							Hourly (VMT/hr)			**Annual (VMT/yr)**		
	Paved	**Unpaved**					**Paved**	**Unpaved**	**Total**	**Paved**	**Unpaved**	**Total**
TRK1	100%	0%	Haul Truck	Off-Site	ECS Building Scrap Bay	Scrap	0.99	0.00	0.99	3,300	0	3,300
TRK2	100%	0%	Haul Truck	Off-Site	Scrap Yard	Scrap	1.31	0.00	1.31	1,868	0	1,868
TRK3	66%	34%	Euclid/Roll-Off Truck	Around Scrap Yard	Around Scrap Yard	Scrap	0.52	0.26	0.78	736	371	1,107
TRK4	66%	34%	Haul Truck	Around Scrap Yard	Around Scrap Yard	Scrap	0.52	0.26	0.78	736	371	1,107
TRK5	100%	0%	Haul Truck	Off-Site	Silos	Coal/Coke	4.23	0.00	4.23	688	0	688
TRK6	100%	0%	Euclid/Roll-off Truck	Off-Site	Storage	Raw Materials / Supplies	2.40	0.00	2.40	279	0	279
TRK7	100%	0%	Forklift/Loader	Storage	Meltshop	Raw Materials / Supplies	0.13	0.00	0.13	15	0	15
TRK8	100%	0%	Haul Truck	Off-Site	Silos	Fluxing Agent	6.35	0.00	6.35	1,529	0	1,529
TRK9	100%	0%	Haul Truck	Off-Site	Alloy Pile	Alloy Aggregate	2.47	0.00	2.47	587	0	587
TRK10	100%	0%	Haul Truck	Meltshop	Off-Site	Removed Refractory / Other Materials	1.29	0.00	1.29	15	0	15
TRK11	100%	0%	Haul Truck	Finished Products Storage	Off-Site	Finished Product	5.62	0.00	5.62	26,618	0	26,618
TRK12	100%	0%	Gas Cylinders Truck	Off-Site	Gas Storage Area	Gas Cylinders	2.25	0.00	2.25	847	0	847
TRK13	100%	0%	Haul Truck	Mill Scale Pile	Off-Site	Mill Scale	1.42	0.00	1.42	17	0	17
TRK14	19%	81%	Euclid/Roll-off Truck	Meltshop	Quench Building	Slag	0.07	0.29	0.35	405	1,780	2,184
TRK15	0%	100%	Euclid/Roll-off Truck	Quench Building	SPP Area	Slag	0.00	0.06	0.06	0	352	352
TRK16	0%	100%	Loader	Within SPP Area	Within SPP Area	Slag	0.00	0.05	0.05	0	305	305
TRK17	80%	20%	Haul Truck	SPP Area	Off-Site	Slag	0.90	0.22	1.12	5,560	1,351	6,910
TRK18	100%	0%	Trailer	Trailer Parking Area	Trailer Parking Area	-	0.86	0.00	0.86	4,090	0	4,090
TRK19	87%	13%	Loader	General Support	General Support	-	8.67	1.35	10.02	26,834	4,166	31,000
Paved			***Total***				***40.00***			***74,123***		
Unpaved			***Total***					***2.48***			***8,696***	

Table A-14. Roads Post-Project PTE

Truck ID	Road Type (%)		Truck Type	Origin	Emission Factor (lb/VMT)											
					Hourly						Annual					
					Paved			Unpaved			Paved			Unpaved		
	Paved	Unpaved			Total PM	Total PM_{10}	Total $PM_{2.5}$	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total PM	Total PM_{10}	Total $PM_{2.5}$
TRK1	100%	0%	Haul Truck	Off-Site	0.039	0.0077	0.0019	1.63	0.44	0.044	0.035	0.0070	0.0017	0.96	0.26	0.026
TRK2	100%	0%	Haul Truck	Off-Site	0.039	0.0077	0.0019	1.63	0.44	0.044	0.035	0.0070	0.0017	0.96	0.26	0.026
TRK3	66%	34%	Euclid/Roll-Off Truck	Around Scrap Yard	0.044	0.0088	0.0021	1.73	0.46	0.046	0.039	0.0079	0.0019	1.02	0.27	0.027
TRK4	66%	34%	Haul Truck	Around Scrap Yard	0.039	0.0077	0.0019	1.63	0.44	0.044	0.035	0.0070	0.0017	0.96	0.26	0.026
TRK5	100%	0%	Haul Truck	Off-Site	0.039	0.0077	0.0019	1.63	0.44	0.044	0.035	0.0070	0.0017	0.96	0.26	0.026
TRK6	100%	0%	Euclid/Roll-off Truck	Off-Site	0.044	0.0088	0.0021	1.73	0.46	0.046	0.039	0.0079	0.0019	1.02	0.27	0.027
TRK7	100%	0%	Forklift/Loader	Storage	0.008	0.0016	0.0004	0.82	0.22	0.022	0.007	0.0015	0.0004	0.49	0.13	0.013
TRK8	100%	0%	Haul Truck	Off-Site	0.039	0.0077	0.0019	1.63	0.44	0.044	0.035	0.0070	0.0017	0.96	0.26	0.026
TRK9	100%	0%	Haul Truck	Off-Site	0.039	0.0077	0.0019	1.63	0.44	0.044	0.035	0.0070	0.0017	0.96	0.26	0.026
TRK10	100%	0%	Haul Truck	Meltshop	0.039	0.0077	0.0019	1.63	0.44	0.044	0.035	0.0070	0.0017	0.96	0.26	0.026
TRK11	100%	0%	Haul Truck	Finished Products Storage	0.039	0.0077	0.0019	1.63	0.44	0.044	0.035	0.0070	0.0017	0.96	0.26	0.026
TRK12	100%	0%	Gas Cylinders Truck	Off-Site	0.008	0.0016	0.0004	0.82	0.22	0.022	0.007	0.0015	0.0004	0.49	0.13	0.013
TRK13	100%	0%	Haul Truck	Mill Scale Pile	0.039	0.0077	0.0019	1.63	0.44	0.044	0.035	0.0070	0.0017	0.96	0.26	0.026
TRK14	19%	81%	Euclid/Roll-off Truck	Meltshop	0.044	0.0088	0.0021	1.73	0.46	0.046	0.039	0.0079	0.0019	1.02	0.27	0.027
TRK15	0%	100%	Euclid/Roll-off Truck	Quench Building	0.044	0.0088	0.0021	1.73	0.46	0.046	0.039	0.0079	0.0019	1.02	0.27	0.027
TRK16	0%	100%	Loader	Within SPP Area	0.049	0.0098	0.0024	1.81	0.48	0.048	0.044	0.0088	0.0022	1.07	0.28	0.028
TRK17	80%	20%	Haul Truck	SPP Area	0.039	0.0077	0.0019	1.63	0.44	0.044	0.035	0.0070	0.0017	0.96	0.26	0.026
TRK18	100%	0%	Trailer	Trailer Parking Area	0.021	0.0042	0.0010	1.24	0.33	0.033	0.019	0.0037	0.0009	0.73	0.20	0.020
TRK19	87%	13%	Loader	General Support	0.049	0.0098	0.0024	1.81	0.48	0.048	0.044	0.0088	0.0022	1.07	0.28	0.028
Paved Unpaved			***Total Total***													

Table A-14. Roads Post-Project PTE

Truck ID	Road Type (%)		Truck Type	Origin	Hourly Emissions (lb/hr)								
					Paved			Unpaved			Total		
	Paved	Unpaved			Total PM	Total PM_{10}	Total $PM_{2.5}$	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total PM	Total PM_{10}	Total $PM_{2.5}$
TRK1	100%	0%	Haul Truck	Off-Site	3.85E-02	7.71E-03	1.89E-03	0.00E+00	0.00E+00	0.00E+00	3.85E-02	7.71E-03	1.89E-03
TRK2	100%	0%	Haul Truck	Off-Site	5.09E-02	1.02E-02	2.50E-03	0.00E+00	0.00E+00	0.00E+00	5.09E-02	1.02E-02	2.50E-03
TRK3	66%	34%	Euclid/Roll-Off Truck	Around Scrap Yard	2.27E-02	4.53E-03	1.11E-03	4.51E-01	1.20E-01	1.20E-02	4.73E-01	1.25E-01	1.31E-02
TRK4	66%	34%	Haul Truck	Around Scrap Yard	2.01E-02	4.01E-03	9.85E-04	4.27E-01	1.14E-01	1.14E-02	4.47E-01	1.18E-01	1.24E-02
TRK5	100%	0%	Haul Truck	Off-Site	1.64E-01	3.28E-02	8.05E-03	0.00E+00	0.00E+00	0.00E+00	1.64E-01	3.28E-02	8.05E-03
TRK6	100%	0%	Euclid/Roll-off Truck	Off-Site	1.05E-01	2.10E-02	5.16E-03	0.00E+00	0.00E+00	0.00E+00	1.05E-01	2.10E-02	5.16E-03
TRK7	100%	0%	Forklift/Loader	Storage	1.07E-03	2.14E-04	5.26E-05	0.00E+00	0.00E+00	0.00E+00	1.07E-03	2.14E-04	5.26E-05
TRK8	100%	0%	Haul Truck	Off-Site	2.46E-01	4.92E-02	1.21E-02	0.00E+00	0.00E+00	0.00E+00	2.46E-01	4.92E-02	1.21E-02
TRK9	100%	0%	Haul Truck	Off-Site	9.56E-02	1.91E-02	4.69E-03	0.00E+00	0.00E+00	0.00E+00	9.56E-02	1.91E-02	4.69E-03
TRK10	100%	0%	Haul Truck	Meltshop	5.00E-02	1.00E-02	2.45E-03	0.00E+00	0.00E+00	0.00E+00	5.00E-02	1.00E-02	2.45E-03
TRK11	100%	0%	Haul Truck	Finished Products Storage	2.18E-01	4.35E-02	1.07E-02	0.00E+00	0.00E+00	0.00E+00	2.18E-01	4.35E-02	1.07E-02
TRK12	100%	0%	Gas Cylinders Truck	Off-Site	1.84E-02	3.68E-03	9.04E-04	0.00E+00	0.00E+00	0.00E+00	1.84E-02	3.68E-03	9.04E-04
TRK13	100%	0%	Haul Truck	Mill Scale Pile	5.51E-02	1.10E-02	2.71E-03	0.00E+00	0.00E+00	0.00E+00	5.51E-02	1.10E-02	2.71E-03
TRK14	19%	81%	Euclid/Roll-off Truck	Meltshop	2.86E-03	5.72E-04	1.41E-04	4.96E-01	1.32E-01	1.32E-02	4.99E-01	1.33E-01	1.34E-02
TRK15	0%	100%	Euclid/Roll-off Truck	Quench Building	0.00E+00	0.00E+00	0.00E+00	9.80E-02	2.61E-02	2.61E-03	9.80E-02	2.61E-02	2.61E-03
TRK16	0%	100%	Loader	Within SPP Area	0.00E+00	0.00E+00	0.00E+00	8.92E-02	2.38E-02	2.38E-03	8.92E-02	2.38E-02	2.38E-03
TRK17	80%	20%	Haul Truck	SPP Area	3.48E-02	6.96E-03	1.71E-03	3.57E-01	9.51E-02	9.51E-03	3.92E-01	1.02E-01	1.12E-02
TRK18	100%	0%	Trailer	Trailer Parking Area	1.80E-02	3.60E-03	8.84E-04	0.00E+00	0.00E+00	0.00E+00	1.80E-02	3.60E-03	8.84E-04
TRK19	87%	13%	Loader	General Support	4.23E-01	8.47E-02	2.08E-02	2.44E+00	6.49E-01	6.49E-02	2.86E+00	7.34E-01	8.57E-02
Paved			***Total***		***1.56***	***0.31***	***0.08***						
Unpaved			***Total***					***4.35***	***1.16***	***0.12***			

Table A-14. Roads Post-Project PTE

Truck ID	Road Type (%)		Truck Type	Origin	Annual Emissions (tpy)								
					Paved			Unpaved			Total		
	Paved	Unpaved			Total PM	Total PM_{10}	Total $PM_{2.5}$	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total PM	Total PM_{10}	Total $PM_{2.5}$
TRK1	100%	0%	Haul Truck	Off-Site	5.74E-02	1.15E-02	2.82E-03	0.00E+00	0.00E+00	0.00E+00	5.74E-02	1.15E-02	2.82E-03
TRK2	100%	0%	Haul Truck	Off-Site	3.25E-02	6.49E-03	1.59E-03	0.00E+00	0.00E+00	0.00E+00	3.25E-02	6.49E-03	1.59E-03
TRK3	66%	34%	Euclid/Roll-Off Truck	Around Scrap Yard	1.45E-02	2.89E-03	7.10E-04	1.89E-01	5.03E-02	5.03E-03	2.03E-01	5.32E-02	5.74E-03
TRK4	66%	34%	Haul Truck	Around Scrap Yard	1.28E-02	2.56E-03	6.28E-04	1.79E-01	4.76E-02	4.76E-03	1.92E-01	5.02E-02	5.39E-03
TRK5	100%	0%	Haul Truck	Off-Site	1.20E-02	2.39E-03	5.87E-04	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.39E-03	5.87E-04
TRK6	100%	0%	Euclid/Roll-off Truck	Off-Site	5.47E-03	1.09E-03	2.69E-04	0.00E+00	0.00E+00	0.00E+00	5.47E-03	1.09E-03	2.69E-04
TRK7	100%	0%	Forklift/Loader	Storage	5.57E-05	1.11E-05	2.74E-06	0.00E+00	0.00E+00	0.00E+00	5.57E-05	1.11E-05	2.74E-06
TRK8	100%	0%	Haul Truck	Off-Site	2.66E-02	5.31E-03	1.30E-03	0.00E+00	0.00E+00	0.00E+00	2.66E-02	5.31E-03	1.30E-03
TRK9	100%	0%	Haul Truck	Off-Site	1.02E-02	2.04E-03	5.01E-04	0.00E+00	0.00E+00	0.00E+00	1.02E-02	2.04E-03	5.01E-04
TRK10	100%	0%	Haul Truck	Meltshop	2.69E-04	5.38E-05	1.32E-05	0.00E+00	0.00E+00	0.00E+00	2.69E-04	5.38E-05	1.32E-05
TRK11	100%	0%	Haul Truck	Finished Products Storage	4.63E-01	9.25E-02	2.27E-02	0.00E+00	0.00E+00	0.00E+00	4.63E-01	9.25E-02	2.27E-02
TRK12	100%	0%	Gas Cylinders Truck	Off-Site	3.11E-03	6.23E-04	1.53E-04	0.00E+00	0.00E+00	0.00E+00	3.11E-03	6.23E-04	1.53E-04
TRK13	100%	0%	Haul Truck	Mill Scale Pile	2.97E-04	5.94E-05	1.46E-05	0.00E+00	0.00E+00	0.00E+00	2.97E-04	5.94E-05	1.46E-05
TRK14	19%	81%	Euclid/Roll-off Truck	Meltshop	7.95E-03	1.59E-03	3.90E-04	9.04E-01	2.41E-01	2.41E-02	9.12E-01	2.43E-01	2.45E-02
TRK15	0%	100%	Euclid/Roll-off Truck	Quench Building	0.00E+00	0.00E+00	0.00E+00	1.79E-01	4.76E-02	4.76E-03	1.79E-01	4.76E-02	4.76E-03
TRK16	0%	100%	Loader	Within SPP Area	0.00E+00	0.00E+00	0.00E+00	1.63E-01	4.33E-02	4.33E-03	1.63E-01	4.33E-02	4.33E-03
TRK17	80%	20%	Haul Truck	SPP Area	9.66E-02	1.93E-02	4.74E-03	6.50E-01	1.73E-01	1.73E-02	7.47E-01	1.93E-01	2.21E-02
TRK18	100%	0%	Trailer	Trailer Parking Area	3.83E-02	7.66E-03	1.88E-03	0.00E+00	0.00E+00	0.00E+00	3.83E-02	7.66E-03	1.88E-03
TRK19	87%	13%	Loader	General Support	5.88E-01	1.18E-01	2.89E-02	2.22E+00	5.92E-01	5.92E-02	2.81E+00	7.10E-01	8.81E-02
Paved			***Total***		***1.37***	***0.27***	***0.067***						
Unpaved			***Total***					***4.49***	***1.20***	***0.12***			

Table A-15a. Emissions - Emergency Generators

Emission Unit ID	Emission Point ID	Emission Unit Description	Engine Tier	Rating		Operation [1]	Pollutant								
				(hp)	(kW)	(hr/yr)	Total $PM/PM_{10}/PM_{2.5}$	NO_X	CO	VOC	SO_2 (wt% S)	CO_2	CH_4	N_2O	CO_2e
EGEN1	EGEN1	Emergency Generator 1	Model Year 2006+, Tier 3 Engine	1,600	1,193	100	Emission Factor [2] (g/kW-hr)								
							0.20	3.73	3.50	0.27	0.0015	694.26	0.028	0.0056	696.64
							Emission Factor [3] (g/hp-hr)								
							0.15	2.78	2.61	0.20	-	517.72	0.021	0.0042	519.50
							Hourly Emissions [4] (lb/hr)								
							0.53	9.82	9.21	0.70	0.0174	1826.20	0.074	0.0148	1,832.47
							Annual Emissions (tpy)								
							0.0263	0.491	0.460	0.0351	0.00087	91.31	0.00370	0.00074	91.62
EFWP1	EFWP1	Emergency Fire Water Pump 1	Model Year 2006+, Tier 3 Engine	300	224	100	Emission Factor [2] (g/kW-hr)								
							0.20	3.73	3.50	0.27	0.0015	694.26	0.028	0.0056	696.64
							Emission Factor [3] (g/hp-hr)								
							0.15	2.78	2.61	0.20	-	517.72	0.021	0.0042	519.50
							Hourly Emissions [4] (lb/hr)								
							0.10	1.84	1.73	0.13	0.0033	342.41	0.014	0.0028	343.59
							Annual Emissions (tpy)								
							0.0049	0.09	0.086	0.0066	0.00016	17.12	0.00069	0.00014	17.18

[1] Hours of operation for testing and maintenance, are being limited consistent with the requirements of 40 CFR Part 60, Subpart IIII.

[2] Based on NSPS Subpart IIII, referencing Table 1 to 40 CFR 89.112 with emissions of VOC and NO_x speciated based Table 4-6 of the EPA publication “Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling – Compression Ignition”, EPA420-P-02-016.

GHG emission based on the following

For CO_2	73.96	kg/MMBtu	per 40 CFR Part 98, Subpart C, Table C-1
For CH_4	0.0030	kg/MMBtu	per 40 CFR Part 98, Subpart C, Table C-2
For N_2O	0.00060	kg/MMBtu	per 40 CFR Part 98, Subpart C, Table C-2

CO_2e calculated using Global Warming Potentials (GWPs) from of 40 CFR Part 98, Table A-1, December 2014.

CO_2 GWP =	1
CH_4 GWP =	25
N_2O GWP =	298

[3] Emission factor converted to g/hp-hr from g/kW-hr assuming 1.341 hp/kW

[4] Sulfur Dioxide calculated based on maximum fuel sulfur content 15 ppmw

Average brake specific fuel consumption of 7,000 Btu/hp-hr

Diesel heating value of 19,300 Btu/lb

Table A-15b. HAP Emissions - Diesel Emergency Water Pump

Pollutant	Emission Factors [1] lb/MMBtu	Hourly Emissions [2] (lb/hr)	Annual Emissions [3] (tpy)	Hourly Emissions [2] (lb/hr)	Annual Emissions [3] (tpy)
Emission Unit ID		EGEN1		EFWP1	
Emission Point ID		EGEN1		EFWP1	
Emission Unit Description		Emergency Generator 1		Emergency Fire Water Pump 1	
Benzene	9.33E-04	1.04E-02	5.22E-04	1.96E-03	9.80E-05
Toluene	4.09E-04	4.58E-03	2.29E-04	8.59E-04	4.29E-05
Xylene	2.85E-04	3.19E-03	1.60E-04	5.99E-04	2.99E-05
1,3-Butadiene	3.91E-05	4.38E-04	2.19E-05	8.21E-05	4.11E-06
Formaldehyde	1.18E-03	1.32E-02	6.61E-04	2.48E-03	1.24E-04
Acetaldehyde	7.67E-04	8.59E-03	4.30E-04	1.61E-03	8.05E-05
Acrolein	9.25E-05	1.04E-03	5.18E-05	1.94E-04	9.71E-06
Naphthalene	8.48E-05	9.50E-04	4.75E-05	1.78E-04	8.90E-06
Acenaphthylene	5.06E-06	5.67E-05	2.83E-06	1.06E-05	5.31E-07
Acenaphthene	1.42E-06	1.59E-05	7.95E-07	2.98E-06	1.49E-07
Fluorene	2.92E-05	3.27E-04	1.64E-05	6.13E-05	3.07E-06
Phenanthrene	2.94E-05	3.29E-04	1.65E-05	6.17E-05	3.09E-06
Anthracene	1.87E-06	2.09E-05	1.05E-06	3.93E-06	1.96E-07
Fluoranthene	7.61E-06	8.52E-05	4.26E-06	1.60E-05	7.99E-07
Pyrene	4.78E-06	5.35E-05	2.68E-06	1.00E-05	5.02E-07
Benz(a)anthracene	1.68E-06	1.88E-05	9.41E-07	3.53E-06	1.76E-07
Chrysene	3.53E-07	3.95E-06	1.98E-07	7.41E-07	3.71E-08
Benzo(b)fluoranthene	9.91E-08	1.11E-06	5.55E-08	2.08E-07	1.04E-08
Benzo(k)fluoranthene	1.55E-07	1.74E-06	8.68E-08	3.26E-07	1.63E-08
Benzo(a)pyrene	1.88E-07	2.11E-06	1.05E-07	3.95E-07	1.97E-08
Indeno(1,2,3-cd)pyrene	3.75E-07	4.20E-06	2.10E-07	7.88E-07	3.94E-08
Dibenzo(a,h)anthracene	5.83E-07	6.53E-06	3.26E-07	1.22E-06	6.12E-08
Benzo(g,h,i)perylene	4.89E-07	5.48E-06	2.74E-07	1.03E-06	5.13E-08

[1] HAP emissions are calculated based on emission factors for diesel engines per AP-42 Section 3.3, Table 3.3-2.

[2] Hourly Emissions lb/hr) = Rating (hp) x Avg. Brake Specific Fuel Consumption (Btu/hp-hr) x 1/106 (MMBtu/Btu x Emission Factor lb/MMBtu.

[3] Annual Emissions (tpy) = Rating (hp) x Avg. Brake Specific Fuel Consumption (Btu/hp-hr)x Emission Factor lb/MMBtu * 100 (hours/yr) / 2,000 lb/ton).

Table A-16. Emissions - Torch Cutting - Removal/Oxidation of Steel During Torch Cutting

Emission Unit ID	Emission Point ID	Emission Unit Description	Steel Throughput		Steel Removal Rate	Maximum Cutting Rate	Maximum Daily Operation	$PM/PM_{10}/PM_{2.5}$ Emission Factor [1, 2]	$PM/PM_{10}/PM_{2.5}$ Emission Rate [3]		
			(lb/hr)	(tpy)	(in width cut/cut)	(cuts/ft throughput)	(hr/day)	(lb/inch cut)	(lb/hr)	(lb/day)	(tpy)
TORCH1	TORCH1	Cutting Torches	10,000	10,000	1	0.4	12	1.62E-04	0.19	2.34	0.19

[1] Emission factor for oxyacetylene cutting per American Welding Society (AWS).
It is assumed that the emission rate from propane or natural gas cutting is similar to that of oxyacetylene cutting.
[2] Because no PM_{10} or $PM_{2.5}$ emission factors are available, it is conservatively estimated that PM_{10} and $PM_{2.5}$ are equal to PM.
[3] Sample emission calculations

Hourly Emission Rate (lb/hr) =	10,000 lb steel throughput	1 in width cut	1 ft	1 (lb steel cut/lb steel throughput	0.4 cuts	ft length cut x ft thick cut x ft width cut	1	$(12 \text{ in cut})^3$	1.62E-04 lb PM	=	0.19 lb/hr
	hr	cut	12 in	(ft steel cut /ft steel throughput)	feet steel throughput	480 lb steel cut	1 in width cut	$(1 \text{ ft cut})^3$	in length cut, 1 in thick		
Daily Emission Rate (lb/day) =	0.19 lb PM	12 hr								=	2.34 lb/day
	hr	day									
Annual Emission Rate (tpy) =	10,000 ton steel throughput	1 in width cut	1 ft	1 (lb steel cut/lb steel throughput	0.4 cuts	ft length cut x ft thick cut x ft width cut	1	$(12 \text{ in cut})^3$	1.62E-04 lb PM	=	0.19 lb/hr
	yr	cut	12 in	(ft steel cut /ft steel throughput)	feet steel throughput	480 lb steel cut	1 in width cut	$(1 \text{ ft cut})^3$	in length cut, 1 in thick		

Table A-17. Emissions - Storage Tanks - Emission Calculations

AP-42 Section 7.1 Equation	Equation	Parameter Description	Equation Parameter	Emission Unit ID	DSLTK-GEN1	DSLTK-FWP1	DSLTK-VEH	Reference
				Emission Point ID	**DSLTK-GEN1**	**DSLTK-FWP1**	**DSLTK-VEH**	
				Emission Unit Description	**Diesel Storage Tank for Emergency Generator No. 1**	**Diesel Storage Tank for Fire Water Pump No. 1**	**Diesel Storage Tank Supporting On-Site Vehicles**	
				Tank Type	**Horizontal Fixed Roof**	**Horizontal Fixed Roof**	**Vertical Fixed Roof**	
				Parameter Units	**Value**	**Value**	**Value**	
Equation 1-1	$L_T = L_S + L_W$	Total Routine Losses - Diesel	L_T, Diesel	lb/yr, Diesel	0.275	0.275	2.69	AP-42 Section 7.1 Equation 1-1
Equation 1-2	$L_S = 365\ V_V\ W_V\ K_E\ K_S$	Total Routine Losses - Diesel	LT, Diesel	tpy, Diesel	0.00014	0.00014	0.0013	lb/year / 2,000 lb/ton
Equation 1-3	$V_V = (Pi/4^*\ D^\wedge 2)\ ^*\ H_{VO}$	Total Routine Losses - Ethylbenzene	L_T, Ethylbenzene	lb/yr, Ethylbenzene	0.11	0.11	1.07	AP-42 Section 7.1 Equation 40-1
Equation 1-5	$K_E = dT_V/T_{LA} + (dP_V - dP_B)/(P_A - P_{VA})$	Total Routine Losses - Ethylbenzene	L_T, Ethylbenzene	tpy, Ethylbenzene	0.000055	0.000055	0.00053	lb/year / 2,000 lb/ton
Equation 1-7	$dT_V = 0.7^*dT_A + (0.02 \text{ x alpha x I})$	Total Routine Losses - Naphthalene	L_T, Naphthalene	lb/yr, Naphthalene	0.033	0.033	0.33	AP-42 Section 7.1 Equation 40-1
Equation 1-9	$dP_V = P_{VX} - P_{VN}$	Total Routine Losses - Naphthalene	L_T, Naphthalene	tpy, Naphthalene	0.000017	0.000017	0.00016	lb/year / 2,000 lb/ton
Equation 1-10	$dP_B = P_{BP} - P_{BV}$	Standing Loss	L_S	lb/year	0.16	0.16	1.56	AP-42 Section 7.1 Equation 1-2
Equation 1-11	$dT_A = T_{AX} - T_{AN}$	Standing Loss	L_S	tpy	0.000081	0.000081	0.00078	lb/year / 2,000 lb/ton
Equation 1-14	$D_E = \sqrt{(LD/(Pi/4))}$	Maximum Filling Rate	FR_M	gal/hr	500	500	5,000	Equipment Specifications
Equation 1-15	$H_E = (Pi/4)\ ^*\ D$	Vapor Space Volume	V_V	ft^3	37.70	37.70	362.52	AP-42 Section 7.1 Equation 1-3
Equation 1-21	$K_S = 1 / (1 + (0.053^*P_{VA}{}^*H_{VO}))$	Stock Vapor Density	W_V	lb/ft^3	0.00017	0.00017	0.00017	AP-42 Section 7.1 Equation 1-22
Equation 1-22	$W_V = (M_V\ P_{VA}) / (R\ Tv)$	Vapor Space Expansion Factor (per day)	K_E	-	0.070	0.070	0.070	AP-42 Section 7.1 Equation 1-5
Equation 1-25	$P_{VA} = EXP\ [A - (B/T_{LA})]$	Effective tank diameter (For horizontal tanks)	D_E	ft	5.53	5.53	-	AP-42 Section 7.1 Equation 1-14
Equation 1-28	$T_{LA} = 0.4^*T_{AA} + 0.6^*T_B + (0.005^*alpha^*I)$	Effective tank height (For horizontal tanks)	H_E	ft	3.14	3.14	-	AP-42 Section 7.1 Equation 1-15
Equation 1-30	$T_{AA} = (T_{AX} + T_{AN})/2$	Vented Vapor Saturation Factor	K_S	-	1.00	1.00	1.00	AP-42 Section 7.1 Equation 1-21
Equation 1-31	$T_B = T_{AA} + 0.003 \text{ x alpha x I}$	Tank Diameter	D	ft	4	4	8.5	Equipment Specifications
Figure 7.1-17	$T_{LX} = T_{LA} + 0.25^*dT_V$	Tank Height/Length	H_s	ft	6	6	12.6	Equipment Specifications
Figure 7.1-17	$T_{LN} = T_{LA} - 0.25^*dT_V$	Vapor Space Outage	H_{VO}	ft	1.57	1.57	6.39	AP-42 Section 7.1 Equation 1-4
Equation 1-35	$L_W = V_Q\ K_N\ K_P\ W_V\ K_B$	Average Daily Vapor Temperature Range	dT_V	deg R	38.88	38.88	38.88	AP-42 Section 7.1 Equation 1-7
Equation 1-39	$V_Q = 5.614\ Q$	Average Daily Vapor Pressure - Diesel	dP_V, Diesel	psi	0.0047	0.0047	0.0047	AP-42 Section 7.1 Equation 1-9
Equation 40-1	$L_{Ti} = (Z_{Vi})(L_T)$	Average Daily Vapor Pressure - Ethylbenzene	dP_V, Ethylbenzene	psi	0.67	0.67	0.67	AP-42 Section 7.1 Equation 1-9
Equation 40-3	$P_i = (P)(x_i)$	Average Daily Vapor Pressure - Naphthalene	dP_V, Naphthalene	psi	0.25	0.25	0.25	AP-42 Section 7.1 Equation 1-9
Equation 40-4	$x_i = (Z_{Li}\ M_L) / M_i$	Breather Vent Pressure Setting Range	dP_B	psi	0.060	0.060	0.060	AP-42 Section 7.1 Equation 1-10
Equation 40-5	$y_i = P_i / P_{VA}$	Atmospheric Pressure	P_A	psia	14.55	14.55	14.55	AP-42 Section 7.1 Table 7.1-7
Equation 40-6	$Zv_i = y_i\ M_i / M_V$	Vapor Pressure at Daily Average Liquid Surface Temperature - Diesel	P_{VA}, Diesel	psia	0.0073	0.0073	0.0073	AP-42 Section 7.1 Equation 1-25
		Average Daily Liquid Surface Temperature	T_{LA}	deg R	523	523	523	AP-42 Section 7.1 Equation 1-28
		Daily Ambient Temperature Range	dT_A	deg R	20.1	20.1	20.1	AP-42 Section 7.1 Equation 1-11
		Vapor Pressure @ Average Daily Max. Liquid Surface Temp. (T_{LX}) - Diesel	P_{VX}, Diesel	psia	0.010	0.010	0.010	AP-42 Section 7.1 Equation 1-25
		Vapor Pressure @ Average Daily Min. Liquid Surface Temp. (T_{LN}) - Diesel	P_{VN}, Diesel	psia	0.0053	0.0053	0.0053	AP-42 Section 7.1 Equation 1-25
		Vapor Pressure @ Average Daily Max. Liquid Surface Temp. (T_{LX}) - Ethylbenzene	P_{VX}, Ethylbenzene	psia	3.44	3.44	3.44	AP-42 Section 7.1 Equation 1-25
		Vapor Pressure @ Average Daily Min. Liquid Surface Temp. (T_{LN}) - Ethylbenzene	P_{VN}, Ethylbenzene	psia	2.77	2.77	2.77	AP-42 Section 7.1 Equation 1-25
		Vapor Pressure @ Average Daily Max. Liquid Surface Temp. (T_{LX}) - Naphthalene	P_{VX}, Naphthalene	psia	1.04	1.04	1.04	AP-42 Section 7.1 Equation 1-25
		Vapor Pressure @ Average Daily Min. Liquid Surface Temp. (T_{LN}) - Naphthalene	P_{VN}, Naphthalene	psia	0.79	0.79	0.79	AP-42 Section 7.1 Equation 1-25
		Breather Vent Pressure Setting	P_{BP}	psig	0.03	0.03	0.03	AP-42 Section 7.1 Equation 1-10
		Breather Vent Vacuum Setting	P_{BV}	psig	-0.03	-0.03	-0.03	AP-42 Section 7.1 Equation 1-10
		Average daily maximum ambient temperature (for DC-Dulles, VA)	T_{AX}	deg R	524.97	524.97	524.97	AP-42 Section 7.1 Table 7.1-7
		Average daily minimum ambient temperature (for DC-Dulles, VA)	T_{AN}	deg R	504.87	504.87	504.87	AP-42 Section 7.1 Table 7.1-7
		Vapor Molecular Weight - Diesel	M_V, Diesel	lb/lbmol	130	130	130	AP-42 Section 7.1 Table 7.1-2
		Liquid Molecular Weight - Diesel	M_L, Diesel	lb/lbmol	188	188	188	AP-42 Section 7.1 Table 7.1-2
		Liquid Molecular Weight - Ethylbenzene	M_i, Ethylbenzene	lb/lbmol	106.17	106.17	106.17	AP-42 Section 7.1 Table 7.1-3
		Liquid Molecular Weight - Naphthalene	M_i, Naphthalene	lb/lbmol	128.17	128.17	128.17	AP-42 Section 7.1 Table 7.1-3
		Weight Fraction of Ethylbenzene	Z_{li}, Ethylbenzene	lb/lb	0.0030	0.003	0.003	Diesel SDS
		Weight Fraction of Naphthalene	Z_{li}, Naphthalene	lb/lb	0.0025	0.0025	0.0025	Diesel SDS
		Liquid Mole Fraction - Ethylbenzene	x_i, Ethylbenzene	lbmol/lbmol	0.0053	0.0053	0.0053	AP-42 Section 7.1 Equation 40-4
		Liquid Mole Fraction - Naphthalene	x_i, Naphthalene	lbmol/lbmol	0.0037	0.0037	0.0037	AP-42 Section 7.1 Equation 40-4
		Partial Pressure of Component - Ethylbenzene	P_i, Ethylbenzene	psia	0.0036	0.0036	0.0036	AP-42 Section 7.1 Equation 40-3
		Partial Pressure of Component - Naphthalene	P_i, Naphthalene	psia	0.00090	0.00090	0.00090	AP-42 Section 7.1 Equation 40-3
		Vapor Mole Fraction of Component - Ethylbenzene	y_i, Ethylbenzene	lbmol/lbmol	0.49	0.49	0.49	AP-42 Section 7.1 Equation 40-5
		Vapor Mole Fraction of Component - Naphthalene	y_i, Naphthalene	lbmol/lbmol	0.12	0.12	0.12	AP-42 Section 7.1 Equation 40-5
		Vapor Weight Fraction of Component - Ethylbenzene	Z_{vi}, Ethylbenzene	lb/lb	0.40	0.40	0.40	AP-42 Section 7.1 Equation 40-6
		Vapor Weight Fraction of Component - Naphthalene	Z_{vi}, Naphthalene	lb/lb	0.12	0.12	0.12	AP-42 Section 7.1 Equation 40-6
		Ideal Gas Constant	R	(psia ft^3)/(lbmol deg R)	10.731	10.731	10.731	AP-42 Section 7.1 Equation 3-6
		Constant in vapor pressure equation - Diesel	A, Diesel	-	12.101	12.101	12.101	AP-42 Section 7.1 Table 7.1-2
		Constant in the vapor pressure equation - Diesel	B, Diesel	deg R	8,907	8,907	8,907	AP-42 Section 7.1 Table 7.1-2
		Constant in vapor pressure equation - Ethylbenzene	A, Ethylbenzene	-	7	7	7	AP-42 Section 7.1 Table 7.1-3
		Constant in the vapor pressure equation - Ethylbenzene	B, Ethylbenzene	deg R	3,046	3,046	3,046	AP-42 Section 7.1 Table 7.1-3
		Constant in vapor pressure equation - Naphthalene	A, Naphthalene	-	7	7	7	AP-42 Section 7.1 Table 7.1-3
		Constant in the vapor pressure equation - Naphthalene	B, Naphthalene	deg R	3,789	3,789	3,789	AP-42 Section 7.1 Table 7.1-3
		Daily Average Ambient Temperature	T_{AA}	deg R	514.92	514.92	514.92	AP-42 Section 7.1 Equation 1-30
		Liquid Bulk Temperature	T_B	deg R	518.64	518.64	518.64	AP-42 Section 7.1 Equation 1-31
		Tank Paint Solar Absorptance (based on black paint color)	alpha	-	0.97	0.97	0.97	AP-42 Section 7.1 Table 7.1-6

