Pritchett, Jacob A.

From: Schnepp, Jason
Sent: Friday, November 4, 2022 2:42 PM
To: Romaine, Chris; Patel, Minesh
Subject: FW: US Steel Granite City Modeling
Attachments: Granite City Model Report (10-10-22).pdf; Granite City SIL CO.zip; Granite City NAAQS CO.zip

FYI

Jason Schnepp
Manager, CAAPP Construction Unit
217-524-3724

From: Ray, Sarah <Sarah.Ray@illinois.gov>
Sent: Friday, November 4, 2022 2:16 PM
To: Schnepp, Jason <Jason.Schnepp@Illinois.gov>
Subject: FW: US Steel Granite City Modeling

FYI.

From: David Keen <keen@rtpenv.com>
Sent: Monday, October 10, 2022 10:46 AM
To: Ray, Sarah <Sarah.Ray@illinois.gov>
Cc: Colin Campbell <campbell@rtpenv.com>; Gurinder (Gary) Saini <saini@rtpenv.com>; David Keen <keen@rtpenv.com>
Subject: [External] US Steel Granite City Modeling

Sarah,

Please find attached the latest iteration of the US Steel Granite City CO modeling. This analysis was originally submitted in 2020. The model has been revised based upon recent discussions with IEPA (Chris Romaine).

Please let me know if you have any questions or need additional information.

Thanks,
Dave

David Keen
RTP Environmental
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CARBON MONOXIDE AIR DISPERSION MODELING FOR A PREVENTION OF SIGNIFICANT DETERIORATION AND CONSTRUCTION PERMIT REVISION FOR UNITED STATES STEEL GRANITE CITY WORKS



Prepared for:
United States Steel Corporation
Granite City Works
20th and State Streets
Granite City, IL 62040

Prepared by:
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October 2022

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1.0 INTRODUCTION

This document presents the results of the air quality dispersion modeling analysis conducted for the United States Steel Corporation, Granite City Works ("US Steel") iron and steel making facility in Granite City, Illinois. The analysis has been conducted by RTP Environmental Associates, Inc. ("RTP Environmental") on behalf of US Steel.

The analysis evaluated the emissions of the criteria pollutant carbon monoxide ("CO") as regulated under the applicable provisions of the Prevention of Significant Deterioration ("PSD") regulations of 40 CFR § 52.21, incorporated by reference in the federally approved Illinois State Implementation Plan at 40 CFR § 52.738(b).[1] The criteria pollutant analysis was conducted to ensure that the proposed revisions to the CO emission limitations in the Prevention of Significant Deterioration ("PSD") and Construction Permit (Permit Number 95010001) ("1996 Construction Permit") do not cause or contribute to violation of a National Ambient Air Quality Standard (NAAQS).

As required by 40 CFR § 52.21(l), the analysis conforms with the modeling procedures outlined in the Guideline on Air Quality Models[1] promulgated by United States Environmental Protection Agency ("USEPA") (the "Guideline" or "Appendix W"). It also conforms to the Illinois Environmental Protection Agency's (IEPA) Prevention of Significant Deterioration Modeling Guidance[2], the modeling protocol submitted to the IEPA on February 3, 2020, and associated USEPA modeling policy and guidance.

[1] All citations to the PSD regulations herein are to the currently applicable provisions of 40 CFR § 52.21. The analysis also is designed to satisfy the parallel requirements of the currently pending Illinois PSD rule, 35 Ill. Adm. Code Part 204.

2.0 PROJECT DESCRIPTION

The 1996 Construction Permit authorized National Steel to increase iron and steel production limitations for the blast furnaces and basic oxygen furnace ("BOF") shop at the existing integrated iron and steel manufacturing facility in Granite City, in Madison County, Illinois. US Steel purchased the assets of National Steel in 2003, including Granite City Works. US Steel is proposing revisions to the 1996 Construction Permit that involve increases in the CO emission limitations that were established per the PSD requirements. Therefore, the proposed increases in the CO rates were evaluated for PSD requirements including compliance with the NAAQS for CO. No physical changes are proposed in conjunction with the requested revisions to the 1996 Construction Permit.

3.0 FACILITY AND SITE DESCRIPTION

The US Steel Granite City Works produces high-quality hot-rolled, cold-rolled and coated sheet steel products to customers in the construction, container, piping and tubing, service center, and automotive industries. Granite City Works has an annual raw steelmaking capability of 3.58 million net tons.

The facility occupies approximately 400 acres and is located approximately 12 miles east of Lambert, St. Louis International Airport. The approximate Universal Transverse Mercator (UTM) coordinates of the facility are 749,000m East and 4,287,000m North (NAD83, Zone 15). Figure 1 shows the general location of the facility. Figure 2 shows the specific facility location on a 7.5-minute U.S. Geological Survey ("USGS") topographic map.

The US Steel facility is classified under the regulations governing PSD and Title V as a major source. The area of Madison County where US Steel facility is located is classified as attainment or unclassifiable for all regulated pollutants except ozone. St. Louis is classified as marginal nonattainment for the 2015 8-hour ozone standard.

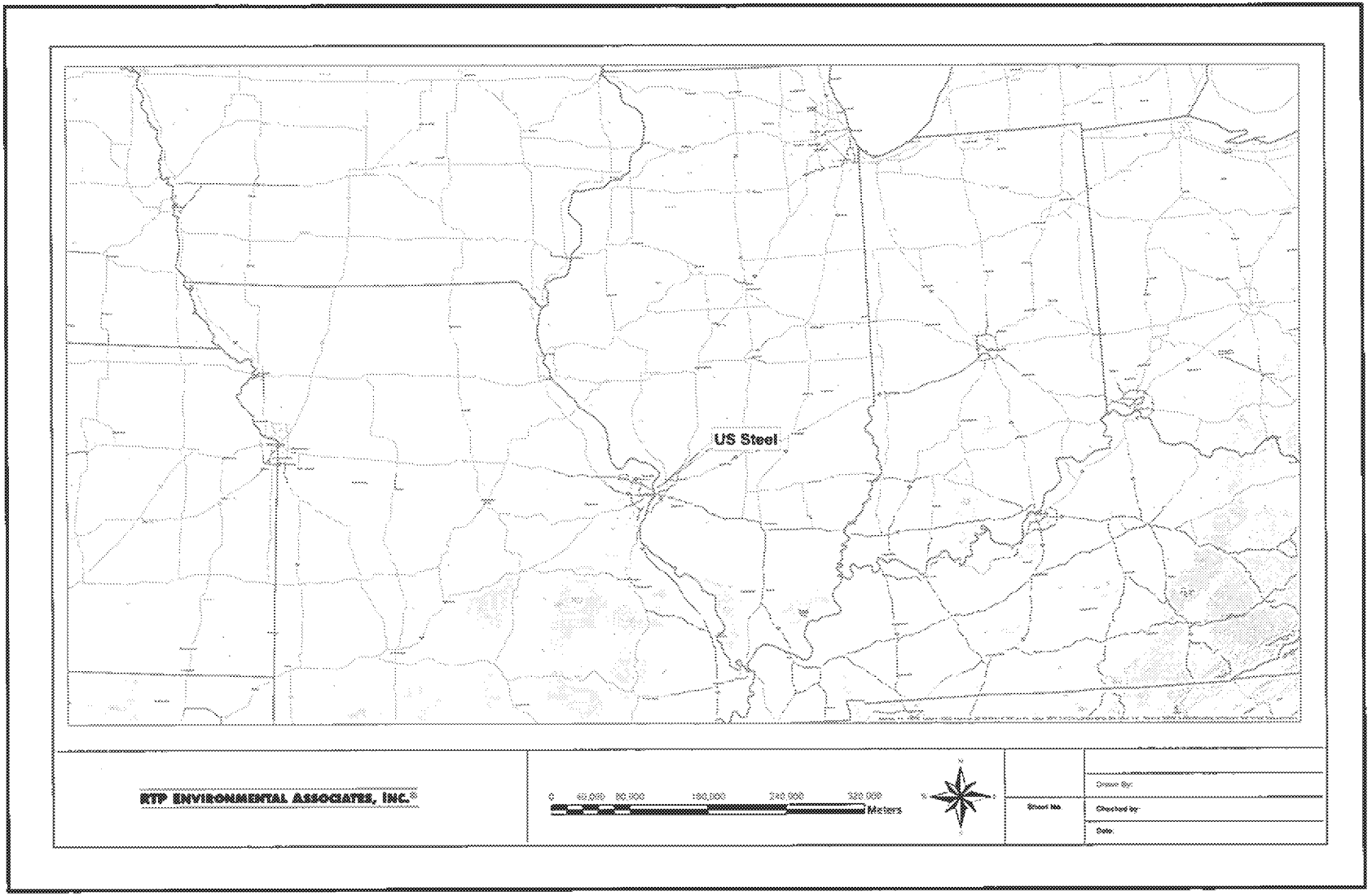


Figure 1. General Location of the US Steel Granite City Works

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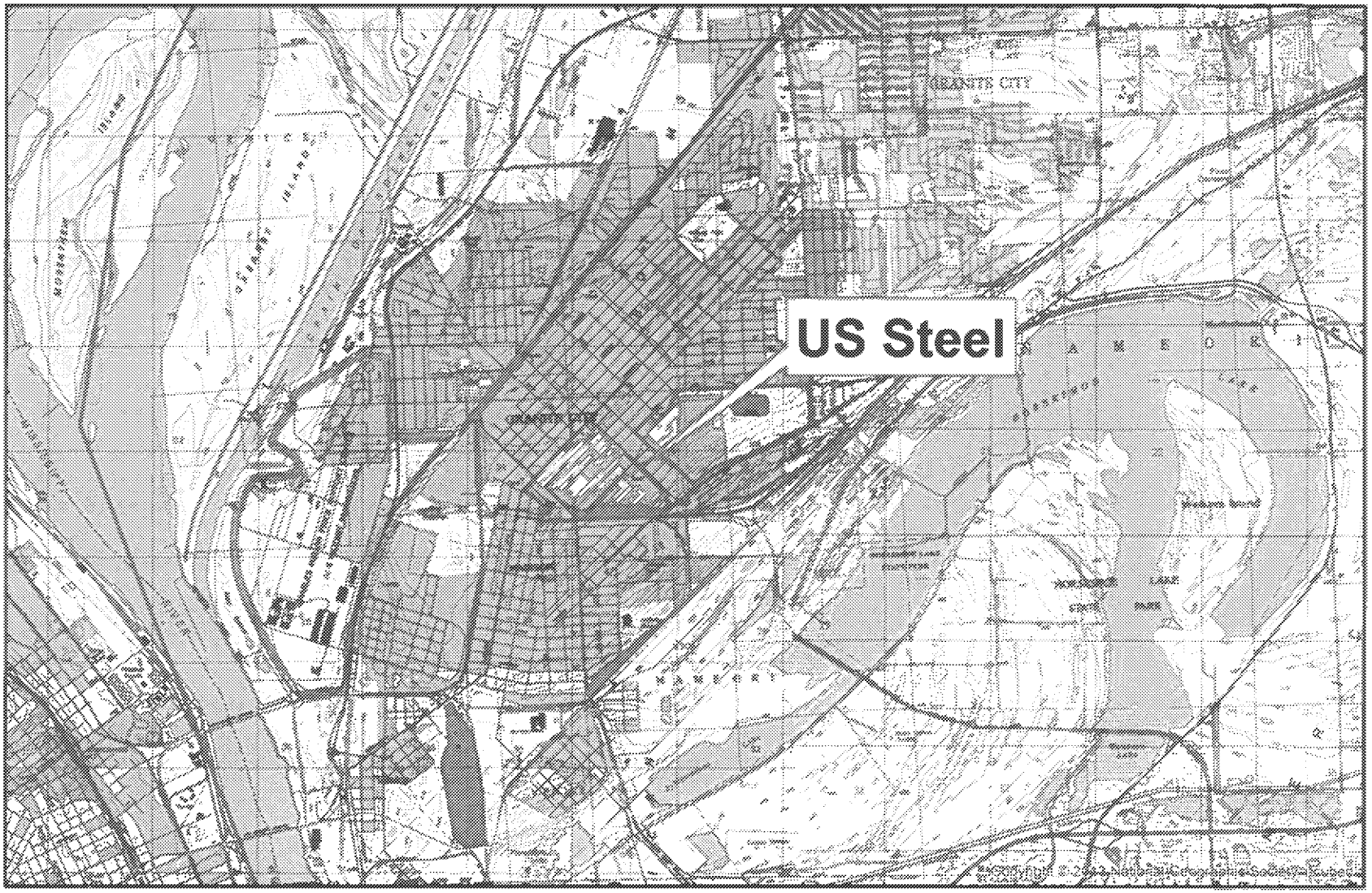


Figure 2. Specific Location of US Steel Granite City Works

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4.0 MODEL SELECTION AND MODEL INPUT

4.1 Model Selection

The latest version of the AMS/EPA Regulatory Model (AERMOD, Version 22112) was used to conduct the dispersion modeling analysis. AERMOD is a Gaussian plume dispersion model that is based on planetary boundary layer principals for characterizing atmospheric stability. The model evaluates the non-Gaussian vertical behavior of plumes during convective conditions with the probability density function and the superposition of several Gaussian plumes. AERMOD is a modeling system with three components: AERMAP is the terrain preprocessor program, AERMET is the meteorological data preprocessor and AERMOD includes the dispersion modeling algorithms.

AERMOD is the required default model for calculating ambient concentrations near the US Steel facility based on the model's ability to incorporate multiple sources and source types. The model can also account for convective updrafts and downdrafts and meteorological data throughout the plume depth. The model also provides parameters required for use with up to date planetary boundary layer parameterization. The model also has the ability to incorporate building wake effects and to calculate concentrations within the cavity recirculation zone. All model options were selected as recommended in the USEPA Guideline on Air Quality Models.

Oris Solution's BEEST Graphical User Interface ("GUI") was used to run AERMOD. The GUI uses an altered version of the AERMOD code to allow for flexibility in the file naming convention. The dispersion algorithms of AERMOD are not altered. Therefore, a model equivalency evaluation pursuant to Section 3.2 of 40 CFR 51, Appendix W was not warranted.

4.2 Model Control Options and Land Use

AERMOD was run in the regulatory default mode for all pollutants with the default rural dispersion coefficients. These coefficients were used by the Illinois Environmental

Protection Agency ("IEPA") in its evaluation of the facility as part of the 1-hr sulfur dioxide ("SO2") Data Requirements Rule ("DRR").

4.3 Source Data

The modeling input data and modeled CO emission rates can be found in Appendix A of this report.

Source Characterization

The majority of modeled source input parameters were obtained from the IEPA's model conducted for the Data Requirements Rule ("DRR").

Point Sources

Most emission sources at the site vent to stacks with a well defined opening. These sources were modeled as point sources in AERMOD. Several other types of sources such as fugitive emissions also required evaluation.

Fugitive Emissions

Fugitive emissions are those that are not emitted from a well defined opening. These sources were modeled as volume sources. The initial dispersion coefficients (sigma y and sigma z) were provided by the IEPA and were calculated based upon the dimensions of the area of release and the equations contained in Table 3-1 of the AERMOD User's Guide.

Flares

The facility uses blast furnace gas flares to combust excess process gas. Emissions that occur only during periods of malfunction are not required to be modeled per 40 CFR Part 51 Appendix W. Non-malfunction emissions were modeled using the procedures outlined in the AERSCREEN Manual[3]. The effective stack height (H, in meters) was computed by the IEPA as a function of heat release rate according to the following equation, where Q is the heat release rate of the flare stack in caloriesper second:

$$H_{equivalent} = H_{actual} + 4.56x10^{-3} \times Q^{0.478}$$

The effective flare stack diameter (d, in meters) was computed as a function of heat release rate according to the following equation, where Q is the heat release rate of the flare in calories per second:

$$d_{equivalent} = 9.88x10^{-4} \times (Q \times 0.45)^{0.5}$$

An exit temperature of 1273K and velocity of 20 m/sec is assumed.

All source locations were based upon a NAD83, UTM Zone 15 projection.

Good Engineering Practice Stack Height Analysis

A Good Engineering Practice ("GEP") stack height evaluation was conducted to determine appropriate building dimensions to include in the model and to calculate the GEP formula stack height used to justify stack height credit for any stacks n excess of 65m. Procedures used are in accordance with those described in the USEPA Guidelines for Determination of Good Engineering Practice Stack Height (Technical Support Document for the Stack Height Regulations-Revised)[4]. GEP formula stack height, as defined in 40 CFR 51, is expressed as GEP = H_b + 1.5L, where H_b is the building height and L is the lesser of the building height or maximum projected width. Building/structure locations were determined from a facility plot plan. The structure locations and heights were obtained from the IEPA and were input to the USEPA's Building Profile Input Program (BPIP-PRIME) computer program to calculate the direction-specific building dimensions needed for AERMOD. The structures included in the GEP analysis are shown as the green blocks in Figure 3. All stacks and structures that are located near a stack were included in the BPIP runs.

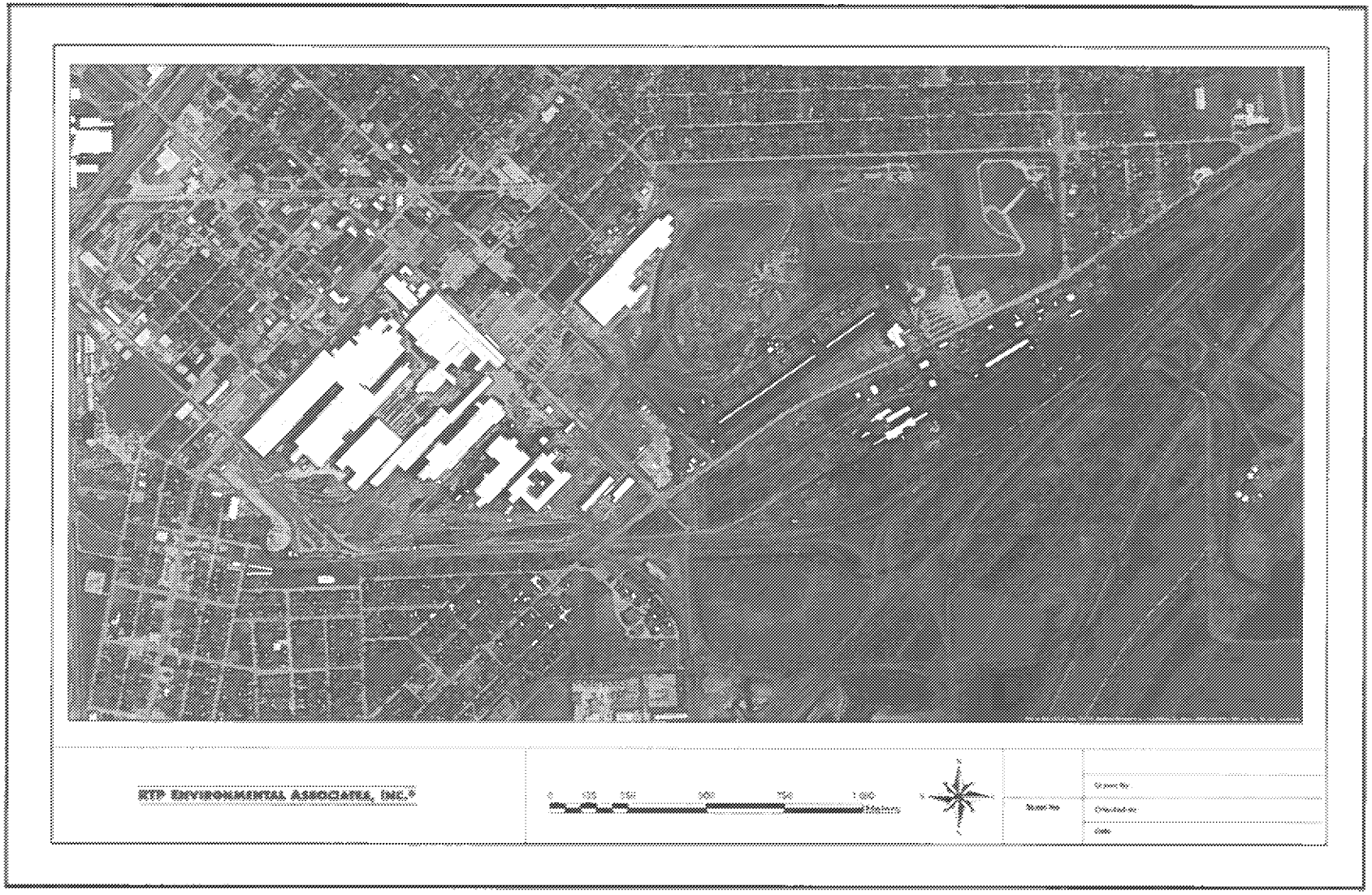


Figure 3. Structures Included in the US Steel GEP Analysis

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4.4 Monitored Background Data

Ambient, background pollutant concentrations are needed to establish a representative background concentration to complete the NAAQS portion of the *Source Impact Analysis* of 40 CFR § 52.21(k). The background concentrations are added to the modeled concentrations to assess NAAQS compliance. Ambient pollutant concentrations are also needed to fulfill the *Air Quality Analysis* requirement of 40 CFR § 52.21(m), as discussed in Section 5.0herein.

Pursuant to 40 CFR § 52.21(i)(5), requirements for ambient monitoring data may be waived by the permitting authority if projected increases in ambient concentrations due to the project are less than the Significant Monitoring Concentrations. However, in light of the decision of the D.C. Circuit Court of Appeals *Sierra Club v. EPA*,[5] US Steel has elected not to request such a waiver at this time.

The USEPA Monitoring Guidelines[6], other USEPA interpretive guidance, and USEPA administrative decisions clarify that representative, existing air quality monitoring data may be used to fulfill the PSD pre-construction monitoring requirements and establish background concentrations needed for assessing NAAQS compliance, in lieu of monitoring data. USEPA's Monitoring Guidelines suggest specific criteria to determine representativeness of off-site data: *quality of the data, currentness of the data, and monitor location.*

There are many existing ambient CO monitors within 100 miles in the facility (Figure 4). Existing monitoring data have been evaluated in relation to the criteria provided in USEPA's Ambient Monitoring Guidelines as being representative of the US Steel site.

We have used recently available, quality assured data (2016-2018) from the AQS monitor in East St. Louis, IL (AQS Site # 17-163-0010). 2018 is the latest year of complete, available data. The 4th quarter of 2019 is incomplete and data are not



Figure 4. Ambient Air Quality Monitors in the Vicinity of the US Steel Facility

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available for 2020-2021. This monitor best represents background concentrations near the facility as it is the closest monitor with current CO data and is in the vicinity of the site and therefore representative of conditions as the site. The background data are presented in Table 1.

Table 1. Proposed Background Concentrations 2016-2018

Pollutant	Averaging Time	Design Value (ppb)[µg/m³]	Basis	AQS Site No.
CO	1-hour	(2,200) [2,515]	Maximum	17-163-0010 St. Louis
	8-hour	(1,440) [1,646]		

The existing monitoring data satisfy the criteria provided in USEPA's Ambient Monitoring Guidelines[7] as being representative of the site.

Monitor Location

Of the monitors available, the East St. Louis monitor represents background concentrations as it is the closest monitor with data for the pollutants of concern that is not also significantly influenced by the localized source impacts.

Data Quality

The monitor data were collected and quality assured by the IEPA.

Currentness of Data

The data were collected during 2016-2018, which represents the recently available, quality assured data available for use in assessing compliance.

4.5 Receptor Data

Modeled receptors were placed in all areas considered as "ambient air" pursuant to 40 CFR 50.1(e). Ambient air is defined as that portion of the atmosphere, external to buildings, to which the general public has access. Approximately 14,100 receptors were used in the AERMOD significant impacts analysis. The receptor grid consisted of three cartesian grids and receptors located at 50m intervals along the facility fence line.

The first cartesian grid extended to approximately 3.0km from the facility in all directions. Receptors in this region were spaced at 100m intervals. The second grid extended to 7.5km. Receptor spacing in this region were 250m. A third grid extended to 15km with a spacing of 500m. The receptor grid was designed such that maximum facility impacts fall within the 100m spacing of receptors. The receptor grid spacing is presented in Table 2.

Table 2. Receptor Grid Spacing

Receptor Spacing (m)	Distance from Facility (m)
100	3,000
250	5,000
500	15,000

The US Steel facility is located in southern Illinois. Terrain within 10km of the site is generally flat. Receptor elevations and hill height scale factors were calculated with AERMAP (18081). The elevation data were obtained from the USGS one arc second National Elevation Data (NED) obtained from the USGS. Locations were based upon a NAD83, UTM Zone 15 projection. The near-field receptor grid is presented in Figure 5.

4.6 Meteorological Data

The 2016-2020, 5-year sequential hourly surface meteorological data from the National Weather Service (NWS) at St. Louis Lambert Field (WBAN No. 13994) and upper air data from the NWS station in Lincoln, IL (WBAN No. 04833) were used in the analysis. These data were processed into a "model-ready" format using AERMET version 21112.

The AERMET meteorological processor requires estimates of the following surface characteristics: surface roughness length, albedo, and Bowen ratio. The surface roughness length is related to the height of obstacles to the wind flow. It is the height above the surface where the average wind speed is zero. The smoother the surface, the lower the roughness length. The surface roughness length influences the surface shear stress and is an important factor in calculating mechanical turbulence and stability. The albedo is the fraction of the total incident solar radiation reflected by the surface back to space without absorption.

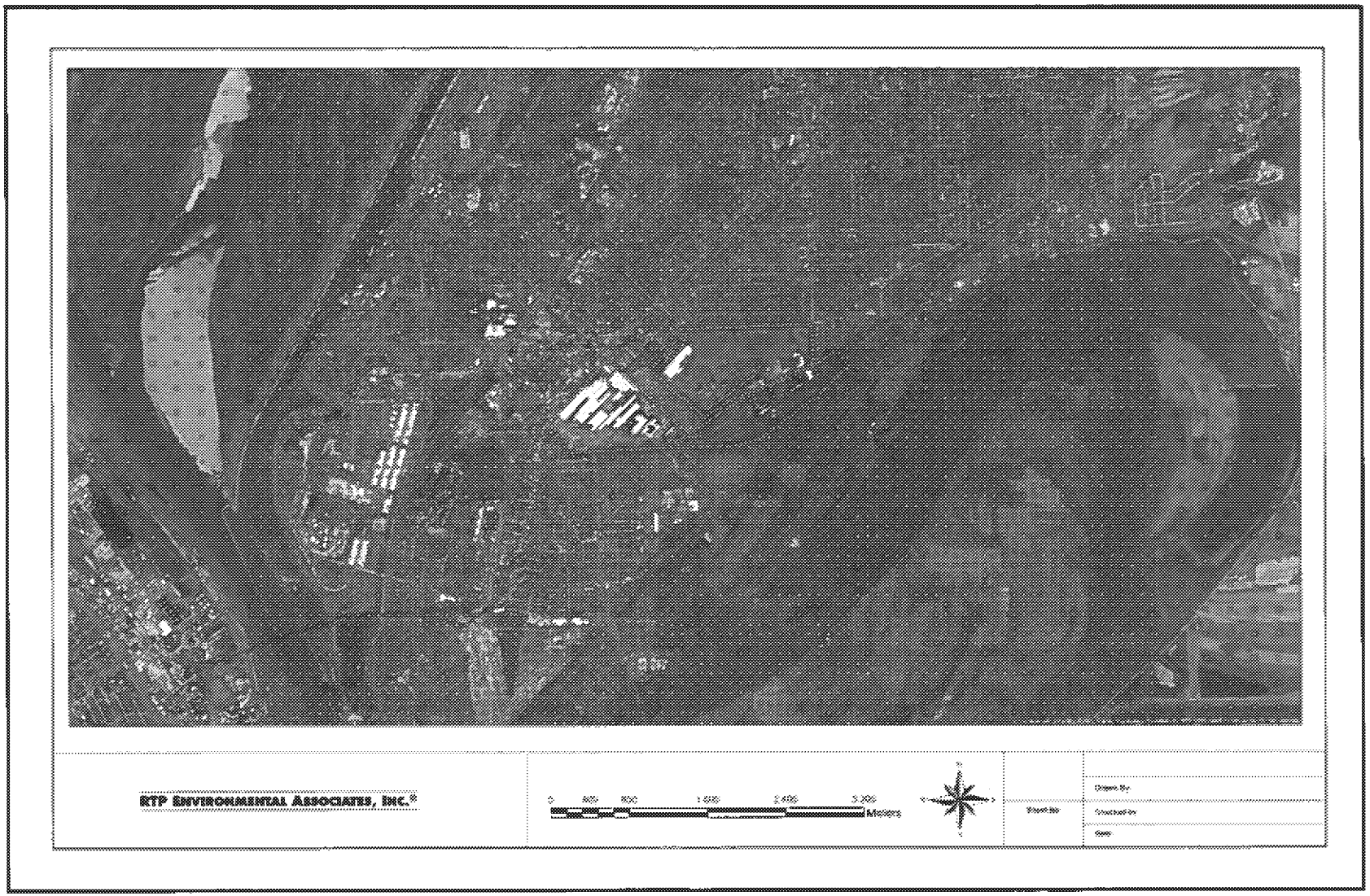


Figure 5. US Steel Facility Near-field Receptor Grid

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The Bowen ratio is an indicator of surface moisture and is the ratio of the sensible heat flux to the latent heat flux. The albedo and Bowen ratio are used for determining the planetary boundary layer parameters for convective conditions due to the surface sensible heat flux. Estimates of the surface characteristics were made by the IEPA using USEPA's AERSURFACE program (Version 13016) and provided to RTP Environmental. A 1km search radius was employed at the location of the meteorological tower. Twelve sectors of 30 degrees each and seasonal resolution were used in the AERSURFACE analysis. RTP employed the "ADJ_U*" option to allow for adjustments to the friction velocity under low wind speeds was employed.

The use of NWS meteorological data for dispersion modeling can often lead to a high incidence of calms and variable wind conditions if the data are collected by Automated Surface Observing Stations ("ASOS"), as are in use at most NWS stations since the mid-1990's. A calm wind is defined as a wind speed less than 3 knots and is assigned a value of 0 knots. In addition, variable wind observations may include wind speeds up to 6 knots, but the wind direction is reported as missing, if the wind direction varies more than 60 degrees during the 2-minute averaging period for the observation. The AERMOD model currently cannot simulate dispersion under calm or missing wind conditions. To reduce the number of calms and missing winds in the surface data, archived 1-minute winds for the ASOS stations were used to calculate hourly average wind speed and directions, which were used to supplement the standard archive of hourly observed winds processed in AERMET. The USEPA AERMINUTE program (Version 15272) was used for these calculations. A wind rose of the 5-year meteorological dataset is provided in Figure 6.

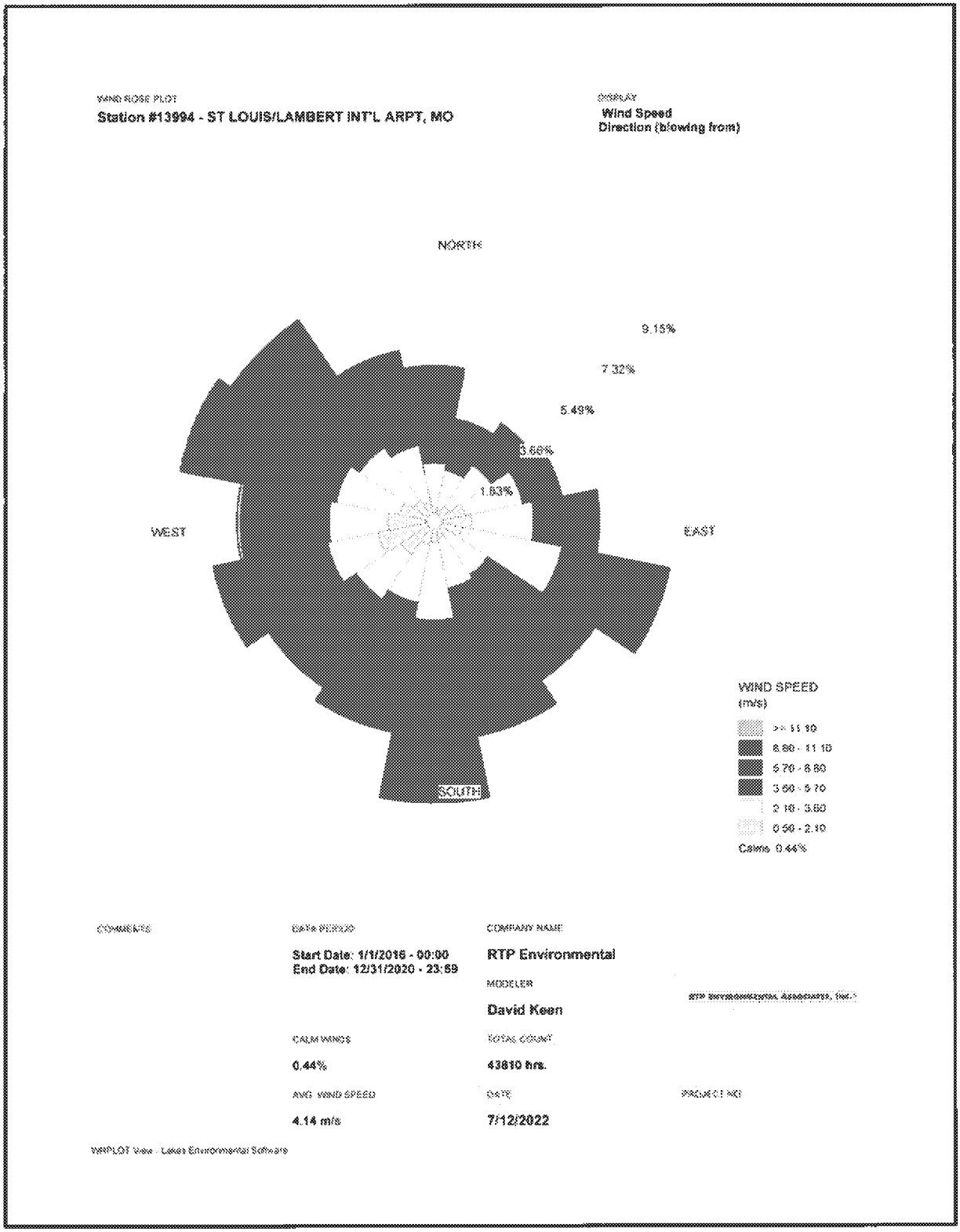


Figure 6. Lambert Field Windrose 2014-2018.

5.0 MODELING METHODOLOGY

5.1 Pollutants Subject to Review

USS Steel is proposing changes to the CO emission limitations in the 1996 Construction Permit that were established per the PSD requirements. Therefore, as requested by Illinois EPA, dispersion modeling of CO emissions have been evaluated and compared to the NAAQS.

5.2 Significant Impact Analysis

The air quality analysis was conducted in two phases: an initial or significant impact analysis, and a refined phase NAAQS analysis. In the significant impact analysis, the calculated maximum impacts due to the project were determined for CO.[b] These impacts determined the net change in air quality resulting from the proposed revision to modification permitted under the 1996 Construction Permit. Five years of meteorological data were used in the significant impact analysis. Maximum modeled CO concentrations were compared to the significance levels. The PSD Class II Significant Impact Levels for CO are listed in Table 3.

Table 3. PSD Class II Significant Impact Levels

Pollutant	Averaging Time	PSD Class II Significant Impact Levels ($\mu g/m^3$)
CO	1-hour	2,000
	8-hour	500

[b] For some of the affected emissions units, in place of project related emissions increases, we conservatively used the potential to emit of CO.

5.3 NAAQS Analysis

Following the determination of significant impacts, a refined air quality analysis to determine compliance with the CO NAAQS was conducted. In the NAAQS analysis, impacts from the US Steel facility were added to concentrations calculated from other nearby sources, plus a regional background concentration. The resultant total concentrations were compared to the NAAQS to assess compliance. The receptors modeled in the NAAQS analyses were limited to those showing a significant CO impact. Five years of meteorological data were again used in this analysis.

Nearby Source Inventory

Off-site sources were included in the NAAQS analysis. A 50km radius was used to define the screening area. A list of sources that are located within the screening area has been obtained from the IEPA as well as the Missouri Department of Natural Resources ("MDNR"). Section 8.3.3.b of Appendix W to 40 CFR Part 51 states that the number of nearby sources to be explicitly modeled is expected to be few, except in unusual situations. Appendix W further states that the sources to be included will usually be located within the first 10 to 20km from the source under consideration. In addition, it states that identification of nearby sources calls for the exercise of professional judgment by the appropriate reviewing authority. Further, USEPA's Guidance for PM2.5 Permit Modeling reiterates the Appendix W emphasis on a 10km screening radius for determining which nearby sources to include in the cumulative modeling analysis.

We conservatively included all sources provided by the IEPA and MDNR that are located within 50km of the US Steel facility. Total facility, potential emissions (i.e., all sources at a facility) were used in the NAAQS evaluation.

NAAQS Compliance Assessment

Ambient background concentrations (as discussed in more detail in Section 4.4) were then added to assess NAAQS compliance. The modeled and monitored values shown in Table 4 were used for this assessment.

Table 4. Monitored and Modeled Values Used to Assess NAAQS Compliance

Pollutant	Averaging Time	Monitored Value	Modeled Value
CO	1-hour & 8-hour	Maximum over 3 years	Highest, second high over 5 years

The NAAQS are shown in Table 5.

Table 5. National Ambient Air Quality Standards

Pollutant	Averaging Time	National Ambient Air Quality Standards ($\mu g/m^3$)	
		Primary	Secondary
CO	1-hour	40,000	--
	8-hour	10,000	--



6.0 RESULTS

Attachment B to this report provides the model summary output. AERMOD input and output files, including the BPIP-PRIME files, are included on the enclosed CD.

6.1 Significant Impact Analysis Results

The project results in CO impacts in excess of the 8-hour Significant Impact Level shown in Table 3. The significant impact analysis results are presented in Table 6. Based upon the results of the significant impacts analysis, a cumulative, NAAQS analysis was conducted.

6.2 NAAQS Analysis Results

Following the determination of significant impacts, an analysis was conducted to assess compliance with the CO NAAQS. The project resulted in insignificant 1-hr CO impacts, as a result the 1-hr average was not included in the NAAQS assessment. All sources located within 50km of the US Steel facility were modeled in conjunction with the US Steel facility in assessing compliance. Background concentrations were added to the model results to assess compliance. Evaluation of compliance with the CO short term standards was based upon the maximum of the highest-second-highest values from the five-year meteorological dataset.

The results of the NAAQS analysis are presented in Table 7. As can be seen, the model demonstrates compliance.

Table 6. Significant Impact Analysis Results

Pollutant	Averaging Period	Maximum Modeled Impact ($\mu g/m^3$)	PSD Significant Class II Impact Level ($\mu g/m^3$)	Significant Monitoring Concentration ($\mu g/m^3$)	Maximum Distance to a Significant Impact (km)
CO	1-hr	1,157	2,000	N/A	NA
	8-hr	692	500	575	2.2

N/A – Not applicable, impacts calculated to be insignificant.

Table 7. NAAQS Analysis Results

Pollutant	Averaging Period	Modeled Concentration ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total Concentration ($\mu g/m^3$)	Standard ($\mu g/m^3$)	Comment
CO	8-hour	2,045	1,646	3,691	10,000	Compliant

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ATTACHMENT A
MODELING INPUT DATA

US Steel Granite City Point Source Model Input (NAD83, Zone 15)
Last Update (10-5-22)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	CO Potential Emissions (lb/hr)	CO Emissions Increase (lb/hr)
132833	DEFAULT	Blast Furnace A Stoves	749816.02	4286808.08	416.83	217.0	500.0	49.66	7.0	1604.52	1604.52
132838	DEFAULT	Blast Furnace B Stoves	749665.50	4286719.93	417.16	225.0	500.0	51.05	9.8	1837.76	1837.76
132837	DEFAULT	Blast Furnace Gas Flare #1	749777.33	4286841.02	418.21	221.8	1831.7	65.62	15.4	6280.99	6280.99
240479	DEFAULT	Blast Furnace Gas Flare #2	749865.93	4286920.23	416.24	221.8	1831.7	65.62	15.4	6280.99	0.00
132836	DEFAULT	Casthouse Baghouse	749616.61	4286732.18	417.75	63.0	150.0	63.88	11.0	63.77	21.68
132927	DEFAULT	Blast Furnace A and B Iron Spout Baghouse	749831.35	4286818.73	415.98	43.0	123.0	43.04	7.8	6.43	2.19
238459	DEFAULT	Cogeneration Boiler BFG-fired some NG-firing	749776.38	4287073.85	415.19	137.0	400.1	62.11	6.0	203.08	0.00
132867	DEFAULT	Boiler 11	749865.15	4286883.84	416.24	149.9	335.0	29.82	8.0	90.48	90.48
132872	DEFAULT	Boiler 12	749881.40	4286887.85	416.50	150.0	335.0	26.74	8.0	90.48	90.48
BOF	DEFAULT	BOF ESP	748415.00	4286681.00	416.57	125.0	400.0	50.00	15.0	4121.79	1274.01
BOF2ND	DEFAULT	BOF Secondary Baghouse	748625.57	4286763.99	413.00	160.0	275.0	38.55	17.0	19.69	19.69
132842	DEFAULT	Slab Reheat Furnace #1	747729.70	4286762.02	417.52	56.8	650.1	44.88	8.0	26.52	0.00
172532	DEFAULT	Slab Reheat Furnace #2	747715.25	4286747.05	416.47	56.8	650.1	44.88	8.0	26.52	0.00
172512	DEFAULT	Slab Reheat Furnace #3	747700.79	4286730.53	415.88	56.8	650.1	44.88	8.0	26.52	0.00
172514	DEFAULT	Slab Reheat Furnace #4	747700.27	4286714.00	416.08	146.0	736.1	26.94	13.7	40.76	0.00
132849	DEFAULT	Galvanizing line #8 - fume scrubber	748883.00	4287195.00	416.57	80.0	80.0	41.66	3.0	0.00	0.00
229337	DEFAULT	Galvanizing line #8 - space heaters	748398.00	4287038.00	418.90	39.0	284.1	23.16	2.0	0.00	0.00
229338	DEFAULT	Galvanizing line #8 - drying oven and storage area heaters	748398.00	4287038.00	418.90	39.0	284.1	23.16	2.0	0.00	0.00
229339	DEFAULT	Galvanizing line #8 - miscellaneous heaters	748398.00	4287038.00	418.90	39.0	284.1	23.16	2.0	0.00	0.00
229601	DEFAULT	Emergency Generator (3500 HP)	749641.00	4286863.00	416.17	37.0	442.0	32.80	1.9	0.00	0.00
GTEWY1	DEFAULT	Gateway Energy & Coke Co., LLC - Coking (New Main Stack)	749279.00	4286984.00	415.78	199.9	293.1	48.249	13.0	2.62E+01	0.00
GTEWY2	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 2 of 6	749549.00	4287055.00	418.18	26.0	299.9	68.093	4.5	6.68E-02	0.00
GTEWY3	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 3 of 6	749433.00	4286972.00	418.93	26.0	299.9	68.093	4.5	6.64E-02	0.00
GTEWY4	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 4 of 6	749357.00	4286918.00	418.64	26.0	299.9	68.093	4.5	6.68E-02	0.00
GTEWY5	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 5 of 6	749278.00	4286861.00	418.44	26.0	299.9	68.093	4.5	6.68E-02	0.00
GTEWY6	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 6 of 6	749202.00	4286808.00	418.60	26.0	299.9	68.093	4.5	6.64E-02	0.00
GTEWY7	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 1 of 6	749624.00	4287108.00	418.50	26.0	299.9	68.093	4.5	6.68E-02	0.00
GTEWY8	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 1	749199.00	4286809.00	418.60	85.0	2000.0	74.653	9.0	7.30E-01	0.00
GTEWY9	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 1 of 6	749620.00	4287113.00	418.11	20.0	400.0	69.602	5.0	1.31E+00	0.00
GTEWY10	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 2	749274.00	4286862.00	418.31	85.0	2000.0	74.653	9.0	7.35E-01	0.00
GTEWY11	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 3	749353.00	4286919.00	418.67	85.0	2000.0	74.653	9.0	7.30E-01	0.00
GTEWY12	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 4	749429.00	4286973.00	419.00	85.0	2000.0	74.653	9.0	7.35E-01	0.00
GTEWY13	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 5	749545.00	4287055.00	418.27	85.0	2000.0	74.653	9.0	7.35E-01	0.00
GTEWY14	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 6	749620.00	4287109.00	418.34	85.0	2000.0	74.653	9.0	7.35E-01	0.00
GTEWY15	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 2 of 6	749545.00	4287060.00	418.24	20.0	400.0	69.602	5.0	1.32E+00	0.00
GTEWY16	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 3 of 6	749429.00	4286977.00	418.93	20.0	400.0	69.602	5.0	1.32E+00	0.00
GTEWY17	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 4 of 6	749352.00	4286923.00	418.57	20.0	400.0	69.602	5.0	1.31E+00	0.00
GTEWY18	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 5 of 6	749274.00	4286866.00	418.24	20.0	400.0	69.602	5.0	1.32E+00	0.00
GTEWY19	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 6 of 6	749198.00	4286813.00	418.77	20.0	400.0	69.602	5.0	1.32E+00	0.00

US Steel Granite City Volume Source Inputs

Source ID	Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Release Height (ft)	Sigma Y (ft)	Sigma Z (ft)	CO Potential Emissions (lb/hr)	CO Emissions Increase (lb/hr)
26070	Ladle Preheaters/Dryers (formerly BOF 4, NG & COG) - Roof Monitor	748457.20	4286596.40	413.88	169.0	21.6	78.6	1.373	1.373
26080	Ladle Preheaters/Dryers (formerly BOF 4, NG & COG) - Roof Monitor	748466.60	4286606.00	413.98	169.0	21.6	78.6	1.373	1.373
26090	Ladle Preheaters/Dryers (formerly BOF 4, NG & COG) - Roof Monitor	748475.40	4286616.10	413.88	169.0	21.6	78.6	1.373	1.373
26100	Ladle Preheaters / Dryers (formerly BOF 5, NG & COG) - Roof Monitor	748483.60	4286624.10	413.85	169.0	21.6	78.6	1.029	1.029
26110	Ladle Preheaters / Dryers (formerly BOF 5, NG & COG) - Roof Monitor	748495.20	4286635.90	414.01	169.0	21.6	78.6	1.029	0.000
26120	Ladle Preheaters / Dryers (formerly BOF 5, NG & COG) - Roof Monitor	748504.10	4286646.00	414.37	169.0	21.6	78.6	1.029	0.000
26130	Ladle Preheaters / Dryers (formerly BOF 5, NG & COG) - Roof Monitor	748513.90	4286656.70	414.63	169.0	21.6	78.6	1.029	0.000
26570	Galv Line 8	748368.26	4287046.91	420.41	101.7	12.3	48.5	0.254	0.000
26580	Galv Line 8	748374.01	4287041.49	420.11	101.7	12.3	48.5	0.254	0.000
26590	Galv Line 8	748379.56	4287036.28	419.82	101.7	12.3	48.5	0.254	0.000
26600	Galv Line 8	748420.52	4286997.79	419.55	38.0	15.1	38.0	0.254	0.000
26610	Galv Line 8	748428.00	4286990.81	419.95	38.0	15.1	38.0	0.254	0.000
26620	Galv Line 8	748436.60	4286982.91	419.85	38.0	15.1	38.0	0.254	0.000
26630	Galv Line 8	748444.54	4286975.49	419.62	38.0	15.1	38.0	0.254	0.000
26640	Galv Line 8	748451.78	4286968.87	418.50	38.0	15.1	38.0	0.254	0.000
26650	Galv Line 8	748324.79	4287118.60	421.65	38.0	15.6	17.7	0.254	0.000
26660	Galv Line 8	748331.95	4287112.00	421.52	38.0	15.6	17.7	0.254	0.000
26670	Galv Line 8	748340.34	4287104.30	421.39	38.0	15.6	17.7	0.254	0.000
26680	Galv Line 8	748347.69	4287097.51	421.29	38.0	15.6	17.7	0.254	0.000
26690	Galv Line 8	748354.48	4287091.31	421.16	38.0	15.6	17.7	0.254	0.000
26700	Galv Line 8	748362.29	4287084.18	420.87	38.0	15.6	17.7	0.254	0.000
26710	Galv Line 8	748370.46	4287076.71	420.51	38.0	15.6	17.7	0.254	0.000
26720	Galv Line 8	748378.04	4287069.70	420.14	38.0	15.6	17.7	0.254	0.000
26730	Galv Line 8	748385.51	4287062.91	419.52	38.0	15.6	17.7	0.254	0.000
0126A_1	Slag Pit Volume 1	749691.91	4286762.44	418.70	53.0	29.0	17.7	0.000	0.000
0126A_2	Slag Pit Volume 2	749708.01	4286772.50	421.33	53.0	29.0	17.7	0.000	0.000
0126A_3	Slag Pit Volume 3	749724.24	4286782.31	420.44	53.0	29.0	17.7	0.000	0.000
0126A_4	Slag Pit Volume 4	749740.84	4286791.62	419.00	53.0	29.0	17.7	0.000	0.000
0126A_5	Slag Pit Volume 5	749757.20	4286801.31	418.86	53.0	29.0	17.7	0.000	0.000

R005487

Off Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
IL131772	DEFAULT	Star Memorial Pet Crematory - Crematory	749244.00	4324455.00	641.44	16.0	800.0	27.585	1.0	2.70E+00	0.00E+00	0.00E+00
IL131843	DEFAULT	Alton Steel Inc. - Electric arc furnaces	747753.00	4307832.00	483.07	100.0	250.1	31.029	24.1	2.25E+02	7.07E+01	7.07E+01
IL131845	DEFAULT	Alton Steel Inc. - 14 inch rolling mill reheat furnace	747843.00	4307692.00	482.64	106.0	300.0	2.394	10.0	2.40E+01	0.00E+00	0.00E+00
IL131945	DEFAULT	Alton Memorial Hospital - 3 Boilers	746364.00	4309470.00	521.36	89.0	389.9	24.108	3.0	0.00E+00	1.28E+01	1.28E+01
IL132062	DEFAULT	Olin Winchester, LLC - Package Boiler (B-4)	750887.00	4308618.00	485.65	35.0	400.0	84.854	2.0	0.00E+00	4.57E+00	4.57E+00
IL132063	DEFAULT	Olin Winchester, LLC - Package Boiler (B-3)	750891.00	4308618.00	485.89	35.0	400.0	84.854	2.0	0.00E+00	4.60E+00	4.60E+00
IL132065	DEFAULT	Olin Winchester, LLC - Package Boiler (B-2)	750892.00	4308613.00	485.53	35.0	400.0	84.854	2.0	0.00E+00	4.57E+00	4.57E+00
IL132064	DEFAULT	Olin Winchester, LLC - Package Boiler (B-1)	750888.00	4308608.00	485.30	35.0	400.0	84.854	2.0	0.00E+00	4.60E+00	4.60E+00
IL132065	DEFAULT	Olin Winchester, LLC - Package Boiler (B-5)	750883.00	4308610.00	485.27	35.0	400.0	84.854	2.0	0.00E+00	4.60E+00	4.60E+00
IL132148	DEFAULT	Amsted Rail Co., Inc. - Electric Arc Furnace #1 (EF-1)	747122.00	4287625.00	425.26	55.0	250.1	54.087	6.2	3.84E+01	4.07E+00	4.07E+00
IL132149	DEFAULT	Amsted Rail Co., Inc. - Electric Arc Furnace #2 (EF-2)	747147.00	4287625.00	425.20	44.0	250.1	42.443	7.0	3.84E+01	4.07E+00	4.07E+00
IL132193	DEFAULT	Veloomy Services, LLC. - North American Boiler	748928.00	4286192.00	416.21	27.0	450.1	24.305	2.3	2.38E+00	0.00E+00	0.00E+00
IL132194	DEFAULT	Veloomy Services, LLC. - Cleaver Brooks boiler	748928.00	4286192.00	416.21	29.0	440.0	39.598	2.0	2.38E+00	0.00E+00	0.00E+00
IL132225	DEFAULT	Gateway Regional Medical Center - Boiler #3	748587.00	4287448.00	426.05	48.0	600.0	41.531	4.5	1.53E+00	1.28E+01	1.28E+01
IL132226	DEFAULT	Gateway Regional Medical Center - Boilers #1 and 2	748592.00	4287452.00	425.95	48.0	600.0	38.966	4.5	3.07E+00	2.57E+01	2.57E+01
IL132247	DEFAULT	Prairie Farms Dairy, Inc. - Boiler #1	747505.00	4287550.00	424.64	75.0	375.0	30.078	2.5	1.30E-01	0.00E+00	0.00E+00
IL132248	DEFAULT	Prairie Farms Dairy, Inc. - Boiler #2	747505.00	4287550.00	424.64	25.0	375.0	65.619	2.5	2.40E-01	1.19E+00	1.19E+00
IL132324	DEFAULT	Precast Metals - Afterburner AB1 and AB2	749469.00	4292536.00	424.97	34.0	1000.0	64.618	4.0	3.23E+00	0.00E+00	0.00E+00
IL132424	DEFAULT	Highland Electric Light Plant - Engine IC-6	788126.93	4293320.17	534.65	28.0	611.1	84.854	2.0	2.07E+01	0.00E+00	0.00E+00
IL132425	DEFAULT	Highland Electric Light Plant - Engine IC-7	788126.93	4293320.17	534.65	57.0	734.1	6.265	11.4	2.51E+01	0.00E+00	0.00E+00
IL132496	DEFAULT	ConocoPhillips Co. - Catalytic reformer #1 (STK12-4)	754869.00	4302625.00	442.55	349.9	600.0	58.810	15.0	6.28E+01	9.53E+01	9.53E+01
IL132510	DEFAULT	ConocoPhillips Co. - Distilling unit, HTR-DU1-F301 (STK5-2)	754827.00	4303077.00	444.69	185.0	319.0	21.878	8.0	1.21E+01	0.00E+00	0.00E+00
IL132511	DEFAULT	ConocoPhillips Co. - Distilling unit: HTR-DU1-F302 (STK5-3)	754826.00	4303100.00	444.49	150.0	150.0	11.677	8.5	1.57E+01	5.20E+00	5.29E+00
IL132512	DEFAULT	ConocoPhillips Co. - Steam methane reformer: SMR Heater (HTR-SMR - STK12-8)	754873.00	4302750.00	443.04	199.9	749.9	36.638	12.0	4.25E+01	6.82E+01	6.82E+01
IL132516	DEFAULT	ConocoPhillips Co. - Rectified absorption unit: Reboiler Heater (HTR-RAU-DEBUT - STK5-5)	754470.00	4302943.00	444.98	75.0	850.0	38.440	5.0	7.14E+00	0.00E+00	0.00E+00
IL132517	DEFAULT	ConocoPhillips Co. - Rectified absorption system to AFG	754240.00	4303144.00	443.47	150.0	710.0	26.358	6.0	0.00E+00	1.20E+02	1.20E+02
IL132519	DEFAULT	ConocoPhillips Co. - Cracked absorption unit (HTR-CAU-RDSTILL - STK5-4)	754468.00	4302963.00	445.41	85.0	800.0	22.173	7.2	6.72E+00	0.00E+00	0.00E+00
IL132520	DEFAULT	ConocoPhillips Co. - CCU-1 Startup heater B-1	754240.00	4303144.00	443.47	212.0	500.1	86.959	4.5	0.00E+00	3.55E+01	3.55E+01
IL132535	DEFAULT	ConocoPhillips Co. - Catalytic cracking unit #2 (STK6-3)	754848.00	4302895.00	443.27	199.9	175.0	49.954	11.0	4.72E+01	2.17E+03	2.17E+03
IL132551	DEFAULT	ConocoPhillips Co. - Alkylation unit, HTR-ALKY-HM2 (STK6-6)	754830.00	4303043.00	442.59	150.0	475.1	12.388	5.7	4.82E+00	0.00E+00	0.00E+00
IL132556	DEFAULT	ConocoPhillips Co. - Utility boiler #15 (STK12-15)	754859.00	4302776.00	443.44	132.0	425.0	43.165	7.0	2.65E+01	1.67E+01	1.62E+01
IL132557	DEFAULT	ConocoPhillips Co. - Utility boiler #16 (STK12-16)	754875.00	4302778.00	443.21	132.0	425.0	43.165	7.0	2.78E+01	1.41E+01	1.41E+01
IL132558	DEFAULT	ConocoPhillips Co. - Utility boiler 17 (STK12-17)	754902.00	4302784.00	442.91	150.0	317.0	52.218	10.0	3.80E+01	1.82E+01	1.82E+01
IL132559	DEFAULT	ConocoPhillips Co. - Utility boiler 18 (STK6-9)	754919.00	4302809.00	442.52	100.0	325.0	14.465	6.2	3.00E+01	6.81E+00	6.81E+00
IL132561	DEFAULT	ConocoPhillips Co. - Hydrodesulfurization unit #1: Charge Heater (HTR-HDU-1 - STK18-1)	755217.00	4302588.00	442.16	150.0	799.1	32.144	5.0	5.60E+00	0.00E+00	0.00E+00
IL132564	DEFAULT	ConocoPhillips Co. - Hydrodesulfurization unit #2: Charge heater (HTR-HDU-2 - STK12-14)	755022.00	4302580.00	442.85	150.0	900.1	31.422	6.8	4.99E+00	0.00E+00	0.00E+00
IL132565	DEFAULT	ConocoPhillips Co. - Cat reformer #3: Stabilizer reboiler (HTR-CR3-H2 - STK12-9)	755014.00	4302580.00	442.62	150.0	950.1	7.019	7.8	4.79E+00	0.00E+00	0.00E+00
IL132567	DEFAULT	ConocoPhillips Co. - Catalytic reformer unit #3: Charge heater (HTR-CR3-H1)	755019.00	4302571.00	442.65	150.0	800.0	28.766	7.8	1.75E+01	8.04E+00	8.04E+00
IL132568	DEFAULT	ConocoPhillips Co. - Catalytic reformer unit #3: First intereactor heater (HTR-CR3-H5)	755019.00	4302548.00	442.78	150.0	749.9	26.919	7.8	2.11E+01	6.93E+00	6.93E+00
IL132569	DEFAULT	ConocoPhillips Co. - Cat reformer #3: Second interreactor heater (HTR-CR3-H6 - STK12-12)	755019.00	4302559.00	442.72	150.0	749.9	14.806	7.8	5.65E+00	0.00E+00	0.00E+00
IL132594	DEFAULT	ConocoPhillips Co. - Sulfuric acid tank	755114.00	4302879.00	441.03	40.0	186.0	26.273	2.0	1.78E+00	2.35E+00	2.35E+00
IL132598	DEFAULT	ConocoPhillips Co. - CCU-2 Startup heater B-1	754240.00	4303144.00	443.47	18.0	509.1	82.964	3.2	4.40E-01	0.00E+00	0.00E+00
IL132599	DEFAULT	Airgas USA, LLC - Liquified carbon dioxide plant	758314.00	4302509.00	435.93	30.0	70.1	79.573	0.2	4.10E-01	0.00E+00	0.00E+00
IL132701	DEFAULT	Kinder Morgan Liquids Terminals, LLC - New Truck loading rack	752998.00	4303078.00	435.83	20.0	70.1	0.762	2.2	4.87E-00	0.00E+00	0.00E+00
IL132739	DEFAULT	National Maintenance and Repair - Cleaver B-rooks boiler (Stack 1 of 2)	750915.00	4300904.00	402.46	34.0	450.1	28.321	7.0	1.90E+00	5.00E-00	5.00E+00
IL132777	DEFAULT	Elias kallal & Schaal Funeral Home & Crematory - Crematorium	742098.00	4312210.00	637.20	30.0	1400.1	18.368	1.7	3.00E+00	0.00E+00	0.00E+00
IL132781	DEFAULT	Christ Bros Products, LLC - Baghouse	758160.00	4283243.00	419.46	32.0	240.0	83.706	3.9	5.56E+01	2.48E+01	2.48E+01
IL132928	DEFAULT	Enable Mississippi River Transmission, LLC - Engine SN-02	782556.00	4285936.00	492.29	30.0	1000.0	9.414	2.6	1.36E+01	0.00E+00	0.00E+00
IL133625	DEFAULT	Waterloo City Light Plant - Engine #1	748326.00	4246760.00	640.45	25.0	749.9	13.579	2.3	4.00E+01	1.33E+00	1.33E+00
IL133627	DEFAULT	Waterloo City Light Plant - Engine #9	748326.00	4246760.00	640.45	17.0	938.1	84.854	1.0	1.50E+01	3.60E+00	3.60E+00
IL133628	DEFAULT	Waterloo City Light Plant - Engine #10	748326.00	4246760.00	640.45	17.0	938.1	84.854	1.0	1.50E+01	3.60E+00	3.60E+00
IL135983	DEFAULT	Lakeview Memorial Gardens - Crematory	782896.00	4273894.00	579.09	16.0	895.0	26.666	2.6	8.40E+00	0.00E+00	0.00E+00
IL136012	DEFAULT	Breckenridge of IL - Natural gas combustion	756461.00	4277782.00	423.82	38.0	341.0	25.781	2.7	3.84E+00	0.00E+00	0.00E+00
IL136014	DEFAULT	Touchette Regional Hospital - 2 Boilers	751890.00	4278014.00	435.94	89.0	300.0	8.860	3.7	2.26E+00	0.00E+00	0.00E+00
IL136038	DEFAULT	Lipchurch Ready Mix Concrete Company - Boiler	749859.00	4276618.00	418.44	30.0	376.1	29.884	0.7	0.00E+00	3.00E-01	3.00E-01

R005488

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
IL136098	DEFAULT	Safety Kleen Systems, Inc. - Pipe still (heat exchanger)	749786.00	4276425.00	420.28	15.0	170.0	0.295	1.0	0.00E+00	1.38E+00	1.38E+00
IL136125	DEFAULT	Milam Recycling and Disposal Facility - Open flare	750434.00	4282812.00	426.54	42.0	1800.1	10.670	1.0	1.83E+01	6.00E+00	6.00E+00
IL136128	DEFAULT	Village of Freeburg - Engine #6	769352.00	4257578.00	509.42	24.0	749.9	24.239	1.8	3.93E+00	0.00E+00	0.00E+00
IL136130	DEFAULT	Village of Freeburg - Engine #4	769352.00	4257578.00	509.42	25.0	550.0	87.871	1.3	9.60E+00	0.00E+00	0.00E+00
IL136131	DEFAULT	Village of Freeburg - Engine #7	769352.00	4257578.00	509.42	22.0	900.1	18.926	2.7	4.50E+01	4.43E+00	4.43E+00
IL136169	DEFAULT	Darling Ingredients, Inc. - Continuous rendering process	747472.00	4281438.00	414.93	44.0	74.9	84.854	4.0	6.67E+00	1.43E+00	1.43E+00
IL136187	DEFAULT	Asphalt Sales & Products Inc. - Drum mix asphalt plant	772959.00	4275690.00	514.30	33.0	325.0	47.134	4.5	6.49E+01	2.90E+01	2.90E+01
IL136486	DEFAULT	Cerro Flow Products, LLC. - Piercing Mill Furnace #2	746228.00	4278272.00	407.32	25.0	299.9	38.901	2.0	8.65E-01	0.00E+00	0.00E+00
IL136547	DEFAULT	Christ Bros Products, LLC - Drum mix asphalt plant	747162.00	4289865.00	448.72	36.0	315.1	86.592	3.5	1.34E+01	5.91E+00	5.91E+00
IL142809	DEFAULT	Magnesium Elektron North America - Combustion units	746452.00	4288724.00	415.49	60.0	450.1	36.537	2.0	1.62E+01	4.44E+00	4.44E+00
IL143317	DEFAULT	Waterloo City Light Plant - Engine #11	748326.00	4246769.00	640.45	17.0	936.1	84.854	1.0	1.50E+01	3.60E+00	3.60E+00
IL143319	DEFAULT	Waterloo City Light Plant - Engine #7	748326.00	4246769.00	640.45	33.0	749.9	84.854	2.0	3.41E+01	0.00E+00	0.00E+00
IL143320	DEFAULT	Waterloo City Light Plant - Engine #8	748326.00	4246769.00	640.45	27.0	680.1	84.230	2.3	1.87E+01	1.38E+00	1.38E+00
IL145809	DEFAULT	ConocoPhillips Co. - Crude heaters (STKS-3)	754415.00	4303016.00	445.93	311.9	530.0	97.970	14.0	7.81E+01	1.98E+01	1.98E+01
IL145820	DEFAULT	ConocoPhillips Co. - Sulfur recovery unit #1 (STK3-1)	752928.00	4303077.00	428.41	125.0	965.9	17.712	7.2	0.00E+00	4.05E+01	4.05E+01
IL145826	DEFAULT	ConocoPhillips Co. - Supplemental air compressor engine CCU-1	754240.00	4303144.00	443.47	15.0	117.1	20.369	1.5	7.10E-01	1.74E+00	1.74E+00
IL145838	DEFAULT	ConocoPhillips Co. - Sulfur recovery unit #2 (STK3-2)	752929.00	4303071.00	428.38	125.0	965.9	17.712	7.2	0.00E+00	4.05E+01	4.05E+01
IL145850	DEFAULT	ConocoPhillips Co. - Flare for major effluent treatment project	754240.00	4303144.00	443.47	30.0	78.0	14.008	9.2	4.51E+00	0.00E+00	0.00E+00
IL147845	DEFAULT	Mayco Mfg, LLC - Britt kettles combustion stack	747189.00	4286970.00	421.78	34.0	250.1	2.362	1.1	2.00E-01	0.00E+00	0.00E+00
IL147846	DEFAULT	Mayco Mfg, LLC - Mixed metals A-it dross baghouse discharge stack	747189.00	4286970.00	421.78	30.0	95.1	52.611	5.0	5.77E-01	0.00E+00	0.00E+00
IL148358	DEFAULT	ConocoPhillips Co. - Catalytic cracking unit #1 (STK6-2)	754864.00	4302895.00	442.88	199.9	175.0	49.954	11.0	2.32E+01	3.84E+01	3.84E+01
IL149875	DEFAULT	City of Alton - Incinerator	749456.00	4310990.00	446.33	25.0	1400.1	53.038	1.0	1.40E+00	0.00E+00	0.00E+00
IL149908	DEFAULT	Charles E. Mahoney - Drum mix asphalt plant	749517.00	4309892.00	443.14	25.0	295.1	66.289	4.0	5.74E+01	2.56E+01	2.56E+01
IL154190	DEFAULT	Milam Recycling and Disposal Facility - Engine #1	750544.00	4282853.00	411.88	26.0	820.0	86.231	0.8	6.93E+00	1.78E+00	1.78E+00
IL154191	DEFAULT	Milam Recycling and Disposal Facility - Engine #2	750538.00	4282852.00	412.01	26.0	820.0	86.231	0.8	6.93E+00	1.78E+00	1.78E+00
IL154192	DEFAULT	Milam Recycling and Disposal Facility - Engine #3	750548.00	4282855.00	411.81	26.0	820.0	86.231	0.8	7.14E+00	1.84E+00	1.84E+00
IL155302	DEFAULT	Alton Steel Inc. - Ladle Furnace	747753.00	4307832.00	433.07	74.0	275.1	87.215	3.0	2.24E+01	1.12E+01	1.12E+01
IL155304	DEFAULT	Precast Metals - Boiler #1	749469.00	4292538.00	424.97	24.0	700.1	20.730	1.6	8.80E-01	0.00E+00	0.00E+00
IL155305	DEFAULT	Granite City Pickling & Warehousing - Boiler	746973.00	4286890.00	422.41	50.0	331.1	15.449	3.7	7.06E-01	0.00E+00	0.00E+00
IL155307	DEFAULT	Kraft Heinz Co. - Boiler 8	748105.00	4289580.00	423.56	40.0	380.0	68.946	2.0	1.44E+00	0.00E+00	0.00E+00
IL155437	DEFAULT	Southwestern Illinois Correctional Center - 2 Boilers	753202.00	4278290.00	421.46	32.0	450.1	15.285	1.5	7.06E-01	0.00E+00	0.00E+00
IL155441	DEFAULT	Asphalt Sales & Products Inc. - Asphalt heaters and boilers	772959.00	4275690.00	514.30	33.0	341.0	18.368	3.2	0.00E+00	2.80E+00	2.80E+00
IL156624	DEFAULT	US Air Force/Scott Air Force Base - Boilers and Heaters	774337.00	4270862.00	440.32	30.0	331.1	23.288	2.2	4.81E+00	0.00E+00	0.00E+00
IL156976	DEFAULT	Olin Winchester, LLC - Package Boiler (B-6)	750906.00	4308625.00	436.06	35.0	400.0	84.854	2.0	0.00E+00	4.60E+00	4.60E+00
IL159940	DEFAULT	Alton Chemical Corp. - 258 Sulfonation Stack	746513.00	4276305.00	407.05	158.0	70.1	41.820	1.0	0.00E+00	5.59E+00	5.59E+00
IL159942	DEFAULT	Alton Chemical Corp. - Unit 266: Flare 36-0011/36-0610	746653.00	4276356.00	410.10	100.0	700.1	59.368	0.7	8.55E+00	4.90E+01	4.90E+01
IL159965	DEFAULT	Alton Chemical Corp. - Flare 36-0219	746513.00	4276305.00	407.05	146.0	1000.0	42.837	0.4	3.84E+00	2.74E+01	2.74E+01
IL160741	DEFAULT	Brady McCasland, Inc. - Compaction plant	748518.00	4276987.00	413.75	17.0	1521.1	65.469	1.8	5.20E-01	0.00E+00	0.00E+00
IL160742	DEFAULT	Darling Ingredients, Inc. - Kewanee boiler	747472.00	4281438.00	414.93	35.0	450.1	54.648	2.6	1.96E+00	1.51E+01	1.51E+01
IL160799	DEFAULT	ConocoPhillips Co. - Supplemental air compressor engine CCU-2	754240.00	4303144.00	443.47	48.0	117.1	20.369	1.5	0.00E+00	1.74E+00	1.74E+00
IL160898	DEFAULT	Alton Chemical Corp. - Boiler 500-15-0110	746653.00	4276489.00	405.22	45.0	350.0	17.318	7.0	4.89E+00	0.00E+00	0.00E+00
IL165120	DEFAULT	BFI Waste Systems of North America, Inc. - Flare	758882.00	4264336.00	574.97	35.0	1600.1	23.485	0.8	6.80E+00	0.00E+00	0.00E+00
IL166479	DEFAULT	Union Electric Co. - Turbine CT02A	749573.00	4283620.00	420.60	30.0	850.0	18.860	11.4	7.73E+01	2.73E+01	2.73E+01
IL166491	DEFAULT	Enable Mississippi River Transmission, LLC - Turbine SN-03	782556.00	4285336.00	492.29	30.0	749.9	86.854	2.5	9.56E+00	0.00E+00	0.00E+00
IL167781	DEFAULT	Amsted Rail Co., Inc. - Pouring and casting (PR/CST-1)	747025.00	4287611.00	424.80	101.0	251.0	34.768	9.7	0.00E+00	6.70E-01	6.70E-01
IL167787	DEFAULT	Amsted Rail Co., Inc. - Ladle Preheater (LDP-1)	747039.00	4287611.00	424.93	82.0	505.0	31.488	6.1	6.50E+00	2.20E-01	2.20E-01
IL167858	DEFAULT	ConocoPhillips Co. - Scot unit	754240.00	4303144.00	443.47	16.0	115.1	15.580	9.0	0.00E+00	1.72E+02	1.72E+02
IL169226	DEFAULT	Messer, LLC - 2 Boilers	752309.00	4301220.00	434.42	15.0	800.0	0.525	1.4	2.52E+00	0.00E+00	0.00E+00
IL172707	DEFAULT	St. Anthony's Hospital - Boiler #4	745097.00	4310364.00	584.58	64.0	400.0	58.634	2.3	0.00E+00	6.02E+00	6.02E+00
IL179611	DEFAULT	Highland Electric Light Plant - Engine IC-1	788126.93	4293320.17	534.65	12.0	656.0	86.920	1.2	1.44E+01	0.00E+00	0.00E+00
IL179671	DEFAULT	Village of Freeburg - Engine #1	769352.00	4257578.00	509.42	30.0	500.1	40.311	1.0	8.55E+00	8.25E-01	8.25E-01
IL179672	DEFAULT	Village of Freeburg - Engine #2	769352.00	4257578.00	509.42	30.0	500.1	40.311	1.0	8.55E+00	8.25E-01	8.25E-01
IL179673	DEFAULT	Village of Freeburg - Engine #3a	769352.00	4257578.00	509.42	25.0	500.1	55.170	1.0	5.92E+00	0.00E+00	0.00E+00
IL181173	DEFAULT	ConocoPhillips Co. - Loading rack	752292.00	4299987.00	429.92	40.0	1800.1	87.510	2.0	1.53E+00	0.00E+00	0.00E+00
IL183733	DEFAULT	Veolia ES Technical Solutions, LLC - Hazardous waste incinerator #4 (rotary kiln)	745532.00	4275942.00	414.76	57.0	650.9	32.570	2.8	3.17E+00	1.16E+01	1.16E+01

R005489

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (3-hour)
IL189969	DEFAULT	US Air Force/Scott Air Force Base - Diesel generators	774337.00	4270852.00	440.57	37.0	402.0	26.380	1.3	5.88E+01	0.00E+00	0.00E+00
IL190080	DEFAULT	Contract Services, LLC - 3 Boilers	749767.00	4275755.00	417.81	40.0	310.0	50.381	4.2	8.53E+00	5.14E+00	5.14E+00
IL192853	DEFAULT	Midwest Metal Coatings, LLC - Chemical coater/infrared oven (CC/IRO)	748283.00	4290595.00	423.88	34.0	110.0	16.926	3.0	2.90E-01	0.00E+00	0.00E+00
IL192964	DEFAULT	Midwest Metal Coatings, LLC - Afterburner	748281.00	4290395.00	423.88	34.0	900.1	23.780	5.0	5.28E-01	0.00E+00	0.00E+00
IL192867	DEFAULT	Midwest Metal Coatings, LLC - Boiler (B1)	748281.00	4290595.00	423.88	34.0	400.0	67.938	1.5	2.12E+00	0.00E+00	0.00E+00
IL198552	DEFAULT	Christ Bros Products, LLC - Drum mix asphalt plant	778702.00	4276845.00	439.34	35.0	297.1	62.254	3.8	2.96E+01	1.32E+01	1.32E+01
IL201662	DEFAULT	Empire Comfort Systems - Stack	765529.00	4266192.00	477.26	25.0	800.0	14.334	1.0	2.68E+00	0.00E+00	0.00E+00
IL204833	DEFAULT	Milam Recycling and Disposal Facility - 3 Passive solar flares	756990.00	4282537.00	594.06	20.0	1800.1	57.138	0.7	4.23E+00	4.38E+00	4.38E+00
IL207740	DEFAULT	Chemtrade Solutions, LLC - Scrubber C007	753339.00	4281367.00	422.21	30.0	70.1	0.394	0.3	0.00E+00	2.00E-01	2.00E-01
IL208343	DEFAULT	Center Point Terminal Co. - Asphalt and polymer modified blend tank (T-9)	748361.00	4289240.00	416.44	38.0	385.1	0.951	1.5	1.00E-01	0.00E+00	0.00E+00
IL209238	DEFAULT	Concrete Supply, LLC - Natural gas combustion	757768.00	4280270.00	444.09	20.0	341.0	25.781	2.7	9.68E-01	0.00E+00	0.00E+00
IL209433	DEFAULT	Alton Water Treatment Facility - Stack	742568.00	4309480.00	488.98	22.0	400.0	85.083	0.7	0.00E+00	5.56E-01	5.56E-01
IL211274	DEFAULT	Kienstra-Illinois, LLC - Natural gas combustion	764850.00	4286982.00	575.95	20.0	341.0	25.781	2.7	7.68E-01	0.00E+00	0.00E+00
IL211772	DEFAULT	Center Point Terminal Co. - Incinerator/waste heat boiler	748361.00	4289240.00	416.44	18.0	650.0	7.979	2.0	1.83E-01	1.05E+00	1.05E+00
IL212692	DEFAULT	Chain of Rocks Recycling & Disposal - Open flare	746945.00	4293274.00	481.53	20.0	1400.1	47.265	0.7	6.92E+00	1.06E+00	1.06E+00
IL212881	DEFAULT	Koch Fertilizer, LLC - Ammonia heater	750908.00	4305316.00	428.15	25.0	250.1	42.443	1.0	2.43E+00	5.30E-01	5.30E-01
IL213573	DEFAULT	Illinois Department of Transportation - R and K model 367-1 incinerator	732106.00	4301282.00	623.78	15.0	736.1	30.885	2.8	2.88E+00	0.00E+00	0.00E+00
IL213834	DEFAULT	Darling Ingredients, Inc. - Johnson boiler	747472.00	4281438.00	414.95	33.0	450.1	46.937	2.5	1.96E+00	1.51E+01	1.51E+01
IL213856	DEFAULT	Solvay Fluorides, LLC - Boiler	750249.00	4278335.00	439.72	30.0	361.0	7.814	2.8	1.44E+00	0.00E+00	0.00E+00
IL215819	DEFAULT	Madison County Sand, LLC - Drum mix asphalt plant	758821.00	4288026.00	422.03	32.0	245.0	64.452	4.1	1.63E+01	5.00E-01	5.00E-01
IL217756	DEFAULT	Phillips 66 Pipeline, LLC - Truck loading racks	744935.00	4274352.00	407.25	20.0	70.1	10.594	2.0	1.10E+01	0.00E+00	0.00E+00
IL218530	DEFAULT	ConocoPhillips Co. - North property ground flare (FLR1-2)	754486.00	4283322.00	445.08	195.0	1800.1	2.394	5.0	1.41E+01	0.00E+00	0.00E+00
IL218537	DEFAULT	Custom Steel Processing - Scrubber	746835.00	4286043.00	416.99	55.0	70.1	49.036	4.2	0.00E+00	1.00E-01	1.00E-01
IL218539	DEFAULT	Custom Steel Processing - Sulfuric acid storage tank	746835.00	4286043.00	416.99	35.0	127.0	0.000	2.6	0.00E+00	1.00E-01	1.00E-01
IL218589	DEFAULT	Contract Services, LLC - Boiler #4	748787.00	4275755.00	417.81	40.0	310.0	49.036	3.7	1.30E+01	1.64E+00	1.64E+00
IL218687	DEFAULT	ConocoPhillips Co. - Gas plant sour water stripper	754260.00	4283134.00	443.47	15.0	128.9	11.882	2.9	1.00E+00	0.00E+00	0.00E+00
IL218995	DEFAULT	Asphalt Sales & Products Inc. - Asphalt silos and truck loadout	772059.00	4275690.00	514.80	32.0	86.1	84.884	1.5	1.26E+00	0.00E+00	0.00E+00
IL219428	DEFAULT	Crown Textile Services - Boiler	744387.00	4259982.00	486.40	24.0	450.1	35.227	1.7	1.03E+00	0.00E+00	0.00E+00
IL220266	DEFAULT	American Colloid Co. - Sand drying	748852.00	4287239.00	419.93	72.0	491.1	28.766	3.9	1.29E+00	0.00E+00	0.00E+00
IL220267	DEFAULT	American Colloid Co. - Space Heaters	748862.00	4287239.00	419.93	35.0	198.1	21.454	1.4	1.30E-01	0.00E+00	0.00E+00
IL220618	DEFAULT	Asphalt Sales & Products Inc. - Drum mix asphalt plant	757560.00	4299905.00	441.63	37.0	280.0	68.322	4.3	7.61E+01	3.40E+01	3.40E+01
IL220849	DEFAULT	ConocoPhillips Co. - Alkylation unit flare (FLR6-1)	755035.00	4283081.00	447.55	199.9	1800.1	2.034	2.5	1.85E+01	0.00E+00	0.00E+00
IL220933	DEFAULT	Waterloo City Light Plant - Dual fuel-fired Turbine GT1	749326.00	4246769.00	640.45	39.0	812.1	41.590	4.8	1.77E+01	0.00E+00	0.00E+00
IL222134	DEFAULT	Asphalt Sales & Products Inc. - Asphalt silo loading	757560.00	4299901.00	441.63	28.0	123.0	4.886	1.7	7.00E-01	0.00E+00	0.00E+00
IL222135	DEFAULT	Asphalt Sales & Products Inc. - Asphalt heaters and boilers	757560.00	4299901.00	441.63	35.0	381.0	26.856	3.7	0.00E+00	2.80E+00	2.80E+00
IL222988	DEFAULT	Apex Oil Co., Inc. - Thermal oxidizers	752471.00	4302667.00	431.07	19.0	820.0	43.985	2.3	2.98E+00	0.00E+00	0.00E+00
IL223786	DEFAULT	Union Electric Co. - Turbine CT05	745755.00	4282930.00	420.96	38.0	803.1	74.948	3.4	4.80E+01	1.30E+00	1.30E+00
IL223787	DEFAULT	Union Electric Co. - Turbine CT04	745776.00	4282947.00	421.18	38.0	803.1	74.948	3.0	4.80E+01	1.30E+00	1.30E+00
IL223798	DEFAULT	Union Electric Co. - Turbine CT05	745538.00	4280520.00	420.90	38.0	803.1	74.948	3.4	6.80E+01	9.00E-01	9.00E-01
IL224187	DEFAULT	Interurban #AWC - Emergency generator	757286.00	4276109.00	462.38	39.0	890.1	51.465	1.3	1.19E+01	4.60E+00	0.00E+00
IL224416	DEFAULT	Belleville Landfill, Inc. - Flare	760402.00	4284040.00	571.88	55.0	1600.1	8.669	0.8	1.72E+01	0.00E+00	0.00E+00
IL224592	DEFAULT	Christ Bros Products, LLC - Drum mix asphalt plant	755685.00	4299823.00	451.18	32.0	251.0	53.625	4.1	3.09E+01	1.38E+01	1.38E+01
IL224594	DEFAULT	Christ Bros Products, LLC - Asphalt tank heaters and boilers	755701.00	4299841.00	427.46	10.0	416.0	42.443	1.0	1.18E+00	2.80E+00	2.80E+00
IL224835	DEFAULT	Enable Mississippi River Transmission, LLC - Compressor engine SN-01	750039.00	4285426.00	410.47	22.0	1125.1	66.453	1.1	5.67E+00	0.00E+00	0.00E+00
IL224839	DEFAULT	Enable Mississippi River Transmission, LLC - Compressor engine SN-02	750044.00	4285416.00	410.24	22.0	1125.1	66.453	1.1	5.67E+00	0.00E+00	0.00E+00
IL224840	DEFAULT	Enable Mississippi River Transmission, LLC - Compressor engine SN-03	750049.00	4285406.00	410.37	22.0	1125.1	66.453	1.1	5.67E+00	0.00E+00	0.00E+00
IL224841	DEFAULT	Enable Mississippi River Transmission, LLC - Compressor engine SN-04	750054.00	4285397.00	410.38	22.0	1125.1	66.453	1.1	5.67E+00	0.00E+00	0.00E+00
IL224891	DEFAULT	Premcor Refining Group, Inc. - Thermal oxidizer	753776.00	4302414.00	429.95	20.0	342.1	49.462	0.8	7.40E-01	0.00E+00	0.00E+00
IL225168	DEFAULT	Metro Crematory - Crematory	754120.00	4290785.00	417.29	18.0	736.1	84.854	1.0	1.50E+00	0.00E+00	0.00E+00
IL225832	DEFAULT	ConocoPhillips Co. - Startup/malfunction/breakdown	754240.00	4305144.00	443.47	103.0	623.9	71.681	4.6	2.86E+01	1.91E+02	1.91E+02
IL225843	DEFAULT	City of O'Fallon - 400 kW (591 HP) Diesel generator	774612.00	4277280.00	434.42	13.0	500.1	86.592	0.7	3.32E+00	0.00E+00	0.00E+00
IL225844	DEFAULT	City of O'Fallon - 900 kW (1 322 HP) Diesel generator	774612.00	4277280.00	434.42	17.0	500.1	86.592	0.7	7.35E+00	0.00E+00	0.00E+00
IL225960	DEFAULT	Waterloo City Light Plant - Engine #4	748326.00	4246769.00	640.45	37.0	680.1	97.904	2.5	3.32E-01	0.00E+00	0.00E+00
IL226013	DEFAULT	Milam Recycling and Disposal Facility - 325 HP Tub grinder	756850.00	4282587.00	594.00	7.0	677.0	74.030	0.3	2.20E+00	8.80E-01	8.80E-01
IL226014	DEFAULT	Milam Recycling and Disposal Facility - Enclosed flare	756476.00	4282925.00	419.82	55.0	1400.1	0.656	12.0	2.40E-01	6.08E+00	6.08E+00

R005490

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
IL226015	DEFAULT	Milam Recycling and Disposal Facility - 750 HP Tub grinder	750550.00	4282537.00	594.06	8.0	627.0	70.881	0.7	5.30E+00	1.90E+00	1.90E+00
IL226184	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - 1F Mix muller (MM-5) Low profile turbine (LF-1) and induction form sta	750075.00	4306259.00	432.32	41.0	209.9	36.080	2.1	2.00E+00	0.00E+00	0.00E+00
IL226204	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - Strip anneal #4 (SA-4)	750150.00	4308388.00	431.16	90.0	350.0	41.426	1.6	9.83E+01	0.00E+00	0.00E+00
IL226256	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - Strip Anneal #3 (SA-3)	750439.00	4308328.00	433.83	100.0	350.0	62.746	1.3	9.83E+01	0.00E+00	0.00E+00
IL226257	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - #7 Strip Anneal (SA-7)	750222.00	4308335.00	433.20	89.0	850.0	38.671	1.5	1.18E+02	0.00E+00	0.00E+00
IL226352	DEFAULT	Olin Winchester, LLC - Hammerm 1 2 and 3 (HM-1 HM-2 and HM-3)	750495.00	4308287.00	434.42	21.0	160.1	19.647	1.8	8.03E+00	0.00E+00	0.00E+00
IL226612	DEFAULT	Solutia Inc. - Santoflex process: Thermal oxidizer 2770934	746325.00	4275822.00	405.12	112.0	865.0	16.794	12.6	1.50E+01	0.00E+00	0.00E+00
IL226783	DEFAULT	Schildknecht Funeral Home, Inc. - Crematory	769033.00	4275796.00	549.57	17.0	1241.0	13.612	1.7	1.20E+00	0.00E+00	0.00E+00
IL227030	DEFAULT	ConocoPhillips Co. - #4 Crude unit heater H-24 (STK9-5)	753051.00	4302413.00	428.81	179.8	550.0	26.207	8.5	2.27E+01	0.00E+00	0.00E+00
IL227032	DEFAULT	ConocoPhillips Co. - Hydrogen plant #1 flare (FLR12-2)	755194.00	4302793.00	443.67	130.0	1800.1	7.970	1.7	1.62E+01	0.00E+00	0.00E+00
IL227034	DEFAULT	ConocoPhillips Co. - Sulfur operation	754240.00	4303144.00	443.47	158.0	590.1	57.753	3.4	0.00E+00	3.00E+01	3.00E+01
IL227035	DEFAULT	ConocoPhillips Co. - Process heater HP-1 (STK12-6)	755194.00	4302793.00	443.67	127.0	360.1	27.093	7.5	6.97E+00	0.00E+00	0.00E+00
IL227038	DEFAULT	ConocoPhillips Co. - SZU Charge heater H-3	755219.00	4302667.00	442.29	150.0	587.1	25.518	5.0	5.75E+00	0.00E+00	0.00E+00
IL227333	DEFAULT	Waterloo City Light Plant - Engine 565	750635.00	4249410.00	628.97	8.0	924.0	61.172	0.7	1.40E+00	0.00E+00	0.00E+00
IL227400	DEFAULT	Collinsville Wastewater Treatment Plant - Emergency diesel generator (2922 HP/2180 kW)	758389.00	4283982.00	419.36	36.0	892.0	67.371	2.0	1.72E+01	1.20E+00	0.00E+00
IL227482	DEFAULT	Totall Metal Recycling, Inc. - Safety certification unit	748030.00	4289120.00	422.74	6.0	587.0	8.069	1.2	1.00E-01	0.00E+00	0.00E+00
IL227590	DEFAULT	Illinois Electric Works - 3 Burn off ovens	747872.00	4288134.00	423.20	46.0	250.1	41.230	2.4	1.17E+00	6.90E-02	6.90E-02
IL227679	DEFAULT	Union Electric Co. - Diesel generator	745516.00	4283326.00	430.38	26.0	490.0	66.831	1.4	1.30E+00	1.60E-01	1.60E-01
IL228119	DEFAULT	St. Clair Crematory - Human crematory	773291.00	4275644.00	507.28	17.0	1241.0	13.612	1.7	1.20E+00	0.00E+00	0.00E+00
IL228260	DEFAULT	Center Ethanol Co. - West boiler	745888.00	4275662.00	412.66	75.0	428.1	43.460	3.0	3.23E+00	0.00E+00	0.00E+00
IL228262	DEFAULT	Center Ethanol Co. - East boiler	745888.00	4275662.00	412.66	75.0	428.1	45.428	3.0	3.23E+00	0.00E+00	0.00E+00
IL228263	DEFAULT	Center Ethanol Co. - RTO	745886.00	4275662.00	412.66	50.0	310.0	70.684	5.5	6.85E+00	0.00E+00	0.00E+00
IL228294	DEFAULT	ConocoPhillips Co. - Distilling west refinery flare (FLR10-1)	753647.00	4302546.00	430.81	197.0	1800.1	6.626	3.0	7.51E+01	0.00E+00	0.00E+00
IL228295	DEFAULT	ConocoPhillips Co. - SZU Regenerator vent	755209.00	4302720.00	442.32	44.0	135.1	32.341	2.0	1.78E+00	2.35E+00	2.35E+00
IL229921	DEFAULT	Christ Bros Products, LLC - 8 Heaters and boilers	754160.00	4283243.00	419.46	37.0	400.0	20.664	1.8	1.18E+00	2.80E+00	2.80E+00
IL229922	DEFAULT	Christ Bros Products, LLC - Silo filling	754160.00	4283243.00	419.46	25.0	74.0	0.262	0.4	5.30E-01	0.00E+00	0.00E+00
IL229923	DEFAULT	Christ Bros Products, LLC - Truck loading	754160.00	4283243.00	419.46	29.0	135.1	48.052	2.0	5.80E-01	0.00E+00	0.00E+00
IL230300	DEFAULT	Afton Chemical Corp. - Flare 36-0050	746478.00	4276793.00	407.28	45.0	1600.1	0.656	8.0	2.20E+00	0.00E+00	0.00E+00
IL230350	DEFAULT	Village of Freeburg - Engine #10	769352.00	4257578.00	509.42	28.0	929.9	87.674	1.5	1.28E+01	3.20E+00	3.20E+00
IL230355	DEFAULT	Asphalt Sales & Products Inc. - Truck loadout	757560.00	4289901.00	441.63	28.0	135.1	43.198	1.9	7.90E-01	0.00E+00	0.00E+00
IL231259	DEFAULT	Village of Freeburg - Engine #11	769352.00	4257578.00	509.42	28.0	929.9	87.674	1.5	1.28E+01	3.20E+00	3.20E+00
IL231260	DEFAULT	Village of Freeburg - Engine #12	769352.00	4257578.00	509.42	28.0	929.9	87.674	1.5	1.28E+01	3.20E+00	3.20E+00
IL231291	DEFAULT	Kurrus Funeral Home - 2 Crematories	759066.00	4271234.00	547.11	18.0	787.0	18.186	1.1	2.70E+00	0.00E+00	0.00E+00
IL232739	DEFAULT	ConocoPhillips Co. - Benzene extraction unit #3 (STK6-4)	754923.00	4302930.00	442.59	185.0	470.0	16.138	9.7	1.22E+01	0.00E+00	0.00E+00
IL232785	DEFAULT	Roxana Landfill, Inc. - Enclosed flare	759153.00	4301368.00	619.62	35.0	1600.1	20.008	12.0	2.31E+01	1.76E+00	1.76E+00
IL233294	DEFAULT	Gateway Terminals, LLC. - Marine vapor combustion unit (MVCU)	744607.00	4275093.00	422.70	74.0	514.0	25.158	3.3	1.69E+01	0.00E+00	0.00E+00
IL233295	DEFAULT	Gateway Terminals, LLC. - Truck/Rail vapor destruction unit (TRCU)	744607.00	4275093.00	422.70	74.0	514.0	25.158	3.3	8.39E+00	0.00E+00	0.00E+00
IL235261	DEFAULT	Gulfstream Aerospace Services Corp. - Make-up air unit 19-3	747629.00	4273460.00	410.10	42.0	577.0	29.356	2.5	1.63E+00	0.00E+00	0.00E+00
IL235939	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - Strip anneal #5 (SA-5)	750151.00	4308378.00	430.91	90.0	450.1	54.087	1.4	1.07E+02	0.00E+00	0.00E+00
IL235940	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - Strip anneal #6 (SA-6)	750207.00	4308390.00	431.87	110.0	580.0	62.779	1.3	1.07E+02	0.00E+00	0.00E+00
IL236260	DEFAULT	Bunge-SF Grain, LLC. - Grain Dryer	746158.00	4281045.00	417.55	96.0	105.0	87.904	8.2	5.06E+00	1.71E+01	1.71E+01
IL236359	DEFAULT	City of Belleville - 2 Emergency generators (1500 kW each)	763544.00	4265595.00	474.70	28.0	627.0	73.767	1.2	2.57E+01	1.84E+00	0.00E+00
IL236927	DEFAULT	Kraft Heinz Co. - Boiler C	748105.00	4289580.00	423.56	40.0	380.0	68.946	2.0	1.44E+00	0.00E+00	0.00E+00
IL236928	DEFAULT	Kraft Heinz Co. - Boiler D	748105.00	4289580.00	423.56	40.0	380.0	68.946	2.0	1.44E+00	0.00E+00	0.00E+00
IL236929	DEFAULT	Kraft Heinz Co. - Boiler E	748105.00	4289580.00	423.56	40.0	380.0	68.946	2.0	1.44E+00	0.00E+00	0.00E+00
IL236930	DEFAULT	National Maintenance and Repair - Cleaver Brooks boiler (Stack 2 of 2)	750920.00	4300904.00	402.46	34.0	450.1	23.321	2.0	1.90E+00	5.00E+00	5.00E+00
IL237099	DEFAULT	Union Electric Co. - Turbine CT028	745573.00	4283613.00	419.69	30.0	850.0	18.850	11.4	7.74E+01	2.73E+01	2.73E+01
IL237182	DEFAULT	Highland Electric Light Plant - Engine IC-6	788126.93	4293320.17	534.65	28.0	612.1	84.854	2.0	1.32E+01	0.00E+00	0.00E+00
IL237183	DEFAULT	Highland Electric Light Plant - Engine IC-8	788126.93	4293320.17	534.65	57.0	734.1	81.762	11.4	2.57E+01	0.00E+00	0.00E+00
IL237340	DEFAULT	Charles E. Mahoney - Asphalt silo filling	749517.00	4309892.00	443.14	25.0	74.0	0.262	0.4	5.30E-01	0.00E+00	0.00E+00
IL237341	DEFAULT	Charles E. Mahoney - Truck loadout	749517.00	4309892.00	443.14	27.0	138.0	42.050	1.9	6.00E-01	0.00E+00	0.00E+00
IL237362	DEFAULT	Charles E. Mahoney - Asphalt heaters and boilers	749517.00	4309892.00	443.14	10.0	350.0	69.995	1.0	1.18E+00	2.80E+00	2.80E+00
IL237659	DEFAULT	Green Plains Madison, LLC - Boiler #1	745256.00	4285477.00	414.14	71.0	284.1	27.960	3.3	1.29E+00	5.60E-01	5.60E-01
IL237660	DEFAULT	Green Plains Madison, LLC - Fire Pump back-up Engine (460 HP)	745121.00	4285409.00	413.85	13.0	627.0	86.231	0.8	4.80E-01	9.40E-01	0.00E+00
IL237661	DEFAULT	Green Plains Madison, LLC - Electrical system backup Engine (1485 HP)	745144.00	4285537.00	415.88	28.0	627.0	73.767	1.2	3.54E+00	1.21E+01	0.00E+00

R005491

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
IL237679	DEFAULT	Green Plains Madison, LLC - Indirect dryer #1	745191.00	4285468.00	415.32	71.0	387.1	12.136	4.6	7.97E+00	4.10E-01	4.10E-01
IL237866	DEFAULT	Amsted Rail Co., Inc. - Curing oven	746913.00	4287625.00	419.33	39.0	258.0	27.978	1.9	2.52E-01	0.00E+00	0.00E+00
IL237899	DEFAULT	Center Ethanol Co. - Emergency generator	745888.00	4275662.00	412.66	28.0	627.0	73.767	1.2	3.30E+00	0.00E+00	0.00E+00
IL237903	DEFAULT	Center Ethanol Co. - Ethanol loadout Rack	745888.00	4275662.00	412.66	19.0	99.1	7.806	0.7	8.86E-01	0.00E+00	0.00E+00
IL238199	DEFAULT	Solutia Inc. - An in-situ soil vapor extraction system	746325.00	4275822.00	405.12	15.0	70.1	23.406	0.2	4.00E-01	0.00E+00	0.00E+00
IL238839	DEFAULT	Waterloo City Light Plant - Turbine Generator (GT2)	748326.00	4246769.00	640.45	39.0	965.9	87.937	4.8	1.78E+01	0.00E+00	0.00E+00
IL238942	DEFAULT	ConocoPhillips Co. - Rental Boiler #3	754240.00	4303144.00	443.47	20.0	550.0	46.412	4.0	1.65E+00	0.00E+00	0.00E+00
IL239395	DEFAULT	Amsted Rail Co., Inc. - Sand dryer	746975.00	4287537.00	422.05	39.0	284.1	23.157	2.0	1.24E+00	0.00E+00	0.00E+00
IL239396	DEFAULT	Amsted Rail Co., Inc. - Thermal sand reclaimer	746975.00	4287537.00	422.05	39.0	284.1	23.157	2.0	3.70E-01	0.00E+00	0.00E+00
IL239899	DEFAULT	Shell Oil Products US - RTO	753758.00	4303650.00	442.59	19.0	300.0	33.948	2.5	0.00E+00	8.47E-01	8.47E-01
IL240053	DEFAULT	Westwood Lands, Inc. - Process heater OFH-1	748864.00	4285684.00	412.99	39.0	284.1	23.157	2.0	8.30E-01	0.00E+00	0.00E+00
IL240359	DEFAULT	Afton Chemical Corp. - Boiler 500-15-0210	748660.00	4276488.00	405.74	45.0	350.0	17.318	7.0	4.89E+00	0.00E+00	0.00E+00
IL240360	DEFAULT	Afton Chemical Corp. - Boiler 500-15-0310	748674.00	4276485.00	407.25	45.0	350.0	17.318	7.0	4.81E+00	0.00E+00	0.00E+00
IL241300	DEFAULT	ConocoPhillips Co. - VOC Flare (West - FLR4-1)	753428.00	4303073.00	428.81	30.0	1800.1	26.174	0.7	1.43E+00	0.00E+00	0.00E+00
IL241301	DEFAULT	ConocoPhillips Co. - VOC Flare (East - FLR4-2)	753441.00	4303073.00	428.77	30.0	1800.1	26.174	0.7	1.43E+00	0.00E+00	0.00E+00
IL241302	DEFAULT	ConocoPhillips Co. - Coker north flare (FLR1-3)	754947.00	4303684.00	444.23	139.0	911.0	26.935	5.4	0.00E+00	3.08E+01	3.08E+01
IL241303	DEFAULT	ConocoPhillips Co. - VF-5 Heater (H350H4 - STK1-1)	754837.00	4303459.00	444.98	150.0	650.0	26.765	12.0	0.00E+00	1.35E+01	1.35E+01
IL241304	DEFAULT	ConocoPhillips Co. - Coker north heater (H351H2 - STK1-2)	754963.00	4303306.00	444.85	150.0	500.1	22.804	10.0	0.00E+00	7.37E+00	7.37E+00
IL241305	DEFAULT	ConocoPhillips Co. - Coker north heater (H351H1 - STK1-3)	754886.00	4303306.00	444.82	150.0	500.1	22.804	10.0	0.00E+00	7.38E+00	7.38E+00
IL241312	DEFAULT	ConocoPhillips Co. - Heater HP-2 (STK7-1)	755263.00	4302920.00	443.86	118.0	400.0	45.002	10.8	0.00E+00	2.87E+01	2.87E+01
IL241405	DEFAULT	Procter & Gamble Distributing - Emergency diesel generator #1	756504.00	4295421.00	425.00	26.0	490.0	60.811	1.4	1.68E+01	0.00E+00	0.00E+00
IL241648	DEFAULT	Procter & Gamble Distributing - Emergency diesel generator #2	756494.00	4295735.00	424.74	26.0	490.0	60.811	1.4	1.68E+01	0.00E+00	0.00E+00
IL242126	DEFAULT	Center Point Terminals Co. - Tank Heater	746359.00	4289027.00	411.84	49.0	331.1	32.144	2.5	1.03E+00	0.00E+00	0.00E+00
IL245579	DEFAULT	Procter & Gamble Distributing - Emergency diesel generator #3	756198.00	4295409.00	424.97	26.0	490.0	60.811	1.4	1.68E+01	0.00E+00	0.00E+00
IL245580	DEFAULT	Procter & Gamble Distributing - Emergency diesel generator #4	756182.00	4295721.00	424.77	26.0	490.0	60.811	1.4	1.68E+01	0.00E+00	0.00E+00
IL245839	DEFAULT	Milam Recycling and Disposal Facility - Landfill gas conversion plant	750866.00	4282895.00	413.09	35.0	70.1	0.000	4.5	9.80E+00	9.00E-01	9.00E-01
IL246758	DEFAULT	Stookey Township WWTP - 2000 kW Emergency generator	756258.00	4269978.00	518.86	28.0	627.0	73.767	1.2	1.54E+01	0.00E+00	0.00E+00
IL248761	DEFAULT	Omega Partners Hartford, LLC - Truck Rail Marine racks loadout and VCUs	752232.00	4300866.00	430.74	33.0	69.5	0.328	0.3	6.60E+00	0.00E+00	0.00E+00
IL248762	DEFAULT	Omega Partners Hartford, LLC - Boiler 1 and 2	752273.00	4300698.00	430.18	58.0	436.0	27.650	3.4	3.83E+00	0.00E+00	0.00E+00
IL248060	DEFAULT	Kraft Heinz Co. - Boiler F	748105.00	4289580.00	423.56	26.0	380.0	34.407	2.0	1.44E+00	0.00E+00	0.00E+00
IL248762	DEFAULT	Olin Winchester, LLC - New Rotary retort process (RDR-2)	750495.00	4306287.00	434.42	16.0	119.9	26.634	1.7	9.62E+00	0.00E+00	0.00E+00
IL248799	DEFAULT	Gateway Terminals, LLC. - 600 HP Boiler	744607.00	4275083.00	422.70	26.0	440.0	39.557	2.2	2.11E+00	0.00E+00	0.00E+00
IL249480	DEFAULT	Highland Electric Light Plant - Engine IC-2	788126.93	4293320.17	534.65	57.0	734.1	61.762	11.4	1.44E+01	0.00E+00	0.00E+00
IL249481	DEFAULT	Highland Electric Light Plant - Engine IC-3	788126.93	4293320.17	534.65	57.0	734.1	61.762	11.4	1.25E+01	0.00E+00	0.00E+00
IL249482	DEFAULT	Highland Electric Light Plant - Engine IC-9	788126.93	4293320.17	534.65	57.0	734.1	61.762	11.4	1.50E+01	0.00E+00	0.00E+00
IL249483	DEFAULT	Highland Electric Light Plant - Engine IC-10	788126.93	4293320.17	534.65	57.0	734.1	61.762	11.4	1.50E+01	0.00E+00	0.00E+00
IL249499	DEFAULT	Roxana Landfill, Inc. - Zink ultra-Low emissions (Zule) Flare	759153.00	4301368.00	619.62	60.0	1800.1	46.838	13.0	1.25E+01	1.55E+01	1.55E+01
IL250343	DEFAULT	Mayco Mfg. LLC - Natural gas combustion	747189.00	4288970.00	421.78	39.0	284.1	23.157	2.0	1.74E+00	0.00E+00	0.00E+00
IL250892	DEFAULT	ConocoPhillips Co - Lift station pump (Z1028)	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	1.40E+00	4.90E-01	4.90E-01
IL250893	DEFAULT	ConocoPhillips Co. - Lift station pump (Z1029)	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	1.30E+00	4.60E-01	4.60E-01
IL250894	DEFAULT	ConocoPhillips Co - Non-emergency air compressor #1	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	6.01E+00	2.12E+00	2.12E+00
IL250895	DEFAULT	ConocoPhillips Co. - Non-emergency air compressor #2	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	6.01E+00	2.12E+00	2.12E+00
IL250896	DEFAULT	ConocoPhillips Co. - Non-emergency air compressor #3	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	5.98E+00	2.10E+00	2.10E+00
IL250897	DEFAULT	ConocoPhillips Co - Non-emergency air compressor #4	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	6.01E+00	2.12E+00	2.12E+00
IL250898	DEFAULT	ConocoPhillips Co. - Non-emergency air compressor #5	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	6.01E+00	2.12E+00	2.12E+00
IL250899	DEFAULT	ConocoPhillips Co. - Non-emergency air compressor #6	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	5.98E+00	2.10E+00	2.10E+00
IL251099	DEFAULT	Amsted Rail Co., Inc. - Annealing Furnace 18	747071.00	4287670.00	426.02	39.0	284.1	23.157	2.0	1.12E+00	1.00E-01	1.00E-01
IL251286	DEFAULT	Premcor Refining Group, Inc. - Vapor Combustion Unit	752775.00	4302414.00	429.95	53.0	289.0	24.830	2.9	1.00E+01	0.00E+00	0.00E+00
IL251735	DEFAULT	ConocoPhillips Co. - Diesel engine (605 HP)	754240.00	4303144.00	443.47	15.0	69.5	0.328	0.3	3.50E+00	0.00E+00	0.00E+00
IL251754	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #1	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL251107	DEFAULT	Alinex USA, Inc. - Natural gas combustion	749698.00	4276478.00	418.37	58.0	436.0	27.650	3.4	3.26E+00	0.00E+00	0.00E+00
IL253166	DEFAULT	Cerro Flow Products, LLC. - Generators	746228.00	4275272.00	407.32	26.0	490.0	60.811	1.4	9.23E-01	2.82E-01	2.82E-01
IL253167	DEFAULT	City of Belleville - Emergency diesel generator (1500 kW)	762469.00	4266351.00	468.70	26.0	490.0	60.811	1.4	1.16E+01	0.00E+00	0.00E+00
IL253300	DEFAULT	Phillips 66 Pipeline, LLC. - Engines (insignificant activities)	744935.00	4274152.00	407.25	26.0	490.0	60.811	1.4	9.23E-01	0.00E+00	0.00E+00
IL253361	DEFAULT	Amsted Rail Co., Inc. - Sand regeneration process (combustion)	746975.00	4287537.00	422.05	39.0	284.1	23.157	2.0	2.80E-01	2.80E-01	2.80E-01

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
IL253367	DEFAULT	Green Plains Madison, LLC - Boiler #2	745258.00	4285486.00	414.27	71.0	284.1	22.960	3.3	1.29E+00	5.00E-01	5.00E-01
IL253368	DEFAULT	Green Plains Madison, LLC - Boiler #3	745260.00	4285481.00	414.24	71.0	284.1	22.960	3.3	1.29E+00	5.00E-01	5.00E-01
IL253369	DEFAULT	Green Plains Madison, LLC - Boiler #4	745262.00	4285500.00	414.21	71.0	284.1	22.960	3.3	1.29E+00	5.00E-01	5.00E-01
IL253370	DEFAULT	Green Plains Madison, LLC - Indirect dryer #2	745164.00	4285430.00	414.60	81.0	387.1	8.430	5.5	7.97E+00	4.10E-01	4.10E-01
IL253386	DEFAULT	G&C Metals, LLC (d/b/a Olin Brass) - Engines (insignificant activities)	750423.00	4308352.00	434.28	26.0	490.0	60.811	1.4	9.23E-01	0.00E+00	0.00E+00
IL253738	DEFAULT	Milam Recycling and Disposal Facility - 2000 scfm Utility Flare	750550.00	4282537.00	594.06	36.0	852.0	18.569	4.6	1.83E+01	7.32E+00	7.32E+00
IL253769	DEFAULT	Veolia ES Technical Solutions, LLC - 2 Emergency generators	745532.00	4275942.00	414.76	26.0	490.0	60.811	1.4	7.41E-01	0.00E+00	0.00E+00
IL254175	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #2	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL254176	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #3	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL254177	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #4	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL254178	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #5	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL254179	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #6	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL254699	DEFAULT	HSHS St. Elizabeth's Hospital - 2 Emergency generators	767237.00	4275111.00	541.01	26.0	627.0	78.767	1.2	1.93E+01	0.00E+00	0.00E+00
IL255341	DEFAULT	Roxana Landfill, Inc. - New open flare	759153.00	4301368.00	619.62	45.0	1800.3	61.434	1.3	8.77E+01	8.17E+00	8.17E+00
IL255537	DEFAULT	Magnesium Elektron North America - Natural gas combustion	746452.00	4285724.00	415.49	39.0	284.1	23.157	2.0	4.20E-01	0.00E+00	0.00E+00
IL255741	DEFAULT	ConocoPhillips Co - Utility Boiler #19 (BLR-19)	754755.00	4302798.00	442.16	132.0	304.1	46.281	7.0	0.00E+00	1.54E+01	1.54E+01
IL255816	DEFAULT	Mayco Mfg, LLC - Expansion: Natural gas combustion	747189.00	4286970.00	421.78	39.0	284.1	23.157	2.0	1.94E+00	0.00E+00	0.00E+00
IL255953	DEFAULT	Moore Recycling Concrete & Asphalt, LLC. - Drum mix asphalt plant	762178.00	4246660.00	463.19	35.0	251.0	56.008	4.0	1.32E+01	0.00E+00	0.00E+00
IL256624	DEFAULT	PBT Acquisition, LLC - ASR Dryer	748704.00	4280830.00	418.77	32.0	305.0	19.483	1.5	2.53E+00	0.00E+00	0.00E+00
IL257535	DEFAULT	Marathon Ashland Pipe Line, LLC - Marine vapor combustion unit	751239.00	4302663.00	402.85	51.0	810.3	27.749	7.4	2.71E+01	0.00E+00	0.00E+00
SJEFF1	DEFAULT	RIVER CEMENT CO. DBA BUZZI UNICEM USA SELMA PLANT	733431.84	4229131.13	406.36	410.0	370.0	54.091	19.0		1.44E+02	1.44E+02
SJEFF2	DEFAULT	RIVER CEMENT CO. DBA BUZZI UNICEM USA SELMA PLANT	733431.84	4229131.13	406.36	125.0	210.0	59.173	6.6		2.04E-02	2.04E-02
SJEFF3	DEFAULT	RIVER CEMENT CO. DBA BUZZI UNICEM USA SELMA PLANT	733431.84	4229131.13	406.36	10.0	1100.0	23.333	0.5		1.32E-01	0.00E+00
SJEFF15	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	52.0	260.0	10.666	2.0		5.09E-03	5.09E-03
SJEFF16	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		2.29E-01	2.29E-01
SJEFF17	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		2.40E-03	2.40E-03
SJEFF18	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		2.29E-01	0.00E+00
SJEFF19	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		1.80E-03	1.80E-03
SJEFF20	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		1.20E-03	1.20E-03
SJEFF21	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		5.40E-04	5.40E-04
SJEFF22	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		4.80E-04	4.80E-04
SJEFF23	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		4.20E-04	4.20E-04
SJEFF24	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		3.60E-04	3.60E-04
SJEFF25	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	15.0	1049.0	149.734	0.2		4.80E-04	0.00E+00
SJEFF26	DEFAULT	AMEREN MISSOURI RUSH ISLAND ENERGY CENTER	739491.07	4224078.19	407.87	700.0	270.0	82.001	20.7		1.73E+03	1.73E+03
SJEFF27	DEFAULT	AMEREN MISSOURI RUSH ISLAND ENERGY CENTER	739491.07	4224078.19	407.87	700.0	270.0	82.001	29.0		2.50E+03	2.50E+03
SJEFF28	DEFAULT	AMEREN MISSOURI RUSH ISLAND ENERGY CENTER	739491.07	4224078.19	407.87	30.0	985.0	105.633	1.3		8.52E-06	0.00E+00
SJEFF29	DEFAULT	AMEREN MISSOURI RUSH ISLAND ENERGY CENTER	739491.07	4224078.19	407.87	240.0	600.0	32.999	7.0		3.54E-03	3.54E-03
SJEFF59	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	14.0	392.0	0.003	1.7	9.03E-01	2.17E-03	2.17E-03
SJEFF60	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	14.0	392.0	0.003	1.7	9.03E-01	2.17E-03	2.17E-03
SJEFF61	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	14.0	392.0	0.003	1.7	4.20E-02	3.00E-04	3.00E-04
SJEFF62	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	14.0	392.0	0.000	1.7	1.12E-02	7.98E-05	7.98E-05
SJEFF63	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	27.0	1800.0	10.046	1.5	2.86E-02	1.63E-01	1.63E-01
SJEFF65	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	20.0	0.0	0.000	0.5	1.45E-02	4.34E-04	4.34E-04
SJEFF66	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	20.0	0.0	0.000	0.5	1.40E-02	4.20E-04	4.20E-04
SJEFF67	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	20.0	-459.7	0.003	2.0	8.35E-02	5.97E-04	5.97E-04
SJEFF68	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	20.0	-459.7	0.003	2.0	3.54E-01	2.53E-03	2.53E-03
SJEFF69	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	14.0	-459.7	0.003	3.0	2.51E-01	1.79E-03	1.79E-03
SJEFF70	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	5.0	-459.7	0.003	0.5	1.11E+00	3.37E-01	0.00E+00
SJEFF71	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	5.0	-459.7	0.003	0.5	1.11E+00	3.37E-01	0.00E+00
SJEFF72	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	5.0	-459.7	0.003	0.5	3.32E-01	1.02E-01	0.00E+00
SJEFF73	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	10.0	-459.7	0.003	1.0	1.82E-05	1.37E-07	1.37E-07
SJEFF74	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	10.0	-459.7	0.003	1.0	1.92E-05	1.37E-07	1.37E-07
SJEFF82	DEFAULT	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	156.0	611.0	39.902	5.8	7.38E-02	3.77E+00	3.77E+00
SJEFF83	DEFAULT	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	156.0	611.0	39.902	5.8	1.96E-01	6.37E+00	6.37E+00

R005493

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
SJEFF86	DEFAULT	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	20.0	0.0	0.000	0.5	1.26E-01	5.08E-04	9.06E-04
SJEFF92	DEFAULT	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	10.0	1100.0	23.333	0.5		2.17E+00	0.00E+00
SJEFF98	DEFAULT	CARONDELET CORPORATION PEVELY	727491.85	4241735.78	485.56	2.5	170.0	46.499	2.0	9.60E-01	4.25E-02	4.25E-02
SJEFF100	DEFAULT	CARONDELET CORPORATION PEVELY	727491.85	4241735.78	485.56	2.5	170.0	46.499	2.0	1.60E-01	1.14E-03	1.14E-03
SJEFF125	DEFAULT	FRED WEBER, INC. ANTONIA	720102.78	4248677.71	670.57	20.0	350.0	49.249	5.0		5.88E-02	5.88E-02
SJEFF126	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	496.22	28.0	1413.0	18.734	2.0		2.83E-01	2.83E-01
SJEFF129	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	496.22	13.0	1354.0	25.666	1.0		1.92E-02	1.92E-02
SJEFF130	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	496.22	30.0	1448.0	22.418	2.0		9.02E-03	9.02E-03
SJEFF131	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	496.22	28.0	1413.0	18.734	2.0		3.50E-01	3.50E-01
SJEFF132	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	496.22	28.0	1413.0	18.734	2.0		2.95E-01	2.95E-01
SJEFF133	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	496.22	18.0	1347.0	16.316	1.0		1.54E-02	1.54E-02
SJEFF134	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	496.22	30.0	1448.0	22.418	2.0		6.01E-03	6.01E-03
SJEFF135	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	496.22	18.0	1354.0	25.666	1.0		1.44E-02	1.44E-02
SJEFF136	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	496.22	28.0	1600.0	18.734	2.0		7.56E-02	7.56E-02
SJEFF137	DEFAULT	JEFFERSON COUNTY CREMATION SERVICES LC PEVELY	728536.07	4239554.86	583.23	10.0	1100.0	23.333	0.5		9.39E-02	9.39E-02
SJEFF138	DEFAULT	SIMPSON CONSTRUCTION MATERIALS PAULINA HILLS SITE	728459.86	4259196.04	426.64	12.0	885.0	42.441	0.5		1.29E-01	1.29E-01
SJEFF144	DEFAULT	N. B. WEST CONTRACTING CO INC HOUSE SPRINGS ASPHALT	712358.42	4251768.19	532.22	32.8	247.0	0.855	3.7	3.03E+00	1.21E+00	1.21E+00
SJEFF145	DEFAULT	N. B. WEST CONTRACTING CO INC HOUSE SPRINGS ASPHALT	712358.42	4251768.19	532.22	5.0	400.0	0.003	2.0	5.35E-02	3.07E-01	3.07E-01
SJEFF146	DEFAULT	N. B. WEST CONTRACTING CO INC HOUSE SPRINGS ASPHALT	712358.42	4251768.19	532.22	5.0	400.0	0.003	2.0	3.61E-01	9.67E-02	9.62E-02
SSTC1	DEFAULT	AMEREN MISSOURI SIOUX ENERGY CENTER	734752.14	4310260.61	445.64	496.5	138.7	46.750	23.6		2.82E+02	2.82E+02
SSTC2	DEFAULT	AMEREN MISSOURI SIOUX ENERGY CENTER	734752.14	4310260.61	445.64	496.5	136.6	46.644	23.6		2.89E+02	2.89E+02
SSTC3	DEFAULT	AMEREN MISSOURI SIOUX ENERGY CENTER	734752.14	4310260.61	445.64	217.0	325.0	50.000	4.5		8.90E-04	8.90E-04
SSTC4	DEFAULT	AMEREN MISSOURI SIOUX ENERGY CENTER	734752.14	4310260.61	445.64	25.0	1100.0	23.333	1.0		1.41E+00	0.00E+00
SSTC9	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	50.0	1000.0	0.151	2.3		2.23E-04	2.23E-04
SSTC10	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	50.0	1000.0	0.151	2.3		1.70E-03	1.70E-03
SSTC11	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	50.0	1000.0	0.151	2.3		2.23E-04	2.23E-04
SSTC12	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	50.0	1000.0	0.151	2.3		1.70E-03	1.70E-03
SSTC13	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	50.0	1000.0	0.151	2.3		2.23E-04	2.23E-04
SSTC14	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	50.0	1000.0	0.151	2.3		1.70E-03	1.70E-03
SSTC15	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	14.0	1063.0	40.515	0.4		3.59E-01	0.00E+00
SSTC16	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	3.0	1011.0	154.085	0.8		1.08E+00	0.00E+00
SSTC17	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	3.0	1011.0	154.085	0.8		1.06E+00	0.00E+00
SSTC18	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	14.0	1063.0	56.732	0.4		3.66E-01	2.38E-04
SSTC28	DEFAULT	GENERAL MOTORS LLC WENTZVILLE CENTER	689428.03	4299089.70	622.57	250.0	365.0	12.999	10.0		2.16E+01	2.16E+01
SSTC29	DEFAULT	GENERAL MOTORS LLC WENTZVILLE CENTER	689428.03	4299089.70	622.57	250.0	365.0	12.999	10.0		7.21E+02	7.21E+02
SSTC30	DEFAULT	GENERAL MOTORS LLC WENTZVILLE CENTER	689428.03	4299089.70	622.57	250.0	365.0	12.999	10.0		2.16E+01	2.16E+01
SSTC31	DEFAULT	GENERAL MOTORS LLC WENTZVILLE CENTER	689428.03	4299089.70	622.57	53.0	528.0	58.899	1.8		1.33E-01	1.33E-01
SSTC45	DEFAULT	SSM HEALTH ST JOSEPH HOSPITAL WEST	695160.96	4297283.00	533.89	66.0	200.0	0.003	3.0		2.81E+00	2.81E+00
SSTC46	DEFAULT	SSM HEALTH ST JOSEPH HOSPITAL WEST	695184.96	4297283.00	533.89	66.0	200.0	0.003	3.0		2.66E-02	2.66E-02
SSTC47	DEFAULT	SSM HEALTH ST JOSEPH HOSPITAL WEST	695316.96	4297283.00	533.89	10.0	1100.0	23.333	0.5		1.02E+00	0.00E+00
SSTC48	DEFAULT	SSM HEALTH ST JOSEPH HOSPITAL WEST	695184.96	4297283.00	533.89	66.0	200.0	0.003	3.0		1.50E-05	1.50E-05
SSTC57	DEFAULT	BLASTCO INC	690213.84	4297755.73	543.44	20.0	0.0	0.000	0.5		3.96E-04	3.96E-04
SSTC63	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	30.0	65.0	19.499	1.5		4.20E-03	4.20E-03
SSTC64	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	17.0	450.0	27.631	1.3		4.09E-03	4.09E-03
SSTC65	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	20.0	0.0	0.000	0.5		4.10E-03	4.10E-03
SSTC66	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	33.0	77.0	33.015	1.5		1.56E-03	1.56E-03
SSTC67	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	33.0	77.0	33.015	1.5		8.40E-04	8.40E-04
SSTC68	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	33.0	450.0	89.416	1.5		1.44E-03	1.44E-03
SSTC69	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	30.0	400.0	29.706	1.0		1.74E-03	1.74E-03
SSTC70	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	30.0	450.0	24.803	1.2		4.68E-03	4.68E-03
SSTC71	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	28.0	475.0	1.667	0.5		0.00E+00	0.00E+00
SSTC72	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	28.0	450.0	27.500	2.3		0.00E+00	0.00E+00
SSTC73	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	10.0	1100.0	23.333	0.5		3.07E+00	0.00E+00
SSTC87	DEFAULT	HANSEN'S TREE SERVICE O'FALLON	697357.18	4298189.47	585.40	20.0	0.0	0.000	0.5	2.10E-02	8.31E-04	8.31E-04
SSTC88	DEFAULT	HANSEN'S TREE SERVICE O'FALLON	697357.18	4298189.47	585.40	20.0	0.0	0.000	0.5	3.14E-02	1.73E-04	1.73E-04

R005494

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lbs/hr) CO	SOx	SO2 (1-hour)
SSTC89	DEFAULT	HANSEN'S TREE SERVICE O'FALLON	697357.18	4298189.47	585.40	20.0	0.0	0.000	0.5	1.20E+00	3.65E-01	3.65E-01
SSTC98	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	3.87E-01	2.76E-03	2.76E-03
SSTC99	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	3.87E-01	2.76E-03	2.76E-03
SSTC100	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	3.87E-01	2.76E-03	2.76E-03
SSTC101	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	3.87E-01	2.76E-03	2.76E-03
SSTC102	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTC103	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTC104	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTC105	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTC106	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTC107	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTL1	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	250.0	326.0	101.627	11.0		2.28E-02	2.28E-02
SSTL2	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	250.0	326.0	101.627	11.0		2.20E-02	2.20E-02
SSTL3	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	350.0	345.0	135.400	14.0		2.97E+02	2.97E+02
SSTL4	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	350.0	374.0	123.284	16.0		4.69E+02	4.69E+02
SSTL5	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	40.0	647.0	38.100	1.0		5.46E-03	5.46E-03
SSTL6	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		4.55E-01	4.55E-01
SSTL7	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		1.96E+00	1.96E+00
SSTL8	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		4.55E-01	4.55E-01
SSTL9	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		2.01E-02	2.01E-02
SSTL10	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		4.55E-01	4.55E-01
SSTL11	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		1.10E-02	1.10E-02
SSTL14	DEFAULT	MISSOURI BAPTIST MEDICAL CENTER NORTH BALLAS	722244.75	4279363.47	652.56	98.0	440.0	9.432	4.5	9.84E-01	1.42E+00	1.42E+00
SSTL15	DEFAULT	MISSOURI BAPTIST MEDICAL CENTER NORTH BALLAS	722244.75	4279363.47	652.56	99.0	440.0	9.432	4.5	1.06E-02	7.55E-05	7.55E-05
SSTL16	DEFAULT	MISSOURI BAPTIST MEDICAL CENTER NORTH BALLAS	722244.75	4279363.47	652.56	30.0	1100.0	23.333	0.5	5.03E+00	1.53E+00	0.00E+00
SSTL17	DEFAULT	MISSOURI BAPTIST MEDICAL CENTER NORTH BALLAS	722244.75	4279363.47	652.56	104.0	450.0	7.172	1.2	2.91E+00	4.19E+00	4.19E+00
SSTL18	DEFAULT	MISSOURI BAPTIST MEDICAL CENTER NORTH BALLAS	722244.75	4279363.47	652.56	104.0	450.0	7.172	1.2	9.59E-02	6.85E-04	6.85E-04
SSTL19	DEFAULT	MONSANTO WORLD HEADQUARTERS LINDBERGH BLVD	726250.11	4283348.63	691.57	40.0	315.0	30.098	4.0		2.95E-05	2.95E-05
SSTL20	DEFAULT	MONSANTO WORLD HEADQUARTERS LINDBERGH BLVD	726250.11	4283348.63	691.57	40.0	315.0	30.098	4.0		2.24E-02	2.24E-02
SSTL21	DEFAULT	MONSANTO WORLD HEADQUARTERS LINDBERGH BLVD	726250.11	4283348.63	691.57	10.0	1100.0	23.333	0.5		1.06E+00	0.00E+00
SSTL22	DEFAULT	MONSANTO WORLD HEADQUARTERS LINDBERGH BLVD	726250.11	4283348.63	691.57	10.0	1100.0	23.333	0.5		5.74E-04	0.00E+00
SSTL23	DEFAULT	U. S. SILICA COMPANY PACIFIC	698244.91	4262010.04	471.16	80.0	150.0	50.000	3.0		2.57E+01	2.57E+01
SSTL24	DEFAULT	U. S. SILICA COMPANY PACIFIC	698244.91	4262010.04	471.16	80.0	150.0	50.000	3.0		6.69E-03	6.69E-03
SSTL25	DEFAULT	U. S. SILICA COMPANY PACIFIC	698244.91	4262010.04	471.16	80.0	150.0	50.000	3.0		2.66E-02	2.66E-02
SSTL26	DEFAULT	U. S. SILICA COMPANY PACIFIC	698244.91	4262010.04	471.16	110.0	70.0	0.003	2.7		1.39E-02	1.39E-02
SSTL27	DEFAULT	ST. JOHNS MERCY MEDICAL CNTR/MAINTENANCE NEW BALLAS RD	722224.73	4280414.44	627.87	30.0	400.0	4.951	4.0		1.11E+01	1.11E+01
SSTL28	DEFAULT	ST. JOHNS MERCY MEDICAL CNTR/MAINTENANCE NEW BALLAS RD	722224.73	4280414.44	627.82	30.0	400.0	4.951	4.0		1.95E-02	1.95E-02
SSTL29	DEFAULT	MONSANTO CHESTERFIELD VILLAGE	712608.90	4282124.50	590.78	159.0	300.0	32.667	4.8		3.08E-05	3.08E-05
SSTL30	DEFAULT	MONSANTO CHESTERFIELD VILLAGE	712608.90	4282124.50	590.78	159.0	300.0	32.667	4.8		2.36E-02	2.36E-02
SSTL31	DEFAULT	MONSANTO CHESTERFIELD VILLAGE	712608.90	4282124.50	590.78	10.0	1100.0	23.333	0.5		4.34E-01	0.00E+00
SSTL32	DEFAULT	MONSANTO CHESTERFIELD VILLAGE	712608.90	4282124.50	590.78	10.0	1100.0	23.333	0.5		4.04E-03	0.00E+00
SSTL33	DEFAULT	MONSANTO CHESTERFIELD VILLAGE	712608.90	4282124.50	590.78	10.0	1100.0	23.333	0.5		3.77E+00	0.00E+00
SSTL37	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	175.0	350.0	4.849	9.0	0.00E+00	0.00E+00	0.00E+00
SSTL38	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	175.0	350.0	4.849	9.0	2.24E+00	1.60E-02	1.60E-02
SSTL39	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	21.0	475.0	9.616	1.2	0.00E+00	0.00E+00	0.00E+00
SSTL40	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	21.0	475.0	9.616	1.2	6.04E-01	4.31E-03	4.31E-03
SSTL41	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	10.0	1100.0	23.333	0.5	1.29E+01	2.34E-03	0.00E+00
SSTL42	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	10.0	1100.0	23.333	0.5	2.12E+01	3.78E-03	0.00E+00
SSTL43	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	10.0	1100.0	23.333	0.5	1.59E+01	4.87E+00	0.00E+00
SSTL44	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	55.0	316.0	84.150	0.7	9.13E-02	2.37E+01	2.37E+01
SSTL45	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	55.0	316.0	84.150	0.7	9.02E-02	4.11E+01	4.11E+01
SSTL46	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	55.0	316.0	84.150	0.7	1.05E-01	1.48E+01	1.48E+01
SSTL47	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	55.0	316.0	84.150	0.7	2.86E-01	2.62E+01	2.62E+01
SSTL48	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	55.0	316.0	84.150	0.7		2.04E-03	2.04E-03
SSTL66	DEFAULT	MISSOURI ASPHALT PRODUCTS, LLC WEST LAKE QUARRY MATERIAL CO	721914.39	4294042.31	462.50	20.0	230.5	31.309	5.1		3.27E-01	3.27E-01

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
SSTL70	DEFAULT	FRED WEBER, INC. ANTIRE	711291.07	4284547.49	448.49	30.0	250.0	58.950	4.0		1.27E+00	1.27E+00
SSTL76	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	45.0	400.0	44.167	2.5	5.58E+00	8.24E+00	8.24E+00
SSTL77	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	45.0	400.0	44.167	2.5	1.38E+00	9.87E-03	9.87E-03
SSTL78	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	38.0	400.0	25.968	2.0	3.02E+00	4.47E+00	4.47E+00
SSTL79	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	38.0	400.0	25.968	2.0	1.06E+00	7.57E-03	7.57E-03
SSTL80	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	50.0	461.0	14.616	3.0	2.95E+00	4.36E+00	4.36E+00
SSTL81	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	50.0	461.0	14.616	3.0	7.02E-01	5.01E-03	5.01E-03
SSTL82	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	1.0	100.0	12.733	0.1	1.66E+00	1.19E-02	1.19E-02
SSTL83	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	15.0	955.0	19.800	0.7	2.52E+01	4.49E-02	0.00E+00
SSTL84	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	7.0	960.0	113.182	0.8	2.50E+01	7.63E+00	0.00E+00
SSTL85	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	30.0	965.0	31.234	5.0	2.03E-01	1.04E-02	1.04E-02
SSTL86	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	17.0	72.0	29.882	2.8		5.58E-03	5.58E-03
SSTL88	DEFAULT	CHAMP LANDFILL COMPANY LLC	720845.43	4291144.98	571.46	28.0	1400.0	25.466	1.0		1.01E+00	1.01E+00
SSTL89	DEFAULT	CHAMP LANDFILL COMPANY LLC	720845.43	4291144.98	571.46	38.3	1400.0	21.568	12.0		7.77E-01	7.77E-01
SSTL90	DEFAULT	CHAMP LANDFILL COMPANY LLC	720845.43	4291144.98	571.46	38.0	1400.0	21.568	12.0		6.35E-01	6.35E-01
SSTL92	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	40.0	1200.0	61.381	1.1		1.86E-02	1.86E-02
SSTL93	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	40.0	1200.0	61.381	1.1		6.98E-02	6.98E-02
SSTL94	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	45.0	1200.0	50.226	1.3		1.70E+01	1.70E+01
SSTL95	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	45.0	1200.0	50.226	1.3		5.43E+01	5.43E+01
SSTL96	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	35.0	1200.0	53.051	1.0		1.22E-01	1.22E-01
SSTL97	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	584.0	1450.0	21.923	4.7		1.08E-03	1.08E-03
SSTL98	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	584.0	1450.0	21.923	4.7		1.07E-03	1.07E-03
SSTL100	DEFAULT	SSM HEALTH ST MARYS HOSPITAL	734075.92	4279544.88	601.67	17.2	500.0	25.000	3.0		9.06E+00	9.06E+00
SSTL101	DEFAULT	SSM HEALTH ST MARYS HOSPITAL	734075.92	4279544.88	601.67	17.2	500.0	25.000	3.0		7.14E-03	7.14E-03
SSTL102	DEFAULT	SSM HEALTH ST MARYS HOSPITAL	734075.92	4279544.88	601.67	130.0	1008.0	53.156	1.0		2.56E+00	0.00E+00
SSTL106	DEFAULT	SSM HEALTH DEPAUL HOSPITAL - ST. LOUIS BRIDGETON	723046.72	4292134.06	542.16	45.0	450.0	21.932	3.0		6.63E-02	6.63E-02
SSTL107	DEFAULT	SSM HEALTH DEPAUL HOSPITAL - ST. LOUIS BRIDGETON	723046.72	4292134.06	542.16	45.0	450.0	21.932	3.0		1.15E-02	1.15E-02
SSTL108	DEFAULT	SSM HEALTH DEPAUL HOSPITAL - ST. LOUIS BRIDGETON	723046.72	4292134.06	542.16	12.0	900.0	38.100	1.2		8.33E+00	0.00E+00
SSTL109	DEFAULT	SSM HEALTH DEPAUL HOSPITAL - ST. LOUIS BRIDGETON	723046.72	4292134.06	542.16	45.0	450.0	21.932	3.0		1.37E-03	1.37E-03
SSTL111	DEFAULT	VETERANS ADMIN MEDICAL CENTER JEFFERSON BARRACKS DRIVE	736944.98	4264089.51	508.83	45.0	425.0	1.667	2.0	3.02E+00	4.35E+00	4.35E+00
SSTL112	DEFAULT	VETERANS ADMIN MEDICAL CENTER JEFFERSON BARRACKS DRIVE	736944.98	4264089.51	508.83	45.0	425.0	1.667	2.0	4.17E-01	2.98E-03	2.98E-03
SSTL113	DEFAULT	VETERANS ADMIN MEDICAL CENTER JEFFERSON BARRACKS DRIVE	736944.98	4264089.51	508.83	45.0	425.0	1.667	2.0	4.40E-03	6.49E-03	6.49E-03
SSTL114	DEFAULT	VETERANS ADMIN MEDICAL CENTER JEFFERSON BARRACKS DRIVE	736944.98	4264089.51	508.83	45.0	425.0	1.667	2.0	6.81E-01	4.86E-03	4.86E-03
SSTL115	DEFAULT	VETERANS ADMIN MEDICAL CENTER JEFFERSON BARRACKS DRIVE	736944.98	4264089.51	508.83	10.0	1100.0	23.333	0.5	1.02E+02	3.11E+01	0.00E+00
SSTL116	DEFAULT	CHRISTIAN HOSPITAL NORTHEAST DUNN ROAD	739738.60	4285554.78	565.65	35.0	270.0	10.000	4.0	1.43E-01	6.26E-03	6.26E-03
SSTL117	DEFAULT	CHRISTIAN HOSPITAL NORTHEAST DUNN ROAD	739738.60	4285554.78	565.65	35.0	270.0	10.000	4.0	9.17E-01	6.55E-03	6.55E-03
SSTL118	DEFAULT	CHRISTIAN HOSPITAL NORTHEAST DUNN ROAD	739738.60	4285554.78	565.65	15.0	-459.7	0.003	1.0	3.28E+01	3.00E-01	0.00E+00
SSTL120	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	15.0	65.0	7.165	2.2		3.20E-03	3.20E-03
SSTL121	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	16.0	75.0	26.949	1.1		8.96E-03	8.96E-03
SSTL122	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	29.0	600.0	14.167	2.5		4.83E-01	4.83E-01
SSTL123	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	30.0	365.0	12.001	1.2		4.48E-01	4.48E-01
SSTL124	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	29.0	360.0	25.499	0.7		1.63E-01	1.63E-01
SSTL126	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	20.0	0.0	0.000	0.5		1.23E-02	1.23E-02
SSTL127	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4269850.38	422.90	30.0	650.0	11.998	1.3		3.60E-03	3.60E-03
SSTL128	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4269850.38	422.90	30.0	650.0	11.998	1.3		1.79E+01	1.79E+01
SSTL129	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4269850.38	422.90	26.0	650.0	13.264	2.0		2.26E-03	2.26E-03
SSTL130	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4269850.38	422.90	26.0	650.0	13.264	2.0		1.44E+01	1.44E+01
SSTL131	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4269850.38	422.90	54.0	1800.0	17.218	2.3		1.21E-03	1.21E-03
SSTL132	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4269850.38	422.90	10.0	1100.0	23.333	0.5		9.83E-01	9.83E-01
SSTL133	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4269850.38	422.90	10.0	1100.0	23.333	0.5		9.83E-01	9.83E-01
SSTL141	DEFAULT	ST. ANTHONY'S MEDICAL CENTER KENNERLY ROAD	728489.70	4265428.04	633.14	25.0	495.0	4.068	2.5		3.40E+00	3.40E+00
SSTL142	DEFAULT	ST. ANTHONY'S MEDICAL CENTER KENNERLY ROAD	728489.70	4265428.04	633.14	25.0	495.0	4.068	2.5		8.76E-04	8.76E-04
SSTL143	DEFAULT	ST. ANTHONY'S MEDICAL CENTER KENNERLY ROAD	728489.70	4265428.04	633.14	30.0	450.0	0.003	1.5		5.59E-04	5.59E-04
SSTL144	DEFAULT	ST. ANTHONY'S MEDICAL CENTER KENNERLY ROAD	728489.70	4265428.04	633.14	10.0	1100.0	23.333	0.5		4.66E-02	0.00E+00
SSTL147	DEFAULT	MSD, MISSOURI RIVER WWTP MO RIVER WASTERWATER TREATMENT PLANT	718333.79	4290583.38	444.32	25.0	550.0	1.181	0.7	9.18E-01	8.00E-01	8.00E-01

R005496

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
SSTL148	DEFAULT	MSD, MISSOURI RIVER WWTP MO RIVER WASTERWATER TREATMENT PLANT	718333.79	4290583.38	444.32	25.0	550.0	1.351	0.7	1.58E+00	5.47E-03	5.47E-03
SSTL149	DEFAULT	MSD, MISSOURI RIVER WWTP MO RIVER WASTERWATER TREATMENT PLANT	718333.79	4290583.38	444.32	15.2	446.0	19.393	1.7	4.42E-01	2.28E-01	2.28E-01
SSTL150	DEFAULT	MSD, MISSOURI RIVER WWTP MO RIVER WASTERWATER TREATMENT PLANT	718333.79	4290583.38	444.32	15.2	446.0	19.393	1.7	9.14E-02	4.81E-03	4.81E-03
SSTL151	DEFAULT	MSD, MISSOURI RIVER WWTP MO RIVER WASTERWATER TREATMENT PLANT	718333.79	4290583.38	444.32	16.0	77.0	4.774	2.0	2.46E+00	4.74E-01	4.74E-01
SSTL152	DEFAULT	SIMPSON CONSTRUCTION MATERIALS LLC VALLEY PARK	715996.20	4268469.87	430.05	42.0	300.0	33.494	4.3	2.49E+01	5.49E+00	5.49E+00
SSTL153	DEFAULT	SIMPSON CONSTRUCTION MATERIALS LLC VALLEY PARK	715996.20	4268469.87	430.05	26.7	400.0	26.785	0.8	3.84E-03	1.20E-04	1.20E-04
SSTL154	DEFAULT	SIMPSON CONSTRUCTION MATERIALS LLC VALLEY PARK	715996.20	4268469.87	430.05	26.7	400.0	26.785	0.8	4.60E-02	1.44E-03	1.44E-03
SSTL162	DEFAULT	MACLAN INDUSTRIES	742056.49	4291436.78	495.44	14.0	190.0	0.003	0.2		2.29E-01	2.29E-01
SSTL165	DEFAULT	MISSOURI AMERICAN WATER-CENTRAL PLANT CHESTERFIELD	715427.34	4284896.78	451.44	22.0	871.0	24.016	0.8		1.02E-01	1.02E-01
SSTL166	DEFAULT	MISSOURI AMERICAN WATER-CENTRAL PLANT CHESTERFIELD	715427.34	4284896.78	451.44	10.0	871.0	24.016	0.8		2.38E-01	2.38E-01
SSTL169	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	20.0	0.0	0.000	0.5	1.79E-01	1.28E-03	1.28E-03
SSTL170	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	25.0	-459.7	0.003	0.8	3.83E+01	3.69E-03	3.69E-03
SSTL171	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	18.0	-459.7	0.003	4.0	1.61E+00	6.69E-02	6.69E-02
SSTL172	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	15.0	-459.7	0.003	2.0	1.20E-02	8.60E-05	8.60E-05
SSTL173	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	16.0	-459.7	0.003	0.5	9.34E-01	2.85E-01	2.85E-01
SSTL174	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	20.0	0.0	0.000	0.5	4.62E-03	3.30E-05	3.30E-05
SSTL175	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	20.0	0.0	0.000	0.5	4.62E-03	3.30E-05	3.30E-05
SSTL196	DEFAULT	FRED WEBER, INC. FT. BELLE	739499.97	4302900.33	443.27	7.7	25.0	11.788	0.9	3.02E+00	1.28E-01	1.28E-01
SSTL199	DEFAULT	A.G. RECYCLING	734844.18	4284158.21	525.43	10.0	1100.0	28.333	0.5		1.59E-01	1.59E-01
SSTL200	DEFAULT	A.G. RECYCLING	734844.18	4284158.21	525.43	10.0	1100.0	28.333	0.5		7.25E-01	7.25E-01
SSTL209	DEFAULT	MISSOURI-AMERICAN WATER CO FLORISSANT	728894.88	4300010.04	461.78	15.0	896.0	0.000	14.0		9.51E+00	9.51E+00
SSTL214	DEFAULT	THE HARPER COMPANY	731184.95	4292013.86	588.35	10.0	1100.0	28.333	0.5		2.75E-01	0.00E+00
SCITY1	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	225.0	330.0	21.217	10.0		2.38E-02	2.38E-02
SCITY2	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	100.0	350.0	47.149	3.0		5.80E-02	5.80E-02
SCITY3	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	225.0	350.0	18.468	10.0		1.67E+01	1.67E+01
SCITY4	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	225.0	350.0	18.468	10.0		1.78E-02	1.78E-02
SCITY5	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	225.0	350.0	18.468	10.0		2.53E+01	2.53E+01
SCITY6	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	225.0	350.0	18.468	10.0		2.15E-02	2.15E-02
SCITY7	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	135.0	950.0	19.367	1.5		1.75E+01	1.75E+01
SCITY8	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	20.0	50.0	70.000	1.0		1.69E+00	1.69E+00
SCITY9	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	70.0	200.0	0.003	5.5	1.93E+00	9.51E-03	9.51E-03
SCITY10	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	70.0	200.0	0.003	5.5	2.13E+00	1.52E-02	1.52E-02
SCITY11	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	100.0	145.0	62.500	4.5	2.53E+00	1.81E-02	1.81E-02
SCITY12	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	100.0	145.0	62.500	4.5	3.20E-01	2.29E-03	2.29E-03
SCITY13	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	12.0	200.0	0.335	1.0	3.77E+00	1.15E+00	0.00E+00
SCITY14	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	45.0	150.0	50.400	2.0	3.55E-02	1.07E-03	1.07E-03
SCITY15	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	45.0	150.0	50.400	2.0	3.07E-02	9.22E-04	9.22E-04
SCITY16	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	45.0	150.0	69.751	1.7	3.07E-02	9.22E-04	9.22E-04
SCITY17	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	16.0	77.0	24.600	0.2		1.41E-03	1.41E-03
SCITY18	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.0	800.0	0.335	0.5	1.63E-01	4.98E-02	0.00E+00
SCITY22	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	20.0	0.0	0.000	0.5	5.72E-03	1.72E-04	1.72E-04
SCITY23	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	10.0	1100.0	28.333	0.5	6.00E-02	1.83E-02	0.00E+00
SCITY24	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	10.0	785.0	42.283	0.3	2.31E+00	6.44E-01	0.00E+00
SCITY25	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	10.0	785.0	42.283	0.3	8.12E-03	4.79E-03	0.00E+00
SCITY26	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	10.0	1100.0	28.333	0.5	1.73E-02	5.29E-03	0.00E+00
SCITY27	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	42.0	77.0	3.734	0.2	4.35E-02	1.33E-02	0.00E+00
SCITY28	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	20.0	200.0	0.335	1.0	1.98E-01	6.04E-02	0.00E+00
SCITY29	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.0	800.0	0.335	0.5	1.07E-01	3.27E-02	0.00E+00
SCITY30	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.0	800.0	0.335	0.5	1.09E-04	3.32E-05	0.00E+00
SCITY31	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	22.0	212.0	1.296	1.0	5.28E-01	1.61E-01	0.00E+00
SCITY32	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	90.0	77.0	33.215	2.2	1.09E-04	3.32E-05	0.00E+00
SCITY33	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	10.0	1100.0	28.333	0.5	3.68E-02	1.12E-02	0.00E+00
SCITY34	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.0	800.0	0.335	0.5	1.98E-01	6.04E-02	0.00E+00
SCITY48	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	111.0	300.0	72.900	4.0		2.58E-01	2.58E-01
SCITY49	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	111.0	300.0	72.900	4.0		2.42E-02	2.42E-02

R005497

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SO2	SO2 (1-hour)
SCITY50	DEFAULT	ASHLEY ENERGY LLC	745821.30	4280225.01	423.00	115.0	300.0	72.800	4.0		1.20E+00	1.20E+00
SCITY51	DEFAULT	ASHLEY ENERGY LLC	745821.30	4280225.01	423.00	115.0	300.0	72.800	4.0		1.51E-01	1.51E-01
SCITY52	DEFAULT	ASHLEY ENERGY LLC	745821.30	4280225.01	423.00	115.0	280.0	41.099	5.0		1.17E+00	1.17E+00
SCITY53	DEFAULT	ASHLEY ENERGY LLC	745821.30	4280225.01	423.00	115.0	280.0	41.099	5.0		6.91E-03	6.91E-03
SCITY54	DEFAULT	ASHLEY ENERGY LLC	745821.30	4280225.01	423.00	115.0	280.0	41.099	5.0		1.17E+00	1.17E+00
SCITY55	DEFAULT	ASHLEY ENERGY LLC	745821.30	4280225.01	423.00	115.0	280.0	41.099	5.0		7.87E-03	7.87E-03
SCITY56	DEFAULT	ASHLEY ENERGY LLC	745821.30	4280225.01	423.00	30.0	975.0	237.684	0.8		3.10E-02	0.00E+00
SCITY57	DEFAULT	ASHLEY ENERGY LLC	745821.30	4280225.01	423.00	165.0	250.0	34.101	4.0		2.59E+01	2.59E+01
SCITY58	DEFAULT	ASHLEY ENERGY LLC	745821.30	4280225.01	423.00	165.0	250.0	34.101	4.0		5.09E+00	5.09E+00
SCITY59	DEFAULT	ASHLEY ENERGY LLC	745821.30	4280225.01	423.00	165.0	250.0	34.101	4.0		3.48E-02	3.48E-02
SCITY60	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.97E-01	3.97E-01	3.97E-01
SCITY61	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.97E-01	5.32E-02	5.32E-02
SCITY62	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.00E+00	4.43E+00	4.43E+00
SCITY63	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.30E-03	2.36E-02	2.36E-02
SCITY64	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.00E+00	4.43E+00	4.43E+00
SCITY65	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.20E+00	2.29E-02	2.29E-02
SCITY66	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	30.0	0.0	0.000	0.5	4.42E+01	1.33E+00	1.33E+00
SCITY67	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	60.0	316.0	63.035	3.0	6.13E+00	4.64E+00	4.64E+00
SCITY68	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	60.0	316.0	63.035	3.0	6.11E-01	5.15E-03	5.15E-03
SCITY69	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.04E+00	4.48E+00	4.48E+00
SCITY70	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	1.14E+00	8.17E-03	8.17E-03
SCITY71	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	10.0	1100.0	23.333	0.5	2.98E-03	4.70E-07	0.00E+00
SCITY72	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	10.0	1100.0	23.333	0.5	7.05E+00	2.15E+00	0.00E+00
SCITY83	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	430.0	35.000	2.0		1.14E-04	1.14E-04
SCITY84	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	430.0	35.000	2.0		4.07E-03	4.07E-03
SCITY85	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	430.0	35.000	2.0		8.40E-03	8.40E-03
SCITY86	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	280.0	35.000	2.0		1.14E+00	1.14E+00
SCITY87	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	280.0	35.000	2.0		4.07E-03	4.07E-03
SCITY88	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	280.0	35.000	2.0		1.14E+00	1.14E+00
SCITY89	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	280.0	35.000	2.0		4.07E-03	4.07E-03
SCITY90	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	10.0	1100.0	23.333	0.5		2.47E+00	0.00E+00
SCITY110	DEFAULT	KCI SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	32.0	120.0	15.453	2.0		2.03E-02	2.03E-02
SCITY111	DEFAULT	KCI SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	482.0	280.0	9.452	3.0		5.70E-03	5.70E-03
SCITY112	DEFAULT	KCI SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	55.0	400.0	13.922	4.0		6.81E+01	6.81E+01
SCITY113	DEFAULT	KCI SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	58.0	480.0	15.922	4.0		3.75E-02	3.75E-02
SCITY114	DEFAULT	KCI SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	45.0	122.0	151.818	2.0		1.14E-02	1.14E-02
SCITY115	DEFAULT	KCI SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	80.0	171.0	69.662	2.0		5.14E-03	5.14E-03
SCITY116	DEFAULT	KCI SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	78.0	176.0	88.484	1.2		1.43E-03	1.43E-03
SCITY117	DEFAULT	KCI SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	10.0	1100.0	23.333	0.5		1.91E-05	1.91E-05
SCITY121	DEFAULT	KCI SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	47.0	340.0	37.778	4.0		9.43E+01	9.43E+01
SCITY122	DEFAULT	KCI SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	42.0	340.0	37.778	4.0		5.31E-02	5.31E-02
SCITY123	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	55.0	700.0	14.738	1.2		6.41E+00	6.41E+00
SCITY124	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	55.0	700.0	14.738	1.2		7.35E-03	7.35E-03
SCITY125	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	55.0	700.0	14.738	1.2		1.86E-02	1.86E-02
SCITY126	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	55.0	700.0	14.738	1.2		5.89E-04	5.89E-04
SCITY127	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	30.0	140.0	8.125	2.0		1.44E-03	1.44E-03
SCITY128	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	15.4	752.2	32.451	1.0		7.85E-03	0.00E+00
SCITY129	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	84.0	1700.0	4.865	3.0		3.72E-02	3.72E-02
SCITY132	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	84.0	1700.0	6.916	3.3		1.72E-02	1.72E-02
SCITY133	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	84.0	1700.0	38.601	2.0		3.72E-03	3.72E-03
SCITY136	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	84.0	1800.0	8.301	3.7		8.58E-03	8.58E-03
SCITY137	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	42.0	1700.0	4.665	2.0		3.72E-03	3.72E-03
SCITY140	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	44.0	200.0	47.149	3.0		5.82E-03	5.82E-03
SCITY141	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	44.0	200.0	47.149	3.0		5.82E-03	5.82E-03
SCITY142	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	34.0	200.0	39.649	2.3		5.16E-03	5.16E-03

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
SCITY142	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	33.0	300.0	20.551	2.2		1.98E-03	1.98E-03
SCITY144	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	33.0	300.0	20.551	2.2		1.98E-03	1.98E-03
SCITY145	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	33.0	300.0	20.551	2.2		1.98E-03	1.98E-03
SCITY146	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	33.0	300.0	20.551	2.2		1.98E-03	1.98E-03
SCITY147	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	25.0	300.0	14.865	2.0		1.14E-02	1.14E-02
SCITY148	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	20.0	0.0	0.000	0.5		3.30E-03	3.30E-03
SCITY149	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	37.0	600.0	38.983	1.2		1.98E-03	1.98E-03
SCITY156	DEFAULT	ST. ALEXIUS HOSPITAL JEFFERSON CAMPUS	741441.37	4274961.73	544.65	115.0	210.0	38.885	5.0		1.19E-02	1.19E-02
SCITY157	DEFAULT	ST. ALEXIUS HOSPITAL JEFFERSON CAMPUS	741441.37	4274961.73	544.65	115.0	210.0	38.885	5.0		1.20E-02	1.20E-02
SCITY158	DEFAULT	ST. ALEXIUS HOSPITAL JEFFERSON CAMPUS	741441.37	4274961.73	544.65	115.0	210.0	38.885	5.0		1.19E-02	1.19E-02
SCITY159	DEFAULT	ST. ALEXIUS HOSPITAL JEFFERSON CAMPUS	741441.37	4274961.73	544.65	14.0	400.0	60.200	0.5		7.80E-01	0.00E+00
SCITY160	DEFAULT	ST. ALEXIUS HOSPITAL JEFFERSON CAMPUS	741441.37	4274961.73	544.65	12.6	200.0	203.400	0.5		7.80E-01	0.00E+00
SCITY162	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	210.0	260.0	17.733	2.8	2.69E+00	1.16E-01	1.16E-01
SCITY163	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	210.0	260.0	17.733	2.8	6.20E+00	4.43E-02	4.43E-02
SCITY164	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	4.20E+00	9.30E-03	0.00E+00
SCITY165	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	4.18E+00	9.20E-03	0.00E+00
SCITY166	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	3.77E+00	8.30E-03	0.00E+00
SCITY167	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	4.12E+00	9.10E-03	0.00E+00
SCITY168	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	4.01E+00	3.23E+00	0.00E+00
SCITY169	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	8.15E+00	1.80E-02	0.00E+00
SCITY170	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	4.90E+00	1.08E-02	0.00E+00
SCITY171	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	8.52E+00	1.88E-02	0.00E+00
SCITY172	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	184.2	400.0	1.949	5.5	4.71E+00	2.04E-01	2.04E-01
SCITY173	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	184.2	400.0	1.949	5.5	1.09E+01	7.76E-02	7.76E-02
SCITY174	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	184.2	400.0	1.949	5.5	2.50E+00	1.08E-01	1.08E-01
SCITY175	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	184.2	400.0	1.949	5.5	6.01E+00	4.29E-02	4.29E-02
SCITY176	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	6.24E+00	1.38E-02	0.00E+00
SCITY177	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	5.17E+00	1.14E-02	0.00E+00
SCITY178	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	9.14E+00	2.02E-02	0.00E+00
SCITY179	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	2.31E+00	9.84E-01	0.00E+00
SCITY180	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	3.88E+00	8.40E-03	0.00E+00
SCITY181	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	2.29E-01	3.53E-03	3.53E-03
SCITY183	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	2.29E-01	2.41E-03	2.41E-03
SCITY185	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	8.24E-02	5.89E-04	5.89E-04
SCITY187	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	2.36E-01	1.69E-03	1.69E-03
SCITY189	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	1.37E+00	4.86E-01	0.00E+00
SCITY190	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	247.0	190.0	20.417	1.2	5.35E-02	2.31E-03	2.31E-03
SCITY191	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	247.0	190.0	20.417	1.2	5.00E-01	3.57E-03	3.57E-03
SCITY192	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	3.69E+01	6.78E-02	0.00E+00
SCITY193	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	8.48E+00	1.56E-02	0.00E+00
SCITY194	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	2.09E+01	4.41E-02	0.00E+00
SCITY227	DEFAULT	INDUSTRIAL CONTAINER SERVICES - MO, LLC MANCHESTER	737686.12	4278652.89	459.06	20.0	250.0	18.068	1.0		2.54E-03	2.54E-03
SCITY228	DEFAULT	INDUSTRIAL CONTAINER SERVICES - MO, LLC MANCHESTER	737686.12	4278652.89	459.06	20.0	150.0	22.218	1.0		1.20E+00	1.20E+00
SCITY229	DEFAULT	INDUSTRIAL CONTAINER SERVICES - MO, LLC MANCHESTER	737686.12	4278652.89	459.06	25.0	0.0	0.000	1.0		2.19E-04	2.19E-04
SCITY242	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	60.0	250.0	71.667	1.7		2.39E-03	2.39E-03
SCITY243	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	60.0	400.0	18.833	1.5		4.37E-03	4.37E-03
SCITY244	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	20.0	0.0	0.000	0.5		1.37E-04	1.37E-04
SCITY245	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	55.0	750.0	11.168	4.3		8.16E-03	8.16E-03
SCITY246	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	43.0	500.0	7.467	2.5		7.33E-05	7.33E-05
SCITY247	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	20.0	0.0	0.000	0.5		3.46E-04	3.46E-04
SCITY248	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	36.0	375.0	1.716	2.0		2.48E-03	2.48E-03
SCITY266	DEFAULT	HUMANE SOCIETY OF MISSOURI ST. LOUIS - MACKLIND AVE	737162.32	4278817.40	474.08	24.0	1139.0	15.515	1.7		1.10E-02	1.10E-02
SCITY267	DEFAULT	HUMANE SOCIETY OF MISSOURI ST. LOUIS - MACKLIND AVE	737162.32	4278817.40	474.08	28.0	1800.0	15.584	2.0		6.76E-01	6.76E-01
SCITY275	DEFAULT	ALSCO, INC ST. LOUIS	743334.17	4275818.28	427.92	10.0	1100.0	23.333	0.5		2.33E+01	2.33E+01
SCITY276	DEFAULT	ALSCO, INC ST. LOUIS	743334.17	4275818.28	427.92	10.0	1100.0	23.333	0.5		4.99E-03	4.99E-03

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	NO2 (1-hour)
SCITY277	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	25.5	800.0	0.003	0.5	7.31E-01	1.75E-05	0.00E+00
SCITY278	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	30.5	250.0	0.003	1.3	3.05E-01	1.28E-04	1.28E-04
SCITY279	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	30.5	250.0	0.003	1.3	6.87E-01	4.91E-03	4.91E-03
SCITY280	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	30.5	250.0	0.003	1.3	3.05E-02	1.28E-05	1.28E-05
SCITY281	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	30.5	250.0	0.003	1.3	6.88E-01	4.92E-03	4.92E-03
SCITY282	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	22.0	250.0	0.003	1.0	1.22E-01	5.27E-03	5.27E-03
SCITY283	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	22.0	250.0	0.003	1.0	2.73E-01	1.05E-03	1.95E-03
SCITY284	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	22.0	250.0	0.003	2.0	6.19E-01	2.56E-04	2.56E-04
SCITY285	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	22.5	250.0	0.003	2.0	1.38E+00	9.84E-03	9.84E-03
SCITY286	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	20.5	800.0	0.003	1.5	6.83E-01	1.53E-05	0.00E+00
SCITY287	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	20.5	800.0	0.003	1.5	7.84E+00	1.88E-04	0.00E+00
SCITY288	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	20.5	800.0	0.003	1.5	7.84E+00	1.38E-04	0.00E+00
SCITY289	DEFAULT	ARTCO ST. LOUIS-AMERICAN RIVER TRANS CO ST. LOUIS	741227.54	4273049.76	423.52	28.0	400.0	50.535	2.0		2.28E-03	2.28E-03
SCITY290	DEFAULT	ARTCO ST. LOUIS-AMERICAN RIVER TRANS CO ST. LOUIS	741227.54	4273049.76	423.52	28.0	400.0	50.535	2.0		2.91E+01	2.91E+01
SCITY291	DEFAULT	ARTCO ST. LOUIS-AMERICAN RIVER TRANS CO ST. LOUIS	741227.54	4273049.76	423.52	28.0	400.0	50.535	2.0		1.63E-03	1.63E-03
SCITY292	DEFAULT	SOUTHERN METAL PROCESSING	739807.53	4271091.77	426.02	31.0	1590.0	19.255	2.5		1.28E+01	1.28E+01
SCITY293	DEFAULT	SOUTHERN METAL PROCESSING	739807.53	4271091.77	426.02	31.0	1590.0	19.255	2.5		3.47E+00	3.47E+00
SCITY295	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.28	527.85	270.0	350.0	14.856	5.0	2.14E+00	6.17E+01	6.17E+01
SCITY296	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.28	527.85	220.0	350.0	14.856	5.0	1.81E+00	1.29E-02	1.29E-02
SCITY297	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.28	527.85	270.0	350.0	14.856	5.0	8.93E-01	2.57E+01	2.57E+01
SCITY298	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.28	527.85	220.0	350.0	14.856	5.0	6.62E+00	4.73E-02	4.73E-02
SCITY299	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.28	527.85	270.0	350.0	14.856	5.0	1.89E+00	5.45E+01	5.45E+01
SCITY300	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.28	527.85	220.0	350.0	14.856	5.0	7.92E+00	5.66E-02	5.66E-02
SCITY301	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.28	527.85	220.0	350.0	14.856	5.0	2.14E+00	6.17E+01	6.17E+01
SCITY302	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.28	527.85	220.0	350.0	14.856	5.0	1.04E+00	7.40E-03	7.40E-03
SCITY303	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.28	527.85	10.0	1100.0	23.333	0.5	9.62E+00	5.13E+00	0.00E+00
SCITY304	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.28	527.85	10.0	1100.0	23.333	0.5	6.88E+00	1.98E+00	0.00E+00
SCITY318	DEFAULT	J S ALBERICI CONSTRUCTION	736723.60	4285287.44	575.43	10.0	1100.0	23.333	0.5	6.88E+00	1.98E+00	0.00E+00
SCITY319	DEFAULT	J S ALBERICI CONSTRUCTION	736723.60	4285287.44	575.43	20.0	0.0	0.000	0.5	7.40E-02	2.22E-03	2.22E-03
SCITY317	DEFAULT	J S ALBERICI CONSTRUCTION	736723.60	4285287.44	575.43	20.0	0.0	0.000	0.5	7.40E-02	2.22E-03	2.22E-03
SCITY318	DEFAULT	J S ALBERICI CONSTRUCTION	736723.60	4285287.44	575.43	10.0	1100.0	23.333	0.5	9.62E-01	3.00E-01	3.00E-01
SCITY319	DEFAULT	J S ALBERICI CONSTRUCTION	736723.60	4285287.44	575.43	20.0	0.0	0.000	0.5	2.00E-02	6.00E-04	6.00E-04
SCITY320	DEFAULT	J S ALBERICI CONSTRUCTION	736723.60	4285287.44	575.43	20.0	0.0	0.000	0.5	1.26E-02	3.70E-04	3.70E-04
SCITY321	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278187.30	467.68	60.0	380.0	33.766	2.0	8.99E-01	3.88E-02	3.88E-02
SCITY322	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278187.30	467.68	80.0	380.0	33.766	2.0	4.60E-01	3.28E-03	3.28E-03
SCITY323	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278187.30	467.68	15.0	850.0	73.133	0.7	1.40E-02	3.08E-05	0.00E+00
SCITY324	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278187.30	467.68	15.0	850.0	73.133	0.7	7.00E-04	1.54E-06	0.00E+00
SCITY325	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278187.30	467.68	15.0	850.0	73.133	0.7	5.78E-03	1.22E-05	0.00E+00
SCITY326	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278187.30	467.68	80.0	405.0	33.766	2.0	8.71E-01	3.76E-03	3.76E-03
SCITY327	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278187.30	467.68	80.0	405.0	33.766	2.0	8.30E-01	5.93E-03	5.93E-03
SCITY328	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278187.30	467.68	80.0	405.0	33.766	2.0	7.48E-01	3.22E-02	3.22E-02
SCITY329	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278187.30	467.68	80.0	405.0	33.766	2.0	9.04E-01	6.48E-03	6.48E-03
SCITY330	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278187.30	467.68	15.0	1007.0	51.650	0.7	4.88E-01	1.03E-03	0.00E+00
SCITY331	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278187.30	467.68	10.0	1100.0	23.333	0.5	4.06E+00	1.24E+00	0.00E+00
SCITY332	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278187.30	467.68	10.0	1100.0	23.333	0.5	2.02E-01	1.44E-03	1.44E-03
SCITY333	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278187.30	467.68	6.0	1157.0	35.000	0.3	8.24E-03	7.52E+00	0.00E+00
SCITY334	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278187.30	467.68	6.0	1076.0	155.667	0.3	2.56E+00	7.82E-01	0.00E+00
SCITY335	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278187.30	467.68	8.9	815.0	37.835	0.8	6.13E-01	1.35E-03	0.00E+00
SCITY344	DEFAULT	PAULO PRODUCTS COMPANY	736597.70	4272776.67	501.13	82.0	200.0	2.933	1.2		5.04E-03	5.04E-03
SCITY353	DEFAULT	CHRISTY REFRACTORIES CO L.L.C	738223.37	4278219.85	483.66	1.0	325.0	0.003	1.0		9.60E-02	9.60E-02
SCITY355	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	431.0	79.216	2.0		9.54E-01	9.54E-01
SCITY356	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	455.0	79.216	2.0		9.54E-01	9.54E-01
SCITY357	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	428.0	79.216	2.0		9.54E-01	9.54E-01
SCITY358	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	565.0	985.0	23.035	0.7		3.05E-01	3.05E-01
SCITY359	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	565.0	985.0	23.035	0.7		3.05E-01	3.05E-01

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
SCITY360	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	565.0	985.0	23.035	0.7		3.05E-01	3.05E-01
SCITY361	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	660.0	300.0	23.035	1.5		1.09E-03	1.09E-03
SCITY362	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	660.0	300.0	23.035	1.5		4.92E-03	4.92E-03
SCITY363	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	390.0	960.0	23.035	0.5		7.17E-01	7.17E-01
SCITY364	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279157.95	459.35	390.0	960.0	23.035	0.5		7.17E-01	7.17E-01
SCITY365	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	790.0	722.0	96.401	2.0		1.19E+00	1.19E+00
SCITY366	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	722.0	96.401	2.0		5.13E+00	5.13E+00
SCITY367	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	722.0	96.401	2.0		8.24E+00	8.24E+00
SCITY368	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	722.0	96.401	2.0		8.24E+00	8.24E+00
SCITY380	DEFAULT	BKEP MATERIALS, LLC ST. LOUIS TERMINAL CO	739332.17	4270413.67	420.93	25.0	450.0	20.000	2.5		2.46E-03	2.46E-03
SCITY381	DEFAULT	BKEP MATERIALS, LLC ST. LOUIS TERMINAL CO	739332.17	4270413.67	420.93	12.0	150.0	8.333	1.0		1.63E-01	1.63E-01
SCITY394	DEFAULT	SAINT LOUIS UNIVERSITY FACILITIES SERVICES	740384.08	4280241.69	507.64	10.0	1100.0	23.333	0.5		2.06E+00	0.00E+00
SCITY395	DEFAULT	SAINT LOUIS UNIVERSITY FACILITIES SERVICES	740384.08	4280241.69	507.64	20.0	0.0	0.000	0.5		9.53E-03	9.53E-03
SCITY396	DEFAULT	SAINT LOUIS UNIVERSITY FACILITIES SERVICES	740384.08	4280241.69	507.64	20.0	0.0	0.000	0.5		1.71E-03	1.71E-03
SCITY401	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	40.0	200.0	21.667	2.5		9.30E-05	9.30E-05
SCITY402	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	40.0	200.0	21.667	2.5		4.97E-03	4.97E-03
SCITY403	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	40.0	200.0	21.667	2.5		5.07E-05	5.07E-05
SCITY404	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	40.0	200.0	21.667	2.5		2.48E-03	2.48E-03
SCITY405	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	10.0	1100.0	23.333	0.5		1.83E-02	0.00E+00
SCITY406	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	23.5	200.0	16.667	2.9		2.55E+00	2.55E+00
SCITY407	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	23.5	200.0	16.667	2.9		2.87E-02	2.87E-02
CJEFF34	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	36.6	77.0	20.000	1.8	2.68E-02		
CJEFF35	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	70.0	350.0	40.000	2.0	2.90E-01		
CJEFF36	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	70.0	850.0	41.667	2.5	2.07E-01		
CJEFF37	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	20.0	0.0	0.000	0.5	9.13E-03		
CJEFF43	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	56.0	370.0	33.333	2.5	1.01E-01		
CJEFF44	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	70.0	850.0	41.667	2.5	8.06E-01		
CJEFF45	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	70.0	850.0	112.999	2.5	9.97E-02		
CJEFF46	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	70.0	850.0	20.600	2.5	2.58E-01		
CSTLC55	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	54.0	375.0	26.555	2.3	1.68E-02		
CSTLC56	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	34.0	375.0	26.555	2.3	1.27E+00		
CSTLC57	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	33.0	428.0	15.669	3.8	1.66E-02		
CSTLC58	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	33.0	428.0	15.669	3.8	3.85E-01		
CSTLC59	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	20.0	250.0	2.083	1.0	7.72E-02		
CSTLC60	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	5.5	1200.0	254.649	0.2	3.28E+00		
CSTLC61	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	5.5	1200.0	254.649	0.2	1.29E-01		
CSTLC62	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	5.5	1200.0	254.649	0.2	9.99E-05		
CSTLC63	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	18.0	425.0	7.047	1.7	6.01E-01		
CSTLC64	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	24.0	270.0	105.951	2.0	3.24E+00		
CSTLC152	DEFAULT	SIMPSON CONSTRUCTION MATERIALS LLC VALLEY PARK	715996.20	4263469.87	430.05	43.0	-459.7	3.225	1.0	1.38E-01		
CSTLC155	DEFAULT	FRED WEBER INC. - SOUTH ASPHALT BATCH SOUTH ASPHALT	732929.25	4259955.19	424.64	37.0	230.0	51.250	4.2	2.57E-01		
CSTLC156	DEFAULT	FRED WEBER INC. - SOUTH ASPHALT BATCH SOUTH ASPHALT	732929.25	4259955.19	424.64	12.0	355.0	0.804	1.3	4.03E-01		
CSTLC157	DEFAULT	FRED WEBER INC. - NORTH ASPHALT H and B	720614.10	4290798.15	468.70	31.0	230.0	80.499	4.2	3.93E+01		
CSTLC158	DEFAULT	FRED WEBER INC. - NORTH ASPHALT H and B	720614.10	4290798.15	468.70	20.0	300.0	16.667	1.1	2.29E-01		
CSTLC207	DEFAULT	MISSOURI-AMERICAN WATER CO FLORISSANT	728394.88	4300010.04	461.78	15.0	896.0	0.000	14.0	1.61E+02		
CCITY65	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	100.0	350.0	29.984	1.3	3.08E-02		
CCITY203	DEFAULT	INDUSTRIAL CONTAINER SERVICES - MO, LLC MANCHESTER	737686.12	4278652.89	459.06	20.0	250.0	18.068	1.0	3.56E-01		
CCITY204	DEFAULT	INDUSTRIAL CONTAINER SERVICES - MO, LLC MANCHESTER	737686.12	4278652.89	459.06	20.0	150.0	22.218	1.0	1.68E+02		
CCITY344	DEFAULT	GP RECYCLING, LLC	743830.86	4284034.28	422.18	20.0	0.0	0.000	0.5	1.72E-02		
CCITY368	DEFAULT	GP RECYCLING, LLC	740384.08	4280241.69	507.64	10.0	1100.0	23.333	0.5	6.73E+00		
CCITY369	DEFAULT	SAINT LOUIS UNIVERSITY FACILITIES SERVICES	740384.08	4280241.69	507.64	20.0	0.0	0.000	0.5	1.33E+00		
CCITY370	DEFAULT	SAINT LOUIS UNIVERSITY FACILITIES SERVICES	740384.08	4280241.69	507.64	20.0	0.0	0.000	0.5	5.69E-02		

R005501

Off-Site Volume Source Inputs

Source ID	Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Release Height (ft)	Sigma Y (ft)	Sigma Z (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
SJEFF64	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	16.4	3.8	15.3	1.28E-02	9.13E-05	9.13E-05
SJEFF84	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6	2.29E-01	4.68E-03	4.68E-03
SJEFF85	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6	2.29E-01	7.06E-03	7.06E-03
SJEFF87	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	16.4	3.8	15.3	2.29E-01	1.44E-03	1.44E-03
SJEFF88	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6	2.29E-01	3.91E-03	3.91E-03
SJEFF89	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6		1.47E-03	1.47E-03
SJEFF90	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6		2.29E-01	2.29E-01
SJEFF91	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6		6.68E-03	6.68E-03
SJEFF99	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6		1.38E-03	1.38E-03
SJEFF101	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6	4.81E-01	2.40E-02	2.40E-02
SJEFF102	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6	6.41E-01	1.42E-02	1.42E-02
SJEFF103	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6	5.24E-01	6.09E-03	6.09E-03
SJEFF104	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6	1.51E-01	3.75E-03	3.75E-03
SJEFF105	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6		1.08E-03	1.08E-03
SJEFF106	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6		1.14E-03	1.14E-03
SJEFF107	AERO METAL FINISHING	718099.61	4263747.23	613.55	8.2	2.3	7.6		2.49E-01	2.49E-01
SJEFF126	FRED WEBER, INC. ANTONIA	720102.79	4248877.71	670.57	8.2	2.3	7.6		3.08E+00	3.08E+00
SSTC56	BLASTCO INC	690213.84	4297755.23	543.44	8.2	2.3	7.6		1.47E-01	1.47E-01
SSTL67	MISSOURI ASPHALT PRODUCTS, LLC WEST LAKE QUARRY MATERIAL CO	721914.39	4294042.31	462.50	16.4	3.8	15.3		5.88E-04	5.88E-04
SSTL68	MISSOURI ASPHALT PRODUCTS, LLC WEST LAKE QUARRY MATERIAL CO	721914.39	4294042.31	462.50	16.4	3.8	15.3		1.02E+00	1.02E+00
SSTL125	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	616.60	8.2	2.3	7.6		7.18E-03	7.18E-03
SSTL197	FRED WEBER, INC. FT. BELLE	739499.97	4302900.13	443.27	8.2	2.3	7.6		1.80E-01	1.80E-01
SCITY19	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.2	2.3	7.6	5.24E-02	2.47E-02	2.47E-02
SCITY20	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.2	2.3	7.6	4.44E-03	7.79E-01	7.79E-01
SCITY21	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.2	2.3	7.6	2.59E+00	7.94E-01	7.94E-01
SCITY44	ADM GRAIN COMPANY ST. LOUIS	744141.30	4284932.90	429.39	15.0	6.2	14.0		6.22E-04	6.22E-04
SCITY45	ADM GRAIN COMPANY ST. LOUIS	744141.30	4284932.90	429.39	15.0	6.2	14.0		2.76E-02	2.76E-02
SCITY118	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	8.2	2.3	7.6		7.50E-05	7.50E-05
SCITY119	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	8.2	2.3	7.6		4.00E-01	4.00E-01
SCITY120	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	8.2	2.3	7.6		2.61E-01	2.61E-01
SCITY130	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		3.60E-04	3.00E-04
SCITY131	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		7.40E-02	7.40E-02
SCITY134	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		7.40E-02	7.40E-02
SCITY135	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		3.00E-04	3.00E-04
SCITY138	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		7.40E-02	7.40E-02
SCITY139	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		3.00E-04	3.00E-04
SCITY182	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	16.4	3.8	15.3	3.36E-02	2.40E-04	2.40E-04
SCITY184	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	16.4	3.8	15.3	6.59E-02	4.71E-04	4.71E-04
SCITY186	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	16.4	3.8	15.3	3.36E-02	2.40E-04	2.40E-04
SCITY188	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	16.4	3.8	15.3	4.95E-02	3.53E-04	3.53E-04
SCITY195	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	8.2	2.3	7.6	8.40E-02	6.00E-04	6.00E-04
SCITY241	PQ CORPORATION -THE	739063.43	4265317.19	495.80	8.2	2.3	7.6		2.66E-02	2.66E-02
SCITY340	PAULO PRODUCTS COMPANY	736597.70	4278776.67	501.12	8.2	2.3	7.6		3.60E-04	3.60E-04
SCITY341	PAULO PRODUCTS COMPANY	736597.70	4278776.67	501.12	8.2	2.3	7.6		1.12E-03	1.13E-03
SCITY342	PAULO PRODUCTS COMPANY	736597.70	4278776.67	501.12	8.2	2.3	7.6		1.20E-03	1.20E-03
SCITY343	PAULO PRODUCTS COMPANY	736597.70	4278776.67	501.12	8.2	2.3	7.6		1.20E-02	1.20E-02
CJEFF33	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.49E-01		
CJEFF36	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	4.71E-03		
CJEFF39	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	3.22E-03		

Off-Site Volume Source Inputs

Source ID	Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Release Height (ft)	Sigma Y (ft)	Sigma Z (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
CJEFF40	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	2.01E-01		
CJEFF41	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.10E-03		
CJEFF42	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	8.18E-04		
CJEFF47	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	6.55E-02		
CJEFF48	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	6.56E-06		
CJEFF49	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	4.09E-04		
CJEFFS0	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	8.48E-04		
CJEFFS1	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	5.28E-02		
CJEFFS2	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	2.46E-03		
CJEFFS3	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.53E-01		
CJEFFS4	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.56E-02		
CJEFFS5	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.16E-01		
CJEFFS6	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	8.45E-03		
CJEFFS7	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	3.42E-01		
CJEFFS8	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	4.74E-03		
CJEFFS9	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.92E-01		
CJEFF60	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.36E-02		
CSTLC92	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	8.2	2.3	7.6	2.25E-01		
CSTLC151	SIMPSON CONSTRUCTION MATERIALS LLC VALLEY PARK	715996.20	4268469.87	430.05	13.5	1.4	0.7	1.58E-01		
CSTLC195	FRED WEBER, INC. FT. BELLE	739499.97	4302900.13	443.27	13.5	1.4	0.7	5.97E-01		
CCITY343	GP RECYCLING, LLC	743830.86	4284034.28	423.18	8.2	2.3	7.6	5.57E-02		

R005503

ATTACHMENT B
MODEL SUMMARY OUTPUT

10-5-21 US Steel CO Scale-up Significant Impacts Analysis Results

Model	File	Pollutant	Average	Group	Rank	Conc/Dep	East (X)	North (Y)	Elev	Hill	Flag		Time	Met File	Sources	Groups	Receptors
AERMOD 22112	Granite City SIL_2019_CO.SUM	CO	1-HR	ALL	1ST	1157.328	746600	4286400	128.87	132.25		0	19020309	STL_LCN19	13	1	14098
AERMOD 22112	Granite City SIL_2016_CO.SUM	CO	1-HR	ALL	1ST	1094.348	750800	4288100	127.44	127.44		0	16121910	STL_LCN16	13	1	14098
AERMOD 22112	Granite City SIL_2018_CO.SUM	CO	1-HR	ALL	1ST	1036.463	749200	4287400	129.9	134.11		0	18112209	STL_LCN18	13	1	14098
AERMOD 22112	Granite City SIL_2020_CO.SUM	CO	1-HR	ALL	1ST	997.1673	746700	4287100	126.89	126.89		0	20010810	STL_LCN20	13	1	14098
AERMOD 22112	Granite City SIL_2017_CO.SUM	CO	1-HR	ALL	1ST	982.0781	748434.9	4287033	127.16	127.16		0	17051502	STL_LCN17	13	1	14098
AERMOD 22112	Granite City SIL_2019_CO.SUM	CO	8-HR	ALL	1ST	691.6775	748481.6	4286378	126.67	126.67		0	19041808	STL_LCN19	13	1	14098
AERMOD 22112	Granite City SIL_2018_CO.SUM	CO	8-HR	ALL	1ST	668.2178	748481.6	4286378	126.67	126.67		0	18111224	STL_LCN18	13	1	14098
AERMOD 22112	Granite City SIL_2017_CO.SUM	CO	8-HR	ALL	1ST	651.0973	750472	4287093	125.7	125.7		0	17090416	STL_LCN17	13	1	14098
AERMOD 22112	Granite City SIL_2016_CO.SUM	CO	8-HR	ALL	1ST	645.9934	748434.9	4287033	127.16	127.16		0	16120108	STL_LCN16	13	1	14098
AERMOD 22112	Granite City SIL_2020_CO.SUM	CO	8-HR	ALL	1ST	618.4866	748434.9	4287033	127.16	127.16		0	20041108	STL_LCN20	13	1	14098

10-5-22 US Steel CO Scale-up Significant Impacts Analysis Results

Pollutant	Average	Group	Rank	Model Conc. (ug/m3)	Significant Impact Level (ug/m3)	% SIL
CO	1-HR	ALL	1ST	1157.3	2,000	58%
CO	8-HR	ALL	1ST	691.7	500	138%

10-5-22 US Steel CO NAAQS Analysis Results

Model	File	Pollutant	Average	Group	Rank	Conc/Dep	East (X)	North (Y)	Elev	Hill	Flag		Time	Met File	Sources	Groups	Receptors
AERMOD 22112	Granite City NAAQS_2016_CO.SUM	CO	8-HR	ALL	2ND	1856.677	748434.9	4287033	127.16	127.16		0	16032208	STL_LCN16	584	1	205
AERMOD 22112	Granite City NAAQS_2017_CO.SUM	CO	8-HR	ALL	2ND	1941.374	748434.9	4287033	127.16	127.16		0	17121624	STL_LCN17	584	1	205
AERMOD 22112	Granite City NAAQS_2018_CO.SUM	CO	8-HR	ALL	2ND	1726.885	748470.1	4287000	126.94	126.94		0	18092424	STL_LCN18	584	1	205
AERMOD 22112	Granite City NAAQS_2019_CO.SUM	CO	8-HR	ALL	2ND	2045.17	748434.9	4287033	127.16	127.16		0	19110908	STL_LCN19	584	1	205
AERMOD 22112	Granite City NAAQS_2020_CO.SUM	CO	8-HR	ALL	2ND	1966.717	748434.9	4287033	127.16	127.16		0	20092408	STL_LCN20	584	1	205

10-5-22 US Steel CO NAAQS Analysis Results

Pollutant	Average	Group	Rank	Model Conc. (ug/m3)	Background Conc. (ug/m3)	Total Conc. (ug/m3)	Standard (ug/m3)	% Standard
CO	8-HR	ALL	2ND	2045.2	1646	3691.2	10,000	37%

Background data from East St. Louis monitor (AQS No. 88-810-029), high second high value from 2016-2018

R005505

REFERENCES

1. Guidelines on Air Quality Models, (Revised). Appendix W of 40 CFR Part 51, 82 FR 5182, January 17, 2017.

2 . Prevention of Significant Deterioration, The Art and Science of PSD Air Quality Analysis, The Modeling Perspective, Illinois Environmental Protection Agency, Modeling Unit, February 27, 2014..

3. AERSCREEN User's Guide, EPA-454/B-15-005, July 2015.

4. Guideline for Determination of Good Engineering Practice Stack Height (Technical Support Document for Stack Height Regulations (Revised). EPA-450/4-80-023R, U.S. Environmental Protection Agency, June 1985.

5. *Sierra Club v. EPA*, No. 10-1413, 2013 WL 216018 (Jan. 22, 2013).

6. Ambient Monitor Guidelines for Prevention of Significant Deterioration, EPA-450/4-87-007, USEPA, May 1987.

7. Ambient Monitor Guidelines for Prevention of Significant Deterioration, EPA-450/4-87-007, USEPA, May 1987.

Pritchett, Jacob A.

Subject:	[External] Canceled: USS & IEPA Conference call
Start:	Tue 11/9/2021 2:00 PM
End:	Tue 11/9/2021 4:00 PM
Show Time As:	Free
Recurrence:	(none)
Organizer:	LaDonna Driver
Importance:	High

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Email communication is not a secure method of communication. Please contact me immediately if you want future communications to be sent via a different medium.

Pritchett, Jacob A.

From: Romaine, Chris
Sent: Tuesday, November 9, 2021 6:41 PM
To: Carter, Sally
Subject: Accepted: USS Conference Call

Pritchett, Jacob A.

From: Romaine, Chris
Sent: Tuesday, November 9, 2021 8:14 AM
To: 'LaDonna Driver'
Subject: Accepted: USS & IEPA Conference call

Pritchett, Jacob A.

From: Romaine, Chris
Sent: Tuesday, November 9, 2021 8:15 AM
To: 'LaDonna Driver'
Subject: Accepted: USS & IEPA Conference call

Kras, Kim

From: Patel, Minesh
Sent: Wednesday, November 9, 2022 7:09 AM
To: Carter, Sally
Subject: FW: US Steel Granite City Modeling
Attachments: Granite City Model Report (10-10-22).pdf; Granite City SIL CO.zip; Granite City NAAQS CO.zip

Fyi.

From: Schnepp, Jason <Jason.Schnepp@Illinois.gov>
Sent: Friday, November 4, 2022 2:42 PM
To: Romaine, Chris <Chris.Romaine@Illinois.gov>; Patel, Minesh <Minesh.Patel@Illinois.gov>
Subject: FW: US Steel Granite City Modeling

FYI

Jason Schnepp
Manager, CAAPP Construction Unit
217-524-3724

From: Ray, Sarah <Sarah.Ray@illinois.gov>
Sent: Friday, November 4, 2022 2:16 PM
To: Schnepp, Jason <Jason.Schnepp@Illinois.gov>
Subject: FW: US Steel Granite City Modeling

FYI.

From: David Keen <keen@rtpenv.com>
Sent: Monday, October 10, 2022 10:46 AM
To: Ray, Sarah <Sarah.Ray@illinois.gov>
Cc: Colin Campbell <campbell@rtpenv.com>; Gurinder (Gary) Saini <saini@rtpenv.com>; David Keen <keen@rtpenv.com>
Subject: [External] US Steel Granite City Modeling

Sarah,

Please find attached the latest iteration of the US Steel Granite City CO modeling. This analysis was originally submitted in 2020. The model has been revised based upon recent discussions with IEPA (Chris Romaine).

Please let me know if you have any questions or need additional information.

Thanks,
Dave

David Keen
RTP Environmental

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CARBON MONOXIDE AIR DISPERSION MODELING FOR A PREVENTION OF SIGNIFICANT DETERIORATION AND CONSTRUCTION PERMIT REVISION FOR UNITED STATES STEEL GRANITE CITY WORKS



Prepared for:
United States Steel Corporation
Granite City Works
20th and State Streets
Granite City, IL 62040

Prepared by:
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304A West Millbrook Road
Raleigh, North Carolina 27609

October 2022

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1.0 INTRODUCTION

This document presents the results of the air quality dispersion modeling analysis conducted for the United States Steel Corporation, Granite City Works ("US Steel") iron and steel making facility in Granite City, Illinois. The analysis has been conducted by RTP Environmental Associates, Inc. ("RTP Environmental") on behalf of US Steel.

The analysis evaluated the emissions of the criteria pollutant carbon monoxide ("CO") as regulated under the applicable provisions of the Prevention of Significant Deterioration ("PSD") regulations of 40 CFR § 52.21, incorporated by reference in the federally approved Illinois State Implementation Plan at 40 CFR § 52.738(b).[1] The criteria pollutant analysis was conducted to ensure that the proposed revisions to the CO emission limitations in the Prevention of Significant Deterioration ("PSD") and Construction Permit (Permit Number 95010001) ("1996 Construction Permit") do not cause or contribute to violation of a National Ambient Air Quality Standard (NAAQS).

As required by 40 CFR § 52.21(l), the analysis conforms with the modeling procedures outlined in the Guideline on Air Quality Models[1] promulgated by United States Environmental Protection Agency ("USEPA") (the "Guideline" or "Appendix W"). It also conforms to the Illinois Environmental Protection Agency's (IEPA) Prevention of Significant Deterioration Modeling Guidance[2], the modeling protocol submitted to the IEPA on February 3, 2020, and associated USEPA modeling policy and guidance.

[1] All citations to the PSD regulations herein are to the currently applicable provisions of 40 CFR § 52.21. The analysis also is designed to satisfy the parallel requirements of the currently pending Illinois PSD rule, 35 Ill. Adm. Code Part 204.

2.0 PROJECT DESCRIPTION

The 1996 Construction Permit authorized National Steel to increase iron and steel production limitations for the blast furnaces and basic oxygen furnace ("BOF") shop at the existing integrated iron and steel manufacturing facility in Granite City, in Madison County, Illinois. US Steel purchased the assets of National Steel in 2003, including Granite City Works. US Steel is proposing revisions to the 1996 Construction Permit that involve increases in the CO emission limitations that were established per the PSD requirements. Therefore, the proposed increases in the CO rates were evaluated for PSD requirements including compliance with the NAAQS for CO. No physical changes are proposed in conjunction with the requested revisions to the 1996 Construction Permit.

3.0 FACILITY AND SITE DESCRIPTION

The US Steel Granite City Works produces high-quality hot-rolled, cold-rolled and coated sheet steel products to customers in the construction, container, piping and tubing, service center, and automotive industries. Granite City Works has an annual raw steelmaking capability of 3.58 million net tons.

The facility occupies approximately 400 acres and is located approximately 12 miles east of Lambert, St. Louis International Airport. The approximate Universal Transverse Mercator (UTM) coordinates of the facility are 749,000m East and 4,287,000m North (NAD83, Zone 15). Figure 1 shows the general location of the facility. Figure 2 shows the specific facility location on a 7.5-minute U.S. Geological Survey ("USGS") topographic map.

The US Steel facility is classified under the regulations governing PSD and Title V as a major source. The area of Madison County where US Steel facility is located is classified as attainment or unclassifiable for all regulated pollutants except ozone. St. Louis is classified as marginal nonattainment for the 2015 8-hour ozone standard.