Table A-17. Emissions - Storage Tanks - Emission Calculations

AP-42 Section 7.1 Equation	Equation	Parameter Description	Equation Parameter	Emission Unit ID	DSLTK-GEN1	DSLTK-FWP1	DSLTK-VEH	Reference
				Emission Point ID	DSLTK-GEN1	DSLTK-FWP1	DSLTK-VEH	
				Emission Unit Description	Diesel Storage Tank for Emergency Generator No. 1	Diesel Storage Tank for Fire Water Pump No. 1	Diesel Storage Tank Supporting On-Site Vehicles	
				Tank Type	Horizontal Fixed Roof	Horizontal Fixed Roof	Vertical Fixed Roof	
				Parameter Units	Value	Value	Value	
		Average Daily Total Insulation Factor (for DC-Dulles, VA)	I	$Btu/ft^2/day$	1,279	1,279	1,279	AP-42 Section 7.1 Table 7.1-7
		Daily Maximum Liquid Surface Temperature	T_{LX}	deg R	533.08	533.08	533.08	AP-42 Section 7.1 Figure 7.1-17
		Daily Minimum Liquid Surface Temperature	T_{LN}	deg R	513.64	513.64	513.64	AP-42 Section 7.1 Figure 7.1-17
		Average vapor temperature	T_V	deg R	527.20	527.20	527.20	AP-42 Section 7.1 Equation 1-33
		Working Loss	L_W	lb/year	0.11	0.11	1.12	AP-42 Section 7.1 Equation 1-35
		Working Loss	L_W	tpy	0.000056	0.000056	0.0006	lb/year / 2,000 lb/ton
		Net Working Loss Throughput	V_Q	ft^3/yr	668	668	6,683	AP-42 Section 7.1 Equation 1-39
		Working Loss Turnover (Saturation) Factor	K_N	-	1	1	1	AP-42 Section 7.1 Equation 1-35
		Working Loss Product Factor	K_P	-	1	1	1	AP-42 Section 7.1 Equation 1-35
		Vent Setting Correction Factor	K_B	-	1	1	1	AP-42 Section 7.1 Equation 1-35
		Annual Net Throughput	Q	bbl/yr	119.05	119.05	1,190.48	ga/yr / 42 gal/bbl
		Annual Net Throughput	Q	ga/yr	5,000	5,000	50,000	Equipment Specifications
		Max Short-Term Emissions, Diesel	L_S, Diesel	lb/hr, Diesel	0.015	0.015	0.15	$(M_V \times P_{VA}) / (R \times T) \times$ Max Fill Rate
		Max Short-Term Emissions, Ethylbenzene	L_S, Ethylbenzene	lb/hr, Ethylbenzene	0.0060	0.0060	0.060	$(M_V \times P_{VA}) / (R \times T) \times$ Max Fill Rate
		Max Short-Term Emissions, Naphthalene	L_S, Naphthalene	lb/hr, Naphthalene	0.0018	0.0018	0.018	$(M_V \times P_{VA}) / (R \times T) \times$ Max Fill Rate

Table A-18a. Site-Wide HAP Emissions Increase Summary - Hourly

Emission Point ID	Emission Point Description	Max Single HAP (lb/hr)	Max Single HAP	Total HAP (lb/hr)	1,3-Butadiene (lb/hr)	2-Methylnaphthalene (lb/hr)	2,3,7,8-Tetrachlorodibenzo-p-dioxin (lb/hr)	3-Methylcholanthrene (lb/hr)	7,12-Dimethylbenz(a)anthracene (lb/hr)	Acenaphthene (lb/hr)	Acenaphthylene (lb/hr)	Acetaldehyde (lb/hr)	Acrolein (lb/hr)	Anthracene (lb/hr)
BH1	Meltshop Baghouse	0.44	Manganese	0.83	-	-	7.75E-06	-	-	-	-	-	-	-
CV1	From EAF & LMS	0.0022	Manganese	0.0042	-	-	3.90E-08	-	-	-	-	-	-	-
CV1	From NG Comb	0.11	Hexane	0.11	-	1.44E-06	-	1.08E-07	9.57E-07	1.08E-07	1.08E-07	-	-	1.44E-07
RMV1	Rolling Mill Vent	0.015	Hexane	0.015	-	1.94E-07	-	1.45E-08	1.29E-07	1.45E-08	1.45E-08	-	-	1.94E-08
EGEN1	Emergency Generator 1	0.013	Formaldehyde	0.043	4.38E-04	-	-	-	-	1.59E-05	5.67E-05	8.59E-03	1.04E-03	2.09E-05
EFWP1	Emergency Fire Water Pump 1	0.0025	Formaldehyde	0.0081	8.21E-05	-	-	-	-	2.98E-06	1.06E-05	1.61E-03	1.94E-04	3.93E-06
DSLTK-GEN1	DSLTK-GEN1	0.0060	Ethylbenzene	0.0078										
DSLTK-FWP1	DSLTK-FWP1	0.0060	Ethylbenzene	0.0078										
DSLTK-VEH	DSLTK-VEH	0.0601	Ethylbenzene	0.0785										
TORCH1	Cutting Torches	5.67E-04	Hexane	5.95E-04	-	7.56E-09	-	5.67E-10	5.04E-09	5.67E-10	5.67E-10	-	-	7.56E-10
Max Single HAP		**0.44**	**Manganese**											
Total HAP				**1.11**										

Table A-18b. Site-Wide HAP Emissions Increase Summary - Annual

Emission Point ID	Emission Point Description	Max Single HAP (tpy)	Max Single HAP (tpy)	Total HAP (tpy)	1,3-Butadiene (tpy)	2-Methylnaphthalene (tpy)	2,3,7,8-Tetrachlorodibenzo-p-dioxin (tpy)	3-Methylcholanthrene (tpy)	7,12-Dimethylbenz(a)anthracene (tpy)	Acenaphthene (tpy)	Acenaphthylene (tpy)	Acetaldehyde (tpy)	Acrolein (tpy)	Anthracene (tpy)
BH1	Meltshop Baghouse	1.21	Manganese	2.31	-	-	2.15E-05	-	-	-	-	-	-	-
CV1	From EAF & LMS	0.0061	Manganese	0.012	-	-	1.08E-07	-	-	-	-	-	-	-
CV1	From NG Comb	0.0044	Hexane	0.0046	-	5.87E-08	-	4.41E-09	3.92E-08	4.41E-09	4.41E-09	-	-	5.87E-09
RMV1	Rolling Mill Vent	0.00033	Hexane	0.00034	-	4.35E-09	-	3.27E-10	2.90E-09	3.27E-10	3.27E-10	-	-	4.35E-10
EGEN1	Emergency Generator 1	0.00066	Formaldehyde	0.0022	2.19E-05	-	-	-	-	7.95E-07	2.83E-06	4.30E-04	5.18E-05	1.05E-06
EFWP1	Emergency Fire Water Pump 1	0.00012	Formaldehyde	0.00041	4.11E-06	-	-	-	-	1.49E-07	5.31E-07	8.05E-05	9.71E-06	1.96E-07
DSLTK-GEN1	DSLTK-GEN1	0.00005	Ethylbenzene	0.000071										
DSLTK-FWP1	DSLTK-FWP1	0.00005	Ethylbenzene	0.000071										
DSLTK-VEH	DSLTK-VEH	0.00053	Ethylbenzene	0.00070										
TORCH1	Cutting Torches	1.13E-05	Hexane	1.19E-05	-	1.51E-10	-	1.13E-11	1.01E-10	1.13E-11	1.13E-11	-	-	1.51E-11
Max Single HAP		**1.21**	**Manganese**											
Total HAP				**2.33**										

Table A-18a. Site-Wide HAP Emissions Increase

Emission Point ID	Emission Point Description	Max Single HAP (lb/hr)	Antimony (lb/hr)	Arsenic (lb/hr)	Benz(a)anthracene (lb/hr)	Benzene (lb/hr)	Benzo(a)pyrene (lb/hr)	Benzo(b)fluoranthene (lb/hr)	Benzo(g,h,i)perylene (lb/hr)	Benzo(k)fluoranthene (lb/hr)	Beryllium (lb/hr)	Cadmium (lb/hr)	Chromium (lb/hr)	Chrysene (lb/hr)
BH1	Meltshop Baghouse	0.44	5.83E-03	1.28E-03	-	-	-	-	-	-	1.51E-03	2.46E-02	8.80E-02	-
CV1	From EAF & LMS	0.0022	2.93E-05	6.44E-06	-	-	-	-	-	-	7.57E-06	1.23E-04	4.42E-04	-
CV1	From NG Comb	0.11	-	1.20E-05	1.08E-07	1.26E-04	7.18E-08	1.08E-07	7.18E-08	1.08E-07	7.18E-07	6.58E-05	8.37E-05	1.08E-07
RMV1	Rolling Mill Vent	0.015	-	1.61E-06	1.45E-08	1.69E-05	9.68E-09	1.45E-08	9.68E-09	1.45E-08	9.68E-08	8.87E-06	1.13E-05	1.45E-08
EGEN1	Emergency Generator 1	0.013	-	-	1.88E-05	1.04E-02	2.11E-06	1.11E-06	5.48E-06	1.74E-06	-	-	-	3.95E-06
EFWP1	Emergency Fire Water Pump 1	0.0025	-	-	3.53E-06	1.96E-03	3.95E-07	2.08E-07	1.03E-06	3.26E-07	-	-	-	7.41E-07
DSLTK-GEN1	DSLTK-GEN1	0.0060												
DSLTK-FWP1	DSLTK-FWP1	0.0060												
DSLTK-VEH	DSLTK-VEH	0.0601												
TORCH1	Cutting Torches	5.67E-04	-	6.30E-08	5.67E-10	6.61E-07	3.78E-10	5.67E-10	3.78E-10	5.67E-10	3.78E-09	3.46E-07	4.41E-07	5.67E-10
Max Single HAP		**0.44**												
Total HAP														

Table A-18b. Site-Wide HAP Emissions Increase

Emission Point ID	Emission Point Description	Max Single HAP (tpy)	Antimony (tpy)	Arsenic (tpy)	Benz(a)anthracene (tpy)	Benzene (tpy)	Benzo(a)pyrene (tpy)	Benzo(b)fluoranthene (tpy)	Benzo(g,h,i)perylene (tpy)	Benzo(k)fluoranthene (tpy)	Beryllium (tpy)	Cadmium (tpy)	Chromium (tpy)	Chrysene (tpy)
BH1	Meltshop Baghouse	1.21	1.62E-02	3.56E-03	-	-	-	-	-	-	4.19E-03	6.83E-02	2.45E-01	-
CV1	From EAF & LMS	0.0061	8.13E-05	1.79E-05	-	-	-	-	-	-	2.10E-05	3.43E-04	1.23E-03	-
CV1	From NG Comb	0.0044	-	4.90E-07	4.41E-09	5.14E-06	2.94E-09	4.41E-09	2.94E-09	4.41E-09	2.94E-08	2.69E-06	3.43E-06	4.41E-09
RMV1	Rolling Mill Vent	0.00033	-	3.63E-08	3.27E-10	3.81E-07	2.18E-10	3.27E-10	2.18E-10	3.27E-10	2.18E-09	2.00E-07	2.54E-07	3.27E-10
EGEN1	Emergency Generator 1	0.00066	-	-	9.41E-07	5.22E-04	1.05E-07	5.55E-08	2.74E-07	8.68E-08	-	-	-	1.98E-07
EFWP1	Emergency Fire Water Pump 1	0.00012	-	-	1.76E-07	9.80E-05	1.97E-08	1.04E-08	5.13E-08	1.63E-08	-	-	-	3.71E-08
DSLTK-GEN1	DSLTK-GEN1	0.00005												
DSLTK-FWP1	DSLTK-FWP1	0.00005												
DSLTK-VEH	DSLTK-VEH	0.00053												
TORCH1	Cutting Torches	1.13E-05	-	1.26E-09	1.13E-11	1.32E-08	7.56E-12	1.13E-11	7.56E-12	1.13E-11	7.56E-11	6.93E-09	8.82E-09	1.13E-11
Max Single HAP		**1.21**												
Total HAP														

Table A-18a. Site-Wide HAP Emissions Increase

Emission Point ID	Emission Point Description	Max Single HAP (lb/hr)	Cobalt (lb/hr)	Dibenzo(a,h) anthracene (lb/hr)	Dichlorobenz ene (lb/hr)	Ethylbenzen e (lb/hr)	Fluoranthen e (lb/hr)	Fluorene (lb/hr)	Formaldehyd e (lb/hr)	Hexane (lb/hr)	Indeno(1,2, 3-cd)pyrene (lb/hr)	Lead Compounds (lb/hr)	Manganese (lb/hr)	Mercury (lb/hr)
BH1	Meltshop Baghouse	0.44	5.30E-03	-	-		-	-	-	-	-	1.87E-01	4.36E-01	7.25E-02
CV1	From EAF & LMS	0.0022	2.66E-05	-	-		-	-	-	-	-	9.41E-04	2.19E-03	3.65E-04
CV1	From NG Comb	0.11	5.02E-06	7.18E-08	7.18E-05		1.79E-07	1.67E-07	4.49E-03	1.08E-01	1.08E-07	-	2.27E-05	1.55E-05
RMV1	Rolling Mill Vent	0.015	6.77E-07	9.68E-09	9.68E-06		2.42E-08	2.26E-08	6.05E-04	1.45E-02	1.45E-08	-	3.06E-06	2.10E-06
EGEN1	Emergency Generator 1	0.013	-	6.53E-06	-		8.52E-05	3.27E-04	1.32E-02	-	4.20E-06	-	-	-
EFWP1	Emergency Fire Water Pump 1	0.0025	-	1.22E-06	-		1.60E-05	6.13E-05	2.48E-03	-	7.88E-07	-	-	-
DSLTK-GEN1	DSLTK-GEN1	0.0060				6.01E-03								
DSLTK-FWP1	DSLTK-FWP1	0.0060				6.01E-03								
DSLTK-VEH	DSLTK-VEH	0.0601				6.01E-02								
TORCH1	Cutting Torches	5.67E-04	2.64E-08	3.78E-10	3.78E-07		9.45E-10	8.82E-10	2.36E-05	5.67E-04	5.67E-10	-	1.20E-07	8.19E-08
Max Single HAP		**0.44**												
Total HAP														

Table A-18b. Site-Wide HAP Emissions Increase

Emission Point ID	Emission Point Description	Max Single HAP (tpy)	Cobalt (tpy)	Dibenzo(a,h) anthracene (tpy)	Dichlorobenzene (tpy)	Ethylbenzene	Fluoranthene (tpy)	Fluorene (tpy)	Formaldehyde (tpy)	Hexane (tpy)	Indeno(1,2,3-cd)pyrene (tpy)	Lead Compounds (tpy)	Manganese (tpy)	Mercury (tpy)
BH1	Meltshop Baghouse	1.21	1.47E-02	-	-		-	-	-	-	-	5.20E-01	1.21E+00	2.02E-01
CV1	From EAF & LMS	0.0061	7.39E-05	-	-		-	-	-	-	-	2.61E-03	6.08E-03	1.01E-03
CV1	From NG Comb	0.0044	2.06E-07	2.94E-09	2.94E-06		7.34E-09	6.85E-09	1.84E-04	4.41E-03	4.41E-09	-	9.30E-07	6.36E-07
RMV1	Rolling Mill Vent	0.00033	1.52E-08	2.18E-10	2.18E-07		5.44E-10	5.08E-10	1.36E-05	3.27E-04	3.27E-10	-	6.89E-08	4.72E-08
EGEN1	Emergency Generator 1	0.00066	-	3.26E-07	-		4.26E-06	1.64E-05	6.61E-04	-	2.10E-07	-	-	-
EFWP1	Emergency Fire Water Pump 1	0.00012	-	6.12E-08	-		7.99E-07	3.07E-06	1.24E-04	-	3.94E-08	-	-	-
DSLTK-GEN1	DSLTK-GEN1	0.00005				5.46E-05								
DSLTK-FWP1	DSLTK-FWP1	0.00005				5.46E-05								
DSLTK-VEH	DSLTK-VEH	0.00053				5.33E-04								
TORCH1	Cutting Torches	1.13E-05	5.29E-10	7.56E-12	7.56E-09		1.89E-11	1.76E-11	4.72E-07	1.13E-05	1.13E-11	-	2.39E-09	1.64E-09
Max Single HAP		**1.21**												
Total HAP														

Table A-18a. Site-Wide HAP Emissions Increase

Emission Point ID	Emission Point Description	Max Single HAP (lb/hr)	Molybdenum (lb/hr)	Naphthalene (lb/hr)	Nickel (lb/hr)	Phenanthrene (lb/hr)	Pyrene (lb/hr)	Selenium (lb/hr)	Toluene (lb/hr)	Xylene (lb/hr)
BH1	Meltshop Baghouse	0.44	-	-	5.10E-03	-	-	3.21E-03	-	-
CV1	From EAF & LMS	0.0022	-	-	2.56E-05	-	-	1.61E-05	-	-
CV1	From NG Comb	0.11	6.58E-05	3.65E-05	1.26E-04	1.02E-06	2.99E-07	1.44E-06	2.03E-04	-
RMV1	Rolling Mill Vent	0.015	8.87E-06	4.92E-06	1.69E-05	1.37E-07	4.03E-08	1.94E-07	2.74E-05	-
EGEN1	Emergency Generator 1	0.013	-	9.50E-04	-	3.29E-04	5.35E-05	-	4.58E-03	3.19E-03
EFWP1	Emergency Fire Water Pump 1	0.0025	-	1.78E-04	-	6.17E-05	1.00E-05	-	8.59E-04	5.99E-04
DSLTK-GEN1	DSLTK-GEN1	0.0060		1.84E-03						
DSLTK-FWP1	DSLTK-FWP1	0.0060		1.84E-03						
DSLTK-VEH	DSLTK-VEH	0.0601		1.84E-02						
TORCH1	Cutting Torches	5.67E-04	3.46E-07	1.92E-07	6.61E-07	5.35E-09	1.57E-09	7.56E-09	1.07E-06	-
Max Single HAP		**0.44**								
Total HAP										

Table A-18b. Site-Wide HAP Emissions Increase

Emission Point ID	Emission Point Description	Max Single HAP (tpy)	Molybdenum (tpy)	Naphthalene (tpy)	Nickel (tpy)	Phenanthrene (tpy)	Pyrene (tpy)	Selenium (tpy)	Toluene (tpy)	Xylene (tpy)
BH1	Meltshop Baghouse	1.21	-	-	1.42E-02	-	-	8.91E-03	-	-
CV1	From EAF & LMS	0.0061	-	-	7.12E-05	-	-	4.48E-05	-	-
CV1	From NG Comb	0.0044	2.69E-06	1.49E-06	5.14E-06	4.16E-08	1.22E-08	5.87E-08	8.32E-06	-
RMV1	Rolling Mill Vent	0.00033	2.00E-07	1.11E-07	3.81E-07	3.08E-09	9.07E-10	4.35E-09	6.17E-07	-
EGEN1	Emergency Generator 1	0.00066	-	4.75E-05	-	1.65E-05	2.68E-06	-	2.29E-04	1.60E-04
EFWP1	Emergency Fire Water Pump 1	0.00012	-	8.90E-06	-	3.09E-06	5.02E-07	-	4.29E-05	2.99E-05
DSLTK-GEN1	DSLTK-GEN1	0.00005		1.67E-05						
DSLTK-FWP1	DSLTK-FWP1	0.00005		1.67E-05						
DSLTK-VEH	DSLTK-VEH	0.00053		1.63E-04						
TORCH1	Cutting Torches	1.13E-05	6.93E-09	3.84E-09	1.32E-08	1.07E-10	3.15E-11	1.51E-10	2.14E-08	-
Max Single HAP		**1.21**								
Total HAP										

Table A-19. Site-Wide Emissions Increase Summary - Hourly

Emission Unit ID	Emission Point ID	Emission Point Description	Hourly PTE (lb/hr)											
			Filterable PM	Total PM	Total PM_{10}	Total $PM_{2.5}$	NO_x	CO	VOC	SO_2	Pb	Max Single HAP [2]	Total HAP	Fluorides
Meltshop														
EAF1, LMS1	BH1	Meltshop Baghouse	13.42	38.77	38.77	38.77	35.10	468.00	35.10	35.10	0.19	0.44	0.83	1.16
EAF1, LMS1, CAST1	CV1	Caster Vent	1.00	1.36	1.36	1.36	8.91	7.93	0.81	0.85	0.0010	0.11	0.12	0.0059
Rolling Mill														
RMV1	RMV1	Rolling Mill Vent [1]	0.028	0.073	0.073	0.073	1.17	0.68	0.082	0.090	-	0.015	0.015	-
CBV1	CBV1	Cooling Beds Vent [1]	0.010	0.010	0.010	0.010	-	-	0.010	-	-	-	-	-
Material Storage Silos														
FLXSLO1	FLXSLO11	Fluxing Agent Storage Silo No. 1	0.13	0.13	0.13	0.13	-	-	-	-	-	-	-	-
FLXSLO1	FLXSLO12	Fluxing Agent Storage Silo No. 2	0.13	0.13	0.13	0.13	-	-	-	-	-	-	-	-
CARBSLO1	CARBSLO1	Carbon Storage Silo No. 1	0.088	0.088	0.088	0.088	-	-	-	-	-	-	-	-
DUSTSLO1	DUSTSLO1	EAF Baghouse Dust Silo	0.056	0.056	0.056	0.056	-	-	-	-	-	-	-	-
Material Handling														
DPEAF1	TR51A	Inside ECS Building Drop Points, Scrap	0.014	0.014	0.0068	0.00103	-	-	-	-	-	-	-	-
DPEAF1	TR51B	Outside ECS Building Drop Points, Scrap, Storage Area	0.038	0.038	0.018	0.0027	-	-	-	-	-	-	-	-
DPEAF1	TR51C	Outside Rail Bins Drop Point, Scrap	0.013	0.013	0.006	0.0009	-	-	-	-	-	-	-	-
DPEAF1	TR51D	Outside Truck Mixed Bins Drop Point, Scrap	0.013	0.013	0.006	0.0009	-	-	-	-	-	-	-	-
DPEAF1	TR51E	Outside Truck Bins Drop Point, Scrap	0.013	0.013	0.006	0.0009	-	-	-	-	-	-	-	-
DPF1	TR71	Inside ECS Building Drop Points, Fluxing Agent	0.0036	0.0036	0.0017	0.00026	-	-	-	-	-	-	-	-
DPAA1	TR81	Outside Drop Points, Alloy Aggregate	0.0010	0.0010	0.0005	0.00007	-	-	-	-	-	-	-	-
DPRW1	TR91A	Inside Drop Points, Removed Refractory and Other	0.0043	0.0043	0.0020	0.00031	-	-	-	-	-	-	-	-
DPRW1	TR91B	Outside Drop Points, Removed Refractory and Other Materials	0.0043	0.0043	0.002	0.0003	-	-	-	-	-	-	-	-
DPS1	TR11A	Outside SPP Pile Drop Points, Slag	0.0017	0.0017	0.00083	0.00012	-	-	-	-	-	-	-	-
DPS1	TR11B	SPP Material Transfers, Crusher, and Screen	0.17	0.17	0.081	0.012	-	-	-	-	-	-	-	-
DPRS1	TR131	Outside Drop Points, Residual Scrap Pile	0.0057	0.0057	0.0027	0.00041	-	-	-	-	-	-	-	-
DPMS1	TR141	Outside Drop Points, Mill Scale Pile	0.016	0.016	0.0073	0.00111	-	-	-	-	-	-	-	-
CR1	CR1	Ball Drop Crushing	0.0096	0.0096	0.0043	0.00080	-	-	-	-	-	-	-	-
Material Storage Piles														
EAF1P	W51A	ECS Scrap Building Storage Pile A	0.0068	0.0068	0.0034	0.00051	-	-	-	-	-	-	-	-
EAF1P	W51B	ECS Scrap Building Storage Pile B	0.0061	0.0061	0.0031	0.00046	-	-	-	-	-	-	-	-
EAF1P	W51C	ECS Scrap Building Storage Pile C	0.0060	0.0060	0.0030	0.00045	-	-	-	-	-	-	-	-
EAF1P	W51D	ECS Scrap Building Overage Scrap Pile	0.091	0.091	0.046	0.0069	-	-	-	-	-	-	-	-
EAF1P	W51E	Outside Rail Scrap 5k Pile A	0.083	0.083	0.041	0.0063	-	-	-	-	-	-	-	-
EAF1P	W51F	Outside Rail Scrap 5k Pile B	0.083	0.083	0.041	0.0063	-	-	-	-	-	-	-	-
EAF1P	W51G	Outside Rail Scrap 5k Pile C	0.083	0.083	0.041	0.0063	-	-	-	-	-	-	-	-
EAF1P	W51H	Outside Rail Scrap 5k Pile D	0.083	0.083	0.041	0.0063	-	-	-	-	-	-	-	-
EAF1P	W51I	Outside Truck Mixed 8k Pile A	0.10	0.10	0.051	0.0078	-	-	-	-	-	-	-	-
EAF1P	W51J	Outside Truck Mixed 8k Pile B	0.11	0.11	0.055	0.0084	-	-	-	-	-	-	-	-
EAF1P	W51K	Outside Truck Scrap 5k Pile A	0.083	0.083	0.041	0.0063	-	-	-	-	-	-	-	-
EAF1P	W51L	Outside Truck Scrap 5k Pile B	0.083	0.083	0.041	0.0063	-	-	-	-	-	-	-	-
EAF1P	W51M	Outside Truck Scrap 5k Pile C	0.083	0.083	0.041	0.0063	-	-	-	-	-	-	-	-
EAF1P	W51N	Outside Truck Scrap 5k Pile D	0.083	0.083	0.041	0.0063	-	-	-	-	-	-	-	-
AAP1	W61	Alloy Aggregate Storage Pile	0.00061	0.00061	0.00030	0.000046	-	-	-	-	-	-	-	-
SPP1	W71A	SPP Slag Storage Pile	0.16	0.16	0.079	0.0120	-	-	-	-	-	-	-	-
SPP1	W71B	SPP Piles	0.025	0.025	0.013	0.0019	-	-	-	-	-	-	-	-
RSP1	W81	Residual Scrap Storage Pile in Scrap Yard	0.20	0.20	0.099	0.015	-	-	-	-	-	-	-	-
MSP1	W111	Mill Scale Pile	0.0049	0.0049	0.0024	0.00037	-	-	-	-	-	-	-	-
Cooling Towers														
CTNC11	CTNC11a	Non-Contact Cooling Tower 1 - Cell 1	0.11	0.11	0.075	0.00024	-	-	-	-	-	-	-	-
CTNC11	CTNC11b	Non-Contact Cooling Tower 1 - Cell 2	0.11	0.11	0.075	0.00024	-	-	-	-	-	-	-	-
CTNC12	CTNC12a	Non-Contact Cooling Tower 2 - Cell 1	0.11	0.11	0.075	0.00024	-	-	-	-	-	-	-	-

Table A-19. Site-Wide Emissions Increase Summary - Hourly

Emission Unit ID	Emission Point ID	Emission Point Description	Hourly PTE (lb/hr)											
			Filterable PM	Total PM	Total PM_{10}	Total $PM_{2.5}$	NO_x	CO	VOC	SO_2	Pb	Max Single HAP [2]	Total HAP	Fluorides
CTNC12	CTNC12b	Non-Contact Cooling Tower 2 - Cell 2	0.11	0.11	0.075	0.00024	-	-	-	-	-	-	-	-
CTC1	CTC1a	Contact Cooling Tower - Cell 1	0.055	0.055	0.038	0.00012	-	-	-	-	-	-	-	-
CTC1	CTC1b	Contact Cooling Tower - Cell 2	0.055	0.055	0.038	0.00012	-	-	-	-	-	-	-	-
Haulroads														
PR1	PR1	Paved Roads	1.56	1.56	0.31	0.077	-	-	-	-	-	-	-	-
UR1	UR1	Unpaved Roads	4.35	4.35	1.16	0.12	-	-	-	-	-	-	-	-
Auxillary Equipment														
EGEN1	EGEN1	Emergency Generator 1	0.53	0.53	0.53	0.53	9.82	9.21	0.70	0.017	-	0.013	0.043	-
EFWP1	EFWP1	Emergency Fire Water Pump 1	0.10	0.10	0.10	0.10	1.84	1.73	0.13	0.0033	-	0.0025	0.0081	-
DSLTK-GEN1	DSLTK-GEN1	Diesel Storage Tank for Emergency Generator No. 1	-	-	-	-	-	-	0.015	-	-	0.0060	0.0078	-
DSLTK-FWP1	DSLTK-FWP1	Diesel Storage Tank for Fire Water Pump No. 1	-	-	-	-	-	-	0.015	-	-	0.0060	0.0078	-
DSLTK-VEH	DSLTK-VEH	Diesel Storage Tank Supporting On-Site Vehicles	-	-	-	-	-	-	0.15	-	-	0.060	0.078	-
TORCH1	TORCH1	Cutting Torches	0.20	0.20	0.20	0.20	0.046	0.026	0.0028	0.0035	1.57E-07	5.67E-04	5.95E-04	-
Total	***Total***		***23.83***	***49.59***	***44.12***	***41.76***	***56.89***	***487.56***	***37.02***	***36.06***	***0.19***	***0.65***	***1.11***	***1.17***

[1] Emissions from the rolling mill vent and the cooling bed vents are conservatively represented using de minimis values. Total rolling mill vent emissions include de minimis values and combustion emissions.

[2] Max Single HAP is Manganese

Table A-20. Site-Wide Emissions Increase Summary - Annual

Emission Unit ID	Emission Point ID	Emission Point Description	Annual PTE (tpy)												
			Filterable PM	Total PM	Total PM_{10}	Total $PM_{2.5}$	NO_x	CO	VOC	SO_2	Pb	Fluorides	Max Single HAP [5]	Total HAP	CO_2e
Meltshop															
EAF1, LMS1	BH1	Meltshop Baghouse	58.78	169.82	169.82	169.82	97.50	1,300	97.50	97.50	0.52	3.23	1.21	2.31	119,513
EAF1, LMS1, CAST1	CV1	Caster Vent	2.45	2.57	2.57	2.57	0.49	8.34	0.80	0.49	0.0026	0.016	0.0061	0.016	951
Rolling Mill															
RMV1	RMV1	Rolling Mill Vent [1]	0.010	0.010	0.010	0.010	0.00014	0.00008	0.010	1.07E-05	-	-	0.00033	0.00034	25.75
CBV1	CBV1	Cooling Beds Vent [1]	0.010	0.010	0.010	0.010	-	-	0.010	-	-	-	-	-	-
Material Storage Silos															
FLXSLO1	FLXSLO11	Fluxing Agent Storage Silo No. 1	0.064	0.064	0.064	0.064	-	-	-	-	-	-	-	-	-
FLXSLO1	FLXSLO12	Fluxing Agent Storage Silo No. 2	0.064	0.064	0.064	0.064	-	-	-	-	-	-	-	-	-
CARBSLO1	CARBSLO1	Carbon Storage Silo No. 1	0.044	0.044	0.044	0.044	-	-	-	-	-	-	-	-	-
DUSTSLO1	DUSTSLO1	EAF Baghouse Dust Silo	0.24	0.24	0.24	0.24	-	-	-	-	-	-	-	-	-
Material Handling															
DPEAF1	TR51A	Inside ECS Building Drop Points, Scrap	0.029	0.029	0.014	0.0021	-	-	-	-	-	-	-	-	-
DPEAF1	TR51B	Outside ECS Building Drop Points, Scrap, Storage Area	0.12	0.12	0.058	0.0088	-	-	-	-	-	-	-	-	-
DPEAF1	TR51C	Outside Rail Bins Drop Point, Scrap	0.041	0.041	0.019	0.0029	-	-	-	-	-	-	-	-	-
DPEAF1	TR51D	Outside Truck Mixed Bins Drop Point, Scrap	0.041	0.041	0.019	0.0029	-	-	-	-	-	-	-	-	-
DPEAF1	TR51E	Outside Truck Bins Drop Point, Scrap	0.041	0.041	0.019	0.0029	-	-	-	-	-	-	-	-	-
DPF1	TR71	Inside ECS Building Drop Points, Fluxing Agent	0.0019	0.0019	0.00088	0.00013	-	-	-	-	-	-	-	-	-
DPAA1	TR81	Outside Drop Points, Alloy Aggregate	0.000085	0.000085	0.000040	0.0000061	-	-	-	-	-	-	-	-	-
DPRW1	TR91A	Inside Drop Points, Removed Refractory and Other	0.00024	0.00024	0.00011	0.000017	-	-	-	-	-	-	-	-	-
DPRW1	TR91B	Outside Drop Points, Removed Refractory and Other Materials	0.00024	0.00024	0.00011	0.000017	-	-	-	-	-	-	-	-	-
DPS1	TR11A	Outside SPP Pile Drop Points, Slag	0.00036	0.00036	0.00017	0.000026	-	-	-	-	-	-	-	-	-
DPS1	TR11B	SPP Material Transfers, Crusher, and Screen	0.19	0.19	0.090	0.014	-	-	-	-	-	-	-	-	-
DPRS1	TR131	Outside Drop Points, Residual Scrap Pile	0.00032	0.00032	0.00015	0.000023	-	-	-	-	-	-	-	-	-
DPMS1	TR141	Outside Drop Points, Mill Scale Pile	0.0013	0.0013	0.00060	0.000091	-	-	-	-	-	-	-	-	-
CR1	CR1	Ball Drop Crushing	0.0049	0.0049	0.0022	0.00041	-	-	-	-	-	-	-	-	-
Material Storage Piles															
EAF1P	W51A	ECS Scrap Building Storage Pile A	0.030	0.030	0.015	0.0023	-	-	-	-	-	-	-	-	-
EAF1P	W51B	ECS Scrap Building Storage Pile B	0.027	0.027	0.013	0.0020	-	-	-	-	-	-	-	-	-
EAF1P	W51C	ECS Scrap Building Storage Pile C	0.026	0.026	0.013	0.0020	-	-	-	-	-	-	-	-	-
EAF1P	W51D	ECS Scrap Building Overage Scrap Pile	0.40	0.40	0.20	0.030	-	-	-	-	-	-	-	-	-
EAF1P	W51E	Outside Rail Scrap 5k Pile A	0.36	0.36	0.18	0.028	-	-	-	-	-	-	-	-	-
EAF1P	W51F	Outside Rail Scrap 5k Pile B	0.36	0.36	0.18	0.028	-	-	-	-	-	-	-	-	-
EAF1P	W51G	Outside Rail Scrap 5k Pile C	0.36	0.36	0.18	0.028	-	-	-	-	-	-	-	-	-
EAF1P	W51H	Outside Rail Scrap 5k Pile D	0.36	0.36	0.18	0.028	-	-	-	-	-	-	-	-	-
EAF1P	W51I	Outside Truck Mixed 8k Pile A	0.45	0.45	0.22	0.034	-	-	-	-	-	-	-	-	-
EAF1P	W51J	Outside Truck Mixed 8k Pile B	0.49	0.49	0.24	0.037	-	-	-	-	-	-	-	-	-
EAF1P	W51K	Outside Truck Scrap 5k Pile A	0.36	0.36	0.18	0.028	-	-	-	-	-	-	-	-	-
EAF1P	W51L	Outside Truck Scrap 5k Pile B	0.36	0.36	0.18	0.028	-	-	-	-	-	-	-	-	-
EAF1P	W51M	Outside Truck Scrap 5k Pile C	0.36	0.36	0.18	0.028	-	-	-	-	-	-	-	-	-
EAF1P	W51N	Outside Truck Scrap 5k Pile D	0.36	0.36	0.18	0.028	-	-	-	-	-	-	-	-	-
AAP1	W61	Alloy Aggregate Storage Pile	0.0027	0.0027	0.0013	0.00020	-	-	-	-	-	-	-	-	-
SPP1	W71A	SPP Slag Storage Pile	0.70	0.70	0.35	0.053	-	-	-	-	-	-	-	-	-
SPP1	W71B	SPP Piles	0.11	0.11	0.055	0.0083	-	-	-	-	-	-	-	-	-
RSP1	W81	Residual Scrap Storage Pile in Scrap Yard	0.87	0.87	0.43	0.066	-	-	-	-	-	-	-	-	-
MSP1	W111	Mill Scale Pile	0.021	0.021	0.011	0.0016	-	-	-	-	-	-	-	-	-
Cooling Towers															
CTNC11	CTNC11a	Non-Contact Cooling Tower 1 - Cell 1	0.48	0.48	0.33	0.0010	-	-	-	-	-	-	-	-	-
CTNC11	CTNC11b	Non-Contact Cooling Tower 1 - Cell 2	0.48	0.48	0.33	0.0010	-	-	-	-	-	-	-	-	-
CTNC12	CTNC12a	Non-Contact Cooling Tower 2 - Cell 1	0.48	0.48	0.33	0.0010	-	-	-	-	-	-	-	-	-
CTNC12	CTNC12b	Non-Contact Cooling Tower 2 - Cell 2	0.48	0.48	0.33	0.0010	-	-	-	-	-	-	-	-	-
CTC1	CTC1a	Contact Cooling Tower - Cell 1	0.24	0.24	0.16	0.0005	-	-	-	-	-	-	-	-	-
CTC1	CTC1b	Contact Cooling Tower - Cell 2	0.24	0.24	0.16	0.0005	-	-	-	-	-	-	-	-	-

Table A-20. Site-Wide Emissions Increase Summary - Annual

Emission Unit ID	Emission Point ID	Emission Point Description	Annual PTE (tpy)												
			Filterable PM	Total PM	Total PM_{10}	Total $PM_{2.5}$	NO_x	CO	VOC	SO_2	Pb	Fluorides	Max Single HAP [5]	Total HAP	CO_2e
Haulroads															
PR1	PR1	Paved Roads	1.37	1.37	0.27	0.067	-	-	-	-	-	-	-	-	-
UR1	UR1	Unpaved Roads	4.49	4.49	1.20	0.12	-	-	-	-	-	-	-	-	-
Auxillary Equipment															
EGEN1	EGEN1	Emergency Generator 1	0.026	0.026	0.026	0.026	0.49	0.460	0.035	0.00087	-	-	0.00066	0.0022	91.62
EFWP1	EFWP1	Emergency Fire Water Pump 1	0.0049	0.0049	0.0049	0.0049	0.09	0.086	0.007	0.00016	-	-	0.00012	0.00041	17.18
DSLTK-GEN1	DSLTK-GEN1	Diesel Storage Tank for Emergency Generator No. 1	-	-	-	-	-	-	0.00014	-	-	-	0.000055	0.000071	-
DSLTK-FWP1	DSLTK-FWP1	Diesel Storage Tank for Fire Water Pump No. 1	-	-	-	-	-	-	0.00014	-	-	-	0.000055	0.000071	-
DSLTK-VEH	DSLTK-VEH	Diesel Storage Tank Supporting On-Site Vehicles	-	-	-	-	-	-	0.0013	-	-	-	0.00053	0.00070	-
TORCH1	TORCH1	Cutting Torches	0.19	0.19	0.19	0.19	4.17E-06	2.42E-06	2.56E-07	3.21E-07	1.44E-11	-	1.13E-05	1.19E-05	0.89
Total	***Total***		***77***	***188***	***179***	***174***	***99***	***1,309***	***98***	***98***	***0.52***	***3.25***	***1.22***	***2.33***	***120,600***
Major NSR Applicability															
Pollutant Attainment Status			-	-	Attainment	Attainment	Attainment	Attainment	Attainment	Attainment	Attainment	-	-	-	-
Potentially Applicable Major NSR Program			PSD	-	PSD	PSD	PSD	PSD	PSD	PSD	PSD	PSD	-	-	PSD
Major NSR "Major Source" Threshold [2, 4]			100	-	100	100	100	100	100	100	100	100	-	-	-
Title V Threshold [4]			100	-	100	100	100	100	100	100	-	-	10	25	100,000
Project Exceeds Major NSR "Major Source" Threshold?			No	-	Yes	Yes	No	Yes	No	No	No	No	-	-	No
Project Exceeds Title V Thresholds?			No	-	Yes	Yes	No	Yes	No	No	-	-	No	No	Yes
PSD Significant Emission Rates (SERs) [3]			25	-	15	10	40	100	40	40	0.6	3	-	-	75,000
Project Meets or Exceeds PSD SER?			Yes	-	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	-	-	Yes

[1] Emissions from the rolling mill vent and the cooling bed vents are conservatively represented using de minimis values. Total rolling mill vent emissions include de minimis values and combustion emissions.
[2] Major source per 40 CFR 52.21(b). NOx is a regulated NSR pollutant for purposes of evaluating PSD applicability because NOx, as measured in the ambient air as nitrogen dioxide (NO2), is a pollutant for which a national ambient air quality standard (NAAQS) has been promulgated (see 40 CFR 50.11).
[3] PSD Significant Emission Rates (SERs) as defined in 40 CFR 52.21.
[4] VOC is not a criteria pollutant but is considered to be a precursor to ozone. Stated value corresponds to the ozone threshold.
[5] Max Single HAP is Manganese

APPENDIX B. EPA RBLC SEARCH RESULTS

Table B-1. EAF/LMS Recent Permit Limitations and Determinations of BACT for CO (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)		Permitted CO Limit		Control
				Value	Unit	Value	Unit	
Facilities With Permits Issued After 2016 [1]								
EAF/LMF	WV-0034	Nucor Steel West Virginia	5/5/2022	3,000,000	tons steel/yr	2.02	lb/ton	Good Combustion Practices
EAFs and LMFs	AR-0173	BIG RIVER STEEL LLC	1/31/2022	250	tons steel/hr	2.02	lb/ton	Scrap Management Plan and Good Operating Practices
SN-01 EAF	AR-0172	STEEL MILL	9/1/2021	250	tons steel/hr	3	lb/ton	Direct Shell Evacuation
Melt Shop #1 (EU 01 Baghouse #1 & #2 Stack)	-	Steel Mill Mini	4/19/2021	2,000,000	tons steel/yr	2	lb/ton	Combustion processes must develop a Good Combustion and Operating Practices (GCOP) Plan.
Melt Shop (EU 01) & Melt Shop Combustion Sources (EU 02)	-	Steel Mill	7/23/2020	1,750,000	tons steel/yr	1.98	lb/ton	The facility is equipped with Continuous Emission Monitors (CEMS) to enable real-time monitoring of CO emissions, allowing adjustments to the process as needed to reduce emissions. Additionally, All EPs are required to have with a Good Work Practices (GWP) Plan or a Good Combustion and Operating Practices (GCOP) Plan.
ELECTRIC ARC FURNACE	-	Steel Mill	1/20/2020	-	-	3.275	lb/ton	GOOD COMBUSTION PRACTICES
Electric Arc Furnaces (EAF)	*TX-0882	SDSW STEEL MILL	01/17/2020	-	-	2.02	lb/ton	GOOD COMBUSTION PRACTICES, CLEAN FUEL
Ladle Metallurgical Stations (LMS)	*TX-0882	SDSW STEEL MILL	01/17/2020	-	-	2.02	lb/ton	GOOD COMBUSTION PRACTICES, CLEAN FUEL
Electric Arc Furnaces (EAF)	OH-0383	Steel Mill Mini	1/17/2020	-	-	2.02	lb/ton	GOOD COMBUSTION PRACTICES, CLEAN FUEL
ELECTRIC ARC FURNACE	*TX-0867	STEEL MANUFACTURING FACILITY	01/02/2020	-	-	3.275	lb/ton	GOOD COMBUSTION PRACTICES
MELT SHOP LADLE PREHEATERS	*TX-0867	STEEL MANUFACTURING FACILITY	01/02/2020	-	-	-	-	GOOD COMBUSTION PRACTICES
Electric Arc Furnace #2 (P905)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	250	tons steel/hr	500	lb/hr	DEC systems with air gap
Electric Arc Furnace #2 (P905)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	250	tons steel/hr	11603.57	ton/yr, rolling 12-month period	DEC systems with air gap

Table B-1. EAF/LMS Recent Permit Limitations and Determinations of BACT for CO (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)		Permitted CO Limit		Control
Twin-Station Ladle Metallurgy Facility (LMF 3/4) (P906)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	250	tons steel/hr	500	lb/hr	DEC systems with air gap
Twin-Station Ladle Metallurgy Facility (LMF 3/4) (P906)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	250	tons steel/hr	11603.57	ton/yr	DEC systems with air gap
Electric Arc Furnaces	*AL-0327	NUCOR STEEL DECATUR, LLC	08/14/2019	-	-	2.3	lb/ton	Direct evacuation control
Electric Arc Furnaces	*AL-0327	NUCOR STEEL DECATUR, LLC	08/14/2019	-	-	1240	lb/hr	Direct evacuation control
Meltshop Operations	-	Gerdau Ameristeel, NC	5/1/2019	90	tons steel/hr	4.4	lb/ton	Direct Evacuation System
Meltshop Baghouse & Fugitives	FL-0368	Nucor Frostproof, FL	2/14/2019	450,000	tons steel/yr	3.5	lb/ton, average of 3 one hour runs	DEC system, use of a scrap management plan & good combustion practices
Meltshop Baghouse & Fugitives	FL-0368	Nucor Frostproof, FL	2/14/2019	450,000	tons steel/yr	210	lb/hr, average of 3 one hour runs	DEC system, use of a scrap management plan & good combustion practices
Ladle metallurgy furnace (EULMF) and two vacuum tank degassers (EUVTD)	MI-0438	GERDAU MACSTEEL MONROE	10/29/2018	130	tons steel/hr	2	lb/ton, averaged monthly	-
Ladle metallurgy furnace (EULMF) and two vacuum tank degassers (EUVTD)	MI-0438	GERDAU MACSTEEL MONROE	10/29/2018	130	tons steel/hr	70.69	ton/yr	-
EUEAF (Electric arc furnace)	MI-0438	GERDAU MACSTEEL MONROE	10/29/2018	130	tons steel/hr	18.55	lb/hr	Direct-Shell Evacuation Control and CO reaction chamber
Electric Arc Furnace and Ladle Metallurgy Furnace	TX-0848	STEEL MILL	09/14/2018	-	-	2	lb/ton	good combustion
Electric Arc Furnace	-	Nucor Sedalia, MO	9/12/2018	450,000	tons steel/yr	3.5	lb/ton	Baghouse/DEC
Electric Arc Furnace and Ladle Metallurgy Station	-	CMC Mesa, AZ	6/14/2018	435,000	tons steel/yr	4	lb/ton	Use of air flaps in Consteel DEC to maximize CO combustion. Employ good combustion practices
ELECTRIC ARC FURNACE	*NE-0063	NUCOR STEEL DIVISION	11/07/2017	1,350,000	tons steel/yr	3.1	lb/ton	BAGHOUSE
Melt Shop	SC-0188	CMC STEEL SOUTH CAROLINA	10/3/2017	1,000,000	tons billet/yr	1.7	lb/ton	Good combustion practices with the use of Direct Evacuation Control (DEC)
Electric Arc Furnace (P900)	OH-0373	CHARTER STEEL - CLEVELAND INC	10/02/2017	110	tons steel/hr	356.4	lb/hr	Direct Evacuation Control (DEC) system with adjustable air gap and water-cooled elbow and duct

Table B-1. EAF/LMS Recent Permit Limitations and Determinations of BACT for CO (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)		Permitted CO Limit		Control
Electric Arc Furnace (P900)	OH-0373	CHARTER STEEL - CLEVELAND INC	10/02/2017	110	tons steel/hr	3.24	lb/ton	Direct Evacuation Control (DEC) system with adjustable air gap and water-cooled elbow and duct
Ladle Metallurgy Furnace (P901)	OH-0373	CHARTER STEEL - CLEVELAND INC	10/02/2017	110	tons steel/hr	33	lb/hr	-
Ladle Metallurgy Furnace (P901)	OH-0373	CHARTER STEEL - CLEVELAND INC	10/02/2017	110	tons steel/hr	126.32	ton/yr	-
Electric Arc Furnace	AL-0319	NUCOR STEEL TUSCALOOSA, INC.	03/09/2017	-	-	2.2	lb/ton	-
Electric Arc Furnace	AL-0319	NUCOR STEEL TUSCALOOSA, INC.	03/09/2017	-	-	660	lb/hr	-
TWO (2) ELECTRIC ARC FURNACES WITH TWO (2) MELTSHOP BAGHOUSES	AL-0309	NUCOR STEEL DECATUR, LLC	03/02/2016	-	-	2.3	lb/ton	DIRECT EVACUATION CONTROL
TWO (2) ELECTRIC ARC FURNACES WITH TWO (2) MELTSHOP BAGHOUSES	AL-0309	NUCOR STEEL DECATUR, LLC	03/02/2016	-	-	1012	lb/hr	DIRECT EVACUATION CONTROL
Electric Arc Furnace	OK-0173	CMC Durant, OK	1/19/2016	-	-	4	lb/ton	Pre-cleaned scrap.
Facilities With Permits Issued Before 2016								
Fume Treatment Plant (EAF)	LA-0309	BENTELER STEEL TUBE FACILITY	6/4/2015	90	tons steel/hr	4.8	lb/ton	-
FG-MELTSHOP (Melt Shop)	MI-0417	GERDAU MACSTEEL, INC.	10/27/2014	130	tons steel/hr	2	lb/ton	Direct Evacuation Control (DEC) and Co Reaction Chamber
FG-MELTSHOP (Melt Shop)	MI-0417	GERDAU MACSTEEL, INC.	10/27/2014	130	tons steel/hr	260	lb/hr	Direct Evacuation Control (DEC) and Co Reaction Chamber
Electric Arc Furnace	TX-0705	STEEL MINIMILL FACILITY	07/24/2014	1,300,000	tons steel/yr	1.3273	lb/ton	Good combustion practices with the operation of a DEC as the method typically employed to control CO.
ELECTRIC ARC FURNACE	NE-0055	NUCOR STEEL	10/09/2013	206	tons scrap/hr	2	lb/ton	-
ELECTRIC ARC FURNACE	NE-0055	NUCOR STEEL	10/09/2013	206	tons scrap/hr	383.3	lb/hr	-
ELECTRIC ARC FURNACE	*TX-0651	STEEL MILL	10/02/2013	316	tons steel/hr	2.27	lb/ton	GOOD COMBUSTION PRACTICE
LADLE FURNACE	*TX-0651	STEEL MILL	10/02/2013	316	tons steel/hr	0.174	lb/ton	GOOD COMBUSTION PRACTICE
EAFS SN-01 AND SN-02	AR-0140	BIG RIVER STEEL LLC	09/18/2013	-	-	2	lb/ton	-

Table B-1. EAF/LMS Recent Permit Limitations and Determinations of BACT for CO (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)		Permitted CO Limit		Control
MELTSHOP	IN-0196	NUCOR STEEL	09/17/2013	502	tons steel/hr	2	lb/ton	-
MELTSHOP	IN-0196	NUCOR STEEL	09/17/2013	502	tons steel/hr	1004	lb/hr	-
Melt Shop (FG-MELTSHOP)	MI-0404	GERDAU MACSTEEL, INC.	01/04/2013	130	tons liquid steel/hr	2	lb/ton	Direct Evacuation Control (DEC) and Co Reaction Chamber
Melt Shop (FG-MELTSHOP)	MI-0404	GERDAU MACSTEEL, INC.	01/04/2013	130	tons liquid steel/hr	260	lb/hr	Direct Evacuation Control (DEC) and Co Reaction Chamber
Electric Arc Furnace	OH-0350	REPUBLIC STEEL	07/18/2012	150	tons steel/hr	2	lb/ton	Direct-Shell Evacuation Control system with adjustable air gap and water-cooled elbow and duct.
Electric Arc Furnace	OH-0350	REPUBLIC STEEL	07/18/2012	150	tons steel/hr	1200	ton/yr	Direct-Shell Evacuation Control system with adjustable air gap and water-cooled elbow and duct.
LADLE METALLURGY SN-01	AR-0138	NUCOR CORPORATION - NUCOR STEEL, ARKANSAS	2/17/2012	-	-	0.02	lb/ton	-

[1] The CMC Mesa, Nucor Sedalia, and Gerdau Ameristeel facilities were not in the RBLC but they are ECS processes/micro mills and are similar to the proposed facility.

* Indicates that the facilities are draft determination in the RBLC database.

Table B-2. EAF/LMS Recent Permit Limitations and Determinations of BACT for NOx (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)		Permitted NO_X Limit		Control
				Value	Unit	Value	Unit	
Facilities With Permits Issued After 2016 [1]								
EAF/LMF	WV-0034	Nucor Steel West Virginia	5/5/2022	3,000,000	tons steel/yr	56.86	lb/hr	EAF - Oxyfuel Burners LMF - Good Combustion Practices
EAFs and LMFs	AR-0173	BIG RIVER STEEL LLC	1/31/2022	250	tons steel/hr	0.35	lb/ton	Scrap Management Plan and Good Operating Practices
SN-01 EAF	AR-0172	Nucor Steel Arkansas	9/1/2021	250	tons steel/hr	2.2	lb/ton	Low Nox Burners
Melt Shop (EU 01) & Melt Shop Combustion Sources (EU 02)	-	Steel Mill	7/23/2021	1,750,000	tons steel/yr	0.42	lb/ton	The facility is equipped with Continuous Emission Monitors (CEMS) to enable real-time monitoring of NOx emissions, allowing adjustments to the process as needed to reduce emissions. Additionally, All EPs are required to have with a Good Work Practices (GWP) Plan or a Good Combustion and Operating Practices (GCOP) Plan.
Melt Shop #1 (EU 01 Baghouse #1 & #2 Stack)	-	Steel Mini Mill	4/19/2021	2,000,000	tons steel/yr	0.42	lb/ton	Combustion processes must develop a Good Combustion and Operating Practices (GCOP) Plan. New equipment in the meltshop is equipped with low-NOx burners (70 lb/MMscf).
ELECTRIC ARC FURNACE	-	Steel Mill	1/20/2020	-	-	0.58	lb/ton	GOOD COMBUSTION PRACTICES
Electric Arc Furnaces (EAF)	*TX-0882	SDSW STEEL MILL	01/17/2020	-	-	0.35	lb/ton	ELECTRIC
Ladle Metallurgical Stations (LMS)	*TX-0882	SDSW STEEL MILL	01/17/2020	-	-	0.35	lb/ton	GOOD COMBUSTION PRACTICES, CLEAN FUEL
Electric Arc Furnaces (EAF)	-	SDSW Steel, TX	1/17/2020	-	-	0.35	lb/ton	ELECTRIC
ELECTRIC ARC FURNACE	*TX-0867	STEEL MANUFACTURING FACILITY	01/02/2020	-	-	0.58	lb/ton	GOOD COMBUSTION PRACTICES
MELT SHOP LADLE PREHEATERS	*TX-0867	STEEL MANUFACTURING FACILITY	01/02/2020	-	-	-	-	GOOD COMBUSTION PRACTICES
Twin-Station Ladle Metallurgy Facility (LMF 3/4) (P906)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	250	tons steel/hr	105	lb/hr	DEC systems with air gap
Twin-Station Ladle Metallurgy Facility (LMF 3/4) (P906)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	250	tons steel/hr	828.5	ton/yr per 12-month rolling period	DEC systems with air gap
Electric Arc Furnace #2 (P905)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	250	tons steel/hr	105	lb/hr	DEC systems with air gap
Electric Arc Furnace #2 (P905)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	250	tons steel/hr	828.5	ton/yr per 12-month rolling period	DEC systems with air gap

Table B-2. EAF/LMS Recent Permit Limitations and Determinations of BACT for NOx (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)		Permitted NO_x Limit		Control
Electric Arc Furnaces	*AL-0327	Nucor Decatur, AL	08/14/2019	-	-	0.42	lb/ton	Oxy-fuel fired burners
Electric Arc Furnaces	*AL-0327	Nucor Decatur, AL	08/14/2019	-	-	226.8	lb/hr	Oxy-fuel fired burners
Meltshop Operations	-	Gerdau Ameristeel, NC	5/1/2019	90	tons steel/hr	0.34	lb/ton	-
Meltshop Baghouse & Fugitives	FL-0368	Nucor Frostproof, FL	2/14/2019	450,000	tons steel/yr	0.3	lb/ton	Oxy-fuel burners on the EAF, DEC System and baghouse controls.
Meltshop Baghouse & Fugitives	FL-0368	Nucor Frostproof, FL	2/14/2019	450,000	tons steel/yr	18	lb/hour, average of 3 one hour runs	Oxy-fuel burners on the EAF, DEC System and baghouse controls.
EUEAF (Electric arc furnace)	MI-0438	Gerdau Macsteel, MI	10/29/2018	130	tons steel/hr	0.27	lb/ton	Real time process optimization (RTPO) combustion controls and oxy-fuel burners.
EUEAF (Electric arc furnace)	MI-0438	GERDAU MACSTEEL MONROE	10/29/2018	130	tons steel/hr	35.1	lb/hr	Real time process optimization (RTPO) combustion controls and oxy-fuel burners.
Ladle metallurgy furnace (EULMF) and two vacuum tank degassers (EUVTD)	MI-0438	GERDAU MACSTEEL MONROE	10/29/2018	130	tons steel/hr	10.3	lb/hr	-
Ladle metallurgy furnace (EULMF) and two vacuum tank degassers (EUVTD)	MI-0438	GERDAU MACSTEEL MONROE	10/29/2018	130	tons steel/hr	42.23	ton/yr per 12-month rolling period	-
Electric Arc Furnace and Ladle Metallurgy Furnace	TX-0848	STEEL MILL	09/14/2018	-	-	0.158	lb/ton	Oxy-fuel burners
Electric Arc Furnace	-	Nucor Sedalia, MO	9/12/2018	450,000	tons steel/yr	0.3	lb/ton	Baghouse/DEC
Electric Arc Furnace and Ladle Metallurgy Station	-	CMC Mesa, AZ	6/14/2018	435,000	tons steel/yr	0.3	lb/ton	Use of good furnace melting practices and oxy-fuel burners to reduce NOx emissions. Employ good combustion practices
ELECTRIC ARC FURNACE	*NE-0063	Nucor Norfolk, NE	11/07/2017	1,350,000	tons steel/yr	0.42	lb/ton	BAGHOUSE
Electric Arc Furnace	AL-0323	OUTOKUMPU STAINLESS USA, LLC	06/13/2017	-	-	0.6	lb/ton	Direct Evacuation Control
Electric Arc Furnace	AL-0323	OUTOKUMPU STAINLESS USA, LLC	06/13/2017	-	-	75.6	lb/hr	Direct Evacuation Control
Electric Arc Furnace	AL-0319	Nucor Tuscaloosa, AL	03/09/2017	-	-	0.35	lb/ton	-
Electric Arc Furnace	AL-0319	Nucor Tuscaloosa, AL	03/09/2017	-	-	105	lb/hr	-

Table B-2. EAF/LMS Recent Permit Limitations and Determinations of BACT for NOx (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)		Permitted NO_X Limit		Control
TWO (2) ELECTRIC ARC FURNACES WITH TWO (2) MELTSHOP BAGHOUSES	AL-0309	NUCOR STEEL DECATUR, LLC	03/02/2016	-	-	0.42	lb/ton	OXY-FUEL BURNERS
TWO (2) ELECTRIC ARC FURNACES WITH TWO (2) MELTSHOP BAGHOUSES	AL-0309	NUCOR STEEL DECATUR, LLC	03/02/2016	-	-	184.8	lb/hr	OXY-FUEL BURNERS
Electric Arc Furnace	OK-0173	CMC Durant, OK	1/19/2016	-	-	0.3	lb/ton	Oxy-firing.
Facilities With Permits Issued Before 2016								
Fume Treatment Plant (EAF)	LA-0309	BENTELER STEEL TUBE FACILITY	6/4/2015	90	tons steel/hr	0.35	lb/ton	-
FG-MELTSHOP (Melt Shop)	MI-0417	GERDAU MACSTEEL, INC.	10/27/2014	130	tons steel/hr	0.2	lb/ton	No controls. Real time process optimization (combustion controls) and the use of oxy-fuel burners.
FG-MELTSHOP (Melt Shop)	MI-0417	GERDAU MACSTEEL, INC.	10/27/2014	130	tons steel/hr	26	lb/hr	No controls. Real time process optimization (combustion controls) and the use of oxy-fuel burners.
Electric Arc Furnace	TX-0705	STEEL MINIMILL FACILITY	07/24/2014	1,300,000	tons steel/yr	0.2159	lb/ton	Good Combustion and/or Process Operation including an EAF carbon injection and furnace burner system that injects carbon and oxygen into the metal/slag interface.
ELECTRIC ARC FURNACE	NE-0055	NUCOR STEEL	10/09/2013	206	tons scrap/hr	0.28	lb/ton	-
ELECTRIC ARC FURNACE	NE-0055	NUCOR STEEL	10/09/2013	206	tons scrap/hr	53.67	lb/hr	-
ELECTRIC ARC FURNACE	*TX-0651	STEEL MILL	10/02/2013	316	tons steel/hr	0.9	lb/ton	OXY FIRED BURNERS
LADLE FURNACE	*TX-0651	STEEL MILL	10/02/2013	316	tons steel/hr	0.548	lb/ton	GOOD COMBUSTION PRACTICE
EAFS SN-01 AND SN-02	AR-0140	BIG RIVER STEEL LLC	09/18/2013	-	-	0.3	lb/ton	-
MELTSHOP	IN-0196	NUCOR STEEL	09/17/2013	502	tons steel/hr	0.35	lb/ton	-
MELTSHOP	IN-0196	NUCOR STEEL	09/17/2013	502	tons steel/hr	175.7	lb/hr	-
Melt Shop (FG-MELTSHOP)	MI-0404	GERDAU MACSTEEL, INC.	01/04/2013	130	tons liquid steel/hr	0.2	lb/ton	Real time process optimization (combustion controls) and the use of oxy-fuel burners.
Melt Shop (FG-MELTSHOP)	MI-0404	GERDAU MACSTEEL, INC.	01/04/2013	130	tons liquid steel/hr	26	lb/hr	Real time process optimization (combustion controls) and the use of oxy-fuel burners.
Electric Arc Furnace	OH-0350	REPUBLIC STEEL	07/18/2012	150	tons steel/hr	0.5	lb/ton	-
Electric Arc Furnace	OH-0350	REPUBLIC STEEL	07/18/2012	150	tons steel/hr	300	ton/yr per 12-month rolling period	-

[1] The CMC Mesa, Nucor Sedalia and Gerdau Ameristeel facilities were not in the RBLC but they are an ECS process/micro mill and are similar to the proposed facility.
* Indicates that the facilities are draft determination in the RBLC database.