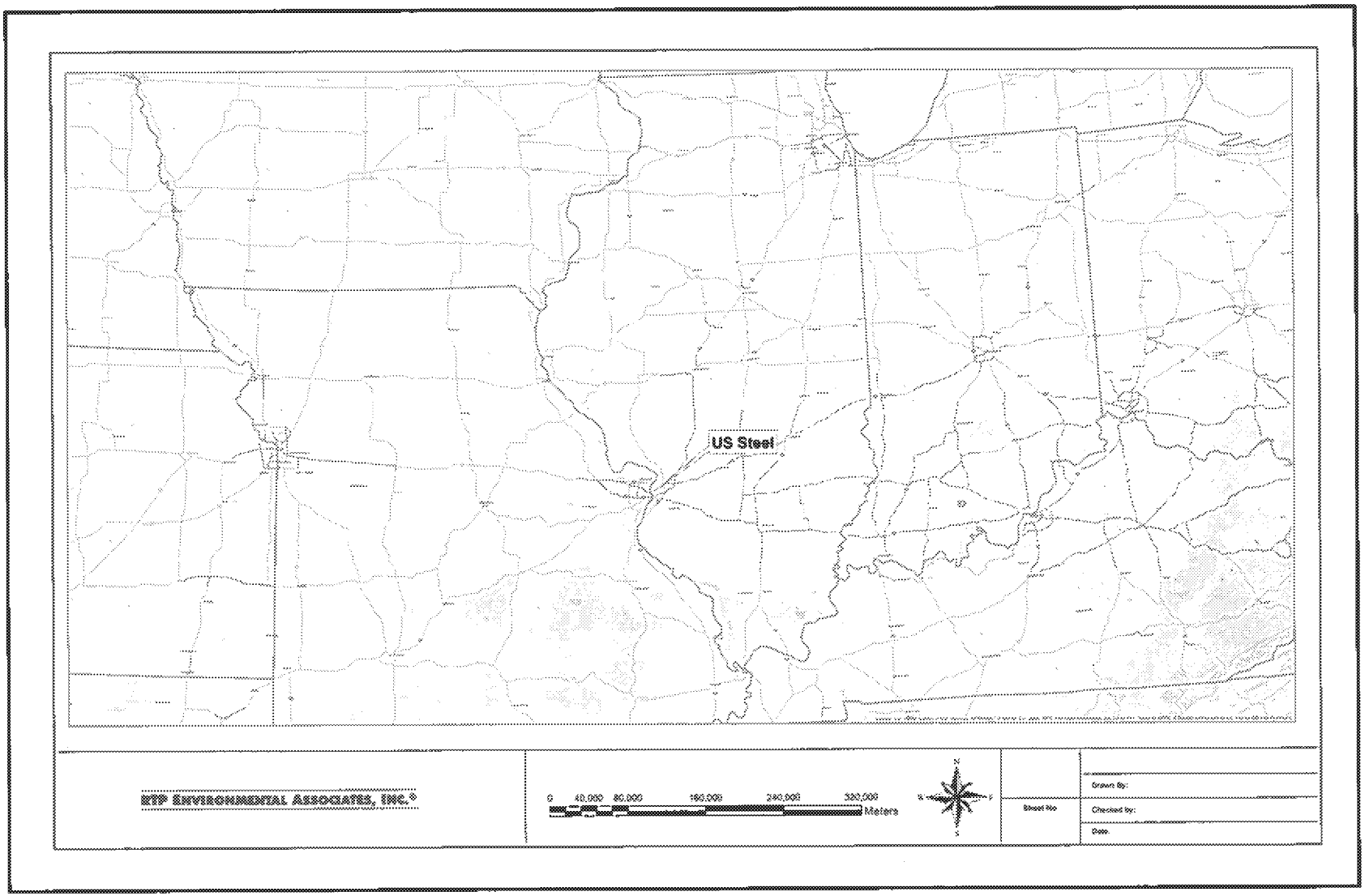


Figure 1. General Location of the US Steel Granite City Works

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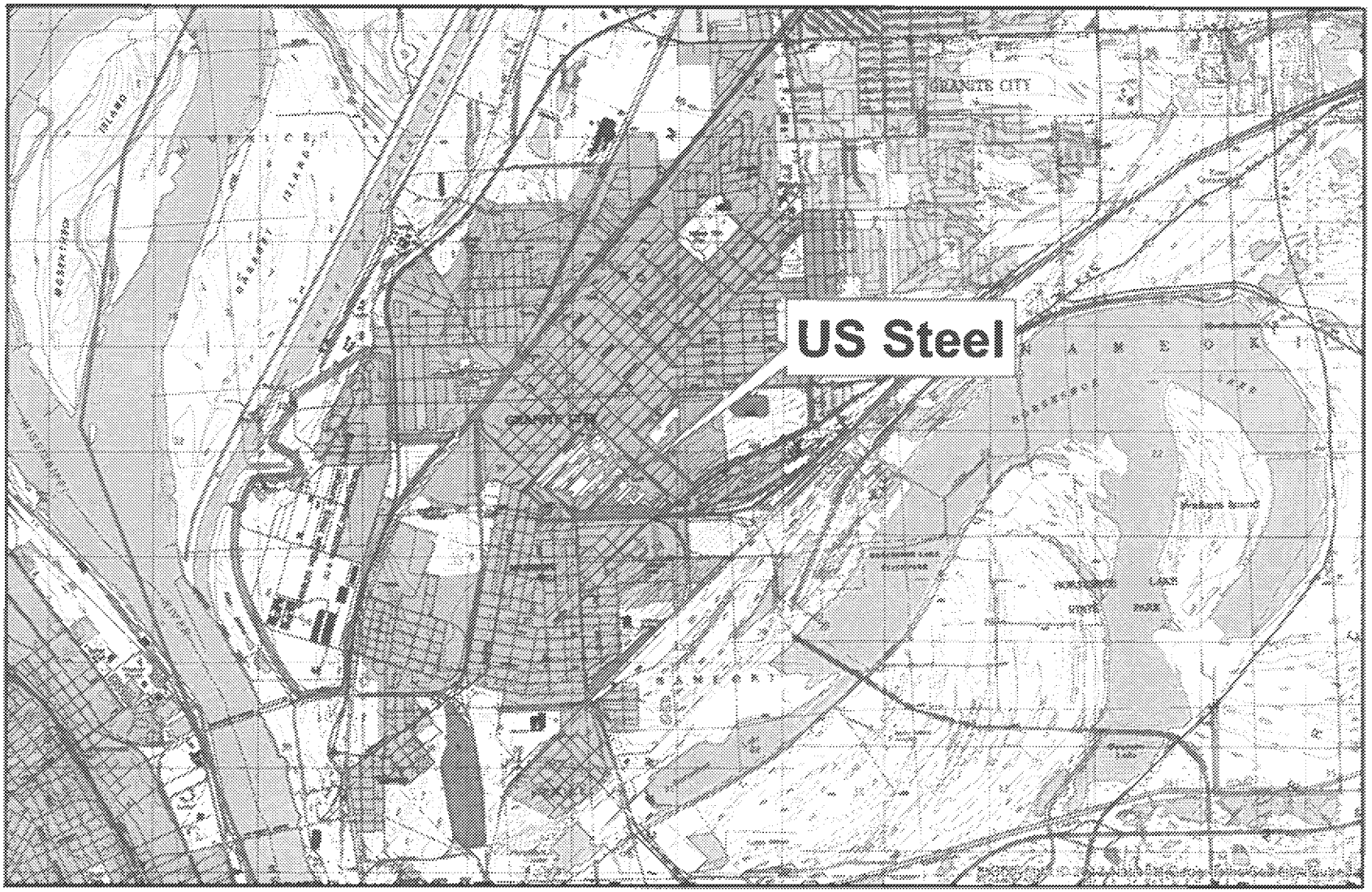


Figure 2. Specific Location of US Steel Granite City Works

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4.0 MODEL SELECTION AND MODEL INPUT

4.1 Model Selection

The latest version of the AMS/EPA Regulatory Model (AERMOD, Version 22112) was used to conduct the dispersion modeling analysis. AERMOD is a Gaussian plume dispersion model that is based on planetary boundary layer principals for characterizing atmospheric stability. The model evaluates the non-Gaussian vertical behavior of plumes during convective conditions with the probability density function and the superposition of several Gaussian plumes. AERMOD is a modeling system with three components: AERMAP is the terrain preprocessor program, AERMET is the meteorological data preprocessor and AERMOD includes the dispersion modeling algorithms.

AERMOD is the required default model for calculating ambient concentrations near the US Steel facility based on the model's ability to incorporate multiple sources and source types. The model can also account for convective updrafts and downdrafts and meteorological data throughout the plume depth. The model also provides parameters required for use with up to date planetary boundary layer parameterization. The model also has the ability to incorporate building wake effects and to calculate concentrations within the cavity recirculation zone. All model options were selected as recommended in the USEPA Guideline on Air Quality Models.

Oris Solution's BEEST Graphical User Interface ("GUI") was used to run AERMOD. The GUI uses an altered version of the AERMOD code to allow for flexibility in the file naming convention. The dispersion algorithms of AERMOD are not altered. Therefore, a model equivalency evaluation pursuant to Section 3.2 of 40 CFR 51, Appendix W was not warranted.

4.2 Model Control Options and Land Use

AERMOD was run in the regulatory default mode for all pollutants with the default rural dispersion coefficients. These coefficients were used by the Illinois Environmental

Protection Agency ("IEPA") in its evaluation of the facility as part of the 1-hr sulfur dioxide ("SO2") Data Requirements Rule ("DRR").

4.3 Source Data

The modeling input data and modeled CO emission rates can be found in Appendix A of this report.

Source Characterization

The majority of modeled source input parameters were obtained from the IEPA's model conducted for the Data Requirements Rule ("DRR").

Point Sources

Most emission sources at the site vent to stacks with a well defined opening. These sources were modeled as point sources in AERMOD. Several other types of sources such as fugitive emissions also required evaluation.

Fugitive Emissions

Fugitive emissions are those that are not emitted from a well defined opening. These sources were modeled as volume sources. The initial dispersion coefficients (sigma y and sigma z) were provided by the IEPA and were calculated based upon the dimensions of the area of release and the equations contained in Table 3-1 of the AERMOD User's Guide.

Flares

The facility uses blast furnace gas flares to combust excess process gas. Emissions that occur only during periods of malfunction are not required to be modeled per 40 CFR Part 51 Appendix W. Non-malfunction emissions were modeled using the procedures outlined in the AERSCREEN Manual[3]. The effective stack height (H, in meters) was computed by the IEPA as a function of heat release rate according to the following equation, where Q is the heat release rate of the flare stack in calories per second:

$$H_{equivalent} = H_{actual} + 4.56x10^{-3} \times Q^{0.478}$$

The effective flare stack diameter (d, in meters) was computed as a function of heat release rate according to the following equation, where Q is the heat release rate of the flare in calories per second:

$$d_{equivalent} = 9.88x10^{-4} \times (Q \times 0.45)^{0.5}$$

An exit temperature of 1273K and velocity of 20 m/sec is assumed.

All source locations were based upon a NAD83, UTM Zone 15 projection.

Good Engineering Practice Stack Height Analysis

A Good Engineering Practice ("GEP") stack height evaluation was conducted to determine appropriate building dimensions to include in the model and to calculate the GEP formula stack height used to justify stack height credit for any stacks n excess of 65m. Procedures used are in accordance with those described in the USEPA Guidelines for Determination of Good Engineering Practice Stack Height (Technical Support Document for the Stack Height Regulations-Revised)[4]. GEP formula stack height, as defined in 40 CFR 51, is expressed as GEP = H_b + 1.5L, where H_b is the building height and L is the lesser of the building height or maximum projected width. Building/structure locations were determined from a facility plot plan. The structure locations and heights were obtained from the IEPA and were input to the USEPA's Building Profile Input Program (BPIP-PRIME) computer program to calculate the direction-specific building dimensions needed for AERMOD. The structures included in the GEP analysis are shown as the green blocks in Figure 3. All stacks and structures that are located near a stack were included in the BPIP runs.

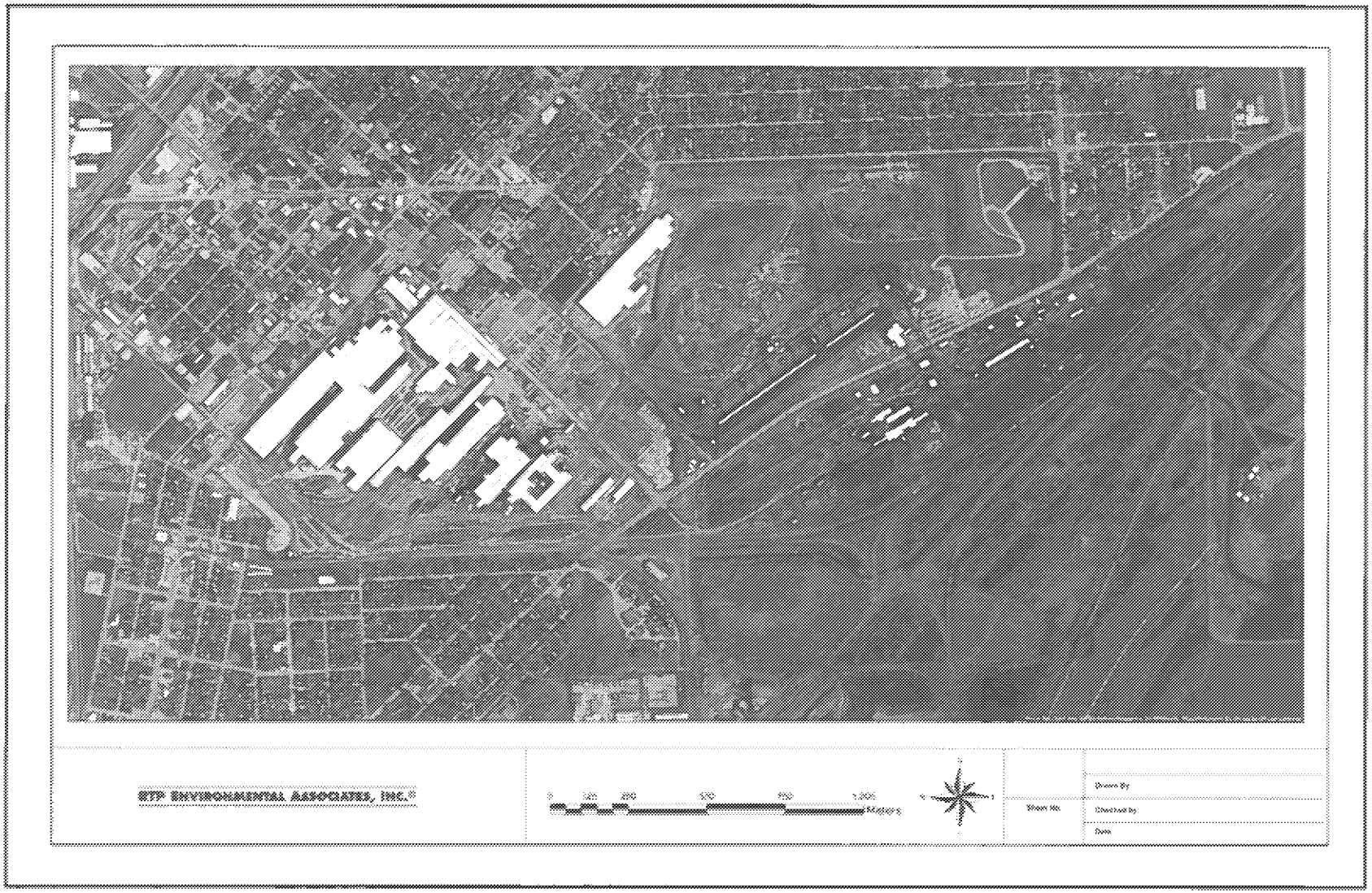


Figure 3. Structures Included in the US Steel GEP Analysis

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4.4 Monitored Background Data

Ambient, background pollutant concentrations are needed to establish a representative background concentration to complete the NAAQS portion of the *Source Impact Analysis* of 40 CFR § 52.21(k). The background concentrations are added to the modeled concentrations to assess NAAQS compliance. Ambient pollutant concentrations are also needed to fulfill the *Air Quality Analysis* requirement of 40 CFR § 52.21(m), as discussed in Section 5.0herein.

Pursuant to 40 CFR § 52.21(i)(5), requirements for ambient monitoring data may be waived by the permitting authority if projected increases in ambient concentrations due to the project are less than the Significant Monitoring Concentrations. However, in light of the decision of the D.C. Circuit Court of Appeals *Sierra Club v. EPA*,[5] US Steel has elected not to request such a waiver at this time.

The USEPA Monitoring Guidelines[6], other USEPA interpretive guidance, and USEPA administrative decisions clarify that representative, existing air quality monitoring data may be used to fulfill the PSD pre-construction monitoring requirements and establish background concentrations needed for assessing NAAQS compliance, in lieu of monitoring data. USEPA's Monitoring Guidelines suggest specific criteria to determine representativeness of off-site data: *quality of the data, currentness of the data, and monitor location*.

There are many existing ambient CO monitors within 100 miles in the facility (Figure 4). Existing monitoring data have been evaluated in relation to the criteria provided in USEPA's Ambient Monitoring Guidelines as being representative of the US Steel site.

We have used recently available, quality assured data (2016-2018) from the AQS monitor in East St. Louis, IL (AQS Site # 17-163-0010). 2018 is the latest year of complete, available data. The 4th quarter of 2019 is incomplete and data are not



Figure 4. Ambient Air Quality Monitors in the Vicinity of the US Steel Facility

R005525

available for 2020-2021. This monitor best represents background concentrations near the facility as it is the closest monitor with current CO data and is in the vicinity of the site and therefore representative of conditions as the site. The background data are presented in Table 1.

Table 1. Proposed Background Concentrations 2016-2018

Pollutant	Averaging Time	Design Value (ppb)[µg/m³]	Basis	AQS Site No.
CO	1-hour	(2,200) [2,515]	Maximum	17-163-0010 St. Louis
	8-hour	(1,440) [1,646]		

The existing monitoring data satisfy the criteria provided in USEPA's Ambient Monitoring Guidelines[7] as being representative of the site.

Monitor Location

Of the monitors available, the East St. Louis monitor represents background concentrations as it is the closest monitor with data for the pollutants of concern that is not also significantly influenced by the localized source impacts.

Data Quality

The monitor data were collected and quality assured by the IEPA.

Currentness of Data

The data were collected during 2016-2018, which represents the recently available, quality assured data available for use in assessing compliance.

4.5 Receptor Data

Modeled receptors were placed in all areas considered as "ambient air" pursuant to 40 CFR 50.1(e). Ambient air is defined as that portion of the atmosphere, external to buildings, to which the general public has access. Approximately 14,100 receptors were used in the AERMOD significant impacts analysis. The receptor grid consisted of three cartesian grids and receptors located at 50m intervals along the facility fence line.

The first cartesian grid extended to approximately 3.0km from the facility in all directions. Receptors in this region were spaced at 100m intervals. The second grid extended to 7.5km. Receptor spacing in this region were 250m. A third grid extended to 15km with a spacing of 500m. The receptor grid was designed such that maximum facility impacts fall within the 100m spacing of receptors. The receptor grid spacing is presented in Table 2.

Table 2. Receptor Grid Spacing

Receptor Spacing (m)	Distance from Facility (m)
100	3,000
250	5,000
500	15,000

The US Steel facility is located in southern Illinois. Terrain within 10km of the site is generally flat. Receptor elevations and hill height scale factors were calculated with AERMAP (18081). The elevation data were obtained from the USGS one arc second National Elevation Data (NED) obtained from the USGS. Locations were based upon a NAD83, UTM Zone 15 projection. The near-field receptor grid is presented in Figure 5.

4.6 Meteorological Data

The 2016-2020, 5-year sequential hourly surface meteorological data from the National Weather Service (NWS) at St. Louis Lambert Field (WBAN No. 13994) and upper air data from the NWS station in Lincoln, IL (WBAN No. 04833) were used in the analysis. These data were processed into a "model-ready" format using AERMET version 21112.

The AERMET meteorological processor requires estimates of the following surface characteristics: surface roughness length, albedo, and Bowen ratio. The surface roughness length is related to the height of obstacles to the wind flow. It is the height above the surface where the average wind speed is zero. The smoother the surface, the lower the roughness length. The surface roughness length influences the surface shear stress and is an important factor in calculating mechanical turbulence and stability. The albedo is the fraction of the total incident solar radiation reflected by the surface back to space without absorption.

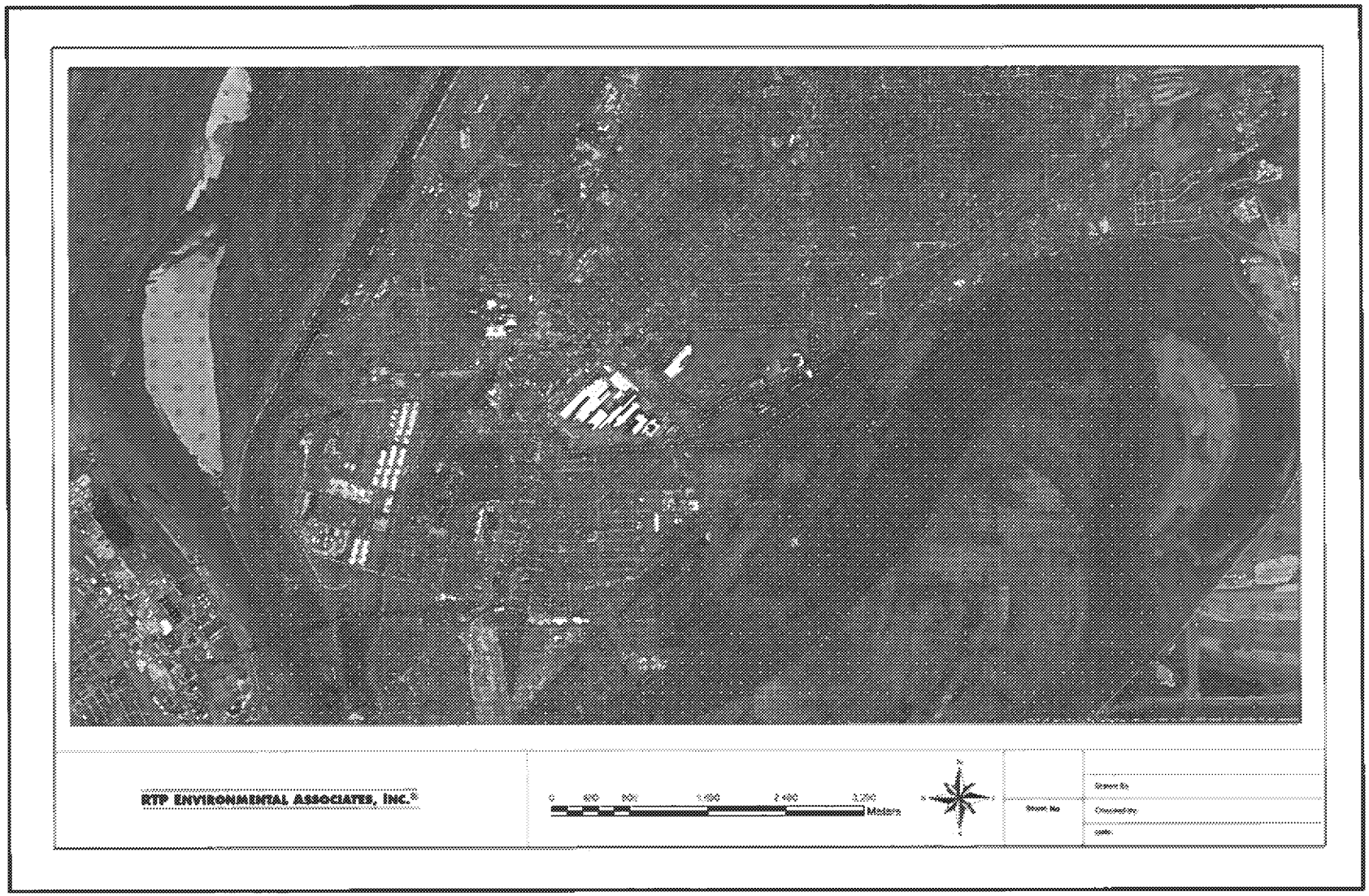


Figure 5. US Steel Facility Near-field Receptor Grid

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The Bowen ratio is an indicator of surface moisture and is the ratio of the sensible heat flux to the latent heat flux. The albedo and Bowen ratio are used for determining the planetary boundary layer parameters for convective conditions due to the surface sensible heat flux. Estimates of the surface characteristics were made by the IEPA using USEPA's AERSURFACE program (Version 13016) and provided to RTP Environmental. A 1km search radius was employed at the location of the meteorological tower. Twelve sectors of 30 degrees each and seasonal resolution were used in the AERSURFACE analysis. RTP employed the "ADJ_U*" option to allow for adjustments to the friction velocity under low wind speeds was employed.

The use of NWS meteorological data for dispersion modeling can often lead to a high incidence of calms and variable wind conditions if the data are collected by Automated Surface Observing Stations ("ASOS"), as are in use at most NWS stations since the mid-1990's. A calm wind is defined as a wind speed less than 3 knots and is assigned a value of 0 knots. In addition, variable wind observations may include wind speeds up to 6 knots, but the wind direction is reported as missing, if the wind direction varies more than 60 degrees during the 2-minute averaging period for the observation. The AERMOD model currently cannot simulate dispersion under calm or missing wind conditions. To reduce the number of calms and missing winds in the surface data, archived 1-minute winds for the ASOS stations were used to calculate hourly average wind speed and directions, which were used to supplement the standard archive of hourly observed winds processed in AERMET. The USEPA AERMINUTE program (Version 15272) was used for these calculations. A wind rose of the 5-year meteorological dataset is provided in Figure 6.

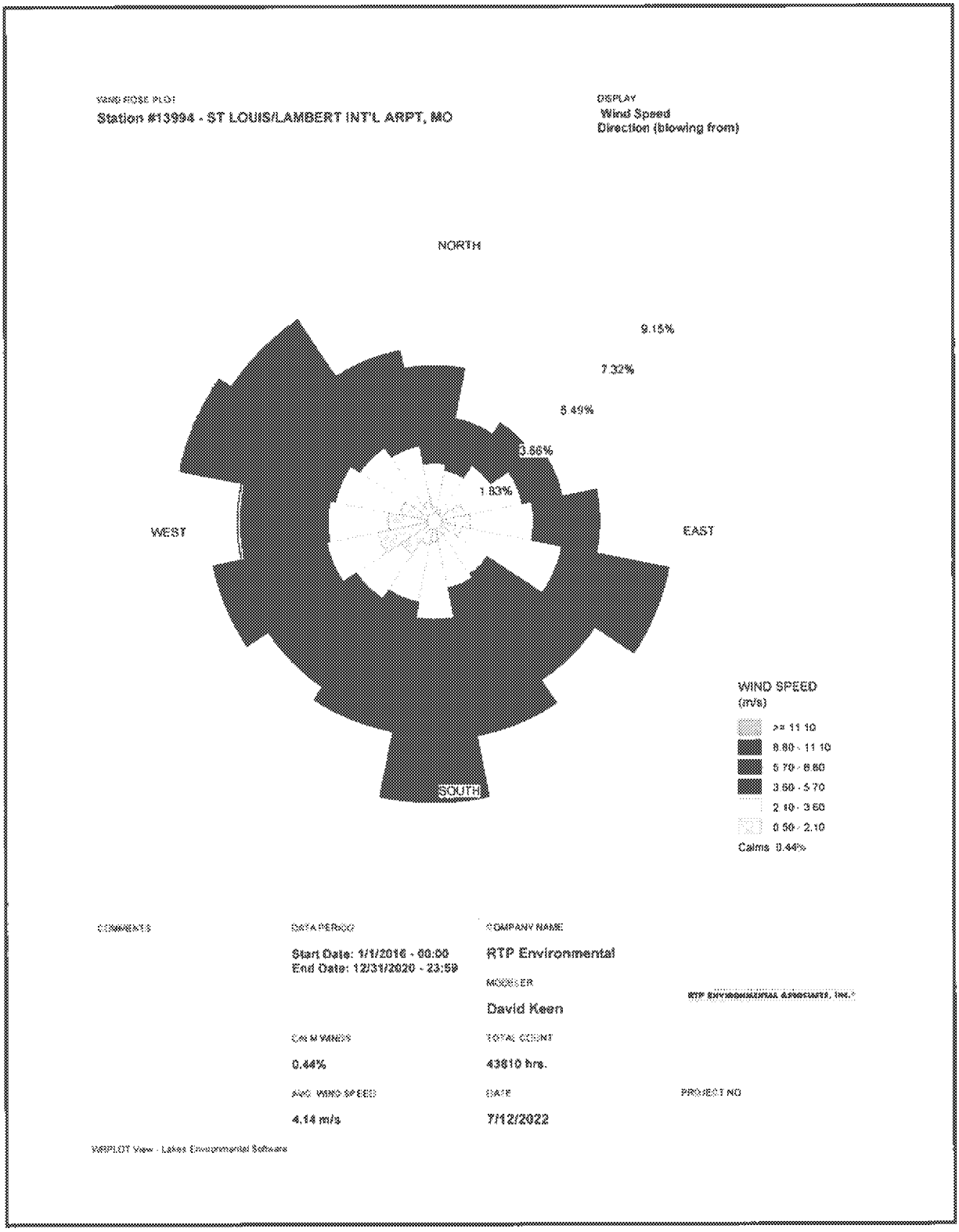


Figure 6. Lambert Field Windrose 2014-2018.

5.0 MODELING METHODOLOGY

5.1 Pollutants Subject to Review

USS Steel is proposing changes to the CO emission limitations in the 1996 Construction Permit that were established per the PSD requirements. Therefore, as requested by Illinois EPA, dispersion modeling of CO emissions have been evaluated and compared to the NAAQS.

5.2 Significant Impact Analysis

The air quality analysis was conducted in two phases: an initial or significant impact analysis, and a refined phase NAAQS analysis. In the significant impact analysis, the calculated maximum impacts due to the project were determined for CO.[b] These impacts determined the net change in air quality resulting from the proposed revision to modification permitted under the 1996 Construction Permit. Five years of meteorological data were used in the significant impact analysis. Maximum modeled CO concentrations were compared to the significance levels. The PSD Class II Significant Impact Levels for CO are listed in Table 3.

Table 3. PSD Class II Significant Impact Levels

Pollutant	Averaging Time	PSD Class II Significant Impact Levels ($\mu g/m^3$)
CO	1-hour	2,000
	8-hour	500

[b] For some of the affected emissions units, in place of project related emissions increases, we conservatively used the potential to emit of CO.

5.3 NAAQS Analysis

Following the determination of significant impacts, a refined air quality analysis to determine compliance with the CO NAAQS was conducted. In the NAAQS analysis, impacts from the US Steel facility were added to concentrations calculated from other nearby sources, plus a regional background concentration. The resultant total concentrations were compared to the NAAQS to assess compliance. The receptors modeled in the NAAQS analyses were limited to those showing a significant CO impact. Five years of meteorological data were again used in this analysis.

Nearby Source Inventory

Off-site sources were included in the NAAQS analysis. A 50km radius was used to define the screening area. A list of sources that are located within the screening area has been obtained from the IEPA as well as the Missouri Department of Natural Resources ("MDNR"). Section 8.3.3.b of Appendix W to 40 CFR Part 51 states that the number of nearby sources to be explicitly modeled is expected to be few, except in unusual situations. Appendix W further states that the sources to be included will usually be located within the first 10 to 20km from the source under consideration. In addition, it states that identification of nearby sources calls for the exercise of professional judgment by the appropriate reviewing authority. Further, USEPA's Guidance for PM2.5 Permit Modeling reiterates the Appendix W emphasis on a 10km screening radius for determining which nearby sources to include in the cumulative modeling analysis.

We conservatively included all sources provided by the IEPA and MDNR that are located within 50km of the US Steel facility. Total facility, potential emissions (i.e., all sources at a facility) were used in the NAAQS evaluation.

NAAQS Compliance Assessment

Ambient background concentrations (as discussed in more detail in Section 4.4) were then added to assess NAAQS compliance. The modeled and monitored values shown in Table 4 were used for this assessment.

Table 4. Monitored and Modeled Values Used to Assess NAAQS Compliance

Pollutant	Averaging Time	Monitored Value	Modeled Value
CO	1-hour & 8-hour	Maximum over 3 years	Highest, second high over 5 years

The NAAQS are shown in Table 5.

Table 5. National Ambient Air Quality Standards

Pollutant	Averaging Time	National Ambient Air Quality Standards ($\mu g/m^3$)	
		Primary	Secondary
CO	1-hour	40,000	--
	8-hour	10,000	--

6.0 RESULTS

Attachment B to this report provides the model summary output. AERMOD input and output files, including the BPIP-PRIME files, are included on the enclosed CD.

6.1 Significant Impact Analysis Results

The project results in CO impacts in excess of the 8-hour Significant Impact Level shown in Table 3. The significant impact analysis results are presented in Table 6. Based upon the results of the significant impacts analysis, a cumulative, NAAQS analysis was conducted.

6.2 NAAQS Analysis Results

Following the determination of significant impacts, an analysis was conducted to assess compliance with the CO NAAQS. The project resulted in insignificant 1-hr CO impacts, as a result the 1-hr average was not included in the NAAQS assessment. All sources located within 50km of the US Steel facility were modeled in conjunction with the US Steel facility in assessing compliance. Background concentrations were added to the model results to assess compliance. Evaluation of compliance with the CO short term standards was based upon the maximum of the highest-second-highest values from the five-year meteorological dataset.

The results of the NAAQS analysis are presented in Table 7. As can be seen, the model demonstrates compliance.

Table 6. Significant Impact Analysis Results

Pollutant	Averaging Period	Maximum Modeled Impact ($\mu g/m^3$)	PSD Significant Class II Impact Level ($\mu g/m^3$)	Significant Monitoring Concentration ($\mu g/m^3$)	Maximum Distance to a Significant Impact (km)
CO	1-hr	1,157	2,000	N/A	NA
	8-hr	692	500	575	2.2

N/A – Not applicable, impacts calculated to be insignificant.

Table 7. NAAQS Analysis Results

Pollutant	Averaging Period	Modeled Concentration ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total Concentration ($\mu g/m^3$)	Standard ($\mu g/m^3$)	Comment
CO	8-hour	2,045	1,646	3,691	10,000	Compliant

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ATTACHMENT A
MODELING INPUT DATA

US Steel Granite City Point Source Model Input (NAD83, Zone 15)
Last Update (10-5-22)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	CO Potential Emissions (lb/hr)	CO Emissions Increase (lb/hr)
132833	DEFAULT	Blast Furnace A Stoves	749816.02	4286809.08	416.83	217.0	500.0	49.66	7.0	1604.52	1604.52
132838	DEFAULT	Blast Furnace B Stoves	749665.50	4286719.93	417.16	225.0	500.0	51.05	9.8	1837.76	1837.76
132837	DEFAULT	Blast Furnace Gas Flare #1	749777.33	4286841.02	418.21	221.8	1831.7	65.62	15.4	6280.99	6280.99
240479	DEFAULT	Blast Furnace Gas Flare #2	749865.93	4286920.23	416.24	221.8	1831.7	65.62	15.4	6280.99	0.00
132836	DEFAULT	Casthouse Baghouse	749616.61	4286732.18	417.75	63.0	150.0	63.88	11.0	63.77	21.68
132927	DEFAULT	Blast Furnace A and B Iron Spout Baghouse	749831.35	4286818.73	415.98	43.0	123.0	43.04	7.8	6.43	2.19
238459	DEFAULT	Cogeneration Boiler BFG-fired some NG-firing	749776.38	4287073.85	415.19	137.0	400.1	62.11	6.0	203.08	0.00
132867	DEFAULT	Boiler 11	749865.15	4286883.84	416.24	149.9	335.0	29.82	8.0	90.48	90.48
132872	DEFAULT	Boiler 12	749881.40	4286887.85	416.50	150.0	335.0	26.74	8.0	90.48	90.48
BOF	DEFAULT	BOF ESP	748415.00	4286681.00	416.57	125.0	400.0	50.00	15.0	4121.79	1274.01
BOF2ND	DEFAULT	BOF Secondary Baghouse	748625.57	4286763.99	413.00	160.0	275.0	38.55	17.0	19.69	19.69
132842	DEFAULT	Slab Reheat Furnace #1	747729.70	4286762.02	417.52	56.8	650.1	44.88	8.0	26.52	0.00
172532	DEFAULT	Slab Reheat Furnace #2	747715.25	4286747.05	416.47	56.8	650.1	44.88	8.0	26.52	0.00
172512	DEFAULT	Slab Reheat Furnace #3	747700.79	4286730.53	415.88	56.8	650.1	44.88	8.0	26.52	0.00
172514	DEFAULT	Slab Reheat Furnace #4	747700.27	4286714.00	416.08	146.0	736.1	26.94	13.7	40.76	0.00
132849	DEFAULT	Galvanizing line #8 - fume scrubber	748883.00	4287195.00	416.57	80.0	80.0	41.66	3.0	0.00	0.00
229337	DEFAULT	Galvanizing line #8 - space heaters	748398.00	4287038.00	418.90	39.0	284.1	23.16	2.0	0.00	0.00
229338	DEFAULT	Galvanizing line #8 - drying oven and storage area heaters	748398.00	4287038.00	418.90	39.0	284.1	23.16	2.0	0.00	0.00
229339	DEFAULT	Galvanizing line #8 - miscellaneous heaters	748398.00	4287038.00	418.90	39.0	284.1	23.16	2.0	0.00	0.00
229601	DEFAULT	Emergency Generator (3500 HP)	749641.00	4286863.00	416.17	37.0	442.0	32.80	1.9	0.00	0.00
GTEWY1	DEFAULT	Gateway Energy & Coke Co., LLC - Coking (New Main Stack)	749279.00	4286984.00	415.78	199.9	293.1	48.249	13.0	2.62E+01	0.00
GTEWY2	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 2 of 6	749549.00	4287055.00	418.18	26.0	299.9	68.093	4.5	6.68E-02	0.00
GTEWY3	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 3 of 6	749433.00	4286972.00	418.93	26.0	299.9	68.093	4.5	6.64E-02	0.00
GTEWY4	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 4 of 6	749357.00	4286918.00	418.64	26.0	299.9	68.093	4.5	6.68E-02	0.00
GTEWY5	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 5 of 6	749278.00	4286861.00	418.44	26.0	299.9	68.093	4.5	6.68E-02	0.00
GTEWY6	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 6 of 6	749202.00	4286808.00	418.60	26.0	299.9	68.093	4.5	6.64E-02	0.00
GTEWY7	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 1 of 6	749624.00	4287108.00	418.50	26.0	299.9	68.093	4.5	6.68E-02	0.00
GTEWY8	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 1	749199.00	4286809.00	418.60	85.0	2000.0	74.653	9.0	7.30E-01	0.00
GTEWY9	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 1 of 6	749620.00	4287113.00	418.11	20.0	400.0	69.602	5.0	1.31E+00	0.00
GTEWY10	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 2	749274.00	4286862.00	418.31	85.0	2000.0	74.653	9.0	7.35E-01	0.00
GTEWY11	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 3	749353.00	4286919.00	418.67	85.0	2000.0	74.653	9.0	7.30E-01	0.00
GTEWY12	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 4	749429.00	4286973.00	419.00	85.0	2000.0	74.653	9.0	7.35E-01	0.00
GTEWY13	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 5	749545.00	4287055.00	418.27	85.0	2000.0	74.653	9.0	7.35E-01	0.00
GTEWY14	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 6	749620.00	4287109.00	418.34	85.0	2000.0	74.653	9.0	7.35E-01	0.00
GTEWY15	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 2 of 6	749545.00	4287060.00	418.24	20.0	400.0	69.602	5.0	1.32E+00	0.00
GTEWY16	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 3 of 6	749429.00	4286977.00	418.93	20.0	400.0	69.602	5.0	1.32E+00	0.00
GTEWY17	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 4 of 6	749352.00	4286923.00	418.57	20.0	400.0	69.602	5.0	1.31E+00	0.00
GTEWY18	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 5 of 6	749274.00	4286866.00	418.24	20.0	400.0	69.602	5.0	1.32E+00	0.00
GTEWY19	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 6 of 6	749198.00	4286813.00	418.77	20.0	400.0	69.602	5.0	1.32E+00	0.00

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US Steel Granite City Volume Source Inputs

Source ID	Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Release Height (ft)	Sigma Y (ft)	Sigma Z (ft)	CO Potential Emissions (lb/hr)	CO Emissions Increase (lb/hr)
26070	Ladle Preheaters/Dryers (formerly BOF 4, NG & COG) - Roof Monitor	748457.20	4286596.40	413.88	169.0	21.6	78.6	1.373	1.373
26080	Ladle Preheaters/Dryers (formerly BOF 4, NG & COG) - Roof Monitor	748466.60	4286606.00	413.98	169.0	21.6	78.6	1.373	1.373
26090	Ladle Preheaters/Dryers (formerly BOF 4, NG & COG) - Roof Monitor	748475.40	4286616.10	413.88	169.0	21.6	78.6	1.373	1.373
26100	Ladle Preheaters / Dryers (formerly BOF 5, NG & COG) - Roof Monitor	748483.60	4286624.10	413.85	169.0	21.6	78.6	1.029	1.029
26110	Ladle Preheaters / Dryers (formerly BOF 5, NG & COG) - Roof Monitor	748495.20	4286635.90	414.01	169.0	21.6	78.6	1.029	0.000
26120	Ladle Preheaters / Dryers (formerly BOF 5, NG & COG) - Roof Monitor	748504.10	4286646.00	414.37	169.0	21.6	78.6	1.029	0.000
26130	Ladle Preheaters / Dryers (formerly BOF 5, NG & COG) - Roof Monitor	748513.90	4286656.70	414.63	169.0	21.6	78.6	1.029	0.000
26570	Galv Line 8	748368.26	4287046.91	420.41	101.7	12.3	48.5	0.254	0.000
26580	Galv Line 8	748374.01	4287041.49	420.11	101.7	12.3	48.5	0.254	0.000
26590	Galv Line 8	748379.56	4287036.28	419.82	101.7	12.3	48.5	0.254	0.000
26600	Galv Line 8	748420.52	4286997.79	419.55	38.0	15.1	38.0	0.254	0.000
26610	Galv Line 8	748428.00	4286990.81	419.95	38.0	15.1	38.0	0.254	0.000
26620	Galv Line 8	748436.60	4286982.91	419.85	38.0	15.1	38.0	0.254	0.000
26630	Galv Line 8	748444.54	4286975.49	419.62	38.0	15.1	38.0	0.254	0.000
26640	Galv Line 8	748451.78	4286968.87	418.50	38.0	15.1	38.0	0.254	0.000
26650	Galv Line 8	748324.79	4287118.60	421.65	38.0	15.6	17.7	0.254	0.000
26660	Galv Line 8	748331.95	4287112.00	421.52	38.0	15.6	17.7	0.254	0.000
26670	Galv Line 8	748340.34	4287104.30	421.39	38.0	15.6	17.7	0.254	0.000
26680	Galv Line 8	748347.69	4287097.51	421.29	38.0	15.6	17.7	0.254	0.000
26690	Galv Line 8	748354.48	4287091.31	421.16	38.0	15.6	17.7	0.254	0.000
26700	Galv Line 8	748362.29	4287084.18	420.87	38.0	15.6	17.7	0.254	0.000
26710	Galv Line 8	748370.46	4287076.71	420.51	38.0	15.6	17.7	0.254	0.000
26720	Galv Line 8	748378.04	4287069.70	420.14	38.0	15.6	17.7	0.254	0.000
26730	Galv Line 8	748385.51	4287062.91	419.52	38.0	15.6	17.7	0.254	0.000
0126A_1	Slag Pit Volume 1	749691.91	4286762.44	418.70	53.0	29.0	17.7	0.000	0.000
0126A_2	Slag Pit Volume 2	749708.01	4286772.50	421.33	53.0	29.0	17.7	0.000	0.000
0126A_3	Slag Pit Volume 3	749724.24	4286782.31	420.44	53.0	29.0	17.7	0.000	0.000
0126A_4	Slag Pit Volume 4	749740.84	4286791.62	419.00	53.0	29.0	17.7	0.000	0.000
0126A_5	Slag Pit Volume 5	749757.20	4286801.31	418.86	53.0	29.0	17.7	0.000	0.000

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Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
IL132772	DEFAULT	Star Memorial Pet Crematory - Crematory	749244.00	4324486.00	641.44	16.0	800.0	27.585	1.0	2.70E+00	0.00E+00	0.00E+00
IL131841	DEFAULT	Alton Steel Inc. - Electric arc furnaces	747753.00	4307832.00	433.07	100.0	250.1	31.029	24.2	2.25E+02	7.07E+01	7.07E+01
IL131845	DEFAULT	Alton Steel Inc. - 14 inch rolling mill reheat furnace	747645.00	4307692.00	432.64	106.0	700.0	2.394	16.0	2.40E+01	0.00E+00	0.00E+00
IL131945	DEFAULT	Alton Memorial Hospital - 3 Boilers	746564.00	4309470.00	521.36	89.0	389.9	24.108	3.0	0.00E+00	1.28E+01	1.28E+01
IL132052	DEFAULT	Olin Winchester, LLC - Package Boiler (B-4)	750887.00	4308614.00	435.63	35.0	400.0	84.854	2.0	0.00E+00	4.57E+00	4.57E+00
IL132062	DEFAULT	Olin Winchester, LLC - Package Boiler (B-3)	750891.00	4308619.00	435.89	35.0	400.0	84.854	2.0	0.00E+00	4.60E+00	4.60E+00
IL132063	DEFAULT	Olin Winchester, LLC - Package Boiler (B-2)	750892.00	4308613.00	435.53	35.0	400.0	84.854	2.0	0.00E+00	4.57E+00	4.57E+00
IL132064	DEFAULT	Olin Winchester, LLC - Package Boiler (B-1)	750888.00	4308609.00	435.30	35.0	400.0	84.854	2.0	0.00E+00	4.60E+00	4.60E+00
IL132065	DEFAULT	Olin Winchester, LLC - Package Boiler (B-5)	750883.00	4308610.00	435.27	35.0	400.0	84.854	2.0	0.00E+00	4.60E+00	4.60E+00
IL132148	DEFAULT	Amsted Rail Co., Inc. - Electric Arc Furnace #1 (EF-1)	747122.00	4287625.00	425.26	55.0	250.1	54.087	8.2	3.84E+01	4.07E+00	4.07E+00
IL132149	DEFAULT	Amsted Rail Co , Inc. - Electric Arc Furnace #2 (EF-2)	747147.00	4287625.00	425.20	44.0	250.1	42.443	7.0	3.84E+01	4.07E+00	4.07E+00
IL132193	DEFAULT	Velocity Services, LLC. - North American Boiler	748928.00	4286192.00	416.21	27.0	450.1	24.305	2.3	2.36E+00	0.00E+00	0.00E+00
IL132194	DEFAULT	Velocity Services, LLC. - Cleaver Brooks boiler	748928.00	4286192.00	416.21	29.0	440.0	39.590	2.0	2.36E+00	0.00E+00	0.00E+00
IL132225	DEFAULT	Gateway Regional Medical Center - Boiler #3	748587.00	4287448.00	426.05	48.0	600.0	41.131	4.5	1.63E+00	1.28E+01	1.28E+01
IL132226	DEFAULT	Gateway Regional Medical Center - Boilers #1 and 2	748592.00	4287452.00	425.95	48.0	600.0	38.986	4.5	3.07E+00	2.57E+01	2.57E+01
IL132247	DEFAULT	Prairie Farms Dairy, Inc. - Boiler #1	747505.00	4287550.00	424.64	75.0	375.0	30.078	2.5	1.30E-01	0.00E+00	0.00E+00
IL132248	DEFAULT	Prairie Farms Dairy, Inc. - Boiler #2	747505.00	4287550.00	424.64	25.0	375.0	65.010	2.5	2.40E-01	1.19E+00	1.19E+00
IL132324	DEFAULT	Precoat Metals - Afterburner AB1 and AB2	749469.00	4292538.00	424.97	34.0	1000.0	64.518	4.0	3.23E+00	0.00E+00	0.00E+00
IL132424	DEFAULT	Highland Electric Light Plant - Engine IC-6	788126.93	4293320.17	534.65	28.0	612.1	84.854	2.0	2.07E+01	0.00E+00	0.00E+00
IL132425	DEFAULT	Highland Electric Light Plant - Engine IC-7	788126.93	4293320.17	534.65	57.0	734.1	6.265	11.4	2.51E+01	0.00E+00	0.00E+00
IL132496	DEFAULT	ConocoPhillips Co. - Catalytic reformer #1 (STK12-4)	754869.00	4302625.00	442.55	349.9	600.0	56.810	15.0	6.28E+01	9.53E+01	9.53E+01
IL132510	DEFAULT	ConocoPhillips Co. - Distilling unit: HTR-DU1-F301 (STK5-2)	754327.00	4303077.00	444.69	185.0	319.0	21.878	8.0	1.21E-01	0.00E+00	0.00E+00
IL132511	DEFAULT	ConocoPhillips Co. - Distilling unit: HTR-DU1-F302 (STK5-1)	754326.00	4303100.00	444.49	150.0	150.0	13.677	8.5	1.97E-01	5.29E+00	5.29E+00
IL132512	DEFAULT	ConocoPhillips Co. - Steam methane reformer: SMR Heater (HTR-SMR - STK12-8)	754873.00	4302750.00	443.04	199.9	749.9	36.638	12.0	4.75E+01	6.82E+01	6.82E+01
IL132516	DEFAULT	ConocoPhillips Co. - Rectified absorption unit: Reboiler heater (HTR-RAU-DEBUT - STK5-5)	754470.00	4302943.00	444.98	75.0	850.0	34.440	5.0	7.14E+00	0.00E+00	0.00E+00
IL132517	DEFAULT	ConocoPhillips Co. - Rectified absorption system to RFG	754240.00	4303144.00	443.47	150.0	710.0	26.338	6.0	0.00E+00	1.20E+02	1.20E+02
IL132519	DEFAULT	ConocoPhillips Co. - Cracked absorption unit (HTR-CAU-ADSTILL - STK5-4)	754468.00	4302968.00	445.41	85.0	800.0	22.173	7.2	6.72E+00	0.00E+00	0.00E+00
IL132526	DEFAULT	ConocoPhillips Co. - CCU-1 Startup Heater 8-1	754240.00	4303144.00	443.47	212.0	500.1	86.953	4.5	0.00E+00	3.55E+01	3.55E+01
IL132535	DEFAULT	ConocoPhillips Co. - Catalytic cracking unit #2 (STK6-3)	754848.00	4302895.00	443.27	199.9	175.0	49.954	11.0	4.72E+01	2.17E+03	2.17E+03
IL132541	DEFAULT	ConocoPhillips Co. - Alkylation unit: HTR-AUXY-HM2 (STK6-6)	754930.00	4303043.00	442.59	150.9	475.1	12.398	9.7	4.32E+00	0.00E+00	0.00E+00
IL132556	DEFAULT	ConocoPhillips Co. - Utility boiler #15 (STK12-15)	754859.00	4302776.00	443.44	132.0	425.0	43.165	7.0	2.65E+01	1.62E+01	1.62E+01
IL132557	DEFAULT	ConocoPhillips Co. - Utility boiler #18 (STK12-18)	754875.00	4302778.00	443.21	132.0	425.0	43.165	7.0	2.78E+01	1.41E+01	1.41E+01
IL132558	DEFAULT	ConocoPhillips Co. - Utility boiler 17 (STK12-17)	754902.00	4302784.00	442.91	150.0	317.0	52.218	10.0	3.60E+01	1.82E+01	1.82E+01
IL132559	DEFAULT	ConocoPhillips Co. - Utility boiler 18 (STK6-9)	754919.00	4302809.00	442.52	100.0	325.0	14.465	6.2	3.00E+01	6.61E+00	6.61E+00
IL132561	DEFAULT	ConocoPhillips Co. - Hydrodesulfurization unit #1: Charge heater (HTR-HDU-1 - STK13-1)	755217.00	4302588.00	442.16	150.0	790.1	32.144	5.0	5.60E+00	0.00E+00	0.00E+00
IL132564	DEFAULT	ConocoPhillips Co. - Hydrodesulfurization unit #2: Charge heater (HTR-HDU-2 - STK12-14)	755022.00	4302530.00	442.95	150.0	900.1	31.422	5.8	4.90E+00	0.00E+00	0.00E+00
IL132565	DEFAULT	ConocoPhillips Co. - Cat reformer #3: Stabilizer reboiler (HTR-CR3-H2 - STK12-9)	755014.00	4302580.00	442.62	150.0	950.1	7.019	7.8	4.79E+00	0.00E+00	0.00E+00
IL132567	DEFAULT	ConocoPhillips Co. - Catalytic reformer unit #3: Charge heater (HTR-CR3 -H4)	755019.00	4302571.00	442.85	150.0	800.0	28.766	7.8	1.75E+01	8.04E+00	8.04E+00
IL132568	DEFAULT	ConocoPhillips Co. - Catalytic reformer unit #3: First interreactor heater (HTR-CR3-H5)	755019.00	4302548.00	442.78	150.0	749.9	26.929	7.8	2.11E+01	6.93E+00	6.93E+00
IL132569	DEFAULT	ConocoPhillips Co. - Cat reformer #3: Second interreactor heater (HTR-CR3-H6 - STK12-12)	755019.00	4302559.00	442.72	150.0	749.9	14.006	7.8	5.55E+00	0.00E+00	0.00E+00
IL132594	DEFAULT	ConocoPhillips Co. - Sulfuric acid tank	755114.00	4302829.00	441.93	40.0	186.0	26.273	2.0	1.78E+00	2.35E+00	2.35E+00
IL132598	DEFAULT	ConocoPhillips Co. - CCU-2 Startup heater 8-1	754240.00	4303144.00	443.47	16.0	509.1	32.964	3.2	4.40E-01	0.00E+00	0.00E+00
IL132599	DEFAULT	Airgas USA, LLC - Liquified carbon dioxide plant	756314.00	4302509.00	435.93	30.0	70.1	79.573	0.2	4.30E-01	0.00E+00	0.00E+00
IL132701	DEFAULT	Kinder Morgan Liquids Terminals, LLC - New Truck loading rack	752998.00	4303578.00	435.63	20.0	70.1	0.262	2.2	4.87E+00	0.00E+00	0.00E+00
IL132739	DEFAULT	National Maintenance and Repair - Cleaver Brooks boiler (Stack 1 of 2)	750915.00	4300804.00	402.46	34.0	450.1	23.321	2.0	1.90E+00	5.00E+00	5.00E+00
IL132777	DEFAULT	Elias Kallal & Schaaf Funeral Home & Crematory - Crematorium	742098.00	4312210.00	627.20	30.0	1400.1	18.368	1.7	3.00E+00	0.00E+00	0.00E+00
IL132781	DEFAULT	Christ Bros Products, LLC - Baghouse	754160.00	4283243.00	419.46	32.0	248.0	83.706	3.9	5.56E+01	2.48E+01	2.48E+01
IL132928	DEFAULT	Enable Mississippi River Transmission, LLC - Engine SN-02	782556.00	4285336.00	492.29	30.0	1000.0	9.414	2.6	1.36E+01	0.00E+00	0.00E+00
IL133625	DEFAULT	Waterloo City Light Plant - Engine #3	748326.00	4246769.00	640.45	28.0	749.9	13.579	2.3	4.00E+01	1.35E+00	1.35E+00
IL133627	DEFAULT	Waterloo City Light Plant - Engine #9	748326.00	4246769.00	640.45	17.0	936.1	84.854	1.0	1.50E+01	3.60E+00	3.60E+00
IL133628	DEFAULT	Waterloo City Light Plant - Engine #10	748326.00	4246769.00	640.45	17.0	936.1	84.854	1.0	1.50E+01	3.60E+00	3.60E+00
IL135983	DEFAULT	Lakeview Memorial Gardens - Crematory	762896.00	4273894.00	579.89	16.0	895.0	26.666	2.6	8.40E+00	0.00E+00	0.00E+00
IL136012	DEFAULT	Breckenridge of IL - Natural gas combustion	756461.00	4277782.00	423.82	38.0	341.0	25.781	2.7	3.94E+00	0.00E+00	0.00E+00
IL136014	DEFAULT	Touchette Regional Hospital - 2 Boilers	751890.00	4279014.00	415.94	39.0	800.0	6.560	3.7	2.26E+00	0.00E+00	0.00E+00
IL136018	DEFAULT	Upchurch Ready Mix Concrete Company - Boiler	749859.00	4276616.00	418.44	30.0	376.1	29.684	3.7	0.00E+00	3.00E-01	3.00E-01

R005539

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
IL136098	DEFAULT	Safety Kleen Systems, Inc. - Pipe still (heat exchanger)	749786.00	4276425.00	420.28	15.0	170.0	0.295	1.0	0.00E+00	1.38E+00	1.38E+00
IL136125	DEFAULT	Milam Recycling and Disposal Facility - Open flare	750434.00	4282812.00	420.54	42.0	1800.1	10.070	1.0	1.83E+01	6.00E+00	6.00E+00
IL136129	DEFAULT	Village of Freeburg - Engine #6	769352.00	4257578.00	509.42	24.0	749.9	24.259	1.8	3.93E+00	0.00E+00	0.00E+00
IL136130	DEFAULT	Village of Freeburg - Engine #4	769352.00	4257578.00	509.42	25.0	550.0	87.871	1.5	9.80E+00	0.00E+00	0.00E+00
IL136131	DEFAULT	Village of Freeburg - Engine #7	769352.00	4257578.00	509.42	22.0	900.1	18.926	2.7	4.50E+01	4.43E+00	4.43E+00
IL136169	DEFAULT	Darling Ingredients, Inc. - Continuous rendering process	747472.00	4281438.00	414.93	44.0	74.9	84.854	4.0	6.67E+00	1.43E+00	1.43E+00
IL136187	DEFAULT	Asphalt Sales & Products Inc. - Drum mix asphalt plant	772959.00	4275690.00	514.30	33.0	325.0	47.134	4.5	6.49E+01	2.90E+01	2.90E+01
IL136486	DEFAULT	Cerro Flow Products, LLC. - Piercing Mill Furnace #2	746228.00	4279272.00	407.32	25.0	298.9	38.901	2.0	8.65E-01	0.00E+00	0.00E+00
IL136547	DEFAULT	Christ Bros Products, LLC - Drum mix asphalt plant	747162.00	4269805.00	448.72	36.0	315.1	86.592	3.5	1.34E+01	5.91E+00	5.91E+00
IL147809	DEFAULT	Magnesium Elektron North America - Combustion units	746452.00	4285724.00	415.49	60.0	450.1	30.537	2.0	1.02E+01	4.44E+00	4.44E+00
IL143317	DEFAULT	Waterloo City Light Plant - Engine #11	748326.00	4246769.00	640.45	17.0	926.1	84.854	1.0	1.50E+01	3.60E+00	3.60E+00
IL143319	DEFAULT	Waterloo City Light Plant - Engine #7	748326.00	4246769.00	640.45	33.0	749.9	84.854	2.0	3.41E+01	0.00E+00	0.00E+00
IL143320	DEFAULT	Waterloo City Light Plant - Engine #8	748326.00	4246769.00	640.45	27.0	680.1	84.230	2.3	1.87E+01	1.36E+00	1.36E+00
IL145809	DEFAULT	ConocoPhillips Co. - Crude heaters (STKS-3)	754415.00	4303016.00	445.93	311.9	530.0	37.970	14.0	7.81E+01	1.98E+01	1.98E+01
IL145830	DEFAULT	ConocoPhillips Co. - Sulfur recovery unit #1 (STKS-1)	752928.00	4303077.00	428.41	125.0	965.9	17.712	7.2	0.00E+00	4.05E+01	4.05E+01
IL145826	DEFAULT	ConocoPhillips Co. - Supplemental air compressor engine CCU-1	754240.00	4303144.00	443.47	15.0	117.1	20.369	1.5	7.10E-01	1.74E+00	1.74E+00
IL145838	DEFAULT	ConocoPhillips Co. - Sulfur recovery unit #2 (STKS-2)	752929.00	4303071.00	428.38	125.0	965.9	17.712	7.2	0.00E+00	4.05E+01	4.05E+01
IL145850	DEFAULT	ConocoPhillips Co. - Flare for major effluent treatment project	754240.00	4303144.00	443.47	30.0	78.0	14.006	9.2	4.51E+00	0.00E+00	0.00E+00
IL147845	DEFAULT	Mayco Mfg, LLC - Britt kettles combustion stack	747189.00	4286970.00	421.78	34.0	250.1	2.362	1.1	2.00E-01	0.00E+00	0.00E+00
IL147846	DEFAULT	Mayco Mfg, LLC - Mixed metals A-II dross baghouse discharge stack	747189.00	4286970.00	421.78	30.0	95.1	52.611	5.0	5.77E-01	0.00E+00	0.00E+00
IL143354	DEFAULT	ConocoPhillips Co. - Catalytic cracking unit #1 (STKS-2)	754864.00	4302895.00	442.88	199.9	175.0	49.954	11.9	2.32E+01	3.84E+01	3.84E+01
IL149873	DEFAULT	City of Alton - Incinerator	749456.00	4310990.00	446.33	25.0	1400.1	53.038	1.0	1.40E+00	0.00E+00	0.00E+00
IL149908	DEFAULT	Charles E. Mahoney - Drum mix asphalt plant	749517.00	4309892.00	443.14	25.0	295.1	66.289	4.0	5.74E+01	2.58E+01	2.58E+01
IL154190	DEFAULT	Milam Recycling and Disposal Facility - Engine #1	750544.00	4282853.00	411.88	26.0	820.0	86.231	0.8	6.93E+00	1.78E+00	1.78E+00
IL154191	DEFAULT	Milam Recycling and Disposal Facility - Engine #2	750538.00	4282852.00	412.01	26.0	820.0	86.231	0.8	6.93E+00	1.78E+00	1.78E+00
IL154192	DEFAULT	Milam Recycling and Disposal Facility - Engine #3	750548.00	4282855.00	411.81	26.0	820.0	86.231	0.8	7.14E+00	1.84E+00	1.84E+00
IL155302	DEFAULT	Alton Steel Inc. - Ladle Furnace	747753.00	4307832.00	433.07	74.0	275.1	87.215	3.0	2.24E+01	1.12E+01	1.12E+01
IL155304	DEFAULT	Precoat Metals - Boiler B1	749469.00	4292538.00	424.97	24.0	700.1	20.730	1.8	8.80E-01	0.00E+00	0.00E+00
IL155305	DEFAULT	Granite City Pickling & Warehousing - Boiler	746973.00	4286880.00	422.41	50.0	331.1	15.449	2.7	7.05E-01	0.00E+00	0.00E+00
IL155307	DEFAULT	Kraft Heinz Co. - Boiler 8	748105.00	4289580.00	423.56	40.0	380.0	68.948	2.0	1.44E+00	0.00E+00	0.00E+00
IL155437	DEFAULT	Southwestern Illinois Correctional Center - 2 Boilers	753202.00	4278290.00	421.46	32.0	450.1	15.285	1.5	7.05E-01	0.00E+00	0.00E+00
IL155441	DEFAULT	Asphalt Sales & Products Inc. - Asphalt heaters and boilers	772959.00	4275680.00	514.30	33.0	341.0	18.368	3.2	0.00E+00	2.80E+00	2.80E+00
IL156624	DEFAULT	US Air Force/Scott Air Force Base - Boilers and Heaters	774337.00	4270842.00	440.32	30.0	331.1	23.288	2.2	4.81E+00	0.00E+00	0.00E+00
IL156970	DEFAULT	Olin Winchester, LLC - Package Boiler (B-6)	750906.00	4308625.00	436.06	35.0	400.0	84.854	2.0	0.00E+00	4.60E+00	4.60E+00
IL159940	DEFAULT	Afton Chemical Corp. - 258 Sulfonation Stack	746613.00	4276305.00	407.65	158.0	70.1	41.820	1.0	0.00E+00	5.59E+00	5.59E+00
IL159942	DEFAULT	Afton Chemical Corp. - Unit 266: Flare 36-0011/36-0610	746653.00	4276356.00	410.10	100.0	700.1	59.368	0.7	8.55E+00	4.90E+01	4.90E+01
IL159965	DEFAULT	Afton Chemical Corp. - Flare 36-0219	746513.00	4276305.00	407.65	148.0	1000.0	42.837	0.4	3.84E+00	2.74E+01	2.74E+01
IL160741	DEFAULT	Brady McCasland, Inc. - Compaction plant	748518.00	4276987.00	413.75	17.0	1521.1	85.469	1.8	5.20E-01	0.00E+00	0.00E+00
IL160742	DEFAULT	Darling Ingredients, Inc. - Kewanee boiler	747472.00	4281438.00	414.93	35.0	450.1	54.448	2.6	1.96E+00	1.51E+01	1.51E+01
IL160799	DEFAULT	ConocoPhillips Co. - Supplemental air compressor engine CCU-2	754240.00	4303144.00	443.47	48.0	117.1	20.369	1.5	0.00E+00	1.74E+00	1.74E+00
IL160898	DEFAULT	Afton Chemical Corp. - Boiler 500-15-0110	746653.00	4276489.00	405.22	45.0	350.0	17.318	7.0	4.89E+00	0.00E+00	0.00E+00
IL165120	DEFAULT	Bfi Waste Systems of North America, Inc. - Flare	758882.00	4264336.00	574.97	35.0	1800.1	23.485	0.8	6.80E+00	0.00E+00	0.00E+00
IL166479	DEFAULT	Union Electric Co. - Turbine CT02A	745573.00	4283620.00	420.60	80.0	850.0	18.860	11.4	7.73E+01	2.73E+01	2.73E+01
IL166491	DEFAULT	Enable Mississippi River Transmission, LLC - Turbine SN-03	782556.00	4285336.00	492.29	30.0	749.9	86.854	2.5	9.56E+00	0.00E+00	0.00E+00
IL167781	DEFAULT	Amsted Rail Co., Inc. - Pouring and casting (PR/CST-1)	747025.00	4287611.00	424.80	101.0	251.0	34.768	9.7	0.00E+00	6.70E-01	6.70E-01
IL167787	DEFAULT	Amsted Rail Co., Inc. - Ladle Preheater 8 (DP-1)	747039.00	4287611.00	424.93	82.0	565.0	31.488	6.1	6.50E+00	2.20E-01	2.20E-01
IL167858	DEFAULT	ConocoPhillips Co. - Scot unit	754240.00	4303144.00	443.47	16.0	115.1	15.580	9.0	0.00E+00	1.72E+02	1.72E+02
IL169226	DEFAULT	Messer, LLC - 2 Boilers	752309.00	4301220.00	434.42	15.0	800.0	0.525	1.4	2.52E+00	0.00E+00	0.00E+00
IL172707	DEFAULT	St. Anthony's Hospital - Boiler #4	745097.00	4310964.00	584.58	64.0	400.0	58.614	2.3	0.00E+00	6.02E+00	6.02E+00
IL179611	DEFAULT	Highland Electric Light Plant - Engine #C-1	788126.98	4293320.17	534.65	12.0	656.0	86.920	1.2	1.44E+01	0.00E+00	0.00E+00
IL179671	DEFAULT	Village of Freeburg - Engine #1	769352.00	4257578.00	509.42	30.0	900.1	40.311	1.0	8.55E+00	8.25E-01	8.25E-01
IL179672	DEFAULT	Village of Freeburg - Engine #2	769352.00	4257578.00	509.42	30.0	900.1	40.311	1.0	8.55E+00	8.25E-01	8.25E-01
IL179673	DEFAULT	Village of Freeburg - Engine #3a	769352.00	4257578.00	509.42	25.0	900.1	55.170	1.0	5.92E+00	0.00E+00	0.00E+00
IL181173	DEFAULT	ConocoPhillips Co. - Loading rack	752282.00	4299987.00	429.92	40.0	1800.1	87.510	2.0	1.53E+00	0.00E+00	0.00E+00
IL183733	DEFAULT	Veolia ES Technical Solutions, LLC - Hazardous waste incinerator #4 (rotary kiln)	745532.00	4275942.00	414.78	57.0	650.9	32.570	2.8	3.17E+00	1.16E+01	1.16E+01

R005540

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
IL189068	DEFAULT	US Air Force/Scott Air Force Base - Diesel generators	774387.00	4270682.00	440.32	37.0	402.0	29.589	1.3	5.83E-01	0.00E+00	0.00E+00
IL190090	DEFAULT	Contract Services, LLC - 3 Boilers	746767.00	4275755.00	417.91	40.0	310.0	50.381	4.2	8.63E+00	5.14E+00	5.14E+00
IL192853	DEFAULT	Midwest Metal Coatings, LLC - Chemical coater/infrared oven (CC/IRO)	748281.00	4290395.00	423.88	34.0	120.0	18.926	5.0	2.90E-01	0.00E+00	0.00E+00
IL192964	DEFAULT	Midwest Metal Coatings, LLC - Afterburner	748281.00	4290395.00	423.88	34.0	800.1	18.780	5.0	3.28E-01	0.00E+00	0.00E+00
IL192967	DEFAULT	Midwest Metal Coatings, LLC - Boiler (B1)	748281.00	4290395.00	423.88	34.0	400.0	67.388	1.5	2.12E+00	0.00E+00	0.00E+00
IL198552	DEFAULT	Christ Bros Products, LLC - Drum mix asphalt plant	778702.00	4276545.00	438.34	85.0	297.1	62.254	3.8	2.95E+01	1.32E+01	1.32E+01
IL201662	DEFAULT	Empire Comfort Systems - Stack	768529.00	4286192.00	477.26	25.0	800.0	14.334	1.0	2.69E+00	0.00E+00	0.00E+00
IL204833	DEFAULT	Milam Recycling and Disposal Facility - 3 Passive solar flares	750650.00	4282537.00	398.06	20.0	1800.1	57.138	0.7	4.23E-08	4.38E+00	4.38E+00
IL207740	DEFAULT	Chemtrade Solutions, LLC - Scrubber C007	753339.00	4281867.00	422.21	30.0	70.1	0.394	0.3	0.00E+00	2.00E-01	2.00E-01
IL208363	DEFAULT	Center Point Terminal Co. - Asphalt and polymer modified blend tank (T-9)	746361.00	4289240.00	416.44	33.0	385.1	0.951	1.5	1.20E-01	0.00E+00	0.00E+00
IL209238	DEFAULT	Concrete Supply, LLC - Natural gas combustion	757768.00	4281270.00	444.69	20.0	341.0	25.231	1.7	9.88E-01	0.00E+00	0.00E+00
IL209493	DEFAULT	Alton Water Treatment Facility - Stack	742583.00	4309460.00	488.98	22.0	400.0	85.083	0.7	0.00E+00	5.50E-01	5.50E-01
IL211274	DEFAULT	Kienstra-Illinois, LLC - Natural gas combustion	764660.00	4286982.00	575.95	20.0	341.0	25.781	1.7	7.88E-01	0.00E+00	0.00E+00
IL211772	DEFAULT	Center Point Terminal Co. - Incinerator/waste heat boiler	746361.00	4289240.00	416.44	18.0	650.0	7.979	2.0	1.83E-01	1.05E+00	1.05E+00
IL212692	DEFAULT	Chain of Rocks Recycling & Disposal - Open Flare	746845.00	4293274.00	431.59	20.0	1400.1	47.269	0.7	6.82E+00	1.06E+00	1.06E+00
IL212881	DEFAULT	Koch Fertilizer, LLC - Ammonia heater	750803.00	4305316.00	428.15	75.0	250.1	42.443	1.0	2.43E+00	5.30E-01	5.30E-01
IL218573	DEFAULT	Illinois Department of Transportation - K and K model 367-2 incinerator	732106.00	4332162.00	623.79	15.0	736.1	30.869	2.5	2.88E+00	0.00E+00	0.00E+00
IL213834	DEFAULT	Darling Ingredients, Inc. - Johnson boiler	747471.00	4281438.00	414.93	33.0	450.1	46.687	2.8	1.96E+00	1.51E+01	1.51E+01
IL213854	DEFAULT	Solvay Fluorides, LLC - Boiler	750245.00	4278215.00	419.72	30.0	361.0	7.314	2.0	1.44E+00	0.00E+00	0.00E+00
IL216315	DEFAULT	Madison County Sand, LLC - Drum mix asphalt plant	758921.00	4289026.00	422.01	32.0	248.0	64.452	4.1	1.63E+01	5.00E-01	5.00E-01
IL217756	DEFAULT	Phillips 66 Pipeline, LLC - Truck loading racks	744935.00	4274152.00	407.25	20.0	70.1	10.564	2.0	1.10E+01	0.00E+00	0.00E+00
IL218580	DEFAULT	ConocoPhillips Co. - North property ground flare (FLR1-2)	754486.00	4303322.00	445.08	195.0	1800.1	2.394	3.0	1.41E+01	0.00E+00	0.00E+00
IL218587	DEFAULT	Custom Steel Processing - Scrubber	746535.00	4286043.00	416.99	55.0	70.1	49.036	4.2	0.00E+00	1.00E-01	1.00E-01
IL218588	DEFAULT	Custom Steel Processing - Sulfuric acid storage tank	746335.00	4286043.00	416.99	35.0	127.0	0.000	2.4	0.00E+00	1.00E-01	1.00E-01
IL218589	DEFAULT	Contract Services, LLC - Boiler #6	746767.00	4275755.00	417.91	40.0	310.0	49.036	3.7	1.80E+01	1.84E+00	1.84E+00
IL218667	DEFAULT	ConocoPhillips Co. - Gas plant sour water stripper	754240.00	4303144.00	443.47	55.0	178.9	11.382	2.9	1.06E+00	0.00E+00	0.00E+00
IL218995	DEFAULT	Asphalt Sales & Products Inc. - Asphalt silos and truck loadout	772958.00	4275690.00	514.30	32.0	86.1	84.854	1.3	1.28E+00	0.00E+00	0.00E+00
IL219420	DEFAULT	Crown Textile Services - Boiler	748287.00	4290382.00	466.49	24.0	450.1	35.227	1.7	1.03E+00	0.00E+00	0.00E+00
IL220265	DEFAULT	American Colloid Co. - Sand drying	746882.00	4287239.00	419.91	72.0	491.1	28.766	3.3	1.29E+00	0.00E+00	0.00E+00
IL220267	DEFAULT	American Colloid Co. - Space Heaters	746882.00	4287239.00	419.91	55.0	198.1	21.486	1.4	2.30E-01	0.00E+00	0.00E+00
IL220618	DEFAULT	Asphalt Sales & Products Inc. - Drum mix asphalt plant	757560.00	4299901.00	441.83	32.0	280.0	68.922	4.3	7.61E+01	3.40E+01	3.40E+01
IL220849	DEFAULT	ConocoPhillips Co. - Alkylation unit flare (FLR6-1)	755035.00	4305081.00	442.55	198.9	1800.1	7.034	2.5	1.85E+01	0.00E+00	0.00E+00
IL222053	DEFAULT	Waterloo City Light Plant - Dual fuel-fired Turbine GT1	748326.00	4246769.00	640.45	39.0	612.1	41.390	4.8	1.77E+01	0.00E+00	0.00E+00
IL222134	DEFAULT	Asphalt Sales & Products Inc. - Asphalt silo loading	757560.00	4299901.00	441.83	26.0	123.0	4.986	1.7	7.00E-01	0.00E+00	0.00E+00
IL222135	DEFAULT	Asphalt Sales & Products Inc. - Asphalt heaters and boilers	757560.00	4299901.00	441.83	25.0	361.0	25.896	1.7	0.00E+00	2.80E+00	2.80E+00
IL222988	DEFAULT	Apex Oil Co., Inc. - Thermal oxidizers	752471.00	4302647.00	431.07	18.0	620.0	43.985	2.3	2.98E+00	0.00E+00	0.00E+00
IL223796	DEFAULT	Union Electric Co. - Turbine CT03	749705.00	4282930.00	420.96	50.0	603.1	74.948	3.4	4.90E-01	1.30E+00	1.30E+00
IL223797	DEFAULT	Union Electric Co. - Turbine CT04	749776.00	4282947.00	421.16	38.0	603.1	74.948	3.4	4.90E-01	1.30E+00	1.30E+00
IL223798	DEFAULT	Union Electric Co. - Turbine CT05	749539.00	4283626.00	420.98	38.0	603.1	74.948	3.4	6.90E-01	9.00E-01	9.00E-01
IL224167	DEFAULT	Interurban ILAWC - Emergency generator	757265.00	4276109.00	482.38	20.0	880.1	51.463	1.3	1.10E+01	6.60E+00	0.00E+00
IL224416	DEFAULT	Belleville Landfill, Inc. - Flare	760402.00	4264046.00	571.88	35.0	1600.1	8.659	0.8	1.22E+01	0.00E+00	0.00E+00
IL224592	DEFAULT	Christ Bros Products, LLC - Drum mix asphalt plant	759865.00	4295823.00	431.10	32.0	251.0	59.628	4.1	9.09E+01	1.38E+01	1.38E+01
IL224594	DEFAULT	Christ Bros Products, LLC - Asphalt tank heaters and boilers	759701.00	4299841.00	427.46	10.0	416.0	42.443	1.0	1.18E+00	2.80E+00	2.80E+00
IL224838	DEFAULT	Enable Mississippi River Transmission, LLC - Compressor engine SN-01	750038.00	4285476.00	410.47	22.0	1125.1	66.453	1.1	5.67E+00	0.00E+00	0.00E+00
IL224839	DEFAULT	Enable Mississippi River Transmission, LLC - Compressor engine SN-02	750044.00	4285416.00	410.24	22.0	1125.1	66.453	1.1	5.67E+00	0.00E+00	0.00E+00
IL224840	DEFAULT	Enable Mississippi River Transmission, LLC - Compressor engine SN-03	750049.00	4285406.00	410.37	22.0	1125.1	66.453	1.1	5.67E+00	0.00E+00	0.00E+00
IL224841	DEFAULT	Enable Mississippi River Transmission, LLC - Compressor engine SN-04	750054.00	4285397.00	410.50	22.0	1125.1	66.453	1.1	5.67E+00	0.00E+00	0.00E+00
IL224901	DEFAULT	Premcor Refining Group, Inc. - Thermal oxidizer	752775.00	4302414.00	429.95	20.0	342.1	49.462	0.8	7.40E-01	0.00E+00	0.00E+00
IL225166	DEFAULT	Metro Crematory - Crematory	754120.00	4290785.00	417.29	18.0	736.1	84.854	1.0	1.50E+00	0.00E+00	0.00E+00
IL225832	DEFAULT	ConocoPhillips Co. - Startup/malfunction/breakdown	754240.00	4303144.00	443.47	103.0	629.8	21.681	4.6	7.86E+01	1.91E+02	1.91E+02
IL225843	DEFAULT	City of O'Fallon - 400 kW (536 HP) Diesel generator	774612.00	4277280.00	434.42	13.0	900.1	86.592	0.7	3.37E+00	0.00E+00	0.00E+00
IL225844	DEFAULT	City of O'Fallon - 900 kW (1,322 HP) Diesel generator	774612.00	4277280.00	434.42	17.0	900.1	86.592	0.7	7.55E+00	0.00E+00	0.00E+00
IL225960	DEFAULT	Waterloo City Light Plant - Engine #4	748326.00	4246769.00	640.45	37.0	680.1	27.004	2.5	3.32E+01	0.00E+00	0.00E+00
IL226013	DEFAULT	Milam Recycling and Disposal Facility - 325 HP Tub grinder	750550.00	4282537.00	398.06	7.0	627.0	74.030	0.5	2.20E-08	8.00E-01	8.00E-01
IL226014	DEFAULT	Milam Recycling and Disposal Facility - Enclosed flare	750476.00	4282825.00	419.62	59.0	1400.1	0.855	12.0	2.40E+01	6.08E+00	6.08E+00

R005541

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
IL226015	DEFAULT	Miarm Recycling and Disposal Facility - 750 HP Tub grinder	750550.00	4282537.00	594.06	8.0	627.0	70.881	0.7	5.30E+00	1.90E+00	1.90E+00
IL226184	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - 1F Mix muller (MM-3); Low profile turbine (LF-1) and induction form sta	750075.00	4306259.00	432.32	41.0	209.9	36.080	2.1	2.00E+00	0.00E+00	0.00E+00
IL226204	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - Strip anneal #4 (SA-4)	750150.00	4308388.00	431.10	90.0	350.0	41.426	1.6	9.33E+01	0.00E+00	0.00E+00
IL226256	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - Strip Anneal #3 (SA-3)	750439.00	4308328.00	433.83	100.0	350.0	62.746	1.3	9.83E+01	0.00E+00	0.00E+00
IL226257	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - #7 Strip Anneal (SA-7)	750222.00	4308335.00	433.20	89.0	850.0	38.671	1.5	1.18E+02	0.00E+00	0.00E+00
IL226352	DEFAULT	Olin Winchester, LLC - Hammermill 1 2 and 3 (HM-1 HM-2 and HM-3)	750495.00	4308287.00	434.42	23.0	160.1	18.647	1.8	8.03E+00	0.00E+00	0.00E+00
IL226612	DEFAULT	Solutia Inc. - Santoflex process: Thermal oxidizer 2770994	746325.00	4275822.00	409.12	112.0	865.0	16.794	12.6	1.50E+01	0.00E+00	0.00E+00
IL226783	DEFAULT	Schildknecht Funeral Home, Inc. - Crematory	769033.00	4275796.00	549.57	17.0	1241.0	13.612	1.7	1.20E+00	0.00E+00	0.00E+00
IL227030	DEFAULT	ConocoPhillips Co. - #4 Crude unit heater H-24 (STK9-5)	753051.00	4302413.00	428.81	179.9	550.0	26.207	8.5	2.27E+01	0.00E+00	0.00E+00
IL227032	DEFAULT	ConocoPhillips Co. - Hydrogen plant #1 flare (FLR12-2)	755194.00	4302793.00	443.67	120.0	1800.1	7.970	1.7	1.62E+01	0.00E+00	0.00E+00
IL227034	DEFAULT	ConocoPhillips Co. - Sulfur operation	754240.00	4303144.00	443.47	158.0	590.1	37.753	3.4	0.00E+00	3.00E+01	3.00E+01
IL227035	DEFAULT	ConocoPhillips Co. - Process heater HP-1 (STK12-6)	755194.00	4302793.00	443.67	127.0	360.1	27.093	7.5	5.97E+00	0.00E+00	0.00E+00
IL227038	DEFAULT	ConocoPhillips Co. - SZU Charge heater H-3	755219.00	4302667.00	442.29	150.0	567.1	25.518	5.0	9.75E+00	0.00E+00	0.00E+00
IL227333	DEFAULT	Waterloo City Light Plant - Engine SGS	750635.00	4249410.00	628.97	8.0	924.0	61.172	0.7	1.40E+00	0.00E+00	0.00E+00
IL227400	DEFAULT	Collinsville Wastewater Treatment Plant - Emergency diesel generator (2922 HP/2180 kW)	758289.00	4283982.00	419.36	36.0	692.0	67.371	2.0	1.72E+01	1.20E+00	0.00E+00
IL227432	DEFAULT	Totall Metal Recycling, Inc. - Safety certification unit	748030.00	4289120.00	422.74	6.0	587.0	8.069	1.2	1.00E-01	0.00E+00	0.00E+00
IL227590	DEFAULT	Illinois Electric Works - 3 Burn off ovens	747872.00	4288124.00	423.20	46.0	250.1	41.230	2.4	1.17E+00	6.90E-02	6.90E-02
IL227679	DEFAULT	Union Electric Co. - Diesal generator	745516.00	4283326.00	430.38	26.0	490.0	50.811	1.4	1.30E+00	1.60E-01	1.60E-01
IL228119	DEFAULT	St. Clair Crematory - Human crematory	773291.00	4275644.00	507.28	17.0	1241.0	13.612	1.7	1.20E+00	0.00E+00	0.00E+00
IL228260	DEFAULT	Center Ethanol Co. - West boiler	745888.00	4275662.00	412.66	75.0	428.1	43.460	3.0	3.23E+00	0.00E+00	0.00E+00
IL228262	DEFAULT	Center Ethanol Co. - East boiler	745888.00	4275662.00	412.66	75.0	428.1	46.428	3.0	3.23E+00	0.00E+00	0.00E+00
IL228263	DEFAULT	Center Ethanol Co. - RTO	745888.00	4275662.00	412.66	50.0	310.0	70.684	5.5	6.85E+00	0.00E+00	0.00E+00
IL228294	DEFAULT	ConocoPhillips Co. - Distilling west refinery flare (FLR10-1)	753647.00	4302546.00	430.31	197.0	1800.1	6.626	3.0	2.51E+01	0.00E+00	0.00E+00
IL228295	DEFAULT	ConocoPhillips Co. - SZU Regenerator vent	755209.00	4302720.00	442.32	44.0	135.1	32.341	2.0	1.78E+00	2.35E+00	2.35E+00
IL229921	DEFAULT	Christ Bros Products, LLC - 3 Heaters and boilers	754160.00	4283243.00	419.46	37.0	400.0	20.664	1.8	1.18E+00	2.80E+00	2.80E+00
IL229922	DEFAULT	Christ Bros Products, LLC - Silo filling	754160.00	4283243.00	419.46	25.0	74.0	0.262	0.4	5.10E-01	0.00E+00	0.00E+00
IL229923	DEFAULT	Christ Bros Products, LLC - Truck loading	754160.00	4283243.00	419.46	29.0	135.1	48.052	2.0	5.80E-01	0.00E+00	0.00E+00
IL230300	DEFAULT	Afton Chemical Corp. - Flare 36-0090	746478.00	4276293.00	407.28	45.0	1600.1	6.656	8.0	2.20E+00	0.00E+00	0.00E+00
IL230350	DEFAULT	Village of Freeburg - Engine #10	769352.00	4257578.00	509.42	28.0	929.9	87.674	1.5	1.28E+01	3.20E+00	3.20E+00
IL230355	DEFAULT	Asphalt Sales & Products Inc. - Truck loadout	757560.00	4299901.00	441.63	28.0	135.1	43.198	1.9	7.90E-01	0.00E+00	0.00E+00
IL231259	DEFAULT	Village of Freeburg - Engine #11	769352.00	4257578.00	509.42	28.0	929.9	87.674	1.5	1.28E+01	3.20E+00	3.20E+00
IL231260	DEFAULT	Village of Freeburg - Engine #12	769352.00	4257578.00	509.42	28.0	929.9	87.674	1.5	1.28E+01	3.20E+00	3.20E+00
IL231291	DEFAULT	Kurrus Funeral Home - 2 Crematories	759066.00	4271234.00	547.11	18.0	787.0	13.186	1.1	2.70E+00	0.00E+00	0.00E+00
IL232739	DEFAULT	ConocoPhillips Co. - Benzene extraction unit #3 (STK6-4)	754923.00	4302930.00	442.58	185.0	470.0	16 138	9.7	1.22E+01	0.00E+00	0.00E+00
IL232785	DEFAULT	Roxana Landfill, Inc. - Enclosed flare	739153.00	4301368.00	619.82	35.0	1600.1	20.008	12.0	2.31E+01	1.76E+00	1.76E+00
IL233294	DEFAULT	Gateway Terminals, LLC. - Marine vapor combustion unit (MVCU)	744607.00	4275093.00	422.70	74.0	514.0	25.158	3.3	1.69E+01	0.00E+00	0.00E+00
IL233295	DEFAULT	Gateway Terminals, LLC. - Truck/Rail vapor destruction unit (TRCU)	744607.00	4275093.00	422.70	74.0	514.0	25.158	3.3	8.39E+00	0.00E+00	0.00E+00
IL235261	DEFAULT	Gulfstream Aerospace Services Corp. - Make-up air unit 19-3	747629.00	4273560.00	410.10	42.0	577.0	29.356	2.5	1.63E+00	0.00E+00	0.00E+00
IL235939	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - Strip anneal #5 (SA-5)	750151.00	4308373.00	430.91	90.0	450.1	54.087	1.4	1.07E+02	0.00E+00	0.00E+00
IL235940	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - Strip anneal #6 (SA-6)	750207.00	4308390.00	431.82	110.0	580.0	62.779	1.3	1.07E+02	0.00E+00	0.00E+00
IL236260	DEFAULT	Bunge-SF Grain, LLC. - Grain Dryer	746158.00	4281045.00	417.55	96.0	105.0	87.904	8.2	5.06E+00	1.71E+01	1.71E+01
IL236359	DEFAULT	City of Belleville - 2 Emergency generators (1500 kW each)	763544.00	4265595.00	474.70	28.0	627.0	73.767	1.2	2.57E+01	1.84E+00	0.00E+00
IL236927	DEFAULT	Kraft Heinz Co. - Boiler C	748105.00	4289580.00	423.56	40.0	380.0	68.946	2.0	1.44E+00	0.00E+00	0.00E+00
IL236928	DEFAULT	Kraft Heinz Co. - Boiler D	748105.00	4289580.00	423.56	40.0	380.0	68.946	2.0	1.44E+00	0.00E+00	0.00E+00
IL236929	DEFAULT	Kraft Heinz Co. - Boiler E	748105.00	4289580.00	423.56	40.0	380.0	68.946	2.0	1.44E+00	0.00E+00	0.00E+00
IL236930	DEFAULT	National Maintenance and Repair - Cleaver Brooks boiler (Stack 2 of 2)	750920.00	4300904.00	462.46	34.0	450.1	23.321	2.0	1.90E+00	5.00E+00	5.00E+00
IL237099	DEFAULT	Union Electric Co. - Turbine CT02B	745573.00	4283613.00	419.69	30.0	850.0	18.860	11.4	7.74E+01	2.73E+01	2.73E+01
IL237182	DEFAULT	Highland Electric Light Plant - Engine IC-6	788126.93	4293320.17	534.65	28.0	612.1	84.854	2.0	1.32E+01	0.00E+00	0.00E+00
IL237183	DEFAULT	Highland Electric Light Plant - Engine IC-8	788126.93	4293320.17	534.65	57.0	734.1	81.762	11.4	2.57E+01	0.00E+00	0.00E+00
IL237340	DEFAULT	Charles E. Mahoney - Asphalt silo filling	749517.00	4309892.00	443.14	25.0	74.0	0.262	0.4	5.30E-01	0.00E+00	0.00E+00
IL237341	DEFAULT	Charles E. Mahoney - Truck loadout	749517.00	4309892.00	443.14	27.0	136.0	42.050	1.9	6.00E-01	0.00E+00	0.00E+00
IL237362	DEFAULT	Charles E. Mahoney - Asphalt heaters and boilers	749517.00	4309892.00	443.14	10.0	350.0	69.995	1.0	1.18E+00	2.80E+00	2.80E+00
IL237659	DEFAULT	Green Plains Madison, LLC - Boiler #1	745256.00	4285477.00	414.14	71.0	284.1	22.960	3.3	1.29E+00	5.00E-01	5.00E-01
IL237660	DEFAULT	Green Plains Madison, LLC - Fire Pump back-up Engine (460 HP)	745191.00	4285409.00	413.85	13.0	627.0	86.231	0 8	4.80E-01	9.40E-01	0.00E+00
IL237661	DEFAULT	Green Plains Madison, LLC - Electrical system backup Engine (1495 HP)	745144.00	4285537.00	415.88	28.0	627.0	73.767	1.2	3.54E+00	1.21E+01	0.00E+00

R005542

Off Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
IL237679	DEFAULT	Green Plains Madison, LLC - Indirect dryer #1	745191.00	4285468.00	416.52	71.0	387.1	12.136	4.6	2.87E+00	4.10E-01	4.10E-01
IL237866	DEFAULT	Amsted Rail Co., Inc. - Curing oven	746913.00	4287625.00	419.29	39.0	258.0	22.078	1.9	2.92E-01	0.00E+00	0.00E+00
IL237899	DEFAULT	Center Ethanol Co. - Emergency generator	745388.00	4275662.00	412.86	28.0	627.0	73.787	1.2	3.30E+00	0.00E+00	0.00E+00
IL237905	DEFAULT	Center Ethanol Co. - Ethanol loadout Rack	745888.00	4275682.00	412.66	19.0	99.1	7.886	0.7	8.86E-01	0.00E+00	0.00E+00
IL238199	DEFAULT	Solutia Inc. - An in-situ soil vapor extraction system	746325.00	4275822.00	405.12	15.0	70.1	73.406	0.2	4.90E-01	0.00E+00	0.00E+00
IL238839	DEFAULT	Waterloo City Light Plant - Turbine Generator (GT2)	748328.00	4246759.00	640.45	39.0	965.9	87.937	4.8	1.78E+01	0.00E+00	0.00E+00
IL238942	DEFAULT	ConocoPhillips Co. - Rental Boiler #3	754240.00	4303144.00	443.47	20.0	550.0	46.412	4.0	1.86E+00	0.00E+00	0.00E+00
IL239385	DEFAULT	Amsted Rail Co., Inc. - Sand dryer	746975.00	4287537.00	422.05	39.0	284.1	23.157	2.0	1.24E+00	0.00E+00	0.00E+00
IL239396	DEFAULT	Amsted Rail Co., Inc. - Thermal sand reclaimer	746975.00	4287537.00	422.05	39.0	284.1	23.157	2.0	3.70E-01	0.00E+00	0.00E+00
IL239899	DEFAULT	Shell Oil Products US - RTO	753758.00	4303650.00	442.59	18.0	200.0	33.948	2.5	8.00E+00	8.47E-01	8.47E-01
IL240053	DEFAULT	Westwood Lands, Inc. - Process heater (DFH-1	748864.00	4286684.00	412.99	39.0	284.1	23.157	2.0	8.30E-01	0.00E+00	0.00E+00
IL240359	DEFAULT	Alton Chemical Corp. - Boiler 500-15-0216	746660.00	4276488.00	405.94	45.0	350.0	17.318	7.0	4.89E+00	0.00E+00	0.00E+00
IL240360	DEFAULT	Alton Chemical Corp. - Boiler 500-15-0310	746674.00	4276485.00	407.25	45.0	350.0	17.318	7.0	4.91E+00	0.00E+00	0.00E+00
IL241300	DEFAULT	ConocoPhillips Co. - VOC Flare (West - FLR4-1)	753428.00	4303073.00	428.51	30.0	1800.1	26.174	0.7	1.43E+00	0.00E+00	0.00E+00
IL241301	DEFAULT	ConocoPhillips Co. - VOC Flare (East - FLR4-2)	753441.00	4303073.00	428.77	30.0	1800.1	26.174	0.7	1.43E+00	0.00E+00	0.00E+00
IL241302	DEFAULT	ConocoPhillips Co. - Coker north flare (FLR1-3)	754947.00	4303684.00	444.23	189.0	911.0	26.535	5.4	0.00E+00	3.08E+01	3.08E+01
IL241303	DEFAULT	ConocoPhillips Co. - VF-5 Heater (H350H4 - STK1-1)	754037.00	4303459.00	444.98	150.0	650.0	26.765	12.0	0.00E+00	1.35E+01	1.35E+01
IL241304	DEFAULT	ConocoPhillips Co. - Coker north heater (H351H2 - STK1-2)	754058.00	4303308.00	444.85	150.0	300.1	22.304	10.0	0.00E+00	7.37E+00	7.37E+00
IL241305	DEFAULT	ConocoPhillips Co. - Coker north heater (H351H1 - STK1-3)	754084.00	4303306.00	444.82	150.0	300.1	22.304	10.0	0.00E+00	7.38E+00	7.38E+00
IL241312	DEFAULT	ConocoPhillips Co. - Heater HP-7 (STK7-1)	755265.00	4302920.00	443.86	118.0	600.0	45.602	10.8	0.00E+00	2.87E+01	2.87E+01
IL241405	DEFAULT	Procter & Gamble Distributing - Emergency diesel generator #1	756504.00	4295421.00	425.00	26.0	490.0	60.811	1.4	1.68E+01	0.00E+00	0.00E+00
IL241449	DEFAULT	Procter & Gamble Distributing - Emergency diesel generator #2	756494.00	4295755.00	424.74	26.0	490.0	60.811	1.4	1.68E+01	0.00E+00	0.00E+00
IL242126	DEFAULT	Center Point Terminals Co. - Tank Heater	749359.00	4289027.00	411.84	49.0	331.1	31.144	2.5	1.03E+00	0.00E+00	0.00E+00
IL241579	DEFAULT	Procter & Gamble Distributing - Emergency diesel generator #3	756198.00	4295409.00	424.97	26.0	490.0	60.811	1.4	1.68E+01	0.00E+00	0.00E+00
IL245580	DEFAULT	Procter & Gamble Distributing - Emergency diesel generator #4	756187.00	4295721.00	424.77	26.0	490.0	60.811	1.4	1.68E+01	0.00E+00	0.00E+00
IL245839	DEFAULT	Milam Recycling and Disposal Facility - Landfill gas conversion plant	750884.00	4282885.00	413.09	58.0	70.1	0.000	4.5	9.80E+00	9.00E-01	9.00E-01
IL246759	DEFAULT	Steckley Township WWTP - 2800 kW Emergency generator	756253.00	4268975.00	518.86	28.0	877.0	73.787	1.2	1.54E+01	0.00E+00	0.00E+00
IL246761	DEFAULT	Omega Partners Hartford, LLC - Truck Rail Marine racks loadout and VCUs	752232.00	4300866.00	430.74	83.0	69.5	0.328	0.3	6.90E+00	0.00E+00	0.00E+00
IL246782	DEFAULT	Omega Partners Hartford, LLC - Boiler 1 and 2	752278.00	4300696.00	430.12	58.0	436.0	27.650	3.4	3.83E+00	0.00E+00	0.00E+00
IL248060	DEFAULT	Kraft Heinz Co. - Boiler P	748103.00	4288580.00	423.56	26.0	380.0	34.407	2.0	1.44E+00	0.00E+00	0.00E+00
IL246282	DEFAULT	Olin Winchester, LLC - New Rotary retort process (ROA-2)	750495.00	4308287.00	454.42	16.0	119.9	26.634	1.7	9.62E+00	0.00E+00	0.00E+00
IL248799	DEFAULT	Gateway Terminals, LLC. - 600 HP Boiler	744607.00	4275093.00	422.70	26.0	440.0	38.557	2.2	2.11E+00	0.00E+00	0.00E+00
IL249450	DEFAULT	Highland Electric Light Plant - Engine IC-2	788126.93	4293320.17	534.65	57.0	734.1	61.762	11.4	1.44E+01	0.00E+00	0.00E+00
IL249451	DEFAULT	Highland Electric Light Plant - Engine IC-3	788126.93	4293320.17	534.65	57.0	734.1	61.762	11.4	1.25E+01	0.00E+00	0.00E+00
IL249452	DEFAULT	Highland Electric Light Plant - Engine IC-9	788126.93	4293320.17	534.65	57.0	734.1	61.762	11.4	1.50E+01	0.00E+00	0.00E+00
IL249453	DEFAULT	Highland Electric Light Plant - Engine IC-10	788126.93	4293320.17	534.65	57.0	734.1	61.762	11.4	1.50E+01	0.00E+00	0.00E+00
IL249499	DEFAULT	Roxana Landfill, Inc. - Zink ultra-Low emissions (Zule) Flare	759193.00	4301368.00	458.62	60.0	1800.1	46.828	13.0	1.25E+01	1.55E+01	1.55E+01
IL250343	DEFAULT	Mayco Mfg, LLC - Natural gas combustion	747588.00	4286870.00	421.78	39.0	284.1	23.157	2.0	1.74E+00	0.00E+00	0.00E+00
IL250892	DEFAULT	ConocoPhillips Co - Lift station pump (21028)	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	1.40E+00	4.90E-01	4.90E-01
IL250893	DEFAULT	ConocoPhillips Co. - Lift station pump (21029)	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	1.90E+00	4.60E-01	4.60E-01
IL250894	DEFAULT	ConocoPhillips Co - Non-emergency air compressor #1	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	6.01E+00	2.12E+00	2.12E+00
IL250895	DEFAULT	ConocoPhillips Co. - Non-emergency air compressor #2	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	6.01E+00	2.12E+00	2.12E+00
IL250896	DEFAULT	ConocoPhillips Co. - Non-emergency air compressor #3	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	5.98E+00	2.10E+00	2.10E+00
IL250897	DEFAULT	ConocoPhillips Co. - Non-emergency air compressor #4	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	6.01E+00	2.12E+00	2.12E+00
IL250898	DEFAULT	ConocoPhillips Co. - Non-emergency air compressor #5	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	6.01E+00	2.12E+00	2.12E+00
IL250899	DEFAULT	ConocoPhillips Co. - Non-emergency air compressor #6	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	5.98E+00	2.10E+00	2.10E+00
IL251099	DEFAULT	Amsted Rail Co., Inc. - Annealing Furnace 18	747071.00	4287670.00	426.02	39.0	284.1	23.157	2.0	1.12E+00	1.00E-01	1.00E-01
IL251285	DEFAULT	Premcor Refining Group, Inc. - Vapor Combustion Unit	752775.00	4302614.00	429.95	53.0	289.0	29.830	2.8	1.00E+01	0.00E+00	0.00E+00
IL251735	DEFAULT	ConocoPhillips Co. - Diesel engine (605 HP)	754240.00	4303144.00	443.47	15.0	99.5	0.328	0.3	3.50E+00	0.00E+00	0.00E+00
IL251754	DEFAULT	Chain of Rocks Recycling & Disposal - Passive Flare #1	746884.00	4293274.00	431.79	10.0	941.0	9.756	0.5	4.85E-01	0.00E+00	0.00E+00
IL253107	DEFAULT	Allnex USA, Inc. - Natural gas combustion	749698.00	4276478.00	418.37	58.0	436.0	27.650	3.4	3.26E+00	0.00E+00	0.00E+00
IL253160	DEFAULT	Cerro Flow Products, LLC. - Generators	746228.90	4275272.00	407.97	26.0	490.0	60.811	1.4	9.73E-01	2.82E-01	2.82E-01
IL253267	DEFAULT	City of Belleville - Emergency diesel generator (1500 kW)	762469.00	4266351.00	468.70	26.0	490.0	60.811	1.4	1.16E+01	0.00E+00	0.00E+00
IL253300	DEFAULT	Phillips 66 Pipeline, LLC - Engines (insignificant activities)	746935.00	4274452.00	407.25	26.0	490.0	60.811	1.4	9.23E-01	0.00E+00	0.00E+00
IL253361	DEFAULT	Amsted Rail Co., Inc. - Sand regeneration process (combustion)	746875.00	4287537.00	422.05	39.0	284.1	23.157	2.0	2.80E-01	2.80E-01	2.80E-01

R005543

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
IL253367	DEFAULT	Green Plains Madison, LLC - Boiler #2	745258.00	4285486.00	414.27	71.0	284.1	22.960	3.3	1.29E+00	5.00E-01	5.00E-01
IL253368	DEFAULT	Green Plains Madison, LLC - Boiler #3	745260.00	4285491.00	414.24	71.0	284.1	22.960	3.3	1.29E+00	5.00E-01	5.00E-01
IL253369	DEFAULT	Green Plains Madison, LLC - Boiler #4	745262.00	4285500.00	414.21	71.0	284.1	22.960	3.3	1.29E+00	5.00E-01	5.00E-01
IL253370	DEFAULT	Green Plains Madison, LLC - Indirect dryer #2	745164.00	4285430.00	414.60	81.0	387.1	8.430	5.5	7.97E+00	4.10E-01	4.10E-01
IL253386	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - Engines (insignificant activities)	750423.00	4308352.00	434.28	26.0	490.0	60.811	1.4	9.23E-01	0.00E+00	0.00E+00
IL253738	DEFAULT	Milam Recycling and Disposal Facility - 2000 scfm Utility Flare	750550.00	4282537.00	594.06	36.0	852.0	18.565	4.6	1.83E+01	7.32E+00	7.32E+00
IL253769	DEFAULT	Veolia ES Technical Solutions, LLC - 2 Emergency generators	745582.00	4275942.00	414.76	26.0	490.0	60.811	1.4	7.41E-01	0.00E+00	0.00E+00
IL254175	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #2	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL254176	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #3	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL254177	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #4	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL254178	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #5	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL254179	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #6	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL254699	DEFAULT	HSHS St. Elizabeth's Hospital - 2 Emergency generators	767237.00	4275111.00	541.01	28.0	627.0	73.767	1.2	1.93E+01	0.00E+00	0.00E+00
IL255341	DEFAULT	Roxana Landfill, Inc. - New open flare	759153.00	4301368.00	619.62	45.0	1800.1	61.434	1.3	3.77E+01	8.17E+00	8.17E+00
IL255527	DEFAULT	Magnesium Elektron North America - Natural gas combustion	746452.00	4285724.00	415.49	39.0	284.1	23.157	3.0	4.20E-01	0.00E+00	0.00E+00
IL255741	DEFAULT	ConocoPhillips Co. - Utility Boiler #19 (BLR-19)	754755.00	4302798.00	442.16	132.0	304.1	46.281	7.0	0.00E+00	1.54E+01	1.54E+01
IL255816	DEFAULT	Mayco Mfg. LLC - Expansion: Natural gas combustion	747189.00	4286970.00	421.78	39.0	284.1	23.157	3.0	1.94E+00	0.00E+00	0.00E+00
IL255953	DEFAULT	Moore Recycling Concrete & Asphalt, LLC. - Drum mix asphalt plant	762178.00	4246660.00	463.19	35.0	251.0	56.908	4.0	1.32E+01	0.00E+00	0.00E+00
IL256624	DEFAULT	PBT Acquisition, LLC - ASR Dryer	748704.00	4280830.00	418.77	52.0	305.0	19.483	1.5	2.53E+00	0.00E+00	0.00E+00
IL257535	DEFAULT	Marathon Ashland Pipe Line, LLC - Marine vapor combustion unit	751239.00	4302863.00	402.85	51.0	810.1	27.748	7.4	2.71E+01	0.00E+00	0.00E+00
SJEFF1	DEFAULT	RIVER CEMENT CO. DBA BUZZI UNICEM USA SELMA PLANT	733431.84	4229131.13	406.36	410.0	370.0	54.081	19.0		1.44E+02	1.44E+02
SJEFF2	DEFAULT	RIVER CEMENT CO. DBA BUZZI UNICEM USA SELMA PLANT	733431.84	4229131.13	406.36	125.0	210.0	59.173	6.6		2.04E-02	2.04E-02
SJEFF3	DEFAULT	RIVER CEMENT CO. DBA BUZZI UNICEM USA SELMA PLANT	733431.84	4229131.13	406.36	10.0	1100.0	23.333	0.5		1.32E-01	0.00E+00
SJEFF15	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	52.0	260.0	10.666	2.0		5.09E-03	5.09E-03
SJEFF16	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		2.29E-01	2.29E-01
SJEFF17	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		2.40E-03	2.40E-03
SJEFF18	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		2.29E-01	0.00E+00
SJEFF19	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		1.80E-03	1.80E-03
SJEFF20	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		1.20E-03	1.20E-03
SJEFF21	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		5.40E-04	5.40E-04
SJEFF22	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		4.80E-04	4.80E-04
SJEFF23	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		4.20E-04	4.20E-04
SJEFF24	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		3.00E-04	3.00E-04
SJEFF25	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	15.0	1049.0	149.734	0.2		4.80E-04	0.00E+00
SJEFF26	DEFAULT	AMEREN MISSOURI RUSH ISLAND ENERGY CENTER	739491.07	4224078.19	407.87	700.0	270.0	82.001	20.7		1.73E+03	1.73E+03
SJEFF27	DEFAULT	AMEREN MISSOURI RUSH ISLAND ENERGY CENTER	739491.07	4224078.19	407.87	700.0	270.0	82.001	29.0		2.50E+03	2.50E+03
SJEFF28	DEFAULT	AMEREN MISSOURI RUSH ISLAND ENERGY CENTER	739491.07	4224078.19	407.87	30.0	985.0	105.633	1.3		8.52E-06	0.00E+00
SJEFF29	DEFAULT	AMEREN MISSOURI RUSH ISLAND ENERGY CENTER	739491.07	4224078.19	407.87	240.0	600.0	32.999	7.0		3.54E-03	3.54E-03
SJEFF59	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	14.0	392.0	0.003	1.7	3.03E-01	2.17E-03	2.17E-03
SJEFF60	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	14.0	392.0	0.003	1.7	3.03E-01	2.17E-03	2.17E-03
SJEFF61	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	14.0	392.0	0.003	1.7	4.20E-02	3.00E-04	3.00E-04
SJEFF62	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	14.0	392.0	0.000	1.7	1.12E-02	7.98E-05	7.98E-05
SJEFF63	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	27.0	1800.0	10.046	1.5	2.86E-02	1.63E-01	1.63E-01
SJEFF65	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	20.0	0.0	0.000	0.5	1.45E-02	4.34E-04	4.34E-04
SJEFF66	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	20.0	0.0	0.000	0.5	1.40E-02	4.20E-04	4.20E-04
SJEFF67	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	20.0	-459.7	0.003	2.0	8.35E-02	5.97E-04	5.97E-04
SJEFF68	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	20.0	-459.7	0.003	2.0	3.54E-01	2.53E-03	2.53E-03
SJEFF69	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	14.0	-459.7	0.003	3.0	2.51E-01	1.79E-03	1.79E-03
SJEFF70	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	5.0	-459.7	0.003	0.5	1.11E+00	3.37E-01	0.00E+00
SJEFF71	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	5.0	-459.7	0.003	0.5	1.11E+00	3.37E-01	0.00E+00
SJEFF72	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	5.0	-459.7	0.003	0.5	3.32E-01	1.02E-01	0.00E+00
SJEFF73	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	10.0	-459.7	0.003	1.0	1.92E-05	1.37E-07	1.37E-07
SJEFF74	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	10.0	-459.7	0.003	1.0	1.92E-05	1.37E-07	1.37E-07
SJEFF82	DEFAULT	ARDAGH GLASS INC. PEVELY	727806.83	4241579.49	466.57	156.0	611.0	39.902	5.8	7.38E-02	3.77E+00	3.77E+00
SJEFF83	DEFAULT	ARDAGH GLASS INC. PEVELY	727806.83	4241579.49	466.57	156.0	611.0	39.902	5.8	1.96E-01	6.37E+00	6.37E+00

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
SJEFF86	DEFAULT	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	486.57	20.0	0.0	0.000	0.5	1.26E-01	9.00E-04	9.00E-04
SJEFF92	DEFAULT	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	486.57	10.0	1100.0	73.333	0.5		2.17E+00	0.00E+00
SJEFF99	DEFAULT	CARONDELET CORPORATION PEVELY	727491.55	4241725.78	485.56	2.5	170.0	46.499	2.0	5.80E-01	4.25E-02	4.25E-02
SJEFF100	DEFAULT	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	2.5	170.0	46.499	2.0	1.60E-01	1.14E-03	1.14E-03
SJEFF125	DEFAULT	FRED WEBER, INC. ANTONIA	720162.79	4248877.71	670.67	20.0	250.0	49.249	5.0		5.88E-02	5.88E-02
SJEFF128	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	28.0	1413.0	18.734	2.0		2.33E-01	2.33E-01
SJEFF129	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	18.0	1364.0	25.666	1.0		1.92E-02	1.92E-02
SJEFF130	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	30.0	1448.0	22.418	2.0		9.62E-03	9.62E-03
SJEFF131	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	28.0	1413.0	18.734	2.0		3.50E-01	3.50E-01
SJEFF132	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	28.0	1413.0	18.734	2.0		2.95E-01	2.95E-01
SJEFF133	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	18.0	1347.0	16.316	1.0		1.54E-02	1.54E-02
SJEFF134	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	30.0	1448.0	22.418	2.0		8.01E-03	8.01E-03
SJEFF135	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	18.0	1354.0	25.666	1.0		1.44E-02	1.44E-02
SJEFF136	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	28.0	1600.0	18.734	2.0		7.50E-02	7.50E-02
SJEFF137	DEFAULT	JEFFERSON COUNTY CREMATION SERVICES LC PEVELY	728536.07	4239554.88	583.23	10.0	1100.0	23.333	0.5		9.39E-02	9.39E-02
SJEFF138	DEFAULT	SHAPESON CONSTRUCTION MATERIALS PAULINA HILLS SITE	726459.96	4250136.04	626.64	12.0	885.0	42.441	0.5		1.29E-01	1.29E-01
SJEFF144	DEFAULT	N. B. WEST CONTRACTING CO INC HOUSE SPRINGS ASPHALT	712358.42	4251768.19	532.22	32.0	267.0	0.855	3.7	3.03E+00	1.21E+00	1.21E+00
SJEFF145	DEFAULT	N. B. WEST CONTRACTING CO INC HOUSE SPRINGS ASPHALT	712358.42	4251768.19	532.22	5.0	400.0	0.003	2.0	5.35E-02	3.07E-01	3.07E-01
SJEFF146	DEFAULT	N. B. WEST CONTRACTING CO INC HOUSE SPRINGS ASPHALT	712358.42	4251768.19	532.22	5.0	400.0	0.003	2.0	3.81E-03	9.62E-08	9.62E-08
SSTC1	DEFAULT	AMEREN MISSOURI SIOUX ENERGY CENTER	734752.14	4310260.61	445.64	496.5	138.7	46.759	23.6		2.32E+02	2.32E+02
SSTC2	DEFAULT	AMEREN MISSOURI SIOUX ENERGY CENTER	734752.14	4310260.61	445.64	496.5	136.6	46.844	23.6		2.89E+02	2.89E+02
SSTC3	DEFAULT	AMEREN MISSOURI SIOUX ENERGY CENTER	734752.14	4310260.61	445.64	217.0	325.0	50.000	4.5		8.90E-04	8.90E-04
SSTC4	DEFAULT	AMEREN MISSOURI SIOUX ENERGY CENTER	734752.14	4310260.61	445.64	25.0	1100.0	23.333	2.0		1.02E+00	0.00E+00
SSTC9	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	30.0	1000.0	0.151	2.3		2.23E-04	2.23E-04
SSTC10	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	50.0	1000.0	0.151	2.3		1.70E-03	1.70E-03
SSTC11	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	50.0	1000.0	0.151	2.3		1.70E-03	1.70E-03
SSTC12	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	30.0	1000.0	0.151	2.3		2.23E-04	2.23E-04
SSTC13	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	50.0	1000.0	0.151	2.3		1.70E-03	1.70E-03
SSTC15	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	14.0	1063.0	40.515	0.4		3.59E-01	0.00E+00
SSTC16	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	3.0	1011.0	154.085	0.8		1.08E+00	0.00E+00
SSTC17	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	3.0	1011.0	154.085	0.8		1.08E+00	0.00E+00
SSTC18	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	14.0	1063.0	58.732	0.4		3.66E-01	2.38E-04
SSTC28	DEFAULT	GENERAL MOTORS LLC WENTZVILLE CENTER	689428.03	4299089.70	622.57	250.0	365.0	17.999	10.0		2.18E+01	2.18E+01
SSTC29	DEFAULT	GENERAL MOTORS LLC WENTZVILLE CENTER	689428.03	4299089.70	622.57	250.0	365.0	17.999	10.0		7.21E+02	7.21E+02
SSTC30	DEFAULT	GENERAL MOTORS LLC WENTZVILLE CENTER	689428.03	4299089.70	622.57	250.0	365.0	17.999	10.0		2.18E+01	2.18E+01
SSTC31	DEFAULT	GENERAL MOTORS LLC WENTZVILLE CENTER	689428.03	4299089.70	622.57	58.0	520.0	58.999	1.6		1.33E-01	1.33E-01
SSTC35	DEFAULT	SSM HEALTH ST JOSEPH HOSPITAL WEST	693164.96	4297283.00	533.89	66.0	200.0	0.003	3.0		2.31E+00	2.31E+00
SSTC46	DEFAULT	SSM HEALTH ST JOSEPH HOSPITAL WEST	693164.96	4297283.00	533.89	66.0	200.0	0.003	3.0		2.66E-02	2.66E-02
SSTC47	DEFAULT	SSM HEALTH ST JOSEPH HOSPITAL WEST	693164.96	4297283.00	533.89	10.0	1100.0	23.333	0.5		1.52E+00	0.00E+00
SSTC48	DEFAULT	SSM HEALTH ST JOSEPH HOSPITAL WEST	693164.96	4297283.00	533.89	66.0	200.0	0.003	3.0		1.50E-03	1.50E-03
SSTC57	DEFAULT	BLASTCO INC	690213.84	4297755.25	543.44	20.0	0.0	0.000	0.5		3.96E-04	3.96E-04
SSTC63	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	30.0	65.0	16.499	1.5		4.20E-03	4.20E-03
SSTC64	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	17.0	450.0	27.831	1.3		4.09E-03	4.09E-03
SSTC65	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	20.0	0.0	0.000	0.5		4.10E-03	4.10E-03
SSTC66	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	33.0	77.0	33.015	1.5		1.56E-03	1.56E-03
SSTC67	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	33.0	77.0	33.015	1.5		8.40E-04	8.40E-04
SSTC68	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	33.0	450.0	29.416	1.5		1.44E-03	1.44E-03
SSTC69	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	30.0	400.0	29.708	1.0		1.74E-03	1.74E-03
SSTC70	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	30.0	450.0	24.803	1.2		4.68E-03	4.68E-03
SSTC71	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	28.0	475.0	1.667	0.5		0.00E+00	0.00E+00
SSTC72	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	28.0	450.0	27.560	2.3		0.00E+00	0.00E+00
SSTC73	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	10.0	1100.0	23.333	0.5		3.07E+00	0.00E+00
SSTC87	DEFAULT	HANSEN'S TREE SERVICE O'FALLON	697357.18	4298189.47	585.40	30.0	0.0	0.000	0.5	2.10E-02	6.31E-04	6.31E-04
SSTC88	DEFAULT	HANSEN'S TREE SERVICE O'FALLON	697357.18	4298189.47	585.40	20.0	0.0	0.000	0.5	5.14E-02	1.73E-04	1.73E-04

R005545

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
SSTC89	DEFAULT	HANSEN'S TREE SERVICE O'FALLON	697367.18	4298189.47	585.40	20.0	0.0	0.000	0.5	1.20E+00	3.65E-01	3.65E-01
SSTC98	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	3.87E-01	2.76E-03	2.76E-03
SSTC99	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	3.87E-01	2.76E-03	2.76E-03
SSTC100	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	3.87E-01	2.76E-03	2.76E-03
SSTC101	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	3.87E-01	2.76E-03	2.76E-03
SSTC102	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTC103	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTC104	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTC105	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTC106	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTC107	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTL1	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	250.0	326.0	101.627	11.0		2.28E-02	2.28E-02
SSTL2	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	250.0	326.0	101.627	11.0		2.20E-02	2.20E-02
SSTL3	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	350.0	349.0	135.400	14.0		2.97E+02	2.97E+02
SSTL4	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	350.0	374.0	123.284	16.0		4.69E+02	4.69E+02
SSTL5	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	40.0	642.0	38.100	1.0		5.46E-03	5.46E-03
SSTL6	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		4.55E-01	4.55E-01
SSTL7	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		1.96E+00	1.96E+00
SSTL8	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		4.55E-01	4.55E-01
SSTL9	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		2.01E-02	2.01E-02
SSTL10	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		4.55E-01	4.55E-01
SSTL11	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		1.10E-02	1.10E-02
SSTL14	DEFAULT	MISSOURI BAPTIST MEDICAL CENTER NORTH BALLAS	722244.75	4279363.47	652.56	99.0	440.0	9.432	4.5	9.84E-01	1.42E+00	1.42E+00
SSTL15	DEFAULT	MISSOURI BAPTIST MEDICAL CENTER NORTH BALLAS	722244.75	4279363.47	652.56	99.0	440.0	9.432	4.5	1.06E-02	7.55E-05	7.55E-05
SSTL16	DEFAULT	MISSOURI BAPTIST MEDICAL CENTER NORTH BALLAS	722244.75	4279363.47	652.56	10.0	1100.0	23.333	0.5	5.03E+00	1.53E+00	0.00E+00
SSTL17	DEFAULT	MISSOURI BAPTIST MEDICAL CENTER NORTH BALLAS	722244.75	4279363.47	652.56	104.0	450.0	7.172	1.2	2.91E+00	4.19E+00	4.19E+00
SSTL18	DEFAULT	MISSOURI BAPTIST MEDICAL CENTER NORTH BALLAS	722244.75	4279363.47	652.56	104.0	450.0	7.172	1.2	9.59E-02	6.85E-04	6.85E-04
SSTL19	DEFAULT	MONSANTO WORLD HEADQUARTERS LINDBERGH BLVD	726250.11	4283348.63	691.57	40.0	315.0	30.098	4.0		2.95E-05	2.95E-05
SSTL20	DEFAULT	MONSANTO WORLD HEADQUARTERS LINDBERGH BLVD	726250.11	4283348.63	691.57	40.0	315.0	30.098	4.0		2.24E-02	2.24E-02
SSTL21	DEFAULT	MONSANTO WORLD HEADQUARTERS LINDBERGH BLVD	726250.11	4283348.63	691.57	10.0	1100.0	23.333	0.5		1.06E+00	0.00E+00
SSTL22	DEFAULT	MONSANTO WORLD HEADQUARTERS LINDBERGH BLVD	726250.11	4283348.63	691.57	10.0	1100.0	23.333	0.5		5.74E-04	0.00E+00
SSTL23	DEFAULT	U. S. SILICA COMPANY PACIFIC	698244.91	4262010.04	471.16	80.0	150.0	50.000	3.0		2.57E+01	2.57E+01
SSTL24	DEFAULT	U. S. SILICA COMPANY PACIFIC	698244.91	4262010.04	471.16	80.0	150.0	50.000	3.0		6.69E-03	6.69E-03
SSTL25	DEFAULT	U. S. SILICA COMPANY PACIFIC	698244.91	4262010.04	471.16	80.0	150.0	50.000	3.0		2.66E-02	2.66E-02
SSTL26	DEFAULT	U. S. SILICA COMPANY PACIFIC	698244.91	4262010.04	471.16	110.0	70.0	0.003	2.7		1.39E-02	1.39E-02
SSTL27	DEFAULT	ST. JOHNS MERCY MEDICAL CNTR/MAINTENANCE NEW BALLAS RD	722224.73	4280414.44	627.82	30.0	400.0	4.951	4.0		1.11E+01	1.11E+01
SSTL28	DEFAULT	ST. JOHNS MERCY MEDICAL CNTR/MAINTENANCE NEW BALLAS RD	722224.73	4280414.44	627.82	30.0	400.0	4.951	4.0		1.95E-02	1.95E-02
SSTL29	DEFAULT	MONSANTO CHESTERFIELD VILLAGE	712608.90	4282124.50	590.78	159.0	300.0	32.667	4.8		3.08E-05	3.08E-05
SSTL30	DEFAULT	MONSANTO CHESTERFIELD VILLAGE	712608.90	4282124.50	590.78	159.0	300.0	32.667	4.8		2.36E-02	2.36E-02
SSTL31	DEFAULT	MONSANTO CHESTERFIELD VILLAGE	712608.90	4282124.50	590.78	10.0	1100.0	23.333	0.5		4.34E-01	0.00E+00
SSTL32	DEFAULT	MONSANTO CHESTERFIELD VILLAGE	712608.90	4282124.50	590.78	10.0	1100.0	23.333	0.5		4.04E-03	0.00E+00
SSTL33	DEFAULT	MONSANTO CHESTERFIELD VILLAGE	712608.90	4282124.50	590.78	10.0	1100.0	23.333	0.5		3.77E+00	0.00E+00
SSTL37	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	175.0	350.0	4.849	9.0	0.00E+00	0.00E+00	0.00E+00
SSTL38	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	175.0	350.0	4.849	9.0	2.24E+00	1.60E-02	1.60E-02
SSTL39	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	21.0	475.0	9.616	1.2	0.00E+00	0.00E+00	0.00E+00
SSTL40	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	21.0	475.0	9.616	1.2	6.04E-01	4.31E-03	4.31E-03
SSTL41	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	10.0	1100.0	23.333	0.5	1.38E+01	2.34E-03	0.00E+00
SSTL42	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	10.0	1100.0	23.333	0.5	2.12E+01	3.78E-02	0.00E+00
SSTL43	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	10.0	1100.0	23.333	0.5	1.59E+01	4.87E+00	0.00E+00
SSTL44	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	55.0	316.0	84.150	0.7	9.13E-02	2.37E+01	2.37E+01
SSTL45	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	55.0	316.0	84.150	0.7	9.02E-02	4.11E+01	4.11E+01
SSTL46	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	55.0	316.0	84.150	0.7	1.05E-01	1.48E+01	1.48E+01
SSTL47	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	55.0	316.0	84.150	0.7	2.86E-01	2.62E+01	2.62E+01
SSTL48	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	55.0	316.0	84.150	0.7		2.04E-03	2.04E-03
SSTL66	DEFAULT	MISSOURI ASPHALT PRODUCTS, LLC WEST LAKE QUARRY MATERIAL CO	721914.39	4294042.31	482.50	20.0	230.5	31.309	5.1		3.27E-01	3.27E-01

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
SSTL70	DEFAULT	FRED WEBER, INC. ANTIRE	711291.07	4264547.49	448.49	30.0	250.0	58.950	4.0		1.27E+00	1.27E+00
SSTL76	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	45.0	400.0	44.167	2.5	5.58E+00	8.24E+00	8.24E+00
SSTL77	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	45.0	400.0	44.167	2.5	1.38E+00	9.87E-03	9.87E-03
SSTL78	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	38.0	400.0	25.968	2.0	3.02E+00	4.47E+00	4.47E+00
SSTL79	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	38.0	400.0	25.968	2.0	1.06E+00	7.57E-03	7.57E-03
SSTL80	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	50.0	461.0	14.616	3.0	2.95E+00	4.36E+00	4.36E+00
SSTL81	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	50.0	461.0	14.616	3.0	7.02E-01	5.01E-03	5.01E-03
SSTL82	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	1.0	100.0	12.733	0.1	1.66E+00	1.19E-02	1.19E-02
SSTL83	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	15.0	955.0	19.800	0.7	2.52E+01	4.49E-02	0.00E+00
SSTL84	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	7.0	960.0	113.182	0.8	2.50E+01	7.68E+00	0.00E+00
SSTL85	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	30.0	965.0	31.234	5.0	2.03E-01	1.04E-02	1.04E-02
SSTL86	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	17.0	72.0	29.882	2.8		5.58E-03	5.58E-03
SSTL88	DEFAULT	CHAMP LANDFILL COMPANY LLC	720845.43	4291144.98	571.46	28.0	1400.0	25.466	1.0		1.01E+00	1.01E+00
SSTL89	DEFAULT	CHAMP LANDFILL COMPANY LLC	720845.43	4291144.98	571.46	38.3	1400.0	21.568	12.0		7.77E-01	7.77E-01
SSTL90	DEFAULT	CHAMP LANDFILL COMPANY LLC	720845.43	4291144.98	571.46	38.0	1400.0	21.568	12.0		6.35E-01	6.35E-01
SSTL92	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	40.0	1200.0	61.381	1.1		1.86E-02	1.86E-02
SSTL93	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	40.0	1200.0	61.381	1.1		6.98E-02	6.98E-02
SSTL94	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	45.0	1200.0	50.226	1.3		1.70E+01	1.70E+01
SSTL95	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	45.0	1200.0	50.226	1.3		5.43E+01	5.43E+01
SSTL96	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	35.0	1200.0	53.051	1.0		1.22E-01	1.22E-01
SSTL97	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	584.0	1450.0	21.923	4.7		1.08E-03	1.08E-03
SSTL98	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	584.0	1450.0	21.923	4.7		1.07E-03	1.07E-03
SSTL100	DEFAULT	SSM HEALTH ST MARYS HOSPITAL	734075.92	4279544.88	601.67	17.2	500.0	25.000	3.0		9.06E+00	9.06E+00
SSTL101	DEFAULT	SSM HEALTH ST MARYS HOSPITAL	734075.92	4279544.88	601.67	17.2	500.0	25.000	3.0		7.14E-03	7.14E-03
SSTL102	DEFAULT	SSM HEALTH ST MARYS HOSPITAL	734075.92	4279544.88	601.67	130.0	1009.0	53.156	1.0		2.56E+00	0.00E+00
SSTL106	DEFAULT	SSM HEALTH DEPAUL HOSPITAL - ST. LOUIS BRIDGETON	723046.72	4292134.06	542.16	45.0	450.0	21.932	3.0		6.63E-02	6.63E-02
SSTL107	DEFAULT	SSM HEALTH DEPAUL HOSPITAL - ST. LOUIS BRIDGETON	723046.72	4292134.06	542.16	45.0	450.0	21.932	3.0		1.15E-02	1.15E-02
SSTL108	DEFAULT	SSM HEALTH DEPAUL HOSPITAL - ST. LOUIS BRIDGETON	723046.72	4292134.06	542.16	12.0	900.0	38.100	1.2		8.33E+00	0.00E+00
SSTL109	DEFAULT	SSM HEALTH DEPAUL HOSPITAL - ST. LOUIS BRIDGETON	723046.72	4292134.06	542.16	45.0	450.0	21.932	3.0		1.37E-03	1.37E-03
SSTL111	DEFAULT	VETERANS ADMIN MEDICAL CENTER JEFFERSON BARRACKS DRIVE	738944.98	4264089.51	508.83	45.0	425.0	1.667	2.0	3.02E+00	4.35E+00	4.35E+00
SSTL112	DEFAULT	VETERANS ADMIN MEDICAL CENTER JEFFERSON BARRACKS DRIVE	738944.98	4264089.51	508.83	45.0	425.0	1.667	2.0	4.17E-01	2.98E-03	2.98E-03
SSTL113	DEFAULT	VETERANS ADMIN MEDICAL CENTER JEFFERSON BARRACKS DRIVE	738944.98	4264089.51	508.83	45.0	425.0	1.667	2.0	4.40E-03	6.49E-03	6.49E-03
SSTL114	DEFAULT	VETERANS ADMIN MEDICAL CENTER JEFFERSON BARRACKS DRIVE	738944.98	4264089.51	508.83	45.0	425.0	1.667	2.0	6.81E-01	4.86E-03	4.86E-03
SSTL115	DEFAULT	VETERANS ADMIN MEDICAL CENTER JEFFERSON BARRACKS DRIVE	738944.98	4264089.51	508.83	10.0	1100.0	23.333	0.5	1.03E+02	3.31E+01	0.00E+00
SSTL116	DEFAULT	CHRISTIAN HOSPITAL NORTHEAST DUNN ROAD	739738.60	4295554.78	565.65	35.0	270.0	10.000	4.0	1.46E-01	8.26E-03	8.26E-03
SSTL117	DEFAULT	CHRISTIAN HOSPITAL NORTHEAST DUNN ROAD	739738.60	4295554.78	565.65	35.0	270.0	10.000	4.0	9.17E-01	6.55E-03	6.55E-03
SSTL118	DEFAULT	CHRISTIAN HOSPITAL NORTHEAST DUNN ROAD	739738.60	4295554.78	565.65	15.0	-459.7	0.003	1.0	3.28E+01	3.00E-01	0.00E+00
SSTL120	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	15.0	65.0	7.185	2.2		3.20E-03	3.20E-03
SSTL121	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	16.0	75.0	26.949	1.1		8.96E-03	8.96E-03
SSTL122	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	29.0	600.0	14.167	2.5		4.83E-01	4.83E-01
SSTL123	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	30.0	365.0	12.001	1.2		4.48E-01	4.48E-01
SSTL124	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	29.0	360.0	25.499	0.7		1.63E-01	1.63E-01
SSTL126	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	20.0	0.0	0.000	0.5		1.23E-02	1.23E-02
SSTL127	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4269850.38	422.90	30.0	650.0	11.998	1.3		3.60E-03	3.60E-03
SSTL128	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4269850.38	422.90	30.0	650.0	11.998	1.3		1.79E+01	1.79E+01
SSTL129	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4269850.38	422.90	26.0	650.0	13.264	2.0		2.26E-03	2.26E-03
SSTL130	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4269850.38	422.90	26.0	650.0	13.264	2.0		1.44E+01	1.44E+01
SSTL131	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4269850.38	422.90	54.0	1800.0	17.218	2.3		1.21E-03	1.21E-03
SSTL132	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4269850.38	422.90	10.0	1100.0	23.333	0.5		9.83E-01	9.83E-01
SSTL133	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4269850.38	422.90	10.0	1100.0	23.333	0.5		9.83E-01	9.83E-01
SSTL141	DEFAULT	ST. ANTHONY'S MEDICAL CENTER KENNERLY ROAD	728489.70	4265428.04	633.14	25.0	495.0	4.068	2.5		3.40E+00	3.40E+00
SSTL142	DEFAULT	ST. ANTHONY'S MEDICAL CENTER KENNERLY ROAD	728489.70	4265428.04	633.14	25.0	495.0	4.068	2.5		8.76E-04	8.76E-04
SSTL143	DEFAULT	ST. ANTHONY'S MEDICAL CENTER KENNERLY ROAD	728489.70	4265428.04	633.14	30.0	450.0	0.003	1.5		5.59E-04	5.59E-04
SSTL144	DEFAULT	ST. ANTHONY'S MEDICAL CENTER KENNERLY ROAD	728489.70	4265428.04	633.14	10.0	1100.0	23.333	0.5		4.66E-02	0.00E+00
SSTL147	DEFAULT	MSD, MISSOURI RIVER WWTP MO RIVER WASTERWATER TREATMENT PLANT	718333.79	4280583.38	444.32	25.0	550.0	1.181	0.7	9.18E-01	8.00E-01	8.00E-01

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Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
SSTL148	DEFAULT	MSD, MISSOURI RIVER WWTP MO RIVER WASTERWATER TREATMENT PLANT	718333.79	4290583.38	444.32	25.0	550.0	1.181	0.7	1.58E+00	5.47E-03	5.47E-03
SSTL149	DEFAULT	MSD, MISSOURI RIVER WWTP MO RIVER WASTERWATER TREATMENT PLANT	718333.79	4290583.38	444.32	15.2	446.0	19.393	1.7	4.42E-01	2.28E-01	2.28E-01
SSTL150	DEFAULT	MSD, MISSOURI RIVER WWTP MO RIVER WASTERWATER TREATMENT PLANT	718333.79	4290583.38	444.32	15.2	446.0	19.393	1.7	9.14E-02	4.81E-03	4.81E-03
SSTL151	DEFAULT	MSD, MISSOURI RIVER WWTP MO RIVER WASTERWATER TREATMENT PLANT	718333.79	4290583.38	444.32	16.0	77.0	4.774	2.0	2.46E+00	4.74E-01	4.74E-01
SSTL152	DEFAULT	SIMPSON CONSTRUCTION MATERIALS LLC VALLEY PARK	715996.20	4268469.87	430.05	42.0	300.0	38.494	4.2	2.49E+01	5.49E+00	5.49E+00
SSTL153	DEFAULT	SIMPSON CONSTRUCTION MATERIALS LLC VALLEY PARK	715996.20	4268469.87	430.05	26.7	400.0	26.785	0.8	3.84E-03	1.20E-04	1.20E-04
SSTL154	DEFAULT	SIMPSON CONSTRUCTION MATERIALS LLC VALLEY PARK	715996.20	4268469.87	430.05	26.7	400.0	26.785	0.8	4.60E-02	1.44E-03	1.44E-03
SSTL162	DEFAULT	MAOLAN INDUSTRIES	742056.49	4291436.76	495.44	14.0	150.0	0.003	0.2		2.29E-01	2.29E-01
SSTL165	DEFAULT	MISSOURI AMERICAN WATER-CENTRAL PLANT CHESTERFIELD	715427.34	4284896.78	451.44	22.0	871.0	24.016	0.8		1.02E-01	1.02E-01
SSTL166	DEFAULT	MISSOURI AMERICAN WATER-CENTRAL PLANT CHESTERFIELD	715427.34	4284896.78	451.44	10.0	871.0	24.016	0.8		2.38E-01	2.38E-01
SSTL169	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	20.0	0.0	0.000	0.5	1.79E-01	1.28E-03	1.28E-03
SSTL170	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	25.0	-459.7	0.003	0.8	2.33E+01	3.69E-03	3.69E-03
SSTL171	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	18.0	-459.7	0.003	4.0	1.61E+00	8.69E-02	8.69E-02
SSTL172	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	15.0	-459.7	0.003	2.0	1.20E-02	8.60E-05	8.60E-05
SSTL173	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	16.0	-459.7	0.003	0.5	9.34E-01	2.85E-01	2.85E-01
SSTL174	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	20.0	0.0	0.000	0.5	4.62E-03	3.30E-05	3.30E-05
SSTL175	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	20.0	0.0	0.000	0.5	4.62E-03	3.30E-05	3.30E-05
SSTL186	DEFAULT	FRED WEBER, INC. FT. BELLE	739499.97	4302906.33	443.27	7.7	25.0	11.758	0.9	3.02E+00	1.28E-01	1.28E-01
SSTL199	DEFAULT	A.G. RECYCLING	734844.18	4284158.21	525.43	10.0	1100.0	23.333	0.5		1.59E-01	1.59E-01
SSTL200	DEFAULT	A.G. RECYCLING	734844.18	4284158.21	525.43	10.0	1100.0	23.333	0.5		7.25E-01	7.25E-01
SSTL209	DEFAULT	MISSOURI-AMERICAN WATER CO FLORISSANT	728394.88	4300010.04	461.78	15.0	896.0	0.000	14.0		9.51E+00	9.51E+00
SSTL214	DEFAULT	THE HARPER COMPANY	731184.93	4292013.86	588.35	10.0	1100.0	23.333	0.5		2.75E-01	0.00E+00
SCITY1	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	225.0	350.0	21.217	10.0		2.38E-02	2.38E-02
SCITY2	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	100.0	350.0	47.349	3.0		5.80E-02	5.80E-02
SCITY3	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	225.0	350.0	18.468	10.0		1.67E+01	1.67E+01
SCITY4	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	225.0	350.0	18.468	10.0		1.78E-02	1.78E-02
SCITY5	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	225.0	350.0	18.468	10.0		2.53E+01	2.53E+01
SCITY6	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	225.0	350.0	18.468	10.0		2.15E-02	2.15E-02
SCITY7	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	135.0	950.0	19.567	3.5		1.75E+01	1.75E+01
SCITY8	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	20.0	50.0	70.000	1.0		1.69E+00	1.69E+00
SCITY9	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	70.0	200.0	0.003	5.5	1.33E+00	9.51E-03	9.51E-03
SCITY10	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	70.0	200.0	0.003	5.5	2.13E+00	1.52E-02	1.52E-02
SCITY11	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	100.0	145.0	62.500	4.5	2.53E+00	1.81E-02	1.81E-02
SCITY12	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	100.0	145.0	62.500	4.5	3.20E-01	2.29E-03	2.29E-03
SCITY13	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	12.0	200.0	0.335	1.0	5.77E+00	1.15E+00	0.00E+00
SCITY14	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	45.0	150.0	50.400	2.0	3.55E-02	1.07E-03	1.07E-03
SCITY15	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	45.0	150.0	50.400	2.0	3.07E-02	9.22E-04	9.22E-04
SCITY16	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	45.0	150.0	69.751	1.7	3.07E-02	9.22E-04	9.22E-04
SCITY17	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	16.0	77.0	24.600	0.2		1.41E-03	1.41E-03
SCITY18	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	3.0	800.0	0.335	0.5	1.63E-01	4.98E-02	0.00E+00
SCITY22	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	20.0	0.0	0.000	0.5	5.72E-03	1.72E-04	1.72E-04
SCITY23	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	10.0	1100.0	23.333	0.5	6.00E-02	1.83E-02	0.00E+00
SCITY24	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	10.0	785.0	42.283	0.3	2.11E+00	6.44E-01	0.00E+00
SCITY25	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	10.0	785.0	42.283	0.3	8.12E-03	4.79E-03	0.00E+00
SCITY26	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	10.0	1100.0	23.333	0.5	1.73E-02	5.29E-03	0.00E+00
SCITY27	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	42.0	77.0	3.734	0.2	4.35E-02	3.33E-02	0.00E+00
SCITY28	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	20.0	200.0	0.335	1.0	1.98E-01	6.04E-02	0.00E+00
SCITY29	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.0	800.0	0.335	0.5	1.07E-01	3.27E-02	0.00E+00
SCITY30	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.0	800.0	0.335	0.5	1.09E-04	3.32E-05	0.00E+00
SCITY31	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	22.0	212.0	1.296	1.0	5.28E-01	1.61E-01	0.00E+00
SCITY32	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	90.0	77.0	33.215	2.2	1.09E-04	3.32E-05	0.00E+00
SCITY33	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	10.0	1100.0	23.333	0.5	3.65E-02	1.12E-02	0.00E+00
SCITY34	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.0	800.0	0.335	0.5	1.98E-01	6.04E-02	0.00E+00
SCITY48	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	111.0	300.0	72.900	4.0		2.58E-01	2.58E-01
SCITY49	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	111.0	300.0	72.900	4.0		2.42E-02	2.42E-02

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Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
SCITY50	DEFAULT	ASHLEY ENERGY LLC	745321.38	4280225.01	423.00	111.0	300.0	72.969	4.0		1.20E+00	1.20E+00
SCITY51	DEFAULT	ASHLEY ENERGY LLC	745321.38	4280225.01	423.00	111.0	300.0	72.969	4.0		1.51E-01	1.51E-01
SCITY52	DEFAULT	ASHLEY ENERGY LLC	745321.38	4280225.01	423.00	115.0	280.0	41.099	5.0		1.17E+00	1.17E+00
SCITY53	DEFAULT	ASHLEY ENERGY LLC	745321.38	4280225.01	423.00	115.0	280.0	41.099	5.0		6.91E-03	6.91E-03
SCITY54	DEFAULT	ASHLEY ENERGY LLC	745321.38	4280225.01	423.00	115.0	280.0	41.099	5.0		1.17E+00	1.17E+00
SCITY55	DEFAULT	ASHLEY ENERGY LLC	745321.38	4280225.01	423.00	115.0	280.0	41.099	5.0		7.87E-03	7.87E-03
SCITY56	DEFAULT	ASHLEY ENERGY LLC	745321.38	4280225.01	423.00	30.0	975.0	237.884	0.8		3.10E-02	0.00E+00
SCITY57	DEFAULT	ASHLEY ENERGY LLC	745321.38	4280225.01	423.00	161.0	250.0	34.101	4.0		2.59E+01	2.59E+01
SCITY58	DEFAULT	ASHLEY ENERGY LLC	745321.38	4280225.01	423.00	161.0	250.0	34.101	4.0		5.09E+00	5.09E+00
SCITY59	DEFAULT	ASHLEY ENERGY LLC	745321.38	4280225.01	423.00	161.0	250.0	34.101	4.0		3.46E-02	3.46E-02
SCITY60	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.97E-01	3.97E-01	3.97E-01
SCITY61	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	5.97E-01	5.32E-02	5.32E-02
SCITY62	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	5.00E+00	4.43E+00	4.43E+00
SCITY63	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.80E+00	2.96E-02	2.96E-02
SCITY64	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	5.00E+00	4.43E+00	4.43E+00
SCITY65	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.20E+00	2.29E-02	2.29E-02
SCITY66	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	20.0	0.0	0.000	0.5	4.42E+01	1.33E+00	1.33E+00
SCITY67	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	69.0	318.0	63.035	3.0	4.15E+00	4.84E+00	4.84E+00
SCITY68	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	69.0	318.0	63.035	3.0	6.13E-01	5.15E-03	5.15E-03
SCITY69	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.04E+00	4.48E+00	4.48E+00
SCITY70	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	1.14E+00	8.17E-03	8.17E-03
SCITY71	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	10.0	1100.0	23.333	0.5	2.98E-03	4.70E-07	0.00E+00
SCITY72	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	10.0	1100.0	23.333	0.5	7.05E+00	2.35E+00	0.00E+00
SCITY83	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	430.0	35.000	2.0		1.14E-04	1.14E-04
SCITY84	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	430.0	35.000	2.0		4.07E-03	4.07E-03
SCITY85	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	430.0	35.000	2.0		8.40E-03	8.40E-03
SCITY86	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	280.0	35.000	2.0		1.14E+00	1.14E+00
SCITY87	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	280.0	35.000	2.0		4.07E-03	4.07E-03
SCITY88	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	280.0	35.000	2.0		1.14E+00	1.14E+00
SCITY89	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	280.0	35.000	2.0		4.07E-03	4.07E-03
SCITY90	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	10.0	1100.0	23.333	0.5		2.47E+00	0.00E+00
SCITY110	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270843.36	414.11	92.0	120.0	15.453	2.0		2.08E-02	2.08E-02
SCITY111	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270843.36	414.11	481.0	300.0	9.432	3.0		5.70E-03	5.70E-03
SCITY112	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270843.36	414.11	56.0	400.0	15.922	4.0		6.81E+01	6.81E+01
SCITY113	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270843.36	414.11	56.0	400.0	15.922	4.0		3.75E-02	3.75E-02
SCITY114	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270843.36	414.11	45.0	122.0	151.818	2.0		1.14E-02	1.14E-02
SCITY115	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270843.36	414.11	50.0	171.0	69.682	2.0		5.14E-03	5.14E-03
SCITY116	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270843.36	414.11	78.0	176.0	88.484	1.2		1.43E-02	1.43E-02
SCITY117	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270843.36	414.11	10.0	1100.0	23.333	0.5		1.91E-03	1.91E-03
SCITY121	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270843.36	414.11	42.0	340.0	37.776	4.0		9.43E-01	9.43E-01
SCITY122	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270843.36	414.11	42.0	340.0	37.776	4.0		5.31E-02	5.31E-02
SCITY123	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	55.0	700.0	14.738	1.2		6.41E+00	6.41E+00
SCITY124	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	55.0	700.0	14.738	1.2		7.35E-03	7.35E-03
SCITY125	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	55.0	700.0	14.738	1.2		1.86E-02	1.86E-02
SCITY126	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	55.0	700.0	14.738	1.2		5.89E-04	5.89E-04
SCITY127	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	30.0	540.0	9.135	2.0		1.44E-03	1.44E-03
SCITY128	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	15.4	752.2	32.451	1.0		7.85E-03	0.00E+00
SCITY129	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	34.0	1700.0	4.665	2.0		3.72E-03	3.72E-03
SCITY132	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	34.0	1700.0	6.816	1.5		1.72E-02	1.72E-02
SCITY133	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	34.0	1700.0	36.601	2.0		3.72E-03	3.72E-03
SCITY136	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	34.0	1800.0	8.301	1.7		8.58E-03	8.58E-03
SCITY137	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	42.0	1700.0	4.665	2.0		3.72E-03	3.72E-03
SCITY140	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	44.0	200.0	47.149	3.0		5.82E-03	5.82E-03
SCITY141	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	44.0	200.0	47.149	3.0		5.82E-03	5.82E-03
SCITY142	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	34.0	200.0	30.649	2.0		5.16E-03	5.16E-03

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
SCITY143	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	33.0	300.0	20.551	2.2		1.98E-03	1.98E-03
SCITY144	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	33.0	300.0	20.551	2.2		1.98E-03	1.98E-03
SCITY145	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	33.0	300.0	20.551	2.2		1.98E-03	1.98E-03
SCITY146	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	33.0	300.0	20.551	2.2		1.98E-03	1.98E-03
SCITY147	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	25.0	300.0	14.865	2.0		1.14E-02	1.14E-02
SCITY148	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	20.0	0.0	0.000	0.5		3.30E-03	3.30E-03
SCITY149	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	37.0	600.0	38.983	1.2		1.98E-03	1.98E-03
SCITY156	DEFAULT	ST. ALEXIUS HOSPITAL JEFFERSON CAMPUS	741441.37	4274961.73	544.65	115.0	210.0	38.885	5.0		1.19E-02	1.19E-02
SCITY157	DEFAULT	ST. ALEXIUS HOSPITAL JEFFERSON CAMPUS	741441.37	4274961.73	544.65	115.0	210.0	38.885	5.0		1.20E-02	1.20E-02
SCITY158	DEFAULT	ST. ALEXIUS HOSPITAL JEFFERSON CAMPUS	741441.37	4274961.73	544.65	115.0	210.0	38.885	5.0		1.19E-02	1.19E-02
SCITY159	DEFAULT	ST. ALEXIUS HOSPITAL JEFFERSON CAMPUS	741441.37	4274961.73	544.65	14.0	490.0	60.200	0.5		7.80E-01	0.00E+00
SCITY160	DEFAULT	ST. ALEXIUS HOSPITAL JEFFERSON CAMPUS	741441.37	4274961.73	544.65	12.6	200.0	205.400	0.5		7.80E-01	0.00E+00
SCITY162	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	210.0	260.0	17.733	2.8	2.69E+00	1.16E-01	1.16E-01
SCITY163	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	210.0	260.0	17.733	2.8	6.20E+00	4.43E-02	4.43E-02
SCITY164	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	4.20E+00	9.30E-03	0.00E+00
SCITY165	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	4.18E+00	9.20E-03	0.00E+00
SCITY166	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	3.77E+00	8.30E-03	0.00E+00
SCITY167	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	4.12E+00	9.10E-03	0.00E+00
SCITY168	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	4.01E+00	1.23E+00	0.00E+00
SCITY169	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	8.15E+00	1.80E-02	0.00E+00
SCITY170	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	4.90E+00	1.08E-02	0.00E+00
SCITY171	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	8.52E+00	1.88E-02	0.00E+00
SCITY172	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	184.2	400.0	1.949	5.5	4.71E+00	2.04E-01	2.04E-01
SCITY173	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	184.2	400.0	1.949	5.5	1.09E+01	7.76E-02	7.76E-02
SCITY174	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	184.2	400.0	1.949	5.5	2.50E+00	1.08E-01	1.08E-01
SCITY175	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	184.2	400.0	1.949	5.5	6.01E+00	4.29E-02	4.29E-02
SCITY176	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	6.24E+00	1.38E-02	0.00E+00
SCITY177	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	5.17E+00	1.14E-02	0.00E+00
SCITY178	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	9.14E+00	2.02E-02	0.00E+00
SCITY179	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	2.31E+00	9.84E-01	0.00E+00
SCITY180	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	3.98E+00	8.40E-03	0.00E+00
SCITY181	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	2.29E-01	3.53E-03	3.53E-03
SCITY183	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	2.29E-01	2.41E-03	2.41E-03
SCITY185	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	8.24E-02	5.89E-04	5.89E-04
SCITY187	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	2.36E-01	1.69E-03	1.69E-03
SCITY189	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	1.37E+00	4.86E-01	0.00E+00
SCITY190	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	247.0	180.0	20.417	1.2	5.35E-02	2.31E-03	2.31E-03
SCITY191	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	247.0	180.0	20.417	1.2	5.00E-01	3.57E-03	3.57E-03
SCITY192	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	3.65E+01	6.78E-02	0.00E+00
SCITY193	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	8.48E+00	1.56E-02	0.00E+00
SCITY194	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	2.09E+01	4.41E-02	0.00E+00
SCITY227	DEFAULT	INDUSTRIAL CONTAINER SERVICES - MO, LLC MANCHESTER	737686.12	4278652.89	459.06	20.0	250.0	18.068	1.0		2.54E-03	2.54E-03
SCITY228	DEFAULT	INDUSTRIAL CONTAINER SERVICES - MO, LLC MANCHESTER	737686.12	4278652.89	459.06	20.0	150.0	22.218	1.0		1.20E+00	1.20E+00
SCITY229	DEFAULT	INDUSTRIAL CONTAINER SERVICES - MO, LLC MANCHESTER	737686.12	4278652.89	459.06	25.0	0.0	0.000	1.0		2.19E-04	2.19E-04
SCITY242	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	60.0	250.0	71.667	1.7		2.39E-03	2.39E-03
SCITY243	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	80.0	400.0	18.833	1.5		4.37E-03	4.37E-03
SCITY244	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	20.0	0.0	0.000	0.5		1.37E-04	1.37E-04
SCITY245	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	95.0	750.0	11.168	4.2		8.16E-03	8.16E-03
SCITY246	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	43.0	500.0	7.467	2.5		7.33E-05	7.33E-05
SCITY247	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	20.0	0.0	0.000	0.5		3.46E-04	3.46E-04
SCITY248	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	96.0	375.0	1.716	2.0		2.48E-03	2.48E-03
SCITY266	DEFAULT	HUMANE SOCIETY OF MISSOURI ST. LOUIS - MACKLIND AVE	737162.32	4278817.40	474.08	24.0	1139.0	19.515	1.7		1.10E-02	1.10E-02
SCITY267	DEFAULT	HUMANE SOCIETY OF MISSOURI ST. LOUIS - MACKLIND AVE	737162.32	4278817.40	474.08	28.0	1800.0	15.584	2.0		6.76E-01	6.76E-01
SCITY275	DEFAULT	ALSCO, INC ST. LOUIS	743334.17	4275818.28	427.92	10.0	1100.0	23.333	0.5		2.33E+01	2.33E+01
SCITY276	DEFAULT	ALSCO, INC ST. LOUIS	743334.17	4275818.28	427.92	10.0	1100.0	23.333	0.5		4.99E-03	4.99E-03

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
SCITY277	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743167.71	4275132.40	439.30	28.5	850.0	0.003	0.5	7.11E-01	1.29E-05	0.00E+00
SCITY278	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743167.71	4275132.40	439.30	28.5	250.0	0.003	1.5	3.05E-01	1.28E-04	1.28E-04
SCITY279	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743167.71	4275132.40	439.30	28.5	250.0	0.003	1.5	6.87E-01	4.91E-03	4.91E-03
SCITY280	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743167.71	4275132.40	439.30	28.5	250.0	0.003	1.5	3.05E-02	1.28E-05	1.28E-05
SCITY281	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743167.71	4275132.40	439.30	28.5	250.0	0.003	1.5	6.89E-01	4.92E-03	4.92E-03
SCITY282	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743167.71	4275132.40	439.30	22.0	250.0	0.003	1.0	1.22E-01	5.27E-03	5.27E-03
SCITY283	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743167.71	4275132.40	439.30	22.0	250.0	0.003	1.0	2.73E-01	1.95E-03	1.95E-03
SCITY284	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743167.71	4275132.40	439.30	22.5	250.0	0.003	2.0	6.30E-01	2.56E-04	2.56E-04
SCITY285	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743167.71	4275132.40	439.30	22.5	250.0	0.003	2.0	1.38E+00	9.84E-03	9.84E-03
SCITY286	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743167.71	4275132.40	439.30	28.5	850.0	0.003	1.5	6.85E-01	1.53E-05	0.00E+00
SCITY287	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743167.71	4275132.40	439.30	28.5	850.0	0.003	1.5	7.84E+00	1.53E-04	0.00E+00
SCITY288	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743167.71	4275132.40	439.30	28.5	850.0	0.003	1.5	7.84E+00	1.38E-04	0.00E+00
SCITY289	DEFAULT	ARTCO ST. LOUIS-AMERICAN RIVER TRANS CO ST. LOUIS	741227.54	4278049.76	423.52	28.0	400.0	50.535	2.0		2.29E-03	2.29E-03
SCITY290	DEFAULT	ARTCO ST. LOUIS-AMERICAN RIVER TRANS CO ST. LOUIS	741227.54	4278049.76	423.52	28.0	400.0	50.535	2.0		2.91E+01	2.91E+01
SCITY291	DEFAULT	ARTCO ST. LOUIS-AMERICAN RIVER TRANS CO ST. LOUIS	741227.54	4278049.76	423.52	28.0	400.0	50.535	2.0		1.63E-03	1.63E-03
SCITY292	DEFAULT	SOUTHERN METAL PROCESSING	739897.53	4271091.77	426.02	91.0	1590.0	19.255	2.5		5.28E+01	1.28E+01
SCITY293	DEFAULT	SOUTHERN METAL PROCESSING	739897.53	4271091.77	426.02	91.0	1590.0	19.255	2.5		3.47E+00	3.47E+00
SCITY295	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	220.0	350.0	14.656	5.0	2.14E+00	6.17E+01	6.17E+01
SCITY296	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	220.0	350.0	14.856	5.0	1.81E+00	1.29E-02	1.29E-02
SCITY297	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	220.0	350.0	14.656	5.0	8.93E-01	2.57E+01	2.57E+01
SCITY298	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	220.0	350.0	14.856	5.0	6.62E+00	4.73E-02	4.73E-02
SCITY299	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	220.0	350.0	14.656	5.0	1.89E+00	5.45E+01	5.45E+01
SCITY300	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	220.0	350.0	14.856	5.0	7.92E+00	5.66E-02	5.66E-02
SCITY301	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	220.0	350.0	14.856	5.0	2.14E+00	6.17E+01	6.17E+01
SCITY302	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	220.0	350.0	14.856	5.0	1.04E+00	7.40E-03	7.40E-03
SCITY303	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	10.0	1100.0	23.333	0.5	9.82E+00	5.13E+00	0.00E+00
SCITY304	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	10.0	1100.0	23.333	0.5	6.00E+00	1.98E+00	0.00E+00
SCITY315	DEFAULT	J S ALBERICI CONSTRUCTION	736723.60	4285287.44	575.43	10.0	1100.0	23.333	0.5	6.00E+00	1.98E+00	0.00E+00
SCITY316	DEFAULT	J S ALBERICI CONSTRUCTION	736723.60	4285287.44	575.43	20.0	0.0	0.000	0.5	7.40E-02	2.22E-03	2.22E-03
SCITY317	DEFAULT	J S ALBERICI CONSTRUCTION	736723.60	4285287.44	575.43	20.0	0.0	0.000	0.5	7.40E-02	2.22E-03	2.22E-03
SCITY318	DEFAULT	J S ALBERICI CONSTRUCTION	736723.60	4285287.44	575.43	10.0	1100.0	23.333	0.5	9.62E-01	3.00E-01	3.00E-01
SCITY319	DEFAULT	J S ALBERICI CONSTRUCTION	736723.60	4285287.44	575.43	20.0	0.0	0.000	0.5	2.00E-02	6.00E-04	6.00E-04
SCITY320	DEFAULT	J S ALBERICI CONSTRUCTION	736723.60	4285287.44	575.43	20.0	0.0	0.000	0.5	1.26E-02	3.70E-04	3.70E-04
SCITY321	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	90.0	380.0	33.766	2.0	8.99E-01	3.88E-02	3.88E-02
SCITY322	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	60.0	380.0	33.766	2.0	4.60E-01	3.28E-03	3.28E-03
SCITY323	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	15.0	850.0	73.133	0.7	1.40E-02	3.09E-06	0.00E+00
SCITY324	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	15.0	850.0	73.133	0.7	7.00E-04	1.54E-06	0.00E+00
SCITY325	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	15.0	850.0	73.133	0.7	5.78E-03	1.22E-06	0.00E+00
SCITY326	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	80.0	405.0	33.766	2.0	8.71E-02	3.76E-03	3.76E-03
SCITY327	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	60.0	405.0	33.766	2.0	8.30E-01	5.93E-03	5.93E-03
SCITY328	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	80.0	405.0	33.766	2.0	7.46E-01	3.22E-02	3.22E-02
SCITY329	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	90.0	405.0	33.766	2.0	9.04E-01	6.46E-03	6.46E-03
SCITY330	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	15.0	1007.0	51.050	0.7	1.68E-01	3.03E-03	0.00E+00
SCITY331	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743917.49	4278167.30	467.68	10.0	1100.0	23.333	0.5	4.00E+00	1.24E+00	0.00E+00
SCITY332	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	10.0	1100.0	23.333	0.5	7.02E-01	1.44E-03	1.44E-03
SCITY333	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743917.49	4278167.30	467.68	6.0	1157.0	95.000	0.3	8.24E+00	1.52E+00	0.00E+00
SCITY334	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	6.0	1076.0	151.667	0.3	1.56E+00	7.82E-01	0.00E+00
SCITY335	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	9.9	815.0	37.895	0.8	8.13E-01	1.35E-03	0.00E+00
SCITY344	DEFAULT	PAULO PRODUCTS COMPANY	736597.70	4276776.67	501.12	32.8	200.0	2.833	1.2		5.04E-03	5.04E-03
SCITY353	DEFAULT	CHRISTY REFRACTORIES CO L L C	738223.37	4278219.85	483.66	1.0	329.0	0.003	1.0		9.60E-02	9.60E-02
SCITY355	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	431.0	79.216	2.0		9.54E-01	9.54E-01
SCITY356	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	455.0	79.216	2.0		9.54E-01	9.54E-01
SCITY357	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	478.0	79.216	2.0		9.54E-01	9.54E-01
SCITY358	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	565.0	985.0	23.035	0.7		3.05E-01	3.05E-01
SCITY359	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	565.0	995.0	23.035	0.7		3.05E-01	3.05E-01

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Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
SCITY360	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	565.0	985.0	23.035	0.7		3.05E-01	3.05E-01
SCITY361	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	660.0	300.0	23.035	1.5		1.09E-03	1.09E-03
SCITY362	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	660.0	300.0	23.035	1.5		4.92E-03	4.92E-03
SCITY363	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	390.0	960.0	23.035	9.5		7.17E-01	7.17E-01
SCITY364	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	390.0	960.0	23.035	9.5		7.17E-01	7.17E-01
SCITY365	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	722.0	96.401	2.0		1.19E+00	1.19E+00
SCITY366	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	722.0	96.401	2.0		5.13E+00	5.13E+00
SCITY367	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	722.0	96.401	2.0		8.24E+00	8.24E+00
SCITY368	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	722.0	96.401	2.0		8.24E+00	8.24E+00
SCITY380	DEFAULT	BKEP MATERIALS, LLC ST. LOUIS TERMINAL CO	739332.17	4270413.67	420.93	25.0	450.0	20.000	2.5		2.46E-03	2.46E-03
SCITY381	DEFAULT	BKEP MATERIALS, LLC ST. LOUIS TERMINAL CO	739332.17	4270413.67	420.93	12.0	150.0	8.333	3.0		1.63E-01	1.63E-01
SCITY394	DEFAULT	SAINT LOUIS UNIVERSITY FACILITIES SERVICES	740384.08	4280241.69	507.64	10.0	1100.0	23.333	0.5		2.05E+00	0.00E+00
SCITY395	DEFAULT	SAINT LOUIS UNIVERSITY FACILITIES SERVICES	740384.08	4280241.69	507.64	20.0	0.0	0.000	0.5		9.53E-03	9.53E-03
SCITY396	DEFAULT	SAINT LOUIS UNIVERSITY FACILITIES SERVICES	740384.08	4280241.69	507.64	20.0	0.0	0.000	0.5		1.71E-03	1.71E-03
SCITY401	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	40.0	200.0	21.667	2.5		9.30E-05	9.30E-05
SCITY402	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	40.0	200.0	21.667	2.5		4.97E-03	4.97E-03
SCITY403	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	40.0	200.0	21.667	2.5		5.07E-05	5.07E-05
SCITY404	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	40.0	200.0	21.667	2.5		2.48E-03	2.48E-03
SCITY405	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	10.0	1100.0	23.333	0.5		1.83E-01	0.00E+00
SCITY406	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	23.5	200.0	16.667	2.9		2.55E+00	2.55E+00
SCITY407	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	23.5	200.0	16.667	2.9		2.87E-02	2.87E-02
CJEFF34	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	36.6	77.0	29.600	1.8	2.68E-02		
CJEFF35	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	70.0	350.0	40.000	2.0	2.90E-01		
CJEFF36	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	70.0	850.0	41.667	2.5	2.07E-01		
CJEFF37	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	20.0	0.0	0.000	0.5	9.13E-03		
CJEFF43	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	56.0	370.0	33.333	2.5	1.01E-01		
CJEFF44	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	70.0	850.0	41.667	2.5	8.06E-01		
CJEFF45	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	70.0	850.0	112.999	2.5	9.97E-02		
CJEFF46	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	70.0	850.0	20.600	2.5	2.58E-01		
CSTLC55	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	34.0	375.0	26.555	2.3	1.68E-02		
CSTLC56	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	34.0	375.0	26.555	2.3	1.27E+00		
CSTLC57	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	33.0	428.0	15.669	3.8	1.66E-02		
CSTLC58	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	33.0	428.0	15.669	3.8	3.85E-01		
CSTLC59	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	20.0	250.0	2.083	1.0	7.72E-02		
CSTLC60	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	5.5	1200.0	254.649	0.2	3.28E+00		
CSTLC61	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	5.5	1200.0	254.649	0.2	1.29E-01		
CSTLC62	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	5.5	1200.0	254.649	0.2	9.99E-05		
CSTLC63	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	19.0	425.0	7.047	1.7	6.01E-01		
CSTLC64	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	24.0	270.0	105.951	2.0	3.24E+00		
CSTLC152	DEFAULT	SIMPSON CONSTRUCTION MATERIALS LLC VALLEY PARK	715996.20	4268469.87	430.05	43.0	-459.7	3.225	1.0	1.38E-01		
CSTLC155	DEFAULT	FRED WEBER INC. - SOUTH ASPHALT BATCH SOUTH ASPHALT	732929.25	4259955.19	424.64	37.0	230.0	51.250	4.2	2.57E+01		
CSTLC156	DEFAULT	FRED WEBER INC. - SOUTH ASPHALT BATCH SOUTH ASPHALT	732929.25	4259955.19	424.64	12.0	355.0	0.804	1.3	4.03E+01		
CSTLC157	DEFAULT	FRED WEBER INC. - NORTH ASPHALT H and B	720614.10	4290798.15	468.70	31.0	230.0	80.499	4.2	3.93E+01		
CSTLC158	DEFAULT	FRED WEBER INC. - NORTH ASPHALT H and B	720614.10	4290798.15	468.70	20.0	300.0	16.667	1.1	2.29E-01		
CSTLC207	DEFAULT	MISSOURI-AMERICAN WATER CO FLORISSANT	728394.88	4306010.04	461.78	15.0	896.0	0.000	14.0	1.61E+02		
CCITY65	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	100.0	350.0	29.984	1.3	3.08E-02		
CCITY203	DEFAULT	INDUSTRIAL CONTAINER SERVICES - MO, LLC MANCHESTER	737686.12	4278652.89	459.06	20.0	250.0	18.068	1.0	3.56E-01		
CCITY204	DEFAULT	INDUSTRIAL CONTAINER SERVICES - MO, LLC MANCHESTER	737686.12	4278652.89	459.06	20.0	150.0	22.218	1.0	1.68E+02		
CCITY344	DEFAULT	GP RECYCLING, LLC	743830.86	4284034.28	422.18	20.0	0.0	0.000	0.5	1.72E-02		
CCITY368	DEFAULT	GP RECYCLING, LLC	740384.08	4280241.69	507.64	10.0	1100.0	23.333	0.5	6.73E+00		
CCITY369	DEFAULT	SAINT LOUIS UNIVERSITY FACILITIES SERVICES	740384.08	4280241.69	507.64	20.0	0.0	0.000	0.5	1.33E+00		
CCITY370	DEFAULT	SAINT LOUIS UNIVERSITY FACILITIES SERVICES	740384.08	4280241.69	507.64	20.0	0.0	0.000	0.5	5.69E-02		

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Off-Site Volume Source Inputs

Source ID	Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Release Height (ft)	Sigma Y (ft)	Sigma Z (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
SJEFF64	MERCY HOSPITAL JEFFERSON	728195.03	4230646.83	425.75	16.4	3.8	15.3	1.28E-02	9.13E-05	9.13E-05
SJEFF84	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6	2.29E-01	4.68E-03	4.68E-03
SJEFF85	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6	2.29E-01	7.06E-03	7.06E-03
SJEFF87	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	16.4	3.8	15.3	2.29E-01	1.44E-03	1.44E-03
SJEFF88	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6	2.29E-01	3.91E-03	3.91E-03
SJEFF89	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6		1.47E-03	1.47E-03
SJEFF90	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6		2.29E-01	2.29E-01
SJEFF91	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6		6.88E-03	6.88E-03
SJEFF93	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6		1.38E-03	1.38E-03
SJEFF101	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6	4.81E-01	2.40E-02	2.40E-02
SJEFF102	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6	6.41E-01	1.42E-02	1.42E-02
SJEFF103	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6	5.24E-01	6.09E-03	6.09E-03
SJEFF104	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6	1.91E-01	3.75E-03	3.75E-03
SJEFF105	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6		1.08E-03	1.08E-03
SJEFF106	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6		1.14E-03	1.14E-03
SJEFF107	AERO METAL FINISHING	718099.61	4263747.23	613.55	8.2	2.3	7.6		2.43E-01	2.43E-01
SJEFF126	FRED WEBER, INC. ANTONIA	720102.79	4248877.71	670.57	8.2	2.3	7.6		3.08E+00	3.08E+00
SSTC56	BLASTCO INC	690213.84	4297755.23	543.44	8.2	2.3	7.6		1.47E-01	1.47E-01
SSTL67	MISSOURI ASPHALT PRODUCTS, LLC WEST LAKE QUARRY MATERIAL CO	721914.39	4294042.31	462.50	16.4	3.8	15.3		5.88E-04	5.88E-04
SSTL68	MISSOURI ASPHALT PRODUCTS, LLC WEST LAKE QUARRY MATERIAL CO	721914.39	4294042.31	462.50	16.4	3.8	15.3		1.02E+00	1.02E+00
SSTL125	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	8.2	2.3	7.6		7.18E-03	7.18E-03
SSTL187	FRED WEBER, INC. FT. BELLE	739499.97	4302900.13	443.27	8.2	2.3	7.6		1.80E-01	1.80E-01
SCITY19	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.2	2.3	7.6	8.24E-02	2.47E-02	2.47E-02
SCITY20	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.2	2.3	7.6	4.44E-03	7.73E-01	7.73E-01
SCITY23	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.2	2.3	7.6	2.59E+00	7.94E-01	7.94E-01
SCITY44	ADM GRAIN COMPANY ST. LOUIS	744141.30	4284932.90	425.39	15.0	0.2	14.0		6.22E-04	6.22E-04
SCITY45	ADM GRAIN COMPANY ST. LOUIS	744141.30	4284932.90	425.39	15.0	0.2	14.0		2.76E-02	2.76E-02
SCITY118	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	8.2	2.3	7.6		7.50E-05	7.50E-05
SCITY119	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	8.2	2.3	7.6		4.00E-01	4.00E-01
SCITY120	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	8.2	2.3	7.6		2.61E-01	2.61E-01
SCITY130	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		3.00E-04	3.00E-04
SCITY131	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		7.40E-02	7.40E-02
SCITY134	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		7.40E-02	7.40E-02
SCITY135	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		3.00E-04	3.00E-04
SCITY138	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		7.40E-02	7.40E-02
SCITY139	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		3.00E-04	3.00E-04
SCITY182	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	16.4	3.8	15.3	3.36E-02	2.40E-04	2.40E-04
SCITY184	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	16.4	3.8	15.3	6.59E-02	4.71E-04	4.71E-04
SCITY186	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	16.4	3.8	15.3	3.36E-02	2.40E-04	2.40E-04
SCITY188	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	16.4	3.8	15.3	4.95E-02	3.53E-04	3.53E-04
SCITY195	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	8.2	2.3	7.6	8.40E-02	6.00E-04	6.00E-04
SCITY241	PQ CORPORATION -THE	739053.43	4285317.19	495.80	8.2	2.3	7.6		2.66E-02	2.66E-02
SCITY340	PAULO PRODUCTS COMPANY	736597.70	4278776.67	501.12	8.2	2.3	7.6		3.60E-04	3.60E-04
SCITY341	PAULO PRODUCTS COMPANY	736597.70	4278776.67	501.12	8.2	2.3	7.6		1.13E-03	1.13E-03
SCITY342	PAULO PRODUCTS COMPANY	736597.70	4278776.67	501.12	8.2	2.3	7.6		1.20E-03	1.20E-03
SCITY343	PAULO PRODUCTS COMPANY	736597.70	4278776.67	501.12	8.2	2.3	7.6		1.20E-02	1.20E-02
CJEFF33	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.49E-01		
CJEFF38	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	4.71E-03		
CJEFF39	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	3.22E-03		

R005553

Off-Site Volume Source Inputs

Source ID	Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Release Height (ft)	Sigma Y (ft)	Sigma Z (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
CJEFF40	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	2.01E-01		
CJEFF41	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.10E-03		
CJEFF42	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	8.18E-04		
CJEFF47	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	6.55E-02		
CJEFF48	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	6.56E-06		
CJEFF49	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	4.09E-04		
CJEFF50	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	8.48E-04		
CJEFF51	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	5.28E-02		
CJEFF52	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	2.46E-03		
CJEFF53	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.53E-01		
CJEFF54	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.56E-02		
CJEFF55	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.16E-03		
CJEFF56	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	8.45E-03		
CJEFF57	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	3.42E-01		
CJEFF58	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	4.74E-03		
CJEFF59	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.92E-01		
CJEFF60	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.36E-02		
CSTLC92	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	8.2	2.3	7.6	2.25E-01		
CSTLC151	SIMPSON CONSTRUCTION MATERIALS LLC VALLEY PARK	715996.20	4268469.87	430.05	13.5	1.4	0.7	1.58E-01		
CSTLC195	FRED WEBER, INC. FT. BELLE	739499.97	4302900.13	443.27	13.5	1.4	0.7	5.97E-01		
CCITY343	GP RECYCLING, LLC	743830.86	4284034.28	423.18	8.2	2.3	7.6	5.57E-02		

R005554

ATTACHMENT B
MODEL SUMMARY OUTPUT

10-5-22 US Steel CO Scale-up Significant Impacts Analysis Results

Model	File	Pollutant	Average	Group	Rank	Conc/Dep	East (X)	North (Y)	Elev	Hill	Flag		Time	Met File	Sources	Groups	Receptors
AERMOD 22112	Granite City SIL_2019_CO.SUM	CO	1-HR	ALL	1ST	1357.328	746400	4286400	128.82	132.25		0	19020109	STL_LCN15	13	1	14098
AERMOD 22112	Granite City SIL_2016_CO.SUM	CO	1-HR	ALL	1ST	1094.348	750800	4288100	127.44	127.44		0	16121910	STL_LCN15	13	1	14098
AERMOD 22112	Granite City SIL_2018_CO.SUM	CO	1-HR	ALL	1ST	1036.463	745200	4287600	129.9	134.11		0	18122209	STL_LCN15	13	1	14098
AERMOD 22112	Granite City SIL_2020_CO.SUM	CO	1-HR	ALL	1ST	997.3573	746700	4287100	126.89	126.89		0	20030610	STL_LCN2C	13	1	14098
AERMOD 22112	Granite City SIL_2017_CO.SUM	CO	1-HR	ALL	1ST	982.0781	748434.9	4287033	127.16	127.16		0	17051502	STL_LCN17	13	1	14098
AERMOD 22112	Granite City SIL_2019_CO.SUM	CO	8-HR	ALL	1ST	881.6775	748481.6	4286378	126.67	126.67		0	19041908	STL_LCN15	13	1	14098
AERMOD 22112	Granite City SIL_2018_CO.SUM	CO	8-HR	ALL	1ST	869.3078	748481.6	4286378	126.67	126.67		0	18111224	STL_LCN18	13	1	14098
AERMOD 22112	Granite City SIL_2017_CO.SUM	CO	8-HR	ALL	1ST	851.0973	750472	4287091	125.7	125.7		0	17090416	STL_LCN17	13	1	14098
AERMOD 22112	Granite City SIL_2016_CO.SUM	CO	8-HR	ALL	1ST	645.9934	748434.9	4287033	127.16	127.16		0	16110108	STL_LCN16	13	1	14098
AERMOD 22112	Granite City SIL_2020_CO.SUM	CO	8-HR	ALL	1ST	618.4866	748434.9	4287033	127.16	127.16		0	20041108	STL_LCN2C	13	1	14098

10-5-22 US Steel CO Scale-up Significant Impacts Analysis Results

Pollutant	Average	Group	Rank	Model Conc. (ug/m3)	Significant Impact Level (ug/m3)	% SIL
CO	1-HR	ALL	1ST	1357.3	2,000	68%
CO	8-HR	ALL	1ST	881.7	500	176%

10-5-22 US Steel CO NAAQS Analysis Results

Model	File	Pollutant	Average	Group	Rank	Conc/Dep	East (X)	North (Y)	Elev	Hill	Flag		Time	Met File	Sources	Groups	Receptors
AERMOD 22112	Granite City NAAQS_2016_CO.SUM	CO	8-HR	ALL	2ND	1856.677	748434.9	4287033	127.16	127.16		0	16032208	STL_LCN15	584	1	205
AERMOD 22112	Granite City NAAQS_2017_CO.SUM	CO	8-HR	ALL	2ND	1941.224	748434.9	4287033	127.16	127.16		0	17123024	STL_LCN17	584	1	205
AERMOD 22112	Granite City NAAQS_2018_CO.SUM	CO	8-HR	ALL	2ND	1726.885	748670.1	4287000	126.94	126.94		0	18092424	STL_LCN18	584	1	205
AERMOD 22112	Granite City NAAQS_2019_CO.SUM	CO	8-HR	ALL	2ND	2045.17	748434.9	4287033	127.16	127.16		0	19110908	STL_LCN15	584	1	205
AERMOD 22112	Granite City NAAQS_2020_CO.SUM	CO	8-HR	ALL	2ND	1966.717	748434.9	4287033	127.16	127.16		0	20092408	STL_LCN2C	584	1	205

10-5-22 US Steel CO NAAQS Analysis Results

Pollutant	Average	Group	Rank	Model Conc. (ug/m3)	Background Conc. (ug/m3)	Total Conc. (ug/m3)	Standard (ug/m3)	% Standard
CO	8-HR	ALL	2ND	2045.2	1646	3691.2	10,000	37%

Background data from East St. Louis monitor (AQS No. 85-510-028), high second high value from 2016-2018.

R005556

REFERENCES

1. Guidelines on Air Quality Models, (Revised). Appendix W of 40 CFR Part 51, 82 FR 5182, January 17, 2017.

2 . Prevention of Significant Deterioration, The Art and Science of PSD Air Quality Analysis, The Modeling Perspective, Illinois Environmental Protection Agency, Modeling Unit, February 27, 2014..

3. AERSCREEN User's Guide. EPA-454/B-15-005, July 2015.

4. Guideline for Determination of Good Engineering Practice Stack Height (Technical Support Document for Stack Height Regulations (Revised). EPA-450/4-80-023R, U.S. Environmental Protection Agency, June 1985.

5. *Sierra Club v. EPA*, No. 10-1413, 2013 WL 216018 (Jan. 22, 2013).

6. Ambient Monitor Guidelines for Prevention of Significant Deterioration, EPA-450/4-87-007, USEPA, May 1987.

7. Ambient Monitor Guidelines for Prevention of Significant Deterioration, EPA-450/4-87-007, USEPA, May 1987.

Kras, Kim

From: Ray, Sarah <Sarah.Ray@illinois.gov>
Sent: Tuesday, November 15, 2022 5:31 PM
To: Stewart, Tamara
Subject: RE: US Steel Granite City Modeling

Hi Tammy,

I spoke with Steve yesterday. He mentioned that he hadn't had a chance to look things over – but thought our approach seemed reasonable. With that in mind, I made some minor revisions to your memo. Feel free to accept/reject as you see fit.

Once you are satisfied with it and the document contains no comments or tracked changes, I think you are good to convert the document into a PDF and send it out.

Thanks,
Sarah

From: Ray, Sarah
Sent: Tuesday, November 1, 2022 9:56 AM
To: Stewart, Tamara <Tamara.Stewart@illinois.gov>
Cc: King, Steven <Steven.King@Illinois.gov>
Subject: RE: US Steel Granite City Modeling

Hi Tammy,

I looked over your results, and I tend to agree with you that the use of the rural option is okay.

As your spreadsheet shows, the maximum modeled concentrations for the 1-hour and 8-hr SIL analyses are higher with the urban option. However, the 8-hour NAAQS concentration is lower.

I tend to think of the SILs as more of a screening metric. So, my personal opinion is that the concentrations associated with the SILs are less important than the results associated with the cumulative modeling.

Provided that Steve also agrees, I think that we are safe to proceed without seeking updated modeling from the consultant.

Thanks,
Sarah

From: Stewart, Tamara <Tamara.Stewart@Illinois.gov>
Sent: Tuesday, November 1, 2022 9:43 AM
To: Ray, Sarah <Sarah.Ray@illinois.gov>
Cc: King, Steven <Steven.King@Illinois.gov>
Subject: RE: US Steel Granite City Modeling

Good morning,
I have run the Urban option, it was higher on a few occasions. Higher than what was modeled by IEPA and RTP. The high correspond with the highs calculated by RTP and I for SIL calcs. The 1-hour high for 2017 and 2020 were higher

than the rural calculations for 1-hr calculated by RTP and IEPA. The NAAQS Urban run values were less than what was calculated by RTP and IEPA see attached. I feel the highs correspond the highs from the RTP and IEPA runs. But I don't understand the highs for 2017 and 2020 for the 1-hr readings. I think the use of the rural option is okay, what are your thoughts. Modeling results attached. I will also re run the years where the high value for the 1-hr was observed.

Thanks

Tammy

From: Ray, Sarah <Sarah.Ray@illinois.gov>
Sent: Thursday, October 27, 2022 10:24 AM
To: Stewart, Tamara <Tamara.Stewart@Illinois.gov>
Cc: King, Steven <Steven.King@illinois.gov>
Subject: RE: US Steel Granite City Modeling

Okay. Thank you for doing that!

This is a particularly complex issue as the distribution between rural and urban land use categories are so close and because certain types of land use categories may negate the effects expected within an urban environment. I looked at the AERMOD Implementation Guide, specifically Section 5: aermod_implementation_guide.pdf (epa.gov). It notes that:

"For most applications, the Land Use Procedure described in Section 7.2.3(c) is sufficient for determining the urban/rural status. However, there may be sources located within an urban area, but located close enough to a body of water or to other non-urban land use categories to result in a predominately rural land use classification within 3 kilometers of the source following that procedure."

"Another aspect of the urban/rural determination that may require special consideration on a case-by-case basis relates to tall stacks located within or adjacent to small to moderate size urban areas. In such cases, the stack height or effective plume height for very buoyant plumes, may extend above the urban boundary layer height."

Google Earth shows that the facility is fairly close to water and your Auer's analysis confirms it (6.1% open water). So, this may potentially offset the Auer's analysis identification of the area as urban. I'm less certain about the height of the stacks at the facility relative to the surrounding area.

I spoke with Steve and think the next step is to run the model internally first using the urban option and compare output with the results you and the consultant each generated without the urban option. Historically, the urban option has been less conservative. If that's the case here as well, then you can add a note to the memo that indicates that you took this additional step and that modeled results were lower than those without the urban option. If modeled results with the urban option turn out to be higher, then I think we should reach out to the consultant to communicate that and to request updated modeling runs that use the urban option.

For information about how to set up the urban mode in AERMOD, see Section 5.2 of the AERMOD Implementation Guide. My thought is that you can likely start with published census data to estimate population for the area. You don't need to worry about the urban roughness length described in Section 5.3. You can just use the default value of 1.

Thank you for all of your work on this!

Kind regards,
Sarah

From: Stewart, Tamara <Tamara.Stewart@Illinois.gov>
Sent: Thursday, October 27, 2022 9:14 AM

To: Ray, Sarah <Sarah.Ray@illinois.gov>
Subject: RE: US Steel Granite City Modeling

They did not provide the 1-hour NAAQS file, I will redo the Auer's with 2016 info and ask Steve King that question. When I ran NLCD 2016 its clearly rural, when I run NLCD 2019 lightly urban. Steve King said you have info on next steps. Sounds interesting.

From: Ray, Sarah <Sarah.Ray@illinois.gov>
Sent: Wednesday, October 26, 2022 4:07 PM
To: Stewart, Tamara <Tamara.Stewart@Illinois.gov>
Subject: RE: US Steel Granite City Modeling

Perfect! Thank you for taking this on!

I looked through the write up and tracked my changes. Mostly, I just changed mentions of "AQPS" to "Modeling Unit." I responded to your comments as well. My thought is that, since your Auer's analysis showed that the area was slightly more urban than rural, that the urban option should be used. However, like I said in my comment, it may be worth talking to Steve King, to get a second opinion about it.

I'm not sure if you've had a chance to speak with him or not, but he worked in the Modeling Unit for a number of years and is usually my go to when I'm uncertain about an approach.

From: Stewart, Tamara <Tamara.Stewart@Illinois.gov>
Sent: Wednesday, October 26, 2022 2:39 PM
To: Ray, Sarah <Sarah.Ray@illinois.gov>
Subject: RE: US Steel Granite City Modeling

I have prepared the memo, basically updated what was already there. It is in the folder. I put a few comments with questions I had. Also files and data comparison spread sheets. I will clean up the AERMOD just to include the necessary files.

N:\BOA\aqp\Air Modeling Central\Granite City US Steel - CO\2022

From: Ray, Sarah <Sarah.Ray@illinois.gov>
Sent: Tuesday, October 11, 2022 11:19 AM
To: Stewart, Tamara <Tamara.Stewart@Illinois.gov>
Cc: Rutherford, Cari <Cari.Rutherford@Illinois.gov>
Subject: FW: US Steel Granite City Modeling

Hi Tammy,

I'm forwarding you Dave's email regarding new CO modeling for US Steel Granite City. This is a PSD project that Cari and I originally reviewed back in 2020. Please review these new modeling files and prepare a memorandum summarizing your review.

I've added the files to the path below, along with a copy of the original memo that Cari and I developed as part of the 2020 review:

N:\BOA\aqp\Air Modeling Central\Granite City US Steel - CO\2022

Please let me know if you have any questions!

Thank you,
Sarah

From: David Keen <keen@rtpenv.com>
Sent: Monday, October 10, 2022 10:46 AM
To: Ray, Sarah <Sarah.Ray@illinois.gov>
Cc: Colin Campbell <campbell@rtpenv.com>; Gurinder (Gary) Saini <saini@rtpenv.com>; David Keen <keen@rtpenv.com>
Subject: [External] US Steel Granite City Modeling

Sarah,

Please find attached the latest iteration of the US Steel Granite City CO modeling. This analysis was originally submitted in 2020. The model has been revised based upon recent discussions with IEPA (Chris Romaine).

Please let me know if you have any questions or need additional information.

Thanks,
Dave

David Keen
RTP Environmental
keen@rtpenv.com
(919) 845-1422 x41
(919) 845-1424 fax
(919) 906-6016 mobile

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Pritchett, Jacob A.

From: Carter, Sally
Sent: Saturday, November 17, 2018 9:41 AM
To: Romaine, Chris; Patel, Minesh
Subject: FW: United States Steel - Second Deliverable to State
Attachments: 7KR0997-US Steel Second Deliverable to State 11.16.18.PDF

From: Katie J. Ginest <Katie.Ginest@heplerbroom.com>
Sent: Friday, November 16, 2018 2:22 PM
To: 'Burlingham, Rebecca' <RBurlingham@atg.state.il.us>; Carter, Sally <Sally.Carter@Illinois.gov>
Cc: 'dwhacker@uss.com' <dwhacker@uss.com>; Katherine D. Hodge <Katherine.Hodge@heplerbroom.com>; Daniel L. Siegfried <Daniel.Siegfried@heplerbroom.com>; Melissa S. Brown <Melissa.Brown@heplerbroom.com>
Subject: [External] RE: United States Steel - Second Deliverable to State

Please see the attached...there was a miss-spelling in the title of the document that has now been corrected.

Thank you, and sorry for the inconvenience.

From: Katie J. Ginest
Sent: Friday, November 16, 2018 2:01 PM
To: Burlingham, Rebecca <RBurlingham@atg.state.il.us>; 'Sally.Carter@illinois.gov' <Sally.Carter@illinois.gov>
Cc: 'dwhacker@uss.com' <dwhacker@uss.com>; Katherine D. Hodge <Katherine.Hodge@heplerbroom.com>; Daniel L. Siegfried <Daniel.Siegfried@heplerbroom.com>; Melissa S. Brown <Melissa.Brown@heplerbroom.com>
Subject: United States Steel - Second Deliverable to State

Per Kathy Hodge, please see the attached.

Thank you,

HEPLERBROOM LLC
Katie J. Ginest
Paralegal
Katie.Ginest@heplerbroom.com
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November 16, 2018

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VIA ELECTRONIC MAIL

Rebecca Burlingham, Esq.
Supervising Attorney
Illinois Attorney General's Office
Environmental Bureau
69 West Washington Street, 18th Floor
Chicago, IL 60602

Re: Second Deliverable to State
United States Steel Corporation
Illinois Pollution Control Board
PCB 2013-53 and PCB 2013-62

Dear Becky:

This letter follows our meeting with you and the Illinois Environmental Protection Agency ("Illinois EPA") on September 19, 2018, regarding the above-referenced pending air permit appeals for United States Steel Corporation's ("USS") Granite City Works ("GCW"), i.e., *United States Steel Corporation v. Illinois Environmental Protection Agency*, PCB 2013-053, and *United States Steel Corporation v. Illinois Environmental Protection Agency*, PCB 2013-062, and our letters of September 17 (Pre-meeting Background/Summary) and October 19, 2018 (First Deliverable).

USS respectfully notes that it was greatly disappointed to hear Illinois EPA's position regarding the progress of settlement efforts in these matters. Throughout these negotiations, USS has provided its best efforts to suggest appropriate practicably enforceable lawful short-term limits that allow for operational flexibility. However, to date, Illinois EPA has rejected all of our offers and responded with no counter offers, except to point to the existing limits that are currently under appeal. Because using the existing emission factors as short-term emission limits does not allow for proper operational flexibility, USS respectfully notes that it cannot agree that such factors be used as emission limits themselves. However, as previously explained, and as explained herein, USS believes many of the factors do have value in the derivation of emission limits.

As you know, during the September 19th meeting, USS and Illinois EPA agreed on a schedule for USS to submit certain information, i.e. deliverables, with the second round of information being due by today, November 16, 2018. Specifically, this second round of information is to address operational variability at GCW, USS's need for practically enforceable emission limits that allow for operational flexibility due to GCW's inherent and dynamic variability in operations, and proposals for how emission factors and operational flexibility concepts should be used to develop enforceable emission limits.[1] Our third and fourth deliverables are due December 31, 2018, and January 31, 2019, respectively.

As previously noted, both USS and Illinois EPA have invested significant resources in attempting to resolve the many and complex issues associated with these appeals, especially as to the emission factors that were incorporated (as enforceable emission limits) from the Construction Permit/Prevention of Significant Deterioration ("PSD") Approval No. 95010001 ("PSD Permit"), issued to National Steel Corporation, the prior owner and operator of GCW, by Illinois EPA on January 25, 1996 (and subsequently revised and reissued on several occasions), and USS's need for practically enforceable emission limits that allow for operational flexibility due to GCW's inherent and dynamic variability in operations. As discussed, due to such operational flexibility requirements at GCW, it is technologically infeasible and economically unreasonable for USS to accept, as permitted emission limits, the "emission factors," which in many cases are published emission factors that are *averages* from data sources other than GCW with varying reliability. Also, in some cases, the emissions factors are based upon a *single* historic stack test using the *average* of three individual test runs.