Table B-3. EAF/LMS Recent Permit Limitations and Determinations of BACT for SO_2 (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)		Permitted SO_2 Limit		Control
				Value	Unit	Value	Unit	
Facilities With Permits Issued After 2016 [1]								
EAF/LMF	WV-0034	Nucor Steel West Virginia	5/5/2022	3,000,000	tons steel/yr	38.99	lb/hr	Scrap Management Plan and Lime Fluxing
EAFs and LMFs	AR-0173	Big River Steel, AR	1/31/2022	250	tons steel/hr	0.2	lb/ton	Scrap Management Plan
SN-01 EAF	AR-0172	Nucor Blytheville, AR	9/1/2021	250	tons steel/hr	0.2	lb/ton	Good Operating Practices
Melt Shop #1 (EU 01 Baghouse #1 & #2 Stack)	-	Steel Mini Mill	4/19/2021	2,000,000	tons steel/yr	0.35	lb/ton	Combustion processes must develop a Good Combustion and Operating Practices (GCOP) Plan and the permittee shall limit the sulfur content of the EAF feedstock utilizing scrap management and/or shall add appropriate fluxes to the charge such that the emission limitations for SO2 are met.
Melt Shop (EU 01) & Melt Shop Combustion Sources (EU 02)	-	STEEL MILL	7/23/2020	1,750,000	tons steel/yr	0.35	lb/ton	The facility is equipped with Continuous Emission Monitors (CEMS) to enable real-time monitoring of SO2 emissions, allowing adjustments to the process as needed to reduce emissions. Additionally, All EPs are required to have with a Good Work Practices (GWP) Plan or a Good Combustion and Operating Practices (GCOP) Plan.
Electric Arc Furnaces (EAF)	*TX-0882	SDSW STEEL MILL	01/17/2020	-	-	0.24	lb/ton	CLEAN SCRAP
Ladle Metallurgical Stations (LMS)	*TX-0882	SDSW STEEL MILL	01/17/2020	-	-	0.24	lb/ton	CLEAN SCRAP
Electric Arc Furnaces (EAF)	-	SDSW Steel, TX	1/17/2020	-	-	0.24	lb/ton	CLEAN SCRAP
ELECTRIC ARC FURNACE	*TX-0867	STEEL MANUFACTURING FACILITY	01/02/2020	-	-	0.216	lb/ton	CLEAN SCRAP
MELT SHOP LADLE PREHEATERS	*TX-0867	STEEL MANUFACTURING FACILITY	01/02/2020	-	-	-	-	CLEAN FUEL AND SCRAP
ELECTRIC ARC FURNACE	-	STEEL MANUFACTURING FACILITY	1/2/2020	-	-	0.216	lb/ton	CLEAN SCRAP
Twin-Station Ladle Metallurgy Facility (LMF 3/4) (P906)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	250	tons steel/hr	87.5	lb/hr	The development, implementation, and maintenance of: (a) a scrap management plan; and (b) a work practice plan addressing argon stirring during LMF desulfurization process.

Table B-3. EAF/LMS Recent Permit Limitations and Determinations of BACT for SO_2 (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)		Permitted SO_2 Limit		Control
Twin-Station Ladle Metallurgy Facility (LMF 3/4) (P906)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	250	tons steel/hr	575.9	ton/yr per 12-month rolling period	The development, implementation, and maintenance of: (a) a scrap management plan; and (b) a work practice plan addressing argon stirring during LMF desulfurization process.
Electric Arc Furnace #2 (P905)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	250	tons steel/hr	87.5	lb/hr	The development, implementation, and maintenance of: (a) a scrap management plan; and (b) a work practice plan addressing argon stirring during LMF desulfurization process.
Electric Arc Furnace #2 (P905)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	250	tons steel/hr	575.9	ton/yr per 12-month rolling period	The development, implementation, and maintenance of: (a) a scrap management plan; and (b) a work practice plan addressing argon stirring during LMF desulfurization process.
Electric Arc Furnaces	*AL-0327	Nucor Decatur, AL	08/14/2019	-	-	0.35	lb/ton	Low sulfur injection carbon (less than or equal to 2% sulfur)
Electric Arc Furnaces	*AL-0327	Nucor Decatur, AL	08/14/2019	-	-	189	lb/hr	Low sulfur injection carbon (less than or equal to 2% sulfur)
Meltshop Operations	-	Gerdau Ameristeel, NC	5/1/2019	90	tons steel/hr	0.16	lb/ton	-
Meltshop Baghouse & Fugitives	FL-0368	Nucor Frostproof, FL	02/14/2019	450,000	tons steel/yr	0.6	lb/ton	Use of natural gas fuel, low-sulfur available carbon-based feed and charge material, as well as good combustion and/or process operations
Meltshop Baghouse & Fugitives	FL-0368	Nucor Frostproof, FL	02/14/2019	450,000	tons steel/yr	36	lb/hr, 30 day rolling average	Use of natural gas fuel, low-sulfur available carbon-based feed and charge material, as well as good combustion and/or process operations
EUEAF (Electric arc furnace)	MI-0438	GERDAU MACSTEEL MONROE	10/29/2018	130	tons steel/hr	0.25	lb/ton	lime coating of the baghouse bags.
EUEAF (Electric arc furnace)	MI-0438	GERDAU MACSTEEL MONROE	10/29/2018	130	tons steel/hr	32.5	lb/hr	lime coating of the baghouse bags.
Ladle metallurgy furnace (EULMF) and two vacuum tank degassers (EUVTD)	MI-0438	GERDAU MACSTEEL MONROE	10/29/2018	130	tons steel/hr	13.05	lb/hr	lime coated baghouse bags
Ladle metallurgy furnace (EULMF) and two vacuum tank degassers (EUVTD)	MI-0438	GERDAU MACSTEEL MONROE	10/29/2018	130	tons steel/hr	45.22	ton/yr per 12-month rolling period	lime coated baghouse bags
Electric Arc Furnace and Ladle Metallurgy Furnace	TX-0848	STEEL MILL	09/14/2018	-	-	0.23	lb/ton	scrap management
Electric Arc Furnace	-	Nucor Sedalia, MO	9/12/2018	450,000	tons steel/yr	0.5	lb/ton	Good process control

Table B-3. EAF/LMS Recent Permit Limitations and Determinations of BACT for SO_2 (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)		Permitted SO_2 Limit		Control
Electric Arc Furnace and Ladle Metallurgy Station	-	CMC Mesa, AZ	6/14/2018	435,000	tons steel/yr	0.3	lb/ton	Use good process operation practices, scrap management and proper management of carbon injection. Employ good combustion practices
Electric Arc Furnace (P900)	OH-0373	CHARTER STEEL - CLEVELAND INC	10/02/2017	110	tons steel/hr	1.51	lb/ton	Melt Shop Sulfur-based Good Operating Practices: The permittee shall follow the melt shop's standard operating procedures as it relates to achieving each heater's final elemental chemistry specification for sulfur content. This includes any procedures for adjusting the sulfur content in the EAF, LMF and/or VTD.
Electric Arc Furnace (P900)	OH-0373	CHARTER STEEL - CLEVELAND INC	10/02/2017	110	tons steel/hr	166.16	lb/hr	Melt Shop Sulfur-based Good Operating Practices: The permittee shall follow the melt shop's standard operating procedures as it relates to achieving each heater's final elemental chemistry specification for sulfur content. This includes any procedures for adjusting the sulfur content in the EAF, LMF and/or VTD.
Ladle Metallurgy Furnace (P901)	OH-0373	CHARTER STEEL - CLEVELAND INC	10/02/2017	110	tons steel/hr	1.51	lb/ton	Melt Shop Sulfur-based Good Operating Practices: The permittee shall follow the melt shop's standard operating procedures as it relates to achieving each heater's final elemental chemistry specification for sulfur content. This includes any procedures for adjusting the sulfur content in the EAF, LMF and/or VTD.
Ladle Metallurgy Furnace (P901)	OH-0373	CHARTER STEEL - CLEVELAND INC	10/02/2017	110	tons steel/hr	166.16	lb/hr	Melt Shop Sulfur-based Good Operating Practices: The permittee shall follow the melt shop's standard operating procedures as it relates to achieving each heater's final elemental chemistry specification for sulfur content. This includes any procedures for adjusting the sulfur content in the EAF, LMF and/or VTD.
Electric Arc Furnace	AL-0323	Outokumpu Stainless, AL	06/13/2017	-	-	0.375	lb/ton	-
Electric Arc Furnace	AL-0323	Outokumpu Stainless, AL	06/13/2017	-	-	47.25	lb/hr	-
Electric Arc Furnace	AL-0319	Nucor Tuscaloosa, AL	03/09/2017	-	-	0.44	lb/ton	-
Electric Arc Furnace	AL-0319	Nucor Tuscaloosa, AL	03/09/2017	-	-	132	lb/hr	-
TWO (2) ELECTRIC ARC FURNACES WITH TWO (2) MELTSHOP BAGHOUSES	AL-0309	NUCOR STEEL DECATUR, LLC	03/02/2016	-	-	0.35	lb/ton	LOW SULFUR CHARGE CARBON (< 2.0 % SULFUR BY WEIGHT)

Table B-3. EAF/LMS Recent Permit Limitations and Determinations of BACT for SO_2 (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)		Permitted SO_2 Limit		Control
TWO (2) ELECTRIC ARC FURNACES WITH TWO (2) MELTSHOP BAGHOUSES	AL-0309	NUCOR STEEL DECATUR, LLC	03/02/2016	-	-	154	lb/hr	LOW SULFUR CHARGE CARBON (< 2.0 % SULFUR BY WEIGHT)
Electric Arc Furnace	OK-0173	CMC Durant, OK	01/19/2016	-	-	0.6	lb/ton	-
Facilities With Permits Issued Before 2016								
Fume Treatment Plant (EAF)	LA-0309	BENTELER STEEL TUBE FACILITY	6/4/2015	90	tons steel/hr	0.6	lb/ton	Scrap management plan
FG-MELTSHOP (Melt Shop)	MI-0417	GERDAU MACSTEEL, INC.	10/27/2014	130	tons steel/hr	0.2	lb/ton	-
FG-MELTSHOP (Melt Shop)	MI-0417	GERDAU MACSTEEL, INC.	10/27/2014	130	tons steel/hr	26	lb/hr	-
Electric Arc Furnace	TX-0705	STEEL MINIMILL FACILITY	07/24/2014	1,300,000	tons steel/yr	0.4	lb/ton	The EAF currently combusts sweet natural gas and low-sulfur carbon feedstock, and uses good management practices to prevent feeding unnecessary sulfur containing materials to the steel producing process.
ELECTRIC ARC FURNACE	NE-0055	NUCOR STEEL	10/09/2013	206	tons scrap/hr	1.5	lb/ton	-
ELECTRIC ARC FURNACE	NE-0055	NUCOR STEEL	10/09/2013	206	tons scrap/hr	546.26	lb/hr	-
ELECTRIC ARC FURNACE	*TX-0651	STEEL MILL	10/02/2013	316	tons steel/hr	1.76	lb/ton	GOOD PROCESS OPERATION AND SCRAP MANAGEMENT
LADLE FURNACE	*TX-0651	STEEL MILL	10/02/2013	316	tons steel/hr	1.76	lb/ton	GOOD PROCESS OPERATION AND SCRAP MANAGEMENT
EAFS SN-01 AND SN-02	AR-0140	BIG RIVER STEEL LLC	09/18/2013	-	-	0.18	lb/ton	SCRAP MANAGEMENT PLAN
MELTSHOP	IN-0196	NUCOR STEEL	09/17/2013	502	tons steel/hr	0.33	lb/ton	-
MELTSHOP	IN-0196	NUCOR STEEL	09/17/2013	502	tons steel/hr	167	lb/hr per 3-hour block average	-
Melt Shop (FG-MELTSHOP)	MI-0404	GERDAU MACSTEEL, INC.	01/04/2013	130	tons liquid steel/hr	0.2	lb/ton	-
Melt Shop (FG-MELTSHOP)	MI-0404	GERDAU MACSTEEL, INC.	01/04/2013	130	tons liquid steel/hr	26	lb/hr	-
Electric Arc Furnace	OH-0350	REPUBLIC STEEL	07/18/2012	150	tons steel/hr	0.39	lb/ton	-
Electric Arc Furnace	OH-0350	REPUBLIC STEEL	07/18/2012	150	tons steel/hr	234	ton/yr per 12-month rolling period	-
LADLE METALLURGY SN-01	AR-0138	NUCOR CORPORATION - NUCOR STEEL, ARKANSAS	02/17/2012	-	-	0.102	lb/ton	-

[1] The CMC Mesa, Nucor Sedalia and Gerdau Ameristeel facilities were not in the RBLC but they are an ECS process/micro mill and are similar to the proposed facility.

* Indicates that the facilities are draft determination in the RBLC database.

Table B-4. EAF/LMS Recent Permit Limitations and Determinations of BACT for PM (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)		Particulate Matter Type	Permitted PM Limit		Control
				Value	Unit		Value	Unit	
Electric Arc Furnaces NSPS AAa							**12 mg/dscm (0.0052 gr/dscf) 3% Opacity from control device, 6% opacity from EAF**		
Electric Arc Furnaces Major Sources NESHAP EEEEE							**0.005 gr/dscf 0.0004 gr/dscf of total metal HAP**		
Integrated Iron and Steel Manufacturing Facilities Major Sources NESHAP FFFFF							**0.004 gr/dscf for ladle metallurgy at a new Basic Oxygen Process Furnace (BOPF) 0.1 gr/dscf for ladle metallurgy at an existing Basic Oxygen Process Furnace (BOPF)**		
Electric Arc Furnaces Area Sources NESHAP YYYYY							**12 mg/dscm (0.0052 gr/dscf) 0.8 lb/ton for production capacity < 150,000 tons 6% opacity from EAF**		
New Large Iron and Steel Foundaries Area Sources NESHAP ZZZZZ							**0.1 lb/ton 0.008 lb metal HAP/ton 20% opacity from fugitive emissions (6 min average)**		
Facilities With Permits Issued After 2016 [1]									
EAF/LMF	WV-0034	Nucor Steel, WV	5/5/2022	3,000,000	tons steel/yr	Particulate matter, total < 10 µ (TPM10)	0.0052	gr/dscf	Direct-shell evacuation control (DEC) system designed and operated to achieve a minimum capture efficiency of 95% of all potential particulate matter emissions from the EAFs and LMFs and evacuate the exhaust to each
EAF/LMF	WV-0034	Nucor Steel, WV	5/5/2022	3,000,000	tons steel/yr	Particulate matter, total < 2.5 µ (TPM2.5)	0.0052	gr/dscf	Direct-shell evacuation control (DEC) system designed and operated to achieve a minimum capture efficiency of 95% of all potential particulate matter emissions from the EAFs and LMFs and evacuate the exhaust to each
EAF/LMF	WV-0034	Nucor Steel, WV	5/5/2022	3,000,000	tons steel/yr	Particulate matter, filterable (FPM)	0.0018	gr/dscf	Direct-shell evacuation control (DEC) system designed and operated to achieve a minimum capture efficiency of 95% of all potential particulate matter emissions from the EAFs and LMFs and evacuate the exhaust to each
EAF/LMF	AR-0173	BIG RIVER STEEL LLC	1/31/2022	250	tons steel/hr	Particulate matter, filterable (FPM)	0.0018	gr/dscf	Fabric Filter
SN-01 EAF	AR-0172	Nucor Steel Arkansas	9/1/2021	250	tons steel/hr	Particulate matter, total < 10 µ (TPM10) Particulate matter, total < 2.5 µ (TPM2.5) Particulate matter, filterable	0.0018	gr/dscf	Fabric Filter

Table B-4. EAF/LMS Recent Permit Limitations and Determinations of BACT for PM (Prior 10 years)

Process	RBLC ID	Facility	Permit Date	Production Capacity (US tpy)		Particulate Matter Type	Permitted PM Limit		Control
SN-01 EAF	-	STEEL MILL	9/1/2021	585	tons steel/yr	PM10	0.0052	gr/dscf	BAGHOUSE
SN-01 EAF	-	STEEL MILL	9/1/2021	585	tons steel/yr	PM2.5	0.052	gr/dscf	BAGHOUSE
Melt Shop #1 (EU 01 Baghouse #1 & #2 Stack)	-	Steel Mini Mill	4/19/2021	2,000,000	tons steel/yr	PM	31.49	lb/hr	Emissions are controlled by 2 baghouses (combined stack). Combustion processes must develop a Good Combustion and Operating Practices (GCOP) Plan and non-combustion processes must develop a Good
Melt Shop #1 (EU 01 Baghouse #1 & #2 Stack)	-	Steel Mini Mill	4/19/2021	2,000,000	tons steel/yr	PM10	90.97	lb/hr	Emissions are controlled by 2 baghouses (combined stack). Combustion processes must develop a Good Combustion and Operating Practices (GCOP) Plan and non-combustion processes must develop a Good
Melt Shop #1 (EU 01 Baghouse #1 & #2 Stack)	-	Steel Mini Mill	4/19/2021	2,000,000	tons steel/yr	PM2.5	59.48	lb/yr	Emissions are controlled by 2 baghouses (combined stack). Combustion processes must develop a Good Combustion and Operating Practices (GCOP) Plan and non-combustion processes must develop a Good
Melt Shop (EU 01) & Melt Shop Combustion Sources	-	Steel Mill	7/23/2020	1,750,000	tons steel/yr	PM	0.0018	gr/dscf	Negative Pressure Pulse-Jet Baghouse (C0101). The Melt Shop is equipped with canopy hoods to capture and vent emissions that are not captured by the direct shell evacuation system (DEC or DSE).
Melt Shop (EU 01) & Melt Shop Combustion Sources	-	STEEL MILL	7/23/2020	1,750,000	tons steel/yr	PM10	0.0052	gr/dscf	Negative Pressure Pulse-Jet Baghouse (C0101). The Melt Shop is equipped with canopy hoods to capture and vent emissions that are not captured by the direct shell evacuation system (DEC or DSE).
Melt Shop (EU 01) & Melt Shop Combustion Sources	-	STEEL MILL	7/23/2020	1,750,000	tons steel/yr	PM2.5	0.0034	gr/dscf	Negative Pressure Pulse-Jet Baghouse (C0101). The Melt Shop is equipped with canopy hoods to capture and vent emissions that are not captured by the direct shell evacuation system (DEC or DSE).
ELECTRIC ARC FURNACE	-	STEEL MILL	1/20/2020	-	-	PM10	-	-	-
ELECTRIC ARC FURNACE	-	STEEL MILL	1/20/2020	-	-	PM2.5	-	-	-
Electric Arc Furnaces (EAF)	*TX-0882	SDSW STEEL MILL	01/17/2020	-	-	Particulate matter, filterable (FPM)	0.0052	gr/dscf	BAGHOUSE
Electric Arc Furnaces (EAF)	*TX-0882	SDSW STEEL MILL	01/17/2020	-	-	Particulate matter, filterable < 10 μ (FPM10)	0.0052	gr/dscf	BGAHOUSE
Electric Arc Furnaces (EAF)	*TX-0882	SDSW STEEL MILL	01/17/2020	-	-	Particulate matter, filterable < 2.5 μ (FPM2.5)	0.0052	gr/dscf	BAGHOUSE

Table B-4. EAF/LMS Recent Permit Limitations and Determinations of BACT for PM (Prior 10 years)

Process	RBLC ID	Facility	Permit Date	Production Capacity (US tpy)		Particulate Matter Type	Permitted PM Limit		Control
Electric Arc Furnaces (EAF)	-	SDSW STEEL MILL	1/17/2020	-	-	PM	0.0052	gr/dscf	BAGHOUSE
Electric Arc Furnaces (EAF)	-	SDSW STEEL MILL	1/17/2020	-	-	PM10	-	-	-
Electric Arc Furnaces (EAF)	-	SDSW STEEL MILL	1/17/2020	-	-	PM2.5	-	-	-
ELECTRIC ARC FURNACE	-	Steel Mill	1/2/2020	-	-	-	-	-	-
Twin-Station Ladle Metallurgy Facility (LMF 3/4) (P906)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	250	tons steel/hr	Particulate matter, filterable (FPM)	19.93	lb/hr	Operation of a baghouse control system a consisting of the following: (a)direct evacuation control (DEC) system for collection of emissions from EAF and LMF; (b)roof canopy hood system for collection of emissions fugitive to the inside of Meltshop #2 from casting operations (P907-Caster #2) and emissions not captured by the DEC control systems;
Twin-Station Ladle Metallurgy Facility (LMF 3/4) (P906)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	250	tons steel/hr	Particulate matter, filterable (FPM)	87.69	ton/yr	Operation of a baghouse control system a consisting of the following: (a)direct evacuation control (DEC) system for collection of emissions from EAF and LMF; (b)roof canopy hood system for collection of emissions fugitive to the inside of Meltshop #2 from casting operations (P907-Caster #2) and emissions not captured by the DEC control systems;
Twin-Station Ladle Metallurgy Facility (LMF 3/4) (P906)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	250	tons steel/hr	Particulate matter, fugitive	20.96	ton/yr	Operation of a baghouse control system a consisting of the following: (a)direct evacuation control (DEC) system for collection of emissions from EAF and LMF; (b)roof canopy hood system for collection of emissions fugitive to the inside of Meltshop #2 from casting operations (P907-Caster #2) and emissions not captured by the DEC control systems;

Table B-4. EAF/LMS Recent Permit Limitations and Determinations of BACT for PM (Prior 10 years)

Process	RBLC ID	Facility	Permit Date	Production Capacity (US tpy)		Particulate Matter Type	Permitted PM Limit		Control
Twin-Station Ladle Metallurgy Facility (LMF 3/4) (P906)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	250	tons steel/hr	Particulate matter, total < 10 µ (TPM10)	26.57	lb/hr	Operation of a baghouse control system a consisting of the following: (a)direct evacuation control (DEC) system for collection of emissions from EAF and LMF; (b)roof canopy hood system for collection of emissions fugitive to the inside of Meltshop #2 from casting operations (P907-Caster #2) and emissions not captured by the DEC control systems;
Twin-Station Ladle Metallurgy Facility (LMF 3/4) (P906)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	250	tons steel/hr	Particulate matter, total < 10 µ (TPM10)	116.38	ton/yr	Operation of a baghouse control system a consisting of the following: (a)direct evacuation control (DEC) system for collection of emissions from EAF and LMF; (b)roof canopy hood system for collection of emissions fugitive to the inside of Meltshop #2 from casting operations (P907-Caster #2) and emissions not captured by the DEC control systems;
Twin-Station Ladle Metallurgy Facility (LMF 3/4) (P906)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	250	tons steel/hr	Particulate matter, total < 2.5 µ (TPM2.5)	26.57	lb/hr	Operation of a baghouse control system a consisting of the following: (a)direct evacuation control (DEC) system for collection of emissions from EAF and LMF; (b)roof canopy hood system for collection of emissions fugitive to the inside of Meltshop #2 from casting operations (P907-Caster #2) and emissions not captured by the DEC control systems;
Twin-Station Ladle Metallurgy Facility (LMF 3/4) (P906)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	250	tons steel/hr	Particulate matter, total < 2.5 µ (TPM2.5)	116.38	ton/yr	Operation of a baghouse control system a consisting of the following: (a)direct evacuation control (DEC) system for collection of emissions from EAF and LMF; (b)roof canopy hood system for collection of emissions fugitive to the inside of Meltshop #2 from casting operations (P907-Caster #2) and emissions not captured by the DEC control systems;

Table B-4. EAF/LMS Recent Permit Limitations and Determinations of BACT for PM (Prior 10 years)

Process	RBLC ID	Facility	Permit Date	Production Capacity (US tpy)		Particulate Matter Type	Permitted PM Limit		Control
Electric Arc Furnace #2 (P905)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	250	tons steel/hr	Particulate matter, filterable (FPM)	19.93	lb/hr	Operation of a baghouse control system a consisting of the following: (a)direct evacuation control (DEC) system for collection of emissions from EAF and LMF; (b)roof canopy hood system for collection of emissions fugitive to the inside of Meltshop #2 from casting operations (P907-Caster #2) and emissions not captured by the DEC control systems;
Electric Arc Furnace #2 (P905)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	250	tons steel/hr	Particulate matter, filterable (FPM)	87.69	ton/yr per 12-month rolling period	Operation of a baghouse control system a consisting of the following: (a)direct evacuation control (DEC) system for collection of emissions from EAF and LMF; (b)roof canopy hood system for collection of emissions fugitive to the inside of Meltshop #2 from casting operations (P907-Caster #2) and emissions not captured by the DEC control systems;
Electric Arc Furnace #2 (P905)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	250	tons steel/hr	Particulate matter, total < 10 μ (TPM10)	26.57	lb/hr	Operation of a baghouse control system a consisting of the following: (a)direct evacuation control (DEC) system for collection of emissions from EAF and LMF; (b)roof canopy hood system for collection of emissions fugitive to the inside of Meltshop #2 from casting operations (P907-Caster #2) and emissions not captured by the DEC control systems;
Electric Arc Furnace #2 (P905)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	250	tons steel/hr	Particulate matter, total < 10 μ (TPM10)	116.38	ton/yr per 12-month rolling period	Operation of a baghouse control system a consisting of the following: (a)direct evacuation control (DEC) system for collection of emissions from EAF and LMF; (b)roof canopy hood system for collection of emissions fugitive to the inside of Meltshop #2 from casting operations (P907-Caster #2) and emissions not captured by the DEC control systems;
Electric Arc Furnace #2 (P905)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	250	tons steel/hr	Particulate matter, total < 2.5 μ (TPM2.5)	26.57	lb/hr	Operation of a baghouse control system a consisting of the following: (a)direct evacuation control (DEC) system for collection of emissions from EAF and LMF; (b)roof canopy hood system for collection of emissions fugitive to the inside of Meltshop #2 from casting operations (P907-Caster #2) and emissions not captured by the DEC control systems;

Table B-4. EAF/LMS Recent Permit Limitations and Determinations of BACT for PM (Prior 10 years)

Process	RBLC ID	Facility	Permit Date	Production Capacity (US tpy)		Particulate Matter Type	Permitted PM Limit		Control
Electric Arc Furnace #2 (P905)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	250	tons steel/hr	Particulate matter, total < 2.5 µ (TPM2.5)	116.38	ton/yr per 12-month rolling period	Operation of a baghouse control system a consisting of the following: (a)direct evacuation control (DEC) system for collection of emissions from EAF and LMF; (b)roof canopy hood system for collection of emissions fugitive to the inside of Meltshop #2 from casting operations (P907-Caster #2) and emissions not captured by the DEC control systems;
Electric Arc Furnace #2 (P905)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	250	tons steel/hr	Particulate matter, fugitive	20.96	ton/yr per 12-month rolling period	Operation of a baghouse control system a consisting of the following: (a)direct evacuation control (DEC) system for collection of emissions from EAF and LMF; (b)roof canopy hood system for collection of emissions fugitive to the inside of Meltshop #2 from casting operations (P907-Caster #2) and emissions not captured by the DEC control systems;
Electric Arc Furnaces	*AL-0327	Nucor Decatur, AL	08/14/2019	-	-	Particulate matter, filterable (FPM)	0.0018	gr/dscf	Baghouse
Electric Arc Furnaces	*AL-0327	Nucor Decatur, AL	08/14/2019	-	-	Particulate matter, filterable (FPM)	33.9	lb/hr	Baghouse
Electric Arc Furnaces	*AL-0327	Nucor Decatur, AL	08/14/2019	-	-	Particulate matter, total (TPM)	0.0052	gr/dscf	Baghouse
Electric Arc Furnaces	*AL-0327	Nucor Decatur, AL	08/14/2019	-	-	Particulate matter, total (TPM)	98.1	lb/hr	Baghouse
Meltshop Operations	-	Gerdau Ameristeel, NC	5/1/2019	90	tons steel/hr	PM10 Filterable	0.05	lb/ton	Fabric Filter
Meltshop Operations	-	Gerdau Ameristeel, NC	5/1/2019	90	tons steel/hr	PM10 Filterable + Condensable	0.24	lb/ton	Fabric Filter
Meltshop Baghouse & Fugitives	FL-0368	Nucor Frostproof, FL	02/14/2019	450,000	tons steel/yr	Particulate matter, filterable (FPM)	0.0018	gr/dscf	Baghouse
Meltshop Baghouse & Fugitives	FL-0368	Nucor Frostproof, FL	02/14/2019	450,000	tons steel/yr	Particulate matter, filterable (FPM)	9.24	lb/hr, average of 3 one-hour runs	Baghouse
Meltshop Baghouse & Fugitives	FL-0368	Nucor Frostproof, FL	02/14/2019	450,000	tons steel/yr	Particulate matter, total (TPM)	0.0024	gr/dscf	Baghouse
Meltshop Baghouse & Fugitives	FL-0368	Nucor Frostproof, FL	02/14/2019	450,000	tons steel/yr	Particulate matter, total (TPM)	12.32	lb/hr, average of 3 one-hour runs	Baghouse
EUEAF (Electric arc furnace)	MI-0438	GERDAU MACSTEEL MONROE	10/29/2018	130	tons steel/hr	Particulate matter, filterable (FPM)	7.84	lb/hr	Direct-Shell Evacuation Control, reaction chamber, and baghouse with high temperature fabric filter bags.
EUEAF (Electric arc furnace)	MI-0438	GERDAU MACSTEEL MONROE	10/29/2018	130	tons steel/hr	Particulate matter, filterable (FPM)	32.15	ton/yr per 12-month rolling period	Direct-Shell Evacuation Control, reaction chamber, and baghouse with high temperature fabric filter bags.
EUEAF (Electric arc furnace)	MI-0438	GERDAU MACSTEEL MONROE	10/29/2018	130	tons steel/hr	Particulate matter, total < 10 µ (TPM10)	12.91	lb/hr	Direct-Shell Evacuation Control, reaction chamber, and baghouse with high temperature fabric filter bags.

Table B-4. EAF/LMS Recent Permit Limitations and Determinations of BACT for PM (Prior 10 years)

Process	RBLC ID	Facility	Permit Date	Production Capacity (US tpy)		Particulate Matter Type	Permitted PM Limit		Control
EUEAF (Electric arc furnace)	MI-0438	GERDAU MACSTEEL MONROE	10/29/2018	130	tons steel/hr	Particulate matter, total < 10 µ (TPM10)	49.7	ton/yr per 12-month rolling period	Direct-Shell Evacuation Control, reaction chamber, and baghouse with high temperature fabric filter bags.
EUEAF (Electric arc furnace)	MI-0438	GERDAU MACSTEEL MONROE	10/29/2018	130	tons steel/hr	Particulate matter, total < 2.5 µ (TPM2.5)	12.91	lb/hr	Direct-Shell Evacuation Control, reaction chamber, and baghouse with high temperature fabric filter bags.
EUEAF (Electric arc furnace)	MI-0438	GERDAU MACSTEEL MONROE	10/29/2018	130	tons steel/hr	Particulate matter, total < 2.5 µ (TPM2.5)	49.7	ton/yr per 12-month rolling period	Direct-Shell Evacuation Control, reaction chamber, and baghouse with high temperature fabric filter bags.
Ladle metallurgy furnace (EULMF) and two vacuum tank degassers (EUVTD)	MI-0438	GERDAU MACSTEEL MONROE	10/29/2018	130	tons steel/hr	Particulate matter, filterable (FPM)	0.0018	gr/dscf	Baghouse and evacuation system
Ladle metallurgy furnace (EULMF) and two vacuum tank degassers (EUVTD)	MI-0438	GERDAU MACSTEEL MONROE	10/29/2018	130	tons steel/hr	Particulate matter, filterable (FPM)	3.88	lb/hr	Baghouse and evacuation system
Ladle metallurgy furnace (EULMF) and two vacuum tank degassers (EUVTD)	MI-0438	GERDAU MACSTEEL MONROE	10/29/2018	130	tons steel/hr	Particulate matter, total < 10 µ (TPM10)	8.95	lb/hr	Baghouse and evacuation system
Ladle metallurgy furnace (EULMF) and two vacuum tank degassers (EUVTD)	MI-0438	GERDAU MACSTEEL MONROE	10/29/2018	130	tons steel/hr	Particulate matter, total < 10 µ (TPM10)	33.47	ton/yr per 12-month rolling period	Baghouse and evacuation system
Ladle metallurgy furnace (EULMF) and two vacuum tank degassers (EUVTD)	MI-0438	GERDAU MACSTEEL MONROE	10/29/2018	130	tons steel/hr	Particulate matter, total < 2.5 µ (TPM2.5)	0.0018	gr/dscf	Baghouse and evacuation system

Table B-4. EAF/LMS Recent Permit Limitations and Determinations of BACT for PM (Prior 10 years)

Process	RBLC ID	Facility	Permit Date	Production Capacity (US tpy)		Particulate Matter Type	Permitted PM Limit		Control
Ladle metallurgy furnace (EULMF) and two vacuum tank degassers (EUVTD)	MI-0438	GERDAU MACSTEEL MONROE	10/29/2018	130	tons steel/hr	Particulate matter, total < 2.5 µ (TPM2.5)	3.88	lb/hr	Baghouse and evacuation system
Electric Arc Furnace and Ladle Metallurgy Furnace	TX-0848	STEEL MILL	09/14/2018	-	-	Particulate matter, total < 10 µ (TPM10)	0.0024	gr/dscf	baghouse
Electric Arc Furnace and Ladle Metallurgy Furnace	TX-0848	STEEL MILL	09/14/2018	-	-	Particulate matter, total < 2.5 µ (TPM2.5)	0.002	gr/dscf	baghouse
Electric Arc Furnace	-	Nucor Sedalia, MO	9/12/2018	450,000	tons steel/yr	Filterable PM	0.0015	gr/dscf	Baghouse
Electric Arc Furnace	-	Nucor Sedalia, MO	9/12/2018	450,000	tons steel/yr	Total PM10, PM2.5, and PM	0.0024	gr/dscf	Baghouse
Electric Arc Furnace and Ladle Metallurgy Station	-	CMC Mesa, AZ	6/14/2018	435,000	tons steel/yr	PM filterable	0.0018	gr/dscf	Use of DEC and Meltshop canopy hood for capture. Use of meltshop baghouse. Use of ladle station roof that shall be exhausted to the meltshop baghouse.
Electric Arc Furnace and Ladle Metallurgy Station	-	CMC Mesa, AZ	6/14/2018	435,000	tons steel/yr	PM10 Filterable and Condensable	0.0024	gr/dscf	Use of DEC and Meltshop canopy hood for capture. Use of meltshop baghouse. Use of ladle station roof that shall be exhausted to the meltshop baghouse.
Electric Arc Furnace and Ladle Metallurgy Station	-	CMC Mesa, AZ	6/14/2018	435,000	tons steel/yr	PM2.5 Filterable and Condensable	0.0024	gr/dscf	Use of DEC and Meltshop canopy hood for capture. Use of meltshop baghouse. Use of ladle station roof that shall be exhausted to the meltshop baghouse.
Melt Shop Equipment (electric arc furnaces fugitives)	SC-0183	NUCOR STEEL - BERKELEY	5/4/2018	175	tons steel/hr	Particulate matter, filterable (FPM)	-	-	Good work practice standards and proper operation and maintenance of baghouses.
Melt Shop	SC-0188	CMC STEEL SOUTH CAROLINA	10/3/2017	1,000,000	tons billet/yr	Particulate matter, filterable < 10 µ (FPM10)	0.0018	gr/dscf	Baghouse
Melt Shop	SC-0188	CMC STEEL SOUTH CAROLINA	10/3/2017	1,000,000	tons billet/yr	Particulate matter, filterable < 2.5 µ (FPM2.5)	0.0018	gr/dscf	Baghouse
Electric Arc Furnace	AL-0319	Nucor Tuscaloosa, AL	03/09/2017	-	-	Particulate matter, filterable (FPM)	0.0018	gr/dscf	-
Electric Arc Furnace	AL-0319	Nucor Tuscaloosa, AL	03/09/2017	-	-	Particulate matter, total < 10 µ (TPM10)	0.0052	gr/dscf	-
Electric Arc Furnace	AL-0319	Nucor Tuscaloosa, AL	03/09/2017	-	-	Particulate matter, total < 2.5 µ (TPM2.5)	0.0049	gr/dscf	-

Table B-4. EAF/LMS Recent Permit Limitations and Determinations of BACT for PM (Prior 10 years)

Process	RBLC ID	Facility	Permit Date	Production Capacity (US tpy)		Particulate Matter Type	Permitted PM Limit		Control
TWO (2) ELECTRIC ARC FURNACES WITH TWO (2) MELTSHOP BAGHOUSES	AL-0309	NUCOR STEEL DECATUR, LLC	03/02/2016	-	-	Particulate matter, filterable (FPM)	0.0018	gr/dscf	BAGHOUSE
TWO (2) ELECTRIC ARC FURNACES WITH TWO (2) MELTSHOP BAGHOUSES	AL-0309	NUCOR STEEL DECATUR, LLC	03/02/2016	-	-	Particulate matter, filterable (FPM)	43.22	lb/hr	BAGHOUSE
TWO (2) ELECTRIC ARC FURNACES WITH TWO (2) MELTSHOP BAGHOUSES	AL-0309	NUCOR STEEL DECATUR, LLC	03/02/2016	-	-	Particulate matter, total (TPM)	0.0052	gr/dscf	BAGHOUSE
TWO (2) ELECTRIC ARC FURNACES WITH TWO (2) MELTSHOP BAGHOUSES	AL-0309	NUCOR STEEL DECATUR, LLC	03/02/2016	-	-	Particulate matter, total (TPM)	124	lb/hr	BAGHOUSE
Electric Arc Furnace	OK-0173	CMC Durant, OK	01/19/2016	-	-	Particulate matter, total < 10 µ (TPM10)	0.0024	gr/dscf	P2 - Pre-cleaned Scrap Add-on - Baghouse
Electric Arc Furnace	OK-0173	CMC Durant, OK	01/19/2016	-	-	Particulate matter, total < 2.5 µ (TPM2.5)	0.0024	gr/dscf	P2 - Pre-cleaned Scrap Add-on - Baghouse
Facilities With Permits Issued Before 2016									
Fume Treatment Plant (EAF)	LA-0309	BENTELER STEEL TUBE FACILITY	6/4/2015	90	tons steel/hr	Particulate matter, total < 10 µ (TPM10)	0.0052	gr/dscf	baghouse
Fume Treatment Plant (EAF)	LA-0309	BENTELER STEEL TUBE FACILITY	6/4/2015	90	tons steel/hr	Particulate matter, total < 2.5 µ (TPM2.5)	0.0052	gr/dscf	baghouse
FG-MELTSHOP (Melt Shop)	MI-0417	GERDAU MACSTEEL, INC.	10/27/2014	130	tons steel/hr	Particulate matter, total < 2.5 µ (TPM2.5)	0.1	lb/ton	Direct evacuation control (DEC), hood, and baghouse.
FG-MELTSHOP (Melt Shop)	MI-0417	GERDAU MACSTEEL, INC.	10/27/2014	130	tons steel/hr	Particulate matter, total < 2.5 µ (TPM2.5)	10.9	lb/hr	Direct evacuation control (DEC), hood, and baghouse.
Electric Arc Furnace	AL-0275	NUCOR STEEL TUSCALOOSA, INC.	07/22/2014	-	-	Particulate matter, filterable (FPM)	0.0018	gr/dscf	Baghouse

Table B-4. EAF/LMS Recent Permit Limitations and Determinations of BACT for PM (Prior 10 years)

Process	RBLC ID	Facility	Permit Date	Production Capacity (US tpy)		Particulate Matter Type	Permitted PM Limit		Control
Electric Arc Furnace	AL-0275	NUCOR STEEL TUSCALOOSA, INC.	07/22/2014	-	-	Particulate matter, filterable < 10 μ (FPM10)	0.0052	gr/dscf	Baghouse
Electric Arc Furnace	AL-0275	NUCOR STEEL TUSCALOOSA, INC.	07/22/2014	-	-	Particulate matter, filterable < 2.5 μ (FPM2.5)	0.0049	gr/dscf	Baghouse
ELECTRIC ARC FURNACE	NE-0055	NUCOR STEEL	10/09/2013	206	tons scrap/hr	Particulate matter, total < 10 μ (TPM10)	0.0052	gr/dscf	The EAF and melthshop will be controlled by two baghouse. The existing positive pressure baghouse has a maximum design value of 965,000 acfm. The project will require Nucor to add a second negative pressure baghouse rated at 630,000 acfm. The source will also use Direct Evacuation Control to capture emissions.
ELECTRIC ARC FURNACE	NE-0055	NUCOR STEEL	10/09/2013	206	tons scrap/hr	Particulate matter, total < 2.5 μ (TPM2.5)	0.0052	gr/dscf	The EAF and melthshop will be controlled by two baghouse. The existing positive pressure baghouse has a maximum design value of 965,000 acfm. The project will require Nucor to add a second negative pressure baghouse rated at 630,000 acfm. The source will also use Direct Evacuation Control to capture emissions.
ELECTRIC ARC FURNACE	NE-0055	NUCOR STEEL	10/09/2013	206	tons scrap/hr	Particulate matter, filterable (FPM)	0.0008	gr/dscf	The EAF and melthshop will be controlled by two baghouse. The existing positive pressure baghouse has a maximum design value of 965,000 acfm. The project will require Nucor to add a second negative pressure baghouse rated at 630,000 acfm. The source will also use Direct Evacuation Control to capture emissions.
ELECTRIC ARC FURNACE	NE-0055	NUCOR STEEL	10/09/2013	206	tons scrap/hr	Particulate matter, filterable < 10 μ (FPM10)	0.0008	gr/dscf	The EAF and melthshop will be controlled by two baghouse. The existing positive pressure baghouse has a maximum design value of 965,000 acfm. The project will require Nucor to add a second negative pressure baghouse rated at 630,000 acfm. The source will also use Direct Evacuation Control to capture emissions.
ELECTRIC ARC FURNACE	NE-0055	NUCOR STEEL	10/09/2013	206	tons scrap/hr	Particulate matter, filterable < 2.5 μ (FPM2.5)	0.0008	dscf/min	The EAF and melthshop will be controlled by two baghouse. The existing positive pressure baghouse has a maximum design value of 965,000 acfm. The project will require Nucor to add a second negative pressure baghouse rated at 630,000 acfm. The source will also use Direct Evacuation Control to capture emissions.
ELECTRIC ARC FURNACE	*TX-0651	STEEL MILL	10/02/2013	316	tons steel/hr	Particulate matter, total (TPM)	0.0032	gr/dscf	ENCLOSURE, CAPTURE, FABRIC FILTER
ELECTRIC ARC FURNACE	*TX-0651	STEEL MILL	10/02/2013	316	tons steel/hr	Particulate matter, filterable < 10 μ (FPM10)	0.0032	gr/dscf	ENCLOSURE, CAPTURE, FABRIC FILTER
ELECTRIC ARC FURNACE	*TX-0651	STEEL MILL	10/02/2013	316	tons steel/hr	Particulate matter, total < 10 μ (TPM10)	0.0052	gr/dscf	ENCLOSURE, CAPTURE, FABRIC FILTER
ELECTRIC ARC FURNACE	*TX-0651	STEEL MILL	10/02/2013	316	tons steel/hr	Particulate matter, filterable < 2.5 μ (FPM2.5)	0.0032	gr/dscf	ENCLOSURE, CAPTURE, FABRIC FILTER

Table B-4. EAF/LMS Recent Permit Limitations and Determinations of BACT for PM (Prior 10 years)

Process	RBLC ID	Facility	Permit Date	Production Capacity (US tpy)		Particulate Matter Type	Permitted PM Limit		Control
ELECTRIC ARC FURNACE	*TX-0651	STEEL MILL	10/02/2013	316	tons steel/hr	Particulate matter, total < 2.5 µ (TPM2.5)	0.0052	gr/dscf	ENCLOSURE, CAPTURE, FABRIC FILTER
LADLE FURNACE	*TX-0651	STEEL MILL	10/02/2013	316	tons steel/hr	Particulate matter, total < 10 µ (TPM10)	0.0052	gr/dscf	ENCLOSURE, CAPTURE, FABRIC FILTER
LADLE FURNACE	*TX-0651	STEEL MILL	10/02/2013	316	tons steel/hr	Particulate matter, filterable < 10 µ (FPM10)	0.0032	gr/dscf	ENCLOSURE, CAPTURE, FABRIC FILTER
LADLE FURNACE	*TX-0651	STEEL MILL	10/02/2013	316	tons steel/hr	Particulate matter, total < 2.5 µ (TPM2.5)	0.0052	gr/dscf	ENCLOSURE, CAPTURE, FABRIC FILTER
LADLE FURNACE	*TX-0651	STEEL MILL	10/02/2013	316	tons steel/hr	Particulate matter, filterable < 2.5 µ (FPM2.5)	0.0032	gr/dscf	EMCLOSURE, CAPTURE, FABRIC FILTER
LADLE FURNACE	*TX-0651	STEEL MILL	10/02/2013	316	tons steel/hr	Particulate matter, total (TPM)	0.0052	gr/dscf	ENCLOSURE, CAPTURE, FABRIC FILTER
EAFS SN-01 AND SN-02	AR-0140	BIG RIVER STEEL LLC	09/18/2013	-	-	Particulate matter, total < 2.5 µ (TPM2.5)	0.0024	gr/dscf	FABRIC FILTER
EAFS SN-01 AND SN-02	AR-0140	BIG RIVER STEEL LLC	09/18/2013	-	-	Particulate matter, filterable (FPM)	0.0018	gr/dscf	BAGHOUSE
EAFS SN-01 AND SN-02	AR-0140	BIG RIVER STEEL LLC	09/18/2013	-	-	Particulate matter, total < 10 µ (TPM10)	0.0024	gr/dscf	BAGHOUSE FOR FILTERABLE
MELTSHOP	IN-0196	NUCOR STEEL	09/17/2013	502	tons steel/hr	Particulate matter, filterable (FPM)	0.0018	gr/dscf	BAGHOUSE
MELTSHOP	IN-0196	NUCOR STEEL	09/17/2013	502	tons steel/hr	Particulate matter, filterable < 10 µ (FPM10)	0.0052	gr/dscf	MELTSHOP BAGHOUSES 1 AND 2 - CONTROLLING 2 EAFS, 1 AOD, 1 DESULFURIZATION STATION, 2 CONTNUOUS CASTERS AND 3 LMFS
MELTSHOP	IN-0196	NUCOR STEEL	09/17/2013	502	tons steel/hr	Particulate matter, filterable < 2.5 µ (FPM2.5)	0.0052	gr/dscf	MELTSHOP BAGHOUSE 1 AND 2 - CONTROLLING 2 EAFS, 1 AOD, 1 DESULFURIZATION STATION, 2 CONTINUOUS CASTERS AND 3 LMFS
Melt Shop (FG-MELTSHOP)	MI-0404	GERDAU MACSTEEL, INC.	01/04/2013	130	tons liquid steel/hr	Particulate matter, total < 10 µ (TPM10)	0.1	lb/ton	Direct Evacuation Control (DEC), hood, and baghouse
Melt Shop (FG-MELTSHOP)	MI-0404	GERDAU MACSTEEL, INC.	01/04/2013	130	tons liquid steel/hr	Particulate matter, total < 10 µ (TPM10)	13	lb/hr	Direct Evacuation Control (DEC), hood, and baghouse
Electric Arc Furnace	OH-0350	REPUBLIC STEEL	07/18/2012	150	tons steel/hr	Particulate matter, filterable (FPM)	0.0052	gr/dscf	Direct-Shell Evacuation Control system with adjustable air gap and water-cooled elbow and duct to Baghouse
Electric Arc Furnace	OH-0350	REPUBLIC STEEL	07/18/2012	150	tons steel/hr	Particulate matter, total < 10 µ (TPM10)	0.0034	gr/dscf	Direct-Shell Evacuation Control system with adjustable air gap and water-cooled elbow and duct to Baghouse
Electric Arc Furnace	OH-0350	REPUBLIC STEEL	07/18/2012	150	tons steel/hr	Particulate matter, total < 2.5 µ (TPM2.5)	0.0033	gr/dscf	Direct-Shell Evacuation Control system with adjustable air gap and water-cooled elbow and duct to Baghouse

[1] The CMC Mesa, Nucor Sedalia and Gerdau Ameristeel facilities were not in the RBLC but they are an ECS process/micro mill and are similar to the proposed facility.
* Indicates that the facilities are draft determination in the RBLC database.

Table B-5. EAF/LMS Recent Permit Limitations and Determinations of BACT for VOC (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)		Permitted VOC Limit		Control
				Value	Unit	Value	Unit	
Facilities With Permits Issued After 2016 [1]								
EAF/LMF	WV-0034	Nucor Steel West Virginia	5/5/2022	3,000,000	tons steel/yr	15.92	lb/hr	EAF - Good Combustion Practices/Scrap Management Plan LMF - Scrap Management Plan
EAFs and LMFs	AR-0173	Big River Steel LLC	1/31/2022	250	tons steel/hr	0.093	lb/ton	Scrap Management System and Good Operating Practices
SN-01 EAF	AR-0172	Nucor Steel Arkansas	9/1/2021	250	tons steel/hr	0.093	lb/ton	Scrap Management System
Melt Shop #1 (EU 01 Baghouse #1 & #2 Stack)	-	Steel Mini Mill	4/19/2021	2,000,000	tons steel/yr	0.09	lb/ton	Combustion processes must develop a Good Combustion and Operating Practices (GCOP) Plan and non- combustion processes must develop a Good Work Practices (GWP) Plan to minimize emissions.
Melt Shop (EU 01) & Melt Shop Combustion Sources (EU 02)	-	STEEL MILL	7/23/2020	1,750,000	tons steel/yr	0.09	lb/ton	All EPs are required to have either a Good Work Practices (GWP) Plan or a Good Combustion & Operating Practices (GCOP) Plan.
ELECTRIC ARC FURNACE	-	Steel Mill	1/20/2020	-	-	0.22	lb/ton	work practices and material inspections, minimize any chlorinated plastics and free organic liquids, including draining any used oil filters
Electric Arc Furnaces	*TX-0882	SDSW STEEL MILL	01/17/2020	-	-	0.093	lb/ton	CLEAN SCRAP
Ladle Metallurgical	*TX-0882	SDSW STEEL MILL	01/17/2020	-	-	0.093	lb/ton	CLEAN SCRAP
Electric Arc Furnaces (EAF)	-	Steel Mini Mill	1/17/2020	-	-	0.093	lb/ton	CLEAN SCRAP
ELECTRIC ARC FURNACE	*TX-0867	STEEL MANUFACTURING FACILITY	01/02/2020	-	-	0.22	lb/ton	work practices and material inspections, minimize any chlorinated plastics and free organic liquids, including draining any used oil filters
MELT SHOP LADLE PREHEATER S	*TX-0867	STEEL MANUFACTURING FACILITY	01/02/2020	-	-	-	-	GOOD COMBUSTION PRACTICES
Twin-Station Ladle Metallurgy Facility (LMF 3/4) (P906)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	250	tons steel/hr	87.5	lb/hr	The development, implementation, and maintenance of a scrap management plan.

Table B-5. EAF/LMS Recent Permit Limitations and Determinations of BACT for VOC (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)		Permitted VOC Limit		Control
Twin-Station Ladle Metallurgy Facility (LMF 3/4) (P906)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	250	tons steel/hr	712.5	ton/yr per 12-month rolling period	The development, implementation, and maintenance of a scrap management plan.
Electric Arc Furnace #2 (P905)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	250	tons steel/hr	87.5	lb/hr	The development, implementation, and maintenance of a scrap management plan.
Electric Arc Furnace #2 (P905)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	250	tons steel/hr	712.5	ton/yr per 12-month rolling period	The development, implementation, and maintenance of a scrap management plan.
Electric Arc Furnaces	*AL-0327	NUCOR STEEL DECATUR, LLC	08/14/2019	-	-	0.13	lb/ton	Scrap management program
Electric Arc Furnaces	*AL-0327	NUCOR STEEL DECATUR, LLC	08/14/2019	-	-	70.2	lb/hr	Scrap management program
Meltshop Operations	-	Gerdau Ameristeel, NC	5/1/2019	90	tons steel/hr	0.34	lb/ton	-
Meltshop Baghouse & Fugitives	FL-0368	Nucor Frostproof, FL	02/14/2019	450,000	tons steel/yr	0.3	lb/ton	Good combustion practice and process control along with a scrap management plan
Meltshop Baghouse & Fugitives	FL-0368	Nucor Frostproof, FL	02/14/2019	450,000	tons steel/yr	18	lb/hr per 3-hr average	Good combustion practice and process control along with a scrap management plan
Electric Arc Furnace and Ladle Metallurgy Furnace	TX-0848	STEEL MILL	09/14/2018	-	-	0.097	lb/ton	scrap management
Electric Arc Furnace	-	Nucor Sedalia, MO	9/12/2018	450,000	tons steel/yr	0.3	lb/ton	Good combustion practice and process control along with a scrap management plan
Electric Arc Furnace and Ladle Metallurgy Station	-	CMC Mesa, AZ	6/14/2018	435,000	tons steel/yr	0.3	lb/ton	Employ good combustion practices. Implement a scrap management plan. Employ good combustion practices
Electric Arc Furnace	AL-0319	NUCOR STEEL TUSCALOOSA, INC.	03/09/2017	-	-	0.13	lb/ton	-
Electric Arc Furnace	AL-0319	NUCOR STEEL TUSCALOOSA, INC.	03/09/2017	-	-	39	lb/hr	-
TWO (2) ELECTRIC ARC FURNACES WITH TWO (2) MELTSHOP BAGHOUSES	AL-0309	NUCOR STEEL DECATUR, LLC	03/02/2016	-	-	0.13	lb/ton	SCRAP MANAGEMENT PROGRAM

Table B-5. EAF/LMS Recent Permit Limitations and Determinations of BACT for VOC (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)		Permitted VOC Limit		Control
TWO (2) ELECTRIC ARC FURNACES WITH TWO (2) MELTSHOP BAGHOUSES	AL-0309	NUCOR STEEL DECATUR, LLC	03/02/2016	-	-	57.2	lb/hr	SCRAP MANAGEMENT PROGRAM
Electric Arc Furnace	OK-0173	CMC Durant, OK	01/19/2016	-	-	0.3	lb/ton	Pre-cleaned scrap
Facilities With Permits Issued Before 2016								
Fume Treatment Plant (EAF)	LA-0309	BENTELER STEEL TUBE FACILITY	6/4/2015	90	tons steel/hr	0.37	lb/ton	scrap management plan and good combustion techniques
Electric Arc Furnace	TX-0705	STEEL MINIMILL FACILITY	07/24/2014	1,300,000	tons steel/yr	0.225	lb/ton	Good Combustion and/or Process Control.
ELECTRIC ARC FURNACE	*TX-0651	STEEL MILL	10/02/2013	316	tons steel/hr	0.43	lb/ton	GOOD COMBUSTION PRACTICE AND PROCESS CONTROL
LADLE FURNACE	*TX-0651	STEEL MILL	10/02/2013	316	tons steel/hr	0.004	lb/ton	GOOD COMBUSTION PRACTICE AND PROCESS CONTROL
MELTSHOP	IN-0196	NUCOR STEEL	09/17/2013	502	tons steel/hr	0.09	lb/ton	-
MELTSHOP	IN-0196	NUCOR STEEL	09/17/2013	502	tons steel/hr	45.18	lb/hr	-
Melt Shop (FG-MELTSHOP)	MI-0404	GERDAU MACSTEEL, INC.	01/04/2013	130	tons liquid steel/hr	0.13	lb/ton	Direct Evacuation Control (DEC) and VOC Reaction Chamber.
Melt Shop (FG-MELTSHOP)	MI-0404	GERDAU MACSTEEL, INC.	01/04/2013	130	tons liquid steel/hr	16.9	lb/hr	Direct Evacuation Control (DEC) and VOC Reaction Chamber.
Electric Arc Furnace	OH-0350	REPUBLIC STEEL	07/18/2012	150	tons steel/hr	0.1	lb/ton	Scrap management and Direct-Shell Evacuation Control system with adjustable air gap and water-cooled elbow and duct.
Electric Arc Furnace	OH-0350	REPUBLIC STEEL	07/18/2012	150	tons steel/hr	60	ton/yr per 12-month rolling period	Scrap management and Direct-Shell Evacuation Control system with adjustable air gap and water-cooled elbow and duct.

[1] The CMC Mesa, Nucor Sedalia and Gerdau Ameristeel facilities were not in the RBLC but they are an ECS process/micro mill and are similar to the proposed facility.
* Indicates that the facilities are draft determination in the RBLC database.

Table B-6. EAF/LMS Recent Permit Limitations and Determinations of BACT for GHGs (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)		Permitted GHG Limit		Control
				Value	Unit	Value	Unit	
Facilities With Permits Issued After 2016 [1]								
EAF/LMF	WV-0034	Nucor Steel West Virginia	5/5/2022	3,000,000	tons steel/yr	47,813	lb/hr	Oxyfuel Burners/Suite of Energy Efficiency Requirements
EAFs and LMFs	AR-0173	BIG RIVER STEEL LLC	1/31/2022	250	tons steel/hr	747,098	tons/yr	Good Operating Practices
SN-01 EAF	AR-0172	Nucor Steel Arkansas	9/1/2021	250	tons steel/hr	747,098	tons/yr	Improved process Control, variable speed drives, transformer efficiency, foamy slag practice, oxy fuel burners
Electric Arc Furnaces (EAF)	*TX-0882	SDSW STEEL MILL	01/17/2020	-	-	-	-	GOOD COMBUSTION PRACTICES, CLEAN FUEL
Ladle Metallurgical Stations	*TX-0882	SDSW STEEL MILL	01/17/2020	-	-	-	-	GOOD COMBUSTION PRACTICES, CLEAN FUEL
Twin-Station Ladle Metallurgy	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	250	tons steel/hr	73,000	lb/hr	Implementation of the following low-emitting processes, system designs, management practices and methods for EAF and LMF
Twin-Station Ladle	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	250	tons steel/hr	594,220	tons/yr per 12-month rolling average	Implementation of the following low-emitting processes, system designs, management
Electric Arc Furnace #2 (P905)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	250	tons steel/hr	73,000	lb/hr	Implementation of the following low-emitting processes, system designs, management practices and methods for EAF and LMF operations resulting in an overall emission rate of 292 lbs CO2e/ton of liquid steel produced. (a)furnace design â€" single bucket batch charging; (b)oxy-fuel burners â€" supplement of chemical energy thru scrap preheating and carbon/oxygen injection; (c)foamy slag practice â€" increased electrical efficiency and reduced radiant heat loss; (d)real-time off-gas analysis and closed-loop process control of oxygen flow and air ingress â€" regulates energy input and post-combustion temperature and composition; (e)ultra-high-power transformer â€" lower power-on times due to faster melting of scrap; (f)eccentric bottom tapping â€" lower treatment requirements in LMF due to reduced slag carryover from tapping; (g)heel practice â€" higher retention of liquid heel heats scrap faster resulting in quick arc stabilization.