In furtherance of its position, USS offers the following additional information:

I. VARIABILITY OF OPERATIONS/EMISSIONS GENERALLY

The United States Environmental Protection Agency ("USEPA") has long recognized that a permit must allow for operational flexibility. Part 70 of the federal regulations specifically states that "[t]he [state] program must allow changes within a permitted facility without requiring a permit revision, if the changes are not modifications under any provision of title I of the act and the changes do not exceed the emissions allowable under the permit . . ." 40 CFR 70.4(d)(3)(viii). Some sources may need provisions accounting for operational flexibility in their permits because they are driven by the marketplace to make quick changes to their products or services. *See* Operating Permits Program White Paper Number 3, "Design of Flexible Air Permits," USEPA Draft, at 5 (Aug. 7, 2000) ("USEPA White Paper Number 3").[2]

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[1] USS reserves the right to refine these responses, as may be necessary, based upon its review/evaluation of additional information moving forward with the future rounds of information to be submitted and working towards resolution of these pending permit appeals.

[2] While USEPA White Paper Number 3 was never finalized, the draft guidance and comments received were considered in fashioning the rulemaking proposal on which the Flexible Air Permitting Rule was based. *See Operating Permit Programs; Flexible Air Permitting Rule*, 74 Fed. Reg. 51,418, 51,420 (Oct. 6, 2009). In 2009, USEPA revised its regulations governing Title V operating permit programs "to promote flexible air permitting (FAP) approaches that provide greater operational flexibility and, at the same time, ensure environmental protection and compliance with applicable laws." *Id.* at 51,418.

A. MACT Regulations

Furthermore, in creating the Maximum Achievable Control Technology ("MACT") regulations, USEPA recognized that operational variability must be taken into account. USEPA explained that "[a]ccounting for variability is appropriate in order to generate a more accurate estimation of the actual, long term, performance of a source . . ." *National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters*, 69 Fed. Reg. 55,218, 55,235 (Sept. 13, 2004). "[N]o source emits any HAP at a constant level," such emissions fluctuate over time and for numerous reasons. *United States Sugar Corp. v. EPA*, No. 11-1108 (D.C. Cir. July 29, 2016). Emissions fluctuate due to "operation of control technologies, variation in combustion materials and combustion conditions, variation in operation of the unit itself, and variation associated with the emission measurement techniques." Memorandum from Stephen D. Page, "EPA Director of Air Quality Planning and Standards, EPA's Response to Remand of the Record for Commercial and Industrial Solid Waste Incineration Units," at 3 (July 14, 2014). The variability also occurs due to "measurements variability (both sampling and analysis) and short-term fluctuations in the emission levels that result from short-term changes in fuels, processes, combustion conditions, and controls." *Id.* at 2-3.

In setting the MACT floor, USEPA must take operational variability into account as sources are required to comply with the MACT standards at all times. As such, "consideration of variability is a key factor in establishing [the MACT] standards." *Id.* at 3. In discussing how USEPA calculates the MACT floor, USEPA explained:

> If EPA were to simply take the average of the stack test data from the best performing source or sources, the MACT floor would not represent the levels of emissions achieved in practice over time because the MACT floors would not reflect variations in material inputs (e.g., fuels), control device performance, operating unit performance (e.g., changes in combustion conditions that impact emissions), and other factors that affect unit performance over time. This is demonstrated by the fact that even single three run tests, which are performed over a short period of time, typically show different emissions levels during each individual test run.

Id. at 5.[3]

Moreover, in promulgating the Iron and Steel Manufacturing MACT standards, USEPA explained that, in practice, it attempts "to ensure that [its] emissions performance estimates reasonably characterize the level of performance that the relevant sources consistently achieve, considering *normal operational variability*." *National Emission Standards for Hazardous Air*

[3] Available stack testing data generated at GCW strongly supports USEPA's consideration of variability in processes that is revealed in the stack testing data. The data indicates that the variations in key parameters, including the calculated emissions during individual runs, are greater than the variation that could be expected in the test method itself.

Pollutants: Integrated Iron and Steel Manufacturing, 68 Fed. Reg. 27,646, 27,649 (May 20, 2003) (emphasis added). USEPA explained:

> Normal variations in process and control device performance and other factors, such as the inherent imprecision of sampling and analysis, which cannot be controlled, will result in variability in the performance of every source over time, including the best-performing sources. We believe that the MACT floor performance level must reasonably account for the ordinary variability in the performance of the best-controlled sources over time and under the most adverse circumstances which can reasonably be expected to occur. As such, the MACT floor performance limit must include a consideration for the variability inherent in the process operations and the control device performance.

Id. at 27,650.

B. AP-42 Emission Factors

AP-42 also recognizes that emissions differ from source to source and that emissions are variable at an individual source. The Introduction of AP-42 states, in particular:

> Emission factors in AP-42 are neither EPA-recommended emission limits (e. g., best available control technology or BACT, or lowest achievable emission rate or LAER) nor standards (e. g., National Emission Standard for Hazardous Air Pollutants or NESHAP, or New Source Performance Standards or NSPS). Use of these factors as source-specific permit limits and/or as emission regulation compliance determinations is not recommended by EPA. Because emission factors essentially represent an average of a range of emission rates, approximately half of the subject sources will have emission rates greater than the emission factor and the other half will have emission rates less than the factor. As such, a permit limit using an AP-42 emission factor would result in half of the sources being in noncompliance.
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> Average emissions differ significantly from source to source and, therefore, emission factors frequently may not provide adequate estimates of the average emissions for a specific source. The extent of between-source variability that exists, even among similar individual sources, can be large depending on process, control system, and pollutant. Although the causes of this variability are considered in emission factor development, this type of information is seldom included in emission test reports used to develop AP-42 factors. As a result, some emission factors are derived from tests that may vary by an order of magnitude or more. Even when the major process variables are accounted for, the emission factors developed may be the result of averaging source tests that differ by factors of five or more.

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> Before simply applying AP-42 emission factors to predict emissions from new or proposed sources, or to make other source-specific emission assessments, the user should review the latest literature and technology to be aware of circumstances that might cause such sources to exhibit emission characteristics different from those of other, typical existing sources. Care should be taken to assure that the subject source type and design, controls, and raw material input are those of the source(s) analyzed to produce the emission factor. This fact should be considered, as well as the age of the information and the user's knowledge of technology advances.
>
> Estimates of short-term or peak (e. g., daily or hourly) emissions for specific sources are often needed for regulatory purposes. Using emission factors to estimate short-term emissions will add further uncertainty to the emission estimate. Short-term emissions from a single specific source often vary significantly with time (i. e., within-source variability) because of fluctuations in process operating conditions, control device operating conditions, raw materials, ambient conditions, and other such factors. Emission factors generally are developed to represent long term average emissions, so testing is usually conducted at normal operating conditions. Parameters that can cause short-term fluctuations in emissions are generally avoided in testing and are not taken into account in test evaluation. Thus, using emission factors to estimate short term emissions will cause even greater uncertainty. The AP-42 user should be aware of this limitation and should evaluate the possible effects on the particular application.

USEPA, Emission Factors & AP-42, Compilation of Air Pollutant Emission Factors, Vol. 1, 5th Ed., ("AP-42") Introduction, available at https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emissions-factors (last visited on November 15, 2018).

C. BACT Regulations

USEPA's Best Available Control Technology ("BACT") regulations also include contingency for operational variability. "Safety factors" for process variability may be built into an emissions limitation in order to address process variations and to protect against test method variability. *See In re Knauf Fiber Glass, GMBH*, PSD Appeal Nos. 99-8 through 99-72 (E.A.B. Mar. 14, 2000). In *In re Knauf Fiber Glass*, the Shasta County, California, Air Quality Management District ("SCAQMD") argued that a 25% variability factor was appropriate "in light of potential variations in the fiberglass insulation manufacturing process, which is affected by glass pull rates, temperature, and humidity." *Id.* at 15. The Environmental Appeals Board agreed with SCAQMD's position, explaining that:

> There is nothing inherently wrong with setting an emission limitation that takes into account a reasonable safety factor. The resulting emission limitation is still an enforceable cap on PM_{10} emissions. The inclusion of a reasonable safety factor in the emission limitation calculation is a legitimate method of deriving a specific emission limitation that may not be exceeded. SCAQMD adequately explained

> why it set the limit where it did, and Petitioners did not meet their burdens of showing why SCAQMD's decision in this case was clearly erroneous or an abuse of discretion.

Id.

II. OPERATIONAL VARIABILITY IN THE IRON AND STEEL INDUSTRY

The major emissions of interest in the iron and steel industry occur from the casthouse during tapping when molten iron and slag are removed from the blast furnace. *See* "NESHAP for Integrated Iron and Steel Plants – Background Information for Proposed Standards," USEPA, EPA-453/R-01-005, at 3-15 to 3-16 (Jan. 2001). Factors affecting the emissions from the casthouse during tapping include "the duration of tapping, exposed surface area of metal and slag, length of runners, and the presence/absence of runner covers and flame suppression, which reduce contact with air." *Id.*; *see also* Proposed Rule, *National Emission Standards for Hazardous Air Pollutants: Integrated Iron and Steel Manufacturing*, 66 Fed. Reg. 36,836, at 36,845 (July 13, 2001).

In the Basic Oxygen Process ("BOP"), "molten iron from a blast furnace and iron scrap are refined in a furnace by lancing (or injecting) high-purity oxygen. The oxygen reacts with carbon and other impurities to remove them from the metal." AP-42, § 12.5.1.4. The rate of particulate matter emissions in the BOP varies according to several factors, including "oxygen blow rate, blowing method, carbon content of iron, percentage of scrap charged, quality of scrap charged, rate of additions, and condition of refractory lining of the vessel." "Revised Standards for Basic Oxygen Process Furnaces – Background Information for Proposed Standards," USEPA, EPA-450/3-82-005a, at 3-32 (Dec. 1982) ("Background Information for Revised BOP Furnace Standards"). Additionally, "[d]uring the production cycle, the gas evolution rate and gas temperature vary considerably. Due to the resultant variations in the concentration of particulate matter and gas temperature and volume in the inlet gas stream, emissions are greater in the beginning of the blowing period than during the remainder of the oxygen blow and the rest of the cycle." *Id.*

Emissions also vary during charging of the BOP furnace: "Charging emissions will vary with the quality and quantity of scrap metal charged to the furnace and with the pour rate. Tapping emissions include iron oxides, sulfur oxides, and other metallic oxides, depending on the grade of scrap used." AP-42, § 12.5.2.4.

In addition, the BOP furnace cycle ranges from 25 to 45 minutes, which again, indicates that a short-term limit in terms of pounds of pollutant per ton of steel produced is inappropriate as the emissions from different heats (or tons of steel) is dependent upon many factors, including the duration of the BOP furnace cycle, and in particular, the duration of the refining stage, as well as the amounts of types of scrap and fluxes used. In addition to the differences in the duration of the blow, blow rate, and fluxes added, some heats require a "re-blow" in which the same heat requires an additional refining stage that is not typical but does occur periodically. This practice would result in a higher pounds of product per ton of steel produced, but would not

result in any net increase of emissions since the reprocessing (or additional refining stage) results in less steel production (as the additional refining on one heat precludes or delays the refining of any subsequent heat).

Secondary sources of emissions include hot metal transfer, desulfurization, skimming, charging, turndown, tapping, deslagging, teeming, ladle maintenance, flux handling, slag handling, and disposal. "The fugitive nature of these emissions make them very difficult to study and quantify. For this reason very little work has been done to characterize the emissions from these secondary sources." Background Information for Revised BOP Furnace Standards at 3-32. Additionally, while iron and iron oxides are most of the emissions, the "relative amounts of the various compounds are influenced by the type of scrap charged." *Id.* at 3-32 – 3-36. "Variation of scrap charge composition can also affect fume capture." *Id.* at 4-32. There are numerous scrap types, which are classified according to size, density, and source of scrap. *Id.* It is recognized that "emissions from one charge to the next are quite variable." *Id.* at 4-36. The rate of pouring of hot metal into the furnace and the positioning of the hot metal ladle with respect to the hood face and furnace mouth can all affect the amount of charging emissions. *See id.* at 4-17. Additionally, the amount of fugitive dust emissions vary based on: "(1) measures of source activity or energy expended (e. g., the speed and weight of a vehicle traveling on an unpaved road), (2) properties of the material being disturbed (e. g., the content of suspendible fines in the surface material on an unpaved road) and (3) climatic parameters (e.g., number of precipitation free days per year, when emissions tend to a maximum)." AP-42, § 12.5.2.9.

III. OPERATIONAL VARIABILITY AT GRANITE CITY WORKS

Operational and process variability must be considered in the development of short-term emission limits, noting that variations would be averaged over a longer period of time. As set forth below, we discuss how operational flexibility would be appropriately incorporated into short-term emission limits based upon existing permit terms for certain emission units at Granite City.

A. Slab Ripping (Condition 7.6.6(e))

i. Description of Process

Steel slabs are produced at the GCW Caster. The slabs are made per customer order which includes chemical properties of the steel and length and width of the slab. Some slabs require resizing to meet customer specifications. The slabs are sent from the caster to the Blooming Mill Rip Yard building for further processing to the customer order. Emissions are generated within the Blooming Mill Rip Yard building by use of a torch during the slab ripping process as well as the minimal use of natural gas by the torches. There are eight stations within the Blooming Mill Rip Yard building used to resize the slabs. Each station is equipped with the same style and type of oxymethane torch and each station/torch can be used for cutting the slab length-wise or width-wise.

ii. Examples of Process Variability

The emissions from these operations are primarily metal oxides formed when the steel is heated above its boiling point and the vapors condense into solid particles. There is also a very small amount of PM/PM_{10} associated with the use of natural gas by the torches. Factors that can influence process variability are the chemical properties of the steel, the cut speed, the amount of natural gas used and natural gas pressure, amount of oxygen used and oxygen pressure, length of cut, width of cut (note thickness of the slab is not a factor due to use of an oxymethane torch[4]), the number of torches in use, the quality of the torch tip, and quantity of customer orders that require either slab ripping, cutting, or both.

iii. Proposed Emission Limit

As noted in the October 19, 2018 first deliverable to Illinois EPA, USS did not create and is unsure of the basis for the existing Title V emission factors and, therefore, formulated a basis for an emission factor that results in a more representative quantity of PM/PM_{10} emissions for slab ripping. Specifically, an emission factor of 0.037 grams of particulate per inch of material cut is used for the PM/PM_{10} emission limit development.

Maximum torch cut rate is 10 inches per minute and maximum torch natural gas consumption is 240 cubic feet per hour. Existing steel tons per day averaged over any calendar month limit (Condition 7.5.6(a)) equals 11,000 net tons per day averaged over any calendar month. Existing steel tons produced per year limit (Condition 5.6.2(a)(1)) equals 3,580,000 tons per year.

Emission factor development:

[(.037 grams PM/inch) x (1 lb/453.592 grams) x (10 inches/minute) x (60 min/hour) x (8760 hours/year) + (.000240 mmcfh) x (1.9 lb PM/mmcf) x (8760 hours/year)] / (3,580,000 steel tons per year) = **0.000121 lb PM(PM_{10})/ ton of steel per torch**

Proposed Short-term PM/PM_{10} Limit for combined Slab Ripping:

(11,000 tons per day) x (0.000121 lb/ton) = **1.3 lb PM(PM_{10})/day averaged over a calendar month per torch**

Proposed Annual PM/PM_{10} Limit for combined Slab Ripping:

(3,580,000 tons per year) x (0.000121 lb/ton) x (1 ton/2000 lbs) = **0.2 tons PM(PM_{10})/year per torch**

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[4] *See* "Clarification and Guidance for the Metal Fabrication Industry," USEPA, Section 313 Reporting Issue Paper, PDF p. 16 (Jan. 1990).

iv. Determination of Compliance

Daily PM emissions for each torch are calculated as follows and compared to the short-term limit:

$$\frac{\sum_1^n \left[(Daily\ Steel\ Production) * (.000121\ \frac{lb\ PM}{ton\ steel})\right]}{n}$$

Where n = days in calendar month

Annual PM emissions for each torch are calculated as follows and compared to the annual limit:

(Annual Steel Production) x (0.000121 lb PM/ton steel) x (1 ton/2000 lbs) = # tons per year of PM/PM_{10}

B. Furnace Blast Uncaptured Fugitive Emissions (Condition 7.4.6(c))

i. Description of Process

Casthouse emissions consisting of particulate matter, sulfur dioxide, nitrogen oxides, carbon monoxide, and organic materials (to a lesser extent) may be generated during tapping of the furnace and the miscellaneous operations that take place within the casthouse structure. Emissions are captured by the Casthouse Baghouse and the Iron Spout Baghouse. Capture control efficiency is conservatively estimated to be 95% as derived from the PSD Permit application. Uncaptured fugitive emissions from the tapping process are emitted through the Casthouse Roof Monitor.

ii. Examples of Process Variability

Ironmaking is a continuous process within the blast furnace; however, it is a semi-continuous process with respect to periodic tapping of molten iron and slag from the bottom of the furnace. Casting emissions vary throughout the tapping cycle, which begins when the taphole is opened, includes casting hot metal and slag, and ends when the taphole is plugged with the mudgun. Emissions occur at the taphole, from the trough, from the runners that transport the iron and slag, and from the ladle that receives the molten iron. Some of the factors affecting these emissions include iron temperature, iron chemistry, production rate, duration of tapping, type of clays used in the taphole, exposed surface area of metal and slag, length of runners, and the presence/absence of runner covers and flame suppression, which reduce contact with air. In addition, USEPA acknowledges that the occasional use of an oxygen lance to open a clogged taphole can result in a short-term increase in emissions. *See* AP-42, § 12.5.2.2.

iii. Proposed Emission Limit

Emission estimate = 0.6 lb/ton uncontrolled (AP-42) with 95% capture = 0.03 lb/ton

Daily iron production is limited to 9,849 tons per day averaged over a calendar month (Condition 7.4.6(a)(i))

Annual iron production is limited to 3,165,000 tons per year (Condition 5.6.2(a)(i))

Proposed PM Limit:

(9,849 tons per day) x (0.03 lb/ton) = **295.5 lb/day averaged over a calendar month**

iv. Determination of Compliance

The capture equipment (Casthouse Baghouse and Iron Spout Baghouse) are operated at all times according to a written operating and maintenance plan, which includes parametric monitoring and inspection and proper response to abnormal conditions. This ensures that the capture efficiency is achieved on a consistent basis.

The hot metal runners and the short slag runner are covered with permanent type runner covers in accordance with the Blast Furnace Runner Cover Plan.

Fugitive emissions from the Blast Furnace Casthouse Roof Monitor are monitored on a weekly basis during normal operations according to Method 9 by a certified observer to verify compliance with the opacity standard. Compliance with the opacity standard and prompt response to abnormal conditions ensures that the emission estimate is representative on a daily average basis.

The hot metal production rate is determined and recorded on a daily basis. Pound per day emissions are determined as an average over a calendar month as shown below:

$$\frac{\sum_1^n \left[(Daily\ Hot\ Metal\ Production) * \left(0.03\ \frac{lb\ PM}{ton\ hot\ metal}\right)\right]}{n}$$

Where n = days in calendar month

C. Hot Metal Desulfurization and Hot Metal Transfer (Condition 7.5.6(e))

i. Description of Process

Molten iron from the blast furnaces is transported to the Basic Oxygen Furnace ("BOF") by torpedo cars. The iron is then transferred from the torpedo cars to a BOP charging ladle at a station located at the BOP Desulfurization ("Desulf") Baghouse. Once transferred to the ladles, the iron is then desulfurized where a combination of lime and magnesium is injected into the

molten iron. The lime and magnesium react with the sulfur within the iron bath forming sulfur compounds that rise to the top of the iron bath into a layer of slag on the surface of the iron. PM emissions from both of these processes are controlled by the Desulf Baghouse.

ii. Examples of Process Variability

The emissions from these operations are primarily metal oxides formed when oxygen in the air reacts with the molten iron. Factors that can influence process variability are hot metal temperature, hot metal chemistry, grade specifications for sulfur concentration, desulfurization injection rate, duration of injection rate, concentration and type of the reagent injected, and the hot metal factor. The hot metal chemistry and grade specification determine the length of injection time required to achieve the desired sulfur concentration. The hot metal factor is the percentage of hot metal required to produce a heat of steel in the BOF Vessels, with the balance consisting of steel scrap and alloys.

In AP-42, USEPA acknowledges process variability for hot metal desulfurization, where USEPA concludes, "[t]he process duration varies with the injection rate, hot metal chemistry, and desired final sulfur content, and is in the range of 5 to 30 minutes." AP-42, § 12.5.1.3. This supports that a pound per ton of product is not a reasonable short-term limit.

iii. Proposed Emission Limit

USS concurs with the existing emission factors of 0.03721 lb PM/ton of iron and 0.03721 lb PM_{10}/ton of iron for use in development of an emission limit.

Daily iron production is limited to 9,849 tons per day averaged over a calendar month (Condition 7.4.6(a)(i))

Annual iron production is limited to 3,165,000 tons per year (Condition 5.6.2(a)(i))

Proposed PM/PM_{10} Limit:

(9,849 tons per day) x (0.03721 lb/ton) = **366.5 lb/day averaged over a calendar month**

iv. Determination of Compliance

A stack test to determine PM/PM_{10} emissions is performed on the Desulf Baghouse every 60 months. Emissions from the baghouse tests are then used to calculate the emission rate on a daily average over the calendar month, compared to the proposed PM/PM_{10} limit of 366.5 lbs/day. The emission rate from the most current stack test is used in the calculation to determine compliance with the daily PM limit. The capture/control equipment (the Desulf Baghouse) is operated at all times according to a written operating and maintenance plan, which includes parametric monitoring and inspection and proper response to abnormal conditions. This ensures that the capture and control system is operating properly and relatively consistently between stack testing.

Daily PM/PM_{10} emissions are calculated as follows:

$$\frac{\sum_1^n \left[(Daily\ Hot\ Metal\ Production) * (TEST\ \frac{lb\ PM/PM10}{ton\ hot\ metal})\right]}{n}$$

Where:
n = days in calendar month
TEST = result of most recent stack test

D. Iron Pellet Screening (Condition 7.1.6(b)(iv))

i. Description of Process

Raw materials such as coke, iron pellets, and fluxes are charged into the blast furnaces in the iron making process. Emissions from raw material handling occur from the screening of the iron pellets prior to charging.

ii. Examples of Process Variability

Variables that can affect emissions from the iron pellet screening process include the ambient weather conditions, pellet size, pellet moisture content, and type of pellet (acid or flux). Small pellets will require the need for more overall pellets to be screened to yield the desired pellet weight for the process. The higher the moisture content the lower the emissions. The desired pellet moisture content is > 1.5%. There are two types of iron pellets, acid and flux. The acid type iron pellet contains a higher concentration of iron per pellet, therefore less screening is required to achieve the correct amount of iron in the furnace. The flux type iron pellet contains some fluxes resulting in a lower concentration of iron per pellet, therefore more screening is required to achieve the correct amount of iron in the furnace.

iii. Proposed Emission Limit

Daily iron production is limited to 9,849 tons per day averaged over a calendar month (Condition 7.4.6(a)(i))

Annual iron production is limited to 3,165,000 tons per year (Condition 5.6.2(a)(i))

Annual pellets charged is limited to 4,308,581 TPY

Calculated (9,849 tons iron per day/3,165,000 annual iron production limit)*(4,308,581 annual tons of pellets charged limit) = 13,408 tons of iron pellets per day

Proposed PM Limit:

(13,408 tons per day) x (0.00375 lb/ton) = **50.3 lb/day averaged over a calendar month**

Proposed PM_{10} Limit:

(13,408 tons per day) x (0.00131 lb/ton) = **17.6 lb/day averaged over a calendar month**

iv. Determination of Compliance

Fugitive emissions from the Pellet Screening operation is monitored on an annual basis during normal operations according to Method 9 by a certified observer to verify compliance with the opacity standard. Blast Furnace personnel routinely observe the iron screening process. Compliance with the opacity standard and prompt response to abnormal conditions ensures that the emission estimate is representative on a daily average basis.

$$\text{PM emissions} = \frac{\sum_1^n \left[(Daily\ Pellets\ Charged) * \left(0.00375\ \frac{lb\ PM}{tons\ of\ pellets}\right)\right]}{n}$$

Where n = days in calendar month

$$PM_{10}\ \text{emissions} = \frac{\sum_1^n \left[(Daily\ Pellets\ Charged) * \left(0.00131\ \frac{lb\ PM}{ton\ of\ pellets}\right)\right]}{n}$$

Where n = days in calendar month

IV. CONSTRUCTION PERMIT ISSUED TO USS FOR COGENERATION BOILER PROJECT

USS also notes that in the construction permit issued initially to USS on January 30, 2008 (and including several subsequent revisions) for the Cogeneration Boiler Project ("Cogen Project"), Illinois EPA established certain production limits, and emission limits for relevant pollutants on a tons per month basis, as well as tons per year basis, from the new cogeneration boiler and the new BFG flare (including emissions associated with the natural gas pilot for the new BFG flare). Moreover, the short-term emission limits (tons per month), along with certain control requirements and work practices, allowed the flexibility needed by USS for operational variability. *See* United States Steel Corporation, Construction Permit No. 06070023, §§ 3.1.5 and 3.1.6 (issued Jan. 30, 2008, revised most recently on Nov. 25, 2015). As to the short-term emission limits, all were established such that the tons per month limits, if annualized, would have exceeded the limitations established for tons per year. *See* id. at § 3.1.6 (b)(2). Finally, the detailed recordkeeping requirements in the construction permit for the Cogen Project provide the necessary information for practical enforceability of the emission limitations.

USS supports Illinois EPA's use of monthly emission limits and annual emission limits, consistent with its approach in the Cogen Project permit.

V. RECENT PERMIT ISSUED TO NUCOR STEEL KANKAKEE, INC.

In a more recent permitting transaction, on October 31, 2018, Illinois EPA issued Construction Permit No. 18060014 to Nucor Steel Kankakee, Inc. ("Nucor Permit"). The permit was issued to construct a new rolling mill facility at Nucor's steel plant near Kankakee, Illinois. In the Nucor Permit, Illinois EPA established short-term and annual limits for emissions for the new reheat furnace. *See* Nucor Steel Kankakee, Inc., Construction Permit No. 18060014, § 2.1.5(a) (issued Oct. 31, 2018). Note that the lb/hr limit for NO_X, if annualized, results in annual emissions that are significantly higher than the annual limitation on NO_X emissions. In addition, Illinois EPA set emissions limitations for the new rolling mill on an annual basis only, with certain recordkeeping requirements that allowed the use of unspecified emission factors. *See id.* at § 2.2.5. Illinois EPA did not require the use of such emission factors as enforceable emission limits. In contrast, however, and as you know is the fundamental basis for USS's appeals, Illinois EPA uses emissions factors (despite AP-42's admonition not to) as enforceable emissions limits in USS' permits.

Finally, on this point, in the Nucor Permit Project Summary, Illinois EPA specifically explained: "In addition to annual limits on emissions, the permit includes short-term emission limits and operational limits, as needed to provide practical enforceability of the annual emission limits." Project Summary for an Application for a Construction Permit/PSD Approval from Nucor Steel Kankakee, Inc. for A New Rolling Milling Facility at its Plant in Bourbonnais, Illinois, Illinois EPA, § 8 (Sept. 2018).

USS supports Illinois EPA's use of short-term emission limits and annual emission limits, consistent with its approach in the Nucor Permit.

VI. FOLLOW-UP ITEMS FROM FIRST DELIVERABLE

In the first deliverable dated October 19, 2018, USS indicated that it was planning to provide updates on the following issues in this second deliverable:

- BOG Additive System (Trackhopper Baghouse) (Condition 7.1.6(b)(ii))
- Continuous Casting Deslagging Station and Associated Material Handling System (Condition 7.6.6(a))
- Blast Furnace and Steel Making (Condition 7.1.6(b)(i))

USS's investigation and evaluation of these issues is continuing, and it will provide the updates in one of the upcoming deliverables.

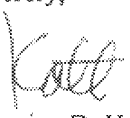
VII. CONCLUSION

USEPA's acknowledgment of short-term variability that is averaged over a longer period of time warrants the necessity and appropriateness of including short-term limits that incorporate such variability, as some emissions may be higher, while others may be lower during a short-term period, but the differences would be averaged out over a longer time period such that the

annual limits would not change. Based on the foregoing, USS respectfully is unable to accept Illinois EPA's position that the emission factors in the PSD Permit should be converted into the CAAPP Permit (and baghouse construction permit) as enforceable emission limits. However, USS does agree that emission factors may be used to develop enforceable emission limits that allow for the necessary operational flexibility at GCW. USS believes the information presented in this submittal moves us forward toward reaching resolution of the pending air permit appeals. While we agree additional work needs to be done, including timely submission of our third and fourth deliverables, USS believes the path forward on these issues is coming together. We look forward to hearing from you after you and Illinois EPA representatives have reviewed the information presented in this letter.

We remain committed to working collaboratively with Illinois EPA and you to resolve these appeals. We appreciate your and Illinois EPA's careful consideration of this submittal and would be pleased to discuss or meet with Illinois EPA to thoroughly address any questions or concerns that you have. In the interim, please let us know if you have any questions.

Sincerely,



Katherine D. Hodge

pc: Sally Carter, Esq. (via electronic mail)
David Hacker, Esq. (via electronic mail)

Pritchett, Jacob A.

From: Romaine, Chris
Sent: Tuesday, November 19, 2019 5:10 PM
To: 'LaDonna Driver'
Subject: Accepted: USS & IEPA Conference call re Permitting

Pritchett, Jacob A.

From: Romaine, Chris
Sent: Wednesday, November 20, 2019 12:28 PM
To: Carter, Sally
Subject: Accepted: USS-

Pritchett, Jacob A.

Subject: FW: USS
Location: TBD

Start: Tue 12/14/2021 1:00 PM
End: Tue 12/14/2021 3:00 PM
Show Time As: Tentative

Recurrence: (none)

Meeting Status: Not yet responded

Organizer: Carter, Sally

-----Original Appointment-----
From: Carter, Sally <Sally.Carter@Illinois.gov>
Sent: Tuesday, November 23, 2021 10:17 AM
To: Carter, Sally; Romaine, Chris; Patel, Minesh
Cc: EPA.Air.BOA.3South.ConferenceRoom3110N
Subject: USS
When: Tuesday, December 14, 2021 1:00 PM-3:00 PM (UTC-06:00) Central Time (US & Canada).
Where: TBD

I am hopefully reserving 3 South.

-----Original Appointment-----
From: Carter, Sally <Sally.Carter@Illinois.gov>
Sent: Tuesday, November 23, 2021 10:17 AM
To: Carter, Sally; Romaine, Chris; Patel, Minesh
Subject: USS
When: Tuesday, December 14, 2021 1:00 PM-3:00 PM (UTC-06:00) Central Time (US & Canada).
Where: TBD

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Pritchett, Jacob A.

Subject: FW: USS
Location: TBD

Start: Tue 12/14/2021 1:00 PM
End: Tue 12/14/2021 3:00 PM
Show Time As: Tentative

Recurrence: (none)

Meeting Status: Not yet responded

Organizer: Carter, Sally

I am hopefully reserving 3 South.

-----Original Appointment-----
From: Carter, Sally <Sally.Carter@Illinois.gov>
Sent: Tuesday, November 23, 2021 10:17 AM
To: Carter, Sally; Romaine, Chris; Patel, Minesh
Subject: USS
When: Tuesday, December 14, 2021 1:00 PM-3:00 PM (UTC-06:00) Central Time (US & Canada).
Where: TBD

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Pritchett, Jacob A.

From: Romaine, Chris
Sent: Tuesday, November 23, 2021 10:18 AM
To: Carter, Sally
Subject: Accepted: USS

Pritchett, Jacob A.

From: Romaine, Chris
Sent: Tuesday, November 23, 2021 10:29 AM
To: Carter, Sally
Subject: Accepted: USS

Pritchett, Jacob A.

From: Romaine, Chris
Sent: Tuesday, November 23, 2021 10:42 AM
To: 'LaDonna Driver'
Subject: Accepted: USS & IEPA Conference call

Cass, Rylee

From: Patel, Minesh
Sent: Wednesday, November 26, 2014 3:32 PM
To: Carter, Sally
Subject: Accepted: USS

Pritchett, Jacob A.

From: Romaine, Chris
Sent: Wednesday, November 28, 2018 11:50 AM
To: Carter, Sally
Subject: Accepted: USS

Pritchett, Jacob A.

From: Romaine, Chris
Sent: Tuesday, November 30, 2021 9:45 AM
To: 'LaDonna Driver'
Subject: Accepted: USS & IEPA Conference call

Pritchett, Jacob A.

From: Romaine, Chris
Sent: Tuesday, November 30, 2021 9:49 AM
To: Carter, Sally
Subject: Accepted: USS

Pritchett, Jacob A.

From: Romaine, Chris
Sent: Wednesday, December 2, 2015 3:49 PM
To: Carter, Sally
Subject: Accepted: USS

Pritchett, Jacob A.

From: Carter, Sally
Sent: Monday, December 3, 2018 8:03 AM
To: Romaine, Chris; Patel, Minesh
Subject: FW: United States Steel - Second Deliverable to State
Attachments: 7KR0997-US Steel Second Deliverable to State 11.16.18.PDF

I know I sent this to you before but here it is again

From: Katie J. Ginest <Katie.Ginest@heplerbroom.com>
Sent: Friday, November 16, 2018 2:22 PM
To: 'Burlingham, Rebecca' <RBurlingham@atg.state.il.us>; Carter, Sally <Sally.Carter@Illinois.gov>
Cc: 'dwhacker@uss.com' <dwhacker@uss.com>; Katherine D. Hodge <Katherine.Hodge@heplerbroom.com>; Daniel L. Siegfried <Daniel.Siegfried@heplerbroom.com>; Melissa S. Brown <Melissa.Brown@heplerbroom.com>
Subject: [External] RE: United States Steel - Second Deliverable to State

Please see the attached...there was a miss-spelling in the title of the document that has now been corrected.

Thank you, and sorry for the inconvenience.

From: Katie J. Ginest
Sent: Friday, November 16, 2018 2:01 PM
To: Burlingham, Rebecca <RBurlingham@atg.state.il.us>; 'Sally.Carter@illinois.gov' <Sally.Carter@illinois.gov>
Cc: 'dwhacker@uss.com' <dwhacker@uss.com>; Katherine D. Hodge <Katherine.Hodge@heplerbroom.com>; Daniel L. Siegfried <Daniel.Siegfried@heplerbroom.com>; Melissa S. Brown <Melissa.Brown@heplerbroom.com>
Subject: United States Steel - Second Deliverable to State

Per Kathy Hodge, please see the attached.

Thank you,

HEPLERBROOM LLC
Katie J. Ginest
Paralegal
Katie.Ginest@heplerbroom.com
Phone: 217-993-6079 Fax: 217-528-3964
4340 Acer Grove Drive, Springfield, IL 62711
www.HeplerBroom.com | vCard

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LICENSED IN ILLINOIS
DIRECT DIAL: 217-993-6071
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SPRINGFIELD, IL 62711
PH: 217-528-3674
FX: 217-528-3964

November 16, 2018

CONFIDENTIAL:
FOR SETTLEMENT PURPOSES ONLY

VIA ELECTRONIC MAIL

Rebecca Burlingham, Esq.
Supervising Attorney
Illinois Attorney General's Office
Environmental Bureau
69 West Washington Street, 18th Floor
Chicago, IL 60602

Re: Second Deliverable to State
United States Steel Corporation
Illinois Pollution Control Board
PCB 2013-53 and PCB 2013-62

Dear Becky:

This letter follows our meeting with you and the Illinois Environmental Protection Agency ("Illinois EPA") on September 19, 2018, regarding the above-referenced pending air permit appeals for United States Steel Corporation's ("USS") Granite City Works ("GCW"), i.e., *United States Steel Corporation v. Illinois Environmental Protection Agency,* PCB 2013-053, and *United States Steel Corporation v. Illinois Environmental Protection Agency,* PCB 2013-062, and our letters of September 17 (Pre-meeting Background/Summary) and October 19, 2018 (First Deliverable).

USS respectfully notes that it was greatly disappointed to hear Illinois EPA's position regarding the progress of settlement efforts in these matters. Throughout these negotiations, USS has provided its best efforts to suggest appropriate practicably enforceable lawful short-term limits that allow for operational flexibility. However, to date, Illinois EPA has rejected all of our offers and responded with no counter offers, except to point to the existing limits that are currently under appeal. Because using the existing emission factors as short-term emission limits does not allow for proper operational flexibility, USS respectfully notes that it cannot agree that such factors be used as emission limits themselves. However, as previously explained, and as explained herein, USS believes many of the factors do have value in the derivation of emission limits.

As you know, during the September 19th meeting, USS and Illinois EPA agreed on a schedule for USS to submit certain information, i.e. deliverables, with the second round of information being due by today, November 16, 2018. Specifically, this second round of information is to address operational variability at GCW, USS's need for practically enforceable emission limits that allow for operational flexibility due to GCW's inherent and dynamic variability in operations, and proposals for how emission factors and operational flexibility concepts should be used to develop enforceable emission limits.[1] Our third and fourth deliverables are due December 31, 2018, and January 31, 2019, respectively.

As previously noted, both USS and Illinois EPA have invested significant resources in attempting to resolve the many and complex issues associated with these appeals, especially as to the emission factors that were incorporated (as enforceable emission limits) from the Construction Permit/Prevention of Significant Deterioration ("PSD") Approval No. 95010001 ("PSD Permit"), issued to National Steel Corporation, the prior owner and operator of GCW, by Illinois EPA on January 25, 1996 (and subsequently revised and reissued on several occasions), and USS's need for practically enforceable emission limits that allow for operational flexibility due to GCW's inherent and dynamic variability in operations. As discussed, due to such operational flexibility requirements at GCW, it is technologically infeasible and economically unreasonable for USS to accept, as permitted emission limits, the "emission factors," which in many cases are published emission factors that are *averages* from data sources other than GCW with varying reliability. Also, in some cases, the emissions factors are based upon a *single* historic stack test using the *average* of three individual test runs.

In furtherance of its position, USS offers the following additional information:

I. VARIABILITY OF OPERATIONS/EMISSIONS GENERALLY

The United States Environmental Protection Agency ("USEPA") has long recognized that a permit must allow for operational flexibility. Part 70 of the federal regulations specifically states that "[t]he [state] program must allow changes within a permitted facility without requiring a permit revision, if the changes are not modifications under any provision of title I of the act and the changes do not exceed the emissions allowable under the permit . . ." 40 CFR 70.4(d)(3)(viii). Some sources may need provisions accounting for operational flexibility in their permits because they are driven by the marketplace to make quick changes to their products or services. *See* Operating Permits Program White Paper Number 3, "Design of Flexible Air Permits," USEPA Draft, at 5 (Aug. 7, 2000) ("USEPA White Paper Number 3").[2]

---

[1] USS reserves the right to refine these responses, as may be necessary, based upon its review/evaluation of additional information moving forward with the future rounds of information to be submitted and working towards resolution of these pending permit appeals.

[2] While USEPA White Paper Number 3 was never finalized, the draft guidance and comments received were considered in fashioning the rulemaking proposal on which the Flexible Air Permitting Rule was based. *See Operating Permit Programs; Flexible Air Permitting Rule*, 74 Fed. Reg. 51,418, 51,420 (Oct. 6, 2009). In 2009, USEPA revised its regulations governing Title V operating permit programs "to promote flexible air permitting (FAP) approaches that provide greater operational flexibility and, at the same time, ensure environmental protection and compliance with applicable laws." *Id.* at 51,418.

A. MACT Regulations

Furthermore, in creating the Maximum Achievable Control Technology ("MACT") regulations, USEPA recognized that operational variability must be taken into account. USEPA explained that "[a]ccounting for variability is appropriate in order to generate a more accurate estimation of the actual, long term, performance of a source . . ." *National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters*, 69 Fed. Reg. 55,218, 55,235 (Sept. 13, 2004). "[N]o source emits any HAP at a constant level," such emissions fluctuate over time and for numerous reasons. *United States Sugar Corp. v. EPA*, No. 11-1108 (D.C. Cir. July 29, 2016). Emissions fluctuate due to "operation of control technologies, variation in combustion materials and combustion conditions, variation in operation of the unit itself, and variation associated with the emission measurement techniques." Memorandum from Stephen D. Page, "EPA Director of Air Quality Planning and Standards, EPA's Response to Remand of the Record for Commercial and Industrial Solid Waste Incineration Units," at 3 (July 14, 2014). The variability also occurs due to "measurements variability (both sampling and analysis) and short-term fluctuations in the emission levels that result from short-term changes in fuels, processes, combustion conditions, and controls." *Id.* at 2-3.

In setting the MACT floor, USEPA must take operational variability into account as sources are required to comply with the MACT standards at all times. As such, "consideration of variability is a key factor in establishing [the MACT] standards." *Id.* at 3. In discussing how USEPA calculates the MACT floor, USEPA explained:

> If EPA were to simply take the average of the stack test data from the best performing source or sources, the MACT floor would not represent the levels of emissions achieved in practice over time because the MACT floors would not reflect variations in material inputs (e.g., fuels), control device performance, operating unit performance (e.g., changes in combustion conditions that impact emissions), and other factors that affect unit performance over time. This is demonstrated by the fact that even single three run tests, which are performed over a short period of time, typically show different emissions levels during each individual test run.

Id. at 5.[3]

Moreover, in promulgating the Iron and Steel Manufacturing MACT standards, USEPA explained that, in practice, it attempts "to ensure that [its] emissions performance estimates reasonably characterize the level of performance that the relevant sources consistently achieve, considering *normal operational variability*." *National Emission Standards for Hazardous Air*

[3] Available stack testing data generated at GCW strongly supports USEPA's consideration of variability in processes that is revealed in the stack testing data. The data indicates that the variations in key parameters, including the calculated emissions during individual runs, are greater than the variation that could be expected in the test method itself.

Pollutants: Integrated Iron and Steel Manufacturing, 68 Fed. Reg. 27,646, 27,649 (May 20, 2003) (emphasis added). USEPA explained:

> Normal variations in process and control device performance and other factors, such as the inherent imprecision of sampling and analysis, which cannot be controlled, will result in variability in the performance of every source over time, including the best-performing sources. We believe that the MACT floor performance level must reasonably account for the ordinary variability in the performance of the best-controlled sources over time and under the most adverse circumstances which can reasonably be expected to occur. As such, the MACT floor performance limit must include a consideration for the variability inherent in the process operations and the control device performance.

Id. at 27,650.

B. AP-42 Emission Factors

AP-42 also recognizes that emissions differ from source to source and that emissions are variable at an individual source. The Introduction of AP-42 states, in particular:

> Emission factors in AP-42 are neither EPA-recommended emission limits (e. g., best available control technology or BACT, or lowest achievable emission rate or LAER) nor standards (e. g., National Emission Standard for Hazardous Air Pollutants or NESHAP, or New Source Performance Standards or NSPS). Use of these factors as source-specific permit limits and/or as emission regulation compliance determinations is not recommended by EPA. Because emission factors essentially represent an average of a range of emission rates, approximately half of the subject sources will have emission rates greater than the emission factor and the other half will have emission rates less than the factor. As such, a permit limit using an AP-42 emission factor would result in half of the sources being in noncompliance.
>
> ***
>
> Average emissions differ significantly from source to source and, therefore, emission factors frequently may not provide adequate estimates of the average emissions for a specific source. The extent of between-source variability that exists, even among similar individual sources, can be large depending on process, control system, and pollutant. Although the causes of this variability are considered in emission factor development, this type of information is seldom included in emission test reports used to develop AP-42 factors. As a result, some emission factors are derived from tests that may vary by an order of magnitude or more. Even when the major process variables are accounted for, the emission factors developed may be the result of averaging source tests that differ by factors of five or more.

***

> Before simply applying AP-42 emission factors to predict emissions from new or proposed sources, or to make other source-specific emission assessments, the user should review the latest literature and technology to be aware of circumstances that might cause such sources to exhibit emission characteristics different from those of other, typical existing sources. Care should be taken to assure that the subject source type and design, controls, and raw material input are those of the source(s) analyzed to produce the emission factor. This fact should be considered, as well as the age of the information and the user's knowledge of technology advances.
>
> Estimates of short-term or peak (e. g., daily or hourly) emissions for specific sources are often needed for regulatory purposes. Using emission factors to estimate short-term emissions will add further uncertainty to the emission estimate. Short-term emissions from a single specific source often vary significantly with time (i. e., within-source variability) because of fluctuations in process operating conditions, control device operating conditions, raw materials, ambient conditions, and other such factors. Emission factors generally are developed to represent long term average emissions, so testing is usually conducted at normal operating conditions. Parameters that can cause short-term fluctuations in emissions are generally avoided in testing and are not taken into account in test evaluation. Thus, using emission factors to estimate short term emissions will cause even greater uncertainty. The AP-42 user should be aware of this limitation and should evaluate the possible effects on the particular application.

USEPA, Emission Factors & AP-42, Compilation of Air Pollutant Emission Factors, Vol. 1, 5th Ed., ("AP-42") Introduction, available at https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emissions-factors (last visited on November 15, 2018).

C. BACT Regulations

USEPA's Best Available Control Technology ("BACT") regulations also include contingency for operational variability. "Safety factors" for process variability may be built into an emissions limitation in order to address process variations and to protect against test method variability. *See In re Knauf Fiber Glass, GMBH*, PSD Appeal Nos. 99-8 through 99-72 (E.A.B. Mar. 14, 2000). In *In re Knauf Fiber Glass*, the Shasta County, California, Air Quality Management District ("SCAQMD") argued that a 25% variability factor was appropriate "in light of potential variations in the fiberglass insulation manufacturing process, which is affected by glass pull rates, temperature, and humidity." *Id.* at 15. The Environmental Appeals Board agreed with SCAQMD's position, explaining that:

> There is nothing inherently wrong with setting an emission limitation that takes into account a reasonable safety factor. The resulting emission limitation is still an enforceable cap on PM_{10} emissions. The inclusion of a reasonable safety factor in the emission limitation calculation is a legitimate method of deriving a specific emission limitation that may not be exceeded. SCAQMD adequately explained

> why it set the limit where it did, and Petitioners did not meet their burdens of showing why SCAQMD's decision in this case was clearly erroneous or an abuse of discretion.

Id.

II. OPERATIONAL VARIABILITY IN THE IRON AND STEEL INDUSTRY

The major emissions of interest in the iron and steel industry occur from the casthouse during tapping when molten iron and slag are removed from the blast furnace. *See* "NESHAP for Integrated Iron and Steel Plants – Background Information for Proposed Standards," USEPA, EPA-453/R-01-005, at 3-15 to 3-16 (Jan. 2001). Factors affecting the emissions from the casthouse during tapping include "the duration of tapping, exposed surface area of metal and slag, length of runners, and the presence/absence of runner covers and flame suppression, which reduce contact with air." *Id.*; *see also* Proposed Rule, *National Emission Standards for Hazardous Air Pollutants: Integrated Iron and Steel Manufacturing*, 66 Fed. Reg. 36,836, at 36,845 (July 13, 2001).

In the Basic Oxygen Process ("BOP"), "molten iron from a blast furnace and iron scrap are refined in a furnace by lancing (or injecting) high-purity oxygen. The oxygen reacts with carbon and other impurities to remove them from the metal." AP-42, § 12.5.1.4. The rate of particulate matter emissions in the BOP varies according to several factors, including "oxygen blow rate, blowing method, carbon content of iron, percentage of scrap charged, quality of scrap charged, rate of additions, and condition of refractory lining of the vessel." "Revised Standards for Basic Oxygen Process Furnaces – Background Information for Proposed Standards," USEPA, EPA-450/3-82-005a, at 3-32 (Dec. 1982) ("Background Information for Revised BOP Furnace Standards"). Additionally, "[d]uring the production cycle, the gas evolution rate and gas temperature vary considerably. Due to the resultant variations in the concentration of particulate matter and gas temperature and volume in the inlet gas stream, emissions are greater in the beginning of the blowing period than during the remainder of the oxygen blow and the rest of the cycle." *Id.*

Emissions also vary during charging of the BOP furnace: "Charging emissions will vary with the quality and quantity of scrap metal charged to the furnace and with the pour rate. Tapping emissions include iron oxides, sulfur oxides, and other metallic oxides, depending on the grade of scrap used." AP-42, § 12.5.2.4.

In addition, the BOP furnace cycle ranges from 25 to 45 minutes, which again, indicates that a short-term limit in terms of pounds of pollutant per ton of steel produced is inappropriate as the emissions from different heats (or tons of steel) is dependent upon many factors, including the duration of the BOP furnace cycle, and in particular, the duration of the refining stage, as well as the amounts of types of scrap and fluxes used. In addition to the differences in the duration of the blow, blow rate, and fluxes added, some heats require a "re-blow" in which the same heat requires an additional refining stage that is not typical but does occur periodically. This practice would result in a higher pounds of product per ton of steel produced, but would not

result in any net increase of emissions since the reprocessing (or additional refining stage) results in less steel production (as the additional refining on one heat precludes or delays the refining of any subsequent heat).

Secondary sources of emissions include hot metal transfer, desulfurization, skimming, charging, turndown, tapping, deslagging, teeming, ladle maintenance, flux handling, slag handling, and disposal. "The fugitive nature of these emissions make them very difficult to study and quantify. For this reason very little work has been done to characterize the emissions from these secondary sources." Background Information for Revised BOP Furnace Standards at 3-32. Additionally, while iron and iron oxides are most of the emissions, the "relative amounts of the various compounds are influenced by the type of scrap charged." *Id.* at 3-32 – 3-36. "Variation of scrap charge composition can also affect fume capture." *Id.* at 4-32. There are numerous scrap types, which are classified according to size, density, and source of scrap. *Id.* It is recognized that "emissions from one charge to the next are quite variable." *Id.* at 4-36. The rate of pouring of hot metal into the furnace and the positioning of the hot metal ladle with respect to the hood face and furnace mouth can all affect the amount of charging emissions. *See id.* at 4-17. Additionally, the amount of fugitive dust emissions vary based on: "(1) measures of source activity or energy expended (e. g., the speed and weight of a vehicle traveling on an unpaved road), (2) properties of the material being disturbed (e. g., the content of suspendible fines in the surface material on an unpaved road) and (3) climatic parameters (e.g., number of precipitation free days per year, when emissions tend to a maximum)." AP-42, § 12.5.2.9.

III. OPERATIONAL VARIABILITY AT GRANITE CITY WORKS

Operational and process variability must be considered in the development of short-term emission limits, noting that variations would be averaged over a longer period of time. As set forth below, we discuss how operational flexibility would be appropriately incorporated into short-term emission limits based upon existing permit terms for certain emission units at Granite City.

A. Slab Ripping (Condition 7.6.6(e))

i. Description of Process

Steel slabs are produced at the GCW Caster. The slabs are made per customer order which includes chemical properties of the steel and length and width of the slab. Some slabs require resizing to meet customer specifications. The slabs are sent from the caster to the Blooming Mill Rip Yard building for further processing to the customer order. Emissions are generated within the Blooming Mill Rip Yard building by use of a torch during the slab ripping process as well as the minimal use of natural gas by the torches. There are eight stations within the Blooming Mill Rip Yard building used to resize the slabs. Each station is equipped with the same style and type of oxymethane torch and each station/torch can be used for cutting the slab length-wise or width-wise.

ii. Examples of Process Variability

The emissions from these operations are primarily metal oxides formed when the steel is heated above its boiling point and the vapors condense into solid particles. There is also a very small amount of PM/PM_{10} associated with the use of natural gas by the torches. Factors that can influence process variability are the chemical properties of the steel, the cut speed, the amount of natural gas used and natural gas pressure, amount of oxygen used and oxygen pressure, length of cut, width of cut (note thickness of the slab is not a factor due to use of an oxymethane torch[4]), the number of torches in use, the quality of the torch tip, and quantity of customer orders that require either slab ripping, cutting, or both.

iii. Proposed Emission Limit

As noted in the October 19, 2018 first deliverable to Illinois EPA, USS did not create and is unsure of the basis for the existing Title V emission factors and, therefore, formulated a basis for an emission factor that results in a more representative quantity of PM/PM_{10} emissions for slab ripping. Specifically, an emission factor of 0.037 grams of particulate per inch of material cut is used for the PM/PM_{10} emission limit development.

Maximum torch cut rate is 10 inches per minute and maximum torch natural gas consumption is 240 cubic feet per hour. Existing steel tons per day averaged over any calendar month limit (Condition 7.5.6(a)) equals 11,000 net tons per day averaged over any calendar month. Existing steel tons produced per year limit (Condition 5.6.2(a)(1)) equals 3,580,000 tons per year.

Emission factor development:

[(.037 grams PM/inch) x (1 lb/453.592 grams) x (10 inches/minute) x (60 min/hour) x (8760 hours/year) + (.000240 mmcfh) x (1.9 lb PM/mmcf) x (8760 hours/year)] / (3,580,000 steel tons per year) = **0.000121 lb PM(PM_{10})/ ton of steel per torch**

Proposed Short-term PM/PM_{10} Limit for combined Slab Ripping:

(11,000 tons per day) x (0.000121 lb/ton) = **1.3 lb PM(PM_{10})/day averaged over a calendar month per torch**

Proposed Annual PM/PM_{10} Limit for combined Slab Ripping:

(3,580,000 tons per year) x (0.000121 lb/ton) x (1 ton/2000 lbs) = **0.2 tons PM(PM_{10})/year per torch**

---

[4] *See* "Clarification and Guidance for the Metal Fabrication Industry," USEPA, Section 313 Reporting Issue Paper, PDF p. 16 (Jan. 1990).

iv. Determination of Compliance

Daily PM emissions for each torch are calculated as follows and compared to the short-term limit:

$$\frac{\sum_1^n \left[(Daily\ Steel\ Production) * (.000121\ \frac{lb\ PM}{ton\ steel})\right]}{n}$$

Where n = days in calendar month

Annual PM emissions for each torch are calculated as follows and compared to the annual limit:

(Annual Steel Production) x (0.000121 lb PM/ton steel) x (1 ton/2000 lbs) = # tons per year of PM/PM_{10}

B. Furnace Blast Uncaptured Fugitive Emissions (Condition 7.4.6(c))

i. Description of Process

Casthouse emissions consisting of particulate matter, sulfur dioxide, nitrogen oxides, carbon monoxide, and organic materials (to a lesser extent) may be generated during tapping of the furnace and the miscellaneous operations that take place within the casthouse structure. Emissions are captured by the Casthouse Baghouse and the Iron Spout Baghouse. Capture control efficiency is conservatively estimated to be 95% as derived from the PSD Permit application. Uncaptured fugitive emissions from the tapping process are emitted through the Casthouse Roof Monitor.

ii. Examples of Process Variability

Ironmaking is a continuous process within the blast furnace; however, it is a semi-continuous process with respect to periodic tapping of molten iron and slag from the bottom of the furnace. Casting emissions vary throughout the tapping cycle, which begins when the taphole is opened, includes casting hot metal and slag, and ends when the taphole is plugged with the mudgun. Emissions occur at the taphole, from the trough, from the runners that transport the iron and slag, and from the ladle that receives the molten iron. Some of the factors affecting these emissions include iron temperature, iron chemistry, production rate, duration of tapping, type of clays used in the taphole, exposed surface area of metal and slag, length of runners, and the presence/absence of runner covers and flame suppression, which reduce contact with air. In addition, USEPA acknowledges that the occasional use of an oxygen lance to open a clogged taphole can result in a short-term increase in emissions. *See* AP-42, § 12.5.2.2.

iii. Proposed Emission Limit

Emission estimate = 0.6 lb/ton uncontrolled (AP-42) with 95% capture = 0.03 lb/ton

Daily iron production is limited to 9,849 tons per day averaged over a calendar month (Condition 7.4.6(a)(i))

Annual iron production is limited to 3,165,000 tons per year (Condition 5.6.2(a)(i))

Proposed PM Limit:

(9,849 tons per day) x (0.03 lb/ton) = **295.5 lb/day averaged over a calendar month**

iv. Determination of Compliance

The capture equipment (Casthouse Baghouse and Iron Spout Baghouse) are operated at all times according to a written operating and maintenance plan, which includes parametric monitoring and inspection and proper response to abnormal conditions. This ensures that the capture efficiency is achieved on a consistent basis.

The hot metal runners and the short slag runner are covered with permanent type runner covers in accordance with the Blast Furnace Runner Cover Plan.

Fugitive emissions from the Blast Furnace Casthouse Roof Monitor are monitored on a weekly basis during normal operations according to Method 9 by a certified observer to verify compliance with the opacity standard. Compliance with the opacity standard and prompt response to abnormal conditions ensures that the emission estimate is representative on a daily average basis.

The hot metal production rate is determined and recorded on a daily basis. Pound per day emissions are determined as an average over a calendar month as shown below:

$$\frac{\sum_1^n \left[(Daily\ Hot\ Metal\ Production) * \left(0.03\ \frac{lb\ PM}{ton\ hot\ metal}\right)\right]}{n}$$

Where n = days in calendar month

C. Hot Metal Desulfurization and Hot Metal Transfer (Condition 7.5.6(e))

i. Description of Process

Molten iron from the blast furnaces is transported to the Basic Oxygen Furnace ("BOF") by torpedo cars. The iron is then transferred from the torpedo cars to a BOP charging ladle at a station located at the BOP Desulfurization ("Desulf") Baghouse. Once transferred to the ladles, the iron is then desulfurized where a combination of lime and magnesium is injected into the

molten iron. The lime and magnesium react with the sulfur within the iron bath forming sulfur compounds that rise to the top of the iron bath into a layer of slag on the surface of the iron. PM emissions from both of these processes are controlled by the Desulf Baghouse.

ii. Examples of Process Variability

The emissions from these operations are primarily metal oxides formed when oxygen in the air reacts with the molten iron. Factors that can influence process variability are hot metal temperature, hot metal chemistry, grade specifications for sulfur concentration, desulfurization injection rate, duration of injection rate, concentration and type of the reagent injected, and the hot metal factor. The hot metal chemistry and grade specification determine the length of injection time required to achieve the desired sulfur concentration. The hot metal factor is the percentage of hot metal required to produce a heat of steel in the BOF Vessels, with the balance consisting of steel scrap and alloys.

In AP-42, USEPA acknowledges process variability for hot metal desulfurization, where USEPA concludes, "[t]he process duration varies with the injection rate, hot metal chemistry, and desired final sulfur content, and is in the range of 5 to 30 minutes." AP-42, § 12.5.1.3. This supports that a pound per ton of product is not a reasonable short-term limit.

iii. Proposed Emission Limit

USS concurs with the existing emission factors of 0.03721 lb PM/ton of iron and 0.03721 lb PM_{10}/ton of iron for use in development of an emission limit.

Daily iron production is limited to 9,849 tons per day averaged over a calendar month (Condition 7.4.6(a)(i))

Annual iron production is limited to 3,165,000 tons per year (Condition 5.6.2(a)(i))

Proposed PM/PM_{10} Limit:

(9,849 tons per day) x (0.03721 lb/ton) = **366.5 lb/day averaged over a calendar month**

iv. Determination of Compliance

A stack test to determine PM/PM_{10} emissions is performed on the Desulf Baghouse every 60 months. Emissions from the baghouse tests are then used to calculate the emission rate on a daily average over the calendar month, compared to the proposed PM/PM_{10} limit of 366.5 lbs/day. The emission rate from the most current stack test is used in the calculation to determine compliance with the daily PM limit. The capture/control equipment (the Desulf Baghouse) is operated at all times according to a written operating and maintenance plan, which includes parametric monitoring and inspection and proper response to abnormal conditions. This ensures that the capture and control system is operating properly and relatively consistently between stack testing.

Daily PM/PM_{10} emissions are calculated as follows:

$$\frac{\sum_1^n \left[(Daily\ Hot\ Metal\ Production) * (TEST\ \frac{lb\ PM/PM10}{ton\ hot\ metal})\right]}{n}$$

Where:
n = days in calendar month
TEST = result of most recent stack test

D. Iron Pellet Screening (Condition 7.1.6(b)(iv))

i. Description of Process

Raw materials such as coke, iron pellets, and fluxes are charged into the blast furnaces in the iron making process. Emissions from raw material handling occur from the screening of the iron pellets prior to charging.

ii. Examples of Process Variability

Variables that can affect emissions from the iron pellet screening process include the ambient weather conditions, pellet size, pellet moisture content, and type of pellet (acid or flux). Small pellets will require the need for more overall pellets to be screened to yield the desired pellet weight for the process. The higher the moisture content the lower the emissions. The desired pellet moisture content is > 1.5%. There are two types of iron pellets, acid and flux. The acid type iron pellet contains a higher concentration of iron per pellet, therefore less screening is required to achieve the correct amount of iron in the furnace. The flux type iron pellet contains some fluxes resulting in a lower concentration of iron per pellet, therefore more screening is required to achieve the correct amount of iron in the furnace.

iii. Proposed Emission Limit

Daily iron production is limited to 9,849 tons per day averaged over a calendar month (Condition 7.4.6(a)(i))

Annual iron production is limited to 3,165,000 tons per year (Condition 5.6.2(a)(i))

Annual pellets charged is limited to 4,308,581 TPY

Calculated (9,849 tons iron per day/3,165,000 annual iron production limit)*(4,308,581 annual tons of pellets charged limit) = 13,408 tons of iron pellets per day

Proposed PM Limit:

(13,408 tons per day) x (0.00375 lb/ton) = **50.3 lb/day averaged over a calendar month**

Proposed PM_{10} Limit:

(13,408 tons per day) x (0.00131 lb/ton) = **17.6 lb/day averaged over a calendar month**

iv. Determination of Compliance

Fugitive emissions from the Pellet Screening operation is monitored on an annual basis during normal operations according to Method 9 by a certified observer to verify compliance with the opacity standard. Blast Furnace personnel routinely observe the iron screening process. Compliance with the opacity standard and prompt response to abnormal conditions ensures that the emission estimate is representative on a daily average basis.

$$\text{PM emissions} = \frac{\sum_1^n \left[(Daily\ Pellets\ Charged) * \left(0.00375\ \frac{lb\ PM}{tons\ of\ pellets}\right) \right]}{n}$$

Where n = days in calendar month

$$PM_{10}\ \text{emissions} = \frac{\sum_1^n \left[(Daily\ Pellets\ Charged) * \left(0.00131\ \frac{lb\ PM}{ton\ of\ pellets}\right) \right]}{n}$$

Where n = days in calendar month

IV. CONSTRUCTION PERMIT ISSUED TO USS FOR COGENERATION BOILER PROJECT

USS also notes that in the construction permit issued initially to USS on January 30, 2008 (and including several subsequent revisions) for the Cogeneration Boiler Project ("Cogen Project"), Illinois EPA established certain production limits, and emission limits for relevant pollutants on a tons per month basis, as well as tons per year basis, from the new cogeneration boiler and the new BFG flare (including emissions associated with the natural gas pilot for the new BFG flare). Moreover, the short-term emission limits (tons per month), along with certain control requirements and work practices, allowed the flexibility needed by USS for operational variability. *See* United States Steel Corporation, Construction Permit No. 06070023, §§ 3.1.5 and 3.1.6 (issued Jan. 30, 2008, revised most recently on Nov. 25, 2015). As to the short-term emission limits, all were established such that the tons per month limits, if annualized, would have exceeded the limitations established for tons per year. *See* id. at § 3.1.6 (b)(2). Finally, the detailed recordkeeping requirements in the construction permit for the Cogen Project provide the necessary information for practical enforceability of the emission limitations.

USS supports Illinois EPA's use of monthly emission limits and annual emission limits, consistent with its approach in the Cogen Project permit.

V. RECENT PERMIT ISSUED TO NUCOR STEEL KANKAKEE, INC.

In a more recent permitting transaction, on October 31, 2018, Illinois EPA issued Construction Permit No. 18060014 to Nucor Steel Kankakee, Inc. ("Nucor Permit"). The permit was issued to construct a new rolling mill facility at Nucor's steel plant near Kankakee, Illinois. In the Nucor Permit, Illinois EPA established short-term and annual limits for emissions for the new reheat furnace. *See* Nucor Steel Kankakee, Inc., Construction Permit No. 18060014, § 2.1.5(a) (issued Oct. 31, 2018). Note that the lb/hr limit for NO_X, if annualized, results in annual emissions that are significantly higher than the annual limitation on NO_X emissions. In addition, Illinois EPA set emissions limitations for the new rolling mill on an annual basis only, with certain recordkeeping requirements that allowed the use of unspecified emission factors. *See id.* at § 2.2.5. Illinois EPA did not require the use of such emission factors as enforceable emission limits. In contrast, however, and as you know is the fundamental basis for USS's appeals, Illinois EPA uses emissions factors (despite AP-42's admonition not to) as enforceable emissions limits in USS' permits.

Finally, on this point, in the Nucor Permit Project Summary, Illinois EPA specifically explained: "In addition to annual limits on emissions, the permit includes short-term emission limits and operational limits, as needed to provide practical enforceability of the annual emission limits." Project Summary for an Application for a Construction Permit/PSD Approval from Nucor Steel Kankakee, Inc. for A New Rolling Milling Facility at its Plant in Bourbonnais, Illinois, Illinois EPA, § 8 (Sept. 2018).

USS supports Illinois EPA's use of short-term emission limits and annual emission limits, consistent with its approach in the Nucor Permit.

VI. FOLLOW-UP ITEMS FROM FIRST DELIVERABLE

In the first deliverable dated October 19, 2018, USS indicated that it was planning to provide updates on the following issues in this second deliverable:

- BOG Additive System (Trackhopper Baghouse) (Condition 7.1.6(b)(ii))
- Continuous Casting Deslagging Station and Associated Material Handling System (Condition 7.6.6(a))
- Blast Furnace and Steel Making (Condition 7.1.6(b)(i))

USS's investigation and evaluation of these issues is continuing, and it will provide the updates in one of the upcoming deliverables.

VII. CONCLUSION

USEPA's acknowledgment of short-term variability that is averaged over a longer period of time warrants the necessity and appropriateness of including short-term limits that incorporate such variability, as some emissions may be higher, while others may be lower during a short-term period, but the differences would be averaged out over a longer time period such that the

annual limits would not change. Based on the foregoing, USS respectfully is unable to accept Illinois EPA's position that the emission factors in the PSD Permit should be converted into the CAAPP Permit (and baghouse construction permit) as enforceable emission limits. However, USS does agree that emission factors may be used to develop enforceable emission limits that allow for the necessary operational flexibility at GCW. USS believes the information presented in this submittal moves us forward toward reaching resolution of the pending air permit appeals. While we agree additional work needs to be done, including timely submission of our third and fourth deliverables, USS believes the path forward on these issues is coming together. We look forward to hearing from you after you and Illinois EPA representatives have reviewed the information presented in this letter.

We remain committed to working collaboratively with Illinois EPA and you to resolve these appeals. We appreciate your and Illinois EPA's careful consideration of this submittal and would be pleased to discuss or meet with Illinois EPA to thoroughly address any questions or concerns that you have. In the interim, please let us know if you have any questions.

Sincerely,



Katherine D. Hodge

pc: Sally Carter, Esq. (via electronic mail)
David Hacker, Esq. (via electronic mail)

Pritchett, Jacob A.

From: Romaine, Chris
Sent: Thursday, December 4, 2014 10:35 AM
To: Carter, Sally
Subject: Accepted: USS Quarterly Meeting

Carter, Sally

From: Romaine, Chris
Sent: Wednesday, December 6, 2023 3:24 PM
To: LaDonna Driver; David W Hacker (DWHacker@uss.com); Campbell, Colin; Gurinder (Gary) Saini; Hardin, Christopher W; Piscitelli, Alexis S; karmentrout@uss.com
Cc: Patel, Minesh
Subject: FW: U.S. Steel Corporation: 119813AAI, 95010001

FYI

The Illinois EPA will be holding a new public comment period on a revised draft denial letter for US Steel's more recent application (not the 2008 application) for revision of Construction Permit 95010001.

The revised draft denial letter should be posted by this Friday on the Illinois EPA's website under Air, Permits and Public Notices. My understanding is that the comment period will be scheduled to close on January 8, 2024.

By the way, we are aware of that US Steel has announced that the primary operation at the Granite City Works are going to be indefinitely idled.

State of Illinois - CONFIDENTIALITY NOTICE: The information contained in this communication is confidential, may be attorney-client privileged or attorney work product, may constitute inside information or internal deliberative staff communication, and is intended only for the use of the addressee. Unauthorized use, disclosure or copying of this communication or any part thereof is strictly prohibited and may be unlawful. If you have received this communication in error, please notify the sender immediately by return e-mail and destroy this communication and all copies thereof, including all attachments. Receipt by an unintended recipient does not waive attorney-client privilege, attorney work product privilege, or any other exemption from disclosure.

Pritchett, Jacob A.

From: Romaine, Chris
Sent: Tuesday, December 8, 2015 3:46 PM
To: Carter, Sally
Subject: Accepted: USS

Pritchett, Jacob A.

Subject: FW: USS
Location: IEPA

Start: Mon 12/14/2015 2:00 PM
End: Mon 12/14/2015 5:00 PM
Show Time As: Tentative

Recurrence: (none)

Meeting Status: Not yet responded

Organizer: Carter, Sally

Please put this on your calendar.

-----Original Appointment-----
From: Carter, Sally
Sent: Tuesday, December 08, 2015 3:39 PM
To: Carter, Sally; Patel, Minesh; Romaine, Chris; Benbenek, Jeff
Subject: USS
When: Monday, December 14, 2015 2:00 PM-5:00 PM (UTC-06:00) Central Time (US & Canada).
Where: IEPA

The conference call with USS set for Tuesday, December 15 has been cancelled. Instead, USS (legal) will be present for a meeting on Monday afternoon at 2 pm. I am not certain if technical staff will be participating by conference call or in person. However, I will arrange for a conference line in the event it is needed.

Pritchett, Jacob A.

Subject: FW: USS
Location: TBD

Start: Tue 12/14/2021 1:00 PM
End: Tue 12/14/2021 3:00 PM
Show Time As: Tentative

Recurrence: (none)

Meeting Status: Not yet responded

Organizer: Carter, Sally

I am hopefully reserving 3 South.

-----Original Appointment-----
From: Carter, Sally <Sally.Carter@Illinois.gov>
Sent: Tuesday, November 23, 2021 10:17 AM
To: Carter, Sally; Romaine, Chris; Patel, Minesh
Subject: USS
When: Tuesday, December 14, 2021 1:00 PM-3:00 PM (UTC-06:00) Central Time (US & Canada).
Where: TBD

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Pritchett, Jacob A.

Subject: FW: USS
Location: TBD

Start: Tue 12/14/2021 1:00 PM
End: Tue 12/14/2021 3:00 PM
Show Time As: Tentative

Recurrence: (none)

Meeting Status: Not yet responded

Organizer: Carter, Sally

-----Original Appointment-----
From: Carter, Sally <Sally.Carter@Illinois.gov>
Sent: Tuesday, November 23, 2021 10:17 AM
To: Carter, Sally; Romaine, Chris; Patel, Minesh
Cc: EPA.Air.BOA.3South.ConferenceRoom3110N
Subject: USS
When: Tuesday, December 14, 2021 1:00 PM-3:00 PM (UTC-06:00) Central Time (US & Canada).
Where: TBD

I am hopefully reserving 3 South.

-----Original Appointment-----
From: Carter, Sally <Sally.Carter@Illinois.gov>
Sent: Tuesday, November 23, 2021 10:17 AM
To: Carter, Sally; Romaine, Chris; Patel, Minesh
Subject: USS
When: Tuesday, December 14, 2021 1:00 PM-3:00 PM (UTC-06:00) Central Time (US & Canada).
Where: TBD

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Pritchett, Jacob A.

Subject:	USS Meeting
Location:	EPA.Air.BOA.3South.ConferenceRoom3110N
Start:	Tue 12/14/2021 1:00 PM
End:	Tue 12/14/2021 3:00 PM
Show Time As:	Tentative
Recurrence:	(none)
Meeting Status:	Not yet responded
Organizer:	Romaine, Chris
Resources:	EPA.Air.BOA.3South.ConferenceRoom3110N

Pritchett, Jacob A.

From: Romaine, Chris
Sent: Tuesday, December 14, 2021 3:14 PM
To: EPA.Air.BOA.3South.ConferenceRoom3110N
Subject: FW: USS
Attachments: USS.ics

Reserving room?

Pritchett, Jacob A.

From: Romaine, Chris
Sent: Wednesday, December 18, 2019 6:40 PM
To: Carter, Sally
Subject: Accepted: USS

Pritchett, Jacob A.

From: Romaine, Chris
Sent: Tuesday, December 20, 2022 10:21 AM
To: LaDonna Driver
Subject: Accepted: Conference Call USS & IEPA

Pritchett, Jacob A.

From: Romaine, Chris
Sent: Tuesday, December 22, 2015 5:51 PM
To: Carter, Sally
Subject: Accepted: USS - Permitting Discussion

I 80 5/15/01 -> C Remains

R005620

Granite City Works
United States Steel
20th & State Streets
Granite City, Illinois 62040
(618) 451-3456

119813AAI
06070022
1/18/08

January 17, 2008

CERTIFIED MAIL NO. 7007 0710 0005 1642 0318
RETURN RECEIPT REQUESTED

Mr. Ed Bakowski
Manager, Permit Section
Division of Air Pollution Control
Illinois Environmental Protection Agency
P. O. Box 19276
Springfield, Il 62794

Dear Mr. Bakowski:

Enclosed is a check in the amount of $500 and Form 197-FEE for the extension of the Emission Reductions Project.

Should you have questions or require further information, please feel free to contact me at (618) 451-3391 or Robert Ribbing at (618) 451-4026.

Sincerely,

Larry Siebenberger

Larry Siebenberger
Manager – Environmental Control

RECEIVED
STATE OF ILLINOIS
JAN 18 2005
Environmental Protection Agency
BUREAU OF AIR

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL -- PERMIT SECTION
P.O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

FEE DETERMINATION FOR CONSTRUCTION PERMIT APPLICATION

FOR AGENCY USE ONLY	
ID NUMBER:	119813AAI
PERMIT #:	06070027
COMPLETE ☑ INCOMPLETE ☐	DATE COMPLETE: 1/18/08
CHECK #: 762628	ACCOUNT NAME: United States Steel Corp

THIS FORM IS TO BE USED BY ALL SOURCES TO SUPPLY FEE INFORMATION THAT MUST ACCOMPANY ALL CONSTRUCTION PERMIT APPLICATIONS. ***THIS APPLICATION MUST INCLUDE PAYMENT IN FULL TO BE DEEMED COMPLETE.*** MAKE CHECK OR MONEY ORDER PAYABLE TO THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY. SEND TO THE ADDRESS ABOVE. DO NOT SEND CASH. REFER TO INSTRUCTIONS (197-INST) FOR ASSISTANCE.

$500.00

SOURCE INFORMATION

1) SOURCE NAME: United States Steel Corporation - Granite City Works	
2) PROJECT NAME: Emission Reductions	3) SOURCE ID NO. (IF APPLICABLE): 119813AAI
4) CONTACT NAME: L. Siebenberger	5) CONTACT PHONE NUMBER: (618) 451-3391

FEE DETERMINATION

6) FILL IN THE FOLLOWING THREE BOXES AS DETERMINED IN SECTIONS 1 THROUGH 4 BELOW:

$ 0	*	$ 500	=	$ 500
SECTION 1 SUBTOTAL		SECTION 2, 3 OR 4 SUBTOTAL		GRAND TOTAL

SECTION 1: STATUS OF SOURCE / PURPOSE OF SUBMITTAL

7) YOUR APPLICATION WILL FALL UNDER ONLY ONE OF THE FOLLOWING SIX CATEGORIES DESCRIBED BELOW. CHECK THE BOX THAT APPLIES, ENTER THE CORRESPONDING FEE IN THE BOX TO THE RIGHT AND COPY THIS FEE INTO THE SECTION 1 SUBTOTAL BOX ABOVE. PROCEED TO APPLICABLE SECTIONS.

FOR PURPOSES OF THIS FORM:

- ***MAJOR SOURCE*** IS A SOURCE THAT IS REQUIRED TO OBTAIN A CAAPP PERMIT.
- ***SYNTHETIC MINOR*** SOURCE IS A SOURCE THAT HAS TAKEN LIMITS ON POTENTIAL TO EMIT IN A PERMIT TO AVOID CAAPP PERMIT REQUIREMENTS (E.G., FESOP).
- ***NON-MAJOR*** SOURCE IS A SOURCE THAT IS NOT A MAJOR OR SYNTHETIC MINOR SOURCE.

☒ EXISTING SOURCE WITHOUT STATUS CHANGE OR WITH STATUS CHANGE FROM SYNTHETIC MINOR TO MAJOR SOURCE OR VICE VERSA. ENTER $0 AND PROCEED TO SECTION 2.	
☐ EXISTING NON-MAJOR SOURCE THAT WILL BECOME SYNTHETIC MINOR OR MAJOR SOURCE. ENTER $5,000 AND PROCEED TO SECTION 4.	
☐ EXISTING MAJOR OR SYNTHETIC MINOR SOURCE THAT WILL BECOME NON-MAJOR SOURCE. ENTER $4,000 AND PROCEED TO SECTION 3.	
☐ NEW MAJOR OR SYNTHETIC MINOR SOURCE. ENTER $5,000 AND PROCEED TO SECTION 4.	$ 0 SECTION 1 SUBTOTAL
☐ NEW NON-MAJOR SOURCE. ENTER $500 AND PROCEED TO SECTION 3.	
☐ AGENCY ERROR. IF THIS IS A TIMELY REQUEST TO CORRECT AN ISSUED PERMIT THAT INVOLVES ONLY AN AGENCY ERROR AND IF THE REQUEST IS RECEIVED WITHIN THE DEADLINE FOR A PERMIT APPEAL TO THE POLLUTION CONTROL BOARD, THEN ENTER $0. SKIP SECTIONS 2, 3 AND 4. PROCEED DIRECTLY TO SECTION 5.	

RECEIVED
STATE OF ILLINOIS
JAN 18 2008
Environmental Protection Agency
BUREAU OF AIR

SECTION 2: SPECIAL CASE FILING FEE

8) FILING FEE. IF THE APPLICATION ONLY ADDRESSES ONE OR MORE OF THE FOLLOWING, CHECK THE APPROPRIATE BOXES, ENTER $500 IN THE SECOND BOX UNDER FEE DETERMINATION ABOVE, SKIP SECTIONS 3 AND 4 AND PROCEED DIRECTLY TO SECTION 5. OTHERWISE, PROCEED TO SECTION 3 OR 4, AS APPROPRIATE.

- ☐ ADDITION OR REPLACEMENT OF CONTROL DEVICES ON PERMITTED UNITS
- ☐ PILOT PROJECTS/TRIAL BURNS BY A PERMITTED UNIT
- ☐ APPLICATIONS ONLY INVOLVING INSIGNIFICANT ACTIVITIES UNDER 35 IAC 201.210 (MAJOR SOURCES ONLY)
- ☐ LAND REMEDIATION PROJECTS
- ☐ REVISIONS RELATED TO METHODOLOGY OR TIMING FOR EMISSION TESTING
- ☒ MINOR ADMINISTRATIVE-TYPE CHANGE TO A PERMIT

THIS AGENCY IS AUTHORIZED TO REQUIRE AND YOU MUST DISCLOSE THIS INFORMATION UNDER 415 ILCS 5/39. FAILURE TO DO SO COULD RESULT IN THE APPLICATION BEING DENIED AND PENALTIES UNDER 415 ILCS 5 ET SEQ. IT IS NOT NECESSARY TO USE THIS FORM IN PROVIDING THIS INFORMATION. THIS FORM HAS BEEN APPROVED BY THE FORMS MANAGEMENT CENTER.

SECTION 3: FEES FOR CURRENT OR PROJECTED NON-MAJOR SOURCES

9) IF THIS APPLICATION CONSISTS OF A SINGLE NEW EMISSION UNIT OR NO MORE THAN TWO MODIFIED EMISSION UNITS, ENTER $500.	9)
10) IF THIS APPLICATION CONSISTS OF MORE THAN ONE NEW EMISSION UNIT OR MORE THAN TWO MODIFIED UNITS, ENTER $1,000.	10)
11) IF THIS APPLICATION CONSISTS OF A NEW SOURCE OR EMISSION UNIT SUBJECT TO SECTION 39.2 OF THE ACT (I.E., LOCAL SITING REVIEW), A COMMERCIAL INCINERATOR OR A MUNICIPAL WASTE, HAZARDOUS WASTE, OR WASTE TIRE INCINERATOR; A COMMERCIAL POWER GENERATOR; OR AN EMISSION UNIT DESIGNATED AS A COMPLEX SOURCE BY AGENCY RULEMAKING, ENTER $15,000.	11)
12) IF A PUBLIC HEARING IS HELD (SEE INSTRUCTIONS), ENTER $10,000.	12)
13) SECTION 3 SUBTOTAL (ADD LINES 9 THROUGH 12) TO BE ENTERED ON PAGE 1.	13)

SECTION 4: FEES FOR CURRENT OR PROJECTED MAJOR OR SYNTHETIC MINOR SOURCES

Application Contains Modified Emission Units Only	14) FOR THE FIRST MODIFIED EMISSION UNIT, ENTER $2,000.	14)	
	15) NUMBER OF ADDITIONAL MODIFIED EMISSION UNITS = _____ X $1,000.	15)	
	16) LINE 14 PLUS LINE 15, OR $5,000, WHICHEVER IS LESS.		16)
Application Contains New And/Or Modified Emission Units	17) FOR THE FIRST NEW EMISSION UNIT, ENTER $4,000.	17)	
	18) NUMBER OF ADDITIONAL NEW AND/OR MODIFIED EMISSION UNITS = _____ X $1,000.	18)	
	19) LINE 17 PLUS LINE 18, OR $10,000, WHICHEVER IS LESS.		19)
Application Contains Netting Exercise	20) NUMBER OF INDIVIDUAL POLLUTANTS THAT RELY ON A NETTING EXERCISE OR CONTEMPORANEOUS EMISSIONS DECREASE TO AVOID APPLICATION OF PSD OR NONATTAINMENT NSR = _____ X $3,000.		20)
Additional Supplemental Fees	21) IF THE NEW SOURCE OR EMISSION UNIT IS SUBJECT TO SECTION 39.2 OF THE ACT (I.E., SITING); A COMMERCIAL INCINERATOR OR OTHER MUNICIPAL WASTE, HAZARDOUS WASTE, OR WASTE TIRE INCINERATOR; A COMMERCIAL POWER GENERATOR; OR ONE OR MORE OTHER EMISSION UNITS DESIGNATED AS A COMPLEX SOURCE BY AGENCY RULEMAKING, ENTER $25,000.		21)
	22) IF THE SOURCE IS A NEW MAJOR SOURCE SUBJECT TO PSD, ENTER $12,000.		22)
	23) IF THE PROJECT IS A MAJOR MODIFICATION SUBJECT TO PSD, ENTER $6,000.		23)
	24) IF THIS IS A NEW MAJOR SOURCE SUBJECT TO NONATTAINMENT (NAA) NSR, ENTER $20,000.		24)
	25) IF THIS IS A MAJOR MODIFICATION SUBJECT TO NAA NSR, ENTER $12,000.		25)
	26) IF APPLICATION INVOLVES A DETERMINATION OF CLEAN UNIT STATUS AND THEREFORE IS NOT SUBJECT TO BACT OR LAER, ENTER $5,000 PER UNIT FOR WHICH A DETERMINATION IS REQUESTED OR OTHERWISE REQUIRED. _____ X $5,000.		26)
	27) IF APPLICATION INVOLVES A DETERMINATION OF MACT FOR A POLLUTANT AND THE PROJECT IS NOT SUBJECT TO BACT OR LAER FOR THE RELATED POLLUTANT UNDER PSD OR NSR (E.G., VOM FOR ORGANIC HAP), ENTER $5,000 PER UNIT FOR WHICH A DETERMINATION IS REQUESTED OR OTHERWISE REQUIRED. _____ X $5,000.		27)
	28) IF A PUBLIC HEARING IS HELD (SEE INSTRUCTIONS), ENTER $10,000.		28)
29) SECTION 4 SUBTOTAL (ADD LINES 16 AND LINES 19 THROUGH 28) TO BE ENTERED ON PAGE 1.			29)

SECTION 5: CERTIFICATION

NOTE. APPLICATIONS WITHOUT A SIGNED CERTIFICATION WILL BE DEEMED INCOMPLETE.

30) I CERTIFY UNDER PENALTY OF LAW THAT, BASED ON INFORMATION AND BELIEF FORMED AFTER REASONABLE INQUIRY, THE INFORMATION CONTAINED IN THIS FEE APPLICATION FORM IS TRUE, ACCURATE AND COMPLETE

BY: _____ (SIGNATURE)

General Manager (TITLE OF SIGNATORY)

David J. Rinloul (TYPED OR PRINTED NAME OF SIGNATORY)

01 / 15 / 08 (DATE)

APPLICATION PAGE _____

Printed on Recycled Paper

197-FEE

D.C.

IBD 5/15/07 C. Romaine

N

Illinois Environmental Protection Agency
Division Of Air Pollution Control -- Permit Section
P.O. Box 19506
Springfield, Illinois 62794-9506

Application For Construction Permit

(For CAAPP & FESOP Sources only)

For Illinois EPA use only	
ID number:	119813AAI
Permit number:	06070022
Date received:	7/11/06

This form is to be used by CAAPP and FESOP sources to supply information necessary to obtain a construction permit. Please attach other necessary information and completed CAAPP forms regarding this construction/modification project.

Source Information

1. Source name: US Steel Corporation - Granite City Works		
2. Source street address: 1951 State Street		
3. City: Granite City		4. Zip code: 62226
5. Is the source located within city limits? ☒ Yes ☐ No		
6. Township name: Granite City	7. County: Madison	8. ID number: 119813AAI

Owner Information

9. Name: United States Steel Corporation		
10. Address: 600 Grant Street		
11. City: Pittsburgh	12. State: PA	13. Zip code: 15219

Operator Information (if different from owner)

14. Name		
15. Address:		
16. City:	17. State:	18. Zip code:

Applicant Information

19. Who is the applicant? ☒ Owner ☐ Operator	20. All correspondence to: (check one) ☐ Owner ☐ Operator ☒ Source
21. Attention name and/or title for written correspondence: Larry Siebenberger / Environmental Manager	
22. Technical contact person for application: Larry Siebenberger	23. Contact person's telephone number: 618.451.3391

RECEIVED
JUL 11 2006
IEPA - DAPC - SPFLD

This Agency is authorized to require and you must disclose this information under 415 ILCS 5/39. Failure to do so could result in this application being denied and penalties under 415 ILCS 5 et seq. It is not necessary to use this form in providing this information. This form has been approved by the forms management center.

Summary Of Application Contents		
24.	Does the application address whether the proposed project would constitute a new major source or major modification under each of the following programs: a) Non-attainment New Source Review – 35 IAC Part 203; b) Prevention of Significant Deterioration (PSD) – 40 CFR 52.21; c) Hazardous Air Pollutants: Regulations Governing Constructed or Reconstructed Major Sources – 40 CFR Part 63?	☒ Yes ☐ No
25.	Does the application identify and address all applicable emissions standards, including those found in the following: a) Board Emission Standards – 35 IAC Chapter I, Subtitle B; b) Federal New Source Performance Standards – 40 CFR Part 60; c) Federal Standards for Hazardous Air Pollutants – 40 CFR Parts 61 and 63?	☒ Yes ☐ No
26.	Does the application include a process flow diagram(s) showing all emission units and control equipment, and their relationship, for which a permit is being sought?	☒ Yes ☐ No
27.	Does the application include a complete process description for the emission units and control equipment for which a permit is being sought?	☒ Yes ☐ No
28.	Does the application include the information as contained in completed CAAPP forms for all appropriate emission units and air pollution control equipment, listing all applicable requirements and proposed exemptions from otherwise applicable requirements, and identifying and describing any outstanding legal actions by either the USEPA or the Illinois EPA? Note: The use of "APC" application forms is not appropriate for applications for CAAPP sources. CAAPP forms should be used to supply information.	☒ Yes ☐ No
29.	If the application contains TRADE SECRET information, has such information been properly marked and claimed, and have two separate copies of the application suitable for public inspection and notice been submitted, in accordance with applicable rules and regulations?	☐ Yes ☐ No ☐ Not Applicable, No TRADE SECRET information in this application
30.	Does the application include a complete form 197-FEE, "FEE DETERMINATION FOR CONSTRUCTION PERMIT APPLICATION" for the emission units and control equipment for which a permit for construction or modification is being sought?	☒ Yes ☐ No

Note 1: Answering "No" to any of the above may result in the application being deemed incomplete.

Signature Block	
This certification must be signed by a responsible official. Applications without a signed certification will be deemed incomplete.	
31.	I certify under penalty of law that, based on information and belief formed after reasonable inquiry, the statements and information contained in this application are true, accurate and complete. Authorized Signature: BY: Michael Fedorenko — Green Manor - Senior Clerk AUTHORIZED SIGNATURE — TITLE OF SIGNATORY MICHAEL FEDORENKO — July 10, 1996 TYPED OR PRINTED NAME OF SIGNATORY — DATE

Note 2: An operating permit for the construction/modification permitted in a construction permit must be obtained by applying for the appropriate revision to the source's CAAPP permit, if necessary.

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL -- PERMIT SECTION
P.O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

FEE DETERMINATION FOR CONSTRUCTION PERMIT APPLICATION

FOR AGENCY USE ONLY

ID NUMBER: 119 813AAI
PERMIT #: 06070022
COMPLETE ☒ INCOMPLETE ☐ DATE COMPLETE: 7/11/06
CHECK #: 522458 ACCOUNT NAME: USS Gran Corp

THIS FORM IS TO BE USED BY ALL SOURCES TO SUPPLY FEE INFORMATION THAT MUST ACCOMPANY ALL CONSTRUCTION PERMIT APPLICATIONS. ***THIS APPLICATION MUST INCLUDE PAYMENT IN FULL TO BE DEEMED COMPLETE.*** MAKE CHECK OR MONEY ORDER PAYABLE TO THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY. SEND TO THE ADDRESS ABOVE. DO NOT SEND CASH. REFER TO INSTRUCTIONS (197-INST) FOR ASSISTANCE. $500.00

SOURCE INFORMATION

1) SOURCE NAME: United States Steel Corporation - Granite City Works
2) PROJECT NAME: Emission Reductions
3) SOURCE ID NO. (IF APPLICABLE): 119813AAI
4) CONTACT NAME: Larry Siebenberger
5) CONTACT PHONE NUMBER: (618) 451-3391

FEE DETERMINATION

6) FILL IN THE FOLLOWING THREE BOXES AS DETERMINED IN SECTIONS 1 THROUGH 4 BELOW:

$ 0	+	$ 10,000	=	$ 10,000
SECTION 1 SUBTOTAL		SECTION 2, 3 OR 4 SUBTOTAL		GRAND TOTAL

SECTION 1: STATUS OF SOURCE / PURPOSE OF SUBMITTAL

7) YOUR APPLICATION WILL FALL UNDER ONLY ONE OF THE FOLLOWING SIX CATEGORIES DESCRIBED BELOW. CHECK THE BOX THAT APPLIES, ENTER THE CORRESPONDING FEE IN THE BOX TO THE RIGHT AND COPY THIS FEE INTO THE SECTION 1 SUBTOTAL BOX ABOVE. PROCEED TO APPLICABLE SECTIONS.

FOR PURPOSES OF THIS FORM:

- ***MAJOR SOURCE*** IS A SOURCE THAT IS REQUIRED TO OBTAIN A CAAPP PERMIT.
- ***SYNTHETIC MINOR SOURCE*** IS A SOURCE THAT HAS TAKEN LIMITS ON POTENTIAL TO EMIT IN A PERMIT TO AVOID CAAPP PERMIT REQUIREMENTS (E.G., FESOP).
- ***NON-MAJOR SOURCE*** IS A SOURCE THAT IS NOT A MAJOR OR SYNTHETIC MINOR SOURCE

☒	EXISTING SOURCE WITHOUT STATUS CHANGE OR WITH STATUS CHANGE FROM SYNTHETIC MINOR TO MAJOR SOURCE OR VICE VERSA. ENTER $0 AND PROCEED TO SECTION 2.	$ 0 SECTION 1 SUBTOTAL
☐	EXISTING NON-MAJOR SOURCE THAT WILL BECOME SYNTHETIC MINOR OR MAJOR SOURCE. ENTER $5,000 AND PROCEED TO SECTION 4.	
☐	EXISTING MAJOR OR SYNTHETIC MINOR SOURCE THAT WILL BECOME NON-MAJOR SOURCE. ENTER $4,000 AND PROCEED TO SECTION 3.	
☐	NEW MAJOR OR SYNTHETIC MINOR SOURCE. ENTER $5,000 AND PROCEED TO SECTION 4.	
☐	NEW NON-MAJOR SOURCE. ENTER $500 AND PROCEED TO SECTION 3.	
☐	AGENCY ERROR. IF THIS IS A TIMELY REQUEST TO CORRECT AN ISSUED PERMIT THAT INVOLVES ONLY AN AGENCY ERROR AND IF THE REQUEST IS RECEIVED WITHIN THE DEADLINE FOR A PERMIT APPEAL TO THE POLLUTION CONTROL BOARD, THEN ENTER $0. SKIP SECTIONS 2, 3 AND 4. PROCEED DIRECTLY TO SECTION 5.	

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SECTION 2: SPECIAL CASE FILING FEE

8) FILING FEE. IF THE APPLICATION ONLY ADDRESSES ONE OR MORE OF THE FOLLOWING, CHECK THE APPROPRIATE BOXES, ENTER $500 IN THE SECOND BOX UNDER FEE DETERMINATION ABOVE, SKIP SECTIONS 3 AND 4 AND PROCEED DIRECTLY TO SECTION 5. OTHERWISE, PROCEED TO SECTION 3 OR 4, AS APPROPRIATE.

- ☐ ADDITION OR REPLACEMENT OF CONTROL DEVICES ON PERMITTED UNITS
- ☐ PILOT PROJECTS/TRIAL BURNS BY A PERMITTED UNIT
- ☐ APPLICATIONS ONLY INVOLVING INSIGNIFICANT ACTIVITIES UNDER 35 IAC 201.210 (MAJOR SOURCES ONLY)
- ☐ LAND REMEDIATION PROJECTS
- ☐ REVISIONS RELATED TO METHODOLOGY OR TIMING FOR EMISSION TESTING
- ☐ MINOR ADMINISTRATIVE-TYPE CHANGE TO A PERMIT

THIS AGENCY IS AUTHORIZED TO REQUIRE AND YOU MUST DISCLOSE THIS INFORMATION UNDER 415 ILCS 5/39. FAILURE TO DO SO COULD RESULT IN THE APPLICATION BEING DENIED AND PENALTIES UNDER 415 ILCS 5 ET SEQ. IT IS NOT NECESSARY TO USE THIS FORM IN PROVIDING THIS INFORMATION. THIS FORM HAS BEEN APPROVED BY THE FORMS MANAGEMENT CENTER.

APPLICATION PAGE _____

SECTION 3: FEES FOR CURRENT OR PROJECTED NON-MAJOR SOURCES

9) IF THIS APPLICATION CONSISTS OF A SINGLE NEW EMISSION UNIT OR NO MORE THAN TWO MODIFIED EMISSION UNITS, ENTER $500.		9)
10) IF THIS APPLICATION CONSISTS OF MORE THAN ONE NEW EMISSION UNIT OR MORE THAN TWO MODIFIED UNITS, ENTER $1,000.		10)
11) IF THIS APPLICATION CONSISTS OF A NEW SOURCE OR EMISSION UNIT SUBJECT TO SECTION 39.2 OF THE ACT (I.E., LOCAL SITING REVIEW); A COMMERCIAL INCINERATOR OR A MUNICIPAL WASTE, HAZARDOUS WASTE, OR WASTE TIRE INCINERATOR; A COMMERCIAL POWER GENERATOR; OR AN EMISSION UNIT DESIGNATED AS A COMPLEX SOURCE BY AGENCY RULEMAKING, ENTER $15,000.		11)
12) IF A PUBLIC HEARING IS HELD (SEE INSTRUCTIONS), ENTER $10,000.		12)
13) SECTION 3 SUBTOTAL (ADD LINES 9 THROUGH 12) TO BE ENTERED ON PAGE 1.		13)

SECTION 4: FEES FOR CURRENT OR PROJECTED MAJOR OR SYNTHETIC MINOR SOURCES

Application Contains Modified Emission Units Only	14) FOR THE FIRST MODIFIED EMISSION UNIT, ENTER $2,000.	14)		
	15) NUMBER OF ADDITIONAL MODIFIED EMISSION UNITS = _____ X $1,000.	15)		
	16) LINE 14 PLUS LINE 15, OR $5,000, WHICHEVER IS LESS.			16)
Application Contains New And/Or Modified Emission Units	17) FOR THE FIRST NEW EMISSION UNIT, ENTER $4,000.	17)	4000	
	18) NUMBER OF ADDITIONAL NEW AND/OR MODIFIED EMISSION UNITS = 6 X $1,000.	18)	6000	
	19) LINE 17 PLUS LINE 18, OR $10,000, WHICHEVER IS LESS.			19) 10000
Application Contains Netting Exercise	20) NUMBER OF INDIVIDUAL POLLUTANTS THAT RELY ON A NETTING EXERCISE OR CONTEMPORANEOUS EMISSIONS DECREASE TO AVOID APPLICATION OF PSD OR NONATTAINMENT NSR = 0 X $3,000.			20)
Additional Supplemental Fees	21) IF THE NEW SOURCE OR EMISSION UNIT IS SUBJECT TO SECTION 39.2 OF THE ACT (I.E., SITING): A COMMERCIAL INCINERATOR OR OTHER MUNICIPAL WASTE, HAZARDOUS WASTE, OR WASTE TIRE INCINERATOR; A COMMERCIAL POWER GENERATOR; OR ONE OR MORE OTHER EMISSION UNITS DESIGNATED AS A COMPLEX SOURCE BY AGENCY RULEMAKING, ENTER $25,000.			21)
	22) IF THE SOURCE IS A NEW MAJOR SOURCE SUBJECT TO PSD, ENTER $12,000.			22)
	23) IF THE PROJECT IS A MAJOR MODIFICATION SUBJECT TO PSD, ENTER $6,000.			23)
	24) IF THIS IS A NEW MAJOR SOURCE SUBJECT TO NONATTAINMENT (NAA) NSR, ENTER $20,000.			24)
	25) IF THIS IS A MAJOR MODIFICATION SUBJECT TO NAA NSR, ENTER $12,000.			25)
	26) IF APPLICATION INVOLVES A DETERMINATION OF CLEAN UNIT STATUS AND THEREFORE IS NOT SUBJECT TO BACT OR LAER, ENTER $5,000 PER UNIT FOR WHICH A DETERMINATION IS REQUESTED OR OTHERWISE REQUIRED. _____ X $5,000.			26)
	27) IF APPLICATION INVOLVES A DETERMINATION OF MACT FOR A POLLUTANT AND THE PROJECT IS NOT SUBJECT TO BACT OR LAER FOR THE RELATED POLLUTANT UNDER PSD OR NSR (E.G., VOM FOR ORGANIC HAP), ENTER $5,000 PER UNIT FOR WHICH A DETERMINATION IS REQUESTED OR OTHERWISE REQUIRED. _____ X $5,000.			27)
	28) IF A PUBLIC HEARING IS HELD (SEE INSTRUCTIONS), ENTER $10,000.			28)
29) SECTION 4 SUBTOTAL (ADD LINES 16 AND LINES 19 THROUGH 28) TO BE ENTERED ON PAGE 1.				29) 10000

SECTION 5: CERTIFICATION

NOTE: APPLICATIONS WITHOUT A SIGNED CERTIFICATION WILL BE DEEMED INCOMPLETE.

30) I CERTIFY UNDER PENALTY OF LAW THAT, BASED ON INFORMATION AND BELIEF FORMED AFTER REASONABLE INQUIRY, THE INFORMATION CONTAINED IN THIS FEE APPLICATION FORM IS TRUE, ACCURATE AND COMPLETE.

BY: Michael Kuhns — General Manager - Complex City Wrong
SIGNATURE — TITLE OF SIGNATORY

MICHAEL FEDORENKO — July 19, 2006
TYPED OR PRINTED NAME OF SIGNATORY — DATE

SECTION ONE Introduction

The United States Steel Corporation-Granite City Works (the Facility) is herein making application for approval to modify the Facility. This application is one of three applications involving several projects. The three applications are being submitted together because all the projects are related to the development of a heat-recovery coke oven battery and associated cogeneration facility. Summaries of the three applications are included in Table 1-1 below:

Table 1-1: Summary of Applications Submitted

APPLICATION NAME	PROJECTS INVOLVED	DESCRIPTION
US Steel Emission Reduction Credit Application	• Boilers 1-10 Shutdown • New Blast Furnace Gas Flare • Coke Oven Gas Desulfurization • Low NOx Burners on Hot Strip Slab Furnaces • #6 Galvanizing Line Shutdown • Booster Pump #4 Shutdown • City Road Sweeping Project	Emission Reduction Credit Application (**this application**) includes projects which have been designed to reduce emissions at the Granite City Works in order to provide Contemporaneous Decreases in Emissions for other projects
US Steel Cogeneration Facility Project Application	• Cogeneration Blast Furnace Gas Fired Boiler • Coke Conveyor System	The Cogeneration Facility application includes the Blast Furnace Gas boiler and steam turbine generator and coke conveyor system to be developed in conjunction with the heat-recovery coke oven battery.
Gateway Energy & Coke Company Heat-Recovery Coke Oven Battery Application	• Heat-Recovery Coke Oven Battery	The heat-recovery battery will provide steam and metallurgical coke to the US Steel Granite City Works and is being developed in conjunction with the Cogeneration Facility.

SECTION ONE Introduction

The Facility is an integrated iron and steel manufacturing plant located in Granite City, Illinois. Its location is shown in **Figure 1-1**. The Facility is a major source as defined by 35 IAC 203.206.

This application for approval to modify is for several projects that will generate emission reduction credits in support of a separate application by Gateway Energy and Coke Company (GECC) for the development of a heat-recovery coke oven battery adjacent to the Facility. The proposed projects in this application will reduce emissions of CO, VOM, SO_x, NO_x and PM_{10} at the Facility. The projects include desulfurization of coke oven gas, shut down of Boilers 1 through 10, installation of low NO_x burners in the slab furnaces at the Hot Strip Mill, replacement of the natural gas (NG) fired coke oven gas booster pump (Pump #4), permanent shutdown of the #6 galvanizing line, modification of the Granite City Works (GCW) Fugitive Dust Control Plan and installation of an additional Blast Furnace Gas (BFG) flare.

As noted above, it is anticipated that the GECC permit application will use a portion of the emissions reductions described in this application. GCW intends to have these emission reductions in place at the time of startup of the GECC facility. If, for any reason, the GECC facility is not built, GCW will re-evaluate these proposed emission reduction projects. Depending on the outcome of that re-evaluation, GCW may decide to not implement some or all of the emission reduction projects.

A separate application has been developed and is being submitted for the installation of a BFG fired cogeneration boiler and steam turbine generator. Although the projects in this application and the application for the cogeneration boiler are considered to be one project by US Steel, the applications have been separated to allow IEPA to finalize the Emission Reduction Credit projects in order to preserve the necessary emission reduction credits, prior to finalizing the cogeneration project (cogeneration boiler and heat-recovery coke oven battery) permits.

This application includes a general facility description below. Section Two includes a discussion of relevant processes at the Facility and the resulting changes that will occur as a result of the proposed projects. Section Three contains an analysis of the emissions changes resulting from the proposed projects. Section Four includes an analysis of the regulatory requirements applicable to the proposed projects.

1.1 GENERAL FACILITY DESCRIPTION

The Facility is located in Madison County, Illinois. The largest city near the Facility is St. Louis, Missouri, which is located approximately 15 kilometers southwest of the Granite City mill. The latitude and longitude of the mill are approximately 38:41:55 and 90:08:42. The Facility occupies approximately 1,100 acres of land in an area primarily used for industrial purposes with residential and agricultural properties nearby. A site location map is provided in **Figure 1-1**. A site map is provided in **Figure 1-2.**

The Facility is owned and operated by United States Steel Corporation. The responsible official is Michael Fedorenko, General Manager-Granite City Works.

The primary contact for questions regarding this application is Mr. Larry Siebenberger, Manager of Environmental Control. His telephone number is 618-451-3391. The secondary contact for questions regarding this application is Mr. Robert Ribbing who may be reached at 618-451-4026.

The street address for the Facility is:

United States Steel – Granite City Works
1951 State Street
Granite City, IL 62040

In general, the Facility receives raw materials by rail and truck, and produces steel coils of various sizes and finishes to meet customer needs. Products are shipped from the mill by rail and truck.

The Standard Industrial Classification (SIC) Code for the facility is 3312.

1.2 PERMITTING HISTORY

The Facility submitted an application for a Clean Air Act Permit Program (CAAPP) permit in February 1996. IEPA is currently drafting the Facility's initial CAAPP Permit. Until the Facility CAAPP permit is finalized the facility operates under 38 separate operating permits for various units. Relevant operating permits are detailed below.

In 1994, the Facility received a SO_2 Federally Enforceable State Operating Permit (FESOP) for combustion of Coke Oven Gas (COG) in certain fuel combustion units. The SO_2 FESOP (IEPA Permit No. 94120017) limited SO_2 emissions from COG combustion at all

COG combustion units. COG desulfurization will eliminate the need to restrict the quantity of COG combusted at certain units to meet the SO_2 limits of the SO_2 FESOP. After installation of the COG desulfurization system, SO_2 FESOP limitations on COG combustion will only be a limiting factor during system downtime.

In late 1994, the Facility submitted a PSD permit application for a production increase. The Production Increase Permit Application showed the project would result in a significant increase in SO_2 and CO. The project netted out of New Source Review for NO_x, PM, PM_{10} and VOM. The Production Increase Permit (IEPA Permit No. 95010001) was issued in 1996 limiting iron and steel production and all blast furnace gas (BFG) combustion and NG combustion at specific units.

Since that time, the Facility has submitted few construction permit applications. One permit which resulted in actual increases of SO_2, NO_x, CO, or PM_{10}, VOM emissions is identified below.

Table 1-1: Contemporaneous Changes in Emissions

Project	Net Emission Increase from Project (tons per year)						Reference
	PM	PM_{10}	NO_x	SO_x	CO	VOM	
Natural Gas Enhancement to Coke Oven Underfire	0.73	0.62	17.22	0.04	5.17	0.34	Particulate emissions based on COG emission factors from AP-42. All other estimates based on NG emission factors from AP-42.

The Facility is an integrated iron and steel mill producing flat rolled steel. The Facility can be broken down into several smaller process plants where intermediate products are produced. The intermediate processes include the coke oven batteries, the by-products plant, the blast furnaces (ironmaking), the basic oxygen furnace (BOF) (steelmaking), the hot strip mill, and other finishing facilities. Processes affected by this application are further described below.

2.1 COKE OVEN BATTERIES

The Facility has two coke oven batteries ("A" battery and "B" battery) which are typically operated at or near their maximum production rate year round. Each battery contains 45 ovens in which coal is charged, and then heated, driving off the volatile organic compounds residing in the coal. The remaining carbon mass is called coke.

The heating process typically takes approximately 16 hours for each oven. Once the coking is completed, doors on both sides of the oven are opened and a ram is used to push the coke out of the oven into a quench car. The quench car transfers the coke to a quench tower, where it is cooled. The quench car has a scrubber system that controls pushing emissions.

The coking process results in a by-product gas that is cleaned and stripped of tar, naphthalene, ammonia, and light oils in the by-products plant. Once cleaned, the by-product gas is suitable for use as a fuel source. The by-product gas, which is called coke oven gas (COG), is then fed into the coke oven battery underfire where it produces the heat used to convert coal to coke. COG is also piped to the boilers, Blast Furnace Stoves, and Slab Furnaces for use as a fuel in these sources.

2.2 BLAST FURNACES

The Facility has two blast furnaces, "A" Blast Furnace and "B" Blast Furnace. The blast furnace process is used to transform iron ore into raw molten iron. In the process iron ore, scrap and other metallics, coke and other carbon containing materials, limestone, and other fluxes (referred to as the burden) are loaded into the blast furnace where they slowly descend. Near the bottom of the furnace through the tuyeres, blast air is blown into the furnace and rises up through the burden. Blast air is high temperature air blown into the furnace in high volumes supporting the burden. At times, liquid materials such

as oils or natural gas can be injected through the tuyeres with the hot blast as an additional source of carbon.

In the furnace, the hot blast air and the carbon in coke, oils, or natural gas react to form carbon monoxide. In the presence of carbon monoxide, the iron oxide in the iron ore reduces to metallic iron. In general, the reactions occurring in the Blast Furnace are described as follows:

$$Fe_2O_3 + 3\ CO \rightarrow 2\ Fe + 3\ CO_2$$
$$CO_2 + C \rightarrow 2\ CO$$

The result is molten iron, molten slag (calcium oxides and impurities), and a by-product gas rich in carbon monoxide called BFG. The BFG is collected at the top of the Blast Furnace and cleaned in a dust catcher and wet scrubber system. BFG is then utilized as a high volume, low heat content fuel at the Facility.

2.3 BLAST FURNACE CASTING

Iron and slag are cast through a tap hole drilled in the bottom of the furnace. Molten iron and slag pours through the tap hole into the trough. The iron and slag is separated and then flows through runners in the casthouse floor. The runners are covered to minimize emissions. The runners direct the iron to a spout where the iron is poured into an iron ladle. The iron ladle is transported via train to the steel shop for conversion to steel. This process is called casting.

The molten slag flows through slag runners and is directed to a pit. While in the pit the slag is cooled using a water spray. Cooled slag is loaded via front-end loader to a truck and shipped off-site as a by-product material.

2.4 BLAST FURNACE GAS COMBUSTION

BFG has a low heat content ranging from under 60 to more than 100 British thermal units per standard cubic foot of gas (Btu/scf). At the Facility, BFG is permitted to be combusted in the Blast Furnace Stoves (BF Stoves), Boilers 1 through 12, and the BFG Flare. Any BFG the Facility is unable to combust for usable heat in the BF Stoves or Boilers is combusted in the BFG Flare. The Facility does not store or ship BFG off-site.

The BFG collected at the top of the blast furnaces is piped to a dust catcher and a gas cleaning system to remove particulate from the BFG. The Blast Furnace Permits (IEPA Nos. 72080034 and 72080036) require the dust removal system remove particulate to less than 0.01 grains per dry standard cubic foot (gr/dscf). After the bulk of the dust is removed, the BFG is piped to the combustion devices described previously to be used as a fuel or to be flared.

2.5 BASIC OXYGEN FURNACE SHOP

Molten iron is transferred via railcars to the Basic Oxygen Furnace Shop (BOF Shop) for conversion to steel. Once the molten iron arrives at the BOF Shop, it is transferred from the railcars to ladles at the hot metal reladling station. From there, molten iron is desulfurized at the desulfurization station and slag in skimmed at the skimming station. After slag skimming, the iron is poured into the BOF for conversion to steel. An electrostatic precipitator controls emissions from the BOF during the conversion of iron to steel.

Once the BOF process is complete, molten steel is transported to the casters for casting into steel slabs. Slabs are then cooled and allowed to stand until needed for conversion into steel sheet coils at the Hot Strip Mill.

2.6 HOT STRIP MILL

At the Hot Strip Mill, slabs are heated in direct-fired slab reheat furnaces to proper rolling temperature. Once heated, the slabs are reduced in thickness in the rolling mill until they are long flat strips of sheet steel. At the end of the hot strip mill the steel sheets are coiled for storage. Coils of steel can be sent for finishing or can be sold unfinished.

2.7 PROPOSED PROJECTS

In this application, U.S. Steel Corporation proposes to make several changes at the Facility in conjunction with the GECC facility development. These changes will include the following projects:

1. Shutdown of Boilers 1 through 10
2. Construction of an additional BFG Flare
3. Construction of a Coke Oven Gas Desulfurization System
4. Installation of Low NO_x burners in the Hot Strip Slab Furnaces

5. Permanent Shutdown of the No. 6 Galvanizing Line
6. Replacement of the NG fired Coke Oven Gas Booster Pump #4 with an electric pump
7. Addition of certain sections of city streets to the roadway dust-sweeping program in the Facility's Fugitive Dust Control Plan

Each of these projects is discussed briefly in the paragraphs below.

2.7.1 Shutdown of Boilers 1 through 10

The shutdown of Boilers 1 through 10 is possible as a result of the steam production capabilities of the planned cogeneration facility (BFG boiler, GECC heat-recovery coke oven battery and the steam turbine generator) and the steam supply agreements between GECC and the Facility. Boilers 1 through 10 are currently permitted to combust BFG, COG, NG, and fuel oil. Although fuel oil has not been combusted in Boilers 1 through 10 for several years, BFG, COG, and NG are fired in the boilers regularly. As a result, shutdown of the boilers will change the profile of fuel consumption at the Facility.

Boiler shutdown will require BFG and COG previously consumed in these boilers to be consumed elsewhere in the facility. Overall BFG and COG fuel use will not be affected by the project as the Facility consumes all BFG and COG fuels it produces either in process or fuel combustion units or in flares. Natural gas consumed in Boilers 1 through 10 will not be shifted to other units and natural gas consumption by the Facility will be reduced proportionally. COG fuel will be shifted from these boilers to other units that utilize COG such as the slab furnaces. The Facility has not fired fuel oil in the boilers for several years due to economic considerations.

2.7.2 Construction of an Additional BFG Flare

Because BFG combustion at the boilers will be reduced as a result of the boiler shutdowns, BFG combustion at other units at the Facility will change. In a separate application, the Facility is applying for a permit to construct a BFG fired boiler to be included as part of a Cogeneration Facility. That boiler will utilize BFG previously consumed at Boilers 1-10. Despite the addition of the BFG Boiler in the Cogeneration Facility, BFG combustion at the BFG flare will increase during Cogeneration Facility downtime. Because BFG is already consumed to the maximum extent possible at the BF Stoves, flaring is the only viable option for the excess of BFG. The Facility BFG flaring is expected to exceed the capacity of its current BFG flare under certain circumstances

such as Cogeneration Facility Boiler maintenance outages. Therefore, the Facility will require an additional BFG flare in order to handle BFG overflows during these times.

2.7.3 Construction of a Coke Oven Gas Desulfurization System

A COG desulfurization system will be installed which will remove hydrogen sulfide from the COG fuel stream after processing in the by-products plant. The COG desulfurization system will consist of a packed tower amine unit that will absorb H_2S, HCN, and CO_2 from the COG and discharge desulfurized COG. The system will then strip these acid gases from the amine solution and they will go through an HCN destruct unit. The HCN destruct unit will convert the HCN in the acid gases to ammonia by controlled hydrolysis and oxidation reaction to minimize corrosion. Further processing of the acid gases occurs in a Claus unit that converts H_2S to elemental sulfur. Gases exiting the Claus unit will be directed through a thermal destruct unit where the remaining sulfur compounds are oxidized and emitted as SO_2. A flow diagram of the COG desulfurization system is included as Figure 2-1.

2.7.4 Installation of Low NO_x Burners in the Hot Strip Slab Furnaces

The Facility will install low NO_x burners on the existing slab furnaces reducing NO_x emissions during the combustion of both natural gas and COG. New low NO_x burners will be used in furnace zones, which burn natural gas alone, as well as furnace zones that burn COG and NG. In addition, due to Boilers 1 through 10 shutdown, COG previously burned in the boilers will need to be shifted to the slab furnaces. This will result in additional COG NO_x reductions, as the fuel will be shifted from higher NO_x burners in the boilers to lower NO_x burners in the slab furnaces.

2.7.5 Permanent Shutdown of the No. 6 Galvanizing Line

The Facility will permanently shutdown the No. 6 Galvanizing Line which has been on standby operations for the last few years. This operational change will result in the elimination of natural gas combustion sources at the Facility.

2.7.6 Replacement of the NG Fired Coke Oven Gas Booster Pump No. 4 with an Electric Pump

The Facility will also replace the existing No. 4 COG booster pump with an electric pump. The No. 4 booster is a natural gas fired 800-hp pump used to pressurize COG for

transfer to COG combustion sources in various areas of the Facility. This replacement project will eliminate all emissions from the booster pump and eliminate the need to meet new federal and proposed state emission standards for existing reciprocating internal combustion engines.

2.7.7 Addition of Certain Sections of City Streets to the Roadway Dust Sweeping Program in the Facility Fugitive Dust Control Plan

The Facility will increase its roadway dust-sweeping program to include portions of truck routes serving the Facility. The roadways have been chosen because of their proximity to the Facility, use as truck routes, moderate to high traffic counts, and observations of silt loadings on the streets during normal operations. It is anticipated that the vacuum sweeping or flushing of these streets on a regular basis will reduce fugitive dust emissions in the Granite City area substantially. The street segments identified for the city street vacuum sweeping/flushing program are shown on Figure 2-2 and detailed in Table 2-1 below.

The above described projects will result in contemporaneous changes in emissions that have been accounted for in the netting analysis in the permit application for the GECC facility. These emission changes are detailed in Section Three.

Table 2-1: City Roads Proposed for Vacuum Sweeping Program

Road	Segment Boundaries	ADT	Segment Length (mile)
Rock Road	Rte 3 & West 20th St. (Railroad Overpass approach)	6300	0.307
West 20th	Rte 3 & Rock Road	2400	0.495
Rock Road	West 20th and Benton St. (Railroad Overpass)	9800	0.411
Benton St.	Rock Rd. and Niedringhaus	1900	0.050
Niedringhaus	Benton and 16th St.	6800	0.192
16th Street	Niedringhaus & Madison	1200	0.587
Madison Ave	16th & 20th	10900	0.477
20th Street	Madison & Gate	8550	0.368
20th Street	Gate & 203	7450	0.345
21st Street	203 and 23rd St.	3000	0.492
Edwardsville Rd (203)	20th & McCambridge Ave (203)	18000	0.764
McCambridge Ave (203)	Edwardsville Rd (203) & 2nd St.	20580	0.422
Edwardsville Rd (203)	20th & Nameoki Rd (203)	13200	0.926
Route 162	Nameoki Rd (203) & Railroad Tracks	12400	0.635
		Distance To Sweep:	6.471

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3.1 AFFECTED EMISSION UNITS

This application includes estimates of emission changes from several process changes at the Facility. The process changes will include the following sources as described in Section 2.7.

- Combustion Sources
  - Boilers 1 through 10 (shutdown)
  - Blast Furnace Gas Flare (New Unit)
  - No. 4 COG Booster Pump (shutdown)
  - Slab Furnaces (NO_x reductions)
  - No. 6 Galvanizing Line heaters (shutdown)
- Process Sources
  - Coke Oven Gas Desulfurization (affects SO_2 and PM_{10} from all COG combustion sources).

In addition, the application includes estimates of emission reductions resulting from the addition of certain portions of truck routes to the roadway-sweeping program.

BFG Combustion emissions are analyzed in the Cogeneration Facility BFG Boiler application being submitted separately. Emission estimates for BFG combustion have not been included in this application. The Facility is permitted to combust all BFG it can produce in combustion units or in the BFG Flare. The addition of a second BFG Flare will not have any effect on emissions from the combustion of BFG or any other fuel. The amount of BFG combusted at the Facility will not be affected by any of the projects proposed in this application. It is expected that the Facility may flare more BFG during certain periods of time than was the practice in the past; however, this will not result in any change in emissions from BFG combustion. As a result, BFG combustion emissions from Boilers 1 through 10 and the proposed flare have not been included in the net emission change calculations below.

3.2 EMISSION FACTORS

The paragraphs below detail the development of the emission factors used for the determination of emission reductions resulting from the projects proposed in this application.

3.2.1 Natural Gas Emission Factors

Emission factors for natural gas combustion at the boilers and galvanizing line heaters are taken from the most recent version of AP-42 Section 1.4 except for the NO_x value. The NO_x emission factor is based on a 1992 stack test at Boiler No. 12 (included in Appendix C). The emission factors for natural gas combustion in Boilers 1 through 10 and the No. 6 Galvanizing Line heaters are shown in Table 3-1 below.

Baseline emission factors for the combustion of natural gas in the slab furnaces are taken from the most recent version of AP-42 Section 1.4 except for the NO_x value. The slab furnaces (1-4) baseline NO_x emission factor is based on a stack test of No. 4 slab furnace.

Table 3-1: Natural Gas Emission Factors

Equipment	Emission Factors (lbs./MMBtu)						
	CO	NO_x	PM	PM_{10}	$PM_{2.5}$	SO_x	VOM
Boilers 1-10	0.0824	0.306	0.0075	0.0075	0.0075	0.0006	0.0054
No. 6 Line Heaters	0.0824	0.306	0.0075	0.0075	0.0075	0.0006	0.0054
Slab Furnaces 1-4 (Baseline)	0.0824	0.393	0.0075	0.0075	0.0075	0.0006	0.0054
Slab Furnaces 1-3 (Low NO_x)	0.0824	0.0867	0.0075	0.0075	0.0075	0.0006	0.0054
Slab Furnaces 4 (Low NO_x)	0.0824	0.2072	0.0075	0.0075	0.0075	0.0006	0.0054

Slab furnace low NO_x emission factors are based on engineering evaluations of the slab furnaces by Bloom Engineering and the proposed use of the Bloom Series 1500 and 1610 burners. The low NO_x emission factors are Bloom Engineering's guaranteed emission rates for those burners under the operating conditions identified during the engineering evaluation.

3.2.2 Coke Oven Gas Emission Factors

COG combustion emission factors for PM are based on stack testing performed at the Facility and the expected reductions in COG H_2S levels resulting from desulfurization. Stack test results are included in Appendix C. Pre-desulfurization emission factors for SO_x are based on average H_2S concentrations of 303.3 grains per 100 scf of COG during 2000 and 2001 as measured for the SO_2 FESOP.

The post-desulfurization emission factors for SO_x are based on an average H_2S concentration of 25 grains per 100 scf of COG as guaranteed by the unit's vendor. Post-desulfurization particulate matter emission factors were estimated by multiplying the ratio of H_2S concentration during particulate matter testing and the concentration of H_2S expected in the future case by the sulfate and sulfuric acid portions of the particulate matter sampled during testing. The particulate matter and SO_x emission factors are shown below in Table 3-2.

Table 3-2: Pre and Post Desulfurization COG Combustion Emission Factors

Fuel	Emission Factors (lbs./MMscf)			
	PM	PM_{10}	$PM_{2.5}$	SO_x
COG Combustion (pre-desulfurization)	71.6	71.6	71.6	807
Desulfurized COG Combustion	42.96	42.96	42.96	67.25

Notes: PM_{10} emission factors for COG combustion include both filterable and condensable particulate fractions.
Desulfurized COG Combustion SO_x factor assumes 25 grains H_2S per 100 scf of COG.

No changes to emissions of NO_x, CO, or VOM are expected as a result of the desulfurization project. The desulfurization system is a pollution control system that removes hydrogen sulfide directly from the fuel prior to combustion. The removal of hydrogen sulfide from the fuel will reduce particulate matter emissions, in addition to SO_x emissions, by reducing sulfates and sulfuric acid mist. Although the system will remove some nitrogen in the form of hydrogen cyanide, the affect on NO_x emissions is believed to be insignificant at this time.

Emissions of NO_x from the combustion of COG at the slab furnaces will be affected by the installation of the low NO_x burners on those units. The baseline COG NO_x emission factor for the slab furnaces was calculated based on a NG stack test on No. 4 furnace and two stack tests on No. 12 Boiler (NG and COG). The COG NO_x factor assumes the ratio of COG to NG NO_x emissions is the same at the slab furnaces as it is at the boilers. Slab Furnace COG combustion NOx emission factors are shown in Table 3-4 below.

Slab furnace low NO_x emission factors for COG combustion are based on engineering evaluations of the slab furnaces by Bloom Engineering and the proposed use of the Bloom Series 1500 and 1610 burners. The low NO_x emission factors are Bloom Engineering's guaranteed emission rates for those burners under the operating conditions identified during the engineering evaluation.

Table 3-3: Slab Furnace NO_x Emission Factors for COG Combustion

Equipment	NO_x Emission Factors (lbs/MMBtu)
Slab Furnaces 1-4 (Baseline)	0.563
Slab Furnaces 1-3 (Low NO_x)	0.310
Slab Furnaces 4 (Low NO_x)	0.358
Boiler 1-10	0.43

3.2.3 Reciprocating Internal Combustion Engine Emission Factors

Emission factors for the No. 4 COG booster pump are based on US EPA emission factors in Table 3.2-3 of Section 3.2 of AP-42. The emission factors are for stationary internal combustion engines and are for 4-stroke rich burn NG fired engines. The emission factors are shown below in Table 3-3.

Table 3-4: NG Fired Reciprocating Internal Combustion Engine Emission Factors

Emission Factors (lbs./MMBtu)						
CO	NO_x	PM	PM_{10}	$PM_{2.5}$	SO_x	VOM
3.51	2.3	0.019	0.019	0.019	0.0006	0.0296

3.2.4 Street Sweeping Program Fugitive Road Dust Emission Factors

The fugitive road dust emission factors used for the city street vacuum sweeping program emission reduction estimates are based on the methodology and information in the USEPA's AP-42 Section 13.2.1 Paved Roads. The emission factor estimation method USEPA proposes in their Paved Roads section of AP-42 is based on the predictive emission factor equation shown below.

$$E=k * (sL/2)^{0.65} * (w/3)^{1.5} * (1- P/(4*N)$$

Where:

E = Annual Average Size Specific Particulate Emission Factor (lbs/vehicle mile traveled)
k = particle size multiplier (lbs/vehicle mile traveled)
sL = road surface silt loading (g/m^2)
w = Average weight (tons) of the vehicles travelling the road
P = Average number of precipitation days in each year
N = 365 days per year

The particle size multipliers used for the emission estimates in this application are the multiplier from Table 13.2.1-1. The PM_{10} multiplier used from this table was 0.016 lbs/vehicle mile traveled.

The road surface silt loading values used were based on the default values given in Table 13.2.1-3 and were based on average daily traffic data for each road segment obtained from the Illinois Department of Transportation with a slight modification. For each industrial entrance or exit on a road segment, the silt loading value was assumed to be the higher value from the next lower average daily traffic category. AP-42 recommends that in lieu of increasing silt loading

values, six miles be added to the road segment length for each trackout point. However, this method was developed for countywide estimates, and is inconsistent with the predictive equation. The predictive equation shows that emissions on a per mile traveled basis are proportional to silt loading. Since trackout areas result in increased silt loading, it follows that silt loading should be increased in the equation for trackout areas. The method utilized in this application accounts for the increased silt loading on roads where industrial traffic enters each road segment.

The average weight of vehicles travelling each road segment were based on the average vehicle weights (4.3 tons) used by IEPA for the Madison County fugitive road dust emission estimates as provided by Sam Long of the IEPA. These average vehicle weights were adjusted upwards for the increased number of transport trucks entering and exiting the Granite City Works. Because these emission factors are for truck routes, a disproportionate number of semi trailers travel the road segments modeled as compared to the average county road. To account for this, typical truck volumes and gross vehicular weights (empty and loaded) for transport trucks serving the Granite City Works were weighted into the county average weights based on typical average daily traffic volumes for each road segment. For these emission factor estimates, average vehicle weights increased to from 4.4 tons to 6.4 tons for some road segments.

The average number of precipitation days used was 110 days based on the information contained in Section 13.2.1 of AP-42 Figure 13.2.1-2 for the St. Louis Region.

These emission factor calculations for each road segment in the road sweeping program are detailed in Table 3-5 below.

Table 3-5: Road Segment Specific Fugitive Road Dust Emission Factor Calculations

Road	Segment Boundaries	ADT	Average Weight (tons)	Silt Loadings (g/m2)	PM-10 Emission Factor (lb/VMT)
Rock Road	Rte 3 & West 20th St. (Railroad Overpass approach)	6300	6.357	0.060	0.00424
West 20th	Rte 3 & Rock Road	2400	6.357	0.200	0.00978
Rock Road	West 20th and Benton St. (Railroad Overpass)	9800	6.357	0.060	0.00424
Benton St.	Rock Rd. and Niedringhaus	1900	6.357	0.200	0.00978
Niedringhaus	Benton and 16th St.	6800	6.357	0.060	0.00424
16th Street	Niedringhaus & Madison	1200	6.357	0.600	0.02043
Madison Ave	16th & 20th	10900	5.362	0.060	0.00318
20th Street	Madison & Gate	8550	5.737	0.200	0.00832
20th Street	Gate & 203	7450	5.993	0.600	0.01867
21st Street	203 and 23rd St.	3000	4.400	1.000	0.01631
Edwardsville Rd (203)	20th & McCambridge Ave (203)	18000	4.400	0.200	0.00545
McCambridge Ave (203)	Edwardsville Rd (203) & 2nd St.	20580	4.387	0.200	0.00542
Edwardsville Rd (203)	20th & Nameoki Rd (203)	13200	5.274	0.200	0.00729
Route 162	Nameoki Rd (203) & Railroad Tracks	12400	4.364	0.060	0.00222

3.3 PROJECT SPECIFIC EMISSION REDUCTION CALCULATIONS

Net emissions changes have been calculated for each of the projects in this application in accordance with the requirements of 35 IAC 203.208 and 35 IAC 203.302. Baseline actual emissions have been calculated using each unit's actual annual average production rate for the 24 months ending December 31, 2001 in accordance with the definition of actual emissions in 35 IAC 203.104.

Baseline actual emissions were not calculated based on the most recent 24-month period because of outages in 2004 and 2005 and reduced operations related to the bankruptcy of National Steel and sale of the National Steel assets to US Steel in 2002 and 2003.

In 2005, "A" Blast Furnace was down for maintenance for 110 days resulting in reduced production rates for the Facility for 2005. In 2004, "B" Blast Furnace was down for maintenance for 41 days resulting in reduced production rates for the Facility for 2004. In 2002, National Steel, former owner and operator of the Facility, declared bankruptcy. The bankruptcy and sale of the National Steel assets resulted in abnormal operations for both 2002

and 2003. As a result, the Facility proposes to utilize production data from 2000 and 2001 as being most representative of normal source operation.

3.3.1 Boilers 1 through 10 Shutdown Emission Calculations

Boilers 1 through 10 burn BFG, COG, and NG to produce steam. Shutdown of these boilers will result in a reduction of the NG combusted at the facility. The emissions calculations in this section detail the reduction in NG emissions occurring as a result of the Boiler 1-10 shutdown.

As discussed in Section 2.7.1, the boiler shutdowns will not result in any change in the amount of BFG or COG combusted at the Facility. BFG combusted in Boilers 1 through 10 will be shifted to other units including the BFG Flare (Section 3.3.2) and the Cogeneration Boiler being permitted under a separate application. COG combusted in Boilers 1 through 10 currently will also be shifted to other combustion units already combusting COG including the slab furnaces. Therefore, the only reduction in COG combustion emissions that will result directly from the shutdown of Boilers 1 through 10 will be the reduced NO_x emission as a result of the low NO_x burners on Furnaces 1 through 4.

Actual emissions from natural gas combustion at Boilers 1 through 10 for the 24-month period ending December 31, 2001 are calculated in Table 3-6 below. The baseline actual NG emissions are based on the emission factors detailed in Section 3.2.1 and shown in Table 3-1, and the average 2000 and 2001 throughput of 222,755.5 million Btus per year. Throughputs for the 2000 and 2001 base years are included in Appendix D.

Table 3-6: Average Actual Emissions for Boilers 1-10

Unit	NG Usage (MMBtu/yr)	Baseline Emissions (Tons per Year)						
		CO	NO_x	PM	PM_{10}	$PM_{2.5}$	SO_x	VOM
Boilers 1-10 NG Combustion	222,755.5	9.17	33.41	0.83	0.83	0.83	0.07	0.60

The future emissions case for the Boilers 1 through 10 shutdown assumes the boilers are shutdown and no NG or any other fuel is consumed by the Boilers 1 through 10. Therefore, the future case for Boilers 1 through 10 is zero emissions.

Because the baseline actual emissions exceed the future case emissions for the boiler shutdowns, the project will result in a net emission decrease. The net decrease in emissions is the amount by which the future case emissions are exceeded by the baseline actual emissions. This calculation is shown in Table 3-7 below.

Table 3-7: Boilers 1-10 Net Emissions Reduction Calculation

Unit	Net Emissions Calculation (Tons per Year)						
	CO	NO_x	PM	PM_{10}	$PM_{2.5}$	SO_x	VOM
Boilers 1-10 NG Combustion Actuals	9.17	33.41	0.83	0.83	0.83	0.07	0.60
Boilers 1-10 Future Case	0	0	0	0	0	0	0
Reductions from Boilers 1-10 (Actuals – Future Case)	9.17	33.41	0.83	0.83	0.83	0.07	0.6

3.3.2 BFG Flare Project Emission Calculations

The construction of an additional BFG flare will not result in any increase or decrease in emissions. The flare will only consume BFG and will not affect BFG emissions at the Facility. BFG production is independent of fuel needs and is proportional only to blast furnace production. The construction of the flare allows the Facility to combust all excess BFG during periods when the proposed Cogeneration Facility BFG Boiler experiences reduced operations.

3.3.3 COG Desulfurization Project Emission Calculations

Baseline actual emissions from COG combustion have been calculated for particulate matter and SO_x. Baseline actual emissions from COG combustion for the COG desulfurization project have not been calculated for CO, NO_x, or VOM because emissions of these pollutants are not expected to be significantly affected by the COG desulfurization project and COG production has not been affected by any of the proposed projects. Baseline actual emissions from COG combustion for particulate matter and SO_x are based on the annual average COG production from the 24-month period ending December 31, 2001 and the emission factors for particulate matter and SO_x detailed in Section 3.2 and shown in Table 3-2. COG combustion baseline actual emissions are shown in Table 3-8 below.

Table 3-8: Average Actual Emissions for COG Combustion

Unit	COG Production (MMBtu/yr)	Baseline Emissions (Tons per Year)			
		PM	PM_{10}	$PM_{2.5}$	SO_x
All COG Combustion units	4,971,685	317.83	317.83	317.83	3620.44

The future emissions case for the COG desulfurization system assumes the COG desulfurization system operates for 47 weeks per year and is down for maintenance or repairs for five weeks per year. Based on the Facility's experience with similar systems at other integrated mills, the Facility believes the five weeks of downtime is a reasonable estimate of the operational and maintenance requirements of the system.

Additionally, the Facility estimates that the COG production at the facility will average approximately 25 million cubic feet per day annually. The desulfurization system will be capable of desulfurizing between 16 and 31.2 million cubic feet per day of COG, however, annual average COG production is estimated at 25 million cubic feet per day or 9,125 million cubic feet per year based on the Facility operating history.

During the 47 weeks of operation, the desulfurization unit is estimated to produce approximately 8,250 million cubic feet of sweet COG. The desulfurization unit will be capable of reducing the H_2S concentration in the COG down to an average of 25 grains per 100 dry standard cubic feet of COG. During downtime, H_2S concentration has been estimated based on a maximum of 451 grains H_2S per 100 dry standard cubic feet of COG. Downtime will result in 35 days and up to 875 million cubic feet of undersulfurized COG production at that H_2S level.

The COG desulfurization system has two COG burners in the system that will utilize sweet (desulfurized) COG as a primary fuel and NG as a backup fuel. One burner is located in the thermal oxidizer unit and has a maximum thermal output of 1.8 million Btu per hour. The second burner supplies heat to the hot oil system and has a maximum thermal output of 1.2 million Btu per hour. These burners will not affect the amount of COG combusted at the Facility. The Facility combusts all the COG it produces regardless of how many units are capable of combusting COG.

Emissions from the COG desulfurization unit exit the thermal oxidizer stack and a second smaller stack for the hot oil heater burner. There are no emissions from these stacks when the COG unit is offline.

Therefore, the future emissions case includes the reduced PM and SO_2 emissions from the COG combustion stacks (including the hot oil heater) for 47 weeks each year. The future emissions case also includes emissions from the incinerator stack during desulfurization unit operation. Added to the desulfurization unit operational emissions are the emissions from COG combustion stacks for the five weeks of annual downtime.

Emissions of PM and SO_2 resulting from COG combustion for the 47 weeks (330 days) of COG desulfurization unit operation assume 25 grains of H_2S per 100 scf of COG. This H_2S level is the design value for the desulfurization system and was used to develop the PM and SO_x emission factors in Table 3-2 in Section 3.2. Emissions of PM and SO_2 from COG combustion during desulfurization system downtime are based on 451 grains of H_2S per 100 scf of COG as

shown in Table 3-2 for the pre-desulfurization emission factors. Emissions from the thermal oxidizer stack on the COG desulfurization unit are based on 24 grains of H_2S per 100 scf of COG cleaned for the 47 weeks of operation of this unit. Thermal oxidizer stack emissions of PM are based on the measured ratio of 12.11 lbs. of SO_2 per lb. of PM. Emissions calculations for the future case of PM and SO_2 emissions are detailed in Table 3-9 below.

Table 3-9: Future Case Emissions for COG Combustion

Unit	COG Production (MMscf/yr)	Proposed Emissions (Tons per Year)			
		PM	PM_{10}	$PM_{2.5}$	SO_x
COG Combustion Units during Desulfurization	8,250	177.21	177.21	177.21	277.31
COG Combustion Units during downtime	875	47.55	47.55	47.55	530.59
Thermal Oxidizer Emissions	8,250	22.00	22.00	22.00	266.22
Totals		**246.76**	**246.76**	**246.76**	**1074.12**

Because the baseline actual emissions exceed the future case emissions for the COG desulfurization project, the project will result in a net emission decrease. The net decrease in emissions is the amount by which the future case emissions are exceeded by the baseline actual emissions. This calculation is shown in Table 3-10 below.

Table 3-10: COG Desulfurization Net Emissions Reduction Calculation

Unit	Net Emissions Calculation (Tons per Year)						
	CO	NO_x	PM	PM_{10}	$PM_{2.5}$	SO_x	VOM
COG Combustion Units Actuals			317.83	317.83	317.83	3620.44	
COG Combustion Future Case			246.76	246.76	246.76	1074.12	
Reductions from COG Desulfurization (Actuals – Future Case)			71.07	71.07	71.07	2546.32	

3.3.4 Installation of Low NO_x Burners on the Hot Strip Furnaces Emission Calculations

The installation of low NO_x burners on the Hot Strip Furnaces will reduce NO_x emissions from the combustion of NG and COG at the Hot Strip. The change to low NO_x burners will not result in an increase or decrease in production of slabs, or in the fuel requirements at the hot strip slab furnaces. As such only NO_x emissions are affected by this project and the only pollutant for which calculation of the change in emissions has been performed. Baseline actual emissions from combustion of these fuels at the Hot Strip was based on the annual average use of these fuels at the Hot Strip Slab Furnaces for the 24-month period ending December 31, 2001 and the emission factors for the Hot Strip Slab Furnaces detailed in Section 3.2.1 and 3.2.2.

In addition, baseline actual NOx emissions include emissions for a portion of the COG combusted at Boilers 1 through 10 because the shutdown of Boilers 1 through 10 will result in

the transfer of COG from Boilers 1 through 10 to the hot strip slab furnaces. The baseline emissions therefore include 73% of the COG combusted at Boilers 1 through 10 during the baseline period because this gas will be transferred from the higher NO_x emission burners on the Boilers to the low NO_x burners proposed for the Hot Strip Slab Furnaces.

Table 3-11 shows the baseline actual emissions calculations for the Hot Strip Slab Furnaces.

Table 3-11: Baseline NO_x Emissions Calculations for the Hot Strip Slab Furnaces

Emission Unit and Fuel	2-year Average Fuel Consumption (MMBtu/yr)	Baseline NO_x Emissions (tpy)
Slab Furnaces 1-4 (NG)	4,437,922	872.05
Slab Furnaces 1-4 (COG)	830,571	233.81
Boilers 1-10* (COG)	977,015	153.34
	Total Baseline NO_x Emissions	1259.20

Note: Boilers 1-10 (COG) Baseline NO_x emissions based on 73% of the 2-year Average Fuel Consumption for the baseline period. The remaining 27% of COG is assumed to be transferred to other COG combustion units.

Based on the information in Table 3-11, the COG combustion baseline fuel consumption used for the Hot Strip Slab Furnace Low NO_x project is equal to 1,543,791 MMBtu/yr. This COG consumption rate is based on 73% of the COG combusted in Boilers 1-10 during the baseline period and 100% of the COG combusted in the Slab Furnaces during the baseline period.

Future NO_x emissions for the Hot Strip Slab Furnace Low NO_x project are based on US Steel's best engineering estimate of projected fuel use at the Hot Strip. Maximum COG usage in the furnaces, based on projected availability of COG was assumed to represent maximum NO_x emission. The remainder of the fuel requirement and the resulting NO_x emissions are based on natural gas, the NG requirements for the Hot Strip Slab Furnaces will be 4,747,462 MMBtu per year and the COG requirements for the Hot Strip Slab Furnaces will be 2,421,388 MMBtu per year.

Comparing the projected COG requirements for the Hot Strip Slab Furnaces to the amount of COG used for the baseline COG consumption rate the baseline COG consumption rate is 877,597 MMBtu per year less than the projected COG requirements. This supports the assumption of 73% of the COG consumed at Boilers 1 through 10 being used at the Hot Strip Slab Furnaces is biased low. At maximum production, US Steel projects the Hot Strip Slab

Furnaces will require more than 100% of the available COG from the Boilers 1 through 10 shutdown.

Future projected NO_x emissions calculations are detailed in Table 3-12 below.

Table 3-12: Hot Strip Future NO_x Emission Calculation

Furnace Identification	NG (MMBtu/year)	COG (MMBtu/yr)	NO_x (tons/yr)
1-3	2,918,967	2,043,944	443.39
4	1,828,794	377,444	256.95
		Projected Future NO_x	**700.35**

Because the baseline actual emissions exceed the future case emissions for the Hot Strip Slab Furnace Low NO_x Burner project, the project will result in a net emission decrease. The net decrease in emissions is the amount by which the future case emissions are exceeded by the baseline actual emissions. This calculation is shown in Table 3-13 below.

Table 3-13: Hot Strip Slab Furnace Low NO_x Burner Net Emissions Reduction Calculation

Unit	NO_x (Tons per Year)
Hot Strip Slab Furnace Actuals	1259.20
Hot Strip Slab Furnace Future Emissions	700.35
Reductions from Low NO_x Burner Project (Actuals – Future Case)	558.85

3.3.5 Permanent Shutdown of No. 6 Galvanizing Line Emission Calculations

The No. 6 Galvanizing Line uses NG to heat the galvanizing pots. The line has been on standby operations for several years. Permanent shutdown of this line will result in a reduction of the NG combusted at the facility. The emissions calculations in this section detail the reduction in NG emissions occurring as a result of the galvanizing line shutdown.

Actual emissions from natural gas combustion at the No. 6 Galvanizing Line for the 24-month period ending December 31, 2001 are calculated in Table 3-14 below. The baseline actual NG emissions are based on the emission factors detailed in Section 3.2.1 and shown in Table 3-1, and the throughputs from the last 24 months of continuous operation prior to placement on standby operations of 119,312.50 million Btus per year. Throughputs for the 2000 and 2001 base years are included in Appendix D.

Table 3-14: Average Actual Emissions for No. 6 Galvanizing Line

Unit	NG Usage (MMBtu/yr)	Baseline Emissions (Tons per Year)						
		CO	NO_x	PM	PM_{10}	$PM_{2.5}$	SO_x	VOM
#6 Galvanizing Line	230,296	9.48	35.24	0.86	0.86	0.86	0.07	0.62

The future emissions case for the No. 6 Galvanizing Line shutdown assumes the line is permanently shutdown and no NG or any other fuel is consumed by the galvanizing pots. Therefore, the future case for No. 6 Galvanizing Line is zero emissions.

Because the baseline actual emissions exceed the future case emissions for the No. 6 Galvanizing Line shutdowns, the project will result in a net emission decrease. The net decrease in emissions is the amount by which the future case emissions are exceeded by the baseline actual emissions. This calculation is shown in Table 3-15 below.

Table 3-15: No. 6 Galvanizing Line Net Emissions Reduction Calculation

Unit	Net Emissions Calculation(Tons per Year)						
	CO	NO_x	PM	PM_{10}	$PM_{2.5}$	SO_x	VOM
No. 6 Galvanizing Line NG Combustion Actuals	4.91	18.25	0.44	0.44	0.44	0.04	0.32
No. 6 Galvanizing Line Future Case	0	0	0	0	0	0	0
Reductions from No. 6 Galvanizing Line Shutdowns (Actuals – Future Case)	4.91	18.25	0.44	0.44	0.44	0.04	0.32

3.3.6 Replacement of the NG Fired Coke Oven Gas Booster Pump No. 4 with an Electric Pump

The No. 4 COG booster pump is a NG fired reciprocating internal combustion engine. The emissions from this booster pump will be eliminated when the pump is replaced with an electric pump. The emissions calculations in this section detail the reduction in NG emissions occurring as a result of the booster pump replacement project.

Actual emissions from the No. 4 COG booster pump for the 24-month period ending December 31, 2001 are calculated in Table 3-16 below. The baseline actual emissions are based on the emission factors detailed in Section 3.2.3 and shown in Table 3-4, and the 2000 and 2001 throughput of 63,739 million Btus per year. Throughputs for the 2000 and 2001 base years are included in Appendix D.

Table 3-16: Average Actual Emissions for No. 4 COG Booster Pump

Unit	NG Usage (MMBtu/yr)	Baseline Emissions (Tons per Year)						
		CO	NO_x	PM	PM_{10}	$PM_{2.5}$	SO_x	VOM
#6 Galvanizing Line	63,769	111.91	72.38	0.62	0.62	0.62	0.02	0.94

The future emissions case for the No. 4 COG Booster Pump replacement project assumes the booster pump is permanently shutdown and replaced with an electric pump with no emissions. Therefore, the future case for No. 4 COG Booster Pump replacement project is zero emissions.

Because the baseline actual emissions exceed the future case emissions for the No. 4 COG Booster Pump replacement project, the project will result in a net emission decrease. The net decrease in emissions is the amount by which the future case emissions are exceeded by the baseline actual emissions. This calculation is shown in Table 3-17 below.

Table 3-17: No. 4 COG Booster Pump Replacement Project Net Emissions Reduction Calculation

Unit	Net Emissions Calculation(Tons per Year)						
	CO	NO_x	PM	PM_{10}	$PM_{2.5}$	SO_x	VOM
No. 4 COG Booster Pump Actuals	111.91	72.38	0.62	0.62	0.62	0.02	0.94
No. 4 COG Booster Pump Future Case	0	0	0	0	0	0	0
No. 4 COG Booster Pump Replacement Project (Actuals – Future Case)	111.91	72.38	0.62	0.62	0.62	0.02	0.94

3.3.7 Addition of Certain Sections of City Streets to the Roadway Dust Sweeping Program in the Facility Fugitive Dust Control Plan

In an effort to reduce the air quality impacts from the operations of the existing Facility and the heat-recovery coke oven battery proposed in a separate application, US Steel is proposing to add certain sections of truck routes on city streets to its regular road sweeping program. This will reduce the silt loading on the local truck routes reducing the fugitive dust emissions from trucks and personal vehicle traffic on truck routes in the vicinity of the Facility. The streets were chosen based on their proximity to the Facility and their use as truck routes for various Facility related transportation functions.

The street segments proposed for the sweeping program are shown on Figure 2-2 and detailed in Section 2.7.7. The calculation of the baseline emissions are based on road segment lengths and average daily traffic information as detailed in Table 2-1 and the emission factors detailed in Section 3.2.3. Emission reductions are based on the use of a vacuum sweeper on a weekly basis on the road segments identified in Table 2-1. Emission reductions are assumed to average 58% for road segments with silt loadings of 0.2 g/m^2 or based on the published upper limit of PM_{10} control efficiencies for industrial paved roads in Table 2-4 of USEPA's report "Control of Open Fugitive Dust Sources": (EPA 450/3/88/008). These estimates assume that the roads have higher levels of silt loadings typical of industrial roads. Emission reductions are assumed to average 37% for road segments with silt loadings less than 0.2 g/m2 based on the published

estimate of PM_{10} control efficiencies for urban paved roads in Table 2-5 of USEPA's report "Control of Open Fugitive Dust Sources"; (EPA 450/3/88/008). This assumes the roads have typical urban street levels of silt loadings.

The estimates of baseline emissions and emission reductions from the vacuum sweeping program are detailed in Table 3-18 below.

Table 3-18: Emission Reduction Calculations for the City Road Sweeping Project

Road	Segment Boundaries	ADT	Segment Length (mile)	PM-10 Emission Factor (lb/VMT)	Uncontrolled PM-10 Emissions (tpy)	Maximum Control Efficiency of Sweeping	Controlled PM-10 Emissions (tpy)
Rock Road	Rte 3 & West 20th St. (Railroad Overpass approach)	6300	0.307	0.00424	1.49525	37%	0.942
West 20th	Rte 3 & Rock Road	2400	0.495	0.00978	2.11920	58%	0.890
Rock Road	West 20th and Benton St. (Railroad Overpass)	9800	0.411	0.00424	3.11695	37%	1.964
Benton St.	Rock Rd. and Niedringhaus	1900	0.050	0.00978	0.16861	58%	0.071
Niedringhaus	Benton and 16th St.	6800	0.192	0.00424	1.00952	37%	0.636
16th Street	Niedringhaus & Madison	1200	0.587	0.02043	2.62793	58%	1.104
Madison Ave	16th & 20th	10900	0.477	0.00318	3.02197	37%	1.904
20th Street	Madison & Gate	8550	0.368	0.00832	4.77796	58%	2.007
20th Street	Gate & 203	7450	0.345	0.01867	8.75181	58%	3.676
21st Street	203 and 23rd St.	3000	0.492	0.01631	4.39473	58%	1.846
Edwardsville Rd (203)	20th & McCambridge Ave (203)	18000	0.764	0.00545	13.66737	58%	5.740
McCambridge Ave (203)	Edwardsville Rd (203) & 2nd St.	20580	0.422	0.00542	8.59322	58%	3.609
Edwardsville Rd (203)	20th & Nameoki Rd (203)	13200	0.926	0.00729	16.25969	58%	6.829
Route 162	Nameoki Rd (203) & Railroad Tracks	12400	0.635	0.00222	3.19414	37%	2.012
				Total Emissions (tons per year)	73.198		33.229
				Reduction in Emissions:			39.969

3.3.8 Summary of Emission Reduction Credit Calculations

Table 3-19 below summarizes the results of the net emission change calculations for all seven emission reduction credit projects in this application.

Table 3-19: Net Emission Reduction Summary Table

Unit (Actuals – Future Case)	Net Emission Reductions (Tons per Year)						
	CO	NO_x	PM	PM_{10}	$PM_{2.5}$	SO_x	VOM
Boilers 1-10 Shutdowns	9.17	33.41	0.83	0.83	0.83	0.07	0.6
COG Desulfurization			71.07	71.07	71.07	2546.32	
Low NO_x Burner Project		577.75					
No. 6 Galvanizing Line Shutdowns	9.48	35.24	0.86	0.86	0.86	0.07	0.62
No. 4 COG Booster Pump Replacement Project	111.91	72.38	0.62	0.62	0.62	0.02	0.94
City Road Sweeping Project			215.62	39.97	8.032		
Totals	130.56	718.78	289.00	113.35	81.41	2546.48	2.16

SECTION FOUR Regulatory Analysis

This section analyzes the federal and state air quality regulations potentially applicable to the proposed projects. It also includes those regulatory exemptions that make potentially applicable rules inapplicable. Because these projects result only in emissions decreases, Prevention of Significant Deterioration (PSD) analysis does not apply.

4.1 BOILERS 1 THROUGH 10 SHUTDOWN

The shutdown of Boilers 1 through 10 will not result in any additional applicable federal or state air quality regulations. However, for the shutdown to be federally enforceable the IEPA operating permit for Boilers 1 through 10, (Permit # 73031119) must be rescinded. Additionally, in order to make the resultant emissions decreases available for use as emission credits for the GC Coke project, the shutdown will require a change in the Production Increase Permit (Permit # 95010001). The Production Increase Permit limits NG consumption for Boilers 1 through 10, Boilers 11 and 12, the Ladle Dryers/Preheaters, the Blast Furnace Stoves and the BFG Flare to 1,346 million cubic feet per year. Since this shutdown is accounting for emission credits equal to 222,755.5 million Btu per year (218.39 million cubic feet per year) the NG limit will need to be reduced by this amount. The new Production Increase Permit limit will be 1,128 million cubic feet per year.

4.2 BFG FLARE

The installation of a second BFG Flare will not result in any newly applicable federal or state air quality regulations.

4.3 COG DESULFURIZATION SYSTEM

The installation of a COG desulfurization system will not result in any additional applicable federal air quality regulations. The system will include COG fired burners with NG as a backup fuel for the thermal oxidizer and for the hot oil heater. Because both burners are less than 10 MMBtu/hr each of these burners qualify for exemptions from otherwise applicable federal New Source Performance Standards (NSPS) and Maximum Available Control Technology (MACT) requirements.

Under 40 CFR 60 Subpart Dc New Source Performance Standards for small industrial steam generating units, 40 CFR 60.40(c)(a) defines affected sources as having a heat input greater than 10 MMBtu/hr. Although the hot oil heater fits the definition of a steam

generating unit, the heat input for this unit is less than 10 MMBtu/hr and therefore, Subpart Dc will not apply. Additionally, because the thermal oxidizer is a direct fired unit, it is not an affected source under the definition of a steam generating unit and 40 CFR 60 Subpart Dc will not apply.

Under 40 CFR 63 Subpart DDDDD National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters, the hot oil heater is defined as an affected source under the definition of a process heater in 63.7575 and under the definition of an affected source in 63.7490(a)(2). However, under 63.7506(c) new small gaseous fuel units are exempt from all requirements under Subpart DDDDD. Because the hot oil heater is fired with COG and NG and has a heat input of less than 10 MMBtu/hr, it is a small gaseous fuel unit and exempt from the requirements of Subpart DDDDD.

In addition, the burner located in the thermal oxidizer is a direct-fired unit. Direct-fired sources do not fall under the definition of a process heater under Subpart 40 CFR 63 DDDDD. Therefore, the thermal oxidizer is not an affected source under this subpart.

4.4 INSTALLATION OF LOW NO_x BURNERS IN THE HOT STRIP SLAB FURNACES

The installation of a Low NOx Burners in the Hot Strip Slab Furnaces will not result in any newly applicable federal or state air quality regulations.

4.5 PERMANENT SHUTDOWN OF THE NO. 6 GALVANIZING LINE

The shutdown of the No. 6 Galvanizing Line will not result in any newly applicable federal or state air quality regulations. However, for the shutdown to be federally enforceable the IEPA operating permit for the No. 6 Galvanizing Line, (Permit # 72080040) must be revised to reflect the permanent shutdown of the emission unit.

4.6 REPLACEMENT OF THE NG FIRED NO. 4 COG BOOSTER PUMP WITH AN ELECTRIC PUMP

The replacement of the NG fired NO. 4 COG Booster Pump will not result in any newly applicable federal or state air quality regulations.

4.7 ADDITION OF CERTAIN SECTIONS OF CITY STREETS TO THE VACUUM SWEEPING PROGRAM IN THE FUGITIVE DUST CONTROL PLAN

The vacuum sweeping of some segments of city streets to the program will require changes to the Facility's Fugitive Dust Control Plan but will not result in any newly applicable federal or state air quality regulations.

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL -- PERMIT SECTION
P.O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

FOR APPLICANT'S USE
Revision #: _____
Date: _____ / _____ / _____
Page _____ of _____
Source Designation: Boilers 1-10

FUEL COMBUSTION EMISSION UNIT DATA AND INFORMATION

FOR AGENCY USE ONLY
ID NUMBER:
EMISSION POINT #:
DATE:

SOURCE INFORMATION

1) SOURCE NAME: US Steel Corporation - Granite City Works

2) DATE FORM PREPARED:

3) SOURCE ID NO. (IF KNOWN): 119813AAI

GENERAL INFORMATION

4) NAME OF EMISSION UNIT: Boilers 1-10

5) NAME OF PROCESS: Steam Generation

6) DESCRIPTION OF PROCESS:

7) DESCRIPTION OF ITEM OR MATERIAL PRODUCED OR ACTIVITY ACCOMPLISHED: Process Steam

8) FLOW DIAGRAM DESIGNATION OF EMISSION UNIT:

9) MANUFACTURER OF EMISSION UNIT (IF KNOWN):

10) MODEL NUMBER (IF KNOWN):

11) SERIAL NUMBER (IF KNOWN):

12) DATES OF COMMENCING CONSTRUCTION, OPERATION AND/OR MOST RECENT MODIFICATION OF THIS EMISSION UNIT (ACTUAL OR PLANNED)

a) CONSTRUCTION (MONTH/YEAR): 1920s

b) OPERATION (MONTH/YEAR):

c) LATEST MODIFICATION (MONTH/YEAR):

13) DESCRIPTION OF MODIFICATION (IF APPLICABLE): Shutdown and abandon in place Boilers 1-10.

THIS AGENCY IS AUTHORIZED TO REQUIRE THIS INFORMATION UNDER ILLINOIS REVISED STATUTES, 1991, AS AMENDED 1992, CHAPTER 111 1/2, PAR. 1039.5. DISCLOSURE OF THIS INFORMATION IS REQUIRED UNDER THAT SECTION. FAILURE TO DO SO MAY PREVENT THIS FORM FROM BEING PROCESSED AND COULD RESULT IN THE APPLICATION BEING DENIED. THIS FORM HAS BEEN APPROVED BY THE FORMS MANAGEMENT CENTER.

FOR APPLICANT'S USE

APPLICATION PAGE _____

14) DOES THE EMISSION UNIT HAVE MORE THAN ONE MODE OF OPERATION? ☐ YES ☐ NO

IF YES, EXPLAIN AND IDENTIFY WHICH MODE IS COVERED BY THIS FORM (NOTE: A SEPARATE PROCESS EMISSION UNIT FORM 240-CAAPP MUST BE COMPLETED FOR EACH MODE):

15) PROVIDE THE NAME AND DESIGNATION OF ALL AIR POLLUTION CONTROL EQUIPMENT CONTROLLING THIS EMISSION UNIT, IF APPLICABLE (FORM 260-CAAPP AND THE APPROPRIATE 260-CAAPP ADDENDUM FORM MUST BE COMPLETED FOR EACH ITEM OF AIR POLLUTION CONTROL EQUIPMENT):

16) WILL EMISSIONS DURING STARTUP EXCEED EITHER THE ALLOWABLE EMISSION RATE PURSUANT TO A SPECIFIC RULE, OR THE ALLOWABLE EMISSION LIMIT AS ESTABLISHED BY AN EXISTING OR PROPOSED PERMIT CONDITION? ☐ YES ☐ NO

IF YES, COMPLETE AND ATTACH FORM 203-CAAPP, "REQUEST TO OPERATE WITH EXCESS EMISSIONS DURING STARTUP OF EQUIPMENT".

17) PROVIDE ANY LIMITATIONS ON SOURCE OPERATION AFFECTING EMISSIONS OR ANY WORK PRACTICE STANDARDS (E.G., ONLY ONE UNIT IS OPERATED AT A TIME):

Boilers to be Permanently Shutdown and abandoned in place.

OPERATING INFORMATION

18) ATTACH THE CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSION RELATED, FROM WHICH THE FOLLOWING OPERATING INFORMATION, MATERIAL USAGE INFORMATION AND FUEL USAGE DATA WERE BASED AND LABEL AS EXHIBIT 240-1. REFER TO SPECIAL NOTES OF FORM 202-CAAPP

19a) MAXIMUM OPERATING HOURS	HOURS/DAY: 0	DAYS/WEEK: 0	WEEKS/YEAR: 0	
b) TYPICAL OPERATING HOURS	HOURS/DAY: 0	DAYS/WEEK: 0	WEEKS/YEAR: 0	
20) ANNUAL THROUGHPUT	DEC-FEB(%): 0	MAR-MAY(%): 0	JUN-AUG(%): 0	SEP-NOV(%): 0

FIRING RATE INFORMATION

21a) RATED OR DESIGN HEAT INPUT CAPACITY (MILLION BTU/HR):

b) IS MORE THAN ONE FUEL FIRED AT A TIME? ☐ YES ☐ NO

IF YES, EXPLAIN:

21c) IF HEAT INPUT CAPACITY IS 100 MILLION BTU/HOUR OR GREATER, PROVIDE FURNACE VOLUME (CUBIC FEET)
NOTE: FURNACE VOLUME IS DEFINED AS THAT VOLUME BOUNDED BY THE FRONT FURNACE WALL WHERE THE BURNER IS LOCATED, THE FURNACE SIDE WATERWALL, AND EXTENDING TO THE LEVEL JUST BELOW OR IN FRONT OF THE FIRST ROW OF CONVECTION PASS TUBES.

	NATURAL GAS	FUEL OIL	COAL	OTHER
d) SINGLE FUEL (MAXIMUM - MILLION BTU/HOUR)	0	0	0	0
e) SINGLE FUEL (TYPICAL - MILLION BTU/HOUR)	0	0	0	0
f) COMBINED FUEL (TYPICAL - MILLION BTU/HOUR) (IF APPLICABLE)	0	0	0	0

NATURAL GAS FIRING

22a) CURRENT ORIGIN OF NATURAL GAS:
☐ PIPELINE (FIRM CONTRACT) ☐ BY-PRODUCT, SPECIFY ORIGIN:
☐ PIPELINE (INTERRUPTIBLE SUPPLY CONTRACT) ☐ OTHER, - SPECIFY:

b) TYPICAL HEAT CONTENT (BTU/SCF):

c) MAXIMUM CONSUMPTION	SCF/MONTH:	SCF/YEAR:
d) TYPICAL CONSUMPTION	SCF/MONTH:	SCF/YEAR:

OIL FIRING

23a) OIL TYPE (CHECK ONE):
☐ NO. 1 ☐ NO. 2 ☐ NO. 4 ☐ NO. 5 ☐ NO. 6
☐ OTHER, SPECIFY (INCLUDE GENERATOR OR SUPPLIER):

b) TYPICAL HEAT CONTENT:
☐ BTU/LB - OR - ☐ BTU/GAL

c) IS OIL USED ONLY AS A RESERVE FUEL? ☐ YES ☐ NO

d) TYPICAL SULFUR CONTENT AS FIRED (WT %):

e) TYPICAL ASH CONTENT AS FIRED (WT %):

f) MAXIMUM CONSUMPTION	GAL/MONTH:	GAL/YEAR:
g) TYPICAL CONSUMPTION	GAL/MONTH:	GAL/YEAR:

h) FIRING DIRECTION:
☐ HORIZONTAL ☐ TANGENTIAL ☐ OTHER, SPECIFY:

SOLID FUEL FIRING

*24a) SOLID FUEL TYPE (CHECK ALL THAT APPLY): ☐ SUB-BITUMINOUS COAL ☐ LIGNITE COAL ☐ BITUMINOUS COAL ☐ ANTHRACITE COAL ☐ OTHER, SPECIFY:

b) TYPICAL HEAT CONTENT AS FIRED (BTU/LB):	c) TYPICAL MOISTURE CONTENT AS FIRED (WT %):
d) TYPICAL SULFUR CONTENT AS FIRED (WT %):	e) TYPICAL ASH CONTENT AS FIRED (WT %):
f) TYPICAL FINES CONTENT (% LESS THAN 1/8 INCH).	g) IS THE COAL CLEANED? ☐ YES ☐ NO
h) HOW MUCH COAL REFUSE IS IN THE FUEL? (WT %):	

i) MAXIMUM CONSUMPTION	TON/MONTH:	TON/YEAR:
j) TYPICAL CONSUMPTION	TON/MONTH:	TON/YEAR:

k) FIRING TYPE (CHECK ONE):
☐ TRAVELING GRATE ☐ SPREADER STOKER % REINJECTION:
☐ CYCLONE ☐ PULVERIZED, TYPE (CIRCLE ONE) WET BOTTOM DRY BOTTOM
☐ HORIZONTALLY OPPOSED ☐ OTHER, SPECIFY: _____

*NOTE: IF REQUIRED, SUBMIT COPIES OF THOSE PORTIONS OF COAL SUPPLY CONTRACTS WHICH SET FORTH THE SPECIFICATIONS OF THE FUEL AND THE DURATION OF THE CONTRACT. IF THE ACTUAL FUEL FIRED IS A BLEND OF COAL, SUBMIT APPROPRIATE PORTIONS OF ALL FUEL CONTRACTS AND STATE THE MANNER BY WHICH THE FUELS ARE BLENDED AND ACTUALLY FIRED. ATTACH AND LABEL AS EXHIBIT 240-2.

OTHER FUEL FIRING

25a) OTHER FUEL FIRING

	TYPE	SUPPLIER
a)		
b)		

b) TYPICAL HEAT CONTENT (SPECIFY UNITS):	c) TYPICAL NITROGEN CONTENT AS FIRED (WT %):
d) TYPICAL SULFUR CONTENT AS FIRED (WT %):	e) TYPICAL ASH CONTENT AS FIRED (WT %):

f) MAXIMUM CONSUMPTION	(SPECIFY UNITS/MONTH):	(SPECIFY UNITS/YEAR):
g) TYPICAL CONSUMPTION	(SPECIFY UNITS/MONTH):	(SPECIFY UNITS/YEAR):

APPLICABLE RULES

26) PROVIDE ANY SPECIFIC EMISSION STANDARD(S) AND LIMITATION(S) SET BY RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT (E.G., PARTICULATE MATTER, IAC 212.206. <= 0.10 LBS/MMBTU):

REGULATED AIR POLLUTANT(S)	EMISSION STANDARD(S)	REQUIREMENT(S)

27) PROVIDE ANY SPECIFIC RECORDKEEPING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	RECORDKEEPING RULE(S)	REQUIREMENT(S)

28) PROVIDE ANY SPECIFIC REPORTING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	REPORTING RULE(S)	REQUIREMENT(S)

29) PROVIDE ANY SPECIFIC MONITORING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	MONITORING RULE(S)	REQUIREMENT(S)

30) PROVIDE ANY SPECIFIC TESTING RULES AND/OR PROCEDURES WHICH ARE APPLICABLE TO THIS EMISSION UNIT :

REGULATED AIR POLLUTANT(S)	TESTING RULE(S)	REQUIREMENT(S)

R005661

31) DOES THE EMISSION UNIT QUALIFY FOR AN EXEMPTION FROM AN OTHERWISE APPLICABLE RULE? ☐ YES ☐ NO

IF YES, THEN LIST BOTH THE RULE FROM WHICH IT IS EXEMPT AND THE RULE WHICH ALLOWS THE EXEMPTION. PROVIDE A DETAILED EXPLANATION JUSTIFYING THE EXEMPTION. INCLUDE DETAILED SUPPORTING DATA AND CALCULATIONS. ATTACH AND LABEL AS EXHIBIT 240-3, OR REFER TO OTHER ATTACHMENT(S) WHICH ADDRESS AND JUSTIFY THIS EXEMPTION.

COMPLIANCE INFORMATION

32) IS THE EMISSION UNIT IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS? ☐ YES ☐ NO

IF NO, THEN FORM 294-CAAPP "COMPLIANCE PLAN/SCHEDULE OF COMPLIANCE – ADDENDUM FOR NON COMPLYING EMISSION UNITS" MUST BE COMPLETED AND SUBMITTED WITH THIS APPLICATION.

33) EXPLANATION OF HOW INITIAL COMPLIANCE IS TO BE, OR WAS PREVIOUSLY, DEMONSTRATED:

34) EXPLANATION OF HOW ONGOING COMPLIANCE WILL BE DEMONSTRATED:

TESTING, MONITORING, RECORDKEEPING AND REPORTING

35a) LIST THE PARAMETERS THAT RELATE TO AIR EMISSIONS FOR WHICH RECORDS ARE BEING MAINTAINED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE. INCLUDE THE UNIT OF MEASUREMENT, THE METHOD OF MEASUREMENT, AND THE FREQUENCY OF SUCH RECORDS (E.G., HOURLY, DAILY, WEEKLY):

PARAMETER	UNIT OF MEASUREMENT	METHOD OF MEASUREMENT	FREQUENCY

35b) BRIEFLY DESCRIBE THE METHOD BY WHICH RECORDS WILL BE CREATED AND MAINTAINED. FOR EACH RECORDED PARAMETER INCLUDE THE METHOD OF RECORDKEEPING, TITLE OF PERSON RESPONSIBLE FOR RECORDKEEPING, AND TITLE OF PERSON TO CONTACT FOR REVIEW OF RECORDS:

PARAMETER	METHOD OF RECORDKEEPING	TITLE OF PERSON RESPONSIBLE	TITLE OF CONTACT PERSON

c) IS COMPLIANCE OF THE EMISSION UNIT READILY DEMONSTRATED BY REVIEW OF THE RECORDS? ☐ YES ☐ NO

IF NO, EXPLAIN:

d) ARE ALL RECORDS READILY AVAILABLE FOR INSPECTION, COPYING AND SUBMITTAL TO THE AGENCY UPON REQUEST? ☐ YES ☐ NO

IF NO, EXPLAIN:

36a) DESCRIBE ANY MONITORS OR MONITORING ACTIVITIES USED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE:

b) WHAT PARAMETER(S) IS(ARE) BEING MONITORED (E.G., OPACITY)?

c) DESCRIBE THE LOCATION OF EACH MONITOR (E.G., IN STACK MONITOR):

36d) IS EACH MONITOR EQUIPPED WITH A RECORDING DEVICE? ☐ YES ☐ NO

IF NO, LIST ALL MONITORS WITHOUT A RECORDING DEVICE:

e) IS EACH MONITOR REVIEWED FOR ACCURACY ON AT LEAST A QUARTERLY BASIS? ☐ YES ☐ NO

IF NO, EXPLAIN:

f) IS EACH MONITOR OPERATED AT ALL TIMES THE ASSOCIATED EMISSION UNIT IS IN OPERATION? ☐ YES ☐ NO

IF NO, EXPLAIN:

37) PROVIDE INFORMATION ON THE MOST RECENT TESTS, IF ANY, IN WHICH THE RESULTS ARE USED FOR PURPOSES OF THE DETERMINATION OF FEES, RULE APPLICABILITY OR COMPLIANCE. INCLUDE THE TEST DATE, TEST METHOD USED, TESTING COMPANY, OPERATING CONDITIONS EXISTING DURING THE TEST AND A SUMMARY OF RESULTS. IF ADDITIONAL SPACE IS NEEDED, ATTACH AND LABEL AS EXHIBIT 240-4:

TEST DATE	TEST METHOD	TESTING COMPANY	OPERATING CONDITIONS	SUMMARY OF RESULTS

38) DESCRIBE ALL REPORTING REQUIREMENTS AND PROVIDE THE TITLE AND FREQUENCY OF REPORT SUBMITTALS TO THE AGENCY:

REPORTING REQUIREMENTS	TITLE OF REPORT	FREQUENCY

(39)EMISSION INFORMATION

○ [1]ACTUAL EMISSION RATE
○ [1]UNCONTROLLED EMISSION RATE

REGULATED AIR POLLUTANT		LBS PER HOUR (LBS/HR)	TONS PER YEAR (TONS/YR)	[3]OTHER TERMS	[3]OTHER TERMS	[4]DM	ALLOWABLE BY RULE EMISSION RATE [5]RATE (UNITS)	APPLICABLE RULES	TONS PER YEAR (TONS/YR)	[2]PERMITTED EMISSION RATE RATE (UNITS)	TONS PER YEAR (TONS/YR)
CARBON MONOXIDE (CO)	MAXIMUM:	0					( )	C g			0
	TYPICAL:						( )				
LEAD	MAXIMUM:	0					( )				0
	TYPICAL:						( )				
NITROGEN OXIDES (NOx)	MAXIMUM:	0					( )				0
	TYPICAL:						( )				
PARTICULATE MATTER (PART)	MAXIMUM:	0					( )				0
	TYPICAL:						( )				
PARTICULATE MATTER <= 10 MICROMETERS (PM10)	MAXIMUM:	0					( )				0
	TYPICAL:						( )				
SULFUR DIOXIDE (SO2)	MAXIMUM:	0					( )				0
	TYPICAL:						( )				
VOLATILE ORGANIC MATERIAL (VOM)	MAXIMUM:	0					( )				0
	TYPICAL:						( )				
OTHER, SPECIFY:	MAXIMUM:						( )				
	TYPICAL:						( )				
EXAMPLE: PARTICULATE MATTER	MAXIMUM:	*5.00*	*21.9*	*0.3 GR/DSCF*		*1*	*6.0 (LBS/HR)*	*212.321*	*26.28*	*5.5 LBS/HR*	*22*
	TYPICAL:	*4.00*	*14.4*	*0.24 GR/DSCF*		*4*	*5.5 (LBS/HR)*	*212.321*	*19.80*		

IMPORTANT: ATTACH CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH EMISSIONS WERE DETERMINED AND LABEL AS EXHIBIT 240-5.

[1]CHECK UNCONTROLLED EMISSION RATE BOX IF CONTROL EQUIPMENT IS USED, OTHERWISE CHECK AND PROVIDE THE ACTUAL EMISSION RATE TO ATMOSPHERE, INCLUDING INDOORS. SEE INSTRUCTIONS.
[2]PROVIDE THE EMISSION RATE THAT WILL BE USED AS A PERMIT SPECIAL CONDITION. THIS LIMIT WILL BE USED TO DETERMINE THE PERMIT FEE.
[3]PLEASE PROVIDE ANY OTHER EMISSION RATE WHICH IS COMMONLY USED, REQUIRED BY A SPECIFIC LIMITATION OR THAT WAS MEASURED (E.G. PPM, GR/DSCF, ETC.)
[4]DM - DETERMINATION METHOD: 1) STACK TEST, 2) MATERIAL BALANCE, 3) STANDARD EMISSION FACTOR (AP-42 OR AIRS), 4) ENGINEERING ESTIMATE, 5) SPECIAL EMISSION FACTOR (NOT AP-42 OR AIRS)
[5]RATE - ALLOWABLE EMISSION RATE SPECIFIED BY MOST STRINGENT APPLICABLE RULE.

R005665

(40) HAZARDOUS AIR POLLUTANT EMISSION INFORMATION

HAP INFORMATION		☐ [1]ACTUAL EMISSION RATE ☐ [1]UNCONTROLLED EMISSION RATE				ALLOWABLE BY RULE	
NAME OF HAP EMITTED	[2]CAS NUMBER		POUNDS PER HOUR (LBS/HR)	TONS PER YEAR (TONS/YR)	[3]OTHER TERMS	[4]DM	[5]RATE OR STANDARD	APPLICABLE RULE
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
EXAMPLE:		MAXIMUM:	*10.0*	*1.2*		*2*	*98% by wt control device*	*CFR 61*
Benzene	*71432*	TYPICAL:	*8.0*	*0.8*		*2*	*leak-light trucks*	*61.302(b),(d)*

IMPORTANT: ATTACH CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH EMISSIONS WERE DETERMINED AND LABEL AS EXHIBIT 240-6.

[1]PROVIDE UNCONTROLLED EMISSIONS IF CONTROL EQUIPMENT IS USED. OTHERWISE, PROVIDE ACTUAL EMISSIONS TO THE ATMOSPHERE, INCLUDING INDOORS. CHECK BOX TO SPECIFY.
[2]CAS - CHEMICAL ABSTRACT SERVICE NUMBER.
[3]PLEASE PROVIDE ANY OTHER EMISSION RATE WHICH IS COMMONLY USED, REQUIRED BY A SPECIFIC LIMITATION OR THAT WAS MEASURED (E.G., PPM, GR/DSCF, ETC.).
[4]DM - DETERMINATION METHOD: 1) STACK TEST, 2) MATERIAL BALANCE, 3) STANDARD EMISSION FACTOR (AP-42 OR AIRS, 4) ENGINEERING ESTIMATE, 5) SPECIAL EMISSION FACTOR (NOT AP-42 OR AIRS).
[5]RATE - ALLOWABLE EMISSION RATE OR STANDARD SPECIFIED BY MOST STRINGENT APPLICABLE RULE.

R005666

EXHAUST POINT INFORMATION

THIS SECTION SHOULD NOT BE COMPLETED IF EMISSIONS ARE EXHAUSTED THROUGH AIR POLLUTION CONTROL EQUIPMENT.

41) FLOW DIAGRAM DESIGNATION OF EXHAUST POINT:

42) DESCRIPTION OF EXHAUST POINT (STACK, VENT, ROOF MONITOR, INDOORS, ETC.). IF THE EXHAUST POINT DISCHARGES INDOORS, DO NOT COMPLETE THE REMAINING ITEMS.

43) DISTANCE TO NEAREST PLANT BOUNDARY FROM EXHAUST POINT DISCHARGE (FT):

44) DISCHARGE HEIGHT ABOVE GRADE (FT):

45) GOOD ENGINEERING PRACTICE (GEP) HEIGHT, IF KNOWN (FT):

46) DIAMETER OF EXHAUST POINT (FT): NOTE: FOR A NON CIRCULAR EXHAUST POINT, THE DIAMETER IS 1.128 TIMES THE SQUARE ROOT OF THE AREA.

47) EXIT GAS FLOW RATE	a) MAXIMUM (ACFM):	b) TYPICAL (ACFM):
48) EXIT GAS TEMPERATURE	a) MAXIMUM (°F):	b) TYPICAL (°F):

49) DIRECTION OF EXHAUST (VERTICAL, LATERAL, DOWNWARD):

50) LIST ALL EMISSION UNITS AND CONTROL DEVICES SERVED BY THIS EXHAUST POINT:

	NAME	FLOW DIAGRAM DESIGNATION
a)		
b)		
c)		
d)		
e)		

THE FOLLOWING INFORMATION NEED ONLY BE SUPPLIED IF READILY AVAILABLE.

51a) LATITUDE:	b) LONGITUDE:	
52) UTM ZONE:	b) UTM VERTICAL (KM):	c) UTM HORIZONTAL (KM):

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL – PERMIT SECTION
P.O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

FOR APPLICANT'S USE
Revision #:
Date: ____ / ____ / ____
Page ____ of ____
Source Designation: BFG Flare

AIR POLLUTION CONTROL EQUIPMENT DATA AND INFORMATION

FOR AGENCY USE ONLY
ID NUMBER:
CONTROL EQUIPMENT #:
DATE:

THIS FORM MUST BE COMPLETED FOR EACH AIR POLLUTION CONTROL EQUIPMENT. COMPLETE AND PROVIDE THIS FORM IN ADDITION TO THE APPLICABLE ADDENDUM FORM 260-A THROUGH 260-K. A SEPARATE FORM MUST BE COMPLETED FOR EACH MODE OF OPERATION OF AIR POLLUTION CONTROL EQUIPMENT FOR WHICH A PERMIT IS BEING SOUGHT.

SOURCE INFORMATION

1) SOURCE NAME: US Steel Corporation - Granite City Works

2) DATE FORM PREPARED:	3) SOURCE ID NO. (IF KNOWN): 119813AAI

GENERAL INFORMATION

4) NAME OF AIR POLLUTION CONTROL EQUIPMENT AND/OR CONTROL SYSTEM:
#2 Blast Furnace Gas Flare

5) FLOW DIAGRAM DESIGNATION OF CONTROL EQUIPMENT AND/OR CONTROL SYSTEM:
#2 Blast Furnace Gas Flare

6) MANUFACTURER OF CONTROL EQUIPMENT (IF KNOWN):
Unknown

7) MODEL NUMBER (IF KNOWN):	8) SERIAL NUMBER (IF KNOWN):
9) DATES OF COMMENCING CONSTRUCTION, OPERATION AND/OR MOST RECENT MODIFICATION OF THIS EQUIPMENT (ACTUAL OR PLANNED)	a) CONSTRUCTION (MONTH/YEAR):
	b) OPERATION (MONTH/YEAR):
	c) LATEST MODIFICATION (MONTH/YEAR):

10) BRIEFLY DESCRIBE MODIFICATION (IF APPLICABLE):
Addition of a second Blast Furnace Gas Flare to handle excess BFG resulting from the shutdown of Boilers 1-10.

THIS AGENCY IS AUTHORIZED TO REQUIRE THIS INFORMATION UNDER ILLINOIS REVISED STATUTES, 1991, AS AMENDED 1992, CHAPTER 111 1/2, PAR. 1039.5. DISCLOSURE OF THIS INFORMATION IS REQUIRED UNDER THAT SECTION. FAILURE TO DO SO MAY PREVENT THIS FORM FROM BEING PROCESSED AND COULD RESULT IN THE APPLICATION BEING DENIED. THIS FORM HAS BEEN APPROVED BY THE FORMS MANAGEMENT CENTER.

FOR APPLICANT'S USE
BFG Flare

APPLICATION PAGE ____

11) LIST ALL EMISSION UNITS AND OTHER CONTROL EQUIPMENT DUCTING EMISSIONS TO THIS CONTROL EQUIPMENT:

NAME	DESIGNATION OR CODE NUMBER
BFG Main Line	

12) DOES THE CONTROL EQUIPMENT HAVE MORE THAN ONE MODE OF OPERATION? ☐ YES ☒ NO

IF YES, EXPLAIN AND IDENTIFY WHICH MODE IS COVERED BY THIS FORM (NOTE: A SEPARATE AIR POLLUTION CONTROL EQUIPMENT FORM 260-CAAPP MUST BE COMPLETED FOR EACH MODE):

13) IDENTIFY ALL ATTACHMENTS TO THIS FORM RELATED TO THIS AIR POLLUTION CONTROL EQUIPMENT(E.G., TECHNICAL DRAWINGS):

None

OPERATING SCHEDULE

14) IDENTIFY ANY PERIOD WHEN THE CONTROL EQUIPMENT WILL NOT BE OPERATING DUE TO SCHEDULED MAINTENANCE AND/OR REPAIRS WHEN THE FEEDING EMISSION UNIT(S) TO THIS CONTROL EQUIPMENT IS/ARE IN OPERATION:

Maintenance will be performed on an as needed basis and scheduled to the extent possible when only one flare is required to handle excess BFG.

15a) IDENTIFY ANY PERIODS DURING OPERATION OF THE FEEDING EMISSION UNIT(S) WHEN THE CONTROL EQUIPMENT IS/ARE NOT USED:

BFG Flare is used when the there is an excess of BFG. When there is not excess or excess can be handled by one flare, second flare will be dormant.

b) IS THIS CONTROL EQUIPMENT IN OPERATION AT ALL OTHER TIMES THAT THE FEEDING EMISSION UNIT(S) IS/ARE IN OPERATION? ☒ YES ☐ NO

IF NO, EXPLAIN AND PROVIDE THE DURATION OF THE CONTROL EQUIPMENT DOWNTIME:

APPLICABLE RULES

16) PROVIDE ANY SPECIFIC EMISSION STANDARD(S) AND LIMITATION(S) SET BY RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT (E.G., VOM, IAC 218.207(b)(1); 81% OVERALL & 90% CONTROL DEVICE EFF.):

REGULATED AIR POLLUTANT(S)	EMISSION STANDARD(S)	REQUIREMENT(S)
None		

17) PROVIDE ANY SPECIFIC RECORDKEEPING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	RECORDKEEPING RULE(S)	REQUIREMENT(S)
None		

18) PROVIDE ANY SPECIFIC REPORTING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	REPORTING RULE(S)	REQUIREMENT(S)
None		

19) PROVIDE ANY SPECIFIC MONITORING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	MONITORING RULE(S)	REQUIREMENT(S)
None		

20) PROVIDE ANY SPECIFIC TESTING RULES AND/OR PROCEDURES WHICH ARE APPLICABLE TO THIS EMISSION UNIT :

REGULATED AIR POLLUTANT(S)	TESTING RULE(S)	REQUIREMENT(S)
None		

R005670

COMPLIANCE INFORMATION

21) IS THE CONTROL SYSTEM IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS? ☒ YES ☐ NO

IF NO, THEN FORM 294-CAAPP "COMPLIANCE PLAN/SCHEDULE OF COMPLIANCE – ADDENDUM FOR NON COMPLYING EMISSION UNITS" MUST BE COMPLETED AND SUBMITTED WITH THIS APPLICATION.

22) EXPLANATION OF HOW INITIAL COMPLIANCE IS TO BE, OR WAS PREVIOUSLY, DEMONSTRATED:

23) EXPLANATION OF HOW ONGOING COMPLIANCE WILL BE DEMONSTRATED:

TESTING, MONITORING, RECORDKEEPING AND REPORTING

24a) LIST THE PARAMETERS THAT RELATE TO AIR EMISSIONS FOR WHICH RECORDS ARE BEING MAINTAINED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE. INCLUDE THE UNIT OF MEASUREMENT, THE METHOD OF MEASUREMENT, AND THE FREQUENCY OF SUCH RECORDS (E.G., HOURLY, DAILY, WEEKLY).

PARAMETER	UNIT OF MEASUREMENT	METHOD OF MEASUREMENT	FREQUENCY
Flow	cubic feet	flowmeter	continuous

24b) BRIEFLY DESCRIBE THE METHOD BY WHICH RECORDS WILL BE CREATED AND MAINTAINED. FOR EACH RECORDED PARAMETER INCLUDE THE METHOD OF RECORDKEEPING, TITLE OF PERSON RESPONSIBLE FOR RECORDKEEPING, AND TITLE OF PERSON TO CONTACT FOR REVIEW OF RECORDS:

PARAMETER	METHOD OF RECORDKEEPING	TITLE OF PERSON RESPONSIBLE	TITLE OF CONTACT PERSON

c) IS COMPLIANCE OF THE CONTROL EQUIPMENT READILY DEMONSTRATED BY REVIEW OF THE RECORDS? ☒ YES ☐ NO

IF NO, EXPLAIN:

d) ARE ALL RECORDS READILY AVAILABLE FOR INSPECTION, COPYING AND/OR SUBMITTAL TO THE AGENCY UPON REQUEST? ☒ YES ☐ NO

IF NO, EXPLAIN:

25a) DESCRIBE ANY MONITORS OR MONITORING ACTIVITIES USED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE:

None

b) WHAT OPERATING PARAMETER(S) IS(ARE) BEING MONITORED (E.G., COMBUSTION CHAMBER TEMPERATURE)?

c) DESCRIBE THE LOCATION OF EACH MONITOR (E.G., EXIT OF COMBUSTION CHAMBER):

25d) IS EACH MONITOR EQUIPPED WITH A RECORDING DEVICE? ☐ YES ☐ NO

IF NO, LIST ALL MONITORS WITHOUT A RECORDING DEVICE:

e) IS EACH MONITOR REVIEWED FOR ACCURACY ON AT LEAST A QUARTERLY BASIS? ☐ YES ☐ NO

IF NO, EXPLAIN.

f) IS EACH MONITOR OPERATED AT ALL TIMES THE CONTROL EQUIPMENT IS IN OPERATION? ☐ YES ☐ NO

IF NO, EXPLAIN:

26) PROVIDE INFORMATION ON THE MOST RECENT TESTS, IF ANY, IN WHICH THE RESULTS ARE USED FOR PURPOSES OF THE DETERMINATION OF FEES, RULE APPLICABILITY OR COMPLIANCE. INCLUDE THE TEST DATE, TEST METHOD USED, TESTING COMPANY, OPERATING CONDITIONS EXISTING DURING THE TEST AND A SUMMARY OF RESULTS. IF ADDITIONAL SPACE IS NEEDED, ATTACH AND LABEL AS EXHIBIT 260-1:

TEST DATE	TEST METHOD	TESTING COMPANY	OPERATING CONDITIONS	SUMMARY OF RESULTS
None				

27) DESCRIBE ALL REPORTING REQUIREMENTS AND PROVIDE THE TITLE AND FREQUENCY OF REPORT SUBMITTALS TO THE AGENCY:

REPORTING REQUIREMENTS	TITLE OF REPORT	FREQUENCY
NOne		

CAPTURE AND CONTROL

28) DESCRIBE THE CAPTURE SYSTEM USED TO CONTAIN, COLLECT AND TRANSPORT EMISSIONS TO THE CONTROL EQUIPMENT. INCLUDE ALL HOODS, DUCTS, FANS, ETC. ALSO INCLUDE THE METHOD OF CAPTURE USED AT EACH EMISSION POINT. (IF ADDITIONAL SPACE IS NEEDED, ATTACH AND LABEL AS EXHIBIT 260-2):

System is a closed system where BFG is collected from the top of the Blast Furnaces and particulate is removed in the dust catcher and fed into the BFG main for distribution to fuel burning units.

29) ARE FEATURES OF THE CAPTURE SYSTEM ACCURATELY DEPICTED IN THE FLOW DIAGRAM CONTAINED IN THIS APPLICATION? ☐ YES ☐ NO

IF NO, A SKETCH SHOWING THE FEATURES OF THE CAPTURE SYSTEM SHOULD BE ATTACHED AND LABELED AS EXHIBIT 260-3.