Table B-6. EAF/LMS Recent Permit Limitations and Determinations of BACT for GHGs (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)		Permitted GHG Limit		Control
Electric Arc Furnace #2 (P905)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	250	tons steel/hr	594,220	tons/yr per 12-month rolling average	Implementation of the following low-emitting processes, system designs, management practices and methods for EAF and LMF operations resulting in an overall emission rate of 292 lbs CO2e/ton of liquid steel produced. (a)furnace design â€“ single bucket batch charging; (b)oxy-fuel burners â€“ supplement of chemical energy thru scrap preheating and carbon/oxygen injection; (c)foamy slag practice â€“ increased electrical efficiency and reduced radiant heat loss; (d)real-time off-gas analysis and closed-loop process control of oxygen flow and air ingress â€“ regulates energy input and post-combustion temperature and composition; (e)ultra-high-power transformer â€“ lower power-on times due to faster melting of scrap; (f)eccentric bottom tapping â€“ lower treatment requirements in LMF due to reduced slag carryover from tapping; (g)heel practice â€“ higher retention of liquid heel heats scrap faster resulting in quick arc stabilization.
Electric Arc Furnaces	*AL-0327	NUCOR STEEL DECATUR, LLC	08/14/2019	-	-	504000 TONS/YEAR	tons/yr	-
Meltshop Operations	-	Gerdau Ameristeel, NC	5/1/2019	90	tons steel/hr	-	-	-
Meltshop Baghouse & Fugitives	FL-0368	Nucor Frostproof, FL	02/14/2019	450,000	tons steel/yr	438	lb/ton	Scrap preheating & an energy monitoring and management system
Meltshop Baghouse & Fugitives	FL-0368	Nucor Frostproof, FL	02/14/2019	450,000	tons steel/yr	26,280	lb/hr per 12-month rolling average	Scrap preheating & an energy monitoring and management system

Table B-6. EAF/LMS Recent Permit Limitations and Determinations of BACT for GHGs (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)		Permitted GHG Limit		Control
Melt Shop (FGMELTSHOP)	MI-0438	GERDAU MACSTEEL MONROE	10/29/2018	-	-	256,694	tons/yr per 12-month rolling average	Energy efficiency management plan
Electric Arc Furnace and Ladle Metallurgy Furnace	TX-0848	STEEL MILL	09/14/2018	-	-	-	-	scrap management, good combustion
Electric Arc Furnace	-	Nucor Sedalia, MO	9/12/2018	450,000	tons steel/yr	438	lb/ton	Various Technologies
Electric Arc Furnace and Ladle Metallurgy Station	-	CMC Mesa, AZ	6/14/2018	435,000	tons steel/yr	-	-	Employ good combustion practices. Implement a scrap management plan. Employ good combustion practices
Electric Arc Furnace	AL-0319	NUCOR STEEL TUSCALOOSA, INC.	03/09/2017	-	-	378,621	tons/yr	-
Electric Arc Furnace	OK-0173	CMC Durant, OK	01/19/2016	-	-	535	lb/ton	Pre-heating scrap with exhausts from furnace
Facilities With Permits Issued Before 2016								
Fume Treatment Plant (EAF)	LA-0309	BENTELER STEEL TUBE FACILITY	6/4/2015	90	tons steel/hr	-	-	designs and work practices
FG-MELTSHOP (Melt Shop)	MI-0417	GERDAU MACSTEEL, INC.	10/27/2014	130	tons steel/hr	320	lb/ton	-
FG-MELTSHOP (Melt Shop)	MI-0417	GERDAU MACSTEEL, INC.	10/27/2014	130	tons steel/hr	134,396	tons/yr per 12-month rolling average	-
MELT SHOP GHG	AR-0140	BIG RIVER STEEL LLC	9/18/2013	-	-	0	lb/ton	ENERGY EFFICIENCY IMPROVEMENTS
MELTSHOP	IN-0196	NUCOR STEEL	09/17/2013	502	tons steel/hr	544,917	tons/yr	-
Melt Shop (FG-MELTSHOP)	MI-0404	GERDAU MACSTEEL, INC.	01/04/2013	130	tons liquid steel/hr	0	lb/ton	-
Melt Shop (FG-MELTSHOP)	MI-0404	GERDAU MACSTEEL, INC.	01/04/2013	130	tons liquid steel/hr	157,365	tons/yr per 12-month rolling average	-

[1] The CMC Mesa, Nucor Sedalia and Gerdau Ameristeel facilities were not in the RBLC but they are an ECS process/micro mill and are similar to the proposed facility.

* Indicates that the facilities are draft determination in the RBLC database.

Table B-7. EAF/LMS Recent Permit Limitations and Determinations of BACT for Fluorides (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)		Permitted Fluoride Limit		Control
				Value	Unit	Value	Unit	
Facilities With Permits Issued After 2016 [1]								
EAF/LMF	WV-0034	Nucor Steel West Virginia	5/5/2022	3,000,000	tons steel/yr	0.57	lb/hr	Direct-shell evacuation control (DEC) system designed and operated to achieve a minimum capture efficiency of 95% of all potential particulate matter emissions from the EAFs and LMFs and evacuate the exhaust to each associated EAF baghouse.
SN-01 EAF	AR-0172	Steel Mill	9/1/2021	250	tons steel/hour	-	-	-
Melt Shop #1 (EU 01) Baghouse #1 & #2 Stack	-	Steel Mini Mill	4/19/2021	2,000,000	tons steel/yr	0.0035	lb/ton	Emissions are controlled by 2 baghouses (combined stack). Noncombustion processes must develop a Good Work Practices (GWP) Plan to minimize emissions.
Melt Shop (EU 01) & Melt Shop Combustion Sources (EU 02)	-	Steel Mill	7/23/2020	1,750,000	tons steel/yr	-	-	-
Electric Arc Furnaces (EAF)	*TX-0882	SDSW Steel, TX	01/17/2020	-	-	0.01	lb/ton	BAGHOUSE
Ladle Metallurgical Stations (LMS)	*TX-0882	SDSW Steel, TX	01/17/2020	-	-	0.01	GR/DSCF	BAGHOUSE
Electric Arc Furnaces (EAF)	-	SDSW Steel, TX	01/17/2020	-	-	0.01	lb/ton	Baghouse
Electric Arc Furnaces (EAF)	-	Steel Manufacturing Facility	1/2/2020	-	-	-	-	-
Meltshop Operations	-	Gerdau Ameristeel, NC	5/1/2019	90	tons steel/hour	N/A	N/A	-
Meltshop Baghouse & Fugitives	FL-0368	Nucor Frostproof, FL	2/14/2019	450,000	tons steel/yr	0.059	lb/ton	Baghouse
Meltshop Baghouse & Fugitives	FL-0368	NUCOR STEEL FLORIDA FACILITY	2/14/2019	450,000	tons steel/yr	3.54	lb/hr	Baghouse
Electric Arc Furnaces (EAF)	*NE-0061	Nucor Norfolk, NE	12/30/2018	206	tons scrap/hour	0.0059	lb/ton	-
Electric Arc Furnaces (EAF)	-	Nucor Sedalia, FL	9/12/2018	450,000	tons steel/yr	0.059	lb/ton	Baghouse
Electric Arc Furnace and Ladle Metallurgy Station	-	CMC Mesa, AZ	6/14/2018	435,000	tons steel/yr	0.01	lb/ton	-

Table B-7. EAF/LMS Recent Permit Limitations and Determinations of BACT for Fluorides (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)		Permitted Fluoride Limit		Control
				Value	Unit	Value	Unit	
Melt Shop Equipment (furnace baghouse)	SC-0183	NUCOR STEEL - BERKELEY	5/4/2018	175	tons steel/hour	0.09	lb/hr 12-HOUR BLOCK AVERAGE/PARTICU LATE	Direct shell evacuation furnace baghouse.
Melt Shop Equipment (furnace baghouse)	SC-0183	NUCOR STEEL - BERKELEY	5/4/2018	175	tons steel/hour	1.57	lb/hr 12-HOUR BLOCK AVERAGE/GASEOU S	Direct shell evacuation furnace baghouse.
Electric Arc Furnaces (EAF)	*NE-0062	Nucor Norfolk, NE	07/07/2017	1,350,000	tons steel/yr	0.059	lb/ton	BAGHOUSE
Electric Arc Furnaces (EAF)	OK-0173	CMC STEEL OKLAHOMA	1/19/2016	-	-	N/A	N/A	-

[1] The CMC Mesa, CMC Oklahoma, Nucor Sedalia, and Gerdau Ameristeel facilities were not in the RBLC but they are an ECS process/micro mill and are similar to the proposed facility.
* Indicates that the facilities are draft determination in the RBLC database.

Table B-8. Ladle/Tundish Preheaters and Dryers Recent Permit Limitations and Determinations of BACT for CO (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)	Permitted CO Limit	Control
Comparable Facilities [1]						
Meltshop Natural Gas Combustion	-	NUCOR STEEL SEDALIA	9/12/2018	450,000 tpy	0.084 lb/MMBtu	GCP of pipeline quality natural gas
Ladle Preheaters	-	CMC MESA	6/14/2018	435000 tpy	0.084 lb/MMBtu	-
Ladle Dryer	-	CMC MESA	6/14/2018	435000 tpy	0.084 lb/MMBtu	-
Tundish Preheater	-	CMC MESA	6/14/2018	435000 tpy	0.084 lb/MMBtu	-
Tundish Dryer	-	CMC MESA	6/14/2018	435000 tpy	0.084 lb/MMBtu	-
Tundish Mandril Dryer	-	CMC MESA	6/14/2018	435000 tpy	0.084 lb/MMBtu	-
Heaters (Gas-Fired)	OK-0173	CMC STEEL OKLAHOMA	1/19/2016	-	0.084 lb/MMBtu	Natural gas fuel
Ladle and Tundish Preheaters, Dryers and Skull Cutting	FL-0368	NUCOR STEEL FLORIDA FACILITY	2/14/2019	45.75 MMBtu/hr	0.084 lb/MMBtu	Good combustion practices
Not Comparable Facilities [2]						
LADLE DRYERS AND PREHEATERS	*TX-0882	SDSW STEEL MILL	1/17/2020	-	0.082 lb/MMBtu	GOOD COMBUSTION PRACTICES, CLEAN FUEL
Tundish Dryer and Tundish Preheaters	*TX-0882	SDSW STEEL MILL	1/17/2020	-	0.082 lb/MMBtu	GOOD COMBUSTION PRACTICES, CLEAN FUEL
MELT SHOP LADLE PREHEATERS	*TX-0867	STEEL MANUFACTURING FACILITY	1/2/2020	-	-	GOOD COMBUSTION PRACTICES
Tundish Dryer #2 (P030)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	1.2 MMBtu/hr	0.02 lb/hr 0.09 tons/yr, 12-month rolling period	Use of natural gas, good combustion practices and design
Ladle Preheaters and Dryers (P021-023, P025-026)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	16 MMBtu/hr	0.32 lb/hr 1.4 tons/yr, 12-month rolling period	Use of natural gas, good combustion practices and design
Tundish Preheaters #3 and #4 (P028 and P029)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	9.5 MMBtu/hr	0.19 lb/hr 0.83 tons/yr, 12-month rolling period	Use of natural gas, good combustion practices and design

Table B-8. Ladle/Tundish Preheaters and Dryers Recent Permit Limitations and Determinations of BACT for CO (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)	Permitted CO Limit	Control
Ladle preheater	MI-0438	GERDAU MACSTEEL MONROE	10/29/2018	30 MMBtu/hr	0.084 lb/MMBtu, hourly average	Use of NG fuel, and good combustion practices.
TK Engergizer Ladle Heater (5 MMBtu/hr)	AL-0319	NUCOR STEEL TUSCALOOSA, INC.	3/9/2017	-	0.084 lb/MMBtu	-
NG Combustion Units	WV-0034	Nucor Steel West Virginia	5/5/2022	3000000 TPY	0.082 lb/MMBtu	Good Combustion Practices
TUNDISH NOZZLE PREHEATERS	IN-0196	NUCOR STEEL	9/17/2013	6.4 MMBtu/hr	84 lb/MMcf natural gas 0.53 lb/hr	Using natural gas as the primary fuel and propane as backup fuel. Limit of 500 hrs/yr operation when combusting propane.
TUNDISH PREHEATERS	IN-0196	NUCOR STEEL	9/17/2013	502 tons/hr steel 12 MMBtu/hr each preheater	84 lb/MMcf natural gas 4.94 lb/hr	Using natural gas as the primary fuel and propane as backup fuel. Limit of 500 hrs/yr operation when combusting propane.

[1] The CMC Mesa and Nucor Sedalia facilities were not in the RBLC but are an ECS process/micro mill and are similar to the proposed facility.

[2] These RBLC listings are either not considered an ECS process, a micro mill, or both like the proposed CMC facility. Since the technologies at these facilities are different than technology used at the proposed facility, they are not appropriate for comparison.

* Indicates that the facilities are draft determination in the RBLC database.

Table B-9. Ladle/Tundish Preheaters and Dryers Recent Permit Limitations and Determinations of BACT for NO_x (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)	Permitted NO_X Limit	Control
Comparable Facilities [1]						
Meltshop Natural Gas Combustion	-	NUCOR STEEL SEDALIA	9/12/2018	450,000 tpy	0.1 lb/MMBtu	GCP of pipeline quality natural gas
Ladle Preheaters	-	CMC MESA	6/14/2018	435000 tons/yr	0.098 lb/MMBtu	-
Ladle Dryer	-	CMC MESA	6/14/2018	435000 tons/yr	0.098 lb/MMBtu	-
Tundish Preheater	-	CMC MESA	6/14/2018	435000 tons/yr	0.098 lb/MMBtu	-
Tundish Dryer	-	CMC MESA	6/14/2018	435000 tons/yr	0.098 lb/MMBtu	-
Tundish Mandril Dryer	-	CMC MESA	6/14/2018	435000 tons/yr	0.098 lb/MMBtu	-
Heaters (Gas-Fired)	OK-0173	CMC STEEL OKLAHOMA	1/19/2016		0.1 lb/MMBtu	Natural gas fuel
Ladle and Tundish Preheaters, Dryers and Skull Cutting	FL-0368	NUCOR STEEL FLORIDA FACILITY	2/14/2019	45.75 MMBtu/hr	0.1 lb/MMBtu	Good combustion practices
Not Comparable Facilities [2]						
NG Combustion Units	WV-0034	Nucor Steel West Virginia	5/5/2022	3000000 TPY	0.1 lb/MMBtu	Low NOx Burners and Good Combustion Practices
Tundish Dryer and Tundish Preheaters	*TX-0882	SDSW STEEL MILL	1/17/2020	-	0.1 lb/MMBtu	GOOD COMBUSTION PRACTICES, CLEAN FUEL
MELT SHOP LADLE PREHEATERS	*TX-0867	STEEL MANUFACTURING FACILITY	1/2/2020	-	-	GOOD COMBUSTION PRACTICES
Tundish Dryer #2 (P030)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	1.2 MMBtu/hr	0.12 lb/hr 0.53 tons/yr, rolling 12-month period	Use of natural gas, good combustion practices and design
Ladle Preheaters and Dryers (P021-023, P025-026)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	16 MMBtu/hr	1.6 lb/hr 7.01 tons/yr, rolling 12-month period	Use of natural gas, good combustion practices and design
Tundish Preheaters #3 and #4 (P028 and P029)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	9.5 MMBtu/hr	0.95 lb/hr 4.16 tons/yr, rolling 12-month period	Use of natural gas, good combustion practices and design

Table B-9. Ladle/Tundish Preheaters and Dryers Recent Permit Limitations and Determinations of BACT for NO_x (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)	Permitted NO_X Limit	Control
Ladle preheater	MI-0438	GERDAU MACSTEEL MONROE	10/29/2018	30 MMBtu/hr	0.08 lb/MMBtu	Low NOx burners, use of NG fuel, and good combustion practices.
TK Engergizer Ladle Heater (5 MMBtu/hr)	AL-0319	NUCOR STEEL TUSCALOOSA, INC.	3/9/2017	-	0.1 lb/MMBtu	-
TUNDISH NOZZLE PREHEATERS	IN-0196	NUCOR STEEL	9/17/2013	6.4 MMBtu/hr	100 lb/MMcf natural gas 0.63 lb/hr	USING NATURAL GAS AS THE PRIMARY FUEL AND PROPANE AS BACKUP FUEL. EACH UNIT IS LIMITED TO 500 HRS/YR OPERATION WHEN COMBUSTING PROPANE.
TUNDISH PREHEATERS	IN-0196	NUCOR STEEL	9/17/2013	502 tons/hr 12 MMBtu/hr each preheater	100 lb/MMcf natural gas 5.9 lb/hr	USING NATURAL GAS AS THE PRIMARY FUEL AND PROPANE AS BACKUP FUEL. EACH UNIT IS LIMITED TO 500 HRS/YR OPERATION WHEN COMBUSTING PROPANE.

[1] The CMC Mesa and Nucor Sedalia facilities were not in the RBLC but are an ECS process/micro mill and are similar to the proposed facility.

[2] These RBLC listings are either not considered an ECS process, a micro mill, or both like the proposed CMC facility. Since the technologies at these facilities are different than technology used at the proposed facility, they are not appropriate for comparison.

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Table B-10. Ladle/Tundish Preheaters and Dryers Recent Permit Limitations and Determinations of BACT for SO_2 (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)	Permitted SO_2 Limit	Control
Comparable Facilities [1]						
Meltshop Natural Gas Combustion	-	NUCOR STEEL SEDALIA	9/12/2018	450,000 tpy	0.0006 lb/MMBtu	GCP of pipeline quality natural gas
Ladle Preheaters	-	CMC MESA	6/14/2018	435000 tons/yr	0.0006 lb/MMBtu	-
Ladle Dryer	-	CMC MESA	6/14/2018	435000 tons/yr	0.0006 lb/MMBtu	-
Tundish Preheater	-	CMC MESA	6/14/2018	435000 tons/yr	0.0006 lb/MMBtu	-
Tundish Dryer	-	CMC MESA	6/14/2018	435000 tons/yr	0.0006 lb/MMBtu	-
Tundish Mandril Dryer	-	CMC MESA	6/14/2018	435000 tons/yr	0.0006 lb/MMBtu	-
Ladle and Tundish Preheaters, Dryers and Skull Cutting	FL-0368	NUCOR STEEL FLORIDA FACILITY	2/14/2019	45.75 MMBtu/hr	0.0006 lb/MMBtu	Natural gas with a sulfur content less than 2.0 gr/100 scf
Not Comparable Facilities [2]						
NG Combustion Units	WV-0034	Nucor Steel West Virginia	5/5/2022	3000000 TPY	0.0006 lb/MMBtu	Good Combstion Practices, Clean Fuel
LADLE DRYERS AND PREHEATERS	*TX-0882	SDSW STEEL MILL	1/17/2020	-	0.0006 lb/MMBtu	GOOD COMBUSTION PRACTICES, CLEAN FUEL
Tundish Dryer and Tundish Preheaters	*TX-0882	SDSW STEEL MILL	1/17/2020	-	0.0006 lb/MMBtu	GOOD C OMBUSTION PRACTICES, CLEAN FUEL
MELT SHOP LADLE PREHEATERS	*TX-0867	STEEL MANUFACTURING FACILITY	1/2/2020	-	-	CLEAN FUEL AND SCRAP
Tundish Dryer #2 (P030)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	1.2 MMBtu/hr	0.001 lb/hr 0.004 tons/yr, rolling 12-month period	Use of natural gas, good combustion practices and design
Ladle Preheaters and Dryers (P021-023, P025-026)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	16 MMBtu/hr	0.01 lb/hr 0.04 tons/yr, rolling 12-month period	Use of natural gas, good combustion practices and design

Table B-10. Ladle/Tundish Preheaters and Dryers Recent Permit Limitations and Determinations of BACT for SO_2 (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)	Permitted SO_2 Limit	Control
Tundish Preheaters #3 and #4 (P028 and P029)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	9.5 MMBtu/hr	0.01 lb/hr 0.04 tons/yr, rolling 12-month period	Use of natural gas, good combustion practices and design
Ladle preheater	MI-0438	GERDAU MACSTEEL MONROE	10/29/2018	30 MMBtu/hr	0.0006 lb/MMBtu, averaged hourly	Use of NG fuel and good combustion practices.
TK Engergizer Ladle Heater (5 MMBtu/hr)	AL-0319	NUCOR STEEL TUSCALOOSA, INC.	3/9/2017	-	0.0006 lb/MMBtu	-
TUNDISH NOZZLE PREHEATERS	IN-0196	NUCOR STEEL	9/17/2013	6.4 MMBtu/hr	0.6 lb/MMcf natural gas 0.004 lb/hr total	USING NATURAL GAS AS THE PRIMARY FUEL AND PROPANE AS BACKUP FUEL. EACH UNIT IS LIMITED TO 500 HRS/YR OPERATION WHEN COMBUSTING PROPANE.
TUNDISH PREHEATERS	IN-0196	NUCOR STEEL	9/17/2013	502 tons/hr 12 MMBtu/hr each preheater	0.6 lb/MMcf natural gas 0.035 lb/hr total	USING NATURAL GAS AS THE PRIMARY FUEL AND PROPANE AS BACKUP FUEL. EACH UNIT IS LIMITED TO 500 HRS/YR OPERATION WHEN COMBUSTING PROPANE.

[1] The CMC Mesa and Nucor Sedalia facilities were not in the RBLC but are an ECS process/micro mill and are similar to the proposed facility.

[2] These RBLC listings are either not considered an ECS process, a micro mill, or both like the proposed CMC facility. Since the technologies at these facilities are different than technology used at the proposed facility, they are not appropriate for comparison.

* Indicates that the facilities are draft determination in the RBLC database.

Table B-11a. Ladle/Tundish Preheaters and Dryers Recent Permit Limitations and Determinations of BACT for PM (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)	Particulate Matter Type	Permitted PM Limit	Control
Comparable Facilities[1]							
Meltshop Natural Gas Combustion	-	NUCOR STEEL SEDALIA	9/12/2018	450,000 tpy	PM10	0.0076 lb/MMBtu	GCP of pipeline quality natural gas
Meltshop Natural Gas Combustion	-	NUCOR STEEL SEDALIA	9/12/2018	450,000 tpy	PM2.5	0.0076 lb/MMBtu	GCP of pipeline quality natural gas
Ladle Preheaters	-	CMC MESA	6/14/2018	435000 tons/yr	PM10	0.0075 lb/MMBtu	-
Ladle Preheaters	-	CMC MESA	6/14/2018	435000 tons/yr	PM2.5	0.0075 lb/MMBtu	-
Ladle Dryer	-	CMC MESA	6/14/2018	435000 tons/yr	PM10	0.0075 lb/MMBtu	-
Ladle Dryer	-	CMC MESA	6/14/2018	435000 tons/yr	PM2.5	0.0075 lb/MMBtu	-
Tundish Preheater	-	CMC MESA	6/14/2018	435000 tons/yr	PM10	0.0075 lb/MMBtu	-
Tundish Preheater	-	CMC MESA	6/14/2018	435000 tons/yr	PM2.5	0.0075 lb/MMBtu	-
Tundish Dryer	-	CMC MESA	6/14/2018	435000 tons/yr	PM10	0.0075 lb/MMBtu	-
Tundish Dryer	-	CMC MESA	6/14/2018	435000 tons/yr	PM2.5	0.0075 lb/MMBtu	-
Tundish Mandril Dryer	-	CMC MESA	6/14/2018	435000 tons/yr	PM10	0.0075 lb/MMBtu	-
Tundish Mandril Dryer	-	CMC MESA	6/14/2018	435000 tons/yr	PM2.5	0.0075 lb/MMBtu	-
Heaters (Gas-Fired)	OK-0173	CMC STEEL OKLAHOMA	1/19/2016	-	Particulate matter, total 10 (TPM10)	0.0076 lb/MMBtu	Natural gas fuel
Heaters (Gas-Fired)	OK-0173	CMC STEEL OKLAHOMA	1/19/2016	-	Particulate matter, total 2.5 (TPM2.5)	0.0076 lb/MMBtu	Natural gas fuel
Ladle and Tundish Preheaters, Dryers and Skull Cutting	FL-0368	NUCOR STEEL FLORIDA FACILITY	2/14/2019	45.75 MMBtu/hr	Particulate matter, total 10 (TPM10)	0.0076 lb/MMBtu	Use of natural gas
Ladle and Tundish Preheaters, Dryers and Skull Cutting	FL-0368	NUCOR STEEL FLORIDA FACILITY	2/14/2019	45.75 MMBtu/hr	Particulate matter, total 2.5 (TPM2.5)	0.0076 lb/MMBtu	Use of natural gas
Not Comparable Facilities[2]							
NG Combustion Units	WV-0034	Nucor Steel West Virginia	5/5/2022	3000000 TPY	Particulate matter, total (TPM)	0.00186 lb/MMBtu	Good Combustion Practices
NG Combustion Units	WV-0034	Nucor Steel West Virginia	5/5/2022	3000000 TPY	Particulate matter, total 10 (TPM10)	0.00745 lb/MMBtu	Good Combustion Practices
NG Combustion Units	WV-0034	Nucor Steel West Virginia	5/5/2022	3000000 TPY	Particulate matter, total 2.5 (TPM2.5)	0.00745 lb/MMBtu	Good Combustion Practices
LADLE DRYERS AND PREHEATERS	*TX-0882	SDSW STEEL MILL	1/17/2020	-	Particulate matter, total (TPM)	0.0075 lb/MMBtu	GOOD COMBUSTION PRACTICES, CLEAN FUEL
LADLE DRYERS AND PREHEATERS	*TX-0882	SDSW STEEL MILL	1/17/2020	-	Particulate matter, total 10 (TPM10)	0.0075 lb/MMBtu	GOOD COMBUSTION PRACTICES, CLEAN FUEL
LADLE DRYERS AND PREHEATERS	*TX-0882	SDSW STEEL MILL	1/17/2020	-	Particulate matter, total 2.5 (TPM2.5)	0.0075 lb/MMBtu	GOOD COMBUSTION PRACTICES, CLEAN FUEL
Tundish Dryer and Tundish Preheaters	*TX-0882	SDSW STEEL MILL	1/17/2020	-	Particulate matter, total (TPM)	0.0075 lb/MMBtu	GOOD COMBUSTION PRACTICES, CLEAN FUEL
Tundish Dryer and Tundish Preheaters	*TX-0882	SDSW STEEL MILL	1/17/2020	-	Particulate matter, total 10 (TPM10)	0.0075 lb/MMBtu	GOOD COMBUSTION PRACTICES, CLEAN FUEL
Tundish Dryer and Tundish Preheaters	*TX-0882	SDSW STEEL MILL	1/17/2020	-	Particulate matter, total 2.5 (TPM2.5)	0.0075 lb/MMBtu	GOOD COMBUSTION PRACTICES, CLEAN FUEL

Table B-11a. Ladle/Tundish Preheaters and Dryers Recent Permit Limitations and Determinations of BACT for PM (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)	Particulate Matter Type	Permitted PM Limit	Control
Tundish Dryer #2 (P030)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	1.2 MMBtu/hr	Particulate matter, total (TPM)	0.004 lb/hr 0.02 tons/yr, rolling 12-month period	Use of natural gas, good combustion practices and design
Tundish Dryer #2 (P030)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	1.2 MMBtu/hr	Particulate matter, total 10 (TPM10)	0.004 lb/hr 0.02 tons/yr, rolling 12-month period	Use of natural gas, good combustion practices and design
Tundish Dryer #2 (P030)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	1.2 MMBtu/hr	Particulate matter, total 2.5 (TPM2.5)	0.004 lb/hr 0.02 tons/yr, rolling 12-month period	Use of natural gas, good combustion practices and design
Ladle Preheaters and Dryers (P021-023, P025-026)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	16 MMBtu/hr	Particulate matter, total (TPM)	0.05 lb/hr 0.22 tons/yr, rolling 12-month period	Use of natural gas, good combustion practices and design
Ladle Preheaters and Dryers (P021-023, P025-026)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	16 MMBtu/hr	Particulate matter, total 10 (TPM10)	0.05 lb/hr 0.22 tons/yr, rolling 12-month period	Use of natural gas, good combustion practices and design
Ladle Preheaters and Dryers (P021-023, P025-026)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	16 MMBtu/hr	Particulate matter, total 2.5 (TPM2.5)	0.05 lb/hr 0.22 tons/yr, rolling 12-month period	Use of natural gas, good combustion practices and design
Tundish Preheaters #3 and #4 (P028 and P029)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	9.5 MMBtu/hr	Particulate matter, total (TPM)	0.03 lb/hr 0.13 tons/yr, rolling 12-month period	Use of natural gas, good combustion practices and design
Tundish Preheaters #3 and #4 (P028 and P029)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	9.5 MMBtu/hr	Particulate matter, total 10 (TPM10)	0.03 lb/hr 0.13 tons/yr, rolling 12-month period	Use of natural gas, good combustion practices and design
Tundish Preheaters #3 and #4 (P028 and P029)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	9.5 MMBtu/hr	Particulate matter, total 2.5 (TPM2.5)	0.03 lb/hr 0.13 tons/yr, rolling 12-month period	Use of natural gas, good combustion practices and design
Ladle preheater	MI-0438	GERDAU MACSTEEL MONROE	10/29/2018	30 MMBtu/hr	Particulate matter, filterable (FPM)	0.0076 lb/MMBtu, hourly average	Use of NG fuel and good combustion practices.
Ladle preheater	MI-0438	GERDAU MACSTEEL MONROE	10/29/2018	30 MMBtu/hr	Particulate matter, total 10 (TPM10)	0.0076 lb/MMBtu, hourly average	Use of NG fuel and good combustion practices.
Ladle preheater	MI-0438	GERDAU MACSTEEL MONROE	10/29/2018	30 MMBtu/hr	Particulate matter, total 2.5 (TPM2.5)	0.0076 lb/MMBtu, hourly average	Use of NG fuel and good combustion practices.
TK Engergizer Ladle Heater (5 MMBtu/hr)	AL-0319	NUCOR STEEL TUSCALOOSA, INC.	3/9/2017	-	Particulate matter, filterable (FPM)	0.0076 lb/MMBtu	-

Table B-11a. Ladle/Tundish Preheaters and Dryers Recent Permit Limitations and Determinations of BACT for PM (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)	Particulate Matter Type	Permitted PM Limit	Control
TUNDISH NOZZLE PREHEATERS	IN-0196	NUCOR STEEL	9/17/2013	6.4 MMBtu/hr	Particulate matter, total 10 (TPM10)	7.6 lb/MMcf natural gas 0.05 lb/hr	USING NATURAL GAS AS THE PRIMARY FUEL AND PROPANE AS BACKUP FUEL. EACH UNIT IS LIMITED TO 500 HRS/YR OPERATION WHEN COMBUSTING PROPANE.
TUNDISH NOZZLE PREHEATERS	IN-0196	NUCOR STEEL	9/17/2013	6.4 MMBtu/hr	Particulate matter, total 2.5 (TPM2.5)	7.6 lb/MMcf natural gas 0.05 lb/hr	USING NATURAL GAS AS THE PRIMARY FUEL AND PROPANE AS BACKUP FUEL. EACH UNIT IS LIMITED TO 500 HRS/YR OPERATION WHEN COMBUSTING PROPANE.
TUNDISH NOZZLE PREHEATERS	IN-0196	NUCOR STEEL	9/17/2013	6.4 MMBtu/hr	Particulate matter, filterable (FPM)	1.9 lb/MMcf natural gas 0.012 lb/hr	USING NATURAL GAS AS THE PRIMARY FUEL AND PROPANE AS BACKUP FUEL. EACH UNIT IS LIMITED TO 500 HRS/YR OPERATION WHEN COMBUSTING PROPANE.
TUNDISH PREHEATERS	IN-0196	NUCOR STEEL	9/17/2013	502 tons/hr 12 MMBtu/hr each preheater	Particulate matter, filterable (FPM)	1.9 lb/MMcf natural gas 0.11 lb/hr	USING NATURAL GAS AS THE PRIMARY FUEL AND PROPANE AS BACKUP FUEL. EACH UNIT IS LIMITED TO 500 HRS/YR OPERATION WHEN COMBUSTING PROPANE.
TUNDISH PREHEATERS	IN-0196	NUCOR STEEL	9/17/2013	502 tons/hr 12 MMBtu/hr each preheater	Particulate matter, filterable 10 (FPM10)	7.6 lb/MMcf natural gas 0.45 lb/hr	USING NATURAL GAS AS THE PRIMARY FUEL AND PROPANE AS BACKUP FUEL. EACH UNIT IS LIMITED TO 500 HRS/YR OPERATION WHEN COMBUSTING PROPANE.
TUNDISH PREHEATERS	IN-0196	NUCOR STEEL	9/17/2013	502 tons/hr 12 MMBtu/hr each preheater	Particulate matter, filterable 10 (FPM2.5)	7.6 lb/MMcf natural gas 0.45 lb/hr	USING NATURAL GAS AS THE PRIMARY FUEL AND PROPANE AS BACKUP FUEL. EACH UNIT IS LIMITED TO 500 HRS/YR OPERATION WHEN COMBUSTING PROPANE.

[1] The CMC Mesa and Nucor Sedalia facilities were not in the RBLC but are an ECS process/micro mill and are similar to the proposed facility.