30) PROVIDE THE ACTUAL (MINIMUM AND TYPICAL) CAPTURE SYSTEM EFFICIENCY, CONTROL EQUIPMENT DESTRUCTION/REMOVAL EFFICIENCY, AND THE OVERALL REDUCTION EFFICIENCY PROVIDED BY THE COMBINATION OF THE CAPTURE SYSTEM AND CONTROL EQUIPMENT FOR EACH REGULATED AIR POLLUTANT TO BE CONTROLLED. ATTACH THE CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH THESE EFFICIENCIES WERE BASED AND LABEL AS EXHIBIT 260-4.

a) CONTROL PERFORMANCE:

	REGULATED AIR POLLUTANT	CAPTURE SYSTEM EFFICIENCY (%) (MIN)	CAPTURE SYSTEM EFFICIENCY (%) (TYP)	CONTROL EQUIPMENT EFFICIENCY (%) (MIN)	CONTROL EQUIPMENT EFFICIENCY (%) (TYP)	OVERALL REDUCTION EFFICIENCY (%) (MIN)	OVERALL REDUCTION EFFICIENCY (%) (TYP)
i	ALL	100	100				
ii							
iii							

iv. EXPLAIN ANY OTHER REQUIRED LIMITS ON CONTROL EQUIPMENT PERFORMANCE SUCH AS OUTLET CONCENTRATION, COOLANT TEMPERATURE, ETC.:

b) METHOD USED TO DETERMINE EACH OF THE ABOVE EFFICIENCIES (E.G., STACK TEST, MATERIAL BALANCE, MANUFACTURER'S GUARANTEE, ETC.) AND THE DATE LAST TESTED, IF APPLICABLE:

	EFFICIENCY DETERMINATION METHOD	DATE LAST TESTED
CAPTURE:	Closed system	N/A
CONTROL:		
OVERALL:		

c) REQUIRED PERFORMANCE:

	REGULATED AIR POLLUTANT	CAPTURE SYSTEM EFFICIENCY (%)	CONTROL EQUIPMENT EFFICIENCY (%)	OVERALL REDUCTION EFFICIENCY (%)	APPLICABLE RULE
i	N/A				
ii					
iii					

iv EXPLAIN ANY OTHER REQUIRED LIMITS ON CONTROL EQUIPMENT PERFORMANCE SUCH AS OUTLET CONCENTRATION, COOLANT TEMPERATURE, ETC.:

(31) EMISSION INFORMATION

REGULATED AIR POLLUTANT		[1] ACTUAL EMISSION RATE: LBS PER HOUR (LBS/HR)	[1] ACTUAL EMISSION RATE: TONS PER YEAR (TONS/YR)	[1] ACTUAL EMISSION RATE: [3] OTHER TERMS	[1] ACTUAL EMISSION RATE: [3] OTHER TERMS	[1] ACTUAL EMISSION RATE: [4] DM	ALLOWABLE BY RULE EMISSION RATE: [5] RATE (UNITS)	ALLOWABLE BY RULE EMISSION RATE: APPLICABLE RULES	ALLOWABLE BY RULE EMISSION RATE: TONS PER YEAR (TONS/YR)	[2] PERMITTED EMISSION RATE: RATE (UNITS)	[2] PERMITTED EMISSION RATE: TONS PER YEAR (TONS/YR)
CARBON MONOXIDE (CO)	MAXIMUM:						( )				
	TYPICAL:						( )				
LEAD	MAXIMUM:						( )				
	TYPICAL:						( )				
NITROGEN OXIDES (NOx)	MAXIMUM:						( )				
	TYPICAL:						( )				
PARTICULATE MATTER (PART)	MAXIMUM:						( )				
	TYPICAL:						( )				
PARTICULATE MATTER <= 10 MICROMETERS (PM10)	MAXIMUM:						( )				
	TYPICAL:						( )				
SULFUR DIOXIDE (SO2)	MAXIMUM:						( )				
	TYPICAL:						( )				
VOLATILE ORGANIC MATERIAL (VOM)	MAXIMUM:						( )				
	TYPICAL:						( )				
OTHER, SPECIFY:	MAXIMUM:						( )				
	TYPICAL:						( )				
EXAMPLE: PARTICULATE MATTER	MAXIMUM:	*5.00*	*21.9*	*0.3 GR/DSCF*		*1*	*6.0 (LBS/HR)*	*212.321*	*26.28*	*5.5 LBS/HR*	*22*
	TYPICAL:	*4.00*	*14.4*	*0.24 GR/DSCF*		*4*	*5.5 (LBS/HR)*	*212.321*	*19.80*		

IMPORTANT: ATTACH CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH EMISSIONS WERE DETERMINED AND LABEL AS EXHIBIT 260-5.

[1] PROVIDE CONTROLLED EMISSIONS (E.G., THE EMISSIONS THAT WOULD RESULT AFTER ALL CONTROL AND CAPTURE EFFICIENCIES ARE ACCOUNTED FOR).
[2] PROVIDE THE EMISSION RATE THAT WILL BE USED AS A PERMIT SPECIAL CONDITION. THIS LIMIT WILL BE USED TO DETERMINE THE PERMIT FEE.
[3] PLEASE PROVIDE ANY OTHER EMISSION RATE WHICH IS COMMONLY USED, REQUIRED BY A SPECIFIC LIMITATION OR THAT WAS MEASURED (E.G. PPM, GR/DSCF, ETC.)
[4] DM - DETERMINATION METHOD: 1) STACK TEST, 2) MATERIAL BALANCE, 3) STANDARD EMISSION FACTOR (AP-42 OR AIRS), 4) ENGINEERING ESTIMATE, 5) SPECIAL EMISSION FACTOR (NOT AP-42 OR AIRS)
[5] RATE - ALLOWABLE EMISSION RATE SPECIFIED BY MOST STRINGENT APPLICABLE RULE.

(32) HAZARDOUS AIR POLLUTANT EMISSION INFORMATION

HAP INFORMATION		[1]ACTUAL EMISSION RATE				ALLOWABLE BY RULE	
NAME OF HAP EMITTED	[2]CAS NUMBER		POUNDS PER HOUR (LBS/HR)	TONS PER YEAR (TONS/YR)	[3]OTHER TERMS	[4]DM	[5]RATE OR STANDARD	APPLICABLE RULE
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
EXAMPLE:		MAXIMUM:	*10.0*	*1.2*		*2*	*98% by wt control device*	*CFR 61*
Benzene	*71432*	TYPICAL:	*8.0*	*0.8*		*2*	*leak-tight trucks*	*61.302(b),(d)*

IMPORTANT: ATTACH CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH EMISSIONS WERE DETERMINED AND LABEL AS EXHIBIT 250-6.

[1]PROVIDE CONTROLLED EMISSIONS (E.G., THE EMISSIONS THAT WOULD RESULT AFTER ALL CONTROL AND CAPTURE EFFICIENCIES ARE ACCOUNTED FOR).
[2]CAS - CHEMICAL ABSTRACT SERVICE NUMBER.
[3]PLEASE PROVIDE ANY OTHER EMISSION RATE WHICH IS COMMONLY USED, REQUIRED BY A SPECIFIC LIMITATION OR THAT WAS MEASURED (E.G., PPM, GR/DSCF, ETC.).
[4]DM - DETERMINATION METHOD: 1) STACK TEST, 2) MATERIAL BALANCE, 3) STANDARD EMISSION FACTOR (AP-42 OR AIRS, 4) ENGINEERING ESTIMATE, 5) SPECIAL EMISSION FACTOR (NOT AP-42 OR AIRS).
[5]RATE - ALLOWABLE EMISSION RATE OR STANDARD SPECIFIED BY MOST STRINGENT APPLICABLE RULE.

R005676

EXHAUST POINT INFORMATION

33) DESCRIPTION OF EXHAUST POINT (STACK, VENT, ROOF MONITOR, INDOORS, ETC.). IF THE EXHAUST POINT DISCHARGES INDOORS, DO NOT COMPLETE THE REMAINING ITEMS.

Flare Stack

34) DISTANCE TO NEAREST PLANT BOUNDARY FROM EXHAUST POINT DISCHARGE (FT):

600 ft

35) DISCHARGE HEIGHT ABOVE GRADE (FT):

120

36) GOOD ENGINEERING PRACTICE (GEP) HEIGHT, IF KNOWN (FT):

37) DIAMETER OF EXHAUST POINT (FT): NOTE: FOR A NON CIRCULAR EXHAUST POINT, THE DIAMETER IS 1.128 TIMES THE SQUARE ROOT OF THE AREA.

7 ft.

38) EXIT GAS FLOW RATE	a) MAXIMUM (ACFM): 202646	b) TYPICAL (ACFM): < max
39) EXIT GAS TEMPERATURE	a) MAXIMUM (°F): 500	b) TYPICAL (°F): < max

40) DIRECTION OF EXHAUST (VERTICAL, LATERAL, DOWNWARD):

vertical

41) LIST ALL EMISSION UNITS AND CONTROL DEVICES SERVED BY THIS EXHAUST POINT:

	NAME	FLOW DIAGRAM DESIGNATION
a)	#2 BFG Flare	
b)		
c)		
d)		
e)		
f)		
g)		

42) WHAT PERCENTAGE OF THE CONTROL EQUIPMENT EMISSIONS ARE BEING DUCTED TO THIS EXHAUST POINT (%)?

100

43) IF THE PERCENTAGE OF THE CONTROL EQUIPMENT EMISSIONS BEING DUCTED TO THE EXHAUST POINT IS NOT 100%, THEN EXPLAIN WHERE THE REMAINING EMISSIONS ARE BEING EXHAUSTED TO:

THE FOLLOWING INFORMATION NEED ONLY BE SUPPLIED IF READILY AVAILABLE.

44 a) LATITUDE:	b) LONGITUDE:	
45) UTM ZONE:	b) UTM VERTICAL (KM):	c) UTM HORIZONTAL (KM):

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL -- PERMIT SECTION
P.O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

FOR APPLICANT'S USE
Revision #: 1
Date: ____ / ____ / ____
Page ____ of ____
Source Designation: BFG Flare

SUPPLEMENTAL FORM AIR POLLUTION CONTROL EQUIPMENT FLARE (260J)

FOR AGENCY USE ONLY
ID NUMBER:
CONTROL EQUIPMENT #:
DATE:

DATA AND INFORMATION

1) FLOW DIAGRAM DESIGNATION OF FLARE:
Blast Furnace Gas Flare

2a) MAXIMUM CAPACITY OF FLARE (SCF/MIN):	b) MAXIMUM CAPACITY OF FLARE (SCF/HR):
540,000,000	9,000,000

3a) NATURAL GAS FLOW RATE TO FLARE PILOT FLAME (SCFM/MIN):	b) NATURAL GAS FLOW RATE TO FLARE PILOT FLAME (SCF/HR):
55	3270

4) IS PILOT FLAME EQUIPPED WITH A MONITOR? ☐ YES ☒ NO

IF YES, WHAT TYPE? (CHECK ONE)
☐ THERMOCOUPLE ☐ INFRA-RED ☐ ULTRA VIOLET ☐ CAMERA WITH MONITORING CONTROL ROOM
☐ OTHER, DESCRIBE: _____

5) IS FLARE STEAM ASSISTED? ☐ YES ☒ NO

6) IS FLARE CONSIDERED SMOKELESS? ☒ YES ☐ NO

7a) FLARE TIP DIAMETER (INCHES):	b) TEMPERATURE OF FLARE GAS (DEGREES F°):
84 inches	500

THIS AGENCY IS AUTHORIZED TO REQUIRE THIS INFORMATION UNDER ILLINOIS REVISED STATUTES, 1991, AS AMENDED 1992, CHAPTER 111 1/2, PAR. 1039.6. DISCLOSURE OF THIS INFORMATION IS REQUIRED UNDER THAT SECTION. FAILURE TO DO SO MAY PREVENT THIS FORM FROM BEING PROCESSED AND COULD RESULT IN THE APPLICATION BEING DENIED. THIS FORM HAS BEEN APPROVED BY THE FORMS MANAGEMENT CENTER

FOR APPLICANT'S USE

APPLICATION PAGE ____

8) INLET EMISSION STREAM PARAMETERS:

	MAX	TYPICAL
PRESSURE (mmHG):		
HEAT CONTENT (BTU/SCF):	100+	80
OXYGEN CONTENT:	(%)	(%)
MOISTURE CONTENT:	(%)	(%)
RELATIVE HUMIDITY:	(%)	(%)

ARE HALOGENATED ORGANICS PRESENT? ☐ YES ☒ NO

ARE PARTICULATES PRESENT? ☒ YES ☐ NO

ARE METALS PRESENT? ☒ YES ☐ NO

9a) MAXIMUM RATE DURING EMERGENCY FOR ONE MAJOR PIECE OF EQUIPMENT OR PROCESS UNIT (SCF/MIN):

150,000

b) MAXIMUM RATE DURING EMERGENCY FOR ONE MAJOR PIECE OF EQUIPMENT OR PROCESS UNIT (BTU/MIN):

12,000,000

10a) TYPICAL OPERATING RATE (SCF/MIN):	b) TYPICAL OPERATING RATE (BTU/MIN):
< Max	< Max

11) FLARE OPERATING PARAMETERS:

	DURING MAXIMUM OPERATION OF FEEDING UNIT(S)	DURING TYPICAL OPERATION OF FEEDING UNIT(S)
INLET GAS TEMPERATURE (DEGREES F°):		
INLET GAS FLOW RATE (SCFM):		
EFFICIENCY (VOM REDUCTION):	(%) N/A	(%) N/A
EFFICIENCY (OTHER, SPECIFY REGULATED AIR POLLUTANT CO):	(%)	(%)

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL -- PERMIT SECTION
P.O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

FOR APPLICANT'S USE
Revision #: _____
Date: ____ / ____ / ____
Page _____ of _____
Source Designation:
COG Cobustion

FUEL COMBUSTION EMISSION UNIT DATA AND INFORMATION

FOR AGENCY USE ONLY
ID NUMBER:
EMISSION POINT #:
DATE:

SOURCE INFORMATION

1) SOURCE NAME:
US Steel Corporation - Granite City Works

2) DATE FORM PREPARED:

3) SOURCE ID NO. (IF KNOWN): 119813AAI

GENERAL INFORMATION

4) NAME OF EMISSION UNIT:
Various

5) NAME OF PROCESS:
COG Combustion

6) DESCRIPTION OF PROCESS:
Combustion of by-product COG in various emission units at the facility.

7) DESCRIPTION OF ITEM OR MATERIAL PRODUCED OR ACTIVITY ACCOMPLISHED:
Direct and indirect heating

8) FLOW DIAGRAM DESIGNATION OF EMISSION UNIT:
various

9) MANUFACTURER OF EMISSION UNIT (IF KNOWN):

10) MODEL NUMBER (IF KNOWN):

11) SERIAL NUMBER (IF KNOWN):

12) DATES OF COMMENCING CONSTRUCTION, OPERATION AND/OR MOST RECENT MODIFICATION OF THIS EMISSION UNIT (ACTUAL OR PLANNED)
a) CONSTRUCTION (MONTH/YEAR):
b) OPERATION (MONTH/YEAR):
c) LATEST MODIFICATION (MONTH/YEAR):

13) DESCRIPTION OF MODIFICATION (IF APPLICABLE):
Addition of a COG desulfurization system to remove sulfur compounds from the COG prior to combustion in various fuel burning emission units at the facility.

THIS AGENCY IS AUTHORIZED TO REQUIRE THIS INFORMATION UNDER ILLINOIS REVISED STATUTES, 1991, AS AMENDED 1992, CHAPTER 111 1/2, PAR. 1039.5. DISCLOSURE OF THIS INFORMATION IS REQUIRED UNDER THAT SECTION. FAILURE TO DO SO MAY PREVENT THIS FORM FROM BEING PROCESSED AND COULD RESULT IN THE APPLICATION BEING DENIED. THIS FORM HAS BEEN APPROVED BY THE FORMS MANAGEMENT CENTER.

FOR APPLICANT'S USE
COG Combustion

APPLICATION PAGE _____

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240-CAAPP

14) DOES THE EMISSION UNIT HAVE MORE THAN ONE MODE OF OPERATION? ☐ YES ☒ NO

IF YES, EXPLAIN AND IDENTIFY WHICH MODE IS COVERED BY THIS FORM (NOTE: A SEPARATE PROCESS EMISSION UNIT FORM 240-CAAPP MUST BE COMPLETED FOR EACH MODE):

15) PROVIDE THE NAME AND DESIGNATION OF ALL AIR POLLUTION CONTROL EQUIPMENT CONTROLLING THIS EMISSION UNIT, IF APPLICABLE (FORM 260-CAAPP AND THE APPROPRIATE 260-CAAPP ADDENDUM FORM MUST BE COMPLETED FOR EACH ITEM OF AIR POLLUTION CONTROL EQUIPMENT):

COG Desulfurization

16) WILL EMISSIONS DURING STARTUP EXCEED EITHER THE ALLOWABLE EMISSION RATE PURSUANT TO A SPECIFIC RULE, OR THE ALLOWABLE EMISSION LIMIT AS ESTABLISHED BY AN EXISTING OR PROPOSED PERMIT CONDITION? ☐ YES ☒ NO

IF YES, COMPLETE AND ATTACH FORM 203-CAAPP, "REQUEST TO OPERATE WITH EXCESS EMISSIONS DURING STARTUP OF EQUIPMENT".

17) PROVIDE ANY LIMITATIONS ON SOURCE OPERATION AFFECTING EMISSIONS OR ANY WORK PRACTICE STANDARDS (E.G., ONLY ONE UNIT IS OPERATED AT A TIME):

SO2 FESOP (Permit # 94120017) limits SO2 emissions at COG combustion sources at the facility.

OPERATING INFORMATION

18) ATTACH THE CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSION RELATED, FROM WHICH THE FOLLOWING OPERATING INFORMATION, MATERIAL USAGE INFORMATION AND FUEL USAGE DATA WERE BASED AND LABEL AS EXHIBIT 240-1. REFER TO SPECIAL NOTES OF FORM 202-CAAPP.

19a) MAXIMUM OPERATING HOURS: 8760	HOURS/DAY: 24	DAYS/WEEK: 7	WEEKS/YEAR: 52
b) TYPICAL OPERATING HOURS: 8760	HOURS/DAY:	DAYS/WEEK:	WEEKS/YEAR:

20) ANNUAL THROUGHPUT	DEC-FEB(%): 25	MAR-MAY(%): 25	JUN-AUG(%): 25	SEP-NOV(%): 25

FIRING RATE INFORMATION

21a) RATED OR DESIGN HEAT INPUT CAPACITY (MILLION BTU/HR): Varies

b) IS MORE THAN ONE FUEL FIRED AT A TIME? ☒ YES ☐ NO

IF YES, EXPLAIN:

COG and natural gas can be mixed and fired at the same time. Blast Furnace Gas can also be fired with COG in the boilers and blast furnace stoves.

21c) IF HEAT INPUT CAPACITY IS 100 MILLION BTU/HOUR OR GREATER, PROVIDE FURNACE VOLUME (CUBIC FEET)
NOTE. FURNACE VOLUME IS DEFINED AS THAT VOLUME BOUNDED BY THE FRONT FURNACE WALL WHERE THE BURNER IS LOCATED, THE FURNACE SIDE WATERWALL, AND EXTENDING TO THE LEVEL JUST BELOW OR IN FRONT OF THE FIRST ROW OF CONVECTION PASS TUBES.

	NATURAL GAS	FUEL OIL	COAL	OTHER
d) SINGLE FUEL (MAXIMUM - MILLION BTU/HOUR)				
e) SINGLE FUEL (TYPICAL - MILLION BTU/HOUR)				
f) COMBINED FUEL (TYPICAL - MILLION BTU/HOUR) (IF APPLICABLE)				

NATURAL GAS FIRING

22a) CURRENT ORIGIN OF NATURAL GAS:
☒ PIPELINE (FIRM CONTRACT) ☐ BY-PRODUCT, SPECIFY ORIGIN:
☐ PIPELINE (INTERRUPTIBLE SUPPLY CONTRACT) ☐ OTHER, - SPECIFY:

b) TYPICAL HEAT CONTENT (BTU/SCF):
1000

c) MAXIMUM CONSUMPTION	SCF/MONTH:	SCF/YEAR:
d) TYPICAL CONSUMPTION	SCF/MONTH:	SCF/YEAR:

OIL FIRING

23a) OIL TYPE (CHECK ONE):
☐ NO. 1 ☐ NO. 2 ☐ NO. 4 ☐ NO. 5 ☐ NO. 6
☐ OTHER, SPECIFY (INCLUDE GENERATOR OR SUPPLIER):

b) TYPICAL HEAT CONTENT:
☐ BTU/LB - OR - ☐ BTU/GAL

c) IS OIL USED ONLY AS A RESERVE FUEL? ☐ YES ☐ NO

d) TYPICAL SULFUR CONTENT AS FIRED (WT %):

e) TYPICAL ASH CONTENT AS FIRED (WT %):

f) MAXIMUM CONSUMPTION	GAL/MONTH:	GAL/YEAR:
g) TYPICAL CONSUMPTION	GAL/MONTH:	GAL/YEAR:

h) FIRING DIRECTION:
☐ HORIZONTAL ☐ TANGENTIAL ☐ OTHER, SPECIFY:

SOLID FUEL FIRING

*24a) SOLID FUEL TYPE (CHECK ALL THAT APPLY): ☐ SUB-BITUMINOUS COAL ☐ LIGNITE COAL ☐ BITUMINOUS COAL ☐ ANTHRACITE COAL ☐ OTHER, SPECIFY:

b) TYPICAL HEAT CONTENT AS FIRED (BTU/LB):	c) TYPICAL MOISTURE CONTENT AS FIRED (WT %):
d) TYPICAL SULFUR CONTENT AS FIRED (WT %):	e) TYPICAL ASH CONTENT AS FIRED (WT %):
f) TYPICAL FINES CONTENT (% LESS THAN 1/8 INCH):	g) IS THE COAL CLEANED? ☐ YES ☐ NO

h) HOW MUCH COAL REFUSE IS IN THE FUEL? (WT %):

i) MAXIMUM CONSUMPTION	TON/MONTH:	TON/YEAR:
j) TYPICAL CONSUMPTION	TON/MONTH:	TON/YEAR:

k) FIRING TYPE (CHECK ONE):
☐ TRAVELING GRATE ☐ SPREADER STOKER % REINJECTION:
☐ CYCLONE ☐ PULVERIZED, TYPE (CIRCLE ONE): WET BOTTOM DRY BOTTOM
☐ HORIZONTALLY OPPOSED ☐ OTHER, SPECIFY:

*NOTE: IF REQUIRED, SUBMIT COPIES OF THOSE PORTIONS OF COAL SUPPLY CONTRACTS WHICH SET FORTH THE SPECIFICATIONS OF THE FUEL AND THE DURATION OF THE CONTRACT. IF THE ACTUAL FUEL FIRED IS A BLEND OF COAL, SUBMIT APPROPRIATE PORTIONS OF ALL FUEL CONTRACTS AND STATE THE MANNER BY WHICH THE FUELS ARE BLENDED AND ACTUALLY FIRED. ATTACH AND LABEL AS EXHIBIT 240-2.

OTHER FUEL FIRING

25a) OTHER FUEL FIRING

	TYPE	SUPPLIER
a)	Coke Oven Gas (COG)	Granite City Works
b)		

b) TYPICAL HEAT CONTENT (SPECIFY UNITS): 560 Btu/scf	c) TYPICAL NITROGEN CONTENT AS FIRED (WT %): 6
d) TYPICAL SULFUR CONTENT AS FIRED (WT %): < 1	e) TYPICAL ASH CONTENT AS FIRED (WT %):

f) MAXIMUM CONSUMPTION	(SPECIFY UNITS/MONTH): 775 MMscf/mo	(SPECIFY UNITS/YEAR): 9,125 MMscf / year
g) TYPICAL CONSUMPTION	(SPECIFY UNITS/MONTH): 744 MMscf / mo	(SPECIFY UNITS/YEAR): 8,760 MMscf / year

APPLICABLE RULES

26) PROVIDE ANY SPECIFIC EMISSION STANDARD(S) AND LIMITATION(S) SET BY RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT (E.G., PARTICULATE MATTER, IAC 212.206, <= 0.10 LBS/MMBTU):

REGULATED AIR POLLUTANT(S)	EMISSION STANDARD(S)	REQUIREMENT(S)
SO2	214.421	Combinations of fuels limited
SO2	SO2 FESOP	See Permit 94120017

27) PROVIDE ANY SPECIFIC RECORDKEEPING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	RECORDKEEPING RULE(S)	REQUIREMENT(S)

28) PROVIDE ANY SPECIFIC REPORTING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	REPORTING RULE(S)	REQUIREMENT(S)

29) PROVIDE ANY SPECIFIC MONITORING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	MONITORING RULE(S)	REQUIREMENT(S)
SO2	SO2 FESOP	Monitor H2S and record SO2 emissions at certain emission
		units

30) PROVIDE ANY SPECIFIC TESTING RULES AND/OR PROCEDURES WHICH ARE APPLICABLE TO THIS EMISSION UNIT :

REGULATED AIR POLLUTANT(S)	TESTING RULE(S)	REQUIREMENT(S)

R005684

31) DOES THE EMISSION UNIT QUALIFY FOR AN EXEMPTION FROM AN OTHERWISE APPLICABLE RULE? ☐ YES ☒ NO

IF YES, THEN LIST BOTH THE RULE FROM WHICH IT IS EXEMPT AND THE RULE WHICH ALLOWS THE EXEMPTION. PROVIDE A DETAILED EXPLANATION JUSTIFYING THE EXEMPTION. INCLUDE DETAILED SUPPORTING DATA AND CALCULATIONS. ATTACH AND LABEL AS EXHIBIT 240-3, OR REFER TO OTHER ATTACHMENT(S) WHICH ADDRESS AND JUSTIFY THIS EXEMPTION.

COMPLIANCE INFORMATION

32) IS THE EMISSION UNIT IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS? ☒ YES ☐ NO

IF NO, THEN FORM 294-CAAPP "COMPLIANCE PLAN/SCHEDULE OF COMPLIANCE -- ADDENDUM FOR NON COMPLYING EMISSION UNITS" MUST BE COMPLETED AND SUBMITTED WITH THIS APPLICATION.

33) EXPLANATION OF HOW INITIAL COMPLIANCE IS TO BE, OR WAS PREVIOUSLY, DEMONSTRATED:

Monitor H2S in accordance with requirements of SO2 FESOP

34) EXPLANATION OF HOW ONGOING COMPLIANCE WILL BE DEMONSTRATED:

Monitor H2S in accordance with requirements of SO2 FESOP.

TESTING, MONITORING, RECORDKEEPING AND REPORTING

35a) LIST THE PARAMETERS THAT RELATE TO AIR EMISSIONS FOR WHICH RECORDS ARE BEING MAINTAINED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE. INCLUDE THE UNIT OF MEASUREMENT, THE METHOD OF MEASUREMENT, AND THE FREQUENCY OF SUCH RECORDS (E.G., HOURLY, DAILY, WEEKLY):

PARAMETER	UNIT OF MEASUREMENT	METHOD OF MEASUREMENT	FREQUENCY
H2S	gr/dscf	H2S monitor	continuous
flow	cubic feet	flow meter	continuous

35b) BRIEFLY DESCRIBE THE METHOD BY WHICH RECORDS WILL BE CREATED AND MAINTAINED. FOR EACH RECORDED PARAMETER INCLUDE THE METHOD OF RECORDKEEPING, TITLE OF PERSON RESPONSIBLE FOR RECORDKEEPING, AND TITLE OF PERSON TO CONTACT FOR REVIEW OF RECORDS:

PARAMETER	METHOD OF RECORDKEEPING	TITLE OF PERSON RESPONSIBLE	TITLE OF CONTACT PERSON

c) IS COMPLIANCE OF THE EMISSION UNIT READILY DEMONSTRATED BY REVIEW OF THE RECORDS? ☒ YES ☐ NO

IF NO, EXPLAIN:

d) ARE ALL RECORDS READILY AVAILABLE FOR INSPECTION, COPYING AND SUBMITTAL TO THE AGENCY UPON REQUEST? ☒ YES ☐ NO

IF NO, EXPLAIN:

36a) DESCRIBE ANY MONITORS OR MONITORING ACTIVITIES USED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE:

H2S

b) WHAT PARAMETER(S) IS(ARE) BEING MONITORED (E.G., OPACITY)?

H2S content of COG

c) DESCRIBE THE LOCATION OF EACH MONITOR (E.G., IN STACK MONITOR):

COG main feed line

36d) IS EACH MONITOR EQUIPPED WITH A RECORDING DEVICE? ☒ YES ☐ NO

IF NO, LIST ALL MONITORS WITHOUT A RECORDING DEVICE:

e) IS EACH MONITOR REVIEWED FOR ACCURACY ON AT LEAST A QUARTERLY BASIS? ☒ YES ☐ NO

IF NO, EXPLAIN:

f) IS EACH MONITOR OPERATED AT ALL TIMES THE ASSOCIATED EMISSION UNIT IS IN OPERATION? ☒ YES ☐ NO

IF NO, EXPLAIN:

37) PROVIDE INFORMATION ON THE MOST RECENT TESTS, IF ANY, IN WHICH THE RESULTS ARE USED FOR PURPOSES OF THE DETERMINATION OF FEES, RULE APPLICABILITY OR COMPLIANCE. INCLUDE THE TEST DATE, TEST METHOD USED, TESTING COMPANY, OPERATING CONDITIONS EXISTING DURING THE TEST AND A SUMMARY OF RESULTS. IF ADDITIONAL SPACE IS NEEDED, ATTACH AND LABEL AS EXHIBIT 240-4:

TEST DATE	TEST METHOD	TESTING COMPANY	OPERATING CONDITIONS	SUMMARY OF RESULTS

38) DESCRIBE ALL REPORTING REQUIREMENTS AND PROVIDE THE TITLE AND FREQUENCY OF REPORT SUBMITTALS TO THE AGENCY:

REPORTING REQUIREMENTS	TITLE OF REPORT	FREQUENCY

(39)EMISSION INFORMATION

REGULATED AIR POLLUTANT		☐ [1]ACTUAL EMISSION RATE ☒ [1]UNCONTROLLED EMISSION RATE					ALLOWABLE BY RULE EMISSION RATE			[2]PERMITTED EMISSION RATE	
		LBS PER HOUR (LBS/HR)	TONS PER YEAR (TONS/YR)	[3]OTHER TERMS	[3]OTHER TERMS	[4]DM	[5]RATE (UNITS)	APPLICABLE RULES	TONS PER YEAR (TONS/YR)	RATE (UNITS)	TONS PER YEAR (TONS/YR)
CARBON MONOXIDE (CO)	MAXIMUM:						( )				
	TYPICAL:						( )				
LEAD	MAXIMUM:						( )				
	TYPICAL:						( )				
NITROGEN OXIDES (NOx)	MAXIMUM:						( )				
	TYPICAL:						( )				
PARTICULATE MATTER (PART)	MAXIMUM:		327				( )				
	TYPICAL:		318				( )				
PARTICULATE MATTER <= 10 MICROMETERS (PM10)	MAXIMUM:		327				( )				
	TYPICAL:		318				( )				
SULFUR DIOXIDE (SO2)	MAXIMUM:		5533				( )				
	TYPICAL:		3620				( )				
VOLATILE ORGANIC MATERIAL (VOM)	MAXIMUM:						( )				
	TYPICAL:						( )				
OTHER, SPECIFY: H2S	MAXIMUM:			4.51 gr/dscf			( )				
	TYPICAL:			3.00 gr/dscf			( )				
EXAMPLE: PARTICULATE MATTER	*MAXIMUM:*	*5.00*	*21.9*	*0.3 GR/DSCF*		*1*	*6.0 (LBS/HR)*	*212.321*	*26.28*	*5.5 LBS/HR*	*22*
	TYPICAL:	*4.00*	*14.4*	*0.24 GR/DSCF*		*4*	*5.5 (LBS/HR)*	*212.321*	*19.80*		

IMPORTANT: ATTACH CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH EMISSIONS WERE DETERMINED AND LABEL AS EXHIBIT 240-5.

[1]CHECK UNCONTROLLED EMISSION RATE BOX IF CONTROL EQUIPMENT IS USED, OTHERWISE CHECK AND PROVIDE THE ACTUAL EMISSION RATE TO ATMOSPHERE, INCLUDING INDOORS. SEE INSTRUCTIONS.
[2]PROVIDE THE EMISSION RATE THAT WILL BE USED AS A PERMIT SPECIAL CONDITION. THIS LIMIT WILL BE USED TO DETERMINE THE PERMIT FEE.
[3]PLEASE PROVIDE ANY OTHER EMISSION RATE WHICH IS COMMONLY USED, REQUIRED BY A SPECIFIC LIMITATION OR THAT WAS MEASURED (E.G. PPM, GR/DSCF, ETC.)
[4]DM - DETERMINATION METHOD: 1) STACK TEST, 2) MATERIAL BALANCE, 3) STANDARD EMISSION FACTOR (AP-42 OR AIRS), 4) ENGINEERING ESTIMATE, 5) SPECIAL EMISSION FACTOR (NOT AP-42 OR AIRS)
[5]RATE - ALLOWABLE EMISSION RATE SPECIFIED BY MOST STRINGENT APPLICABLE RULE.

R005688

(40) HAZARDOUS AIR POLLUTANT EMISSION INFORMATION

HAP INFORMATION		☐ [1]ACTUAL EMISSION RATE ☐ [1]UNCONTROLLED EMISSION RATE				ALLOWABLE BY RULE	
NAME OF HAP EMITTED	[2]CAS NUMBER		POUNDS PER HOUR (LBS/HR)	TONS PER YEAR (TONS/YR)	[3]OTHER TERMS	[4]DM	[5]RATE OR STANDARD	APPLICABLE RULE
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
EXAMPLE:		MAXIMUM:	*10.0*	*1.2*		*2*	*98% by wt control device*	*CFR 61*
Benzene	*71432*	TYPICAL:	*8.0*	*0.8*		*2*	*leak-tight trucks*	*61.302(b),(d)*

IMPORTANT: ATTACH CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH EMISSIONS WERE DETERMINED AND LABEL AS EXHIBIT 240-6.

[1]PROVIDE UNCONTROLLED EMISSIONS IF CONTROL EQUIPMENT IS USED. OTHERWISE, PROVIDE ACTUAL EMISSIONS TO THE ATMOSPHERE, INCLUDING INDOORS. CHECK BOX TO SPECIFY.
[2]CAS - CHEMICAL ABSTRACT SERVICE NUMBER.
[3]PLEASE PROVIDE ANY OTHER EMISSION RATE WHICH IS COMMONLY USED, REQUIRED BY A SPECIFIC LIMITATION OR THAT WAS MEASURED (E.G., PPM, GR/DSCF, ETC.).
[4]DM - DETERMINATION METHOD: 1) STACK TEST, 2) MATERIAL BALANCE, 3) STANDARD EMISSION FACTOR (AP-42 OR AIRS, 4) ENGINEERING ESTIMATE, 9) SPECIAL EMISSION FACTOR (NOT AP-42 OR AIRS).
[5]RATE - ALLOWABLE EMISSION RATE OR STANDARD SPECIFIED BY MOST STRINGENT APPLICABLE RULE.

R005689

EXHAUST POINT INFORMATION

THIS SECTION SHOULD NOT BE COMPLETED IF EMISSIONS ARE EXHAUSTED THROUGH AIR POLLUTION CONTROL EQUIPMENT.

41) FLOW DIAGRAM DESIGNATION OF EXHAUST POINT:
Various

42) DESCRIPTION OF EXHAUST POINT (STACK, VENT, ROOF MONITOR, INDOORS, ETC.). IF THE EXHAUST POINT DISCHARGES INDOORS, DO NOT COMPLETE THE REMAINING ITEMS.

43) DISTANCE TO NEAREST PLANT BOUNDARY FROM EXHAUST POINT DISCHARGE (FT):

44) DISCHARGE HEIGHT ABOVE GRADE (FT):

45) GOOD ENGINEERING PRACTICE (GEP) HEIGHT, IF KNOWN (FT):

46) DIAMETER OF EXHAUST POINT (FT): NOTE: FOR A NON CIRCULAR EXHAUST POINT, THE DIAMETER IS 1.128 TIMES THE SQUARE ROOT OF THE AREA.

47) EXIT GAS FLOW RATE	a) MAXIMUM (ACFM):	b) TYPICAL (ACFM):
48) EXIT GAS TEMPERATURE	a) MAXIMUM (°F):	b) TYPICAL (°F):

49) DIRECTION OF EXHAUST (VERTICAL, LATERAL, DOWNWARD):

50) LIST ALL EMISSION UNITS AND CONTROL DEVICES SERVED BY THIS EXHAUST POINT:

	NAME	FLOW DIAGRAM DESIGNATION
a)		
b)		
c)		
d)		
e)		

THE FOLLOWING INFORMATION NEED ONLY BE SUPPLIED IF READILY AVAILABLE.

51a) LATITUDE:	b) LONGITUDE:	
52) UTM ZONE:	b) UTM VERTICAL (KM):	c) UTM HORIZONTAL (KM):

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL -- PERMIT SECTION
P.O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

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Source Designation:

AIR POLLUTION CONTROL EQUIPMENT DATA AND INFORMATION

FOR AGENCY USE ONLY
ID NUMBER:
CONTROL EQUIPMENT #:
DATE:

THIS FORM MUST BE COMPLETED FOR EACH AIR POLLUTION CONTROL EQUIPMENT. COMPLETE AND PROVIDE THIS FORM IN ADDITION TO THE APPLICABLE ADDENDUM FORM 260-A THROUGH 260-K. A SEPARATE FORM MUST BE COMPLETED FOR EACH MODE OF OPERATION OF AIR POLLUTION CONTROL EQUIPMENT FOR WHICH A PERMIT IS BEING SOUGHT.

SOURCE INFORMATION

1) SOURCE NAME: U.S. Steel - Granite City Works

2) DATE FORM PREPARED:

3) SOURCE ID NO. (IF KNOWN): 119813AAI

GENERAL INFORMATION

4) NAME OF AIR POLLUTION CONTROL EQUIPMENT AND/OR CONTROL SYSTEM:
C.O.G. Desulfurization System

5) FLOW DIAGRAM DESIGNATION OF CONTROL EQUIPMENT AND/OR CONTROL SYSTEM:
C.O.G. Desulfurization

6) MANUFACTURER OF CONTROL EQUIPMENT (IF KNOWN):

7) MODEL NUMBER (IF KNOWN):

8) SERIAL NUMBER (IF KNOWN):

9) DATES OF COMMENCING CONSTRUCTION, OPERATION AND/OR MOST RECENT MODIFICATION OF THIS EQUIPMENT (ACTUAL OR PLANNED)

a) CONSTRUCTION (MONTH/YEAR): 07/07

b) OPERATION (MONTH/YEAR):

c) LATEST MODIFICATION (MONTH/YEAR):

10) BRIEFLY DESCRIBE MODIFICATION (IF APPLICABLE):
Addition of a C.O.G. desulfurization system to the C.O.G. fuel distribution system afer the C.O.G. passes through the by-products plant.

THIS AGENCY IS AUTHORIZED TO REQUIRE THIS INFORMATION UNDER ILLINOIS REVISED STATUTES, 1991, AS AMENDED 1992, CHAPTER 111 1/2, PAR. 1039.5. DISCLOSURE OF THIS INFORMATION IS REQUIRED UNDER THAT SECTION. FAILURE TO DO SO MAY PREVENT THIS FORM FROM BEING PROCESSED AND COULD RESULT IN THE APPLICATION BEING DENIED. THIS FORM HAS BEEN APPROVED BY THE FORMS MANAGEMENT CENTER.

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COG Desulf

APPLICATION PAGE _____

11) LIST ALL EMISSION UNITS AND OTHER CONTROL EQUIPMENT DUCTING EMISSIONS TO THIS CONTROL EQUIPMENT:

NAME	DESIGNATION OR CODE NUMBER
Coke Oven Batteries	
By-product Plant	

12) DOES THE CONTROL EQUIPMENT HAVE MORE THAN ONE MODE OF OPERATION? ☐ YES ☒ NO

IF YES, EXPLAIN AND IDENTIFY WHICH MODE IS COVERED BY THIS FORM (NOTE: A SEPARATE AIR POLLUTION CONTROL EQUIPMENT FORM 260-CAAPP MUST BE COMPLETED FOR EACH MODE):

13) IDENTIFY ALL ATTACHMENTS TO THIS FORM RELATED TO THIS AIR POLLUTION CONTROL EQUIPMENT (E.G., TECHNICAL DRAWINGS):

See Process Flow Diagram Figure 2-1.

OPERATING SCHEDULE

14) IDENTIFY ANY PERIOD WHEN THE CONTROL EQUIPMENT WILL NOT BE OPERATING DUE TO SCHEDULED MAINTENANCE AND/OR REPAIRS WHEN THE FEEDING EMISSION UNIT(S) TO THIS CONTROL EQUIPMENT IS/ARE IN OPERATION:

Maintenance on desulfurization system will be conducted annually for up to five weeks.

15a) IDENTIFY ANY PERIODS DURING OPERATION OF THE FEEDING EMISSION UNIT(S) WHEN THE CONTROL EQUIPMENT IS/ARE NOT USED:

Annual Maintenance

C.O.G. Desulfurization System Malfunction / Shutdown

b) IS THIS CONTROL EQUIPMENT IN OPERATION AT ALL OTHER TIMES THAT THE FEEDING EMISSION UNIT(S) IS/ARE IN OPERATION? ☒ YES ☐ NO

IF NO, EXPLAIN AND PROVIDE THE DURATION OF THE CONTROL EQUIPMENT DOWNTIME:

APPLICABLE RULES

16) PROVIDE ANY SPECIFIC EMISSION STANDARD(S) AND LIMITATION(S) SET BY RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT (E.G., VOM, IAC 218.207(b)(1), 81% OVERALL & 90% CONTROL DEVICE EFF.):

REGULATED AIR POLLUTANT(S)	EMISSION STANDARD(S)	REQUIREMENT(S)
SO2	SO2 FESOP	SO2 limits at C.O.G. combustion units

17) PROVIDE ANY SPECIFIC RECORDKEEPING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	RECORDKEEPING RULE(S)	REQUIREMENT(S)
SO2	SO2 FESOP	H2S concentration / SO2 emission rates

18) PROVIDE ANY SPECIFIC REPORTING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	REPORTING RULE(S)	REQUIREMENT(S)

19) PROVIDE ANY SPECIFIC MONITORING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	MONITORING RULE(S)	REQUIREMENT(S)
SO2	SO2 FESOP	Monitor H2S

20) PROVIDE ANY SPECIFIC TESTING RULES AND/OR PROCEDURES WHICH ARE APPLICABLE TO THIS EMISSION UNIT :

REGULATED AIR POLLUTANT(S)	TESTING RULE(S)	REQUIREMENT(S)

R005693

COMPLIANCE INFORMATION

21) IS THE CONTROL SYSTEM IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS? ☒ YES ☐ NO

IF NO, THEN FORM 294-CAAPP "COMPLIANCE PLAN/SCHEDULE OF COMPLIANCE – ADDENDUM FOR NON COMPLYING EMISSION UNITS" MUST BE COMPLETED AND SUBMITTED WITH THIS APPLICATION.

22) EXPLANATION OF HOW INITIAL COMPLIANCE IS TO BE, OR WAS PREVIOUSLY, DEMONSTRATED:

Monitor H2S concentration of C.O.G.

23) EXPLANATION OF HOW ONGOING COMPLIANCE WILL BE DEMONSTRATED:

Monitor H2S concentration

TESTING, MONITORING, RECORDKEEPING AND REPORTING

24a) LIST THE PARAMETERS THAT RELATE TO AIR EMISSIONS FOR WHICH RECORDS ARE BEING MAINTAINED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE. INCLUDE THE UNIT OF MEASUREMENT, THE METHOD OF MEASUREMENT, AND THE FREQUENCY OF SUCH RECORDS (E.G., HOURLY, DAILY, WEEKLY):

PARAMETER	UNIT OF MEASUREMENT	METHOD OF MEASUREMENT	FREQUENCY
Volume	cu. ft.	Flow meter	Hourly
H2S concent.	gr/100 scf	Method	Daily

24b) BRIEFLY DESCRIBE THE METHOD BY WHICH RECORDS WILL BE CREATED AND MAINTAINED. FOR EACH RECORDED PARAMETER INCLUDE THE METHOD OF RECORDKEEPING, TITLE OF PERSON RESPONSIBLE FOR RECORDKEEPING, AND TITLE OF PERSON TO CONTACT FOR REVIEW OF RECORDS:

PARAMETER	METHOD OF RECORDKEEPING	TITLE OF PERSON RESPONSIBLE	TITLE OF CONTACT PERSON

c) IS COMPLIANCE OF THE CONTROL EQUIPMENT READILY DEMONSTRATED BY REVIEW OF THE RECORDS? ☒ YES ☐ NO

IF NO, EXPLAIN:

d) ARE ALL RECORDS READILY AVAILABLE FOR INSPECTION, COPYING AND/OR SUBMITTAL TO THE AGENCY UPON REQUEST? ☒ YES ☐ NO

IF NO, EXPLAIN.

25a) DESCRIBE ANY MONITORS OR MONITORING ACTIVITIES USED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE:

Monitor H2S concentration

b) WHAT OPERATING PARAMETER(S) IS(ARE) BEING MONITORED (E.G., COMBUSTION CHAMBER TEMPERATURE)?

COG temperature, COG pressure, COG flow, Amine temperature, amine flow, fuel gas flow, thermal oxidizer temperature, stack temperature.

c) DESCRIBE THE LOCATION OF EACH MONITOR (E.G., EXIT OF COMBUSTION CHAMBER):

To be determined.

25d) IS EACH MONITOR EQUIPPED WITH A RECORDING DEVICE? ☒ YES ☐ NO

IF NO, LIST ALL MONITORS WITHOUT A RECORDING DEVICE:

e) IS EACH MONITOR REVIEWED FOR ACCURACY ON AT LEAST A QUARTERLY BASIS? ☐ YES ☒ NO

IF NO, EXPLAIN:

Annual accuracy checks during plant maintenance when needed.

f) IS EACH MONITOR OPERATED AT ALL TIMES THE CONTROL EQUIPMENT IS IN OPERATION? ☒ YES ☐ NO

IF NO, EXPLAIN:

26) PROVIDE INFORMATION ON THE MOST RECENT TESTS, IF ANY, IN WHICH THE RESULTS ARE USED FOR PURPOSES OF THE DETERMINATION OF FEES, RULE APPLICABILITY OR COMPLIANCE. INCLUDE THE TEST DATE, TEST METHOD USED, TESTING COMPANY, OPERATING CONDITIONS EXISTING DURING THE TEST AND A SUMMARY OF RESULTS. IF ADDITIONAL SPACE IS NEEDED, ATTACH AND LABEL AS EXHIBIT 260-1:

TEST DATE	TEST METHOD	TESTING COMPANY	OPERATING CONDITIONS	SUMMARY OF RESULTS
NA				

27) DESCRIBE ALL REPORTING REQUIREMENTS AND PROVIDE THE TITLE AND FREQUENCY OF REPORT SUBMITTALS TO THE AGENCY:

REPORTING REQUIREMENTS	TITLE OF REPORT	FREQUENCY

CAPTURE AND CONTROL

28) DESCRIBE THE CAPTURE SYSTEM USED TO CONTAIN, COLLECT AND TRANSPORT EMISSIONS TO THE CONTROL EQUIPMENT. INCLUDE ALL HOODS, DUCTS, FANS, ETC. ALSO INCLUDE THE METHOD OF CAPTURE USED AT EACH EMISSION POINT. (IF ADDITIONAL SPACE IS NEEDED, ATTACH AND LABEL AS EXHIBIT 260-2):

NA

29) ARE FEATURES OF THE CAPTURE SYSTEM ACCURATELY DEPICTED IN THE FLOW DIAGRAM CONTAINED IN THIS APPLICATION? ☒ YES ☐ NO

IF NO, A SKETCH SHOWING THE FEATURES OF THE CAPTURE SYSTEM SHOULD BE ATTACHED AND LABELED AS EXHIBIT 280-3:

30) PROVIDE THE ACTUAL (MINIMUM AND TYPICAL) CAPTURE SYSTEM EFFICIENCY, CONTROL EQUIPMENT DESTRUCTION/REMOVAL EFFICIENCY, AND THE OVERALL REDUCTION EFFICIENCY PROVIDED BY THE COMBINATION OF THE CAPTURE SYSTEM AND CONTROL EQUIPMENT FOR EACH REGULATED AIR POLLUTANT TO BE CONTROLLED. ATTACH THE CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH THESE EFFICIENCIES WERE BASED AND LABEL AS EXHIBIT 280-4:

a) CONTROL PERFORMANCE:

	REGULATED AIR POLLUTANT	CAPTURE SYSTEM EFFICIENCY (%) (MIN)	CAPTURE SYSTEM EFFICIENCY (%) (TYP)	CONTROL EQUIPMENT EFFICIENCY (%) (MIN)	CONTROL EQUIPMENT EFFICIENCY (%) (TYP)	OVERALL REDUCTION EFFICIENCY (%) (MIN)	OVERALL REDUCTION EFFICIENCY (%) (TYP)
i	H2S (SO2)	91.67	93.75	91.67	93.75	83.33	87.50
ii							
iii							

iv. EXPLAIN ANY OTHER REQUIRED LIMITS ON CONTROL EQUIPMENT PERFORMANCE SUCH AS OUTLET CONCENTRATION, COOLANT TEMPERATURE, ETC.

NA

b) METHOD USED TO DETERMINE EACH OF THE ABOVE EFFICIENCIES (E.G., STACK TEST, MATERIAL BALANCE, MANUFACTURER'S GUARANTEE, ETC.) AND THE DATE LAST TESTED, IF APPLICABLE:

	EFFICIENCY DETERMINATION METHOD	DATE LAST TESTED
CAPTURE:	NA	
CONTROL:	NA	
OVERALL:	NA	

c) REQUIRED PERFORMANCE:

	REGULATED AIR POLLUTANT	CAPTURE SYSTEM EFFICIENCY (%)	CONTROL EQUIPMENT EFFICIENCY (%)	OVERALL REDUCTION EFFICIENCY (%)	APPLICABLE RULE
i					None
ii					
iii					

iv EXPLAIN ANY OTHER REQUIRED LIMITS ON CONTROL EQUIPMENT PERFORMANCE SUCH AS OUTLET CONCENTRATION, COOLANT TEMPERATURE, ETC.:

NA

(3)EMISSION INFORMATION

REGULATED AIR POLLUTANT		[1]ACTUAL EMISSION RATE					ALLOWABLE BY RULE EMISSION RATE			[2]PERMITTED EMISSION RATE	
		LBS PER HOUR (LBS/HR)	TONS PER YEAR (TONS/YR)	[3]OTHER TERMS	[3]OTHER TERMS	[4]DM	[5]RATE (UNITS)	APPLICABLE RULES	TONS PER YEAR (TONS/YR)	RATE (UNITS)	TONS PER YEAR (TONS/YR)
CARBON MONOXIDE (CO)	MAXIMUM:	16.2									
	TYPICAL:										
LEAD	MAXIMUM:										
	TYPICAL:										
NITROGEN OXIDES (NOx)	MAXIMUM:	0.27									
	TYPICAL:										
PARTICULATE MATTER (PART)	MAXIMUM:										
	TYPICAL:										
PARTICULATE MATTER <= 10 MICROMETERS (PM10)	MAXIMUM:										
	TYPICAL:										
SULFUR DIOXIDE (SO2)	MAXIMUM:	66.5				4					
	TYPICAL:										
VOLATILE ORGANIC MATERIAL (VOM)	MAXIMUM:	0.02									
	TYPICAL:										
OTHER, SPECIFY: H2S in gas	MAXIMUM:			25gr/100		4					
	TYPICAL:			20 gr/100		4					
EXAMPLE: PARTICULATE MATTER	MAXIMUM:	*6.00*	*21.9*	*0.3 GR/DSCF*		*1*	*6.0 (LBS/HR)*	*212.321*	*26.28*	*5.5 LBS/HR*	*22*
	TYPICAL:	*4.00*	*14.4*	*0.24 GR/DSCF*		*4*	*5.5 (LBS/HR)*	*212.321*	*19.80*		

IMPORTANT: ATTACH CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH EMISSIONS WERE DETERMINED AND LABEL AS EXHIBIT 26B-5.

[1]PROVIDE CONTROLLED EMISSIONS (E.G., THE EMISSIONS THAT WOULD RESULT AFTER ALL CONTROL AND CAPTURE EFFICIENCIES ARE ACCOUNTED FOR).
[2]PROVIDE THE EMISSION RATE THAT WILL BE USED AS A PERMIT SPECIAL CONDITION. THIS LIMIT WILL BE USED TO DETERMINE THE PERMIT FEE.
[3]PLEASE PROVIDE ANY OTHER EMISSION RATE WHICH IS COMMONLY USED, REQUIRED BY A SPECIFIC LIMITATION OR THAT WAS MEASURED (E.G. PPM, GR/DSCF, ETC.)
[4]DM - DETERMINATION METHOD: 1) STACK TEST, 2) MATERIAL BALANCE, 3) STANDARD EMISSION FACTOR (AP-42 OR AIRS), 4) ENGINEERING ESTIMATE, 5) SPECIAL EMISSION FACTOR (NOT AP-42 OR AIRS).
[5]RATE - ALLOWABLE EMISSION RATE SPECIFIED BY MOST STRINGENT APPLICABLE RULE.

R005698

(32) HAZARDOUS AIR POLLUTANT EMISSION INFORMATION

HAP INFORMATION		[1]ACTUAL EMISSION RATE					ALLOWABLE BY RULE	
NAME OF HAP EMITTED	[2]CAS NUMBER		POUNDS PER HOUR (LBS/HR)	TONS PER YEAR (TONS/YR)	[3]OTHER TERMS	[4]DM	[5]RATE OR STANDARD	APPLICABLE RULE
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM						
		TYPICAL:						
		MAXIMUM						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
EXAMPLE:		MAXIMUM:	*10.0*	*1.2*		*2*	*98% by wt control device*	*CFR 61*
Benzene	*71432*	TYPICAL:	*8.0*	*0.8*		*2*	*leak-tight trucks*	*61.302(b),(d)*

IMPORTANT: ATTACH CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH EMISSIONS WERE DETERMINED AND LABEL AS EXHIBIT 260-6.

[1]PROVIDE CONTROLLED EMISSIONS (E.G., THE EMISSIONS THAT WOULD RESULT AFTER ALL CONTROL AND CAPTURE EFFICIENCIES ARE ACCOUNTED FOR).
[2]CAS - CHEMICAL ABSTRACT SERVICE NUMBER.
[3]PLEASE PROVIDE ANY OTHER EMISSION RATE WHICH IS COMMONLY USED, REQUIRED BY A SPECIFIC LIMITATION OR THAT WAS MEASURED (E.G., PPM, GR/DSCF, ETC.).
[4]DM - DETERMINATION METHOD: 1) STACK TEST, 2) MATERIAL BALANCE, 3) STANDARD EMISSION FACTOR (AP-42 OR AIRS, 4) ENGINEERING ESTIMATE, 5) SPECIAL EMISSION FACTOR (NOT AP-42 OR AIRS).
[5]RATE - ALLOWABLE EMISSION RATE OR STANDARD SPECIFIED BY MOST STRINGENT APPLICABLE RULE.

R005699

EXHAUST POINT INFORMATION

33) DESCRIPTION OF EXHAUST POINT (STACK, VENT, ROOF MONITOR, INDOORS, ETC.). IF THE EXHAUST POINT DISCHARGES INDOORS, DO NOT COMPLETE THE REMAINING ITEMS.

Stack

34) DISTANCE TO NEAREST PLANT BOUNDARY FROM EXHAUST POINT DISCHARGE (FT):

35) DISCHARGE HEIGHT ABOVE GRADE (FT):

120

36) GOOD ENGINEERING PRACTICE (GEP) HEIGHT, IF KNOWN (FT):

37) DIAMETER OF EXHAUST POINT (FT): NOTE: FOR A NON CIRCULAR EXHAUST POINT, THE DIAMETER IS 1.128 TIMES THE SQUARE ROOT OF THE AREA.

1.25

38) EXIT GAS FLOW RATE	a) MAXIMUM (ACFM):	b) TYPICAL (ACFM):
	232.000	
39) EXIT GAS TEMPERATURE	a) MAXIMUM (°F):	b) TYPICAL (°F):
	1,200	1,000

40) DIRECTION OF EXHAUST (VERTICAL, LATERAL, DOWNWARD):

Vertical

41) LIST ALL EMISSION UNITS AND CONTROL DEVICES SERVED BY THIS EXHAUST POINT:

	NAME	FLOW DIAGRAM DESIGNATION
a)	C.O.G. Desulfurization Unit	C.O.G. Desulf
b)		
c)		
d)		
e)		
f)		
g)		

42) WHAT PERCENTAGE OF THE CONTROL EQUIPMENT EMISSIONS ARE BEING DUCTED TO THIS EXHAUST POINT (%)?

100%

43) IF THE PERCENTAGE OF THE CONTROL EQUIPMENT EMISSIONS BEING DUCTED TO THE EXHAUST POINT IS NOT 100%, THEN EXPLAIN WHERE THE REMAINING EMISSIONS ARE BEING EXHAUSTED TO:

THE FOLLOWING INFORMATION NEED ONLY BE SUPPLIED IF READILY AVAILABLE.

44a) LATITUDE:	b) LONGITUDE:	
45) UTM ZONE:	b) UTM VERTICAL (KM):	c) UTM HORIZONTAL (KM):
15	4286.93814	749.967190

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL -- PERMIT SECTION
P.O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

FOR APPLICANT'S USE
Revision #: _____
Date: ____ / ____ / ____
Page _____ of _____
Source Designation: COG Desulf Afterburner

SUPPLEMENTAL FORM AIR POLLUTION CONTROL EQUIPMENT AFTERBURNER (260B)

FOR AGENCY USE ONLY
ID NUMBER:
CONTROL EQUIPMENT#:
DATE:

DATA AND INFORMATION

1) FLOW DIAGRAM DESIGNATION OF AFTERBURNER:
Thermal Oxidizer

2) FUEL USED IN BURNERS:
☐ NATURAL GAS ☐ FUEL OIL; NUMBER: _____
☒ OTHER, SPECIFY: Desulfurized Coke Oven Gas

3) BURNERS PER AFTERBURNER: 1 AT 1.8 (MILLION BTU/HR, EACH)

4) MINIMUM COMBUSTION CHAMBER TEMPERATURE (DEGREES FAHRENHEIT):
1,000

5) IS A CATALYST USED?: ☐ YES ☒ NO
IF YES, CATALYST MATERIAL:

6) EXPECTED FREQUENCY OF CATALYST REPLACEMENT:

7) DATE CATALYST WAS LAST REPLACED (MONTH/YEAR): /

8) EXPLAIN DEGRADATION OR PERFORMANCE INDICATOR CRITERIA DETERMINING CATALYST REPLACEMENT:

9a) IS A HEAT EXCHANGER USED?: ☐ YES ☒ NO
IF YES, DESCRIBE:

b) HEAT EXCHANGER SURFACE AREA (FT²):

c) AVERAGE THERMAL EFFICIENCY (%):

10) DESCRIBE METHOD OF GAS MIXING USED:

11) RANGE OF RETENTION TIME: TO (SEC)

12) COMBUSTION CHAMBER LENGTH (FEET):

THIS AGENCY IS AUTHORIZED TO REQUIRE THIS INFORMATION UNDER ILLINOIS REVISED STATUTES, 1991, AS AMENDED 1992, CHAPTER 111 1/2, PAR. 1039.5. DISCLOSURE OF THIS INFORMATION IS REQUIRED UNDER THAT SECTION. FAILURE TO DO SO MAY PREVENT THIS FORM FROM BEING PROCESSED AND COULD RESULT IN THE APPLICATION BEING DENIED. THIS FORM HAS BEEN APPROVED BY THE FORMS MANAGEMENT CENTER.

FOR APPLICANT'S USE

APPLICATION PAGE _____

13) COMBUSTION CHAMBER CROSS SECTIONAL AREA (SQUARE FEET):

14) INLET EMISSION STREAM PARAMETERS:

	MAX	TYPICAL
PRESSURE (mmHG):		
HEAT CONTENT (BTU/SCF):		
OXYGEN CONTENT (%):		
MOISTURE CONTENT (%):		

ARE HALOGENATED ORGANICS PRESENT? ☐ YES ☒ NO

ARE PARTICULATES PRESENT? ☐ YES ☒ NO

ARE METALS PRESENT? ☐ YES ☒ NO

15) AFTERBURNER OPERATING PARAMETERS:

	DURING MAXIMUM OPERATION OF FEEDING UNIT(S)	DURING TYPICAL OPERATION OF FEEDING UNIT(S)
COMBUSTION CHAMBER TEMPERATURE (DEGREES FAHRENHEIT):	1200	1200
INLET GAS TEMPERATURE (DEGREES FAHRENHEIT):		
INLET FLOW RATE (SCFM):		
EFFICIENCY (VOM REDUCTION):	(%)	(%)
EFFICIENCY (OTHER; SPECIFY CONTAMINANT: H2S):	(%)	(%)

16) FOR THERMAL AFTERBURNERS, IS THE COMBUSTION CHAMBER TEMPERATURE CONTINUOUSLY MONITORED AND RECORDED? ☒ YES ☐ NO

17) FOR CATALYTIC AFTERBURNERS, IS THE TEMPERATURE RISE ACROSS THE CATALYST BED CONTINUOUSLY MONITORED AND RECORDED? ☐ YES ☐ NO

18) IS THE VOM CONCENTRATION OF EXHAUST MONITORED AND RECORDED? ☐ YES ☒ NO

19) IS THE OPERATION OF THE AFTERBURNER DISCONTINUED DURING THE NON-OZONE SEASON (SEPTEMBER 1 TO MAY 31)? ☐ YES ☒ NO

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL – PERMIT SECTION
P.O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

FOR APPLICANT'S USE
Revision #: _____
Date: ____ / ____ / ____
Page _____ of _____
Source Designation: _____

PROCESS EMISSION UNIT DATA AND INFORMATION	FOR AGENCY USE ONLY
	ID NUMBER:
	EMISSION POINT #:
	DATE:

SOURCE INFORMATION	
1) SOURCE NAME: US Steel Granite City Works	
2) DATE FORM PREPARED:	3) SOURCE ID NO. (IF KNOWN): 119813AAI

GENERAL INFORMATION	
4) NAME OF EMISSION UNIT: Hot Strip Slab Furnaces # 1-3	
5) NAME OF PROCESS: Hot Strip Mill	
6) DESCRIPTION OF PROCESS: Heating of steel slabs prior to rolling in the mill to produce steel coils	
7) DESCRIPTION OF ITEM OR MATERIAL PRODUCED OR ACTIVITY ACCOMPLISHED: Steel Coils	
8) FLOW DIAGRAM DESIGNATION OF EMISSION UNIT: N/A	
9) MANUFACTURER OF EMISSION UNIT (IF KNOWN): N/A	
10) MODEL NUMBER (IF KNOWN):	11) SERIAL NUMBER (IF KNOWN):
12) DATES OF COMMENCING CONSTRUCTION, OPERATION AND/OR MOST RECENT MODIFICATION OF THIS EMISSION UNIT (ACTUAL OR PLANNED)	a) CONSTRUCTION (MONTH/YEAR):
	b) OPERATION (MONTH/YEAR):
	c) LATEST MODIFICATION (MONTH/YEAR):
13) DESCRIPTION OF MODIFICATION (IF APPLICABLE): Installation of Low NOx burners on the slab furnaces to reduce NOx emissions.	

THIS AGENCY IS AUTHORIZED TO REQUIRE THIS INFORMATION UNDER ILLINOIS REVISED STATUTES, 1991, AS AMENDED 1992, CHAPTER 111 1/2, PAR. 1039.5. DISCLOSURE OF THIS INFORMATION IS REQUIRED UNDER THAT SECTION. FAILURE TO DO SO MAY PREVENT THIS FORM FROM BEING PROCESSED AND COULD RESULT IN THE APPLICATION BEING DENIED. THIS FORM HAS BEEN APPROVED BY THE FORMS MANAGEMENT CENTER.

FOR APPLICANT'S USE

14) DOES THE EMISSION UNIT HAVE MORE THAN ONE MODE OF OPERATION? ☐ YES ☒ NO

IF YES, EXPLAIN AND IDENTIFY WHICH MODE IS COVERED BY THIS FORM (NOTE: A SEPARATE PROCESS EMISSION UNIT FORM 220-CAAPP MUST BE COMPLETED FOR EACH MODE):

15) PROVIDE THE NAME AND DESIGNATION OF ALL AIR POLLUTION CONTROL EQUIPMENT CONTROLLING THIS EMISSION UNIT, IF APPLICABLE (FORM 260-CAAPP AND THE APPROPRIATE 260-CAAPP ADDENDUM FORM MUST BE COMPLETED FOR EACH ITEM OF AIR POLLUTION CONTROL EQUIPMENT):

Low NOx burners

16) WILL EMISSIONS DURING STARTUP EXCEED EITHER THE ALLOWABLE EMISSION RATE PURSUANT TO A SPECIFIC RULE, OR THE ALLOWABLE EMISSION LIMIT AS ESTABLISHED BY AN EXISTING OR PROPOSED PERMIT CONDITION? ☐ YES ☒ NO

IF YES, COMPLETE AND ATTACH FORM 203-CAAPP, "REQUEST TO OPERATE WITH EXCESS EMISSIONS DURING STARTUP OF EQUIPMENT".

17) PROVIDE ANY LIMITATIONS ON SOURCE OPERATION AFFECTING EMISSIONS OR ANY WORK PRACTICE STANDARDS (E.G., ONLY ONE UNIT IS OPERATED AT A TIME):

OPERATING INFORMATION

18) ATTACH THE CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSION RELATED, FROM WHICH THE FOLLOWING OPERATING INFORMATION, MATERIAL USAGE INFORMATION AND FUEL USAGE DATA WERE BASED AND LABEL AS EXHIBIT 220-1. REFER TO SPECIAL NOTES OF FORM 202-CAAPP.

19a) MAXIMUM OPERATING HOURS	HOURS/DAY: 24	DAYS/WEEK: 7	WEEKS/YEAR: 52	
b) TYPICAL OPERATING HOURS	HOURS/DAY: 24	DAYS/WEEK: 7	WEEKS/YEAR: 52	
20) ANNUAL THROUGHPUT	DEC-FEB(%): 25	MAR-MAY(%): 25	JUN-AUG(%): 25	SEP-NOV(%): 25

MATERIAL USAGE INFORMATION

21a) RAW MATERIALS	MAXIMUM RATES LBS/HR	MAXIMUM RATES TONS/YEAR	TYPICAL RATES LBS/HR	TYPICAL RATES TONS/YEAR
Steel Slabs		4,100,000		

21b) PRODUCTS	MAXIMUM RATES LBS/HR	MAXIMUM RATES TONS/YEAR	TYPICAL RATES LBS/HR	TYPICAL RATES TONS/YEAR
Steel Coils		4,003,336		

21c) BY-PRODUCT MATERIALS	MAXIMUM RATES LBS/HR	MAXIMUM RATES TONS/YEAR	TYPICAL RATES LBS/HR	TYPICAL RATES TONS/YEAR

FUEL USAGE DATA

22a) MAXIMUM FIRING RATE (MILLION BTU/HR):	b) TYPICAL FIRING RATE (MILLION BTU/HR):	c) DESIGN CAPACITY FIRING RATE (MILLION BTU/HR):
360 (Each Furnace)		360 (Each Furnace)

d) FUEL TYPE:

☒ NATURAL GAS ☐ FUEL OIL: GRADE NUMBER _____ ☐ COAL ☐ OTHER See 220-2

IF MORE THAN ONE FUEL IS USED, ATTACH AN EXPLANATION AND LABEL AS EXHIBIT 220-2.

e) TYPICAL HEAT CONTENT OF FUEL (BTU/LB, BTU/GAL OR BTU/SCF):	f) TYPICAL SULFUR CONTENT (WT %, NA FOR NATURAL GAS):
1020	NA
g) TYPICAL ASH CONTENT (WT %, NA FOR NATURAL GAS):	h) ANNUAL FUEL USAGE (SPECIFY UNITS, E.G., SCF/YEAR, GAL/YEAR, TON/YEAR):
NA	

23) ARE COMBUSTION EMISSIONS DUCTED TO THE SAME STACK OR CONTROL AS PROCESS UNIT EMISSIONS? ☒ YES ☐ NO

IF NO, IDENTIFY THE EXHAUST POINT FOR COMBUSTION EMISSIONS:

APPLICABLE RULES

24) PROVIDE ANY SPECIFIC EMISSION STANDARD(S) AND LIMITATION(S) SET BY RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT (E.G., VOM, IAC 218.204(j)(4), 3.5 LBS/GAL):

REGULATED AIR POLLUTANT(S)	EMISSION STANDARD(S)	REQUIREMENT(S)
SO2	SO2 FESOP	SO2 < 2,299 lbs. / 3 hours for furnaces 1 through 3
SO2	SO2 FESOP	SO2 < 9,754 lbs. / 24 hours for furnaces 1 through 3
SO2	SO2 FESOP	SO2 < 987 tpy for furnaces 1 through 3

25) PROVIDE ANY SPECIFIC RECORDKEEPING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	RECORDKEEPING RULE(S)	REQUIREMENT(S)
SO2	SO2 FESOP	Records of SO2 emissions

26) PROVIDE ANY SPECIFIC REPORTING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	REPORTING RULE(S)	REQUIREMENT(S)
None		

27) PROVIDE ANY SPECIFIC MONITORING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	MONITORING RULE(S)	REQUIREMENT(S)
SO2	SO2 FESOP	Monitor H2S content of coke oven gas fuel

28) PROVIDE ANY SPECIFIC TESTING RULES AND/OR PROCEDURES WHICH ARE APPLICABLE TO THIS EMISSION UNIT :

REGULATED AIR POLLUTANT(S)	TESTING RULE(S)	REQUIREMENT(S)
None		

R005706

29) DOES THE EMISSION UNIT QUALIFY FOR AN EXEMPTION FROM AN OTHERWISE APPLICABLE RULE? ☐ YES ☒ NO

IF YES, THEN LIST BOTH THE RULE FROM WHICH IT IS EXEMPT AND THE RULE WHICH ALLOWS THE EXEMPTION. PROVIDE A DETAILED EXPLANATION JUSTIFYING THE EXEMPTION. INCLUDE DETAILED SUPPORTING DATA AND CALCULATIONS. ATTACH AND LABEL AS EXHIBIT 220-3, OR REFER TO OTHER ATTACHMENT(S) WHICH ADDRESS AND JUSTIFY THIS EXEMPTION.

COMPLIANCE INFORMATION

30) IS THE EMISSION UNIT IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS? ☒ YES ☐ NO

IF NO, THEN FORM 294-CAAPP "COMPLIANCE PLAN/SCHEDULE OF COMPLIANCE – ADDENDUM FOR NON COMPLYING EMISSION UNITS" MUST BE COMPLETED AND SUBMITTED WITH THIS APPLICATION.

31) EXPLANATION OF HOW INITIAL COMPLIANCE IS TO BE, OR WAS PREVIOUSLY, DEMONSTRATED:

SO2 FESOP monitoring program

32) EXPLANATION OF HOW ONGOING COMPLIANCE WILL BE DEMONSTRATED:

SO2 FESOP Monitoring program

TESTING, MONITORING, RECORDKEEPING AND REPORTING

33a) LIST THE PARAMETERS THAT RELATE TO AIR EMISSIONS FOR WHICH RECORDS ARE BEING MAINTAINED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE. INCLUDE THE UNIT OF MEASUREMENT, THE METHOD OF MEASUREMENT, AND THE FREQUENCY OF SUCH RECORDS (E.G., HOURLY, DAILY, WEEKLY):

PARAMETER	UNIT OF MEASUREMENT	METHOD OF MEASUREMENT	FREQUENCY
COG flow	MMscf	flowmeter	hourly
NG flow	MMscf	flowmeter	monthly

33b) BRIEFLY DESCRIBE THE METHOD BY WHICH RECORDS WILL BE CREATED AND MAINTAINED. FOR EACH RECORDED PARAMETER INCLUDE THE METHOD OF RECORDKEEPING, TITLE OF PERSON RESPONSIBLE FOR RECORDKEEPING, AND TITLE OF PERSON TO CONTACT FOR REVIEW OF RECORDS:

PARAMETER	METHOD OF RECORDKEEPING	TITLE OF PERSON RESPONSIBLE	TITLE OF CONTACT PERSON
COG flow	database	Env. Specialist	Env. Specialist
NG flow	database	Env. Specialist	Env. Specialist

c) IS COMPLIANCE OF THE EMISSION UNIT READILY DEMONSTRATED BY REVIEW OF THE RECORDS? ☒ YES ☐ NO

IF NO, EXPLAIN:

d) ARE ALL RECORDS READILY AVAILABLE FOR INSPECTION, COPYING AND SUBMITTAL TO THE AGENCY UPON REQUEST? ☒ YES ☐ NO

IF NO, EXPLAIN:

34a) DESCRIBE ANY MONITORS OR MONITORING ACTIVITIES USED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE:

COG H2S monitoring

b) WHAT PARAMETER(S) IS(ARE) BEING MONITORED (E.G., VOM EMISSIONS TO ATMOSPHERE)?

H2S content of COG

c) DESCRIBE THE LOCATION OF EACH MONITOR (E.G., IN STACK MONITOR 3 FEET FROM EXIT):

COG distribution line

34d) IS EACH MONITOR EQUIPPED WITH A RECORDING DEVICE? ☒ YES ☐ NO

IF NO, LIST ALL MONITORS WITHOUT A RECORDING DEVICE:

e) IS EACH MONITOR REVIEWED FOR ACCURACY ON AT LEAST A QUARTERLY BASIS? ☒ YES ☐ NO

IF NO, EXPLAIN:

f) IS EACH MONITOR OPERATED AT ALL TIMES THE ASSOCIATED EMISSION UNIT IS IN OPERATION? ☒ YES ☐ NO

IF NO, EXPLAIN:

35) PROVIDE INFORMATION ON THE MOST RECENT TESTS, IF ANY, IN WHICH THE RESULTS ARE USED FOR PURPOSES OF THE DETERMINATION OF FEES, RULE APPLICABILITY OR COMPLIANCE. INCLUDE THE TEST DATE, TEST METHOD USED, TESTING COMPANY, OPERATING CONDITIONS EXISTING DURING THE TEST AND A SUMMARY OF RESULTS. IF ADDITIONAL SPACE IS NEEDED, ATTACH AND LABEL AS EXHIBIT 220-4.

TEST DATE	TEST METHOD	TESTING COMPANY	OPERATING CONDITIONS	SUMMARY OF RESULTS

36) DESCRIBE ALL REPORTING REQUIREMENTS AND PROVIDE THE TITLE AND FREQUENCY OF REPORT SUBMITTALS TO THE AGENCY:

REPORTING REQUIREMENTS	TITLE OF REPORT	FREQUENCY

(37)EMISSION INFORMATION

REGULATED AIR POLLUTANT		☐ [1]ACTUAL EMISSION RATE ☒ [1]UNCONTROLLED EMISSION RATE					ALLOWABLE BY RULE EMISSION RATE			[2]PERMITTED EMISSION RATE	
		LBS PER HOUR (LBS/HR)	TONS PER YEAR (TONS/YR)	[3]OTHER TERMS	[3]OTHER TERMS	[4]DM	[5]RATE (UNITS)	APPLICABLE RULES	TONS PER YEAR (TONS/YR)	RATE (UNITS)	TONS PER YEAR (TONS/YR)
CARBON MONOXIDE (CO)	MAXIMUM:						( )				
	TYPICAL:						( )				
LEAD	MAXIMUM:						( )				
	TYPICAL:						( )				
NITROGEN OXIDES (NOx)	MAXIMUM:						( )				
	TYPICAL:						( )				
PARTICULATE MATTER (PART)	MAXIMUM:						( )				
	TYPICAL:						( )				
PARTICULATE MATTER <= 10 MICROMETERS (PM10)	MAXIMUM:						( )				
	TYPICAL:						( )				
SULFUR DIOXIDE (SO2)	MAXIMUM:						( )				
	TYPICAL:						( )				
VOLATILE ORGANIC MATERIAL (VOM)	MAXIMUM:						( )				
	TYPICAL:						( )				
OTHER, SPECIFY: _____	MAXIMUM:						( )				
	TYPICAL:						( )				
EXAMPLE: PARTICULATE MATTER	MAXIMUM:	*5.00*	*21.9*	*0.3 GR/DSCF*		*1*	*6.0 (LBS/HR)*	*212.321*	*26.28*	*5.5 LBS/HR*	*22*
	TYPICAL:	*4.00*	*14.4*	*0.24 GR/DSCF*		*4*	*5.5 (LBS/HR)*	*212.321*	*19.80*		

IMPORTANT: ATTACH CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH EMISSIONS WERE DETERMINED AND LABEL AS EXHIBIT 220-5.

[1]CHECK UNCONTROLLED EMISSION RATE BOX IF CONTROL EQUIPMENT IS USED, OTHERWISE CHECK AND PROVIDE THE ACTUAL EMISSION RATE TO ATMOSPHERE, INCLUDING INDOORS. SEE INSTRUCTIONS.
[2]PROVIDE THE EMISSION RATE THAT WILL BE USED AS A PERMIT SPECIAL CONDITION. THIS LIMIT WILL BE USED TO DETERMINE THE PERMIT FEE.
[3]PLEASE PROVIDE ANY OTHER EMISSION RATE WHICH IS COMMONLY USED, REQUIRED BY A SPECIFIC LIMITATION OR THAT WAS MEASURED (E.G. PPM, GR/DSCF, ETC.)
[4]DM - DETERMINATION METHOD: 1) STACK TEST, 2) MATERIAL BALANCE, 3) STANDARD EMISSION FACTOR (AP-42 OR AIRS), 4) ENGINEERING ESTIMATE, 5) SPECIAL EMISSION FACTOR (NOT AP-42 OR AIRS)
[5]RATE - ALLOWABLE EMISSION RATE SPECIFIED BY MOST STRINGENT APPLICABLE RULE.

R005710

(38) HAZARDOUS AIR POLLUTANT EMISSION INFORMATION

○ [1]ACTUAL EMISSION RATE
○ [1]UNCONTROLLED EMISSION RATE

NAME OF HAP EMITTED	[2]CAS NUMBER		POUNDS PER HOUR (LBS/HR)	TONS PER YEAR (TONS/YR)	[3]OTHER TERMS	[4]DM	ALLOWABLE BY RULE: [5]RATE OR STANDARD	ALLOWABLE BY RULE: APPLICABLE RULE
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
EXAMPLE:		MAXIMUM:	*10.0*	*1.2*		*2*	*98% by wt control device*	*CFR 61*
Benzene	*71432*	TYPICAL:	*8.0*	*0.8*		*2*	*leak-tight trucks*	*61.302(b).(d)*

IMPORTANT: ATTACH CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH EMISSIONS WERE DETERMINED AND LABEL AS EXHIBIT 220-6.

[1]PROVIDE UNCONTROLLED EMISSIONS IF CONTROL EQUIPMENT IS USED. OTHERWISE, PROVIDE ACTUAL EMISSIONS TO THE ATMOSPHERE, INCLUDING INDOORS. CHECK BOX TO SPECIFY.
[2]CAS - CHEMICAL ABSTRACT SERVICE NUMBER.
[3]PLEASE PROVIDE ANY OTHER EMISSION RATE WHICH IS COMMONLY USED, REQUIRED BY A SPECIFIC LIMITATION OR THAT WAS MEASURED (E.G., PPM, GR/DSCF, ETC.).
[4]DM - DETERMINATION METHOD: 1) STACK TEST, 2) MATERIAL BALANCE, 3) STANDARD EMISSION FACTOR (AP-42 OR AIRS, 4) ENGINEERING ESTIMATE, 5) SPECIAL EMISSION FACTOR (NOT AP-42 OR AIRS).
[5]RATE - ALLOWABLE EMISSION RATE OR STANDARD SPECIFIED BY MOST STRINGENT APPLICABLE RULE.

EXHAUST POINT INFORMATION

THIS SECTION SHOULD NOT BE COMPLETED IF EMISSIONS ARE EXHAUSTED THROUGH AIR POLLUTION CONTROL EQUIPMENT

39) FLOW DIAGRAM DESIGNATION OF EXHAUST POINT:

40) DESCRIPTION OF EXHAUST POINT (STACK, VENT, ROOF MONITOR, INDOORS, ETC.). IF THE EXHAUST POINT DISCHARGES INDOORS, DO NOT COMPLETE THE REMAINING ITEMS.

41) DISTANCE TO NEAREST PLANT BOUNDARY FROM EXHAUST POINT DISCHARGE (FT):

42) DISCHARGE HEIGHT ABOVE GRADE (FT):

43) GOOD ENGINEERING PRACTICE (GEP) HEIGHT, IF KNOWN (FT):

44) DIAMETER OF EXHAUST POINT (FT): NOTE: FOR A NON CIRCULAR EXHAUST POINT, THE DIAMETER IS 1.128 TIMES THE SQUARE ROOT OF THE AREA.

45) EXIT GAS FLOW RATE	a) MAXIMUM (ACFM):	b) TYPICAL (ACFM):
46) EXIT GAS TEMPERATURE	a) MAXIMUM (°F):	b) TYPICAL (°F):

47) DIRECTION OF EXHAUST (VERTICAL, LATERAL, DOWNWARD):

48) LIST ALL EMISSION UNITS AND CONTROL DEVICES SERVED BY THIS EXHAUST POINT:

	NAME	FLOW DIAGRAM DESIGNATION
a)		
b)		
c)		
d)		
e)		

THE FOLLOWING INFORMATION NEED ONLY BE SUPPLIED IF READILY AVAILABLE

49a) LATITUDE:	b) LONGITUDE:	
50) UTM ZONE:	b) UTM VERTICAL (KM):	c) UTM HORIZONTAL (KM):

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL -- PERMIT SECTION
P.O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

FOR APPLICANT'S USE
Revision #:
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Source Designation:

AIR POLLUTION CONTROL EQUIPMENT DATA AND INFORMATION

FOR AGENCY USE ONLY
ID NUMBER:
CONTROL EQUIPMENT #:
DATE:

THIS FORM MUST BE COMPLETED FOR EACH AIR POLLUTION CONTROL EQUIPMENT. COMPLETE AND PROVIDE THIS FORM IN ADDITION TO THE APPLICABLE ADDENDUM FORM 260-A THROUGH 260-K. A SEPARATE FORM MUST BE COMPLETED FOR EACH MODE OF OPERATION OF AIR POLLUTION CONTROL EQUIPMENT FOR WHICH A PERMIT IS BEING SOUGHT.

SOURCE INFORMATION

1) SOURCE NAME: United States Steel - Granite City Works

2) DATE FORM PREPARED:	3) SOURCE ID NO. (IF KNOWN): 119813AAI

GENERAL INFORMATION

4) NAME OF AIR POLLUTION CONTROL EQUIPMENT AND/OR CONTROL SYSTEM: Low NOx Burners on Slab Furnaces 1-3

5) FLOW DIAGRAM DESIGNATION OF CONTROL EQUIPMENT AND/OR CONTROL SYSTEM:

6) MANUFACTURER OF CONTROL EQUIPMENT (IF KNOWN): To Be Determined

7) MODEL NUMBER (IF KNOWN):	8) SERIAL NUMBER (IF KNOWN):

9) DATES OF COMMENCING CONSTRUCTION, OPERATION AND/OR MOST RECENT MODIFICATION OF THIS EQUIPMENT (ACTUAL OR PLANNED)	a) CONSTRUCTION (MONTH/YEAR):
	b) OPERATION (MONTH/YEAR):
	c) LATEST MODIFICATION (MONTH/YEAR):

10) BRIEFLY DESCRIBE MODIFICATION (IF APPLICABLE): Installation of Low NOx Burners on Slab Furnaces

THIS AGENCY IS AUTHORIZED TO REQUIRE THIS INFORMATION UNDER ILLINOIS REVISED STATUTES, 1991, AS AMENDED 1992, CHAPTER 111 1/2, PAR. 1039.5. DISCLOSURE OF THIS INFORMATION IS REQUIRED UNDER THAT SECTION. FAILURE TO DO SO MAY PREVENT THIS FORM FROM BEING PROCESSED AND COULD RESULT IN THE APPLICATION BEING DENIED. THIS FORM HAS BEEN APPROVED BY THE FORMS MANAGEMENT CENTER.

FOR APPLICANT'S USE

APPLICATION PAGE _____

11) LIST ALL EMISSION UNITS AND OTHER CONTROL EQUIPMENT DUCTING EMISSIONS TO THIS CONTROL EQUIPMENT:

NAME	DESIGNATION OR CODE NUMBER

12) DOES THE CONTROL EQUIPMENT HAVE MORE THAN ONE MODE OF OPERATION? ☐ YES ☒ NO

IF YES, EXPLAIN AND IDENTIFY WHICH MODE IS COVERED BY THIS FORM (NOTE: A SEPARATE AIR POLLUTION CONTROL EQUIPMENT FORM 260-CAAPP MUST BE COMPLETED FOR EACH MODE):

13) IDENTIFY ALL ATTACHMENTS TO THIS FORM RELATED TO THIS AIR POLLUTION CONTROL EQUIPMENT(E.G., TECHNICAL DRAWINGS):

None

OPERATING SCHEDULE

14) IDENTIFY ANY PERIOD WHEN THE CONTROL EQUIPMENT WILL NOT BE OPERATING DUE TO SCHEDULED MAINTENANCE AND/OR REPAIRS WHEN THE FEEDING EMISSION UNIT(S) TO THIS CONTROL EQUIPMENT IS/ARE IN OPERATION:

None

15a) IDENTIFY ANY PERIODS DURING OPERATION OF THE FEEDING EMISSION UNIT(S) WHEN THE CONTROL EQUIPMENT IS/ARE NOT USED:

None

b) IS THIS CONTROL EQUIPMENT IN OPERATION AT ALL OTHER TIMES THAT THE FEEDING EMISSION UNIT(S) IS/ARE IN OPERATION? ☒ YES ☐ NO

IF NO, EXPLAIN AND PROVIDE THE DURATION OF THE CONTROL EQUIPMENT DOWNTIME:

APPLICABLE RULES

16) PROVIDE ANY SPECIFIC EMISSION STANDARD(S) AND LIMITATION(S) SET BY RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT (E.G., VOM, IAC 218.207(b)(1), 81% OVERALL & 90% CONTROL DEVICE EFF.):

REGULATED AIR POLLUTANT(S)	EMISSION STANDARD(S)	REQUIREMENT(S)
None		

17) PROVIDE ANY SPECIFIC RECORDKEEPING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	RECORDKEEPING RULE(S)	REQUIREMENT(S)
None		

18) PROVIDE ANY SPECIFIC REPORTING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	REPORTING RULE(S)	REQUIREMENT(S)
None		

19) PROVIDE ANY SPECIFIC MONITORING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	MONITORING RULE(S)	REQUIREMENT(S)
None		

20) PROVIDE ANY SPECIFIC TESTING RULES AND/OR PROCEDURES WHICH ARE APPLICABLE TO THIS EMISSION UNIT :

REGULATED AIR POLLUTANT(S)	TESTING RULE(S)	REQUIREMENT(S)
None		

COMPLIANCE INFORMATION

21) IS THE CONTROL SYSTEM IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS? ☒ YES ☐ NO

IF NO, THEN FORM 294-CAAPP "COMPLIANCE PLAN/SCHEDULE OF COMPLIANCE -- ADDENDUM FOR NON COMPLYING EMISSION UNITS" MUST BE COMPLETED AND SUBMITTED WITH THIS APPLICATION.

22) EXPLANATION OF HOW INITIAL COMPLIANCE IS TO BE, OR WAS PREVIOUSLY, DEMONSTRATED:

No regulatory requirements for NOx reduction at this time.

23) EXPLANATION OF HOW ONGOING COMPLIANCE WILL BE DEMONSTRATED:

Engineering Design and Mfr Guarantee
Stack Testing

TESTING, MONITORING, RECORDKEEPING AND REPORTING

24a) LIST THE PARAMETERS THAT RELATE TO AIR EMISSIONS FOR WHICH RECORDS ARE BEING MAINTAINED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE. INCLUDE THE UNIT OF MEASUREMENT, THE METHOD OF MEASUREMENT, AND THE FREQUENCY OF SUCH RECORDS (E.G., HOURLY, DAILY, WEEKLY):

PARAMETER	UNIT OF MEASUREMENT	METHOD OF MEASUREMENT	FREQUENCY
None			

24b) BRIEFLY DESCRIBE THE METHOD BY WHICH RECORDS WILL BE CREATED AND MAINTAINED. FOR EACH RECORDED PARAMETER INCLUDE THE METHOD OF RECORDKEEPING, TITLE OF PERSON RESPONSIBLE FOR RECORDKEEPING, AND TITLE OF PERSON TO CONTACT FOR REVIEW OF RECORDS:

PARAMETER	METHOD OF RECORDKEEPING	TITLE OF PERSON RESPONSIBLE	TITLE OF CONTACT PERSON

c) IS COMPLIANCE OF THE CONTROL EQUIPMENT READILY DEMONSTRATED BY REVIEW OF THE RECORDS? ☐ YES ☐ NO

IF NO, EXPLAIN:

d) ARE ALL RECORDS READILY AVAILABLE FOR INSPECTION, COPYING AND/OR SUBMITTAL TO THE AGENCY UPON REQUEST? ☐ YES ☐ NO

IF NO, EXPLAIN:

25a) DESCRIBE ANY MONITORS OR MONITORING ACTIVITIES USED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE:

None

b) WHAT OPERATING PARAMETER(S) IS(ARE) BEING MONITORED (E.G., COMBUSTION CHAMBER TEMPERATURE)?

c) DESCRIBE THE LOCATION OF EACH MONITOR (E.G., EXIT OF COMBUSTION CHAMBER):

25d) IS EACH MONITOR EQUIPPED WITH A RECORDING DEVICE? ☐ YES ☐ NO

IF NO, LIST ALL MONITORS WITHOUT A RECORDING DEVICE:

e) IS EACH MONITOR REVIEWED FOR ACCURACY ON AT LEAST A QUARTERLY BASIS? ☐ YES ☐ NO

IF NO, EXPLAIN:

f) IS EACH MONITOR OPERATED AT ALL TIMES THE CONTROL EQUIPMENT IS IN OPERATION? ☐ YES ☐ NO

IF NO, EXPLAIN:

26) PROVIDE INFORMATION ON THE MOST RECENT TESTS, IF ANY, IN WHICH THE RESULTS ARE USED FOR PURPOSES OF THE DETERMINATION OF FEES, RULE APPLICABILITY OR COMPLIANCE. INCLUDE THE TEST DATE, TEST METHOD USED, TESTING COMPANY, OPERATING CONDITIONS EXISTING DURING THE TEST AND A SUMMARY OF RESULTS. IF ADDITIONAL SPACE IS NEEDED, ATTACH AND LABEL AS EXHIBIT 26D-1:

TEST DATE	TEST METHOD	TESTING COMPANY	OPERATING CONDITIONS	SUMMARY OF RESULTS
None				

27) DESCRIBE ALL REPORTING REQUIREMENTS AND PROVIDE THE TITLE AND FREQUENCY OF REPORT SUBMITTALS TO THE AGENCY:

REPORTING REQUIREMENTS	TITLE OF REPORT	FREQUENCY

CAPTURE AND CONTROL

28) DESCRIBE THE CAPTURE SYSTEM USED TO CONTAIN, COLLECT AND TRANSPORT EMISSIONS TO THE CONTROL EQUIPMENT. INCLUDE ALL HOODS, DUCTS, FANS, ETC. ALSO INCLUDE THE METHOD OF CAPTURE USED AT EACH EMISSION POINT. (IF ADDITIONAL SPACE IS NEEDED, ATTACH AND LABEL AS EXHIBIT 26D-2)

Not Applicable. Control System is Burner Design, and no capture is required.

29) ARE FEATURES OF THE CAPTURE SYSTEM ACCURATELY DEPICTED IN THE FLOW DIAGRAM CONTAINED IN THIS APPLICATION? ☐ YES ☐ NO

IF NO, A SKETCH SHOWING THE FEATURES OF THE CAPTURE SYSTEM SHOULD BE ATTACHED AND LABELED AS EXHIBIT 260-3.

30) PROVIDE THE ACTUAL (MINIMUM AND TYPICAL) CAPTURE SYSTEM EFFICIENCY, CONTROL EQUIPMENT DESTRUCTION/REMOVAL EFFICIENCY, AND THE OVERALL REDUCTION EFFICIENCY PROVIDED BY THE COMBINATION OF THE CAPTURE SYSTEM AND CONTROL EQUIPMENT FOR EACH REGULATED AIR POLLUTANT TO BE CONTROLLED. ATTACH THE CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH THESE EFFICIENCIES WERE BASED AND LABEL AS EXHIBIT 260-4.

a) CONTROL PERFORMANCE:

	REGULATED AIR POLLUTANT	CAPTURE SYSTEM EFFICIENCY (%) (MIN)	CAPTURE SYSTEM EFFICIENCY (%) (TYP)	CONTROL EQUIPMENT EFFICIENCY (%) (MIN)	CONTROL EQUIPMENT EFFICIENCY (%) (TYP)	OVERALL REDUCTION EFFICIENCY (%) (MIN)	OVERALL REDUCTION EFFICIENCY (%) (TYP)
i	Not Applicable						
ii							
iii							

iv. EXPLAIN ANY OTHER REQUIRED LIMITS ON CONTROL EQUIPMENT PERFORMANCE SUCH AS OUTLET CONCENTRATION, COOLANT TEMPERATURE, ETC.

b) METHOD USED TO DETERMINE EACH OF THE ABOVE EFFICIENCIES (E.G., STACK TEST, MATERIAL BALANCE, MANUFACTURER'S GUARANTEE, ETC.) AND THE DATE LAST TESTED, IF APPLICABLE:

	EFFICIENCY DETERMINATION METHOD	DATE LAST TESTED
CAPTURE:		
CONTROL:		
OVERALL:		

c) REQUIRED PERFORMANCE:

	REGULATED AIR POLLUTANT	CAPTURE SYSTEM EFFICIENCY (%)	CONTROL EQUIPMENT EFFICIENCY (%)	OVERALL REDUCTION EFFICIENCY (%)	APPLICABLE RULE
i					
ii					
iii					

iv EXPLAIN ANY OTHER REQUIRED LIMITS ON CONTROL EQUIPMENT PERFORMANCE SUCH AS OUTLET CONCENTRATION, COOLANT TEMPERATURE, ETC.

(31)EMISSION INFORMATION

REGULATED AIR POLLUTANT		[1]ACTUAL EMISSION RATE					ALLOWABLE BY RULE EMISSION RATE			[3]PERMITTED EMISSION RATE	
		LBS PER HOUR (LBS/HR)	TONS PER YEAR (TONS/YR)	[3]OTHER TERMS	[3]OTHER TERMS	[4]DM	[5]RATE (UNITS)	APPLICABLE RULES	TONS PER YEAR (TONS/YR)	RATE (UNITS)	TONS PER YEAR (TONS/YR)
CARBON MONOXIDE (CO)	MAXIMUM:						( )				
	TYPICAL:						( )				
LEAD	MAXIMUM:						( )				
	TYPICAL:						( )				
NITROGEN OXIDES (NOx)	MAXIMUM:		443.40				( )				443.40
	TYPICAL:						( )				
PARTICULATE MATTER (PART)	MAXIMUM:						( )				
	TYPICAL:						( )				
PARTICULATE MATTER <= 10 MICROMETERS (PM10)	MAXIMUM:						( )				
	TYPICAL:						( )				
SULFUR DIOXIDE (SO2)	MAXIMUM:						( )				
	TYPICAL:						( )				
VOLATILE ORGANIC MATERIAL (VOM)	MAXIMUM:						( )				
	TYPICAL:						( )				
OTHER, SPECIFY:	MAXIMUM:						( )				
	TYPICAL:						( )				
EXAMPLE: PARTICULATE MATTER	MAXIMUM:	*5.00*	*21.9*	*0.3 GR/DSCF*		*1*	*6.0 (LBS/HR)*	*212.321*	*26.28*	*5.5 LBS/HR*	*22*
	TYPICAL:	*4.00*	*14.4*	*0.24 GR/DSCF*		*4*	*5.5 (LBS/HR)*	*212.321*	*19.80*		

IMPORTANT: ATTACH CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH EMISSIONS WERE DETERMINED AND LABEL AS EXHIBIT 260-5.

[1]PROVIDE CONTROLLED EMISSIONS (E.G., THE EMISSIONS THAT WOULD RESULT AFTER ALL CONTROL AND CAPTURE EFFICIENCIES ARE ACCOUNTED FOR).
[2]PROVIDE THE EMISSION RATE THAT WILL BE USED AS A PERMIT SPECIAL CONDITION. THIS LIMIT WILL BE USED TO DETERMINE THE PERMIT FEE.
[3]PLEASE PROVIDE ANY OTHER EMISSION RATE WHICH IS COMMONLY USED, REQUIRED BY A SPECIFIC LIMITATION OR THAT WAS MEASURED (E.G. PPM, GR/DSCF, ETC.)
[4]DM - DETERMINATION METHOD: 1) STACK TEST, 2) MATERIAL BALANCE, 3) STANDARD EMISSION FACTOR (AP-42 OR AIRS), 4) ENGINEERING ESTIMATE, 5) SPECIAL EMISSION FACTOR (NOT AP-42 OR AIRS)
[5]RATE - ALLOWABLE EMISSION RATE SPECIFIED BY MOST STRINGENT APPLICABLE RULE.

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(32) HAZARDOUS AIR POLLUTANT EMISSION INFORMATION

HAP INFORMATION		[1]ACTUAL EMISSION RATE				ALLOWABLE BY RULE	
NAME OF HAP EMITTED	[2]CAS NUMBER		POUNDS PER HOUR (LBS/HR)	TONS PER YEAR (TONS/YR)	[3]OTHER TERMS	[4]DM	[5]RATE OR STANDARD	APPLICABLE RULE
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
EXAMPLE:		MAXIMUM:	*10.0*	*1.2*		*2*	*98% by wt control device*	*CFR 61*
Benzene	*71432*	TYPICAL:	*8.0*	*0.8*		*2*	*leak-tight trucks*	*61.302(b),(d)*

IMPORTANT: ATTACH CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH EMISSIONS WERE DETERMINED AND LABEL AS EXHIBIT 260-8.

[1]PROVIDE CONTROLLED EMISSIONS (E.G., THE EMISSIONS THAT WOULD RESULT AFTER ALL CONTROL AND CAPTURE EFFICIENCIES ARE ACCOUNTED FOR).
[2]CAS - CHEMICAL ABSTRACT SERVICE NUMBER.
[3]PLEASE PROVIDE ANY OTHER EMISSION RATE WHICH IS COMMONLY USED, REQUIRED BY A SPECIFIC LIMITATION OR THAT WAS MEASURED (E.G., PPM, GR/DSCF, ETC.).
[4]DM - DETERMINATION METHOD: 1) STACK TEST, 2) MATERIAL BALANCE, 3) STANDARD EMISSION FACTOR (AP-42 OR AIRS, 4) ENGINEERING ESTIMATE, 5) SPECIAL EMISSION FACTOR (NOT AP-42 OR AIRS).
[5]RATE - ALLOWABLE EMISSION RATE OR STANDARD SPECIFIED BY MOST STRINGENT APPLICABLE RULE.

EXHAUST POINT INFORMATION

33) DESCRIPTION OF EXHAUST POINT (STACK, VENT, ROOF MONITOR, INDOORS, ETC.). IF THE EXHAUST POINT DISCHARGES INDOORS, DO NOT COMPLETE THE REMAINING ITEMS.

Stack

34) DISTANCE TO NEAREST PLANT BOUNDARY FROM EXHAUST POINT DISCHARGE (FT):

150

35) DISCHARGE HEIGHT ABOVE GRADE (FT):

100

36) GOOD ENGINEERING PRACTICE (GEP) HEIGHT, IF KNOWN (FT):

37) DIAMETER OF EXHAUST POINT (FT): NOTE: FOR A NON CIRCULAR EXHAUST POINT, THE DIAMETER IS 1.128 TIMES THE SQUARE ROOT OF THE AREA.

38) EXIT GAS FLOW RATE	a) MAXIMUM (ACFM): 188,000	b) TYPICAL (ACFM):
39) EXIT GAS TEMPERATURE	a) MAXIMUM (°F): 650	b) TYPICAL (°F):

40) DIRECTION OF EXHAUST (VERTICAL, LATERAL, DOWNWARD):

vertical

41) LIST ALL EMISSION UNITS AND CONTROL DEVICES SERVED BY THIS EXHAUST POINT:

	NAME	FLOW DIAGRAM DESIGNATION
a)		
b)		
c)		
d)		
e)		
f)		
g)		

42) WHAT PERCENTAGE OF THE CONTROL EQUIPMENT EMISSIONS ARE BEING DUCTED TO THIS EXHAUST POINT (%)?

100

43) IF THE PERCENTAGE OF THE CONTROL EQUIPMENT EMISSIONS BEING DUCTED TO THE EXHAUST POINT IS NOT 100%, THEN EXPLAIN WHERE THE REMAINING EMISSIONS ARE BEING EXHAUSTED TO:

THE FOLLOWING INFORMATION NEED ONLY BE SUPPLIED IF READILY AVAILABLE.

44a) LATITUDE:	b) LONGITUDE:	
45) UTM ZONE:	b) UTM VERTICAL (KM):	c) UTM HORIZONTAL (KM):

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL – PERMIT SECTION
P.O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

FOR APPLICANT'S USE
Revision #: _____
Date: ____ / ____ / ____
Page _____ of _____
Source Designation:
_____

PROCESS EMISSION UNIT DATA AND INFORMATION

FOR AGENCY USE ONLY
ID NUMBER:
EMISSION POINT #:
DATE:

SOURCE INFORMATION

1) SOURCE NAME:
US Steel Granite City Works

2) DATE FORM PREPARED:

3) SOURCE ID NO. (IF KNOWN): 119813AAI

GENERAL INFORMATION

4) NAME OF EMISSION UNIT:
Hot Strip Slab Furnaces # 4

5) NAME OF PROCESS:
Hot Strip Mill

6) DESCRIPTION OF PROCESS:
Heating of steel slabs prior to rolling in the mill to produce steel coils

7) DESCRIPTION OF ITEM OR MATERIAL PRODUCED OR ACTIVITY ACCOMPLISHED:
Steel Coils

8) FLOW DIAGRAM DESIGNATION OF EMISSION UNIT:
N/A

9) MANUFACTURER OF EMISSION UNIT (IF KNOWN):
N/A

10) MODEL NUMBER (IF KNOWN):

11) SERIAL NUMBER (IF KNOWN):

12) DATES OF COMMENCING CONSTRUCTION, OPERATION AND/OR MOST RECENT MODIFICATION OF THIS EMISSION UNIT (ACTUAL OR PLANNED)

a) CONSTRUCTION (MONTH/YEAR):

b) OPERATION (MONTH/YEAR):

c) LATEST MODIFICATION (MONTH/YEAR):

13) DESCRIPTION OF MODIFICATION (IF APPLICABLE):
Installation of Low NOx burners on the slab furnaces to reduce NOx emissions.

THIS AGENCY IS AUTHORIZED TO REQUIRE THIS INFORMATION UNDER ILLINOIS REVISED STATUTES, 1991, AS AMENDED 1992, CHAPTER 111 1/2, PAR. 1039.5. DISCLOSURE OF THIS INFORMATION IS REQUIRED UNDER THAT SECTION. FAILURE TO DO SO MAY PREVENT THIS FORM FROM BEING PROCESSED AND COULD RESULT IN THE APPLICATION BEING DENIED. THIS FORM HAS BEEN APPROVED BY THE FORMS MANAGEMENT CENTER.

FOR APPLICANT'S USE
_____

14) DOES THE EMISSION UNIT HAVE MORE THAN ONE MODE OF OPERATION? ☐ YES ☒ NO

IF YES, EXPLAIN AND IDENTIFY WHICH MODE IS COVERED BY THIS FORM (NOTE: A SEPARATE PROCESS EMISSION UNIT FORM 220-CAAPP MUST BE COMPLETED FOR EACH MODE).

15) PROVIDE THE NAME AND DESIGNATION OF ALL AIR POLLUTION CONTROL EQUIPMENT CONTROLLING THIS EMISSION UNIT, IF APPLICABLE (FORM 260-CAAPP AND THE APPROPRIATE 260-CAAPP ADDENDUM FORM MUST BE COMPLETED FOR EACH ITEM OF AIR POLLUTION CONTROL EQUIPMENT):

Low NOx burners

16) WILL EMISSIONS DURING STARTUP EXCEED EITHER THE ALLOWABLE EMISSION RATE PURSUANT TO A SPECIFIC RULE, OR THE ALLOWABLE EMISSION LIMIT AS ESTABLISHED BY AN EXISTING OR PROPOSED PERMIT CONDITION? ☐ YES ☒ NO

IF YES, COMPLETE AND ATTACH FORM 203-CAAPP, "REQUEST TO OPERATE WITH EXCESS EMISSIONS DURING STARTUP OF EQUIPMENT".

17) PROVIDE ANY LIMITATIONS ON SOURCE OPERATION AFFECTING EMISSIONS OR ANY WORK PRACTICE STANDARDS (E.G., ONLY ONE UNIT IS OPERATED AT A TIME):

OPERATING INFORMATION

18) ATTACH THE CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSION RELATED, FROM WHICH THE FOLLOWING OPERATING INFORMATION, MATERIAL USAGE INFORMATION AND FUEL USAGE DATA WERE BASED AND LABEL AS EXHIBIT 220-1. REFER TO SPECIAL NOTES OF FORM 202-CAAPP.

19a) MAXIMUM OPERATING HOURS	HOURS/DAY: 24	DAYS/WEEK: 7	WEEKS/YEAR: 52	
b) TYPICAL OPERATING HOURS	HOURS/DAY: 24	DAYS/WEEK: 7	WEEKS/YEAR: 52	
20) ANNUAL THROUGHPUT	DEC-FEB(%): 25	MAR-MAY(%): 25	JUN-AUG(%): 25	SEP-NOV(%): 25

MATERIAL USAGE INFORMATION

21a) RAW MATERIALS	MAXIMUM RATES LBS/HR	MAXIMUM RATES TONS/YEAR	TYPICAL RATES LBS/HR	TYPICAL RATES TONS/YEAR
Steel Slabs		4,100,000		

21b) PRODUCTS	MAXIMUM RATES LBS/HR	MAXIMUM RATES TONS/YEAR	TYPICAL RATES LBS/HR	TYPICAL RATES TONS/YEAR
Steel Coils		4,003,336		

21c) BY-PRODUCT MATERIALS	MAXIMUM RATES LBS/HR	MAXIMUM RATES TONS/YEAR	TYPICAL RATES LBS/HR	TYPICAL RATES TONS/YEAR

FUEL USAGE DATA

22a) MAXIMUM FIRING RATE (MILLION BTU/HR):	b) TYPICAL FIRING RATE (MILLION BTU/HR):	c) DESIGN CAPACITY FIRING RATE (MILLION BTU/HR):
360 (Each Furnace)		360 (Each Furnace)

d) FUEL TYPE:

☒ NATURAL GAS ☐ FUEL OIL: GRADE NUMBER _____ ☐ COAL ☐ OTHER See 220-2

IF MORE THAN ONE FUEL IS USED, ATTACH AN EXPLANATION AND LABEL AS EXHIBIT 220-2.

e) TYPICAL HEAT CONTENT OF FUEL (BTU/LB, BTU/GAL OR BTU/SCF):	f) TYPICAL SULFUR CONTENT (WT %., NA FOR NATURAL GAS):
1020	NA
g) TYPICAL ASH CONTENT (WT % , NA FOR NATURAL GAS):	h) ANNUAL FUEL USAGE (SPECIFY UNITS, E.G., SCF/YEAR, GAL/YEAR, TON/YEAR):
NA	

23) ARE COMBUSTION EMISSIONS DUCTED TO THE SAME STACK OR CONTROL AS PROCESS UNIT EMISSIONS? ☒ YES ☐ NO

IF NO, IDENTIFY THE EXHAUST POINT FOR COMBUSTION EMISSIONS:

APPLICABLE RULES

24) PROVIDE ANY SPECIFIC EMISSION STANDARD(S) AND LIMITATION(S) SET BY RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT (E.G., VOM, IAC 218.204(j)(4), 3.5 LBS/GAL):

REGULATED AIR POLLUTANT(S)	EMISSION STANDARD(S)	REQUIREMENT(S)
SO2	SO2 FESOP	SO2 < 11,873 lbs. / 24 hours for furnace 4
SO2	SO2 FESOP	SO2 < 1,204 tpy for furnace 4

25) PROVIDE ANY SPECIFIC RECORDKEEPING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	RECORDKEEPING RULE(S)	REQUIREMENT(S)
SO2	SO2 FESOP	Records of SO2 emissions

26) PROVIDE ANY SPECIFIC REPORTING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	REPORTING RULE(S)	REQUIREMENT(S)
None		

27) PROVIDE ANY SPECIFIC MONITORING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	MONITORING RULE(S)	REQUIREMENT(S)
SO2	SO2 FESOP	Monitor H2S content of coke oven gas fuel

28) PROVIDE ANY SPECIFIC TESTING RULES AND/OR PROCEDURES WHICH ARE APPLICABLE TO THIS EMISSION UNIT :

REGULATED AIR POLLUTANT(S)	TESTING RULE(S)	REQUIREMENT(S)
None		

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29) DOES THE EMISSION UNIT QUALIFY FOR AN EXEMPTION FROM AN OTHERWISE APPLICABLE RULE? ☐ YES ☒ NO

IF YES, THEN LIST BOTH THE RULE FROM WHICH IT IS EXEMPT AND THE RULE WHICH ALLOWS THE EXEMPTION. PROVIDE A DETAILED EXPLANATION JUSTIFYING THE EXEMPTION. INCLUDE DETAILED SUPPORTING DATA AND CALCULATIONS. ATTACH AND LABEL AS EXHIBIT 220-3, OR REFER TO OTHER ATTACHMENT(S) WHICH ADDRESS AND JUSTIFY THIS EXEMPTION.

COMPLIANCE INFORMATION

30) IS THE EMISSION UNIT IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS? ☒ YES ☐ NO

IF NO, THEN FORM 294-CAAPP "COMPLIANCE PLAN/SCHEDULE OF COMPLIANCE – ADDENDUM FOR NON COMPLYING EMISSION UNITS" MUST BE COMPLETED AND SUBMITTED WITH THIS APPLICATION.

31) EXPLANATION OF HOW INITIAL COMPLIANCE IS TO BE, OR WAS PREVIOUSLY, DEMONSTRATED:

SO2 FESOP monitoring program

32) EXPLANATION OF HOW ONGOING COMPLIANCE WILL BE DEMONSTRATED:

SO2 FESOP Monitoring program

TESTING, MONITORING, RECORDKEEPING AND REPORTING

33a) LIST THE PARAMETERS THAT RELATE TO AIR EMISSIONS FOR WHICH RECORDS ARE BEING MAINTAINED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE. INCLUDE THE UNIT OF MEASUREMENT, THE METHOD OF MEASUREMENT, AND THE FREQUENCY OF SUCH RECORDS (E.G., HOURLY, DAILY, WEEKLY):

PARAMETER	UNIT OF MEASUREMENT	METHOD OF MEASUREMENT	FREQUENCY
COG flow	MMscf	flowmeter	hourly
NG flow	MMscf	flowmeter	monthly

33b) BRIEFLY DESCRIBE THE METHOD BY WHICH RECORDS WILL BE CREATED AND MAINTAINED. FOR EACH RECORDED PARAMETER INCLUDE THE METHOD OF RECORDKEEPING, TITLE OF PERSON RESPONSIBLE FOR RECORDKEEPING, AND TITLE OF PERSON TO CONTACT FOR REVIEW OF RECORDS:

PARAMETER	METHOD OF RECORDKEEPING	TITLE OF PERSON RESPONSIBLE	TITLE OF CONTACT PERSON
COG flow	database	Env. Specialist	Env. Specialist
NG flow	database	Env. Specialist	Env. Specialist

c) IS COMPLIANCE OF THE EMISSION UNIT READILY DEMONSTRATED BY REVIEW OF THE RECORDS? ☒ YES ☐ NO

IF NO, EXPLAIN:

d) ARE ALL RECORDS READILY AVAILABLE FOR INSPECTION, COPYING AND SUBMITTAL TO THE AGENCY UPON REQUEST? ☒ YES ☐ NO

IF NO, EXPLAIN:

34a) DESCRIBE ANY MONITORS OR MONITORING ACTIVITIES USED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE:

COG H2S monitoring

b) WHAT PARAMETER(S) IS(ARE) BEING MONITORED (E.G., VOM EMISSIONS TO ATMOSPHERE)?

H2S content of COG

c) DESCRIBE THE LOCATION OF EACH MONITOR (E.G., IN STACK MONITOR 3 FEET FROM EXIT):

COG distribution line

34d) IS EACH MONITOR EQUIPPED WITH A RECORDING DEVICE? ☒ YES ☐ NO

IF NO, LIST ALL MONITORS WITHOUT A RECORDING DEVICE:

e) IS EACH MONITOR REVIEWED FOR ACCURACY ON AT LEAST A QUARTERLY BASIS? ☒ YES ☐ NO

IF NO, EXPLAIN:

f) IS EACH MONITOR OPERATED AT ALL TIMES THE ASSOCIATED EMISSION UNIT IS IN OPERATION? ☒ YES ☐ NO

IF NO, EXPLAIN:

35) PROVIDE INFORMATION ON THE MOST RECENT TESTS, IF ANY, IN WHICH THE RESULTS ARE USED FOR PURPOSES OF THE DETERMINATION OF FEES, RULE APPLICABILITY OR COMPLIANCE. INCLUDE THE TEST DATE, TEST METHOD USED, TESTING COMPANY, OPERATING CONDITIONS EXISTING DURING THE TEST AND A SUMMARY OF RESULTS. IF ADDITIONAL SPACE IS NEEDED, ATTACH AND LABEL AS EXHIBIT 220-4:

TEST DATE	TEST METHOD	TESTING COMPANY	OPERATING CONDITIONS	SUMMARY OF RESULTS

36) DESCRIBE ALL REPORTING REQUIREMENTS AND PROVIDE THE TITLE AND FREQUENCY OF REPORT SUBMITTALS TO THE AGENCY:

REPORTING REQUIREMENTS	TITLE OF REPORT	FREQUENCY

(37)EMISSION INFORMATION

REGULATED AIR POLLUTANT		☐ [1]ACTUAL EMISSION RATE ☒ [1]UNCONTROLLED EMISSION RATE					ALLOWABLE BY RULE EMISSION RATE			[2]PERMITTED EMISSION RATE	
		LBS PER HOUR (LBS/HR)	TONS PER YEAR (TONS/YR)	[3]OTHER TERMS	[3]OTHER TERMS	[4]DM	[5]RATE (UNITS)	APPLICABLE RULES	TONS PER YEAR (TONS/YR)	RATE (UNITS)	TONS PER YEAR (TONS/YR)
CARBON MONOXIDE (CO)	MAXIMUM:						( )				
	TYPICAL:						( )				
LEAD	MAXIMUM:						( )				
	TYPICAL:						( )				
NITROGEN OXIDES (NOx)	MAXIMUM:						( )				
	TYPICAL:						( )				
PARTICULATE MATTER (PART)	MAXIMUM:						( )				
	TYPICAL:						( )				
PARTICULATE MATTER <= 10 MICROMETERS (PM10)	MAXIMUM:						( )				
	TYPICAL:						( )				
SULFUR DIOXIDE (SO2)	MAXIMUM:						( )				
	TYPICAL:						( )				
VOLATILE ORGANIC MATERIAL (VOM)	MAXIMUM:						( )				
	TYPICAL:						( )				
OTHER, SPECIFY: _____	MAXIMUM:						( )				
	TYPICAL:						( )				
EXAMPLE: PARTICULATE MATTER	MAXIMUM	*5.00*	*21.9*	*0.3 GR/DSCF*		*1*	*6.0 (LBS/HR)*	*212.321*	*26.28*	*5.5 LBS/HR*	*22*
	TYPICAL:	*4.00*	*14.4*	*0.24 GR/DSCF*		*4*	*5.5 (LBS/HR)*	*212.321*	*19.80*		

IMPORTANT: ATTACH CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH EMISSIONS WERE DETERMINED AND LABEL AS EXHIBIT 220-8.

[1]CHECK UNCONTROLLED EMISSION RATE BOX IF CONTROL EQUIPMENT IS USED, OTHERWISE CHECK AND PROVIDE THE ACTUAL EMISSION RATE TO ATMOSPHERE, INCLUDING INDOORS. SEE INSTRUCTIONS.
[2]PROVIDE THE EMISSION RATE THAT WILL BE USED AS A PERMIT SPECIAL CONDITION. THIS LIMIT WILL BE USED TO DETERMINE THE PERMIT FEE.
[3]PLEASE PROVIDE ANY OTHER EMISSION RATE WHICH IS COMMONLY USED, REQUIRED BY A SPECIFIC LIMITATION OR THAT WAS MEASURED (E.G. PPM, GR/DSCF, ETC.)
[4]DM - DETERMINATION METHOD: 1) STACK TEST, 2) MATERIAL BALANCE, 3) STANDARD EMISSION FACTOR (AP-42 OR AIRS), 4) ENGINEERING ESTIMATE, 5) SPECIAL EMISSION FACTOR (NOT AP-42 OR AIRS)
[5]RATE - ALLOWABLE EMISSION RATE SPECIFIED BY MOST STRINGENT APPLICABLE RULE.

(38) HAZARDOUS AIR POLLUTANT EMISSION INFORMATION

○ [1]ACTUAL EMISSION RATE
○ [1]UNCONTROLLED EMISSION RATE

NAME OF HAP EMITTED	[2]CAS NUMBER		POUNDS PER HOUR (LBS/HR)	TONS PER YEAR (TONS/YR)	[3]OTHER TERMS	[4]DM	ALLOWABLE BY RULE [5]RATE OR STANDARD	ALLOWABLE BY RULE APPLICABLE RULE
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
EXAMPLE:								
Benzene	*71432*	MAXIMUM:	*10.0*	*1.2*		*2*	*98% by wt control device*	*CFR 61*
		TYPICAL:	*8.0*	*0.8*		*2*	*leak-tight trucks*	*61.302(b),(d)*

IMPORTANT: ATTACH CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH EMISSIONS WERE DETERMINED AND LABEL AS EXHIBIT 220-6.

[1]PROVIDE UNCONTROLLED EMISSIONS IF CONTROL EQUIPMENT IS USED. OTHERWISE, PROVIDE ACTUAL EMISSIONS TO THE ATMOSPHERE, INCLUDING INDOORS. CHECK BOX TO SPECIFY.
[2]CAS - CHEMICAL ABSTRACT SERVICE NUMBER.
[3]PLEASE PROVIDE ANY OTHER EMISSION RATE WHICH IS COMMONLY USED, REQUIRED BY A SPECIFIC LIMITATION OR THAT WAS MEASURED (E.G., PPM, GR/DSCF, ETC.).
[4]DM - DETERMINATION METHOD: 1) STACK TEST, 2) MATERIAL BALANCE, 3) STANDARD EMISSION FACTOR (AP-42 OR AIRS, 4) ENGINEERING ESTIMATE, 5) SPECIAL EMISSION FACTOR (NOT AP-42 OR AIRS).
[5]RATE - ALLOWABLE EMISSION RATE OR STANDARD SPECIFIED BY MOST STRINGENT APPLICABLE RULE.

R005731

EXHAUST POINT INFORMATION

THIS SECTION SHOULD NOT BE COMPLETED IF EMISSIONS ARE EXHAUSTED THROUGH AIR POLLUTION CONTROL EQUIPMENT

39) FLOW DIAGRAM DESIGNATION OF EXHAUST POINT:

40) DESCRIPTION OF EXHAUST POINT (STACK, VENT, ROOF MONITOR, INDOORS, ETC.). IF THE EXHAUST POINT DISCHARGES INDOORS, DO NOT COMPLETE THE REMAINING ITEMS.

41) DISTANCE TO NEAREST PLANT BOUNDARY FROM EXHAUST POINT DISCHARGE (FT):

42) DISCHARGE HEIGHT ABOVE GRADE (FT):

43) GOOD ENGINEERING PRACTICE (GEP) HEIGHT, IF KNOWN (FT):

44) DIAMETER OF EXHAUST POINT (FT): NOTE: FOR A NON CIRCULAR EXHAUST POINT, THE DIAMETER IS 1.128 TIMES THE SQUARE ROOT OF THE AREA

45) EXIT GAS FLOW RATE	a) MAXIMUM (ACFM):	b) TYPICAL (ACFM):
46) EXIT GAS TEMPERATURE	a) MAXIMUM (°F):	b) TYPICAL (°F):

47) DIRECTION OF EXHAUST (VERTICAL, LATERAL, DOWNWARD):

48) LIST ALL EMISSION UNITS AND CONTROL DEVICES SERVED BY THIS EXHAUST POINT:

	NAME	FLOW DIAGRAM DESIGNATION
a)		
b)		
c)		
d)		
e)		

THE FOLLOWING INFORMATION NEED ONLY BE SUPPLIED IF READILY AVAILABLE.

49a) LATITUDE:	b) LONGITUDE:	
50) UTM ZONE:	b) UTM VERTICAL (KM):	c) UTM HORIZONTAL (KM):

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL – PERMIT SECTION
P.O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

FOR APPLICANT'S USE
Revision #: _____
Date: _____ / _____ / _____
Page _____ of _____
Source Designation: _____

AIR POLLUTION CONTROL EQUIPMENT DATA AND INFORMATION

FOR AGENCY USE ONLY
ID NUMBER:
CONTROL EQUIPMENT #:
DATE:

THIS FORM MUST BE COMPLETED FOR EACH AIR POLLUTION CONTROL EQUIPMENT. COMPLETE AND PROVIDE THIS FORM IN ADDITION TO THE APPLICABLE ADDENDUM FORM 260-A THROUGH 260-K. A SEPARATE FORM MUST BE COMPLETED FOR EACH MODE OF OPERATION OF AIR POLLUTION CONTROL EQUIPMENT FOR WHICH A PERMIT IS BEING SOUGHT.

SOURCE INFORMATION

1) SOURCE NAME: United States Steel - Granite City Works

2) DATE FORM PREPARED:	3) SOURCE ID NO. (IF KNOWN): 119813AAI

GENERAL INFORMATION

4) NAME OF AIR POLLUTION CONTROL EQUIPMENT AND/OR CONTROL SYSTEM
Low NOx Burners on Slab Furnace 1-4

5) FLOW DIAGRAM DESIGNATION OF CONTROL EQUIPMENT AND/OR CONTROL SYSTEM:

6) MANUFACTURER OF CONTROL EQUIPMENT (IF KNOWN):
To Be Determined

7) MODEL NUMBER (IF KNOWN):	8) SERIAL NUMBER (IF KNOWN):
9) DATES OF COMMENCING CONSTRUCTION, OPERATION AND/OR MOST RECENT MODIFICATION OF THIS EQUIPMENT (ACTUAL OR PLANNED)	a) CONSTRUCTION (MONTH/YEAR):
	b) OPERATION (MONTH/YEAR):
	c) LATEST MODIFICATION (MONTH/YEAR):

10) BRIEFLY DESCRIBE MODIFICATION (IF APPLICABLE):
Installation of Low NOx Burners on Slab Furnaces

THIS AGENCY IS AUTHORIZED TO REQUIRE THIS INFORMATION UNDER ILLINOIS REVISED STATUTES, 1991, AS AMENDED 1992, CHAPTER 111 1/2, PAR. 1039.5. DISCLOSURE OF THIS INFORMATION IS REQUIRED UNDER THAT SECTION. FAILURE TO DO SO MAY PREVENT THIS FORM FROM BEING PROCESSED AND COULD RESULT IN THE APPLICATION BEING DENIED. THIS FORM HAS BEEN APPROVED BY THE FORMS MANAGEMENT CENTER.

FOR APPLICANT'S USE
_____

APPLICATION PAGE _____

11) LIST ALL EMISSION UNITS AND OTHER CONTROL EQUIPMENT DUCTING EMISSIONS TO THIS CONTROL EQUIPMENT:

NAME	DESIGNATION OR CODE NUMBER

12) DOES THE CONTROL EQUIPMENT HAVE MORE THAN ONE MODE OF OPERATION? ☐ YES ☒ NO

IF YES, EXPLAIN AND IDENTIFY WHICH MODE IS COVERED BY THIS FORM (NOTE: A SEPARATE AIR POLLUTION CONTROL EQUIPMENT FORM 260-CAAPP MUST BE COMPLETED FOR EACH MODE):

13) IDENTIFY ALL ATTACHMENTS TO THIS FORM RELATED TO THIS AIR POLLUTION CONTROL EQUIPMENT(E.G., TECHNICAL DRAWINGS):

None

OPERATING SCHEDULE

14) IDENTIFY ANY PERIOD WHEN THE CONTROL EQUIPMENT WILL NOT BE OPERATING DUE TO SCHEDULED MAINTENANCE AND/OR REPAIRS WHEN THE FEEDING EMISSION UNIT(S) TO THIS CONTROL EQUIPMENT IS/ARE IN OPERATION:

None

15a) IDENTIFY ANY PERIODS DURING OPERATION OF THE FEEDING EMISSION UNIT(S) WHEN THE CONTROL EQUIPMENT IS/ARE NOT USED:

None

b) IS THIS CONTROL EQUIPMENT IN OPERATION AT ALL OTHER TIMES THAT THE FEEDING EMISSION UNIT(S) IS/ARE IN OPERATION? ☒ YES ☐ NO

IF NO, EXPLAIN AND PROVIDE THE DURATION OF THE CONTROL EQUIPMENT DOWNTIME:

APPLICABLE RULES

16) PROVIDE ANY SPECIFIC EMISSION STANDARD(S) AND LIMITATION(S) SET BY RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT (E.G., VOM, IAC 218.207(b)(1), 81% OVERALL & 90% CONTROL DEVICE EFF.):

REGULATED AIR POLLUTANT(S)	EMISSION STANDARD(S)	REQUIREMENT(S)
None		

17) PROVIDE ANY SPECIFIC RECORDKEEPING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	RECORDKEEPING RULE(S)	REQUIREMENT(S)
None		

18) PROVIDE ANY SPECIFIC REPORTING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	REPORTING RULE(S)	REQUIREMENT(S)
None		

19) PROVIDE ANY SPECIFIC MONITORING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	MONITORING RULE(S)	REQUIREMENT(S)
None		

20) PROVIDE ANY SPECIFIC TESTING RULES AND/OR PROCEDURES WHICH ARE APPLICABLE TO THIS EMISSION UNIT :

REGULATED AIR POLLUTANT(S)	TESTING RULE(S)	REQUIREMENT(S)
None		

R005735

COMPLIANCE INFORMATION

21) IS THE CONTROL SYSTEM IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS? ☒ YES ☐ NO

IF NO, THEN FORM 294-CAAPP "COMPLIANCE PLAN/SCHEDULE OF COMPLIANCE -- ADDENDUM FOR NON COMPLYING EMISSION UNITS" MUST BE COMPLETED AND SUBMITTED WITH THIS APPLICATION.

22) EXPLANATION OF HOW INITIAL COMPLIANCE IS TO BE, OR WAS PREVIOUSLY, DEMONSTRATED:

No regulatory requirements for NOx reduction at this time.

23) EXPLANATION OF HOW ONGOING COMPLIANCE WILL BE DEMONSTRATED:

Engineering Design and Mfr Guarantee
Stack Testing

TESTING, MONITORING, RECORDKEEPING AND REPORTING

24a) LIST THE PARAMETERS THAT RELATE TO AIR EMISSIONS FOR WHICH RECORDS ARE BEING MAINTAINED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE. INCLUDE THE UNIT OF MEASUREMENT, THE METHOD OF MEASUREMENT, AND THE FREQUENCY OF SUCH RECORDS (E.G., HOURLY, DAILY, WEEKLY):

PARAMETER	UNIT OF MEASUREMENT	METHOD OF MEASUREMENT	FREQUENCY
None			

24b) BRIEFLY DESCRIBE THE METHOD BY WHICH RECORDS WILL BE CREATED AND MAINTAINED. FOR EACH RECORDED PARAMETER INCLUDE THE METHOD OF RECORDKEEPING, TITLE OF PERSON RESPONSIBLE FOR RECORDKEEPING, AND TITLE OF PERSON TO CONTACT FOR REVIEW OF RECORDS:

PARAMETER	METHOD OF RECORDKEEPING	TITLE OF PERSON RESPONSIBLE	TITLE OF CONTACT PERSON

c) IS COMPLIANCE OF THE CONTROL EQUIPMENT READILY DEMONSTRATED BY REVIEW OF THE RECORDS? ☐ YES ☐ NO

IF NO, EXPLAIN:

d) ARE ALL RECORDS READILY AVAILABLE FOR INSPECTION, COPYING AND/OR SUBMITTAL TO THE AGENCY UPON REQUEST? ☐ YES ☐ NO

IF NO, EXPLAIN:

25a) DESCRIBE ANY MONITORS OR MONITORING ACTIVITIES USED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE:

None

b) WHAT OPERATING PARAMETER(S) IS(ARE) BEING MONITORED (E.G., COMBUSTION CHAMBER TEMPERATURE)?

c) DESCRIBE THE LOCATION OF EACH MONITOR (E.G., EXIT OF COMBUSTION CHAMBER):

25d) IS EACH MONITOR EQUIPPED WITH A RECORDING DEVICE? ☐ YES ☐ NO

IF NO, LIST ALL MONITORS WITHOUT A RECORDING DEVICE:

e) IS EACH MONITOR REVIEWED FOR ACCURACY ON AT LEAST A QUARTERLY BASIS? ☐ YES ☐ NO

IF NO, EXPLAIN:

f) IS EACH MONITOR OPERATED AT ALL TIMES THE CONTROL EQUIPMENT IS IN OPERATION? ☐ YES ☐ NO

IF NO, EXPLAIN:

26) PROVIDE INFORMATION ON THE MOST RECENT TESTS, IF ANY, IN WHICH THE RESULTS ARE USED FOR PURPOSES OF THE DETERMINATION OF FEES, RULE APPLICABILITY OR COMPLIANCE. INCLUDE THE TEST DATE, TEST METHOD USED, TESTING COMPANY, OPERATING CONDITIONS EXISTING DURING THE TEST AND A SUMMARY OF RESULTS. IF ADDITIONAL SPACE IS NEEDED, ATTACH AND LABEL AS EXHIBIT 260-1:

TEST DATE	TEST METHOD	TESTING COMPANY	OPERATING CONDITIONS	SUMMARY OF RESULTS
None				

27) DESCRIBE ALL REPORTING REQUIREMENTS AND PROVIDE THE TITLE AND FREQUENCY OF REPORT SUBMITTALS TO THE AGENCY:

REPORTING REQUIREMENTS	TITLE OF REPORT	FREQUENCY

CAPTURE AND CONTROL

28) DESCRIBE THE CAPTURE SYSTEM USED TO CONTAIN, COLLECT AND TRANSPORT EMISSIONS TO THE CONTROL EQUIPMENT. INCLUDE ALL HOODS, DUCTS, FANS, ETC. ALSO INCLUDE THE METHOD OF CAPTURE USED AT EACH EMISSION POINT. (IF ADDITIONAL SPACE IS NEEDED, ATTACH AND LABEL AS EXHIBIT 260-2):

Not Applicable. Control System is Burner Design, and no capture is required.

29) ARE FEATURES OF THE CAPTURE SYSTEM ACCURATELY DEPICTED IN THE FLOW DIAGRAM CONTAINED IN THIS APPLICATION? ☐ YES ☐ NO

IF NO, A SKETCH SHOWING THE FEATURES OF THE CAPTURE SYSTEM SHOULD BE ATTACHED AND LABELED AS EXHIBIT 260-3.

30) PROVIDE THE ACTUAL (MINIMUM AND TYPICAL) CAPTURE SYSTEM EFFICIENCY, CONTROL EQUIPMENT DESTRUCTION/REMOVAL EFFICIENCY, AND THE OVERALL REDUCTION EFFICIENCY PROVIDED BY THE COMBINATION OF THE CAPTURE SYSTEM AND CONTROL EQUIPMENT FOR EACH REGULATED AIR POLLUTANT TO BE CONTROLLED. ATTACH THE CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH THESE EFFICIENCIES WERE BASED AND LABEL AS EXHIBIT 260-4.

a) CONTROL PERFORMANCE:

	REGULATED AIR POLLUTANT	CAPTURE SYSTEM EFFICIENCY (%) (MIN)	CAPTURE SYSTEM EFFICIENCY (%) (TYP)	CONTROL EQUIPMENT EFFICIENCY (%) (MIN)	CONTROL EQUIPMENT EFFICIENCY (%) (TYP)	OVERALL REDUCTION EFFICIENCY (%) (MIN)	OVERALL REDUCTION EFFICIENCY (%) (TYP)
i	Not Applicable						
ii							
iii							

iv EXPLAIN ANY OTHER REQUIRED LIMITS ON CONTROL EQUIPMENT PERFORMANCE SUCH AS OUTLET CONCENTRATION, COOLANT TEMPERATURE, ETC.:

b) METHOD USED TO DETERMINE EACH OF THE ABOVE EFFICIENCIES (E.G., STACK TEST, MATERIAL BALANCE, MANUFACTURER'S GUARANTEE, ETC.) AND THE DATE LAST TESTED, IF APPLICABLE.

	EFFICIENCY DETERMINATION METHOD	DATE LAST TESTED
CAPTURE:		
CONTROL:		
OVERALL:		

c) REQUIRED PERFORMANCE:

	REGULATED AIR POLLUTANT	CAPTURE SYSTEM EFFICIENCY (%)	CONTROL EQUIPMENT EFFICIENCY (%)	OVERALL REDUCTION EFFICIENCY (%)	APPLICABLE RULE
i					
ii					
iii					

iv EXPLAIN ANY OTHER REQUIRED LIMITS ON CONTROL EQUIPMENT PERFORMANCE SUCH AS OUTLET CONCENTRATION, COOLANT TEMPERATURE, ETC.:

(31)EMISSION INFORMATION

REGULATED AIR POLLUTANT		[1]ACTUAL EMISSION RATE: LBS PER HOUR (LBS/HR)	TONS PER YEAR (TONS/YR)	[3]OTHER TERMS	[3]OTHER TERMS	[4]DM	ALLOWABLE BY RULE EMISSION RATE: [5]RATE (UNITS)	APPLICABLE RULES	TONS PER YEAR (TONS/YR)	[2]PERMITTED EMISSION RATE: RATE (UNITS)	TONS PER YEAR (TONS/YR)
CARBON MONOXIDE (CO)	MAXIMUM:										
	TYPICAL:										
LEAD	MAXIMUM:										
	TYPICAL:										
NITROGEN OXIDES (NOx)	MAXIMUM:		700.35								700.35
	TYPICAL:										
PARTICULATE MATTER (PART)	MAXIMUM:										
	TYPICAL:										
PARTICULATE MATTER <= 10 MICROMETERS (PM10)	MAXIMUM:										
	TYPICAL:										
SULFUR DIOXIDE (SO2)	MAXIMUM										
	TYPICAL:										
VOLATILE ORGANIC MATERIAL (VOM)	MAXIMUM:										
	TYPICAL:										
OTHER, SPECIFY: _____	MAXIMUM:										
	TYPICAL:										
EXAMPLE: PARTICULATE MATTER	*MAXIMUM*	*5.00*	*21.9*	*0.3 GR/DSCF*		*1*	*6.0 (LBS/HR)*	*212.321*	*26.28*	*5.5 LBS/HR*	*22*
	TYPICAL	*4.00*	*14.4*	*0.24 GR/DSCF*		*4*	*5.5 (LBS/HR)*	*212.321*	*19.80*		

IMPORTANT: ATTACH CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH EMISSIONS WERE DETERMINED AND LABEL AS EXHIBIT 260-5.

[1]PROVIDE CONTROLLED EMISSIONS (E.G., THE EMISSIONS THAT WOULD RESULT AFTER ALL CONTROL AND CAPTURE EFFICIENCIES ARE ACCOUNTED FOR).
[2]PROVIDE THE EMISSION RATE THAT WILL BE USED AS A PERMIT SPECIAL CONDITION. THIS LIMIT WILL BE USED TO DETERMINE THE PERMIT FEE.
[3]PLEASE PROVIDE ANY OTHER EMISSION RATE WHICH IS COMMONLY USED, REQUIRED BY A SPECIFIC LIMITATION OR THAT WAS MEASURED (E.G. PPM, GR/DSCF, ETC.)
[4]DM - DETERMINATION METHOD: 1) STACK TEST, 2) MATERIAL BALANCE, 3) STANDARD EMISSION FACTOR (AP-42 OR AIRS), 4) ENGINEERING ESTIMATE, 5) SPECIAL EMISSION FACTOR (NOT AP-42 OR AIRS)
[5]RATE - ALLOWABLE EMISSION RATE SPECIFIED BY MOST STRINGENT APPLICABLE RULE.

R005740

(32) HAZARDOUS AIR POLLUTANT EMISSION INFORMATION

HAP INFORMATION		[1]ACTUAL EMISSION RATE					ALLOWABLE BY RULE	
NAME OF HAP EMITTED	[2]CAS NUMBER		POUNDS PER HOUR (LBS/HR)	TONS PER YEAR (TONS/YR)	[3]OTHER TERMS	[4]DM	[5]RATE OR STANDARD	APPLICABLE RULE
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
EXAMPLE:		MAXIMUM:	*10.0*	*1.2*		*2*	*98% by wt control device*	*CFR 61*
Benzene	*71432*	TYPICAL:	*8.0*	*0.8*		*2*	*leak-tight trucks*	*61.302(b),(d)*

IMPORTANT: ATTACH CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH EMISSIONS WERE DETERMINED AND LABEL AS EXHIBIT 260-6.

[1]PROVIDE CONTROLLED EMISSIONS (E.G., THE EMISSIONS THAT WOULD RESULT AFTER ALL CONTROL AND CAPTURE EFFICIENCIES ARE ACCOUNTED FOR).
[2]CAS - CHEMICAL ABSTRACT SERVICE NUMBER.
[3]PLEASE PROVIDE ANY OTHER EMISSION RATE WHICH IS COMMONLY USED, REQUIRED BY A SPECIFIC LIMITATION OR THAT WAS MEASURED (E.G., PPM, GR/DSCF, ETC.).
[4]DM - DETERMINATION METHOD: 1) STACK TEST, 2) MATERIAL BALANCE, 3) STANDARD EMISSION FACTOR (AP-42 OR AIRS, 4) ENGINEERING ESTIMATE, 5) SPECIAL EMISSION FACTOR (NOT AP-42 OR AIRS).
[5]RATE - ALLOWABLE EMISSION RATE OR STANDARD SPECIFIED BY MOST STRINGENT APPLICABLE RULE.

R005741

EXHAUST POINT INFORMATION

33) DESCRIPTION OF EXHAUST POINT (STACK, VENT, ROOF MONITOR, INDOORS, ETC.). IF THE EXHAUST POINT DISCHARGES INDOORS, DO NOT COMPLETE THE REMAINING ITEMS.

4 Stacks (1 for each furnace)

34) DISTANCE TO NEAREST PLANT BOUNDARY FROM EXHAUST POINT DISCHARGE (FT):

150

35) DISCHARGE HEIGHT ABOVE GRADE (FT):

100(#1-3) , 140 (#4)

36) GOOD ENGINEERING PRACTICE (GEP) HEIGHT, IF KNOWN (FT):

37) DIAMETER OF EXHAUST POINT (FT): NOTE. FOR A NON CIRCULAR EXHAUST POINT, THE DIAMETER IS 1.128 TIMES THE SQUARE ROOT OF THE AREA.

38) EXIT GAS FLOW RATE	a) MAXIMUM (ACFM): 188000(1-3) 530000(4)	b) TYPICAL (ACFM):
39) EXIT GAS TEMPERATURE	a) MAXIMUM (°F): 650(#1-3) 700(#4)	b) TYPICAL (°F):

40) DIRECTION OF EXHAUST (VERTICAL, LATERAL, DOWNWARD):

vertical

41) LIST ALL EMISSION UNITS AND CONTROL DEVICES SERVED BY THIS EXHAUST POINT:

NAME	FLOW DIAGRAM DESIGNATION
a)	
b)	
c)	
d)	
e)	
f)	
g)	

42) WHAT PERCENTAGE OF THE CONTROL EQUIPMENT EMISSIONS ARE BEING DUCTED TO THIS EXHAUST POINT (%)?

100

43) IF THE PERCENTAGE OF THE CONTROL EQUIPMENT EMISSIONS BEING DUCTED TO THE EXHAUST POINT IS NOT 100%, THEN EXPLAIN WHERE THE REMAINING EMISSIONS ARE BEING EXHAUSTED TO:

THE FOLLOWING INFORMATION NEED ONLY BE SUPPLIED IF READILY AVAILABLE.

44a) LATITUDE:	b) LONGITUDE:	
45) UTM ZONE:	b) UTM VERTICAL (KM):	c) UTM HORIZONTAL (KM):

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL – PERMIT SECTION
P.O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

FOR APPLICANT'S USE
Revision #: _____
Date: ____ / ____ / ____
Page ____ of ____
Source Designation: _____

SUPPLEMENTAL FORM AIR POLLUTION CONTROL EQUIPMENT NOx CONTROL (260I)

FOR AGENCY USE ONLY
ID NUMBER:
CONTROL EQUIPMENT #:
DATE:

NOTE: A COMBUSTION MODIFICATION SUCH AS ADDING A LOW NOx BURNER REQUIRES A SEPARATE ATTACHMENT DESCRIBING THE TYPE OF MODIFICATION AND SUBMITTAL OF THE MANUFACTURER'S SPECIFICATIONS AND GUARANTEES.

DATA AND INFORMATION

1) FLOW DIAGRAM DESIGNATION OF CONTROL:
Low NOx Burners

2) TYPE OF CONTROL:

- ☐ SELECTIVE CATALYTIC REDUCTION
- ☐ NON-SELECTIVE CATALYTIC REDUCTION
- ☐ SELECTIVE NON-CATALYTIC REDUCTION
- ☒ LOW NOx BURNERS
- ☐ WATER INJECTION IN BURNER
- ☐ STEAM INJECTION IN BURNER
- ☐ FLUE GAS RECIRCULATION
- ☐ CO-FIRING
- ☐ OVERFIRE AIR
- ☐ LOW ACCESS AIR
- ☐ BIAS FIRING
- ☐ OTHER, DESCRIBE: _____

3) FOR REDUCTION DEVICES:

TEMPERATURE AT WHICH REDUCTION OCCURS (DEGREES FAHRENHEIT):

REDUCING AGENT:

REDUCING AGENT USE RATE:

DESCRIPTION OF INJECTION SYSTEM:

THIS AGENCY IS AUTHORIZED TO REQUIRE THIS INFORMATION UNDER ILLINOIS REVISED STATUTES, 1991, AS AMENDED 1992, CHAPTER 111 1/2, PAR. 1039.5. DISCLOSURE OF THIS INFORMATION IS REQUIRED UNDER THAT SECTION. FAILURE TO DO SO MAY PREVENT THIS FORM FROM BEING PROCESSED AND COULD RESULT IN THE APPLICATION BEING DENIED. THIS FORM HAS BEEN APPROVED BY THE FORMS MANAGEMENT CENTER.

FOR APPLICANT'S USE

4) FOR CATALYTIC DEVICES:

TYPE OF CATALYST USED:

EXPECTED FREQUENCY OF REPLACEMENT:

5) DESCRIBE NOx CONTROL UTILIZED:

Low NOx burners on Slab Furnaces

6) NOx CONTROL PARAMETERS:

	DURING MAXIMUM OPERATION OF FEEDING UNIT(S)	DURING TYPICAL OPERATION OF FEEDING UNIT(S)
INLET GAS TEMPERATURE (DEGREES F°):		
INLET GAS FLOW RATE (SCFM):		
REDUCING AGENT INPUT RATE (LB/HR):		
WATER OR STEAM INPUT RATE (LB/HR):		
FLUE GAS RECIRCULATIONS:	(%)	(%)
EFFICIENCY (NOx REDUCTION):	(%)	(%)

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL -- PERMIT SECTION
P.O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

FOR APPLICANT'S USE
Revision #: _____
Date: ____ / ____ / ____
Page _____ of _____
Source Designation:
_____

PROCESS EMISSION UNIT DATA AND INFORMATION

FOR AGENCY USE ONLY
ID NUMBER:
EMISSION POINT #:
DATE:

SOURCE INFORMATION

1) SOURCE NAME:
US Steel Granite City Works

2) DATE FORM PREPARED:

3) SOURCE ID NO. (IF KNOWN): 119813AAI

GENERAL INFORMATION

4) NAME OF EMISSION UNIT:
#6 Galvanizing Line

5) NAME OF PROCESS:
Galvanizing

6) DESCRIPTION OF PROCESS:
Melting and application of zinc onto steel coils

7) DESCRIPTION OF ITEM OR MATERIAL PRODUCED OR ACTIVITY ACCOMPLISHED:
Galvanized steel

8) FLOW DIAGRAM DESIGNATION OF EMISSION UNIT:
N/A

9) MANUFACTURER OF EMISSION UNIT (IF KNOWN):

10) MODEL NUMBER (IF KNOWN):

11) SERIAL NUMBER (IF KNOWN):

12) DATES OF COMMENCING CONSTRUCTION, OPERATION AND/OR MOST RECENT MODIFICATION OF THIS EMISSION UNIT (ACTUAL OR PLANNED)

a) CONSTRUCTION (MONTH/YEAR):

b) OPERATION (MONTH/YEAR):

c) LATEST MODIFICATION (MONTH/YEAR):

13) DESCRIPTION OF MODIFICATION (IF APPLICABLE):
Permanent shutdown of the #6 Galvanizing Line.

THIS AGENCY IS AUTHORIZED TO REQUIRE THIS INFORMATION UNDER ILLINOIS REVISED STATUTES, 1991, AS AMENDED 1992, CHAPTER 111 1/2, PAR. 1039.5. DISCLOSURE OF THIS INFORMATION IS REQUIRED UNDER THAT SECTION. FAILURE TO DO SO MAY PREVENT THIS FORM FROM BEING PROCESSED AND COULD RESULT IN THE APPLICATION BEING DENIED. THIS FORM HAS BEEN APPROVED BY THE FORMS MANAGEMENT CENTER.

FOR APPLICANT'S USE
_____

14) DOES THE EMISSION UNIT HAVE MORE THAN ONE MODE OF OPERATION? ☐ YES ☒ NO

IF YES, EXPLAIN AND IDENTIFY WHICH MODE IS COVERED BY THIS FORM (NOTE: A SEPARATE PROCESS EMISSION UNIT FORM 220-CAAPP MUST BE COMPLETED FOR EACH MODE):

15) PROVIDE THE NAME AND DESIGNATION OF ALL AIR POLLUTION CONTROL EQUIPMENT CONTROLLING THIS EMISSION UNIT, IF APPLICABLE (FORM 260-CAAPP AND THE APPROPRIATE 260-CAAPP ADDENDUM FORM MUST BE COMPLETED FOR EACH ITEM OF AIR POLLUTION CONTROL EQUIPMENT):

16) WILL EMISSIONS DURING STARTUP EXCEED EITHER THE ALLOWABLE EMISSION RATE PURSUANT TO A SPECIFIC RULE, OR THE ALLOWABLE EMISSION LIMIT AS ESTABLISHED BY AN EXISTING OR PROPOSED PERMIT CONDITION? ☐ YES ☒ NO

IF YES, COMPLETE AND ATTACH FORM 203-CAAPP, "REQUEST TO OPERATE WITH EXCESS EMISSIONS DURING STARTUP OF EQUIPMENT".

17) PROVIDE ANY LIMITATIONS ON SOURCE OPERATION AFFECTING EMISSIONS OR ANY WORK PRACTICE STANDARDS (E.G., ONLY ONE UNIT IS OPERATED AT A TIME):

Permanent Shutdown.

OPERATING INFORMATION

18) ATTACH THE CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSION RELATED, FROM WHICH THE FOLLOWING OPERATING INFORMATION, MATERIAL USAGE INFORMATION AND FUEL USAGE DATA WERE BASED AND LABEL AS EXHIBIT 220-1. REFER TO SPECIAL NOTES OF FORM 202-CAAPP.

19a) MAXIMUM OPERATING HOURS	HOURS/DAY: 0	DAYS/WEEK: 0	WEEKS/YEAR: 0	
b) TYPICAL OPERATING HOURS	HOURS/DAY: 0	DAYS/WEEK:	WEEKS/YEAR:	
20) ANNUAL THROUGHPUT	DEC-FEB(%):	MAR-MAY(%):	JUN-AUG(%):	SEP-NOV(%):

MATERIAL USAGE INFORMATION

21a) RAW MATERIALS	MAXIMUM RATES LBS/HR	MAXIMUM RATES TONS/YEAR	TYPICAL RATES LBS/HR	TYPICAL RATES TONS/YEAR

21b) PRODUCTS	MAXIMUM RATES		TYPICAL RATES	
	LBS/HR	TONS/YEAR	LBS/HR	TONS/YEAR

21c) BY-PRODUCT MATERIALS	MAXIMUM RATES		TYPICAL RATES	
	LBS/HR	TONS/YEAR	LBS/HR	TONS/YEAR

FUEL USAGE DATA

22a) MAXIMUM FIRING RATE (MILLION BTU/HR):	b) TYPICAL FIRING RATE (MILLION BTU/HR):	c) DESIGN CAPACITY FIRING RATE (MILLION BTU/HR):

d) FUEL TYPE:

☐ NATURAL GAS ☐ FUEL OIL: GRADE NUMBER _____ ☐ COAL ☐ OTHER _____

IF MORE THAN ONE FUEL IS USED, ATTACH AN EXPLANATION AND LABEL AS EXHIBIT 220-2.

e) TYPICAL HEAT CONTENT OF FUEL (BTU/LB, BTU/GAL OR BTU/SCF):	f) TYPICAL SULFUR CONTENT (WT %, NA FOR NATURAL GAS):
g) TYPICAL ASH CONTENT (WT %, NA FOR NATURAL GAS):	h) ANNUAL FUEL USAGE (SPECIFY UNITS, E.G., SCF/YEAR, GAL/YEAR, TON/YEAR):

23) ARE COMBUSTION EMISSIONS DUCTED TO THE SAME STACK OR CONTROL AS PROCESS UNIT EMISSIONS? ☐ YES ☐ NO

IF NO, IDENTIFY THE EXHAUST POINT FOR COMBUSTION EMISSIONS:

APPLICABLE RULES

24) PROVIDE ANY SPECIFIC EMISSION STANDARD(S) AND LIMITATION(S) SET BY RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT (E.G., VOM, IAC 218.204(j)(4), 3.5 LBS/GAL):

REGULATED AIR POLLUTANT(S)	EMISSION STANDARD(S)	REQUIREMENT(S)

25) PROVIDE ANY SPECIFIC RECORDKEEPING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	RECORDKEEPING RULE(S)	REQUIREMENT(S)

26) PROVIDE ANY SPECIFIC REPORTING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	REPORTING RULE(S)	REQUIREMENT(S)

27) PROVIDE ANY SPECIFIC MONITORING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	MONITORING RULE(S)	REQUIREMENT(S)

28) PROVIDE ANY SPECIFIC TESTING RULES AND/OR PROCEDURES WHICH ARE APPLICABLE TO THIS EMISSION UNIT :

REGULATED AIR POLLUTANT(S)	TESTING RULE(S)	REQUIREMENT(S)

R005748

29) DOES THE EMISSION UNIT QUALIFY FOR AN EXEMPTION FROM AN OTHERWISE APPLICABLE RULE? ☐ YES ☐ NO

IF YES, THEN LIST BOTH THE RULE FROM WHICH IT IS EXEMPT AND THE RULE WHICH ALLOWS THE EXEMPTION. PROVIDE A DETAILED EXPLANATION JUSTIFYING THE EXEMPTION. INCLUDE DETAILED SUPPORTING DATA AND CALCULATIONS. ATTACH AND LABEL AS EXHIBIT 220-3, OR REFER TO OTHER ATTACHMENT(S) WHICH ADDRESS AND JUSTIFY THIS EXEMPTION.

COMPLIANCE INFORMATION

30) IS THE EMISSION UNIT IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS? ☐ YES ☐ NO

IF NO, THEN FORM 294-CAAPP "COMPLIANCE PLAN/SCHEDULE OF COMPLIANCE – ADDENDUM FOR NON COMPLYING EMISSION UNITS" MUST BE COMPLETED AND SUBMITTED WITH THIS APPLICATION.

31) EXPLANATION OF HOW INITIAL COMPLIANCE IS TO BE, OR WAS PREVIOUSLY, DEMONSTRATED:

32) EXPLANATION OF HOW ONGOING COMPLIANCE WILL BE DEMONSTRATED:

TESTING, MONITORING, RECORDKEEPING AND REPORTING

33a) LIST THE PARAMETERS THAT RELATE TO AIR EMISSIONS FOR WHICH RECORDS ARE BEING MAINTAINED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE. INCLUDE THE UNIT OF MEASUREMENT, THE METHOD OF MEASUREMENT, AND THE FREQUENCY OF SUCH RECORDS (E.G., HOURLY, DAILY, WEEKLY):

PARAMETER	UNIT OF MEASUREMENT	METHOD OF MEASUREMENT	FREQUENCY

33b) BRIEFLY DESCRIBE THE METHOD BY WHICH RECORDS WILL BE CREATED AND MAINTAINED. FOR EACH RECORDED PARAMETER INCLUDE THE METHOD OF RECORDKEEPING, TITLE OF PERSON RESPONSIBLE FOR RECORDKEEPING, AND TITLE OF PERSON TO CONTACT FOR REVIEW OF RECORDS:

PARAMETER	METHOD OF RECORDKEEPING	TITLE OF PERSON RESPONSIBLE	TITLE OF CONTACT PERSON

c) IS COMPLIANCE OF THE EMISSION UNIT READILY DEMONSTRATED BY REVIEW OF THE RECORDS? ☐ YES ☐ NO

IF NO, EXPLAIN:

d) ARE ALL RECORDS READILY AVAILABLE FOR INSPECTION, COPYING AND SUBMITTAL TO THE AGENCY UPON REQUEST? ☐ YES ☐ NO

IF NO, EXPLAIN:

34a) DESCRIBE ANY MONITORS OR MONITORING ACTIVITIES USED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE:

b) WHAT PARAMETER(S) IS(ARE) BEING MONITORED (E.G., VOM EMISSIONS TO ATMOSPHERE)?

c) DESCRIBE THE LOCATION OF EACH MONITOR (E.G., IN STACK MONITOR 3 FEET FROM EXIT):

34d) IS EACH MONITOR EQUIPPED WITH A RECORDING DEVICE? ☐ YES ☐ NO

IF NO, LIST ALL MONITORS WITHOUT A RECORDING DEVICE:

e) IS EACH MONITOR REVIEWED FOR ACCURACY ON AT LEAST A QUARTERLY BASIS? ☐ YES ☐ NO

IF NO, EXPLAIN:

f) IS EACH MONITOR OPERATED AT ALL TIMES THE ASSOCIATED EMISSION UNIT IS IN OPERATION? ☐ YES ☐ NO

IF NO, EXPLAIN:

35) PROVIDE INFORMATION ON THE MOST RECENT TESTS, IF ANY, IN WHICH THE RESULTS ARE USED FOR PURPOSES OF THE DETERMINATION OF FEES, RULE APPLICABILITY OR COMPLIANCE. INCLUDE THE TEST DATE, TEST METHOD USED, TESTING COMPANY, OPERATING CONDITIONS EXISTING DURING THE TEST AND A SUMMARY OF RESULTS. IF ADDITIONAL SPACE IS NEEDED, ATTACH AND LABEL AS EXHIBIT 220-4:

TEST DATE	TEST METHOD	TESTING COMPANY	OPERATING CONDITIONS	SUMMARY OF RESULTS

36) DESCRIBE ALL REPORTING REQUIREMENTS AND PROVIDE THE TITLE AND FREQUENCY OF REPORT SUBMITTALS TO THE AGENCY:

REPORTING REQUIREMENTS	TITLE OF REPORT	FREQUENCY

(37)EMISSION INFORMATION

REGULATED AIR POLLUTANT		☐ [1]ACTUAL EMISSION RATE ☐ [1]UNCONTROLLED EMISSION RATE					ALLOWABLE BY RULE EMISSION RATE			[2]PERMITTED EMISSION RATE	
		LBS PER HOUR (LBS/HR)	TONS PER YEAR (TONS/YR)	[3]OTHER TERMS	[3]OTHER TERMS	[4]DM	[5]RATE (UNITS)	APPLICABLE RULES	TONS PER YEAR (TONS/YR)	RATE (UNITS)	TONS PER YEAR (TONS/YR)
CARBON MONOXIDE (CO)	MAXIMUM:	0									
	TYPICAL:										
LEAD	MAXIMUM:										
	TYPICAL:										
NITROGEN OXIDES (NOx)	MAXIMUM:	0									
	TYPICAL:										
PARTICULATE MATTER (PART)	MAXIMUM:	0									
	TYPICAL:										
PARTICULATE MATTER <= 10 MICROMETERS (PM10)	MAXIMUM:	0									
	TYPICAL:										
SULFUR DIOXIDE (SO2)	MAXIMUM:	0									
	TYPICAL:										
VOLATILE ORGANIC MATERIAL (VOM)	MAXIMUM:	0									
	TYPICAL:										
OTHER, SPECIFY: _____	MAXIMUM:										
	TYPICAL:										
EXAMPLE: PARTICULATE MATTER	MAXIMUM:	*5.00*	*21.9*	*0.3 GR/DSCF*		*1*	*6.0 (LBS/HR)*	*212.321*	*26.28*	*5.5 LBS/HR*	*22*
	TYPICAL:	*4.00*	*14.4*	*0.24 GR/DSCF*		*4*	*5.5 (LBS/HR)*	*212.321*	*19.80*		

IMPORTANT: ATTACH CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH EMISSIONS WERE DETERMINED AND LABEL AS EXHIBIT 220-5.

[1]CHECK UNCONTROLLED EMISSION RATE BOX IF CONTROL EQUIPMENT IS USED, OTHERWISE CHECK AND PROVIDE THE ACTUAL EMISSION RATE TO ATMOSPHERE, INCLUDING INDOORS. SEE INSTRUCTIONS.
[2]PROVIDE THE EMISSION RATE THAT WILL BE USED AS A PERMIT SPECIAL CONDITION. THIS LIMIT WILL BE USED TO DETERMINE THE PERMIT FEE.
[3]PLEASE PROVIDE ANY OTHER EMISSION RATE WHICH IS COMMONLY USED, REQUIRED BY A SPECIFIC LIMITATION OR THAT WAS MEASURED (E.G. PPM, GR/DSCF, ETC.).
[4]DM - DETERMINATION METHOD: 1) STACK TEST, 2) MATERIAL BALANCE, 3) STANDARD EMISSION FACTOR (AP-42 OR AIRS), 4) ENGINEERING ESTIMATE, 5) SPECIAL EMISSION FACTOR (NOT AP-42 OR AIRS).
[5]RATE - ALLOWABLE EMISSION RATE SPECIFIED BY MOST STRINGENT APPLICABLE RULE.

R005752

(38) HAZARDOUS AIR POLLUTANT EMISSION INFORMATION

☐ [1]ACTUAL EMISSION RATE
☐ [1]UNCONTROLLED EMISSION RATE

NAME OF HAP EMITTED	[2]CAS NUMBER		POUNDS PER HOUR (LBS/HR)	TONS PER YEAR (TONS/YR)	[3]OTHER TERMS	[4]DM	ALLOWABLE BY RULE: [5]RATE OR STANDARD	ALLOWABLE BY RULE: APPLICABLE RULE
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
EXAMPLE:		MAXIMUM:	*10.0*	*1.2*		*2*	*98% by wt control device*	*CFR 61*
Benzene	*71432*	TYPICAL:	*8.0*	*0.8*		*2*	*leak-tight trucks*	*61.302(b),(d)*

IMPORTANT: ATTACH CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH EMISSIONS WERE DETERMINED AND LABEL AS EXHIBIT 220-6.

[1]PROVIDE UNCONTROLLED EMISSIONS IF CONTROL EQUIPMENT IS USED. OTHERWISE, PROVIDE ACTUAL EMISSIONS TO THE ATMOSPHERE, INCLUDING INDOORS. CHECK BOX TO SPECIFY.
[2]CAS - CHEMICAL ABSTRACT SERVICE NUMBER.
[3]PLEASE PROVIDE ANY OTHER EMISSION RATE WHICH IS COMMONLY USED, REQUIRED BY A SPECIFIC LIMITATION OR THAT WAS MEASURED (E.G., PPM, GR/DSCF, ETC.).
[4]DM - DETERMINATION METHOD: 1) STACK TEST, 2) MATERIAL BALANCE, 3) STANDARD EMISSION FACTOR (AP-42 OR AIRS, 4) ENGINEERING ESTIMATE, 5) SPECIAL EMISSION FACTOR (NOT AP-42 OR AIRS).
[5]RATE - ALLOWABLE EMISSION RATE OR STANDARD SPECIFIED BY MOST STRINGENT APPLICABLE RULE.

R005753

EXHAUST POINT INFORMATION

THIS SECTION SHOULD NOT BE COMPLETED IF EMISSIONS ARE EXHAUSTED THROUGH AIR POLLUTION CONTROL EQUIPMENT.

39) FLOW DIAGRAM DESIGNATION OF EXHAUST POINT:		
40) DESCRIPTION OF EXHAUST POINT (STACK, VENT, ROOF MONITOR, INDOORS, ETC.). IF THE EXHAUST POINT DISCHARGES INDOORS, DO NOT COMPLETE THE REMAINING ITEMS.		
41) DISTANCE TO NEAREST PLANT BOUNDARY FROM EXHAUST POINT DISCHARGE (FT):		
42) DISCHARGE HEIGHT ABOVE GRADE (FT):		
43) GOOD ENGINEERING PRACTICE (GEP) HEIGHT, IF KNOWN (FT):		
44) DIAMETER OF EXHAUST POINT (FT). NOTE: FOR A NON CIRCULAR EXHAUST POINT, THE DIAMETER IS 1.128 TIMES THE SQUARE ROOT OF THE AREA.		
45) EXIT GAS FLOW RATE	a) MAXIMUM (ACFM):	b) TYPICAL (ACFM):
46) EXIT GAS TEMPERATURE	a) MAXIMUM (°F):	b) TYPICAL (°F):
47) DIRECTION OF EXHAUST (VERTICAL, LATERAL, DOWNWARD):		

48) LIST ALL EMISSION UNITS AND CONTROL DEVICES SERVED BY THIS EXHAUST POINT:

	NAME	FLOW DIAGRAM DESIGNATION
a)		
b)		
c)		
d)		
e)		

THE FOLLOWING INFORMATION NEED ONLY BE SUPPLIED IF READILY AVAILABLE.

49a) LATITUDE:	b) LONGITUDE:	
50) UTM ZONE:	b) UTM VERTICAL (KM):	c) UTM HORIZONTAL (KM):

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL -- PERMIT SECTION
P.O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

FOR APPLICANT'S USE
Revision #: _____
Date: ____ / ____ / ____
Page _____ of _____
Source Designation: _____

STATIONARY INTERNAL COMBUSTION ENGINE OR TURBINE DATA AND INFORMATION

FOR AGENCY USE ONLY
ID NUMBER:
EMISSION POINT #:
DATE:

SOURCE INFORMATION

1) SOURCE NAME: United States Steel - Granite City Works

2) DATE FORM PREPARED:

3) SOURCE ID NO. (IF KNOWN): 119813AAI

GENERAL INFORMATION

4) NAME OF EMISSION UNIT: #4 Coke Oven Gas (COG) Booster Pump

5) NAME OF PROCESS: COG Distribution

6) DESCRIPTION OF PROCESS: Distribution of COG to various fuel burning units in the Facility

7) DESCRIPTION OF ITEM OR MATERIAL PRODUCED OR ACTIVITY ACCOMPLISHED: COG Distribution

8) FLOW DIAGRAM DESIGNATION OF EMISSION UNIT: N/A

9) MANUFACTURER OF EMISSION UNIT (IF KNOWN):

10) MODEL NUMBER (IF KNOWN):

11) SERIAL NUMBER (IF KNOWN):

12) DATES OF COMMENCING CONSTRUCTION, OPERATION AND/OR MOST RECENT MODIFICATION OF THIS EMISSION UNIT (ACTUAL OR PLANNED)

a) CONSTRUCTION (MONTH/YEAR):

b) OPERATION (MONTH/YEAR):

c) LATEST MODIFICATION (MONTH/YEAR):

13) DESCRIPTION OF MODIFICATION (IF APPLICABLE): Permanent shutdown of #4 COG Booster Pump and replacement with an electric pump with no emissions.

THIS AGENCY IS AUTHORIZED TO REQUIRE THIS INFORMATION UNDER ILLINOIS REVISED STATUTES, 1991, AS AMENDED 1992, CHAPTER 111 1/2, PAR. 1039.5. DISCLOSURE OF THIS INFORMATION IS REQUIRED UNDER THAT SECTION. FAILURE TO DO SO MAY PREVENT THIS FORM FROM BEING PROCESSED AND COULD RESULT IN THE APPLICATION BEING DENIED. THIS FORM HAS BEEN APPROVED BY THE FORMS MANAGEMENT CENTER.

FOR APPLICANT'S USE
_____

14) DOES THE EMISSION UNIT HAVE MORE THAN ONE MODE OF OPERATION? ☐ YES ☒ NO

IF YES, EXPLAIN AND IDENTIFY WHICH MODE IS COVERED BY THIS FORM (NOTE: A SEPARATE PROCESS EMISSION UNIT FORM 270-CAAPP MUST BE COMPLETED FOR EACH MODE):

15) PROVIDE THE NAME AND DESIGNATION OF ALL AIR POLLUTION CONTROL EQUIPMENT CONTROLLING THIS EMISSION UNIT, IF APPLICABLE (FORM 260-CAAPP AND THE APPROPRIATE 260-CAAPP ADDENDUM FORM MUST BE COMPLETED FOR EACH ITEM OF AIR POLLUTION CONTROL EQUIPMENT):

None

16) WILL EMISSIONS DURING STARTUP EXCEED EITHER THE ALLOWABLE EMISSION RATE PURSUANT TO A SPECIFIC RULE, OR THE ALLOWABLE EMISSION LIMIT AS ESTABLISHED BY AN EXISTING OR PROPOSED PERMIT CONDITION? ☐ YES ☒ NO

IF YES, COMPLETE AND ATTACH FORM 203-CAAPP, "REQUEST TO OPERATE WITH EXCESS EMISSIONS DURING STARTUP OF EQUIPMENT".

17) PROVIDE ANY LIMITATIONS ON SOURCE OPERATION AFFECTING EMISSIONS OR ANY WORK PRACTICE STANDARDS (E.G., ONLY ONE UNIT IS OPERATED AT A TIME):

Permanent Shutdown and replacement with an electric unit

OPERATING INFORMATION

18) ATTACH THE CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSION RELATED, FROM WHICH THE FOLLOWING OPERATING INFORMATION, MATERIAL USAGE INFORMATION AND FUEL USAGE DATA WERE BASED AND LABEL AS EXHIBIT 270-1. REFER TO SPECIAL NOTES OF FORM 202-CAAPP.

19a) MAXIMUM OPERATING HOURS	HOURS/DAY: 0	DAYS/WEEK: 0	WEEKS/YEAR: 0	
b) TYPICAL OPERATING HOURS	HOURS/DAY: 0	DAYS/WEEK:	WEEKS/YEAR:	
20) ANNUAL THROUGHPUT	DEC-FEB(%): 0	MAR-MAY(%): 0	JUN-AUG(%): 0	SEP-NOV(%): 0

FIRING RATE INFORMATION

21) DESCRIPTION (CHECK AS MANY AS APPLY):
☒ INTERNAL COMBUSTION ENGINE ☐ SPARK IGNITED ENGINE ☒ RECIPROCATING ENGINE
☐ COMBINED CYCLE TURBINE ☐ STATIONARY TURBINE ☐ SIMPLE CYCLE TURBINE
☐ REGENERATIVE CYCLE TURBINE ☐ LARGE BORE ENGINE

22) AIR CHARGING: ☐ NATURALLY ASPIRATED ☐ BLOWER SCAVENGED ☐ TURBOCHARGED

23) NO. OF CYLINDERS PER ENGINE:

24a) RATED OR DESIGN HEAT INPUT CAPACITY (MILLION BTU/HR):

8.80

24b) IS MORE THAN ONE FUEL FIRED AT A TIME? ☐ YES ☒ NO

IF YES, EXPLAIN:

	NATURAL GAS	FUEL OIL	COAL	OTHER
c) SINGLE FUEL (MAXIMUM - MILLION BTU/HOUR)	8.8			
d) SINGLE FUEL (TYPICAL - MILLION BTU/HOUR)				
e) COMBINED FUEL (TYPICAL - MILLION BTU/HOUR) (IF APPLICABLE)				

25a) BASE LOAD (KW):	b) TIME SPENT AT THIS LOAD (%):
26a) PEAK LOAD (KW):	b) TIME SPENT AT THIS LOAD (%):
27a) OTHER LOAD (KW):	b) TIME SPENT AT THIS LOAD (%):

NATURAL GAS FIRING

28a) CURRENT ORIGIN OF NATURAL GAS: ☒ PIPELINE (FIRM CONTRACT) ☐ BY-PRODUCT, SPECIFY ORIGIN:

☐ PIPELINE (INTERRUPTIBLE SUPPLY CONTRACT) ☐ OTHER, - SPECIFY: _____

b) TYPICAL HEAT CONTENT (BTU/SCF): 1020

c) MAXIMUM CONSUMPTION	SCF/MONTH:	SCF/YEAR: 0
d) TYPICAL CONSUMPTION	SCF/MONTH:	SCF/YEAR:

OIL FIRING

29a) OIL TYPE (CHECK ONE): ☐ NO. 1 ☐ NO. 2 ☐ NO. 4 ☐ NO. 5 ☐ NO. 6

☐ OTHER, SPECIFY (INCLUDE GENERATOR OR SUPPLIER): _____

b) TYPICAL HEAT CONTENT: _____ ☐ BTU/LB - OR - ☐ BTU/GAL	c) IS OIL USED ONLY AS A RESERVE FUEL? ☐ YES ☒ NO
d) TYPICAL SULFUR CONTENT AS FIRED (WT %):	e) TYPICAL ASH CONTENT AS FIRED (WT %):

f) MAXIMUM CONSUMPTION	GAL/MONTH:	GAL/YEAR:
g) TYPICAL CONSUMPTION	GAL/MONTH:	GAL/YEAR:

h) FIRING DIRECTION: ☐ HORIZONTAL ☐ TANGENTIAL ☐ OTHER, SPECIFY:

OTHER FUEL FIRING

30a) OTHER FUEL FIRING

	TYPE	SUPPLIER
a)		
b)		

b) TYPICAL HEAT CONTENT (SPECIFY UNITS):	c) TYPICAL NITROGEN CONTENT AS FIRED (WT %):
d) TYPICAL SULFUR CONTENT AS FIRED (WT %):	e) TYPICAL ASH CONTENT AS FIRED (WT %):

f) MAXIMUM CONSUMPTION	(SPECIFY UNITS):	(SPECIFY UNITS):
g) TYPICAL CONSUMPTION	(SPECIFY UNITS):	(SPECIFY UNITS):

COMBUSTION CONTROL INFORMATION

31a) IS THERE ANY TYPE OF INTERNAL CONTROL USED TO REDUCE EMISSIONS ?
(A 260-CAAPP FORM MUST BE COMPLETED FOR EXTERNAL CONTROLS)

☐ YES ☒ NO

IF NO, GO TO ITEM 33.

b) TOTAL % REDUCTION IN EMISSIONS

☐ NO_x _____% ☐ CO _____% ☐ VOM _____%

☐ PM_{10} _____% ☐ PM _____% ☐ SO_2 _____%

c) CHECK THE FOLLOWING THAT APPLY:

☐ WATER INJECTION WATER TO FUEL RATIO: _____

☐ FLUE GAS RECIRCULATION % RECIRCULATED _____

☐ OXYGEN TRIM AIR TO FUEL RATIO: _____

☐ REDUCED RESIDENCE TIME (SPECIFY SEC): _____

☐ REDUCED TEMPERATURE (SPECIFY DEGREES F): _____

☐ FUEL INJECTION RETARD (SPECIFY DEGREES): _____

☐ (NON)SELECTIVE CATALYTIC REDUCTION (260-CAAPP)

☐ OTHER, EXPLAIN:

d) MAXIMUM START-UPS IN A YEAR?	e) TIME FROM START UP TO STEADY LOAD (MINUTES OR HOURS):

APPLICABLE RULES

32) PROVIDE ANY SPECIFIC EMISSION STANDARD(S) AND LIMITATION(S) SET BY RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT (E.G., SULFUR DIOXIDE ; CFR SUBPART GG, 0.015% BY VOL. AT 15% O_2):

REGULATED AIR POLLUTANT(S)	EMISSION STANDARD(S)	REQUIREMENT(S)

33) PROVIDE ANY SPECIFIC RECORDKEEPING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	RECORDKEEPING RULE(S)	REQUIREMENT(S)

34) PROVIDE ANY SPECIFIC REPORTING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	REPORTING RULE(S)	REQUIREMENT(S)

35) PROVIDE ANY SPECIFIC MONITORING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	MONITORING RULE(S)	REQUIREMENT(S)

36) PROVIDE ANY SPECIFIC TESTING RULES AND/OR PROCEDURES WHICH ARE APPLICABLE TO THIS EMISSION UNIT :

REGULATED AIR POLLUTANT(S)	TESTING RULE(S)	REQUIREMENT(S)

R005759

37) DOES THE EMISSION UNIT QUALIFY FOR AN EXEMPTION FROM AN OTHERWISE APPLICABLE RULE? ☐ YES ☒ NO

IF YES, THEN LIST BOTH THE RULE FROM WHICH IT IS EXEMPT AND THE RULE WHICH ALLOWS THE EXEMPTION. PROVIDE A DETAILED EXPLANATION JUSTIFYING THE EXEMPTION. INCLUDE DETAILED SUPPORTING DATA AND CALCULATIONS. ATTACH AND LABEL AS EXHIBIT 270-2, OR REFER TO OTHER ATTACHMENT(S) WHICH ADDRESS AND JUSTIFY THIS EXEMPTION.

COMPLIANCE INFORMATION

38) IS THE EMISSION UNIT IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS? ☒ YES ☐ NO

IF NO, THEN FORM 294-CAAPP "COMPLIANCE PLAN/SCHEDULE OF COMPLIANCE – ADDENDUM FOR NON COMPLYING EMISSION UNITS" MUST BE COMPLETED AND SUBMITTED WITH THIS APPLICATION.

39) EXPLANATION OF HOW INITIAL COMPLIANCE IS TO BE, OR WAS PREVIOUSLY, DEMONSTRATED:

40) EXPLANATION OF HOW ONGOING COMPLIANCE WILL BE DEMONSTRATED:

TESTING, MONITORING, RECORDKEEPING AND REPORTING

41a) LIST THE PARAMETERS THAT RELATE TO AIR EMISSIONS FOR WHICH RECORDS ARE BEING MAINTAINED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE. INCLUDE THE UNIT OF MEASUREMENT, THE METHOD OF MEASUREMENT, AND THE FREQUENCY OF SUCH RECORDS (E.G., HOURLY, DAILY, WEEKLY):

PARAMETER	UNIT OF MEASUREMENT	METHOD OF MEASUREMENT	FREQUENCY

41b) BRIEFLY DESCRIBE THE METHOD BY WHICH RECORDS WILL BE CREATED AND MAINTAINED. FOR EACH RECORDED PARAMETER INCLUDE THE METHOD OF RECORDKEEPING, TITLE OF PERSON RESPONSIBLE FOR RECORDKEEPING, AND TITLE OF PERSON TO CONTACT FOR REVIEW OF RECORDS:

PARAMETER	METHOD OF RECORDKEEPING	TITLE OF PERSON RESPONSIBLE	TITLE OF CONTACT PERSON

c) IS COMPLIANCE OF THE EMISSION UNIT READILY DEMONSTRATED BY REVIEW OF THE RECORDS? ☐ YES ☐ NO

IF NO, EXPLAIN:

d) ARE ALL RECORDS READILY AVAILABLE FOR INSPECTION, COPYING AND SUBMITTAL TO THE AGENCY UPON REQUEST? ☐ YES ☐ NO

IF NO, EXPLAIN:

42a) DESCRIBE ANY MONITORS OR MONITORING ACTIVITIES USED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE:

b) WHAT PARAMETER(S) IS(ARE) BEING MONITORED (E.G., OPACITY)?

c) DESCRIBE THE LOCATION OF EACH MONITOR (E.G., IN STACK MONITOR):

42d) IS EACH MONITOR EQUIPPED WITH A RECORDING DEVICE? ☐ YES ☐ NO

IF NO, LIST ALL MONITORS WITHOUT A RECORDING DEVICE:

e) IS EACH MONITOR REVIEWED FOR ACCURACY ON AT LEAST A QUARTERLY BASIS? ☐ YES ☐ NO

IF NO, EXPLAIN:

f) IS EACH MONITOR OPERATED AT ALL TIMES THE ASSOCIATED EMISSION UNIT IS IN OPERATION? ☐ YES ☐ NO

IF NO, EXPLAIN:

43) PROVIDE INFORMATION ON THE MOST RECENT TESTS, IF ANY, IN WHICH THE RESULTS ARE USED FOR PURPOSES OF THE DETERMINATION OF FEES, RULE APPLICABILITY OR COMPLIANCE. INCLUDE THE TEST DATE, TEST METHOD USED, TESTING COMPANY, OPERATING CONDITIONS EXISTING DURING THE TEST AND A SUMMARY OF RESULTS. IF ADDITIONAL SPACE IS NEEDED, ATTACH AND LABEL AS EXHIBIT 220-4:

TEST DATE	TEST METHOD	TESTING COMPANY	OPERATING CONDITIONS	SUMMARY OF RESULTS

44) DESCRIBE ALL REPORTING REQUIREMENTS AND PROVIDE THE TITLE AND FREQUENCY OF REPORT SUBMITTALS TO THE AGENCY:

REPORTING REQUIREMENTS	TITLE OF REPORT	FREQUENCY

(45)EMISSION INFORMATION

☒ [1]ACTUAL EMISSION RATE
☐ [1]UNCONTROLLED EMISSION RATE

REGULATED AIR POLLUTANT		LBS PER HOUR (LBS/HR)	TONS PER YEAR (TONS/YR)	[3]OTHER TERMS	[3]OTHER TERMS	[4]DM	ALLOWABLE BY RULE EMISSION RATE: [5]RATE (UNITS)	APPLICABLE RULES	ALLOWABLE BY RULE EMISSION RATE: TONS PER YEAR (TONS/YR)	[2]PERMITTED EMISSION RATE: RATE (UNITS)	[2]PERMITTED EMISSION RATE: TONS PER YEAR (TONS/YR)
CARBON MONOXIDE (CO)	MAXIMUM:						( )				0
	TYPICAL:						( )				
LEAD	MAXIMUM:						( )				
	TYPICAL:						( )				
NITROGEN OXIDES (NOx)	MAXIMUM:						( )				0
	TYPICAL:						( )				
PARTICULATE MATTER (PART)	MAXIMUM:						( )				0
	TYPICAL:						( )				
PARTICULATE MATTER <= 10 MICROMETERS (PM10)	MAXIMUM:						( )				0
	TYPICAL:						( )				
SULFUR DIOXIDE (SO2)	MAXIMUM:						( )				0
	TYPICAL:						( )				
VOLATILE ORGANIC MATERIAL (VOM)	MAXIMUM:						( )				0
	TYPICAL:						( )				
OTHER, SPECIFY: _____	MAXIMUM:						( )				
	TYPICAL:						( )				
EXAMPLE: PARTICULATE MATTER	MAXIMUM:	*5.00*	*21.9*	*0.3 GR/DSCF*		*1*	*6.0 (LBS/HR)*	*212.321*	*26.28*	*5.5 LBS/HR*	*22*
	TYPICAL:	*4.00*	*14.4*	*0.24 GR/DSCF*		*4*	*5.5 (LBS/HR)*	*212.321*	*19.80*		

IMPORTANT: ATTACH CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH EMISSIONS WERE DETERMINED AND LABEL AS EXHIBIT 270-3.

[1]CHECK UNCONTROLLED EMISSION RATE BOX IF CONTROL EQUIPMENT IS USED, OTHERWISE CHECK AND PROVIDE THE ACTUAL EMISSION RATE TO ATMOSPHERE, INCLUDING INDOORS. SEE INSTRUCTIONS.
[2]PROVIDE THE EMISSION RATE THAT WILL BE USED AS A PERMIT SPECIAL CONDITION. THIS LIMIT WILL BE USED TO DETERMINE THE PERMIT FEE.
[3]PLEASE PROVIDE ANY OTHER EMISSION RATE WHICH IS COMMONLY USED, REQUIRED BY A SPECIFIC LIMITATION OR THAT WAS MEASURED (E.G. PPM, GR/DSCF, ETC.)
[4]DM - DETERMINATION METHOD: 1) STACK TEST, 2) MATERIAL BALANCE, 3) STANDARD EMISSION FACTOR (AP-42 OR AIRS), 4) ENGINEERING ESTIMATE, 5) SPECIAL EMISSION FACTOR (NOT AP-42 OR AIRS)
[5]RATE - ALLOWABLE EMISSION RATE SPECIFIED BY MOST STRINGENT APPLICABLE RULE.

R005763

(46) HAZARDOUS AIR POLLUTANT EMISSION INFORMATION

HAP INFORMATION		☐ [1]ACTUAL EMISSION RATE ☐ [1]UNCONTROLLED EMISSION RATE				ALLOWABLE BY RULE	
NAME OF HAP EMITTED	[2]CAS NUMBER		POUNDS PER HOUR (LBS/HR)	TONS PER YEAR (TONS/YR)	[3]OTHER TERMS	[4]DM	[5]RATE OR STANDARD	APPLICABLE RULE
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
EXAMPLE:		MAXIMUM:	*10.0*	*1.2*		*2*	*98% by wt control device*	*CFR 51*
Benzene	*71432*	TYPICAL:	*8.0*	*0.8*		*2*	*leak-tight trucks*	*61.302(b),(d)*

IMPORTANT: ATTACH CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH EMISSIONS WERE DETERMINED AND LABEL AS EXHIBIT 270-4.

[1]PROVIDE UNCONTROLLED EMISSIONS IF CONTROL EQUIPMENT IS USED. OTHERWISE, PROVIDE ACTUAL EMISSIONS TO THE ATMOSPHERE, INCLUDING INDOORS. CHECK BOX TO SPECIFY.
[2]CAS - CHEMICAL ABSTRACT SERVICE NUMBER.
[3]PLEASE PROVIDE ANY OTHER EMISSION RATE WHICH IS COMMONLY USED, REQUIRED BY A SPECIFIC LIMITATION OR THAT WAS MEASURED (E.G., PPM, GR/DSCF, ETC.).
[4]DM - DETERMINATION METHOD: 1) STACK TEST, 2) MATERIAL BALANCE, 3) STANDARD EMISSION FACTOR (AP-42 OR AIRS, 4) ENGINEERING ESTIMATE, 5) SPECIAL EMISSION FACTOR (NOT AP-42 OR AIRS).
[5]RATE - ALLOWABLE EMISSION RATE OR STANDARD SPECIFIED BY MOST STRINGENT APPLICABLE RULE.

R005764

EXHAUST POINT INFORMATION

THIS SECTION SHOULD NOT BE COMPLETED IF EMISSIONS ARE EXHAUSTED THROUGH AIR POLLUTION CONTROL EQUIPMENT.

47) FLOW DIAGRAM DESIGNATION OF EXHAUST POINT:
NA - Permit to Shutdown Emission Unit

48) DESCRIPTION OF EXHAUST POINT (STACK, VENT, ROOF MONITOR, INDOORS, ETC.) IF THE EXHAUST POINT DISCHARGES INDOORS, DO NOT COMPLETE THE REMAINING ITEMS.

49) DISTANCE TO NEAREST PLANT BOUNDARY FROM EXHAUST POINT DISCHARGE (FT):

50) DISCHARGE HEIGHT ABOVE GRADE (FT):

51) GOOD ENGINEERING PRACTICE (GEP) HEIGHT, IF KNOWN (FT):

52) DIAMETER OF EXHAUST POINT (FT): NOTE: FOR A NON CIRCULAR EXHAUST POINT, THE DIAMETER IS 1.128 TIMES THE SQUARE ROOT OF THE AREA.

53) EXIT GAS FLOW RATE	a) MAXIMUM (ACFM):	b) TYPICAL (ACFM):
54) EXIT GAS TEMPERATURE	a) MAXIMUM (°F):	b) TYPICAL (°F):

55) DIRECTION OF EXHAUST (VERTICAL, LATERAL, DOWNWARD):

56) LIST ALL EMISSION UNITS AND CONTROL DEVICES SERVED BY THIS EXHAUST POINT:

	NAME	FLOW DIAGRAM DESIGNATION
a)		
b)		
c)		
d)		
e)		

THE FOLLOWING INFORMATION NEED ONLY BE SUPPLIED IF READILY AVAILABLE.

57a) LATITUDE:	b) LONGITUDE:	
58) UTM ZONE:	b) UTM VERTICAL (KM):	c) UTM HORIZONTAL (KM):

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL – PERMIT SECTION
P.O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

FOR APPLICANT'S USE
Revision #: _____
Date: _____ / _____ / _____
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Source Designation: _____

FUGITIVE EMISSIONS DATA AND INFORMATION

FOR AGENCY USE ONLY
ID NUMBER:
EMISSION POINT #:
DATE:

THIS FORM MAY BE COMPLETED FOR FUGITIVE EMISSION ACTIVITIES RATHER THAN COMPLETING AN EMISSION UNIT OR STAND ALONE FORM. FUGITIVE EMISSIONS ARE DEFINED AS THOSE EMISSIONS WHICH COULD NOT REASONABLY PASS THROUGH A STACK, CHIMNEY, VENT OR OTHER FUNCTIONALLY EQUIVALENT OPENING. NOTE THAT UNCAPTURED PROCESS EMISSION UNIT EMISSIONS ARE TYPICALLY NOT CONSIDERED FUGITIVE AND MUST BE ACCOUNTED FOR ON THE APPROPRIATE EMISSION UNIT OR STAND ALONE FORM. ANY EMISSIONS AT THE SOURCE NOT PREVIOUSLY ACCOUNTED FOR ON AN EMISSION UNIT OR STAND ALONE FORM MUST BE ACCOUNTED FOR ON THIS FORM.

SOME EXAMPLES OF EMISSIONS WHICH ARE TYPICALLY CONSIDERED FUGITIVE ARE:

- ROAD DUST EMISSIONS (PAVED ROADS, UNPAVED ROADS, AND LOTS)
- STORAGE PILE EMISSIONS (WIND EROSION, VEHICLE DUMP AND LOAD)
- LOADING/UNLOADING OPERATION EMISSION
- EMISSIONS FROM MATERIAL BEING TRANSPORTED IN A VEHICLE
- EMISSIONS OCCURRING FROM THE UNLOADING AND TRANSPORTING OF MATERIALS COLLECTED BY POLLUTION CONTROL EQUIPMENT
- 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.)
- GENERAL CLEAN-UP VOM EMISSIONS

NOTE THAT TOTAL EMISSIONS FROM THE SOURCE (TS) ARE EQUAL TO SOURCE-WIDE TOTAL EMISSION UNIT EMISSIONS (PT) PLUS TOTAL FUGITIVE EMISSIONS (FT), E.G., TS = PT + FT.

SOURCE INFORMATION	
1) SOURCE NAME: United States Steel - Granite City Works	
2) DATE FORM PREPARED:	3) SOURCE ID NO. (IF KNOWN): 119813AAI

THIS AGENCY IS AUTHORIZED TO REQUIRE THIS INFORMATION UNDER ILLINOIS REVISED STATUTES, 1991, AS AMENDED 1992, CHAPTER 111 1/2, PAR. 1039.5. DISCLOSURE OF THIS INFORMATION IS REQUIRED UNDER THAT SECTION. FAILURE TO DO SO MAY PREVENT THIS FORM FROM BEING PROCESSED AND COULD RESULT IN THE APPLICATION BEING DENIED. THIS FORM HAS BEEN APPROVED BY THE FORMS MANAGEMENT CENTER

FOR APPLICANT'S USE

APPLICATION PAGE _____

GENERAL INFORMATION

4) PROVIDE THE FOLLOWING INFORMATION FOR THE FUGITIVE EMISSION POINTS AT THE SOURCE INCLUDED IN THIS APPLICATION. SIMILAR POINTS MAY BE GROUPED TOGETHER.

NOTE: ATTACH THE CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, FROM WHICH THE ABOVE EMISSIONS WERE BASED AND LABEL AS EXHIBIT 391-1. IF THE ABOVE SPACE WAS NOT ADEQUATE, LIST ALL OTHER FUGITIVE POINTS AND INCLUDE THE REQUIRED INFORMATION ON THIS ATTACHMENT.

FOR PAVED AND UNPAVED ROADS, INCLUDE ROAD MILES (E.G., 5 MILES OF UNPAVED ROADS); FOR STORAGE PILES, INDICATE THE MATERIAL BEING STORED (E.G., 20 LIMESTONE STORAGE PILES); FOR EQUIPMENT LEAK POINTS, GROUP SIMILAR POINTS TOGETHER (E.G., 15 ORGANIC LIQUID PUMPS); FOR TRANSFER POINTS, IDENTIFY THE ORIGIN AND DESTINATION OF TRANSFER AND THE MATERIAL BEING TRANSFERRED (E.G., 5 BELT TO BIN TRANSFERS OF CORN).

FUGITIVE POINT(S)	REGULATED AIR POLLUTANT(S)	UNCONTROLLED ANNUAL EMISSIONS (TONS/YR)	
		MAXIMUM	TYPICAL
City Roads in Vacuum	PM10	73.20	
Sweeping Program			
(6.5 miles of city roads)			

5) ATTACH A DIAGRAM OF THE SOURCE THAT INDICATES THE LOCATION OF ALL FUGITIVE EMISSION POINTS. A SKETCH DRAWING WITH THE PROPER NOTATIONS IS SUFFICIENT. ALTERNATIVELY, THE REQUIRED INFORMATION MAY BE PLACED ON A COPY OF AN EXISTING PLAN OR MAP SUBMITTED WITH THIS APPLICATION (E.G., PLOT PLAN/MAP). ALSO INDICATE ON THIS DIAGRAM THE LOCATION OF ANY AMBIENT AIR MONITORING STATIONS. LABEL THIS DIAGRAM 391-2. NOTE: EQUIPMENT LEAK FUGITIVE EMISSION POINTS NEED NOT BE SHOWN ON THIS DIAGRAM.