[2] These RBLC listings are either not considered an ECS process, a micro mill, or both like the proposed CMC facility. Since the technologies at these facilities are different than technology used at the proposed facility, they are not appropriate for comparison.

* Indicates that the facilities are draft determination in the RBLC database.

Table B-11b. Casting Operations Recent Permit Limitations and Determinations of BACT for PM (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)	Particulate Matter Type	Permitted PM Limit	Control
Comparable Facilities[1]							
Caster Mold - Oil Pyrolysis, S1	-	CMC MESA	6/14/2018	435000 tons/yr	PM PM10 PM2.5	0.14 lb/hr, 3-hour average	Use of Meltshop Baghouse
Caster Mold - Oil Combustion, S1	-	CMC MESA	6/14/2018	435000 tons/yr	PM PM10 PM2.5	0.00209 lb PM/hr, 3-hour average 0.00182 lb PM_{10}/hr, 3-hour average 0.00027 lb $PM_{2.5}$/hr, 3-hour average	Use of Meltshop Baghouse
Caster Mold - Oil Pyrolysis, CV	-	CMC MESA	6/14/2018	435000 tons/yr	PM PM10 PM2.5	0.58 lb/hr, 3-hour average	Use of Meltshop Baghouse
Caster Mold - Oil Combustion, CV	-	CMC MESA	6/14/2018	435000 tons/yr	PM PM10 PM2.5	0.00837 lb PM/hr, 3-hour average 0.00727 lb PM_{10}/hr, 3-hour average 0.0011 lb $PM_{2.5}$/hr, 3-hour average	Use of Meltshop Baghouse
Not Comparable Facilities[2]							
Caster (EUCASTER)	MI-0404	GERDAU MACSTEEL, INC.	1/4/2013	130 tons/hr liquid steel	Particulate matter, total 10 (TPM10)	-	Permanent ladle cover, tapping ladles from the bottom, use of an enclosed tundish and the use of pipeline quality natural gas in the cutting torches.
EUCASTER	MI-0417	GERDAU MACSTEEL, INC.	10/27/2014	130 tons/hr liquid steel	Particulate matter, total 2.5 (TPM2.5)	-	Permanent ladle cover, tapping ladles from the bottom, use of an enclosed tundish and the use of pipeline quality natural gas in the cutting torches.
Casters	AR-0173	BIG RIVER STEEL LLC	1/31/2022	0	FPM, TPM10, TPM2.5	0.0620 LB/TON STEEL	Good operating practices
A-Line Caster Spray Vent (EP 01-14)	KY-0115	NUCOR STEEL GALLATIN, LLC	4/19/2021	2000000 tons steel cast/yr	FPM	0.0030 GR/DSCF	The permittee must develop a Good Work Practices (GWP) Plan to minimize emissions.
A-Line Caster Spray Vent (EP 01-14)	KY-0115	NUCOR STEEL GALLATIN, LLC	4/19/2021	2000000 tons steel cast/yr	TPM10	0.0005 GR/DSCF	The permittee must develop a Good Work Practices (GWP) Plan to minimize emissions.
A-Line Caster Spray Vent (EP 01-14)	KY-0115	NUCOR STEEL GALLATIN, LLC	4/19/2021	2000000 tons steel cast/yr	TPM2.5	0.0001 GR/DSCF	The permittee must develop a Good Work Practices (GWP) Plan to minimize emissions.
B-Line Caster Spray Vent (EP 20-11)	KY-0115	NUCOR STEEL GALLATIN, LLC	4/19/2021	2000000 tons steel cast/yr	FPM	0.0030 GR/DSCF	The permittee must develop a Good Work Practices (GWP) Plan to minimize emissions.
B-Line Caster Spray Vent (EP 20-11)	KY-0115	NUCOR STEEL GALLATIN, LLC	4/19/2021	2000000 tons steel cast/yr	TPM10	0.0005 GR/DSCF	The permittee must develop a Good Work Practices (GWP) Plan to minimize emissions.
B-Line Caster Spray Vent (EP 20-11)	KY-0115	NUCOR STEEL GALLATIN, LLC	4/19/2021	2000000 tons steel cast/yr	TPM2.5	0.0001 GR/DSCF	The permittee must develop a Good Work Practices (GWP) Plan to minimize emissions.

Table B-11b. Casting Operations Recent Permit Limitations and Determinations of BACT for PM (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)	Particulate Matter Type	Permitted PM Limit	Control
EP 01-05 - Caster Spray Vent	KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	1750000 tons steel cast/yr	FPM	9.38 lb/hr	This EP is required to have a Good Work Practices (GWP) Plan.
EP 01-05 - Caster Spray Vent	KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	1750000 tons steel cast/yr	TPM10	1.5 lb/hr	This EP is required to have a Good Work Practices (GWP) Plan.
EP 01-05 - Caster Spray Vent	KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	1750000 tons steel cast/yr	TPM2.5	0.19 lb/hr	This EP is required to have a Good Work Practices (GWP) Plan.
Caster #2 (P907)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	250 ton/hr liquid steel	Particulate matter, filterable (FPM)	19.93 lb/hr 87.69 tons/yr, rolling 12-month basis	Operation of a baghouse control system a consisting of the following: (a)direct evacuation control (DEC) system for collection of emissions from EAF and LMF; (b)roof canopy hood system for collection of emissions fugitive to the inside of Meltshop #2 from casting operations (P907-Caster #2) and emissions not captured by the DEC control systems:
Caster #2 (P907)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	250 ton/hr liquid steel	Particulate matter, fugitive	20.96 tons particulate/rolling, 12 month period 12.21 tons PM10/rolling, 12-month period 8.95 tons PM2.5/rolling, 12-month period	Operation of a baghouse control system a consisting of the following: (a)direct evacuation control (DEC) system for collection of emissions from EAF and LMF; (b)roof canopy hood system for collection of emissions fugitive to the inside of Meltshop #2 from casting operations (P907-Caster #2) and emissions not captured by the DEC control systems:
Caster #2 (P907)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	250 ton/hr liquid steel	Particulate matter, total 10 (TPM10)	26.57 lb/hr 116.38 lb/yr, rolling 12-month basis	Operation of a baghouse control system a consisting of the following: (a)direct evacuation control (DEC) system for collection of emissions from EAF and LMF; (b)roof canopy hood system for collection of emissions fugitive to the inside of Meltshop #2 from casting operations (P907-Caster #2) and emissions not captured by the DEC control systems:
Caster #2 (P907)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	250 ton/hr liquid steel	Particulate matter, total 2.5 (TPM2.5)	26.57 lb/hr 116.38 lb/yr, rolling 12-month basis	Operation of a baghouse control system a consisting of the following: (a)direct evacuation control (DEC) system for collection of emissions from EAF and LMF; (b)roof canopy hood system for collection of emissions fugitive to the inside of Meltshop #2 from casting operations (P907-Caster #2) and emissions not captured by the DEC control systems:

[1] The CMC Mesa facility was not in the RBLC but is an ECS process/micro mill and are similar to the proposed facility.
[2] These RBLC listings are either not considered an ECS process, a micro mill, or both like the proposed CMC facility. Since the technologies at these facilities are different then technology used at
* Indicates that the facilities are draft determination in the RBLC database.

Table B-12a. Ladle/Tundish Preheaters and Dryers Recent Permit Limitations and Determinations of BACT for VOC (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)	Permitted VOC Limit	Control
Comparable Facilities[1]						
Meltshop Natural Gas Combustion	-	NUCOR STEEL SEDALIA	9/12/2018	450,000 tpy	0.055 lb/MMBtu	GCP of pipeline quality natural gas
Ladle Preheaters	-	CMC MESA	6/14/2018	435000 tons/yr	0.0053 lb/MMBtu	-
Ladle Dryer	-	CMC MESA	6/14/2018	435000 tons/yr	0.0053 lb/MMBtu	-
Tundish Preheater	-	CMC MESA	6/14/2018	435000 tons/yr	0.0053 lb/MMBtu	-
Tundish Dryer	-	CMC MESA	6/14/2018	435000 tons/yr	0.0053 lb/MMBtu	-
Tundish Mandril Dryer	-	CMC MESA	6/14/2018	435000 tons/yr	0.0053 lb/MMBtu	-
Heaters (Gas-Fired)	OK-0173	CMC STEEL OKLAHOMA	1/19/2016	-	0.0055 lb/MMBtu	Natural gas fuel
Ladle and Tundish Preheaters, Dryers and Skull Cutting	FL-0368	NUCOR STEEL FLORIDA FACILITY	2/14/2019	45.75 MMBtu/hr	0.0055 lb/MMBtu	Good combustion practices and using pipeline quality natural gas
Not Comparable Facilities[2]						
NG Combustion Units	WV-0034	Nucor Steel West Virginia	5/5/2022	3000000 TPY	0.0054 lb/MMBtu	Good Combustion Practices
LADLE DRYERS AND PREHEATERS	*TX-0882	SDSW STEEL MILL	1/17/2020	-	0.0054 lb/MMBtu	GOOD COMBUSTION PRACTICES, CLEAN FUEL
Tundish Dryer and Tundish Preheaters	*TX-0882	SDSW STEEL MILL	1/17/2020	-	0.0054 lb/MMBtu	GOOD COMBUSTION PRACTICES, CLEAN FUEL
MELT SHOP LADLE PREHEATERS	*TX-0867	STEEL MANUFACTURING FACILITY	1/2/2020	-	-	GOOD COMBUSTION PRACTICES
Tundish Dryer #2 (P030)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	1.2 MMBtu/hr	0.01 lb/hr 0.03 tons/yr, rolling 12-month period	Use of natural gas, good combustion practices and design
Ladle Preheaters and Dryers (P021-023, P025-026)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	16 MMBtu/hr	0.09 lb/hr 0.39 tons/yr, rolling 12-month period	Use of natural gas, good combustion practices and design
Tundish Preheaters #3 and #4 (P028 and P029)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	9.5 MMBtu/hr	0.05 lb/hr 0.22 tons/yr, rolling 12-month period	Use of natural gas, good combustion practices and design

Table B-12a. Ladle/Tundish Preheaters and Dryers Recent Permit Limitations and Determinations of BACT for VOC (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)	Permitted VOC Limit	Control
Ancillary Equipment (ladle preheaters/dryers)	SC-0183	NUCOR STEEL - BERKELEY	5/4/2018	4 ladle preheaters/dryers (9.9 MMBtu/hr, each), 2 ladle preheaters/dryers (10 MMBtu/hr, each), and 2 ladle preheaters/dryers (12.5 MMBtu/hr, each), total rating of 84.6 MMBtu/hr (all existing)	-	Good Combustion Practices
Ancillary Equipment (tundish preheaters/dryers)	SC-0183	NUCOR STEEL - BERKELEY	5/4/2018	17 tundish preheaters/dryers (3 MMBtu/hr, each) and 3 tundish preheaters/dryers (2 MMBtu/hr, each). Total rating of 57 MMBtu/hr (all existing).	-	Good combustion practices
TK Engergizer Ladle Heater (5 MMBtu/hr)	AL-0319	NUCOR STEEL TUSCALOOSA, INC.	3/9/2017	-	0.0055 lb/MMBtu	-
LADLE FURNACE	*TX-0651	STEEL MILL	10/2/2013	316 tons/hr 1,500,000 tons/yr	0.004 lb/ton steel	GOOD COMBUSTION PRACTICE AND PROCESS CONTROL
TUNDISH NOZZLE PREHEATERS	IN-0196	NUCOR STEEL	9/17/2013	6.4 MMBtu/hr	5.5 lb/MMcf natural gas 0.035 lb/hr	USING NATURAL GAS AS THE PRIMARY FUEL AND PROPANE AS BACKUP FUEL. EACH UNIT IS LIMITED TO 500 HRS/YR OPERATION WHEN COMBUSTING PROPANE.
TUNDISH PREHEATERS	IN-0196	NUCOR STEEL	9/17/2013	502 tons/hr 12 MMBtu/hr each preheater	5.5 lb/MMcf natural gas 0.32 lb/hr	USING NATURAL GAS AS THE PRIMARY FUEL AND PROPANE AS BACKUP FUEL. EACH UNIT IS LIMITED TO 500 HRS/YR OPERATION WHEN COMBUSTING PROPANE.

[1] The CMC Mesa and Nucor Sedalia facilities were not in the RBLC but are an ECS process/micro mill and are similar to the proposed facility.

[2] These RBLC listings are either not considered an ECS process, a micro mill, or both like the proposed CMC facility. Since the technologies at these facilities are different than technology used at the proposed facility, they are not appropriate for comparison.

* Indicates that the facilities are draft determination in the RBLC database.

Table B-12b. Casting Operations Recent Permit Limitations and Determinations of BACT for VOC from (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)	Permitted VOC Limit	Control
Comparable Facilities [1]						
Caster Mold - Oil Pyrolysis, S1	-	CMC MESA	6/14/2018	435000 tons/yr	0.14 lb/hr, 3-hour average	Good combustion practices and the use of pipeline quality natural gas.
Caster Mold - Oil Combustion, S1	-	CMC MESA	6/14/2018	435000 tons/yr	0.00021 lb/hr, 3-hour average	Good combustion practices and the use of pipeline quality natural gas.
Caster Mold - Oil Pyrolysis, CV	-	CMC MESA	6/14/2018	435000 tons/yr	0.58 lb/hr, 3-hour average	Good combustion practices and the use of pipeline quality natural gas.
Caster Mold - Oil Combustion, CV	-	CMC MESA	6/14/2018	435000 tons/yr	0.0008 lb/hr, 3-hour average	Good combustion practices and the use of pipeline quality natural gas.
Not Comparable Facilities [2]						
A-Line Caster Spray Vent (EP 01-14)	KY-0115	NUCOR STEEL GALLATIN, LLC	4/19/2021	2000000 tons steel cast/yr	0.4 LB/HR	The permittee must develop a Good Work Practices (GWP) Plan to minimize emissions.
B-Line Caster Spray Vent (EP 20-11)	KY-0115	NUCOR STEEL GALLATIN, LLC	4/19/2021	2000000 tons steel cast/yr	0.8 LB/HR	The permittee must develop a Good Work Practices (GWP) Plan to minimize emissions.
EP 01-05 - Caster Spray Vent	KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	1750000 tons steel produced/yr	0.4 LB/HR	This EP is required to have a Good Work Practices (GWP) Plan.
EP 01-05 - Caster Spray Vent	KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	1750000 tons steel cast/yr	0.4 lb/hr	This EP is required to have a Good Work Practices (GWP) Plan.
Caster (EUCASTER)	MI-0404	GERDAU MACSTEEL, INC.	1/4/2013	130 tons/hr liquid steel	-	Good combustion practices and the use of pipe-line quality natural gas.
Caster #2 (P907)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	250 ton/hr liquid steel	0.35 lbs/ton of liquid steel produced 87.5 lb/hr 712.25 tons/yr	The development, implementation, and maintenance of a scrap management plan.
Casting Operations	TX-0705	STEEL MINIMILL FACILITY	7/24/2014	1300000 tons/yr liquid steel	-	The facility uses good combustion practices to minimize emissions of VOC from the ladle preheaters and ladle resin dryers.

[1] The CMC Mesa facility was not in the RBLC but is an ECS process/micro mill and are similar to the proposed facility.

[2] These RBLC listings are either not considered an ECS process, a micro mill, or both like the proposed CMC facility. Since the technologies at these facilities are different then technology used at the proposed facility, they are not appropriate for comparison.

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Table B-13. Ladle/Tundish Preheaters and Dryers Recent Permit Limitations and Determinations of BACT for GHGs (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)	Permitted CO2e Limit	Control
Comparable Facilities [1]						
Meltshop Natural Gas Combustion	-	NUCOR STEEL SEDALIA	9/12/2018	450,000 tpy	120 lb/MMBtu	GCP of pipeline quality natural gas
Heaters (Gas-Fired)	OK-0173	CMC STEEL OKLAHOMA	1/19/2016	-	120 lb/MMBtu	Natural gas fuel
Ladle and Tundish Preheaters, Dryers and Skull Cutting	FL-0368	NUCOR STEEL FLORIDA FACILITY	2/14/2019	45.75 MMBtu/hr	120 lb/MMBtu	Good combustion practices and using pipeline quality natural gas
Not Comparable Facilities [2]						
LADLE DRYERS AND PREHEATERS	*TX-0882	SDSW STEEL MILL	1/17/2020	-	117.1 lb/MMBtu	GOOD COMBUSTION PRACTICES, CLEAN FUEL
Tundish Dryer and Tundish Preheaters	*TX-0882	SDSW STEEL MILL	1/17/2020	-	117.1 lb/MMBtu	GOOD COMBUSTION PRACTICES, CLEAN FUEL
Tundish Dryer #2 (P030)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	1.2 MMBtu/hr	140.22 lb/hr 614.18 tons/yr, rolling 12-month period	Use of natural gas and energy efficient design
Ladle Preheaters and Dryers (P021-023, P025-026)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	16 MMBtu/hr	1869.65 lb/hr 8189.03 tons/yr, rolling 12-month period	Use of natural gas and energy efficient design
Tundish Preheaters #3 and #4 (P028 and P029)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	9.5 MMBtu/hr	1110.1 lb/hr 4862.24 tons/yr, rolling 12-month period	Use of natural gas and energy efficient design
TK Engergizer Ladle Heater (5 MMBtu/hr)	AL-0319	NUCOR STEEL TUSCALOOSA, INC.	3/9/2017	-	2565 tons/yr, 12-month rolling total	-

[1] The CMC Mesa and Nucor Sedalia facilities were not in the RBLC but are an ECS process/micro mill and are similar to the proposed facility.

[2] These RBLC listings are either not considered an ECS process, a micro mill, or both like the proposed CMC facility. Since the technologies at these facilities are different than technology used at the proposed facility, they are not appropriate for comparison.

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Table B-14. Rolling Mill/Cooling Beds Recent Permit Limitations and Determinations of BACT for PM (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)	Particulate Matter Type	Permitted PM Limit	Control
Comparable Facilities							
Rolling Operations	FL-0368	NUCOR STEEL FLORIDA FACILITY	02/14/2019	--	PM Total	0	Good industry practices
Rolling Mill and Cutting Torches	IL-0126	NUCOR STEEL KANKAKEE, INC.	11/1/2018	500,000	PM Filterable	6.65 tpy 0.027 lb/hr	Good industry practices for a rolling mill
Rolling Mill and Cutting Torches	IL-0126	NUCOR STEEL KANKAKEE, INC.	11/1/2018	500,000	PM_{10} Total	6.65 tpy 0.027 lb/hr	Good industry practices for a rolling mill
Rolling Mill and Cutting Torches	IL-0126	NUCOR STEEL KANKAKEE, INC.	11/1/2018	500,000	$PM_{2.5}$ Total	2.46 tpy 0.010 lb/hr	Good industry practices for a rolling mill
Rolling Mill (P009)	OH-0369	NUCOR STEEL MARION, INC.	8/29/2017	154.5 MMBtu/hr	PM Total	3.59 tpy	--
Rolling Mill (P009)	OH-0369	NUCOR STEEL MARION, INC.	8/29/2017	154.5 MMBtu/hr	PM_{10} Total	3.59 tpy	--
Rolling Mill (P009)	OH-0369	NUCOR STEEL MARION, INC.	8/29/2017	154.5 MMBtu/hr	$PM_{2.5}$ Total	3.59 tpy	--
Not Comparable Facilities							
KY-0115	KY-0115	NUCOR STEEL GALLATIN, LLC	4/19/2021	3500000	FPM	0.04 LB/HR	The permittee must develop a Good Work Practices (GWP) Plan to minimize emissions. Equipped with a dust collector.
KY-0115	KY-0115	NUCOR STEEL GALLATIN, LLC	4/19/2021	3500000	TPM10	0.04 LB/HR	The permittee must develop a Good Work Practices (GWP) Plan to minimize emissions. Equipped with a dust collector.
KY-0115	KY-0115	NUCOR STEEL GALLATIN, LLC	4/19/2021	3500000	TPM2.5	0.04 LB/HR	The permittee must develop a Good Work Practices (GWP) Plan to minimize emissions. Equipped with a dust collector.
KY-0110	KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	1110000.00	FPM	0.011 LB/HR	This EP is required to have a Good Work Practices (GWP) Plan and a baghouse designed to control 99.9% of particulate emissions.
KY-0110	KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	1110000.00	TPM10	0.011 LB/HR	This EP is required to have a Good Work Practices (GWP) Plan and a baghouse designed to control 99.9% of particulate emissions.
KY-0110	KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	1110000.00	TPM2.5	0.011 LB/HR	This EP is required to have a Good Work Practices (GWP) Plan and a baghouse designed to control 99.9% of particulate emissions.

Table B-15. Rolling Mill/Cooling Beds Recent Permit Limitations and Determinations of BACT for VOC (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)	Permitted VOC Limit	Control
Comparable Facilities						
Rolling Mill (P009)	OH-0369	NUCOR STEEL MARION, INC	8/29/2017	154.4 MMBTU/H	9.26 TPY	-
Rolling Operations	FL-0368	NUCOR STEEL FLORIDA FACILITY	2/14/2019	0	0	Limiting the oil and grease usage; Good Operating Practices
Not Comparable Facilities [1]						
Hot Rolling Mill	AL-0307	Alloys Plant	10/9/2015	0	106 PPMVD	Fume Exhaust Control

[1] These RBLC listings are either not considered an ECS process, a micro mill, or both like the proposed CMC facility. Since the technologies at these facilities are different than technology used at the proposed facility, they are not appropriate for comparison.

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Table B-16 . Storage Silos Recent Permit Limitations and Determinations of BACT for PM (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)	Particulate Matter Type	Permitted PM Limit	Control
Comparable Facilities[1]							
Two Carbon/Lime Silos	-	Gerdau Ameristeel, NC	5/1/2019	90 tph	PM10 Filterable	-	Fabric Filters
Loading of flux from storage silo to EAF	-	CMC Steel Arizona	6/14/2018	450000 tons of steel per year	PM	-	Fugitive dust control plan Partial enclosure in scrap bay building
Silos	FL-0368	NUCOR STEEL FLORIDA FACILITY	02/14/2019	0	Particulate matter, filterable (FPM)	0.005 GR/DSCF	Bin vent filters
Materials Storage Silos	OK-0173	CMC STEEL OKLAHOMA	01/19/2016	0	Particulate matter, total (TPM10)	0.01 GR/DSCF	Baghouses.
Materials Storage Silos	OK-0173	CMC STEEL OKLAHOMA	01/19/2016	0	Particulate matter, total (TPM2.5)	0.01 GR/DSCF	Baghouses.
Materials Storage Silos	-	Nucor Sedalia	9/12/2018	450000 tpy	$PM/PM_{10}/PM_{2.5}$	0.01 gr/dscf	Baghouse
STORAGE SILOS	TX-0882	STEEL DYNAMICS SOUTHWEST, LLC SDSW STEEL MILL	1/17/2020	0	FPM, TPM10, TPM2.5	0.01 GR/DSCF	BAGHOUSE
Not Comparable Facilities[2]							
LMF Silo #2 & Lime/Carbon Silo: P032,P033,P034	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	0	Particulate matter, filterable (FPM)	0.02 GR/DSCF	Fabric filter
LMF Silo #2 & Lime/Carbon Silo: P032,P033,P034	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	0	Particulate matter, filterable (FPM10)	0.02 GR/DSCF	Fabric filter
LMF Silo #2 & Lime/Carbon Silo: P032,P033,P034	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	0	Particulate matter, filterable (FPM2.5)	0.02 GR/DSCF	Fabric filter
Limestone Receiving #2 (F007)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	262800 T/YR	Particulate matter, fugitive	1.16 T/YR	Minimization of drop height
Limestone Receiving #2 (F007)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	262800 T/YR	Particulate matter, filterable (FPM10)	1.16 T/YR	Minimization of drop height
Limestone Receiving #2 (F007)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	262800 T/YR	Particulate matter, filterable (FPM2.5)	1.16 T/YR	Minimization of drop height
STORAGE SILOS	*TX-0882	SDSW STEEL MILL	01/17/2020	0	Particulate matter, total (TPM)	0.01 GR/DSCF	BAGHOUSE
STORAGE SILOS	*TX-0882	SDSW STEEL MILL	01/17/2020	0	Particulate matter, total (TPM10)	0.01 GR/DSCF	BAGHOUSE
STORAGE SILOS	*TX-0882	SDSW STEEL MILL	01/17/2020	0	Particulate matter, total (TPM2.5)	0.01 GR/DSCF	BAGHOUSE
EP 07-02 - DRI Storage Silo #1	KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	1750000 TPY	FPM, TPM10, TPM2.5	0.001 GR/DSCF	For DRI Storage Silo #1 (EP 07-02): The permittee shall install, operate, and maintain a dust collector for the silo designed to control particulate grain loading to 0.001 grain/dscf and the flow rate to 1200 dscf/min and a passive bin vent for the silo designed to control particulate grain loading to 0.001 grain/dscf and the flow rate to 148 dscf/min.

Table B-16 . Storage Silos Recent Permit Limitations and Determinations of BACT for PM (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)	Particulate Matter Type	Permitted PM Limit	Control
EP 07-03 - DRI Storage Silo #2	KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	1750000 TPY	FPM, TPM10, TPM2.5	0.001 GR/DSCF	For EP 07-03 - DRI Storage Silo #2: The permittee shall install, operate, and maintain a dust collector for the silo designed to control particulate grain loading to 0.001 grain/dscf and the flow rate to 1200 dscf/min and a passive bin vent for the silo designed to control particulate grain loading to 0.001 grain/dscf and the flow rate to 148 dscf/min.
EP 07-04 - DRI Storage Silo Loadout	KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	1750000 TPY	FPM, TPM10, TPM2.5	0.001 GR/DSCF	For EP 07-04 - DRI Storage Silo Loadout: The permittee shall install, operate, and maintain a dust collector for the silo designed to control particulate grain loading to 0.001 grain/dscf and the flow rate to 1200 dscf/min and a passive bin vent for the silo designed to control particulate grain loading to 0.001 grain/dscf and the flow rate to 148 dscf/min.
LIME / CARBON STORAGE SILOS	IN-0235	STEEL DYNAMICS INC. - FLAT ROLL DIVISION	11/05/2015	-	Particulate matter, filterable (FPM)	0.01 GR/DSCF	BIN VENT
Carbon/Lime Storage and charging	LA-0309	BENTELER STEEL TUBE FACILITY	06/04/2015	0	Particulate matter, total (TPM10)	0.005 GR/DSCF	filter / dust collector
Carbon/Lime Storage and charging	LA-0309	BENTELER STEEL TUBE FACILITY	06/04/2015	0	Particulate matter, total (TPM2.5)	0.005 GR/DSCF	Filter / Dust Collector
Material Handling	LA-0309	BENTELER STEEL TUBE FACILITY	06/04/2015	0	Particulate matter, total (TPM10)	0.005 GR/DSCF	baghouses
Material Handling	LA-0309	BENTELER STEEL TUBE FACILITY	06/04/2015	0	Particulate matter, total (TPM2.5)	0.005 GR/DSCF	baghouses
Flux and Carbon storage material handling	OH-0350	REPUBLIC STEEL	07/18/2012	0	Particulate matter, total (TPM10)	2.4 LB/H	Enclosures and baghouse
Flux and Carbon storage material handling	OH-0350	REPUBLIC STEEL	07/18/2012	0	Particulate matter, total (TPM2.5)	0.37 LB/H	Enclosures and Baghouse
Raw Material Handling and Processing (carbon dump fugitives)	SC-0183	NUCOR STEEL - BERKELEY	05/04/2018	0	Particulate matter, filterable (FPM)	0	Good Work Practice Standards and Proper Operation and Maintenance.
Raw Material Handling and Processing (lime dump fugitives)	SC-0183	NUCOR STEEL - BERKELEY	05/04/2018	0	Particulate matter, filterable (FPM)	0	Good Work Practice Standards and Proper Operation and Maintenance
THREE STORAGE BIN/SILOS ID#12A, 12B, AND 12C	IN-0156	STEEL DYNAMICS, INC. - STRUCTURAL AND RAIL DIVISION	12/31/2012	0	Particulate matter, filterable (FPM)	0.01 GR/DSCF 3% Opacity for 6-minute average	BIN VENT FILTER
THREE STORAGE BIN/SILOS ID#12A, 12B, AND 12C	IN-0156	STEEL DYNAMICS, INC. - STRUCTURAL AND RAIL DIVISION	12/31/2012	0	Particulate matter, filterable (FPM10)	0.01 GR/DSCF 3% Opacity for 6-minute average	BIN VENT FILTER

[1] The CMC Mesa, Nucor Sedalia, and Gerdau Ameristeel facilities were not in the RBLC but they are an ECS process/micro mill and are similar to the proposed facility.

[2] These RBLC listings are either not considered an ECS process, a micro mill, or both like the proposed CMC facility. Since the technologies at these facilities are different than technology used at the proposed facility, they are not appropriate for comparison.

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Table B-17. Storage Piles & Material Transfers Recent Permit Limitations and Determinations of BACT for PM (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)	Particulate Matter Type	Permitted PM Limit	Control
Building or Structure Housing Any Iron or Steel Foundry Emissions Source, NESHAP EEEEE						20% opacity from fugitive emissions (6-minute average)	
New Large Iron and Steel Foundaries Area Sources, NESHAP ZZZZZ						20% opacity from fugitive emissions (6 min average)	
Fugitive Dust from Dust-Generating Operations, Maricopa County Regulation III Rule 310						20% opacity from fugitive emissions	
Open Storage Piles and Material Handling, Maricopa County Regulation III Rule 316 Section 307.1							One of the following: spray material with water; maintain a 1.5% or more soil moisture content of the open storage piles; locate open storage pile(s) in a pit/in the bottom of a pit; arrange open storage pile(s) such that storage pile(s) of larger diameter products are on the perimeter and act as barriers to/for open storage pile(s) that could create fugitive dust emissions; construct and maintain wind barriers, storage silos, or a three-sided enclosure with walls, whose length is no less than equal to the length of the pile, whose distance from the pile is no more than twice the height of the pile, whose height is equal to the pile height, and whose porosity is no more than 50%; cover open storage piles with tarps, plastic, or other material to prevent wind from removing the coverings; maintain a visible crust.
Open Storage Piles and Material Handling, Maricopa County Regulation III Rule 316 Section 307.1							When installing new open storage pile(s): Install the open storage pile(s) 25 feet or more from the property line; and limit the height of the open storage pile(s) to less than 45 feet. An owner, operator, or person subject to this rule may be allowed to install the open storage pile(s) less than 25 feet from the property line, if the owner, operator, or person subject to this rule can demonstrate to the Control Officer that there is not adequate space to install the open storage pile(s).
Open Storage Piles and Material Handling, Maricopa County Regulation III Rule 316 Section 307.1							For open storage pile(s) more than eight feet high and not covered, completely wet surface of the open storage pile(s).