APPLICABLE RULES

6) PROVIDE ANY SPECIFIC EMISSION STANDARD(S) AND LIMITATIONS(S) WHICH ARE APPLICABLE TO FUGITIVE EMISSIONS AT THE SOURCE (E.G., ROAD SEGMENT F, PM-10, IAC 212.316(d), OPACITY < OR = 10% AT 4 FT):

FUGITIVE POINTS(S)	REGULATED AIR POLLUTANT(S)	EMISSION STANDARD(S)	REQUIREMENT(S)
None			

7) PROVIDE ANY SPECIFIC RECORDKEEPING RULE(S) WHICH ARE APPLICABLE:

FUGITIVE POINTS(S)	REGULATED AIR POLLUTANT(S)	EMISSION STANDARD(S)	REQUIREMENT(S)
None			

IF ADDITIONAL SPACE IS NEEDED, ATTACH AND LABEL AS 391-3.

R005768

APPLICABLE RULES (CON'T)

8) PROVIDE ANY SPECIFIC REPORTING RULE(S) WHICH ARE APPLICABLE:

FUGITIVE POINTS(S)	REGULATED AIR POLLUTANT(S)	EMISSION STANDARD(S)	REQUIREMENT(S)
None			

9) PROVIDE ANY SPECIFIC MONITORING RULE(S) WHICH ARE APPLICABLE:

FUGITIVE POINTS(S)	REGULATED AIR POLLUTANT(S)	EMISSION STANDARD(S)	REQUIREMENT(S)
None			

10) PROVIDE ANY SPECIFIC TESTING RULES AND/OR PROCEDURES WHICH ARE APPLICABLE:

FUGITIVE POINTS(S)	REGULATED AIR POLLUTANT(S)	EMISSION STANDARD(S)	REQUIREMENT(S)
None			

IF ADDITIONAL SPACE IS NEEDED, ATTACH AND LABEL AS 391-3.

COMPLIANCE INFORMATION

11) IS EACH FUGITIVE POINT IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS? ☒ YES ☐ NO

IF NO, THEN FORM 294-CAAPP "COMPLIANCE PLAN/SCHEDULE OF COMPLIANCE – ADDENDUM FOR NON COMPLYING EMISSION UNITS" MUST BE COMPLETED AND SUBMITTED WITH THIS APPLICATION.

12) EXPLANATION OF HOW INITIAL COMPLIANCE IS TO BE, OR WAS PREVIOUSLY, DEMONSTRATED:

City Roads, no applicable regulatory requirements.

13) EXPLANATION OF HOW ONGOING COMPLIANCE WILL BE DEMONSTRATED:

TESTING, MONITORING, RECORDKEEPING AND REPORTING

14a) LIST THE PARAMETERS THAT RELATE TO AIR EMISSIONS FOR WHICH RECORDS ARE BEING MAINTAINED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE. INCLUDE THE UNIT OF MEASUREMENT, THE METHOD OF MEASUREMENT, AND THE FREQUENCY OF SUCH RECORDS (E.G., HOURLY, DAILY, WEEKLY):

PARAMETER	FUGITIVE POINT	METHOD OF MEASUREMENT	FREQUENCY

b) BRIEFLY DESCRIBE THE METHOD BY WHICH RECORDS WILL BE CREATED AND MAINTAINED. FOR EACH RECORDED PARAMETER INCLUDE THE METHOD OF RECORDKEEPING, TITLE OF PERSON RESPONSIBLE FOR RECORDKEEPING, AND TITLE OF PERSON TO CONTACT FOR REVIEW OF RECORDS:

PARAMETER	METHOD OF RECORDKEEPING	TITLE OF PERSON RESPONSIBLE	TITLE OF CONTACT PERSON

c) IS COMPLIANCE OF THE EMISSION UNIT READILY DEMONSTRATED BY REVIEW OF THE RECORDS? ☐ YES ☐ NO

IF NO, EXPLAIN:

d) ARE ALL RECORDS READILY AVAILABLE FOR INSPECTION, COPYING AND/OR SUBMITTAL TO THE AGENCY UPON REQUEST? ☐ YES ☐ NO

IF NO, EXPLAIN:

15a) DESCRIBE ANY MONITORS OR MONITORING ACTIVITIES USED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE.

Records of vacuum sweeping operations to determine compliance with fugitive dust program

b) WHAT PARAMETER(S) IS(ARE) BEING MONITORED?

Dates, times, Sweeper Operations

c) DESCRIBE THE LOCATION OF EACH MONITOR AND/OR MONITORING PROCEDURES:

NA, No monitors will be used. Log will be kept of sweeping program

d) IS EACH MONITOR EQUIPPED WITH A RECORDING DEVICE? ☐ YES ☒ NO

IF NO, LIST ALL MONITORS WITHOUT A RECORDING DEVICE:

e) IS EACH MONITOR REVIEWED FOR ACCURACY ON AT LEAST A QUARTERLY BASIS? ☐ YES ☐ NO

IF NO, EXPLAIN:

f) IS EACH MONITOR OPERATED AT ALL TIMES THAT FUGITIVE EMISSIONS MAY OCCUR? ☐ YES ☐ NO

IF NO, EXPLAIN:

16) PROVIDE INFORMATION ON THE MOST RECENT TESTS, IF ANY, IN WHICH THE RESULTS ARE USED FOR PURPOSES OF THE DETERMINATION OF FEES, RULE APPLICABILITY OR COMPLIANCE. INCLUDE THE TEST DATE, TEST METHOD USED, TESTING COMPANY, OPERATING CONDITIONS EXISTING DURING THE TEST AND A SUMMARY OF RESULTS. IF ADDITIONAL SPACE IS NEEDED, ATTACH AND LABEL AS EXHIBIT 391-4.

FUGITIVE POINT(S)	TEST DATE	TEST METHOD	TESTING FIRM	OPERATING CONDITIONS	SUMMARY OF RESULTS
None					

17) DESCRIBE ALL REPORTING REQUIREMENTS AND PROVIDE THE TITLE AND FREQUENCY OF REPORT SUBMITTALS TO THE AGENCY:

FUGITIVE POINT(S)	REPORTING REQUIREMENTS	TITLE OF REPORT	FREQUENCY
None			

FUGITIVE DUST (complete if applicable)

18a) ARE OPACITY READINGS REQUIRED TO BE TAKEN? ☐ YES ☒ NO

IF YES, SPECIFY THE RELEVANT FUGITIVE POINT(S):

i) _____

ii) _____

iii) _____

b) SPECIFY THE FREQUENCY OF OPACITY READINGS:

c) IS USEPA METHOD 9 USED TO READ ALL VISIBLE EMISSIONS? ☐ YES ☐ NO

IF NO, EXPLAIN AND SPECIFY THE METHOD USED:

19) IS AN OPERATING PROGRAM FOR FUGITIVE PARTICULATE MATTER AND/OR PM10 CONTROL REQUIRED PURSUANT TO 35 ILL. ADM. CODE 212.309? ☒ YES ☐ NO

IF YES, HAS SUCH A PROGRAM PREVIOUSLY BEEN SUBMITTED TO THE AGENCY? ☒ YES ☐ NO

IF SUCH A PROGRAM HAS NOT BEEN SUBMITTED, IT SHOULD BE ATTACHED TO THIS FORM UPON SUBMITTAL AND LABELED AS 391-5.

20) IS THE SOURCE IN COMPLIANCE WITH 35 ILL. ADM. CODE 212.301 WHICH STATES THAT NO EMISSIONS SHALL BE VISIBLE BEYOND THE PROPERTY LINE OF THE SOURCE? ☒ YES ☐ NO

IF NO, EXPLAIN.

FUGITIVE VOM FROM EQUIPMENT LEAKS (complete if applicable)

21) INDICATE WHICH OF THE FOLLOWING METHODS WAS USED TO ESTIMATE FUGITIVE EMISSIONS OF VOM FROM EQUIPMENT LEAKS:

☐ AVERAGE EMISSION FACTOR ☐ LEAK/NO LEAK EMISSION FACTOR ☐ STRATIFIED EMISSION FACTOR ☐ LEAK RATE/SCREENING VALUE CORRELATION

☐ OTHER; (SPECIFY):

_____

ATTACH A COPY OF THE FINAL REPORT FOR ANY OF THE ABOVE TESTS THAT HAVE BEEN PERFORMED. THIS REPORT SHOULD SUMMARIZE THE TEST PROCEDURES AND RESULTS. LABEL AS 391-6.

22) IS THERE AN ACTIVE INSPECTION AND MONITORING PROGRAM OF EQUIPMENT LEAKS? ☐ YES ☐ NO

IF YES, PROVIDE A DESCRIPTION OF SUCH PROGRAM OR ATTACH THE INSPECTION PROGRAM TO THIS FORM AND LABEL AS 391-7:

FUGITIVE VOM FROM CLEANUP OPERATIONS (complete if applicable)

23) COMPLETE THE FOLLOWING FOR EACH VOM CONTAINING MATERIAL USED FOR CLEANUP FOR WHICH THE EMISSIONS ARE FUGITIVE AND HAVE NOT BEEN ACCOUNTED FOR ELSEWHERE IN THIS APPLICATION:

	GENERIC NAME OF CLEANUP MATERIAL	DENSITY (LB/GAL)	VOM CONTENT (WEIGHT %)	ANNUAL USAGE (GAL/YEAR) MAX	ANNUAL USAGE (GAL/YEAR) TYPICAL
a)					
b)					
c)					

24) EXPLAIN THE MEANS BY WHICH THESE MATERIALS ARE USED AND WHAT EQUIPMENT OR ITEMS ARE BEING CLEANED:

25a) ARE ALL VOM USED IN CLEANUP OPERATIONS CONSIDERED TO BE EMITTED? ☐ YES ☐ NO

IF NO, EXPLAIN:

b) IF APPLICABLE, COMPLETE ITEMS i, ii, AND iii BELOW:

i) PROVIDE THE MAXIMUM AND TYPICAL AMOUNT OF VOM RECLAIMED AND/OR SHIPPED OFF-SITE AND HENCE, NOT EMITTED:

	(GAL/YR)	(TONS/YR)
MAX		
TYP		

ii) EXPLAIN THE MEANS BY WHICH VOM IS COLLECTED FOR RECLAMATION AND/OR DISPOSAL:

iii) EXPLAIN THE MEANS BY WHICH THE AMOUNT OF VOM COLLECTED IS MEASURED OR DETERMINED:

FUGITIVE CONTROL

26) COMPLETE THE FOLLOWING, INCLUDING THE MINIMUM AND TYPICAL REDUCTION EFFICIENCY FOR EACH CONTROL MEASURE UTILIZED:

	CONTROL MEASURES	REGULATED AIR POLLUTANT	FUGITIVE POINT(S) CONTROLLED	REDUCTION EFF.(%) MIN	REDUCTION EFF.(%) TYP	FREQUENCY OF CONTROL APPLICATION
a)	Vacuum Sweeping	PM10	City Roads	37	58	Weekly
b)	See Section 3 of					
c)	Application for					
d)	Additional Emission					
e)	Data.					

NOTE: IF ADDITIONAL SPACE IS NEEDED, ATTACH AND LABEL AS 391-8.

27) PROVIDE A DESCRIPTION OF EACH OF THE CONTROL MEASURES INDICATED IN ITEM 32. IF ADDITIONAL SPACE IS NEEDED, ATTACH AND LABEL AS 391-9.

	CONTROL MEASURE(S)	DESCRIPTION
a)	Vacuum Sweeping	Use a Vacuum Sweeper on Designated Segments of truck routes through Granite City, IL. This will reduce fugitive particulate emissions around GCW
b)		

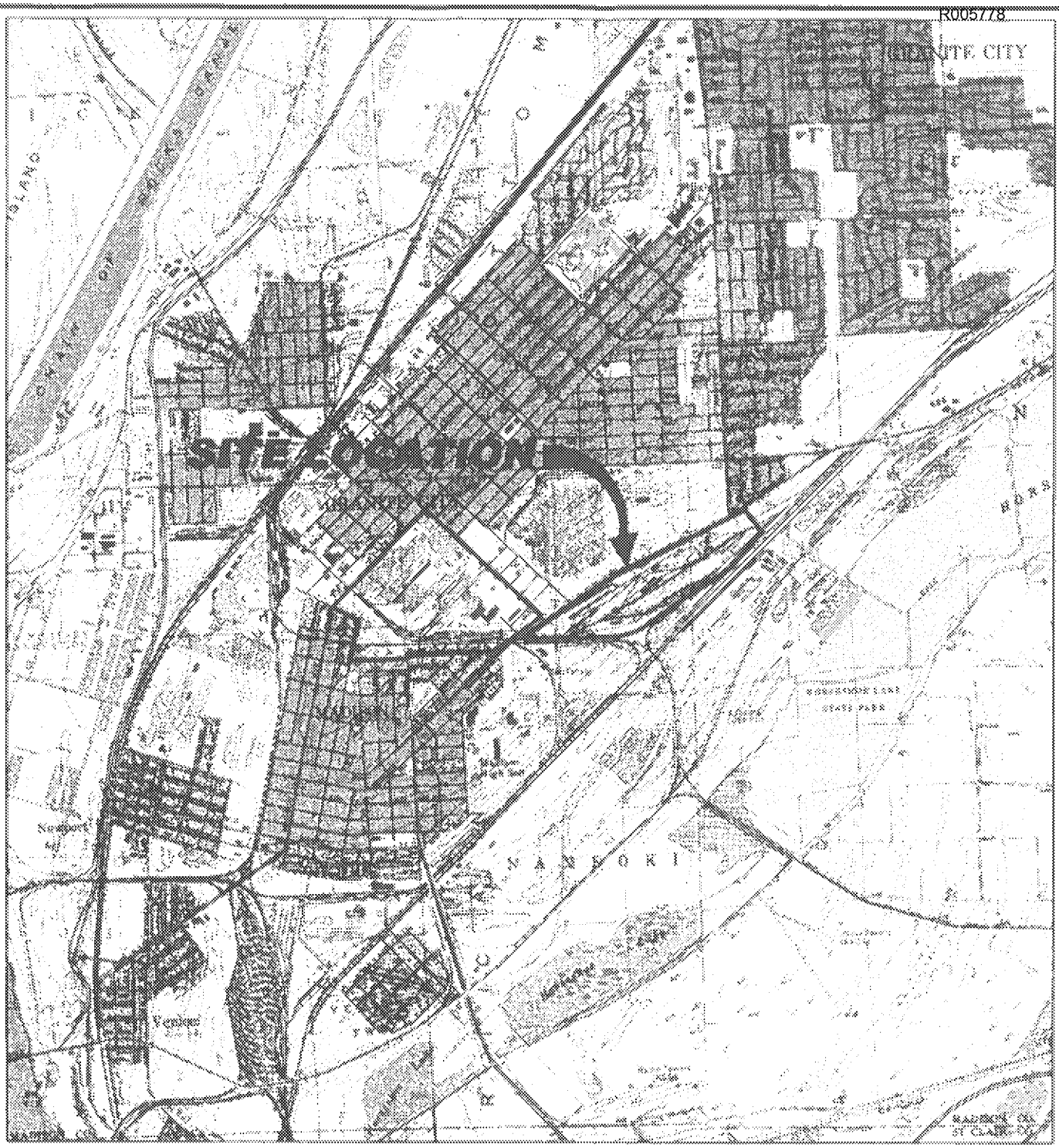
27) (CONTINUED) PROVIDE A DESCRIPTION OF EACH OF THE CONTROL MEASURES INDICATED IN ITEM 26. IF ADDITIONAL SPACE IS NEEDED, ATTACH AND LABEL AS 391-9.

	CONTROL MEASURE(S)	DESCRIPTION
c)		
d)		
e)		
f)		
g)		
h)		

Figures

EL-MAGH OF RECORD/ARMS
JUN 04 2015
REVIEWED

R005778



SOURCE: MAP TAKEN FROM ELECTRONIC USGS DIGITAL RASTER GRAPHIC 7.5 MINUTE TOPOGRAPHIC MAP OF GRANITE CITY, AND MONKS MOUND, ILL. REVISED 1993



QUADRANGLE LOCATION

0 1000

1:400

SCALE METER

UNITED STATES STEEL CORPORATION
GRANITE CITY WORKS
GRANITE CITY, ILLINOIS

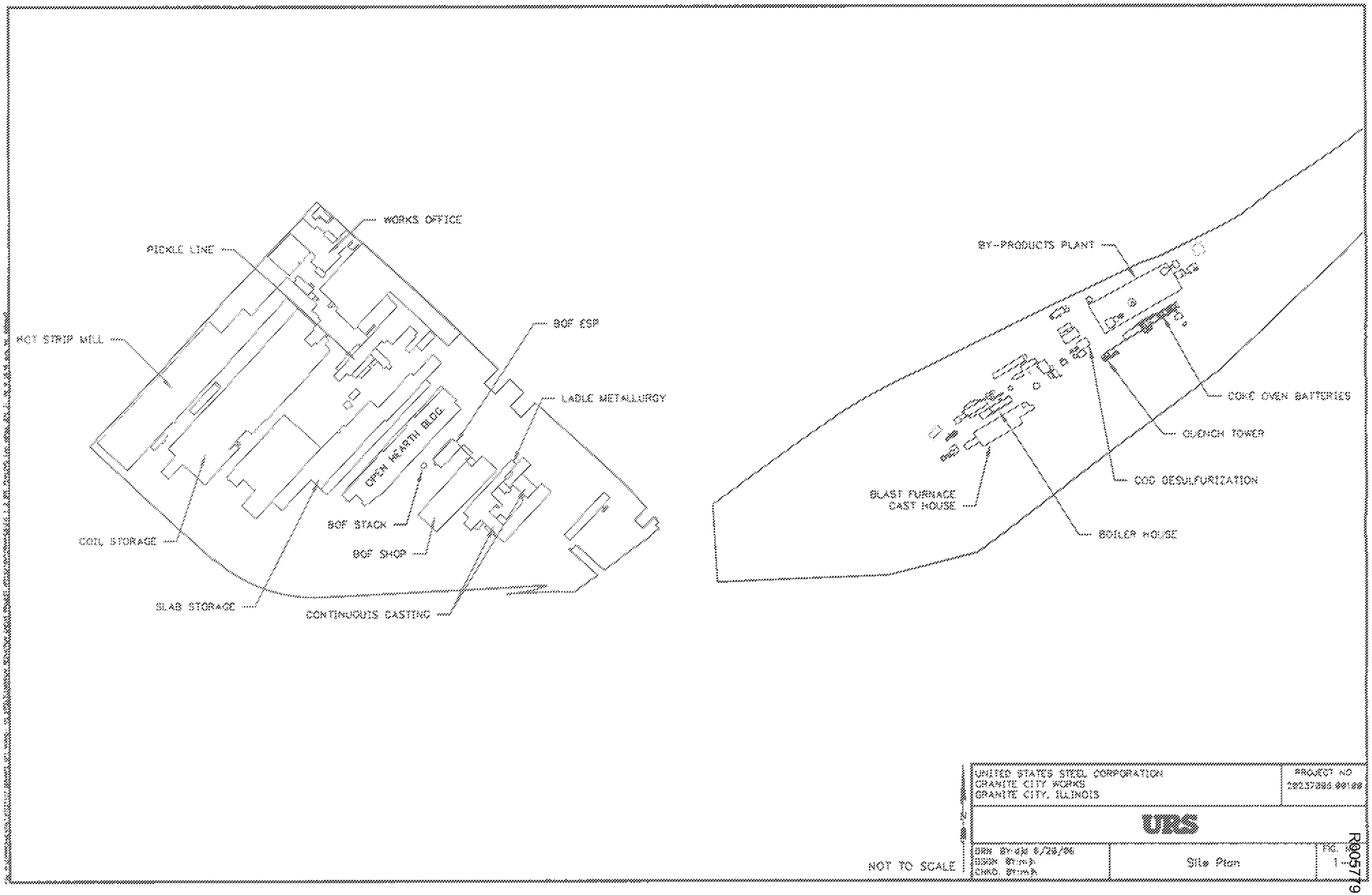
PROJECT NO. 20237107.00000

URS

DRN. BY: djd 6/13/06
DSGN. BY: mh
CHKD. BY:

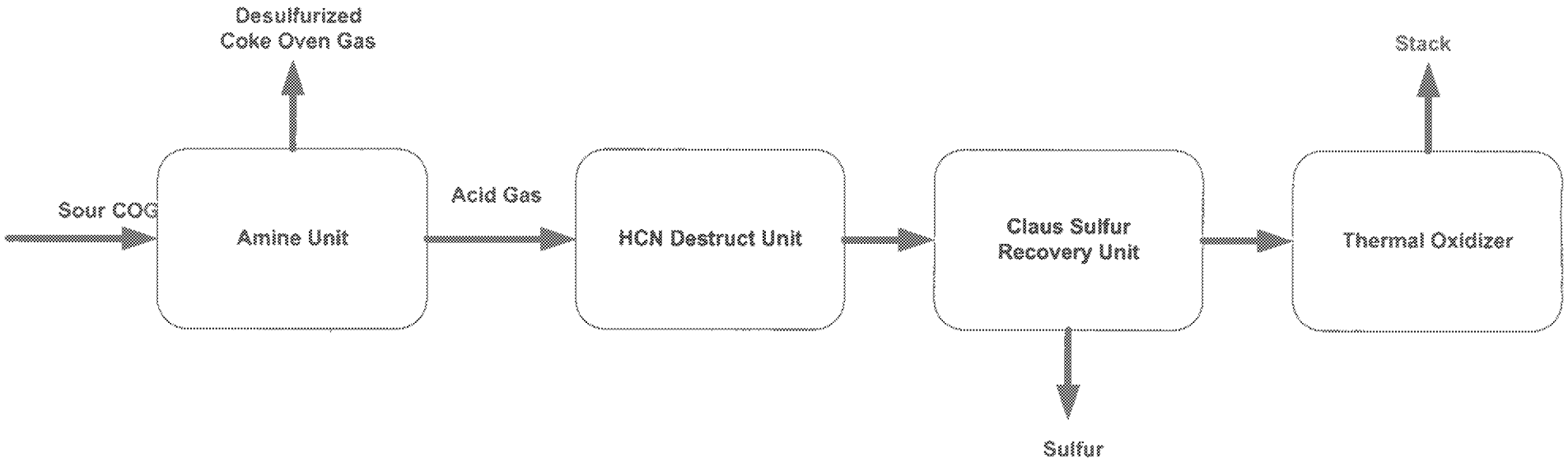
Site Location Map

FIG. NO. 1-1

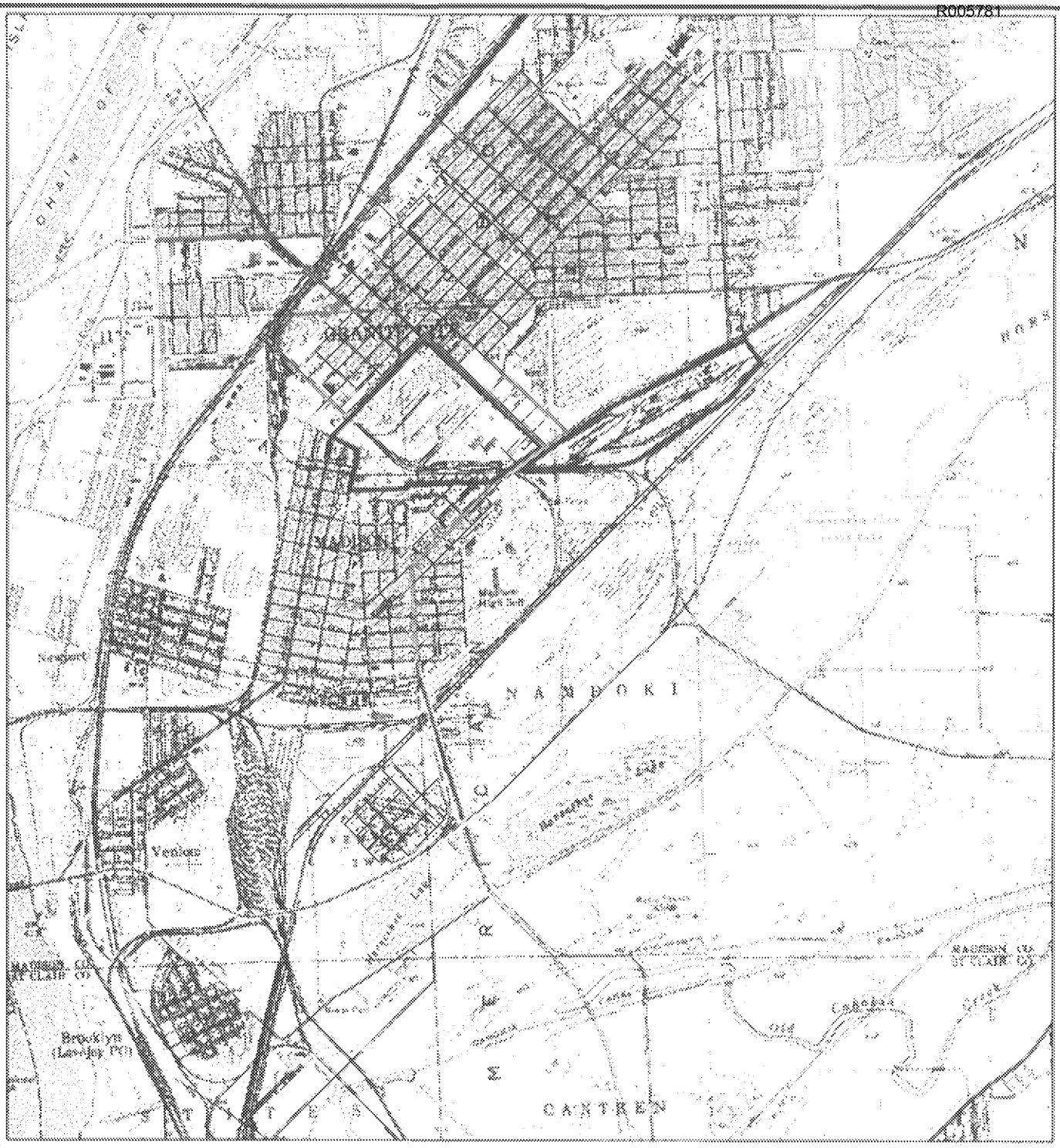

WORKS OFFICE
PICKLE LINE
HOT STRIP MILL
BOF ESP
LADLE METALLURGY
OPEN HEARTH BLDG
BOF STACK
BOF SHOP
COIL STORAGE
SLAB STORAGE
CONTINUOUS CASTING
BY-PRODUCTS PLANT
COKE OVEN BATTERIES
QUENCH TOWER
COG DESULFURIZATION
BLAST FURNACE
CAST HOUSE
BOILER HOUSE
NOT TO SCALE
UNITED STATES STEEL CORPORATION
GRANITE CITY WORKS
GRANITE CITY, ILLINOIS
PROJECT NO
28237886.00100
URS
DRN. BY: dji 6/28/96
DSGN. BY: mjh
CHKD. BY: mjh
Site Plan
FIG. 1-

R0005779

FIGURE 2-1



R005780



SOURCE: MAP TAKEN FROM ELECTRONIC USGS DIGITAL RASTER GRAPHIC 7.5 MINUTE TOPOGRAPHIC MAP OF GRANITE CITY, AND MONKS MOUND, ILL. REVISED 1993

LEGEND

ROAD SEGMENTS INCLUDED IN VACUUM SWEEPING PROGRAM

ILLINOIS

0 1000

1:400

SCALE METER

UNITED STATES STEEL CORPORATION GRANITE CITY WORKS GRANITE CITY, ILLINOIS		PROJECT NO. 28237107.08000
URS		
DRN. BY: djd 6/13/00 DSGN. BY: mh CHKD. BY:	Proposed Road Vacuum Sweeping Program	FIG. NO. 2-2

FINAL DRAFT/PROPOSED CAAPP PERMIT
U. S. Steel Corporation - Granite City
I.D. No.: 119813AAI
Application No.: 96030056
October 7, 2003

217/782-2113

REVISED
OPERATING PERMIT

PERMITTEE

U.S. Steel Granite City
Attn: Larry Siebenberger
Route 203 and 20th Street
Granite City, Illinois 62040

Application No.: 95010001 I.D. No.: 119813AAI
Applicant's Designation: Date Received: April 29, 2002
Subject: Production Increase, Renewal
Date Issued: June 25, 2002 Expiration Date: June 25, 2007
Location: Southeastern Granite City

Permit is hereby granted to the above-designated Permittee for an increase in the allowable production rate of iron (from 2,372,500 to 3,165,000 net tons per year) and steel (from 2,774,000 to 3,580,000 net tons per year) as described in the above-referenced application. This permit is subject to standard conditions attached hereto and the following special conditions:

1. Prior to issuance of this permit, a draft of this permit has undergone a public notice and comment period, and a public hearing was held.

BLAST FURNACE OPERATIONS

2a. Total combined production of hot metal (a.k.a., iron) from blast furnaces A and B shall not exceed 9,849 net tons per day, averaged over any calendar month, and;

b. Total combined production of hot metal from blast furnaces A and B shall not exceed 3,165,000 net tons per year.

3a. Particulate emissions from the blast furnace casthouse baghouse and iron spout baghouse shall not exceed 0.010 gr/dscf, pursuant to 35 Ill. Adm. Code 212.445(b)(1).

b. The opacity of emissions from the blast furnace casthouse baghouse and the iron spout baghouse shall not exceed 10% on a 6 minute rolling average basis, pursuant to 35 Ill. Adm. Code 212.445(b)(1).

4a. Emissions of particulate matter from any opening in the blast furnace casthouse shall not exceed 20% opacity on a 6-minute rolling average basis beginning from initiation of the opening of the tap hole up to the point where iron and slag stops flowing in the troughs, pursuant to 35 Ill. Adm. Code 212.445(a)(2).

5. Emissions from Blast Furnace operations shall not exceed the limits in attached Tables 1 and 5.

BASIC OXYGEN FURNACE SHOP

6a. Total combined production of liquid steel from the Basic Oxygen Furnaces (BOFs) shall not exceed 11,000 net tons per day, averaged over any calendar month, and;

b. Total combined production of liquid steel from the BOFs shall not exceed 3,580,000 net tons per year.

7. The emissions of PM-10 from the BOF ESP stack for the total of all BOF processes (i.e., operations from the beginning of the charging process through the end of the tapping process) shall not exceed 60.0 lbs/hr and 0.225 lbs per ton of steel in process, pursuant to 35 Ill. Adm. Code 212.458(b)(23).

8. Visible emissions from any opening in the BOF shop (e.g., roof monitor) shall not exceed 20% on a 3 minute rolling average basis.

9a. The Permittee shall determine the opacity from the openings BOF shop on at least a weekly basis. Observations shall be conducted for at least an hour or the entire BOF cycle, whichever is greater.

b. The Permittee shall determine the opacity from the BOF ESP stack for at least one hour on any normal work day (i.e., Monday through Friday) that the continuous opacity monitor on the BOF ESP stack has an outage that exceeds two consecutive hours and is still down. The readings shall commence as soon as possible after the opacity monitor has been down for two consecutive hours. If meteorological conditions or lack of visibility preclude these observations from being conducted, then this shall be noted in the log book.

c. The opacity shall be determined in accordance with the observation procedures set out in 40 CFR Part 60, Appendix

A, Method 9 including the requirement that readings be taken by a certified observer.

d. These determinations shall be recorded in a log book, which at a minimum shall include the date and time of observations, name and title of observer, individual opacity readings, calculated opacity so as to determine compliance with Section 212.123, and calculated opacity relative to 20% opacity on a three minute rolling average basis.

10. The Permittee shall follow the BOF operating procedures and requirements specified in attachment A. These requirements are designed to ensure proper operation of the BOF control system. These procedures shall be posted in the BOF pulpit (a.k.a., control room).

11. Flame suppression shall be used and maintained during the entire tapping process.

12a. The stack gas pulpit set point of the BOF ESP control system shall be set in accordance with the following, so as to establish sufficient particulate matter capture efficiency of the charging and primary hoods:

i. Set point requirements while only a single BOF vessel is in operation;

A. Minimum set point during charging process: 550,000 cfm;

B. Minimum set point during refining process: 650,000 cfm;

C. Minimum set point during tapping process: 200,000 cfm (until one minute after completing alloy addition);

b. i. During dual operation of BOF vessels (a.k.a., overlapping BOF operation) the minimum set point shall be 700,000 cfm.

iii. Overlapping operations of the BOF vessels is allowed under the following conditions:

A. The hot metal charge of the second vessel shall be initiated and completed during the time between completion of the blow and start of tap on the first vessel while sufficient

draft at the ESP capture system is established and maintained for both vessels.

B. The charge and/or blow on one vessel shall not begin until sufficient draft has been established at the associated ESP capture system (a.k.a., doghouse) and the alloy addition at the vessel tapping has been completed for a least 1 minute.

C. Sufficient draft at the ESP capture system of the vessel being tapped shall be maintained for at least 1 minute after alloy addition has been completed. After such period, the capture system draft may be transferred over to the other vessel in order to satisfy condition (A) above.

D. Only overlapping of the hot metal charge of the second vessel after the end of blow and prior to onset of tap of the first vessel and overlapping of tapping of the first vessel, after alloy addition, and the hot metal charge and/or blow on the second vessel are allowed.

E. Condition B and C above shall be part of the Standard Operating Procedure (SOP) of the BOF vessels.

c. The BOF capture system shall be operated at the above minimum set points until and unless the Agency approves a lower minimum set point based on a demonstration that a better level of particulate matter control will occur, except for purposes of emissions testing as related to the set point.

d. The Permittee shall calibrate, operate, and maintain a continuous strip chart recorder of the ESP stack gas flow rate as measured by the stack gas flow meter during ESP use.

e. The Permittee shall record for each steel production cycle the various stack gas flow rates for each process (i.e., for each charge, each refine, each tap) of each steel production cycle. That is, the Permittee shall be able to distinguish the measured flow rate of stack gas during each production cycle.

f. The stack gas flow meter shall be calibrated on at least a quarterly basis.

13a. The Permittee shall operate and maintain the waste gas suction monitor system that continually measures and records for each process (i.e., for each charge, each refine, each tap) of each steel production cycle the static pressure in the main downcommer duct of the ESP emissions capture and transport system.

b. The waste gas suction monitoring system shall be used as a mechanism to ensure sufficient draft is maintained in the emissions capture hoods and transport ducts so as to maximize emissions capture and transport and minimize uncaptured emissions and emission leaks.

c. The monitoring system shall be operated and maintained to ensure accurate and useful data.

d. The Permittee shall continuously record the static pressure in the main downcommer duct of the ESP emissions capture and transport system.

14a. The Permittee shall visually inspect at least monthly all visible BOF vessel enclosures, hooding and ducts used to capture and transport emissions for the BOF ESP control system.

b. A log shall maintained of these inspections which includes observations of the physical appearance of the capture system and any noted deficiencies (e.g., the presence of any holes in ductwork or hoods, flow constrictions caused by dents or accumulated dust in ductwork, and fan erosion).

c. Any leaks or areas otherwise noted to be in need of repair, shall be repaired as soon as practicable.

15a. The Permittee shall operate, maintain, and repair the BOF ESP in a manner that assures compliance with the conditions of this permit.

b. An adequate inventory of spare parts for the BOF ESP shall be maintained.

16. Written operating procedures for the BOF ESP shall be maintained and updated describing proper normal process and equipment operating parameters, monitoring and instrumentation for measuring control equipment operating

parameters, control equipment inspection and maintenance practices, and the availability of spare parts from inventory, local suppliers and other sources.

17. The Permittee shall keep operating records, a maintenance log, and inspection log for the BOF ESP and associated control systems which includes the following:

a. Operating time of the BOF;

b. Operating time of the capture systems and performance parameters, including air flow and fan amperage through the fan motors, gas temperature at inlet to ESP, damper settings, and steam injection rate;

c. Operating time of the ESP and performance parameters, including voltage and amperage of each transformer/rectifier set, number of sections in use;

d. All routine and nonroutine maintenance performed, including dates and duration of outages, inspection schedule and findings, leaks detected, repair actions, and replacements.

18. Emissions from the BOF Shop shall not exceed the limits in attached Tables 2 and 5.

Note: For purposes of this permit, a BOF cycle is defined as the period from the beginning of the charging process through the end of the tapping process. The cycle is comprised of three main processes which are charging, refining, and tapping.

CONTINUOUS CASTING OPERATIONS

19. The continuous casting operations shall comply with 35 Ill. Adm. Code 212.450 and 212.458(b)(8).

20. Emissions from the continuous casting operations shall not exceed the limits in Tables 3 and 5.

FUEL COMBUSTION

21. Total fuel usage for blast furnace stoves (A and B), boiler house boilers (1-10), blast furnace boilers (11 and 12), ladle drying preheaters and blast furnace gas flares shall not exceed the following limits:

a. Natural Gas usage: 225 million ft^3 per month and 1,346 million ft^3 per year;

b. Blast Furnace Gas (BFG) usage: 30,800 million ft^3 per month and 185,030 million ft^3 per year;

c. Fuel Oil usage: 60 thousand gallons per month and 365 thousand gallons per year.

22. Emissions from the fuel combustion units listed above shall not exceed the limits in Tables 4 and 5.

ON-SITE FUGITIVE DUST CONTROL

(Refer to Attachment B for a table which summarizes the required on-site fugitive dust roadway control measures and maps indicating the referred to road segments)

23. The Permittee shall immediately initiate and maintain the on-site fugitive dust control measures specified in this permit so as eliminate dust spillage on in-plant and out-of-plant roadways.

24a. The Permittee shall sweep or flush at least every day the paved access area below the BOF ESP where ESP dust collection bags are used, stored and transported.

b. The Permittee shall implement a housekeeping program for the non-roadway areas below and around the BOF ESP. This program shall, at a minimum, contain the following:

i. The ground and other accessible areas where dust may gather shall be swept or cleaned at least every day;

ii. Cleaning shall be performed in such a manner as to minimize the escape of dust into the atmosphere;

iii. Dust collection bags shall be inspected at least daily for rips, tears, or insecure connection to the discharge chutes of the ESP hoppers;

iv. Dust collection bags shall be inspected after removal from, and connection to, the discharge chutes of the ESP hoppers;

v. Ripped or torn bags shall be taken out of service and transported as soon as practicable in a covered truck.

25. Fugitive emissions of particulate matter from any roadway or parking area shall not exceed an opacity of 5%, pursuant to 35 Ill. Adm. code 212.316(e)(1).

26a. UNPAVED ROADS: On unpaved roads that are part of normal traffic patterns as identified in attachment B (including roads B, C, E, N, F-F, and CS(2)) the Permittee shall apply a chemical dust suppressant at least three times a month, with the following exceptions:

i. Road segment G-G, which shall be sprayed at least quarterly;

ii. Road segments P, V, Z, D-D, E-E, and H, which shall be sprayed at least 4 times per month until paving is completed. Paving shall be completed on these roads no later than July 31, 1996;

iii. Road segment L, which shall be sprayed at least 4 times per month.

b. All other unpaved roads shall be treated as necessary.

c. Applications of suppressant may be less frequent than specified above if weather conditions, i.e., precipitation or temperature, interfere with the schedule for spraying, provided each such instance shall be recorded in accordance with the daily records for on-site fugitive dust control required by this permit.

27a. PAVED ROADWAYS AND AREAS: Paved roadways and areas shall be maintained in good condition.

b. On paved roadways and other areas, the Permittee shall sweep or flush as follows:

i. Road segments D, K, M, F, G, J, R, and O shall be swept or flushed at least daily;

ii. Road segments P, V, W, X, Z, D-D, E-E, and CS(1) shall be swept or flushed at least five days per week;

iii. Road segments S and T shall be swept or flushed at least every other day;

iv. Road segments A and H shall be swept or flushed at least once per month;

v. All gate areas leading from the Steelworks area shall be swept or flushed at least daily;

vi. All gate areas leading from the iron making area shall be swept or flushed at least five times per week.

28. The above on-site dust control measures shall be conducted to maximize their effectiveness by performing said measures when the roads or areas are not normally obstructed by parked vehicles and by preferentially using filter sweeping (e.g., Enviro-Whirl sweeper) for the gate areas, the roads and areas surrounding the BOF and BOF ESP, and other key areas.

29. The Permittee shall maintain daily records relative to the on-site fugitive dust control program which includes the following information as a minimum:

a. The date (and time for the gate areas) each road or area was treated;

b. The manner in which the road or area was treated (i.e., filter sweep, conventional sweep, suppressant spray or flush);

c. Detailed information for use of dust suppressant, including but not limited to the application rate, dilution ratio, type of suppressant used, and the number of gallons of suppressant applied;

d. Observations, if any, concerning the condition of the roadway, e.g., presence of parked vehicles, detection of potholes;

e. The amount of precipitation and temperature recorded for each day, and if determination was made to suspend application of suppressant, include name and title of person who made determination to suspend application and explanation;

f. Any and all suspensions or deviations from the designated control procedures, with date, description, and explanation for suspension of application.

OFF-SITE FUGITIVE DUST CONTROL

30. The Permittee or the Permittee's Agent shall sweep or flush the following Granite City street road areas:

a. At least weekly, the quarter mile segment of Madison Avenue in front of the 16th street gate (i.e., 1/8 of a mile in either direction);

b. At least weekly, segment of 20th street between Lee and Quincy roads;

c. At least monthly, segment of 20th street between Madison and Route 203 (a.k.a. Edwardsville Road).

PM-10 CONTINGENCY MEASURES

31. The Permittee shall comply with the additional control measures (e.g., PM-10 contingency plan) required by 35 Ill Adm. Code Part 212 Subpart U.

COMPLIANCE DETERMINATIONS

32a. Compliance with the daily limits of this permit shall be determined from a monthly total of the relevant daily data divided by the number of days in the month.

b. Compliance with the monthly limits of this permit (e.g., fuel usage) shall be determined by direct comparison of monthly data to the applicable limit.

c. i. Compliance with the annual limits of this permit shall be determined based on a calendar year.

ii. A. Compliance with the production limits in conditions 2(b) and 6(b) shall also be determined on a month by month basis by showing that the actual production of iron and steel from the plant did not exceed the scheduled rate of production for a month given in the most recent production schedule provided to the Agency that shows compliance with the following requirements.

B. If no production schedule is submitted to the Agency by the Permittee for a particular year, the scheduled monthly production of iron and steel shall be set at one twelfth of the

annual production limits in conditions 2(b) and 6(b).

C. 1. The Permittee may submit a schedule for iron and steel production for each month of the calendar year. Such schedule shall provide the scheduled monthly iron and steel production for each month and the total of such scheduled production shall not exceed the annual production limits in conditions 2(b) and 6(b). This schedule shall be submitted each year no later than December 15th of the preceding year.

2. During the course of the year, the Permittee may submit a revised production schedule which accounts for actual production levels which were below that scheduled for the previous months, provided that in no case shall the scheduled production for prior months in such a revised schedule be lowered to less than actual production levels or raised. Such revised schedule shall be submitted to the Agency no later than 15 days after the first day of the month for which scheduled production has been raised. Such schedule shall be accompanied by data on actual production in preceding months.

33a. Compliance with opacity limits and measurements of opacity shall be made by opacity readings taken in accordance with the observation procedures set out in 40 CFR Part 60, Appendix A, Method 9.

b. The Permittee shall have at least two employees or agents experienced in making opacity readings to the extent that it is reasonably possible to do so, who shall be able to make the opacity readings required by this permit.

34a. Blast furnace hot metal production shall be measured at the BOF hot metal transfer station, and adjusted by documented slag and iron losses.

b. BOF liquid steel production shall be initially measured by a scale equipped crane and adjusted based upon documented steel production analysis of the continuous casters.

c. BFG usage shall be calculated based on the total BFG produced per net ton hot metal (NTHM) derived by the following formula and adjusted per analysis of documented BFG consumptions:

$$\text{mmft}^3 \text{ BFG per month} = \frac{(4.585277 \text{ NTHM/day} + 498.191)}{80} \times \begin{pmatrix} \text{Number of} \\ \text{days in} \\ \text{that month} \end{pmatrix}$$

d. Natural gas usage shall be determined by metered volumes.

e. Fuel oil usage shall be determined by tank height differentials.

RECORD KEEPING

35. The Permittee shall keep records of the following items and such other items which may be appropriate to allow the Agency to review compliance:

a. Blast Furnace hot metal production (total combined daily, monthly and annual in tons), including documentation on iron and slag losses;

b. BOF liquid steel production (total combined daily, monthly and annual in tons), including documentation on adjustments made due to production analysis and losses;

c. Fuel usage as follows; Usage of natural gas and BFG (total combined million ft^3 per month and year, each) and fuel oil (total combined gallons/month and year) for the blast furnace stoves (A and B), boiler house boilers (1-10), blast furnace boilers (11 and 12), ladle drying preheaters and blast furnace gas flares.

36. All records and logs required by this permit shall be retained at a readily accessible location at the source for at least three years from the date of entry and shall be made available for inspection and copying by the Agency and USEPA upon request. Any records retained in a computer shall be capable of being retrieved and printed on paper during normal source office hours so as to be able to respond to an Agency request for records during the course of a source inspection.

TESTING

37. The special conditions of this permit supplement the special conditions of any existing operating permits for this source, and supersede such conditions in cases where a conflict exists.

38a. The following tests shall be performed by no later than August 6, 1997 to demonstrate compliance with the conditions of this permit.

i. Fuel Combustion Units testing: The emissions of particulate matter from boiler #12 while burning blast furnace gas shall be measured. This test shall be designed to verify compliance with the requirements of this permit and the emission factor used (i.e., 2.9 lbs particulate emitted per mmcf BFG burned);

b. The test shall be performed by an approved independent testing service during conditions which are representative of maximum emissions and at the maximum production rates allowed, or as close to such rates as reasonable if the Permittee demonstrates to the Agency prior to testing that testing at such production rates within the time constraints of an Agency request to test is not practicable.

c. i. The following methods and procedures shall be used for the testing, unless another method is approved by the Agency: Refer to 40 CFR 60, Appendix A for USEPA test methods;

Location of sample points	USEPA Method 1
Gas flow and velocity	USEPA Method 2
Particulate Matter	USEPA Method 5

ii. All particulate measured shall be considered PM-10 unless emissions are tested by an appropriate USEPA test method for measurement of PM-10, as specified in 35 Ill. Adm. Code 212.110(e).

d. At least 30 days prior to the actual date of testing, a written test plan shall be submitted to the Agency for review and approval. This plan shall be describe the specific procedures for testing, including as a minimum:

i. The persons who will be performing sampling and analysis and their experience with similar tests;

ii. The specific conditions under which testing will be performed including a discussion of why these conditions will be representative of maximum emissions and the means by which operating parameters for the source and the emissions capture and control system will be determined;

iii. The specific determinations of emissions and operation which are intended to be made, including sampling and monitoring locations;

iv. The test methods which will be used, with the specific analysis methods;

v. Any proposed use of an alternative test method, with detailed justification;

vii. The format and content of the Source Test Report.

e. The Agency shall be notified before these tests to enable the Agency to observe these tests. Notification for the expected date of testing shall be submitted a minimum of thirty (30) days prior to the expected date. Notification of the actual and expected time of testing shall be submitted a minimum of five (5) working days prior to the actual date of the test. The Agency may at its discretion accept notifications with shorter advance notice provided that the Agency will not accept such notifications if it interferes with the Agency's ability to observe testing.

f. The Final Report of these tests shall include as a minimum:

i. A tabular summary of results which includes:

- Process weight rate and/or fuel usage rate
- Production rate
- Allowable emission limit
- Measured emission rate
- Determined emission factor
- Compliance demonstrated - Yes/No
- Any other pertinent information

ii. Description of test methods and procedures used, including description of sampling train, analysis equipment, and test schedule;

iii. Detailed description of test conditions, including,

- Pertinent process information (e.g. fuel or raw material consumption)

- Control equipment information, i.e. equipment condition and operating parameters during testing;

iv. Data and calculations, including copies of all raw data sheets and records of laboratory analyses, sample calculations, and data on equipment calibration;

g. Copies of the Final Report for these tests shall be submitted to the Agency within 14 days after the test results are compiled and finalized.

h. Submittals of information shall be made as follows:

i. Notice of Test - one copy to Source Emission Test Specialist, one copy to Regional Office, and one copy to Permit Section;

ii. Final Report - one copy to Source Emission Test Specialist, one copy to Regional Office, and one copy to Permit Section.

Pertinent Addresses are:

Illinois Environmental Protection Agency
Division of Air Pollution Control
9511 West Harrison
Des Plaines, Illinois 60016

Illinois Environmental Protection Agency
Division of Air Pollution Control
Regional Office
2009 Mall Street
Collinsville, Illinois 62234

Illinois Environmental Protection Agency
Division of Air Pollution Control
Attn: Permit Section
P.O. Box 19506

Springfield, Illinois 62794-9506

REPORTING

39. If there is an exceedance of the requirements of this permit as determined by the records required by this permit, the Permittee shall submit a report to the Agency's Compliance Unit in Springfield, Illinois within 30 days after the exceedance. The report shall include the emissions released in accordance with the record keeping requirements, a copy of the relevant records, and a description of the exceedance or violation, cause of the exceedance, and efforts to reduce emissions and future occurrences. This report shall be sent to:

Illinois EPA
Bureau of Air
Compliance Section (#40)
P.O. Box 19276
Springfield, Illinois 62794-9276

40. The Permittee shall submit the following additional information from the prior calendar year with the Annual Emissions Report, due May 1st of each year:

a. Iron and steel production (tons/month and tons/yr, each);

b. Natural gas and BFG usage ($mmft^3$/month and $mmft^3$/yr, each);

c. Fuel oil usage (thousand gallons/month and thousand gallons/yr, for each type of oil).

APPLICABILITY OF MAJOR SOURCE RULES

41a. As a consequence of the above conditions, this permit is issued based upon the following changes in emissions, as further described in Table 6, accompanying increased production as allowed by this permit:

i. The increases in emissions of lead and VOM are not significant under 35 Ill. Adm. Code Part 203 or 40 CFR 52.21 - Prevention of Significant Deterioration;

ii. The increase in emissions of NO_x are being accompanied by contemporaneous emission decreases provided by the shutdown of equipment and operations such that the net emissions change is not significant under 35 Ill.

Adm. Code Part 203 or 40 CFR 52.21 - Prevention of Significant Deterioration.

iii. The increase in emissions of PM and PM-10 are being accompanied by contemporaneous emission decreases provided by additional road dust control and BOF capture and control such that the net emissions change is not significant under 35 Ill. Adm. Code Part 203 or 40 CFR 52.21 - Prevention of Significant Deterioration.

Also, the Permittee has agreed to provide further additional dust control consisting of the sweeping of Granite City public streets and housekeeping measures in the area below and surrounding the BOF ESP. Attachment C is a listing of the emission reductions provided by these control measures.

b. The increases in emissions of SO_2 and CO are significant under 40 CFR 52.21 - Prevention of Significant Deterioration (PSD). Accordingly, the project is considered a major modification and must comply with the requirements of PSD. These requirements include a demonstration of best available control requirements for affected SO_2 and CO emission units, an analysis of air quality impacts, an analysis of the impacts of the project on visibility, vegetation's and soils, and the application and proposed permit must undergo a public participation. The Agency has determined that these additional requirements have been met.

c. The changes in emissions pertinent to this project are summarized as follows:

Units = tons/year

* Emission increases which could occur from the project:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
51.6	- 52.0	238.8	476.0	5,685	59.3	0.54

* Creditable contemporaneous actual emission decreases:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
58.0	58.0	226.5	0.38	23.31	32.8	0.0

* Other contemporaneous emission increases:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
20.7	20.3	26.0	0.25	11.8	1.6	0.0

* Net emission changes:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
+14.3	-89.2	+38.3	+475.9	+5,673	+28.1	+0.54

* Significant Levels:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
15	25	40	40	100	40	0.6

d. This revised operating permit issued January 5, 1999 is issued such that the net increase in emissions of PM, PM_{10}, SO_2, NO_x and VOM resulting from increased natural gas combustion are not significant under 35 Ill. Adm. Code Part 203 or 40 CFR 52.21 - Prevention of significant Deterioration. The accounting of the increases in emissions are shown in Tables 7, 8 and 9 of the attachments.

e. The changes in emissions pertinent to the revised operating permit issued January 5, 1999 are summarized as follows:

* Emission increase from increased natural gas combustion:

PM-10	PM	NO_x	SO_2	CO	VOM
3.43	3.43	205.94	0.40	26.92	1.88

* Natural gas combustion baseline emissions (average of 1996 and 1997 actuals):

PM-10	PM	NO_x	SO_2	CO	VOM
2.9	2.9	174.11	0.34	22.76	1.59

* Net emission changes:

PM-10	PM	NO_x	SO_2	CO	VOM

0.53	0.53	31.83	0.06	4.16	0.29

* Significant levels:

PM-10	PM	NO_x	SO_2	CO	VOM
15	25	40	40	100	40

Explanatory Note:

PM	=	Particulate matter = particulate;
PM-10	=	Particulate matter less than or equal to 10 micrometers in size;
SO_2	=	Sulfur dioxide;
NO_x	=	Nitrogen oxides;
VOM	=	Volatile organic material;
CO	=	Carbon monoxide;
mm	=	Million;
gr/dscf	=	Grains per dry standard cubic foot;
acfm	=	Actual cubic feet per minute;
mmcf	=	Million cubic feet;
Mgal	=	Thousands of gallons.

If you have any questions on this permit, please call Kevin Smith at 217/782-2113.

Donald E. Sutton, P.E.
Manager, Permit Section
Division of Air Pollution Control

DES:KLS:jar

cc: IEPA, FOS Region 3

TABLE 1

BLAST FURNACE OPERATIONS

Maximum Hot Metal Production = 3,165,000 net tons per year

1. Casthouse Baghouse (furnace tapping)- captured emissions ducted to baghouse, uncaptured emissions emitted through roof, other openings, etc.

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.0703	111.19
PM-10	0.0703	111.19
SO_2	0.2006	422.0
NO_x	0.0144	22.79
VOM	0.0946	149.68

2. Blast Furnace - Uncaptured fugitives

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.031	49.06
PM-10	0.0155	24.53
SO_2	0.0104	21.94
NO_x	0.0007	1.14
VOM	0.0047	7.42

3. Blast Furnace Charging
Maximum pellets charged = 4,308,581 tons/yr

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.0024	5.17
PM-10	0.0024	5.17

4. Slag Pits

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.00417	6.60
PM-10	0.00417	6.60
SO_2	0.0100	15.83

5. Iron Spout Baghouse- captured emissions controlled by iron spout baghouse.

Pollutant	Emission Factor (lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.02548	40.32
PM-10	0.02548	40.32
SO_2	0.0073	13.89

6. Iron Pellet Screen
Maximum pellets charged = 4,308,581 tons/yr

Pollutant	Emission Factor (lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.00279	6.01
PM-10	0.00279	6.01

2. TABLE 2

BOF SHOP

Maximum Liquid Steel Production = 3,560,000 net tons per year

1. BOF ESP Stack (charge, refine, tap)

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.16	262.80
PM-10	0.16	262.80
NO_x	0.0389	69.63
VOM	0.0060	10.74
CO	8.993	16,097.47
Lead	0.1934 lbs/hr	1.26 tons/yr

2. BOF Roof Monitor

Pollutant	Emission Factor (lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.0987	176.71
PM-10	0.06614	118.40
Lead	0.0129 lbs/hr	0.08 tons/yr

3. Desulfurization and Reladling - Hot Metal Transfer

Pollutant	Emission Factor (lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.03721	58.68
PM-10	0.03721	58.68
VOM	0.0010	1.58
Lead	0.0133 lbs/hr	0.09 tons/yr

4. BOF Additive System (i.e., fluxes) with Baghouse, a.k.a., BOF hoppex baghouse

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.00032	0.57
PM-10	0.00032	0.57

5. Flux conveyor & transfer pits, bin floor

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.0016	2.86
PM-10	0.0016	2.86

6. Hot metal charging ladle slag skimmer

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.0050	7.94
PM-10	0.0050	7.94

3. TABLE 3

CONTINUOUS CASTING OPERATIONS

Maximum Liquid Steel Throughput = 3,560,000 net tons per year

1. Argon Stirring Station and Material Handling Tripper (Ladle Metallurgy)

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.00715	12.80
PM-10	0.00715	12.80

2. Deslagging Station and Material HS.

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.00355	6.35
PM-10	0.00355	6.35

3. Caster Molds - Casting

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.006	10.74
PM-10	0.006	10.74
NO_x	0.050	89.50

4. Casters Spray Chambers

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.00852	15.25
PM-10	0.00852	15.25

5. Slab Cut-off

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.0071	12.71
PM-10	0.0071	12.71

6. Slab Ripping

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.00722	12.92
PM-10	0.00722	12.92

TABLE 4

CERTAIN FUEL COMBUSTION UNITS

1. 10 boilers (#'s 1 - 10)

2. 2 boilers (#'s 11 - 12)

3. Blast Furnace Stoves A & B.

4. BFG Flares

5. Ladle Drying Preheaters (5 heaters).

Total combined fuel usage from affected units (i.e., Boilers, BF stoves, BF Flares, ladle drying preheaters)

	Maximum Usage (mmft³/Yr)
NATURAL Gas (Total)	1,346
BFG	185,030
Fuel Oil	365 thousand gallons/yr

1. Natural Gas

Pollutant	Emission Factor (Lbs/mmcf)	Maximum Emissions (Tons/Yr)
PM	5.1	3.43
PM-10	5.1	3.43
SO_2	0.6	0.40
NO_x	306	205.94
VOM	2.8	1.88
CO	40	26.92

2. BFG

Pollutant	Emission Factor (Lbs/mmcf)	Maximum Emissions (Tons/Yr)
PM	2.9	268.29
PM-10	2.9	268.29
SO_2	6.65	615.22
NO_x	5.28	488.48
CO	13.7	1,267.46

3. Fuel Oil

Pollutant	Emission Factor (Lbs/Mgal)	Maximum Emissions (Tons/Yr)
PM	9.72	1.77
PM-10	9.72	1.77
SO_2	141.3	25.79
NO_x	55	10.04
VOM	0.28	0.05
CO	5.0	0.91
Lead	0.336	0.06 (waste oil)

4. TABLE 5

LIMITS ON EMISSIONS FROM MAJOR PROCESSES AND ACTIVITIES

Units = tons/year

	PM	PM-10	SO_2	NO_x	VOM	CO	Lead
Blast Furnace Operations	218	194	474	24	157	----	---
BOF Shop	510	451	---	70	12	16,097	1.43
Continuous Casting Operations	71	71	---	90	---	----	---
Certain Fuel Combustion Units[A]	274	274	641	706	2	1,295	0.06
Roadways	27	27	---	---	---	----	---
Material Handling	2	2	---	---	---	----	---
Total	1,102	1,019	1,115	890	171	17,392	1.49

[A] Blast furnace stoves (A and B), boiler house boilers (1-10), blast furnace boilers (11 and 12), ladle drying preheaters and blast furnace gas flares.

TABLE 6

EMISSIONS SUMMARY

Units = tons/year

- Emission increases which could occur from the project:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
51.6	-52.0	238.8	476.0	5,685	59.3	0.54

- Creditable contemporaneous actual emission decreases:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
58.0	58.0	226.5	0.38	23.31	32.8	0.0

- Other contemporaneous emission increases:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
20.7	20.3	26.0	0.25	11.8	1.6	0.0

- Net emission changes:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
+14.3	-89.2	+38.3	+475.9	+5,673	+28.1	+0.54

- Significant Levels:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
15	25	40	40	100	40	0.6

TABLE 7

Change in Emissions from Increased Natural Gas Combustion

Baseline Emissions (Average of 1996 and 1997 Actuals)

Pollutant	Emissions (Tons/Yr)
PM	2.9
PM-10	2.9
SO_2	0.34

NO_x	174.11
VOM	1.59
CO	22.76

Potential Emissions from Natural Gas Usage of 1,346 $mmft^3/Yr$

Pollutant	Emissions (Tons/Yr)
PM	3.43
PM-10	3.43
SO_2	0.40
NO_x	205.94
VOM	1.88
CO	26.92

Net Emission Change

Pollutant	Emissions (Ton/Yr)	Significant Emissions Level (Tons/Yr)
PM	0.53	25
PM-10	0.53	15
SO_2	0.06	40
NO_x	31.83	40
VOM	0.29	40
CO	4.16	100

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TABLE 8

1996 Actual Emissions from Natural Gas Usage of 1,131 $mmft^3/Yr$

Pollutant	Emissions (Tons/Yr)
PM	2.88
PM-10	2.88
SO_2	0.34
NO_x	173.04
VOM	1.58
CO	22.62

TABLE 9

1997 Emissions from an Allowable Natural Gas Usage of 1,145 $mmft^3/Yr$

Pollutant	Emissions (Tons/Yr)
PM	2.92
PM-10	2.92
SO_2	0.34
NO_x	175.19
VOM	1.60
CO	22.9

KLS:jar

ATTACHMENT A

PROCEDURES TO ENSURE PROPER OPERATION
OF BOF ESP CONTROL SYSTEM

1. The emissions control operator shall:

   a. Check on a regular basis and report to the emissions control foreman or melter:

      i. Any ESP fields down;

      ii. Any ESP fields in which the meter readings are showing no current or a fault;

   b. Check on a regular basis that doors on all hopper screws are closed;

   c. Inspect on a regular basis the fans and motors for unusual sounds and/or visual problems. Any abnormalities will be immediately reported to the melter or maintenance foreman for investigation.

2. The melter shall:

   a. Check on a regular basis and report to the emissions control foreman or the area electrician any fields which the pulpit precipitator field short indicators shows as having a short and is able to reset;

b. Check on a regular basis and report to the emissions control foreman or the maintenance foreman any draft or fan problems;

c. Check the ESP stack opacity monitor on a regular basis and initiate the following in the event that the stack opacity level, as determined by the opacity monitor, exceeds 30% opacity on a six minute average:

i. Check the pulpit indicators for proper operation of the steam and spray water system. Report any problems to emission control foreman or maintenance foreman;

ii. Check the stack gas pulpit set point for proper setting;

iii. Call the emissions control operator who shall perform the following steps;

A. Check the AVC operation and power level. Report any problems to electrical maintenance foreman or area electrician;

B. Check to ensure that doors on all hopper screws are closed;

d. Check oxygen blow rates and adjust, if necessary;

e. Check hot metal chemistry;

f. A log shall be maintained of the above checks and any actions taken as a result.

3. The emission control foreman shall:

a. Check on a regular basis the opacity monitor exceedances and trends. The control specialist shall be contacted to correct any problems;

b. Check on a regular basis the draft rate set points;

c. Check on a regular basis primary and secondary damper settings;

d. Check on a regular basis ESP operation, including the following:

i. Fields down;

ii. Fields indicating shorts and unable to reset;

iii. Hopper screw doors are closed;

e. Check on a regular basis blow rates;

f. Check on a regular basis spray water system operation;

g. Check on a regular basis steam injection rate;

h. Contact the area manager regarding electrical maintenance and to schedule the ESP repair work;

i. Contact the area manger for mechanical maintenance to schedule the isolation of the ESP channel by closing the inlet and outlet gates of that chamber and opening the top hatches for entry into the chamber;

j. Notify the emissions control operator and melter when isolation work begins;

k. A log shall be maintained of the above checks and any actions taken as a result.

4. The crane operator shall use the following procedures, as appropriate, to minimize emissions and maximize emissions capture by the hoods:

a. Use controlled pouring of the hot metal into the BOF vessel;

b. Use careful positioning of the hot metal ladle with respect to the hood face and furnace mouth;

c. Use the most beneficial furnace tilt angle;

d. These procedures shall be posted in the crane operator booth.

ATTACHMENT B

ON-SITE FUGITIVE DUST ROADWAY CONTROL MEASURES AND MAPS SHOWING THE ROAD SEGMENTS

APPENDIX B SO2 FESOP Permit

FINAL DRAFT/PROPOSED CAAPP PERMIT
U. S. Steel Corporation - Granite City
I.D. No.: 119813AAI
Application No.: 96030056
October 7, 2003

217/782-2113

FEDERALLY ENFORCEABLE STATE OPERATING PERMIT - REVISED

PERMITTEE

Granite City Division
of National Steel Corporation
Attn: Joseph S. Kocot
20th and State Street
Granite City, Illinois 62040

Application No.: 94120017 I.D. No.: 119813AAI
Applicant's Designation: Date Received: April 1, 1996
Subject: Sulfur Dioxide Emission Limits
Date Issued: November 19, 1996 Expiration Date: February 22, 2000
Location: Granite City

Permit is hereby granted to the above-designated Permittee to OPERATE emission source(s) and/or air pollution control equipment consisting of sulfur dioxide emission units as described in the above-referenced application and as enumerated in the existing permits listed in Table 1. This permit is subject to standard conditions attached hereto and the following special conditions:

1. This federally enforceable state operating permit is issued to limit sulfur dioxide emissions to levels which ensure that compliance with the national ambient air quality standard for sulfur dioxide is maintained in the surrounding area.

LIMITATIONS ON EMISSIONS AND OPERATIONS

2. Emissions of sulfur dioxide (SO_2) from each unit operating group as a whole shall not exceed the following limits:

Unit Operating Group	Sulfur Dioxide Emissions* (Lbs/3-Hours)	(Lbs/Day)	(Tons/Yr)
Slab Reheat Furnaces (1-3)	2,299	9,754	987
Slab Reheat Furnace 4		11,873	1,204
Blast Furnace Stoves (A and B)		19,774	3,609
Boilerhouse Boilers(1-10)		20,285	3,702
Blast Furnace Boilers (11 and 12)		20,584	3,756
Ladle Drying Preheaters	555	2,786	509
Blast Furnace Casthouse Baghouse		3,430	626
Iron Spout Baghouse		170	31

* Refer to special note of the Compliance Determinations Section of this permit.

3. Fuel oil shall not be fired in the Blast Furnace Stoves and Ladle Drying Preheaters.

4a. Slab Reheat Furnaces 1-4 shall use fuel oil only from tank 5.

b. Boilerhouse Boilers 1-10 shall use fuel oil only from tank 102.

c. Blast Furnace Boilers 11 and 12 shall use fuel oil only from tank 101.

5. The Agency shall be allowed to sample all fuels at the above location.

6a. The #6 Galvanizing Line Furnace and the #6 Galvanizing Pot shall use natural gas only.

b. The #7A Galvanizing Line Furnace shall use natural gas only.

COKE OVEN GAS FLOW METERS AND HYDROGEN SULFIDE MONITOR OPERATION

7a. By no later than December 31, 1996 the Permittee shall install a system for monitoring the hydrogen sulfide (H_2S) content of the coke oven gas (COG) for each unit operating group.

b. The Permittee shall test, operate, and maintain a system for measuring the COG usage for each unit operating group.

c. These systems shall result in the acquisition of validated data which are representative of each unit operating groups emissions.

8a. A flow meter shall be maintained on the main Blast Furnace and Steelworks COG feed lines and each individual emission unit or unit operating group and shall be used to measure the COG usage rate. Flow meters shall be used to measure the COG usage on each individual emission unit or unit operating group. The total COG usage for each unit operating group as a whole shall be the sum of the individual usage for the emission units of that group as measured by the individual meters or that measured by a single flow meter measuring the COG usage for the unit operating group as a whole.

b. The COG flow meter system shall meet the applicable requirements of Performance Specification 6 of 40 CFR 60, Appendix B, i.e., flow rate measurement specifications.

c. The COG flow meter system shall be capable of recording the COG usage in standard cubic feet on a hourly basis and daily basis.

d. The COG flow meter system shall be operated, and data collected, reduced and maintained, in accordance with the applicable requirements of 40 CFR 60.13 and 35 Ill. Adm. Code Part 201 Subpart L.

e. i. Sufficient information on COG usage shall be obtained from the COG flow meter system to allow the determination of hourly and/or daily COG usage for each unit operating group, as needed for the emission rate calculations of this permit.

ii. If a single flow meter on an unit operating group fails, then the COG usage for that group may be calculated using the difference between overall total COG usage and the total COG usage at the remaining properly operating COG flow meters, or the difference in COG usage from the main COG feed line of the affected unit operating group and the COG usage at the remaining properly operating flow meters associated with that main feed line;

iii. In the event that several flow meters are down such that the above COG usage calculation is not possible, the COG usage for the affected unit operating group(s) shall be determined by a method approved by the Agency (e.g., use of temporary backup measurement system). In no case shall COG usage not be determined by a method described in this permit, or an approved alternative method, so as to result in insufficient data being obtained to determine the COG usage for any unit operating group as needed to evaluate compliance using the emission rate calculations of this permit.

9a. The Permittee shall install, operate, and maintain a continuous monitoring system to measure and record the H2S content in the COG of the main COG feed line.

b. The H_2S concentration shall be measured on a wet gas basis.

c. The H_2S monitoring system shall meet the applicable requirements of Performance Specification 7 of 40 CFR 60, Appendix B.

d. The H_2S monitoring system shall be equipped with a strip chart recorder or disk storage and shall be capable of recording the H_2S content in grains per standard cubic feet on a hourly average basis and daily average basis.

e. The H_2S monitoring system shall be operated, and data collected, reduced and maintained, in accordance with the applicable requirements of 40 CFR 60.13 and 35 Ill. Adm. Code Part 201 Subpart L.

f. The H_2S monitoring system shall obtain hourly average H_2S content data for at least 75% of the daily operating hours in which COG is produced (e.g., at 24 hours/day COG production, at least 18 hourly averages of H_2S content must be obtained). In the event that this minimum data requirement cannot be met by the H_2S monitoring system, the H_2S content data shall be supplemented or obtained by one of the following alternative methods:

i. H_2S determined by type of coal used during that period and previous recorded H_2S content when using this coal type. This method shall only be used for a maximum of 15 days per calendar year.

ii. A manual sample of COG shall be taken daily and the H_2S content shall be determined by 40 CFR 60, Appendix A, Method 11, as adapted to measure higher ranges of H_2S. This value, or a value based on the mean of the daily values plus two standard deviations for the previous 90 days for which a reading was obtained, whichever is higher, shall be used. Should a coal blend change occur during the period this alternative method is being used, the mean value plus two standard deviations will be adjusted to reflect any potential change in the H_2S content from that of the previous coal blend.

g. The H_2S monitoring system shall be the primary means of determining the H_2S content of the COG. The alternative methods, as specified above, shall only be used in the event of a malfunction or breakdown of the H_2S monitoring system.

10. In the event of malfunction or breakdown of a COG flow meter or the H_2S monitoring system, the Permittee shall

repair and recalibrate the meter or monitoring system as soon as practicable but no later than 10 days after the malfunction or breakdown is detected, unless prior Agency approval is obtained by submitting adequate justification to the Agency detailing the reasons for delay. Records of repair and recalibration must be maintained in accordance with the recordkeeping requirements of this permit. This condition does not relieve the Permittee of the minimum data obtaining requirements of this permit.

COMPLIANCE DETERMINATIONS

11a. Compliance with the lbs/3-hours limits shall be demonstrated using the following emission rate calculations for eight discrete 3-hour periods per day, with the first period beginning at midnight.

b. Compliance with the daily emission limits of this permit shall be demonstrated using the following emission rate calculation equations based on a daily block basis (i.e., midnight to midnight).

12. The compliance calculations shall be the primary compliance method for determining compliance with the emission limits in this permit, except for the blast furnace casthouse baghouse and iron spout baghouse, for which stack testing shall be the primary means of determining compliance.

13a. Total SO_2 emissions from an unit operating group for determination of compliance with the SO_2 limits of this permit shall be the sum of the emissions resulting from the use of COG and fuel oil at the unit operating group, i.e.:

Lbs SO_2 per unit operating group = SO_2 emissions from fuel oil usage + SO_2 emissions from COG usage

Special Note: The SO_2 emissions which would result from the use of blast furnace gas and natural gas in the unit operating groups has been accounted for in the SO_2 limits of this permit. This was accomplished by lowering the permitted SO_2 from the SO_2 levels used for air quality modeling by an amount equal to the SO_2 which would have been emitted should the unit operating groups use blast furnace gas or natural gas continuously. The SO_2 emissions from blast furnace gas and natural gas were calculated using standard emission factors as found in AIRS Facility Subsystem, Source Classification Codes and

Emission Factor Listing for Criteria Air Pollutants, EPA Document Number EPA 450/4-90-003, and Compilation of Air Pollution Emission Factors, Vol. 1, Stationary Point and Other Sources, AP-42.

b. The SO_2 emissions attributable to fuel oil usage shall be calculated using the recorded parameters required by this permit and the following equation:

Lbs SO_2/period = gallons of oil burned per period x sulfur content in weight percent of the fuel oil used x density of the fuel oil used in pounds per gallon x 2.

Note that emissions attributable to fuel oil used in each tank must be calculated individually using the most recent recorded parameters of the oil in that tank).

c. The SO_2 emissions attributable to COG usage shall be calculated using the recorded parameters required by this permit and the following equation:

Lbs SO_2/period = thousand standard cubic feet of COG burned per period x average H_2S content of the COG in grains per standard cubic foot for the period x 0.269.

14. Stack test measurement shall be the primary method of determining compliance of the Blast Furnace Casthouse and Iron Spout Baghouse with the lbs/day limits in this permit.

The secondary means of determining compliance shall be the following emission calculation equations:

a. The SO_2 attributable to the Blast Furnace Casthouse Baghouse shall be calculated using an emission factor of 0.173 lbs SO_2 per ton of hot metal cast.

b. The SO_2 attributable to the Iron Spout Baghouse shall be calculated using an emission factor of 0.0063 lbs SO_2 per ton of hot metal cast.

15. Compliance with the tons/yr limits of this permit shall be determined using a rolling total of 12 consecutive calendar months of data.

16a. i. Usage of fuel oil for a specific time period shall be determined by monitoring the difference in oil height in a tank before and after oil use, and then converting this difference in height to gallons of oil used for that period.

ii. When fuel oil is used at both unit operating groups of Slab Reheat Furnaces 1-3 and Slab Reheat Furnace 4 during the same period such that the oil usage at each individual unit operating group is not directly measurable using the above specified difference in oil height method, the oil usage at the individual unit operating groups during such period shall be calculated using a ratio of the Btu's of each unit operating group during that period times the oil usage.

b. i. The sulfur content and density as determined by the ASTM methods specified in the testing requirements of this permit shall be used in emission calculations until any additional oil is added to a tank upon which the sulfur content and density of that tank as calculated in the following item (ii) shall be used.

ii. The sulfur content and density of the fuel oil shall be determined after each instance that oil is added to a tank by taking a weighted average of the sulfur content and density of the oil in that tank and the oil being added, provided that the sulfur content and density of the fuel oil being added must be determined by the ASTM methods indicated above. Alternatively, the Permittee may use the ASTM methods indicated above in lieu of using the weighted average determination method.

iii. The most recent determined values for the fuel oil weight percent sulfur content and density shall be used in compliance calculations.

17. Usage of COG shall be determined by the COG flow meters.

18a. For use in the lbs/3-hours compliance calculations, the average H_2S content of COG shall be calculated using an arithmetic average of all available H_2S data during the 3-hour period that COG was burned. In the event that the H_2S monitoring system is unable to obtain a single reading for the 3-hour period, the H_2S content for that 3-hour period shall be obtained by one of the previously specified alternative methods of this permit (i.e., manual

sampling of H_2S content or determined by type of coal used during that period and previous recorded H_2S content when using this coal type).

b. For use in the lbs/day compliance calculations, the daily average H_2S content of COG shall be calculated using an arithmetic average of all available hourly average H_2S content data for that day, and at least data from 75% of the daily operating hours.

TESTING

19a. Each COG flow meter used in compliance calculations for this permit shall be performance initially and at least every 12 months thereafter, in accordance with the procedures of 40 CFR 60, Appendix B, Performance Specification 6.

b. The results of these tests shall be sent to the Division of Air Pollution Control Permit Section and Regional Office within 14 days after compilation of results and maintained in accordance with the recordkeeping specified in this permit.

20a. The H_2S monitor shall be initially, and at least every 12 months thereafter, performance tested in accordance with 40 CFR 60, Appendix B, Performance Specification 7 as follows:

b. The H_2S content in grains per standard cubic foot of COG shall be determined using 40 CFR 60, Appendix A, Method 11 as adapted to measure higher ranges of H_2S.

c. The following revisions shall be made to Method 11 to allow the measuring of higher ranges of H_2S:

i. Diluent air shall mean air containing less than 0.5 ppm total sulfur compounds and less than 10 ppm each of moisture and hydrocarbons.

ii. 7.0 Procedure - Located after the sampling valve, there will be a gas mixing box with a metered supply of (heated) diluent air. This metered supply of diluent air will be introduced prior to sampling and adjusted so that the final dilution of sample will be 1:20 (i.e., 0.05 liters/min of sample to 0.95 liters/min of dilution air).

iii. 9.4 - Vm = Volume of gas sample through the gas

meter (meter conditions), liters/20.

$V_{m_{std}}$ = (Corrected) volume at standard conditions of gas sampled through the dry gas meter. (Standard Liters)

d. The results of these tests shall be sent to the Division of Air Pollution Control Permit Section and Regional Office within 14 days after compilation of results and maintained in accordance with the recordkeeping specified in this permit.

21a. Initially and at least once every 12 months thereafter, the weight percent sulfur content and density of the fuel oil in tanks 101, 102 and 5 shall be determined by testing a representative sample of the oil in each tank.

b. Prior to taking the oil samples to be tested, the contents of tanks 101, 102 and 5 shall be mixed by utilizing the recirculation systems to ensure that the contents of the tanks are reasonably uniform, and hence representative of the entire contents of the tanks.

c. The Permittee shall use the American Society for Testing and Materials (ASTM) method D129-64 for sulfur content in weight percent and ASTM method D12-98 for density in pounds per gallon (lbs/gal).

d. The results of these tests shall be maintained at a readily accessible location at the source for a period of three years and shall be available to representatives of the Agency and USEPA for inspection and copying during daily working and/or operating hours.

22a. Emissions of sulfur dioxide from the blast furnace casthouse baghouse and/or iron spout baghouse shall be measured within 90 days of the receipt of a written request by the Agency. The Agency will provide additional time for testing upon request from the Permittee which shows that it is not feasible to perform representative testing within 90 days. These tests shall be designed to allow evaluation of compliance with the emission limits of this permit.

b. These tests shall be performed by an independent testing service under conditions which are representative of maximum emissions.

c. The following methods shall be used for the testing:

Location of sample points	USEPA Method 1
Gas flow and velocity	USEPA Method 2
Sulfur Dioxide	USEPA Method 6B

d. The Agency shall be notified before these tests to enable the Agency to observe these tests. Notification for the expected date of testing shall be submitted a minimum of thirty (30) days prior to the expected date. Notification of the actual and expected time of testing shall be submitted a minimum of five (5) working days prior to the actual date of the test. The Agency may at its discretion accept notifications with shorter advance notice provided that the Agency will not accept such notifications if it interferes with the Agency's ability to observe testing.

e. The Final Report of these tests shall include as a minimum:

i. A tabular summary of results which includes:

- Identity of the emission unit and/or units tested;
- Tons of hot metal cast per day;
- Sulfur dioxide emission rate in lbs/day;
- Compliance demonstrated - Yes/No.

ii. Description of test methods and procedures used, including description of sampling train, analysis equipment, and test schedule.

iii. Detailed description of test conditions, including, pertinent process information (e.g. fuel or raw material consumption).

iv. Data and calculations, including copies of all raw data sheets and records of laboratory analyses, sample calculations, and data on equipment calibration.

f. Copies of the Final Report for these tests shall be submitted to the Agency within 14 days after the test results are compiled and finalized.

g. Submittals of information shall be made as follows:

i. Notice of Test - two copies to Compliance Section and one copy to Regional Office.

ii. Final Report - two copies to Compliance Section and one copy to Regional Office.

Pertinent Addresses are:

Illinois EPA
Division of Air Pollution Control
Regional Office
2009 Mall Street
Collinsville, Illinois 62234

Illinois EPA
Division of Air Pollution Control
Compliance Section (#40)
1340 North Ninth Street
P.O. Box 19276
Springfield, Illinois 62794-9276

RECORDKEEPING

23. Records shall be maintained of the following:

a. The hourly average, 3-hour average and daily average H_2S content of the COG in grains per standard cubic foot.

b. The H_2S monitor strip chart or disk storage.

c. Thousand standard cubic feet of COG used per 3-hours for slab reheat furnaces 1-3 and ladle drying preheaters and per day for each unit operating group.

d. The calibration, maintenance and repair of the H_2S monitor and each COG flow meter used in compliance calculations.

e. The weight percent sulfur content of the fuel oil in tanks 101, 102 and 5 as determined by the testing requirement of this permit and as determined after each instance that oil is added to a tank.

f. The density (lbs/gal) of the fuel oil in tanks 101, 102 and 5 as determined by the testing requirement of this permit and after each instance that oil is added to a tank.

APPENDIX C

Emission Factor Support Materials

1.4 Natural Gas Combustion

1.4.1 General[1-2]

Natural gas is one of the major combustion fuels used throughout the country. It is mainly used to generate industrial and utility electric power, produce industrial process steam and heat, and heat residential and commercial space. Natural gas consists of a high percentage of methane (generally above 85 percent) and varying amounts of ethane, propane, butane, and inerts (typically nitrogen, carbon dioxide, and helium). The average gross heating value of natural gas is approximately 1,020 British thermal units per standard cubic foot (Btu/scf), usually varying from 950 to 1,050 Btu/scf.

1.4.2 Firing Practices[1-3]

There are three major types of boilers used for natural gas combustion in commercial, industrial, and utility applications: watertube, firetube, and cast iron. Watertube boilers are designed to pass water through the inside of heat transfer tubes while the outside of the tubes is heated by direct contact with the hot combustion gases and through radiant heat transfer. The watertube design is the most common in utility and large industrial boilers. Watertube boilers are used for a variety of applications, ranging from providing large amounts of process steam, to providing hot water or steam for space heating, to generating high-temperature, high-pressure steam for producing electricity. Furthermore, watertube boilers can be distinguished either as field erected units or packaged units.

Field erected boilers are boilers that are constructed on site and comprise the larger sized watertube boilers. Generally, boilers with heat input levels greater than 100 MMBtu/hr, are field erected. Field erected units usually have multiple burners and, given the customized nature of their construction, also have greater operational flexibility and NO_x control options. Field erected units can also be further categorized as wall-fired or tangential-fired. Wall-fired units are characterized by multiple individual burners located on a single wall or on opposing walls of the furnace while tangential units have several rows of air and fuel nozzles located in each of the four corners of the boiler.

Package units are constructed off-site and shipped to the location where they are needed. While the heat input levels of packaged units may range up to 250 MMBtu/hr, the physical size of these units are constrained by shipping considerations and generally have heat input levels less than 100 MMBtu/hr. Packaged units are always wall-fired units with one or more individual burners. Given the size limitations imposed on packaged boilers, they have limited operational flexibility and cannot feasibly incorporate some NO_x control options.

Firetube boilers are designed such that the hot combustion gases flow through tubes, which heat the water circulating outside of the tubes. These boilers are used primarily for space heating systems, industrial process steam, and portable power boilers. Firetube boilers are almost exclusively packaged units. The two major types of firetube units are Scotch Marine boilers and the older firebox boilers. In cast iron boilers, as in firetube boilers, the hot gases are contained inside the tubes and the water being heated circulates outside the tubes. However, the units are constructed of cast iron rather than steel. Virtually all cast iron boilers are constructed as package boilers. These boilers are used to produce either low-pressure steam or hot water, and are most commonly used in small commercial applications.

Natural gas is also combusted in residential boilers and furnaces. Residential boilers and furnaces generally resemble firetube boilers with flue gas traveling through several channels or tubes with water or air circulated outside the channels or tubes.

1.4.3 Emissions[3-4]

The emissions from natural gas-fired boilers and furnaces include nitrogen oxides (NO_x), carbon monoxide (CO), and carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), volatile organic compounds (VOCs), trace amounts of sulfur dioxide (SO_2), and particulate matter (PM).

Nitrogen Oxides -

Nitrogen oxides formation occurs by three fundamentally different mechanisms. The principal mechanism of NO_x formation in natural gas combustion is thermal NO_x. The thermal NO_x mechanism occurs through the thermal dissociation and subsequent reaction of nitrogen (N_2) and oxygen (O_2) molecules in the combustion air. Most NO_x formed through the thermal NO_x mechanism occurs in the high temperature flame zone near the burners. The formation of thermal NO_x is affected by three furnace-zone factors: (1) oxygen concentration, (2) peak temperature, and (3) time of exposure at peak temperature. As these three factors increase, NO_x emission levels increase. The emission trends due to changes in these factors are fairly consistent for all types of natural gas-fired boilers and furnaces. Emission levels vary considerably with the type and size of combustor and with operating conditions (e.g., combustion air temperature, volumetric heat release rate, load, and excess oxygen level).

The second mechanism of NO_x formation, called prompt NO_x, occurs through early reactions of nitrogen molecules in the combustion air and hydrocarbon radicals from the fuel. Prompt NO_x reactions occur within the flame and are usually negligible when compared to the amount of NO_x formed through the thermal NO_x mechanism. However, prompt NO_x levels may become significant with ultra-low-NO_x burners.

The third mechanism of NO_x formation, called fuel NO_x, stems from the evolution and reaction of fuel-bound nitrogen compounds with oxygen. Due to the characteristically low fuel nitrogen content of natural gas, NO_x formation through the fuel NO_x mechanism is insignificant.

Carbon Monoxide -

The rate of CO emissions from boilers depends on the efficiency of natural gas combustion. Improperly tuned boilers and boilers operating at off-design levels decrease combustion efficiency resulting in increased CO emissions. In some cases, the addition of NO_x control systems such as low NO_x burners and flue gas recirculation (FGR) may also reduce combustion efficiency, resulting in higher CO emissions relative to uncontrolled boilers.

Volatile Organic Compounds -

The rate of VOC emissions from boilers and furnaces also depends on combustion efficiency. VOC emissions are minimized by combustion practices that promote high combustion temperatures, long residence times at those temperatures, and turbulent mixing of fuel and combustion air. Trace amounts of VOC species in the natural gas fuel (e.g., formaldehyde and benzene) may also contribute to VOC emissions if they are not completely combusted in the boiler.

Sulfur Oxides -

Emissions of SO_2 from natural gas-fired boilers are low because pipeline quality natural gas typically has sulfur levels of 2,000 grains per million cubic feet. However, sulfur-containing odorants are added to natural gas for detecting leaks, leading to small amounts of SO_2 emissions. Boilers combusting unprocessed natural gas may have higher SO_2 emissions due to higher levels of sulfur in the natural gas. For these units, a sulfur mass balance should be used to determine SO_2 emissions.

Particulate Matter -

Because natural gas is a gaseous fuel, filterable PM emissions are typically low. Particulate matter from natural gas combustion has been estimated to be less than 1 micrometer in size and has filterable and condensable fractions. Particulate matter in natural gas combustion are usually larger molecular weight hydrocarbons that are not fully combusted. Increased PM emissions may result from poor air/fuel mixing or maintenance problems.

Greenhouse Gases -[6-9]

CO_2, CH_4, and N_2O emissions are all produced during natural gas combustion. In properly tuned boilers, nearly all of the fuel carbon (99.9 percent) in natural gas is converted to CO_2 during the combustion process. This conversion is relatively independent of boiler or combustor type. Fuel carbon not converted to CO_2 results in CH_4, CO, and/or VOC emissions and is due to incomplete combustion. Even in boilers operating with poor combustion efficiency, the amount of CH_4, CO, and VOC produced is insignificant compared to CO_2 levels.

Formation of N_2O during the combustion process is affected by two furnace-zone factors. N_2O emissions are minimized when combustion temperatures are kept high (above 1475°F) and excess oxygen is kept to a minimum (less than 1 percent).

Methane emissions are highest during low-temperature combustion or incomplete combustion, such as the start-up or shut-down cycle for boilers. Typically, conditions that favor formation of N_2O also favor emissions of methane.

1.4.4 Controls[4,10]

NO_x Controls -

Currently, the two most prevalent combustion control techniques used to reduce NO_x emissions from natural gas-fired boilers are flue gas recirculation (FGR) and low NO_x burners. In an FGR system, a portion of the flue gas is recycled from the stack to the burner windbox. Upon entering the windbox, the recirculated gas is mixed with combustion air prior to being fed to the burner. The recycled flue gas consists of combustion products which act as inerts during combustion of the fuel/air mixture. The FGR system reduces NO_x emissions by two mechanisms. Primarily, the recirculated gas acts as a dilutent to reduce combustion temperatures, thus suppressing the thermal NO_x mechanism. To a lesser extent, FGR also reduces NO_x formation by lowering the oxygen concentration in the primary flame zone. The amount of recirculated flue gas is a key operating parameter influencing NO_x emission rates for these systems. An FGR system is normally used in combination with specially designed low NO_x burners capable of sustaining a stable flame with the increased inert gas flow resulting from the use of FGR. When low NO_x burners and FGR are used in combination, these techniques are capable of reducing NO_x emissions by 60 to 90 percent.

Low NO_x burners reduce NO_x by accomplishing the combustion process in stages. Staging partially delays the combustion process, resulting in a cooler flame which suppresses thermal NO_x formation. The two most common types of low NO_x burners being applied to natural gas-fired boilers are staged air burners and staged fuel burners. NO_x emission reductions of 40 to 85 percent (relative to uncontrolled emission levels) have been observed with low NO_x burners.

Other combustion control techniques used to reduce NO_x emissions include staged combustion and gas reburning. In staged combustion (e.g., burners-out-of-service and overfire air), the degree of staging is a key operating parameter influencing NO_x emission rates. Gas reburning is similar to the use of overfire

in the use of combustion staging. However, gas reburning injects additional amounts of natural gas in the upper furnace, just before the overfire air ports, to provide increased reduction of NO_x to NO_2.

Two postcombustion technologies that may be applied to natural gas-fired boilers to reduce NO_x emissions are selective noncatalytic reduction (SNCR) and selective catalytic reduction (SCR). The SNCR system injects ammonia (NH_3) or urea into combustion flue gases (in a specific temperature zone) to reduce NO_x emission. The Alternative Control Techniques (ACT) document for NO_x emissions from utility boilers, maximum SNCR performance was estimated to range from 25 to 40 percent for natural gas-fired boilers.[12] Performance data available from several natural gas fired utility boilers with SNCR show a 24 percent reduction in NO_x for applications on wall-fired boilers and a 13 percent reduction in NO_x for applications on tangential-fired boilers.[11] In many situations, a boiler may have an SNCR system installed to trim NO_x emissions to meet permitted levels. In these cases, the SNCR system may not be operated to achieve maximum NO_x reduction. The SCR system involves injecting NH_3 into the flue gas in the presence of a catalyst to reduce NO_x emissions. No data were available on SCR performance on natural gas fired boilers at the time of this publication. However, the ACT Document for utility boilers estimates NO_x reduction efficiencies for SCR control ranging from 80 to 90 percent.[12]

Emission factors for natural gas combustion in boilers and furnaces are presented in Tables 1.4-1, 1.4-2, 1.4-3, and 1.4-4.[11] Tables in this section present emission factors on a volume basis (lb/10^6 scf). To convert to an energy basis (lb/MMBtu), divide by a heating value of 1,020 MMBtu/10^6 scf. For the purposes of developing emission factors, natural gas combustors have been organized into three general categories: large wall-fired boilers with greater than 100 MMBtu/hr of heat input, boilers and residential furnaces with less than 100 MMBtu/hr of heat input, and tangential-fired boilers. Boilers within these categories share the same general design and operating characteristics and hence have similar emission characteristics when combusting natural gas.

Emission factors are rated from A to E to provide the user with an indication of how "good" the factor is, with "A" being excellent and "E" being poor. The criteria that are used to determine a rating for an emission factor can be found in the Emission Factor Documentation for AP-42 Section 1.4 and in the introduction to the AP-42 document.

1.4.5 Updates Since the Fifth Edition

The Fifth Edition was released in January 1995. Revisions to this section are summarized below. For further detail, consult the Emission Factor Documentation for this section. These and other documents can be found on the Emission Factor and Inventory Group (EFIG) home page (http://www.epa.gov/ttn/chief).

Supplement D, March 1998

- Text was revised concerning Firing Practices, Emissions, and Controls.
- All emission factors were updated based on 482 data points taken from 151 source tests. Many new emission factors have been added for speciated organic compounds, including hazardous air pollutants.

July 1998 - minor changes

- Footnote D was added to table 1.4-3 to explain why the sum of individual HAP may exceed VOC or TOC, the web address was updated, and the references were reordered.

Table 1.4-1. EMISSION FACTORS FOR NITROGEN OXIDES (NO_x) AND CARBON MONOXIDE (CO) FROM NATURAL GAS COMBUSTION[a]

Combustor Type (MMBtu/hr Heat Input) [SCC]	NO_x[b]		CO	
	Emission Factor (lb/10^6 scf)	Emission Factor Rating	Emission Factor (lb/10^6 scf)	Emission Factor Rating
Large Wall-Fired Boilers (>100) [1-01-006-01, 1-02-006-01, 1-03-006-01]				
Uncontrolled (Pre-NSPS)[c]	280	A	84	B
Uncontrolled (Post-NSPS)[c]	190	A	84	B
Controlled - Low NO_x burners	140	A	84	B
Controlled - Flue gas recirculation	100	D	84	B
Small Boilers (<100) [1-01-006-02, 1-02-006-02, 1-03-006-02, 1-03-006-03]				
Uncontrolled	100	B	84	B
Controlled - Low NO_x burners	50	D	84	B
Controlled - Low NO_x burners/Flue gas recirculation	32	C	84	B
Tangential-Fired Boilers (All Sizes) [1-01-006-04]				
Uncontrolled	170	A	24	C
Controlled - Flue gas recirculation	76	D	98	D
Residential Furnaces (<0.3) [No SCC]				
Uncontrolled	94	B	40	B

[a] Reference 11. Units are in pounds of pollutant per million standard cubic feet of natural gas fired. To convert from lb/10^6 scf to kg/10^6 m^3, multiply by 16. Emission factors are based on an average natural gas higher heating value of 1,020 Btu/scf. To convert from lb/10^6 scf to lb/MMBtu, divide by 1,020. The emission factors in this table may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to this average heating value. SCC = Source Classification Code. ND = no data. NA = not applicable.

[b] Expressed as NO_2. For large and small wall fired boilers with SNCR control, apply a 24 percent reduction to the appropriate NO_x emission factor. For tangential-fired boilers with SNCR control, apply a 13 percent reduction to the appropriate NO_x emission factor.

[c] NSPS=New Source Performance Standard as defined in 40 CFR 60 Subparts D and Db. Post-NSPS units are boilers with greater than 250 MMBtu/hr of heat input that commenced construction modification, or reconstruction after August 17, 1971, and units with heat input capacities between 100 and 250 MMBtu/hr that commenced construction modification, or reconstruction after June 19, 1984.

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TABLE 1.4-2. EMISSION FACTORS FOR CRITERIA POLLUTANTS AND GREENHOUSE GASES FROM NATURAL GAS COMBUSTION[a]

Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
CO_2[b]	120,000	A
Lead	0.0005	D
N_2O (Uncontrolled)	2.2	E
N_2O (Controlled-low-NO_X burner)	0.64	E
PM (Total)[c]	7.6	D
PM (Condensable)[c]	5.7	D
PM (Filterable)[c]	1.9	B
SO_2[d]	0.6	A
TOC	11	B
Methane	2.3	B
VOC	5.5	C

[a] Reference 11. Units are in pounds of pollutant per million standard cubic feet of natural gas fired. Data are for all natural gas combustion sources. To convert from $lb/10^6$ scf to $kg/10^6$ m^3, multiply by 16. To convert from $lb/10^6$ scf to lb/MMBtu, divide by 1,020. The emission factors in this table may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to this average heating value. TOC = Total Organic Compounds. VOC = Volatile Organic Compounds.

[b] Based on approximately 100% conversion of fuel carbon to CO_2. $CO_2[lb/10^6 scf] = (3.67)(CON)(C)(D)$, where CON = fractional conversion of fuel carbon to CO_2, C = carbon content of fuel by weight (0.76), and D = density of fuel, 4.2×10^4 $lb/10^6$ scf.

[c] All PM (total, condensible, and filterable) is assumed to be less than 1.0 micrometer in diameter. Therefore, the PM emission factors presented here may be used to estimate PM_{10}, $PM_{2.5}$ or PM_1 emissions. Total PM is the sum of the filterable PM and condensible PM. Condensible PM is the particulate matter collected using EPA Method 202 (or equivalent). Filterable PM is the particulate matter collected on, or prior to, the filter of an EPA Method 5 (or equivalent) sampling train.

[d] Based on 100% conversion of fuel sulfur to SO_2. Assumes sulfur content is natural gas of 2,000 grains/10^6 scf. The SO_2 emission factor in this table can be converted to other natural gas sulfur contents by multiplying the SO_2 emission factor by the ratio of the site-specific sulfur content (grains/10^6 scf) to 2,000 grains/10^6 scf.

TABLE 1.4-3. EMISSION FACTORS FOR SPECIATED ORGANIC COMPOUNDS FROM NATURAL GAS COMBUSTION[a]

CAS No.	Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
91-57-6	2-Methylnaphthalene[b,c]	2.4E-05	D
56-49-5	3-Methylchloranthrene[b,c]	<1.8E-06	E
	7,12-Dimethylbenz(a)anthracene[b,c]	<1.6E-05	E
83-32-9	Acenaphthene[b,c]	<1.8E-06	E
203-96-8	Acenaphthylene[b,c]	<1.8E-06	E
120-12-7	Anthracene[b,c]	<2.4E-06	E
56-55-3	Benz(a)anthracene[b,c]	<1.8E-06	E
71-43-2	Benzene[b]	2.1E-03	B
50-32-8	Benzo(a)pyrene[b,c]	<1.2E-06	E
205-99-2	Benzo(b)fluoranthene[b,c]	<1.8E-06	E
191-24-2	Benzo(g,h,i)perylene[b,c]	<1.2E-06	E
205-82-3	Benzo(k)fluoranthene[b,c]	<1.8E-06	E
106-97-8	Butane	2.1E+00	E
218-01-9	Chrysene[b,c]	<1.8E-06	E
53-70-3	Dibenzo(a,h)anthracene[b,c]	<1.2E-06	E
25321-22-6	Dichlorobenzene[b]	1.2E-03	E
74-84-0	Ethane	3.1E+00	E
206-44-0	Fluoranthene[b,c]	3.0E-06	E
86-73-7	Fluorene[b,c]	2.8E-06	E
50-00-0	Formaldehyde[b]	7.5E-02	B
110-54-3	Hexane[b]	1.8E+00	E
193-39-5	Indeno(1,2,3-cd)pyrene[b,c]	<1.8E-06	E
91-20-3	Naphthalene[b]	6.1E-04	E
109-66-0	Pentane	2.6E+00	E
85-01-8	Phenanathrene[b,c]	1.7E-05	D

TABLE 1.4-3. EMISSION FACTORS FOR SPECIATED ORGANIC COMPOUNDS FROM NATURAL GAS COMBUSTION (Continued)

CAS No.	Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
74-98-6	Propane	1.6E+00	E
129-00-0	Pyrene[b, c]	5.0E-06	E
108-88-3	Toluene[b]	3.4E-03	C

[a] Reference 11. Units are in pounds of pollutant per million standard cubic feet of natural gas fired. Data are for all natural gas combustion sources. To convert from $lb/10^6$ scf to $kg/10^6$ m^3, multiply by 16. To convert from $lb/10^6$ scf to lb/MMBtu, divide by 1,020. Emission Factors preceeded with a less-than symbol are based on method detection limits.

[b] Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.

[c] HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.

[d] The sum of individual organic compounds may exceed the VOC and TOC emission factors due to differences in test methods and the availability of test data for each pollutant.

TABLE 1.4-4. EMISSION FACTORS FOR METALS FROM NATURAL GAS COMBUSTION[a]

CAS No.	Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
7440-38-2	Arsenic[b]	2.0E-04	E
7440-39-3	Barium	4.4E-03	D
7440-41-7	Beryllium[b]	<1.2E-05	E
7440-43-9	Cadmium[b]	1.1E-03	D
7440-47-3	Chromium[b]	1.4E-03	D
7440-48-4	Cobalt[b]	8.4E-05	D
7440-50-8	Copper	8.5E-04	C
7439-96-5	Manganese[b]	3.8E-04	D
7439-97-6	Mercury[b]	2.6E-04	D
7439-98-7	Molybdenum	1.1E-03	D
7440-02-0	Nickel[b]	2.1E-03	C
7782-49-2	Selenium[b]	<2.4E-05	E
7440-62-2	Vanadium	2.3E-03	D
7440-66-6	Zinc	2.9E-02	E

[a] Reference 11. Units are in pounds of pollutant per million standard cubic feet of natural gas fired. Data are for all natural gas combustion sources. Emission factors preceeded by a less-than symbol are based on method detection limits. To convert from $lb/10^6$ scf to $kg/10^6$ m^3, multiply by 16. To convert from $lb/10^6$ scf to lb/MMBtu, divide by 1,020.

[b] Hazardous Air Pollutant as defined by Section 112(b) of the Clean Air Act.

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Appendix C
Development of Desulfurized COG Particulate Emission Factors

Results from a recent stack test on Boiler 12 firing 100 % COG.
Based on US EPA Methods 201A and 202
Sulfate and H2SO4 fractions in the front half filterable particulate and
back half condensables were determined from available samples

	COG PM10 Emission Factors (lbs./mmscf)			
	PM10	Total	Sulfate	H2SO4
Current	Front Half	14.99	5.5423	0
	Back Half	56.61	9.445	16.283

Stack Test Parameters

560 Assumed heating value of COG (Btu/scf)
297.13 Monitored H2S grain loading of COG under stack test conditions

Future Case
25 Guaranteed H2S grain loading of COG during Desulfurization
451 Maximum Grain Loading of raw COG based on USS experience (2.2 lbs./MMBtu)

To determine the COG PM10 emission factors for the future scenario estimate reduced sulfate and H2SO4 fractions
Assume sulfate and H2SO4 levels are directly proportional to COG H2S level

For the front half sulfate,

$$\text{Sulfate} = \frac{25}{297.13} \times 5.5423$$

Sulfate = 0.466 lbs./mmscf
Reduction = 5.542 - 0.466
Reduction = 5.076 lbs./mmscf

For the back half sulfate,

$$\text{Sulfate} = \frac{25}{297.13} \times 9.445$$

Sulfate = 0.795 lbs./mmscf
Reduction = 9.445 - 0.795
Reduction = 8.650 lbs./mmscf

For H2SO4,

$$\text{H2SO4} = \frac{25}{297.13} \times 16.283$$

H2SO4 = 1.370023
Reduction = 16.283 - 1.370
Reduction = 14.913 lbs./mmscf

Assume PM10 is reduced 1:1 by the reductions in sulfate and H2SO4
For the filterable portion of PM10,
PM10 = 14.99 - 5.076
PM10 = 9.914 lbs./mmscf

For the condensable portion of PM10,
PM10 = 56.61 - 23.563
PM10 = 33.047 lbs./mmscf

Appendix C
Development of Desulfurized COG Particulate Emission Factors

Final Emission Factor Table

	COG PM10 Emission Factors (lbs./mmscf)			
	PM10	Total	Sulfate	H2SO4
Current	Front Half	14.99	5.5423	0
	Back Half	56.61	9.445	16.283
Future	Front Half	9.91	0.4663	0.0000
	Back Half	33.05	0.7947	1.3700

Assume PM = PM10 = PM2.5

Appendix C
COG Combustion PM10 Stack Test Sulfur Concentrations

SUMMARY OF TEST RESULTS

TABLE	Sulfur Compounds Emissions
COMPANY	US Steel Granite City Works
LOCATION	Granite City, Illinois
SOURCE	Boiler 12 Stack
TEST DATE	2/13/2006

RUN NO	1	
TEST TIME	0959-1159	
COG Consumption (scf)		569000
Stack Gas Parameters		
Temperature, °F		303.8
Velocity, av. ft/sec		39.1
Volumetric flow, acfm		104,735
Volumetric flow, scfm		72,196
Volumetric flow, dscfh		3,907,721
Moisture, av. % vol		9.8
Carbon Dioxide, av. % vol		4.1
Oxygen, av. % vol		13.0
Particulate Sample		
Time, min		120.0
Volume, dscf		92.352
Front Half Sulfate (as SO_4), mg		16.9
Back Half Sulfate (as SO_4), mg		28.8
Back Half Sulfuric Acid, mg		49.7
Isokinetic Ratio, %		99.2
Front-Half Sulfate Emissions (as SO_4)		
Concentration		
grains/dscf		0.0028
x 10^{-6} lb/dscf		0.404
Emission Rate		
lb/hr		1.58
lb/hr as S		0.53
lbs./mmscf		5.54
Back-Half Sulfate Emissions (as SO_4)		
Concentration		
grains/dscf		0.0048
x 10^{-6} lb/dscf		0.688
Emission Rate		
lb/hr		2.69
lb/hr as S		0.90
lbs./mmscf		9.44
Back-Half Sulfuric Acid Emissions (as H_2SO_4)		
Concentration		
grains/dscf		0.0083
x 10^{-6} lb/dscf		1.185
Emission Rate		
lb/hr		4.63
lb/hr as S		1.51
lbs./mmscf		16.28
Sulfur Dioxide Emissions (as SO_2)		
Concentration		
ppm v db		380.0
Emission Rate		
lb/hr		246.71
lb/hr as S		123.47
lbs./mmscf		867.18
Total Sulfur Emissions including SO_2 (as S)		
Emission Rate		
lb/hr		126.41

Appendix C
COG Combustion PM10 Stack Test Results

SUMMARY OF TEST RESULTS

TABLE	PM_{10} Particulate Emission Summary
COMPANY	US Steel Granite City Works
LOCATION	Granite City, Illinois
SOURCE	Boiler 12 Stack
TEST DATE	2/13/2006

RUN NO	1	
TEST TIME	0959-1159	
COG Consumption (scf)		569000
Stack Gas Parameters		
Temperature, °F		305.8
Velocity, av. ft/sec		38.1
Volumetric flow, acfm		102,063
Volumetric flow, scfm		70,053
Volumetric flow, dscfh		3,682,608
Moisture, av. % vol		12.4
Carbon Dioxide, av. % vol		4.1
Oxygen, av. % vol		13.0
PM_{10} Sample		
Time, min		120.0
Volume, dscf		48.551
>PM_{10} particulate, mg		0.6
Front half PM_{10} particulate, mg		25.5
Back half PM_{10} particulate, mg		96.3
Total PM_{10} particulate, mg		121.8
Isokinetic Ratio, %		96.7
D_{50} Cutpoint, µm		9.52
>PM_{10} Emissions		
Concentration		
grains/dscf		0.0002
x 10^{-6} lb/dscf		0.027
Emission Rate		
lb/hr		0.10
Front-Half PM_{10} Emissions		
Concentration		
grains/dscf		0.0081
x 10^{-6} lb/dscf		1.158
Emission Rate		
lb/hr		4.26
lbs./mmscf		14.69
Back-Half PM_{10} Emissions		
Concentration		
grains/dscf		0.0306
x 10^{-6} lb/dscf		4.374
Emission Rate		
lb/hr		16.11
lbs /mmscf		56.61
Total PM_{10} Emissions		
Concentration		
grains/dscf		0.0387
x 10^{-6} lb/dscf		5.532
Emission Rate		
lb/hr		20.37

NO_x EMISSION TEST
#12 BOILER STACK
GRANITE CITY STEEL DIVISION
NATIONAL STEEL CORPORATION
GRANITE CITY, ILLINOIS

ARI PROJECT NO. 436-34

REPORT PREPARED FOR:

GRANITE CITY STEEL DIVISION
NATIONAL STEEL CORPORATION
20TH & STATE STREETS
GRANITE CITY, ILLINOIS

REPORT PREPARED BY:

ARI ENVIRONMENTAL, INC.
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WAUCONDA, ILLINOIS 60084
(708) 487-1580

NOVEMBER 4, 1992 TEST

NO_x EMISSION TEST
#12 BOILER STACK
GRANITE CITY STEEL DIVISION: GRANITE CITY, ILLINOIS

I. INTRODUCTION AND SUMMARY

ARI Environmental, Inc. was retained by the Granite City Steel Division of the National Steel Corporation located in Granite City, Illinois to conduct a nitrogen oxide emission test on the #12 Boiler exhaust stack on November 4, 1992.

The run was completed on November 4, 1992 when the boiler was operating with natural gas.

Test methods followed those as detailed in the Code of Federal Regulations, CFR40, Part 60, Appendix A; and the Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III, Stationary Source Specific Methods.

Testing was conducted boy Mr. M. Barton, Mr. D. Chapman and Mr. E. Kelly of ARI Environmental. Mr. Jeff Blaies of Granite City Steel was present to coordinate the tests and monitor the process conditions.

This report summarizes the test procedures and results of the test. Included, as appendices, is a documentation of all field test data, calculation summary data, strip chart data and logger data.

The results of the test are summarized below:

#12 Boiler (Natural Gas)

	Run #1
Nitrogen Oxide (as NO_2)	
Concentration, ppmv	73.7
Emission rate, lbs./hr.	32.276

NO_x EMISSION TEST
#12 BOILER STACK
GRANITE CITY STEEL DIVISION: GRANITE CITY, ILLINOIS

II. TESTING AND ANALYTICAL PROCEDURES

Overview

ARI Environmental, Inc. was retained by the Granite City Steel Division of the National Steel Corporation in Granite City, Illinois to conduct a nitrogen oxide emission test on the #12 Boiler exhaust stack November 4, 1992.

Methodology

Sampling was conducted following USEPA Methods 1-4, 6C, 7E and 10 as detailed in the Code of Federal Regulations, CFR40, Part 60, 1991 and the Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III, Stationary Source Specific Methods.

Sample Location (USEPA Method 1)

Samples were taken from two 3" diameter test ports located on the stack exhaust. The test ports were located five diameters downstream and five diameters upstream from the last flow disturbances. The stack diameter at this location was 90.5 inches.

Gas Flow and Temperature (USEPA Method 2)

Velocity and volume flow was determined following USEPA Method 2. Velocity and temperature readings were taken on each of 8 points on two traverses for a total of 16 points.

Velocity traverses in the stack were made with a type "S" pitot tube. The velocity head was read on a Dwyer inclined vertical manometer to the nearest 0.01 in H_2O. Temperature measurements in the stack were made with a Chromel-Alumel thermocouple and connected to an Omega Model 170 digital direct read-out potentiometer accurate to approximately 1% of the absolute stack temperature.

Stack Gas CO_2, O_2 and N_2 Content (USEPA Method 3)

The stack gas molecular weight was determined following EPA Method 3. Gas samples were collected in a 60 liter Tedlar bag using ARI's integrated bag collection system and analyzed for CO_2, O_2 and N_2 (by difference) using a Hays Orsat type gas analyzer after each sampling run.

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Stack Gas Moisture Content (USEPA Method 4)

Moisture sampling was conducted following EPA Method 4 on the exhaust stack.

Nitrogen Oxides Determination (USEPA Method 7E)

Continuous NO_x sampling was conducted following EPA Method 7E. The NO_x monitor used was ARI's TECO Model 10 NO_x monitor. Data was recorded on a pen strip chart recorder and ARI's data logger system. Calibration gas and zero air was introduced directly into the 3-way valve for calibration of the NO_x monitor.

The average zero and calibration drift values obtained during each test run on each monitor were used to correct the data for that test run.

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NO_x EMISSION TEST
#12 BOILER STACK
GRANITE CITY STEEL DIVISION: GRANITE CITY, ILLINOIS

SUMMARY OF EMISSION TEST RESULTS

TABLE: III-2

COMPANY: Granite City Steel Division: Granite City, Illinois

LOCATION: #12 Boiler Stack (Natural Gas)

TEST DATE: November 4, 1992
TEST TIME: 1223-1333

STACK GAS

Temperature, °F	300.6
Velocity, fps	35.4
Volume flow, acfm	94,999.5
Volume flow, scfm db	61,131.2
Volume flow, dscfh	3,667,873.2
Moisture, % by volume	6.7
CO_2, % by volume	8.1

NITROGEN OXIDES (as NO_2)

Concentration	
ppmv, db	73.7
x 10^{-6} lbs./dscf	8.8
Emission rate	
lbs./hr.	32.276

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NO_x EMISSION TEST
12 BOILER STACK
NOVEMBER 4, 1992

Natural Gas Usage 117 MMBTU/hr.

$$\frac{32.276 \text{ lb./hr. } NO_x}{117 \text{ MMBTU/hr.}} = 0.3 \text{ lb./MMBTU } NO_x$$

$$0.3 \text{ lb./MMBTU} \times 1019 \text{ BTU/ft.}^3 = 306 \text{ lb./MM ft.}^3 \text{ } NO_x$$

SUMMARY OF TEST RESULTS

COMPANY	US Steel Granite City
LOCATION	Granite City, IL
SOURCE	Boiler 12
RUN NO	Coke Oven Gas
TEST DATE	2/13/2006
TEST TIME	0959-1159

Stack Gas Parameters

Temperature, °F	303.8
Velocity, av. ft/sec	39.1
Volumetric flow, acfm	104,735
Volumetric flow, scfm	72,196
Volumetric flow, dscfh	3,907,721
Moisture, av. % vol	9.8
Carbon Dioxide, av. % vol	4.1
Oxygen, av. % vol	13.0

Sulfur Dioxide Emissions

Concentration	
ppm v db	380.0
Emission Rate	
lb/hr	246.71

Nitrogen Oxides Emissions

Concentration	
ppm v db	147.4
Emission Rate	
lb/hr	68.75

Carbon Monoxide Emissions

Concentration	
ppm v db	0.1
Emission Rate	
lb/hr	0.03

VOC (as C) Emissions

Concentration	
ppm v db	1.2
Emission Rate	
lb/hr	0.17

H_2S Emissions

Concentration	
ppm v db	< 0.5
Emission Rate	
lb/hr	< 0.17

$$\frac{16.75\ lb/h}{284,000} \times 560\ mg/kg$$

$$= 159.72\ mg/h$$

$$= 0.43\ lb/mg/h$$

13.2.1 Paved Roads

13.2.1.1 General

Particulate emissions occur whenever vehicles travel over a paved surface such as a road or parking lot. Particulate emissions from paved roads are due to direct emissions from vehicles in the form of exhaust, brake wear and tire wear emissions and resuspension of loose material on the road surface. In general terms, resuspended particulate emissions from paved roads originate from, and result in the depletion of, the loose material present on the surface (i.e., the surface loading). In turn, that surface loading is continuously replenished by other sources. At industrial sites, surface loading is replenished by spillage of material and trackout from unpaved roads and staging areas. Figure 13.2.1-1 illustrates several transfer processes occurring on public streets.

Various field studies have found that public streets and highways, as well as roadways at industrial facilities, can be major sources of the atmospheric particulate matter within an area.[1-9] Of particular interest in many parts of the United States are the increased levels of emissions from public paved roads when the equilibrium between deposition and removal processes is upset. This situation can occur for various reasons, including application of granular materials for snow and ice control, mud/dirt carryout from construction activities in the area, and deposition from wind and/or water erosion of surrounding unstabilized areas. In the absence of continuous addition of fresh material (through localized trackout or application of antiskid material), paved road surface loading should reach an equilibrium value in which the amount of material resuspended matches the amount replenished. The equilibrium surface loading value depends upon numerous factors. It is believed that the most important factors are: mean speed of vehicles traveling the road; the average daily traffic (ADT); the number of lanes and ADT per lane; the fraction of heavy vehicles (buses and trucks); and the presence/absence of curbs, storm sewers and parking lanes.[10]

The particulate emission factors presented in the previous version of this section of AP-42, dated October 2002, implicitly included the emissions from vehicles in the form of exhaust, brake wear, and tire wear as well as resuspended road surface material. EPA included these sources in the emission factor equation for paved roads since the field testing data used to develop the equation included both the direct emissions from vehicles and emissions from resuspension of road dust.

This version of the paved road emission factor equation only estimates particulate emissions from resuspended road surface material [28]. The particulate emissions from vehicle exhaust, brake wear, and tire wear are now estimated separately using EPA's MOBILE6.2 [27]. This approach eliminates the possibility of double counting emissions. Double counting results when employing the previous version of the emission factor equation in this section and MOBILE6.2 to estimate particulate emissions from vehicle traffic on paved roads. It also incorporates the decrease in exhaust emissions that has occurred since the paved road emission factor equation was developed. The previous version of the paved road emission factor equation includes estimates of emissions from exhaust, brake wear, and tire wear based on emission rates for vehicles in the 1980 calendar year fleet. The amount of PM released from vehicle exhaust has decreased since 1980 due to lower new vehicle emission standards and changes in fuel characteristics.

13.2.1.2 Emissions And Correction Parameters

Dust emissions from paved roads have been found to vary with what is termed the "silt loading" present on the road surface as well as the average weight of vehicles traveling the road. The term silt loading (sL) refers to the mass of silt-size material (equal to or less than 75 micrometers [μm] in physical diameter) per unit area of the travel surface. The total road surface dust loading consists of loose material that can be collected by broom sweeping and vacuuming of the traveled portion of the paved road. The silt fraction is determined by measuring the proportion of the loose dry surface dust that passes through a 200-mesh screen, using the ASTM-C-136 method. Silt loading is the product of the silt fraction and the total loading, and is abbreviated "sL". Additional details on the sampling and analysis of such material are provided in AP-42 Appendices C.1 and C.2.

The surface sL provides a reasonable means of characterizing seasonal variability in a paved road emission inventory. In many areas of the country, road surface loadings [11-21] are heaviest during the late winter and early spring months when the residual loading from snow/ice controls is greatest. As noted earlier, once replenishment of fresh material is eliminated, the road surface loading can be expected to reach an equilibrium value, which is substantially lower than the late winter/early spring values.

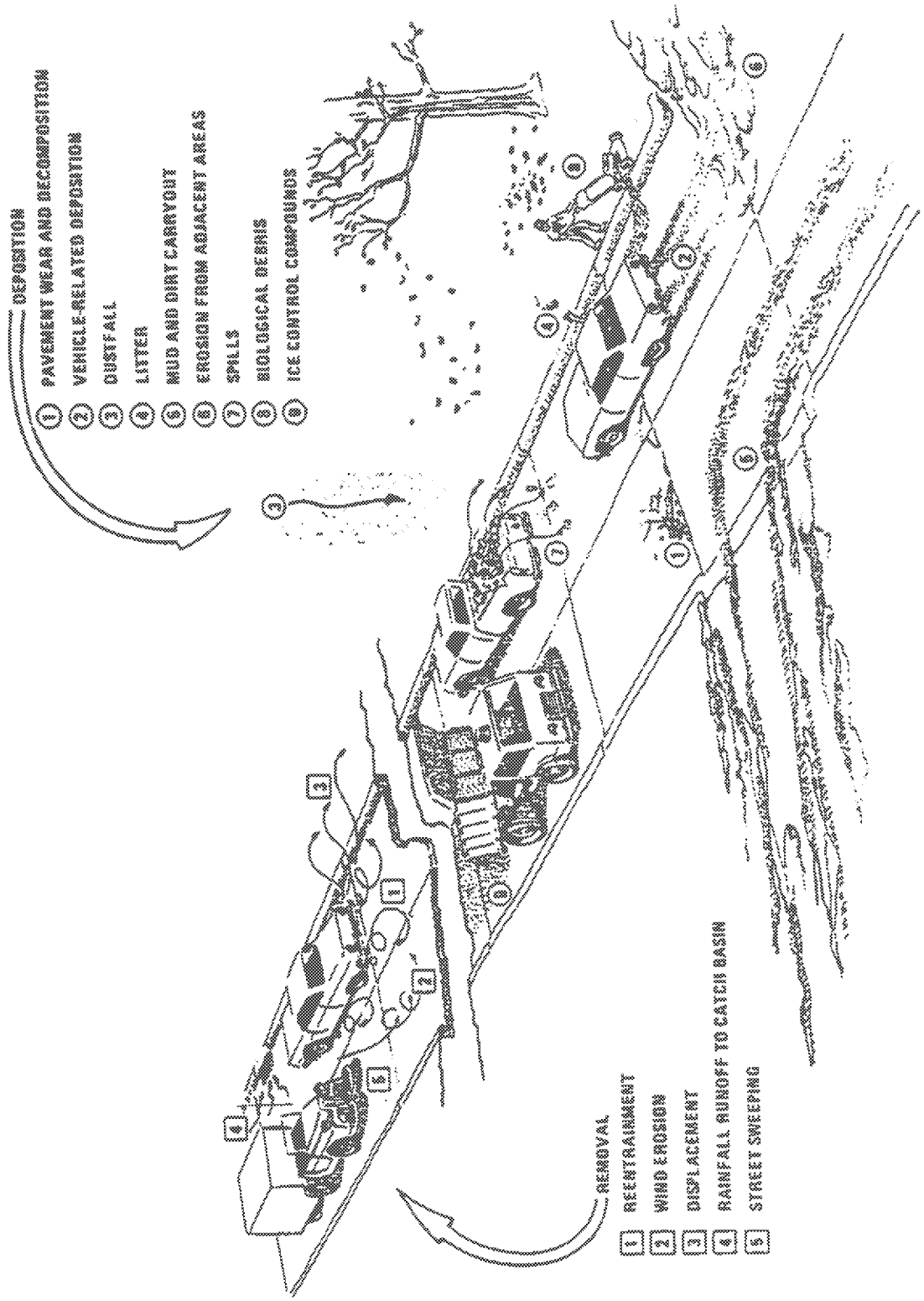


Figure 13.2.1-1. Deposition and removal processes.

13.2.1.3 Predictive Emission Factor Equations [20]

The quantity of particulate emissions from resuspension of loose material on the road surface due to vehicle travel on a dry paved road may be estimated using the following empirical expression:

$$E = k\left(\frac{sL}{2}\right)^{0.65} \times \left(\frac{W}{3}\right)^{1.5} - C \qquad (1)$$

where: E = particulate emission factor (having units matching the units of k),
k = particle size multiplier for particle size range and units of interest (see below),
sL = road surface silt loading (grams per square meter) (g/m^2),
W = average weight (tons) of the vehicles traveling the road, and
C = emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear.

It is important to note that Equation 1 calls for the average weight of all vehicles traveling the road. For example, if 99 percent of traffic on the road are 2 ton cars/trucks while the remaining 1 percent consists of 20 ton trucks, then the mean weight "W" is 2.2 tons. More specifically, Equation 1 is *not* intended to be used to calculate a separate emission factor for each vehicle weight class. Instead, only one emission factor should be calculated to represent the "fleet" average weight of all vehicles traveling the road.

The particle size multiplier (k) above varies with aerodynamic size range as shown in Table 13.2.1-1. To determine particulate emissions for a specific particle size range, use the appropriate value of k shown in Table 13.2.1-1.

The emission factors for the exhaust, brake wear and tire wear of a 1980's vehicle fleet (C) was obtained from EPA's MOBILE6.2 model [28]. The emission factor also varies with aerodynamic size range

Table 13.2-1.1. PARTICLE SIZE MULTIPLIERS FOR PAVED ROAD EQUATION

Size range[a]	Particle Size Multiplier k[b]		
	g/VKT	g/VMT	lb/VMT
PM-2.5[c]	1.1	1.8	0.0040
PM-10	4.6	7.3	0.016
PM-15	5.5	9.0	0.020
PM-30[d]	24	38	0.082

[a] Refers to airborne particulate matter (PM-x) with an aerodynamic diameter equal to or less than x micrometers.

[b] Units shown are grams per vehicle kilometer traveled (g/VKT), grams per vehicle mile traveled (g/VMT), and pounds per vehicle mile traveled (lb/VMT). The multiplier k includes unit conversions to produce emission factors in the units shown for the indicated size range from the mixed units required in Equation 1.

[c] Ratio of PM-2.5 to PM-10 taken from Reference 22.

[d] PM-30 is sometimes termed "suspendable particulate" (SP) and is often used as a surrogate for TSP.

as shown in Table 13.2.1-2.

Table 13.2.1-2. EMISSION FACTOR FOR 1980'S VEHICLE FLEET EXHAUST, BRAKE WEAR AND TIRE WEAR

Particle Size Range[a]	C, Emission Factor for Exhaust, Brake Wear and Tire Wear[b]		
	g/VMT	g/VKT	lb/VMT
$PM_{2.5}$	0.1617	0.1005	0.00036
PM_{10}	0.2119	0.1317	0.00047
PM_{15}	0.2119	0.1317	0.00047
PM_{30}[c]	0.2119	0.1317	0.00047

[a] Refers to airborne particulate matter (PM-x) with an aerodynamic diameter equal to or less than x micrometers.
[b] Units shown are grams per vehicle kilometer traveled (g/VKT), grams per vehicle mile traveled (g/VMT), and pounds per vehicle mile traveled (lb/VMT).
[c] PM-30 is sometimes termed "suspendable particulate" (SP) and is often used as a surrogate for TSP.

Equation 1 is based on a regression analysis of numerous emission tests, including 65 tests for PM-10.[10] Sources tested include public paved roads, as well as controlled and uncontrolled industrial paved roads. All sources tested were of freely flowing vehicles traveling at constant speed on relatively level roads. No tests of "stop-and-go" traffic or vehicles under load were available for inclusion in the data base. The equations retain the quality rating of A (B for PM-2.5), if applied within the range of source conditions that were tested in developing the equation as follows:

Silt loading:	0.03 - 400 g/m^2 0.04 - 570 grains/square foot (ft^2)
Mean vehicle weight:	1.8 - 38 megagrams (Mg) 2.0 - 42 tons
Mean vehicle speed:	16 - 88 kilometers per hour (kph) 10 - 55 miles per hour (mph)

Note: There may be situations where low silt loading and/or low average weight will yield calculated negative emissions from equation 1. If this occurs, the emissions calculated from equation 1 should be set to zero.

Users are cautioned that application of equation 1 outside of the range of variables and operating conditions specified above, e.g., application to roadways or road networks with speeds below 10 mph and with stop-and-go traffic, will result in emission estimates with a higher level of uncertainty. In these situations, users are encouraged to consider alternative methods that are

equally or more plausible in light of local emissions data and/or ambient concentration or compositional data.

To retain the quality rating for the emission factor equation when it is applied to a specific paved road, it is necessary that reliable correction parameter values for the specific road in question be determined. With the exception of limited access roadways, which are difficult to sample, the collection and use of site-specific silt loading (sL) data for public paved road emission inventories are strongly recommended. The field and laboratory procedures for determining surface material silt content and surface dust loading are summarized in Appendices C.1 and C.2. In the event that site-specific values cannot be obtained, an appropriate value for a paved public road may be selected from the values in Table 13.2.1-3, but the quality rating of the equation should be reduced by 2 levels. Also, recall that Equation 1 refers to emissions due to freely flowing (not stop-and-go) traffic at constant speed on level roads.

Equation 1 may be extrapolated to average uncontrolled conditions (but including natural mitigation) under the simplifying assumption that annual (or other long-term) average emissions are inversely proportional to the frequency of measurable (> 0.254 mm [0.01 inch]) precipitation by application of a precipitation correction term. The precipitation correction term can be applied on a daily or an hourly basis [36].

For the daily basis, Equation 1 becomes:

$$E_{ext} = \left[k \left(\frac{sL}{2} \right)^{0.65} \left(\frac{W}{3} \right)^{1.5} - C \right] \left(1 - \frac{P}{4N} \right) \qquad (2)$$

where k, sL, W, *and* C are as defined in Equation 1 and

E_{ext} = annual or other long-term average emission factor in the same units as k,
P = number of "wet" days with at least 0.254 mm (0.01 in) of precipitation during the averaging period, and
N = number of days in the averaging period (e.g., 365 for annual, 91 for seasonal, 30 for monthly).

Note that the assumption leading to Equation 2 is based on analogy with the approach used to develop long-term average unpaved road emission factors in Section 13.2.2. However, Equation 2 above incorporates an additional factor of "4" in the denominator to account for the fact that paved roads dry more quickly than unpaved roads and that the precipitation may not occur over the complete 24-hour day.

For the hourly basis, equation 1 becomes:

$$E_{ext} = \left[k \left(\frac{sL}{2} \right)^{0.65} \left(\frac{W}{3} \right)^{1.5} - C \right] \left(1 - \frac{1.2P}{N} \right) \qquad (3)$$

where k, sL, and W, and C are as defined in Equation 1 and

E_{ext} = annual or other long-term average emission factor in the same units as k,
P = number of hours with at least 0.254 mm (0.01 in) of precipitation during the averaging period, and
N = number of hours in the averaging period (e.g., 8760 for annual, 2124 for season 720 for monthly).

Note: In the hourly moisture correction term (1-1.2P/N) for equation 3, the 1.2 multiplier is applied to account for the residual mitigative effect of moisture. For most applications, this equation will produce satisfactory results. However, if the time interval for which the equation is applied is short, e.g., for one hour or one day, the application of this multiplier makes it possible for the moisture correction term to become negative. This will result in calculated negative emissions which is not realistic. Users should expand the time interval to include sufficient "dry" hours such that negative emissions are not calculated. For the special case where this equation is used to calculate emissions on an hour by hour basis, such as would be done in some emissions modeling situations, the moisture correction term should be modified so that the moisture correction "credit" is applied to the first hours following cessation of precipitation. In this special case, it is suggested that this 20% "credit" be applied on a basis of one hour credit for each hour of precipitation up to a maximum of 12 hours.

Note that the assumption leading to Equation 3 is based on analogy with the approach used to develop long-term average unpaved road emission factors in Section 13.2.2.

Figure 13.2.1-2 presents the geographical distribution of "wet" days on an annual basis for the United States. Maps showing this information on a monthly basis are available in the *Climatic Atlas of the United States*[23]. Alternative sources include other Department of Commerce publications (such as local climatological data summaries). The National Climatic Data Center (NCDC) offers several products that provide hourly precipitation data. In particular, NCDC offers *Solar and Meteorological Surface Observation Network 1961-1990* (SAMSON) CD-ROM, which contains 30 years worth of hourly meteorological data for first-order National Weather Service locations. Whatever meteorological data are used, the source of that data and the averaging period should be clearly specified.

It is emphasized that the simple assumption underlying Equations 2 and 3 has not been verified in any rigorous manner. For that reason, the quality ratings for Equations 2 and 3 should be downgraded one letter from the rating that would be applied to Equation 1.

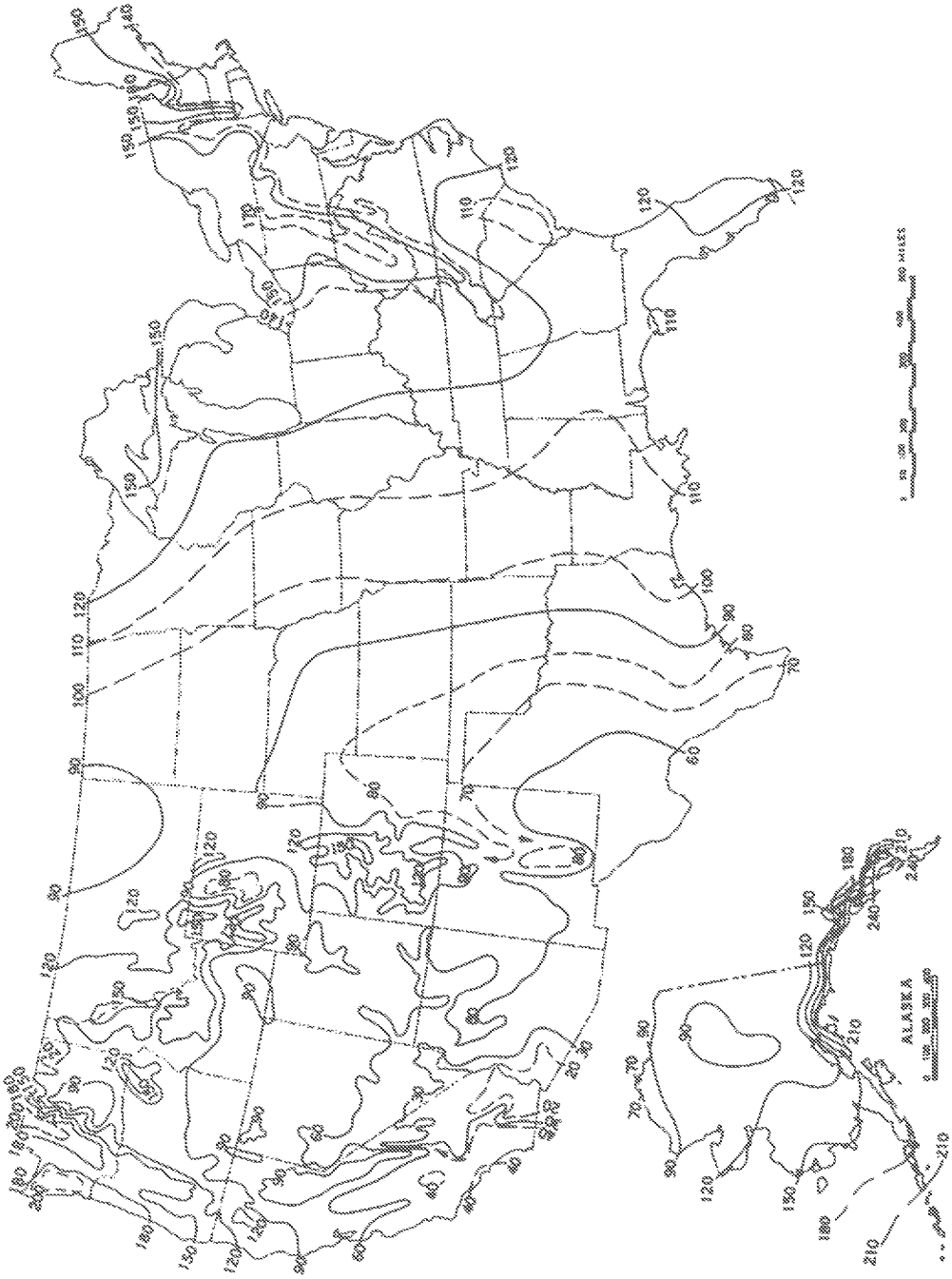


Figure 13.2.1-2. Mean number of days with 0.01 inch or more of precipitation in the United States.

Table 13.2.1-3 presents recommended default silt loadings for normal baseline conditions and for wintertime baseline conditions in areas that experience frozen precipitation with periodic application of antiskid material[24]. The winter baseline is represented as a multiple of the non-winter baseline, depending on the ADT value for the road in question. As shown, a multiplier of 4 is applied for low volume roads (< 500 ADT) to obtain a wintertime baseline silt loading of 4 X 0.6 = 2.4 g/m^2.

Table 13.2.1-3. Ubiquitous Silt Loading Default Values with Hot Spot Contributions from Anti-Skid Abrasives (g/m^2)

ADT Category	< 500	500-5,000	5,000-10,000	> 10,000
Ubiquitous Baseline g/m^2	0.6	0.2	0.06	0.03 0.015 limited access
Ubiquitous Winter Baseline Multiplier during months with frozen precipitation	X4	X3	X2	X1
Initial peak additive contribution from application of antiskid abrasive (g/m^2)	2	2	2	2
Days to return to baseline conditions (assume linear decay)	7	3	1	0.5

It is suggested that an additional (but temporary) silt loading contribution of 2 g/m^2 occurs with each application of antiskid abrasive for snow/ice control. This was determined based on a typical application rate of 500 lb per lane mile and an initial silt content of 1 % silt content. Ordinary rock salt and other chemical deicers add little to the silt loading, because most of the chemical dissolves during the snow/ice melting process.

To adjust the baseline silt loadings for mud/dirt trackout, the number of trackout points is required. It is recommended that in calculating PM-10 emissions, six additional miles of road be added for each active trackout point from an active construction site, to the paved road mileage of the specified category within the county. In calculating PM-2.5 emissions, it is recommended that three additional miles of road be added for each trackout point from an active construction site.

It is suggested the number of trackout points for activities other than road and building construction areas be related to land use. For example, in rural farming areas, each mile of paved road would have a specified number of trackout points at intersections with unpaved roads. This value could be estimated from the unpaved road density (mi/sq. mi.).

The use of a default value from Table 13.2.1-3 should be expected to yield only an order-of-magnitude estimate of the emission factor. Public paved road silt loadings are dependent

upon: traffic characteristics (speed, ADT, and fraction of heavy vehicles); road characteristics (curbs, number of lanes, parking lanes); local land use (agriculture, new residential construction) and regional/seasonal factors (snow/ice controls, wind blown dust). As a result, the collection and use of site-specific silt loading data is highly recommended. In the event that default silt loading values are used, the quality ratings for the equation should be downgraded 2 levels.

Limited access roadways pose severe logistical difficulties in terms of surface sampling, and few silt loading data are available for such roads. Nevertheless, the available data do not suggest great variation in silt loading for limited access roadways from one part of the country to another. For annual conditions, a default value of 0.015 g/m^2 is recommended for limited access roadways.[9,22] Even fewer of the available data correspond to worst-case situations, and elevated loadings are observed to be quickly depleted because of high traffic speeds and high ADT rates. A default value of 0.2 g/m^2 is recommended for short periods of time following application of snow/ice controls to limited access roads.[22]

The limited data on silt loading values for industrial roads have shown as much variability as public roads. Because of the variations of traffic conditions and the use of preventive mitigative controls, the data probably do not reflect the full extent of the potential variation in silt loading on industrial roads. However, the collection of site specific silt loading data from industrial roads is easier and safer than for public roads. Therefore, the collection and use of site-specific silt loading data is preferred and is highly recommended. In the event that site-specific values cannot be obtained, an appropriate value for an industrial road may be selected from the mean values given in Table 13.2.1-4, but the quality rating of the equation should be reduced by 2 levels.

Table 13.2.1-4 (Metric And English Units). TYPICAL SILT CONTENT AND LOADING VALUES FOR PAVED ROADS AT INDUSTRIAL FACILITIES[a]

Industry	No. Of Sites	No. Of Samples	Silt Content (%)		No. Of Travel Lanes	Total Loading x 10^{-3}			Silt Loading (g/m^2)	
			Range	Mean		Range	Mean	Units[b]	Range	Mean
Copper smelting	1	3	15.4-21.7	19.0	2	12.9-19.5 45.8-69.2	15.9 55.4	kg/km lb/mi	188-400	292
Iron and steel production	9	48	1.1-35.7	12.5	2	0.006-4.77 0.020-16.9	0.495 1.75	kg/km lb/mi	0.09-79	9.7
Asphalt batching	1	3	2.6-4.6	3.3	1	12.1-18.0 43.0-64.0	14.9 52.8	kg/km lb/mi	76-193	120
Concrete batching	1	3	5.2-6.0	5.5	2	1.4-1.8 5.0-6.4	1.7 5.9	kg/km lb/mi	11-12	12
Sand and gravel processing	1	3	6.4-7.9	7.1	1	2.8-5.5 9.9-19.4	3.8 13.3	kg/km lb/mi	53-95	70
Municipal solid waste landfill	2	7	—	—	2	—	—	—	1.1-32.0	7.4
Quarry	1	6	—	—	2	—	—	—	2.4-14	8.2

[a] References 1-2,5-6,11-13. Values represent samples collected from *industrial* roads. Public road silt loading values are presented in Table-13.2.1-2. Dashes indicate information not available.

[b] Multiply entries by 1000 to obtain stated units; kilograms per kilometer (kg/km) and pounds per mile (lb/mi).

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13.2.1.4 Controls[4,5]

Because of the importance of the silt loading, control techniques for paved roads attempt either to prevent material from being deposited onto the surface (preventive controls) or to remove from the travel lanes any material that has been deposited (mitigative controls). Covering of loads in trucks, and the paving of access areas to unpaved lots or construction sites, are examples of preventive measures. Examples of mitigative controls include vacuum sweeping, water flushing, and broom sweeping and flushing. Actual control efficiencies for any of these techniques can be highly variable. Locally measured silt loadings before and after the application of controls is the preferred method to evaluate controls. It is particularly important to note that street sweeping of gutters and curb areas may actually increase the silt loading on the traveled portion of the road. Redistribution of loose material onto the travel lanes will actually produce a short-term increase in the emissions.

In general, preventive controls are usually more cost effective than mitigative controls. The cost-effectiveness of mitigative controls falls off dramatically as the size of an area to be treated increases. The cost-effectiveness of mitigative measures is also unfavorable if only a short period of time is required for the road to return to equilibrium silt loading condition. That is to say, the number and length of public roads within most areas of interest preclude any widespread and routine use of mitigative controls. On the other hand, because of the more limited scope of roads at an industrial site, mitigative measures may be used quite successfully (especially in situations where truck spillage occurs). Note, however, that public agencies could make effective use of mitigative controls to remove sand/salt from roads after the winter ends.

Because available controls will affect the silt loading, controlled emission factors may be obtained by substituting controlled silt loading values into the equation. (Emission factors from controlled industrial roads were used in the development of the equation.) The collection of surface loading samples from treated, as well as baseline (untreated), roads provides a means to track effectiveness of the controls over time.

13.2.1.5 Changes since Fifth Edition

The following changes were made since the publication of the Fifth Edition of AP-42:

1) The particle size multiplier was reduced by approximately 55% as a result of emission testing specifically to evaluate the PM-2.5 component of the emissions.

2) Default silt loading values were included in Table 13.2.1-2 replacing the Tables and Figures containing silt loading statistical information.

3) Editorial changes within the text were made indicating the possible causes of variations in the silt loading between roads within and among different locations. The uncertainty of using the default silt loading value was discussed.

4) Section 13.2.1.1 was revised to clarify the role of dust loading in resuspension. Additional minor text changes were made.

5) Equations 2 and 3, Figure 13.2.1-2, and text were added to incorporate natural mitigation into annual or other long-term average emission factors.

6) The emission factor equation was adjusted to remove the component of particulate emissions from exhaust, brake wear, and tire wear. The parameter C in the new equation varies with aerodynamic size range of the particulate matter. Table 13.2.1-2 was added to present the new coefficients.

7) The default silt loading values in Table 13.2.1-3 were revised to incorporate the results from a recent analysis of silt loading data.

8) References were rearranged and renumbered.

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3.2 Natural Gas-fired Reciprocating Engines

3.2.1 General[1-3]

Most natural gas-fired reciprocating engines are used in the natural gas industry at pipeline compressor and storage stations and at gas processing plants. These engines are used to provide mechanical shaft power for compressors and pumps. At pipeline compressor stations, engines are used to help move natural gas from station to station. At storage facilities, they are used to help inject the natural gas into high pressure natural gas storage fields. At processing plants, these engines are used to transmit fuel within a facility and for process compression needs (e.g., refrigeration cycles). The size of these engines ranges from 50 brake horsepower (bhp) to 11,000 bhp. In addition, some engines in service are 50 - 60 years old and consequently have significant differences in design compared to newer engines, resulting in differences in emissions and the ability to be retrofitted with new parts or controls.

At pipeline compressor stations, reciprocating engines are used to power reciprocating compressors that move compressed natural gas (500 - 2000 psig) in a pipeline. These stations are spaced approximately 50 to 100 miles apart along a pipeline that stretches from a gas supply area to the market area. The reciprocating compressors raise the discharge pressure of the gas in the pipeline to overcome the effect of frictional losses in the pipeline upstream of the station, in order to maintain the required suction pressure at the next station downstream or at various downstream delivery points. The volume of gas flowing and the amount of subsequent frictional losses in a pipeline are heavily dependent on the market conditions that vary with weather and industrial activity, causing wide pressure variations. The number of engines operating at a station, the speed of an individual engine, and the amount of individual engine horsepower (load) needed to compress the natural gas is dependent on the pressure of the compressed gas received by the station, the desired discharge pressure of the gas, and the amount of gas flowing in the pipeline. Reciprocating compressors have a wider operating bandwidth than centrifugal compressors, providing increased flexibility in varying flow conditions. Centrifugal compressors powered by natural gas turbines are also used in some stations and are discussed in another section of this document.

A compressor in storage service pumps gas from a low-pressure storage field (500 - 800 psig) to a higher pressure transmission pipeline (700 - 1000 psig) and/or pumps gas from a low-pressure transmission line (500 - 800 psig) to a higher pressure storage field (800 - 2000 psig).

Storage reciprocating compressors must be flexible enough to allow operation across a wide band of suction and discharge pressures and volume variations. The compressor must be able to compress at high compression ratios with low volumes and compress at low compression ratios with high volumes. These conditions require varying speeds and load (horsepower) conditions for the reciprocating engine powering the reciprocating compressor.

Reciprocating compressors are used at processing plants for process compression needs (e.g. refrigeration cycles). The volume of gas compressed varies, but the pressure needed for the process is more constant than the other two cases mentioned above.

3.2.2 Process Description[1-3]

Natural gas-fired reciprocating engines are separated into three design classes: 2-cycle (stroke) lean-burn, 4-stroke lean-burn, and 4-stroke rich-burn. Two-stroke engines complete the power cycle in a

single crankshaft revolution as compared to the two crankshaft revolutions required for 4-stroke engines. All engines in these categories are spark-ignited.

In a 2-stroke engine, the air-to-fuel charge is injected with the piston near the bottom of the power stroke. The intake ports are then covered or closed, and the piston moves to the top of the cylinder, compressing the charge. Following ignition and combustion, the power stroke starts with the downward movement of the piston. As the piston reaches the bottom of the power stroke, exhaust ports or valves are opened to exhaust, or scavenge, the combustion products, and a new air-to-fuel charge is injected. Two-stroke engines may be turbocharged using an exhaust-powered turbine to pressurize the charge for injection into the cylinder and to increase cylinder scavenging. Non-turbocharged engines may be either blower scavenged or piston scavenged to improve removal of combustion products. Historically, 2-stroke designs have been widely used in pipeline applications. However, current industry practices reflect a decline in the usage of new 2-stroke engines for stationary applications.

Four-stroke engines use a separate engine revolution for the intake/compression cycle and the power/exhaust cycle. These engines may be either naturally aspirated, using the suction from the piston to entrain the air charge, or turbocharged, using an exhaust-driven turbine to pressurize the charge. Turbocharged units produce a higher power output for a given engine displacement, whereas naturally aspirated units have lower initial costs and require less maintenance.

Rich-burn engines operate near the stoichiometric air-to-fuel ratio (16:1) with exhaust excess oxygen levels less than 4 percent (typically closer to 1 percent). Additionally, it is likely that the emissions profile will be considerably different for a rich-burn engine at 4 percent oxygen than when operated closer to stoichiometric conditions. Considerations such as these can impact the quantitative value of the emission factor presented. It is also important to note that while rich-burn engines may operate, by definition, with exhaust oxygen levels as high as 4 percent, in reality, most will operate within plus or minus 1 air-to-fuel ratio of stoichiometry. Even across this narrow range, emissions will vary considerably, sometimes by more than an order of magnitude. Air-to-fuel ratios were not provided in the gathered emissions data used to develop the presented factors.

Lean-burn engines may operate up to the lean flame extinction limit, with exhaust oxygen levels of 12 percent or greater. The air to fuel ratios of lean-burn engines range from 20:1 to 50:1 and are typically higher than 24:1. The exhaust excess oxygen levels of lean-burn engines are typically around 8 percent, ranging from 4 to 17 percent. Some lean-burn engines are characterized as clean-burn engines. The term "clean-burn" technology is a registered trademark of Cooper Energy Systems and refers to engines designed to reduce NO_x by operating at high air-to-fuel ratios. Engines operating at high air-to-fuel ratios (greater than 30:1) may require combustion modification to promote stable combustion with the high excess air. These modifications may include a turbo charger or a precombustion chamber (PCC). A turbo charger is used to force more air into the combustion chamber, and a PCC is used to ignite a fuel-rich mixture that propagates into the main cylinder and ignites the very lean combustion charge. Lean-burn engines typically have lower oxides of nitrogen (NO_x) emissions than rich-burn engines.

3.2.3 Emissions

The primary criteria pollutants from natural gas-fired reciprocating engines are oxides of nitrogen (NO_x), carbon monoxide (CO), and volatile organic compounds (VOC). The formation of nitrogen oxides is exponentially related to combustion temperature in the engine cylinder. The other pollutants, CO and VOC species, are primarily the result of incomplete combustion. Particulate matter (PM) emissions include trace amounts of metals, non-combustible inorganic material, and condensible,

semi-volatile organics which result from volatized lubricating oil, engine wear, or from products of incomplete combustion. Sulfur oxides are very low since sulfur compounds are removed from natural gas at processing plants. However, trace amounts of sulfur containing odorant are added to natural gas at city gates prior to distribution for the purpose of leak detection.

It should be emphasized that the actual emissions may vary considerably from the published emission factors due to variations in the engine operating conditions. This variation is due to engines operating at different conditions, including air-to-fuel ratio, ignition timing, torque, speed, ambient temperature, humidity, and other factors. It is not unusual to test emissions from two identical engines in the same plant, operated by the same personnel, using the same fuel, and have the test results show significantly different emissions. This variability in the test data is evidenced in the high relative standard deviation reported in the data set.

3.2.3.1 Nitrogen Oxides -

Nitrogen oxides are formed through three fundamentally different mechanisms. The principal mechanism of NO_x formation with gas-fired engines is thermal NO_x. The thermal NO_x mechanism occurs through the thermal dissociation and subsequent reaction of nitrogen (N_2) and oxygen (O_2) molecules in the combustion air. Most NO_x formed through the thermal NO_x mechanism occurs in high-temperature regions in the cylinder where combustion air has mixed sufficiently with the fuel to produce the peak temperature fuel/air interface. The second mechanism, called prompt NO_x, occurs through early reactions of nitrogen molecules in the combustion air and hydrocarbon radicals from the fuel. Prompt NO_x reactions occur within the flame and are usually negligible compared to the level of NO_x formed through the thermal NO_x mechanism. The third mechanism, fuel NO_x, stems from the evolution and reaction of fuel-bound nitrogen compounds with oxygen. Natural gas has negligible chemically bound fuel nitrogen (although some molecular nitrogen is present).

Essentially all NO_x formed in natural gas-fired reciprocating engines occurs through the thermal NO_x mechanism. The formation of NO_x through the prompt NO_x mechanism may be significant only under highly controlled situations in rich-burn engines when the thermal NO_x mechanism is suppressed. The rate of NO_x formation through the thermal NO_x mechanism is highly dependent upon the stoichiometric ratio, combustion temperature, and residence time at the combustion temperature. Maximum NO_x formation occurs through the thermal NO_x mechanism near the stoichiometric air-to-fuel mixture ratio since combustion temperatures are greatest at this air-to-fuel ratio.

3.2.3.2 Carbon Monoxide and Volatile Organic Compounds -

CO and VOC emissions are both products of incomplete combustion. CO results when there is insufficient residence time at high temperature to complete the final step in hydrocarbon oxidation. In reciprocating engines, CO emissions may indicate early quenching of combustion gases on cylinder walls or valve surfaces. The oxidation of CO to carbon dioxide (CO_2) is a slow reaction compared to most hydrocarbon oxidation reactions.

The pollutants commonly classified as VOC can encompass a wide spectrum of volatile organic compounds that are photoreactive in the atmosphere. VOC occur when some of the gas remains unburned or is only partially burned during the combustion process. With natural gas, some organics are carryover, unreacted, trace constituents of the gas, while others may be pyrolysis products of the heavier hydrocarbon constituents. Partially burned hydrocarbons result from poor air-to-fuel mixing prior to, or during, combustion, or incorrect air-to-fuel ratios in the cylinder during combustion due to maladjustment of the engine fuel system. Also, low cylinder temperature may yield partially burned hydrocarbons due to excessive cooling through the walls, or early cooling of the gases by expansion of the combustion volume caused by piston motion before combustion is completed.

3.2.3.3 Particulate Matter[4] -

PM emissions result from carryover of noncombustible trace constituents in the fuel and lubricating oil and from products of incomplete combustion. Emission of PM from natural gas-fired reciprocating engines are generally minimal and comprise fine filterable and condensible PM. Increased PM emissions may result from poor air-to-fuel mixing or maintenance problems.

3.2.3.4 Carbon Dioxide, Methane, and Nitrous Oxide[5] -

Carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) are referred to as greenhouse gases. Such gases are largely transparent to incoming solar radiation; however, they absorb infrared radiation re-emitted by the Earth. Where available, emission factors for these pollutants are presented in the emission factors tables of this section.

3.2.4 Control Technologies

Three generic control techniques have been developed for reciprocating engines: parametric controls (timing and operating at a leaner air-to-fuel ratio); combustion modifications such as advanced engine design for new sources or major modification to existing sources (clean-burn cylinder head designs and prestratified charge combustion for rich-burn engines); and postcombustion catalytic controls installed on the engine exhaust system. Post-combustion catalytic technologies include selective catalytic reduction (SCR) for lean-burn engines, nonselective catalytic reduction (NSCR) for rich-burn engines, and CO oxidation catalysts for lean-burn engines.

3.2.4.1 Control Techniques for 4-Cycle Rich-burn Engines[4,6] -

Nonselective Catalytic Reduction (NSCR) -

This technique uses the residual hydrocarbons and CO in the rich-burn engine exhaust as a reducing agent for NO_x. In an NSCR, hydrocarbons and CO are oxidized by O_2 and NO_x. The excess hydrocarbons, CO, and NO_x pass over a catalyst (usually a noble metal such as platinum, rhodium, or palladium) that oxidizes the excess hydrocarbons and CO to H_2O and CO_2, while reducing NO_x to N_2. NO_x reduction efficiencies are usually greater than 90 percent, while CO reduction efficiencies are approximately 90 percent.

The NSCR technique is effectively limited to engines with normal exhaust oxygen levels of 4 percent or less. This includes 4-stroke rich-burn naturally aspirated engines and some 4-stroke rich-burn turbocharged engines. Engines operating with NSCR require tight air-to-fuel control to maintain high reduction effectiveness without high hydrocarbon emissions. To achieve effective NO_x reduction performance, the engine may need to be run with a richer fuel adjustment than normal. This exhaust excess oxygen level would probably be closer to 1 percent. Lean-burn engines could not be retrofitted with NSCR control because of the reduced exhaust temperatures.

Prestratified Charge -

Prestratified charge combustion is a retrofit system that is limited to 4-stroke carbureted natural gas engines. In this system, controlled amounts of air are introduced into the intake manifold in a specified sequence and quantity to create a fuel-rich and fuel-lean zone. This stratification provides both a fuel-rich ignition zone and rapid flame cooling in the fuel-lean zone, resulting in reduced formation of NO_x. A prestratified charge kit generally contains new intake manifolds, air hoses, filters, control valves, and a control system.

3.2.4.2 Control Techniques for Lean-burn Reciprocating Engines[4,6] -

Selective Catalytic Reduction[4,6] -

Selective catalytic reduction is a postcombustion technology that has been shown to be effective in reducing NO_x in exhaust from lean-burn engines. An SCR system consists of an ammonia storage, feed, and injection system, and a catalyst and catalyst housing. Selective catalytic reduction systems selectively reduce NO_x emissions by injecting ammonia (either in the form of liquid anhydrous ammonia or aqueous ammonium hydroxide) into the exhaust gas stream upstream of the catalyst. Nitrogen oxides, NH_3, and O_2 react on the surface of the catalyst to form N_2 and H_2O. For the SCR system to operate properly, the exhaust gas must be within a particular temperature range (typically between 450 and 850°F). The temperature range is dictated by the catalyst (typically made from noble metals, base metal oxides such as vanadium and titanium, and zeolite-based material). Exhaust gas temperatures greater than the upper limit (850°F) will pass the NO_x and ammonia unreacted through the catalyst. Ammonia emissions, called NH_3 slip, are a key consideration when specifying a SCR system. SCR is most suitable for lean-burn engines operated at constant loads, and can achieve efficiencies as high as 90 percent. For engines which typically operate at variable loads, such as engines on gas transmission pipelines, an SCR system may not function effectively, causing either periods of ammonia slip or insufficient ammonia to gain the reductions needed.

Catalytic Oxidation -

Catalytic oxidation is a postcombustion technology that has been applied, in limited cases, to oxidize CO in engine exhaust, typically from lean-burn engines. As previously mentioned, lean-burn technologies may cause increased CO emissions. The application of catalytic oxidation has been shown to be effective in reducing CO emissions from lean-burn engines. In a catalytic oxidation system, CO passes over a catalyst, usually a noble metal, which oxidizes the CO to CO_2 at efficiencies of approximately 70 percent for 2SLB engines and 90 percent for 4SLB engines.

3.2.5 Updates Since the Fifth Edition

The Fifth Edition was released in January 1995. Revisions to this section since that date are summarized below. For further detail, consult the memoranda describing each supplement or the background report for this section. These and other documents can be found on the Clearinghouse for Inventories/Emission Factors (CHIEF) electronic bulletin board (919-541-5742), or on the new Emission Factor and Inventory Group (EFIG) home page (http://www.epa.gov/ttn/chief).

Supplement A, February 1996

- In the table for uncontrolled natural gas prime movers, the Source Classification Code (SCC) for 4-cycle lean-burn was changed from 2-01-002-53 to 2-02-002-54. The SCC for 4-cycle rich-burn was changed from 2-02-002-54 to 2-02-02-002-53.

- An SCC (2-02-002-53) was provided for 4-cycle rich-burn engines, and the "less than" symbol (<) was restored to the appropriate factors.

Supplement B, October 1996

- The introduction section was revised.

- Text was added concerning process description of turbines.

- Text concerning emissions and controls was revised.
- References in various tables were editorially corrected.
- The inconsistency between a CO_2 factor in the table and an equation in the footnote was corrected.

Supplement F, July 2000

- Turbines used for natural gas compression were removed from this section and combined with utility turbines in Section 3.1. Section 3.2 now only contains information on natural gas-fired reciprocating engines.
- All emission factors were updated based on emissions data points taken from 70 emission reports containing over 400 source tests. Many new emission factors have been incorporated in this section for speciated organic compounds, including hazardous air pollutants.

TABLE 3.2-1 UNCONTROLLED EMISSION FACTORS FOR 2-STROKE LEAN-BURN ENGINES[a]
(SCC 2-02-002-52)

Pollutant	Emission Factor (lb/MMBtu)[b] (fuel input)	Emission Factor Rating
Criteria Pollutants and Greenhouse Gases		
NO_x[c] 90 - 105% Load	3.17 E+00	A
NO_x[c] <90% Load	1.94 E+00	A
CO[c] 90 - 105% Load	3.86 E-01	A
CO[c] <90% Load	3.53 E-01	A
CO_2[d]	1.10 E+02	A
SO_2[e]	5.88 E-04	A
TOC[f]	1.64 E+00	A
Methane[g]	1.45 E+00	C
VOC[h]	1.20 E-01	C
PM10 (filterable)[i]	3.84 E-02	C
PM2.5 (filterable)[i]	3.84 E-02	C
PM Condensable[j]	9.91 E-03	E
Trace Organic Compounds		
1,1,2,2-Tetrachloroethane[k]	6.63 E-05	C
1,1,2-Trichloroethane[k]	5.27 E-05	C
1,1-Dichloroethane	3.91 E-05	C
1,2,3-Trimethylbenzene	3.54 E-05	D
1,2,4-Trimethylbenzene	1.11 E-04	C
1,2-Dichloroethane	4.22 E-05	D
1,2-Dichloropropane	4.46 E-05	C
1,3,5-Trimethylbenzene	1.80 E-05	D
1,3-Butadiene[k]	8.20 E-04	D
1,3-Dichloropropene[k]	4.38 E-05	C
2,2,4-Trimethylpentane[k]	8.46 E-04	B
2-Methylnaphthalene[k]	2.14 E-05	C
Acenaphthene[k]	1.33 E-06	C

Table 3.2-1. UNCONTROLLED EMISSION FACTORS FOR 2-STROKE LEAN-BURN ENGINES

(Continued)

Pollutant	Emission Factor (lb/MMBtu)[b] (fuel input)	Emission Factor Rating
Acenaphthylene[k]	3.17 E-06	C
Acetaldehyde[k,l]	7.76 E-03	A
Acrolein[k,l]	7.78 E-03	A
Anthracene[k]	7.18 E-07	C
Benz(a)anthracene[k]	3.36 E-07	C
Benzene[k]	1.94 E-03	A
Benzo(a)pyrene[k]	5.68 E-09	D
Benzo(b)fluoranthene[k]	8.51 E-09	D
Benzo(e)pyrene[k]	2.34 E-08	D
Benzo(g,h,i)perylene[k]	2.48 E-08	D
Benzo(k)fluoranthene[k]	4.26 E-09	D
Biphenyl[k]	3.95 E-06	C
Butane	4.75 E-03	C
Butyr/Isobutyraldehyde	4.37 E-04	C
Carbon Tetrachloride[k]	6.07 E-05	C
Chlorobenzene[k]	4.44 E-05	C
Chloroform[k]	4.71 E-05	C
Chrysene[k]	6.72 E-07	C
Cyclohexane	3.08 E-04	C
Cyclopentane	9.47 E-05	C
Ethane	7.09 E-02	A
Ethylbenzene[k]	1.08 E-04	B
Ethylene Dibromide[k]	7.34 E-05	C
Fluoranthene[k]	3.61 E-07	C
Fluorene[k]	1.69 E-06	C
Formaldehyde[k,l]	5.52 E-02	A

Table 3.2-1. UNCONTROLLED EMISSION FACTORS FOR 2-STROKE LEAN-BURN ENGINES
(Concluded)

Pollutant	Emission Factor (lb/MMBtu)[b] (fuel input)	Emission Factor Rating
Indeno(1,2,3-c,d)pyrene[k]	9.93 E-09	D
Isobutane	3.75 E-03	C
Methanol[k]	2.48 E-03	A
Methylcyclohexane	3.38 E-04	C
Methylene Chloride[k]	1.47 E-04	C
n-Hexane[k]	4.45 E-04	C
n-Nonane	3.08 E-05	C
n-Octane	7.44 E-05	C
n-Pentane	1.53 E-03	C
Naphthalene[k]	9.63 E-05	C
PAH[k]	1.34 E-04	D
Perylene[k]	4.97 E-09	D
Phenanthrene[k]	3.53 E-06	C
Phenol[k]	4.21 E-05	C
Propane	2.87 E-02	C
Pyrene[k]	5.84 E-07	C
Styrene[k]	5.48 E-05	A
Toluene[k]	9.63 E-04	A
Vinyl Chloride[k]	2.47 E-05	C
Xylene[k]	2.68 E-04	A

[a] Reference 7. Factors represent uncontrolled levels. For NO_x, CO, and PM10, "uncontrolled" means no combustion or add-on controls; however, the factor may include turbocharged units. For all other pollutants, "uncontrolled" means no oxidation control; the data set may include units with control techniques used for NOx control, such as PCC and SCR for lean burn engines, and PSC for rich burn engines. Factors are based on large population of engines. Factors are for engines at all loads, except as indicated. SCC = Source Classification Code. TOC = Total Organic Compounds. PM10 = Particulate Matter ≤ 10 microns (μm) aerodynamic diameter. A "<" sign in front of a factor means that the corresponding emission factor is based on one-half of the method detection limit.

[b] Emission factors were calculated in units of (lb/MMBtu) based on procedures in EPA

Method 19. To convert from (lb/MMBtu) to (lb/10^6 scf), multiply by the heat content of the fuel. If the heat content is not available, use 1020 Btu/scf. To convert from (lb/MMBtu) to (lb/hp-hr) use the following equation:

$$\text{lb/hp-hr} = (\text{lb/MMBtu})(\text{heat input, MMBtu/hr})(1/\text{operating HP, 1/hp})$$

[c] Emission tests with unreported load conditions were not included in the data set.

[d] Based on 99.5% conversion of the fuel carbon to CO_2. CO_2 [lb/MMBtu] = (3.67)(%CON)(C)(D)(1/h), where %CON = percent conversion of fuel carbon to CO_2, C = carbon content of fuel by weight (0.75), D = density of fuel, 4.1 E+04 lb/10^6 scf, and h = heating value of natural gas (assume 1020 Btu/scf at 60°F).

[e] Based on 100% conversion of fuel sulfur to SO_2. Assumes sulfur content in natural gas of 2,000 gr/10^6 scf.

[f] Emission factor for TOC is based on measured emission levels of 43 tests.

[g] Emission factor for methane is determined by subtracting the VOC and ethane emission factors from the TOC emission factor. Measured emission factor for methane compares well with the calculated emission factor, 1.48 lb/MMBtu vs. 1.45 lb/MMBtu, respectively.

[h] VOC emission factor is based on the sum of the emission factors for all speciated organic compounds less ethane and methane.

[i] Considered ≤ 1 μm in aerodynamic diameter. Therefore, for filterable PM emissions, PM10(filterable) = PM2.5(filterable).

[j] No data were available for condensable PM emissions. The presented emission factor reflects emissions from 4SLB engines.

[k] Hazardous Air Pollutant as defined by Section 112(b) of the Clean Air Act.

[l] For lean burn engines, aldehyde emissions quantification using CARB 430 may reflect interference with the sampling compounds due to the nitrogen concentration in the stack. The presented emission factor is based on FTIR measurements. Emissions data based on CARB 430 are available in the background report.

Table 3.2-2. UNCONTROLLED EMISSION FACTORS FOR 4-STROKE LEAN-BURN ENGINES[a]
(SCC 2-02-002-54)

Pollutant	Emission Factor (lb/MMBtu)[b] (fuel input)	Emission Factor Rating
Criteria Pollutants and Greenhouse Gases		
NO_x[c] 90 - 105% Load	4.08 E+00	B
NO_x[c] <90% Load	8.47 E-01	B
CO[c] 90 - 105% Load	3.17 E-01	C
CO[c] <90% Load	5.57 E-01	B
CO_2[d]	1.10 E+02	A
SO_2[e]	5.88 E-04	A
TOC[f]	1.47 E+00	A
Methane[g]	1.25 E+00	C
VOC[h]	1.18 E-01	C
PM10 (filterable)[i]	7.71 E-05	D
PM2.5 (filterable)[i]	7.71 E-05	D
PM Condensable[j]	9.91 E-03	D
Trace Organic Compounds		
1,1,2,2-Tetrachloroethane[k]	<4.00 E-05	E
1,1,2-Trichloroethane[k]	<3.18 E-05	E
1,1-Dichloroethane	<2.36 E-05	E
1,2,3-Trimethylbenzene	2.30 E-05	D
1,2,4-Trimethylbenzene	1.43 E-05	C
1,2-Dichloroethane	<2.36 E-05	E
1,2-Dichloropropane	<2.69 E-05	E
1,3,5-Trimethylbenzene	3.38 E-05	D
1,3-Butadiene[k]	2.67E-04	D
1,3-Dichloropropene[k]	<2.64 E-05	E
2-Methylnaphthalene[k]	3.32 E-05	C
2,2,4-Trimethylpentane[k]	2.50 E-04	C
Acenaphthene[k]	1.25 E-06	C

Table 3.2-2. UNCONTROLLED EMISSION FACTORS FOR 4-STROKE LEAN-BURN ENGINES
(Continued)

Pollutant	Emission Factor (lb/MMBtu)[b] (fuel input)	Emission Factor Rating
Acenaphthylene[k]	5.53 E-06	C
Acetaldehyde[k,l]	8.36 E-03	A
Acrolein[k,l]	5.14 E-03	A
Benzene[k]	4.40 E-04	A
Benzo(b)fluoranthene[k]	1.66 E-07	D
Benzo(e)pyrene[k]	4.15 E-07	D
Benzo(g,h,i)perylene[k]	4.14 E-07	D
Biphenyl[k]	2.12 E-04	D
Butane	5.41 E-04	D
Butyr/Isobutyraldehyde	1.01 E-04	C
Carbon Tetrachloride[k]	<3.67 E-05	E
Chlorobenzene[k]	<3.04 E-05	E
Chloroethane	1.87 E-06	D
Chloroform[k]	<2.85 E-05	E
Chrysene[k]	6.93 E-07	C
Cyclopentane	2.27 E-04	C
Ethane	1.05 E-01	C
Ethylbenzene[k]	3.97 E-05	B
Ethylene Dibromide[k]	<4.43 E-05	E
Fluoranthene[k]	1.11 E-06	C
Fluorene[k]	5.67 E-06	C
Formaldehyde[k,l]	5.28 E-02	A
Methanol[k]	2.50 E-03	B
Methylcyclohexane	1.23 E-03	C
Methylene Chloride[k]	2.00 E-05	C
n-Hexane[k]	1.11 E-03	C
n-Nonane	1.10 E-04	C

Table 3.2-2. UNCONTROLLED EMISSION FACTORS FOR 4-STROKE LEAN-BURN ENGINES
(Continued)

Pollutant	Emission Factor (lb/MMBtu)[b] (fuel input)	Emission Factor Rating
n-Octane	3.51 E-04	C
n-Pentane	2.60 E-03	C
Naphthalene[k]	7.44 E-05	C
PAH[k]	2.69 E-05	D
Phenanthrene[k]	1.04 E-05	D
Phenol[k]	2.40 E-05	D
Propane	4.19 E-02	C
Pyrene[k]	1.36 E-06	C
Styrene[k]	<2.36 E-05	E
Tetrachloroethane[k]	2.48 E-06	D
Toluene[k]	4.08 E-04	B
Vinyl Chloride[k]	1.49 E-05	C
Xylene[k]	1.84 E-04	B

[a] Reference 7. Factors represent uncontrolled levels. For NO_x, CO, and PM10, "uncontrolled" means no combustion or add-on controls; however, the factor may include turbocharged units. For all other pollutants, "uncontrolled" means no oxidation control; the data set may include units with control techniques used for NOx control, such as PCC and SCR for lean burn engines, and PSC for rich burn engines. Factors are based on large population of engines. Factors are for engines at all loads, except as indicated. SCC = Source Classification Code. TOC = Total Organic Compounds. PM-10 = Particulate Matter < 10 microns (μm) aerodynamic diameter. A "<" sign in front of a factor means that the corresponding emission factor is based on one-half of the method detection limit.

[b] Emission factors were calculated in units of (lb/MMBtu) based on procedures in EPA Method 19. To convert from (lb/MMBtu) to (lb/10^6 scf), multiply by the heat content of the fuel. If the heat content is not available, use 1020 Btu/scf. To convert from (lb/MMBtu) to (lb/hp-hr) use the following equation:

$$\text{lb/hp-hr} = (\text{lb/MMBtu})(\text{heat input, MMBtu/hr})(1/\text{operating HP})(1/\text{hp})$$

[c] Emission tests with unreported load conditions were not included in the data set.

[d] Based on 99.5% conversion of the fuel carbon to CO_2. CO_2 [lb/MMBtu] = (3.67)(%CON)(C)(D)(1/h), where %CON = percent conversion of fuel carbon to CO_2, C = carbon content of fuel by weight (0.75), D = density of fuel, 4.1 E+04 lb/10^6 scf, and

h = heating value of natural gas (assume 1020 Btu/scf at 60°F).

[c] Based on 100% conversion of fuel sulfur to SO_2. Assumes sulfur content in natural gas of 2,000 gr/10^6scf.

[f] Emission factor for TOC is based on measured emission levels from 22 source tests.

[g] Emission factor for methane is determined by subtracting the VOC and ethane emission factors from the TOC emission factor. Measured emission factor for methane compares well with the calculated emission factor, 1.31 lb/MMBtu vs. 1.25 lb/MMBtu, respectively.

[h] VOC emission factor is based on the sum of the emission factors for all speciated organic compounds less ethane and methane.

[i] Considered ≤ 1 μm in aerodynamic diameter. Therefore, for filterable PM emissions, PM10(filterable) = PM2.5(filterable).

[j] PM Condensable = PM Condensable Inorganic + PM-Condensable Organic

[k] Hazardous Air Pollutant as defined by Section 112(b) of the Clean Air Act.

[l] For lean burn engines, aldehyde emissions quantification using CARB 430 may reflect interference with the sampling compounds due to the nitrogen concentration in the stack. The presented emission factor is based on FTIR measurements. Emissions data based on CARB 430 are available in the background report.

Table 3.2-3. UNCONTROLLED EMISSION FACTORS FOR 4-STROKE RICH-BURN ENGINES[a]
(SCC 2-02-002-53)

Pollutant	Emission Factor (lb/MMBtu)[b] (fuel input)	Emission Factor Rating
Criteria Pollutants and Greenhouse Gases		
NO_x[c] 90 - 105% Load	2.21 E+00	A
NO_x[c] <90% Load	2.27 E+00	C
CO[c] 90 - 105% Load	3.72 E+00	A
CO[c] <90% Load	3.51 E+00	C
CO_2[d]	1.10 E+02	A
SO_2[e]	5.88 E-04	A
TOC[f]	3.58 E-01	C
Methane[g]	2.30 E-01	C
VOC[h]	2.96 E-02	C
PM10 (filterable)[i,j]	9.50 E-03	E
PM2.5 (filterable)[j]	9.50 E-03	E
PM Condensable[k]	9.91 E-03	E
Trace Organic Compounds		
1,1,2,2-Tetrachloroethane[l]	2.53 E-05	C
1,1,2-Trichloroethane[l]	<1.53 E-05	E
1,1-Dichloroethane	<1.13 E-05	E
1,2-Dichloroethane	<1.13 E-05	E
1,2-Dichloropropane	<1.30 E-05	E
1,3-Butadiene[l]	6.63 E-04	D
1,3-Dichloropropene[l]	<1.27 E-05	E
Acetaldehyde[l,m]	2.79 E-03	C
Acrolein[l,m]	2.63 E-03	C
Benzene[l]	1.58 E-03	B
Butyr/isobutyraldehyde	4.86 E-05	D
Carbon Tetrachloride[l]	<1.77 E-05	E

Table 3.2-3. UNCONTROLLED EMISSION FACTORS FOR 4-STROKE RICH-BURN ENGINES
(Concluded)

Pollutant	Emission Factor (lb/MMBtu)[b] (fuel input)	Emission Factor Rating
Chlorobenzene[l]	<1.29 E-05	E
Chloroform[l]	<1.37 E-05	E
Ethane[n]	7.04 E-02	C
Ethylbenzene[l]	<2.48 E-05	E
Ethylene Dibromide[l]	<2.13 E-05	E
Formaldehyde[l,m]	2.05 E-02	A
Methanol[l]	3.06 E-03	D
Methylene Chloride[l]	4.12 E-05	C
Naphthalene[l]	<9.71 E-05	E
PAH[l]	1.41 E-04	D
Styrene[l]	<1.19 E-05	E
Toluene[l]	5.58 E-04	A
Vinyl Chloride[l]	<7.18 E-06	E
Xylene[l]	1.95 E-04	A

[a] Reference 7. Factors represent uncontrolled levels. For NO_x, CO, and PM-10, "uncontrolled" means no combustion or add-on controls; however, the factor may include turbocharged units. For all other pollutants, "uncontrolled" means no oxidation control; the data set may include units with control techniques used for NOx control, such as PCC and SCR for lean burn engines, and PSC for rich burn engines. Factors are based on large population of engines. Factors are for engines at all loads, except as indicated. SCC = Source Classification Code. TOC = Total Organic Compounds. PM10 = Particulate Matter < 10 microns (μm) aerodynamic diameter. A "<" sign in front of a factor means that the corresponding emission factor is based on one-half of the method detection limit.

[b] Emission factors were calculated in units of (lb/MMBtu) based on procedures in EPA Method 19. To convert from (lb/MMBtu) to (lb/10^6 scf), multiply by the heat content of the fuel. If the heat content is not available, use 1020 Btu/scf. To convert from (lb/MMBtu) to (lb/hp-hr) use the following equation:

$$\text{lb/hp-hr} = (\text{lb/MMBtu})(\text{heat input, MMBtu/hr})(1/\text{operating HP})(1/\text{hp})$$

[c] Emission tests with unreported load conditions were not included in the data set.

[d] Based on 99.5% conversion of the fuel carbon to CO_2. CO_2 [lb/MMBtu] = (3.67)(%CON)(C)(D)(1/h), where %CON = percent conversion of fuel carbon to CO_2,

C = carbon content of fuel by weight (0.75), D = density of fuel, 4.1 E+04 lb/10^6 scf, and h = heating value of natural gas (assume 1020 Btu/scf at 60°F).

[e] Based on 100% conversion of fuel sulfur to SO_2. Assumes sulfur content in natural gas of 2,000 gr/10^6scf.

[f] Emission factor for TOC is based on measured emission levels from 6 source tests.

[g] Emission factor for methane is determined by subtracting the VOC and ethane emission factors from the TOC emission factor.

[h] VOC emission factor is based on the sum of the emission factors for all speciated organic compounds. Methane and ethane emissions were not measured for this engine category.

[i] No data were available for uncontrolled engines. PM10 emissions are for engines equipped with a PCC.

[j] Considered ≤ 1 μm in aerodynamic diameter. Therefore, for filterable PM emissions, PM10(filterable) = PM2.5(filterable).

[k] No data were available for condensable emissions. The presented emission factor reflects emissions from 4SLB engines.

[l] Hazardous Air Pollutant as defined by Section 112(b) of the Clean Air Act.

[m] For rich-burn engines, no interference is suspected in quantifying aldehyde emissions. The presented emission factors are based on FTIR and CARB 430 emissions data measurements.

[n] Ethane emission factor is determined by subtracting the VOC emission factor from the NMHC emission factor.

References For Section 3.2

1. *Engines, Turbines, And Compressors Directory*, American Gas Association, Catalog #XF0488.

2. *Standards Support And Environmental Impact Statement, Volume I: Stationary Internal Combustion Engines*, EPA-450/2-78-125a, U. S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, NC, July 1979.

3. *Alternative Control Techniques Document - NO_x Emissions From Stationary Reciprocating Engines*, EPA-453/R-93-032, July 1993.

4. *Handbook - Control Technologies For Hazardous Air Pollutants*, EPA-625/6-91-014, June 1991.

5. *Limiting Net Greenhouse Gas Emissions In The United States, Volume II: Energy Responses*, Report for the Office of Environmental Analysis, Office of Policy, Planning and Analysis, Department of Energy (DOE), DOE/PE-0101 Volume II, September 1991.

6. C. Castaldini, *NO_x Reduction Technologies For Natural Gas Industry Prime Movers*, GRI-90/0215, Gas Research Institute, Chicago, IL, August 1990.

7. *Emission Factor Documentation for AP-42 Section 3.2, Natural Gas-Fired Reciprocating Engines*, EPA Contract No. 68-D2-0160, Alpha-Gamma Technologies, Inc., Raleigh, North Carolina, July 2000.

NO_x EMISSION TEST
#4 SLAB FURNACE
STACK EMISSION TEST
MAY 19, 1992
March

Introduction and Summary of Results

On March 19, 1992 the exhaust gas from #4 Slab Furnace was tested for NO_x concentration while burning natural gas. Test Methods followed those detailed in the Code of Federal Regulations, CFR 40, Part 60, Appendix A: and the Quality Assurance Handbook for Air Pollution Measurement. System, Volume III, Stationary Source Specific Methods. The results of the test indicate an average emission rate of .393 lb. NO_x per mmbtu.

Overview

In order to determine the NO_x emissions generated during #4 Slab Furnace was fired on natural gas. Based upon the amount of fuel used during the test and the NO_x lb./hr. obtained by testing the NO_x lb./mmbtu are determined.

Test Methodology and Equipment

Sampling was conducted following USEPA Method 7E. The NO_x monitor used was AIR's TECO Model 10 NO_x monitor. Data was recorded on a dual pen strip chart recorder. Calibration gas and zero air was introduced directly into the 3-way valve for calibration of the NO_x monitor.

The average zero and calibration drift valves obtained during each test run on each monitor were used to correct the data for that test run.

Results

Average concentration of NO_x during the tests are as follows:

Run one	=	96.561 lb./hr.
Run two	=	96.256 lb./hr.
Run three	=	100.960 lb./hr.
Average	=	97.925 lb./hr.

Average fuel usage rate = 250.67 mmbtu/hr.

97.925 lb. NO_x/hr./250.67 mmbtu/hr. = 0.393 lb./mmbtu

SOW OCO
[redacted]

SO_2, NO_x, CO EMISSION TEST PROGRAM
#4 SLAB FURNACE EXHAUST STACK
GRANITE CITY STEEL DIVISION: GRANITE CITY, ILLINOIS

SUMMARY OF EMISSION TEST RESULTS

TABLE: III-1

COMPANY: Granite City Steel Division: Granite City, Illinois

LOCATION: Slab Furnace No. 4 Exhaust Stack

TEST DATE: 3/19/92

TEST RUN:	1	2	3	
TEST TIME:	1522-1622	1639-1739	1757-1857	Avg
STACK GAS				
Temperature, °F	776.5	789.8	791.1	785.8
Velocity, fps	22.6	23.2	22.7	22.8
Volume flow, acfm	239,771	246,125	240,463	242,120
Volume Flow, scfm, db	89,105	90,503	88,524	89,377
Volume flow, dscfh	5,346,298	5,430,194	5,311,457	5,362,650
Moisture, % by volume	11.4	11.4	11.2	11.3
CO_2, % by volume	6.5	6.6	6.6	6.6
O_2, % by volume	9.1	9.1	9.1	9.1
Sulfur Dioxide				
Concentration				
ppmv db	14.1	15.8	16.1	15.3
x 10^{-6} lbs/dscf	2.3	2.6	2.7	2.5
Emission Rate				
lbs/hr	12.484	14.214	14.231	13.643
Carbon Monoxide				
Concentration				
ppmv,db	5.8	6.3	5.8	6.0
x 10^{-6} lbs/dscf	0.4	0.5	0.4	0.4
Emission Rate				
lbs/hr	2.263	2.496	2.243	2.3
Nitrogen Oxides (As NO_2)				
Concentration				
ppmv, db	151.3	148.5	159.2	153.0
x 10^{-6} lbs/dscf	18.1	17.7	19.0	18.3
Emission Rate				
lbs/hr	96.561	96.256	100.960	97.9

APPENDIX D

2000 and 2001 Throughputs

Appendix D
Fuel Throughputs used for Baseline Emissions Calculations for the US Steel Granite City Works

year	Unit	Fuel	Throughput (MMBtu)												Two Year Average
			January	Feb.	March	April	May	June	July	August	Sept.	October	Nov.	Dec.	
2000	Boiler 1-10	COG	92,357	81,252	68,832	102,980	92,931	85,325	94,751	102,467	96,288	109,023	139,709	124,084	
2001	Boiler 1-10	COG	98,588	81,030	61,580	63,183	53,133	44,920	63,116	69,578	66,904	47,510	54,210	60,279	977,015.0
2000	Boiler 1-10	NG	38,975	9,910	13,397	13,726	8,736	8,405	9,897	10,183	13,298	18,232	12,861	40,248	
2001	Boiler 1-10	NG	33,850	18,884	9,791	14,053	10,131	8,316	9,162	19,454	12,009	56,003	26,852	29,138	222,755.5
2000	All	COG	416,037	413,096	438,719	437,898	462,926	440,073	464,583	457,580	427,913	445,875	429,311	419,633	
2001	All	COG	418,531	406,884	453,179	433,564	424,342	391,278	408,913	430,664	385,768	316,895	308,506	311,202	4,971,685
2000	Slab Furnaces	NG	455,215	381,381	464,096	416,361	181,445	427,291	414,888	417,978	435,582	412,846	250,429	398,794	
2001	Slab Furnaces	NG	417,161	313,391	363,764	388,352	375,359	364,472	297,224	405,891	312,497	343,726	297,190	320,511	4,437,922
2000	Slab Furnaces	COG	70,694	95,382	52,348	72,144	30,960	69,695	83,510	61,294	66,124	65,349	51,033	58,822	
2001	Slab Furnaces	COG	48,463	83,602	96,153	91,158	58,959	101,090	87,507	86,783	83,898	57,629	53,412	35,132	830,571
2000	COG Booster	NG	3,199	2,041	3,575	5,316	5,468	5,317	6,399	6,152	5,568	5,797	5,693	5,591	
2001	COG Booster	NG	4,683	4,948	4,989	5,288	5,622	5,535	5,301	6,908	7,360	5,918	5,369	5,481	63,769
1999	#6 Galv. Line	NG		15,592	22,904	23,706	20,994	20,672	25,550	25,287	20,332	21,550	15,665	9,714	
2000	#6 Galv. Line	NG	23,891	21,406	20,656	22,843	17,318	23,592	22,200	19,666	13,766	12,652	15,441	8,513	
2001	#6 Galv. Line	NG	16,681												230,296

R005884

BOL REFERENCE SHEET --- SAME FACILITY

Facility Number: 119813AAI
Facility Name: US Steel
USEPA Number:
File Category: Permits

FOR ADDITIONAL INFORMATION ON THIS, SEE CATEGORY 03M/CD UNDER THIS SAME FILE HEADING.

DATE OF OTHER DOCUMENT	DESCRIPTION OF OTHER DOCUMENT
July 7, 2006	Permit # 06 07 0022
	Emission Reduction Air Permit Application.
	Co-Generation Facility Air Permit Application.

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ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19506, SPRINGFIELD, ILLINOIS 62794-9506 – (217) 782-2113

ROD R. BLAGOJEVICH, GOVERNOR DOUGLAS P. SCOTT, DIRECTOR

217/782-2113

CONSTRUCTION PERMIT

JUL 06 2015

REVIEWER JRM

PERMITTEE

United States Steel Corporation
Attn: Larry Siebenberger
600 Grant Street
Pittsburgh, PA 15219

Application No.: 06070022
Applicant's Designation:
I.D. No.: 119813AAI
Date Received: October 19, 2007
Subject: Emission Reduction Projects
Date Issued: January 16, 2008
Location: 1951 State Street, Granite City

This Permit is hereby granted to the above-designated Permittee to CONSTRUCT emission source(s) and/or air pollution control equipment consisting of a coke oven gas desulfurization system for the existing coke oven by-products plant and low NO_x burners in the hot strip slab furnaces, which would generate creditable emission reductions that would facilitate construction of other projects at the source, as described in the above-referenced application. This Permit is subject to standard conditions attached hereto and the following special condition(s):

1a. i. This permit authorizes construction of a coke oven gas (COG) desulfurization system ("affected system"), which consists of a packed tower amine unit, hydrogen cyanide destruct unit, and a Claus sulfur recovery unit with oxidizer. The affected system is designed to remove hydrogen sulfide (H_2S) from the COG stream after processing in the by-products plant, prior to use as fuel.

ii. This permit is issued based upon the construction of the affected system being an emission control project that will reduce emissions of particulate matter (PM), particles with size equal to or smaller than 10 microns (PM_{10}), sulfur dioxide (SO_2), and sulfuric acid mist currently accompanying use of coke oven gas in combustion units at the source.

Note: The application indicates an annual decrease of 71 tons of PM/PM_{10}, 2,546 tons of SO_2, and 56 tons of sulfuric acid mist, from this system.

iii. This permit does not alter requirements of existing permits for the plant, including Permit Number 94120017, which addresses SO_2 emissions from certain fuel burning emission units at the plant.

b. i. This permit authorizes installation of low NO_x burners on hot strip slab furnaces 1 through 4 (the affected furnaces).

Note: The application indicates an annual decrease of 381.77 tons of NO_x from the installation of low NO_x burners in the affected furnaces.

c. This permit also acknowledges the planned permanent shutdown of Boilers 1-10, which would accompany construction of a new co-generation facility. Once the boilers are permanently shutdown, the restart of any of these boilers would require a construction permit from the Illinois EPA.

Note: The application indicates an annual decrease of 9.2 tons of CO, 186.7 tons of NO_x, 0.8 tons of PM/PM_{10}, 0.1 tons of SO_2, and 0.6 tons of VOM from the shutdown of Boilers 1-10. These values represent the actual emissions attributable to natural gas combustion in Boilers 1-10 and a portion of the NO_x emissions attributable to a portion of the COG burned in the boilers.

The affected furnaces will combust additional COG and less natural gas due to the shutdown of Boilers 1-10. This transfer of COG will result in an overall decrease in emissions because affected boilers have higher NO_x emissions burners whereas the affected furnaces have low NO_x burners.

d. This permit does not authorize the construction of new emission units at the source. In particular, this permit does not authorize construction of a co-generation facility or a heat recovery coke manufacturing facility, for which separate applications have been submitted and are currently pending with the Illinois EPA. (I.D. 119813AAI, Application No. 06070023, and ID 119040ATN, Application No. 06050052).

2a. i. The source shall operate the affected system at all times the by-products plant is producing COG, except when undertaking maintenance or repairs of the system. This total "outage" period shall not exceed 35 days (840 hours) per calendar year.

ii. A. COG production during periods of time when the affected system is not operating shall not exceed 1,092 mmscf/year.

B. Total COG production from the existing coke oven battery shall not exceed 1,140 mmscf/month and 11,400 mmscf/year.

Note: This limit is based on the design capacity of the affected system as indicated in the application, i.e., 31.2 mmscf/day, monthly average.

iii. A. The affected system shall be operated and maintained in conformance with good air pollution control practices.

B. The oxidizer combustion chamber for the sulfur recovery unit shall be operated at a temperature that is consistent with at least the manufacturer's recommended temperature.

b. i. The affected furnaces shall be equipped, operated, and maintained with low NO_x burners. The burners shall be operated and maintained in conformance with good air pollution control practices.

ii. Operation of the affected furnaces shall not exceed the following limits:

Emission Unit	Total Gas Usage (mmBtu/year)	COG Usage (mmBtu/year)
Hot Strip Slab Furnace #3	1,654,304	1,187,790
Hot Strip Slab Furnace #4	2,206,238	1,544,367
Total (Furnaces 1-4)	7,169,150	2,421,388

c. Conditions 2(a)(i) and (ii), 2(b), and 3 of this permit take effect upon initial startup of new facility(ies) whose permitting, as reflected in Construction Permit(s) for those new unit(s), relies upon the emission reductions provided by the projects addressed by this permit.