Table B-17. Storage Piles & Material Transfers Recent Permit Limitations and Determinations of BACT for PM (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)	Particulate Matter Type	Permitted PM Limit	Control
Comparable Facilities[1]							
Raw and Waste Material Storage and Handling & Slag Yard	FL-0368	NUCOR STEEL FLORIDA FACILITY	02/14/2019	--	PM Filterable	0	Use of equipment enclosures, water sprays, and minimizing wind erosion and drop points
Storage Piles : Refractory and Slag	OK-0173	CMC STEEL OKLAHOMA	01/19/2016	--	PM Total	0	Minimizing drop height. In addition, use of windbreaks and watering of piles may be used, although watering may result in unacceptable solidification of slag or other materials discharged from high-temperature operations. Most of the outdoor piles materials are scrap steel which has very little brittle materials susceptible to becoming fugitive dust.
ES-3 Particulate Emissions	--	GERDAU AMERISTEEL, NC	5/1/2019	--	PM	0	None
Storage Piles	--	CMC STEEL MESA	6/14/2018	--	TSP/PM_{10}	0	Enclosures, wetting/watering and material moisture content
Slag/Mill Scale Control Device	--	NUCOR STEEL MISSOURI FACILITY	9/12/2018	--	$PM/PM_{10}/PM_{2.5}$	0	Water spray or dust suppressant emission control system in slag yard when screens or crusher are operating. Minimize drop heights.
Not Comparable Facilities[2]							
Slag Storage Piles	AR-0173	BIG RIVER STEEL LLC	1/31/2022	0	FPM	0.58 TPY	Dust Control Plan
Slag Storage Piles	AR-0173	BIG RIVER STEEL LLC	1/31/2022	0	TPM10	0.29 TPY	Dust Control Plan
Slag Storage Piles	AR-0173	BIG RIVER STEEL LLC	1/31/2022	0	TPM2.5	0.1 TPY	Dust Control Plan

[1] The CMC Mesa, Nucor Missouri and Gerdau Ameristeel facilities were not in the RBLC but they are an ECS process/micro mill and are similar to the proposed facility.
[2] The RBLC listings are either not condiered an ECS process, a micro mill, or both like the proposed CMC facility. Since the technologies at these facilities are different than technology used at the proposed facility, they are not appropriate for comparison.
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Table B-18. Cooling Tower Recent Permit Limitations and Determinations of BACT for PM (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)	Particulate Matter Type	Permitted PM Limit	Control
Comparable Facilities[1]							
Contact and Non-Contact Cooling Towers	-	CMC STEEL MESA	6/14/2018	-	PM, PM_{10}, $PM_{2.5}$	0.0005 % DRIFT RATE	Drift eliminators
Two Cooling Towers	FL-0368	NUCOR STEEL FLORIDA FACILITY	02/14/2019	19,650 gal/min	Particulate matter, total (TPM)	0.001 % DRIFT RATE	Drift eliminators
Cooling Towers	OK-0173	CMC STEEL OKLAHOMA	01/19/2016	0	Particulate matter, total (TPM10)	0.001 % DRIFT	Drift eliminators.
Cooling Towers	-	Nucor Sedalia	9/12/2018	450000 tpy	$PM/PM_{10}/PM_{2.5}$	0.001% DRIFT 2,500 ppm TDS limit	Drift Eliminators/TDS limit for circulated water
Not Comparable Facilities[2]							
Cooling Towers	IL-0126	NUCOR STEEL KANKAKEE, INC.	11/01/2018	4500 gallons/minute	Particulate matter, total (TPM)	0.001 WEIGHT PERCENT 4000 TOTAL DISOLVED SOLID	Drift eliminators
Contact Cooling Towers - Melt Shop 2 (P027)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	2.7 MMGAL/H	Particulate matter, filterable (FPM)	1.17 T/YR	i.use of drift eliminator(s) designed to achieve a 0.001% drift rate; ii.maintenance of a total dissolved solids (TDS) content (for the 5 individual cooling towers) not to exceed the ppm in the circulating cooling water based on a rolling 12-month average as indicated in the table below: Cooling Tower - TDS (ppm) Meltshop 2 Cooling Tower - 1000 Caster Mold Water Cooling Tower - 800 Tunnel Furnace Cooling Tower - 800 Caster Non-Contact 2 Cooling Tower - 800 Caster Contact 2 Cooling Tower - 1400
Contact Cooling Towers - Melt Shop 2 (P027)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	2.7 MMGAL/H	Particulate matter, filterable (FPM10)	0.93 T/YR	i.use of drift eliminator(s) designed to achieve a 0.001% drift rate; ii.maintenance of a total dissolved solids (TDS) content (for the 5 individual cooling towers) not to exceed the ppm in the circulating cooling water based on a rolling 12-month average as indicated in the table below: Cooling Tower - TDS (ppm) Meltshop 2 Cooling Tower - 1000 Caster Mold Water Cooling Tower - 800 Tunnel Furnace Cooling Tower - 800 Caster Non-Contact 2 Cooling Tower - 800 Caster Contact 2 Cooling Tower - 1400
Contact Cooling Towers (P014)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	6.41 MMGAL/H	Particulate matter, filterable (FPM)	8.7 T/YR	i.use of drift eliminator(s) designed to achieve a 0.003% drift rate; ii.maintenance of a total dissolved solids (TDS) content (for the 5 individual cooling towers) not to exceed the ppm in the circulating cooling water based on a rolling 12-month average as indicated in the table below: Cooling Tower - TDS (ppm) Meltshop Cooling Tower (501) - 800 Caster Non-Contact Cooling Tower (6 Cell) - 800 Caster Contact Cooling Tower (503) - 1100 Mill Contact Cooling Tower (505) - 2000 Laminar Flow Cooling Tower (506) - 1400

Table B-18. Cooling Tower Recent Permit Limitations and Determinations of BACT for PM (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)	Particulate Matter Type	Permitted PM Limit	Control
Contact Cooling Towers (P014)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	6.41 MMGAL/H	Particulate matter, filterable (FPM10)	6.95 T/YR	i.use of drift eliminator(s) designed to achieve a 0.003% drift rate; ii.maintenance of a total dissolved solids (TDS) content (for the 5 individual cooling towers) not to exceed the ppm in the circulating cooling water based on a rolling 12-month average as indicated in the table below: Cooling Tower - TDS (ppm) Meltshop Cooling Tower (501) - 800 Caster Non-Contact Cooling Tower (6 Cell) - 800 Caster Contact Cooling Tower (503) - 1100 Mill Contact Cooling Tower (505) - 2000 Laminar Flow Cooling Tower (506) - 1400
Contact Cooling Towers (P014)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	6.41 MMGAL/H	Particulate matter, filterable (FPM2.5)	0.02 T/YR	i.use of drift eliminator(s) designed to achieve a 0.003% drift rate; ii.maintenance of a total dissolved solids (TDS) content (for the 5 individual cooling towers) not to exceed the ppm in the circulating cooling water based on a rolling 12-month average as indicated in the table below: Cooling Tower - TDS (ppm) Meltshop Cooling Tower (501) - 800 Caster Non-Contact Cooling Tower (6 Cell) - 800 Caster Contact Cooling Tower (503) - 1100 Mill Contact Cooling Tower (505) - 2000 Laminar Flow Cooling Tower (506) - 1400
COOLING TOWER: ROLLING MILL/CASTER (NON-CONTACT) ID#15E	IN-0156	STEEL DYNAMICS, INC. - STRUCTURAL AND RAIL DIVISION	12/21/2012	18000 GAL/MIN	Particulate matter, filterable (FPM)	0.003 % DRIFT RATE	DRIFT ELIMINATOR; DO NOT USE CHROMIUM-BASED WATER TREATMENT CHEMICALS IN ANY OF THE COOLING TOWERS.
COOLING TOWER: ROLLING MILL/CASTER (NON-CONTACT) ID#15E	IN-0156	STEEL DYNAMICS, INC. - STRUCTURAL AND RAIL DIVISION	12/21/2012	18000 GAL/MIN	Particulate matter, filterable (FPM10)	0.003 % DRIFT RATE	DRIFT ELIMINATOR; DO NOT USE CHROMIUM-BASED WATER TREATMENT CHEMICALS IN ANY OF THE COOLING TOWERS.
COOLING TOWER: CASTER SPRAYS (CONTACT) ID#15F	IN-0156	STEEL DYNAMICS, INC. - STRUCTURAL AND RAIL DIVISION	12/21/2012	3500 GAL/MIN	Particulate matter, filterable (FPM)	0.001 % DRIFT RATE	DRIFT ELIMINATOR; DO NOT USE CHROMIUM-BASED WATER TREATMENT CHEMICALS IN ANY OF THE COOLING TOWERS.
COOLING TOWER: CASTER SPRAYS (CONTACT) ID#15F	IN-0156	STEEL DYNAMICS, INC. - STRUCTURAL AND RAIL DIVISION	12/21/2012	3500 GAL/MIN	Particulate matter, filterable (FPM10)	0.001 % DRIFT RATE	DRIFT ELIMINATOR; DO NOT USE CHROMIUM-BASED WATER TREATMENT CHEMICALS IN ANY OF THE COOLING TOWERS.
COOLING TOWER: ROLLING MILL (CONTACT) ID#15A	IN-0156	STEEL DYNAMICS, INC. - STRUCTURAL AND RAIL DIVISION	12/21/2012	8000 GAL/MIN	Particulate matter, filterable (FPM)	0.001 % DRIFT RATE	DRIFT ELIMINATOR; DO NOT USE CHROMIUM-BASED WATER TREATMENT CHEMICALS IN ANY OF THE COOLING TOWERS.
COOLING TOWER: ROLLING MILL (CONTACT) ID#15A	IN-0156	STEEL DYNAMICS, INC. - STRUCTURAL AND RAIL DIVISION	12/21/2012	8000 GAL/MIN	Particulate matter, filterable (FPM10)	0.001 % DRIFT RATE	DRIFT ELIMINATOR; DO NOT USE CHROMIUM-BASED WATER TREATMENT CHEMICALS IN ANY OF THE COOLING TOWERS.
COOLING TOWER: LVD BOILER (CONTACT) ID#15G	IN-0156	STEEL DYNAMICS, INC. - STRUCTURAL AND RAIL DIVISION	12/21/2012	2500 GAL/MIN	Particulate matter, filterable (FPM)	0.005 % DRIFT RATE	DRIFT ELIMINATOR; DO NOT USE CHROMIUM-BASED WATER TREATMENT CHEMICALS IN ANY OF THE COOLING TOWERS.

Table B-18. Cooling Tower Recent Permit Limitations and Determinations of BACT for PM (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)	Particulate Matter Type	Permitted PM Limit	Control
COOLING TOWER: LVD BOILER (CONTACT) ID#15G	IN-0156	STEEL DYNAMICS, INC. - STRUCTURAL AND RAIL DIVISION	12/21/2012	2500 GAL/MIN	Particulate matter, filterable (FPM10)	0.005 % DRIFT RATE	DRIFT ELIMINATOR; DO NOT USE CHROMIUM-BASED WATER TREATMENT CHEMICALS IN ANY OF THE COOLING TOWERS.
COOLING TOWER: ROLLING MILL (CONTACT) ID#15B	IN-0156	STEEL DYNAMICS, INC. - STRUCTURAL AND RAIL DIVISION	12/21/2012	4000 GAL/MIN	Particulate matter, filterable (FPM)	0.001 % DRIFT RATE	DRIFT ELIMINATOR; DO NOT USE CHROMIUM-BASED WATER TREATMENT CHEMICALS IN ANY OF THE COOLING TOWERS
COOLING TOWER: ROLLING MILL (CONTACT) ID#15B	IN-0156	STEEL DYNAMICS, INC. - STRUCTURAL AND RAIL DIVISION	12/21/2012	4000 GAL/MIN	Particulate matter, filterable (FPM10)	0.001 % DRIFT RATE	DRIFT ELIMINATOR; DO NOT USE CHROMIUM-BASED WATER TREATMENT CHEMICALS IN ANY OF THE COOLING TOWERS.
COOLING TOWER: ROLLING MILL ID#15C (NONCONTACT)	IN-0156	STEEL DYNAMICS, INC. - STRUCTURAL AND RAIL DIVISION	12/21/2012	81250 GAL/MIN	Particulate matter, filterable (FPM)	0.001 % DRIFT RATE	DRIFT ELIMINATOR; DO NOT USE CHROMIUM-BASED WATER TREATMENT CHEMICALS IN ANY OF THE COOLING TOWERS.
COOLING TOWER: ROLLING MILL ID#15C (NONCONTACT)	IN-0156	STEEL DYNAMICS, INC. - STRUCTURAL AND RAIL DIVISION	12/21/2012	81250 GAL/MIN	Particulate matter, filterable (FPM10)	0.001 % DRIFT RATE	DRIFT ELIMINATOR; DO NOT USE CHROMIUM-BASED WATER TREATMENT CHEMICALS IN ANY OF THE COOLING TOWERS.
COOLING TOWER: #1 CAST ID#15D (CONTACT)	IN-0156	STEEL DYNAMICS, INC. - STRUCTURAL AND RAIL DIVISION	12/21/2012	5000 GAL/MIN	Particulate matter, filterable (FPM)	0.001 % DRAFT RATE	DRIFT ELIMINATOR; DO NOT USE CHROMIUM-BASED WATER TREATMENT CHEMICALS IN ANY OF THE COOLING TOWERS.
COOLING TOWER: #1 CAST ID#15D (CONTACT)	IN-0156	STEEL DYNAMICS, INC. - STRUCTURAL AND RAIL DIVISION	12/21/2012	5000 GAL/MIN	Particulate matter, filterable (FPM10)	0.001 % DRAFT RATE	DRIFT ELIMINATOR; DO NOT USE CHROMIUM-BASED WATER TREATMENT CHEMICALS IN ANY OF THE COOLING TOWERS.
Cooling Towers	LA-0309	BENTELER STEEL TUBE FACILITY	06/04/2015	0	Particulate matter, total (TPM10)	0.0005 % DRIFT RATE	drift eliminators
Cooling Towers	LA-0309	BENTELER STEEL TUBE FACILITY	06/04/2015	0	Particulate matter, total (TPM2.5)	0.0005 % DRIFT RATE	drift eliminators
Caster Cooling Tower (EUCASTERCOOLTWR)	MI-0404	GERDAU MACSTEEL, INC.	01/04/2013	1630 GAL/MIN	Particulate matter, total (TPM10)	0.0005 % DRIFT LOSS	Drift eliminator
EUCASTERCOOLTWR (Caster cooling tower)	MI-0417	GERDAU MACSTEEL, INC.	10/27/2014	1630 GAL/MIN	Particulate matter, total (TPM2.5)	0.0005 % DRIFT LOSS	Drift eliminator
Cooling Towers	SC-0183	NUCOR STEEL - BERKELEY	05/04/2018	0	Particulate matter, filterable (FPM)	0.66 LB/HR	Proper Equipment Design, Operation and Maintenance
Cooling Towers	SC-0183	NUCOR STEEL - BERKELEY	05/04/2018	0	Particulate matter, filterable (FPM10)	0.33 LB/HR	Proper Equipment Design, Operation and Maintenance
Cooling Towers	SC-0183	NUCOR STEEL - BERKELEY	05/04/2018	0	Particulate matter, filterable (FPM2.5)	0.0013 LB/HR	Proper Equipment Design, Operation and Maintenance
Cooling Towers (non-contact cooling tower)	SC-0183	NUCOR STEEL - BERKELEY	05/04/2018	0	Particulate matter, filterable (FPM)	0.12 LB/HR	Proper Equipment Design, Operation and Maintenance
Cooling Towers (non-contact cooling tower)	SC-0183	NUCOR STEEL - BERKELEY	05/04/2018	0	Particulate matter, filterable (FPM10)	0.05 LB/HR	Proper Equipment Design, Operation and Maintenance
Cooling Towers (non-contact cooling tower)	SC-0183	NUCOR STEEL - BERKELEY	05/04/2018	0	Particulate matter, filterable (FPM2.5)	0.0003 LB/HR	Proper Equipment Design, Operation and Maintenance
Cooling Towers (contact cooling tower)	SC-0183	NUCOR STEEL - BERKELEY	05/04/2018	0	Particulate matter, filterable (FPM)	0.13 LB/HR	Proper Equipment Design, Operation and Maintenance
Cooling Towers (contact cooling tower)	SC-0183	NUCOR STEEL - BERKELEY	05/04/2018	0	Particulate matter, filterable (FPM10)	0.06 LB/HR	Proper Equipment Design, Operation and Maintenance
Cooling Towers (contact cooling tower)	SC-0183	NUCOR STEEL - BERKELEY	05/04/2018	0	Particulate matter, filterable (FPM2.5)	0.0003 LB/HR	Proper Equipment Design, Operation and Maintenance

Table B-18. Cooling Tower Recent Permit Limitations and Determinations of BACT for PM (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)	Particulate Matter Type	Permitted PM Limit	Control
Cooling Towers	WV-0034	Nucor Steel West Virginia	5/5/2022	90000 gpm	Particulate matter, total (TPM)	0.0005% Drift Loss	Drift Eliminator
Cooling Towers	AR-0173	BIG RIVER STEEL LLC	1/31/2022	0	FPM, TPM10, TPM2.5	0.0005% Drift Loss	-
SN-212 Cooling Tower	AR-0172	NUCOR STEEL ARKANSAS	9/1/2021	0	FPM, TPM10, TPM2.5	0.0005% Drift Loss	-
EP 09-01 - Melt Shop ICW Cooling Tower	KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	52000 gal/min	FPM, TPM10, TPM2.5	0.36 LB/HR	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.
EP 09-02 - Melt Shop DCW Cooling Tower	KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	5900 gal/min	FPM, TPM10, TPM2.5	0.04 LB/HR	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.
EP 09-03 - Rolling Mill ICW Cooling Tower	KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	8500 gal/min	FPM, TPM10, TPM2.5	0.06 LB/HR	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.
EP 09-04 - Rolling Mill DCW Cooling Tower	KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	22750 gal/min	FPM, TPM10, TPM2.5	0.17 LB/HR	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.
EP 09-05 - Rolling Mill Quench/ACC Cooling Tower	KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	90000 gal/min	FPM, TPM10, TPM2.5	0.78 LB/HR	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.
EP 09-06 - Light Plate Quench DCW Cooling Tower	KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	8000 gal/min	FPM, TPM10, TPM2.5	0.06 LB/HR	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.
EP 09-07 - Heavy Plate Quench DCW Cooling Tower	KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	3000 gal/min	FPM, TPM10, TPM2.5	0.02 LB/HR	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.
EP 09-08 - Air Separation Plant Cooling Tower	KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	14000 gal/min	FPM, TPM10, TPM2.5	0.1 LB/HR	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.
Laminar Cooling Tower - Hot Mill Cells (EP 03-09)	KY-0115	NUCOR STEEL GALLATIN, LLC	4/19/2021	35000 gal/min	FPM, TPM10, TPM2.5	0.27 LB/HR	Mist Eliminator, 0.001% drift loss
Direct Cooling Tower-Caster & Roughing Mill Cells (EP 03-10)	KY-0115	NUCOR STEEL GALLATIN, LLC	4/19/2021	26300 gal/min	FPM, TPM10, TPM2.5	0.17 LB/HR	Mist Eliminator, 0.001% drift loss
Melt Shop #2 Cooling Tower (indirect) (EP 03-11)	KY-0115	NUCOR STEEL GALLATIN, LLC	4/19/2021	59500 gal/min	FPM, TPM10, TPM2.5	0.39 LB/HR	Mist Eliminator, 0.001% drift loss
Cold Mill Cooling Tower (EP 03 12)	KY-0115	NUCOR STEEL GALLATIN, LLC	4/19/2021	20000 gal/min	FPM, TPM10, TPM2.5	0.14 LB/HR	Mist Eliminator, 0.001% drift loss
Air Separation Plant Cooling Tower (EP 03-13)	KY-0115	NUCOR STEEL GALLATIN, LLC	4/19/2021	15000 gal/min	FPM, TPM10, TPM2.5	0.08 LB/HR	Mist Eliminator, 0.001% drift loss
DCW Auxiliary Cooling Tower (EP 03-14)	KY-0115	NUCOR STEEL GALLATIN, LLC	4/19/2021	9250 gal/min	FPM, TPM10, TPM2.5	0.06 LB/HR	Mist Eliminator, 0.001% drift loss

[1] The CMC Mesa and Nucor Sedalia facilities were not in the RBLC but are an ECS process/micro mill and are similar to the proposed facility.

[2] These RBLC listings are either not considered an ECS process, a micro mill, or both like the proposed CMC facility. Since the technologies at these facilities are different then technology used at the proposed facility, they are not appropriate for comparison.

* Indicates that the facilities are draft determination in the RBLC database.

Table B-19. Ball Crushing Recent Permit Limitations and Determinations of BACT for PM (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Production Capacity (US tpy)	Particulate Matter Type	Permitted PM Limit	Control
Comparable Facilities [1]							
Raw and Waste Material Storage and Handling Slag Yard	FL-0368	NUCOR STEEL FLORIDA FACILITY	02/14/2019	--	PM Filterable	0	Use of equipment enclosures, water sprays, and minimizing wind erosion and drop points
Slag/Mill Scale Control Device	--	NUCOR STEEL MISSOURI FACILITY	9/12/2018	--	$PM/PM_{10}/PM_{2.5}$	0	Water spray or dust suppressant emission control system in slag yard when screens or crusher are operating. Minimize drop heights.
Not Comparable Facilities [2]							
North Alloy Storage and Handling (F006)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	--	Particulate matter, total (TPM)	0.68 lb/hr 0.0024 gr/dscf	Fabric filter
North Alloy Storage and Handling (F006)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	--	Particulate matter, total 10 (TPM10)	0.68 lb/hr 0.0024 gr/dscf	Fabric filter
North Alloy Storage and Handling (F006)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	--	Particulate matter, total 2.5 (TPM2.5)	0.68 lb/hr 0.0024 gr/dscf	Fabric filter
Raw Material Handling and Processing (carbon dump fugitives)	SC-0183	NUCOR STEEL - BERKELEY	05/04/2018	--	Particulate matter, filterable (FPM)	0	Good Work Practice Standards and Proper Operation and Maintenance.
Raw Material Handling and Processing (lime dump fugitives)	SC-0183	NUCOR STEEL - BERKELEY	05/04/2018	--	Particulate matter, filterable (FPM)	0	Good Work Practice Standards and Proper Operation and Maintenance
Raw Material Handling and Processing (alloy grizzly fugitives)	SC-0183	NUCOR STEEL - BERKELEY	05/04/2018	--	Particulate matter, filterable (FPM)	0	Good Work Practice Standards and Proper Operation and Maintenance.
Raw Material Handling and Processing (misc. debris handling)	SC-0183	NUCOR STEEL - BERKELEY	05/04/2018	--	Particulate matter, filterable (FPM)	0	Good Work Practice Standards and Proper Operation and Maintenance.
Slag Handling and Conveying	AR-0173	BIG RIVER STEEL LLC	1/31/2022	--	FPM	1.11 TPY	Dust Control Plan
Slag Handling and Conveying	AR-0173	BIG RIVER STEEL LLC	1/31/2022	--	TPM10	0.37 TPY	Dust Control Plan
Slag Handling and Conveying	AR-0173	BIG RIVER STEEL LLC	1/31/2022	--	TPM2.5	0.1 TPY	Dust Control Plan
EP 12-01 - Slag Processing Equipment	KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	1750000 tons steel cast/yr	FPM	0.012 lb/ton	Slag Processing (EP 12-01) shall only be performed on wetted material.
EP 12-01 - Slag Processing Equipment	KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	1750000 tons steel cast/yr	TPM10	0.005 lb/ton	Slag Processing (EP 12-01) shall only be performed on wetted material.
EP 12-01 - Slag Processing Equipment	KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	1750000 tons steel cast/yr	TPM2.5	0.003 lb/ton	Slag Processing (EP 12-01) shall only be performed on wetted material.
Slag Handling, Crushing and Screening	TN-0183	SINOVA SILICON LLC	--	--	FPM	0.068 lb/hr	Water misting for crushing ands screening operations
Slag Handling, Crushing and Screening	TN-0183	SINOVA SILICON LLC	--	--	TPM10	0.0256 lb/hr	Water misting for crushing ands screening operations
Slag Handling, Crushing and Screening	TN-0183	SINOVA SILICON LLC	--	--	TPM2.5	0.003 lb/hr	Water misting for crushing ands screening operations

[1] The Nucor Missouri facility was not in the RBLC but they are an ECS process/micro mill and are similar to the proposed facility.
[2] These RBLC listings are either not considered an ECS process, a micro mill, or both like the proposed CMC facility. Since the technologies at these facilities are different than technology used at the proposed facility, they are not appropriate for comparison.
* Indicates that the facilities are draft determination in the RBLC database.

Table B-20. Roads Recent Permit Limitations and Determinations of BACT for PM (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Distance Traveled	Particulate Matter Type	Permitted PM Limit	Control
Building or Structure Housing Any Iron or Steel Foundry Emissions Source, NESHAP EEEEE						**20% opacity from fugitive emissions (6-minute average)**	
New Large Iron and Steel Foundries Area Sources, NESHAP ZZZZZ						**20% opacity from fugitive emissions (6 min average)**	
Fugitive Dust from Dust-Generating Operations, Maricopa County Regulation III Rule 310						**20% opacity from fugitive emissions**	**Dust Control Plan for dust-generating operations that disturbs a surface area of 0.10 acre or greater.**
Unpaved Parking Lots, Staging Areas, and Areas Where Support equipment and Vehicles Operate, Maricopa County Regulation III Rule 316 Section 307.2							**One of the following: apply and maintain water; apply and maintain dust suppressant other than water; apply and maintain a layer of washed gravel that is at least six inches deep.**
Haul/Access Roads that Are Not in Permanent Areas of a Facility, Maricopa County Regulation III Rule 316 Section 307.3							**One of the following: speed control and watering; install and maintain a paved surface; apply and maintain a layer of washed gravel that is at least six inches deep; apply and maintain dust suppressant other than water; install and maintain a cohesive hard surface. If these options are infeasible then a minimum distance of 25 feet must be maintained between the property line and the haul/access road.**
Roadways and Streets, Emissions from Existing and New Nonpoint Sources, Arizona Administrative Code R18-2-605						**Prevent excessive amounts of particulate matter from becoming airborne**	**Temporary paving, dust suppressants, wetting down, detouring or other reasonable means.**
Roadways and Streets, Emissions from Existing and New Nonpoint Sources, Arizona Administrative Code R18-2-605						**Prevent excessive amounts of particulate matter from becoming airborne**	**Wetting, applying dust suppressants, or covering the load**
Comparable Facilities [1]							
Roads	FL-0368	NUCOR STEEL FLORIDA FACILITY	02/14/2019	--	PM Fugitive	0	Fugitive Dust Control Plan
Paved Roads and Surfaces	--	CMC MESA	6/14/2018	--	PM	0	Road watering and/or vacuuming system for the paved haul roads to keep the road surfaces sufficiently moist to comply with the opacity limitations. The paved area shall be watered and vacuumed, in a manner designed to ensure capture of the vacuumed material, at least once every shift. These measures shall ensure 96% control efficiency for haul road PM emissions. More frequent vacuuming and/or watering may be required to ensure compliance with the opacity limitation.
Unpaved Staging Areas, Unpaved Parking Areas, and Unpaved Material Storage Areas	--	CMC MESA	6/14/2018	--	PM	0	Apply water so that the surface is visibly moist; pave; apply and maintain gravel, recycled asphalt, or other suitable material; apply or maintain a suitable dust suppressant other than water; or limit vehicle trips to no more than 20 per day per road and limit vehicle speeds to no more than 15 mph.
Unpaved Haul/Access Roads	--	CMC MESA	6/14/2018	--	PM	0	Apply water so that the surface is visibly moist; pave; apply and maintain gravel, recycled asphalt, or other suitable material; apply or maintain a suitable dust suppressant other than water; or limit vehicle trips to no more than 20 per day per road and limit vehicle speeds to no more than 15 mph.
Roads	--	CMC OK	1/15/2016	--	TSP/PM_{10}/$PM_{2.5}$	0	Work practice standards of paving and sweeping of haul roads when needed, and setting of speed limits on plant roads to minimize fugitive dust emissions.
Haul Roads	--	NUCOR MISSOURI FACILITY	9/12/2018	--	PM/PM_{10}/$PM_{2.5}$	0	Work practice standards of cleaning, watering and/or vacuum-sweeping paved and unpaved haul roads. Application of watering at a minimum rate of 0.1 gallons per square foot of unpaved haul road surface area per day. Speed limit of 25 mph on unpaved haul roads. Silt loading sampling for paved haul roads not to exceed 0.3 grams per square meter per individual sample. Paving with concrete or asphalt. Maintain a Fugitive Dust Control Plan.

Table B-20. Roads Recent Permit Limitations and Determinations of BACT for PM (Prior 10 years)

Process	RBLC ID	Facility	Permit Date (from RBLC)	Distance Traveled	Particulate Matter Type	Permitted PM Limit	Control
Not Comparable Facilities [2]							
Plant Roadways & Parking Areas (F005)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	686,399 miles per year	PM Fugitive	16.74 tpy	Paved: sweeping, vacuuming, washing with water, and posted speed limits to comply with the applicable requirements. Unpaved: use of dust suppressant as necessary to comply with the applicable requirements.
Plant Roadways & Parking Areas (F005)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	686,399 miles per year	PM_{10} Filterable	3.55 tpy	Paved: sweeping, vacuuming, washing with water, and posted speed limits to comply with the applicable requirements. Unpaved: use of dust suppressant as necessary to comply with the applicable requirements.
Plant Roadways & Parking Areas (F005)	*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	09/27/2019	686,399 miles per year	$PM_{2.5}$ Filterable	0.75 tpy	Paved: sweeping, vacuuming, washing with water, and posted speed limits to comply with the applicable requirements. Unpaved: use of dust suppressant as necessary to comply with the applicable requirements.
Paved Roadways	AR-0173	BIG RIVER STEEL LLC	1/31/2022	0	FPM	2.8 TPY	Development and Implementation of Fugitive Dust Control Plan
Paved Roadways	AR-0173	BIG RIVER STEEL LLC	1/31/2022	0	TPM10	0.6 TPY	Development and Implementation of Fugitive Dust Control Plan
Paved Roadways	AR-0173	BIG RIVER STEEL LLC	1/31/2022	0	TPM2.5	0.2 TPY	Development and Implementation of Fugitive Dust Control Plan
Unpaved Roadways	AR-0173	BIG RIVER STEEL LLC	1/31/2022	0	FPM	0.81 TPY	Development and Implementation of Fugitive Dust Control Plan
Unpaved Roadways	AR-0173	BIG RIVER STEEL LLC	1/31/2022	0	TPM10	0.38 TPY	Development and Implementation of Fugitive Dust Control Plan
Unpaved Roadways	AR-0173	BIG RIVER STEEL LLC	1/31/2022	0	TPM2.5	0.06 TPY	Development and Implementation of Fugitive Dust Control Plan
Roadways	IL-0126	NUCOR STEEL KANKAKEE, INC.	11/01/2018	--	PM Filterable	2.39 tpy	Roadways must be paved; Preventative measures, including posted 15 MPH speed limit and good work practices (e.g., water flushing, vacuuming and sweeping)
Roadways	IL-0126	NUCOR STEEL KANKAKEE, INC.	11/01/2018	--	PM_{10} Total	0.48 tpy	Roadways must be paved; Preventative measures, including posted 15 MPH speed limit and good work practices (e.g., water flushing, vacuuming and sweeping)
Roadways	IL-0126	NUCOR STEEL KANKAKEE, INC.	11/01/2018	--	$PM_{2.5}$ Total	0.12 tpy	Roadways must be paved; Preventative measures, including posted 15 MPH speed limit and good work practices (e.g., water flushing, vacuuming and sweeping)
New and Modified Roadways	IL-0132	NUCOR STEEL KANKAKEE, INC	1/25/2021	0	TPM	0	Roadways shall be paved; speed limit posting of 15 miles/hour; best management practices to reduce fugitive emissions in accordance with written operating program that provides for cleaning or treatment of roadways
New and Modified Roadways	IL-0132	NUCOR STEEL KANKAKEE, INC	1/25/2021	0	TPM10	0	Roadways shall be paved; speed limit posting of 15 miles/hour; best management practices to reduce fugitive emissions in accordance with written operating program that provides for cleaning or treatment of roadways
New and Modified Roadways	IL-0132	NUCOR STEEL KANKAKEE, INC	1/25/2021	0	TPM2.5	0	Roadways shall be paved; speed limit posting of 15 miles/hour; best management practices to reduce fugitive emissions in accordance with written operating program that provides for cleaning or treatment of roadways
EP 14-01 - Paved Roadways	KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	374840 miles per year	Particulate matter, fugitive	0	surface improvements (pavement), sweeping (good work practice) and watering
EP 14-02 - Unpaved Roadways	KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	69905 miles per year	Particulate matter, fugitive	0	surface improvements (pavement), sweeping (good work practice) and watering

[1] The CMC Mesa, CMC OK and Nucor Missouri facilities were not in the RBLC but they are an ECS process/micro mill and are similar to the proposed facility.
[2] These RBLC listings are either not considered an ECS process, a micro mill, or both like the proposed CMC facility. Since the technologies at these facilities are different than technology used at the proposed facility, they are not appropriate for comparison.
* Indicates that the facilities are draft determination in the RBLC database.