Note: This permit does not specify particular levels of sulfur removal by the affected system before the above date(s) when operated on a voluntary basis. This is because the reduction in sulfur from the COG achieved by the system will exceed the equivalent SO_2 emissions from the sulfur recovery unit. This reduction in sulfur will also be accompanied by a reduction in particulate emissions when COG is burned.

3a. i. The H_2S content of the raw COG entering the desulfurization system shall not exceed 500 grains of H_2S/100 scf of COG.

ii. The H_2S content of COG shall not exceed 66 grains/100 scf of COG, annual average

iii. During periods of time when the affected system is operating, the H_2S content of COG shall not exceed the following limits:: 25 grains of H_2S/100 scf of COG, monthly average, excluding outages, startup, shutdown, and upsets such as failure of fans, pumps or heat exchangers and aberrations in the composition or condition of the raw COG.

b. i. Annual emissions of the source from combustion of COG shall not exceed the following limits:

	Limits (Tons/Year)	
	PM_{10}	SO_2
"Outage" of Affected System	47.55	530.59
Total (includes normal and outage):	224.80	807.90

ii. Emissions from the sulfur recovery unit shall not exceed the following limits:

PM_{10}		SO_2	
(Lbs/Hr)	(Tons/Yr)	(Lbs/Hr)	(Tons/Yr)
5.6	24.6	67.3	294.7

iii. Combined emissions of PM_{10} and SO_2 from the sulfur recovery unit and combustion of coke oven gas shall not exceed 246.8 and 1,074.1 tons/year for PM_{10} and SO_2, respectively.

iv. The SO_2 emission limits in this permit are based on the H_2S content of the coke oven gas. These limits do not include emissions attributable to sulfur compounds other than H_2S.

c. i. A. Emissions of NO_x from the affected furnaces shall not exceed the following limits:

Furnace	Limit (Lbs/mmBtu)
Furnace #1	0.150
Furnace #2	0.150
Furnace #3	0.264
Furnace #4	0.283

B. Emissions of NO_x from the affected furnaces (combined) shall not exceed 73 tons/month and 724.09 tons/year.

ii. This permit is issued based upon installation of low NO_x burners for the affected furnaces without any increase in emissions of CO, VOM, SO_2 and PM/PM_{10}.

d. Compliance with the annual limits shall be determined from a running total of 12 months of data, unless otherwise specified.

4a. i. Within one year of initial startup of the affected system, the PM_{10}, NO_x, CO, and SO_2 emissions of the sulfur recovery unit shall be measured during conditions which are representative of maximum emissions.

ii. Within 180 days of initial startup of the low NO_x burners, the NO_x and CO emissions of each affected furnace shall be measured during conditions which are representative of maximum emissions.

b. The following methods and procedures shall be used for testing of emissions, unless another method is approved by the Illinois EPA: Refer to 40 CFR 60, Appendix A, for USEPA test methods.

Location of Sample Points	USEPA Method 1
Gas Flow and Velocity	USEPA Method 2
Flue Gas Weight	USEPA Method 3
Moisture	USEPA Method 4
PM_{10}	USEPA Method 201A* and 202
Sulfur Dioxide	USEPA Method 6
Nitrogen Oxides	USEPA Method 7

Carbon Monoxide	USEPA Method 10

* The Permittee may also use Method 5, instead of Method 201A, provided that the measured results are considered PM_{10}.

c. At least 60 days prior to the actual date of emissions testing, a written test plan shall be submitted to the Illinois EPA for review. This plan shall describe the specific procedures for testing, including as a minimum:

i. The person(s) who will be performing sampling and analysis and their experience with similar tests.

ii. The specific conditions under which testing will be performed, including a discussion of why these conditions will be representative of maximum emissions, any constraints on the operating configuration of the unit during testing, and the means by which the operating parameters for the emission unit and any control equipment will be determined.

iii. The specific determinations of emissions and operation which are intended to be made, including sampling and monitoring locations.

iv. The test method(s) which will be used, with the specific analysis method, if the method can be used with different analysis methods.

v. Any minor changes in standard methodology proposed to accommodate the specific circumstances of testing, with justification.

vi. The format and content of the Source Test Report.

d. The Illinois EPA shall be notified prior to this emissions test to enable the Illinois EPA to observe the test. Notification of the expected date of testing shall be submitted a minimum of thirty days prior to the expected date. Notification of the actual date and expected time of testing shall be submitted a minimum of five working days prior to the actual date of the test. The Illinois EPA may at its discretion accept notifications with shorter advance notice provided that the Illinois EPA will not accept such notifications if it interferes with the Illinois EPA's ability to observe testing.

e. Copies of the Final Report(s) for this emissions test shall be submitted to the Illinois EPA within 45 days after completion of the test program. The Final Report shall include as a minimum:

i. A summary of results

ii. General information

iii. Description of test method(s), including description of sampling points, sampling train, analysis equipment, and test schedule

iv. Detailed description of test conditions, including

A. Process information, i.e., mode(s) of operation, process rate, e.g. raw material consumption

B. Control equipment information, i.e., equipment condition and operating parameters during testing

v. Data and calculations, including copies of all raw data sheets and records of laboratory analyses, sample calculations, and data on equipment calibration.

5a. The Permittee shall install, operate, and maintain a continuous monitoring system for the H_2S content of COG after processing by the affected system. (See also Condition 7 of FESOP 94120017)

b. The Permittee shall equip the thermal oxidizer for the sulfur recovery unit with a continuous monitoring system which is installed, calibrated, maintained, and operated according to vendor specifications at all times that the affected system is in operation, to monitor the combustion chamber temperature.

c. The Permittee shall keep the following records for each required monitoring system.

i. Recorded data.

ii. A log of operating time for the control system or devices, monitoring system, and the coke oven byproducts plant.

iii. A maintenance log for the oxidizer and monitoring device detailing all routine and non-routine maintenance performed including dates and duration of any outages.

6. The Permittee shall conduct sampling and analysis for the H_2S content and total sulfur content of raw and treated COG (grains/100 scf).

7. The Permittee shall maintain records of the following items:

a. Operating Records for the Packed Tower Amine Unit

i. Amine temperature leaving the unit (°F).

ii. Amine flow (gallons/minute).

iii. COG flow into or out of the unit.

b. Logs for the Affected System and Affected Furnaces

i. Operating logs.

ii. Maintenance logs detailing all routine and non-routine maintenance performed including dates and duration of any outages.

c. Production Records

i. COG production during periods of time when the affected system is operating (mmscf/month and mmscf/year).

ii. COG production during periods of time when the affected system is not operating (mmscf/month and mmscf/year).

iii. COG usage (mmBtu/month and mmBtu/year) for the affected furnaces #1-2 (combined), #3, and #4.

iv. Natural gas usage (mmBtu/month and mmBtu/year) for the affected furnaces #1-2 (combined), #3, and #4.

d. Records of H_2S content of COG:

i. H_2S content of raw COG.

ii. H_2S content of COG, annual average.

iii. H_2S content of treated COG, excluding outages, startup, shutdown, and upsets, monthly average.

e. Emission Records

i. Emissions of PM_{10} and SO_2 from COG combustion based on the above records and separately recorded for total emissions and emissions during outage of the affected system.

ii. Emissions of PM_{10} and SO_2 from the sulfur recovery unit (tons/month and tons/year).

iii. Emissions of NO_x from the affected furnaces (tons/month and tons/year).

8. One copy of required reports and notifications shall be sent to:

Illinois Environmental Protection Agency
Division of Air Pollution Control
Compliance Section (#40)
P.O. Box 19276
Springfield, Illinois 62794-9276

and one copy shall be sent to the Illinois EPA's regional office at the following address unless otherwise indicated:

Illinois Environmental Protection Agency
Division of Air Pollution Control
2009 Mall Street
Collinsville, Illinois 62234

and one copy of reports and notifications concerning emission testing or continuous monitoring systems shall be sent to:

Illinois Environmental Protection Agency
Division of Air Pollution Control
Source Monitoring Unit
9511 West Harrison
Des Plaines, Illinois 60016

9. The affected system and affected furnaces with low NO_x burners may be operated under this permit until final action is taken on the source's CAAPP application.

It should be noted that this permit has been reissued. The original permit was issued on January 18, 2007.

If you have any questions on this permit, please contact Jason Schnepp at 217/782-2113.

COPY
Edwin C. Bakowski, P.E.

Edwin C. Bakowski, P.E.
Acting Manager, Permit Section
Division of Air Pollution Control

Date Signed: January 16, 2008

JWS for 1/16/8

ECB:JMS:jws

cc: Region 3
CES

STATE OF ILLINOIS
ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL
P. O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

R005894
JUN 04 2015

STANDARD CONDITIONS FOR CONSTRUCTION/DEVELOPMENT PERMITS ISSUED BY THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

July 1, 1985

The Illinois Environmental Protection Act (Illinois Revised Statutes, Chapter 111-1/2, Section 1039) authorizes the Environmental Protection Agency to impose conditions on permits which it issues.

The following conditions are applicable unless susperseded by special condition(s).

1. Unless this permit has been extended or it has been voided by a newly issued permit, this permit will expire one year from the date of issuance, unless a continuous program of construction or development on this project has started by such time.

2. The construction or development covered by this permit shall be done in compliance with applicable provisions of the Illinois Environmental Protection Act and Regulations adopted by the Illinois Pollution Control Board.

3. There shall be no deviations from the approved plans and specifications unless a written request for modification, along with plans and specifications as required, shall have been submitted to the Agency and a supplemental written permit issued.

4. The permittee shall allow any duly authorized agent of the Agency upon the presentation of credentials, at reasonable times:

   a. to enter the permittee's property where actual or potential effluent, emission or noise sources are located or where any activity is to be conducted pursuant to this permit,

   b. to have access to and to copy any records required to be kept under the terms and conditions of this permit,

   c. to inspect, including during any hours of operation of equipment constructed or operated under this permit, such equipment and any equipment required to be kept, used, operated, calibrated and maintained under this permit,

   d. to obtain and remove samples of any discharge or emissions of pollutants, and

   e. to enter and utilize any photographic, recording, testing, monitoring or other equipment for the purpose of preserving, testing, monitoring, or recording any activity, discharge, or emission authorized by this permit.

5. The issuance of this permit:

   a. shall not be considered as in any manner affecting the title of the premises upon which the permitted facilities are to be located,

   b. does not release the permittee from any liability for damage to person or property caused by or resulting from the construction, maintenance, or operation of the proposed facilities,

   c. does not release the permittee from compliance with other applicable statutes and regulations of the United States, of the State of Illinois, or with applicable local laws, ordinances and regulations,

   d. does not take into consideration or attest to the structural stability of any units or parts of the project, and

e. in no manner implies or suggests that the Agency (or its officers, agents or employees) assumes any liability, directly or indirectly, for any loss due to damage, installation, maintenance, or operation of the proposed equipment or facility.

6. a. Unless a joint construction/operation permit has been issued, a permit for operation shall be obtained from the Agency before the equipment covered by this permit is placed into operation.

b. For purposes of shakedown and testing, unless otherwise specified by a special permit condition, the equipment covered under this permit may be operated for a period not to exceed thirty (30) days.

7. The Agency may file a complaint with the Board for modification, suspension or revocation of a permit:

a. upon discovery that the permit application contained misrepresentations, misinformation or false statements or that all relevant facts were not disclosed, or

b. upon finding that any standard or special conditions have been violated, or

c. upon any violations of the Environmental Protection Act or any regulation effective thereunder as a result of the construction or development authorized by this permit.

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19506, SPRINGFIELD, ILLINOIS 62794-9506 - (217) 782-2113

ROD R. BLAGOJEVICH, GOVERNOR DOUGLAS P. SCOTT, DIRECTOR

217/782-2113

CONSTRUCTION PERMIT

BUREAU OF AIR
PERMIT SECTION
JUN 04 2007
REVIEWER JRM

PERMITTEE

United States Steel Corporation
Attn: Larry Siebenberger
600 Grant Street
Pittsburgh, PA 15219

Application No.: 06070022
Applicant's Designation:
I.D. No.: 119813AAI
Date Received: July 11, 2006
Subject: Emission Reduction Projects
Date Issued: January 18, 2007
Location: 1951 State Street, Granite City

This Permit is hereby granted to the above-designated Permittee to CONSTRUCT emission source(s) and/or air pollution control equipment consisting of a coke oven gas desulfurization system for the existing coke oven by-products plant and low NO_x burners in the hot strip slab furnaces, which would generate creditable emission reductions that would facilitate construction of other projects at the source, as described in the above-referenced application. This Permit is subject to standard conditions attached hereto and the following special condition(s):

1a. i. This permit authorizes construction of a coke oven gas (COG) desulfurization system ("affected system"), which consists of a packed tower amine unit, hydrogen cyanide destruct unit, and a Claus sulfur recovery unit with oxidizer. The affected system is designed to remove hydrogen sulfide (H_2S) from the COG stream after processing in the by-products plant, prior to use as fuel.

ii. This permit is issued based upon the construction of the affected system being an emission control project that will reduce emissions of particulate matter (PM), particles with size equal to or smaller than 10 microns (PM_{10}), sulfur dioxide (SO_2), and sulfuric acid mist currently accompanying use of coke oven gas in combustion units at the source.

Note: The application indicates an annual decrease of 71 tons of PM/PM_{10}, 2,546 tons of SO_2, and 56 tons of sulfuric acid mist, from this system.

iii. This permit does not alter requirements of existing permits for the plant, including Permit Number 94120017, which addresses SO_2 emissions from certain fuel burning emission units at the plant.

b. i. This permit authorizes installation of low NO_x burners on hot strip slab furnaces 1 through 4 (the affected furnaces).

Note: The application indicates an annual decrease of 381.77 tons of NO_x from the installation of low NO_x burners in the affected furnaces.

c. This permit also acknowledges the planned permanent shutdown of Boilers 1-10, which would accompany construction of a new co-generation facility. Once the boilers are permanently shutdown, the restart of any of these boilers would require a construction permit from the Illinois EPA.

Note: The application indicates an annual decrease of 9.2 tons of CO, 186.7 tons of NO_x, 0.8 tons of PM/PM_{10}, 0.1 tons of SO_2, and 0.6 tons of VOM from the shutdown of Boilers 1-10. These values represent the actual emissions attributable to natural gas combustion in Boilers 1-10 and a portion of the NO_x emissions attributable to a portion of the COG burned in the boilers.
The affected furnaces will combust additional COG and less natural gas due to the shutdown of Boilers 1-10. This transfer of COG will result in an overall decrease in emissions because affected boilers have higher NO_x emissions burners whereas the affected furnaces have low NO_x burners.

d. This permit does not authorize the construction of new emission units at the source. In particular, this permit does not authorize construction of a co-generation facility or a heat recovery coke manufacturing facility, for which separate applications have been submitted and are currently pending with the Illinois EPA. (I.D. 119813AAI, Application No. 06070023, and ID 119040ATN, Application No. 06050052).

2a. i. The source shall operate the affected system at all times the by-products plant is producing COG, except when undertaking maintenance or repairs of the system. This total "outage" period shall not exceed 35 days (840 hours) per calendar year.

ii. A. COG production during periods of time when the affected system is not operating shall not exceed 1,092 mmscf/year.

B. Total COG production from the existing coke oven battery shall not exceed 1,140 mmscf/month and 11,400 mmscf/year.

Note: This limit is based on the design capacity of the affected system as indicated in the application, i.e., 31.2 mmscf/day, monthly average.

iii. A. The affected system shall be operated and maintained in conformance with good air pollution control practices.

B. The oxidizer combustion chamber for the sulfur recovery unit shall be operated at a temperature that is consistent with at least the manufacturer's recommended temperature.

b. i. The affected furnaces shall be equipped, operated, and maintained with low NO_x burners. The burnere shall be operated and maintained in conformance with good air pollution control practices.

ii. Operation of the affected furnaces shall not exceed the following limits:

Emission Unit	Total Gas Usage (mmBtu/year)	COG Usage (mmBtu/year)
Hot Strip Slab Furnace #3	1,654,304	1,187,790
Hot Strip Slab Furnace #4	2,206,238	1,544,367
Total (Furnaces 1-4)	7,169,150	2,421,388

c. Conditions 2(a)(i) and (ii), 2(b), and 3 of this permit take effect upon initial startup of new facility(ies) whose permitting, ae reflected in Construction Permit(s) for those new unit(s), relies upon the emission reductions provided by the projects addressed by this permit.

Note: This permit does not specify particular levels of sulfur removal by the affected system before the above date(s) when operated on a voluntary basis. This is because the reduction in sulfur from the COG achieved by the system will exceed the equivalent SO_2 emissions from the sulfur recovery unit. This reduction in sulfur will also be accompanied by a reduction in particulate emissions when COG is burned.

3a. i. The H_2S content of the raw COG entering the desulfurization system shall not exceed 500 grains of H_2S/100 scf of COG.

ii. The H_2S content of COG shall not exceed 66 grains/100 scf of COG, annual average

iii. During periods of time when the affected system is operating, the H_2S content of COG shall not exceed the following limits:: 25 grains of H_2S/100 scf of COG, monthly average, excluding outages, startup, shutdown, and upsets such as failure of fans, pumps or heat exchangers and aberrations in the composition or condition of the raw COG.

b. i. Annual emissions of the source from combustion of COG shall not exceed the following limits:

	Limits (Tons/Year)	
	PM_{10}	SO_2
"Outage" of Affected System	47.55	530.59
Total (includes normal and outage):	224.80	807.90

ii. Emissions from the sulfur recovery unit shall not exceed the following limits:

PM_{10}		SO_2	
(Lbs/Hr)	(Tons/Yr)	(Lbs/Hr)	(Tons/Yr)
5.6	24.6	67.3	294.7

iii. Combined emissions of PM_{10} and SO_2 from the sulfur recovery unit and combustion of coke oven gas shall not exceed 246.8 and 1,074.1 tons/year for PM_{10} and SO_2, respectively.

iv. The SO_2 emission limits in this permit are based on the H_2S content of the coke oven gas. These limits do not include emissions attributable to sulfur compounds other than H_2S.

c. i. A. Emissions of NO_x from the affected furnaces shall not exceed the following limits:

Furnace	Limit (Lbs/mmBtu)
Furnace #1	0.150
Furnace #2	0.150
Furnace #3	0.264
Furnace #4	0.283

B. Emissions of NO_x from the affected furnaces (combined) shall not exceed 73 tons/month and 724.09 tons/year.

ii. This permit is issued based upon installation of low NO_x burners for the affected furnaces without any increase in emissions of CO, VOM, SO_2 and PM/PM_{10}.

d. Compliance with the annual limits shall be determined from a running total of 12 months of data, unless otherwise specified.

4a. i. Within one year of initial startup of the affected system, the PM_{10}, NO_x, CO, and SO_2 emissions of the sulfur recovery unit shall be measured during conditions which are representative of maximum emissions.

ii. Within 180 days of initial startup of the low NO_x burners, the NO_x and CO emissions of each affected furnace shall be measured during conditions which are representative of maximum emissions.

b. The following methods and procedures shall be used for testing of emissions, unless another method is approved by the Illinois EPA: Refer to 40 CFR 60, Appendix A, for USEPA test methods.

Location of Sample Points	USEPA Method 1
Gas Flow and Velocity	USEPA Method 2
Flue Gas Weight	USEPA Method 3
Moisture	USEPA Method 4

PM_{10}	USEPA Method 201A` and 202
Sulfur Dioxide	USEPA Method 6
Nitrogen Oxides	USEPA Method 7
Carbon Monoxide	USEPA Method 10

` The Permittee may also use Method 5, instead of Method 201A, provided that the measured results are considered PM_{10}.

c. At least 60 days prior to the actual date of emissions testing, a written test plan shall be submitted to the Illinois EPA for review. This plan shall describe the specific procedures for testing, including as a minimum:

i. The person(s) who will be performing sampling and analysis and their experience with similar tests.

ii. The specific conditions under which testing will be performed, including a discussion of why these conditions will be representative of maximum emissions, any constraints on the operating configuration of the unit during testing, and the means by which the operating parameters for the emission unit and any control equipment will be determined.

iii. The specific determinations of emissions and operation which are intended to be made, including sampling and monitoring locations.

iv. The test method(s) which will be used, with the specific analysis method, if the method can be used with different analysis methods.

v. Any minor changes in standard methodology proposed to accommodate the specific circumstances of testing, with justification.

vi. The format and content of the Source Test Report.

d. The Illinois EPA shall be notified prior to this emissions test to enable the Illinois EPA to observe the test. Notification of the expected date of testing shall be submitted a minimum of thirty days prior to the expected date. Notification of the actual date and expected time of testing shall be submitted a minimum of five working days prior to the actual date of the test. The Illinois EPA may at its discretion accept notifications with shorter advance notice provided that the Illinois EPA will not accept such notifications if it interferes with the Illinois EPA's ability to observe testing.

e. Copies of the Final Report(s) for this emissions test shall be submitted to the Illinois EPA within 45 days after completion of the test program. The Final Report shall include as a minimum:

i. A summary of results

ii. General information

iii. Description of test method(s), including description of sampling points, sampling train, analysis equipment, and test schedule

iv. Detailed description of test conditions, including

A. Process information, i.e., mode(s) of operation, process rate, e.g. raw material consumption

B. Control equipment information, i.e., equipment condition and operating parameters during testing

v. Data and calculations, including copies of all raw data sheets and records of laboratory analyses, sample calculations, and data on equipment calibration.

5a. The Permittee shall install, operate, and maintain a continuous monitoring system for the H_2S content of COG after processing by the affected system. (See also Condition 7 of FESOP 94120017)

b. The Permittee shall equip the thermal oxidizer for the sulfur recovery unit with a continuous monitoring system which is installed, calibrated, maintained, and operated according to vendor specifications at all times that the affected system is in operation, to monitor the combustion chamber temperature.

c. The Permittee shall keep the following records for each required monitoring system.

i. Recorded data.

ii. A log of operating time for the control system or devices, monitoring system, and the coke oven byproducts plant.

iii. A maintenance log for the oxidizer and monitoring device detailing all routine and non-routine maintenance performed including dates and duration of any outages.

6. The Permittee shall conduct sampling and analysis for the H_2S content and total sulfur content of raw and treated COG (grains/100 scf).

7. The Permittee shall maintain records of the following items:

a. Operating Records for the Packed Tower Amine Unit

i. Amine temperature leaving the unit (°F).

ii. Amine flow (gallons/minute).

iii. COG flow into or out of the unit.

b. Logs for the Affected System and Affected Furnaces

i. Operating logs.

ii. Maintenance logs detailing all routine and non-routine maintenance performed including dates and duration of any outages.

c. Production Records

i. COG production during periods of time when the affected system is operating (mmscf/month and mmscf/year).

ii. COG production during periods of time when the affected system is not operating (mmscf/month and mmscf/year).

iii. COG usage (mmBtu/month and mmBtu/year) for the affected furnaces #1-2 (combined), #3, and #4.

iv. Natural gas usage (mmBtu/month and mmBtu/year) for the affected furnaces #1-2 (combined), #3, and #4.

d. Records of H_2S content of COG:

i. H_2S content of raw COG.

ii. H_2S content of COG, annual average.

iii. H_2S content of treated COG, excluding outages, startup, shutdown, and upsets, monthly average.

e. Emission Records

i. Emissions of PM_{10} and SO_2 from COG combustion based on the above records and separately recorded for total emissions and emissions during outage of the affected system.

ii. Emissions of PM_{10} and SO_2 from the sulfur recovery unit (tons/month and tons/year).

iii. Emissions of NO_x from the affected furnaces (tons/month and tons/year).

8. One copy of required reports and notifications shall be sent to:

Illinois Environmental Protection Agency
Division of Air Pollution Control
Compliance Section (#40)
P.O. Box 19276
Springfield, Illinois 62794-9276

and one copy shall be sent to the Illinois EPA's regional office at the following address unless otherwise indicated:

Illinois Environmental Protection Agency
Division of Air Pollution Control
2009 Mall Street
Collinsville, Illinois 62234

and one copy of reports and notifications concerning emission testing or continuous monitoring systems shall be sent to:

Illinois Environmental Protection Agency
Division of Air Pollution Control
Source Monitoring Unit
9511 West Harrison
Des Plaines, Illinois 60016

9. The affected system and affected furnaces with low NO_x burners may be operated under this permit until final action is taken on the source's CAAPP application.

If you have any questions on this permit, please contact Jason Schnepp at 217/782-2113.

COPY
Original Signed by
Edwin C. Bakowski, P.E.

Edwin C. Bakowski, P.E.
Acting Manager of Permit Section
Division of Air Pollution Control
JMS 11/16/07
ECB:JMS:psj

cc: Region 3
CES

217/785-1705

CONSTRUCTION PERMIT
(SUBJECT TO INTEGRATED PROCESSING)

PERMITTEE

United States Steel Corporation - Granite City Works
Attn: Bryan Kresak, Environmental Director
1951 State Street
Granite City, Illinois 62040

Application No.: 11050006
Applicant's Designation:
I.D. No.: 119813AAI
Date Received: November 16, 2011
Subject: Emission Reduction Project
Date Issued: April 1, 2013
Location: 1951 State Street, Granite City, Madison County

This Permit is hereby granted to the above-designated Permittee to CONSTRUCT emission source(s) and/or air pollution control equipment consisting of an emission reduction project for charging and tapping of the two existing basic oxygen process furnaces (BOPFs), as described in the above-referenced application. This Permit is subject to standard conditions attached hereto and the findings and conditions in Part 1 of this Permit.

This Permit also authorizes the Clean Air Act Permit Program (CAAPP) permit for the source (Permit 96030056) to be revised by administrative amendment, in accordance with Section 39.5(13)(c)(v) of the Environmental Protection Act (Act). This is because this Permit was subject to "Integrated Processing," i.e., this Permit was subject to procedural requirements and includes compliance requirements that are substantially equivalent to those that apply to CAAPP permits. This was done because certain provisions in CAAPP Permit 96030056 will no longer be appropriate or necessary with this emission reduction project, when particulate emissions from tapping and charging of the BOPFs are controlled with a new baghouse control system. The specific revisions that may be made by administrative amendment to Permit 96030056 pursuant to this Permit are set forth in Part 2 of thic Permit.

If you have any questions on this Permit, please contact Kevin Smith at 217/785-1705.

Edwin C. Bakowski, P.E.
Manager, Permit Section
Division of Air Pollution Control

Date Signed: _____

ECB:KLS:psj

cc: FOS - Region 3, Illinois EPA
CAAPP Permit File - 96030056

PART 1: FINDINGS AND CONDITIONS FOR THE CONSTRUCTION PERMIT

FINDINGS

1. Introduction

a. This permit authorizes an emission reduction project for particulate emissions from the two existing Basic Oxygen Process Furnaces at the source. The project involves installation of a new control system for emissions of particulate from charging and tapping of these furnaces. The existing electrostatic precipitator (ESP) would continue to be used to control particulate emissions from these furnaces from refining.

This project will include the following elements:

- Installation of a baghouse with a nominal capacity of 900,000 actual cubic feet per minute.
- Upgrade of the existing local capture hoods for charging and installation of new ductwork to connect to the new baghouse rather than to the existing ESP.
- Installation of local capture hoods for tapping and ductwork to connect to the new baghouse.
- Installation of dampers, actuators, automated operating system and other equipment associated with the new ductwork.
- Repairs and upgrades to the enclosures at each BOPF.

b. For the purpose of this construction permit:

i. The "BOPFs" are the two existing Basic Oxygen Process Furnaces or Basic Oxygen Furnaces (BOFs) at the Granite City Works.

ii. The "BOPF baghouse" is the new baghouse for control of emissions from charging and tapping of the BOPFs.

iii. The "BOPF baghouse system" is the new control system for control of emissions from charging and tapping of the BOPFs, including the capture hoods, ductwork and the BOPF bagouse.

2. Integrated Processing

a. With this emission reduction project, when particulate emissions from tapping and charging of the BOPFs are controlled with the BOPF baghouse system, certain requirements in the CAAPP Permit for the source that currently address the BOPFs and the existing ESP control system would no longer be appropriate or necessary. This is because particulate emissions would also be controlled by the BOPF baghouse system. In particular, use of flame suppression to control emissions from tapping would no longer be practical because of the presence of induced draft from the local capture hoods. The BOPF baghouse system would also be designed with the capacity to control particulate emissions from tapping

of one BOPF and charging of the other BOPF at the same time so that certain portions of tapping and charging of the BOPFs and oxygen blowing of the BOPFs do not have to be staggered.

b. To make these consequences of this project for the future operation of the BOPFs clear and certain at the time that this construction permit was issued, this permit was subject to Integrated Processing pursuant to Section 39.5(13)(c)(v) of the Act and 35 IAC 270.302(e). In particular, this permit was subject to procedural requirements that are substantially equivalent to those that apply to CAAPP permits, including a public comment period and review of a proposed permit by USEPA. This permit also includes compliance requirements that are substantially equivalent to those that apply to CAAPP permits, e.g., it provides for Periodic Monitoring for the BOPF baghouse system. The specific changes to the CAAPP permit for the source (Permit 96030056) that may be made by administrative amendment pursuant to this construction permit to address operation of the BOPFs with the BOPF baghouse are set forth in Part 2 of this permit.

3. Applicable Regulatory Requirements

a. This permit does not affect applicable emission standards for the BOPFs, including associated control equipment, as set forth in the CAAPP permit for the source, Permit 96030056, including the following:

i. Applicable emission standards of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Integrated Iron and Steel Manufacturing Facilities, 40 CFR 63 Subpart FFFFF, including standards for both captured and uncaptured emissions.

ii. Applicable state emission standards in 35 IAC 212.446 and related provisions pursuant to 35 IAC Part 201 Subpart I that address operation of the BOPFs during malfunction or breakdown.

b. When the BOPF baghouse control system begins to operate and the existing ESP control system is only controlling primary particulate emissions of the BOPFs, the capture systems in the ESP control system would not be subject to operational requirements of the NESHAP, including operating parameter limits and associated operational monitoring. However, this construction permit would continue to impose such requirements on the capture systems in the ESP control system. (See Condition 1(c)(ii).)

4. Non-Applicability Provisions

a. This permit is issued based on this project not constituting a major modification subject to Prevention of Significant Deterioration (PSD), 40 CFR 52.21, or Major Stationary Sources

Construction and Modification (MSSCAM), 35 IAC Part 203. This is because this project is an emission reduction project that will reduce particulate emissions and will not act to increase production or emissions of any pollutants from the BOPFs.

b. This permit is issued based on this project, as described in the application, not constituting a modification of the BOPFs under the federal New Source Performance Standards (NSPS), 40 CFR 60 Subpart Na, as the project has the primary function of reducing emissions and therefore is not a modification pursuant to 40 CFR 60.14(e)(5).

CONDITIONS

1. Operational Requirements

a. The design capacity of the BOPF baghouse shall be at least 900,000 acfm, so as to be able to simultaneously control tapping of one BOPF and charging of the other and to control the simultaneous tapping of both BOPFs.

b. The Permittee shall prepare and submit to the Illinois EPA its initial revisions to the plans for the BOPFs required by the NESHAP, 40 CFR 63 Subpart FFFFF (i.e., the operation and maintenance plan required by 40 CFR 63.7800(b) and the startup, shutdown and malfunction plan required by 40 CFR 63.7810(c)) to address the BOPF baghouse system at least 30 days in advance of initial operation of the BOPFs with this system.

c. When the BOPF baghouse control system begins to operate:

i. The Permittee shall not conduct refining simultaneously in both BOPFs unless this mode of operation is authorized by an appropriate construction permit.

ii. The Permittee shall continue to operate the ESP capture systems in accordance with applicable operational requirements of the NESHAP for capture systems for secondary emissions from BOPFs (e.g. 40 CFR 63.7800(b)(1) and (3)), even though the ESP only controls primary emissions from the BOPFs.

d. After the shakedown of the BOPF baghouse system is complete and in no case later than six months after initial operation of the BOPFs with the BOPF baghouse system, the existing ESP shall only be used for control of emissions from charging and tapping of the BOPFs during an extended outage of the BOPF baghouse.

2. Emission Limit

a. Following completion of the shakedown period for the BOPF baghouse system, the emissions of particulate matter (PM) from the BOPF baghouse, as would be measured by USEPA Method 5, 5D or

17, shall not exceed 0.005 grains per dry standard cubic foot (gr/dcsf).

3-1. Emission Testing Requirements

a. The Permittee shall have emissions testing conducted for the BOPF baghouse and the existing ESP by a qualified testing service as follows:

i. A performance test for PM emissions shall be conducted within 180 days of initial operation of the BOPFs with the BOPF baghouse system, unless this is prevented by *force majeure* event(s), in which case, testing shall be conducted as soon as practicable after the force majeure event occurs.* This performance test shall be conducted in accordance with 40 CFR 63.7824(c) to verify compliance with applicable emission limits for PM set by the NESHAP and this permit and to establish new operating limits for the capture systems for the BOPFs pursuant to the NESHAP and this permit. For this purpose, performance testing shall be conducted for operation of the BOPFs with the BOPF baghouse and ESP systems.

* If testing is or will be delayed because of event(s) that the Permittee considers to constitute force majeure, the Permittee shall notify the Illinois EPA, as set forth by 40 CFR 63.7(a)(4).

ii. A. A further test for PM emissions and tests for emissions of filterable PM_{10} and $PM_{2.5}$, condensable particulate matter, lead, NO_x, CO and VOM shall be conducted within one year of initial operation of both BOPFs with charging and tapping controlled by the BOPF baghouse system. The measurements for emissions of PM and other pollutants required by these tests and the tests required by Condition 3-1(a)(iii) may be combined with other measurements required for the BOPFs if measurements are conducted within the time periods specified by these conditions. In conjunction with this emission testing, the Permittee shall conduct or have conducted measurements as necessary to evaluate the actual operation and capture efficiency achieved by the hoods for charging and tapping as compared to their design. These tests and measurements shall be the basis of the Project Report required by Condition 6(d) for the BOPF baghouse system.

B. Notwithstanding the above, testing for emissions of NO_x, CO or VOM from the BOPF baghouse need not be conducted if preliminary measurements for the pollutant indicate emissions are below the detection limit of the applicable test method.

iii. A follow-up test for emissions of PM, filterable PM_{10} and $PM_{2.5}$, condensable particulate matter and lead shall be conducted between 24 and 36 months of the completion of the emission testing required by Condition 3-1(a)(ii).

b. i. Testing for PM emissions shall be conducted using applicable methods and procedures specified by the NESHAP.

ii. Applicable USEPA test methods and procedures shall be used for testing of emissions of pollutants other than PM, including the following methods for measurement of the emissions of different pollutants, unless other methods are approved by the Illinois EPA as part of the approval of a test plan. Refer to 40 CFR 60, Appendix A, and 40 CFR 51, Appendix M, for USEPA test methods.

Filterable PM_{10} and $PM_{2.5}$	Method 201A
Condensable Particulate Matter	Method 202
Lead	Method 29
Nitrogen Oxides	Method 7E
Carbon Monoxide	Method 10
Volatile Organic Material	Method 25A

iii. During all test runs for emissions of PM and filterable PM_{10} and $PM_{2.5}$ required by Condition 3-1(a), observations of the opacity of the exhaust from the roof monitor of the BOPF shop shall also be conducted in accordance with applicable methods and procedures of the NESHAP, including 40 CFR 63.7823(d), and information recorded on the timing of charging, refining, tapping and deslagging of each BOPF, so opacity data may be correlated with the operation of the BOPFs.

c. The Permittee shall submit a written plan to the Illinois EPA for review and comment for this testing. This plan shall be submitted at least 60 days prior to the actual date of testing and include the following information at a minimum:

i. A description of the planned emission test.

ii. The person(s) who will be performing sampling and analysis and their experience with similar tests.

iii. The specific operating conditions under which testing will be performed, including a discussion of why these conditions will appropriately address operation of the BOPFs and associated control systems and the levels of operating parameters of the control systems at or within which compliance is intended to be shown.

iv. The specific determination of emissions intended to be made, including sampling and monitoring locations.

v. The test methods that will be used, with the specific analysis method.

vi. Any minor changes in standard methodology proposed to accommodate the specific circumstances of testing, with justification.

vii. A statement that the testing will be performed by a qualified independent testing service.

viii. If preliminary measurements will be made for emissions of NO_x, CO, or VOM from the BOPF baghouse, to determine whether emissions are below the detection limit of the applicable test method, a description of the proposed approach to such measurements.

d. i. Prior to carrying out each set of emission tests, the Permittee shall notify the Illinois EPA a minimum of 30 days prior to the scheduled date of these tests with the exact date and time that testing would begin, to enable the Illinois EPA to witness these tests.

ii. If the scheduled date for testing is changed, the Permittee shall inform the Illinois EPA within 5 working days of the new date and time for testing.

iii. Notwithstanding the above, the Illinois EPA may, at its discretion, accept notifications with shorter advance notice provided that the Illinois EPA will not accept such notifications if it interferes with the Illinois EPA's ability to observe testing.

e. The Permittee shall submit three copies of the Final Report(s) for emissions tests to the Illinois EPA no later than 60 days after completion of sampling. The Final Report shall include at a minimum:

i. General information, i.e., date of test, names of testing personnel, and names of Illinois EPA observers.

ii. A summary of the measured emissions in pounds per hour, lbs/ton steel and, for particulate matter, in gr/dscf.

iii. Detailed data for operating parameters of the control system during testing, including data recorded by the operational monitoring systems and, as applicable, proposed operating parameter limits based on the emission testing.

iv. Description of test method(s), including description of sampling points, sampling train, analysis equipment, and test schedule.

v. Data and calculations, including copies of all raw data sheets and records of laboratory analyses, sample calculations, and data on equipment calibration.

vi. A comparison of measured data to applicable emission standards and limits and a statement whether compliance was demonstrated.

vii. The data for opacity of the exhaust through the roof monitor of the BOPF shop during testing and the timing of charging, refining, tapping and deslagging of the BOPFs, as determined and recorded pursuant to Condition 3-1(b)(iii), accompanied by copies of the certification(s) pursuant to USEPA Method 9 of the individual(s) who made the observations of opacity.

viii. If emission testing for NO_x, CO or VOM from the BOPF baghouse was not conducted, as provided for by Condition 3-1(a)(ii)(B), documentation for the preliminary measurements that show emissions are below the detection limit of the applicable test method.

f. The Permittee shall retain copies of these reports for these emission tests for at least five years beyond the date that an emission test report is superseded by subsequent testing for all pollutants.

3-2. Requirements for Opacity Observations from the BOPF Shop

a. The Permittee shall conduct opacity observations for the BOPF shop as follows, while the capture systems for the BOPFs are operated, as practicable, at minimum values of the operating parameters at which the Permittee normally expects to operate these systems.

i. Observations shall be promptly conducted following initial operation of the BOPFs with the BOPF baghouse system.

ii. Thereafter, until the performance testing required by Condition 3-1(a)(i) is conducted, these observations shall be conducted at least every 15 operating days of the BOPFs.

b. These observations shall be conducted in accordance with 40 CFR 63.6(h)(5) and 63.7823(d). As these observations must extend over at least three steel production cycles pursuant to 40 CFR 63.7823(d)(ii), opacity observations that the Permittee is otherwise required to conduct for the BOPF Shop may provide a portion of these observations.

c. The Permittee shall submit individual reports to the Illinois EPA for these opacity observations, which reports shall be submitted within 10 days of the date of observations. In addition to relevant information for reports for opacity observations, these reports shall include the actual values of the operating

parameters of the capture systems for the BOPF that were monitored during each steel production cycle for which observations were conducted.

3-3. Additional Testing Requirements

a. In conjunction with the emission testing required by Condition 3-1(a)(ii) or (iii), the Permittee shall conduct or have conducted measurements as necessary for a determination of the PM control efficiency of the BOPF baghouse during normal operation of the BOPFs, including associated control systems, which efficiency may be determined either "directly" (e.g., by measurements of the PM loading at the inlet of the BOPF baghouse for comparison to the measured PM emission rate) or "indirectly" (e.g., by recordkeeping for the amount of material collected by this baghouse over a week or month, to determine an average collection rate per hour or per steel production cycle, for comparison to the measured emission rate).

b. These measurements and the determination of the PM control efficiency of the BOPF baghouse, in percent, shall be included in the relevant report for emission testing pursuant to Condition 3-1(e).

4. Monitoring and Instrumentation Requirements

a. The Permittee shall fulfill applicable monitoring requirements of the NESHAP, 40 CFR 63 Subpart FFFFF, for the BOPF baghouse system, including:

i. Monitoring, as required by 40 CFR 63.7800(b)(3) and 63.7830(a), for selected operating parameters of each capture system that are appropriate for its design and representative and reliable indicators of the performance of the capture system. At a minimum, the selected parameters must include parameters that indicate the level of the ventilation draft and the damper position settings for the capture system when operating to collect emissions, including revised settings for seasonal variations. The selection of operating parameters must be supported by documentation in the revised operation and maintenance plan for the BOPFs.

ii. Operating a bag leak detection system on the BOPF baghouse, as required by 40 CFR 63.7830(b)(1) and 63.7833(c)(1) and (4), with timely initiation of appropriate corrective action(s) in the event that the bag leak detection system alarm is triggered and fulfillment of associated recordkeeping and reporting requirements.

iii. The Permittee shall make its initial revisions, as needed to address the BOPF baghouse system, to the site-specific monitoring plan for the BOPFs required by 40 CFR

63.7831(a), at least 30 days in advance of initial operation of the BOPFs with the BOPF baghouse system.

b. The Permittee shall monitor the following operating parameters for the BOPF baghouse system if not otherwise monitored pursuant to the NESHAP. For this purpose, the Permittee may either directly monitor these parameters or indirectly derive and automatically record data for these parameters from other operating parameters that are continuously monitored.

i. The actual volumetric flow rate, in cubic feet per minute (acfm), through each separately ducted hood.

ii. The actual volumetric flow rate (acfm) at the inlet to the baghouse.

c. When the BOPF baghouse control system begins to operate and the ESP is only controlling primary emissions, the Permittee shall continue to conduct operational monitoring for the capture systems associated with the ESP in accordance with relevant monitoring requirements of the NESHAP (e.g., 40 CFR 63.7830(a) and 63.7831(e)), even though the ESP only controls primary emissions of the BOPFs.

5. Recordkeeping Requirements

a. The Permittee shall maintain a file or other records that contain the following information for the BOPF baghouse system:

i. Design data for the capture hoods for charging and tapping, including the analysis for the levels of capture achieved by the hoods for emissions of particulate, i.e., percentages of total emissions from charging and tapping that are collected and directed to the BOPF baghouse.

ii. The manufacturer's specifications for the capacity (acfm and scfm) and particulate emissions (gr/dscf) of the BOPF baghouse and the manufacturer's recommended operating and maintenance procedures for this baghouse.

b. After charging and tapping of both BOPFs first begin to be controlled with the BOPF baghouse system, the Permittee shall keep records of the following information for the BOPFs. The preparation of these records by the Permittee may be automated or these records may be prepared manually or by a combination of manual and automated methods. These records may be combined with other records that are kept by the Permittee for the BOPFs.

i. Records for the BOPFs for the total number of steel production cycles per day (24-hours).

ii. Records for the following information, as calculated from data monitored pursuant to Condition 4(b):

A. The average flow rate through each separately ducted hood for each BOPF for each steel production cycle (acfm).

B. The average flow rate at the inlet to the BOPF baghouse per steel production cycle (acfm/cycle), daily (24-hour) average.

C. The average flow rate at the inlet to the ESP per steel production cycle (acfm/cycle), daily (24-hour) average.

c. After tapping and charging of both BOPFs first begin to be controlled with the BOPF baghouse system, the Permittee shall keep records for periods when charging or tapping of a BOPF is not controlled by this system, including a description of the event, the probable cause(s) of the event, the remedial action(s) taken and any measure(s) taken to prevent similar events in the future.

d. The Permittee shall retain records required by this permit and make them available to the Illinois EPA and USEPA in accordance with Conditions 5.9.6(a) and (b) of the CAAPP permit for the source, Permit 96030056.

6. Reporting Requirements

a. The Permittee shall notify the Illinois EPA of the following events with respect to the design, construction and shakedown of the BOPF baghouse system:

i. Finalization of the design for the BOPF baghouse, within 15 days of the date that this occurs, which notification shall include the following information: total filter area, number of compartments, number of bags and dimensions and the selected filter material with performance specifications.

ii. The planned date for initial operation of the BOPF(s) with the BOPF baghouse system, at least 5 days in advance, which notification shall also include the date on which it is expected that the opacity observations required by Condition 3-2(a)(i) will be conducted. If operation with this system will be phased, i.e., the emissions from charging and tapping of both BOPFs will not initially all be controlled by this system, this notification shall include the planned schedule for phase-in of control of emissions by this system.

iii. The date that tapping and charging of both BOPFs are initially controlled with the BOPF baghouse system, no later than 30 days after this date.

iv. The date that the shakedown of the BOPF baghouse system is completed, no later than 30 days after this date.

b. The Permittee shall notify the Illinois EPA of periods, if any, during the construction of the BOPF baghouse system that would be accompanied by extended interruptions in the operation of the BOPFs (i.e., interruptions whose expected duration would be longer than 72 hours). For this purpose, the Permittee may provide a separate notice in advance of each such period, with the notice submitted at least 5 days in advance, if possible, or otherwise as soon as practical. Alternatively, the Permittee may provide copies of the schedules for the construction of the BOPF baghouse system identifying such periods, with a schedule initially submitted within 10 days of the initial development of the schedule and revised schedules submitted within 15 days of substantial revisions to the schedule. These notifications need only be submitted to the Illinois EPA's Regional Office in Collinsville and may be submitted either by facsimile or by electronic mail.

c. After the shakedown of the BOPF baghouse system is complete, the Permittee shall notify the Illinois EPA if the ESP will be used for control of emissions from charging and tapping of the BOPFs, with description of the planned use of the ESP and explanation.

d. Within 18 months of the date that tapping and charging of both BOPFs are initially controlled with the BOPF baghouse system, the Permittee shall submit a Project Report to the Illinois EPA that evaluates the emissions of particulate (as PM_{10} and $PM_{2.5}$) and lead from the BOPFs with the BOPF baghouse system. This one-time report shall include the following:

i. An assessment of the actual levels of capture (percent) that are achieved for emissions from charging and tapping, during normal operation of the BOPFs and control systems.

ii. An assessment of overall emissions of particulate matter and lead from the BOPFs on a short-term basis (in lbs/hour and lbs/ton of steel), with typical and maximum emission rates, for normal operation.

iii. A review of the probable effect of upsets in the operation of the BOPF baghouse system on the short-term emissions of the BOPFs, considering upsets that have been experienced.

iv. An assessment of the distribution of emissions of particulate and lead from the BOPFs between the ESP, BOPF baghouse and roof monitor (uncaptured emissions) on a short-term basis, with the typical distribution of emissions, the distribution of emissions with maximum emissions at the roof monitor, and the distribution of emissions with maximum emissions at the ESP, all for normal operation.

vi. An assessment of the actual reductions in annual emissions of particulate matter (tons/year) from the BOPFs that should be achieved with the BOPF baghouse system.

vii. An assessment of the typical range of opacity from the roof monitor during tapping of a single BOPF, charging of a single BOPF, overlapping tapping and charging of the BOPFs, and periods of operation other than charging and tapping.

viii. Appropriate data and analysis to support the above assessments.

PART 2: CHANGES THAT ARE "PRE-AUTHORIZED" TO THE CAAPP PERMIT

Provisions of CAAPP Permit 96030056 (abridged) Marked to Show the Changes That May Be Made to the Provisions by Administrative Amendment Pursuant to Integrated Processing

These changes may only be made after the Permittee has confirmed its intention to proceed with this emission reduction project as described in the application for this construction permit and as addressed by Part 1 of this permit.

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10.0 ATTACHMENTS

1 Example Certification by a Responsible Official
2 Emissions of Particulate Matter from Process Emission Units

Note: This permit has two version of Section 7.5, which contains the unit-specific conditions for the Basic Oxygen Processes. The first version reflects the "current version" of Section 7.5, as was also present in the previous CAAPP permit for the source. This version of Section 7.5 only applies until a new baghouse control system that is part of an emission reduction project for the Basic Oxygen Process Furnaces (BOPFs) begins operation to control particulate emissions of these furnaces. The second version of Section 7.5 addresses the future operation of the BOPFs with the new baghouse control system and will become applicable when the new baghouse system begins operation to control emissions of these furnaces, superseding the first version of Section 7.5.

Changes to Current Section 7.5 of the CAAPP Permit (abridged)

7.5 Basic Oxygen Processes – Version 1

Note: This is the first version of Section 7.5 in this permit. This version only applies until a new baghouse control system that is part of an emission reduction project for the Basic Oxygen Process Furnaces (BOPFs) begins operation to control particulate emissions of these furnaces. At such time, the second version of Section 7.5 will become applicable, superseding this version of Section 7.5. (See Condition 7.5.15.)

(No changes to Conditions 7.5.1 through 7.5.14)

7.5.15 Transition

This version of Section 7.5 only applies until a new baghouse control system that is part of an emission reduction project for the BOP furnaces, which is addressed by Construction Permit 11050006, begins operation to control particulate emissions of these furnaces. At such time, the second version of Section 7.5 will become applicable, superseding this version of Section 7.5.

Changes to Add a New Version of Section 7.5 to the CAAPP Permit

7.5 Basic Oxygen Processes - Version 2

Note: This is the second version of Section 7.5 in this permit. This version of Section 7.5 will become applicable when the new baghouse control system for the BOPFs begins operation to control emissions of these furnaces. At such time, this version of Section 7.5 will supersede the first version of Section 7.5. (See Condition 7.5.15.)

7.5.1 Description

Reladling and Desulfurization Stations:

Molten iron is received by rail from the blast furnaces in torpedo cars. The iron is then transferred to the charging ladles at the reladling station. In the desulfurization stations a combination of lime and magnesium is injected into the molten iron to remove the sulfur. The sulfur reacts with the lime and magnesium and forms a layer of slag on the surface of the iron. A collection system with a positive pressure baghouse is used to control emissions of particulate matter from these stations.

Slag Skimming:

After the molten iron is desulfurized, the ladle it is moved to this station where a mechanical arm is used to scrape slag from the surface of the iron into slag pots. A collection system with a baghouse is used to control emissions from this process.

Basic Oxygen Process Furnaces (BOPFs or BOFs):

The steel production cycle or "heat" in a BOPF begins with the charging of scrap metal into the BOPF vessel. Molten iron is then charged into the vessel. During periods of reduced molten iron availability, the scrap metal may be preheated with a natural gas fired lance to increase its temperature and reduce the amount of molten iron that is needed. Flux materials are also added to the vessel. After the BOPF is charged, an oxygen lance is inserted through the roof of the BOPF to begin the refining phase with the "oxygen blow". In the BOPF, the injected oxygen reacts exothermically with the carbon in the iron generating heat, melting the scrap and reducing the amount of carbon in the bath, thus converting the iron to steel. When refining is completed, the BOPF is tapped, by pouring the molten steel from the vessel into a transfer ladle. After tapping, the slag is emptied from the vessel into a slag ladle, preparing the BOPF for the next heat. The steel production cycle is then repeated.

Emissions of particulate from the BOPFs from charging and tapping (also referred to as "secondary emissions") are captured by local hoods and ducted to a baghouse (the BOPF baghouse

system). Emissions of particulate from refining are captured by the roofs over the BOPFs and ducted to an electrostatic precipitator (the ESP system). The openings in the roofs of the BOPFs for the oxygen lances are also fitted with steam rings. The steam rings inject steam into the area between the oxygen lance and the "lance hole," acting to suppress particulate emissions through this area during oxygen blowing.

Ladle Preheating and Drying:

In this unit, lances combust either natural gas or coke oven gas to produce the heat needed to dry and preheat iron and steel handling ladles. The refractory linings of freshly re-bricked or repaired ladles must be completely dried and preheated before use. The drying process is necessary because any moisture left in the refractory would immediately vaporize and expand when the ladles are filled with molten metal. This sudden expansion could cause the refractory lining to split which would allow the molten metal to come into contact with, and damage the shell of the ladle. Emissions from this unit consist of particulate matter, sulfur dioxide, nitrogen oxides, carbon monoxide and organic materials from fuel combustion.

Ladle Metallurgy Furnaces (LMF) and Argon Stirring Stations:

At the LMF station and the argon stirring stations, final adjustments are made to the composition of a ladle of steel and the steel is held pending casting. At the LMF station, electricity can also be used to heat a ladle of steel if it has cooled below the range at which steel can be cast.

If the steel does not need to be reheated and at most minor adjustments are needed to its composition, the ladle of steel goes to one of the two argon stirring stations. At these stations, stirring lances are inserted into the steel and argon is pumped into the steel to maintain uniform composition and temperature. A baghouse is also used to control emissions from the operations.

Note: This narrative description is for informational purposes only and is not enforceable.

7.5.2 List of Basic Oxygen Processes and Air Pollution Control Equipment

Location	Descriptions	Date Constructed	Emission Control Equipment
Basic Oxygen Process Furnace (BOPF) Shop	Hot Metal Transfer Station	Prior to 05/1983	Reladle/ Desulfurization Baghouse
	Two Hot Metal Desulfurization Stations		
	Slag Skimming Station	1985	Skimmer Baghouse

Location	Descriptions	Date Constructed	Emission Control Equipment
Basic Oxygen Process Furnace (BOPF) Shop	Hot Metal Transfer Station	Prior to 05/1983	Reladle/ Desulfurization Baghouse
	Two Hot Metal Desulfurization Stations		
	Slag Skimming Station	1985	Skimmer Baghouse
	Basic Oxygen Process Furnaces (BOPFs or BOFs) #1 and #2, with Steam Rings	Prior to 08/1972	Baghouse (Charging and Tapping) and Electrostatic Precipitator (Refining)
	Ladle Drying/Preheating (coke oven gas and natural gas modes)	Prior to 08/1972	None
	Ladle Metallurgy Furnace (LMF) Station	Prior to 1986	Baghouse #2
	Argon Stirring Stations	Around 1988	

7.5.3-1 Applicable State Provisions

a. Pursuant to 35 IAC 212.446, emissions of particulate matter from basic oxygen processes shall be controlled as follows:

i. Charging, Refining and Tapping (BOF Operations). Particulate matter emissions from all basic oxygen furnaces (BOFs) shall be collected and ducted to pollution control equipment. Emissions from basic oxygen furnace operations during the entire cycle (operations from the beginning of the charging process through the end of the tapping process) shall not exceed the allowable emission rate specified by 35 IAC 212.322. For purposes of computing the process weight rate, nongaseous material charged to the furnace and process oxygen shall be included. No material shall be included more than once [35 IAC 212.446(a)].

ii. Hot Metal Transfer, Hot Metal Desulfurization and Ladle Lancing.

Particulate matter emissions from hot metal transfers to a mixer or ladle, hot metal desulfurization operations and ladle lancing shall be collected and ducted to pollution control equipment, and emissions from the pollution control equipment shall not exceed 69 mg/dscm (0.03 gr/dscf) [35 IAC 212.446(b)(1)].

iii. For openings in the building housing the BOFs, no person shall cause or allow emissions to exceed an opacity of 20 percent, as determined by averaging any

12 consecutive observations taken at 15 second intervals [35 IAC 212.446(c)].

b. Pursuant to 35 IAC 212.458, no person shall cause or allow emissions of PM_{10}, other than that of fugitive particulate matter, into the atmosphere to exceed the following limits during any one hour period:

i. 32.25 ng/J (0.075 lbs/mmBtu) of heat input from the burning of coke oven gas (at ladle dryers/preheaters) [35 IAC 212.458(b)(9)].

ii. 27.24 kg/hr (60 lbs/hr) and 0.1125 kg/Mg (0.225 lbs/T) of total steel in process whichever limit is more stringent for the total of all basic oxygen furnace operations (charging, refining and tapping, as described in 35 IAC 212.446(a)) and measured at the BOF stack [35 IAC 212.458(b)(23)].

iii. 22.9 mg/scm (0.01 gr/scf) from any process emissions unit, except as otherwise provided in 35 IAC 212.458 or in 35 IAC 212.443 and 212.446 [35 IAC 212.458(b)(7)].

c. Pursuant to 35 IAC 212.123(a), no person shall cause or allow the emission of smoke or other particulate matter, with an opacity greater than 30 percent, into the atmosphere from any emission unit other than those emission units subject to the requirements of 35 IAC 212.122, except as allowed by 35 IAC 212.123(b) and 212.124.

d. The basic oxygen processes are subject to 35 IAC 214.301, which provides that no person shall cause or allow the emission of SO_2 into the atmosphere from any process emission source to exceed 2000 ppm.

7.5.3-2 Applicable NESHAP Provisions

a. i. The Basic Oxygen Processes are subject to 40 CFR Part 63, Subpart FFFFF, the NESHAP for Integrated Iron and Steel Manufacturing Facilities. Applicable provisions of this NESHAP are addressed below and in other conditions of this section of the permit (Section 7.5).

ii. The Permittee shall operate and maintain the BOPFs and associated capture and control systems in accordance with applicable requirements of the NESHAP, 40 CFR 63 Subpart FFFFF, including requirements for operational monitoring, performance testing for opacity and emissions of particulate matter,* operation of capture and control systems within established limits for operating parameters,

implementation of specified operation and maintenance practices, recordkeeping and reporting. [T1]

* As related to testing of emissions, if the Permittee is not willing to consider all particulate matter measured by testing to be PM-10, as provided for by 35 IAC 212.108(a)(3), performance tests for emissions of particulate matter shall also include measurements for emissions of PM-10 in accordance with 35 IAC 212.108(a)(1) or (2).

Note: This condition, which was originally established in Construction Permit 95010001, as revised on December 17, 2012, requires the Permittee to comply with the operating and maintenance requirements of 40 CFR 63 Subpart FFFFF as the means to verify ongoing compliance with the requirements of Conditions 7.5.3-1(a)(iii) and (b)(ii) and to address implementation of good air pollution control practice for the BOPFs, including associated emission control systems. The requirements of the NESHAP are addressed below and in other conditions in this section of the permit.

b. Pursuant to 40 CFR 63.7790(a) and Table 1 to 40 CFR Part 63 Subpart FFFFF, the emissions from the Basic Oxygen Processes shall not exceed the following limits, which are applicable to operations at an existing basic oxygen process furnace (BOPF) shop:

i. The Permittee must not cause to be discharged to the atmosphere any gases that exit from a primary emission control system for a BOPF with an open hood system that contain, on a flow-weighted basis, particulate matter in excess of 0.02 gr/dscf during the steel production cycle. [NESHAP, Table 1, Paragraph 9(b)]

ii. The Permittee must not cause to be discharged to the atmosphere any gases that exit from a control device used solely for collection of secondary emissions from a BOPF that contain particulate matter in excess of 0.01 gr/dscf during the steel production cycle. [NESHAP, Table 1, Paragraph 9(c)]

iii. For each hot metal transfer, slag skimming, and hot metal desulfurization operation, the Permittee must not cause to be discharged to the atmosphere any gases that exit from a control device that contain particulate matter in excess of 0.01 gr/dscf. [NESHAP, Table 1, Paragraph 10]

iv. For each ladle metallurgy furnace operation, the Permittee must not cause to be discharged to the atmosphere any gases that exit from a control device that contain particulate matter in excess of 0.01 gr/dscf. [NESHAP, Table 1, Paragraph 11]

iv. For each roof monitor on the BOPF Shop, the Permittee must not cause to be discharged to the atmosphere any secondary emissions that exit any opening in the BOPF shop or any other building housing the BOPF shop operations that exhibit opacity greater than 20 percent (3-minute average). [NESHAP, Table 1, Paragraph 12]

c. Pursuant to 40 CFR 63.7790(b)(3), for each ESP applied to control emissions from a BOPF, the Permittee must maintain the hourly average opacity of emissions exiting the control device at or below 10 percent.

7.5.4 Non-Applicability of Regulations of Concern

a. Pursuant to 35 IAC 212.324(a)(3) and 212.316(f), the emission limitations of 35 IAC 212.324 and 212.316 are not applicable to the basic oxygen processes because these processes are subject to specific emission standards and limitations contained in 35 IAC Part 212 Subpart P, as addressed in Conditions 7.5.3-1(a) and (b).

b. Except where noted, 35 IAC 212.321 and 35 IAC 212.322 shall not apply to the steel manufacturing processes subject to 35 IAC 212.442 through 35 IAC 212.452 [35 IAC 212.441].

c. This permit is issued based on the basic oxygen processes not being subject to the applicable requirements of 35 IAC 219.301 because these processes do not emit photochemically reactive organic material as defined in 35 IAC 211.4690.

d. The basic oxygen processes are not subject to 35 IAC 216.121 because they are not fuel combustion emission units as defined in 35 IAC 211.2470.

7.5.5-1 NESHAP Requirements for Operation and Maintenance (40 CFR 63.7800 and 63.7833)

a. Pursuant to 40 CFR 63.7800(a), as required by 40 CFR 63.6(e)(1)(i), the Permittee must always operate and maintain each individual BOPF and each BOPF shop ancillary operation, including air pollution control and monitoring equipment, in a manner consistent with good air pollution control practices for minimizing emissions at least to the levels required by 40 CFR 63 Subpart FFFFF.

b. Pursuant to 40 CFR 63.7800(b), the Permittee shall prepare and operate at all times according to a written operation and maintenance plan for each capture system for secondary emissions from the BOPF and the ESP for the BOPF (which are subject to operating limits pursuant to 40 CFR 63.7790(b)) and the BOPF baghouse and other baghouses for BOF shop ancillary operations (which are required to have bag leak detection systems). Each plan shall address the following elements:

i. Monthly inspections of the equipment that is important to the performance of the total capture system (e.g., pressure sensors, dampers, and damper switches). This inspection shall include observations of the physical appearance of the equipment (e.g., presence of holes in ductwork or hoods, flow constrictions caused by dents or accumulated dust in the ductwork, and fan erosion). The operation and maintenance plan also must include requirements to repair any defect or deficiency in the capture system before the next scheduled inspection. [40 CFR 63.7800(b)(1)]

ii. Preventative maintenance for each control device, including a preventative maintenance schedule that is consistent with the manufacturer's instructions for routine and long-term maintenance. [40 CFR 63.7800(b)(2)]

iii. Operating limits for each capture system applied to secondary emissions from the BOPF, which operating limits must be established according to the following requirements: [40 CFR 63.7800(b)(3)]

A. Select operating limit parameters appropriate for the capture system design that are representative and reliable indicators of the performance of the capture system. At a minimum, the Permittee must use appropriate operating limit parameters that indicate the level of the ventilation draft and the damper position settings for the capture system when operating to collect emissions, including revised settings for seasonal variations. Appropriate operating limit parameters for ventilation draft include, but are not limited to, volumetric flow rate through each separately ducted hood, total volumetric flow rate at the inlet to the control device to which the capture system is vented, fan motor amperage, or static pressure.

B. For each operating limit parameter selected above, designate the value or setting for the parameter at which the capture system operates during the process operation. As more than one process may operate simultaneously, designate the value or setting for the parameter at which the capture system operates during each possible configuration that the BOPF may operate.

C. Include documentation in the plan to support the selection of the operating limits established for the capture system. This documentation must include a description of the capture system design, a description of the capture system operating during production, a description of each selected operating limit parameter, a rationale for why you chose the parameter, a description of the method used to monitor the parameter according to the requirements of 40 CFR 63.7830(a), and the data used to set the value or setting for the parameter for each process configuration.

iv. Corrective action procedures for baghouses equipped with bag leak detection systems. In the event a bag leak detection system alarm is triggered, the Permittee shall initiate corrective action to determine the cause of the alarm within 1 hour of the alarm, initiate corrective action to correct the cause of the problem within 24 hours of the alarm, and complete the corrective action as soon as practicable. Corrective actions may include, but are not limited to the following: [40 CFR 63.7800(b)(4)]

A. Inspecting the baghouse for air leaks, torn or broken bags or filter media, or any other condition that may cause an increase in emissions.

B. Sealing off defective bags or filter media.

C. Replacing defective bags or filter media or otherwise repairing the control device.

D. Sealing off a defective baghouse compartment.

E. Cleaning the bag leak detection system probe, or otherwise repair the bag leak detection system.

F. Shutting down the process producing the particulate emissions.

v. Corrective action procedures for the ESP, as it is equipped with a COMS. In the event the ESP exceeds the opacity operating limit in 40 CFR 63.7790(b)(3), the Permittee shall take corrective actions consistent with the site-specific monitoring plan in accordance with 40 CFR 63.7831(a)(8). [40 CFR 63.7800(b)(6)]

7.5.5-2 Work Practices Provisions for Startup, Shutdown and Malfunction Plans and Associated Procedures

a. NESHAP Provisions

i. Pursuant to 40 CFR 63.7810, the Permittee must be in compliance with the emission limitations and operation and maintenance requirements in 40 CFR 63 Subpart FFFFF at all times, except during periods of startup, shutdown and malfunction as defined in 40 CFR 63.2

ii. Pursuant to 40 CFR 63.7810(c), the Permittee shall develop a written startup, shutdown, and malfunction plan for the BOPFs according to the provisions of 40 CFR 63.6(e)(3).

iii. Pursuant to 40 CFR 63.7835:

A. Consistent with 40 CFR 63.6(e) and 63.7(e)(1), deviations from NESHAP requirements that occur during a period of startup, shutdown, or malfunction are not violations if the Permittee demonstrates to the Illinois EPA that the Permittee was operating in accordance with 40 CFR 63.6(e)(1).

B. The Illinois EPA will determine whether deviations that occur during a period of startup, shutdown, or malfunction are violations, according to the provisions in 40 CFR 63.6(e).

iv. The Permittee shall fulfill the applicable reporting requirements identified in Condition 5.10.5(b) and 40 CFR 63.7841(b)(4) and (c).

v. The Permittee shall keep records in accordance with 40 CFR 63.7842(a)(2) related to startup, shutdown and malfunction.

b. Provisions of State Emission Standards, Pursuant to 35 IAC 201.149 and Part 201 Subpart I

i. Subject to the following terms and conditions, the Permittee is authorized to continue to operate in violation of the applicable standards as specified below in the event of a malfunction or breakdown.

A. For the BOPFs, the applicable state standards in Condition 7.5.3-1(a)(iii), (b)(ii) and (c), and

B. For the LMF, the applicable state standards in Conditions 7.5.3-1(b)(iii) and (c).

Note: This authorization is provided because the Permittee applied for such authorization in its CAAPP application, generally explaining why such continued operation would be required to prevent injury to personnel or severe damage to equipment, and describing the measures that will be taken to minimize emissions from any malfunctions and breakdowns.

ii. This authorization only allows such continued operation as necessary to prevent injury to personnel or severe damage to equipment and does not extend to continued operation solely for the economic benefit of the Permittee.

iii. Upon occurrence of excess emissions due to malfunction or breakdown, the Permittee shall, as soon as practicable, repair the units and/or re-establish applicable control practices.

iv. The Permittee shall fulfill the applicable recordkeeping requirements of Condition 7.5.9(h) and reporting requirements of Condition 5.10.5-2.

v. Following notification to the Illinois EPA (see Condition 5.10.5-2(a)(i)) of a malfunction or breakdown with excess emissions, the Permittee shall comply with all reasonable directives of the Illinois EPA with respect to such incident.

vi. This authorization does not relieve the Permittee from the continuing obligation to minimize excess emissions during malfunction or breakdown. As provided by 35 IAC 201.265, an authorization in a

permit for continued operation with excess emissions during malfunction and breakdown does not shield the Permittee from enforcement for any such violation and only constitutes a prima facie defense to such an enforcement action provided that the Permittee has fully complied with all terms and conditions connected with such authorization.

7.5.5-3 Work Practices from Permit 10080021 (T1)

a. During the refining phase of operation, the steam rings on the BOPFs shall be operated in accordance with written procedures developed by the Permittee that set forth the timing and rate of steam injection as related to furnace operation and reflect good air pollution control practice to minimize emissions of particulate matter.

7.5.5-4 Operational Requirements from Permit 11050006 [T1]

a. The design capacity of the BOPF baghouse shall be at least 900,000 acfm, so as to be able to simultaneously control tapping of one BOPF and charging of the other BOPF and the simultaneous tapping of both BOPFs.

b. When the BOPF baghouse control system begins to operate:

i. The Permittee shall not conduct oxygen blowing simultaneously in both BOPFs unless this mode of operation is authorized by an appropriate construction permit.

ii. The Permittee shall continue to operate the capture systems that are part of the ESP control system in accordance with applicable operational requirements of the NESHAP for capture systems for secondary emissions from BOPFs (e.g. 40 CFR 63.7800(b)(1) and (3)), even though the ESP control system only controls primary emissions from the BOPFs.

c. After the shakedown of the BOPF baghouse system is complete and in no case later than six months after initial operation of the BOPFs with the BOPF baghouse system, the ESP shall only be used for control of emissions from charging and tapping of the BOPFs during an extended outage of the BOPF baghouse.

7.5.6 Production and Emission Limitations from Permits 95010001 and 83050042

a. Total combined production of liquid steel from the BOPFs shall not exceed 11,000 net tons per day, averaged over any calendar month. [T1]

b. BOF Shop Emissions (tons/yr total) shall not exceed the following limits: [T1]

PM	PM_{10}	NO_x	VOM	CO	Lead
510	451	70	12	16,097	1.43

c. BOF ESP Stack emissions shall not exceed the following limits: [T1]

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.16	262.80
PM_{10}	0.16	262.80
NO_x	0.0389	69.63
VOM	0.0060	10.74
CO	8.993	16,097.47
Lead	0.1934 lbs/hr	1.26

d. BOP Roof Monitor emissions shall not exceed the following limits: [T1]

Pollutant	(Lbs/Ton)	(Tons/Yr)
PM	0.0987	176.71
PM_{10}	0.06614	118.40
Lead	0.0129 lbs/hr	0.08

e. Hot Metal Desulfurization and Hot Metal Transfer emissions shall not exceed the following limits: [T1]

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.03721	58.88
PM_{10}	0.03721	58.88
VOM	0.0010	1.58
Lead	0.0133 lbs/hr	0.09

f. Hot metal charging and ladle slag skimming emissions shall not exceed the following limits: [T1]

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.0050	7.94
PM_{10}	0.0050	7.94

g. Emissions from Argon Stirring Station and Material Handling Tripper (Ladle Metallurgy Baghouse #2) shall not exceed the following limits: (See also Section 7.1)

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)

PM	0.00715	12.80
PM_{10}	0.00715	12.80

h. Compliance with the annual limits in Conditions 7.5.6(b) through (g) shall be determined on a calendar year basis. [T1]

Note: These provisions (Conditions 7.5.6(a) through (h) were originally established in Construction Permit 95010001.

i. Emissions of particulate matter from the Ladle metallurgy station and the existing argon stirring station shall not exceed 16.20 tons per year. [T1]

j. The maximum process weight for 1) argon stirring, 2) ladle reheat, 3) alloy addition, 4) ladle slag skimming, and 5) hot metal desulfurization shall not exceed 356.7 tons per hour for 8,760 hours per year. [T1]

Note: These provisions (Conditions 7.5.6(i) and (j)) were originally established in Permit 83050042.

7.5.6-1 Emission Limit from Permit 11050006

a. Following completion of the shakedown period for the BOPF baghouse system, the emissions of particulate matter (PM) from the BOPF baghouse, as would be measured by USEPA Method 5, 5D or 17, shall not exceed 0.005 grains per dry standard cubic foot (gr/dcsf).

7.5.7 Testing Requirements

a. Testing Requirements in 40 CFR Part 63 Subpart FFFFF:

i. For the BOPFs, pursuant to testing provisions of this NESHAP, as provided below, testing of particulate matter (PM) emissions of the ESP shall be conducted at least every 30 months and testing of the BOPF baghouse shall be conducted at least every five years.

A. Pursuant to 40 CFR 63.7821(b), for the BOPFs (which are equipped with a control device other than a baghouse), the Permittee shall conduct performance tests for the ESP no less frequently than twice (at mid-term and renewal) during each term of the title V operating permit (i.e., this CAAPP permit).

B. Pursuant to 40 CFR 63.7821(c), for the BOPFs (as they are equipped with a baghouse), the Permittee shall conduct performance tests for

the baghouse no less frequently than once every 60 months.

ii. Pursuant to 40 CFR 63.7821(c), for each BOPF Process equipped with a baghouse, other than the BOPFs, the Permittee shall conduct subsequent performance tests no less frequently than once during each term of the Title V operating permit (every 60 months).

iii. The Permittee shall use the following test methods for compliance demonstration with the emission limits for particulate matter: [40 CFR 63.7822(b)]

A. The Permittee shall determine the concentration of particulate matter according to the following test methods in Appendix A to 40 CFR Part 60.

1. Method 1 to select sampling port locations and the number of traverse points. Sampling ports must be located at the outlet of the control device and prior to any releases to the atmosphere.

2. Method 2, 2F, or 2G to determine the volumetric flow rate of the stack gas.

3. Method 3, 3A, or 3B to determine the dry molecular weight of the stack gas.

4. Method 4 to determine the moisture content of the stack gas.

5. Method 5, 5D, or 17, as applicable, to determine the concentration of particulate matter (front half filterable catch only).

B. The Permittee shall collect a minimum sample volume of 60 dry standard cubic feet (dscf) of gas during each particulate matter test run. Three valid test runs are needed to comprise a performance test.

iv. Pursuant to 40 CFR 63.7822(g), for the ESP (which is a primary emission control system applied to emissions from a BOPF with an open hood system), the Permittee shall complete the following requirements:

A. Sample only during the steel production cycle. The Permittee shall conduct sampling under

conditions that are representative of normal operation. The Permittee shall record the start and end time of each steel production cycle and each period of abnormal operation; and

B. Sample for an integral number of steel production cycles. The steel production cycle begins when the scrap is charged to the BOF and ends 3 minutes after the slag is emptied from the vessel into the slag pot.

v. Pursuant to 40 CFR 63.7822(h), for a control device applied to emissions from BOPF shop ancillary operations (hot metal transfer, slag skimming, hot metal desulfurization, or ladle metallurgy), the Permittee shall sample only when the operation(s) is being conducted.

vi. The Permittee shall conduct each visible emissions performance test such that the opacity observations overlap with the performance test for particulate matter (PM). [40 CFR 63.7823(b)]

vii. The following test methods shall be used for opacity observations pursuant to 40 CFR 63.7823(d):

Using a certified observer, the Permittee shall determine the opacity of emissions according to Method 9 in Appendix A to Part 60 as specified below:

A. Instead of procedures in section 2.4 of Method 9 in Appendix A to 40 CFR Part 60, the Permittee shall record observations to the nearest 5 percent at 15-second intervals for at least three steel production cycles.

B. Instead of procedures in section 2.5 of Method 9 in Appendix A to 40 CFR Part 60, the Permittee shall determine the 3-minute block average opacity from the average of 12 consecutive observations recorded at 15-second intervals.

b. Pursuant to Sections 39.5(7)(d) and (p) of the Act, in conjunction with the testing of emissions required for an emission unit in the BOPF shop by the NESHAP (Condition 7.5.7(a), which requires testing at the midterm and renewal of this CAAPP permit), the Permittee shall also have testing conducted to measure emissions of other pollutants as follows.

i. Testing shall be conducted for PM/PM_{10}*, lead and other pollutants as follow: BOPFs (ESP) - NO_x, VOM and CO; and Hot Metal Desulfurization and Slag Skimming (Baghouses) - VOM.

* As an alternative to measurements for PM_{10} emissions, the measured results for PM, as determined in accordance with the NESHAP, shall be considered PM_{10}, as provided for by 35 IAC 212.108.

ii. The relevant test method specified by the NESHAP or the following USEPA test methods shall be used for this testing, unless another USEPA test method is approved by the Illinois EPA during the review of a Test Plan submitted by the Permittee prior to testing.

Location of Sample Points	Method 1
Gas Flow and Velocity	Method 2
Flue Gas Weight	Method 3
Moisture	Method 4
VOM	Method 18 or 25A
NO_x	Method 7E or 19
CO	Method 10 or 10B
Lead	Method 29

iii. For this emission testing, test notifications and reporting shall be done by the Permittee in accordance with Condition 8.6.2 and 8.6.3 of this permit.

c. As provided by 35 IAC 212.446(c), observations to determine compliance with the opacity standard in 35 IAC 212.446(c) (see Condition 7.5.3-1(a)(iii)) shall be performed in accordance with 40 CFR Part 60, Appendix A, Method 9, incorporated by reference in 35 IAC 212.113, except that compliance shall be determined by averaging any 12 consecutive observations taken at 15 second intervals.

7.5.7-1 Emission Testing Requirements from Permit 11050006

a. The Permittee shall have emissions testing conducted for the BOPF baghouse and ESP by a qualified testing service as follows:

i. A performance test for PM emissions shall be conducted within 180 days of initial operation of the BOPFs with the BOPF baghouse system, unless this is prevented by *force majeure* event(s), in which case, testing shall be conducted as soon as practicable after the force majeure event occurs.* This performance test shall be conducted in accordance with 40 CFR 63.7824(c) to verify compliance with

applicable emission limits for PM set by the NESHAP and this permit and to establish new operating limits for the capture systems for the BOPFs pursuant to the NESHAP and this permit. For this purpose, performance testing shall be conducted for operation of the BOPFs with the BOPF baghouse and ESP systems.

* If testing is or will be delayed because of event(s) that the Permittee considers to constitute force majeure, the Permittee shall notify the Illinois EPA, as set forth by 40 CFR 63.7(a)(4).

ii. A. A further test for PM emissions and tests for emissions of filterable PM_{10} and $PM_{2.5}$, condensable particulate matter, lead, NO_x, CO and VOM shall be conducted within one year of initial operation of both BOPFs with charging and tapping controlled by the BOPF baghouse system. The measurements for emissions of PM and other pollutants required by these tests and the tests required by Condition 7.5.7-1(a)(iii) may be combined with other measurements required for the BOPFs if measurements are conducted within the time periods specified by these conditions. In conjunction with this emission testing, the Permittee shall conduct or have conducted measurements as necessary to evaluate the actual operation and capture efficiency achieved by the hoods for charging and tapping as compared to their design. These tests and measurements shall be the basis of the Project Report required by Condition 7.5.10-1(c)(iii) for the BOPF baghouse system.

B. Notwithstanding the above, testing for emissions of NO_x, CO or VOM from the BOPF baghouse need not be conducted if preliminary measurements for the pollutant indicate emissions are below the detection limit of the applicable test method.

iii. A follow-up test for emissions of PM, filterable PM_{10} and $PM_{2.5}$, condensable particulate matter and lead shall be conducted between 24 and 36 months of the completion of the emission testing required by Condition 7.5.7-1(a)(ii).

b. i. Testing for PM emissions shall be conducted using applicable methods and procedures specified by the NESHAP.

ii. Applicable USEPA test methods and procedures shall be used for testing of emissions of pollutants other than PM, including the following methods for measurement of the emissions of different pollutants, unless other methods are approved by the Illinois EPA as part of the approval of a test plan. Refer to 40 CFR 60, Appendix A, and 40 CFR 51, Appendix M, for USEPA test methods.

Filterable PM_{10} and $PM_{2.5}$	Method 201A
Condensable Particulate	Method 202
Lead	Method 29
Nitrogen Oxides	Method 7E
Carbon Monoxide	Method 10
Volatile Organic Material	Method 25A

iii. During all test runs for emissions of PM and filterable PM_{10} or $PM_{2.5}$ required by Condition 7.5.7-1(a), observations of the opacity of the exhaust from the roof monitor of the BOPP shop shall also be conducted in accordance with applicable methods and procedures of the NESHAP, including 40 CFR 63.7823(d), and information recorded on the timing of charging, refining, tapping and deslagging of each BOPF, so opacity data may be correlated with the operation of the BOPFs.

c. The Permittee shall submit a written plan to the Illinois EPA for review and comment for this testing. This plan shall be submitted at least 60 days prior to the actual date of testing and include the following information at a minimum:

i. A description of the planned emission test.

ii. The person(s) who will be performing sampling and analysis and their experience with similar tests.

iii. The specific operating conditions under which testing will be performed, including a discussion of why these conditions will appropriately address operation of the BOPFs and associated control systems and the levels of operating parameters of the control systems at or within which compliance is intended to be shown.

iv. The specific determination of emissions intended to be made, including sampling and monitoring locations.

v. The test methods that will be used, with the specific analysis method.

vi. Any minor changes in standard methodology proposed to accommodate the specific circumstances of testing, with justification.

vii. A statement that the testing will be performed by a qualified independent testing service.

viii. If preliminary measurements will be made for emissions of NO_x, CO, or VOM from the BOPF baghouse to determine whether emissions are below the detection limit of the applicable test method, a description of the proposed approach to such measurements.

d. i. Prior to carrying out each set of emission tests, the Permittee shall notify the Illinois EPA a minimum of 30 days prior to the scheduled date of these tests with the exact date and time that testing would begin, to enable the Illinois EPA to witness these tests.

ii. If the scheduled date for testing is changed, the Permittee shall inform the Illinois EPA within 5 working days of the new date and time for testing.

iii. Notwithstanding the above, the Illinois EPA may, at its discretion, accept notifications with shorter advance notice provided that the Illinois EPA will not accept such notifications if it interferes with the Illinois EPA's ability to observe testing.

e. The Permittee shall submit three copies of the Final Report(s) for emissions tests to the Illinois EPA no later than 60 days after completion of sampling. The Final Report shall include at a minimum:

i. General information, i.e., date of test, names of testing personnel, and names of Illinois EPA observers.

ii. A summary of the measured emissions in pounds per hour, lbs/ton steel and, for PM, in gr/dscf.

iii. Detailed data for operating parameters of the control system during testing, including data recorded by the operational monitoring systems and, as applicable, proposed operating parameter limits based on the emission testing.

iv. Description of test method(s), including description of sampling points, sampling train, analysis equipment, and test schedule.

v. Data and calculations, including copies of all raw data sheets and records of laboratory analyses.

sample calculations, and data on equipment calibration.

vi. A comparison of measured data to applicable emission standards and limits and a statement whether compliance was demonstrated.

vii. The data for opacity of the exhaust through the roof monitor of the BOPF shop during testing and the timing of charging, refining, tapping and deslagging of the BOPFs, as determined and recorded pursuant to Condition 7.5.7-1(b)(iii), accompanied by copies of the certification(s) pursuant to USEPA Method 9 of the individual(s) who made the observations of opacity.

viii. If emission testing for NO_x, CO or VOM from the BOPF baghouse was not conducted, as provided for by Condition 7.5.7-1(a)(ii)(B), documentation for the preliminary measurements that show emissions are below the detection limit of the applicable test method.

f. The Permittee shall retain copies of the reports for these emission tests for at least five years beyond the date that an emission test report is superseded by subsequent testing for all pollutants.

7.5.7-2 Other Testing Requirements from Permit 11050006

a. In conjunction with the emission testing required by Condition 7.5.7-1(a)(ii) or (iii), the Permittee shall conduct or have conducted measurements as necessary for a determination of the PM control efficiency of the BOPF baghouse during normal operation of the BOPFs, including associated control systems, which efficiency may be determined either "directly" (e.g., by measurements of the PM loading at the inlet of the BOPF baghouse for comparison to the measured PM emission rate) or "indirectly" (e.g., by recordkeeping for the amount of material collected by this baghouse over a week or month, to determine an average collection rate per hour or per steel production cycle, for comparison to the measured emission rate).

b. These measurements and the determination of the PM control efficiency of the BOPF baghouse, in percent, shall be included in the relevant report for emission testing pursuant to Condition 7.5.7-1(e).

7.5.8 NESHAP Monitoring and Inspection Requirements

a. NESHAP Monitoring for Capture Systems (40 CFR 63.7830(a))

For each capture system for secondary emissions from the BOPFs (as it is subject to an operating limit pursuant to ~~in~~ 40 CFR 63.7790(b)(1) established in Permittee's capture system operation and maintenance plan), the Permittee shall install, operate, and maintain a continuous parameter monitoring system (CPMS) according to the requirements in 40 CFR 63.7830(a) and 63.7831(e).

b. NESHAP Monitoring for Baghouses (40 CFR 63.7830(b)(1) and 63.7833(c)))

The Permittee shall operate and maintain a bag leak detection system on each baghouse for the BOPFs and each baghouse for BOPF shop ancillary operation(s) (i.e., Baghouse #2, the slag skimmer baghouse and the BOPF baghouse) according to 40 CFR 63.7831(f) and 63.7833(c)(1) and (4) and monitor the relative change in particulate matter loadings according to the requirements in 40 CFR 63.7832.

c. NESHAP Inspections for Baghouses [40 CFR 63.7830(b)(4) and 63.7833(c)(2)]

The Permittee shall conduct inspections of each baghouse for the BOPFs and each baghouse for BOPF shop ancillary operation(s) at the specified frequencies according to the following requirements~~:~~. Pursuant to 40 CFR 63.7833(c)(3), the Permittee shall also maintain all records needed to document conformance with these requirements.

i. Monitor the pressure drop across each baghouse cell each day to ensure pressure drop is within the normal operating range identified in the operation and maintenance manual. [40 CFR 63.7830(b)(4)(i)]

ii. Confirm that dust is being removed from hoppers through weekly visual inspections or other means of ensuring the proper functioning of removal mechanisms. [40 CFR 63.7830(b)(4)(ii)]

iii. Check the compressed air supply for pulse-jet baghouses each day. [40 CFR 63.7830(b)(4)(iii)]

iv. Monitor cleaning cycles to ensure proper operation using an appropriate methodology. [40 CFR 63.7830(b)(4)(iv)]

v. Check bag cleaning mechanisms for proper functioning through monthly visual inspections or equivalent means. [40 CFR 63.7830(b)(4)(v)]

vi. Make monthly visual checks of bag tension on reverse air and shaker-type baghouses to ensure that bags are not kinked (kneed or bent) or laying on their sides. The Permittee does not have to make this check for shaker-type baghouses using self-tensioning (spring-loaded) devices. [40 CFR 63.7830(b)(4)(vi)]

vii. Confirm the physical integrity of the baghouse through quarterly visual inspections of the baghouse interior for air leaks. [40 CFR 63.7830(b)(4)(vii)]

viii. Inspect fans for wear, material buildup, and corrosion through quarterly visual inspections, vibration detectors, or equivalent means. [40 CFR 63.7830(b)(4)(viii)]

d. NESHAP Monitoring for the ESP [40 CFR 63.7830(d) and 63.7833(g)]

i. For the ESP for BOPFs (which is ~~are~~ subject to an opacity operating limit pursuant to 40 CFR 63.7790(b)(3)), the Permittee shall operate and maintain a continuous opacity monitoring system (COMS) according to the requirements in 40 CFR 63.7831(h) and monitor the hourly average opacity of emissions exiting the stack according to the requirements in 40 CFR 63.7832.~~.~~ [40 CFR 63.7830(d)]~~.~~

ii. If the hourly average opacity for the ESP for the BOPFs exceeds the operating limit, the Permittee shall follow the following procedures:

A. The Permittee shall initiate corrective action to determine the cause of the exceedance within 1 hour. During any period of corrective action, the Permittee must continue to monitor and record all required operating parameters for equipment that remains in operation. Within 24 hours of the exceedance, the Permittee shall measure and record the hourly average operating parameter value for the emission unit on which corrective action was taken. If the hourly average parameter value meets the applicable operating limit, then the corrective action was successful and the emission unit is in compliance with the applicable operating limit. [40 CFR 63.7833(g)(1)]

B. If the required initial corrective action was not successful, the Permittee shall complete additional corrective action within the next 24 hours (48 hours from the time of the exceedance). During any period of corrective action, the Permittee shall continue to monitor and record all required operating parameters for equipment that remains in operation. After this second 24-hour period, the Permittee shall again measure and record the hourly average operating parameter value for the emission unit on which corrective action was taken. If the hourly average parameter value meets the applicable operating limit, then the corrective action was successful and the emission unit is in compliance with the applicable operating limit. [40 CFR 63.7833(g)(2)]

C. For purposes of 40 CFR 63.7833(g)(1) and (2), in the case of an exceedance of the hourly average opacity operating limit for an ESP, measurements of the hourly average opacity based on visible emission observations in accordance with Method 9 may be taken to evaluate the effectiveness of corrective action. [40 CFR 63.7833(g)(3)]

D. If the second attempt at corrective action required by 40 CFR 63.7833(g)(2) was not successful, the Permittee shall report the exceedance as a deviation in the next semiannual compliance report according to 40 CFR 63.7841(b). [40 CFR 63.7833(g)(4)]

e. NESHAP Requirements for Installation, Operation, And Maintenance of Monitors for Baghouses [40 CFR 63.7831(f)]

For the BOPF baghouse and the baghouses for BOPF shop ancillary operations (i.e., the slag skimmer baghouse and Baghouse #2), which are all subject to 40 CFR 63.7830(b)(1)), the Permittee shall install, operate and maintain the bag leak detection system according to the following requirements of 40 CFR 63.7831(f) and monitor the relative change on particulate matter loading according to the requirements in 40 CFR 63.7832:

i. The system must be certified by the manufacturer to be capable of detecting emissions of particulate matter at concentrations of 10 milligrams per actual cubic meter (0.0044 grains per actual cubic foot) or less. [40 CFR 63.7831(f)(1)]

ii. The system must provide output of relative changes in particulate matter loadings. [40 CFR 63.7831(f)(2)]

iii. The system must be equipped with an alarm that will sound when an increase in relative particulate loadings is detected over a preset level. The alarm must be located such that it can be heard by the appropriate plant personnel. [40 CFR 63.7831(f)(3)]

iv. Each system that works based on the triboelectric effect must be installed, operated, and maintained in a manner consistent with the guidance document, "Fabric Filter Bag Leak Detection Guidance", EPA-454/R-98-015, September 1997. The Permittee may install, operate, and maintain other types of bag leak detection systems in a manner consistent with the manufacturer's written specifications and recommendations. [40 CFR 63.7831(f)(4)]

v. To make the initial adjustment of the system, the Permittee shall establish the baseline output by adjusting the sensitivity (range) and the averaging period of the device. Then, the Permittee shall establish the alarm set points and the alarm delay time. [40 CFR 63.7831(f)(5)]

vi. Following the initial adjustment, the Permittee may not adjust the sensitivity or range, averaging period, alarm set points, or alarm delay time, except as detailed in the Permittee's operation and maintenance plan. The Permittee may not increase the sensitivity by more than 100 percent or decrease the sensitivity by more than 50 percent over a 365-day period unless a responsible official certifies, in writing, that the baghouse has been inspected and found to be in good operating condition. [40 CFR 63.7831(f)(6)]

vii. Where multiple detectors are required, the system's instrumentation and alarm may be shared among detectors. [40 CFR 63.7831(f)(7)]

f. NESHAP Requirements for Installation, Operation And Maintenance of the COMS for the ESP [40 CFR 63.7831(h)]

For the ESP (which is subject to the opacity limit in 40 CFR 63.7790(b)(3)), the Permittee shall install, operate, and maintain a COMS according to the following requirements in 40 CFR 63.7831 (h)(1) through (4):

i. The Permittee shall install, operate, and maintain each COMS according to Performance Specification 1 in 40 CFR Part 60, Appendix B.

ii. The Permittee shall conduct a performance evaluation of each COMS according to 40 CFR 63.8 and Performance Specification 1 in Appendix B to 40 CFR Part 60.

iii. Each COMS must complete a minimum of one cycle of sampling and analyzing for each successive 10-second period and one cycle of data recording for each successive 6-minute period.

iv. COMS data must be reduced to 6-minute averages as specified in 40 CFR 63.8(g)(2) and to hourly averages where required by 40 CFR 63 Subpart FFFFF.

g. General Requirements for Monitoring: [40 CFR 63.7832]

i. For purposes of the NESHAP, 40 CFR 63 Subpart FFFFF, except for monitoring malfunctions, out-of-control periods as specified in 40 CFR 63.8(c)(7), associated repairs, and required quality assurance or control activities (including as applicable, calibration checks and required zero and span adjustments), the Permittee shall monitor continuously (or collect data at all required intervals) at all times a subject control/capture system is operating.

ii. The Permittee may not use data recorded during monitoring malfunctions, associated repairs, and required quality assurance or control activities in data averages and calculations used to report emission or operating levels or to fulfill a minimum data availability requirement, if applicable. The Permittee shall use all the data collected during all other periods in assessing compliance.

iii. A monitoring malfunction is any sudden, infrequent, not reasonably preventable failure of the monitoring to provide valid data. Monitoring failures that are caused in part by poor maintenance or careless operation are not malfunctions.

7.5.8-1 Additional Requirements for Opacity Observations

The following opacity observations shall be performed pursuant to Section 39.5(7)(a), (b) and (p) of the Act:

a. Routine Opacity Observations for the BOPF Shop

The Permittee shall have the opacity of the exhaust of the building housing the BOPFs determined by a qualified observer in accordance with USEPA Method 9 while the BOF(s) are operating, as further specified below.

i. Observations of opacity shall be conducted on the following frequency unless absence of adequate daylight or weather conditions preclude scheduled observation, in which case, the next observations shall be conducted on the next operating day of the BOF(s) during which observations of opacity can reasonably be conducted in accordance with USEPA Method 9, except that reading shall be taken as a 3-minute average (12 consecutive observations taken 15 seconds intervals).

ii. If a baghouse is not installed for control of tapping emissions from the BOFs, these readings shall be performed for at least five days out of every seven. A day is defined as any day when a BOF is in operation for a minimum of four hours during conditions that are acceptable for Method 9 readings. A minimum of 60 consecutive minutes of opacity readings must be obtained and must encompass at least one steel production cycle. A production cycle is defined as the beginning of scrap charging to the completion of deslagging of the steelmaking vessel. Results of these readings shall be reduced to three minute rolling averages.

iii. Beginning 30 days after initial startup of a baghouse for control of tapping emissions from the BOFs, the Permittee shall have the opacity of the exhaust of the building housing the BOFs determined by a qualified observer in accordance with USEPA Method 9 while the BOF(s) are operating, as further specified below.

A. The duration of opacity observations for each test shall be one complete steel making cycle.

B. Observations of opacity shall be conducted on the following frequency unless absence of adequate daylight or weather conditions preclude scheduled observation, in which case, the next observations shall be conducted on the next operating day of the BOF(s) during which observations of opacity can reasonably be conducted in accordance with USEPA Method 9.

C. On a weekly basis (at least once every seven operating days of the BOFs) except as provided below.

D. On a daily basis (at least 5 days out of seven operating days of the BOFs) if any of the five previous 3-minute average observations measured opacity of 18 percent or more, continuing on a daily basis until the maximum opacities measured in five consecutive daily observations are all less than 18 percent, at which time observations on a weekly basis shall resume.

b. Additional Opacity Observations for the BOPF Shop

Upon written request by the Illinois EPA, additional opacity observations shall be conducted within 5 operating days for the BOPFs from the date of the request by the Illinois EPA or on the date agreed upon by the Illinois EPA, whichever is later. For such observations conducted pursuant to a request from the Illinois EPA:

i. The Permittee shall notify the Illinois EPA at least 24 hours in advance of the date and time of these observations, in order to enable the Illinois EPA to witness the observations. This notification shall include the name and employer of the qualified observer(s).

ii. The Permittee shall promptly notify the Illinois EPA of any changes in the time or date for observations.

iii. The duration of these observations shall cover a complete heat or cycle.

iv. The Permittee shall provide a copy of the current certification for the opacity observer and observer's readings to the Illinois EPA at the time of the observations, if the Illinois EPA personnel are present.

c. Opacity Observations for the ESP for the BOPFs

i. The Permittee shall determine the opacity from the BOPF ESP stack for at least one hour on any normal work day that the continuous opacity monitor on the BOF ESP stack has an outage that exceeds two consecutive hours and is still down. The readings shall commence as soon as possible after the opacity monitor has been down for two consecutive hours. If meteorological conditions or lack of visibility preclude these observations from being conducted, then this shall be noted in the log book.

ii. The opacity shall be determined in accordance with the observation procedures set out in 40 CFR Part 60, Appendix A, Method 9.

d. Additional Opacity Observations for the BOPF Shop during the Shakedown of the BOPF Baghouse System

i. The Permittee shall conduct opacity observations for the BOPF shop as follows, while the capture systems for the BOPFs are operated, as practicable, at minimum values of the operating parameters at which the Permittee normally expects to operate these systems.

A. Observations shall be promptly conducted following initial operation of the BOPFs with the BOPF baghouse system.

B. Thereafter, until the performance testing required by Condition 7.5.7-1(a)(i) is conducted, these observations shall be conducted at least every 15 operating days of the BOPF.

ii. These observations shall be conducted in accordance with 40 CFR 63.6(h)(5) and 63.7823(d). As observations must extend over at least three steel production cycles pursuant to 40 CFR 63.7823(d)(ii), opacity observations that the Permittee is otherwise required to conduct for the BOPF Shop by other conditions of this permit may provide a portion of these observations.

iii. The Permittee shall submit individual reports to the Illinois EPA for these opacity observations, which reports shall be submitted within 10 days of the date of observations. In addition to relevant information for reports for opacity observations, these reports shall include the actual values of the operating parameters of the capture systems for the BOPF that were monitored during each steel production cycle for which observations were conducted.

e. The Permittee shall keep records for all opacity observations for the BOPF shop and the BOPF ESP made in accordance with USEPA Method 9 that the Permittee conducts or that are conducted at its behest by individuals who are qualified to make such observations. For each occasion on which such observations are made, these records shall include a formal record for the observations, including a description of the observations that were made, the operating condition of the subject process, the observed opacity, and copies of the raw data sheets for the observations.

7.5.8-2 Operational Monitoring for Steam Rings from Construction Permit 10080021

The Permittee shall install, maintain and operate a continuous monitoring system on each steam ring for the steam valve position (open or closed) and the rate at which steam is being injected.

7.5.8-3 Monitoring Requirements from Permit 11050006

a. The Permittee shall fulfill applicable monitoring requirements of the NESHAP, 40 CFR 63 Subpart FFFFF, for the BOPF baghouse system by operating a bag leak detection system on the BOPF baghouse, as specified by 40 CFR 63.7830(b)(1) and 63.7833(c)(1) and (4), with timely initiation of appropriate corrective action(s) in the event that the bag leak detection system alarm is triggered and fulfillment of associated recordkeeping and reporting requirements. (See also Condition 7.5.8.)

b. The Permittee shall monitor the following operating parameters for the BOPF baghouse system if not otherwise monitored pursuant to the NESHAP, 40 CFR 63 Subpart FFFFF. For this purpose, the Permittee may either directly monitor these parameters or indirectly derive and automatically record data for these parameters from other operating parameters that are continuously monitored.

i. The actual volumetric flow rate, in cubic feet per minute (acfm), through each separately ducted hood.

ii. The actual volumetric flow rate (acfm) at the inlet to the baghouse.

c. When the BOPF baghouse control system begins to operate and the ESP is only controlling primary emissions, the Permittee shall continue to conduct operational monitoring for the capture systems associated with the ESP in accordance with applicable requirements of the NESHAP (e.g., 40 CFR 63.7830(a) and 63.7831(e)), even though the ESP only controls primary emissions of the BOPFs.

7.5.9 Recordkeeping Requirements

The Permittee shall maintain records of the following items pursuant to Sections 39.5(7)(a), (b) and (e) of the Act:

a. 40 CFR 63 Subpart FFFFF [40 CFR 63.7842 and 63.7843]

i. The Permittee shall keep the following records specified in 40 CFR 63.7842 (a)(1) through (a)(3):

A. A copy of each notification and report that the Permittee submitted to comply with 40 CFR 63 Subpart FFFFF, including all documentation supporting any initial notification or notification of compliance status that the Permittee submitted, according to the requirements in 40 CFR 63.10(b)(2)(xiv).

B. The records in 40 CFR 63.6(e)(3)(iii) through (v) related to startup, shutdown, and malfunction.

C. Records of performance tests, performance evaluations, and opacity observations as required in 40 CFR 63.10(b)(2)(viii).

ii. For each COMS, the Permittee shall keep the following records specified in 40 CFR 63.7842 (b)(1) through (4):

A. Records described in 40 CFR 63.10(b)(2)(vi) through (xi).

B. Monitoring data for a performance evaluation as required in 40 CFR 63.6(h)(7)(i) and (ii).

C. Previous (that is, superseded) versions of the performance evaluation plan as required in 40 CFR 63.8(d)(3).

D. Records of the date and time that each deviation started and stopped, and whether the deviation occurred during a period of startup, shutdown, or malfunction or during another period.

iii. Pursuant to 40 CFR 63.7842(c), the Permittee shall keep the records specified in 40 CFR 63.6(h)(6) for visual observations.

iv. Pursuant to 40 CFR 63.7842(d), the Permittee shall keep the records required in 40 CFR 63.7833 and 63.7834 to show continuous compliance with each emission limitation and operation and maintenance requirement that applies to the Permittee.

v. Pursuant to 40 CFR 63.7843, the Permittee shall keep and retain records required by the NESHAP as follows:

A. The Permittee shall keep the records in a form suitable and readily available for expeditious review, according to 40 CFR 63.10(b)(1).

B. As specified in 40 CFR 63.10(b)(1), the Permittee shall keep each record for 5 years following the date of each occurrence, measurement, maintenance, corrective action, report, or record.

C. The Permittee shall keep each record on site for at least 2 years after the date of each occurrence, measurement, maintenance, corrective action, report, or record, according to 40 CFR 63.10(b)(1). The Permittee may keep the records offsite for the remaining 3 years.

vi. Pursuant to 40 CFR 63.7834(b), the Permittee shall maintain a current copy of the operation and maintenance plan required in 40 CFR 63.7800(b) onsite and available for inspection upon request. The Permittee must keep the plans for the life of subject process or until the process is no longer subject to the requirements of 40 CFR 63 Subpart FFFFF.

vii. Pursuant to 40 CFR 63.7831(a), the Permittee shall maintain a copy of the site-specific monitoring plan for each CPMS required by 40 CFR 63.7830. In addition, if the Permittee operates under manufacturer's specifications or manufacturer's instructions, such manufacturer's documentation shall be kept at the source as part of the required records.

b. Recordkeeping from Permits 72080043 and 95010001:

The Permittee shall keep the following records:

i. Total production of molten steel at the BOPFs (daily, monthly, and annual production in tons).

ii. Records of all opacity observations. (See also Condition 7.5.8-1(e).)

c. Recordkeeping from Permit 08110016:

The operating and maintenance records that the Permittee maintains for the ESP shall include the following information for the induced draft fans on the ESP, in addition to other required information:

i. The periods of time when the BOPFs operated with less than three properly functioning fans, with description and explanation.

ii. The periods of time when the BOPFs are operating and a spare fan is not available, with the identity of the fan(s) that were not available and explanation, e.g., spare fan not available due to regularly scheduled maintenance or spare fan not available due to unplanned breakdown of the main bearings.

d. Recordkeeping for the steam rings on the BOFs from Construction Permit 10080021:

i. A. The Permittee shall maintain a record of the steam valve position (open or closed) and the rate at which steam is being injected, as determined by the continuous monitoring systems required by Condition 7.5.8-2.

B. In addition to keeping records of the data measured by these monitoring systems, the Permittee shall keep records of the operation, calibration and maintenance of these systems.

ii. The Permittee shall maintain an operating log or other records for the BOFs and steam rings that contain information generally documenting the steam rings are being operated in accordance with Condition 7.5.5-3, including information for the timing of the refining phase of each heat of a BOF.

iii. The Permittee shall maintain detailed records of the following information for each heat in a BOF in which the steam ring was not operated during the refining phase:

A. Identification of the heat and the duration of the incident, i.e., start time and time normal operation was achieved or the refining phase was completed.

B. Description of the incident, impact on effectiveness of the steam ring, probable cause, and corrective actions.

C. Verification that the established procedures were followed or a description and explanation why procedures were not followed.

Note: These records may be kept with other logs or records that the Permittee keeps for the BOPFs and their instrumentation and need not be kept as a separate record.

e. Production Records

The Permittee shall keep annual records (tons/year) of steel processed at the slag skimming station, the argon stirring station and ladle metallurgy furnace station.

f. Emissions Records

The Permittee shall keep the following records related to the emissions of the basic oxygen processes to verify compliance with the applicable limits in Conditions 7.5.6(b) through (g):

i. A file containing the emission factors used by the Permittee to determine emissions of different pollutants from such processes, with supporting documentation. These records shall be reviewed and updated by the Permittee as necessary to assure that the emission factors that it uses to determine emissions of the processes do not understate actual emissions, including review when emission testing is conducted for a process. These records shall be prepared and copies sent to the Illinois EPA in accordance with Condition 5.9.6(c).

ii. Records for any periods of operation of a process that are not otherwise addressed in the required records during which the established emission factor in Condition 7.5.9(f)(i) would understate actual emissions of the process, with description of the period of operation and an estimate of the additional emissions during such period that would not be accounted for by the established factor, with supporting explanation and calculations.

iii. Records for the annual emissions of such processes for comparison to the limits in Conditions 7.5.6(c) through (g), with supporting calculations.

iv. Records for combined annual emissions of such processes, based on the summation of the above data, for comparison to the limits in Condition 7.5.6(b).

g. Additional Operational Records

In the operational logs or other records for the operation of the basic oxygen processes, the Permittee shall keep records identifying process upsets that result in the generation of additional opacity or PM emissions, such as loss of the slag cover on the molten metal in a vessel or a spill of molten metal. For these upsets, these records shall include the time of the upset, a description of the

upset, and a discussion of the consequences for PM emissions from the basic oxygen processes.

h. Records for Malfunctions or Breakdowns

Pursuant to 35 IAC 201.263, the Permittee shall maintain records of continued operation of the BOPs and LMF as addressed by Condition 7.5.5-2(b), during malfunctions or breakdowns, which at a minimum, shall include the following records. The preparation of these records shall be completed within 45 days of an incident, unless the Permittee conducts a root cause analysis for the incident, in which case the preparation of these records, other than the root cause analysis, shall be completed within 120 days of the incident.

i. Date, time and duration of the incident.

ii. A detailed description of the incident, including:

A. A chronology of significant events during and leading up to the incident.

B. Relevant operating data for the unit, including information such as operator log entries and directives provided by management during the incident.

C. The measures taken to reduce the quantity of emissions and the duration of the incident including the resources utilized to address the incident.

D. The magnitude of emissions during the incident.

iii. An explanation why continued operation of the furnace(s) was necessary to prevent personnel injury or prevent equipment damage.

iv. A discussion of the cause(s) or probable cause(s) of the incident including the following:

A. Whether the incident was sudden, unavoidable, or preventable, including:

1. Why the equipment design did not prevent the incident;

2. Why better maintenance could not have avoided the incident;

3. Why better operating practices could not have avoided the incident; and

4. Why there was no advance indication for the incident.

B. Whether the incident stemmed from any activity or event that could have been foreseen, avoided or planned for.

C. Whether the incident was or is part of a recurring pattern indicative of inadequate design, operation or maintenance.

v. A description of any steps taken or to be taken to prevent similar future incidents or reduce their frequency and severity.

vi. As an alternative to keeping the records required by Condition 7.5.9(h)(iv), the Permittee may perform a root cause analysis. For this purpose, a root cause analysis is an analysis whose purpose is to determine, correct and eliminate the primary causes of the incident and the excess emissions resulting there from. If the Permittee performs a root cause analysis method that would define the problem, define all causal relationships, provide a causal path to the root cause, delineate the evidence, and provide solutions to prevent a recurrence. Such an analysis shall be completed within one year of the incident.

7.5.9-1 Recordkeeping Requirements from Permit 11050006

a. The Permittee shall maintain a file or other records that contain the following information for the BOPF baghouse system:

i. Design data for the capture hoods for charging and tapping, including the analysis for the levels of capture achieved by the hoods for emissions of particulate, i.e., percentages of total emissions from charging and tapping that are collected and directed to the BOPF baghouse.

ii. The manufacturer's specifications for the capacity (acfm and scfm) and particulate emissions (gr/dscf) of the BOPF baghouse and the manufacturer's recommended operating and maintenance procedures for this baghouse.

b. After charging and tapping of both BOPFs first begin to be controlled with the BOPF baghouse system, the Permittee shall keep records of the following information for the BOPFs. The preparation of these records by the Permittee may be automated or these records may be prepared manually or by a combination of manual and automated methods. These

records may be combined with other records that are kept by the Permittee for the BOPFs.

i. Records for the BOPFs for the total number of steel production cycles per day (24-hours).

ii. Records for the following information, as calculated from data monitored pursuant to Conditions 7.5.8-3(b) and (c):

A. The average flow rate through each separately ducted hood for each BOPF for each steel production cycle (acfm).

B. The average flow rate at the inlet to the BOPF baghouse per steel production cycle (acfm/cycle), daily (24-hour) average.

C. The average flow rate at the inlet to the ESP per steel production cycle (acfm/cycle), daily (24-hour) average.

c. After tapping and charging of both BOPFs first begin to be controlled with the BOPF baghouse system, the Permittee shall keep records for periods when charging or tapping of a BOPF is not controlled by this system, including a description of the event, the probable cause(s) of the event, the remedial action(s) taken and any measure(s) taken to prevent similar events in the future.

7.5.10 General Reporting Requirements

a. 40 CFR Part 63, Subpart FFFFF [40 CFR 63.7841]

i. Compliance report due dates. Unless the Administrator has approved a different schedule, the Permittee shall submit a semiannual compliance report to the permitting authority according to the following requirements:

A. Semi-annual compliance report must cover the semiannual reporting period from January 1 through June 30 or the semiannual reporting period from July 1 through December 31.

B. Each compliance report must be postmarked or delivered no later than July 31 or January 31, whichever date comes first after the end of the semiannual reporting period.

ii. Compliance report contents. Each compliance report shall include the following information:

A. Company name and address.

B. Statement by a responsible official, with that official's name, title, and signature, certifying the truth, accuracy, and completeness of the content of the report.

C. Date of report and beginning and ending dates of the reporting period.

D. If the Permittee had a startup, shutdown, or malfunction during the reporting period and the Permittee took actions consistent with the source's startup, shutdown, and malfunction plan, the compliance report must include the information in 40 CFR 63.10(d)(5)(i).

E. If there were no deviations from the continuous compliance requirements in 40 CFR 63.7833 and 63.7834 that apply to the Permittee, a statement that there were no deviations from the emission limitations or operation and maintenance requirements during the reporting period.

F. If there were no periods during which a continuous monitoring system (including a CPMS, COMS, or continuous emission monitoring system (CEMS)) was out-of-control as specified in 40 CFR 63.8(c)(7), a statement that there were no periods during which the CPMS was out-of-control during the reporting period.

G. For each deviation from an emission limitation in 40 CFR 63.7790 that occurs at each Basic Oxygen Process where the Permittee is not using a continuous monitoring system (including a CPMS, COMS, or CEMS) to comply with an emission limitation in 40 CFR Subpart FFFFF, the compliance report must contain the information described in Condition 7.5.10(a)(ii)(A) through (F) and the following information (this includes periods of startup, shutdown, and malfunction):

1. The total operating time of each Basic Oxygen Process during the reporting period.

2. Information on the number, duration, and cause of deviations (including unknown

cause, if applicable) as applicable and the corrective action taken.

H. For each deviation from an emission limitation occurring at each Basic Oxygen Furnace Process where the Permittee is using a continuous monitoring system (including a CPMS or COMS) to comply with the emission limitation in 40 CFR 63 Subpart FFFFF, the Permittee shall include the following information (this includes periods of startup, shutdown, and malfunction):

1. The date and time that each malfunction started and stopped.

2. The date and time that each continuous monitoring was inoperative, except for zero (low-level) and high-level checks.

3. The date, time, and duration that each continuous monitoring system was out-of-control as specified in 40 CFR 63.8(c)(7), including the information in 40 CFR 63.8(c)(8).

4. The date and time that each deviation started and stopped, and whether each deviation occurred during a period of startup, shutdown, or malfunction or during another period.

5. A summary of the total duration of the deviation during the reporting period and the total duration as a percent of the total source operating time during that reporting period.

6. A breakdown of the total duration of the deviations during the reporting period including those that are due to startup, shutdown, control equipment problems, process problems, other known causes, and other unknown causes.

7. A summary of the total duration of continuous monitoring system downtime during the reporting period and the total duration of continuous monitoring system downtime as a percent of the total source operating time during the reporting period.

8. A brief description of the Basic Oxygen Processes.

9. A brief description of the continuous monitoring system.

10. The date of the latest continuous monitoring system certification or audit.

11. A description of any changes in continuous monitoring systems, processes, or controls since the last reporting period.

iii. Immediate startup, shutdown, and malfunction report. If the Permittee had a startup, shutdown, or malfunction during the semiannual reporting period that was not consistent with the source's startup, shutdown, and malfunction plan, the Permittee shall submit an immediate startup, shutdown, and malfunction report according to the requirements in 40 CFR 63.10(d)(5)(ii).

b. Monthly Opacity Exceedance Report.

Monthly opacity exceedance reports for the BOPF ESP shall be sent to the Illinois EPA Regional Office. These reports shall contain all opacity measurements which exceed 30 percent, averaged over a six minute period. These "excess opacity" reports shall provide, for each such incident, the percent opacity measured as well as the date and span of such incident. These reports shall state the reasons for the excess opacity. The reports shall also specify the dates of those periods during which the continuous monitoring system was not in operation [Section 39.5(7)(f)(ii) of the Act].

c. Reporting of Deviations

i. Pursuant to Section 39.5(7)(f)(ii) of the Act, the Permittee shall promptly notify the Illinois EPA, Air Compliance Section, within 30 days of deviations by the Basic Oxygen Furnace Processes from applicable requirements, unless a NESHAP standard specifies a different timeframe, as follows:

A. Requirements in Conditions 7.5.3-1 and 7.5.3-2.

B. Requirements in Condition 7.5.5-1.

C. Requirements in Condition 7.5.5-3.

D. Requirements in Conditions 7.5.6(a) through (j).

ii. All such deviations shall be summarized and reported as part of the semiannual monitoring report required by Condition 8.6.1.

iii. The Permittee shall notify the Illinois EPA, Air Compliance Section, of all other deviations as part of the semiannual monitoring reports required by Condition 8.6.1.

iv. All required deviation reports described in Condition 7.5.10(c) above shall contain the following information:

A. Date, time and duration of the deviation;

B. Description of the deviation;

C. Probable cause of the deviation; and

D. Any corrective action or preventative measures taken.

d. The Permittee shall fulfill the following reporting requirements:

i. Reporting on malfunction and breakdown (state authorization) shall be performed in accordance with Condition 5.10.5-2.

ii. Reporting on the Federal SSM authorization shall be performed in accordance with Condition 5.10.5-3.

7.5.10-1 Reporting Requirements from Permits

a. Report Required by Permit 08110016:

After the initial year of operation (12 calendar months) of the BOPF with an ESP with four fans, the Permittee shall submit a report to the Illinois EPA that evaluates the impacts of the addition of a fourth fan to the ESP on the particulate matter emissions of the BOPF. This report shall, at a minimum, include the following information and address impacts on both stack emissions of particulate matter (i.e., emissions from the ESP stack) and uncaptured emissions of particulate matter (e.g., emissions from the roof monitor of the BOPF Shop). This report shall be submitted by the end of the third month following the initial year of operation with an ESP with four fans.

i. A description of cyclical operating scenarios in which the availability of a spare fan resulted in a

decrease in short-term emissions, with an assessment of the changes in the hourly emission rates, with supporting documentation and calculations.

ii. A description of typical operating scenarios, if any, in which the availability of a spare fan resulted in an increase in short-term emissions, with an assessment of the changes in the hourly emission rates, with supporting documentation and calculations.

iii. An assessment of the overall effect of the addition of a fourth fan on actual annual emissions of the BOF, with supporting operating data and calculations.

b. Report Required by Permit 10080021:

i. Within six months of initial startup of the steam rings on the BOFs, the Permittee shall submit to the Illinois EPA: 1) A Project Report; and 2) A draft of the Permittee's written operating procedures for the steam rings, as required by Condition 7.5.5-3, for review and comment by the Illinois EPA. This Project Report shall include the following:

A. An assessment, with supporting documentation, of the effect of the steam rings on the opacity and, as feasible, particulate loading of the exhaust from the roof monitor of the BOPF Shop during refining, correlated with the rate of steam injection and other operating parameters of the BOF's and their control system; and

B. An identification of circumstances, if any, in which the steam rings must be operated to maintain compliance with applicable emission standards.

ii. The Permittee shall submit reports to the Illinois EPA on a semi-annual basis that include the following information for the operation of the steam rings on the BOFs:

A. Total number of heats during the reporting period.

B. Number of heats during the reporting period without steam rings operating properly, by type of incident, e.g., breakdown of the steam ring interrupting operation, malfunction of the steam ring with insufficient steam flow, or breakdown of support system.

c. Reporting Required by Permit 11050006

i. The Permittee shall notify the Illinois EPA of the following events with respect to the shakedown of the BOPF baghouse system:

A. The planned date for initial operation of the BOPF(s) with this system, at least 5 days in advance, which notification shall also include the date on which it is expected that the opacity observations required by Condition 7.5.8-1(d)(i)(A) will be conducted. If operation with this system will be phased, i.e., the emissions from charging and tapping of both BOPFs will not initially all be controlled by this system, this notification shall include the planned schedule for phase-in of control of emissions by this system.

B. The date that tapping and charging of both BOPFs are initially controlled with this system, no later than 30 days after this date.

C. The date that the shakedown of this system is completed, no later than 30 days after this date.

ii. After the shakedown of the BOPF baghouse system is complete, the Permittee shall notify the Illinois EPA if the ESP will be used for control of emissions from charging and tapping of the BOPFs, with description of the planned use of the ESP and explanation.

iii. Within 18 months of the date that tapping and charging of both BOPFs are initially controlled with the BOPF baghouse system, the Permittee shall submit a Project Report to the Illinois EPA that evaluates the emissions of particulate (as PM_{10} and $PM_{2.5}$) and lead from the BOPFs with this system. This one-time report shall include the following:

A. An assessment of the actual levels of capture (percent) that are achieved for emissions from charging and tapping, during normal operation of the BOPFs and control systems.

B. An assessment of the actual level of overall control (percent) for emissions from charging and tapping, for normal operation of the BOPFs and the BOPF baghouse system.

C. An assessment of overall emissions of particulate and lead from the BOPFs on a short-term basis (in lbs/hour and lbs/ton of steel),

with typical and maximum emission rates, for normal operation.

D. A review of the probable effect of upsets in the operation of the BOPF baghouse system on the short-term emissions of the BOPFs, considering upsets that have been experienced.

E. An assessment of the distribution of emissions of particulate and lead from the BOPFs between the ESP, baghouse and roof monitor (uncaptured emissions) on a short-term basis, with the typical distribution of emissions, the distribution of emissions with maximum emissions at the roof monitor, and the distribution of emissions with maximum emissions at the ESP, all for normal operation.

F. An assessment of the actual reductions in annual emissions of particulate (tons/year) from the BOPFs that should be achieved with the BOPF baghouse system.

G. An assessment of the typical range of opacity from the roof monitor during tapping of a single BOPF, charging of a single BOPF, overlapping tapping and charging of the BOPFs, and periods of operation other than charging and tapping.

H. Appropriate data and analysis to support the above assessments.

7.5.11 Operational Flexibility/Anticipated Operating Scenarios

The BOPFs shall only be operated as top oxygen injected vessels, except that, for purposes of checkout and emission testing only, the furnaces may be operated as peripheral and bottom oxygen injected furnaces for a maximum of 120 days. Any further operation of the furnaces as other than top oxygen injected vessels shall be pursuant to a permit granted for such additional operation. [Permit 72080043]

7.5.12 Compliance Procedures

a. Compliance with the applicable standards of Conditions 7.5.3-1 and 7.5.3-2 is addressed by the work practices, testing, monitoring, recordkeeping and reporting requirements in Section 7.5 of this permit.

b. Compliance with the production/emission limits of Conditions 7.5.6 and 5.6.2 is addressed by the work practices, testing monitoring, recordkeeping and reporting requirements in Sections 7.5 and 5 of this permit.

7.5.13 Compliance Schedule and Current Enforcement Status

a. The Permittee shall comply with the following schedule of compliance applicable to BOF shop emissions and established in accordance with modified Consent Order 05-CH-750 (December 23, 2009):

Commitment	Timing
Certify compliance	March 31, 2011

b. Submittal of Progress Reports

Quarterly Progress Reports shall be submitted beginning with September 2011 and ending upon the achievement of compliance. Each quarterly report shall be submitted no later than 5 days after the end of the corresponding calendar month. The Progress Report shall contain at least the following:

i. The required date for achieving commitments, and actual dates when such commitments were achieved.

ii. Any commitments accepted by the Permittee or otherwise established for the BOFs as part of the resolution of the above referenced Consent Order, with the associated timing for each commitment.

iii. A discussion of progress in complying with commitments that are subject to future deadlines.

iv. If any commitment was not met, an explanation of why the required timeframe or commitment was not met, and any preventive or corrective measures adopted to achieve required commitment.

c. After completion of all required commitments and certification of compliance, as identified in Condition 7.5.13(a) no further Quarterly Progress Reports are required to be submitted.

7.5.14 State-Only Conditions

State-only conditions are not being established.

7.5.15 Transition

This version of Section 7.5 (Version 2) will become applicable when the BOPF baghouse control system, which is part of the emission reduction project for the BOPFs addressed by Construction Permit 11050006, begins operation to control particulate emissions of these furnaces. At such time, this version of Section 7.5 will supersede the first version of Section 7.5.

Illinois Environmental Protection Agency
Bureau of Air, Permit Section
Springfield, Illinois

April 2013

Responsiveness Summary For Public Questions and Comments on the Proposed Issuance of a Construction Permit with Integrated Processing for an Emission Reduction Project for the Existing Basic Oxygen Process Furnaces at United States Steel Corporation's Granite City Works Granite City, Illinois

Source Identification No.: 119813AAI
Construction Permit No.: 11050006
CAAPP Permit No.: 96030056

DECISION

On April 1, 2013, the Illinois Environmental Protection Agency (Illinois EPA) issued Construction Permit 11050056 to United States Steel Corporation, Granite City Works (US Steel) for a planned emission reduction project for the two basic oxygen furnaces (BOFs) at this steel mill. The Illinois EPA processed the permit application for this project using "Integrated Processing." Accordingly, the construction permit issued for this project also authorizes certain related changes to be made to the Clean Air Act Permit Program (CAAPP) permit for the Granite City Works by administrative amendment.

The construction permit that has now been issued, compared to the draft permit prepared by the Illinois EPA, includes a number of changes that were made in response to comments that were received. It also includes a number of other improvements that resulted from the Illinois EPA's further evaluations concerning this planned emission reduction project.

BACKGROUND

The Illinois EPA Bureau of Air evaluates applications and issues permits for sources of emissions. Applications for air pollution control permits must appropriately address compliance with applicable air pollution control laws and regulations before a permit can be issued.

US Steel applied for an air pollution control construction permit for an emission reduction project that will involve the installation of a new control system with a filter or "baghouse" for the two BOFs at its Granite City Works. The new system will control secondary particulate emissions from the BOFs, i.e., the particulate emissions from charging and tapping of the BOFs. The particulate emissions from the refining process in the BOFs will continue to be controlled by the existing electrostatic precipitator (ESP). The new baghouse control system will improve overall control of the particulate emissions of the BOFs. US Steel has agreed to install this new baghouse control system to reduce particulate emissions of the BOFs pursuant to a Memorandum of Understanding between US Steel and the Illinois EPA (Agreement).[1]

US Steel requested that the Illinois EPA process the construction permit application for the new baghouse control system using "Integrated Processing," following procedural requirements that are substantially equivalent to those that apply to CAAPP permits.[2] (The CAAPP is Illinois' operating permit program pursuant to Title V of the federal Clean Air Act for major sources of emissions and certain other stationary sources of emissions.) With integrated processing, a construction permit may also authorize certain related changes to be made to the CAAPP permit for a source by administrative amendment. US Steel requested integrated processing of the construction permit application for the new baghouse system because the CAAPP permit for the Granite City Works, Permit 96030056, contains certain requirements that will no longer be appropriate when the particulate emissions of the BOFs are controlled by the combination of the new control system and the existing ESP system.[3] US Steel made this request in

[1] United States Steel Corporation Granite City Works and IEPA: Memorandum of Understanding, effective July 1, 2010, when signed by Douglas Scott, Director of the Illinois EPA.

[2] Illinois' CAAPP program provides for integrated processing in Section 39.5(13)(c)(v) of the Environmental Protection Act and 35 IAC 270.302(e).

[3] For example, the current CAAPP permit contains limits for the minimum air flows to the ESP during charging and tapping that would no longer be relevant when these emissions are controlled with the new baghouse system.

order to have certainty about the requirements that will apply to the BOFs with the new baghouse system. This would be provided with integrated processing because the construction permit for this new system would also set out the related revisions to the CAAPP permit that would be made to address this system and provide for these revisions to occur by administrative amendment of the CAAPP permit. The Illinois EPA has now processed the construction permit application for the new baghouse system using integrated processing.[4]

By a separate application, US Steel also requested that a previous construction permit issued for the Granite City Works, Construction Permit/PSD Approval 95010001, be revised to remove conditions that would no longer be appropriate when the new baghouse control system begins operation. Permit 95010001 was originally issued on January 25, 1996 for a project involving increases in the production of iron and steel by the source. The changes requested to Permit 95010001 would provide further certainty about the requirements that would apply to the BOFs with the new baghouse control system. The Illinois EPA has already acted on US Steel's request to revise Permit 95010001. The revised permit was issued on December 17, 2012. The public comment period that preceded that action was combined with the public comment period on the draft of the construction permit for the planned baghouse system, which is discussed below.[5]

PUBLIC PARTICIPATION AND USEPA REVIEW

Following its initial review of US Steel's application for a construction permit for the baghouse control system, the Illinois EPA Bureau of Air made a preliminary determination that the application met the standards for issuance of a permit. The Illinois EPA prepared a draft of the construction permit that it proposed to issue for public review and comment. The findings and conditions for the construction permit were included in "Part 1" of the draft permit. The specific changes that would be authorized to be made to the CAAPP permit for the Granite City Works were included in Part 2 of the draft permit.

The public comment period on the draft construction permit began with the publication of a notice in the Granite City Press Record on May 30, 2012. The notice ran again in the Granite City Press Record on June 6th and 13th, 2012. A public hearing was held on July 18, 2012 at the Granite City Township Hall to receive oral comments and answer questions regarding the construction permit application and draft construction permit for the new baghouse control system. The comment period closed on August 17, 2012.

Following the close of the comment period, the Illinois EPA reviewed the oral comments that were made at the public hearing and the written comments that were submitted. A "proposed construction permit" was then prepared, which contained certain changes from the draft permit that the Illinois EPA made in response to the comments that were received.

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[4] The Illinois EPA previously issued a construction permit for this emission reduction project on August 21, 2011 without using integrated processing. US Steel appealed that permit, filing a Petition for Review with the Pollution Control Board on October 10, 2011. A key element in US Steel's appeal was that the Illinois EPA had not used integrated processing prior to issuing that construction permit.

[5] When the revision of Permit 95010001 was issued on December 17, 2012, the Illinois EPA released a separate Responsiveness Summary to accompany that action. That Responsiveness Summary addressed comments and questions received during the public comment period regarding US Steel's request for revision to Permit 95010001 and the draft of the revision of that permit prepared by the Illinois EPA.

Following procedural requirements for the processing of CAAPP permits, this proposed construction permit was then submitted to USEPA for its review on February 7, 2013. USEPA did not object to the issuance of the proposed construction permit. The Illinois EPA has now issued a construction permit that is identical to the proposed permit submitted to USEPA. The Illinois EPA has also prepared this Responsiveness Summary, to accompany the issuance of this permit, to respond to comments and question that were received during the public comment period on the draft permit.

AVAILABILITY OF DOCUMENTS

The construction permit issued by the Illinois EPA and this responsiveness summary are available by internet, http://www.epa.state.il.us/public-notices/. This information may also be available on the internet database that USEPA Region 5 maintains for certain air pollution control permits issued in Illinois, Illinois Permit Database, available at http://www.epa.gov/reg5oair/permits/ilonline.html. Copies of these documents may also be obtained by contacting the Illinois EPA at the telephone numbers listed at the end of this responsiveness summary.

QUESTIONS AND COMMENTS WITH RESPONSES BY THE AGENCY

1. The new baghouse would control emissions from tapping and charging of the basic oxygen furnaces (BOFs), but emissions from refining would continue to be controlled by the existing electrostatic precipitator (ESP). Is there a reason that the baghouse could not also control refining?

   The new baghouse system is not designed to control the refining or "primary emissions" of the BOFs because that is not the main target of the Agreement. The bulk of the improvement in control of particulate emissions that is sought is for the secondary emissions of the BOFs, i.e., emissions from charging and tapping of the BOFs. This is where the current control system on the BOFs may be greatly improved to obtain significant benefits for ambient air quality.

   Moreover, baghouses commonly are not considered suitable for control of the primary emissions of a BOF. If one attempted to use a baghouse to control these emissions, the high moisture level in the flue gas entering the baghouse would quickly blind the filter material, interfering with proper operation of the baghouse. The high moisture level is a consequence of the water sprays that are used to cool the flue gas before it enters the baghouse or other control device. This cooling is needed to both protect the control device from damage and, as the volume of flue gas is reduced by cooling, to facilitate effective control of emissions. Accordingly, the primary emissions of BOFs are controlled with ESPs or scrubbers.[6] In this case, primary emissions would continue to be controlled by the existing ESP. The performance of the existing ESP should be expected to improve significantly when it is no longer being relied upon for control of secondary emissions and can be operated for control of only primary emissions.[7]

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[6] For example, the particulate emissions of the other BOFs in Illinois, at Mittal Steel, in Riverdale, in the Chicago area, are controlled by the combination of an ESP system for primary emissions and a baghouse system for secondary emissions.

[7] Accordingly, the Agreement appropriately provided for a new baghouse system for control of emissions from charging and tapping. The Agreement also sets a more stringent limit for the ESP,

2. While I am grateful that a baghouse system will be installed on the BOFs, could the system be better? It has taken many years to get to this point. As long as US Steel is installing a baghouse system for the BOFs, why not install the most protective one available, with the greatest emission reduction that can be made. It will be better for public health and perhaps the area can truly meet the National Ambient Air Quality Standards (NAAQS) for particulate matter.

The Illinois EPA appreciates this sentiment. However, the planned project for the BOFs is appropriate. Secondary emissions from the BOFs will be controlled by a baghouse control system that is specifically designed for effective capture and control of secondary emissions, with greater capacity that the current hooding. This system will be connected to a large baghouse designed for control of secondary emissions, rather than being served by an ESP that must also control the primary emissions of the BOFs.

3. The baghouse at Gateway Energy, the new coke plant in Granite City, is required to remove 99.99 percent of the $PM_{2.5}$ emission. The baghouse proposed to be used for the BOP furnaces would only have 97 percent removal. Why won't the new baghouse for the BOFs be as good as the baghouse at Gateway Energy?

The main baghouse at Gateway Energy and the new baghouse planned for the BOFs at the Granite City Works should not be directly compared in the way that they have been in this comment. In fact, the proposed baghouse at US Steel would be subject to the same performance requirement for as the main baghouse at the existing Gateway Energy plant, i.e., a limit of 0.005 gr/scf for filterable particulate matter in the exhaust from the baghouse.[8]

The cited efficiency values for these baghouses actually address different aspects of the performance of these two control systems. As such, they do not provide a direct comparison of the two baghouses and do not indicate that the new baghouse for the BOFs would not be as "good" as the baghouse at Gateway Energy. For the Gateway baghouse, the efficiency value is actually a specification for the removal capability of the filter fabric, not the overall control efficiency of the baghouse. In contrast, the cited efficiency value for the new control system for the BOFs actually addresses the design control efficiency of the new baghouse for secondary emissions from the existing BOFs at the Granite City Works. As such, it considers the actual nature and loading of particulate matter in the stream that would be entering the baghouse. For baghouses, these are critical factors for the numerical value of control efficiency that is achieved by a baghouse when it is used in a particular application. Accordingly, the performance of filter-type control devices is more appropriately addressed, from a technical perspective, in terms of the outlet dust loading that is achievable or required. On this basis, the requirements for these two baghouses are identical.

0.01 gr/scf , compared to 0.02 gr/scf. However, it did not provide for a new control system to be installed for refining emissions of the BOFs, replacing the existing ESP.

[8] Refer to Condition 4.1.5(a) of Construction Permit/PSD Approval 06070020.

4. USEPA has certified numerous filters for 99.99 percent removal efficiency for $PM_{2.5}$. According to the construction permit application, the proposed baghouse for the BOFs will have 97 percent removal efficiency for PM.

The Illinois EPA is not aware of any "filters," i.e., baghouses, that USEPA has certified for their removal efficiency. USEPA has certified various filtration materials for achievement of 99.99 percent removal for $PM_{2.5}$. These certifications are based on evaluations of samples of those materials made in a laboratory using a standardized analytical methodology. This methodology involves introducing a stream of particulate matter of uniform size at a constant rate to the sample of filter material that is being tested. As such, USEPA's certifications for filtration materials do not reflect the performance of the filtration fabrics in actual applications, much less the performance of entire baghouse systems. Accordingly, this comment does not provide meaningful data against which to compare the new baghouse control system for the BOFs.

Incidentally, it is expected that, in practice, the overall performance of the new baghouse will be better than 97 percent, which is a design specification for this device that was provided in the application.

5. Is this the best baghouse and filter available? Comparing the proposed baghouse to other baghouse units, will this be the best baghouse available? Are the full capabilities of the baghouse going to be used? Could the baghouse achieve a higher efficiency?

Since the new control system is an emission reduction project, a case-by-case review of the performance or the efficiency of the baghouse is not required by applicable rules. However, as reflected in the construction permit, the new baghouse control system must meet emission limits for particulate matter established by USEPA as Maximum Achievable Control Technology, under the Iron and Steel NESHAP, 40 CFR 63 Subpart FFFFF. As such, a modern baghouse is required.

6. If there is a baghouse control system or filter that would be more protective, that is what I want. I am thrilled about this project but I think of its cost. USEPA is going to set revised NAAQS for $PM_{2.5}$ and ambient air quality in Granite City is not going to meet them. It seems like this is the appropriate time to just get it done. Otherwise, it might not happen for a long time.

The Illinois EPA appreciates the desire to have the most efficient and protective baghouse control system for the BOFs. However, the planned project for the BOFs is a reasonable project that US Steel has committed to implement for control of secondary emissions. A modern capture system connected to a large baghouse will be installed, taking the place of the existing ESP for control of secondary emissions.[9]

7. The draft construction permit for the new baghouse control system would limit its emissions of particulate as particulate matter (PM) but not as PM_{10} or $PM_{2.5}$. For PM_{10} and $PM_{2.5}$, the permit would only require emissions testing followed by submission of a onetime report evaluating PM_{10} and

[9] **There also have been significant improvements in ambient air quality in the Granite City area, with monitoring in recent years showing attainment of the historic federal National Ambient Air Quality Standards (NAAQS) for $PM_{2.5}$.**

$PM_{2.5}$ emissions with the new control system, presumably for purposes related to the state implementation plan. Why is there no ongoing accountability for PM_{10} and $PM_{2.5}$ emissions?

The permit addresses the particulate emissions of the BOFs in terms of PM because this currently is the most effective and practical way to address these emissions. This is also reason why the Agreement between US Steel and the Illinois EPA addressed the particulate emissions of the BOFs in terms of PM. This is possible because PM, PM_{10} and $PM_{2.5}$ are all different approaches to the measurement and quantification of particulate.[10] As a consequence, limits on the particulate emissions of an emission unit in terms of PM also act in practice to generally address and restrict the unit's emissions of PM_{10} and $PM_{2.5}$. In the simplest terms, a lower limit for particulate emissions in terms of PM, also results in lower emissions of particulate as PM_{10} and $PM_{2.5}$.

Currently, the most effective way to address control of particulate emissions from BOFs is as PM because this is how the particulate emissions of BOFs and their control systems have historically been addressed. There is a body of emission testing upon which to rely when making projections for the PM emission rates that are or will be achievable from BOFs with the use of certain control technology. A similar body of data does not exist for the control of emissions in terms of PM_{10} or $PM_{2.5}$. As a consequence, emission limits expressed in terms of PM can effectively be more stringent than limits expressed in terms of PM_{10} or $PM_{2.5}$. Since they have a better basis, they do not need to account for the high level of uncertainty that would need to be considered if limits were set in terms of PM_{10} or $PM_{2.5}$.[11] Emission limits in terms of PM are also expected to be more effective because procedures for testing PM emissions have been used for decades and the conditions needed for accurate measurements are well understood. This is not the case for PM_{10} or $PM_{2.5}$.[12] This means that another source of uncertainty

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[10] USEPA categorizes particulate as supercoarse, coarse, fine and ultra fine. Supercoarse particulate has an aerodynamic diameter of greater than 10 microns, coarse particulate has an aerodynamic diameter between 2.5 and 10 microns, fine particulate has an aerodynamic diameter between 2.5 and 0.1 microns, and ultrafine particulate has an aerodynamic diameter of 0.1 microns or less. PM_{10} is composed of coarse, fine, and ultrafine particulate. $PM_{2.5}$ is composed of fine and ultrafine particulate. As such, $PM_{2.5}$ is a subset or component of PM_{10}.

[11] For example, if $PM_{2.5}$ makes up approximately 20 percent of the particulate emissions of an emission unit after control, a limit of 0.005 gr/scf for PM is generally equivalent to a limit of 0.001 gr/scf for $PM_{2.5}$. (0.005 gr/scf x 0.20 = 0.001 gr/scf).

In actual practice, when relying upon the relationship between different forms for particulate, one should consider the accuracy and reliability of the available data for particle size distribution (i.e., the percentage of the PM emissions that are of different sizes). The better the data for particle size distribution and the lower the variability in this data, the simpler and more consistent the relationship. For example, if the available data is only sufficient to indicate that between 10 and 30 percent of the PM emissions are $PM_{2.5}$ (i.e., 20 ± 10 percent), a limit for $PM_{2.5}$ based on a PM emission rate of 0.005 gr/scf would reasonably be set at 0.0015 gr/scf. To provide the necessary assurance that the limit can be complied with and is "achievable," the limit must be based on the upper bound for the fraction of PM that may be $PM_{2.5}$. In this example, this results in a $PM_{2.5}$ limit of 0.0015 gr/scf. (0.005 gr/scf x 0.30 = 0.0015 gr/scf).

Incidentally, if condensable particulate is present, another consideration for this relationship is the data that is available for emissions of condensable particulate. The relationship between emissions of PM, PM_{10} and $PM_{2.5}$ is most direct when condensable particulate is not a significant fraction of the particulate emissions, as is the case for the emissions of BOFs.

The need for any of these considerations is avoided if limits for particulate can simply be set in terms of PM.

[12] For example, USEPA has not yet developed a reference method for testing emissions of filterable PM_{10} or $PM_{2.5}$ from "wet stacks." In a wet stack, moisture in the flue gas may lead to agglomeration of individual particles as they pass through the test apparatus. This prevents reliable and accurate measurements of PM_{10} or $PM_{2.5}$ emissions. The current test methods for filterable PM_{10}

that would be present for limits in terms of PM_{10} or $PM_{2.5}$ is avoided when limits are set for PM.

In this case, limits in terms of PM are also more practical because the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Integrated Iron and Steel Manufacturing Facilities, 40 CFR 63 Subpart FFFFF, addresses particulate emissions from BOFs in terms of PM. Accordingly, the performance testing that is required pursuant to this NESHAP will also serve to address compliance with the permit limits for particulate. As such, compliance with particulate limits in terms of PM will be easier to implement.

Moreover, the Agreement between US Steel and the Illinois EPA was made possible because it addresses particulate emissions in terms of PM, rather than $PM_{2.5}$. This enabled US Steel to make commitments for the emissions of the new baghouse control system that US Steel was confident could be met. It also minimized US Steel's burden for additional emissions testing that would not be required by the NESHAP. At the same time, limits for the new control system could be and were still be set in the Agreement that should significantly reduce the secondary emissions of the BOFs, including emissions as $PM_{2.5}$.

8. Since there is a difference between $PM_{2.5}$ and PM_{10}, why would the draft construction permit for the new baghouse control system not set limits for $PM_{2.5}$.

As discussed, in this case, the difference between PM and $PM_{2.5}$ is not sufficient to support setting an emission limit in this construction permit in terms of $PM_{2.5}$. Reductions in the particulate emissions of the BOFs can be achieved with an emissions limit for the baghouse system that is in terms of PM.

9. How significant is it that the Agreement between US Steel and the Illinois EPA sets emission limits for particulate in terms of PM? Does this act to preclude the establishment of emissions limits in terms of $PM_{2.5}$ in the construction permit?

The Agreement does not directly preclude the establishment of limits for $PM_{2.5}$ in the construction permit for this emission reduction project. However, the approach taken to particulate emissions in the Agreement is significant as it is a reflection of the various considerations that culminated with an Agreement that addresses particulate emissions with limits that were expressed in terms of PM.

10. Given that the purpose of the new baghouse control system is to reduce the $PM_{2.5}$ emissions of the BOFs, that the Granite City area is designated nonattainment for $PM_{2.5}$ and could well be nonattainment under revisions to the $PM_{2.5}$ NAAQS that USEPA has proposed, is there anything that prevents Illinois EPA from putting a $PM_{2.5}$ limit in the construction permit?

As discussed, a variety of considerations lead to a construction permit that addresses control of particulate emissions from the BOFs in terms of PM. Most significantly, a limit that addresses the particulate emissions of the BOFs in terms of PM also addresses emissions of $PM_{2.5}$, likely more

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and/or $PM_{2.5}$ were developed for "dry stacks," where agglomeration is not a factor, and accordingly are only appropriate for testing of dry stacks.

effectively than if a limit were to be established in terms of $PM_{2.5}$. Accordingly, factors cited by this comment do not provide an adequate basis to set limits in terms of $PM_{2.5}$ in the construction permit for the new baghouse control system.

11. It seems that the draft construction permit for the baghouse control system has many provisions that are not in the Agreement. This suggests to me that the Illinois EPA chose not to put a $PM_{2.5}$ limit in that permit.

The draft construction permit would not set any emission limits that are not established by the Agreement or by applicable emission standards. The "other" provisions in this draft permit, which are broadly referred to by this comment, would deal with testing, operational monitoring, recordkeeping and reporting. These provisions would serve to verify ongoing compliance with the applicable emission limits. These provisions would also be needed to address the transition from the current requirements for testing, operational monitoring, recordkeeping and reporting to the new requirements that will apply with the baghouse control system. Finally, the permit would rely upon the general authority of the Illinois EPA to reasonably require sources to gather emission and emission related data. These provisions in the draft construction permit would be reasonable and appropriate, addressing aspects and implications of this emission reduction project that were not explicitly addressed in the Agreement. The presence of these provisions in the draft construction permit does not show that it would be appropriate for the construction permit for the baghouse system to set limits for $PM_{2.5}$ emissions.

12. Under what circumstances would the Illinois EPA set a $PM_{2.5}$ limit in a construction permit?

Construction permits issued by the Illinois EPA currently include limits for $PM_{2.5}$ emissions when federal or state "New Source Review" (NSR) rules[13] necessitate such limits because of the nature and circumstances of the projects that are the subjects of the permits. The NSR rules do not provide a basis to set limits for emissions of $PM_{2.5}$ in the construction for the new baghouse control system for the BOFs. This is because this project will reduce the emissions of $PM_{2.5}$ from the BOFs.[14]

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[13] In Illinois, the New Source Review (NSR) Rules consist of the federal rules for Prevention of Significant Deterioration of Air Quality (PSD), 40 CFR 52.21, and state rules for Major Stationary Source Construction and Modification (MSSCAM), 35 IAC Part 203.

[14] In general, construction permits currently set emission limits in terms of $PM_{2.5}$ for two types of projects relative to emissions of $PM_{2.5}$, "minor projects" and "major projects." For minor projects, which are far more common, construction permits set limits for $PM_{2.5}$ emissions as needed to address applicability of NSR. The limits for $PM_{2.5}$ emissions in these permits restrict emissions or the increases in emissions of $PM_{2.5}$ from a source or project to less than the emission thresholds at which the project would be considered major under the applicable NSR rules for its $PM_{2.5}$ emissions. However, since limits for PM emissions also serve to restrict emissions of $PM_{2.5}$, limits in terms of $PM_{2.5}$ are only set when limits in terms of PM or, in some cases, PM_{10} will also not be sufficient to address applicability of NSR rules to a project for $PM_{2.5}$ emissions.

For major projects for emissions of $PM_{2.5}$, which are far less common, NSR rules now generally require that the construction permits for such projects explicitly address $PM_{2.5}$ emissions, with limits that represent Best Available Control Technology or the Lowest Achievable Emission Rate that are in terms of $PM_{2.5}$ emissions.

The relevant emissions thresholds under the NSR rules that distinguish minor projects from major projects, i.e., major new sources and major modifications, are as follows:

Thresholds for a major source:

Federal PSD rules, 40 CFR 52.21 - Either 100 or 250 tons/year, depending on the category of source

State nonattainment NSR rules, 35 IAC Part 203 - 100 tons/year

13. Do any BOF shops at steel mills in the United States have limits for $PM_{2.5}$ emissions?

Given the current circumstances for control and regulation of $PM_{2.5}$ emissions, the Illinois EPA does not believe that any existing BOF shops in the United States, similar to this BOF shop, are subject to limits expressed in terms of $PM_{2.5}$ emissions.[15] In any case, it would not be an appropriate use of Illinois EPA resources to conduct a survey to definitively answer this question. This is because even if another existing BOF shop in the country is subject to limits for $PM_{2.5}$ emissions, it would not show that it is appropriate to include such limits in this construction permit. As already discussed, emissions of $PM_{2.5}$ can be addressed and restricted by limits for emissions of PM. This is because $PM_{2.5}$ is a component of PM so limits for PM emissions act in practice to also constrain $PM_{2.5}$ emissions.

14. There are gaps in the description of the new baghouse in the application for the new baghouse control system that make it difficult to evaluate the draft construction permit. On the general data and information form for the baghouse, the manufacturer and model number of the baghouse are shown as "to be determined." On the form for filter control equipment, the filter material is described simply as "polyester." The filtering area is also "to be determined." Inlet emission stream parameters, including mean particle diameter are unknown. Are there reasons why these details are not provided or were marked the way they were? Has Illinois EPA obtained any more information for the baghouse, such as the supplier, model number, or filter area or details concerning the operation of the baghouse?

The application contains the information that is currently available for the new control system. US Steel has not yet entered into a contract for this project and the new baghouse has not yet been designed.[16] The application is based on a preliminary or conceptual design that US Steel had prepared for the project, including the performance specifications that are to be met by the baghouse, i.e., a PM emission rate of no more than 0.005 grains/dry standard cubic foot (gr/dscf). Given the cost of this project, US Steel will not enter into a contract for the baghouse until after this project is fully permitted. Only then will a firm be selected to provide the baghouse and the engineering design of this device begin.

15. Even though the draft construction permit would not set limits for emission of $PM_{2.5}$, it would require testing for emissions for $PM_{2.5}$, which I am not questioning. What use does the Illinois EPA plan to make of the results from this testing?

This testing would identify the specific relationship between the emissions of PM, PM_{10} and $PM_{2.5}$ from the BOFs. As such, $PM_{2.5}$ emission

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Threshold for a major modification for emissions of $PM_{2.5}$ - 10 tons/year

[15] It is expected that only BOFs that recently underwent permitting for proposed modifications, if any, will be subject to limits that address emissions of $PM_{2.5}$. Such limits would be a consequence of the New Source Review rules that apply to modifications and, even if technically sound, would not provide any insight as to an appropriate limit for these BOFs as they are not being modified.

[16] Due its size and other project-specific considerations, the baghouse for this project will be designed by the selected manufacturer specifically for the project. The baghouse will not be a stock model of baghouse.

data gathered by this testing would improve the data used in future air quality modeling that is conducted for the Granite City area or the St. Louis region for $PM_{2.5}$ air quality. If found to be necessary for the attainment of the NAAQS for $PM_{2.5}$, including attainment of the anticipated future revisions to the $PM_{2.5}$ NAAQS by USEPA, the data gathered by this testing could assist in development of new standards for the BOFs, either in terms of PM, PM_{10} or $PM_{2.5}$ emissions, as appropriate.[17] Finally, the data gathered by these tests would support future permitting in Illinois and in other states in circumstances in which NSR rules do require that limits be set for particulate emissions as $PM_{2.5}$.[18]

16. Condition 3-1(b)(ii) of the draft construction permit, as it addresses the required testing for emissions of filterable PM_{10} and $PM_{2.5}$, should not specify that this testing must be conducted with USEPA Method 201 or 201A. Rather, use of only Method 201A should be specified. This is because Method 201 only measures PM_{10} emissions, whereas Method 201A can be used for measurements of both PM_{10} and $PM_{2.5}$.

The error in the draft permit identified by this comment has been corrected in the construction permit that has been issued. That is, the measurements of PM_{10} and $PM_{2.5}$ emissions that are required must be made using USEPA Method 201A.

17. Condition 3-1 (e)(iii) of the Draft Construction Permit would require the final report for emission testing that is submited to the Illinois EPA to contain the operating parameter limits for the new baghouse control system that are proposed by US Steel based on such testing. Under what circumstances are proposed operating parameters limits considered applicable? When proposed operating parameter limits are submitted, what are the procedure and the timeframe in which Illinois EPA reviews and establishes them?

The provisions of the Iron and Steel NESHAP, including 40 CFR 63.9(h)(2)(ii), 63.7790(b)(1), 63.7800(b)(3) and 63.7824(a) and (c), govern the operating parameters limits for the BOFs with baghouse control system, which are addressed by this comment. This NESHAP does not provide for approval of a source's proposed operating parameters limits by a permitting authority. Rather the limits that are established for operating parameters under this NESHAP are the levels of operating parameters during performance testing. These levels are contained or documented in the current Operating and Maintenance Plan for a subject facility which the source must maintain pursuant to this NESHAP, which plan specifies how the subject facility must be operated.[19]

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[17] It should not be expected that this testing would ever be used to demonstrate compliance with standards or limits for $PM_{2.5}$ emissions, as there would not be any limits in terms of $PM_{2.5}$ emissions when this testing is conducted.

[18] US Steel would also use the results of this testing in preparing the "performance report" required for this project by Condition 6(d) of the construction permit. In this report, US Steel must evaluate the reduction in emissions that is achieved by this project for emissions of particulate as $PM_{2.5}$.

[19] In this case, to revise or set new operating parameter limits for the capture system on the BOFs under the Iron and Steel NESHAP, US Steel must first submit a written notification or request to the Illinois EPA to conduct performance tests that would be the basis of the new operating parameters limits. In this case, this notification would address the "initial performance test" conducted for the BOFs with the new baghouse control system. It is expected that this notification would also address the initial operation of the BOFs with the baghouse system, until the performance tests are conducted. During this period, the current limits for operating parameters of the capture system, with control of secondary emissions with the existing ESP, would no longer be applicable but testing will not yet have been conducted to demonstrate the adequacy

18. Condition 3-2(a) of the draft construction permit would require US Steel to make measurements in order to determine the PM efficiency of the new baghouse. The condition would allow for these measurements to be made directly or indirectly. Would direct measurement likely be more accurate than indirect? If so, why not require direct measurement?

These measurements, which would relate to the efficiency of the new baghouse control system,[20] are being required to obtain information on the amount of PM collected by this system. This information is of interest to the Illinois EPA as related to the overall reduction in particulate emissions of the BOFs that is achieved in actual practice by this new system.[21] The required measurements are not needed to confirm compliance with an applicable limit or control requirement. As such, it is reasonable and appropriate for the construction permit to provide flexibility in the approach that US Steel uses for these measurements. At this time, this is especially true, as neither approach to measurements is preferred. Direct measurements of the PM loading into the baghouse would be expected to be more precise and correlate directly with measurements of emissions. However, these measurements would be taken over a relatively short period of time so would not necessarily be more accurate than indirect measurements, based on the amount of particulate collected by this system over a week or month. Indirect measurements would likely be more accurate as they address a longer period of operation of the BOFs. However, they would be less precise, as much larger amounts of material would be involved. As such, there is not a clear preference for the approach that should be taken to the measurements.

19. Currently with the ESP, the PM emissions of the BOP furnaces are reported to be 439.5 tons/year. With the new baghouse system, they would be 405.4, which boggles my mind.

The emission data cited by this comment, which was provided by US Steel for the application for a construction permit, is a very conservative evaluation of the change in emissions that would accompany this project. It reflects maximum operation of the BOFs, at their annual capacity, and

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of the new limits for operating parameters with the baghouse system. In conjunction with US Steel's written notification for planned testing, subject to any directives from the Illinois EPA in response to this notification, US Steel must also revise its operation and maintenance plan under the NESHAP. This revision would need to address the levels of operating parameters during the initial operation of the BOFs with the baghouse, consistent with US Steel's description of operation during this period as provided in the written notification for testing.

The next step in setting new operating parameter limits is for performance tests to be conducted for the BOFs to demonstrate the adequacy of the new limits. These performance tests would be conducted with the new baghouse control system operating at the levels of operating parameters that US Steel seeks to establish as the new limits. Following the date of testing, US Steel would be expected to continue to operate at or above the levels of parameters present during testing if testing demonstrated compliance while operating at those levels.

The final step in the process of setting new operating parameter limits is US Steel's submittal to the Illinois EPA of the report for this testing, with the new values for these limits. With this report, US Steel must also certify that the BOFs operated at these values of operating parameters during testing and that the testing was properly conducted for the purpose of setting new limits for operating parameters. As part of this step, US Steel must also revise its operating and maintenance plan to reflect that these new limits for operating parameters are applicable on a continuing basis.

[20] The efficiency of a baghouse, in percent, is calculated as follows:
100 x [1 - (Inlet Mass - Outlet Mass)/Outlet Mass] = Percent Control Efficiency

[21] Based on public comments, this information is also of concern to the public as it would support comparison between the new baghouse control system and baghouse systems at other sources.

a minimum level of improvement in control of emissions by the new baghouse system. Accordingly, this data overstates both current emissions and future emissions. A better assessment for the change in emissions is provided later, in response to another comment.

20. Please clarify in the permit record what the projected and baseline actual emissions are for each modified or affected emission unit. As presented in the available support information, it is not clear whether the reported "current" and "future" emissions represent "baseline actual emissions" and "projected actual emissions", as defined at 40 CFR 52.21(b)(48) and (b)(41), respectively. See Statement of Basis at page 8. Clarification is needed to ascertain the actual amount of the projected overall emissions reduction due to the project.

The Illinois EPA does not believe that the information requested by this comment, which relates to the planned issuance of a construction permit for the new baghouse control system, is needed to support that proposed action. This is because an essential element of a modification under New Source Review is that a proposed project would act to increase emissions of one or more pollutants that are regulated under New Source Review. As discussed, the proposed baghouse system would be an emission reduction project for particulate emissions of the BOFs and would be carried out to meet provisions of the Agreement. The new baghouse system would not increase the capacity or efficiency of the BOFs. There also would not be any collateral increases in emissions of other, non-target pollutants from the operation of the system. As such, the new baghouse system should not be considered a modification for purposes of New Source Review.[22]

Even though the reduction in particulate emissions need not be quantified in response to this comment, the Illinois EPA has further examined the amount of the emissions reduction that may be assumed for this project. This evaluation has been conducted in terms of emissions of PM_{10} because underlying emission data is more reliable for PM_{10} than for $PM_{2.5}$. For purposes of PSD, 40 CFR 52.21, the historic actual emissions of the BOFs are appropriately assumed to be on the order of 314 tons of PM_{10} per year.[23] The future emissions of projected future actual emissions should be expected to be at most about 260 tons of PM_{10} per year.[24] This yields a reduction of approximately 54 tons of PM_{10} per year.

21. Condition 1(b) of the draft construction would require US Steel to submit its initial revisions to the operation and maintenance plan required by the Iron and Steel NESHAP to address the BOFs with the new baghouse control system at least 30 days in advance of initial operation with this

[22] For example, refer to correspondence from USEPA concerning a proposed improvement of particulate matter control at Lehigh Portland Cement in Mitchell, Indiana (Letter, February 12, 2001, Pamela Blakley, USEPA Region 5, Air Programs Branch, to Paul Dubenetzky, Office of Air Management, Indiana Department of Environmental Management.)

[23] The average of the PM_{10} emissions reported by US Steel in its Annual Emission Reports for the peak years of production during the last ten years, 2004 and 2005, is 313.90 tons per year. In each of these years, the BOFs operated at about 72 percent of their permitted annual rate.

[24] The future emissions were conservatively calculated assuming that the BOFs would actually operate near their permitted annual rate compared to the maximum rate that US Steel has achieved in practice, i.e., 90 percent compared to 75 percent. To account for the normal operation of control devices, the baghouse and ESP were also conservatively assumed to comply with applicable emission standards under the new control configuration by 40 and 20 percent respectively. For example, rather than having emissions of 31.9 pounds per hour (745,200 scfm/min x 0.005 gr/scf x 60 min/hr ÷ 7,000), on annual basis, actual PM_{10} emissions would be 19.2 pounds/hr (31.9 x (1.0 - 0.6) = 19.14 pounds/hour).

system. However, the revision to this plan should not be submitted until after the initial performance testing is performed and completed, as required pursuant to Condition 3-1(a)(i). As this performance testing is needed to establish new limits for operating parameters, it is necessary for the testing to be completed in order to accurately revise this plan. Thus, this condition should specify that US Steel must submit a revised operation and maintenance plan after it has determined the new and revised operational limits for the control system.

This comment did not support any changes to the construction permit. As observed by this comment, US Steel will need to revise its operation and maintenance plan after performance testing is conducted for the BOF with the new baghouse control system. However, an earlier revision to this plan will also be needed, as addressed by Condition 1(b). This is because the BOFs must always be operated in accordance with a current operation and maintenance plan. If US Steel does not make any revisions to this plan until after initial performance testing with the new baghouse control system is completed, the BOFs would not be operating in accordance with the current plan.[25]

Incidentally, the subsequent revision to the operation and maintenance plan, which must occur after the initial performance testing of the BOFs with the baghouse control system, is also addressed by the permit. It is addressed in Condition 3-1(a)(i) in the permit, which deals with the initial testing of the BOFs with the new control system in place.

22. Condition 3-1(a)(i) of the draft construction permit would require that the source "promptly" conduct performance testing for PM emissions in accordance with the NESHAP following initial operation of the BOFs with the baghouse, to establish new operating limits for the capture system for the BOFs. This condition should provide that "promptly" means that the performance test will be conducted after shakedown. It should also specify that the performance testing be conducted to demonstrate compliance with the emission limit in Condition 2(a) and applicable NESHAP limits for the baghouse and the ESP, as well as to establish new and revised operational limits for the baghouse and ESP control systems.

Changes have been made in the issued permit in response to this comment. First, as requested by this comment, Condition 3-1(a)(i) in the issued permit specifies the goals of the required testing, i.e., to verify compliance with the applicable emission limits for PM set by the NESHAP and this permit and to establish new operating limits for the capture systems for the BOFs. This clarification is reasonable since this testing will have several functions.

As also requested by this comment, Condition 3-1(a)(i) in the issued permit does not require that this initial testing for PM emissions be "promptly" conducted once the new baghouse control system begins operation. Instead, the condition requires that this testing be conducted within 180 days of initial startup of the baghouse system or, if delayed by force majeure events, such later date that testing can first be conducted. This is reasonable and appropriate as it will

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[25] The existing Operation and Maintenance Plan, addressing operation of the BOFs with only the ESP control system, will immediately become inadequate when the new baghouse control system begins to operate. First, the plan would not address the baghouse control system. Second, the provisions in the plan for operation of the ESP control system would no longer be appropriate as secondary emissions are being controlled by the baghouse control system.

accommodate typical shakedown of equipment by US Steel and initial emission testing. However, the condition does not specify that initial testing shall be conducted only after shakedown of the new system is complete, as was requested by the comment. Rather the condition reflects the common practice of air pollution control rules, including the NSPS and NESHAP, when dealing with required timing of initial emission testing. Emission testing is required to be conducted within a set number of days from the date of initial startup of an emission unit or the date that new requirements become applicable. Any extensions of this timing are addressed on a case-by-case basis through administrative discretion. This accommodates typical or routine shakedown of equipment prior to requiring initial emission testing while also accommodating unforeseen events that cannot practically be more concretely addressed by the provisions of a rule. The comment does not explain why it would be appropriate to deviate from this established practice in this case, to directly link the timing for emission testing to the completion of shakedown.[26]

This change to Condition 3-1(a)(i) has implications for the permit that were not considered by this comment but also resulted in changes in the issued permit. As the permit would not require that emission testing of the BOFs with the new baghouse control system be conducted promptly, the actual duration of the "interim period" until this testing is conducted is uncertain and could be significant. This is of concern as related to the effectiveness of capture of secondary emissions of the BOFs during this transition period.[27] This is now directly addressed in the issued permit by new Condition 3-2. It requires US Steel to promptly conduct initial observations, in accordance with the Iron and Steel NESHAP, for the opacity of emissions from the roof monitor of the BOF shop. Thereafter, until emission testing with the new baghouse system is conducted, these observations must be made at least every 15 operating days. Since these opacity observations will address the uncaptured emissions from the BOF shop, they will address the effectiveness of capture of emissions during the interim period. They will serve to directly determine compliance during this period with the applicable opacity limit for the BOF shop until the initial performance testing of the BOFs with the baghouse control system is conducted.

23. In addition to requiring testing for emissions of particulate (PM, filterable PM_{10} and $PM_{2.5}$, condensable particulate matter) and lead, draft Condition 3-1(a)(ii) would require testing for emissions of NO_x, CO and VOM within one year of initial operation of the new baghouse control system. Since this system will not function to control emissions of gaseous pollutants, testing should not be required for NO_x, CO and VOM. Because there are no limits for emissions of these pollutants from the baghouse, testing the baghouse for these pollutants would yield results that are only minimally useful. Also, based on the Iron and Steel NESHAP and a recent information collection request by USEPA, VOM and CO are not

[26] In addition, setting a deadline for this testing based on completion of shakedown would be problematic because the term "shakedown" is not defined by the Iron and Steel NESHAP. Moreover, a certain period of time would occur between the date that "shakedown" is completed and the date that emission testing can be scheduled. (Otherwise, shakedown would, at least in part, be defined circularly as the date when required emission testing is or could first reasonably be conducted.)

[27] The performance of both the baghouse and ESP control devices during the transitional period will be directly addressed through the continuous monitoring systems on these devices, which systems will be operational during this period. The new baghouse will have a bag leak detection system. The existing ESP already has a continuous opacity monitoring system.

pollutants of concern for control devices for BOF secondary emissions. Accordingly, the permit should not require emissions testing for these pollutants. Moreover, if testing is required for these pollutants, it should only be for the ESP. This would not only be more effective, but would also be consistent with historical practice. In particular, should testing be required for the ESP for NO_x, CO and VOM, test results can be compared to applicable permit limits (CAAPP Permit No. 96030056, Condition 7.5.6(c).

In response to this comment, changes have been made in the issued permit related to testing of the baghouse control system for emissions of NO_x, CO and VOM. In the issued permit, new Condition 3-1(a)(ii)(B) now provides that emissions testing for the baghouse for these pollutant(s) would not be required if preliminary measurements show emissions of pollutant(s) that are below the detection level of the test method(s).[28] As observed by this comment, emissions of NO_x, CO and VOM from BOFs are generally considered to be associated with the refining process rather than charging and tapping. Accordingly, the issued permit would not require emission testing for the baghouse for these pollutants if this is confirmed by preliminary measurements to characterize emissions of these pollutants. In this regard, this comment did not provide the results of actual emission measurements that confirm that emissions of NO_x, CO and VOM from BOFs are effectively associated with the refining process. Such data is important because, as noted by the comment, permit limits have been established for emissions of these pollutants from the BOFs that occur through the ESP stack.

Changes have not been made to the testing requirements for the ESP. As already noted, permit limits have previously been established for emissions of NO_x, CO and VOM from the BOFs as currently controlled by the ESP. As testing of the ESP under the new control configuration is being required for particulate and lead, it is reasonable that testing also be conducted for these other pollutants for which limits have been established. This testing will provide timely confirmation of the emission rates of these pollutants under the new control configuration. As emission testing must be conducted for the ESP in any case, US Steel will only bear an incremental increase in cost for testing additional pollutants.

24. Condition 3-1(b)(i) and (ii) of the draft construction permit would provide, respectively, that PM testing must be conducted using applicable procedures specified in the NESHAP and testing of other pollutants must be conducted using applicable USEPA procedures. In Condition 3-1(b)(ii), the draft permit list methods for filterable PM_{10} and $PM_{2.5}$ and condensable PM, which seems inconsistent with the statement to use applicable USEPA methods for testing pollutants other than PM. This will create ambiguity as it is unclear whether the listed test methods for PM_{10} and $PM_{2.5}$ are intended to apply to testing for other pollutants, which does not seem appropriate. Clarification is sought regarding the applicable test methods for PM and other pollutants.

Condition 3-1(b)(ii) in the draft permit did not specify test methods for four pollutants, i.e., lead, NO_x, CO and VOM, for which the permit would

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[28] As the issued permit would now address preliminary measurements to characterize emissions, related changes have also been made to the required contents of test plans and emission test reports.

require testing. In response to this comment, this condition in the issued permit also identifies the USEPA test methods that are to be used for testing emissions of these four pollutants unless the Illinois EPA approves use of other USEPA test methods as part of its review of the test plan. This eliminates uncertainty about the methods that are expected to be used for testing of these pollutants.

With respect to methods for testing "particulate," the draft permit clearly specified the methods that would be used for testing different "classes" of particulate, as follows. In this regard, the terms PM, filterable PM_{10}, filterable $PM_{2.5}$ and condensable particulate matter refer to different classes of particulate that are, in practice, effectively defined by the test methods that are used for measurement of emissions. Accordingly, the only change that has been made in the issued permit related to testing of particulate is a correction related to the method used for testing PM_{10} and $PM_{2.5}$, as has already been discussed.[29]

Methods 5, 5D or 17 (methods specified by the NESHAP)	Particulate matter (filterable)
Method 201A	Filterable PM_{10}
Method 201A	Filterable $PM_{2.5}$
Method 202	Condensable particulate matter

25. I appreciate the potential air quality benefits of this project and the work that US Steel and the Illinois EPA and have done for this project.

This comment, which does not request any changes to the draft permits, is acknowledged.

FOR ADDITIONAL INFORMATION

Questions about the permit decision should be directed to:

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[29] It should be noted that the term "particulate" is used in this Responsiveness Summary to generically address the various forms in which particulate have been regulated or addressed by USEPA and by other regulatory agencies. The term particulate is not used to designate "particulate matter (PM)," which is a specific type of particulate that is subject to regulation. Most noteworthy, PM is the form of particulate for which USEPA has set limits in the Iron and Steel NESHAP and for which limits are set in the Agreement.

LISTING OF SIGNIFICANT CHANGES BETWEEN THE DRAFT PERMIT AND THE ISSUED PERMIT

PART 1: FINDINGS AND CONDITIONS FOR THE CONSTRUCTION PERMIT

Finding 3(a)(ii):

This finding no longer refers to provisions in the CAAPP permit for the Granite City Works that were established pursuant to 35 IAC Part 201 Subpart I related to "startup" of the BOFs. This is because the CAAPP permit for the source does not include any such provisions for the BOFs. Accordingly, this change corrects an inadvertent error in the draft permit.

Condition 3-1(a)(i):

In response to comments, two changes have been made to this condition. First, this condition which addresses the initial PM testing of the BOFs with the new baghouse, now specifies the purpose of the emission testing that is required. That is, the purpose of this testing are to verify compliance with the applicable emission limits for PM set by the NESHAP and this permit and to establish new operating limits for the capture systems for the BOFs. This clarification requested by a comment is reasonable since this testing will have multiple purposes.

Second, this condition does not require that the initial PM testing of the BOFs with the new baghouse system be "promptly" conducted once this system begins operation. Instead, the condition requires that this testing be conducted within 180 days of initial startup of the baghouse system or, if delayed by force majeure events, such later date that testing can first be conducted. This change is reasonable because it was recognized that compliance during the period until this testing is performed can appropriately be addressed by a means other than testing, i.e., appropriate observations for opacity. Accordingly, this condition now accommodates typical shakedown of the new equipment followed by initial emission testing, as requested by a comment. In this regard, the condition reflects the common practice of air pollution control rules, including the NSPS and NESHAP, when dealing with required timing of initial emission testing. This testing is required to be conducted within a set number of days from the date of initial startup of an emission unit or the date that new requirements become applicable. Any extensions of this timing are addressed on a case-by-case basis through administrative discretion. This accommodates typical or routine shakedown of equipment before initial emission testing is required while also accommodating unforeseen events that cannot practically be more concretely addressed by the explicit provisions of a rule.

This change to this condition has implications for the permit that were not considered by this comment but which also resulted in changes in the issued permit. As the permit would not require that emission testing of the BOFs with the new baghouse control system be conducted promptly upon startup of the new baghouse system, the actual duration of the interim period until this testing is conducted is uncertain and could be significant. This is of concern as related to the effectiveness of capture of secondary emissions of the BOFs during this transition period. This is now directly addressed by new Condition 3-2 in the issued permit, which now requires observations for the opacity of emissions from the roof monitor of the BOF shop, as discussed further below.

Condition 3-1(a)(ii):

In response to a comment, changes have been made to this condition which addresses testing of the baghouse control system for emissions of NO_x, CO and VOM. In the issued permit, new Condition 3-1(a)(ii)(B) now provides that emissions testing for the baghouse for these pollutant(s) would not be required if preliminary measurements show emissions of these pollutant(s) are below the detection level of the test method(s). As observed by this comment, emissions of NO_x, CO and VOM from BOFs are generally considered to be associated with the refining process rather than charging and tapping. Accordingly, the issued permit would not require emission testing for the baghouse for these pollutants if this is confirmed by preliminary measurements to characterize emissions of these pollutants, i.e., emissions are below the detection limit of the applicable test method. In addition, as the issued permit would now address preliminary measurements to characterize emissions, related changes have also been made to the required contents of test plans and emission test reports (*See* Conditions 3-1(c)(viii) and (e)(viii).)

Condition 3-1(b)(ii):

In response to comments, changes have been made to this condition which addresses the methods that are to be used for emission testing. First, the condition provides that Method 201A is to be used for testing for emissions of filterable PM_{10} and $PM_{2.5}$. The condition no longer provides that such measurements may be conducted using Method 201. This is because only Method 201A can provide measurements for both PM_{10} and $PM_{2.5}$. This corrects an error in the draft permit.

Second, this condition, now identifies the USEPA test methods that are to be used for testing emissions of four pollutants, lead, NO_x, CO and VOM, unless the Illinois EPA approves use of other USEPA test methods as part of its review of the test plan. The draft permit did not specify test methods for these pollutants, for which emission testing would be required. This change eliminates uncertainty about the methods that are expected to be used for testing of these four pollutants.

Condition 3-1(b)(ii):

This condition, which requires that observations for opacity of emissions from the BOF shop be conducted during testing for particulate emissions, now specifically refers to 40 CFR 63.7823(d). These observations must be made in accordance with applicable provisions of the Iron and Steel NESHAP. The change was made to emphasize this requirement.

Conditions 3-1(c)(viii) (new):

This new condition would require the relevant test plans submitted by US Steel prior to emission testing to provide a description of the proposed approach to preliminary measurements for emissions of NO_x, CO, or VOM from the BOF baghouse if US Steel is planning to conduct such measurements to determine whether emissions are below the detection limit of the applicable test method. This is a logical consequence of new Condition 3-1(a)(ii)(B).

Conditions 3-1(e)(viii) (new):

This new condition would require the relevant reports submitted by US Steel for emission testing include documentation for preliminary measurements that show

emissions of NO_x, CO, or VOM from the BOF baghouse are below the detection limit of the applicable test method if US Steel relied on such measurements to not conduct further emission testing for these pollutant(s). This is a logical consequence of new Condition 3-1(a)(ii)(B).

Condition 3-2 (new):
(In the issued permit, draft Condition 3-2 has been renumbered as Condition 3-3)

When the BOFs begin operating with the new baghouse control system, this new condition requires US Steel to promptly conduct initial observations, in accordance with the Iron and Steel NESHAP, for the opacity of emissions from the roof monitor of the BOF shop. Thereafter, until emission testing with the new baghouse system is conducted, these observations must be made at least every 15 operating days. Since these opacity observations will address the uncaptured emissions from the BOF shop, they will address the effectiveness of capture of emissions during the interim period. They will serve to directly verify compliance during this period with the applicable opacity limit for the roof monitor of the BOF shop until the initial performance testing of the BOFs with the baghouse control system is conducted.

This new condition is a logical corollary to the change that has been made to Condition 3-1(a)(i). There will now be an interim period until a performance test for PM emissions will be conducted, which test would also include simultaneous observations for the opacity of the emissions from the roof monitor of the BOF shop. It is now appropriate that the permit include compliance provisions as necessary to address compliance with applicable requirements during this interim period. The proper operation of both the baghouse and ESP control devices during this period will already be directly addressed through the continuous monitoring systems on these devices, which are required by the Iron and Steel NESHAP and must be operational during this period. (The new baghouse will have a bag leak detection system. The existing ESP already has a continuous opacity monitoring system.) However, the opacity of the emissions of the roof monitor on the BOF shop, which is a measure of the effectiveness with which the particulate emissions of the BOFs are captured with the new baghouse system, would not be addressed by the Iron and Steel NESHAP until the initial performance test is conducted. Thus, it is appropriate for the issued permit to now require opacity observations during the interim period to verify proper capture of emissions during this period.

Condition 6(a)(i):

This condition, which requires advance notice to the Illinois EPA prior to beginning operation of the BOFs with the new baghouse system, now also requires that this notice provide the expected timing of the initial opacity observations for emissions from the roof monitor on the BOF shop that are required during the "interim period." This is a logical consequence of the requirement for such observations, as it would enable the Illinois EPA to confirm the timeliness of such observations.

PART 2: CHANGES THAT ARE "PRE-AUTHORIZED" TO THE CAAPP PERMIT

(All changes are in the new version of Section 7.5 for the revisions to the CAAPP permit)

General Clarification of Terminology in Section 7.5:

Various changes have been made in Part 2 of the Construction Permit to improve the clarity or precision of the terminology that would be used in the revised CAAPP permit. In particular, the word "affected" would generally not be used in Section 7.5 in the revised CAAPP permit. In the context of Section 7.5 of the CAAPP permit and this permit action, the word "affected" is either superfluous or ambiguous. This is because this construction permit addresses specific emission units and control devices, e.g., the new baghouse control system and the existing BOFs. The word "affected" is not actually needed to categorically describe the emission units that are addressed by this permitting action, which are subject to a particular set of requirements. In addition, Section 7.5 of the CAAPP permit generally addresses "basic oxygen processes." The word "affected" is not consistently used in the current version of Section 7.5 of the CAAPP permit to further identify the basic oxygen processes that are being addressed. It would be confusing to now add the word "affected" to Section 7.5 of the CAAPP permit to specifically designate the new baghouse control system. Accordingly, the word "affected" has been removed. The generic terms for the emission units that are being addressed by Section 7.5 of the CAAPP permit continues to be "basic oxygen processes," consistent with the title of this section.

Similarly, the current Section 7.5 uses both the terms BOPF and BOF for the subject furnaces. Again, this is an unnecessary source of confusion. The revision to Section 7.5 consistently uses the term BOPF (i.e., NESHAP terminology) with two exceptions. The first exception in the conditions for the state emission standards, in which the regulatory provisions uses the term BOF. The second exception is in introductory material, so as to explain that the terms BOPF and BOF mean the same thing.

Further Improvement of Organization of Section 7.5:

Upon further review of the draft permit, it was realized that further improvements needed to be made to the organization of Section 7.5 in the revised CAAPP permit. For example, state and NESHAP standards have been addressed in separate conditions, i.e., Conditions 7.5.3-1 and 7.5.3-2. Related records have been better grouped together in Condition 7.5.9. One-time, project-specific reporting requirements, which are carried over into the CAAPP permit from various construction permits, have been shifted into a separate condition dealing with such reports, Condition 7.5.10-1, to distinguish them from ongoing reporting requirements.

Improved Citations for the Iron and Steel NESHAP in Section 7.5:

Certain citations to the Iron and Steel NESHAP, 40 CFR 63 Subpart FFFFF, were improved. For example, in the initial condition in Section 7.5 of the revised CAAPP permit that addresses this NESHAP (now Condition 7.5.3-2), which identifies applicable NESHAP emission standards, the specific paragraphs from Table 1 of this NESHAP are now identified. Regulatory citations are also provided for certain records required by this NESHAP where those citations were missing. For example, see Condition 7.7.9(a)(v), which now appropriately provides a citation to 40 CFR 63.7843.

Removal of "Expired" Requirements from Section 7.5:

A few requirements that on their face are now outdated have been removed. For example, the initial operational requirements for the steam rings on the furnaces, which applied through October 31, 2012, have been removed (draft Condition 7.5.5-3(b)). The permit would provide that only the more rigorous requirements, as now apply, would be included in the revised CAAPP permit (Condition 7.5.5-3(a)).

Changes in Part II of the Permit That Carry Over Changes to Construction Permit/PSD Approval 95010001

New Condition 7.5.3-2(a)(ii) addresses new provisions added to Construction Permit/PSD Approval 95010001, when it was recently revised in December 2012. It is appropriate that these new provisions also be carried over into the revised CAAPP Permit as they now are applicable to the BOFs. In particular, "new" Condition 9 was added to in Permit 95010001 when it was revised. It requires US Steel to operate and maintain the BOFs and associated capture and control systems in accordance with applicable compliance requirements of the Iron and Steel NESHAP for the specific purpose of providing practical enforceability to certain other conditions in Permit 95010001 that apply to the BOFs. In this regard, the compliance requirements of this NESHAP will take the place of certain compliance requirements in Permit 95010001 that will no longer be applicable when the BOFs begin to be controlled by the new baghouse control system or other baghouse control system for secondary emissions of the BOFs. Given the ongoing function of the compliance requirements of the NESHAP as the mechanism for assuring compliance with certain requirements for the BOFs in Permit 95010001, it is appropriate that this function, as reflected in and addressed by Condition 9 of revised Permit 95010001, be carried over into the revised CAAPP permit.

Inclusion of the NESHAP Standard for Control Devices for Secondary Emissions from BOFs

New Condition 7.5.3-2(b)(ii) would include the relevant standard of the Iron and Steel NESHAP for control devices that control secondary emissions from BOFs in the revised CAAPP permit. This addition to the permit corrects an omission in the draft permit.

Changes in Part II of the Permit That Carry Over Changes in Part I of the Permit

Condition 7.5.7-1 - This condition repeats Condition 3-1 from Part 1 of the Construction Permit, which deals with emission testing of the BOFs with the new baghouse control system. It now includes the changes that have been made to Condition 3-1, as discussed above.

Condition 7.5.8-1(d) (new) - This new condition for the revised CAAPP permit repeats new Condition 3-2 from Part 1 of the Construction Permit, which deals with observations of the opacity of emission from the roof monitor on the BOF shop during the "interim period" before the initial testing with the new baghouse system is conducted. It is also appropriate that these requirements be included in the revised CAAPP Permit as they will apply to operation with the new control system. The requirements would be added to Condition 7.5.8-1

of the CAAPP permit as it addresses "Additional Requirements for Opacity Observations."

Condition 7.5.10-1(c)(i)(A) - This condition repeats Condition 6(a)(i) from Part 1 of the Construction Permit, which deals with the advance notice to the Illinois EPA prior to beginning operation of the BOFs with the new baghouse system. It now includes the changes that have made to Condition 6(a)(i), as discussed above.

Appendix D –
Process Description

APPENDIX D: PROCESS DESCRIPTIONS

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Division of Records Management
Retention

FEB 16 2023

Reviewer: MDB

APPENDIX D

PROCESS DESCRIPTIONS

APPENDIX D

Section 7.1 Process Description
Material Handling

PROCESS DESCRIPTION

Section 7.1 Material Handling

Coal Handling and Processing – Coal Crusher

Primary Coal Crushing:

This emissions unit (also known as the by-mixer) is mainly used in the winter to break-up frozen chunks of coal. This step is necessary to reduce the size of the coal to aid in transfer of the coal to the pulverizers and to aid in the coking process itself. Potential emissions from this unit consist of particulate matter generated from the crushing operations.

EXHIBIT 220-5

Section 7.1 Material Handling

Coal Handling and Processing – Coal Crusher

The sample calculation methods presented below are used to determine emission rates for the coal pulverizing emission unit described in this application.
Emission factors for this unit are provided in ***Appendix E***.

Emissions of particulate matter from the coal pulverizing process are determined with the following equation:

$$E_{PM} = (EF)(P)$$

Where:

E_{PM} = Particulate matter emission rate in pounds per hour;
EF = Emission factor in pounds per ton; and
P = Process weight rate in tons per hour

$$E_{PM\ max} = (.02\ lb/Ton\ coal * 104\ T/hr)$$
$$= 2.08\ lb/hr < allowable$$

PROCESS DESCRIPTION

Section 7.1 Material Handling

Coal Handling and Processing – Coal Pulverizers

Coal Pulverizer:

There are two coal pulverizers in this emissions unit. Only one pulverizer can be used at any one time. The remaining pulverizer is maintained as a backup unit. The pulverizing step is necessary to reduce the size of the coal to aid in the coking process. Potential emissions from this unit consist of particulate matter generated from the pulverizing operations.

EXHIBIT 260-5

Section 7.1 Material Handling

Coal Handling and Processing – Coal Pulverizers

The sample calculation methods presented below are used to determine emission rates for the coal pulverizing emission unit described in this application.
Emission factors for this unit are provided in ***Appendix E***.

Emissions of particulate matter from the coal pulverizing process are determined with the following equation:

$$E_{PM} = (EF)(P)\left(1 - \frac{C}{100}\right)$$

Where:

E_{PM} = Particulate matter emission rate in pounds per hour;
EF = Emission factor in pounds per ton; and
P = Process weight rate in tons per hour
C = Net control efficiency (PM=99.32; PM-10 = 99.32)

$$E_{PM\ max} = (.02\ lb/Ton\ coal * 104\ T/hr * .0068)$$
$$= 0.014\ lb/hr < allowable$$

PROCESS DESCRIPTION

Section 7.1 Material Handling

Blast Furnaces – Screening, Conveyors and Feed Hoppers, Stock House Storage Bins and New Coke Conveyance System

Blast Furnace Raw Material Handling Systems

Raw materials such as coke, iron-bearing materials, and fluxes are charged to the blast furnaces in the iron making process. The materials are charged in the top of the furnace from skip cars, which are filled in the stock house from conveyors or hoppers. Iron pellets and coke are screened by screening equipment (3 screeners – 2 coke, 1 iron pellets) prior to charging.

New Coke Conveyance System

The coke conveyor system transfers coke from Gateway Energy to U. S. Steel to be used in the existing Blast Furnaces.

EXHIBIT 260-5

Section 7.1 Material Handling

Blast Furnaces – Screening, Conveyors and Feed Hoppers, Stock House Storage Bins and New Coke Conveyance System

The calculation methods presented below are used to determine emission rates from the Flux Conveyor and Transfer Pits emission unit described in this application.

Emissions of particulate matter generated by each conveying operation are determined with the following equation:

$$E_{CV} = (EF)(P)\left(1 - \frac{C}{100}\right)$$

Where:

E_{CV} = Particulate matter (PM and PM-10) emission rate in tons per year
EF = Emission factor in pounds per ton
P = Process weight rate in net tons per year
C = Net control efficiency (99.33 % for PM and PM-10)

Maximum PM/PM-10 emission rate, $E_{PM/PM\text{-}10\ MAX}$, is calculated as shown below.

$E_{PM/PM\text{-}10\ MAX}$ **= (0.2286 lb/ton) * (3,580,000 net tons/yr) * (1-0.993)**
= 5728.72 lbs/yr
= 2.86 tons /yr
≤ Allowable

PROCESS DESCRIPTION

Section 7.1 Material Handling

Steel Making Conveyors and Storage Bins

Flux Conveyor and Transfer Pits:

Raw materials used in the BOFs and LMF are delivered to the facility by both truck and railcar. The trucks and railcars are either unloaded to the ground or directly into an underground feed hopper. Materials unloaded to the ground are placed in storage piles, or in super sacks, endloaders are used to transfer the materials from the storage piles or super sacks to the underground feed hopper. The underground feed hopper then feeds material onto BOF material transfer conveyor C-1. This material transfer is controlled by the Trackhopper Baghouse, this baghouse empties back onto C-1 conveyor.

Materials added in the BOF and LMF are transferred from the underground feed hopper, by a conveyor system consisting of three conveyors (nos. C-1, C-2 and C-3) arranged in series. From conveyor C-3 the materials are offloaded into storage bins 1 through 10, or a rotating hopper known as the lazy susan, or onto conveyor C-5. The storage bins unload materials to conveyor C-4, which transfers and off-loads the materials into the BOF feed hoppers for the #1 vessel or #2 vessel. The lazy susan feeds directly into the BOFs Alloy transfer car. Conveyor C-5 transfers materials to the LMF material handling system. All operations carried out within this unit take place within enclosed structures. The transfer from conveyors C-1 to C-2 and C-2 to C-3 are controlled by the Binfloor Baghouse, this baghouse empties into Bin #2.

Materials are transferred from the BOF Binfloor to the LMF on conveyor C-5. This conveyor off-loads into storage bins which transfer to conveyor C-6. The emissions from the transfer from C-5 to C-6 are handled by Baghouse 1. Additional raw materials used in the LMF are transferred from the Tripper Conveyor to a set of storage bins. Emissions generated by loadout of the Tripper Conveyor are controlled by Baghouse #2.

Emission factors for these material handling operations are provided in ***Appendix E.***

EXHIBIT 260-5

Section 7.1 Material Handling

Steel Making Conveyors and Storage Bins

The calculation methods presented below are used to determine emission rates from the Flux Conveyor and Transfer Pits emission unit described in this application.

Emissions of particulate matter generated by each conveying operation are determined with the following equation:

$$E_{CV} = (EF)(P)\left(1 - \frac{C}{100}\right)$$

Where:

E_{CV} = Particulate matter (PM and PM-10) emission rate in tons per year
EF = Emission factor in pounds per ton
P = Process weight rate in net tons per year
C = Net control efficiency (99.33 % for PM and PM-10)

Maximum PM/PM-10 emission rate, $E_{PM/PM\text{-}10\ MAX}$, is calculated as shown below.

$E_{PM/PM\text{-}10\ MAX}$ = (0.2286 lb/ton) * (3,580,000 net tons/yr) * (1-0.993)
= 5728.72 lbs/yr
= 2.86 tons /yr
≤ Allowable

PROCESS DESCRIPTION

Section 7.1 Material Handling

LMF Material Handling System

Material Handling System:

LMF materials from the BOF Binfloor are transferred to this unit on conveyor number five. This conveyor off-loads into storage bins that then loadout to conveyor number six. Baghouse # 1 controls this operation. Potential emissions from this unit consist of particulate matter generated by material transfer from conveyor five to six.

APPENDIX D

Section 7.2 Process Description
Coke Production

PROCESS DESCRIPTION

Section 7.2 Coke Production

Battery "A" Charging

Coking Process - "A" Charging

The operation carried out in this unit includes unloading coal from the Larry cars into the coke ovens. Coal is charged to the ovens through four charging port lids, on each oven, utilizing sequential charging with steam aspiration to the collecting mains. Potential emissions from this unit consist of particulate matter, sulfur dioxide, nitrogen oxides, carbon monoxide, volatile organic materials, and HAPs. Each coke oven charge is approximately 16 tons of coal.

PROCESS DESCRIPTION

Section 7.2 Coke Production

Battery "B" Charging

Coking Process - "B" Charging

The operation carried out in this unit includes unloading coal from the Larry cars into the coke ovens. Coal is charged to the ovens through four charging port lids, on each oven, utilizing sequential charging with steam aspiration to the collecting mains. Potential emissions from this unit consist of particulate matter, sulfur dioxide, nitrogen oxides, carbon monoxide, volatile organic materials, and HAPs. Each coke oven charge is approximately 16 tons of coal.

EXHIBIT 220-5

Section 7.2 Coke Production

Coke Oven Charging

The calculation methods presented below are used to determine emission rates from the coke oven charging process described in this application.

Emission rates for pollutants generated by the coke oven charging is determined with the following equation:

$$E_C = N_T/T \times 0.005/CR$$

Where:

E_C	=	BSO Emission Factor (kg/Mg)
N_T	=	Total number of ovens on battery
T	=	Coking cycle time (hr)
0.005	=	Typical emission rate per charge (kg/hr)
CR	=	Coal charge rate (MG/hr)

Note : Individual pollutant are then multiplied by the ratio of that pollutant to BSO (Draft AP-42 Table 4-10)

PROCESS DESCRIPTION

Section 7.2 Coke Production

"A" Pushing

Coking Process - "A" Pushing:

Once the coking cycle in an oven has been completed, the push and coke side doors are removed, respectively, by the pushing machine and coke-side door machines. A ram on the pushing machine pushes the coke out through a guide on the door machine. The coke falls through the guide, which is covered by a hood on the machine, and into the quench box. The emissions from pushing are controlled by a mobile scrubber car equipped with a venturi scrubber. The venturi scrubber is equipped with a mist eliminator and an exhaust fan. There are currently two mobile scrubber cars used to control pushing (EQC#3 and EQC#4). The quench box and scrubber car travel with this system to the coke quenching operation.

EXHIBIT 220-5

Section 7.2 Coke Production

Coke Oven Pushing

The calculation methods presented below are used to determine emission rates from the coke oven pushing process described in this application.

The operation carried out in this unit includes coke oven unloading into the EQC car. Potential emissions from this unit consist of particulate matter, sulfur dioxide, nitrogen oxides, carbon monoxide, volatile organic materials, and HAPs.

Emission rates for pollutants generated by the coke pushing are determined with the following equation:

$$E_{CO} = (EF)(P)(1 - \frac{C}{100})$$

Where:

E_{CO} = Pollutant emission rate in pounds per hour (per pollutant, per operation);
EF = Emission factor in pounds of pollutant per ton of coke; and
P = Process weight rate in tons of coke pushed per hour
C = Control Efficiency (PM=97.5; PM-10=96.67)

$E_{pm\ max}$ = 1.15 lb/Ton Coke * 39 Ton/hr * (1-.975) = 1.12 lb/hr < Allowable

PROCESS DESCRIPTION

Section 7.2 Coke Production

Battery "B" Pushing

Coking Process - "B" Pushing:

Once the coking cycle in an oven has been completed, the push and coke side doors are removed, respectively, by the pushing machine and coke-side door machines. A ram on the pushing machine pushes the coke out through a guide on the door machine. The coke falls through the guide, which is covered by a hood on the machine, and into the quench box. The emissions from pushing are controlled by a mobile scrubber car equipped with a venturi scrubber. The venturi scrubber is equipped with a mist eliminator and an exhaust fan. There are currently two mobile scrubber cars used to control pushing (EQC#3 and EQC#4). The quench box and scrubber car travel with this system to the coke quenching operation.

EXHIBIT 260-5

Section 7.2 Coke Production

Coke Oven Pushing

The calculation methods presented below are used to determine emission rates from the coke oven pushing process described in this application.

The operation carried out in this unit includes coke oven unloading into the EQC car. Potential emissions from this unit consist of particulate matter, carbon monoxide, volatile organic materials, and HAPs.

Emission rates for pollutants generated by the coke pushing are determined with the following equation:

$$E_{CO} = (EF)(P)(1 - \frac{C}{100})$$

Where:

E_{CO} = Pollutant emission rate in pounds per hour (per pollutant, per operation);
EF = Emission factor in pounds of pollutant per ton of coke; and
P = Process weight rate in tons of coke pushed per hour
C = Control Efficiency (PM = 97.5; PM-10 = 96.7)

$E_{pm\ max}$ = 1.15 lb/Ton Coke * 39 Ton/hr * (1-.975) = 1.12 lb/hr < Allowable

PROCESS DESCRIPTION

Section 7.2 Coke Production

Quenching

Coke Quenching with Baffles:

In this operation, coke pushed from the ovens is quenched with water. There are two locations where quenching normally takes place. The primary quench station is the West Quench Tower, which is a Low Emission Quench Tower (LEQT) equipped with baffles. The secondary quench station is the East Quench Tower, which is the original quench tower that was replaced by the LEQT. The East Quench Tower is used as a backup for the West Quench Tower.

EXHIBIT 220-5

Section 7.2 Coke Production

Quenching

The calculation methods presented below are used to determine emission rates from the coke quenching emission unit described in this application. Emission factors for this unit are provided in ***Appendix E***.

Emissions from the coke quenching process are determined with the following equation:

$$E_{CQ} = (EF)(P)$$

Where:

E_{CQ} = Particulate matter emission rate in pounds per hour;
EF = Emission factor in pounds per ton;
P = Facility coke production rate in tons per hour

Emissions from the hand quenching process are considered negligible.

PROCESS DESCRIPTION

Section 7.2 Coke Production

"A" Underfiring

"A" Coke Oven Battery Underfiring:

Coke oven gas (COG) is combusted to generate the heat required to convert coal to coke. The COG is treated by both the by-products plant and, except during maintenance and outage, by the COG desulfurization system. Natural gas may also be added through the blending station in order to stabilize the heat content of the COG. Emissions from this unit occur at the main stacks of each battery and are mainly the by-products of combustion, including particulate matter, sulfur dioxide, nitrogen oxides, carbon monoxide, and volatile organic materials.

EXHIBIT 240-5

Section 7.2 Coke Production

"A" Underfiring

The calculation methods presented below are used to determine emission rates from the coke ovens described in this application.

Emission factors for this unit are provided in ***Appendix E***. Emission rates for each of the aforementioned pollutants are determined with the following equation:

$$E_{CO} = (EF)(P)$$

Where:

E_{CO} = Pollutant emission rate in pounds per hour;
EF = Emission factor; and
P = Process variable (tons of coke per hour for PM and VOM emissions and MMft3/hour of coke oven gas for all other pollutants)

PROCESS DESCRIPTION

Section 7.2 Coke Production
"B" Underfiring

"B" Coke Oven Battery Underfiring:

Coke oven gas (COG) is combusted to generate the heat required to convert coal to coke. The COG is treated by both the by-products plant and, except during maintenance and outage, by the COG desulfurization system. Natural gas may also be added through the blending station in order to stabilize the heat content of the COG. Emissions from this unit occur at the main stacks of each battery and are mainly the by-products of combustion, including particulate matter, sulfur dioxide, nitrogen oxides, carbon monoxide, and volatile organic materials.

EXHIBIT 240-5

Section 7.2 Coke Production

"B" Underfiring

The calculation methods presented below are used to determine emission rates from the coke ovens described in this application.

Emission factors for this unit are provided in ***Appendix E***. Emission rates for each of the aforementioned pollutants are determined with the following equation:

$$E_{CO} = (EF)(P)$$

Where:

E_{CO} = Pollutant emission rate in pounds per hour;
EF = Emission factor; and
P = Process variable (tons of coke per hour for PM and VOM emissions and MMft3/hour of coke oven gas for all other pollutants)

PROCESS DESCRIPTION

Section 7.2 Coke Production

Fugitive Sources

Lid, Door and Offtake Leaks:

Coke Oven lids, doors, and offtake piping are normally sealed, however they are under pressure during the coking cycle and could leak. Potential emissions from this unit consist of particulate matter, sulfur dioxide, nitrogen oxides, carbon monoxide, volatile organic materials, and HAPs.

Emission rates for pollutants generated by the coke oven fugitive lid leaks, fugitive door leaks, and standpipe flaring operations (each) are determined by using AP-42 (Section 12.2, Table 12.2-13) lb/ton emission factors. See ***Appendix E*** for emission rate calculations.

APPENDIX D

Section 7.3 Process Description
Byproducts

PROCESS DESCRIPTION

Section 7.3 Byproduct Recovery
Coal Tar Processing

Coal Tar Processing:

Tar is collected into a tar sump. The tar is decanted by passing through one of three decanters. Sludge from the decanters is dumped into hoppers from where it is collected by a company for further treatment. Tar from the decanters pass through two dehydration tanks where the water is removed. The tar is then pumped to a storage tank, where it is stored until shipment.

PROCESS DESCRIPTION

Section 7.3 Byproduct Recovery
Light Oil Processing Unit

Light Oil Processing Unit:

Processing the Light Oil generated at the Light Oil Scrubber, also called Benzol Washer, is the main activity of this unit. In the Light Oil Scrubber, wash oil is used to scrub out Light Oil from the Coke Oven Gas. Next wash oil is cleaned and re-circulated back through the Light Oil scrubber as described below.

After scrubbing out the light oil in the Light Oil Scrubber, the wash oil passes through two oil to vapor heat exchangers, where the light oil is vaporized. The vapors are then passed through two cool water condensers to condense out the light oil. The light oil then passes through the Secondary Light Oil Separator, where any remaining wash oil and water is removed. The liquid oil is then pumped into one of six storage tanks.

After passing through the oil to vapor heat exchangers, the wash oil passes through steam heaters, the Wash Oil Still, coolers, and finally the Wash Oil Recirculating Tank before it is reintroduced in the Light Oil Scrubber.

PROCESS DESCRIPTION

Section 7.3 Byproduct Recovery

Coke Byproduct Recovery Plant and COG Desulfurization System

Coke Oven Gas Processing Unit:

COG is made up of various organic materials volatilized during the coal-to-coke conversion process. The raw coke oven gas from U. S. Steel's two existing coke oven batteries is processed in the coke by-product recovery plant, where various byproducts are removed. Once treated, the COG is used as a fuel in the coke batteries and in various boilers and furnaces throughout the facility.

COG from the coke ovens first passes through the primary cooler where it is cooled. The cooling of COG causes tar, naphthalene, and liquor to condense. The cool COG is then pushed through the entire by-product plant with the aid of exhausters. More tar and liquor are removed by the centrifugal force created in the exhausters. Droplets of tar, naphthalene, and liquor accumulate and drain to the tar sump. Ammonia present in the COG is then removed by passing it through ammonia absorber. The removal of ammonia is accomplished by exposing the COG to a spray of sulfuric acid in the ammonia absorber. The COG then enters the Tar Spray Final Cooler where the COG is further cooled and most of the naphthalene is removed with tar injection. Next COG passes through the Light Oil Scrubber, which is designed to remove the remaining naphthalene and "Light Oils".

From the light oil scrubber, the treated COG is normally further processed in the COG desulfurization system to remove sulfur. The COG is not always processed by desulfurization system because of the need for periodic maintenance on the system. The permit limits the amount of time during which this may occur. COG desulfurization system consists of a packed tower amine unit, hydrogen cyanide destruction unit, and a Claus sulfur recovery unit with tail gas oxidizer. The system removes hydrogen sulfide (H_2S) from the treated COG stream from the by-product plant. The COG desulfurization system is not part of the by-products recovery plant.

The COG stream from the by-product plant is sent to a pressure holding tank from where the COG is distributed to underfire the Coke Oven Batteries and various parts of the plant.

PROCESS DESCRIPTION

Section 7.3 Byproduct Recovery
Byproducts Fugitives

By-Products Plant Equipment Leaks:

Since most of the process units associated with the Bproducts Plant are part of a closed system, they have negligible emissions, except when there is a leak in that system. The emission calculation of equipment leaks (pumps, valves, exhausters etc.) at the Byproducts Plant is presented in ***Appendix E***.

Railroad Tanker Cars:

Loading loss from loading light oil into railroad tanker cars can be found in ***Appendix E***.

Byproducts Cooling Towers:

The Byproducts Plant Cooling Towers control the temperature of cooling water used in the Primary and Final Coolers. These are indirect cooling processes. The make-up water for these towers is river water.

Because this is an indirect cooling water cooling tower, emissions from this cooling tower are negligible.

APPENDIX D

Section 7.4 Process Description
Blast Furnaces

PROCESS DESCRIPTION

Section 7.4 Blast Furnaces

"A" and "B" Charging Fugitive Emissions

Emission Calculations for Blast Furnace Charging System ("A" and "B"):
This emission unit consists of the equipment and operations used to feed raw materials into the blast furnaces. The raw materials are loaded out of the high-line storage bins and into skips, which are rail mounted cars pulled by cables to the top of the blast furnace. Upon arrival at the top of the blast furnace, the contents of the skips are transferred to the furnace. The skips are then lowered back down the track to be refilled as needed. Potential emissions from this unit consist of particulate matter generated by the transfer of materials from the skips to the blast furnace. Emission rates and factors for these operations are provided in *Appendix E*.

PROCESS DESCRIPTION

Section 7.4 Blast Furnaces
"A" and "B" Casthouse

Emission Calculations for Blast Furnace "A" and "B" Casthouse Uncaptured Fugitives
Fugitive emissions from this unit consist of particulate matter from the blast furnace casthouse. Casthouse uncaptured fugitive emissions consist of those casthouse emissions that were not captured by a baghouse and miscellaneous operations. Emission rates and factors for these processes are provided in ***Appendix E.***

PROCESS DESCRIPTION

Section 7.4 Blast Furnaces

Blast Furnaces and Casthouse

Blast Furnaces and Casthouse:
Iron ore is converted to molten iron in the "A" and "B" Blast Furnaces. Iron ore, coke and a variety of fluxes (collectively called the burden) are charged into the top of the furnace, while heated air is blown up through the burden at a high velocity. Molten iron and slag accumulate in the bottom of the furnace, where a taphole is periodically drilled. The molten iron and slag pour out of the furnace into a trough, where the slag is separated from the iron. The iron moves down runners until it pours into torpedo cars. From here, the iron is taken to the Basic Oxygen Furnace (BOF) shop, where it is converted into steel. The slag travels down a separate runner and dumps into the slag pits. The molten slag is quenched with a mixture of water and potassium permanganate solution.

Charging of the Blast Furnace generates particulate matter emissions. Each furnace has a double-bell system to minimize emissions from charging.

Casthouse emissions consisting of particulate matter, sulfur dioxide, nitrogen oxides, carbon monoxide, and organic materials are generated during tapping of the furnace and the miscellaneous operations that take place within the casthouse structure. Particulate Matter emissions are controlled by the Casthouse Baghouse and the Iron Spout Baghouse.

Emissions may also be discharged from a blast furnace during startup, malfunctions and shutdowns for routine maintenance. Each furnace is equipped with bleeder valves which will relieve to the atmosphere if the furnace becomes over pressurized. This can occur during furnace slips when material in the furnace bridges forming a void and then collapses. Slips can cause over pressurization. In this condition, the stock in the furnace will bridge and cause a void to develop. The void will increase until the bridge collapses. Backdrafting of the blast furnaces is conducted to perform certain repairs, both routine and non-routine. Steam is utilized to draw furnace gases back through the tuyeres and out of backdraft stacks.

PROCESS DESCRIPTION

Section 7.4 Blast Furnaces

Slag Handling

Emission Calculations for Furnace Slag Handling

A mixture of water and potassium permanganate is sprayed onto the slag to both cool it and to convert hydrogen sulfide to sulfur dioxide. Endloaders are then used to load the cooled slag into trucks for disposal off-site. Potential emissions from this unit consist of particulate matter and sulfur dioxide generated from the slag spraying operation. Emission rates and factors for this unit are provided in ***Appendix E***.

PROCESS DESCRIPTION

Section 7.4 Blast Furnaces

"A" and "B" Stoves

Blast Furnace "A" and "B" Stoves:
The blast air stoves heat the blast air for the blast furnaces. Emissions from the stoves consist of particulate matter, sulfur dioxide, nitrogen oxides, and carbon monoxide generated as by-products of the combustion of Blast Furnace Gas (BFG) and Coke Oven Gas (COG). In addition, the blast furnaces can also use fuel oil in the event that other fuels are not available.

The byproduct gases from the blast furnaces are first cleaned in a BFG Pretreatment system with mechanical separation and water wash to remove entrained dust and are then combusted in the stoves for the blast furnaces and other units at the source. BFG is primarily made up of carbon monoxide. The heat generated by the combustion of these gases is used to heat the brick inside of the stoves. The air flow is switched and this stored heat is then transferred to the blast air that is blown into the blast furnaces as part of the iron making process. There are three stoves for each furnace, which enables a continuous supply of blast air to the blast furnace. Only two of the three stoves will burn at any given time. All three stoves are exhausted to a common stack.

Excess BFG is also used in the various other fuel combustion emission units at the source. BFG that cannot be used as fuel is flared in either BFG flare #1 or #2.

PROCESS DESCRIPTION

Section 7.4 Blast Furnaces
Pellet Screening

Particulate Matter Emission Calculations for Pellet Screening:
Pellets loaded into this unit are passed through vibrating screens to separate the pellets from the pellet chips and fines. Potential emissions from this unit consist of particulate matter generated by the screening operation. Emission rates and factors for this unit are provided in *Appendix E.*

EXHIBIT 297-1

Section 7.4 Blast Furnaces

Torpedo Car Dekishing Emissions

Emission Calculations for Torpedo Car Dekishing:

The calculation methods presented below are used to determine emission rates from the torpedo car dekishing emission unit described in the application.

Kish is removed from torpedo cars with both jackhammers and natural gas fired lances. The jackhammers that are used are mounted on mobile hydraulic arms that are controlled by human operators. The kish removed from the interior of the torpedo cars with jackhammers is dumped onto the ground where endloaders and cranes are used to load it into trucks for disposal. Lances are most often used when the kish buildup is excessive or the kish is still in a molten or superheated state below the surface. Kish that is melted away from the sides of the torpedo cars with lances is poured onto the ground and allowed to cool and harden. Endloaders and cranes are then used to breakup the solidified kish and load it into trucks for disposal. The standard operating procedure is to wet the material before it is broken up. Potential emissions from this unit consist of particulate matter generated by the kish dumping, handling and loading operations. In addition, there may be emissions of particulate matter, sulfur dioxide, nitrogen oxides, carbon monoxide and organic materials generated by the combustion of natural gas. Emission factors for this unit are provided in ***Appendix E***.

Emissions of particulate matter generated when the torpedo cars are dumped onto the ground and when the kish is loaded into trucks are determined with the following equation:

$$E_{KH} = 0.0032(k)(P)\left[\frac{\left(\frac{U}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}}\right]$$

Where:

E_{KH} = Particulate matter emission rate in pounds per hour;
k = Particle size multiplier (0.74 for PM, 0.35 for PM-10);
P = Process weight rate in tons per hour;
U = Mean wind speed (mean = 10 mph); and
M = Material moisture content (typical = 1 percent)

Emissions generated by the combustion of natural gas are determined with the following equation:

$$E_{NG} = (NG)(EF)$$

Where:

E_{NG} = Emission rate in pounds per hour;
NG = Natural gas consumption rate in MMft3/hour; and
EF = Emission Factor (lb/MMft^3)

The net combined particulate matter emission rate for this unit is determined with the following equation:

$E_{PM} = E_{KIIUnload} + E_{KIILoad} + E_{NGPM\ (negl.)}$

Maximum particulate matter emission rate, $E_{PM\ MAX}$, is calculated as follows.

$E_{PM\ MAX}$ = **(.03 lb/ton)(2.25 ton/hr)**
= **0.0675 lb/hr**

As the emission rate is less than 0.1 lb/hr, this source is claimed insignificant per 201.201(a)2.

EXHIBIT 297-2

Section 7.4 Blast Furnaces
Baghouse Emptying Emissions

Baghouse Emptying:

Emissions from this unit consist of particulate emissions from collection bag removal and replacing and loading of material into trucks. Emission factors from this process are provided in ***Appendix E***.

Emission calculations of PM and PM-10 from the loading of the material into trucks are determined with the following equation:

$$E_{BG} = (EF)(P)$$

Where:

E_{BG}	=	Particulate matter emission rate in pounds per hour;
EF	=	Emission factor in pounds per ton;
P	=	Iron production rate in tons per hour

$E_{PM\ Max}$ = 0.61 lb/Ton Dust * 0.35 Ton/hr
= 0.214 lb/hr < 1 lb/hr
= 0.94 Ton/yr

$E_{PM\text{-}10\ Max}$ = 0.61 lb/Ton Dust * 0.35 Ton/hr
= 0.214 lb/hr < 1 lb/hr
= 0.94 Ton/yr

Dust Catcher Unloading:

The Blast Furnace Gas used as fuel in the Blast Furnace Stoves is cleaned in a closed gas cleaning system. The only emissions from this unit consist of particulate emissions from the unloading of the material from the Dust Catcher. There is a separate gas cleaning system for each furnace. Emission factors from this process are provided in ***Appendix E***.

Emission calculations of PM and PM-10 from the Dust Catcher unloading are determined with the following equation:

$$E_{DC} = (EF)(P)$$

Where:

E_{DC} = Particulate matter emission rate in pounds per hour;
EF = Emission factor in pounds per ton;
P = Iron production rate in tons per hour

$E_{PM\ Max}$ = 0.107 lb/Ton Dust * 6.25 Ton/hr
= 0.6689 lb/hr < 1 lb/hr

$E_{PM\text{-}10\ Max}$ = 0.00507 lb/Ton Dust * 6.25 Ton/hr
= 0.032 lb/hr < 1 lb/hr

EXHIBIT 391-1

Section 7.4 Blast Furnaces

Material Handling Sources

Coke Handling:

Following is a list of fugitive points under the category of coke handling.

- Conveyor # 4 - Coke Transfer
- Coke Screen # 1
- Conveyor # 5 - Coke Transfer
- Conveyor # 6 - Coke Transfer
- Coke Hopper
- High Line Coke Transfer
- Purchased Coke Receiving and Handling
- Coke Storage Piles
- Coke Stacking
- Coke Feed System
- Purchased Coke Screen # 2
- Conveyors # 16 and # 16A - Coke Transfer

Pellet Handling:

Following is a list of fugitive points under the category of pellet handling.

- High Line Bunkers
- Pellet Receiving and Handling
- Pellet Feed System
- Pellet Screen
- Pellet Storage Piles
- Conveyor # 19 - Pellet Transfer
- Off Sized Pellet Material Handling # 1
- Off Sized Pellet Material Handling # 2
- Off Sized Screening (Pellet Material) # 2
- Process Material Handling

Limestone Handling:

Following is a list of fugitive points under the category of limestone handling.

- Commodities Receiving and Handling
- Commodities Storage Piles

Coke Breeze Handling

Coke Breeze Handling consists of the following fugitive points.

- Coke hopper
- Various Coke Breeze Transfer Points

Coal Handling:

Following is a list of fugitive points under the category of coal handling.

- Coal Receiving and Handling
- Coal Storage Piles
- Railcar Coal Transfer
- Conveyor #1 - Coal Transfer
- Primary Coal Crusher
- Conveyor #2 - Coal Transfer
- Coal Blending
- Coal Pulverizing
- Conveyor #3 - Pulverized Coal Transfer
- Coal Bunkers A & B
- Runaround System

APPENDIX D

Section 7.5 Process Description
Basic Oxygen Processes

PROCESS DESCRIPTION

Section 7.5 Basic Oxygen Processes
Reladling and Desulfurization Stations

BOF Reladling and Desulfurization Stations:
Molten iron from the blast furnaces is transported to the BOF by torpedo cars. The iron is then transferred to the charging ladles at the reladling station. In the desulfurization stations a combination of lime and magnesium is injected into the molten iron to remove the sulfur. The sulfur reacts with the lime and magnesium and forms a layer of slag on the surface of the iron. A collection system with a positive pressure baghouse is used to control emissions of particulate matter from these stations. Emission rates and factors for these operations are provided in ***Appendix E.***

PROCESS DESCRIPTION

Section 7.5 Basic Oxygen Processes

Basic Oxygen Furnaces

Basic Oxygen Furnaces:

A fresh BOF charge usually begins with scrap metal. The scrap is charged into the BOF vessel. Molten iron is then charged into the vessel. A secondary hood is utilized to capture emissions during the charge. During periods of reduced molten iron availability scrap may be preheated with a natural gas fired lance to increase the temperature and reduce the amount of molten iron needed for a heat of steel. The BOF is then closed off and an oxygen lance is inserted to begin the melting and refining process. The oxygen lance openings on each BOF are equipped with steam rings. The steam rings are control measures for emissions of particulate matter from the BOF during the "oxygen blow" or refining phase when oxygen is being fed into the furnaces. The steam rings would inject steam in the area between the oxygen lance and the "lance hole" in the lid of the furnaces, acting to suppress the emissions of particulate through this area during the refining phase. In the BOF, the injected oxygen reacts exothermically with the carbon in the iron generating heat which melts the scrap and reduces the amount of carbon in the bath thus converting the iron to steel. When the refining process is completed, the molten steel is poured into a steel transfer ladle. Materials such as aluminum, silica, and manganese are added, as required, depending upon the particular steel alloy being produced. After the molten steel is tapped, the remaining slag is then dumped into a slag ladle. Emissions from these operations are captured and controlled with an electrostatic precipitator (ESP). A baghouse will be installed in the future to control secondary particulate emissions from charging and tapping.

PROCESS DESCRIPTION

Section 7.5 Basic Oxygen Processes
Slag Skimming

BOF Slag Skimming:

After the molten iron is desulfurized the ladle is moved to the slag skimming station where a mechanical arm is used to scrape slag from the surface of the iron. This slag is scraped from the iron ladles and into slag pots. A collection system with a baghouse is used to control emissions from this process.

EXHIBIT 260-5

Section 7.5 Basic Oxygen Processes
Slag Skimming

The calculation methods presented below are used to determine emission rates from the BOF slag skimming process described in this application.

Emission factors are provided in ***Appendix E***. Particulate matter emissions from this unit are determined with the following equation:

$$E = (P)(EF)\left(1 - \frac{C}{100}\right)$$

Where:

E = Emission rate in pounds per hour;
P = Iron throughput rate in tons per hour;
EF = Emission factor (lb/ton); and
C = Control efficiency of baghouse (%) (PM/ PM-10 = 99%)

Maximum PM emission rate, $E_{PM\ MAX}$, is calculated as shown below.

$E_{PM\ MAX}$ = (0.5 lb/ton)(3,165,000 ton/yr)(1-0.99)/2000
= 7.91 TPY ≤ allowable

$E_{PM\text{-}10\ MAX}$ = (0.5 lb/ton)(3,165,000 ton/yr)(1-0.99)/2000
= 7.91 TPY ≤ allowable

PROCESS DESCRIPTION

Section 7.5 Basic Oxygen Processes
BOF Roof Monitor Fugitives

BOF Roof Monitor:

The source of emissions to the roof monitor consist of uncaptured fugitives from Desulfurizing, Slag Skimming and the BOF. Also contributing to roof monitor emissions is molten iron transfer from torpedo cars to iron ladles and from iron ladles to the BOF. The potential emissions from this unit consist of particulate matter. Emission rates and factors for these operations are provided in ***Appendix E.***

PROCESS DESCRIPTION

Section 7.5 Basic Oxygen Processes
LMF and Argon Stirring Stations

Ladle Metallurgy Furnaces (LMF) and Argon Stirring Stations:
At the LMF station and the argon stirring stations, final adjustments are made to the composition of steel in the ladle and the ladle is held pending casting. At the LMF station, electricity can also be used to heat the steel in the ladle if it has cooled below the range at which steel can be cast.

If the steel does not need to be reheated and at most minor adjustments are needed to its composition, the ladle of steel goes to one of the two argon stirring stations. At these stations, stirring lances are inserted into the steel and argon is pumped into the steel to maintain uniform composition and temperature. A baghouse is also used to control emissions from the operations.

ATTACHMENT 220-1

Section 7.5 Basic Oxygen Processes
LMF and Argon Stirring Stations

Material Handling Tripper Conveyor:

In this unit, raw materials are transfered from the Tripper Conveyor to a set of storage bins that supply raw materials to the LMF. Potential emissions from this unit consist of particulate matter generated by loadout of the Tripper Conveyor. Baghouse #2 is used to control emissions from this operation.

ATTACHMENT 220-1

Section 7.5 Basic Oxygen Processes
LMF and Argon Stirring Stations

Slag Dispensing:

Prior to the LMF station, synthetic slag is added to the molten steel. The slag is made up of lime and other mineral products and is used to remove impurities in the steel. The addition of these materials is controlled by Baghouse #2.

PROCESS DESCRIPTION

Section 7.5 Basic Oxygen Processes
Ladle Preheating and Drying

BOF Ladle Preheating and Drying:
In this unit, lances combust either natural gas or coke oven gas to produce the heat needed to dry and preheat iron and steel handling ladles. The refractory linings of freshly re-bricked or repaired ladles must be completely dried and preheated before use. The drying process is necessary because any moisture left in the refractory would immediately vaporize and expand when the ladles are filled with molten iron or steel. This sudden expansion could cause the refractory lining to split which would allow the molten iron and steel to come into contact with, and damage the shell of the ladle. Emissions from this unit consist of particulate matter, sulfur dioxide, nitrogen oxides, carbon monoxide and organic materials generated by fuel combustion.

EXHIBIT 297-1

Section 7.5 Basic Oxygen Processes
Lime/Magnesium Handling & Storage

Lime/Magnesium Handling and Storage Unit:

The sample calculation method presented below is used to determine emission rates of particulates from the lime/magnesium injection system used in the iron desulfurization processes carried out at the Granite City facility. There are two desulfurization stations in the BOF area. Each of these injection systems has its own lime storage silo. The lime/magnesium material is delivered to the facility by truck and is pneumatically conveyed to the injection hoppers. Baghouse-type filtering systems located on each injection hopper control particulate emissions and return the captured material to the feed system. The transfer process does not occur without the baghouse in operation. Emission factors for the lime/magnesium transfer processes are provided in ***Appendix E***. Potential emissions from these operations are determined with the following equation:

$$E = (EF)(P)\left(1 - \frac{C}{100}\right)$$

Where:

E = Emission rate in tons/yr
EF = Emission factor in pounds of pollutant per ton of material transferred, 0.27
P = Material transfer rate in tons per year, 4953
C = Control efficiency of collection system (estimated to be 99 %)

E = 0.27 * 4953 * (1-0.99)
= 13.37 lbs/yr
= 13.37 / 8760 lbs/hr
= 0.0015 lbs/hr

As the particulate emission rate is much less than 0.1 lb/hr, this unit is claimed to be insignificant per 201.210(a)2.

APPENDIX D

Section 7.6 Process Description
Continuous Casting

PROCESS DESCRIPTION

Section 7.6 Continuous Casting

Deslagging Station

Deslagging Station:

Molten steel from the BOFs is transferred directly from the BOFs to the continuous casting building. The first operation carried out in this building is the skimming of slag from the surface of the molten steel. Slag removed by this operation is skimmed into slag pots for disposal. Baghouse #1 is used to control emissions from this process.

PROCESS DESCRIPTION

Section 7.6 Continuous Casting
Continuous Casters

Continuous Casting:
There are two continuous casting lines in operation in the caster building. Ladles of molten steel are hoisted by crane and placed in revolving turrets located at the top of the casters. Each turret holds two ladles at a time. When one ladle of steel has been cast the turret is rotated and the second ladle is tapped. The empty ladle is then replaced with a full one. The tapping process involves opening the taphole located on the bottom of the ladle and allowing the molten steel to flow into an intermediate chamber called a "Tundish". The Tundish has a taphole in the bottom through which the molten steel flows directly into the casters. The Tundish maintains a steady stream of molten steel flowing into the caster while ladles are being changed.

The molten steel from the casters continuously passes through a system of rollers and straighteners. Water is sprayed onto the slab throughout this process to complete the solidification of the slab.

PROCESS DESCRIPTION

Section 7.6 Continuous Casting
Spray Chambers

Continuous Casting - Spray Chambers:
Once the molten steel enters the casters, it continuously passes through a system of rollers and straighteners until it is finally formed into a steel slab. Water is sprayed onto the slab throughout this process to speed up the solidification process and reduce emissions. Potential emissions from this unit consist of particulate matter.

PROCESS DESCRIPTION

Section 7.6 Continuous Casting

Slab Cutting

Steel Slab Cutting:

In this unit automated natural gas and oxygen fired cutting torches are used to cut the steel slab coming from the continuous casters into individual slabs that can be handled for further processing. There is one cutting machine on each casting line. Potential emissions generated from this unit during the cutting of the steel consist of particulate matter. Because of the small size of the torches, the emissions generated as by-products of the combustion of natural gas are considered negligible.

PROCESS DESCRIPTION

Section 7.6 Continuous Casting

Slab Ripping

Steel Slab Ripping:

In this unit natural gas fired cutting torches are used to cut steel slabs lengthwise. Slab ripping activities are conducted in a building, under roof, separate from the caster. Potential emissions generated from this unit during the cutting of the steel consist of particulate matter. Because of the small size of the torches, the emissions generated as by-products of the combustion of natural gas are considered negligible.

APPENDIX D

Section 7.7 Process Description
Hot Strip Mill

PROCESS DESCRIPTION

Section 7.7 – Hot Strip Mill

Reheat Furnaces 1 – 4

HSM Reheat Furnaces 1 – 4

Steel slabs are heated in the slab reheat furnaces, so they can be formed further in the facility's hot strip mill. Some of the slabs are shipped to the facility from outside suppliers.

The following fuels or combination of these fuels are fired by all the four furnaces: natural gas and coke oven gas (COG). Reheat furnace emissions are the by-products of combustion. Emission rates and factors can be found in ***Appendix E.***

PROCESS DESCRIPTION

Section 7.7 – Hot Strip Mill

Hot Strip Mill Fugitives

HSM Fugitives

The Hot Strip Mill (HSM) process begins at the point that steel slabs are removed from the reheat furnaces. At this point the slabs have been heated to approximately 2,300 deg. F so that they may be formed into the desired coils. In the HSM the steel is rolled and formed between large rollers to reduce the thickness and width to the desired dimensions. There two (2) vertical edgers used to reduce the width of the slab, five (5) roughing mill stands used for initial slab thickness reductions and an additional seven (7) finishing mill stands used to reduce the thickness to the required final dimension. Once the steel has been reduced to the required dimensions it is passed through the Laminar Table. The Laminar Table is essentially a large water spray chamber used to cool the steel so that it can be coiled. There are three coilers in this unit. The forming equipment used in this unit is subjected to a constant water spray used to cool the rolls used to form the steel.

The water used for cooling in this unit is either cooled in the facility's cooling tower system and reused throughout the facility or is processed in the wastewater treatment plant. Organic or hazardous materials are added to the water used in this unit. Potential emissions from this unit consist of small quantities of volatile organic materials derived from the lubricant used on the machinery (Hot Rolling Oil) that can volatize due to the heat of the slabs. The emission rates and factors are presented in ***Appendix E.***

APPENDIX D

Section 7.8 Process Description
Finishing

PROCESS DESCRIPTION

Section 7.8 – Finishing Operations
#7 and #8 Galvanizing Line Preparation

#7 and #8 Galvanizing Line Preparation

Steel coils that are to be galvanized in this unit are first joined end to end by spot (resistance) welding the leading edge of one coil to the trailing edge of another coil. The steel is then passed through a rinse station where it is rinsed with either a weak alkaline solution or a weak acid solution. The purpose of this rinse is to clean the steel and break down any oils that may be on the surfaces. The emissions from this unit are exhausted to a packed column wet scrubber. After cleaning and rinsing the steel is dried by a steam dryer.

PROCESS DESRIPTION

Section 7.8 – Finishing Operations

#7 and #8 Galvanizing Line Furnaces

#7 and #8 Galvanizing Line Furnaces

#7 and #8 Galvanizing Line furnaces are natural gas firing furnaces. Steel sheet is passed through the furnaces to raise the temperature of the steel sheet prior to the application of zinc or "galvanizing" coating. Potential emissions from this unit consist of particulate matter, sulfur dioxide, nitrogen oxides, carbon monoxide and volatile organic materials generated as by-products of fuel combustion.

PROCESS DESCRIPTION

Section 7.8 – Finishing Operations

#7 and #8 Galvanizing Line Finishing Processes

#7 and #8 Galvanizing Line Finishing Processes

After the steel is coated with zinc, it is cooled and then dipped into a "Chem-treat" bath. This non-organic chemical puts a layer of rust-preventative on the steel. The steel is coated with oil to protect the surfaces, recoiled, and sprayed with edge sealer (oil) to protect the edges of the steel. The oil applied to the steel is a light petroleum based oil used to inhibit corrosion. Edge sealers are oils used to protect the edges of the steel and inhibit corrosion.

PROCESS DESCRIPTION

Section 7.8 – Finishing Operations
Pickling Line

Pickling Line

Coils are processed in this unit to clean the steel and prepare it for other treatments such as cold rolling or galvanizing. At the start of the pickling line, the coils are unwound and the leading edge of each coil is trimmed off square. The leading edge of each coil is then spot (resistance) welded to the trailing edge of the previous coil. By joining the coils in this manner the pickling line runs a continuous ribbon of steel and does not need to be taken out of production to reload. After the steel coils are joined the steel is passed through an acid bath. This acid bath consists of four dip tanks arranged in series and uses a solution of hydrochloric acid and water to clean the surfaces of the steel sheet. A scrubbing system with mist eliminator is used to control hydrogen chloride emissions from this process. When the steel comes out of the fourth acid dip tank it is passed through a cold rinse tank in which cool water is used to rinse the acid off the steel. The next step is to pass the steel through a hot rinse tank. In this tank hot water is used to rinse any remaining acid away from the steel and to raise the temperature of the steel to speed the drying process. The steel is then passed through a hot air dryer to complete the drying process. The steel that is to be shipped is coated with oil immediately prior to recoiling to inhibit corrosion. In the final step of the pickling process, the steel is recoiled.

APPENDIX D

Section 7.9 Process Description
Wastewater Treatment

PROCESS DESCRIPTION

Section 7.9 – Wastewater Treatment Plant

Primary & Byproducts Water Treatment

Primary Wastewater Treatment System

The system is used to treat waste process water generated in both the iron and steelworks manufacturing areas in the facility. Emissions from this system are attributed to the blast furnace (BF) clarifiers, dust ponds, BF ditch, BF lagoon, steelworks ditch, steel works lagoon, and the wastewater treatment plant, itself. The ditches are used to transfer the BF and steelworks wastewater streams to the lagoons. The wastewater treatment plant is a simple system used to remove suspended solids and breakdown organics prior to discharge.

Byproducts Wastewater Treatment System

The system is used to treat waste process water generated in the coke oven by-product plant. Waste process water from the by-products plant is piped to the by-products wastewater treatment plant. The water treated in this system is primarily made up of process wastewater used to cool the processes and equipment used in the byproducts plant. The treatment process carried out consists of the use of biological activity to breakdown the organic materials contained in the waste stream.

APPENDIX D

Section 7.10 Process Description
Boilers

PROCESS DESCRIPTION

Section 7.10 – Boilers

Boilers 11 and 12

Boilers 11 & 12:
Boilers 11 and 12 are located in Boiler House 2 and are rated at 225 mmBtu/hour each. Each of these boilers are physically capable of combusting various combinations of natural gas, coke oven gas (COG) and blast furnace gas (BFG). U. S. Steel has a construction permit to install Flue Gas Recirculation on these boilers for control of NO_x emissions (Construction Permit 10080022).

EXHIBIT 240-5

Section 7.10 – Boilers
Boilers 11 & 12

The sample calculation method presented below is used to determine emission rates from boilers 11 and 12 described in this application.

Potential emissions from these units consist of particulate matter, lead, sulfur dioxide, nitrogen oxides, carbon monoxide and organic materials. The emission factors for the various fuels combusted in these units are provided in ***Appendix E***. Emission rates for these units are determined with the following equation:

$$E = (FR)\left[\left(\frac{COG}{100}\right)\left(\frac{EFC}{HCC}\right)+\left(\frac{NG}{100}\right)\left(\frac{EFN}{HCN}\right)+\left(\frac{BFG}{100}\right)\left(\frac{EFB}{HCB}\right)+\left(\frac{\#6}{100}\right)\left(\frac{EF6}{HC6}\right)+\left(\frac{WO}{100}\right)\left(\frac{EFW}{HCW}\right)\right]$$

Where:

E = Emission Rate (lb/hr);
FR = Firing rate of furnace (MMBtu/hr);
COG = Percent of heat input derived from coke oven gas combustion;
EFC = Coke oven gas combustion emission factor (lb/MMft^3);
HCC = Typical heat content of coke oven gas (MMBtu/MMft3);
NG = Percent of heat input derived from natural gas combustion;
EFN = Natural gas combustion emission factor (lb/MMft^3);
HCN = Typical heat content of natural gas (MMBtu/MMft3);
BFG = Percent of heat input derived from blast furnace gas combustion;
EFB = Blast furnace gas combustion emission factor (lb/MMft^3);
HCB = Typical heat content of blast furnace gas (MMBtu/MMft3);
#6 = Percent of heat input derived from #6 residual oil combustion;
EF6 = #6 residual oil combustion emission factor (lb/10^3 gal);
HC6 = Typical heat content of #6 residual oil (MMBtu/10^3 gal);
WO = Percent of heat input derived from waste oil combustion;
EFW = Waste oil combustion emission factor (lb/10^3 gal); and
HCW = Typical heat content of waste oil (typical = 140 MMBtu/10^3 gal);

PROCESS DESCRIPTION

Section 7.10 – Boilers

Power Boiler #1

Power Boiler #1

Power Boiler #1 is used for cogeneration, producing both electricity and process steam as it supplies high pressure steam which is sent to a steam turbine that generates electricity for use at the source. Low-pressure steam from this turbine is used for manufacturing operations at the source.

BFG is a primary fuel for this boiler. Natural gas is used for the pilot flame and also for combustion control.

A cooling tower operates in conjunction with the new boiler and associated steam turbine.

EXHIBIT 240-5

Section 7.10 – Boilers

Power Boiler #1

The sample calculation method presented below is used to determine emission rates from Power Boiler #1.

Potential emissions from this unit consists of particulate matter, lead, sulfur dioxide, nitrogen oxides, carbon monoxide and organic materials. The emission factors for the various fuels combusted in this unit are provided in ***Appendix E***. Emission rates for these units are determined with the following equation:

$$E = (FR)\left[\left(\frac{COG}{100}\right)\left(\frac{EFC}{HCC}\right)+\left(\frac{NG}{100}\right)\left(\frac{EFN}{HCN}\right)+\left(\frac{BFG}{100}\right)\left(\frac{EFB}{HCB}\right)+\left(\frac{\#6}{100}\right)\left(\frac{EF6}{HC6}\right)+\left(\frac{WO}{100}\right)\left(\frac{EFW}{HCW}\right)\right]$$

Where:

E = Emission Rate (lb/hr);
FR = Firing rate of furnace (MMBtu/hr);
COG = Percent of heat input derived from coke oven gas combustion;
EFC = Coke oven gas combustion emission factor (lb/MMft^3);
HCC = Typical heat content of coke oven gas (MMBtu/MMft3);
NG = Percent of heat input derived from natural gas combustion;
EFN = Natural gas combustion emission factor (lb/MMft^3);
HCN = Typical heat content of natural gas (MMBtu/MMft3);
BFG = Percent of heat input derived from blast furnace gas combustion;
EFB = Blast furnace gas combustion emission factor (lb/MMft^3);
HCB = Typical heat content of blast furnace gas (MMBtu/MMft3);
#6 = Percent of heat input derived from #6 residual oil combustion;
EF6 = #6 residual oil combustion emission factor (lb/10^3 gal);
HC6 = Typical heat content of #6 residual oil (MMBtu/10^3 gal);
WO = Percent of heat input derived from waste oil combustion;
EFW = Waste oil combustion emission factor (lb/10^3 gal); and
HCW = Typical heat content of waste oil (typical = 140 MMBtu/10^3 gal);

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PROCESS DESCRIPTION

Section 7.10 – Boilers

Portable Boilers 1 – 4

Portable Boilers 1 – 4

The four, natural gas fired 100 MMBTU/hr, portable boilers would be used to provide low-pressure process steam to address interruptions in the normal steam supply to the source, i.e., steam from U. S. Steel's existing Boilers 11 and 12 and Power Boiler #1 and from the six waste heat recovery boilers at the adjacent Gateway Energy and Coke facility. During periods when the affected boilers are not needed, these boilers may be taken off-site. The boilers would be brought back to the site and installed when the boilers are needed again. For this purpose, the original boilers may be reinstalled or different boilers installed, subject to the conditions Construction Permit #10100042.

EXHIBIT 240-5

Section 7.10 – Boilers
Portable Boilers 1 - 4

The sample calculation method presented below is used to determine emission rates from portable boilers one through 4 described in this application.

Potential emissions from these units consist of particulate matter, lead, sulfur dioxide, nitrogen oxides, carbon monoxide and organic materials. The emission factors for the natural gas combusted in these units are provided in ***Appendix E***.

APPENDIX D

Section 7.11 Process Description
Reciprocating Internal Combustion Engines

PROCESS DESCRIPTION

Section 7.11 – Internal Combustion Engine

Emergency-Engine Generator

Emergency Engine Generator

A 3,500 HP diesel fuel fired emergency engine-generator is used for power outages at the facility.

APPENDIX D

Section 7.12 Process Description
Gasoline Tanks

PROCESS DESCRIPTION

Section 7.12 – Gasoline Storage and Dispensing

Gasoline Storage Tanks

Gasoline Storage and Dispensing

Gasoline storage and dispensing is conducted for U. S. Steel's fleet of gasoline fueled vehicles. There are several such stations at the facility so that fleet vehicles do not have to travel on public roads to reach the fueling stations. Gasoline storage tanks have emissions from working and breathing losses, which have been estimated as shown in ***Appendix E***.

APPENDIX D

Section 7.13 Process Description
Fugitive Dust

PROCESS DESCRIPTION

Section 7.13 – Fugitive Dust

Various Fugitive Dust Sources

Fugitive Dust

Fugitive dust is emitted from vehicle traffic, unloading operations, wind erosion of piles, roadways, parking lots and other open areas at the facility. The source also emits fugitive dust from an on-site landfill for furnace dusts and other industrial wastes, which results in negligible emissions. Emission calculations from these sources are presented in ***Appendix E***.

APPENDIX E: EMISSION UNITS & PTE CALCULATIONS

IEPA
Division of Air Pollution Control
FEB 16 2023
Reviewer: MHH

APPENDIX E

Facility-Wide Source Summary

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application

Table 15.0 Facility-Wide Emission Point Summary

Permit Section	Area	Emission units	Emission Sources	Source Type	Emission Point ID	PTE Table No.	PFD Figure No.
Section 7.1 Material Handling	Coal Handling and Processing	Coal Crusher	Material Crushing	Stack	Handling-S001	Table E-1.1	Figure C-2
		Coal Pulverizers (2) to Baghouse	Material Crushing	Stack	Handling-S002	Table E-1.1	Figure C-2
		Coal Bins	Material Handling	Fugitive	Handling-F001	Table E-1.1	Figure C-2
		Conveyors	Material Handling	Fugitive	Handling-F002	Table E-1.1	Figure C-2
	Blast Furnace	Coke Screens (2)	Material Handling	Fugitive	Handling-F003	Table E-1.2	Figure C-2
		Iron Pellet Screen	Material Handling	Fugitive	Handling-F004	Table E-1.2	Figure C-2
		Stock House Storage Bins	Material Handling	Fugitive	Handling-F005	Table E-1.2	Figure C-2
		New Coke Conveyance System to Baghouse	Material Handling	Stack	Handling-S003	Table E-1.2	Figure C-1
		Conveyors and feed hoppers	Material Handling	Fugitive	Handling-F006	Table E-1.2	Figure C-2
	Steelmaking	Dump Pit Conveyor to Trackhopper Baghouse	Material Handling	Stack	Handling-S004	Table E-1.3	Figure C-8
		Conveyors and Storage Bins to Binfloor Baghouse	Material Handling	Stack	Handling-S005	Table E-1.3	Figure C-8
		LMF Conveyors and Storage Bins to Baghouse 1	Material Handling	Stack	BOP-S007	Table E-5.7	Figure C-8
Section 7.2 Coke Production	Coke Oven Battery "A"	Charging Emissions	Charging Emissions	Fugitive	Coke-F001	Table E-2.2	Figure C-2
		Lid Leaks	Lid Leaks	Fugitive	Coke-F002	Table E-2.2	Figure C-2
		Offtake Leaks	Offtake Leaks	Fugitive	Coke-F003	Table E-2.2	Figure C-2
		Soaking	Soaking	Fugitive	Coke-F004	Table E-2.2	Figure C-2
		Decarbonization	Decarbonization	Fugitive	Coke-F005	Table E-2.2	Figure C-2
		Door Leaks	Door Leaks	Fugitive	Coke-F006	Table E-2.2	Figure C-2
	Coke Oven Battery "B"	Charging Emissions	Charging Emissions	Fugitive	Coke-F007	Table E-2.2	Figure C-2
		Lid Leaks	Lid Leaks	Fugitive	Coke-F008	Table E-2.2	Figure C-2
		Offtake Leaks	Offtake Leaks	Fugitive	Coke-F009	Table E-2.2	Figure C-2
		Soaking	Soaking	Fugitive	Coke-F010	Table E-2.2	Figure C-2
		Decarbonization	Decarbonization	Fugitive	Coke-F011	Table E-2.2	Figure C-2
		Door Leaks	Door Leaks	Fugitive	Coke-F012	Table E-2.2	Figure C-2
	Larry Cars (2)	Material Handling	Material Handling	Fugitive	Coke-F013	Table E-2.3	Figure C-2
	Coke Oven "A" Bleeder Flare	Coke Oven "A" Bleeder	Coke Oven Bleeder Venting	Stack	Coke-S001	Table E-2.1	Figure C-2
	Coke Oven "B" Bleeder Flare	Coke Oven "B" Bleeder	Coke Oven Bleeder Venting	Stack	Coke-S002	Table E-2.1	Figure C-2
	Pushing / Quench Cars (2)	Pushing Emissions to Scrubber	Material Handling	Stack	Coke-S003	Table E-2.3	Figure C-2
	East Quench Station (Backup)	Hot Coke Quenching	Hot Coke Quenching	Stack	Coke-S004	Table E-2.4	Figure C-2
	West Quench Station	Hot Coke Quenching	Hot Coke Quenching	Stack	Coke-S006	Table E-2.4	Figure C-2
	Battery A Coke Oven Underfiring	Coke Underfiring	Coke Underfiring	Stack	Coke-S005	Table E-2.5	Figure C-2
	Battery B Coke Oven Underfiring	Coke Underfiring	Coke Underfiring	Stack	Coke-S007	Table E-2.5	Figure C-2
Section 7.3 ByProduct Recovery	Coal Tar Processing	Tar Collection Tanks (2)	Working & Breathing Losses	Stack	ByProduct-S001	Table E-3.3	Figure C-3
		Tar Storage Tank	Working & Breathing Losses	Stack	ByProduct-S002	Table E-3.3	Figure C-3
	Tanks	Tar Dehydration Tanks (2)	Working & Breathing Losses	Stack	ByProduct-S003	Table E-3.4	Figure C-3
		Light Oil Storage Tanks (4)	Working & Breathing Losses	Stack	ByProduct-S004	Table E-3.4	Figure C-4
		Ammonia Liquor Storage Tanks (2)	Working & Breathing Losses	Stack	ByProduct-S005	Table E-3.4	Figure C-3
	COG Desulfurization	Claus Sulfur Recovery Unit to Thermal Oxidizer	Combustion Emissions	Stack	ByProduct-S006	Table E-3.6	Figure C-5
	COG Processing	COG Holding Tank	Working & Breathing Losses	Stack	ByProduct-S007	Table E-3.2	Figure C-6
	COG Processing	COG Flare	Combustion Emissions	Stack	ByProduct-S008	Table E-3.7	Figure C-2, Figure C-6
	Tanks	Ammonia Liquor Collection/Head Tank	Working & Breathing Losses	Stack	ByProduct-S009	Table E-3.4	Figure C-3
	COG Processing	Coke Oven Gas Transfer & Handling	COG Transfer & Handling	Fugitive	ByProduct-F001	Table E-3.1	Figure C-6
		Gas Coolers	Gas Cooling	Fugitive	ByProduct-F002	Table E-3.1	Figure C-6
		Gas Processing/Cleaning Unit	Gas Processing/Cleaning	Fugitive	ByProduct-F003	Table E-3.1	Figure C-6
	Light Oil Processing	Light oil stills	Still Emissions	Fugitive	ByProduct-F004	Table E-3.2	Figure C-4
		Light oil process condensers	Condensers	Fugitive	ByProduct-F005	Table E-3.2	Figure C-4
		Light oil sump	Sump Emissions	Fugitive	ByProduct-F006	Table E-3.2	Figure C-4
	Coal Tar Processing	Tar Transfer	Fugitive Emissions	Fugitive	ByProduct-F007	Table E-3.3	Figure C-3
		Decanter	Fugitive Emissions	Fugitive	ByProduct-F008	Table E-3.4	Figure C-3
		Railcar Loading	Loading Emissions	Fugitive	ByProduct-F009	Table E-3.5	Figure C-3
		Truck Loading	Loading Emissions	Fugitive	ByProduct-F010	Table E-3.5	Figure C-3
	COG Desulfurization	Packed Tower Amine Unit & HCN Destruction Unit	Fugitive Leaks	Fugitive	ByProduct-F011	Table E-3.6	Figure C-5

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Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application

Table 15.0 Facility-Wide Emission Point Summary

Permit Section	Area	Emission units	Emission Sources	Source Type	Emission Point ID	PTE Table No.	PFD Figure No.
Section 7.4 Blast Furnaces	Casthouse	Blast Furnace Double Bell System	Blast Furnace "A" and "B" Charging	Stack	BF-S001	Table E-4.1	Figure C-7
		Casthouse Baghouse	Furnace Tapping, Iron & Slag Trough	Stack	BF-S002	Table E-4.2	Figure C-7
		Iron Spout Baghouse	Torpedo Car Loading, Iron & Slag Runners, Hot Metal Fuming	Stack	BF-S003	Table E-4.3	Figure C-7
	Blast Furnaces	Blast Furnace Gas Flare #1	Bleeder Valves, Gas Cleaning System	Stack	BF-S004	Table E-4.4	Figure C-7
		Blast Furnace Gas Flare #2	Bleeder Valves, Gas Cleaning System	Stack	BF-S005	Table E-4.4	Figure C-7
		Blast Furnace "A" Backdraft Stack	Backdraft Steaming for Maintenance	Stack	BF-S006	Table E-4.5	N/A
		Blast Furnace "B" Backdraft Stack	Backdraft Steaming for Maintenance	Stack	BF-S007	Table E-4.5	N/A
		Blast Furnace "A" Stoves	Firing of natural gas, COG, and BFG	Stack	BF-S008	Table E-4.6	Figure C-7
		Blast Furnace "B" Stoves	Firing of natural gas, COG, and BFG	Stack	BF-S009	Table E-4.6	Figure C-7
	Casthouse	Casthouse Roof Monitors	Fugitives from Casthouse Operations	Fugitive	BF-F001	Table E-4.7	Figure C-7
		Slag Pits	Material Handling/Fuming	Fugitive	BF-F002	Table E-4.8	Figure C-7
Section 7.5 Basic Oxygen Processes (BOP)	BOP Shop	Reladle/Desulf Baghouse	Hot Metal Transfer, Desulfurization	Stack	BOP-S001	Table E-5.1	Figure C-8
		Skimmer Baghouse	Slag Skimming	Stack	BOP-S003	Table E-5.3	Figure C-8
		Secondary Baghouse	BOF Charging & Tapping	Stack	BOP-S004	Table E-5.4	Figure C-8
		ESP	BOF (All Operations)	Stack	BOP-S005	Table E-5.5	Figure C-8
		Ladle Preheater	Ladle Preheat/Drying	Stack	BOP-S006	Table E-5.6	Figure C-8
		Baghouse 1	Deslagging Station, Slag Dispensing Station, Alloy Materia Handling, Tripper Conveyor	Stack	BOP-S007	Table E-5.7	Figure C-9
		Fume Baghouse 2	Ladle Metallurgy Station, Argon Stirring Station	Stack	BOP-S008	Table E-5.8	Figure C-9
		Hot Metal Transfer	Kish	Fugitive	BOP-F001	Table E-5.9	Figure C-8
		Slag Skimming	Kish	Fugitive	BOP-F002	Table E-5.10	Figure C-8
		BOP Shop Roof Monitors	BOF Charging & Tapping	Fugitive	BOP-F003	Table E-5.11	Figure C-8
Section 7.6 Continuous Casting	Casters	Baghouse 1[1]	Steel Deslagging Station	Stack	BOP-S007	Table E-5.7	Figure C-9
		Caster Molds 1 & 2	Fuming Metal	Fugitive	Caster-F001	Table E-6.1	Figure C-10
		Casters 1 & 2 Spray Chambers	Spray Particulate	Fugitive	Caster-F002	Table E-6.1	Figure C-10
		Caster Slab Cut-Off	Cutting Particulate	Fugitive	Caster-F003	Table E-6.1	Figure C-10
		Caster Slab Ripping	Cutting Particulate	Fugitive	Caster-F004	Table E-6.1	Figure C-10
		Caster Scarfing	Torching Particulate	Fugitive	Caster-F005	Table E-6.1	Figure C-10
Section 7.7 Hot Strip Mill	Hot Strip Mill	Slab Reheat Furnace #1	Combustion Emissions	Stack	HSM-S001	Table E-7.1	Figure C-11
		Slab Reheat Furnace #2	Combustion Emissions	Stack	HSM-S002	Table E-7.2	Figure C-11
		Slab Reheat Furnace #3	Combustion Emissions	Stack	HSM-S003	Table E-7.3	Figure C-11
		Slab Reheat Furnace #4	Combustion Emissions	Stack	HSM-S004	Table E-7.4	Figure C-11
		Hot Roll Oil Vaporization	Fugitive Emissions from Rolling Operations	Fugitive	HSM-F001	Table E-7.5	Figure C-11
Section 7.8 Finishing	Galvinizing Line #7A	Cleaner Section	Cleaner fumes	Stack	Finishing-S001	Table E-8.1	Figure C-12
		Natural gas furnace	Natural gas combustion	Stack	Finishing-S002	Table E-8.2	Figure C-12
		Galvanizing pot	Molten zinc	Fugitive	Finishing-F001	Table E-8.3	Figure C-12
		Miscellaneous heaters	Fuel Combustion	Stack	Finishing-S003	Table E-8.4	Figure C-12
	Galvinizing Line #8	Cleaner Section	Cleaner fumes	Stack	Finishing-S004	Table E-8.5	Figure C-13
		Natural fas furnace	Natural gas combustion	Stack	Finishing-S005	Table E-8.6	Figure C-13
		Galvinizing pots (2)	Molten zinc	Fugitive	Finishing-F002	Table E-8.7	Figure C-13
		Miscellaneous heaters	Fuel combustion	Stack	Finishing-S006	Table E-8.8	Figure C-13
		Melting kettle	Molten zinc	Stack	Finishing-S007	Table E-8.9	Figure C-13
	Finishing Operations	HCl Pickling Line	Acid fumes	Stack	Finishing-S008	Table E-8.10	Figure C-14
		Coating operations	Oil vapors	Fugitive	Finishing-F003	Table E-8.11	Figure C-14
		Building and storage areas heaters	Fuel combustion	Stack	Finishing-S009	Table E-8.12	Figure C-14
Section 7.9 WWTP	Byproduct & Central Wastewater Treatment Plant	Equalization Storage Tanks	Evaporative Emissions	Fugitive	WWTP-F001	Table E-9.1	Figure C-15
		Aeration Basins (2)	Evaporative Emissions	Fugitive	WWTP-F002	Table E-9.1	Figure C-15
		Clarifiers (2)	Evaporative Emissions	Fugitive	WWTP-F003	Table E-9.1	Figure C-15
		Blast Furnace Stabilization Pond (Lagoon)	Evaporative Emissions	Fugitive	WWTP-F004	Table E-9.1	Figure C-15
		Steelworks Stabilization Pond (Lagoon)	Evaporative Emissions	Fugitive	WWTP-F005	Table E-9.1	Figure C-15
		Sand Filters (8)	Evaporative Emissions	Fugitive	WWTP-F006	Table E-9.1	Figure C-15

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Company Name: U. S. Steel
Facility Name: Gary Works
Project Description: CAAPP Renewal Application

Table 15.0 Facility-Wide Emission Point Summary

Permit Section	Area	Emission Units	Emission Sources	Source Type	Emission Point ID	PTE Table No.	PFD Figure No.
Section 7.10 Boilers	Boilery	Boiler # 11	Fuel Combustion	Stack	BOILERS-S001	Table E-10.1	N/A
		Boiler # 12	Fuel Combustion	Stack	BOILERS-S002	Table E-10.2	N/A
		Power Boiler # 1	Fuel Combustion	Stack	BOILERS-S003	Table E-10.3	Figure C-16
		Portable Boiler # 1	Fuel Combustion	Stack	BOILERS-S004	Table E-10.4	Figure C-16
		Portable Boiler # 2	Fuel Combustion	Stack	BOILERS-S005	Table E-10.4	Figure C-16
		Portable Boiler # 3	Fuel Combustion	Stack	BOILERS-S006	Table E-10.3	Figure C-16
		Portable Boiler # 4	Fuel Combustion	Stack	BOILERS-S007	Table E-10.4	Figure C-16
Section 7.11 Reciprocating Engines	Reciprocating Internal Combustion Engines	Emergency generator engine (1,500 hp)	Fuel Combustion	Stack	RICE-S001	Table E-11.1	N/A
		100/LMF Diesel Pump	Fuel Combustion	Stack	RICE-S002	Table E-11.2	N/A
		100/LMF Diesel Pump	Fuel Combustion	Stack	RICE-S003	Table E-11.2	N/A
		100/LMF Diesel Pump (Cold Weil)	Fuel Combustion	Stack	RICE-S004	Table E-11.2	N/A
		80C Diesel Pump	Fuel Combustion	Stack	RICE-S005	Table E-11.2	N/A
		Emergency Diesel Compressor	Fuel Combustion	Stack	RICE-S006	Table E-11.2	N/A
		Emergency Diesel Service Water Pump	Fuel Combustion	Stack	RICE-S009	Table E-11.2	N/A
Section 7.12 Gasoline Storage Tanks	Gasoline Storage Tanks	Tank #521 - Storeroom	Working & Breathing Losses	Stack	TANK-S001	Table E-12.1	N/A
		Tank #402 - Machine shop	Working & Breathing Losses	Stack	TANK-S002	Table E-12.2	N/A
		Tank #701 - WWTP	Working & Breathing Losses	Stack	TANK-S003	Table E-12.3	N/A
		Tank #83 - Blast furnace	Working & Breathing Losses	Stack	TANK-S004	Table E-12.4	N/A
		Tank #304	Working & Breathing Losses	Stack	TANK-S005	Table E-12.5	N/A
		Tank #322	Working & Breathing Losses	Stack	TANK-S006	Table E-12.6	N/A
		Tank #407 - Hot Strip Roll Shop	Working & Breathing Losses	Stack	TANK-S007	Table E-12.7	N/A
		Tank #813	Working & Breathing Losses	Stack	TANK-S008	Table E-12.8	N/A
Section 7.13 Fugitive Dust	Various Dust Sources	Landfill	Fugitive Dust	Fugitive	DUST-F001	Table E-13.1	N/A
		Roadways	Fugitive Dust	Fugitive	DUST-F002	Table E-13.2	N/A
		Parking Lots	Fugitive Dust	Fugitive	DUST-F003	Table E-13.3	N/A
		Unloading Operations	Fugitive Dust	Fugitive	DUST-F004	Table E-13.4	N/A
		Storage Piles	Fugitive Dust	Fugitive	DUST-F005	Table E-13.5	N/A
		Beaching Areas	Fugitive Dust	Fugitive	DUST-F006	Table E-13.6	N/A
Section 5.0	Byproducts	Primary Cooling Tower	Evaporative/Drift Emissions	Fugitive	CT-F001	Table E-14.1	Figure C-6
	Hot Strip Mill	Reheat Furnace Cooling Tower	Evaporative/Drift Emissions	Fugitive	CT-F002	Table E-14.1	Figure C-11
	Finishing	Triple G Galv Line Cooling Tower	Evaporative/Drift Emissions	Fugitive	CT-F003	Table E-14.1	Figure C-13
	Caster #1	Caster 1 Spray Cooling Tower	Evaporative/Drift Emissions	Fugitive	CT-F004	Table E-14.1	Figure C-10
		Caster 1 Secondary Cooling Tower	Evaporative/Drift Emissions	Fugitive	CT-F005	Table E-14.1	Figure C-10
	Caster #2	Caster 2 Spray Cooling Tower	Evaporative/Drift Emissions	Fugitive	CT-F006	Table E-14.1	Figure C-10
		Caster 2 Secondary Cooling Tower	Evaporative/Drift Emissions	Fugitive	CT-F007	Table E-14.1	Figure C-10
	Cogeneration Unit	Cogen Cooling Tower	Evaporative/Drift Emissions	Fugitive	CT-F008	Table E-14.1	N/A
	Blast Furnaces	#4 Turbo Blower Cooling Tower	Evaporative/Drift Emissions	Fugitive	CT-F009	Table E-14.1	N/A
		#5 Turbo Blower Cooling Tower	Evaporative/Drift Emissions	Fugitive	CT-F010	Table E-14.1	N/A
		Hot Blast Valve Cooling Tower	Evaporative/Drift Emissions	Fugitive	CT-F011	Table E-14.1	N/A
		Stack & Tuyere Cooling Tower	Evaporative/Drift Emissions	Fugitive	CT-F012	Table E-14.1	N/A
		Bosh Cooling Tower	Evaporative/Drift Emissions	Fugitive	CT-F013	Table E-14.1	N/A
	Steelworks Turbine Plant	#3 Cooling Tower	Evaporative/Drift Emissions	Fugitive	CT-F014	Table E-14.1	N/A

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Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application

Table E-2S.2 Summary of Potential Emissions

Permit Section	Emission Unit/Area	CO		Lead		NO_x		PM		PM_{10}		$PM_{2.5}$		SO_2		VOM	
		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
5.0	Cooling Towers	0.00	0.00	0.00	0.00	0.00	0.00	29.89	130.93	12.00	52.56	0.088	0.28	0.00	0.00	0.00	0.00
7.1	Material Handling	0.00	0.00	0.11	0.46	0.00	0.00	9.96	43.64	9.52	41.68	9.44	41.35	0.00	0.00	0.00	0.00
7.2	Coke Production	3,110.31	13,623.14	0.00	0.00	177.09	775.65	60.16	263.50	60.16	263.50	46.93	205.53	23.65	103.58		
7.3	Byproduct Recovery	41.28	180.81	0.00	0.00	7.89	33.59	5.62	24.60	5.62	24.60	80.80	353.89	17.63	77.24		
7.4	Blast Furnaces	217.55	952.89	0.01	0.05	87.00	381.05	79.63	348.78	73.54	323.08	72.33	316.78	726.94	3,184.00	50.78	222.43
7.5	Basic Oxygen Processes	3,675.89	16,100.39	0.33	1.45	18.74	73.30	131.56	576.15	117.40	514.20	117.15	513.12	0.08	0.35	2.86	12.51
7.6	Continuous Casting	0.00	0.00	0.03	0.08	20.43	89.50	11.79	51.62	11.79	51.62	11.79	51.62	0.00	0.00	0.00	0.00
7.7	Hot Strip Mill	6.23	27.30	0.00	0.00	180.20	789.28	8.47	37.08	8.47	37.08	8.47	37.08	33.80	148.05	3.94	17.25
7.8	Finishing Operations	7.42	32.51	0.02	0.08	13.08	57.28	1.89	8.26	1.89	8.26	1.89	8.26	0.10	0.44	15.05	65.91
7.9	Wastewater Treatment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.55	19.91
7.10	Boilers	162.04	709.72	0.00	0.01	66.66	291.95	29.81	130.55	29.53	129.34	29.44	128.93	59.31	259.79	21.87	95.78
7.11	Internal Combustion Engines	11.66	51.06	0.00	0.00	50.28	220.25	1.19	5.21	1.03	4.52	1.01	4.42	0.89	3.90	1.48	6.47
7.12	Gasoline Storage Tanks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	2.39
7.13	Fugitive Dust Sources	0.00	0.00	0.00	0.00	0.00	0.00	10.16	44.52	2.90	12.70	0.29	0.90	0.00	0.00	0.00	0.00
ALL SECTIONS	All Sources	7,232.38	31,677.81	0.49	2.15	619.17	2,711.94	380.12	1,664.92	333.87	1,462.35	317.54	1,369.83	948.82	4,133.88	142.34	623.46

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APPENDIX E

Section 7.1 PTE Calcs
Material Handling

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.1 - Material Handling - FTS

Table F-1.C Material Handling Potential Emissions Summary

Emission Unit ID	Source Type	Emission Point	Process Emission Unit(s)	CO		Lead		NO_x		PM		PM_{10}		$PM_{2.5}$		SO_2		VOM	
				lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	tpy	tpy	lb/hr	tpy	lb/hr	tpy
Handling-SD01	Stack	Coal Crusher	Coal Handling & Processing Area	-	-	0.00	0.00	-	-	5.60	24.52	5.60	24.52	5.60	24.52	-	-	-	-
Handling-SD02	Stack	Coal Pulverizer Baghouse	Coal Pulverizers (2)	-	-	0.00	0.00	-	-	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-
Handling-SD03	Stack	New Coke Conveyance System	Blast Furnace Area Coke System	-	-	0.10	0.45	-	-	0.13	0.85	0.10	0.45	0.10	0.45	-	-	-	-
Handling-SD04	Stack	Trackhopper Baghouse	Dump Pit Conveyor	-	-	0.00	0.00	-	-	0.13	0.57	0.13	0.57	0.13	0.57	-	-	-	-
Handling-SD05	Stack	Bin Floor Baghouse	Steelmaking Area Conveyors and Storage Bins	-	-	0.00	0.00	-	-	0.65	2.86	0.65	2.86	0.65	2.86	-	-	-	-
BOP-SD01	Stack	Baghouse 5	LMF Conveyors and Storage Bins	-	-	0.00	0.00	-	-	1.45	6.35	1.45	6.35	1.45	6.35	-	-	-	-
Handling-FG01	Fugitive	Coal Bins	Coal Handling & Processing Area	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Handling-FG02	Fugitive	Conveyors	Coal Handling & Processing Area	-	-	0.00	0.00	-	-	0.14	0.60	0.06	0.26	0.01	0.03	-	-	-	-
Handling-FG03	Fugitive	Coke Screens (2)	Blast Furnace Area	-	-	0.00	0.00	-	-	0.36	1.56	0.17	0.76	0.17	0.76	-	-	-	-
Handling-FG04	Fugitive	Iron Pellet Screen	Blast Furnace Area	-	-	0.00	0.00	-	-	1.37	6.01	1.37	6.01	1.37	6.01	-	-	-	-
Handling-FG05	Fugitive	Stock House Storage Bins	Blast Furnace Area	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Handling-FG06	Fugitive	Conveyors and Feed Hoppers	Blast Furnace Area	-	-	0.00	0.00	-	-	0.03	0.11	0.02	0.10	0.00	0.01	-	-	-	-
Material Handling	All Sources (Includes BOP-SD01)			0.90	0.89	0.11	0.46	0.00	0.00	9.96	43.64	9.52	41.68	9.84	43.35	0.00	0.00	0.00	0.00

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Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.1 - Material Handling - P-02

Table C-3-1: Coal Handling & Processing Particulate Emissions Summary

Process: Materials Handling
Group: Coal Handling & Processing
Emission Unit (S): Handling-5001, Handling-5002, Handling-F001, Handling-F002

Pollutant	Emission Point ID	Potential Emissions (lb/hr)	Maximum Coal Throughput (ton/hr)	Throughput Source	Emission Factor (lb/ton)	Emission Factor Source	Notes
PM							
Coal Crusher	Handling-5001	24.67	909.000	CAAPP No. 96030056, Section 7.2.1	0.054	AP-42 Table 12.5-2B (5/86) Coal Crushing with Retractions	
Coal Pulverizers (2)	Handling-5002	0.547E-04	909.000	CAAPP No. 96030056, Section 7.2.1	1.8E-04	Assumed equal to PM_{10}. PM factor not available.	
Coal Bins	Handling-F001	-	909.000	CAAPP No. 96030056, Section 7.2.1	-		Included in conveyor emissions.
Conveyors	Handling-F002	0.60	909.000	CAAPP No. 96030056, Section 7.2.1	1.31E-03	See calculations below	
PM_{10}							
Coal Crusher	Handling-5001	24.67	909.000	CAAPP No. 96030056, Section 7.2.1	0.054	Assumed equal to PM	
Coal Pulverizers (2)	Handling-5002	0.00	909.000	CAAPP No. 96030056, Section 7.2.1	1.8E-04	AP-42 Table 12.5-1B (5/86) Primary Coal Pulverizer with Bag Enclosure	
Coal Bins	Handling-F001	-	909.000	CAAPP No. 96030056, Section 7.2.1	-		Included in conveyor emissions.
Conveyors	Handling-F002	0.28	909.000	Assumes all coal is conveyed to coal crusher, pulverizer, and bin.	0.001	See calculations below	
$PM_{2.5}$							
Coal Crusher	Handling-5001	24.52	909.000	CAAPP No. 96030056, Section 7.2.1	0.054	Assumed equal to PM	
Coal Pulverizers (2)	Handling-5002	5.56E-04	909.000	CAAPP No. 96030056, Section 7.2.1	1.8E-04	Assumed equal to PM_{10}	
Coal Bins	Handling-F001	-	909.000	CAAPP No. 96030056, Section 7.2.1	-		Included in conveyor emissions.
Conveyors	Handling-F002	0.04	909.000	Assumes all coal is conveyed to coal crusher, pulverizer, and bin.	1.97E-05	See calculations below	
Lead (Pb)							
Coal Crusher	Handling-5001	9.41E-06	909.000	CAAPP No. 96030056, Section 7.2.1	1.71E-09	Granite City Coal Blend Analysis of 0.0000015 wt% (1st/2Q/1992) + 20% compliance margin	
Coal Pulverizers (2)	Handling-5001	3.50E-10	909.000	CAAPP No. 96030056, Section 7.2.1	6.37E-14	Granite City Coal Blend Analysis of 0.0000015 wt% (1st/2Q/1992) + 20% compliance margin	
Coal Bins	Handling-F001	-	909.000	CAAPP No. 96030056, Section 7.2.1	-		Included in conveyor emissions.
Conveyors	Handling-F002	1.08E-07	909.000	Assumes all coal is conveyed to coal crusher, pulverizer, and bin.	1.97E-10	Granite City Coal Blend Analysis of 0.0000015 wt% (1st/2Q/1992) + 20% compliance margin	

Material Transfer Emissions		Units	Notes
PM Particle Size Multiplier (k)	0.74	n/a	AP-42 Section 13.2.4 (1/95)
PM_{10} Particle Size Multiplier (k)	0.35	n/a	AP-42 Section 13.2.4 (1/95)
$PM_{2.5}$ Particle Size Multiplier (k)	0.05	n/a	AP-42 Section 13.2.4 (1/95)
Wind Speed (u)	8.90	mph	Illinois Annual Average Wind Speed for STL Airport
Moisture Content (M)	7.80	%	AP-42 Table 13.2.4-1 (1/95) for Coal
PM Emission Factor	0.0011	lb/ton	AP-42 Section 13.2.4 (1/95) Equation 1
PM_{10} Emission Factor	5.25E-04	lb/ton	AP-42 Section 13.2.4 (1/95) Equation 1
$PM_{2.5}$ Emission Factor	5.47E-05	lb/ton	AP-42 Section 13.2.4 (1/95) Equation 1

Eqn. 1

$$E = k(0.0032)\frac{\left(\frac{U}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}} \quad \text{(lb/ton)}$$

R006083

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 2.1 - Material Handling - PTE

Table E-1.2 Blast Furnace Material Handling Potential Emission Summary

Process: Material Handling
Area: Blast Furnace
Emission Unit ID: Handling-FB05, Handling-FB04, Handling-FB03, Handling-FB06, Handling-SB03

Pollutant	Emission Point ID	Proposed Emissions (tpy)	Maximum Throughput (tph)	Throughput Source	Emission Factor (lb/ton)	Emission Factor Source	Notes
PM							
Coke Screens (2)	Handling-FB03	1.96	1,421,000	Maximum USS coke production of 681,000 tpy plus SunCoke production of 740,000 tpy	0.002759	AP-42 Table 11.19.2-2 (8/04) for Screening (Controlled)	
Iron Pellet Screen	Handling-FB04	6.01	4,308,581	Table 1 rep. 4 PSD Permit No: 95010001 Permit Limit	0.002739	CAAPP No. 96030056, Section 7.1.6.b.iv	
Stock House Storage Bins	Handling-FB05	-	-	-	-	-	Included in conveyor emissions
New Coke Conveyance System	Handling-SB03	0.65	740,000	CAAPP no. 96030056, Section 7.1.6.a.i - Permit Limit	0.001757	Backed from Permit Limit of 0.65 tpy @ 740,000 tons of coke	
Conveyors and Feed Hoppers	Handling-FB06	0.21	700,000	Maximum USS coke production of 681,000 tpy (SunCoke conveyor system is separate)	0.0006	AER Emission Factor (2013) - calculated based on AP-42 Section 13.2.4. Assumes 90% control.	
PM_{10}							
Coke Screens (2)	Handling-FB03	0.53	1,421,000	Maximum actual monthly throughput in last 5 years, scaled to 12 months	7.46E-04	AP-42 Table 11.19.2-2 (8/04) for Screening (Controlled)	
Iron Pellet Screen	Handling-FB04	6.01	4,308,581	Table 1 rep. 4 PSD Permit No: 95010001 Permit Limit	2.79E-03	CAAPP No. 96030056, Section 7.1.6.b.iv	
Stock House Storage Bins	Handling-FB05	-	-	-	-	-	Included in conveyor emissions.
New Coke Conveyance System	Handling-SB03	0.45	740,000	CAAPP no. 96030056, Section 7.1.6.a.i	8.40E-04	Apr-12 22, 2010 Coke Conveyor Baghouse Stack Test, 9.13 lb/hr and production capacity 1865.28 tons/day	
Conveyors and Feed Hoppers	Handling-FB06	0.20	700,000	Maximum USS coke production of 681,000 tpy (SunCoke conveyor system is separate)	0.00028	AER Emission Factor (2013) - calculated based on AP-42 Section 13.2.4. Assumes 90% control.	
$PM_{2.5}$							
Coke Screens (2)	Handling-FB03	0.53	1,421,000	Maximum actual monthly throughput in last 5 years, scaled to 12 months	7.46E-04	Assumed equal to PM_{10}.	
Iron Pellet Screen	Handling-FB04	6.01	4,308,581	Table 1 rep. 4 PSD Permit No: 95010001 Permit Limit	2.79E-03	Assumed equal to PM_{10}.	
Stock House Storage Bins	Handling-FB05	-	-	-	-	-	Included in conveyor emissions.
New Coke Conveyance System	Handling-SB03	0.45	740,000	CAAPP No. 96030056, Section 7.1.6.a.i	8.40E-04	Assumed equal to PM_{10}.	
Conveyors and Feed Hoppers	Handling-FB06	0.20	700,000	Maximum USS coke production of 681,000 tpy (SunCoke conveyor system is separate)	0.00028	AER Emission Factor (2013) - calculated based on AP-42 Section 13.2.4. Assumes 90% control.	
Lead (Pb)							
Coke Screens (2)	Handling-FB03	0.000019	1,421,000	Maximum actual monthly throughput in last 5 years, scaled to 12 months	2.66E-08	Granite City Coal Blend Analysis of 0.000015 wt% (10/20/1997) + 20% compliance margin	
Iron Pellet Screen	Handling-FB04	0.0000	4,308,581	Table 1 rep. 4 PSD Permit No: 95010001 Permit Limit	1.50E-07	Total Metal Analysis for Blast Furnace Cast Dust Catcher of 0.000015 wt% (10/20/1997) + 20% compliance margin	
Stock House Storage Bins	Handling-FB05	-	-	-	-	-	Included in conveyor emissions.
New Coke Conveyance System	Handling-SB03	0.45	740,000	CAAPP no. 96030056, Section 7.1.6.a.i	4.67E-08	Granite City Coal Blend Analysis of 0.000015 wt% (10/20/1997) + 20% compliance margin	
Conveyors and Feed Hoppers	Handling-FB06	0.000004	700,000	Maximum USS coke production of 681,000 tpy (SunCoke conveyor system is separate)	1.29E-08	Granite City Coal Blend Analysis of 0.000015 wt% (10/20/1997) + 20% compliance margin	

R006084

Company Name: U. S. Steel
Facility Name: Granite City Works
Permit Description: CAAPP Renewal Application
Permit Section: Section 5.3 - Materials Handling - PM

Table E-1.3 Steelmaking Material Handling Potential Emissions Summary

Process: Material Handling
Area: Steelmaking
Emission Unit ID: Handling 5604, Handling 5605, BOF 4003

Pollutant	Emission Point ID	Potential Emissions (tpy)	Maximum Throughput (tpy)	Recognized Source	Emission Factor (lb/ton)	Emission Factor Source	Notes
PM							
Dump Pit Conveyor	Handling 5604	0.57	3,560,000	CAAPP No. 96030056 Section 5.6.2.a	0.00032	CAAPP No. 96030056 Attachment 3	
Conveyors and Storage Bins	Handling 5605	2.85	3,560,000	CAAPP No. 96030056 Section 5.6.2.a	0.0016	CAAPP No. 96030056 Attachment 3	
BOF Conveyors and Storage Bins	BOF 4003	6.25	3,560,000	CAAPP No. 96030056 Section 5.6.2.a	0.00351	CAAPP No. 96030056 Attachment 3	
PM_{10}							
Dump Pit Conveyor	Handling 5604	0.57	3,560,000	CAAPP No. 96030056 Section 5.6.2.a	0.00032	CAAPP No. 96030056 Attachment 3	
Conveyors and Storage Bins	Handling 5605	2.85	3,560,000	CAAPP No. 96030056 Section 5.6.2.a	0.0016	CAAPP No. 96030056 Attachment 3	
BOF Conveyors and Storage Bins	BOF 4003	6.25	3,560,000	CAAPP No. 96030056 Section 5.6.2.a	0.00351	CAAPP No. 96030056 Attachment 3	
$PM_{2.5}$							
Dump Pit Conveyor	Handling 5604	0.57	3,560,000	CAAPP No. 96030056 Section 5.6.2.a	0.00032	Assume = PM_{10}	
Conveyors and Storage Bins	Handling 5605	2.85	3,560,000	CAAPP No. 96030056 Section 5.6.2.a	0.0016	Assume = PM_{10}	
BOF Conveyors and Storage Bins	BOF 4003	6.25	3,560,000	CAAPP No. 96030056 Section 5.6.2.a	0.00351	Assume = PM_{10}	
Lead (Pb)							
Dump Pit Conveyor	Handling 5604	0.0001	3,560,000	CAAPP No. 96030056 Section 5.6.2.a	0.000000056	Total Metal Analysis for BOF Shop Fugitive Dust (1/17/1995) + 20% compliance margin	
Conveyors and Storage Bins	Handling 5605	0.0005	3,560,000	CAAPP No. 96030056 Section 5.6.2.a	0.000000313	Total Metal Analysis for BOF Shop Fugitive Dust (1/17/1995) + 20% compliance margin	
BOF Conveyors and Storage Bins	BOF 4003	0.01	3,560,000	CAAPP No. 96030056 Section 5.6.2.a	0.000001	Total Metal Analysis for BOF Fume Baghouse at 0.14 wt% (6/28/2013) + 20% compliance margin	

APPENDIX E

Section 7.2 PTE Calcs
Coke Production

Company Name: U.S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.2 - Coke Production - PSD

Table E-2.0 Coke Production Potential Emissions Summary

Emission Unit ID	Source Type	Emission Point	Process Emission Unit(s)	CO		Lead		NO_x		PM		PM_{10}		$PM_{2.5}$		SO_2		VOM	
				lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Coke-S001	Stack	Coke Oven Bleeder Flare	Coke Oven Bleeder Flare	11.39	58.64	-	-	2.46	10.78	0.00	0.00	0.00	0.00	0.00	0.00	1.31	5.84	2.28	9.98
Coke-S002	Stark	Coke Oven Bleeder Flare	Coke Oven Bleeder Flare	11.39	58.64	-	-	2.46	10.78	0.00	0.00	0.00	0.00	0.00	0.00	1.31	5.84	2.28	9.98
Coke-F001	Fugitive	Coke Oven Battery "A"	Charging emissions	0.01	0.05	0.00	0.00	-	-	0.01	0.08	0.01	0.08	0.01	0.08	-	-	0.02	0.18
Coke-F002	Fugitive		Lid leaks	0.00	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00	0.00	0.00	-	-	0.00	0.00
Coke-F003	Fugitive		Offtake leaks	0.00	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00	0.00	0.00	-	-	0.00	0.00
Coke-F004	Fugitive		Soaking	0.10	0.45	-	-	0.10	0.45	0.78	3.41	0.78	3.41	0.78	3.41	5.13	22.47	0.31	1.36
Coke-F005	Fugitive		Decarbonization	1,502.97	6,583.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Coke-F006	Fugitive		Door leaks	0.13	0.76	0.00	0.00	-	-	0.27	1.17	0.27	1.17	0.27	1.17	-	-	0.35	1.52
Coke-F007	Fugitive	Coke Oven Battery "B"	Charging emissions	0.01	0.05	0.00	0.00	-	-	0.01	0.08	0.01	0.08	0.01	0.08	-	-	0.02	0.18
Coke-F008	Fugitive		Lid leaks	0.00	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00	0.00	0.00	-	-	0.00	0.00
Coke-F009	Fugitive		Offtake leaks	0.00	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00	0.00	0.00	-	-	0.00	0.00
Coke-F010	Fugitive		Soaking	0.10	0.45	-	-	0.10	0.45	0.78	3.41	0.78	3.41	0.78	3.41	5.13	22.47	0.31	1.36
Coke-F011	Fugitive		Decarbonization	1,502.97	6,583.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Coke-F012	Fugitive		Door leaks	0.13	0.76	0.00	0.00	-	-	0.27	1.17	0.27	1.17	0.27	1.17	-	-	0.35	1.52
Coke-S003	Stack	Pushing / Quench Cars (2) Scrubber	Scrubber Exhaust	6.53	28.60	0.00	0.00	1.97	8.63	6.49	28.42	6.49	28.42	6.49	28.42	10.16	44.49	7.98	34.96
Coke-F013	Fugitive	Pushing / Quench Cars (2)	Material Handling - Fugitives																
Coke-S004	Stack	Fast Quench Station (Backup)	Hot Coke Quenching	-	-	-	-	-	-	12.67	54.60	12.67	54.60	12.67	54.60	-	-	-	-
Coke-S005	Stack	West Quench Station	Hot Coke Quenching	-	-	-	-	-	-	32.13	140.74	32.13	140.74	32.13	140.74	-	-	-	-
Coke-S006	Fugitive	Battery A Coke Oven Underfiring	Coke Underfiring	35.24	154.36	-	-	85.00	372.28	3.47	15.21	3.47	15.21	3.47	15.21	11.92	52.21	4.87	21.34
Coke-S007	Fugitive	Battery B Coke Oven Underfiring	Coke Underfiring	35.24	154.36	-	-	85.00	372.28	3.47	15.21	3.47	15.21	3.47	15.21	11.92	52.21	4.87	21.34
Coke Production	All Sources			3,110.31	13,623.14	0.00	0.00	177.08	775.65	60.16	263.50	60.16	263.50	60.16	263.50	48.93	209.53	23.85	103.58

R0006087

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.2 - Coke Production - PTE

Table E-2.1 Coke Oven Flares Potential Emissions Summary

Process Coke Oven Bleeder Flares
Emission Point IDs Coke-S001, Coke-S002

Hours of Operation	8,760	hrs/yr	
Maximum Flare Design Heat Release	192.00	MMBtu/hr	
Coke Oven Gas Heat Content[1]	555	Btu/scf	
Maximum Pilot Gas Usage	48.26	MMscf/yr	
Maximum COG Flaring	1,094	MMscf/yr	(CAAPP Permit 7.3.7.b.i.)

Pollutant	Potential Emissions per Unit (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Criteria Pollutants:					
Particulate Matter (PM)	0.00	0	µg/l	AP-42 Section 13.5 for non smoking flares	
Particulate Matter <10 microns (PM_{10})	0.00	0	µg/l	Assume equal to PM.	
Particulate Matter < 2.5 microns ($PM_{2.5}$)	0.00	0	µg/l	Assume equal to PM.	
Sulfur Dioxide (SO_2)	11.67	20	lb/MMscf	AP-42 Table 13.5-1	
Nitrogen Oxides (NO_x)	21.55	37.74	lb/MMscf	AP-42 Table 13.5-1	
Volatile Organic Matter (VOM)	19.97	34.97	lb/MMscf	AP-42 Table 13.5-1	
Carbon Monoxide (CO)	117.28	205.35	lb/MMscf	AP-42 Table 13.5-1	
Greenhouse Gas Pollutants:					
Carbon Dioxide (CO_2)	98,298	116.89	lb/MMBtu	40 CFR 98, Subpart C, Table C-1 (Natural gas)	
Methane (CH_4)	1.85	2.20E-03	lb/MMBtu	40 CFR 98, Subpart C, Table C-2 (Natural gas)	
Nitrous Oxides (N_2O)	0.19	2.20E-04	lb/MMBtu	40 CFR 98, Subpart C, Table C-2 (Natural gas)	
Carbon Dioxide Equivalent (CO_2e)[2]	98,394	-	-	40 CFR 98, Subpart A, Table A-1	

1. Average site-specific heat content of 555 Btu/scf for coke oven gas.
2. GHGs are calculated in CO_2e using Global Warming Potentials (GWP) from 40 CFR 98, Subpart A, Table A-1 (74 FR 56374, Oct. 30, 2009) and the following equation:
CO_2e (tpy) = CO_2 (tpy) * CO_2 GWP (1) + CH_4 (tpy) * CH_4 GWP (21) + N_2O (tpy) * N_2O GWP (310)

R006088

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 2.2 - Coke Production - ETS

Table E-2.7 Coke Oven Batteries Potential Emissions Summary

Process	Coke Oven Batteries A & B (Charging, Lid leaks, Offtake leaks, Door leaks, Soaking, Decarbonizing)
Emission Point IDs	Coke-F001, Coke-F002, Coke-F003, Coke-F004, Coke-F005, Coke-F006, Coke-F007, Coke-F008, Coke-F009, Coke-F010, Coke-F011, Coke-F012

Hours of Operation	8,760	hrs/yr	
Control Device	Emergency Flares		
Charging - BSO Emission Rate	0.0215	lb/hr	(Average 2012 Rate for A & B Batteries + 20% Compliance Margin)
Lid Leaks - BSO Emission Rate	7.75E-05	lb/hr	(Average 2012 Rate for A & B Batteries + 20% Compliance Margin)
Offtake Leaks - BSO Emission Rate	0.00021	lb/hr	(Average 2012 Rate for A & B Batteries + 20% Compliance Margin)
Door Leaks - BSO Emission Rate	0.316	lb/hr	(Average 2012 Rate for A & B Batteries + 20% Compliance Margin)

Pollutant	Potential Emissions (tpy)	Maximum Throughput (tpy)	Throughput Source	Emission Factor (BSO Ratio)	Emission Factor Source
Criteria Pollutants:					
Particulate Matter (PM)					
Charging	8.38	908,000	CAAPP No. 96030056 Section 7.2.1	1.7	AP-42 Table 12.2-4 BSO Ratio for Total PM, Filterable + Condensable
Lid leaks	5.77E-04	908,000	CAAPP No. 96030056 Section 7.2.1	1.7	AP-42 Table 12.2-4 BSO Ratio for Total PM, Filterable + Condensable
Offtake leaks	1.58E-03	908,000	CAAPP No. 96030056 Section 7.2.1	1.7	AP-42 Table 12.2-4 BSO Ratio for Total PM, Filterable + Condensable
Door leaks	2.35	908,000	CAAPP No. 96030056 Section 7.2.1	1.7	AP-42 Table 12.2-4 BSO Ratio for Total PM, Filterable + Condensable
Soaking	6.81	908,000	CAAPP No. 96030056 Section 7.2.1	0.015	lb/ton of coal charged (AP-42 Table 12.2-18, Total PM)
Decarbonization	-	-	-	-	-
Particulate Matter <10 microns (PM_{10})					
Charging	8.38	908,000	CAAPP No. 96030056 Section 7.2.1	1.70	Assumed equal to PM.
Lid leaks	5.77E-04	908,000	CAAPP No. 96030056 Section 7.2.1	1.70	Assumed equal to PM.
Offtake leaks	1.57E-03	908,000	CAAPP No. 96030056 Section 7.2.1	1.70	Assumed equal to PM.
Door leaks	2.35	908,000	CAAPP No. 96030056 Section 7.2.1	1.70	Assumed equal to PM.
Soaking	6.81	908,000	CAAPP No. 96030056 Section 7.2.1	0.015	lb/ton of coal charged (AP-42 Table 12.2-18, Total PM)
Decarbonization	-	-	-	-	-
Particulate Matter < 2.5 microns ($PM_{2.5}$)					
Charging	8.38	908,000	CAAPP No. 96030056 Section 7.2.1	1.70	Assumed equal to PM.
Lid leaks	5.77E-04	908,000	CAAPP No. 96030056 Section 7.2.1	1.70	Assumed equal to PM.
Offtake leaks	1.58E-03	908,000	CAAPP No. 96030056 Section 7.2.1	1.70	Assumed equal to PM.
Door leaks	2.35	908,000	CAAPP No. 96030056 Section 7.2.1	1.70	Assumed equal to PM.
Soaking	6.81	908,000	CAAPP No. 96030056 Section 7.2.1	0.015	lb/ton of coal charged (AP-42 Table 12.2-18, Total PM)
Decarbonization	-	-	-	-	-
Nitrogen Oxides (NO_x)					
Charging	-	-	-	-	-
Lid leaks	-	-	-	-	-
Offtake leaks	-	-	-	-	-
Door leaks	-	-	-	-	-
Soaking	0.41	908,000	CAAPP No. 96030056 Section 7.2.1	0.001	lb/ton of coal charged (AP-42 Table 12.2-18)
Decarbonization	-	-	-	-	-
Sulfur Dioxide (SO_2)					
Charging	-	-	-	-	-
Lid leaks	-	-	-	-	-
Offtake leaks	-	-	-	-	-
Door leaks	-	-	-	-	-
Soaking	22.95	908,000	CAAPP No. 96030056 Section 7.2.1	0.099	lb/ton of coal charged (AP-42 Table 12.2-18)
Decarbonization	-	-	-	-	-
Volatile Organic Material (VOM)					
Charging	0.71	908,000	CAAPP No. 96030056 Section 7.2.1	2.2	AP-42 Table 12.2-4 BSO Ratio for VOM
Lid leaks	9.67E-04	908,000	CAAPP No. 96030056 Section 7.2.1	2.2	AP-42 Table 12.2-4 BSO Ratio for VOM
Offtake leaks	1.98E-03	908,000	CAAPP No. 96030056 Section 7.2.1	2.2	AP-42 Table 12.2-4 BSO Ratio for VOM
Door leaks	3.04	908,000	CAAPP No. 96030056 Section 7.2.1	2.2	AP-42 Table 12.2-4 BSO Ratio for VOM
Soaking	2.72	908,000	CAAPP No. 96030056 Section 7.2.1	0.006	lb/ton of coal charged (AP-42 Table 12.2-18)

R0006089

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.2 - Coke Production - PTE

Table E-2.2 Coke Oven Batteries Potential Emissions Summary

Process: Coke Oven Batteries A & B (Charging, Lid leaks, Offtake leaks, Door leaks, Soaking, Decarbonizing)
Emission Point IDs: Coke-F001, Coke-F002, Coke-F003, Coke-F004, Coke-F005, Coke-F006, Coke-F007, Coke-F008, Coke-F009, Coke-F010, Coke-F011, Coke-F01.

Hours of Operation	8,760	hrs/yr	
Control Device	Emergency Flares		
Charging - BSO Emission Rate	0.0215	lb/hr	(Average 2012 Rate for A & B Batteries + 20% Compliance Margin)
Lid Leaks - BSO Emission Rate	7.75E-05	lb/hr	(Average 2012 Rate for A & B Batteries + 20% Compliance Margin)
Offtake Leaks - BSO Emission Rate	0.00021	lb/hr	(Average 2012 Rate for A & B Batteries + 20% Compliance Margin)
Door Leaks - BSO Emission Rate	0.316	lb/hr	(Average 2012 Rate for A & B Batteries + 20% Compliance Margin)

Pollutant	Potential Emissions (tpy)	Maximum Throughput (tpy)	Throughput Source	Emission Factor (BSO Ratio)	Emission Factor Source
Decarbonization	-	-	-	-	-
Carbon Monoxide (CO)					
Charging	0.10	908,000	CAAPP No. 96030056 Section 7.2.1	1.1	AP-42 Table 12.2-4 BSO Ratio for CO
Lid leaks	0.00	908,000	CAAPP No. 96030056 Section 7.2.1	1.1	AP-42 Table 12.2-4 BSO Ratio for CO
Offtake leaks	0.00	908,000	CAAPP No. 96030056 Section 7.2.1	1.1	AP-42 Table 12.2-4 BSO Ratio for CO
Door leaks	1.52	908,000	CAAPP No. 96030056 Section 7.2.1	1.1	AP-42 Table 12.2-4 BSO Ratio for CO
Soaking	0.91	908,000	CAAPP No. 96030056 Section 7.2.1	0.002	lb/ton of coal charged (AP-42 Table 12.2-18)
Decarbonization	13,166.00	908,000	CAAPP No. 96030056 Section 7.2.1	29	lb/ton of coal charged (AP-42 Table 12.2-18)
Lead (Pb)					
Charging	2.88E-08	908,000	CAAPP No. 96030056 Section 7.2.1	0.000018	Wt% (Granite City Coal Blend Analysis, 10/20/1992 + 20% compliance margin)
Lid leaks	1.04E-10	908,000	CAAPP No. 96030056 Section 7.2.1	0.000018	Wt% (Granite City Coal Blend Analysis, 10/20/1992 + 20% compliance margin)
Offtake leaks	2.78E-10	908,000	CAAPP No. 96030056 Section 7.2.1	0.000018	Wt% (Granite City Coal Blend Analysis, 10/20/1992 + 20% compliance margin)
Door leaks	4.23E-07	908,000	CAAPP No. 96030056 Section 7.2.1	0.000018	Wt% (Granite City Coal Blend Analysis, 10/20/1992 + 20% compliance margin)
Soaking	-	-	-	-	-
Decarbonization	-	-	-	-	-
Hazardous Air Pollutants:					
Benzene					
Charging	0.05	908,000	CAAPP No. 96030056 Section 7.2.1	0.5	AP-42 Table 12.2-4 BSO Ratio for Benzene
Lid leaks	1.78E-04	908,000	CAAPP No. 96030056 Section 7.2.1	0.5	AP-42 Table 12.2-4 BSO Ratio for Benzene
Offtake leaks	4.56E-04	908,000	CAAPP No. 96030056 Section 7.2.1	0.5	AP-42 Table 12.2-4 BSO Ratio for Benzene
Door leaks	0.69	908,000	CAAPP No. 96030056 Section 7.2.1	0.5	AP-42 Table 12.2-4 BSO Ratio for Benzene
Soaking	-	-	-	-	-
Decarbonization	-	-	-	-	-
Hydrogen Sulfide					
Charging	0.01	908,000	CAAPP No. 96030056 Section 7.2.1	0.15	AP-42 Table 12.2-4 BSO Ratio for Hydrogen Sulfide
Lid leaks	5.09E-05	908,000	CAAPP No. 96030056 Section 7.2.1	0.15	AP-42 Table 12.2-4 BSO Ratio for Hydrogen Sulfide
Offtake leaks	1.35E-04	908,000	CAAPP No. 96030056 Section 7.2.1	0.15	AP-42 Table 12.2-4 BSO Ratio for Hydrogen Sulfide
Door leaks	0.21	908,000	CAAPP No. 96030056 Section 7.2.1	0.15	AP-42 Table 12.2-4 BSO Ratio for Hydrogen Sulfide
Soaking	-	-	-	-	-
Decarbonization	-	-	-	-	-
Ammonia					
Charging	0.01	908,000	CAAPP No. 96030056 Section 7.2.1	0.15	AP-42 Table 12.2-4 BSO Ratio for Ammonia
Lid leaks	5.09E-05	908,000	CAAPP No. 96030056 Section 7.2.1	0.15	AP-42 Table 12.2-4 BSO Ratio for Ammonia
Offtake leaks	1.35E-04	908,000	CAAPP No. 96030056 Section 7.2.1	0.15	AP-42 Table 12.2-4 BSO Ratio for Ammonia
Door leaks	1.59	908,000	CAAPP No. 96030056 Section 7.2.1	1.15	AP-42 Table 12.2-4 BSO Ratio for Ammonia
Soaking	-	-	-	-	-
Decarbonization	-	-	-	-	-
Greenhouse Gas Pollutants:					
Carbon Dioxide (CO_2)					
Charging	0.05	908,000	CAAPP No. 96030056 Section 7.2.1	0.5	AP-42 Table 12.2-4 BSO Ratio for Carbon Monoxide
Lid leaks	1.78E-04	908,000	CAAPP No. 96030056 Section 7.2.1	0.5	AP-42 Table 12.2-4 BSO Ratio for Carbon Monoxide
Offtake leaks	4.56E-04	908,000	CAAPP No. 96030056 Section 7.2.1	0.5	AP-42 Table 12.2-4 BSO Ratio for Carbon Monoxide

R006090

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.2 - Coke Production - FTE

Table E-2.2 Coke Oven Batteries Potential Emissions Summary

Process: Coke Oven Batteries A & B (Charging, Lid leaks, Offtake leaks, Door leaks, Soaking, Decarbonizing)
Emission Point IDs: Coke-FB01, Coke-F002, Coke-F003, Coke-F004, Coke-F005, Coke-F006, Coke-F007, Coke-F008, Coke-F009, Coke-F010, Coke-F011, Coke-F01.

Hours of Operation	8,760	hr/yr	
Control Device	Emergency Flares		
Charging - BSO Emission Rate	0.0215	lb/hr	(Average 2012 Rate for A & B Batteries + 20% Compliance Margin)
Lid Leaks - BSO Emission Rate	4.75E-05	lb/hr	(Average 2012 Rate for A & B Batteries + 20% Compliance Margin)
Offtake Leaks - BSO Emission Rate	0.000021	lb/hr	(Average 2012 Rate for A & B Batteries + 20% Compliance Margin)
Door Leaks - BSO Emission Rate	0.018	lb/hr	(Average 2012 Rate for A & B Batteries + 20% Compliance Margin)

Pollutant	Potential Emissions (tpy)	Maximum Throughput (tpy)	Throughput Source	Emission Factor (BSO Ratio)	Emission Factor Source
Door leaks	0.83	908,000	CAAPP No. 96030056 Section 7.2.1	0.8	AP-42 Table 12.2-4 BSO Ratio for Carbon Monoxide
Soaking	-	-	-	-	-
Decarbonization	-	-	-	-	-
Methane (CH_4)					
Charging	0.25	908,000	CAAPP No. 96030056 Section 7.2.1	? ?	AP-42 Table 12.2-4 BSO Ratio for Methane
Lid leaks	9.18E-04	908,000	CAAPP No. 96030056 Section 7.2.1	? ?	AP-42 Table 12.2-4 BSO Ratio for Methane
Offtake leaks	2.03E-03	908,000	CAAPP No. 96030056 Section 7.2.1	? ?	AP-42 Table 12.2-4 BSO Ratio for Methane
Door leaks	3.73	908,000	CAAPP No. 96030056 Section 7.2.1	? ?	AP-42 Table 12.2-4 BSO Ratio for Methane
Soaking	-	-	-	-	-
Decarbonization	-	-	-	-	-
Carbon Dioxide Equivalent (CO_2e)[1]					
Charging	5.49	-	-	-	-
Lid leaks	0.02	-	-	-	-
Offtake leaks	0.05	-	-	-	-
Door leaks	78.05	-	-	-	-
Soaking	-	-	-	-	-
Decarbonization	-	-	-	-	-

1. GHGs are calculated in CO_2e using Global Warming Potentials (GWP) from 40 CFR 98, Subpart A, Table A-1 (74 FR 56374, Oct. 30, 2009) and the following equation:
CO_2e (tpy) = CO_2 (tpy) * CO_2 GWP (1) + CH_4 (tpy) * CH_4 GWP (21)

R006091

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.2 - Coke Production - PTE

Table E-2.3 Coke Pushing/Quench Cars Potential Emissions Summary

Process: Pushing/Quench Cars (2)
Emission Point IDs: Coke-S003, Coke-F013 (Both Controlled Emissions from the Scrubber and Uncaptured Fugitives are represented in the factors shown below).

Hours of Operation (each): 8,760 hrs/yr
Control Device: Mobile Venturi Scrubber

Pollutant	Potential Emissions[3] (tpy)	Maximum Throughput (tpy)	Throughput Source	Emission Factor (lb/ton)	Emission Factor Source
Criteria Pollutants:					
Particulate Matter (PM)	28.42	1,421,000	Conversion of 908,000 tpy coal to coke, plus SunCoke	0.04	lb/ton of coke pushed, NESHAP limit
Particulate Matter <10 microns (PM_{10})	28.42	1,421,000	Conversion of 908,000 tpy coal to coke, plus SunCoke	0.04	Assume 100% of PM
Particulate Matter < 2.5 microns ($PM_{2.5}$)	28.42	1,421,000	Conversion of 908,000 tpy coal to coke, plus SunCoke	0.04	Assume 100% of PM
Nitrogen Oxides (NO_x)	8.63	908,000	CAAPP No. 96030056 Section 7.2.1	0.019	lb/ton coal, AP-42 Table 12.2-9
Sulfur Dioxide (SO_2)	44.49	908,000	CAAPP No. 96030056 Section 7.2.1	0.098	lb/ton coal, AP-42 Table 12.2-9
Volatile Organic Material (VOM)	34.96	908,000	CAAPP No. 96030056 Section 7.2.1	0.077	lb/ton coal, AP-42 Table 12.2-9
Carbon Monoxide (CO)	28.60	908,000	CAAPP No. 96030056 Section 7.2.1	0.063	lb/ton coal, AP-42 Table 12.2-9
Lead (Pb)	3.27E-06	908,000	CAAPP No. 96030056 Section 7.2.1	7.20E-09	Granite City Coal Blend Analysis (10/20/1992) + 20% compliance margin
Hazardous Air Pollutants:					
Organics					
Benzene	14.53	908,000	CAAPP No. 96030056 Section 7.2.1	0.03	AP-42 Tables 12.2-9 (Controlled)
Methanol	3.74	908,000	CAAPP No. 96030056 Section 7.2.1	0.01	AP-42 Tables 12.2-9 (Controlled)
Phenol	3.06	908,000	CAAPP No. 96030056 Section 7.2.1	0.01	AP-42 Tables 12.2-9 (Controlled)
Naphthalene	0.50	908,000	CAAPP No. 96030056 Section 7.2.1	1.10E-03	AP-42 Tables 12.2-10 (Controlled)
Acenaphthylene	0.21	908,000	CAAPP No. 96030056 Section 7.2.1	4.65E-04	AP-42 Tables 12.2-10 (Controlled)
Metals					
Manganese	4.68E-03	908,000	CAAPP No. 96030056 Section 7.2.1	1.03E-05	AP-42 Tables 12.2-10 (Controlled)
Nickel	0.01	908,000	CAAPP No. 96030056 Section 7.2.1	1.12E-05	AP-42 Tables 12.2-10 (Controlled)
Arsenic	4.25E-03	908,000	CAAPP No. 96030056 Section 7.2.1	9.37E-06	AP-42 Tables 12.2-10 (Controlled)
Chromium	2.26E-03	908,000	CAAPP No. 96030056 Section 7.2.1	4.98E-06	AP-42 Tables 12.2-10 (Controlled)
Selenium	1.18E-03	908,000	CAAPP No. 96030056 Section 7.2.1	2.59E-06	AP-42 Tables 12.2-10 (Controlled)
Greenhouse Gas Pollutants:					
Carbon Dioxide (CO_2)	7,264.00	908,000	CAAPP No. 96030056 Section 7.2.1	16.00	AP-42 Tables 12.2-9

R006092

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.2 - Coke Production - PTE

Table E-2.4 Coke Pushing/Quench Cars Potential Emissions Summary

Process East Quench Station (Back-up)
Emission Point IDs Coke-S004

Hours of Operation (each) 438 hrs/yr
Control Device None

Pollutant	Potential Emissions (tpy)	Maximum Throughput[1] (tpy)	Throughput Source	Emission Factor (lb/ton)	Emission Factor Source
Particulate Matter (PM)	54.60	40,000	CAAPP No. 96030056 Section 7.2.1	2.73	lb/ton coal, AP-42 Table 12.2-12 (Filterable) - Dirty water, tall tower
Particulate Matter <10 microns (PM_{10})	54.60	40,000	CAAPP No. 96030056 Section 7.2.1	2.73	Assumed 100% of PM.
Particulate Matter < 2.5 microns ($PM_{2.5}$)	54.60	40,000	CAAPP No. 96030056 Section 7.2.1	2.73	Assumed 100% of PM.

1. Maximum throughput at East Tower is 30,000 tpy of coke, which is approximately 40,000 tpy of coal. Permit limits East Station to 5% production.

Process West Quench Station (Main)
Emission Point IDs Coke-S005

Hours of Operation 8,760 hrs/yr
Control Device Low Emission Tower

Pollutant	Potential Emissions[1] (tpy)	Maximum Throughput[1] (tpy)	Throughput Source	Emission Factor (lb/ton)	Emission Factor Source
Particulate Matter (PM)	140.74	908,000	CAAPP No. 96030056 Section 7.2.1	0.31	AP-42 Table 12.2-12 (Filterable) - Clean water, normal tower height, and proper maintenance
Particulate Matter <10 microns (PM_{10})	140.74	908,000	CAAPP No. 96030056 Section 7.2.1	0.31	Assumed 100% of PM.
Particulate Matter < 2.5 microns ($PM_{2.5}$)	140.74	908,000	CAAPP No. 96030056 Section 7.2.1	0.31	Assumed 100% of PM.

1. Maximum throughput at West Tower assumes 100% of production as a worst-case. Permit allows for use of East Station for 5% production.

R006093

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.2 - Coke Production - PTE

Table E-2.5 Coke Oven Underfiring

Process: Coke Oven Underfiring
Emission Point ID: Coke-S006 & S007

Hours of Operation: 8,760 hrs/yr
Control Device: None

Pollutant	Potential Emissions (tpy)	Maximum Throughput (tpy)	Throughput Source	Emission Factor (lb/ton)	Emission Factor Source
Criteria Pollutants:					
Particulate Matter (PM)	30.42	908,000	CAAPP No. 96030056 Section 7.2.1	0.067	AP-42 Section 12.2 Table 12.2-13
Particulate Matter <10 microns (PM_{10})	30.42	908,000	CAAPP No. 96030056 Section 7.2.1	0.067	AP-42 Section 12.2 Table 12.2-13
Particulate Matter < 2.5 microns ($PM_{2.5}$)	30.42	908,000	CAAPP No. 96030056 Section 7.2.1	0.067	AP-42 Section 12.2 Table 12.2-13
Nitrogen Oxides (NO_x)	744.56	908,000	CAAPP No. 96030056 Section 7.2.1	1.64	AP-42 Table 12.2-16
Sulfur Dioxide (SO_2)	104.42	908,000	CAAPP No. 96030056 Section 7.2.1	0.23	AP-42 Table 12.2-16 (Sulfur Oxides (DCOG))
Volatile Organic Material (VOM)	42.68	908,000	CAAPP No. 96030056 Section 7.2.1	0.094	AP-42 Table 12.2-16
Carbon Monoxide (CO)	308.72	908,000	CAAPP No. 96030056 Section 7.2.1	0.68	AP-42 Table 12.2-16
Hazardous Air Pollutants:					
Benzene	0.45	908,000	CAAPP No. 96030056 Section 7.2.1	9.88E-04	USS COG Analysis (3/11/2011) + 20% compliance margin
Greenhouse Gas Pollutants:					
Carbon Dioxide (CO_2)	129,390	908,000	CAAPP No. 96030056 Section 7.2.1	285.00	AP-42 Table 12.2-16 (COG)
Methane (CH_4)	95.34	908,000	CAAPP No. 96030056 Section 7.2.1	0.21	AP-42 Table 12.2-16
Carbon Dioxide Equivalent (CO_2e)[1]	131,392	-	-	-	-

1. GHGs are calculated in CO_2e using Global Warming Potentials (GWP) from 40 CFR 98, Subpart A, Table A-1 (74 FR 56374, Oct. 30, 2009) and the following equation:
CO_2e (tpy) = CO_2 (tpy) * CO_2 GWP (1) + CH_4 (tpy) * CH_4 GWP (21)

R006094

APPENDIX E

Section 7.3 PTE Calcs
Byproducts

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.3 - Byproduct Recovery - PTE

Table E-3.0 Byproduct Recovery Potential Emissions Summary

Emission Unit ID	Source Type	Emission Point	Process Emission Unit(s)	CO		Lead		NO_x		PM		PM_{10}		$PM_{2.5}$		SO_2		VOM	
				lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Byproduct-F001	Fugitive	COG Processing	Coke Oven Gas Handling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.37	1.64
Byproduct-F002	Fugitive	COG Processing	Gas Coolers	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.37	1.64
Byproduct-F003	Fugitive	COG Processing	Gas Processing/Cleaning unit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.37	1.64
Byproduct-F004	Fugitive	Light Oil Processing	Light Oil Stills (Wash Oil Stills)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.75	7.67
Byproduct-F005	Fugitive	Light Oil Processing	Light Oil Process Condensers	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.82	3.63
Byproduct-F006	Fugitive	Light Oil Processing	Light Oil Sump	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.18	0.61
Byproduct-S001	Stack	Coal Tar Processing	Tar Collection Tanks	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.92	12.79
Byproduct-S002	Stack	Coal Tar Processing	Tar Storage Tank																
Byproduct-F007	Fugitive	Coal Tar Processing	Tar Transfer																
Byproduct-S003	Stack	Coal Dehydration Processing	Dehydration Tanks (2)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.18	0.85
Byproduct-S004	Stack	Coal Light Processing	Light Oil Storage Tanks (4)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.75	3.27
Byproduct-S005	Stack	Coal Ammonia Processing	Ammonia Liquor Storage Tanks	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.06	0.24
Byproduct-F008	Fugitive	Coal Tar Processing	Tar Decanters	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.01	0.06
Byproduct-F009	Fugitive	Coal Tar Processing	Railcar Loading	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00
Byproduct-F010	Fugitive	Coal Tar Processing	Truck Loading																
Byproduct-F011	Fugitive	COG Desulfurization System	Packed Tower Amine Unit and Hydrogen Cyanide Destruction Unit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Byproduct-S006	Stack	Thermal Oxidizer	Claus Sulfur Recovery Unit	0.00	0.00	-	-	0.11	0.46	5.62	24.60	5.62	24.60	5.62	24.60	57.28	294.70	2.70	11.83
Byproduct-S007	Stack	Coal COG Processing	COG Holding Tank	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Byproduct-S008	Stack	Coal COG Processing	COG Holding Flare	41.28	180.81	-	-	7.58	33.23	0.00	0.00	0.00	0.00	0.00	0.00	13.51	59.19	7.03	30.79
Byproduct-S009	Stack	Coal COG Processing	Ammonia Liquor Collector/Head Tank	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.12	0.53
Byproduct Recovery	All Sources			41.28	180.81	0.00	0.00	7.69	33.69	5.62	24.60	5.62	24.60	5.62	24.60	80.80	353.89	17.63	77.24

R006096

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.3 - Byproduct Recovery

Table E-3.7 Byproduct Recovery Potential Emissions Summary

Process: By Product Recovery
Emission Units: Coke Oven Gas Processing Unit (COG Transfer & Handling, Gas Coolers, Gas Processing/Cleaning)
Emission Unit ID: Byproduct-F001, Byproduct-F002, Byproduct-F003

Control Device: Clean Gas Blanketing, Steam Blanketing, Negative Pressure Systems
Operating Schedule: 365 days/year

Pollutant	Emission Point ID	Potential Emissions (tpy)	Throughput Source	Exhauster Seals		Vents (Open-Ended Lines)		Pressure Relief Devices		Shut-Off Valves		Pump Shafts		Edges/Flanges		Emission Factor Source
				Emission Factor	Emission Factor Units	Emission Factor	Emission Factor Units	Emission Factor	Emission Factor Units	Emission Factor	Emission Factor Units	Emission Factor	Emission Factor Units	Emission Factor	Emission Factor Units	
Equipment Count (per type)				1		1		3		3		1		1		
Criteria Pollutants:																
Volatile Organic Material (VOM)																
COG Transfer & Handling	Byproduct-F001	1.64	CAAPP No. 96030056 Section 7.3.7.b.ii	1.20	lb/day	0.12	lb/day	4.9	lb/day	0.26	lb/day	1.7	lb/day	0.79	lb/day	
Gas Coolers	Byproduct-F002	1.64	CAAPP No. 96030056 Section 7.3.7.b.ii	1.20	lb/day	0.12	lb/day	4.9	lb/day	0.26	lb/day	1.7	lb/day	0.79	lb/day	AP-42 Table 12.7-24 (05/2008) Quarterly Inspections
Gas Processing/Cleaning	Byproduct-F003	1.64	CAAPP No. 96030056 Section 7.3.7.b.ii	1.20	lb/day	0.12	lb/day	4.9	lb/day	0.26	lb/day	1.7	lb/day	0.79	lb/day	
Hazardous Air Pollutants:																
Benzene			Max. Benzene Content of COG	0.00	wt%	Granite City COG Analysis (March 2006) + 20%										
COG Transfer & Handling	Byproduct-F001	0.08	CAAPP No. 96030056 Section 7.3.7.b.ii	0.06	lb/day	0.006	lb/day	0.245	lb/day	0.013	lb/day	0.085	lb/day	0.0395	lb/day	
Gas Coolers	Byproduct-F002	0.08	CAAPP No. 96030056 Section 7.3.7.b.ii	0.06	lb/day	0.006	lb/day	0.245	lb/day	0.013	lb/day	0.085	lb/day	0.0395	lb/day	AER Calculations (COG Analysis from March 2006) + Compliance Margin
Gas Processing/Cleaning	Byproduct-F003	0.08	CAAPP No. 96030056 Section 7.3.7.b.ii	0.06	lb/day	0.006	lb/day	0.245	lb/day	0.013	lb/day	0.085	lb/day	0.0395	lb/day	

R006097

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.3 - Byproduct Recovery

Table E-3.2 Byproduct Recovery Potential Emissions Summary

Process: By-Product Recovery
Emission Units: Light Oil Processing (Stills, Process Condensers, Sumps)
Emission Unit ID: Byproduct-F004, Byproduct-F005, Byproduct-F006

Control Device: Clean Gas Blanketing, Steam Blanketing, Negative Pressure Systems

Pollutant	Emission Point ID	Potential Emissions (tpy)	Maximum Throughput (tpy)	Throughput Source	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Criteria Pollutants:								
Volatile Organic Material (VOM)								
Stills	Byproduct-F004	7.67	1,421,000	908,000 tpy coal converted to coke, + SunCoke capacity	0.0108	lb/ton coke	AP-42 Table 12.2-23 (S/08) Wash Oil Decanter	
Light Oil Condenser	Byproduct-F005	3.69	1,421,000	908,000 tpy coal converted to coke, + SunCoke capacity	0.0052	lb/ton coke	AP-42 Table 12.2-23 (S/08) Light-oil condenser vent with gas blanketing at Furnace Plant	
Light Oil Sump	Byproduct-F006	0.61	1,421,000	908,000 tpy coal converted to coke, + SunCoke capacity	0.00086	lb/ton coke	AP-42 Table 12.2-23 (S/08) Light-oil sump with gas blanketing at Furnace Plant	
Hazardous Air Pollutants:								
Benzene								
Stills	Byproduct-F004	5.40	1,421,000	908,000 tpy coal converted to coke, + SunCoke capacity	0.0076	lb/ton coke	AP-42 Table 12.2-22 (S/08) Wash Oil Decanter	
Light Oil Condenser	Byproduct-F005	2.56	1,421,000	908,000 tpy coal converted to coke, + SunCoke capacity	0.0036	lb/ton coke	AP-42 Table 12.2-22 (S/08) Light-oil condenser vent with gas blanketing at Furnace Plant	
Light Oil Sump	Byproduct-F006	0.43	1,421,000	908,000 tpy coal converted to coke, + SunCoke capacity	0.0006	lb/ton coke	AP-42 Table 12.2-22 (S/08) Light-oil sump with gas blanketing at Furnace Plant	

R006098

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.3 - Byproduct Recovery

Table E-3.3 Byproduct Recovery Potential Emissions Summary

Process: Byproduct Recovery
Emission Units: Coal Tar Processing (Tar Collection & Transfer, Tar Storage Tanks)
Emission Unit ID: Byproduct-S001, Byproduct-S002, Byproduct-F007

Control Device: Clean Gas Blanketing, Steam Blanketing, Negative Pressure Systems

Pollutant	Emission Point ID	Potential Emissions (tpy)	Maximum Throughput (tpy)	Throughput Source	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Criteria Pollutants:								
Volatile Organic Material (VOM)								
Tar Collection Tanks (2 @ 6,000 gal each) Tar Transfer Tar Storage Tank	Byproduct-S001 Byproduct-F007 Byproduct-S002	12.79	1,421,000	908,000 tpy coal converted to coke, + SunCoke capacity	0.018	lb/ton coke	AP-42 Table 12.2-23 (5/08) for tar storage tank with gas blanketing	
Hazardous Air Pollutants:								
Benzene								
Tar Collection Tanks (2 @ 6,000 gal each) Tar Transfer Tar Storage Tank	Byproduct-S001 Byproduct-F007 Byproduct-S002	0.54	1,421,000	908,000 tpy coal converted to coke, + SunCoke capacity	0.0007%	lb/ton coke	AP-42 Table 12.2-22 (5/08) for tar storage tank with gas blanketing at Furnace Plant	

R0006099

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.3 - Byproduct Recovery

Table E-3.4 Byproduct Recovery Potential Emissions Summary

Process Byproduct Recovery
Emission Units Dehydration tanks, Decanters, Light Oil Storage Tanks, Ammonia Liquor Storage Tanks
Emission Unit ID Byproduct-S003, Byproduct-S004, Byproduct-S005, Byproduct-F008

Control Device Clean Gas Blanketing, Steam Blanketing, Negative Pressure Systems

Pollutant	Emission Point ID	Potential Emissions (tpy)	Maximum Throughput (tpy)	Throughput Source	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Criteria Pollutants:								
Volatile Organic Material (VOM)								
Dehydration Tanks (2)	Byproduct-S003	0.85	1,421,000	908,000 tpy coal converted to coke, + SunCoke capacity	0.0012	lb/ton coke	AP-42 Table 12.2-23 (5/08) for tar dewatering tank with gas blanketing at Furnace Plant	
Decanter	Byproduct-F008	3.27	1,421,000	908,000 tpy coal converted to coke, + SunCoke capacity	0.0046	lb/ton coke	AP-42 Table 12.2-23 (5/08) for tar decanter with gas blanketing at Furnace Plant	
Light Oil Storage Tanks (4)	Byproduct-S004	0.24	1,421,000	908,000 tpy coal converted to coke, + SunCoke capacity	0.00034	lb/ton coke	AP-42 Table 12.2-23 (5/08) for light-oil storage tank with gas blanketing at Furnace Plant	
Ammonia Liquor Storage Tanks (2)	Byproduct-S005	0.06	1,421,000	908,000 tpy coal converted to coke, + SunCoke capacity	0.00008	lb/ton coke	AP-42 Table 12.2-23 (5/08) for excess ammonia liquor tank with gas blanketing at Furnace Plant	
Ammonia Liquor Collector/Head Tank	Byproduct-S009	0.53	1,421,000	908,000 tpy coal converted to coke, + SunCoke capacity	0.00074	lb/ton coke	AP-42 12.2-23 - Flushing Liquor Circulation Tank with Gas Blanketing	
Hazardous Air Pollutants:								
Benzene								
Dehydration Tanks (2)	Byproduct-S003	0.60	1,421,000	908,000 tpy coal converted to coke, + SunCoke capacity	0.00084	lb/ton coke	AP-42 Table 12.2-22 (5/08) for tar dewatering tank with gas blanketing at Furnace Plant	
Decanter	Byproduct-F008	1.56	1,421,000	908,000 tpy coal converted to coke, + SunCoke capacity	0.0022	lb/ton coke	AP-42 Table 12.2-22 (5/08) for tar decanter with gas blanketing at Furnace Plant	
Light Oil Storage Tanks (4)	Byproduct-S004	0.18	1,421,000	908,000 tpy coal converted to coke, + SunCoke capacity	0.00025	lb/ton coke	AP-42 Table 12.2-22 (5/08) for light-oil storage tank with gas blanketing at Furnace Plant	
Ammonia Liquor Storage Tanks (2)	Byproduct-S005	0.04	1,421,000	908,000 tpy coal converted to coke, + SunCoke capacity	0.00006	lb/ton coke	AP-42 Table 12.2-22 (5/08) for excess ammonia liquor tank with gas blanketing at Furnace Plant	
Ammonia Liquor Collector/Head Tank	Byproduct-S009	0.37	1,421,000	908,000 tpy coal converted to coke, + SunCoke capacity	0.00052	lb/ton coke	AP-42 Table 12.2-22 (2008) - Flushing Liquor Circulation Tank with Gas Blanketing	

R006100

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.3 - Byproduct Recovery

Table E-3.5 Byproduct Recovery Potential Emissions Summary

Process Byproduct Recovery
Emission Units Railcar & Truck Loading
Emission Unit ID Byproduct-F009, Byproduct-F018

Control Device Vapor Recovery System, Negative Pressure

Pollutant	Emission Point ID	Potential Emissions (tpy)	Maximum Throughput[1] (gal/yr)	Throughput Source	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Criteria Pollutants:								
Volatile Organic Material (VOM)								
Railcar loading	Byproduct-F009	1.36E-05	697,546	2012 actual coal tar production scaled in proportion with facility iron production rates	0.000039	lb/Mgal	AP-42 Ch. 5.2	
Truck loading	Byproduct-F010							
Hazardous Air Pollutants:								
Benzene								
Railcar loading	Byproduct-F009	1.42E-05	697,546	2012 actual coal tar production scaled in proportion with facility iron production rates	0.0000407	lb/Mgal	% benzene from Clairton coal tar analysis (2009) + 20% compliance	
Truck loading	Byproduct-F010							

1. Density of coal tar = 10.26 lb/gal.

R006101

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.3 - Byproduct Recovery

Table E-3.6 Byproduct Recovery Potential Emissions Summary

Process: Byproduct Recovery
Emission Units: COG Desulfurization System (Packed Tower Amine Unit and HCN Destruction Unit, Claus Sulfur Recovery Unit)
Emission Unit ID: Byproduct-S006, Byproduct-F011

Control Device: Closed Systems (Packed Tower Amine Unit and HCN Destruction Unit), Thermal Oxidizer (Claus Sulfur Recovery Unit)

Pollutant	Emission Point ID	Potential Emissions (tpy)	Operating Rate	Units	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Criteria Pollutants:								
Particulate Matter (PM)								
Packed Tower Amine Unit & HCN Destruction Unit	Byproduct-F011	Closed System - No Emissions						
Claus Sulfur Recovery Unit to Thermal Oxidizer	Byproduct-S006	24.60	640	hrs/yr	76.88	lb/hr	CAAPP No. 96030056 Section 7.3.2.e.i	
Particulate Matter <10 microns (PM_{10})								
Packed Tower Amine Unit & HCN Destruction Unit	Byproduct-F011	Closed System - No Emissions						
Claus Sulfur Recovery Unit to Thermal Oxidizer	Byproduct-S006	24.60	640	hrs/yr	76.88	lb/hr	CAAPP No. 96030056 Section 7.3.2.e.i	
Particulate Matter < 2.5 microns ($PM_{2.5}$)								
Packed Tower Amine Unit & HCN Destruction Unit	Byproduct-F011	Closed System - No Emissions						
Claus Sulfur Recovery Unit to Thermal Oxidizer	Byproduct-S006	24.60	640	hrs/yr	76.88	lb/hr	Assumed 100% of PM_{10}	
Nitrogen Oxides (NO_x)								
Packed Tower Amine Unit & HCN Destruction Unit	Byproduct-F011	Closed System - No Emissions						
Claus Sulfur Recovery Unit to Thermal Oxidizer	Byproduct-S006	0.46	640	hrs/yr	1.44	lb/hr	Stack Test 12/17/2010 + 20% compliance margin	
Volatile Organic Material (VOM)								
Packed Tower Amine Unit & HCN Destruction Unit	Byproduct-F011	Closed System - No Emissions						
Claus Sulfur Recovery Unit to Thermal Oxidizer	Byproduct-S006	11.83	2.25	MMcf/hr	1.20	lb/MMscf	FIRE v6.25(1-02-007-07) - COG Combustion	
Sulfur Dioxide (SO_2)								
Packed Tower Amine Unit & HCN Destruction Unit	Byproduct-F011	Closed System - No Emissions						
Claus Sulfur Recovery Unit to Thermal Oxidizer	Byproduct-S006	294.70	640	hrs/yr	920.94	lb/hr	Current Permit Limit	
Carbon Monoxide (CO)								
Packed Tower Amine Unit & HCN Destruction Unit	Byproduct-F011	Closed System - No Emissions						
Claus Sulfur Recovery Unit to Thermal Oxidizer	Byproduct-S006	1.92E-03	640	hrs/yr	0.01	lb/hr	Stack Test 12/17/2010 + 20% compliance margin	

R006102

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.3 - Byproduct Recovery

Table E-3.7 Byproduct Recovery Potential Emissions Summary

Process: Byproduct Recovery
Emission Units: COG Flare (COG Holding Tank, COG Holding Flare)
Emission Unit ID: Byproduct-S007, Byproduct-S008

Control Device: None

Pollutant	Emission Point ID	Potential Emissions (tpy)	Maximum Throughput	Throughput Source	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Criteria Pollutants:								
Particulate Matter (PM)								
COG Holding Flare	Byproduct-S008	0	1761	2012 actual scaled to maximum proportionate with total COG production	0	lb/MMBtu	AP-42 Table 13.5-1 - Smokeless Flares	
Particulate Matter <10 microns (PM_{10})								
COG Holding Flare	Byproduct-S008	0	1761	2012 actual scaled to maximum proportionate with total COG production	0	lb/MMBtu	AP-42 Table 13.5-1 - Smokeless Flares	
Particulate Matter < 2.5 microns ($PM_{2.5}$)								
COG Holding Flare	Byproduct-S008	0	1761	2012 actual scaled to maximum proportionate with total COG production	0	lb/MMBtu	AP-42 Table 13.5-1 - Smokeless Flares	
Nitrogen Oxides (NO_x)								
COG Holding Flare	Byproduct-S008	33.23	1761	2012 actual scaled to maximum proportionate with total COG production	37.74	lb/MMscf	AP-42 Table 13.5-1	
Volatile Organic Material (VOM)								
COG Holding Tank	Byproduct-S007	No Emissions Under Normal Operation						
COG Holding Flare	Byproduct-S008	30.79	1761	2012 actual scaled to maximum proportionate with total COG production	34.97	lb/MMscf	AP-42 Table 13.5-1	
Sulfur Dioxide (SO_2)								
COG Holding Flare	Byproduct-S008	59.19	1761	2012 actual scaled to maximum proportionate with total COG production	67.23	lb/MMscf	Assumes all H2S is converted to SO2 at maximum concentration of 25 gr/dscf per permit limit	

R006103

Process	**Byproduct Recovery**
Emission Units	**COG Flare (COG Holding Tank, COG Holding Flare)**
Emission Unit ID	**Byproduct-S007, Byproduct-S008**
Control Device	None

Pollutant	Emission Point ID	Potential Emissions (tpy)	Maximum Throughput	Throughput Source	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Carbon Monoxide (CO)								
COG Holding Flare	Byproduct-S008	180.81	1761	2012 actual scaled to maximum proportionate with total COG production	205.35	lb/MMscf	AP-42 Table 13.5-1	
Hazardous Air Pollutants:								
Benzene								
COG Holding Tank	Byproduct-S007	No Emissions Under Normal Operation						
COG Holding Flare	Byproduct-S008	0.45	1761	2012 actual scaled to maximum proportionate with total COG production	1.47408	wt%	USS COG Analysis (3/11/2011) + 20% compliance margin	

R006104

APPENDIX E

Section 7.4 PTE Calcs
Blast Furnaces

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.4 - Blast Furnaces - PTE

Table E-4.D Blast Furnaces Potential Emissions Summary

Emission Unit ID	Source Type	Emission Point	Process Emission Unit(s)	CO		Lead		NO_x		PM		PM_{10}		$PM_{2.5}$		SO_2		VOM	
				lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
BF-5001	Stack	Blast Furnace Double Bell System	Blast Furnace "A" and "B" Charging	-	-	0.00	0.00	-	-	1.18	5.17	1.18	5.17	0.27	1.18	-	-	-	-
BF-5002	Stack	Casthouse Baghouse	Furnace Tapping, Iron & Slag Trough	60.70	265.86	0.00	0.02	5.26	23.79	25.40	111.25	25.40	111.25	25.40	111.25	72.48	317.45	34.18	149.70
BF-5003	Stack	Iron Spout Baghouse	Torpedo Car Loading, Iron & Slag Runners, Hot Metal Fuming	6.08	26.64	0.00	0.02	0.69	3.04	9.21	40.32	9.21	40.32	9.21	40.32	2.28	9.97	0.90	3.95
BF-5004	Stack	Blast Furnace Gas Flare #1	Bleeder Valves, Gas Cleaning System	126.88	555.73	-	-	56.68	248.25	26.86	117.64	26.86	117.64	26.86	117.64	622.61	2,727.03	-	-
BF-5005	Stack	Blast Furnace Gas Flare #2	Bleeder Valves, Gas Cleaning System	3.89	17.06	-	-	1.50	6.57	0.82	3.61	0.82	3.61	0.82	3.61	1.89	8.28	-	-
BF-5006	Stack	Blast Furnace "A" Backdraft Stack	Backdraft Steaming for Maintenance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BF-5007	Stack	Blast Furnace "B" Backdraft Stack	Backdraft Steaming for Maintenance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BF-5008	Stack	Blast Furnace "A" Stoves	Firing of natural gas, COG, and BFG	20.00	87.59	0.00	0.00	22.67	99.28	3.45	15.11	2.96	12.97	2.66	11.65	28.32	88.99	14.01	61.34
BF-5009	Stack	Blast Furnace "B" Stoves	Firing of natural gas, COG, and BFG																
BF-F001	Fugitive	Casthouse Roof Monitors	Fugitives from Casthouse Operations	-	-	0.00	0.00	0.25	1.11	11.20	49.06	5.60	24.53	5.60	24.53	3.76	16.46	1.70	7.44
BF-F002	Fugitive	Slag Pits	Material Handling/Fuming	-	-	-	-	-	-	1.51	6.60	1.51	6.60	1.51	6.60	3.61	15.82	-	-
Blast Furnaces	All Sources			217.55	952.88	0.01	0.05	87.00	381.05	79.63	348.78	73.54	322.08	72.33	316.79	728.94	3,184.00	50.78	222.43

R006106

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.4 - Blast Furnaces - PTE

Table E-4.1 Blast Furnaces Potential Emissions Summary

Process	Emissions from Furnace Charging (Double Bell System)	
Emission Unit ID	BF-S001	
Annual Production Rate	4,308,581 tons of iron pellets/yr	CAAPP Permit 7.4.6.a.ii.
Hours of Operation	8760 hrs/yr	
Control Device	None	

Pollutant	PTE[1] (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source
Particulate Matter (PM)	5.17	0.0024	lb/ton	Current Permit Limit 7.4.6.d (p. 158)
Particulate Matter <10 microns (PM_{10})	5.17	0.0024	lb/ton	Current Permit Limit 7.4.6.d (p. 158)
Particulate Matter <2.5 microns ($PM_{2.5}$)	1.18	0.0006	lb/ton	PM2.5 represents 23% of TSP; obtained from AP-42, 5th ed., Section 12.5 (Iron and Steel Production), Table 12.5-2
Lead	0.00	0.0000	wt%	Total Metal Analysis for Blast Furnace Gas Dust Catcher 10/20/1992 (0.3 PPM) + 20% compliance margin

1. Emission calculations are representative of the total amount of iron pellets that can be charged per year (both furnaces combined).

R006107

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.4 - Blast Furnaces - PTE

Table E-4.2 Blast Furnaces Potential Emissions Summary

Process	Emissions from Iron and Slag Trough and Tapping to Casthouse Baghouse
Emission Unit ID	BF-S002
Annual Production Rate	3,165,000 tons of iron/yr
Hours of Operation	8760 hrs/yr
Control Device	Casthouse Baghouse

Pollutant	PTE (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Particulate Matter (PM)	111.25	0.0703	lb/ton	Current Permit Limit 7.4.6.b (p. 158)	
Particulate Matter <10 microns (PM_{10})	111.25	0.0703	lb/ton	Current Permit Limit 7.4.6.b (p. 158)	
Particulate Matter <2.5 microns ($PM_{2.5}$)	111.25	0.0703	lb/ton	Assume 100% of PM_{10}	
Nitrogen Oxides (NO_x)	22.79	0.0144	lb/ton	Current Permit Limit 7.4.6.b (p. 158)	
Carbon dioxide (CO)	265.86	0.17	lb/ton	ICR Stack Test March 15 &19, 2012 + 20% compliance margin	New Pollutant Data for this Source
Volatile Organic Matter (VOM)	149.70	0.0946	lb/ton	Current Permit Limit 7.4.6.b (p. 158)	
Sulfur Dioxide (SO_2)	317.45	0.2006	lb/ton	Current Permit Limit 7.4.6.b (p. 158)	
Lead (Pb)	0.02	1.38E-05	lb/ton	ICR Stack Test March 15 &19, 2012 + 20% compliance margin	New Pollutant Data for this Source

R006108

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.4 - Blast Furnaces - PTE

Table E-4.3 Blast Furnaces Potential Emissions Summary

Process	Emissions from Torpedo Car Loading, Iron Runners, Slag Runners, Fuming from Hot Metal
Emission Unit ID	BF-S003
Annual Production Rate	3,165,000 tons of iron/yr
Hours of Operation	8760 hrs/yr
Control Device	Ironspout Baghouse

Pollutant	PTE (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Particulate Matter (PM)	40.32	0.02548	lb/ton	Current Permit Limit 7.4.6.f (p. 159)	
Particulate Matter <10 microns (PM_{10})	40.32	0.02548	lb/ton	Current Permit Limit 7.4.6.f (p. 159)	
Particulate Matter <2.5 microns ($PM_{2.5}$)	40.32	0.03	lb/ton	Assume 100% of PM10	
Nitrogen Oxides (NO_x)	3.04	0.0019	lb/ton	ICR Stack Test March 13 & 14, 2012 + 20% compliance margin	New Pollutant Data for this Source
Carbon dioxide (CO)	26.64	0.0168	lb/ton	ICR Stack Test March 13 &14, 2012 + 20% compliance margin	New Pollutant Data for this Source
Volatile Organic Matter (VOM)	3.95	0.0025	lb/ton	ICR Stack Test March 13 &14, 2012 + 20% compliance margin	New Pollutant Data for this Source
Sulfur Dioxide (SO_2)	9.97	0.0063	lb/ton	Current Permit Limit 7.12.g (p. 44)	
Lead (Pb)	0.02	1.29E-05	lb/ton	ICR Stack Test March 13 &14, 2012 + 20% compliance margin	

R006109

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.4 - Blast Furnaces - PTE

Table E-4.4 Blast Furnaces Potential Emissions Summary

Process	Emissions from Blast Furnace Gas Flare #1	
Emission Unit ID	BF-S004	
Annual Blast Furnace Gas Usage	81,129 MMscf/yr	Estimated maximum based on 2013 YTD scaled to maximum production.
Annual Blast Furnace Gas Usage	7,301,610 MMBtu/yr	
Average Heating Value of BFG	90 Btu/scf	(2013 Actual Average)
Hours of Operation	8760 hrs/yr	
Control Device	BFG pretreatment dust catchers and wet scrubbers	

Pollutant	PTE (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Criteria Pollutants:					
Particulate Matter (PM)	117.64	2.90	lb/mmscf	Permit No: 95010001 Condition 5.6.2 a(iii)(B) (2)	
Particulate Matter <10 microns (PM_{10})	117.64	2.90	lb/mmscf	Permit No: 95010001 Condition 5.6.2 a(iii)(B) (2)	
Particulate Matter <2.5 microns ($PM_{2.5}$)	117.64	2.90	lb/mmscf	Assume 100% of PM10	
Nitrogen Oxides (NOx)	248.25	0.068	lb/MMBtu	AP-42 Table 13.5-1 (Sept-1991)	
Carbon dioxide (CO)	555.73	13.70	lb/mmscf	Permit No: 95010001 Condition 5.6.2 a(iii)(B) (2)	
Sulfur Dioxide (SO_2)	2727.03	67.23	lb/mmscf	SO2 = 2S gr H2S / 100 CF * (1 lb H2S/7,000 gr H2S) * (1 mol H2S/34 lb H2S) * (1 mol SO2/1 mol H2S) * (64 lb SO2/mol SO2)	Based on max H2S permit limit. Assumes all H2S is converted to SO2.

R006110

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.4 - Blast Furnaces - PTE

Table E-4.5 Blast Furnaces Potential Emissions Summary

Process	Emissions from Blast Furnace Gas Flare #2	
Emission Unit ID	BF-S005	
Annual Blast Furnace Gas Usage	2,490 mmscf/yr	Estimated maximum based on 2013 YTD scaled to maximum production.
Hours of Operation	8760 hrs/yr	
Control Device	BFG pretreatment dust catchers and wet srubbers	

Pollutant	PTE (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source
Criteria Pollutants:				
Particulate Matter (PM)	3.61	2.90	lb/mmscf	Permit No: 95010001 Condition 5.6.2 a(iii)(B) (2)
Particulate Matter <10 microns (PM_{10})	3.61	2.90	lb/mmscf	Permit No: 95010001 Condition 5.6.2 a(iii)(B) (2)
Particulate Matter <2.5 microns ($PM_{2.5}$)	3.61	2.90	lb/mmscf	Assume 100% of PM10
Nitrogen Oxides (NOx)	6.57	5.28	lb/mmscf	Permit No: 95010001 Condition 5.6.2 a(iii)(B) (2)
Carbon dioxide (CO)	17.06	13.70	lb/mmscf	Permit No: 95010001 Condition 5.6.2 a(iii)(B) (2)
Sulfur Dioxide (SO_2)	8.28	6.65	lb/mmscf	Permit No: 95010001 Condition 5.6.2 a(iii)(B) (2)

R006111

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.4 - Blast Furnaces - PTE

Table E-4.6 Blast Furnaces Potential Emissions Summary

Process	**Emissions from Blast Furnace Backdraft Stacks**
Emission Unit ID	**BF-S006 & BF-S007**
Control Device	Preparation of Furnace of Maintenance (Steaming)

Pollutant	PTE (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source
Criteria Pollutants:				
Particulate Matter (PM)	Negligible Emissions from Steaming of Equipment			
Particulate Matter <10 microns (PM_{10})	Negligible Emissions from Steaming of Equipment			
Particulate Matter <2.5 microns ($PM_{2.5}$)	Negligible Emissions from Steaming of Equipment			
Nitrogen Oxides (NOx)	Negligible Emissions from Steaming of Equipment			
Carbon dioxide (CO)	Negligible Emissions from Steaming of Equipment			
Sulfur Dioxide (SO_2)	Negligible Emissions from Steaming of Equipment			

R006112

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.4 - Blast Furnaces - PTE

Table E-4.7 Blast Furnaces Potential Emissions Summary

Emission Unit: Blast Furnace Stoves
Emission Point ID: BF-S008 & BF-S009

Hours of Operation: 8,760 hr/yr
Control Device: None

Fuel Type: Natural Gas
Fuel Heating Value: 1,020 Btu/scf
Permit Limit (Natural Gas Usage): 1,222,980 MMBtu/yr
Maximum Fuel Usage (Natural Gas): 1,199 MMscf/yr (Scaled to PTE max based on 2013 actual data)

Pollutant	Potential Emissions (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Criteria Pollutants:					
Particulate Matter (PM)	4.56	7.6	lb/MMscf	AP-42 Table 1.4-2 (Jul-1998)	Note that the current permit cites older factors that should be revised.
Particulate Matter <10 microns (PM_{10})	4.56	7.6	lb/MMscf	AP-42 Table 1.4-2 (Jul-1998)	Note that the current permit cites older factors that should be revised.
Particulate Matter < 2.5 microns ($PM_{2.5}$)	4.56	7.6	lb/MMscf	Assumed 100% of PM_{10}	
Nitrogen Oxides (NO_x)	0.36	0.60	lb/MMscf	AP-42 Table 1.4-1 (Jul-1998)	This factor is currently cited in the permit (AP-42 has not changed).
Volatile Organic Material (VOM)	59.95	100	lb/MMscf	AP-42 Table 1.4-2 (Jul-1998)	Note that the current permit cites older factors that should be revised.
Sulfur Dioxide (SO_2)	3.30	5.5	lb/MMscf	AP-42 Table 1.4-2 (Jul-1998)	Note that the current permit cites older factors that should be revised.
Carbon Monoxide (CO)	50.36	84	lb/MMscf	AP-42 Table 1.4-2 (Jul-1998)	Note that the current permit cites older factors that should be revised.
Lead (Pb)	3.00E-04	0.0005	lb/MMscf	AP-42 Table 1.4-2 (Jul-1998)	Note that the current permit cites older factors that should be revised.
Hazardous Air Pollutants:					
Organics					
Benzene	1.26E-03	2.10E-03	lb/MMscf	AP-42 Table 1.4-3 (07/98)	
Greenhouse Gas Pollutants:					
Carbon Dioxide (CO_2)	1,129	116.89	lb/MMBtu	40 CFR 98, Subpart C, Table C-1 for Natural Gas	
Methane (CH_4)	0	2.20E-03	lb/MMBtu	40 CFR 98, Subpart C, Table C-2 for Natural Gas	
Nitrous Oxides (N_2O)	2.13E-03	2.20E-04	lb/MMBtu	40 CFR 98, Subpart C, Table C-2 for Natural Gas	
Carbon Dioxide Equivalent (CO_2e)*	1,130	-	-	40 CFR 98, Subpart A, Table A-1	

*GHGs are calculated in CO_2e using Global Warming Potentials (GWP) from 40 CFR 98, Subpart A, Table A-1 (74 FR 56374, Oct. 30, 2009) and the following equation:
CO_2e (tpy) = CO_2 (tpy) * CO_2 GWP (1) + CH_4 (tpy) * CH_4 GWP (21) + N_2O (tpy) * N_2O GWP (310)

R006113

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.4 - Blast Furnaces - PTE

Table E-4.7 Blast Furnaces Potential Emissions Summary

Emission Unit	Blast Furnace Stoves	
Emission Point ID	BF-5008 & BF-5009	
Hours of Operation	8,760	hrs/yr
Control Device	None	
Fuel Type	Coke Oven Gas	
Fuel Heating Value	555	Btu/scf
Maximum Fuel Usage (COG)	1,287,600	MMBtu/yr
Maximum Fuel Usage (COG)	2,320	MMscf/yr (Scaled to PTE max based on 2013 actual data)

Pollutant	Potential Emissions (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Criteria Pollutants:					
Particulate Matter (PM)	7.19	6.2	lb/MMscf	FIRE v6.25 (1-02-007-07) - External Combustion Boiler COG	
Particulate Matter <10 microns (PM_{10})	5.05	4.35	lb/MMscf	FIRE v6.25 (1-02-007-07) - External Combustion Boiler COG	
Particulate Matter < 2.5 microns ($PM_{2.5}$)	3.73	3.219	lb/MMscf	FIRE v6.25 (1-02-007-07) - External Combustion Boiler COG	
Nitrogen Oxides (NO_x)	92.80	80.0	lb/MMscf	FIRE v6.25 (1-02-007-07) - External Combustion Boiler COG	
Volatile Organic Material (VOM)	1.39	1.2	lb/MMscf	FIRE v6.25 (1-02-007-07) - External Combustion Boiler COG	
Sulfur Dioxide (SO_2)	77.98	67.23	lb/MMscf	(25 gr H2S / 100 CF COG) * (1 lb H2S/7,000 gr H2S) * (1 mol H2S/34 lb H2S) * (1 mol SO2/1 mol H2S) * (64 lb SO2/mol SO2) * (1 ton SO2/2,000 lb SO2)	Calculation from Permit Condition 5.12(f) - p. 43 at max H2S of 25
Carbon Monoxide (CO)	21.34	18.40	lb/MMscf	FIRE v6.25 (1-02-007-07) - External Combustion Boiler COG	
Hazardous Air Pollutants:					
Organics					
Benzene	0.02	0.0177	lb/MMscf	COG Analysis (3/11/2011) + 20% compliance margin	
Greenhouse Gas Pollutants:					
Carbon Dioxide (CO_2)	52,582	22.66	tons/MMscf	USS GHG Report for 2012	
Methane (CH_4)	1	3.17E-04	tons/MMscf	USS GHG Report for 2012	
Nitrous Oxides (N_2O)	0	6.60E-05	tons/MMscf	USS GHG Report for 2012	
Carbon Dioxide Equivalent (CO_2e)*	52,645	-	-	40 CFR 98, Subpart A, Table A-1	

*GHGs are calculated in CO_2e using Global Warming Potentials (GWP) from 40 CFR 98, Subpart A, Table A-1 (74 FR 56374, Oct. 30, 2009) and the following equation:
CO_2e (tpy) = CO_2 (tpy) * CO_2 GWP (1) + CH_4 (tpy) * CH_4 GWP (21) + N_2O (tpy) * N_2O GWP (310)

R006114

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.4 - Blast Furnaces - PTE

Table E-4.7 Blast Furnaces Potential Emissions Summary

Emission Unit	Blast Furnace Stoves	
Emission Point ID	BF-S003 & BF-S009	
Hours of Operation	8,760	hrs/yr
Control Device	None	
Fuel Type	Blast Furnace Gas	
Fuel Heating Value	90	Btu/scf
Permit Limit (BFG Usage)	7,075,530	MMBtu/yr
Maximum Fuel Usage (BFG)	78,617	MMscf/yr (Scaled to PTE max based on 2013 actual data)

Pollutant	Potential Emissions (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Criteria Pollutants:					
Particulate Matter (PM)	3.36	2.90	lb/MMscf	Current Permit Limit (p. 28)	
Particulate Matter <10 microns (PM_{10})	3.36	2.90	lb/MMscf	Current Permit Limit (p. 28)	
Particulate Matter < 2.5 microns ($PM_{2.5}$)	3.36	2.90	lb/MMscf	Assumed 100% of PM10	
Nitrogen Oxides (NO_x)	6.12	5.28	lb/MMscf	Current Permit Limit (p. 28)	
Sulfur Dioxide (SO_2)	7.71	6.65	lb/MMscf	Current Permit Limit (p. 28)	
Carbon Monoxide (CO)	15.89	13.70	lb/MMscf	Current Permit Limit (p. 28)	
Greenhouse Gas Pollutants:					
Carbon Dioxide (CO_2)	1,976,019	25.13	tons/MMscf	USS GHG Report for 2012	
Methane (CH_4)	0	2.23E-06	tons/MMscf	USS GHG Report for 2012	
Nitrous Oxides (N_2O)	1	1.01E-05	tons/MMscf	USS GHG Report for 2012	
Carbon Dioxide Equivalent (CO_2e)*	1,976,270	-	-	40 CFR 98, Subpart A, Table A-1	

*GHGs are calculated in CO_2e using Global Warming Potentials (GWP) from 40 CFR 98, Subpart A, Table A-1 (74 FR 56374, Oct. 30, 2009) and the following equation:
CO_2e (tpy) = CO_2 (tpy) * CO_2 GWP (1) + CH_4 (tpy) * CH_4 GWP (21) + N_2O (tpy) * N_2O GWP (310)

R006115

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.4 - Blast Furnaces - PTE

Table E-4.8 Blast Furnaces Potential Emissions Summary

Process	Emissions from Iron Slag trough and Torpedo Car Loading
Emission Unit ID	BF-F001
Annual Production Rate	3,165,000 tons of iron/yr
Hours of Operation	8760 hrs/yr
Control Device	Uncaptured Fugitives (Casthouse Roof Monitors)

Pollutant	PTE (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source
Criteria Pollutants:				
Particulate Matter (PM)	49.06	0.031	lb/ton	Current Permit Limit 7.4.6.c (p. 158)
Particulate Matter <10 microns (PM_{10})	24.53	0.0155	lb/ton	Current Permit Limit 7.4.6.c (p. 158)
Particulate Matter <2.5 microns ($PM_{2.5}$)	24.53	0.016	lb/ton	Assume = 100% of PM10
Nitrogen Oxides (NOx)	1.11	0.0007	lb/ton	Current Permit Limit 7.4.6.c (p. 158)
Volatile Organic Matter (VOM)	7.44	0.0047	lb/ton	Current Permit Limit 7.4.6.c (p. 158)
Sulfur Dioxide (SO_2)	16.46	0.0104	lb/ton	Current Permit Limit 7.4.6.c (p. 158)
Lead (Pb)	0.00	2.42E-06	lb/ton	Total Metal Analysis for Blast Furnace Iron Spout Baghouse 10/20/1992 + 20% compliance margin

R006116

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.4 - Blast Furnaces - PTE

Table E-4.9 Blast Furnaces Potential Emissions Summary

Process	Emissions from Slag Pits
Emission Unit ID	BF-F002
Annual Production Rate	3,165,000 tons of iron/yr
Hours of Operation	8760 hrs/yr
Control Device	Water Spraying

Pollutant	PTE (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source
Criteria Pollutants:				
Particulate Matter (PM)	6.60	0.00417	lb/ton	Current Permit Limit 7.4.6.e (p. 158)
Particulate Matter <10 microns (PM_{10})	6.60	0.00417	lb/ton	Current Permit Limit 7.4.6.e (p. 158)
Particulate Matter <2.5 microns ($PM_{2.5}$)	6.60	0.00417	lb/ton	Assume = 100% of PM10
Sulfur Dioxide (SO_2)	15.83	0.01000	lb/ton	Current Permit Limit 7.4.6.e (p. 158)

R006117

APPENDIX E

Section 7.5 PTE Calcs
Basic Oxygen Processes

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.5 - Basic Oxygen Processes - PTE

Table C-5.0 BOP Potential Emissions Summary

Emission Unit ID	Source Type	Emission Point	Process Emission Unit(s)	CO		Lead		NO_x		PM		PM_{10}		$PM_{2.5}$		SO_2		VOM	
				lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
BOP-5001	Stack	Reladie/Denuit (Soda Ash) Baghouse	Hot Metal Transfer, Desulfurization	--	--	0.02	0.09	--	--	13.44	58.88	13.44	58.88	13.44	58.88	--	--	0.36	1.58
BOP-5002	Stack	Skimmer Baghouse	Slag Skimming	--	--	--	--	--	--	1.81	7.91	1.81	7.91	1.81	7.91	--	--	--	--
BOP-5004	Stack	Secondary Baghouse	BOF Charging & Tapping	--	--	0.00	0.00	--	--	0.33	1.33	0.45	1.97	0.33	1.45	--	--	--	--
BOP-5005	Stack	ESP	BOF (All Operations)	3,875.22	16,997.47	0.25	1.36	15.80	69.68	85.39	380.40	65.38	286.40	65.38	286.40	--	--	2.40	10.74
BOP-5006	Stack	Ladle Preheater	Ladle Preheat/Drying	0.67	2.92	0.00	0.00	0.84	3.67	0.06	0.28	0.06	0.27	0.06	0.27	0.06	0.25	0.04	0.17
BOP-5007	Stack	Baghouse 1	Deslagging Station, Slag Dispensing Station, Alloy Material Handling, Tripper Conveyor	--	--	0.00	0.01	--	--	1.45	6.35	1.45	6.35	1.45	6.35	--	--	--	--
BOP-5008	Stack	Fume Baghouse 2	Ladle Metallurgy Station, Argon Stirring Station	--	--	0.00	0.01	--	--	2.92	12.80	2.92	12.80	2.92	12.80	--	--	--	--
BOP-F001	Fugitive	Hot Metal Transfer	Kish	--	--	0.00	0.00	--	--	2.25	9.86	2.25	9.86	2.25	9.86	--	--	--	--
BOP-F002	Fugitive	Slag Skimming	Kish	--	--	0.00	0.00	--	--	2.04	8.94	2.04	8.94	2.04	8.94	--	--	--	--
BOP-F003	Fugitive	BOP Shop Roof Monitors	BOF Charging & Tapping	--	--	0.02	0.08	--	--	40.34	176.67	27.05	118.39	27.05	118.39	--	--	--	--
BOP	All Sources			3,875.88	16,999.39	0.33	1.45	16.73	73.35	131.01	573.80	118.85	511.78	116.40	510.71	0.06	0.25	2.80	12.51

R006119

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.5 - Basic Oxygen Processes - PTE

Table E-5.1 BOP Potential Emissions Summary

Process	Hot Metal Transfer & Desulfurization
Emission Unit ID	S001
Hourly Production Rate	361 tons of iron/hr
Annual Production Rate	3,165,000 tons of iron/yr
Hours of Operation	8760 hrs/yr
Control Device	Reladle/Desulf Baghouse

Pollutant	PTE (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
PM	58.88	0.03721	lb/ton	CAAPP Permit 7.5.6.e. Limit	
PM_{10}	58.88	0.03721	lb/ton	CAAPP Permit 7.5.6.e. Limit	
$PM_{2.5}$	58.88	0.03721	lb/ton	Assumed 100% of PM10.	
VOM	1.58	0.001	lb/ton	CAAPP Permit 7.5.6.e. Limit	
Lead (Pb)	0.09	0.0133	lb/hr	CAAPP Permit 7.5.6.e. Limit	

R006120

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.5 - Basic Oxygen Processes - PTE

Table E-5.3 BOP Potential Emissions Summary

Process	Slag Skimming	
Emission Unit ID	S003	
Hourly Production Rate	361	tons of iron/hr
Annual Production Rate	3,165,000	tons of iron/yr
Hours of Operation	8760	hrs/yr
Control Device	Skimmer Baghouse	

Pollutant	PTE (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
PM	7.91	0.0050	lb/ton	CAAPP Permit Limit 7.5.6.f.	
PM_{10}	7.91	0.0050	lb/ton	CAAPP Permit Limit 7.5.6.f.	
$PM_{2.5}$	7.91	0.0050	lb/ton	Assumed 100% of PM10	

R006121

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.5 - Basic Oxygen Processes - PTE

Table E-5.4 BOP Potential Emissions Summary

Process	BOF Charging & Tapping	
Emission Unit ID	S004	
Hourly Production Rate	410	tons of steel/hr
Annual Production Rate	3,580,000	tons of steel/yr
Hours of Operation	8760	hrs/yr
Control Device	Secondary Baghouse	

Pollutant	PTE (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
PM	5.73	0.003	lb/ton	AP 4.2 Table 12.5-2	Includes Charging and Tapping EF
PM_{10}	1.97	0.001	lb/ton	AP 4.2 Table 12.5-2	Includes Charging and Tapping EF
$PM_{2.5}$	0.90	0.001	lb/ton	AP 4.2 Table 12.5-2	Includes Charging and Tapping EF
Lead (Pb)	0.00	1.15E-07	lb/ton	Total Metal Analysis for Blast Furnace Gas Dust Catcher (10/20/1992) + 20% compliance margin	

R006122

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.5 - Basic Oxygen Processes - PTE

Table E-5.5 BOP Potential Emissions Summary

Process	**BOF Operations**
Emission Unit ID	S005
Hourly Production Rate	410 tons of steel/hr
Annual Production Rate	3,580,000 tons of steel/yr
Hours of Operation	8760 hrs/yr
Control Device	Electrostatic Precipator (ESP)

Pollutant	PTE (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
PM	286.40	0.16	lb/ton	CAAPP Permit Limit 7.5.6.c.	
PM_{10}	286.40	0.16	lb/ton	CAAPP Permit Limit 7.5.6.c.	
$PM_{2.5}$	286.40	0.16	lb/ton	Assume 100% of PM10	
NO_x	69.63	0.0389	lb/ton	CAAPP Permit Limit 7.5.6.c.	USS has conducted testing indicating higher short-term emissions are possible. USS is currently working with IEPA to resolve.
VOM	10.74	0.0060	lb/ton	CAAPP Permit Limit 7.5.6.c.	USS has conducted testing indicating higher short-term emissions are possible. USS is currently working with IEPA to resolve.
CO	16,097.47	8.993	lb/ton	CAAPP Permit Limit 7.5.6.c.	
Lead (Pb)	1.26	0.1934	lb/hr	CAAPP Permit Limit 7.5.6.c.	

R006123

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.5 - Basic Oxygen Processes - PTE

Table E-5.6 BOP Potential Emissions Summary

Process	Ladle Preheating & Drying		
Emission Unit ID	S006		
Number of Ladle heaters	2		
Heat Content - Natural Gas	1020	Btu/scf	
Annual Gas Usage	68	MMscf/yr	
Heat Content - Coke Oven Gas	555	Btu/scf	
Coke Oven Gas Usage	6.8	MMscf/yr	(Currently not firing COG - PTE assumes ~ 10% of fuel consumption)
Hours of Operation	8760	hrs/yr	
Control Device	None		

Natural Gas Combustion

Pollutant	PTE (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Criteria Pollutants:					
PM	0.26	7.6	lb/MMscf	AP-42 Table 1.4-2 (Jul-1998)	Note that the current permit cites older factors that should be revised.
PM_{10}	0.26	7.6	lb/MMscf	AP-42 Table 1.4-2 (Jul-1998)	Note that the current permit cites older factors that should be revised.
$PM_{2.5}$	0.26	7.6	lb/MMscf	Assumed 100% of PM_{10}	
SO_2	0.02	0.60	lb/MMscf	AP-42 Table 1.4-1 (Jul-1998)	This factor is currently cited in the permit (AP-42 has not changed).
NO_x	3.40	100	lb/MMscf	AP-42 Table 1.4-2 (Jul-1998)	Note that the current permit cites older factors that should be revised.
VOM	0.19	5.5	lb/MMscf	AP-42 Table 1.4-2 (Jul-1998)	Note that the current permit cites older factors that should be revised.
CO	2.86	84	lb/MMscf	AP-42 Table 1.4-2 (Jul-1998)	Note that the current permit cites older factors that should be revised.
Lead (Pb)	0.00	0.0005	lb/MMscf	AP-42 Table 1.4-2 (Jul-1998)	Note that the current permit cites older factors that should be revised.
Hazardous Air Pollutants:					
Ammonia	0.11	3	lb/MMscf	AP-42 Table 1.4-2 (Jul-1998)	
Benzene	0.00	0.002	lb/MMscf	AP-42 Table 1.4-2 (Jul-1998)	
Greenhouse Gas Pollutants:					
Carbon Dioxide (CO_2)	4,054	116.89	lb/MMBtu	40 CFR 98, Subpart C, Table C-1 (Natural gas)	
Methane (CH_4)	0.08	2.20E-03	lb/MMBtu	40 CFR 98, Subpart C, Table C-2 (Natural gas)	
Nitrous Oxides (N_2O)	0.01	2.20E-04	lb/MMBtu	40 CFR 98, Subpart C, Table C-2 (Natural gas)	
Carbon Dioxide Equivalent (CO_2e)[2]	4,058	-	-	40 CFR 98, Subpart A, Table A-1	

R006124

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.5 - Basic Oxygen Processes - PTE

Table E-5.6 BOP Potential Emissions Summary
Coke Oven Gas Combustion

Pollutant	PTE (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
PM	0.02	6.2	lb/MMscf	FIRE v6.25 (1-02-007-07) - External Combustion Boiler COG	
PM_{10}	0.01	4.35	lb/MMscf	FIRE v6.25 (1-02-007-07) - External Combustion Boiler COG	
$PM_{2.5}$	0.01	3.219	lb/MMscf	FIRE v6.25 (1-02-007-07) - External Combustion Boiler COG	
SO_2	0.23	67.23	lb/MMscf	(25 gr H2S / 100 CF COG) * (1 lb H2S/7,000 gr H2S) * (1 mol H2S/34 lb H2S) * (1 mol SO2/1 mol H2S) * (64 lb SO2/mol SO2) * (1 ton SO2/2,000 lb SO2)	Permit limit of 25 g/dscf of H2S. Assumes all is converted to SO2.
NO_x	0.27	80	lb/MMscf	FIRE v6.25 (1-02-007-07) - External Combustion Boiler COG	
VOM	0.00	1.2	lb/MMscf	FIRE v6.25 (1-02-007-07) - External Combustion Boiler COG	
CO	0.06	18.4	lb/MMscf	FIRE v6.25 (1-02-007-07) - External Combustion Boiler COG	
Hazardous Air Pollutants:					
Benzene	0.00	0.02	lb/MMscf	USS COG Analysis (3/11/2011) + 20% compliance margin	
Greenhouse Gas Pollutants:					
Carbon Dioxide (CO_2)	154.12	22.66	tons/MMscf	USS GHG Emissions Report Factor (2012)	
Methane (CH_4)	0.00	3.17E-04	tons/MMscf	USS GHG Emissions Report Factor (2012)	
Nitrous Oxides (N_2O)	0.00	6.60E-05	tons/MMscf	USS GHG Emissions Report Factor (2012)	
Carbon Dioxide Equivalent (CO_2e)[2]	154	-	-	40 CFR 98, Subpart A, Table A-1	

R006125

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.5 - Basic Oxygen Processes - PTE

Table E-5.7 BOP Potential Emissions Summary

Process	Deslagging Station, Slag Dispensing Station, Alloy Material Handling, Tripper Conveyor	
Emission Unit ID	S007	
Hourly Production Rate	410	tons of steel/hr
Annual Production Rate	3,580,000	tons of steel/yr
Hours of Operation	8760	hrs/yr
Control Device	Baghouse 1	

Pollutant	PTE (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
PM	6.35	0.00355	lb/ton	CAAPP Permit Limit 7.6.6.a.	
PM_{10}	6.35	0.00355	lb/ton	CAAPP Permit Limit 7.6.6.a.	
$PM_{2.5}$	6.35	0.00355	lb/ton	Assumed 100% of PM_{10}	
Lead (Pb)	0.01	5.96E-06	lb/ton	Total metal Analysis for LMF Fume Baghouse (6/28/2011) + 20% compliance margin	

R006126

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.5 - Basic Oxygen Processes - PTE

Table E-5.8 BOP Potential Emissions Summary

Process	Ladle Metallurgy Station & Argon Stirring Station	
Emission Unit ID	S008	
Hourly Production Rate	410	tons of steel/hr
Annual Production Rate	3,580,000	tons of steel/yr
Hours of Operation	8760	hrs/yr
Control Device	Fume Baghouse 2	

Pollutant	PTE (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
PM	12.80	0.00715	lb/ton	CAAPP Permit Limit 7.5.6.g.	
PM_{10}	12.80	0.00715	lb/ton	CAAPP Permit Limit 7.5.6.g.	
$PM_{2.5}$	12.80	0.01	lb/ton	Assumed 100% of PM_{10}	
Lead (Pb)	0.01	5.49E-06	lb/ton	#2 LMF Baghouse Stack Test (5/16-17/2012) + 20% compliance margin	

R006127

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.5 - Basic Oxygen Processes - PTE

Table E-5.9 BOP Potential Emissions Summary

Process	Fugitives from Hot Metal Transfer/Kish	
Emission Unit ID	F001	
Hourly Production Rate	410	tons of steel/hr
Annual Production Rate	3,580,000	tons of steel/yr
Hours of Operation	8760	hrs/yr
Control Device	None	

Pollutant	PTE (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
PM	9.86	0.0055	lb/ton	AP-42 Table 12.5-1 with 97.1% capture/control applied	
PM_{10}	9.86	0.0055	lb/ton	AP-42 Table 12.5-1 with 97.1% capture/control applied	
$PM_{2.5}$	9.86	0.0055	lb/ton	Assumed 100% of PM_{10}	
Lead (Pb)	0.00	1.26E-07	lb/ton	BOF Hot Desulf Baghouse Dust Analysis (6/23/11) + 20% compliance margin	

R006128

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.5 - Basic Oxygen Processes - PTE

Table E-5.10 BOP Potential Emissions Summary

Process	Fugitives from Slag Skimming/Kish
Emission Unit ID	F002
Hourly Production Rate	410 tons of steel/hr
Annual Production Rate	3,580,000 tons of steel/yr
Hours of Operation	8760 hrs/yr
Control Device	None

Pollutant	PTE (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
PM	8.94	0.0050	lb/ton	CAAPP Permit Limit 7.5.6.f.	
PM_{10}	8.94	0.0050	lb/ton	CAAPP Permit Limit 7.5.6.f.	
$PM_{2.5}$	8.94	0.00500	lb/ton	Assumed 100% of PM_{10}	
Lead (Pb)	0.00	1.32E-07	lb/ton	Total Metal Analysis for BOP Slag Skimmer Baghouse Dust (6/28/2011) + 20% compliance margin	

R006129

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.5 - Basic Oxygen Processes - PTE

Table E-5.11 BOP Potential Emissions Summary

Process	Fugitives from BOF Charging & Tapping
Emission Unit ID	F003
Hourly Production Rate	410 tons of steel/hr
Annual Production Rate	3,580,000 tons of steel/yr
Hours of Operation	8760 hrs/yr
Control Device	Uncontrolled (Roof Monitors)

Pollutant	PTE (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
PM	176.67	0.0987	lb/ton	CAAPP Permit Limit 7.5.6.d.	
PM_{10}	118.39	0.06614	lb/ton	CAAPP Permit Limit 7.5.6.d.	
$PM_{2.5}$	118.39	0.06614	lb/ton	Assumed 100% of PM10	
Lead (Pb)	0.08	0.0129	lb/hr	CAAPP Permit Limit 7.5.6.d.	

R006130

APPENDIX E

Section 7.6 PTE Calcs
Continuous Casting

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.6 : Continuous Casting - PTE

Table E-6.0 Continuous Casting Potential Emissions Summary

Emission Unit ID	Source Type	Emission Point	Process Emission Unit(s)	CO		Lead		NO_x		PM		PM_{10}		$PM_{2.5}$		SO_2		VOM	
				lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
BOP-5007	Stack	Baghouse 1[1]	Steel Destagging Station	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Caster-F001	Fugitive	Caster Molds 1 & 2	Fuming Metal	--	--	0.00	0.01	20.43	89.50	2.45	10.74	2.45	10.74	2.45	10.74	--	--	--	--
Caster-F002	Fugitive	Casters 1 & 2 Spray Chambers	Spray Particulate		--	0.01	0.03	--	--	3.48	15.25	3.48	15.25	3.48	15.25	--	--	--	--
Caster-F003	Fugitive	Caster Slab Cut-Off	Cutting Particulate	--	--	0.00	0.02	--	--	2.90	12.71	2.90	12.71	2.90	12.71	--	--	--	--
Caster-F004	Fugitive	Caster Slab Ripping	Cutting Particulate	--	--	0.00	0.02	--	--	2.95	12.92	2.95	12.92	2.95	12.92	--	--	--	--
Caster-F005	Fugitive	Caster Scarfing	Torching Particulate	--	--	0.07	0.30	--	--	40.87	179.00	40.87	179.00	40.87	179.00	--	--	--	--
Continuous Casting	All Sources			0.00	0.00	0.02	0.09	20.43	89.50	11.79	51.62	11.79	51.62	11.79	51.62	0.00	0.00	0.00	0.00

1. Emissions from Baghouse 1 are included in the Section 7.5 (Basic Oxygen Process) emission calculations
2. Emissions from Caster cooling towers are in included in Section 5.0 (Overall Source) emission calculations

R006132

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.6 – Continuous Casting – FTE

Table 8-6.1 Continuous Casting Potential Emissions Summary

Process: Continuous Casting
Emission Unit ID: BOP-S007, Caster-F001, Caster-F002, Caster-F003, Caster-F004
Hours of Operation: 8760 hrs/yr
Production Rate: 3,580,000 tons/yr

Pollutant	Emission Point ID	Potential Emissions Per Unit (tpy)	Maximum Throughput Per Unit (tpy)	Emission Factor (lb/ton)	Emission Factor Source	Notes
PM						
Steel Deslagging Station	BOP-S007	-	-	-	-	Included in emission point BOP-S007 emission calculations.
Caster Molds 1 and 2	Caster-F001	10.74	3,580,000	0.006	CAAPP No. 96030056 Section 7.6.6.b	
Casters #1 and #2: Spray Chambers	Caster-F002	15.25	3,580,000	0.00852	CAAPP No. 96030056 Section 7.6.6.c	
Slab Cut-off	Caster-F003	12.71	3,580,000	0.0071	CAAPP No. 96030056 Section 7.6.6.d	
Slab Ripping	Caster-F004	12.92	3,580,000	0.00722	CAAPP No. 96030056 Section 7.6.6.e	
Slab Scarfing	Caster-F005	179.00	3,580,000	0.1	AP-42 Section 12.5 Table 12.5-1 Machine Scarfing Uncontrolled	
PM_{10}						
Steel Deslagging Station	BOP-S007	-	-	-	-	Included in emission point BOP-S007 emission calculations.
Caster Molds 1 and 2	Caster-F001	10.74	3,580,000	0.006	CAAPP No. 96030056 Section 7.6.6.b	
Casters #1 and #2: Spray Chambers	Caster-F002	15.25	3,580,000	0.00852	CAAPP No. 96030056 Section 7.6.6.c	
Slab Cut-off	Caster-F003	12.71	3,580,000	0.0071	CAAPP No. 96030056 Section 7.6.6.d	
Slab Ripping	Caster-F004	12.92	3,580,000	0.00722	CAAPP No. 96030056 Section 7.6.6.e	
Slab Scarfing	Caster-F005	179.00	3,580,000	0.1	AP-42 Section 12.5 Table 12.5-1 Machine Scarfing Uncontrolled	
$PM_{2.5}$						
Steel Deslagging Station	BOP-S007	-	-	-	-	Included in emission point BOP-S007 emission calculations.
Caster Molds 1 and 2	Caster-F001	10.74	3,580,000	0.006	Assumed equal to PM_{10}.	
Casters #1 and #2: Spray Chambers	Caster-F002	15.25	3,580,000	0.00852	Assumed equal to PM_{10}.	
Slab Cut-off	Caster-F003	12.71	3,580,000	0.0071	Assumed equal to PM_{10}.	
Slab Ripping	Caster-F004	12.92	3,580,000	0.00722	Assumed equal to PM_{10}.	
Slab Scarfing	Caster-F005	179.00	3,580,000	0.1	Assumed equal to PM10.	
NO_x						
Caster Molds 1 and 2	Caster-F001	89.50	3,580,000	0.050	CAAPP No. 96030056 Section 7.6.6.b	

R006133

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.6 : Continuous Casting - PTE

Table E-6.1 Continuous Casting Potential Emissions Summary

Process	Continuous Casting
Emission Unit ID	BOP-S007, Caster-F001, Caster-F002, Caster-F003, Caster-F004
Hours of Operation	8760 hrs/yr
Production Rate	3,580,000 tons/yr

Pollutant	Emission Point ID	Potential Emissions Per Unit (tpy)	Maximum Throughput Per Unit (tpy)	Emission Factor (lb/ton)	Emission Factor Source	Notes
Lead (Pb)						
Steel Deslagging Station	BOP-S007	-	-	-	-	Included in emission point BOP-S007 emission calculations.
Caster Molds 1 and 2	Caster-F001	0.02	3,580,000	1.01E-05	Total Metal Analysis for LMF Fume Baghouse (6/28/11) + 20% compliance margin	
Casters #1 and #2: Spray Chambers	Caster-F002	0.03	3,580,000	1.43E-05	Total Metal Analysis for LMF Fume Baghouse (6/28/11) + 20% compliance margin	
Slab Cut-off	Caster-F003	0.02	3,580,000	8.19E-05	Total Metal Analysis for LMF Fume Baghouse (6/28/11) + 20% compliance margin	
Slab Ripping	Caster-F004	0.02	3,580,000	1.21E-05	Total Metal Analysis for LMF Fume Baghouse (6/28/11) + 20% compliance margin	
Slab Scarfing	Caster-F005	0.30	3,580,000	1.68E-04	Total Metal Analysis for LMF Fume Baghouse (6/28/11) + 20% compliance margin	

R006134

APPENDIX E

Section 7.7 PTE Calcs
Hot Strip Mill

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.7 - Hot Strip Mill - PTE

Table E-7.0 Hot Strip Mill Potential Emissions Summary

Emission Unit ID	Source Type	Emission Point	Process Emission Unit(s)	CO		Lead		NO_x		PM		PM_{10}		$PM_{2.5}$		SO_2		VOM	
				lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
HSM-S001	Stack	Furnace Stack	Slab Reheat Furnace #1	1.48	6.47	0.00	0.00	27.06	118.50	1.87	8.17	1.87	8.17	1.87	8.17	7.45	32.63	0.78	3.40
HSM-S002	Stack	Furnace Stack	Slab Reheat Furnace #2	0.12	0.53	0.00	0.00	27.06	118.50	1.87	8.17	1.87	8.17	1.87	8.17	7.45	32.63	0.78	3.40
HSM-S003	Stack	Furnace Stack	Slab Reheat Furnace #3	0.30	1.30	0.00	0.00	47.62	208.57	1.87	8.17	1.87	8.17	1.87	8.17	7.45	32.63	0.78	3.40
HSM-S004	Stack	Furnace Stack	Slab Reheat Furnace #4	4.34	19.03	0.00	0.00	78.47	343.70	2.87	12.56	2.87	12.56	2.87	12.56	11.45	50.16	1.19	5.22
HSM-F001	Fugitive	Hot Rolling Mill	Hot Roll Oil Vaporization	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.42	1.83
Hot Strip Mill	All Sources			6.23	27.30	0.00	0.00	180.20	789.28	8.47	37.08	8.47	37.08	8.47	37.08	33.80	148.05	3.94	17.25

R006136

Company Name:	U. S. Steel	
Facility Name:	Granite City Works	
Project Description:	CAAPP Renewal Application	
Permit Section:	Section 7.7 - Hot Strip Mill - RTE	
Table B-2.1:	Hot Strip Mill Potential Emissions Summary	
Emission Unit:	Slab Reheat Furnace #1	
Emission Point ID:	HSM-S001	
Hours of Operation:	8,760	hrs/yr
Control Device:	Low NO_x Burners	
Rated Heat Input Capacity:	322	MMBtu/hr
Fuel Type:	Natural Gas	
Fuel Heating Value:	1,020	Btu/scf
Permit Limit (Natural Gas Usage):	1,046,392	MMBtu/yr
Maximum Fuel Usage (Natural Gas):	1,026	MMscf/yr

Total Gas Usage Limit for All Reheat Furnaces (#1 - #4), minus CCM; total limit, allocated based on rated capacity

Pollutant	Potential Emissions (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Criteria Pollutants:					
Particulate Matter (PM)	6.87	13.40	lb/MMscf	8/11/201 Stack Test on Furnace #4 + 20% compliance margin	
Particulate Matter <10 microns (PM_{10})	6.87	13.40	lb/MMscf	PM10 = PM	
Particulate Matter < 2.5 microns ($PM_{2.5}$)	6.87	13.40	lb/MMscf	PM2.5 = PM	
Nitrogen Oxides (NO_x)	78.48	0.15	lb/MMBtu	Permit Limit	
Volatile Organic Material (VOM)	2.82	5.50	lb/MMscf	AP-42 Table 1.4-2 (07/98)	
Sulfur Dioxide (SO_2)	0.31	0.60	lb/MMscf	AP-42 Table 1.4-2 (07/98)	
Carbon Monoxide (CO)	6.15	11.99	lb/MMscf	1/8/2010 Stack Test on Furnace #1 + 20% compliance margin	
Lead (Pb)	2.56E-04	5.00E-04	lb/MMscf	AP-42 Table 1.4-2 (07/98)	
Hazardous Air Pollutants:					
Organics					
Benzene	1.08E-03	2.10E-03	lb/MMscf	AP-42 Table 1.4-3 (07/98)	
Greenhouse Gas Pollutants:					
Carbon Dioxide (CO_2)	164,854	116.89	lb/MMBtu	40 CFR 98, Subpart C, Table C-1 for Natural Gas	
Methane (CH_4)	3	2.20E-03	lb/MMBtu	40 CFR 98, Subpart C, Table C-2 for Natural Gas	
Nitrous Oxides (N_2O)	0	2.20E-04	lb/MMBtu	40 CFR 98, Subpart C, Table C-2 for Natural Gas	
Carbon Dioxide Equivalent (CO_2e)*	165,016	-	-	40 CFR 98, Subpart A, Table A-1	

*GHGs are calculated in CO_2e using Global Warming Potentials (GWP) from 40 CFR 98, Subpart A, Table A-1 (74 FR 56374, Oct. 30, 2009) and the following equation:

CO_2e (tpy) = CO_2 (tpy) * CO_2 GWP (1) + CH_4 (tpy) * CH_4 GWP (21) + N_2O (tpy) * N_2O GWP (310)

R006137

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.7 - Hot Strip Mill - FTE

Table E-7.3 Hot Strip Mill Potential Emissions Summary

Emission Unit	Slab Reheat Furnace #3	
Emission Point ID	HSM-S003	
Hours of Operation	8,760	hrs/yr
Control Device	Low NO_x Burners	
Rated Heat Input Capacity	322	MMBtu/hr
Fuel Type	Coke Oven Gas	
Fuel Heating Value	555	Btu/scf
Permit Limit (COG Usage)	583,667	MMBtu/yr
Maximum Fuel Usage (COG)	982	MMscf/yr

Permit Limit for total COG use (Furnaces #1 - #4), allocated based on rated capacity

Pollutant	Potential Emissions (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Criteria Pollutants:					
Particulate Matter (PM)	1.30	2.698	lb/MMscf	8/11/2010 Stack Test on Furnace #4 + 20% compliance margin	
Particulate Matter <10 microns (PM_{10})	1.30	2.698	lb/MMscf	8/11/2010 Stack Test on Furnace #4 + 20% compliance margin	
Particulate Matter < 2.5 microns ($PM_{2.5}$)	1.30	2.698	lb/MMscf	8/11/2010 Stack Test on Furnace #4 + 20% compliance margin	
Nitrogen Oxides (NO_x)	40.02	0.15	lb/MMBtu	Permit Limit	
Volatile Organic Material (VOM)	0.58	1.20	lb/MMscf	FIRE v6.25 [1-02-007-07] - External Combustion Boiler COG	
Sulfur Dioxide (SO_2)	32.32	67.23	lb/MMscf	(25 gr H2S / 100 CF COG) * (1 lb H2S/7,000 gr H2S) * (1 mol H2S/34 lb H2S) * (1 mol SO2/1 mol H2S) * (64 lb SO2/mol SO2) * (1 ton SO2/2,000 lb SO2) * 0.269	Calculation from Permit Condition 5.12(f) - p. 43 using permit limit of 25 g/dscf
Carbon Monoxide (CO)	0.32	0.67	lb/MMscf	3/24/2010 Stack Test on Furnace #1 + 20% compliance margin	
Hazardous Air Pollutants:					
Organics					
Benzene	0.01	0.0177	lb/MMscf	COG Analysis (3/11/2011) + 20% compliance margin	
Greenhouse Gas Pollutants:					
Carbon Dioxide (CO_2)	145,670	103.29	lb/MMBtu	40 CFR 98, Subpart C, Table C-1 for Coke Oven Gas	
Methane (CH_4)	1	1.05E-03	lb/MMBtu	40 CFR 98, Subpart C, Table C-2 for Coke Oven Gas	
Nitrous Oxides (N_2O)	0	2.20E-04	lb/MMBtu	40 CFR 98, Subpart C, Table C-2 for Coke Oven Gas	
Carbon Dioxide Equivalent (CO_2e)*	145,797	-	-	40 CFR 98, Subpart A, Table A-1	

*GHGs are calculated in CO_2e using Global Warming Potentials (GWP) from 40 CFR 98, Subpart A, Table A-1 (74 FR 56374, Oct. 30, 2009) and the following equation:

CO_2e (tpy) = CO_2 (tpy) * CO_2 GWP (1) + CH_4 (tpy) * CH_4 GWP (21) + N_2O (tpy) * N_2O GWP (310)

R006138

Company Name:	U. S. Steel	
Facility Name:	Granite City Works	
Project Description:	CAAPP Renewal Application	
Permit Section:	Section 7.2 - Hot Strip Mill - PTE	
Table E-7.2	Hot Strip Mill Potential Emissions Summary	
Emission Unit	Slab Reheat Furnace #2	
Emission Point ID	HSM-S002	
Hours of Operation	8,760	hrs/yr
Control Device	Low NO_x Burners	
Rated Heat Input Capacity	322	MMBtu/hr
Fuel Type	Natural Gas	
Fuel Heating Value	1,020	Btu/scf
Permit Limit (Natural Gas Usage)	1,046,392	MMBtu/yr
Maximum Fuel Usage (Natural Gas)	1,026	MMscf/yr

Total Gas Usage Limit for All Reheat Furnaces (#1 - #4), minus COG total limit, allocated based on rated capacity

Pollutant	Potential Emissions (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Criteria Pollutants:					
Particulate Matter (PM)	6.87	13.40	lb/MMscf	8/11/201 Stack Test on Furnace #4 + 20% compliance margin	
Particulate Matter <10 microns (PM_{10})	6.87	13.40	lb/MMscf	PM10 = PM	
Particulate Matter < 2.5 microns ($PM_{2.5}$)	6.87	13.40	lb/MMscf	PM2.5 = PM	
Nitrogen Oxides (NO_x)	78.48	0.15	lb/MMBtu	Permit Limit	
Volatile Organic Material (VOM)	2.82	5.50	lb/MMscf	AP-42 Table 1.4-2 (07/98)	
Sulfur Dioxide (SO_2)	0.31	0.60	lb/MMscf	AP-42 Table 1.4-2 (07/98)	
Carbon Monoxide (CO)	0.19	0.37	lb/MMscf	1/7/2010 Stack Test on Furnace #3 + 20% compliance margin	
Lead (Pb)	2.56E-04	5.00E-04	lb/MMscf	AP-42 Table 1.4-2 (07/98)	
Hazardous Air Pollutants:					
Organics					
Benzene	1.08E-03	2.10E-03	lb/MMscf	AP-42 Table 1.4-3 (07/98)	
Greenhouse Gas Pollutants:					
Carbon Dioxide (CO_2)	164,854	116.89	lb/MMBtu	40 CFR 98, Subpart C, Table C-1 for Natural Gas	
Methane (CH_4)	3	2.20E-03	lb/MMBtu	40 CFR 98, Subpart C, Table C-2 for Natural Gas	
Nitrous Oxides (N_2O)	0	2.20E-04	lb/MMBtu	40 CFR 98, Subpart C, Table C-2 for Natural Gas	
Carbon Dioxide Equivalent (CO_2e)*	165,016	-	-	40 CFR 98, Subpart A, Table A-1	

*GHGs are calculated in CO_2e using Global Warming Potentials (GWP) from 40 CFR 98, Subpart A, Table A-1 (74 FR 56374, Oct. 30, 2009) and the following equation:

CO_2e (tpy) = CO_2 (tpy) * CO_2 GWP (1) + CH_4 (tpy) * CH_4 GWP (21) + N_2O (tpy) * N_2O GWP (310)

R006139

Company Name:	U. S. Steel	
Facility Name:	Granite City Works	
Project Description:	CAAPP Renewal Application	
Permit Section:	Section 7.7 - Hot Strip Mill - PTE	
Table E-7.2	Hot Strip Mill Potential Emissions Summary	
Emission Unit	Slab Reheat Furnace #2	
Emission Point ID	HSM-S002	
Hours of Operation	8,760	hrs/yr
Control Device	Low NO_x Burners	
Rated Heat Input Capacity	322	MMBtu/hr
Fuel Type	Coke Oven Gas	
Fuel Heating Value	555	Btu/scf
Permit Limit (COG Usage)	533,667	MMBtu/yr
Maximum Fuel Usage (COG)	962	MMscf/yr

Permit Limit for total COG use (Furnaces #1 - #4), allocated based on rated capacity

Pollutant	Potential Emissions (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Criteria Pollutants:					
Particulate Matter (PM)	1.30	2.698	lb/MMscf	8/11/2010 Stack Test on Furnace #4 + 20% compliance margin	
Particulate Matter <10 microns (PM_{10})	1.30	2.698	lb/MMscf	8/11/2010 Stack Test on Furnace #4 + 20% compliance margin	
Particulate Matter < 2.5 microns ($PM_{2.5}$)	1.30	2.698	lb/MMscf	8/11/2010 Stack Test on Furnace #4 + 20% compliance margin	
Nitrogen Oxides (NO_x)	40.02	0.15	lb/MMBtu	Permit Limit	
Volatile Organic Material (VOM)	0.58	1.20	lb/MMscf	FIRE v6.25 (1-02-007-07) - External Combustion Boiler COG	
Sulfur Dioxide (SO_2)	32.32	67.23	lb/MMscf	(25 gr H2S / 100 CF COG) * (1 lb H2S/7,000 gr H2S) * (1 mol H2S/34 lb H2S) * (1 mol SO2/1 mol H2S) * (64 lb SO2/mol SO2) * (1 ton SO2/2,000 lb SO2) * 0.269	Calculation from Permit Condition 5.12(f) - p. 43 using permit limit of 25 g/dscf
Carbon Monoxide (CO)	0.32	0.67	lb/MMscf	3/23/2010 Stack Test on Furnace #2 + 20% compliance margin	
Hazardous Air Pollutants:					
Organics					
Benzene	0.01	0.0177	lb/MMscf	COG Analysis (3/11/2011) + 20% compliance margin	
Greenhouse Gas Pollutants:					
Carbon Dioxide (CO_2)	145,670	103.29	lb/MMBtu	40 CFR 98, Subpart C, Table C-1 for Coke Oven Gas	
Methane (CH_4)	1	1.06E-03	lb/MMBtu	40 CFR 98, Subpart C, Table C-2 for Coke Oven Gas	
Nitrous Oxides (N_2O)	0	2.20E-04	lb/MMBtu	40 CFR 98, Subpart C, Table C-2 for Coke Oven Gas	
Carbon Dioxide Equivalent (CO_2e)*	145,797	-	-	40 CFR 98, Subpart A, Table A-1	

*GHGs are calculated in CO_2e using Global Warming Potentials (GWP) from 40 CFR 98, Subpart A, Table A-1 (74 FR 56374, Oct. 30, 2009) and the following equation:

CO_2e (tpy) = CO_2 (tpy) * CO_2 GWP (1) + CH_4 (tpy) * CH_4 GWP (21) + N_2O (tpy) * N_2O GWP (310)

R006140

Company Name:	U. S. Steel		
Facility Name:	Granite City Works		
Project Description:	CAAPP Renewal Application		
Permit Section:	Section 7.7 - Hot Strip Mill - PTE		
Table E-7.3	Hot Strip Mill Potential Emissions Summary		
Emission Unit	Slab Reheat Furnace #3		
Emission Point ID	HSM-S003		
Hours of Operation	8,760	hrs/yr	
Control Device	Low NO_x Burners		
Rated Heat Input Capacity	322	MMBtu/hr	
Fuel Type	Natural Gas		
Fuel Heating Value	1,020	Btu/scf	
Permit Limit (Natural Gas Usage)	1,046,392	MMBtu/yr	Total Gas Usage Limit for All Reheat Furnaces (#1 - #4), minus COG
Maximum Fuel Usage (Natural Gas)	1,026	MMscf/yr	total limit, allocated based on rated capacity

Pollutant	Potential Emissions (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Criteria Pollutants:					
Particulate Matter (PM)	6.87	13.40	lb/MMscf	8/11/201 Stack Test on Furnace #4 + 20% compliance margin	
Particulate Matter <10 microns (PM_{10})	6.87	13.40	lb/MMscf	PM10 = PM	
Particulate Matter < 2.5 microns ($PM_{2.5}$)	6.87	13.40	lb/MMscf	PM2.5 = PM	
Nitrogen Oxides (NO_x)	138.12	0.264	lb/MMBtu	Permit Limit	
Volatile Organic Material (VOM)	2.82	5.50	lb/MMscf	AP-42 Table 1.4-2 (07/98)	
Sulfur Dioxide (SO_2)	0.31	0.60	lb/MMscf	AP-42 Table 1.4-2 (07/98)	
Carbon Monoxide (CO)	0.88	1.71	lb/MMscf	1/6/2010 Stack Test on Furnace #3 + 20% compliance margin	
Lead (Pb)	2.56E-04	5.00E-04	lb/MMscf	AP-42 Table 1.4-2 (07/98)	
Hazardous Air Pollutants:					
Organics					
Benzene	1.08E-03	2.10E-03	lb/MMscf	AP-42 Table 1.4-3 (07/98)	
Greenhouse Gas Pollutants:					
Carbon Dioxide (CO_2)	164,854	116.89	lb/MMBtu	40 CFR 98, Subpart C, Table C-1 for Natural Gas	
Methane (CH_4)	3	2.20E-03	lb/MMBtu	40 CFR 98, Subpart C, Table C-2 for Natural Gas	
Nitrous Oxides (N_2O)	0	2.20E-04	lb/MMBtu	40 CFR 98, Subpart C, Table C-2 for Natural Gas	
Carbon Dioxide Equivalent (CO_2e)*	165,016	-	-	40 CFR 98, Subpart A, Table A-1	

*GHGs are calculated in CO_2e using Global Warming Potentials (GWP) from 40 CFR 98, Subpart A, Table A-1 (74 FR 56374, Oct. 30, 2009) and the following equation:
CO_2e (tpy) = CO_2 (tpy) * CO_2 GWP (1) + CH_4 (tpy) * CH_4 GWP (21) + N_2O (tpy) * N_2O GWP (310)

R006141

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.2 - Hot Strip Mill - PTE

Table E-7.3 Hot Strip Mill Potential Emissions Summary

Emission Unit	Slab Reheat Furnace #3	
Emission Point ID	HSM-S003	
Hours of Operation	8,760	hrs/yr
Control Device	Low NO_x Burners	
Rated Heat Input Capacity	322	MMBtu/hr
Fuel Type	Coke Oven Gas	
Fuel Heating Value	555	Btu/scf
Permit Limit (COG Usage)	533,667	MMBtu/yr
Maximum Fuel Usage (COG)	962	MMscf/yr

Permit Limit for total COG use (Furnaces #1 - #4), allocated based on rated capacity

Pollutant	Potential Emissions (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Criteria Pollutants:					
Particulate Matter (PM)	1.30	2.698	lb/MMscf	8/11/2010 Stack Test on Furnace #4 + 20% compliance margin	
Particulate Matter <10 microns (PM_{10})	1.30	2.698	lb/MMscf	8/11/2010 Stack Test on Furnace #4 + 20% compliance margin	
Particulate Matter < 2.5 microns ($PM_{2.5}$)	1.30	2.698	lb/MMscf	8/11/2010 Stack Test on Furnace #4 + 20% compliance margin	
Nitrogen Oxides (NO_x)	70.44	0.264	lb/MMBtu	Permit Limit	
Volatile Organic Material (VOM)	0.58	1.20	lb/MMscf	FIRE v6.25 (1-02-007-07) - External Combustion Boiler COG	
Sulfur Dioxide (SO_2)	32.32	67.23	lb/MMscf	(25 gr H2S / 100 CF COG) * (1 lb H2S/7,000 gr H2S) * (1 mol H2S/34 lb H2S) * (1 mol SO2/1 mol H2S) * (64 lb SO2/mol SO2) * (1 ton SO2/2,000 lb SO2) * 0.269	Calculation from Permit Condition 5.12(f) - p. 43 using permit limit of 25 g/dscf
Carbon Monoxide (CO)	0.42	0.87	lb/MMscf	3/23/2010 Stack Test on Furnace #3 + 20% compliance margin	
Hazardous Air Pollutants:					
Organics					
Benzene	0.01	0.0177	lb/MMscf	COG Analysis (3/11/2011) + 20% compliance margin	
Greenhouse Gas Pollutants:					
Carbon Dioxide (CO_2)	145,670	109.29	lb/MMBtu	40 CFR 98, Subpart C, Table C-1 for Coke Oven Gas	
Methane (CH_4)	1	1.06E-03	lb/MMBtu	40 CFR 98, Subpart C, Table C-2 for Coke Oven Gas	
Nitrous Oxides (N_2O)	0	2.20E-04	lb/MMBtu	40 CFR 98, Subpart C, Table C-2 for Coke Oven Gas	
Carbon Dioxide Equivalent (CO_2e)*	145,797	-	-	40 CFR 98, Subpart A, Table A-1	

*GHGs are calculated in CO_2e using Global Warming Potentials (GWP) from 40 CFR 98, Subpart A, Table A-1 (74 FR 56374, Oct. 30, 2009) and the following equation:
CO_2e (tpy) = CO_2 (tpy) * CO_2 GWP (1) + CH_4 (tpy) * CH_4 GWP (21) + N_2O (tpy) * N_2O GWP (310)

R006142

Company Name:	U. S. Steel	
Facility Name:	Granite City Works	
Project Description:	CAAPP Renewal Application	
Permit Section:	Section 7.2 - Hot Strip Mill - RTE	
Table E-7.3	Hot Strip Mill Potential Emissions Summary	
Emission Unit	Slab Reheat Furnace #4	
Emission Point ID	HSM-5004	
Hours of Operation	8,760	hrs/yr
Control Device	Low NO_x Burners	
Rated Heat Input Capacity	495	MMBtu/hr
Fuel Type	Natural Gas	
Fuel Heating Value	1,020	Btu/scf
Permit Limit (Natural Gas Usage)	1,606,588	MMBtu/yr
Maximum Fuel Usage (Natural Gas)	1,577	MMscf/yr

Total Gas Usage Limit for All Reheat Furnaces (#1 - #4), minus COG total limit, allocated based on rated capacity

Pollutant	Potential Emissions (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Criteria Pollutants:					
Particulate Matter (PM)	10.57	13.40	lb/MMscf	8/11/201 Stack Test on Furnace #4 + 20% compliance margin	
Particulate Matter <10 microns (PM_{10})	10.57	13.40	lb/MMscf	PM10 = PM	
Particulate Matter < 2.5 microns ($PM_{2.5}$)	10.57	13.40	lb/MMscf	PM2.5 = PM	
Nitrogen Oxides (NO_x)	227.61	0.283	lb/MMBtu	Permit Limit	
Volatile Organic Material (VOM)	4.34	5.50	lb/MMscf	AP-42 Table 1.4-2 (07/98)	
Sulfur Dioxide (SO_2)	0.47	0.60	lb/MMscf	AP-42 Table 1.4-2 (07/98)	
Carbon Monoxide (CO)	3.67	4.65	lb/MMscf	Average of Jan-2010 Stack Tests on Furnaces #1, #2, #3 + 20% compliance margin	
Lead (Pb)	3.94E-04	5.00E-04	lb/MMscf	AP-42 Table 1.4-2 (07/98)	
Hazardous Air Pollutants:					
Organics					
Benzene	1.66E-03	2.10E-03	lb/MMscf	AP-42 Table 1.4-3 (07/98)	
Greenhouse Gas Pollutants:					
Carbon Dioxide (CO_2)	233,425	116.89	lb/MMBtu	40 CFR 98, Subpart C, Table C-1 for Natural Gas	
Methane (CH_4)	5	2.20E-03	lb/MMBtu	40 CFR 98, Subpart C, Table C-3 for Natural Gas	
Nitrous Oxides (N_2O)	0	2.20E-04	lb/MMBtu	40 CFR 98, Subpart C, Table C-2 for Natural Gas	
Carbon Dioxide Equivalent (CO_2e)*	233,673	-	-	40 CFR 98, Subpart A, Table A-1	

* GHGs are calculated in CO_2e using Global Warming Potentials (GWP) from 40 CFR 98, Subpart A, Table A-1 (74 FR 56374, Oct. 30, 2009) and the following equation:
CO_2e (tpy) = CO_2 (tpy) * CO_2 GWP (1) + CH_4 (tpy) * CH_4 GWP (21) + N_2O (tpy) * N_2O GWP (310)

R006143

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.7 - Hot Strip Mill - PTE

Table E-7.4 Hot Strip Mill Potential Emissions Summary

Emission Unit	Slab Reheat Furnace #4	
Emission Point ID	HSM-5004	
Hours of Operation	8,760	hrs/yr
Control Device	Low NO_x Burners	
Rated Heat Input Capacity	495	MMBtu/hr
Fuel Type	Coke Oven Gas	
Fuel Heating Value	555	Btu/scf
Permit Limit (COG Usage)	820,888	MMBtu/yr
Maximum Fuel Usage (COG)	1,478	MMscf/yr

Permit Limit for total COG use (Furnaces #1 - #4), allocated based on rated capacity

Pollutant	Potential Emissions (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Criteria Pollutants:					
Particulate Matter (PM)	1.99	2.69E	lb/MMscf	8/11/2010 Stack Test on Furnace #4 + 20% compliance margin	
Particulate Matter <10 microns (PM_{10})	1.99	2.69E	lb/MMscf	8/11/2010 Stack Test on Furnace #4 + 20% compliance margin	
Particulate Matter < 2.5 microns ($PM_{2.5}$)	1.99	2.69E	lb/MMscf	8/11/2010 Stack Test on Furnace #4 + 20% compliance margin	
Nitrogen Oxides (NO_x)	116.06	0.283	lb/MMBtu	Permit Limit	
Volatile Organic Material (VOM)	0.89	1.20	lb/MMscf	FIRE v6.25 [1-02-007-07] - External Combustion Boiler COG	
Sulfur Dioxide (SO_2)	49.69	67.23	lb/MMscf	(25 gr H2S / 100 CF COG) * (1 lb H2S/7,000 gr H2S) * (1 mol H2S/34 lb H2S) * (1 mol SO2/1 mol H2S) * (64 lb SO2/mol SO2) * (1 ton SO2/2,000 lb SO2) * 0.269	Calculation from Permit Condition 5.12(f) - p. 43 using permit limit of 25 g/dscf
Carbon Monoxide (CO)	15.36	20.78	lb/MMscf	3/25/2010 Stack Test on Furnace #4 + 20% compliance margin	
Hazardous Air Pollutants:					
Organics					
Benzene	0.01	0.0177	lb/MMscf	COG Analysis (3/11/2011) + 20% compliance margin	
Greenhouse Gas Pollutants:					
Carbon Dioxide (CO_2)	223,933	103.29	lb/MMBtu	40 CFR 98, Subpart C, Table C-1 for Coke Oven Gas	
Methane (CH_4)	2	1.06E-03	lb/MMBtu	40 CFR 98, Subpart C, Table C-2 for Coke Oven Gas	
Nitrous Oxides (N_2O)	0	2.20E-04	lb/MMBtu	40 CFR 98, Subpart C, Table C-2 for Coke Oven Gas	
Carbon Dioxide Equivalent (CO_2e)*	224,130	-	-	40 CFR 98, Subpart A, Table A-1	

*GHGs are calculated in CO_2e using Global Warming Potentials (GWP) from 40 CFR 98, Subpart A, Table A-1 (74 FR 56374, Oct. 30, 2009) and the following equation:

CO_2e (tpy) = CO_2 (tpy) * CO_2 GWP (1) + CH_4 (tpy) * CH_4 GWP (21) + N_2O (tpy) * N_2O GWP (310)

R006144

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.7 - Hot Strip Mill - PTE

Table E-7.5 Hot Strip Mill Potential Emissions Summary

Emission Unit	Hot Roll Oil Vaporization	
Emission Point ID	HSM-F001	
Annual Production Rate	3,580,000	tons/yr
Oil Usage Rate	0.00102	lbs oil per ton of steel

Pollutant	Potential Emissions (tpy)	Production Rate (tpy)	Hot Roll Oil Usage (lb/ton)	Hot Roll Oil Volatile Fraction	Notes
Volatile Organic Material (VOM)	1.83	3,580,000	0.00102	100%	Usage based on 2012 actuals + 20% compliance margin, scaled to maximum production capacity.

R006145

APPENDIX E

Section 7.8 PTE Calcs
Finishing

Company Name: U.S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 2.8: Galvanizing / ETS

Table E-8.0 Finishing Potential Emissions Summary

Emission Unit ID	Source Type	Area	Emission Point	Process Emission Unit(s)	CO		SO_2		NO_x		PM		PM_{10}		$PM_{2.5}$		SO_2		VOM	
					lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
FINISHING-5001*	Stack	Galvanizing Line #7A	Cleaner Section	Cleaner Fumes*	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FINISHING-5002	Stack		Natural Gas Furnace	Natural Gas Combustion	3.85	17.31	0.00	0.01	4.71	20.61	0.36	1.57	0.36	1.57	0.03	0.12	0.26	1.13
FINISHING-5003	Fugitive		Galvanizing Pots (3)	Molten Zinc	--	--	0.01	0.03	--	--	0.00	0.00	0.00	0.00	0.00	0.00	--	--	--	--
FINISHING-5004	Stack		Misc. Heaters	Fuel Combustion	0.39	1.72	0.00	0.01	0.47	2.05	0.04	0.16	0.04	0.16	0.00	0.01	0.03	0.11
FINISHING-5005	Stack	Galvanizing Line #8	Cleaner Section	Cleaner Fumes	--	--	--	--	--	--	0.24	1.06	0.24	1.06	0.12	1.06	--	--	--	--
FINISHING-5006	Stack		Natural Gas Furnace	Natural Gas Combustion	3.93	8.37	0.00	0.00	2.06	9.03	0.16	0.72	0.16	0.72	0.16	0.72	0.03	0.14	0.15	0.67
FINISHING-5007	Fugitive		Galvanizing Pots (2)	Molten Zinc	--	--	0.01	0.03	--	--	0.10	0.44	0.10	0.44	0.10	0.44	--	--	--	--
FINISHING-5008	Stack		Misc. Heaters	Fuel Combustion	0.97	4.25	0.00	0.00	5.80	23.28	0.15	0.64	0.15	0.64	0.15	0.64	0.03	0.13	0.35	1.52
FINISHING-5009	Stack		Melting Kettle	Molten Zinc	--	--	--	--	--	--	0.44	1.92	0.44	1.92	0.44	1.92	--	--	--	--
FINISHING-5010	Stack	Finishing Operations	HCl Pickling Line	Acid Fumes	--	--	--	--	--	--	0.37	1.63	0.37	1.63	0.37	1.63	--	--	--	--
FINISHING-5011	Fugitive		Coating Operations	Oil Vapors	--	--	--	--	--	--	--	--	--	--	--	--	--	--	14.20	62.65
FINISHING-5012	Stack		Burning & Storage Area Heaters	Fuel Combustion	0.13	0.85	0.00	0.00	0.08	0.35	0.03	0.13	0.03	0.13	0.01	0.03	0.00	0.02	0.05	0.22
Finishing	All Sources				2.42	32.51	0.02	0.09	13.08	57.28	1.89	8.26	1.89	8.26	1.89	8.26	0.48	0.44	15.05	65.91

*Line #7A and Line #8 Cleaner Sections both vent to the same scrubber. Total emissions are reported under Finishing-5004.

R006147

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.8 - Finishing - PTE

Table E-8.1 Finishing Operations Potential Emissions Summary

Process	Finishing
Emission Unit	Galvanizing Line #7ACleaning Section
Emission Point ID	Finishing-S001

Control Device: Fume Scrubber

*Galv A and Galv B Cleaning Lines Share a Single Scrubber. Emissions are reported under Galv B (Finishing-S004)

Pollutant	Potential Emissions (tpy)	Maximum Throughput Per Unit[1] (tpy)	Throughput Source	Emission Factor (lb/ton)	Emission Factor Source	Notes
Criteria Pollutants:						
Particulate Matter (PM)	See Finishing-S004	3,580,000	CAAPP No. 96030056 Section 5.6.2.a.i	2.00E-07	AP-42 Table 12.14-2 (4/81) for Kettle Pot	
Particulate Matter <10 microns (PM_{10})	See Finishing-S004	3,580,000	CAAPP No. 96030056 Section 5.6.2.a.i	2.00E-07	Assumed equal to PM.	
Particulate Matter < 2.5 microns ($PM_{2.5}$)	See Finishing-S004	3,580,000	CAAPP No. 96030056 Section 5.6.2.a.i	2.00E-07	Assumed equal to PM.	

1. Maximum throughput is conservatively assumed to be 100 percent of steel throughput.

R006148

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.8 - Finishing - PTE

Table E-8.2 Finishing Operations Potential Emissions Summary

Process	Finishing	
Emission Unit	Galvanizing Line #7ANatural Gas Furnace	
Emission Point ID	Finishing-S002	
Hours of Operation	8,760	hrs/yr
Control Device	None	
Rated Heat Input Capacity	48	MMBtu/hr
Maximum Fuel Usage	420,480	MMBtu/yr
Maximum Fuel Usage[1]	412	MMscf/yr
Fuel Type	Natural Gas	

Pollutant	Potential Emissions (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Criteria Pollutants:					
Particulate Matter (PM)	1.57	7.60	lb/MMscf	AP-42 Table 1.4-2 (7/98)	
Particulate Matter <10 microns (PM_{10})	1.57	7.60	lb/MMscf	AP-42 Table 1.4-2 (7/98)	
Particulate Matter < 2.5 microns ($PM_{2.5}$)	1.57	7.60	lb/MMscf	AP-42 Table 1.4-2 (7/98)	
Nitrogen Oxides (NO_x)	20.61	100.00	lb/MMscf	AP-42 Table 1.4-2 (7/98)	
Volatile Organic Material (VOM)	1.13	5.50	lb/MMscf	AP-42 Table 1.4-2 (7/98)	
Sulfur Dioxide (SO_2)	0.12	0.60	lb/MMscf	AP-42 Table 1.4-2 (7/98)	
Carbon Monoxide (CO)	17.31	84.00	lb/MMscf	AP-42 Table 1.4-1 (7/98)	
Lead (Pb)	1.03E-04	5.00E-04	lb/MMscf	AP-42 Table 1.4-2 (7/98)	
Hazardous Air Pollutants:					
Organics					
Benzene	4.33E-04	2.10E-03	lb/MMscf	AP-42 Table 1.4-3 (7/98)	
Greenhouse Gas Pollutants:					
Carbon Dioxide (CO_2)	24,575	116.89	lb/MMBtu	40 CFR 98, Subpart C, Table C-1	
Methane (CH_4)	0	2.20E-03	lb/MMBtu	40 CFR 98, Subpart C, Table C-2	
Nitrous Oxides (N_2O)	0	2.20E-04	lb/MMBtu	40 CFR 98, Subpart C, Table C-2	
Carbon Dioxide Equivalent (CO_2e)[2]	24,599	-	-	40 CFR 98, Subpart A, Table A-1	

1. Maximum fuel usage in MMscf calculated based on a natural gas heat value of 1,020 Btu/scf.
2. GHGs are calculated in CO_2e using Global Warming Potentials (GWP) from 40 CFR 98, Subpart A, Table A-1 (74 FR 56374, Oct. 30, 2009) and the following equation:
CO_2e (tpy) = CO_2 (tpy) * CO_2 GWP (1) + CH_4 (tpy) * CH_4 GWP (21) + N_2O (tpy) * N_2O GWP (310)

R006149

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.8 - Finishing - PTE

Table E-8.3 Finishing Operations Potential Emissions Summary

Process	Finishing
Emission Unit	Galvanizing Line #7AGalvanizing Pot
Emission Point ID	Finishing-F001
Control Device	None

Pollutant	Potential Emissions (tpy)	Maximum Throughput Per Unit[1] (tpy)	Throughput Source	Emission Factor (lb/ton)	Emission Factor Source	Notes
Particulate Matter (PM)	3.58E-04	3,580,000	CAAPP No. 96030056 Section 5.6.2.a.i	2.00E-07	AP-42 Table 12.14-2 (4/81) for Kettle Pot	
Particulate Matter <10 microns (PM_{10})	3.58E-04	3,580,000	CAAPP No. 96030056 Section 5.6.2.a.i	2.00E-07	Assumed equal to PM.	
Particulate Matter < 2.5 microns ($PM_{2.5}$)	3.58E-04	3,580,000	CAAPP No. 96030056 Section 5.6.2.a.i	2.00E-07	Assumed equal to PM.	
Lead (Pb)	0.06	3,580,000	CAAPP No. 96030056 Section 5.6.2.a.i	3.60E-05	Source Test + 20% compliance margin	

1. Maximum throughput is conservatively assumed to be 100 percent of steel throughput.

R006150

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.8 - Finishing - PTE

Table E-8.4 Finishing Operations Potential Emissions Summary

Process	**Finishing**	
Emission Unit	**Galvanizing Line #7AMiscellaneous Heaters**	
Emission Point ID	**Finishing-5003**	
Hours of Operation	8,760	hrs/yr
Control Device	None	
Rated Heat Input Capacity	4.79	MMBtu/hr
Maximum Fuel Usage	41,984	MMBtu/yr
Maximum Fuel Usage[1]	41	MMscf/yr
Fuel Type	Natural Gas	

Pollutant	Potential Emissions (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Criteria Pollutants:					
Particulate Matter (PM)	0.04	1.90	lb/MMscf	AP-42 Table 1.4-2 (07/98)	
Particulate Matter <10 microns (PM_{10})	0.16	7.60	lb/MMscf	AP-42 Table 1.4-2 (07/98)	
Particulate Matter < 2.5 microns ($PM_{2.5}$)	0.16	7.60	lb/MMscf	AP-42 Table 1.4-2 (07/98)	
Nitrogen Oxides (NO_x)	2.06	100.00	lb/MMscf	AP-42 Table 1.4-1 (07/98)	
Volatile Organic Material (VOM)	0.11	5.50	lb/MMscf	AP-42 Table 1.4-2 (07/98)	
Sulfur Dioxide (SO_2)	0.01	0.60	lb/MMscf	AP-42 Table 1.4-2 (07/98)	
Carbon Monoxide (CO)	1.73	84.00	lb/MMscf	AP-42 Table 1.4-1 (07/98)	
Lead (Pb)	1.03E-05	5.00E-04	lb/MMscf	AP-42 Table 1.4-2 (07/98)	
Hazardous Air Pollutants:					
Organics					
Benzene	4.32E-05	2.10E-03	lb/MMscf	AP-42 Table 1.4-3 (07/98)	
Greenhouse Gas Pollutants:					
Carbon Dioxide (CO_2)	2,454	116.89	lb/MMBtu	40 CFR 98, Subpart C, Table C-1	
Methane (CH_4)	0	2.20E-03	lb/MMBtu	40 CFR 98, Subpart C, Table C-2	
Nitrous Oxides (N_2O)	4.63E-03	2.20E-04	lb/MMBtu	40 CFR 98, Subpart C, Table C-2	
Carbon Dioxide Equivalent (CO_2e)[2]	2,456	-	-	40 CFR 98, Subpart A, Table A-1	

1. Maximum fuel usage in MMscf calculated based on a natural gas heat value of 1,020 Btu/scf.
2. GHGs are calculated in CO_2e using Global Warming Potentials (GWP) from 40 CFR 98, Subpart A, Table A-1 (74 FR 56374, Oct. 30, 2009) and the following equation:
   CO_2e (tpy) = CO_2 (tpy) * CO_2 GWP (1) + CH_4 (tpy) * CH_4 GWP (21) + N_2O (tpy) * N_2O GWP (310)

R006151

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.8 - Finishing - PTE

Table E-8.5 Finishing Operations Potential Emissions Summary

Process: Finishing
Emission Unit: Galvanizing Line #8Cleaning Section
Emission Point ID: Finishing-S004

Control Device: Fume Scrubber

Pollutant	Potential Emissions (tpy)	Maximum Throughput Per Unit (tpy)	Throughput Source	Emission Factor (lb/ton)	Emission Factor Source	Notes
Criteria Pollutants:						
Particulate Matter (PM)	1.06	-	-	-	-	Potential emissions per CAAPP No. 96030056 Section 7.8.7.b.v
Particulate Matter <10 microns (PM_{10})	1.06	-	-	-	-	Assumed equal to PM.
Particulate Matter < 2.5 microns ($PM_{2.5}$)	1.06	-	-	-	-	Assumed equal to PM.

R006152

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.8 - Finishing - PTE

Table E-8.6 Finishing Operations Potential Emissions Summary

Process	Finishing	
Emission Unit	Galvanizing Line #8Natural Gas Furnace	
Emission Point ID	Finishing-S005	
Hours of Operation	8,760	hrs/yr
Control Device	NO_x Catalytic Converter	
Heat Input Limit[1]	54.6	MMBtu/hr
Maximum Fuel Usage	478,296	MMBtu/yr
Maximum Fuel Usage[2]	469	MMscf/yr
Fuel Type	Natural Gas	

Pollutant	Potential Emissions (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Criteria Pollutants:					
Particulate Matter (PM)	0.72	-	-	-	Potential emissions per CAAPP No. 96030056 Section 7.8.7.b.i.B
Particulate Matter <10 microns (PM_{10})	0.72	-	-	-	Potential emissions per CAAPP No. 96030056 Section 7.8.7.b.i.B
Particulate Matter < 2.5 microns ($PM_{2.5}$)	0.72	-	-	-	Assumed equal to PM_{10}.
Nitrogen Oxides (NO_x)	9.04	-	-	-	Potential emissions per CAAPP No. 96030056 Section 7.8.7.b.i.A
Volatile Organic Material (VOM)	0.67	-	-	-	Potential emissions per CAAPP No. 96030056 Section 7.8.7.b.i.B
Sulfur Dioxide (SO_2)	0.14	-	-	-	Potential emissions per CAAPP No. 96030056 Section 7.8.7.b.i.B
Carbon Monoxide (CO)	8.37	-	-	-	Potential emissions per CAAPP No. 96030056 Section 7.8.7.b.i.B
Lead (Pb)	1.17E-04	5.00E-04	lb/MMscf	AP-42 Table 1.4-2 (07/98)	
Hazardous Air Pollutants:					
Organics					
Benzene	4.92E-04	2.10E-03	lb/MMscf	AP-42 Table 1.4-3 (07/98)	
Greenhouse Gas Pollutants:					
Carbon Dioxide (CO_2)	27,954	116.89	lb/MMBtu	40 CFR 98, Subpart C, Table C-1	
Methane (CH_4)	0.53	2.20E-03	lb/MMBtu	40 CFR 98, Subpart C, Table C-2	
Nitrous Oxides (N_2O)	0.05	2.20E-04	lb/MMBtu	40 CFR 98, Subpart C, Table C-2	
Carbon Dioxide Equivalent (CO_2e)[3]	27,981	-	-	40 CFR 98, Subpart A, Table A-1	

1. Heat input limit per CAAPP No. 96030056 Section 7.8.7.a.i.
2. Maximum fuel usage in MMscf calculated based on a natural gas heat value of 1,020 Btu/scf.
3. GHGs are calculated in CO_2e using Global Warming Potentials from 40 CFR 98, Subpart A, Table A-1 and the following equation:

CO_2e (tpy) = CO_2 (tpy) * CO_2 GWP + CH_4 (tpy) * CH_4 GWP + N_2O (tpy) * N_2O GWP

R006153

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.8 - Finishing - PTE

Table E-8.7 Finishing Operations Potential Emissions Summary

Process Finishing
Emission Unit Galvanizing Line #8, Galvanizing Pots (2)
Emission Point ID Finishing-F002

Control Device None

Pollutant	Potential Emissions per Pot (tpy)	Maximum Throughput Per Unit[1] (tpy)	Throughput Source	Emission Factor (lb/ton)	Emission Factor Source	Notes
Criteria Pollutants:						
Particulate Matter (PM)	0.44	-	-	-	-	Potential emissions per CAAPP No. 96030056 Section 7.8.7.b.vii
Particulate Matter <10 microns (PM_{10})	0.44	-	-	-	-	Assumed equal to PM.
Particulate Matter < 2.5 microns ($PM_{2.5}$)	0.44	-	-	-	-	Assumed equal to PM.
Lead (Pb)	0.03	1,790,000	CAAPP No. 96030056 Section 5.6.2.a.i	3.00E-05	Source Test	

1. Maximum throughput is conservatively assumed to be 100 percent of steel throughput (i.e., 50 percent per pot).

R006154

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.8 - Finishing - PTE
Table E-8.8	Finishing Operations Potential Emissions Summary
Process	Finishing
Emission Unit	Galvanizing Line #8Space Heaters, Drying Oven, & Miscellaneous Heaters
Emission Point ID	Finishing-S006

Hours of Operation	8,760	hrs/yr
Control Device	None	
Total Rated Heat Input Capacity[1]	39.53	MMBtu/hr
Total Maximum Fuel Usage	346,308	MMBtu/yr
Total Maximum Fuel Usage[2]	340	MMscf/yr
Fuel Type	Natural Gas	

Pollutant	Potential Emissions (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Criteria Pollutants:					
Particulate Matter (PM)	0.64	-	-	-	Potential emissions from CAAPP No. 96030056 Section 7.8.7.b.ii-iv.
Particulate Matter <10 microns (PM_{10})	0.64	-	-	-	Potential emissions from CAAPP No. 96030056 Section 7.8.7.b.ii-iv.
Particulate Matter < 2.5 microns ($PM_{2.5}$)	0.64	-	-	-	Potential emissions from CAAPP No. 96030056 Section 7.8.7.b.ii-iv.
Nitrogen Oxides (NO_x)	21.28	-	-	-	Potential emissions from CAAPP No. 96030056 Section 7.8.7.b.ii-iv.
Volatile Organic Material (VOM)	1.12	-	-	-	Potential emissions from CAAPP No. 96030056 Section 7.8.7.b.ii-iv.
Sulfur Dioxide (SO_2)	0.13	-	-	-	Potential emissions from CAAPP No. 96030056 Section 7.8.7.b.ii-iv.
Carbon Monoxide (CO)	4.25	-	-	-	Potential emissions from CAAPP No. 96030056 Section 7.8.7.b.ii-iv.
Lead (Pb)	8.49E-05	5.00E-04	lb/MMscf	AP-42 Table 1.4-2 (07/98)	
Hazardous Air Pollutants:					
Organics					
Benzene	3.56E-04	2.10E-03	lb/MMscf	AP-42 Table 1.4-3 (07/98)	
Greenhouse Gas Pollutants:					
Carbon Dioxide (CO_2)	20,240	116.89	lb/MMBtu	40 CFR 98, Subpart C, Table C-1	
Methane (CH_4)	0	2.20E-03	lb/MMBtu	40 CFR 98, Subpart C, Table C-2	
Nitrous Oxides (N_2O)	0	2.20E-04	lb/MMBtu	40 CFR 98, Subpart C, Table C-2	
Carbon Dioxide Equivalent (CO_2e)[3]	20,259	-	-	40 CFR 98, Subpart A, Table A-1	

1. Per CAAPP No. 96030056 Section 7.8.7.a.ii-iv for space heaters, building and storage area heaters, and miscellaneous heaters.
2. Maximum fuel usage in MMscf calculated based on a natural gas heat value of 1,020 Btu/scf.
3. GHGs are calculated in CO_2e using Global Warming Potentials from 40 CFR 98, Subpart A, Table A-1 and the following equation:

CO_2e (tpy) = CO_2 (tpy) * CO_2 GWP + CH_4 (tpy) * CH_4 GWP + N_2O (tpy) * N_2O GWP

R006155

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.8 - Finishing - PTE

Table E-8.9 Finishing Operations Potential Emissions Summary

Process: Finishing
Emission Unit: Galvanizing Line #8Melting Kettle
Emission Point ID: Finishing-S007

Control Device: None

Pollutant	Potential Emissions per Pot (tpy)	Maximum Throughput Per Unit (tpy)	Throughput Source	Emission Factor (lb/ton)	Emission Factor Source	Notes
Criteria Pollutants:						
Particulate Matter (PM)	1.92	-	-	-	-	Potential emissions from CAAPP No. 96030056 Section 7.8.7.b.vi
Particulate Matter <10 microns (PM_{10})	1.92	-	-	-	-	Assumed equal to PM10.
Particulate Matter < 2.5 microns ($PM_{2.5}$)	1.92	-	-	-	-	Assumed equal to PM10.

R006156

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.8 - Finishing - PTE

Table E-8.10 Finishing Operations Potential Emissions Summary

Process	**Finishing**
Emission Unit	**HCl Pickling Line**
Emission Point ID	**Finishing-S008**
Hours of Operation	8,760 hrs/yr
Control Device	Fume Scrubbers (2)

Pollutant	Potential Emissions (tpy)	Emission Factor (lb/hr)	Emission Factor Source
Criteria Pollutants:			
Particulate Matter (PM)	1.63	0.37	Pickling Line Fume Scrubber No. 1 (South) and Scrubber No. 2 (North) Stack Test 7/17-18/2012 - Average HCL emissions of Scrubber No. 1&No. 2 (+20% compliance margin)
Particulate Matter <10 microns (PM_{10})	1.63	0.37	Assume equal to PM.
Particulate Matter < 2.5 microns ($PM_{2.5}$)	1.63	0.37	Assume equal to PM.
Hazardous Air Pollutants:			
Hydrochloric Acid (HCl)	1.63	0.37	Assume equal to PM.

R006157

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.8 - Finishing - PTE

Table E-8.11 Finishing Operations Potential Emissions Summary

Process	Finishing
Emission Unit	Coating Operations (Oil)
Emission Point ID	Finishing-F003
Hours of Operation	8,760 hrs/yr
Control Device	None

Pollutant	Potential Emissions (tpy)	Maximum Throughput Per Unit (tpy)	Throughput Source	Emission Factor (lb/ton)	Emission Factor Source	Notes
Criteria Pollutants:						
Volatile Organic Material (VOM)	62.65	1,253,000	Approx. 35% of total Product is Coated based on historical average	0.10	Engineering Estimate (per AER)	

R006158

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.8 - Finishing - PTE

Table E-8.12 Finishing Operations Potential Emissions Summary

Process	Finishing	
Emission Unit	Building & Storage Heaters	
Emission Point ID	Finishing-5006	
Hours of Operation	8,760	hrs/yr
Control Device	None	
Total Rated Heat Input Capacity[1]	9.84	MMBtu/hr
Total Maximum Fuel Usage	86,198	MMBtu/yr
Total Maximum Fuel Usage[2]	85	MMscf/yr
Fuel Type	Natural Gas	

Pollutant	Potential Emissions (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Criteria Pollutants:					
Particulate Matter (PM)	0.13	-	-	-	Potential emissions from CAAPP No. 96030056 Section 7.8.7.b.iii.
Particulate Matter <10 microns (PM_{10})	0.13	-	-	-	Potential emissions from CAAPP No. 96030056 Section 7.8.7.b.iii.
Particulate Matter < 2.5 microns ($PM_{2.5}$)	0.13	-	-	-	Potential emissions from CAAPP No. 96030056 Section 7.8.7.b.iii.
Nitrogen Oxides (NO_x)	4.29	-	-	-	Potential emissions from CAAPP No. 96030056 Section 7.8.7.b.iii.
Volatile Organic Material (VOM)	0.22	-	-	-	Potential emissions from CAAPP No. 96030056 Section 7.8.7.b.iii.
Sulfur Dioxide (SO_2)	0.03	-	-	-	Potential emissions from CAAPP No. 96030056 Section 7.8.7.b.iii.
Carbon Monoxide (CO)	0.85	-	-	-	Potential emissions from CAAPP No. 96030056 Section 7.8.7.b.iii.
Lead (Pb)	2.11E-05	5.00E-04	lb/MMscf	AP-42 Table 1.4-2 (07/98)	
Hazardous Air Pollutants:					
Organics					
Benzene	8.87E-05	2.10E-03	lb/MMscf	AP-42 Table 1.4-3 (07/98)	
Greenhouse Gas Pollutants:					
Carbon Dioxide (CO_2)	5,038	116.89	lb/MMBtu	40 CFR 98, Subpart C, Table C-1	
Methane (CH_4)	0	2.20E-03	lb/MMBtu	40 CFR 98, Subpart C, Table C-2	
Nitrous Oxides (N_2O)	0	2.20E-04	lb/MMBtu	40 CFR 98, Subpart C, Table C-2	
Carbon Dioxide Equivalent (CO_2e)[3]	5,043	-	-	40 CFR 98, Subpart A, Table A-1	

1. Per CAAPP No. 96030056 Section 7.8.7.a.ii-iv for space heaters, building and storage area heaters, and miscellaneous heaters.
2. Maximum fuel usage in MMscf calculated based on a natural gas heat value of 1,020 Btu/scf.
3. GHGs are calculated in CO_2e using Global Warming Potentials from 40 CFR 98, Subpart A, Table A-1 and the following equation:
CO_2e (tpy) = CO_2 (tpy) * CO_2 GWP + CH_4 (tpy) * CH_4 GWP + N_2O (tpy) * N_2O GWP

R006159

APPENDIX E

Section 7.9 PTE Calcs
Wastewater Treatment

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.9 - Wastewater Treatment Plant (WWTP)

Table E-9.6 WWTP Potential Emissions Summary

Emission Unit ID	Source Type	Emission Point	Process Emission Unit(s)	CO		Lead		NO_x		PM		PM_{10}		$PM_{2.5}$		SO_2		VOM	
				lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
WWTP-F001	Fugitive	Evaporative Losses	Equalization Tanks																
WWTP-F002	Fugitive	Evaporative Losses	PFG Clarifiers																
WWTP-F003	Fugitive	Evaporative Losses	Aeration basin Clarifiers	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.55	19.93
WWTP-F004	Fugitive	Evaporative Losses	Lagoons																
WWTP F005	Fugitive	Evaporative Losses	Sand Filters																
WWTP	All Sources			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.55	19.93

R006161

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.9 - Wastewater Treatment Plant (WWTP)
Table E-9.1	WWTP Potential Emissions Summary
Process	Wastewater Treatment Plant
Emission Units	Equalization Tanks, BFG Clarifiers, Aeration Basin Clarifiers, Lagoons, Sand filters
Emission Point IDs	WWTP-F001, WWTP-F002, WWTP-F003,WWTP-F004, WWTP-F005
Hours of Operation	8,760 hrs/yr
Control Device	None

Pollutant	Potential Emissions (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Criteria Pollutants:					
Volatile Organic Material (VOM)					
Primary WWTP	18.40	4.20	lb/hr	SIMS Model Maximum Uncontrolled Emissions	AER Calculation Method
Byproducts WWTP	1.51	0.35	lb/hr	SIMS Model Maximum Uncontrolled Emissions	AER Calculation Method
Hazardous Air Pollutants:					
Benzene					
Primary WWTP	-	-	-	-	
Byproducts WWTP	0.66	0.15	lb/hr	SIMS Model Maximum Uncontrolled Emissions	AER Calculation Method

R006162

APPENDIX E

Section 7.10 PTE Calcs
Boilers

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.10 - Boilers - PTE

Table E-10.0 Boiler Potential Emissions Summary

Emission Unit ID	Source Type	Emission Point	Process Emission Unit(s)	CO		Lead		NO_x		PM		PM_{10}		$PM_{2.5}$		SO_2		VOM	
				lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
BOILER-5001	Stack	Boiler Exhaust Stack	Boiler #11	17.08	74.82	0.00	0.00	5.78	25.30	1.36	5.95	1.36	5.95	1.36	5.95	2.48	10.86	2.55	11.16
BOILER-5002	Stack	Boiler Exhaust Stack	Boiler #12	30.48	133.51	0.00	0.00	17.87	78.25	6.30	27.60	6.07	26.60	5.83	25.56	12.32	53.96	14.15	61.96
BOILER-5003	Stack	Boiler Exhaust Stack	Power Boiler #1	83.33	364.97	0.00	0.01	31.15	136.42	17.33	75.90	17.33	75.90	17.33	75.90	39.37	172.45	1.65	18.35
BOILER-5004	Stack	Boiler Exhaust Stack	Portable Boiler #1	7.79	34.10	0.00	0.00	2.97	13.99	0.70	3.09	0.70	3.09	0.70	3.09	0.96	0.24	0.51	2.23
BOILER-5005	Stack	Boiler Exhaust Stack	Portable Boiler #2	7.79	34.10	0.00	0.00	2.97	13.99	0.70	3.09	0.70	3.09	0.70	3.09	0.96	0.24	0.51	2.23
BOILER-5006	Stack	Boiler Exhaust Stack	Portable Boiler #3	7.79	34.10	0.00	0.00	2.97	13.99	0.70	3.09	0.70	3.09	0.70	3.09	0.96	0.24	0.51	2.23
BOILER-5007	Stack	Boiler Exhaust Stack	Portable Boiler #4	7.79	34.10	0.00	0.00	2.97	13.99	0.70	3.09	0.70	3.09	0.70	3.09	0.96	0.24	0.51	2.23
Boilers	All Sources			162.04	709.72	0.00	0.01	66.66	291.95	29.81	130.55	29.58	129.54	29.44	128.93	59.31	259.79	21.87	95.78

R006164

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.10 - Boilers - PTE

Table E-10.1 Boiler Potential Emissions Summary

Emission Unit	Boiler #11	
Emission Point ID	Boiler-S001	
Hours of Operation	8,760	hrs/yr
Control Device	None	
Rated Heat Input Capacity	225	MMBtu/hr
Fuel Type	Natural Gas	
Fuel Heating Value	1,020	Btu/scf
Permit Limit (Natural Gas Usage)	226,440	MMBtu/yr
Maximum Fuel Usage (Natural Gas)	222	MMscf/yr (Scaled to PTE max based on 2013 actual data)

Pollutant	Potential Emissions (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Criteria Pollutants:					
Particulate Matter (PM)	0.84	7.6	lb/MMscf	AP-42 Table 1.4-2 (Jul-1998)	
Particulate Matter <10 microns (PM_{10})	0.84	7.6	lb/MMscf	AP-42 Table 1.4-2 (Jul-1998)	
Particulate Matter < 2.5 microns ($PM_{2.5}$)	0.84	7.6	lb/MMscf	Assumed 100% of PM_{10}	
Nitrogen Oxides (NO_x)	0.07	0.60	lb/MMscf	AP-42 Table 1.4-1 (Jul-1998)	Note that the current permit cites older factors that should be revised.
Volatile Organic Material (VOM)	11.10	100	lb/MMscf	AP-42 Table 1.4-2 (Jul-1998)	
Sulfur Dioxide (SO_2)	0.61	5.5	lb/MMscf	AP-42 Table 1.4-2 (Jul-1998)	
Carbon Monoxide (CO)	9.32	84	lb/MMscf	AP-42 Table 1.4-2 (Jul-1998)	
Lead (Pb)	5.55E-05	0.0005	lb/MMscf	AP-42 Table 1.4-2 (Jul-1998)	
Hazardous Air Pollutants:					
Organics					
Benzene	2.33E-04	2.10E-03	lb/MMscf	AP-42 Table 1.4-3 (07/98)	
Greenhouse Gas Pollutants:					
Carbon Dioxide (CO_2)	13,192	59.42	tons/MMscf	USS GHG Emissions Report Factor (2012)	
Methane (CH_4)	70	0.32	tons/MMscf	USS GHG Emissions Report Factor (2012)	
Nitrous Oxides (N_2O)	0.02	1.12E-04	tons/MMscf	USS GHG Emissions Report Factor (2012)	
Carbon Dioxide Equivalent (CO_2e)*	14,673	-	-	40 CFR 98, Subpart A, Table A-1	

*GHGs are calculated in CO_2e using Global Warming Potentials (GWP) from 40 CFR 98, Subpart A, Table A-1 (74 FR 56374, Oct. 30, 2009) and the following equation:
CO_2e (tpy) = CO_2 (tpy) * CO_2 GWP (1) + CH_4 (tpy) * CH_4 GWP (21) + N_2O (tpy) * N_2O GWP (310)

R006165

Company Name:	U. S. Steel	
Facility Name:	Granite City Works	
Project Description:	CAAPP Renewal Application	
Permit Section:	Section 7.10 - Boilers - PTE	
Table E-15.1	Boiler Potential Emissions Summary	
Emission Unit	Boiler #11	
Emission Point ID	Boiler-5081	
Hours of Operation	8,760	hrs/yr
Control Device	None	
Rated Heat Input Capacity	225	MMBtu/hr
Fuel Type	Coke Oven Gas	
Fuel Heating Value	555	Btu/scf
Permit Limit (COG Usage)	22	MMBtu/yr
Maximum Fuel Usage (COG)	0.04	MMscf/yr

This boiler does not normally burn COG. Assumed 10% capacity for PTE calcs.

Pollutant	Potential Emissions (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Criteria Pollutants:					
Particulate Matter (PM)	1.24E-04	6.2	lb/MMscf	FIRE v6.25 (1-02-007-07) - External Combustion Boiler COG	
Particulate Matter <10 microns (PM_{10})	8.70E-05	4.35	lb/MMscf	FIRE v6.25 (1-02-007-07) - External Combustion Boiler COG	
Particulate Matter < 2.5 microns ($PM_{2.5}$)	6.44E-05	3.219	lb/MMscf	FIRE v6.25 (1-02-007-07) - External Combustion Boiler COG	
Nitrogen Oxides (NO_x)	1.34E-03	67.23	lb/MMscf	(25 gr H2S / 100 CF COG) * (1 lb H2S/7,000 gr H2S) * (1 mol H2S/34 lb H2S) * (1 mol SO2/1 mol H2S) * (64 lb SO2/mol SO2) * (1 ton SO2/2,000 lb SO2)	
Volatile Organic Material (VOM)	1.60E-03	80	lb/MMscf	FIRE v6.25 (1-02-007-07) - External Combustion Boiler COG	
Sulfur Dioxide (SO_2)	2.40E-05	1.2	lb/MMscf	FIRE v6.25 (1-02-007-07) - External Combustion Boiler COG	Calculation from Permit Condition 5.12(f) - p. 43 at permit limit of 25 gr H2S/100 cf
Carbon Monoxide (CO)	3.68E-04	18.4	lb/MMscf	FIRE v6.25 (1-02-007-07) - External Combustion Boiler COG	
Hazardous Air Pollutants:					
Organics					
Benzene	5.42E-06	0.27	lb/MMscf	USS COG Analysis (3/11/2013) + 20% compliance margin	
Greenhouse Gas Pollutants:					
Carbon Dioxide (CO_2)	0.91	22.66	tons/MMscf	USS GHG Emissions Report Factor (2012)	
Methane (CH_4)	0.00	3.17E-04	tons/MMscf	USS GHG Emissions Report Factor (2012)	
Nitrous Oxides (N_2O)	0.00	6.60E-05	tons/MMscf	USS GHG Emissions Report Factor (2012)	
Carbon Dioxide Equivalent (CO_2e)*	1	-	-	40 CFR 98, Subpart A, Table A-1	

*GHGs are calculated in CO_2e using Global Warming Potentials (GWP) from 40 CFR 98, Subpart A, Table A-1 (74 FR 56374, Oct. 30, 2009) and the following equation:
CO_2e (tpy) = CO_2 (tpy) * CO_2 GWP (1) + CH_4 (tpy) * CH_4 GWP (21) + N_2O (tpy) * N_2O GWP (310)

R006166

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.10 - Boilers - PTE

Table E-10.1 Boiler Potential Emissions Summary

Emission Unit	Boiler #11	
Emission Point ID	Boiler-5001	
Hours of Operation	8,760	hrs/yr
Control Device	None	
Rated Heat Input Capacity	225	MMBtu/hr
Fuel Type	Blast Furnace Gas	
Fuel Heating Value	90	Btu/scf
Permit Limit (BFG Usage)	860,580	MMBtu/yr
Maximum Fuel Usage (BFG)	9,562	MMscf/yr

(Scaled to PTE max based on 2013 actual data)

Pollutant	Potential Emissions (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Criteria Pollutants:					
Particulate Matter (PM)	13.86	2.90	lb/MMscf	Current Permit Limit (p. 26)	
Particulate Matter <10 microns (PM_{10})	13.86	2.90	lb/MMscf	Current Permit Limit (p. 26)	
Particulate Matter < 2.5 microns ($PM_{2.5}$)	13.86	2.90	lb/MMscf	Assumed PM2.5 = 100% of PM10	
Nitrogen Oxides (NO_x)	25.24	5.28	lb/MMscf	Current Permit Limit (p. 26)	
Sulfur Dioxide (SO_2)	31.79	6.65	lb/MMscf	Current Permit Limit (p. 26)	
Carbon Monoxide (CO)	65.50	13.70	lb/MMscf	Current Permit Limit (p. 26)	
Lead (Pb)	4.99E-05	1.04E-05	lb/MMscf	Total Metal Analysis for Blast Furnace Dust Catcher (10/20/1992) + 20% compliance margin	
Greenhouse Gas Pollutants:					
Carbon Dioxide (CO_2)	275,723	28.84	tons/MMscf	USS GHG Report for 2012	
Methane (CH_4)	0.02	2.31E-06	tons/MMscf	USS GHG Report for 2012	
Nitrous Oxides (N_2O)	0.1	1.05E-05	tons/MMscf	USS GHG Report for 2012	
Carbon Dioxide Equivalent (CO_2e)*	275,755	-	-	40 CFR 98, Subpart A, Table A-1	

*GHGs are calculated in CO_2e using Global Warming Potentials (GWP) from 40 CFR 98, Subpart A, Table A-1 (74 FR 56374, Oct. 30, 2009) and the following equation:

CO_2e (tpy) = CO_2 (tpy) * CO_2 GWP (1) + CH_4 (tpy) * CH_4 GWP (21) + N_2O (tpy) * N_2O GWP (310)

R006167

Company Name:	U. S. Steel	
Facility Name:	Granite City Works	
Project Description:	CAAPP Renewal Application	
Permit Section:	Section 7.10 - Boilers - PTE	
Table E-10.2	Boiler Potential Emissions Summary	
Emission Unit	Boiler #12	
Emission Point ID	Boiler-5002	
Hours of Operation	8,760	hrs/yr
Control Device	None	
Rated Heat Input Capacity	225	MMBtu/hr
Fuel Type	Natural Gas	
Fuel Heating Value	1,020	Btu/scf
Permit Limit (Natural Gas Usage)	383,520	MMBtu/yr
Maximum Fuel Usage (Natural Gas)	376	MMscf/yr

(Scaled to PTE max based on 2013 actual data)

Pollutant	Potential Emissions (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Criteria Pollutants:					
Particulate Matter (PM)	1.43	7.6	lb/MMscf	AP-42 Table 1.4-2 (Jul-1998)	
Particulate Matter <10 microns (PM_{10})	1.43	7.6	lb/MMscf	AP-42 Table 1.4-2 (Jul-1998)	
Particulate Matter < 2.5 microns ($PM_{2.5}$)	1.43	7.6	lb/MMscf	Assumed 100% of PM_{10}	Note that the current permit uses older factors that should be revised.
Nitrogen Oxides (NO_x)	0.11	0.60	lb/MMscf	AP-42 Table 1.4-1 (Jul-1998)	
Volatile Organic Material (VOM)	18.80	100	lb/MMscf	AP-42 Table 1.4-2 (Jul-1998)	
Sulfur Dioxide (SO_2)	1.03	5.5	lb/MMscf	AP-42 Table 1.4-2 (Jul-1998)	
Carbon Monoxide (CO)	15.79	84	lb/MMscf	AP-42 Table 1.4-2 (Jul-1998)	
Lead (Pb)	9.40E-05	0.0005	lb/MMscf	AP-42 Table 1.4-2 (Jul-1998)	
Hazardous Air Pollutants:					
Organics					
Benzene	3.95E-04	2.10E-03	lb/MMscf	AP-42 Table 1.4-3 (07/98)	
Greenhouse Gas Pollutants:					
Carbon Dioxide (CO_2)	22,343	59.42	tons/MMscf	USS GHG Emissions Report Factor (2012)	
Methane (CH_4)	119	0.32	tons/MMscf	USS GHG Emissions Report Factor (2012)	
Nitrous Oxides (N_2O)	0.04	1.12E-04	tons/MMscf	USS GHG Emissions Report Factor (2012)	
Carbon Dioxide Equivalent (CO_2e)*	24,851	-	-	40 CFR 98, Subpart A, Table A-1	

*GHGs are calculated in CO_2e using Global Warming Potentials (GWP) from 40 CFR 98, Subpart A, Table A-1 (74 FR 56374, Oct. 30, 2009) and the following equation:

CO_2e (tpy) = CO_2 (tpy) * CO_2 GWP (1) + CH_4 (tpy) * CH_4 GWP (21) + N_2O (tpy) * N_2O GWP (310)

R006168

Company Name:	U. S. Steel	
Facility Name:	Granite City Works	
Project Description:	CAAPP Renewal Application	
Permit Section:	Section 7.10 - Boilers - PTE	
Table E-10.2	Boiler Potential Emissions Summary	
Emission Unit	Boiler #12	
Emission Point ID	Boiler-5002	
Hours of Operation	8,760	hrs/yr
Control Device	None	
Rated Heat Input Capacity	225	MMBtu/hr
Fuel Type	Coke Oven Gas	
Fuel Heating Value	555	Btu/scf
Permit Limit (COG Usage)	604,950	MMBtu/yr
Maximum Fuel Usage (COG)	1,090	MMscf/yr

(Scaled to PTE max based on 2013 actual data)

Pollutant	Potential Emissions (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Criteria Pollutants:					
Particulate Matter (PM)	3.38	6.2	lb/MMscf	FIRE v6.25 (1-02-007-07) - External Combustion Boiler COG	
Particulate Matter <10 microns (PM_{10})	2.37	4.35	lb/MMscf	FIRE v6.25 (1-02-007-07) - External Combustion Boiler COG	
Particulate Matter < 2.5 microns ($PM_{2.5}$)	1.75	3.219	lb/MMscf	FIRE v6.25 (1-02-007-07) - External Combustion Boiler COG	
Nitrogen Oxides (NO_x)	36.64	67.23	lb/MMscf	(25 gr H2S / 100 CF COG) * (1 lb H2S/7,000 gr H2S) * (1 mol H2S/34 lb H2S) * (1 mol SO2/1 mol H2S) * (64 lb SO2/mol SO2) * (1 ton SO2/2,000 lb SO2)	
Volatile Organic Material (VOM)	43.60	80	lb/MMscf	FIRE v6.25 (1-02-007-07) - External Combustion Boiler COG	
Sulfur Dioxide (SO_2)	0.65	1.2	lb/MMscf	FIRE v6.25 (1-02-007-07) - External Combustion Boiler COG	Calculation from Permit Condition 5.12(f) - p. 43 at permit limit of 25 gr H2S/100 cf
Carbon Monoxide (CO)	10.03	18.4	lb/MMscf	FIRE v6.25 (1-02-007-07) - External Combustion Boiler COG	
Hazardous Air Pollutants:					
Organics					
Benzene	0.15	0.27	lb/MMscf	USS COG Analysis (3/11/2011) + 20% compliance margin	
Greenhouse Gas Pollutants:					
Carbon Dioxide (CO_2)	24,705	22.66	tons/MMscf	USS GHG Emissions Report Factor (2012)	
Methane (CH_4)	0.35	3.17E-04	tons/MMscf	USS GHG Emissions Report Factor (2012)	
Nitrous Oxides (N_2O)	0.07	6.60E-05	tons/MMscf	USS GHG Emissions Report Factor (2012)	
Carbon Dioxide Equivalent (CO_2e)*	24,734	-	-	40 CFR 98, Subpart A, Table A-1	

*GHGs are calculated in CO_2e using Global Warming Potentials (GWP) from 40 CFR 98, Subpart A, Table A-1 (74 FR 56374, Oct. 30, 2009) and the following equation:

CO_2e (tpy) = CO_2 (tpy) * CO_2 GWP (1) + CH_4 (tpy) * CH_4 GWP (21) + N_2O (tpy) * N_2O GWP (310)

R006169

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.10 - Boilers - PTE

Table 6-10.2 Boiler Potential Emissions Summary

Emission Unit	Boiler #12	
Emission Point ID	Boiler-5002	
Hours of Operation	8,760	hrs/yr
Control Device	None	
Rated Heat Input Capacity	225	MMBtu/hr
Fuel Type	Blast Furnace Gas	
Fuel Heating Value	90	Btu/scf
Permit Limit (BFG Usage)	1,414,890	MMBtu/yr
Maximum Fuel Usage (BFG)	15,721	MMscf/yr

(Scaled to PTE max based on 2013 actual data)

Pollutant	Potential Emissions (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Criteria Pollutants:					
Particulate Matter (PM)	22.80	2.90	lb/MMscf	Current Permit Limit (p. 26)	
Particulate Matter <10 microns (PM_{10})	22.80	2.90	lb/MMscf	Current Permit Limit (p. 26)	
Particulate Matter < 2.5 microns ($PM_{2.5}$)	22.80	2.90	lb/MMscf	Assumed PM2.5 = 100% of PM10	
Nitrogen Oxides (NO_x)	41.50	5.28	lb/MMscf	Current Permit Limit (p. 26)	
Sulfur Dioxide (SO_2)	52.27	6.65	lb/MMscf	Current Permit Limit (p. 26)	
Carbon Monoxide (CO)	107.69	13.70	lb/MMscf	Current Permit Limit (p. 26)	
Lead (Pb)	8.21E-05	1.04E-05	lb/MMscf	Total Metal Analysis for Blast Furnace Dust Catcher (10/20/1992) + 20% compliance margin	
Greenhouse Gas Pollutants:					
Carbon Dioxide (CO_2)	453,320	28.84	tons/MMscf	USS GHG Report for 2012	
Methane (CH_4)	0.04	2.31E-06	tons/MMscf	USS GHG Report for 2012	
Nitrous Oxides (N_2O)	0.2	1.05E-05	tons/MMscf	USS GHG Report for 2012	
Carbon Dioxide Equivalent (CO_2e)*	453,372	-	-	40 CFR 98, Subpart A, Table A-1	

*GHGs are calculated in CO_2e using Global Warming Potentials (GWP) from 40 CFR 98, Subpart A, Table A-1 (74 FR 56374, Oct. 30, 2009) and the following equation:

CO_2e (tpy) = CO_2 (tpy) * CO_2 GWP (1) + CH_4 (tpy) * CH_4 GWP (21) + N_2O (tpy) * N_2O GWP (310)

R006170

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.18 - Boilers - PTE

Table E-10.3 Boiler Potential Emissions Summary

Emission Unit	Power Boiler #1 (Cogen)	
Emission Point ID	Boiler-S003	
Hours of Operation	8,760	hrs/yr
Control Device	None	
Rated Heat Input Capacity	505	MMBtu/hr
Fuel Type	Natural Gas	
Fuel Heating Value	1,020	Btu/scf
Permit Limit (Natural Gas Usage)	272,340	MMBtu/yr
Maximum Fuel Usage (Natural Gas)	267	MMscf/yr

Pollutant	Potential Emissions (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Criteria Pollutants:					
Particulate Matter (PM)	1.01	7.6	lb/MMscf	AP-42 Table 1.4-2 (Jul-1998)	
Particulate Matter <10 microns (PM_{10})	1.01	7.6	lb/MMscf	AP-42 Table 1.4-2 (Jul-1998)	
Particulate Matter < 2.5 microns ($PM_{2.5}$)	1.01	7.6	lb/MMscf	Assumed 100% of PM10.	
Nitrogen Oxides (NO_x)	0.08	0.6	lb/MMscf	AP-42 Table 1.4-1 (Jul-1998)	Note that the current permit cites older factors that should be revised.
Volatile Organic Material (VOM)	13.35	100.0	lb/MMscf	AP-42 Table 1.4-2 (Jul-1998)	
Sulfur Dioxide (SO_2)	0.73	5.5	lb/MMscf	AP-42 Table 1.4-2 (Jul-1998)	
Carbon Monoxide (CO)	11.21	84.0	lb/MMscf	AP-42 Table 1.4-2 (Jul-1998)	
Lead (Pb)	6.68E-05	5.00E-04	lb/MMscf	AP-42 Table 1.4-2 (Jul-1998)	
Hazardous Air Pollutants:					
Organics					
Benzene	2.80E-04	2.10E-03	lb/MMscf	AP-42 Table 1.4-3 (07/98)	
Greenhouse Gas Pollutants:					
Carbon Dioxide (CO_2)	15,866	59.42	tons/MMscf	USS GHG Emissions Report Factor (2012)	
Methane (CH_4)	84	0.32	tons/MMscf	USS GHG Emissions Report Factor (2012)	
Nitrous Oxides (N_2O)	0	1.12E-04	tons/MMscf	USS GHG Emissions Report Factor (2012)	
Carbon Dioxide Equivalent (CO_2e)*	17,647	-	-	40 CFR 98, Subpart A, Table A-1	

*GHGs are calculated in CO_2e using Global Warming Potentials (GWP) from 40 CFR 98, Subpart A, Table A-1 (74 FR 56374, Oct. 30, 2009) and the following equation:

CO_2e (tpy) = CO_2 (tpy) * CO_2 GWP (1) + CH_4 (tpy) * CH_4 GWP (21) + N_2O (tpy) * N_2O GWP (310)

R006171

Company Name:	U. S. Steel	
Facility Name:	Granite City Works	
Project Description:	CAAPP Renewal Application	
Permit Section:	Section 7.18 - Boilers - PTE	
Table E-10.3	Boiler Potential Emissions Summary	
Emission Unit	Power Boiler #1 (Cogen)	
Emission Point ID	Boiler-5003	
Hours of Operation	8,760	hrs/yr
Control Device	None	
Rated Heat Input Capacity	505	MMBtu/hr
Fuel Type	Blast Furnace Gas	
Fuel Heating Value	90	Btu/scf
Permit Limit (BFG Usage)	4,647,870	MMBtu/yr
Maximum Fuel Usage (BFG)	51,643	MMscf/yr

Pollutant	Potential Emissions (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Criteria Pollutants:					
Particulate Matter (PM)	74.88	2.90	lb/MMscf	Current Permit Limit (p. 26)	
Particulate Matter < 10 microns (PM_{10})	74.88	2.90	lb/MMscf	Current Permit Limit (p. 26)	
Particulate Matter < 2.5 microns ($PM_{2.5}$)	74.88	2.90	lb/MMscf	Assumed PM2.5 = 100% of PM10	
Nitrogen Oxides (NO_x)	135.34	5.28	lb/MMscf	Current Permit Limit (p. 26)	
Sulfur Dioxide (SO_2)	171.71	6.65	lb/MMscf	Current Permit Limit (p. 26)	
Carbon Monoxide (CO)	353.75	13.70	lb/MMscf	Current Permit Limit (p. 26)	
Lead (Pb)	0.01	2.49E-04	lb/MMscf	Stack Test (4/6-7/2010) + 20% compliance margin	
Greenhouse Gas Pollutants:					
Carbon Dioxide (CO_2)	1,298,034	25.13	tons/MMscf	USS GHG Emissions Report Factor (2012)	
Methane (CH_4)	0.1	2.23E-06	tons/MMscf	USS GHG Emissions Report Factor (2012)	
Nitrous Oxides (N_2O)	1	1.01E-05	tons/MMscf	USS GHG Emissions Report Factor (2012)	
Carbon Dioxide Equivalent (CO_2e)*	1,298,199	-	-	40 CFR 98, Subpart A, Table A-1	

*GHGs are calculated in CO_2e using Global Warming Potentials (GWP) from 40 CFR 98, Subpart A, Table A-1 (74 FR 56374, Oct. 30, 2009) and the following equation:

CO_2e (tpy) = CO_2 (tpy) * CO_2 GWP (1) + CH_4 (tpy) * CH_4 GWP (21) + N_2O (tpy) * N_2O GWP (310)

R006172

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.10 - Boilers - PTE

Table E-10.4 Boiler Potential Emissions Summary

Emission Unit	Portable Boilers #1 - #4	
Emission Point ID	Boiler-S004, Boiler-S005, Boiler-S006, Boiler-S007	
Hours of Operation	8,760	hrs/yr
Control Device	FGR	
Rated Heat Input Capacity (Each)	100	MMBtu/hr
Fuel Type	Natural Gas	
Fuel Heating Value	1,020	Btu/scf
Maximum Fuel Usage (Natural Gas)	812	MMscf/yr (Permit Limit for Each Boiler)

Pollutant	Potential Emissions (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Criteria Pollutants:					
Particulate Matter (PM)	3.09	7.6	lb/MMscf	AP-42 Table 1.4-2 (07/98)	
Particulate Matter <10 microns (PM_{10})	3.09	7.6	lb/MMscf	AP-42 Table 1.4-2 (07/98)	
Particulate Matter < 2.5 microns ($PM_{2.5}$)	3.09	7.6	lb/MMscf	AP-42 Table 1.4-2 (07/98)	
Nitrogen Oxides (NO_X)	12.99	32.0	lb/MMscf	AP-42 Table 1.4-1 for Small Boilers < 100 MMBtu/hr with FGR (07/98)	
Volatile Organic Material (VOM)	2.23	5.5	lb/MMscf	AP-42 Table 1.4-2 (07/98)	
Sulfur Dioxide (SO_2)	0.24	0.6	lb/MMscf	AP-42 Table 1.4-2 (07/98)	
Carbon Monoxide (CO)	34.10	84.0	lb/MMscf	AP-42 Table 1.4-1 for Small Boilers < 100 MMBtu/hr with FGR (07/98)	
Lead (Pb)	2.03E-04	5.00E-04	lb/MMscf	AP-42 Table 1.4-2 (07/98)	
Hazardous Air Pollutants:					
Organics					
Benzene	8.53E-04	2.10E-03	lb/MMscf	AP-42 Table 1.4-3 (07/98)	

R006173

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.10 - Boilers - PTE

Table E-10.4 Boiler Potential Emissions Summary

Emission Unit	Portable Boilers #1 - #4	
Emission Point ID	Boiler-S004, Boiler-S005, Boiler-S006, Boiler-S007	
Hours of Operation	8,760	hrs/yr
Control Device	FGR	
Rated Heat Input Capacity (Each)	100	MMBtu/hr
Fuel Type	Natural Gas	
Fuel Heating Value	1,020	Btu/scf
Maximum Fuel Usage (Natural Gas)	812	MMscf/yr (Permit Limit for Each Boiler)

Pollutant	Potential Emissions (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Greenhouse Gas Pollutants:					
Carbon Dioxide (CO_2)	51,197	116.89	lb/MMBtu	40 CFR 98, Subpart C, Table C-1 for Natural Gas	
Methane (CH_4)	1	2.20E-03	lb/MMBtu	40 CFR 98, Subpart C, Table C-2 for Natural Gas	
Nitrous Oxides (N_2O)	0	2.20E-04	lb/MMBtu	40 CFR 98, Subpart C, Table C-2 for Natural Gas	
Carbon Dioxide Equivalent (CO_2e)*	51,247	-	-	40 CFR 98, Subpart A, Table A-1	

$PM/PM_{10}/PM_{2.5}$, VOM, SO_2, CO, individual HAP, and total HAP. This is because the fuel usage limit per boiler (812 MMscf/yr) is greater than the combined fuel usage limit (1,738 MMscf/yr) divided by 4. Similarly, Potential Emissions Per Boiler multiplied by 4 results in emissions greater than the limit listed in Section 7.10.13.j.ii for NO_x because the NO_x limit per boiler in Section 7.10.13.k is greater than the combined NO_x limit of 31.9 tpy divided by 4. US Steel will limit natural gas usage as required by the permit.

** GHGs are calculated in CO_2e using Global Warming Potentials (GWP) from 40 CFR 98, Subpart A, Table A-1 (74 FR 56374, Oct. 30, 2009) and the following equation:

CO_2e (tpy) = CO_2 (tpy) * CO_2 GWP (1) + CH_4 (tpy) * CH_4 GWP (21) + N_2O (tpy) * N_2O GWP (310)

R006174

APPENDIX E

Section 7.11 PTE Calcs
Reciprocating Internal Combustion Engines

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.11 - Reciprocating Internal Combustion Engines (RICE) - PTE

Table E-11.0 RICE Potential Emissions Summary

Emission Unit ID	Source Type	Emission Point	Process Emission Unit(s)	CO		Lead (Pb)		NO_x		PM		PM_{10}		$PM_{2.5}$		SO_2		VOM	
				lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
RICE-5001	Stack	Engine Exhaust Stack	Emergency Engine - Diesel (3,500 hp)	1.20	5.28	--	--	4.54	19.87	0.14	0.62	0.14	0.62	0.14	0.62	0.12	0.54	0.15	0.65
RICE-5002	Stack	Engine Exhaust Stack	Emergency Diesel Pump (1 CC) - LMF	0.50	2.18	--	--	2.81	10.11	0.16	0.72	0.16	0.72	0.16	0.72	0.15	0.67	0.19	0.82
RICE-5003	Stack	Engine Exhaust Stack	Emergency Diesel Pump (1 CC) - LMF																
RICE-5004	Stack	Engine Exhaust Stack	Emergency Diesel Pump (1 CC) - LMF Cold Well																
RICE-5005	Stack	Engine Exhaust Stack	Emergency Diesel Pump (2 CC)																
RICE-5006	Stack	Engine Exhaust Stack	Emergency Diesel Compressor																
RICE-5009	Stack	Engine Exhaust Stack	Emergency Diesel Service Water Pump																
Engines	All Sources			1.70	7.46	0.00	0.00	6.84	29.98	0.31	1.34	0.31	1.34	0.31	1.34	0.87	3.80	0.32	1.39

R006176

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.11 - Reciprocating Internal Combustion Engines (RICE) - PTE

Table E-11.1 RICE Potential Emissions Summary

Process	Emergency Diesel Engines > 600 hp (1)	
Facility ID	Emergency Back-up Diesel Generator	
Emission Point ID	RICE-S001	
Hours of Operation[1]	500	hrs/yr
Control Device	None	
Power Output	3,500	hp
Maximum Fuel Input[2]	24.50	MMBtu/hr
Fuel Type	Diesel	

Pollutant	Potential Emissions (total) (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Criteria Pollutants:					
Particulate Matter (PM)	0.62	2.48	lb/hr	CAAPP 96030056, Section 7.11.6	
Particulate Matter <10 microns (PM_{10})	0.62	2.48	lb/hr	Assume = 100% of PM	
Particulate Matter < 2.5 microns ($PM_{2.5}$)	0.62	2.48	lb/hr	Assume = 100% of PM	
Nitrogen Oxides (NO_x)	19.87	79.49	lb/hr	CAAPP 96030056, Section 7.11.6	
Volatile Organic Material (VOM)	0.56	6.42E-04	lb/hp-hr	AP-42 Table 3.4-1 (10/96)	Nonmethane fraction (91%) of TOC, per AP-42 Table 3.4-1 footnote f.
Sulfur Dioxide (SO_2)	3.14	12.54	lb/hr	CAAPP 96030056, Section 7.11.6	
Carbon Monoxide (CO)	5.28	21.11	lb/hr	CAAPP 96030056, Section 7.11.6	
Hazardous Air Pollutants:					
Organics					
Benzene	4.75E-03	7.76E-04	lb/MMBtu	AP-42 Table 3.4-3 (10/96)	
Toluene	1.72E-03	2.81E-04	lb/MMBtu	AP-42 Table 3.4-3 (10/96)	
Xylene	1.18E-03	1.93E-04	lb/MMBtu	AP-42 Table 3.4-3 (10/96)	
Naphthalene	7.96E-04	1.30E-04	lb/MMBtu	AP-42 Table 3.4-3 (10/96)	
Formaldehyde	4.83E-04	7.89E-05	lb/MMBtu	AP-42 Table 3.4-3 (10/96)	
Greenhouse Gas Pollutants:					
Carbon Dioxide (CO_2)	999	163.05	lb/MMBtu	40 CFR 98 Subpart C, Table C-1	
Methane (CH_4)	0.04	0.01	lb/MMBtu	40 CFR 98 Subpart C, Table C-2	
Nitrous Oxides (N_2O)	0.01	1.32E-03	lb/MMBtu	40 CFR 98 Subpart C, Table C-2	
Carbon Dioxide Equivalent (CO_2e)[3]	1,002	-	-	40 CFR 98 Subpart A, Table A-1	

1. Hours of operation limited by CAAPP 96030056 Section 7.11.5.
2. Maximum fuel input calculated based on 7,000 Btu/hp-hr (AP-42 Table 3.3-1 footnote a).
3. GHGs are calculated in CO_2e using Global Warming Potentials (GWP) from 40 CFR 98, Subpart A, Table A-1 (74 FR 56374, Oct. 30, 2009) and the following equation:
   CO_2e (tpy) = CO_2 (tpy) * CO_2 GWP (1) + CH_4 (tpy) * CH_4 GWP (21) + N_2O (tpy) * N_2O GWP (310)

R006177

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.11 - Reciprocating Internal Combustion Engines (RICE) - EYE

Table 6-11.2 RICE Potential Emissions Summary

Process	Emergency Diesel Engines < 600 hp (6)
Facility IDs	1CC/LMF Diesel Pump (2), 1CC/LMF Diesel Pump (Cold Well), 2CC Diesel Pump, Emergency Diesel Compressor, Emergency Diesel Service Water Pump
Emission Point IDs	RICE-5002, RICE-5003, RICE-5004, RICE-5005, RICE-5006, RICE-5010

Hours of Operation (each)	100	hrs/yr
Control Device	None	
Power Output (total of all engines)	1,204	hp
Maximum Fuel Input (total)[1]	9.13	MMBtu/hr
Fuel Type	Diesel	

Pollutant	Potential Emissions (total) (tpy)	Emission Factor	Emission Factor Units	Emission Factor Source	Notes
Criteria Pollutants:					
Particulate Matter (PM)	0.72	2.20E-03	lb/hp-hr	Assumed equal to $PM_{2.5}$	
Particulate Matter <10 microns (PM_{10})	0.72	2.20E-03	lb/hp-hr	AP-42 Table 3.3-1 (10/96)	
Particulate Matter < 2.5 microns ($PM_{2.5}$)	0.72	2.20E-03	lb/hp-hr	Assumed equal to PM_{10}	
Nitrogen Oxides (NO_x)	10.11	0.03	lb/hp-hr	AP-42 Table 3.3-1 (10/96)	
Volatile Organic Material (VOM)	0.82	2.51E-03	lb/hp-hr	AP-42 Table 3.3-1 (10/96)	
Sulfur Oxide (SO_x)	0.67	2.05E-03	lb/hp-hr	AP-42 Table 3.3-1 (10/96)	
Carbon Monoxide (CO)	2.18	0.01	lb/hp-hr	AP-42 Table 3.3-1 (10/96)	
Hazardous Air Pollutants:					
Organic:					
Benzene	2.13E-03	9.33E-04	lb/MMBtu	AP-42 Table 3.3-2 (10/96)	
Toluene	9.33E-04	4.09E-04	lb/MMBtu	AP-42 Table 3.3-2 (10/96)	
Xylene	6.50E-04	2.85E-04	lb/MMBtu	AP-42 Table 3.3-2 (10/96)	
Formaldehyde	2.89E-03	1.18E-03	lb/MMBtu	AP-42 Table 3.3-2 (10/96)	
Acetaldehyde	1.75E-03	7.67E-04	lb/MMBtu	AP-42 Table 3.3-2 (10/96)	
Greenhouse Gas Pollutants:					
Carbon Dioxide (CO_2)	373	163.05	lb/MMBtu	40 CFR 98 Subpart C, Table C-1	
Methane (CH_4)	0.02	8.0E-3	lb/MMBtu	40 CFR 98 Subpart C, Table C-2	
Nitrous Oxide (N_2O)	3.02E-03	1.32E-03	lb/MMBtu	40 CFR 98 Subpart C, Table C-2	
Carbon Dioxide Equivalent (CO_2e)[2]	373	-	-	40 CFR 98 Subpart A, Table A-1	

1. Maximum fuel input calculated based on 7,000 Btu/hp-hr (AP-42 Table 3.3-1 Footnote a).
2. GHGs are calculated in CO_2e using Global Warming Potentials (GWP) from 40 CFR 98, Subpart A, Table A-1 (74 FR 56374, Oct. 30, 2009) and the following equation:
CO_2e (tpy) = CO_2 (tpy) * CO_2 GWP (1) + CH_4 (tpy) * CH_4 GWP (21) + N_2O (tpy) * N_2O GWP (310)

R006178

APPENDIX E

Section 7.12 PTE Calcs
Gasoline Tanks

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.12 - Gasoline Storage Tanks - PTE

Table E-12.0 Gasoline Tank Potential Emissions Summary

Emission Unit ID	Source Type	Emission Point	Process Emission Unit(s)	CO		Lead		NO_x		PM		PM_{10}		$PM_{2.5}$		SO_2		VOM	
				lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
TANK-S001	Stack	Working & Breathing Losses	Tank #521 - Storeroom	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.08	0.37
TANK-S002	Stack	Working & Breathing Losses	Tank #402 - Machine Shop	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.11	0.48
TANK-S003	Stack	Working & Breathing Losses	Tank #701 - WWTP	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.07	0.29
TANK-S004	Stack	Working & Breathing Losses	Tank #83 - Blast furnace	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.06	0.25
TANK-S005	Stack	Working & Breathing Losses	Tank #304	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.07	0.29
TANK-S006	Stack	Working & Breathing Losses	Tank #322	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.07	0.29
TANK-S007	Stack	Working & Breathing Losses	Tank #407 - Hot Strip Roll Shop	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.03	0.15
TANK-S008	Stack	Working & Breathing Losses	Tank #813	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.07	0.29
TANKS	All Sources			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	2.39

R006180

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.12 - Gasoline Storage Tanks - PTE

Table E-12.0 Gasoline Tank Potential Emissions Summary

Process: Gasoline Storage Tanks
Emission Unit IDs: TANK-S001, TANK-S002, TANK-S003, TANK-S004, TANK-S005, TANK-S006, TANK-S007, TANK-S008

Pollutant	Emission Point ID	Potential Working Losses Per Tank (lb/yr)	Potential Breathing Losses Per Tank (lb/yr)	Total Potential Emissions Per Tank (tpy)	Maximum Throughput Per Unit (gallons/yr)	Throughput Source	Capacity (gallons)	Notes
Criteria Pollutants:								
VOM								
Tank #521 - Storeroom	Gasoline-S001	462.66	281.70	0.37	52,000	Conservatively assume 1 turnover/week	1,000	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.
Tank #402 - Machine shop	Gasoline-S002	493.32	432.27	0.46	52,000	Conservatively assume 1 turnover/week	1,000	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.
Tank #701 - WWTP	Gasoline-S003	246.66	333.16	0.29	26,000	Conservatively assume 1 turnover/week	500	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.
Tank #B3 - Blast furnace	Gasoline-S004	493.32	-	0.25	52,000	Conservatively assume 1 turnover/week	1,000	Potential emissions assumed equal to working losses for worst-case 1,000 gallon tank (Tank #402). Tank #B3 is underground; therefore, breathing losses are not quantified.
Tank #304	Gasoline-S005	246.66	333.16	0.29	26,000	Conservatively assume 1 turnover/week	500	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.
Tank #322	Gasoline-S006	246.66	333.16	0.29	26,000	Conservatively assume 1 turnover/week	500	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.
Tank #407 - Hot Strip Roll Shop	Gasoline-S007	123.07	175.79	0.15	13,000	Conservatively assume 1 turnover/week	250	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.
Tank #813	Gasoline-S008	246.66	333.16	0.29	26,000	Conservatively assume 1 turnover/week	500	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.

R006181

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.12 - Gasoline Storage Tanks - PTE

Table E-12.0 Gasoline Tank Potential Emissions Summary

Process: Gasoline Storage Tanks
Emission Unit IDs: TANK-S001, TANK-S002, TANK-S003, TANK-S004, TANK-S005, TANK-S006, TANK-S007, TANK-S008

Pollutant	Emission Point ID	Potential Working Losses Per Tank (lb/yr)	Potential Breathing Losses Per Tank (lb/yr)	Total Potential Emissions Per Tank (tpy)	Maximum Throughput Per Unit (gallons/yr)	Throughput Source	Capacity (gallons)	Notes
Hazardous Air Pollutants:								
Hexane (-n)								
Tank #521 - Storeroom	Gasoline-S001	1.68	1.03	1.35E-03	52,000	Conservatively assume 1 turnover/week	1,000	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.
Tank #402 - Machine shop	Gasoline-S002	1.84	1.62	1.73E-03	52,000	Conservatively assume 1 turnover/week	1,000	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.
Tank #701 - WWTP	Gasoline-S003	0.92	1.25	1.09E-03	26,000	Conservatively assume 1 turnover/week	500	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.
Tank #83 - Blast furnace	Gasoline-S004	1.84	-	9.20E-04	52,000	Conservatively assume 1 turnover/week	1,000	Potential emissions assumed equal to working losses for worst-case 1,000 gallon tank (Tank #402). Tank #83 is underground, therefore, breathing losses are not quantified.
Tank #304	Gasoline-S005	0.92	1.25	1.09E-03	26,000	Conservatively assume 1 turnover/week	500	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.
Tank #322	Gasoline-S006	0.92	1.25	1.09E-03	26,000	Conservatively assume 1 turnover/week	500	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.
Tank #407 - Hot Strip Roll Shop	Gasoline-S007	0.46	0.66	5.60E-04	13,000	Conservatively assume 1 turnover/week	250	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.
Tank #813	Gasoline-S008	0.92	1.25	1.09E-03	26,000	Conservatively assume 1 turnover/week	500	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.

R006182

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.12 - Gasoline Storage Tanks - PTE

Table E-12.0 Gasoline Tank Potential Emissions Summary

Process: Gasoline Storage Tanks
Emission Unit IDs: TANK-S001, TANK-S002, TANK-S003, TANK-S004, TANK-S005, TANK-S006, TANK-S007, TANK-S008

Pollutant	Emission Point ID	Potential Working Losses Per Tank (lb/yr)	Potential Breathing Losses Per Tank (lb/yr)	Total Potential Emissions Per Tank (tpy)	Maximum Throughput Per Unit (gallons/yr)	Throughput Source	Capacity (gallons)	Notes
Benzene								
Tank #521 - Storeroom	Gasoline-S001	1.85	1.13	1.49E-03	52,000	Conservatively assume 1 turnover/week	1,000	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.
Tank #402 - Machine shop	Gasoline-S002	2.04	1.79	1.92E-03	52,000	Conservatively assume 1 turnover/week	1,000	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.
Tank #701 - WWTP	Gasoline-S003	1.02	1.38	1.20E-03	26,000	Conservatively assume 1 turnover/week	500	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.
Tank #83 - Blast furnace	Gasoline-S004	2.04	-	1.02E-03	52,000	Conservatively assume 1 turnover/week	1,000	Potential emissions assumed equal to working losses for worst-case 1,000 gallon tank (Tank #402). Tank #83 is underground; therefore, breathing losses are not quantified.
Tank #304	Gasoline-S005	1.02	1.38	1.20E-03	26,000	Conservatively assume 1 turnover/week	500	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.
Tank #322	Gasoline-S006	1.02	1.38	1.20E-03	26,000	Conservatively assume 1 turnover/week	500	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.
Tank #407 - Hot Strip Roll Shop	Gasoline-S007	0.51	0.73	6.20E-04	13,000	Conservatively assume 1 turnover/week	250	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.
Tank #813	Gasoline-S008	1.02	1.38	1.20E-03	26,000	Conservatively assume 1 turnover/week	500	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.

R006183

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.12 - Gasoline Storage Tanks : PTE

Table E-12.0 Gasoline Tank Potential Emissions Summary

Process: Gasoline Storage Tanks
Emission Unit IDs: TANK-5001, TANK-5002, TANK-5003, TANK-5004, TANK-5005, TANK-5006, TANK-5007, TANK-5008

Pollutant	Emission Point ID	Potential Working Losses Per Tank (lb/yr)	Potential Breathing Losses Per Tank (lb/yr)	Total Potential Emissions Per Tank (tpy)	Maximum Throughput Per Unit (gallons/yr)	Throughput Source	Capacity (gallons)	Notes
Toluene								
Tank #521 - Storeroom	Gasoline-5001	2.05	1.15	1.60E-03	52,000	Conservatively assume 1 turnover/week	1,000	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.
Tank #402 - Machine shop	Gasoline-5002	2.28	2.00	2.14E-03	52,000	Conservatively assume 1 turnover/week	1,000	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.
Tank #701 - WWTP	Gasoline-5003	1.14	1.54	1.34E-03	26,000	Conservatively assume 1 turnover/week	500	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.
Tank #83 - Blast furnace	Gasoline-5004	2.28	-	1.14E-03	52,000	Conservatively assume 1 turnover/week	1,000	Potential emissions assumed equal to working losses for worst-case 1,000 gallon tank (Tank #402). Tank #83 is underground; therefore, breathing losses are not quantified.
Tank #304	Gasoline-5005	1.14	1.54	1.34E-03	26,000	Conservatively assume 1 turnover/week	500	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.
Tank #322	Gasoline-5006	1.14	1.54	1.34E-03	26,000	Conservatively assume 1 turnover/week	500	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.
Tank #407 - Hot Strip Roll Shop	Gasoline-5007	0.57	0.81	6.90E-04	13,000	Conservatively assume 1 turnover/week	250	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.
Tank #813	Gasoline-5008	1.14	1.54	1.34E-03	26,000	Conservatively assume 1 turnover/week	500	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.

R006184

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.12 - Gasoline Storage Tanks - PTE

Table E-12.0 Gasoline Tank Potential Emissions Summary

Process: Gasoline Storage Tanks
Emission Unit IDs: TANK-S001, TANK-S002, TANK-S003, TANK-S004, TANK-S005, TANK-S006, TANK-S007, TANK-S008

Pollutant	Emission Point ID	Potential Working Losses Per Tank (lb/yr)	Potential Breathing Losses Per Tank (lb/yr)	Total Potential Emissions Per Tank (tpy)	Maximum Throughput Per Unit (gallons/yr)	Throughput Source	Capacity (gallons)	Notes
Ethylbenzene								
Tank #521 - Storeroom	Gasoline-S001	0.14	0.08	1.10E-04	52,000	Conservatively assume 1 turnover/week	1,000	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.
Tank #402 - Machine shop	Gasoline-S002	0.15	0.13	1.40E-04	52,000	Conservatively assume 1 turnover/week	1,000	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.
Tank #701 - WWTP	Gasoline-S003	0.08	0.10	9.00E-05	26,000	Conservatively assume 1 turnover/week	500	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.
Tank #83 - Blast furnace	Gasoline-S004	0.15	-	7.50E-05	52,000	Conservatively assume 1 turnover/week	1,000	Potential emissions assumed equal to working losses for worst-case 1,000 gallon tank (Tank #402). Tank #83 is underground; therefore, breathing losses are not quantified.
Tank #304	Gasoline-S005	0.08	0.10	9.00E-05	26,000	Conservatively assume 1 turnover/week	500	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.
Tank #322	Gasoline-S006	0.08	0.10	9.00E-05	26,000	Conservatively assume 1 turnover/week	500	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.
Tank #407 - Hot Strip Roll Shop	Gasoline-S007	0.04	0.05	4.50E-05	13,000	Conservatively assume 1 turnover/week	250	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.
Tank #813	Gasoline-S008	0.08	0.10	9.00E-05	26,000	Conservatively assume 1 turnover/week	500	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.

R006185

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.12 - Gasoline Storage Tanks - PTE

Table E-12.0 Gasoline Tank Potential Emissions Summary

Process: Gasoline Storage Tanks
Emission Unit IDs: TANK-S001, TANK-S002, TANK-S003, TANK-S004, TANK-S005, TANK-S006, TANK-S007, TANK-S008

Pollutant	Emission Point ID	Potential Working Losses Per Tank (lb/yr)	Potential Breathing Losses Per Tank (lb/yr)	Total Potential Emissions Per Tank (tpy)	Maximum Throughput Per Unit (gallons/yr)	Throughput Source	Capacity (gallons)	Notes
Xylene (-m)								
Tank #521 - Storeroom	Gasoline-S001	0.56	0.34	4.50E-04	52,000	Conservatively assume 1 turnover/week	1,000	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.
Tank #402 - Machine shop	Gasoline-S002	0.64	0.56	6.00E-04	52,000	Conservatively assume 1 turnover/week	1,000	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.
Tank #701 - WWTP	Gasoline-S003	0.32	0.43	3.75E-04	26,000	Conservatively assume 1 turnover/week	500	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.
Tank #83 - Blast furnace	Gasoline-S004	0.64	-	3.20E-04	52,000	Conservatively assume 1 turnover/week	1,000	Potential emissions assumed equal to working losses for worst-case 1,000 gallon tank (Tank #402). Tank #83 is underground; therefore, breathing losses are not quantified.
Tank #304	Gasoline-S005	0.32	0.43	3.75E-04	26,000	Conservatively assume 1 turnover/week	500	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.
Tank #322	Gasoline-S006	0.32	0.43	3.75E-04	26,000	Conservatively assume 1 turnover/week	500	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.
Tank #407 - Hot Strip Rod Shop	Gasoline-S007	0.16	0.23	1.95E-04	13,000	Conservatively assume 1 turnover/week	250	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.
Tank #813	Gasoline-S008	0.32	0.43	3.75E-04	26,000	Conservatively assume 1 turnover/week	500	Potential emissions calculated with TANKS 4.0.9.d. RVP 15 Gasoline used as worst-case.

R006186

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Insignificant Activities

Table E-12.2

Non-Gasoline Tank Potential Emissions Summary

Process

Methanol and Diesel Storage Tanks

Pollutant	Annual Emissions (tpy)	Annual Emissions (lbs/yr)	Annual Throughput (gallons/yr)	Throughput Source	Calculation Method
Criteria Pollutants:					
VOM					
Tank # 130 - Methanol	0.00	0.00	0	2012 Actuals	TANKS 4.09d
Tank # 179 - Methanol	0.00	0.00	0	2012 Actuals	TANKS 4.09d
Tank # 189 - Methanol	0.00	0.00	0	2012 Actuals	TANKS 4.09d
Tank # 403 - Methanol	0.01	29.14	1,945	2012 Actuals	TANKS 4.09d
Tank # 427 - Methanol	0.03	53.46	2,784	2012 Actuals	TANKS 4.09d
A-BF-01: (West of Coke Battery) Diesel - Kiesel BF-5	4.19E-03	8.37	204,771	2012 Actuals	TANKS 4.09d
A-BF-12: (Ore Yard) Diesel - Kiesel STRT Sweeper Tank #2 is	6.95E-04	1.39	98,235	2012 Actuals	TANKS 4.09d
A-BF-44: (West of Carpenter Shop) Diesel - Kiesel BF-8	4.33E-03	8.65	256,641	2012 Actuals	TANKS 4.09d
A-CP-11: (EQC Car Track) Diesel - Kiesel Area 308	1.37E-03	2.73	95,468	2012 Actuals	TANKS 4.09d
A-CP-20: (Coal Handling Area) Diesel - Kiesel BF-2	0.01	17.69	493,217	2012 Actuals	TANKS 4.09d
A-LF-01: (Landfill) Diesel	2.55E-04	0.51	13,956	2012 Actuals	TANKS 4.09d
A-NP-11: (Southeat of Paint Line Bldg Lean To and Track No. 62 1/2) Diesel - Kiesel Yard Maintenance	1.01E-03	2.01	71,752	2012 Actuals	TANKS 4.09d
A-NP-12: (Southeast of Paint Line Bldg Lean to and Track No. 62 1/2) Diesel - Kiesel North Plant YMB-5 Bio D	6.00E-04	1.20	21,660	2012 Actuals	TANKS 4.09d
A-RD-01: (River Dock) Diesel	1.30E-04	0.26	1,491	2012 Actuals	TANKS 4.09d
A-SW-24: (East of Old Steel Works Garage) Diesel - Kiesel Coil Truck Tank	1.80E-04	0.36	9,624	2012 Actuals	TANKS 4.09d
A-SW-25: (East of Car Wash Facility) Diesel - Kiesel Crane Tank	7.45E-04	1.49	59,508	2012 Actuals	TANKS 4.09d
A-WWTP-09: (WWTP Between Aeration Basins and Pump Station) Diesel	3.35E-04	0.67	4,587	2012 Actuals	TANKS 4.09d

R006187

APPENDIX E

Section 7.13 PTE Calcs
Fugitive Dust

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.33 - Finishing - PTE

Table E-13.0 Fugitive Dust Potential Emissions Summary

Emission Unit ID	Source Type	Emission Point	Process Emission Unit(s)	CO		Lead		NO_2		PM		PM_{10}		$PM_{2.5}$		SO_2		VOM	
				lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Dust-F001	Fugitive	Landfill	Fugitive Dust	--	--	Neg.	Neg.	--	--	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	--	--	--	--
Dust-F002	Fugitive	Traffic on roadways	Fugitive Dust	--	--	--	--	--	--	7.67	33.60	2.04	8.93	0.20	0.90	--	--	--	--
Dust-F003	Fugitive	Parking lots	Fugitive Dust	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dust-F004	Fugitive	Unloading operations	Fugitive Dust	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dust-F005	Fugitive	Storage piles	Fugitive Dust	--	--	--	--	--	--	2.48	10.92	0.86	3.76	0.00	0.00	--	--	--	--
Dust-F006	Fugitive	Beaching Areas	Fugitive Dust	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fugitive Dust	All Sources			0.00	0.00	0.00	0.00	0.00	0.00	10.15	44.52	2.90	12.70	0.20	0.90	0.00	0.00	0.00	0.00

R006189

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.13 - Fugitive Dust - PTE

Table E-13.1 Fugitive Dust Potential Emissions Summary

Process Landfill
Emission Point ID Dust-F001

Pollutant	Emission Point ID	Potential Emissions Per Unit (tpy)	Maximum Throughput Per Unit (tpy)
PM			
Landfill	Dust-F001	Emissions are negligible.	
PM_{10}			
Landfill	Dust-F001	Emissions are negligible.	
$PM_{2.5}$			
Landfill	Dust-F001	Emissions are negligible.	

R006190

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.13 - Fugitive Dust - PTE

Table E-13.2 Fugitive Dust Potential Emissions Summary

Process: Plant Roadways
Emission Unit ID: DUST-R002

Pollutant	Potential Emissions (tpy)	Notes
PM		
Roadways	33.60	See calculations below. VMT based on 2012 actuals scaled to maximum production rates.
PM_{10}		
Roadways	8.93	
$PM_{2.5}$		
Roadways	0.90	

Paved Roads

PM

Vehicle Type	k	si	W	E (lb/VMT)	Road Traffic (VMT/yr) A	Uncontrolled Emissions (lb/yr) B	Uncontrolled Emissions (ton/yr) C	Control Efficiency (%) D	Controlled Emissions (ton/yr) E	Controlled Emissions (lb/hr) F
CAT Dump YM10 (Loaded)	0.011	0.30	80	0.32	9,618	3,105	1.55	97.45	0.040	0.009
CAT Dump YM10 (Unloaded)	0.011	0.30	40	0.16	9,618	1,551	0.77	97.45	0.020	0.004
Highlift (Loaded) - iron	0.011	0.30	67	0.27	7,725	2,091	1.04	97.45	0.027	0.006
Highlift (Unloaded) - iron	0.011	0.30	54	0.22	7,725	1,670	0.84	97.45	0.021	0.005
Highlift (Loaded) - iron	0.011	0.30	67	0.27	5,151	1,388	0.69	97.45	0.018	0.004
Highlift (Unloaded) - iron	0.011	0.30	54	0.22	5,151	1,113	0.56	97.45	0.014	0.003
Loader (Loaded)- iron	0.011	0.30	67	0.27	5,504	1,483	0.74	97.45	0.019	0.004
Loader (Unloaded) - iron	0.011	0.30	54	0.22	5,504	1,190	0.59	97.45	0.015	0.003
CAT Dump YM56 (Loaded) -iron	0.011	0.30	122.5	0.50	5,151	2,568	1.28	97.45	0.033	0.007
CAT Dump YM56 (Unloaded) - iron	0.011	0.30	83	0.34	5,151	1,726	0.86	97.45	0.022	0.005
Light Duty Gasoline 81 vehicles	0.011	0.30	2	0.01	2,871	22	0.01	97.45	0.000	0.000
Heavy Duty Diesel 45 Vehicles	0.011	0.30	15	0.06	1,595	93	0.05	97.45	0.001	0.000
CAT Dump YM56 (Loaded)	0.011	0.30	122.5	0.50	7,436	3,707	1.85	97.45	0.047	0.011
CAT Dump YM56 (Unloaded)	0.011	0.30	83	0.34	7,436	2,492	1.25	97.45	0.032	0.007
Total					85,635	24,167	12.08		0.308	0.070

TOTAL PM (PAVED/UNPAVED)

Controlled Emissions (ton/yr)	Controlled Emissions (lb/yr)	Controlled Emissions (lb/hr)
33.60	67,195.40	7.65

R006191

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.13 - Fugitive Dust - PTE

Table E-13.2 Fugitive Dust Potential Emissions Summary

Process: Plant Roadways
Emission Unit ID: DUST-F002

PM10

Vehicle Type	k	sL	W	E (lb/VMT)	Road Traffic (VMT/yr) A	Uncontrolled Emissions (lb/yr) B	Uncontrolled Emissions (ton/yr) C	Control Efficiency (%) D	Controlled Emissions (ton/yr) E	Controlled Emissions (lb/hr) F
CAT Dump YM10 (Loaded)	0.0022	0.30	80	0.065	9,618	621	0.31	97.45	0.008	0.002
CAT Dump YM10 (Unloaded)	0.0022	0.30	40	0.032	9,618	308	0.15	97.45	0.004	0.001
Highlift (Loaded) - iron	0.0022	0.30	67	0.054	7,725	416	0.21	97.45	0.005	0.001
Highlift (Unloaded) - iron	0.0022	0.30	54	0.043	7,725	334	0.17	97.45	0.004	0.001
Highlift (Loaded) - iron	0.0022	0.30	67	0.054	5,151	278	0.14	97.45	0.004	0.001
Highlift (Unloaded) - iron	0.0022	0.30	54	0.043	5,151	223	0.11	97.45	0.003	0.001
Loader (Loaded)- iron	0.0022	0.30	67	0.054	5,504	297	0.15	97.45	0.004	0.001
Loader (Unloaded) - iron	0.0022	0.30	54	0.043	5,504	238	0.12	97.45	0.003	0.001
CAT Dump YM56 (Loaded) -iron	0.0022	0.30	122.5	0.100	5,151	514	0.26	97.45	0.007	0.001
CAT Dump YM56 (Unloaded) - iron	0.0022	0.30	83	0.067	5,151	345	0.17	97.45	0.004	0.001
Light Duty Gasoline 81 vehicles	0.0022	0.30	2	0.001	2,871	4	0.00	97.45	0.000	0.000
Heavy Duty Diesel 45 Vehicles	0.0022	0.30	15	0.012	1,595	19	0.01	97.45	0.000	0.000
CAT Dump YM56 (Loaded)	0.0022	0.30	122.5	0.100	7,436	741	0.37	97.45	0.009	0.002
CAT Dump YM56 (Unloaded)	0.0022	0.30	83	0.067	7,436	498	0.25	97.45	0.006	0.001
Total					85,635	4,833	2.42		0.062	0.014

TOTAL PM10 (PAVED/UNPAVED)

Controlled Emissions (ton/yr)	Controlled Emissions (lb/yr)	Controlled Emissions (lb/hr)
8.93	17,866.26	2.03

PM2.5

Vehicle Type	k	sL	W	E (lb/VMT)	Road Traffic (VMT/yr) A	Uncontrolled Emissions (lb/yr) B	Uncontrolled Emissions (ton/yr) C	Control Efficiency (%) D	Controlled Emissions (ton/yr) E	Controlled Emissions (lb/hr) F
CAT Dump YM10 (Loaded)	0.00054	0.30	80	0.016	9,618	152	0.08	97.45	0.0019	0.0004
CAT Dump YM10 (Unloaded)	0.00054	0.30	40	0.008	9,618	75	0.04	97.45	0.0010	0.0002
Highlift (Loaded) - iron	0.00054	0.30	67	0.013	7,725	102	0.05	97.45	0.0013	0.0003
Highlift (Unloaded) - iron	0.00054	0.30	54	0.011	7,725	82	0.04	97.45	0.0010	0.0002
Highlift (Loaded) - iron	0.00054	0.30	67	0.013	5,151	68	0.03	97.45	0.0009	0.0002
Highlift (Unloaded) - iron	0.00054	0.30	54	0.011	5,151	55	0.03	97.45	0.0007	0.0002
Loader (Loaded)- iron	0.00054	0.30	67	0.013	5,504	73	0.04	97.45	0.0009	0.0002
Loader (Unloaded) - iron	0.00054	0.30	54	0.011	5,504	58	0.03	97.45	0.0007	0.0002
CAT Dump YM56 (Loaded) -iron	0.00054	0.30	122.5	0.024	5,151	126	0.06	97.45	0.0016	0.0004
CAT Dump YM56 (Unloaded) - iron	0.00054	0.30	83	0.016	5,151	85	0.04	97.45	0.0011	0.0002
Light Duty Gasoline 81 vehicles	0.00054	0.30	2	0.000	2,871	1	0.00	97.45	0.0000	0.0000
Heavy Duty Diesel 45 Vehicles	0.00054	0.30	15	0.003	1,595	5	0.00	97.45	0.0001	0.0000
CAT Dump YM56 (Loaded)	0.00054	0.30	122.5	0.024	7,436	182	0.09	97.45	0.0023	0.0005
CAT Dump YM56 (Unloaded)	0.00054	0.30	83	0.016	7,436	122	0.06	97.45	0.0016	0.0004
Total					85,635	1,188	0.59		0.0151	0.0034

TOTAL PM2.5 (PAVED/UNPAVED)

Controlled Emissions (ton/yr)	Controlled Emissions (lb/yr)	Controlled Emissions (lb/hr)
0.90	1,794.96	0.20

R006192

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.13 - Fugitive Dust - PTE

Table E-13.7 Fugitive Dust Potential Emissions Summary

Process: Plant Roadways
Emission Unit ID: DUST-F002
Unpaved Roads
PM

Vehicle Type	k	s	W	a	b	E (lb/VMT)	Road Traffic (VMT/yr) A	Uncontrolled Emissions (lb/yr) B	Uncontrolled Emissions (ton/yr) C	Control Efficiency (%) D	Controlled Emissions (ton/yr) E	Controlled Emissions (lb/hr) F
Slagaway Haulers (Loaded) 3 Haulers	4.9	6	210	0.7	0.45	20.41	448	9,142	4.57	97.83	0.10	0.02
Slagaway Haulers (Unloaded) 3 Haulers	4.9	6	70	0.7	0.45	12.45	448	5,576	2.79	97.83	0.06	0.01
CAT Dump YM10 (Loaded)	4.9	6	80	0.7	0.45	13.22	9,240	122,137	61.07	97.83	1.33	0.30
CAT Dump YM10 (Unloaded)	4.9	6	40	0.7	0.45	9.68	9,240	89,409	44.70	97.83	0.97	0.22
Highlift (Loaded) - iron	4.9	6	67	0.7	0.45	12.20	19,868	242,470	121.24	97.83	2.63	0.60
Highlift (Unloaded) - iron	4.9	6	54	0.7	0.45	11.08	19,868	220,040	110.02	97.83	2.39	0.54
Highlift (Loaded) - iron	4.9	6	67	0.7	0.45	12.20	13,246	161,653	80.83	97.83	1.75	0.40
Highlift (Unloaded) - iron	4.9	6	54	0.7	0.45	11.08	13,246	146,699	73.35	97.83	1.59	0.36
Loader (Loaded)- iron	4.9	6	67	0.7	0.45	12.20	14,152	172,707	86.35	97.83	1.87	0.43
Loader (Unloaded) - iron	4.9	6	54	0.7	0.45	11.08	14,152	156,731	78.37	97.83	1.70	0.39
CAT Dump YM56 (Loaded) -iron	4.9	6	122.5	0.7	0.45	16.01	13,246	212,085	106.04	97.83	2.30	0.52
CAT Dump YM56 (Unloaded) - iron	4.9	6	83	0.7	0.45	13.44	13,246	178,006	89.00	97.83	1.93	0.44
CAT Dump YM56 (Loaded)	4.9	6	122.5	0.7	0.45	16.01	7,144	114,393	57.20	97.83	1.24	0.28
CAT Dump YM56 (Unloaded)	4.9	6	83	0.7	0.45	13.44	7,144	96,011	48.01	97.83	1.04	0.24
Light Duty Gasoline 81 vehicles	4.9	6	2	0.7	0.45	2.51	4,790	12,039	6.02	97.83	0.13	0.03
Heavy Duty Diesel 45 Vehicles	4.9	6	15	0.7	0.45	6.22	2,661	16,561	8.28	97.83	0.18	0.04
Kress Carriers (Loaded) 5 Kress	4.9	6	320	0.7	0.45	24.67	26,041	642,307	321.15	97.83	6.97	1.59
Kress Carriers (Unloaded) 5 Kress	4.9	6	160	0.7	0.45	18.06	26,041	470,196	235.10	97.83	5.10	1.16
Total:							214,221	3,068,168	1,534		33.29	7.58

R006193

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.13 - Fugitive Dust - PTE

Table E-13.2 Fugitive Dust Potential Emissions Summary

Process: Plant Roadways
Emission Unit ID: DUST-F002
PM10

Vehicle Type	k	s	W	a	b	E (lb/VMT)	Road Traffic (VMT/yr) A	Uncontrolled Emissions (lb/yr) B	Uncontrolled Emissions (ton/yr) C	Control Efficiency (%) D	Controlled Emissions (ton/yr) E	Controlled Emissions (lb/hr) F
Slagaway Haulers (Loaded) 3 Haulers	1.5	6	210	0.9	0.45	5.44	448	2,436	1.22	97.83	0.03	0.01
Slagaway Haulers (Unloaded) 3 Haulers	1.5	6	70	0.9	0.45	3.32	448	1,486	0.74	97.83	0.02	0.00
CAT Dump YM10 (Loaded)	1.5	6	80	0.9	0.45	3.53	9,240	32,549	16.27	97.83	0.35	0.08
CAT Dump YM10 (Unloaded)	1.5	6	40	0.9	0.45	2.58	9,240	23,827	11.91	97.83	0.26	0.06
Highlift (Loaded) - iron	1.5	6	67	0.9	0.45	3.25	19,868	64,617	32.31	97.83	0.70	0.16
Highlift (Unloaded) - iron	1.5	6	54	0.9	0.45	2.95	19,868	58,640	29.32	97.83	0.64	0.14
Highlift (Loaded) - iron	1.5	6	67	0.9	0.45	3.25	13,246	43,080	21.54	97.83	0.47	0.11
Highlift (Unloaded) - iron	1.5	6	54	0.9	0.45	2.95	13,246	39,094	19.55	97.83	0.42	0.10
Loader (Loaded) - iron	1.5	6	67	0.9	0.45	3.25	14,152	46,026	23.01	97.83	0.50	0.11
Loader (Unloaded) - iron	1.5	6	54	0.9	0.45	2.95	14,152	41,768	20.88	97.83	0.45	0.10
CAT Dump YM56 (Loaded) -iron	1.5	6	172.5	0.9	0.45	4.27	13,246	56,520	28.26	97.83	0.61	0.14
CAT Dump YM56 (Unloaded) - iron	1.5	6	83	0.9	0.45	3.58	13,246	47,438	23.72	97.83	0.51	0.12
CAT Dump YM56 (Loaded)	1.5	6	122.5	0.9	0.45	4.27	7,144	30,485	15.24	97.83	0.33	0.08
CAT Dump YM56 (Unloaded)	1.5	6	83	0.9	0.45	3.58	7,144	25,587	12.79	97.83	0.28	0.06
Light Duty Gasoline 81 vehicles	1.5	6	3	0.9	0.45	0.57	4,790	3,208	1.60	97.83	0.03	0.01
Heavy Duty Diesel 45 Vehicles	1.5	6	15	0.9	0.45	1.66	2,661	4,413	2.21	97.83	0.05	0.01
Kress Carriers (Loaded) 5 Kress	1.5	6	320	0.9	0.45	6.57	26,041	171,172	85.59	97.83	1.86	0.42
Kress Carriers (Unloaded) 5 Kress	1.5	6	160	0.9	0.45	4.81	26,041	125,305	62.65	97.83	1.36	0.31
Total							234,221	817,650	409		8.87	2.02

R006194

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.13 - Fugitive Dust - PTE

Table E-13.2 Fugitive Dust Potential Emissions Summary

Process: Plant Roadways
Emission Unit ID: DUST-F002

PM2.5

Vehicle Type	k	s	W	a	b	E (lb/VMT)	Road Traffic (VMT/yr) A	Uncontrolled Emissions (lb/yr) B	Uncontrolled Emissions (ton/yr) C	Control Efficiency (%) D	Controlled Emissions (ton/yr) E	Controlled Emissions (lb/hr) F
Slagaway Haulers (Loaded) 3 Haulers	0.15	6	210	0.9	0.45	0.54	448	244	0.12	97.83	0.003	0.001
Slagaway Haulers (Unloaded) 3 Haulers	0.15	6	70	0.9	0.45	0.33	448	149	0.07	97.83	0.002	0.000
CAT Dump YM10 (Loaded)	0.15	6	80	0.9	0.45	0.35	9,240	3,255	1.63	97.83	0.035	0.008
CAT Dump YM10 (Unloaded)	0.15	6	40	0.9	0.45	0.26	9,240	2,383	1.19	97.83	0.026	0.006
Highlift (Loaded) - Iron	0.15	6	67	0.9	0.45	0.38	19,868	6,462	3.23	97.83	0.070	0.016
Highlift (Unloaded) - Iron	0.15	6	54	0.9	0.45	0.30	19,868	5,864	2.93	97.83	0.064	0.014
Highlift (Loaded) - Iron	0.15	6	67	0.9	0.45	0.33	13,246	4,308	2.15	97.83	0.047	0.011
Highlift (Unloaded) - Iron	0.15	6	54	0.9	0.45	0.30	13,246	3,909	1.95	97.83	0.042	0.010
Loader (Loaded)- Iron	0.15	6	67	0.9	0.45	0.33	14,152	4,603	2.30	97.83	0.050	0.011
Loader (Unloaded) - Iron	0.15	6	54	0.9	0.45	0.30	14,152	4,177	2.09	97.83	0.045	0.010
CAT Dump YM56 (Loaded) -Iron	0.15	6	122.5	0.9	0.45	0.43	13,246	5,652	2.83	97.83	0.061	0.014
CAT Dump YM56 (Unloaded) - Iron	0.15	6	63	0.9	0.45	0.36	13,246	4,744	2.37	97.83	0.051	0.012
CAT Dump YM56 (Loaded)	0.15	6	122.5	0.9	0.45	0.43	7,144	3,049	1.52	97.83	0.033	0.008
CAT Dump YM56 (Unloaded)	0.15	6	63	0.9	0.45	0.36	7,144	2,559	1.28	97.83	0.028	0.006
Light Duty Gasoline 81 vehicles	0.15	6	3	0.9	0.45	0.07	4,790	321	0.16	97.83	0.003	0.001
Heavy Duty Diesel 45 Vehicles	0.15	6	15	0.9	0.45	0.00	2,661	0	0.00	97.83	0.000	0.000
Kress Carriers (Loaded) 5 Kress	0.15	6	320	0.9	0.45	0.66	26,041	17,117	8.56	97.83	0.186	0.042
Kress Carriers (Unloaded) 5 Kress	0.15	6	160	0.9	0.45	0.48	26,041	12,589	6.27	97.83	0.136	0.031
Total							214,221	81,524	41		0.882	0.201

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

$E = k (sL)^{0.91} (W)^{1.02}$, where: E = particulate emission factor (lb/VMT)
k = base emission factor for particle size range. From Table 13.2.1-1, the base EFs are 0.011 lb/VMT (PM), 0.0022 lb/VMT (PM10), and 0.00054 lb/VMT (PM2.5).
sL = road surface silt loading (g/m^2), value obtained from AP-42 Background Information Document.
W = average weight (tons) of the vehicles traveling the road

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

$E = k (s/12)^a (W/3)^b$, where: E = particulate emission factor (lb/VMT)
k, a, b = empirical constants from Table 13.2.2-2
s = silt content of road surface material (%)
W = mean vehicle weight (ton)

A: Slagaway Haulers and Euclid Trucks travel on road that is paved and unpaved in areas; 0.125 mile is paved/controlled, 0.075 mile is unpaved/uncontrolled, and 0.415 mile is unpaved/controlled.
B = (Particulate Emission Factor E) * A
C = B / (2000 lb/ton)
D: Control efficiency attributed to sweeping and chemical suppression.
E = C * ((100 - D) / 100)
F = E * 2000 lb/ton / 8760 hr/yr

R006195

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.13 - Fugitive Dust - PTE

Table E-13.3 Fugitive Dust Potential Emissions Summary

Process Parking Lots
Emission Unit ID Dust-F003

Pollutant	Potential Emissions (tpy)	Notes
Criteria Pollutants:		
PM		
Parking Lots	--	Included with Roadways
PM_{10}		
Parking Lots	--	Included with Roadways
$PM_{2.5}$		
Parking Lots	--	Included with Roadways

R006196

Company Name:	U. S. Steel
Facility Name:	Granite City Works
Project Description:	CAAPP Renewal Application
Permit Section:	Section 7.13 - Fugitive Dust - PTE

Table E-13.4 Fugitive Dust Potential Emissions Summary

Process	Unloading Operations
Emission Point ID	Dust-F004

Pollutant	Emission Point ID	Potential Emissions Per Unit (tpy)	Maximum Throughput Per Unit (tpy)
Criteria Pollutants:			
PM			
Unloading Operations	Dust-F004	Emissions are accounted for in material handling section.	
PM_{10}			
Unloading Operations	Dust-F004	Emissions are accounted for in material handling section.	
$PM_{2.5}$			
Unloading Operations	Dust-F004	Emissions are accounted for in material handling section.	

R006197

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.13 - Fugitive Dust - PTE

Table E-13.S Fugitive Dust Potential Emissions Summary

Process: Fugitive Dust
Area: Storage Piles
Emission Unit ID: Dust-F005

Pollutant	Emission Point ID	Potential Emissions Per Unit (tpy)	Notes
Criteria Pollutants:			
PM			
Coal Storage Piles	Handling-F001	7.55	See Calculations Below for Pile Erosion Emissions.
Blast Furnace Area Piles	Dust-F005	10.92	See Calculations Below for Pile Erosion Emissions.
PM_{10}			
Coal Storage Piles	Handling-F001	2.60	See Calculations Below for Pile Erosion Emissions.
Blast Furnace Area Piles	Dust-F005	3.76	See Calculations Below for Pile Erosion Emissions.
$PM_{2.5}$			
Coal Storage Piles	Handling-F001	0.00	See Calculations Below for Pile Erosion Emissions.
Blast Furnace Area Piles	Dust-F005	0.00	See Calculations Below for Pile Erosion Emissions.

R006198

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.13 - Fugitive Dust - PTE

Table E-13.5 Fugitive Dust Potential Emissions Summary

Process: Fugitive Dust
Area: Storage Piles
Emission Unit ID: Dust-F005

Storage Pile Material	Pile Size (acre)	Max Pile Height (m)	Max Pile Base Area (m^2)	Pile Radius (m)	Max Pile Surface Area (m^2)	PM Emission Factor Annual (g/m^2)	PM_{10} Emission Factor Annual (g/m^2)	$PM_{2.5}$ Emission Factor Annual (g/m^2)	PM Emissions (tpy)	PM_{10} Emissions (tpy)	$PM_{2.5}$ Emissions (tpy)
Coke	2.6	16.46	10,522	57.87	10,939	139.36	48.03	0.00	1.68	0.58	0.00
Pellet Fines	0.4	16.46	1,619	22.70	1,999	139.36	48.03	0.00	0.31	0.11	0.00
Pellets	1.18	16.46	4,775	38.99	5,183	139.36	48.03	0.00	0.80	0.27	0.00
pellets	1.82	16.46	7,365	48.42	7,779	139.36	48.03	0.00	1.19	0.41	0.00
Coke (emergency)	0.05	16.46	202	8.03	462	139.36	48.03	0.00	0.07	0.02	0.00
Coke (emergency)	0.07	16.46	283	9.50	567	139.36	48.03	0.00	0.09	0.03	0.00
B Scrap (sterling)	0.7	16.46	2,833	30.03	3,230	139.36	48.03	0.00	0.50	0.17	0.00
Dolomite	0.22	16.46	890	16.83	1,245	139.36	48.03	0.00	0.19	0.07	0.00
Nut Coke	0.27	16.46	1,093	18.65	1,457	139.36	48.03	0.00	0.22	0.08	0.00
Gravel	0.21	16.46	850	16.45	1,202	139.36	48.03	0.00	0.18	0.06	0.00
Oversized Nut Coke	0.26	16.46	1,052	18.30	1,415	139.36	48.03	0.00	0.22	0.07	0.00
1/2x4 BF fines (large)	0.18	16.46	728	15.23	1,073	139.36	48.03	0.00	0.16	0.06	0.00
1/4x1/2 BF Fines (small)	0.15	16.46	607	13.90	941	139.36	48.03	0.00	0.14	0.05	0.00
Calcite	0.25	16.46	1,012	17.95	1,373	139.36	48.03	0.00	0.21	0.07	0.00
Large Slag Ballast	0.22	16.46	890	16.83	1,245	139.36	48.03	0.00	0.19	0.07	0.00
Coke	1.35	16.46	5,463	41.70	5,873	139.36	48.03	0.00	0.90	0.31	0.00
Coke	1.35	16.46	5,463	41.70	5,873	139.36	48.03	0.00	0.90	0.31	0.00
Coke	1.35	16.46	5,463	41.70	5,873	139.36	48.03	0.00	0.90	0.31	0.00
Coke	1.35	16.46	5,463	41.70	5,873	139.36	48.03	0.00	0.90	0.31	0.00
Coke	1.35	16.46	5,463	41.70	5,873	139.36	48.03	0.00	0.90	0.31	0.00
4x8 Pit Scrap	0.31	16.46	1,255	19.98	1,625	139.36	48.03	0.00	0.25	0.09	0.00
Coal Pile #1	1.45	13.72	5,853	43.16	6,141	139.36	48.03	0.00	0.94	0.33	0.00
Coal Pile #2	1.45	13.72	5,853	43.16	6,141	139.36	48.03	0.00	0.94	0.33	0.00
Coal Pile #3	1.45	13.72	5,853	43.16	6,141	139.36	48.03	0.00	0.94	0.33	0.00
Coal Pile #4	1.45	13.72	5,853	43.16	6,141	139.36	48.03	0.00	0.94	0.33	0.00
Coal Pile #5	1.45	13.72	5,853	43.16	6,141	139.36	48.03	0.00	0.94	0.33	0.00
Coal Pile #6	1.45	13.72	5,853	43.16	6,141	139.36	48.03	0.00	0.94	0.33	0.00
Coal Pile #7	1.45	13.72	5,853	43.16	6,141	139.36	48.03	0.00	0.94	0.33	0.00
Coal Pile #8	1.45	13.72	5,853	43.16	6,141	139.36	48.03	0.00	0.94	0.33	0.00

1. Emission factors derived from AP-42, Section 13.2.5.3, Equation 3

R006199

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.13 - Fugitive Dust - PTE

Table E-13.6 Fugitive Dust Potential Emissions Summary

Process: Beaching Areas
Emission Point ID: Dust-F006

Pollutant	Emission Point ID	Potential Emissions Per Unit (tpy)	Maximum Throughput Per Unit (tpy)
Criteria Pollutants:			
PM			
Landfill	Dust-F006	Emissions are accounted for elsewhere.	
PM_{10}			
Landfill	Dust-F006	Emissions are accounted for elsewhere.	
$PM_{2.5}$			
Landfill	Dust-F006	Emissions are accounted for elsewhere.	

R006200

APPENDIX E

Section 5.0 PTE Calcs
Cooling Towers

Company Name: U.S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 5.8 - Cooling Towers - CTS

Table C-14.0 Cooling Tower Potential Emissions Summary

Emission Unit ID	Source Type	Emission Point	Process Emission Unit(s)	CO		Lead		NO_x		PM		PM_{10}		$PM_{2.5}$		SO_2		VOM	
				lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
CT-F001	Fugitive	Primary Cooling Tower	Byproducts	-	-	-	-	-	-	2.10	9.18	0.80	3.52	0.00	0.02	-	-	-	-
CT-F002	Fugitive	Reheat Furnace Cooling Tower	Hot Strip Mill	-	-	-	-	-	-	2.10	9.18	0.80	3.52	0.00	0.02	-	-	-	-
CT-F003	Fugitive	Triple Q Galvline Cooling Tower	Finishing	-	-	-	-	-	-	2.10	9.18	0.80	3.52	0.00	0.02	-	-	-	-
CT-F004	Fugitive	Caster 1 Spray Cooling Tower	Caster #1	-	-	-	-	-	-	2.10	9.18	0.80	3.52	0.00	0.02	-	-	-	-
CT-F005	Fugitive	Caster 1 Secondary Cooling Tower	Caster #1	-	-	-	-	-	-	2.10	9.18	0.80	3.52	0.00	0.02	-	-	-	-
CT-F006	Fugitive	Caster 2 Spray Cooling Tower	Caster #2	-	-	-	-	-	-	2.10	9.18	0.80	3.52	0.00	0.02	-	-	-	-
CT-F007	Fugitive	Caster 2 Secondary Cooling Tower	Caster #2	-	-	-	-	-	-	0.38	4.30	0.36	1.65	0.00	0.01	-	-	-	-
CT-F008	Fugitive	Cogen Cooling Tower	Cogeneration Unit - Noncontact Boiler Feedwater	-	-	-	-	-	-	0.85	3.68	0.80	3.52	0.00	0.01	-	-	-	-
CT-F009		#4 Turbo Blower Cooling Tower	Blast Furnaces	-	-	-	-	-	-	2.10	9.18	0.80	3.52	0.00	0.02	-	-	-	-
CT-F010	Fugitive	#5 Turbo Blower Cooling Tower	Blast Furnaces	-	-	-	-	-	-	2.10	9.18	0.80	3.52	0.00	0.02	-	-	-	-
CT-F011	Fugitive	Hot Blast Valve Cooling Tower	Blast Furnaces	-	-	-	-	-	-	0.19	0.25	0.02	0.17	0.00	0.00	-	-	-	-
CT-F012	Fugitive	Stack & Tuyere Cooling Tower	Blast Furnaces	-	-	-	-	-	-	0.21	1.10	0.10	0.42	0.00	0.00	-	-	-	-
CT-F013	Fugitive	Bosh Cooling Tower	Blast Furnaces	-	-	-	-	-	-	2.10	9.18	0.80	3.52	0.00	0.02	-	-	-	-
CT-F014	Fugitive	#3 Cooling Tower	Steelworks Turbine Plant - Noncontact Boiler Feedwater	-	-	-	-	-	-	8.81	38.57	3.38	14.78	0.02	0.08	-	-	-	-
CT-F015	Fugitive	Caster Split Roll Bearing Water Cooling Tower	Caster Split Roll Bearing Water Cooling Tower	-	-	-	-	-	-	0.78	1.28	0.11	0.48	0.00	0.00	-	-	-	-
CT-F016	Fugitive	Caster A/C Cooling Tower	Caster A/C Cooling Tower	-	-	-	-	-	-	0.28	1.28	0.11	0.49	0.00	0.00	-	-	-	-
CT-F017	Fugitive	Machine Water Cooling Tower	Machine Water Cooling Tower	-	-	-	-	-	-	1.70	5.27	0.65	2.02	0.00	0.01	-	-	-	-
Cooling Towers	All Sources			0.00	0.0	0.00	0.00	0.00	0.00	29.89	130.93	12.00	52.56	0.06	0.26	0.00	0.00	0.00	0.00

R006202

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 5.8 - Cooling Towers - PTE

Table E-14.1 Cooling Tower Potential Emissions Summary

Process: Cooling Towers
Emission Unit ID: CT-F001 through CT-F017
Area: Facility-Wide

Hours of Operation (each): 8,760 hrs/yr

Pollutant	Emission Point ID	Potential Emissions Per Unit (tpy)	Circulation Flow Rate (gpm)	Drift Factor (%)	Drift Rate (gpm)	Total Dissolved Solids (ppm)	Density (lb/gal)	Notes
Criteria Pollutants:								
PM								
Byproducts Area Primary Cooling Tower	CT-F001	9.18	10,000	0.01	1.0	4,190	8.34	Non-Contact
Hot Strip Mill Reheat Furnace Cooling Towers (4)	CT-F002	9.18	10,000	0.01	1.0	4,190	8.34	Non-Contact
Triple G Galv Line Cooling Tower	CT-F003	9.18	10,000	0.01	1.0	4,190	8.34	Non-Contact
Caster 1 Spray Cooling Tower	CT-F004	9.18	10,000	0.01	1.0	4,190	8.34	Non-Contact
Caster 1 Secondary Cooling Tower	CT-F005	9.18	10,000	0.01	1.0	4,190	8.34	Contact
Caster 2 Spray Cooling Tower	CT-F006	9.18	10,000	0.01	1.0	4,190	8.34	Non-Contact
Caster 2 Secondary Cooling Tower	CT-F007	4.30	4,679	0.01	0.5	4,190	8.34	Contact
Cogen Cooling Tower	CT-F008	3.86	-	-		4,190	-	Current Permit Limit per CAAPP No. 96030056 Section 7.10.6.b.ii
#4 Turbo Blower Cooling Tower	CT-F009	9.18	10,000	0.01	1.0	4,190	8.34	
#5 Turbo Blower Cooling Tower	CT-F010	9.18	10,000	0.01	1.0	4,190	8.34	Non-Contact
Hot Blast Valve Cooling Tower	CT-F011	0.45	486	0.01	0.0	4,190	8.34	Non-Contact
Stack and Tuyere Cooling Tower	CT-F012	1.10	1,200	0.01	0.1	4,190	8.34	Non-Contact
Bosh Cooling Tower	CT-F013	9.18	10,000	0.01	1.0	4,190	8.34	Non-Contact
#3 Cooling Tower	CT-F014	38.57	42,000	0.01	4.2	4,190	8.34	Steelworks turbine plant - Non-contact
Caster Split Roll Bearing Water Cooling Tower	CT-F015	9.18	10,000	0.01	1.0	4,190	8.34	Non-Contact
Caster A/C Cooling Tower	CT-F016	9.18	10,000	0.01	1.0	4,190	8.34	Non-Contact
Machine Water Cooling Tower	CT-F017	10.96	11,930	0.01	1.2	4,190	8.34	Contact
PM_{10}								
Byproducts Area Primary Cooling Tower	CT-F001	3.52	10,000	0.01	1.0	4,190	8.34	PM10 = ~ 38.3% of PM at this TDS level (see particle size table below)
Hot Strip Mill Reheat Furnace Cooling Tower	CT-F002	3.52	10,000	0.01	1.0	4,190	8.34	PM10 = ~ 38.3% of PM at this TDS level (see particle size table below)
Triple G Galv Line Cooling Tower	CT-F003	3.52	10,000	0.01	1.0	4,190	8.34	PM10 = ~ 38.3% of PM at this TDS level (see particle size table below)
Caster 1 Spray Cooling Tower	CT-F004	3.52	10,000	0.01	1.0	4,190	8.34	PM10 = ~ 38.3% of PM at this TDS level (see particle size table below)
Caster 1 Secondary Cooling Tower	CT-F005	3.52	10,000	0.01	1.0	4,190	8.34	PM10 = ~ 38.3% of PM at this TDS level (see particle size table below)
Caster 2 Spray Cooling Tower	CT-F006	3.52	10,000	0.01	1.0	4,190	8.34	PM10 = ~ 38.3% of PM at this TDS level (see particle size table below)
Caster 2 Secondary Cooling Tower	CT-F007	1.65	4,679	0.01	0.5	4,190	8.34	PM10 = ~ 38.3% of PM at this TDS level (see particle size table below)
Cogen Cooling Tower	CT-F008	3.86	-	-		4,190	-	Current Permit Limit per CAAPP No. 96030056 Section 7.10.6.b.ii
#4 Turbo Blower Cooling Tower	CT-F009	3.52	10,000	0.01	1.0	4,190	8.34	PM10 = ~ 38.3% of PM at this TDS level (see particle size table below)
#5 Turbo Blower Cooling Tower	CT-F010	3.52	10,000	0.01	1.0	4,190	8.34	PM10 = ~ 38.3% of PM at this TDS level (see particle size table below)
Hot Blast Valve Cooling Tower	CT-F011	0.17	486	0.01	0.0	4,190	8.34	PM10 = ~ 38.3% of PM at this TDS level (see particle size table below)
Stack and Tuyere Cooling Tower	CT-F012	0.42	1,200	0.01	0.1	4,190	8.34	PM10 = ~ 38.3% of PM at this TDS level (see particle size table below)
Bosh Cooling Tower	CT-F013	3.52	10,000	0.01	1.0	4,190	8.34	PM10 = ~ 38.3% of PM at this TDS level (see particle size table below)
#3 Cooling Tower	CT-F014	14.78	42,000	0.01	4.2	4,190	8.34	PM10 = ~ 38.3% of PM at this TDS level (see particle size table below)
Caster Split Roll Bearing Water Cooling Tower	CT-F015	3.52	10,000	0.01	1.0	4,190	8.34	PM10 = ~ 38.3% of PM at this TDS level (see particle size table below)
Caster A/C Cooling Tower	CT-F016	3.52	10,000	0.01	1.0	4,190	8.34	PM10 = ~ 38.3% of PM at this TDS level (see particle size table below)
Machine Water Cooling Tower	CT-F017	4.20	11,930	0.01	1.2	4,190	8.34	PM10 = ~ 38.3% of PM at this TDS level (see particle size table below)

R006203

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 5.0 - Cooling Towers - PTE

Table E 14.1 Cooling Tower Potential Emissions Summary

Process: Cooling Towers
Emission Unit ID: CT-F001 through CT-F011
Area: Facility-Wide

Hours of Operation (each): 8,760 hrs/yr

Pollutant	Emission Point ID	Potential Emissions Per Unit (tpy)	Circulation Flow Rate (gpm)	Drift Factor (%)	Drift Rate (gpm)	Total Dissolved Solids (ppm)	Density (lb/gal)	Notes
$PM_{2.5}$								
Byproducts Area Primary Cooling Tower	CT-F001	0.02	10,000	0.01	1.0	4,190	8.34	PM2.5 = ~ 0.2% of PM at this TDS level (see particle size table below)
Hot Strip Mill Reheat Furnace Cooling Tower	CT-F002	0.02	10,000	0.01	1.0	4,190	8.34	PM2.5 = ~ 0.2% of PM at this TDS level (see particle size table below)
Triple G Galv Line Cooling Tower	CT-F003	0.02	10,000	0.01	1.0	4,190	8.34	PM2.5 = ~ 0.2% of PM at this TDS level (see particle size table below)
Caster 1 Spray Cooling Tower	CT-F004	0.02	10,000	0.01	1.0	4,190	8.34	PM2.5 = ~ 0.2% of PM at this TDS level (see particle size table below)
Caster 1 Secondary Cooling Tower	CT-F005	0.02	10,000	0.01	1.0	4,190	8.34	PM2.5 = ~ 0.2% of PM at this TDS level (see particle size table below)
Caster 2 Spray Cooling Tower	CT-F006	0.02	10,000	0.01	1.0	4,190	8.34	PM2.5 = ~ 0.2% of PM at this TDS level (see particle size table below)
Caster 2 Secondary Cooling Tower	CT-F007	0.01	4,679	0.01	0.5	4,190	8.34	PM2.5 = ~ 0.2% of PM at this TDS level (see particle size table below)
Cogen Cooling Tower	CT-F008	0.01	-	-		4,190	-	PM2.5 = ~ 0.2% of PM at this TDS level (see particle size table below)
#4 Turbo Blower Cooling Tower	CT-F009	0.02	10,000	0.01	1.0	4,190	8.34	PM2.5 = ~ 0.2% of PM at this TDS level (see particle size table below)
#5 Turbo Blower Cooling Tower	CT-F010	0.02	10,000	0.01	1.0	4,190	8.34	PM2.5 = ~ 0.2% of PM at this TDS level (see particle size table below)
Hot Blast Valve Cooling Tower	CT-F011	0.00	496	0.01	0.0	4,190	8.34	PM2.5 = ~ 0.2% of PM at this TDS level (see particle size table below)
Stack and Tuyere Cooling Tower	CT-F012	0.00	1,200	0.01	0.1	4,190	8.34	PM2.5 = ~ 0.2% of PM at this TDS level (see particle size table below)
Bosh Cooling Tower	CT-F013	0.02	10,000	0.01	1.0	4,190	8.34	PM2.5 = ~ 0.2% of PM at this TDS level (see particle size table below)
#3 Cooling Tower	CT-F014	0.08	42,000	0.01	4.2	4,190	8.34	PM2.5 = ~ 0.2% of PM at this TDS level (see particle size table below)
Caster Split Roll Bearing Water Cooling Tower	CT-F015	0.02	10,000	0.01	1.0	4,190	8.34	PM10 = ~ 38.3% of PM at this TDS level (see particle size table below)
Caster A/C Cooling Tower	CT-F016	0.02	10,000	0.01	1.0	4,190	8.34	PM10 = ~ 38.3% of PM at this TDS level (see particle size table below)
Machine Water Cooling Tower	CT-F017	0.02	11,950	0.01	1.2	4,190	8.34	PM10 = ~ 38.3% of PM at this TDS level (see particle size table below)

R006204

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 5.0 - Cooling Towers - PTE

Table E-14.1 Cooling Tower Potential Emissions Summary

Process: Cooling Towers
Emission Unit ID: CT-F001 through CT-F011
Area: Facility-Wide

Hours of Operation (each): 8,760 hrs/yr

Pollutant	Emission Point ID	Potential Emissions Per Unit (tpy)	Circulation Flow Rate (gpm)	Drift Factor (%)	Drift Rate (gpm)	Total Dissolved Solids (ppm)	Density (lb/gal)	Notes

Cooling Tower Particulate Size Fractions

TDS mg/l	PM10 fraction %	PM2.5 fraction %
500	89.4%	0.64%
1,000	82.0%	0.30%
1,500	72.6%	0.22%
2,000	63.5%	0.21%
2,500	56.8%	0.21%
3,000	50.0%	0.20%
3,500	43.6%	0.20%
4,000	38.3%	0.20%
4,500	33.6%	0.19%
5,000	30.0%	0.19%
5,500	26.6%	0.18%
6,000	23.6%	0.18%
6,500	20.9%	0.17%
7,000	18.2%	0.17%
8,000	13.6%	0.16%
9,000	9.7%	0.15%
10,000	6.3%	0.15%
12,000	4.5%	0.14%

R006205

Appendix F –
Proposed Permit Changes

RECEIVED
Division of Air Quality
SEP 16 2020
Permitting Unit

APPENDIX F: PROPOSED PERMIT CHANGES

IEPA
Division of Records Management
Rockford

FEB 16 2023

Reviewer: MH

U. S. Steel - Granite City Works
CAAPP Renewal Application No. 96030056

APPENDIX F

PROPOSED CHANGES

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 5.0 - Overall Source Conditions

Proposed Permit Revisions

Condition	Description of Permit Condition	Revision Recommendation
5.3.10		Add RICE MACT requirements for insignificant engines. See added conditions a - z below.
a.	The final rule for Reciprocating Internal Combustion Engines NESHAP, 40 CFR 63 Subpart ZZZZ was published on June 15, 2004, with revisions published January 18, 2008, and March 3, 2010. The regulation covers emissions from stationary spark ignition (SI) and compression ignition (CI) RICE.	
b.	The affected units shall meet the equipment requirements of 40 CFR 63 Subpart ZZZZ as follows:	
b.i	Pursuant to 40 CFR 63.6625(f), existing stationary emergency CI RICE with a site rating less than or equal to 500 hp shall be equipped with a non-resettable hour meter.	
b.ii	Pursuant to 40 CFR 63.6640(f)(1), the Permittee may operate existing stationary emergency RICE with a site rating less than or equal to 500 brake hp for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by Federal, State or local government, the manufacturer, the vendor, or the insurance company associated with the engine. Maintenance checks and readiness testing of such units is limited to 100 hours per year. The Permittee may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required records are maintained indicating that Federal, State, or local standards require maintenance and testing of emergency RICE beyond 100 hours per year. There is no limit on the use of emergency stationary RICE in emergency situations.	
b.iii	Pursuant to 40 CFR 63.6602, the Permittee shall meet the following operating requirements for existing emergency CI RICE with a site rating less than or equal to 500 brake hp:	
b.iii.A	Change the oil and filter every 500 hours of operation or annually, whichever comes first;	
b.iii.B	Inspect the air cleaner every 1,000 hours of operation or annually, whichever comes first; and	
b.iii.C	Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary.	
b.iii.D	If an emergency engine is operating during an emergency and it is not possible to shut down the engine in order to perform the work practice requirements on the schedule required in conditions 5.3.13(e)(iii)(C)(1) through (3), or if performing the work practice standard on the required schedule would otherwise pose and unacceptable risk under Federal, State, or local law, the work practice standard can be delayed until the emergency is over or the unacceptable risk under Federal, State, or local law has abated. The work practice standard shall be performed as soon as practicable after the emergency has ended or the unacceptable risk under Federal, State, or local law has abated. The Permittee shall report any failure to perform the work practice on the schedule and the Federal, State, or local law under which the risk was deemed unacceptable.	
b.iii.E	The Permittee shall minimize each affected engine's time spent at idle during startup and minimize the engine's startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which the emission standards applicable to all times other than startup apply.	
c.	Pursuant to 40 CFR 63.6640(f)(2), the Permittee may operate existing stationary emergency RICE with a site rating of more than 500 brake hp that was installed prior to June 12, 2006, for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by Federal, State or local government, the manufacturer, the vendor, or the insurance company associated with the engine. There is no limit on the use of emergency stationary RICE in emergency situations.	

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 5.0 - Overall Source Conditions

Proposed Permit Revisions

Condition	Description of Permit Condition	Revision Recommendation
5.6.2.a.iii.A	Annual emissions from the fuel combustion units identified in Condition 5.6.2(a)(ii) above shall not exceed the following limits in tons/year:	
	PM/PM_{10} = 274	Emissions should be updated to reflect the most current AP-42 Emission Factors as shown in Appendix E calculations.
	SO_2* = 641	
	Nox = 706	
	VOM = 2	
	CO = 1295	
	Lead = 0.06	
	*These limits have been addressed by an enforcement action, with a compliance schedule established for compliance with these limits. (See Condition 7.4.13)	
5.6.2.a.iii.B	Annual emissions from each individual fuel used in the fuel combustion units identified in Condition 5.6.2(a)(ii) above shall not exceed the following limits:	
5.6.2.a.iii.B.1	Natural Gas	
	PM - Emission factor 5.1 lbs/mmcf - Max Emissions 3.43 T/yr	Emissions should be updated to reflect the most current AP-42 Emission Factors as shown in Appendix E calculations.
	PM_{10} - Emission factor 5.1 lbs/mmcf - Max Emissions 3.43 T/yr	
	SO_2 - Emission factor 0.6 lbs/mmcf - Max Emissions 0.4 T/yr	
	NOx - Emission factor 306 lbs/mmcf - Max Emissions 205.94 T/yr	
	VOM - Emission factor 2.8 lbs/mmcf - Max Emissions 1.88 T/yr	
	CO - Emission factor 40 lbs/mmcf - Max Emissions 26.92 T/yr	
5.10.1.a	Pursuant to Section 39.5(7)(f)(ii) of the Act, the Permittee shall promptly notify the Illinois EPA, Air Compliance Section, within 30 days of deviations from applicable requirements as follows:	Propose removal of 30 day requirement; instead include all deviation reports in semiannual report according to 8.6.1 timelines along with NESHAP reports
5.10.3.a.	The Permittee shall submit quarterly reports (every 3 calendar months) to the Illinois EPA. This report is due 30 days after the end of the reporting period and may be submitted on computer disk. This report shall contain the following information for the days during the quarter:	Propose removal of quarterly requirement; instead include all reports in semiannual report according to 8.6.1 timelines along with NESHAP reports
5.10.7.a.	Pursuant to 40 CFR 63.7545(b), the Permittee must submit an initial Notification according to 40 CFR 63.9(b)(2).	Propose removal - This one-time notification has already been submitted

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.1 - Material Handling

Proposed Changes

Condition No.	Description of Permit Condition	Revision Recommendation
		Add CAM requirements for dump pit conveyor (Handling-S004), raw material conveyor system & storage bins (Handling-S005), and LMF conveyors and storage bins (BOP-S007)
		Add CAM nonapplicability provisions for coal handling and processing equipment and blast furnace/coke material handling equipment Add NSPS Y nonapplicability statement for coal/coke handling equipment
7.1.6.b.i.	Emissions from Material HS and Deslagging Station (Baghouse #1) shall not exceed the following limits: [T1]:	Remove condition - repeated in caster Section
7.1.6.b.i.	Pollutant	Remove condition - repeated in Caster Section 7.6
7.1.6.b.i.	PM	Remove condition - repeated in Caster Section 7.6
7.1.6.b.i.	PM_{10}	Remove condition - repeated in Caster Section 7.6
7.1.10.a.iii.	Pursuant to Permit 06070088 for the new coke conveyor system, the Permittee shall notify the Illinois EPA within 30 days of deviations from applicable emission standards or operating requirements that continue* for more than 24 hours. *For this purpose, time shall be measured from the start of a particular event. The absence of a deviation for a short period shall not be considered to end the event if the deviation resumes. In such circumstances, the event shall be considered to continue until corrective actions are taken so that the deviation ceases or the Permittee takes the affected unit out of service for repairs.	Propose removal of 30 day requirement; instead include all deviation reports in semiannual report according to 8.6.1 timelines
7.1.10.b.i.	Pursuant to Section 39.5(7)(f)(ii) of the Act, the Permittee shall promptly notify the Illinois EPA, Air Compliance Section, within 30 days of deviations by the affected material handling operations and new coke conveyor system from applicable requirements as follows:	Propose removal of 30 day requirement; instead include all deviation reports in semiannual report according to 8.6.1 timelines

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.2 - Coke Production

Proposed Changes

Condition No.	Description of Permit Condition	Revision Recommendation
		Add all CAAPP conditions related to Construction Permit 08060025
7.2.3-2.b.	Battery 8 At no time shall there be any visible emissions from more than 5 percent of the door areas on Battery 8 {T1}. Note: This limit is the determination of LAER for door leaks for Battery 8 was established in Construction Permit C808048.	Please move to Section 7.2.6
7.2.3-2.c.	40 CFR 63.304(b)(3)(ii) 3.3 percent leaking coke oven doors for each by-product coke oven battery not subject to the emission limitation 40 CFR 63.304(b)(3)(i), as determined by the procedures in 40 CFR 63.309(d)(1).	Please elaborate/clarify this limit (e.g. the Permittee shall not exceed...)
7.2.3-3.b.	Battery 8 There shall be no visible emissions from more than 1 percent of the charging ports or lids {T1}. Note: This limit is the determination of LAER for lid leaks for Battery 8 made in Construction Permit C808048.	Please move to Section 7.2.6
7.2.3-3.c.	40 CFR 63.304(b)(2)(ii) 0.4 percent leaking topside port lids, as determined by the procedures in 40 CFR 63.309(d)(1).	Please elaborate/clarify this limit (e.g. the Permittee shall not exceed...)
7.2.3-4	Applicable Standards: Leaks from Off Takes	
7.2.3-4.b.	Battery 8 There shall be no visible emissions from more than 4 percent of the off take piping on the coke ovens on Battery 8 {T1}. Note: This limit is the determination of LAER for off take leaks for Battery 8 made in Construction Permit C808048.	Please move to Section 7.2.6
7.2.3-4.c.	40 CFR 63.304(b)(2)(iii) 2.5 percent leaking off take system(s), as determined by the procedures in 40 CFR 63.309(d)(1).	Please elaborate/clarify this limit (e.g. the Permittee shall not exceed...)
7.2.3-5	Applicable Standards: Coke Oven Pushing	
7.2.3-5.a.	35 IAC 212.443(c)(1)(A) Emissions of uncaptured particulate matter from pushing operations shall not exceed an average of 20 percent opacity for 4 consecutive pushes considering the highest average of six consecutive readings in each push. Compliance with this limit shall be determined in accordance with the procedures in 35 IAC 212.443(c)(1)(B) and Condition 7.2.12.	Propose to consolidate with construction permit LAER opacity limit
7.2.3-5.b.	35 IAC 212.443(c)(2)	
7.2.3-5.b.i.	The particulate emissions from control equipment used to control emissions during pushing operations shall not exceed 0.040 pounds per ton of coke pushed. Compliance shall be determined in accordance with the procedures set forth in 40 CFR Part 60, Appendix A, Methods 1-5, incorporated by reference in Section 212.113. Compliance shall be based on an arithmetic average of three runs (stack tests) and the calculations shall be based on the duration of a push as defined in 35 IAC 212.443(c)(1)(A).	Propose to consolidate with MACT & construction permit LAER PM emission limit
7.2.3-5.b.ii.	The opacity of emissions from control equipment used to control emissions during pushing operations shall not exceed 20%. For a push of less than six minutes duration, the actual number of 15-second readings taken shall be averaged. Compliance shall be determined in accordance with 40 CFR Part 60, Appendix A, Method 9, incorporated by reference in 35 IAC 212.113, Section 2.5 of 40 CFR Part 60, Appendix A, Method 9, incorporated by reference in 35 IAC 212.113, for data reduction shall not be used for pushes of less than six minutes duration [35 IAC 212.443(c)(2)(B)].	Propose to consolidate with construction permit LAER opacity limit
7.2.3-5.c.	40 CFR 63.7290(a)(4) Particulate matter emissions to the atmosphere from the mobile scrubber car for pushing which captures emissions during travel shall not exceed 0.04 lb/ton of coke.	Propose to consolidate with SIP & construction permit LAER PM emission limit
7.2.3-5.d.	Battery 8 Pushing emissions from Battery 8 shall be captured and cleaned by a single-spot, coke guide evacuated, enclosed quench car/scrubber car system which meets the following limitations {T1}:	Please move to Section 7.2.6
7.2.3-5.d.i.	The gas cleaning device shall be operated to meet 0.04 pounds of particulate matter per ton of coke pushed during the pushing operation.	Move to Section 7.2.6 Consolidate with SIP & MACT PM emission limit
7.2.3-5.d.ii.	Visible emissions from the gas cleaning device outlet and uncaptured fugitive emissions shall not exceed 20 percent opacity.	Please move to Section 7.2.6 Consolidate with SIP opacity limits
7.2.3-5.d.	Note: These limits are the determination of LAER for pushing emissions from Battery 8 made in Construction Permit C808048.	Please move to Section 7.2.6

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.2 - Coke Production

Proposed Changes

Condition No.	Description of Permit Condition	Revision Recommendation
7.2.3-7.c.	Battery B Pursuant to Construction Permit 82060043, non-sulfate particulate matter emissions from the battery stack serving Battery B shall not exceed 0.03 gr/dscf. [T1]	Please move to Section 7.2.6
		Add CAM non-applicability condition for all emission units
7.2.6.c.i.	Supplementary natural gas usage for the coke ovens shall not exceed 20 million scf/month and 123 million scf/yr, respectively [T1].	Language added for clarification
7.2.6.c.ii.	Emissions attributable to the combustion of natural gas for the underfiring of the batteries shall not exceed the following limits. Compliance with the annual limits shall be determined from a running total of 12 months of data [T1]:	
	Pollutant	
	NO_x	Emissions should be revised to reflect the latest AP-42 factors as shown in Appendix E calculations
	CO	
	PM	
	PM_{10}	
	VOM	
	SO_2	
7.2.7-2.a.i.	Pursuant to 40 CFR 63.7333(f), the Permittee shall sample and analyze quench water for total dissolved solids on at least a weekly basis in accordance with the procedures specified by 40 CFR 63.7325(e).	Consolidate with SIP quench water testing
7.2.7-2.a.ii.	If the Permittee elects to comply with the TDS limit for quench water in 40 CFR 63.7295(e)(1)(ii), the Permittee must conduct each performance test that applies to the affected quenching operations according to the following conditions in 40 CFR 63.7325(e)(1) and (2):	Consolidate with SIP quench water testing
7.2.7-2.a.ii.A.	Take the quench water sample from a location that provides a representative sample of the quench water as applied to the coke (e.g., from the header that feeds water to the quench tower reservoirs). Conduct sampling under normal and representative operating conditions.	Consolidate with SIP quench water testing
7.2.7-2.a.ii.B.	Determine the TDS concentration of the sample using Method 160.1 in 40 CFR part 136.3 (see residue—filterable"), except that you must dry the total filterable residue at 103 to 105°C instead of 180°C.	Consolidate with SIP quench water testing
7.2.7-2.b.	Requirements of 35 IAC 212.443(h)	Consolidate with MACT quench water testing
7.2.7-2.b.i.	Pursuant to 35 IAC 212.443(h)(3), the quench water shall be sampled for total dissolved solids concentrations in accordance with the methods specified in Standard Methods for the Examination of Water and Wastewater, Section 209C, "Total Filterable Residue Dried at 103-105°C" 15th Edition, 1980, incorporated by reference in 35 IAC 212.113. Analyses shall be performed on grab samples of the quench water as applied to the coke in accordance with the sampling schedule in Condition 7.2.12(c).	Consolidate with MACT quench water testing
7.2.7-2.b.ii.	If the quench station is not used during any given calendar week, the grab samples for that quench station need not be analyzed.	Consolidate with MACT quench water testing
7.2.8-4.b.	Pursuant to Sections 39.5(7)(d) and (p) of the Act, the Permittee shall also record 6-minute average opacity data from the COMS required by Condition 7.2.8-4(a).	Remove condition - requirement is repeated in 7.2.8-4.a.iv
7.2.10.a.	Opacity Monitoring Reports for Combustion Stacks Pursuant to Sections 39.5(7)(a), (d) and (p) of the Act, the Permittee shall provide the following reports for each coke oven battery to the Illinois EPA, including a copy directly to Collinsville Regional Office, on a quarterly basis.	Propose removal of quarterly requirement; instead include all opacity reports in semiannual report according to 8.6.1 timelines along with NESHAP reports
7.2.10.e.v.	Pursuant to Section 39.5(7)(f)(ii) of the Act, the Permittee shall promptly notify the Illinois EPA, Air Compliance Section, within 30 days of deviations by the affected coke oven operations from applicable requirements unless a NESHAP standard specifies a different timeframe as identified in Condition 7.2.11(c) and (d), as follows:	Propose removal of 30 day requirement; instead include all deviation reports in semiannual report according to 8.6.1 timelines along with NESHAP reports
7.2.10.f.iii.	Within two years of initial startup of the low emission quench tower on the West Quench Station, the Permittee shall submit a report evaluating the reduction in filterable and total $PM_{2.5}$ and PM_{10} emissions achieved by this project, on both in terms of emissions per ton of coke quenched and in terms of annual emissions.	Please remove - this is a one-time obligation that has already been fulfilled.

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.3 - Byproduct Recovery

Proposed Changes

Condition	Description of Permit Condition	Revision Recommendation
7.3.3		Add CAM requirements for COG desulfurization system
7.3.4.d.	The COG desulfurization system and COG flare are not subject to 40 CFR 61 Subpart L, National Emission Standards for Benzene Emissions from Coke By-Product Recovery Plants, because both COG systems are not involved in the separation and recovery of coal tar derivatives evolved from coal during the coking process of a coke oven battery.	Typo - Change "40 CFR 63" to "40 CFR 61"
		Add CAM non-applicability condition for COG processing, coal tar processing, light oil processing, COG flare, amine/HCN destruction unit, and railcar/truck loading unit
7.3.5	Operation of COG Flare during Malfunction and Breakdown Pursuant to 35 IAC 201.149 and Part 201 Subpart I, subject to the following terms and conditions, the Permittee is authorized to continue to operate the COG flare in excess of the applicable state standard in Condition 7.3.3(f) in the event of a malfunction or breakdown. Note: This authorization is provided because the Permittee applied for such authorization in its CAAPP application, generally explaining why such continued operation would be required to prevent injury to personnel or severe damage to equipment, and describing the measures that will be taken to minimize emissions from any malfunctions and breakdowns.	Propose moving malfunction/breakdown provisions are to section 7.x.3 rather than their own section (consistent with other permit sections). If this requirement is moved to 7.3.3, the proceeding sections would be renumbered.

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.4 - Blast Furnaces

Proposed Changes

Condition	Description of Permit Condition	Revision Recommendation
7.4.3.b.i.	Uncaptured particulate matter from any opening in a blast furnace cast house shall not exceed 20 percent opacity on a six (6) minute rolling average basis beginning from initiation of the opening of the tap hole up to the point where the iron and slag sto	This condition is identical to 7.4.3(e)(ii) - propose to consolidate requirements
7.4.3.b.ii.A.	Particulate matter emissions from control equipment used to collect any of the emissions from the tap hole, trough, iron or slag runners or iron or slag spouts shall not exceed 0.023 g/dscm (0.010 gr/dscf). Compliance with this standard shall be determin	This condition is identical to 7.4.3(e)(i) - propose to consolidate requirements
7.4.3.e.i.	Particulate matter emissions from a control device shall not exceed 0.01 gr/dscf; and	Propose to consolidate with condition 7.4.3(b)(ii)(A)
7.4.3.e.ii.	Any secondary emissions that exit any opening in the casthouse or structure housing the blast furnace shall not exceed opacity greater than 20 percent (6 minute average).	Propose to consolidate with condition 7.4.3(b)(i)
7.4.4.	Non-Applicability of Regulations of Concern	Add CAM non-applicability statement for all emission units
7.4.6.b.	Casthouse Baghouse emissions shall not exceed the following limits [95010001, T1]:	
7.4.6.b.	Pollutant	
7.4.6.b.		New pollutant data is available for CO and lead from this source based on recent ICR testing.
7.4.6.f.	Iron Spout Baghouse emissions shall not exceed the following limits [95010001, T1]:	
7.4.6.f.	Pollutant	
7.4.6.f.		New pollutant data is available for NOX, CO, and VOM from this source based on recent ICR testing.
7.4.6 g.	Total emissions from blast furnace operations shall not exceed the following limits, tons/yr [95010001, T1]: Blast Furnace Operations *Limit does not address the iron pellet screen (See Section 7.1)	Total emissions should be revised to reflect recent ICR testing data, as shown in Appendix E emission calculations.
7.4.10.b.	Reporting requirements for malfunctions and breakdowns (Permits #72080034, #72080036 and #95010001): The Permittee shall notify the Illinois EPA's regional office by telephone as soon as possible during normal working hours, but no later than the next day	Propose removal of this requirement as it is redundant with/covered by NESHAP SSM Plan reports. If the requirement can't be entirely removed, propose removal of the quarterly requirement; instead include the malfunction & breakdown reports in semiannual report according to 8.6.1 timelines along with NESHAP reports.
7.4.10.c.	Pursuant to Section 39.5(7)(f)(ii) of the Act, the Permittee shall promptly notify the Illinois EPA, Air Compliance Section, within 30 days of deviations by the affected blast furnace processes from applicable requirements unless a NESHAP standard specifies	Propose removal of 30 day requirement; instead include all deviation reports in semiannual report according to 8.6.1 timelines along with NESHAP reports

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.5 - Basic Oxygen Processes

Proposed Changes

Condition No.	Description of Permit Condition	Revision Recommendation
		Add all CAAPP conditions related to Construction Permit 11050006
7.5.3.d		Please remove this condition - all provisions are covered by other conditions
7.5.3		Add CAM requirements for Argon Stirring station
7.5.4		Add nonapplicability provisions for CAM for BOF, LMF, reladle, desulferization, slag skimming, and ladle drying units Add nonapplicability provisions for NSPS Subparts N and Na (pending review of slag skimming station).
7.5.5-3.a.i.A.	The hot metal charge of the second vessel shall be initiated and completed during the time between completion of the blow and start of tap on the first vessel while sufficient draft at the ESP capture system is established and maintained for both vessels.	Propose removal of this condition based on secondary baghouse control of secondary emissions
7.5.5-3.a.i.B.	The charge and/or blow on one vessel shall not begin until sufficient draft has been established at the associated ESP capture system (a.k.a., doghouse) and the alloy addition at the vessel tapping has been completed for at least 1 minute.	Propose removal of this condition based on secondary baghouse control of secondary emissions
7.5.5-3.a.i.C.	Sufficient draft at the ESP capture system of the vessel being tapped shall be maintained for at least 1 minute after alloy addition has been completed. After such period, the capture system draft may be transferred over to the other vessel in order to satisfy Condition (A) above.	Propose removal of this condition based on secondary baghouse control of secondary emissions
7.5.5-3.a.i.D.	Only overlapping of the hot metal charge of the second vessel after the end of blow and prior to onset of tap of the first vessel and overlapping of tapping of the first vessel, after alloy addition, and the hot metal charge and/or blow on the second vessel are allowed.	Propose removal of this condition based on secondary baghouse control of secondary emissions
7.5.5-3.b.i.	The BOF capture system shall be operated at the above minimum set points (see Condition 7.5.5(h)) until and unless the Illinois EPA approves a lower minimum set point based on a demonstration that a better level of particulate matter control will occur, except for purposes of emissions testing as related to the set point. [T1].	Propose removal of this condition based on secondary baghouse control of secondary emissions
7.5.5-3.b.ii.	The Permittee shall operate, maintain, and repair the BOF ESP in a manner that assures compliance with the conditions of Permit 95010001. [T1].	Vague condition - recommend removal based on current operations in compliance with MACT will assure compliance with permit conditions
7.5.6.b.	BOF Shop Emissions (tons/yr total) shall not exceed the following limits: [T1]:	
7.5.6.b.	PM	Emissions should be revised to reflect the latest emission factors from AP-42 as shown in Appendix E calculations.
7.5.6.b.	PM_{10}	
7.5.6.b.	NO_x	
7.5.6.b.	VOM	
7.5.6.b.	CO	
7.5.6.b.	Lead	
7.5.6.c.	BOF ESP Stack (charge, refine, tap) emissions shall not exceed the following limits: [T1]:	
7.5.6.c.	Pollutant	
7.5.6.c.	NO_x	May need revision pending resolution of recent non-compliance test results. USS is currently working with IEPA to resolve.
7.5.6.c.	VOM	
7.5.6.h.i.	Set point requirements while only a single BOF vessel is in operation:	
7.5.6.h.i.A.	Minimum set point during charging operations: 550,000 cfm;	Revise based on secondary baghouse hood flow
7.5.6.h.i.B.	Minimum set point during refining operation: 650,000 cfm; and	Revise based on secondary baghouse hood flow
7.5.6.h.i.C.	Minimum set point during tapping operation: 200,000 cfm (until one minute after completing alloy addition).	Revise based on secondary baghouse hood flow
7.5.6.h.ii.	During dual operation of BOF vessels (a.k.a., overlapping BOF operation) the minimum set point shall be 700,000 cfm.	Revise based on secondary baghouse hood flow
7.5.6.k.	The maximum process weight for 1) argon stirring, 2) ladle reheat, 3) alloy addition, 4) ladle slag skimming, and 5) hot metal desulfurization shall not exceed 356.7 t/hr for 8,760 hours per year. [T1].	Is the process weight requirement meant to be interpreted as an annual average? Inclusion of 8760 hr/yr is confusing and should be removed and, if meant to be an annual average, clarified as such.
7.5.8.d.i.	The Permittee shall operate and maintain the waste gas suction monitor system for the capture system for the Basic Oxygen Furnace that continually measures and records each operation (i.e., for each charge, each refine, each tap) of each steel production cycle the static pressure in the main downcommer duct of the ESP emissions capture and transport system.	Please remove based on secondary baghouse control of secondary emissions
7.5.8.d.i.A.	The Permittee shall use the waste gas suction monitoring system as a mechanism to ensure sufficient draft is maintained in the emissions capture hoods and transport ducts so as to maximize emissions capture and transport and minimize uncaptured emissions and emission leaks.	Please remove based on secondary baghouse control of secondary emissions
7.5.8.d.i.B.	The Permittee shall operate and maintain the system to ensure that accurate and useful data is collected.	Please remove based on secondary baghouse control of secondary emissions

Company Name: U.S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.5 - Basic Oxygen Processes

Proposed Changes

Condition No.	Description of Permit Condition	Revision Recommendation
7.5.6.d.i.C.	The Permittee shall continuously record the static pressure in the main down corner duct of the ESP emissions capture and transport system.	Please remove based on secondary baghouse control of secondary emissions
7.5.6.d.ii.	The Permittee shall calibrate, operate, and maintain a continuous strip chart recorder or disk storage of the ESP stack gas flow rate as measured by the stack gas flow meter during ESP use	Please remove based on secondary baghouse control of secondary emissions
7.5.6.d.iii.	The stack gas flow meter shall be calibrated on at least a quarterly basis	Please remove based on secondary baghouse control of secondary emissions
7.5.6.d.iv A.	The Permittee shall visually inspect at least monthly all visible BOF vessel enclosures, hooding and ducts used to capture and transport emissions for the BOF ESP control system	Please remove based on secondary baghouse control of secondary emissions
7.5.6.d.iv.B.	A log shall be maintained of these inspections which includes observations of the physical appearance of the capture system and any noted deficiencies (e.g., the presence of any holes in ductwork or hoods, flow constrictions caused by dents or accumulated dust in ductwork, and fan erosion).	Please remove based on secondary baghouse control of secondary emissions
7.5.6.d.iv C.	Any leaks or areas otherwise noted to be in need of repair, shall be repaired expeditiously.	Please remove based on secondary baghouse control of secondary emissions
7.5.6 e.i.B.	If a baghouse is not installed for control of tapping emissions from the BOF, these readings shall be performed for at least five days out of every seven. A day is defined as any day when a BOF is in operation for a minimum of four hours during conditions that are acceptable for Method 9 readings. A minimum of 60 consecutive minutes of opacity readings must be obtained and must encompass at least one steel production cycle. A production cycle is defined as the beginning of scrap charging to the completion of deslagging of the steelmaking vessel. Results of these readings shall be reduced to three minute rolling averages.	Please remove based on secondary baghouse control of secondary emissions
7.5.10.b.	Monthly Opacity Exceedance Report. Monthly opacity exceedance reports for the BOF ESP shall be sent to the Illinois EPA Regional Office. These reports shall contain all opacity measurements which exceed 30 percent, averaged over a six minute period. These "excess opacity" reports shall provide, for each such incident, the percent opacity measured as well as the date and span of such incident. These reports shall state the reasons for the excess opacity. The reports shall also specify the dates of those periods during which the continuous monitoring system was not in operation. [Section 39.5(7)(f)(ii) of the Act]	Propose removal of monthly reports; instead include with semiannual exceedance reports submitted according to 8.5.1 timelines along with NESHAP reports
7.5.10.c.	Reporting Requirements from Permit 08110019: After the initial year of operation (12 calendar months) of the BOF with an ESP with four fans, the Permittee shall submit a report to the Illinois EPA that evaluates the impacts of the addition of a fourth fan to the ESP on the particulate matter emissions of the BOF. This report shall, at a minimum, include the following information and address impacts on both stack emissions of particulate matter (i.e., emissions from the ESP stack) and uncaptured emissions of particulate matter (e.g., emissions from the roof monitor of the BOPF Shop). This report shall be submitted by the end of the third month following the initial year of operation with an ESP with four fans.	Please remove this one-time reporting requirement as this has already been met.
7.5.10.c.i.	A description of typical operating scenarios in which the availability of a spare fan resulted in a decrease in short-term emissions, with an assessment of the changes in the hourly emission rates, with supporting documentation and calculations.	Please remove this one-time reporting requirement as this has already been met.
7.5.10.c.ii.	A description of typical operating scenarios, if any, in which the availability of a spare fan resulted in an increase in short-term emissions, with an assessment of the changes in the hourly emission rates, with supporting documentation and calculations.	Please remove this one-time reporting requirement as this has already been met.
7.5.10.c.iii.	An assessment of the overall effect of the addition of a fourth fan on actual annual emissions of the BOF, with supporting operating data and calculations	Please remove this one-time reporting requirement as this has already been met.
7.5.10.d.i.	Pursuant to Section 39.5(7)(f)(ii) of the Act, the Permittee shall promptly notify the Illinois EPA, Air Compliance Section, within 30 days of deviations by the Basic Oxygen Furnace Processes from applicable requirements, unless a NESHAP standard specifies a different timeframe, as follows:	Propose removal of 30 day requirement; instead include all deviation reports in semiannual report according to 8.5.1 timelines along with NESHAP reports
7.5.10.f.i.	Within six months of initial startup of the steam rings on the affected BOFs, the Permittee shall submit to the Illinois EPA: 1) A Project Report; and 2) A draft of the Permittee's written operating procedures for the steam rings, as required by Condition 7.5.5-3(c), for review and comment by the Illinois EPA. This Project Report shall include the following:	Please remove this one-time reporting requirement as this has already been met.
7.5.10.f.i.A.	An assessment, with supporting documentation, of the effect of the steam rings on the opacity and, as feasible, particulate loading of the exhaust from the roof monitor of the BOPF Shop during refining, correlated with the rate of steam injection and other operating parameters of the BOF's and their control system; and	Please remove this one-time reporting requirement as this has already been met.
7.5.10.f.i.B.	An identification of circumstances, if any, in which the steam rings must be operated to maintain compliance with applicable emission standards	Please remove this one-time reporting requirement as this has already been met.

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.6 Continuous Casting

Proposed Changes

Condition No.	Description of Permit Condition	Revision Recommendation
7.6.3		Add CAM requirements for steel deslagging station
7.6.4	Non-Applicability	Add CAM nonapplicability condition for casters #1 & #2 spray chambers, Caster molds #1 & #2, slab cutoff, slab ripping, and cooling towers
7.6.6.a	Emissions from Deslagging Station (Baghouse #1) and associated Material Handling System (see Section 7.1) shall not exceed the following limits:	Please remove condition - already listed in Section 7.1
7.6.6.b	Emissions from Caster Molds – Casting shall not exceed the following limits:	May need to revise pending resolution of current non-compliance issue. USS is working with IEPA to resolve.
7.6.10.a.i	Pursuant to Section 39.5(7)(f)(ii) of the Act, the Permittee shall promptly notify the Illinois EPA, Air Compliance Section, within 30 days of deviations by the affected continuous casting operations from applicable requirements, as follows:	Propose removal of 30 day requirement, instead include all deviation reports in semiannual report according to 8.6.1 timelines along with NESHAP reports

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.7 - Hot Strip Mill

Proposed Changes

Condition	Description of Permit Condition
7.7.4	Non-Applicability
7.7.11.a.i	Report deviations from applicable requirements in within 30 days
7.7.14	State only conditions

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.7 - Hot Strip Mill

Proposed Changes

Condition	Description of Permit Condition	Revision Recommendation
7.7.4	Non-Applicability	Add CAM nonapplicability provisions for all emission units Add Boiler MACT nonapplicability condition for each furnace
7.7.11.a.i	Report deviations from applicable requirements in within 30 days	Propose to revise to semiannual exceedance reports submitted according to 8.6.1 timelines along with NESHAP reports
7.7.14	State only conditions	Propose to move section 7.7.14 to Section 7.10.3 for the limits (a-c) and 7.7.9 and 10 for the recordkeeping and reporting (d)

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.8 - Finishing

Proposed Changes

Condition	Description of Permit Condition	Revision Recommendation
7.8.4	Non-Applicability	Add CAM nonapplicability condition for all emission units
7.8.5-2	NESHAP Work Practices (Galvanizing Lines)	Update Boiler NESHAP conditions to reflect most recent requirements
7.8.7.b.i.A	The NO_x emissions of the furnace shall not exceed 2.07 lbs/hour and 9.04 tons/year.	Update emission limits based on the current AP-42 factors for natural gas combustion.
7.8.7.b.i.B	Emissions of other pollutants from the furnace shall not exceed the following limits:	
7.8.7.b.ii.A	The total combined NO_x emissions of the 5 space heaters shall not exceed 1.69 lbs/hour and 7.39 tons/year.	
7.8.7.b.ii.B	Total emissions of other pollutants from the 5 space heaters shall not exceed the following limits:	
7.8.7.b.iii.A	The total combined NO_x emissions of the drying oven and the building and storage area heaters shall not exceed 0.97 lbs/hour and 4.29 tons/year.	
7.8.7.b.iii.B	Total emissions of other pollutants from the drying oven and the building and storage area heaters shall not exceed the following limits:	
7.8.7.b.iv.A	Total combined NO_x emissions of the 11 miscellaneous heaters shall not exceed 2.19 lbs/hour and 9.60 tons/year.	
7.8.7.b.iv.B	Total combined emissions of other pollutants from the 11 miscellaneous heaters shall not exceed the following limits:	
7.8.11.a.i.	Pursuant to Section 39.5(7)(f)(ii) of the Act, the Permittee shall promptly notify the Illinois EPA, Air Compliance Section, within 30 days of deviations by the affected finishing operations from applicable requirements unless a NESHAP standard specifies a different time frame, as follows:	Propose removal of 30 day requirement; instead include all deviation reports in semiannual report according to 8.6.1 timelines along with NESHAP reports
7.8.14	Pursuant to 35 IAC 217.150, 217.152, and 217.160, by the applicable compliance date for 35 IAC Part 217 Subparts D and E, the Permittee shall comply with applicable requirements of these rules for the affected galvanizing furnaces, including:	Move section 7.7.14 to Section 7.8.3 for the limits (a-c) and 7.8.9 and 10 for the recordkeeping and reporting (d)

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.9 - Wastewater Treatment

Proposed Changes

Condition	Description of Permit Condition	Revision Recommendation
7.9.4.	Non-Applicability of Regulations of Concern	Add CAM nonapplicability condition for all emission units

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.10 - Boilers

Proposed Changes

Condition No.	Description of Permit Condition	Revision Recommendation
7.10.3.b.ii.A.	Particulate Matter (PM) emissions shall not exceed 0.043 lb per mmBtu of heat input or 0.026 lb per mmBtu of steam output (3-run average).	Update limit to 6.7E-03 lb/mmBtu heat input or 1.2E-02 lb/MMBtu heat output, also reference TSM alternate limits
7.10.3.b.ii.B.	Hydrogen Chloride (HCl) emissions shall not exceed 0.0017 lb per mmBtu of heat input or 0.001 lb per mmBtu of steam output.	Update limit to 1.7E-03 lb/mmBtu heat input or 7.9E-03 lb/MMBtu heat output
7.10.3.b.ii.C.	Mercury (Hg) emissions shall not exceed 1.3E-05 lb per mmBtu of heat input or 7.8E-06 lb per mmBtu of steam output.*	Update emission limit to 7.9E-06 lb/ mmBtu heat input or 1.4E-05 lb/mmbtu heat output
7.10.3.b.ii.D.	CO emissions shall not exceed 9 ppm by volume on a dry basis corrected to 3 % oxygen or 0.005 lb per mmBtu of steam output.	Update emission limit to 130 ppm by volume on a dry basis corrected to 3% oxygen
7.10.3.b.ii.E.	Dioxin/Furans (D/F) emissions shall not exceed 0.08 ng/dscm (TEQ) corrected to 7% oxygen or 3.9E-11 (TEQ) lb per mmBtu of steam output.*	Remove limit
7.10.3		Add CAM nonapplicability condition for all emission units
7.10.3		Add 40 CFR 63 Subpart DDDDD nonapplicability requirements for portable boilers
7.10.5-1.a.	Pursuant to Sections 39.5(7)(a) and (d) of the Act, unless the Permittee conducts continuous emission monitoring for CO for an affected boiler, the Permittee shall conduct an annual tune-up for the boiler, as follows, to maintain compliance with 35 IAC 216.121. If annual tune-ups or combustion adjustments are required for an affected boiler pursuant to 40 CFR 63, Subpart DDDDD, these tune-ups shall also be conducted in accordance of applicable provisions of this NESHAP.	Per 40 CFR 63 DDDDD, update to read: "If annual tune-ups or combustion adjustments are required for an affected boiler pursuant to 40 CFR 63, Subpart DDDDD, such tune-up requirements will supersede the requirements currently listed in this condition."
7.10.5-1.a.iii.	Measure the concentrations in the effluent stream of CO in parts per million by volume (ppmv), and oxygen in volume percent, before and after the adjustments are made (measurements may be either on a dry or wet basis, as long as it is the same basis before and after the adjustments are made); and	Measurements should be on a dry basis per the Boiler MACT
7.10.6.a.v.A.	NO_x	Update emission limits based on current AP-42 factors as shown in Appendix E calculations.
7.10.6.a.v.A.	CO	
7.10.6.a.v.A.	VOM	
7.10.6.a.v.A.	PM/PM_{10}	
7.10.6.a.v.A.	SO_2	
7.10.6.a.v.A.	Indiv. Metal HAP	
7.10.6.a.v.A.	Total HAPs	
7.10.6.a.v.C.	NO_x	
7.10.6.a.v.C.	CO	
7.10.6.a.v.C.	VOM	
7.10.6.a.v.C.	PM/PM_{10}	
7.10.6.a.v.C.	SO_2	
7.10.6.a.v.E.	Indiv. Metal HAP	
7.10.6.a.v.C.	Total HAPs	
7.10.8-1.c.i.	The Permittee shall sample and analyze cleaned BFG after the pretreatment system for sulfur content (lb/scf and lb/mmBtu), using appropriate ASTM methods or other comparable methodology. These measurements shall be conducted on at least a quarterly basis. The records for this activity shall also include operating data for the blast furnaces and the BFG pretreatment system at the time of sampling.	Propose changing to semi-annual measurement frequency.
7.10.8-2.	Additional Monitoring Requirements (40 CFR Part 63 Subpart DDDDD) Unless an affected boiler is operating as a blast furnace gas fuel-fired boiler, as defined in 40 CFR 63.7575, or is otherwise exempt, beginning on the compliance date of this NESHAP for existing sources, the Permittee must:	Update to read: "Unless an affected boiler is operating as a blast furnace gas fuel-fired boiler, as defined in 40 CFR 63.7575, burns Gas 1, or is otherwise exempt, beginning on the compliance date of this NESHAP for existing sources, the Permittee must:"
7.10.10.a.	The Permittee shall promptly notify the Illinois EPA, Air Compliance Section, within 30 days of deviations of the affected boilers and affected cooling tower from the following applicable requirements unless a NESHAP standard specifies a different time frame, pursuant to Section 39.5(7)(f)(ii) of the Act:	Update to remove the 30 reporting requirement and rely on semi-annual deviation reporting only
7.10.12.	State-Only Conditions	Move section 7.10.12 to Section 7.10.3 for the limits (a.i.A-D), 7.10.9 for the recordkeeping (a.ii.A-G), and 7.1.1 for reporting (a.iii.A-B)
7.10.13.	Construction Permit Conditions for Equipment that is not yet built Applicable requirements for portable Boilers #1 through #4 from Permit 10100042:	Move Section 7.10.13 to Section 7.10.3 (a-c), 7.10.4 (d-e), 7.10.5 (f-g and i), 7.10.6 (h-k), 7.10.7 (m), 7.10.9 (n), and 7.10.10 (o - p)
7.10.13.d.	This permit is issued based on the emissions of HAPs as listed in Section 112(b) of the Clean Air Act from the affected boilers being less than 10 tons per year of a single HAP and 25 tons per year of any combinations of such HAPs, so that these boilers are considered a minor source for HAPs.	Replace with: "The affected boilers are not subject to 40 CFR 63 DDDDD because they meet the definition of temporary boilers per 40 CFR 63.7575."

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.10 - Boilers

Proposed Changes

Condition No.	Description of Permit Condition	Revision Recommendation
7.10.13.j.i.	Short-term emissions from each portable boiler shall not exceed 0.036 lb of NO $_x$/mmBtu and 3.6 and 3.8 lbs/hour, for NO_x and CO, respectively.	Update emission limits based on current AP-42 factors as shown in Appendix E calculations.
7.10.13.j.ii.	Pollutant	
7.10.13.j.ii.	NO_x	
7.10.13.j.ii.	CO	
7.10.13.j.ii.	VOM	
7.10.13.j.ii.	$PM/PM_{10}/PM_{2.5}$	
7.10.13.j.ii.	SO_2	
7.10.13.j.ii.	Individual HAP[1]	
7.10.13.j.ii.	Total HAP	
7.10.13.j.ii.	Individual HAP refers to individual pollutants, such as Formaldehyde, Benzene, Toluene, Hexane, etc.	

Company Name: U.S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.11 - Internal Combustion Engines

Proposed Changes

Condition	Description of Permit Condition	Revision Recommendation
7.11	Internal Combustion Engine	Add EGE Car Engines to descriptions in 7.11.1 and 7.11.2
7.11.A.	Non-Applicability of Regulations of Concern	Add CAM nonapplicability condition for all emission units
7.11.4.a.	The affected engine is not subject to 40 CFR Part 63 Subpart ZZZZ because it is not a spark ignition engine	Change nonapplicability to 40 CFR 63 Subpart ZZZZ based on being an emergency engine greater than 500 hp
		Add 40 CFR 63 Subpart ZZZZ nonapplicability provisions for EGE car engines based on non-road engine status
7.11.4.c.	The affected engine is not subject to 35 IAC Part 217, because the affected engine is not a type of process emission unit addressed by Part 217.	Change nonapplicability to reference 35 IAC Subpart Q, based on operation as an emergency engine
		Add 35 IAC 217 Subpart Q nonapplicability condition for EGE car engines based on capacity less than 1500 hp, designed to be portable, and moved to a new location every 12 months
7.11.9.c.	Records of hours of operation (hrs/wk).	Add records for emergency and nonemergency operation for emergency generator engine
7.11.10.a.i.	Pursuant to Section 39.5(7)(f)(ii) of the Act, the Permittee shall promptly notify the Illinois EPA, Air Compliance Section, within 30 days of deviations by the affected engine as follows:	Propose to change to semiannual exceedance reports submitted according to § 6.1 timelines along with NESHAP reports

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.12 - Gasoline Storage

Proposed Changes

Condition	Description of Permit Condition	Revision Recommendation
7.12.4.	Non-Applicability of Regulations of Concern	Add CAM nonapplicability requirement for all emission units Add DLD MACT (40 CFR 63 EEEE) nonapplicability requirement for all emission units
7.12.10.a.i.	Pursuant to Section 39.5(7)(f)(ii) of the Act, the Permittee shall promptly notify the Illinois EPA, Air Compliance Section, within 30 days of deviations by the affected gasoline storage tanks from applicable requirements, as follows:	Propose change to semiannual exceedance reports submitted according to 8.6.1 timelines along with NESHAP reports

Company Name: U. S. Steel
Facility Name: Granite City Works
Project Description: CAAPP Renewal Application
Permit Section: Section 7.13 - Fugitive Dust

Proposed Changes

Condition	Description of Permit Condition	Revision Recommendation
7.13.4.	Non-Applicability of Regulations of Concern The landfill operated on the site is not subject to 35 IAC Part 220 for municipal waste landfills. The landfill serves only the needs for Permittee's operations in accepting industrial waste generated on-site and no municipal or any off-site waste is accepted by this landfill.	Add CAM nonapplicability condition for all emission units
7.13.10.b.i.	Pursuant to Section 39.5(7)(f)(iii) of the Act, the Permittee shall promptly notify the Illinois EPA, Air Compliance Section, within 30 days of deviations in the affected areas of fugitive emissions, as follows:	Propose to change to semiannual exceedance reports submitted according to 8.6.1 timelines along with NESHAP reports

R006228

Granite City Works
United States Steel
20th & State Street
Granite City, IL 62040
(618) 451-3456

December 3, 2013

STATE OF ILLINOIS
DEC 03 2013
Environmental Protection Agency
BUREAU OF AIR

HAND DELIVERED

Mr. Bob Bernoteit
Manager, Permit Section
Division of Air Pollution Control
Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276
Springfield, IL 62794-9276

RE: CAAPP Permit Renewal Application (Permit No. 96030056)
East Alton, Illinois (Facility ID 119813AAI)

Dear Mr. Bernoteit:

United States Steel Corporation (U. S. Steel) is submitting one copy of the Clean Air Act Permit Program (CAAPP) permit renewal application for the Granite City Works facility located in Granite City, Illinois. The Granite City Works facility currently operates under CAAPP Permit No. 96030056, which was issued by the Illinois Environmental Protection Agency (IEPA) on May 2, 2011. Per Condition 9.14 of the CAAPP permit, U. S. Steel is submitting this renewal application no later than nine months prior to the current CAAPP permit's expiration date of September 3, 2014.

Please note that at this point U. S. Steel is not submitting forms related to the BOF Secondary Baghouse due to permit requirements currently under appeal and being addressed.

U. S. Steel also requests a permit shield which will provide that compliance with the conditions of this permit shall be deemed compliance with applicable requirements which were applicable as of the date the proposed permit for this source is issued, provided that either the applicable requirements are specifically indentified within the permit, or the IEPA, in acting on this permit application, has determined that other requirements specifically identified are not applicable to this source and this determination is included in the permit.

If you have any questions regarding this application, please do not hesitate to contact me at 618-451-3391.

Sincerely,

Bryan Kresak
Director - Environmental

REVISED PERMIT
DEC 03 2013
REVISED PERMIT

U. S. Steel – Granite City Works
CAAPP Renewal Application Outline
Application No. 96030056
November 2013

STATE OF ILLINOIS
DEC 0 9 2013
Environmental Protection Agency
BUREAU OF AIR

➢ Application Report/Narrative

1.0 Introduction
2.0 Description of Facility and Operations
3.0 Emission Calculations and PTE
4.0 Updates to the CAAPP Permit
5.0 Regulatory Applicability
6.0 Permit Shield Request

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APPENDIX E

PTE CALCULATIONS

TITLE V PERMIT RENEWAL APPLICATION

U. S. Steel Corporation - Granite City Works
> Granite City, Illinois

Title V Renewal
(Application No. 96030056)

Source ID No. 119813AAI

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1. INTRODUCTION

This document constitutes the Title V permit renewal application for the integrated steel mill operated by the United States Steel Corporation - Granite City Works (GCW) located in Granite City, Illinois, and is owned by the Unites States Steel Corporation, Pittsburgh, Pennsylvania (USS). GCW is an integrated iron and steel manufacturing facility consisting of raw material processing/preparation, coke production, iron production, steel production, and steel finishing operations.

USS currently operates GCW under the Title V permit No. 96030056 (also known as the Clean Air Act Permit Program or the "CAAPP" permit) which was originally issued by the Illinois Environmental Protection Agency (IEPA) on September 3, 2009, and revised twice due to appeal on May 2, 2011, and March 4, 2013. The CAAPP permit will expire on September 3, 2014. In accordance with 40 CFR 70.5(a)(1)(iii), USS must submit a complete application for renewal of the CAAPP permit no later than 6 months prior to expiration in order to preserve its permit shield pursuant to 40 CFR 70.4(b)(10), which authorizes continued operation if the state fails to issue a permit prior to the current permit's expiry date. However, IEPA requires CAAPP renewal applications to be submitted no later than 9 months prior to expiration date (December 3, 2013) in order for the submittal to be deemed complete and timely in accordance with the Illinois Administrative Code (IAC) 270.301(d). The purpose of this application is to renew the existing CAAPP permit for USS as required in Condition 9.14 of the permit and 35 IAC 270.301(d).

The CAAPP permit was issued based on USS being a major source for nitrogen oxides (NO_X), particulate matter with an aerodynamic diameter less than 10 microns (PM_{10}), particulate matter with an aerodynamic diameter less than 2.5 microns ($PM_{2.5}$), sulfur dioxide (SO_2), volatile organic material (VOM), carbon monoxide (CO), greenhouse gas (GHG), and hazardous air pollutant (HAP) emissions. GCW is located in the Madison County, Illinois, which is designated as nonattainment for the National Ambient Air Quality Standards (NAAQS) for ozone (marginal nonattainment), $PM_{2.5}$, and lead, and either attainment or unclassifiable for all other criteria pollutants (PM_{10}, CO, NO_X, and SO_2) per 40 CFR Part 81.314.

Included in this document are the required CAAPP permit renewal forms, proposed permit updates, and a discussion of applicable state and federal regulations. Given the size and complexity of the GCW operation, the facility's CAAPP permit is lengthy and complex. USS has modified a number of the terms and conditions of the existing permit to reconcile discrepancies, clarify compliance requirements, and streamlined various compliance demonstration methods and associated monitoring, recordkeeping, and reporting requirements as part of this permit renewal application. The objective of this application is to ensure that USS obtains a renewed CAAPP permit that accurately reflects the operations at the site and which clearly outlines applicable compliance requirements to ensure long-term continuous compliance is achievable.

2. DESCRIPTION OF FACILITY AND OPERATIONS

2.1. FACILITY LOCATION

The U.S. Steel Corporation - Granite City Works is located at 20th and State Streets, Granite City, Illinois, which is in Madison County. A site map is included in Appendix B.

2.2. EQUIPMENT DESCRIPTION AND PROCESS CHANGES

2.2.1. Equipment Description

GCW is an integrated iron and steel manufacturing facility, which includes iron-making, steelmaking, casting, and finishing operations, as well as a coke production facility. The facility operations encompass two coke batteries, two blast furnaces, two basic oxygen furnaces (BOFs), a ladle metallurgy facility (LMF), two continuous slab casters, a hot strip mill, a cold reduction mill, pickling and galvanizing lines, and coating operations. A summary of insignificant emission sources is described in CAAPP permit section 3.0. The significant emission units, along with the control equipment, are described in a tabular format in CAAPP permit section 4.0, and a detailed list of emission units can be found in list of tables in CAAPP permit section 7.1 through 7.13. Process flow diagrams and process descriptions are included in Appendices C and D, respectively. A detailed list of emission units covered by these sections has been provided in Appendix E of this application.

2.2.2. Process Changes

The existing equipment descriptions for the individual processes at GCW in the CAAPP permit sections 7.1 to 7.4 and 7.6 to 7.13 are generally accurate. However, the Basic Oxygen Furnace process described in the CAAPP permit condition 7.5 will eventually need to be updated with the new secondary baghouse added as part of the Emission Reduction Project (Construction Permit No. 11050006) once construction is complete. The new baghouse will control the charging emissions from the two BOFs, which were previously controlled by the existing Electrostatic Precipitator (ESP). Several other construction projects have occurred since the issuance of the previous CAAPP permit, including the New Quench Water Towers for Existing Quench Stations project (Construction Permit No. 08060026) and the Steam Rings for the Basic Oxygen Process Furnaces project (Construction Permit No. 10080021). Updated process descriptions have been included in Appendix D. USS does not seek to make any additional changes to the process operations at GCW. The flow diagrams for the various processes at GCW have also been updated to reflect the current operations and to clearly identify the emission units associated with the various areas. The revised flow diagrams are attached in Appendix C.

3. EMISSION CALCULATIONS AND POTENTIAL TO EMIT

3.1. POTENTIAL TO EMIT

USS requests the following changes, shown in Table 3-1, to the permitted site-wide emission limits. The detailed potential to emit (PTE) calculations, along with the source of the emission factors, are included in Appendix E of this CAAPP permit renewal application. Potential emissions from the various emission units at the facility as outlined in Sections 7.1 to 7.13 of the CAAPP permit are summarized in Table 3-1 below.

Table 3-1. Potential Emissions Summary

Area	PM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	VOM	Pb
5.0 Cooling Towers	97.39	39.71	0.19	0.00	0.00	0.00	0.00	0.00
7.1 Material Handling and Processing Operations	43.64	41.68	41.35	0.00	0.00	0.00	0.00	0.46
7.2 Coke Production	263.50	263.50	263.50	205.53	775.65	13,623.14	103.58	0.00
7.3 Coke By-Product Recovery and COG Desulfurization System	24.60	24.60	24.60	353.89	33.69	180.81	77.24	0.00
7.4 Blast Furnaces	348.76	322.08	316.79	3,184.00	381.05	952.89	222.43	0.05
7.5 Basic Oxygen Processes	573.84	511.79	510.71	0.25	73.30	16,100.39	12.51	1.45
7.6 Continuous Casting	51.62	51.62	51.62	0.00	89.50	0.00	0.00	0.09
7.7 Hot Strip Mill Reheat Furnaces	37.08	37.08	37.08	148.05	789.28	27.30	17.25	0.00
7.8 Finishing Operations	8.26	8.26	8.26	0.44	57.28	32.51	65.91	0.09
7.9 Wastewater Treatment Plant	0.00	0.00	0.00	0.00	0.00	0.00	19.91	0.00
7.10 Boilers	130.55	129.54	128.93	259.79	291.95	709.72	95.78	0.01
7.11 Internal Combustion Engine	1.34	1.34	1.34	3.80	29.98	7.46	1.38	0.00
7.12 Gasoline Storage and Dispensing	0.00	0.00	0.00	0.00	0.00	0.00	2.39	0.00
7.13 Fugitive Dust	44.52	12.70	0.90	0.00	0.00	0.00	0.00	0.00
Total	**1,625**	**1,444**	**1,385**	**4,156**	**2,522**	**31,634**	**618**	**2.15**

It is observed that some emissions depicted in Table 3-1 may have changed from what is currently reflected in the existing CAAPP permit. However, the major source status for NO_X, PM_{10}, SO_2, VOM, CO, GHGs and HAPs still exists. The change in the emissions is attributed to the following:

- Updated emission calculation methodology;
- Use of engineering estimates, process data and reasonable assumptions where necessary;
- Use of more recent stack test and other test report data;
- Changes that were implemented as part of Consent Decree requirements
- Use of updated standard emission rates and emission factors from whence they were used previously. This updated data is either from AP-42, AIRS, WEBFIRE, standard guidance documents, manufacturer's guarantee, construction permit limit, operational restrictions, monitoring, IEPA regulations, Mandatory Reporting Rule (MRR), or NSPS and NESHAP requirements;
- Use of updated software like TANKS 4.0.9.d. for tanks emissions and SIMS Model for WWTP emissions

- Identification of existing and addition of new emission units that were not included in the previous application submittal;
- Incorporate control devices that are either new or were not accounted for previously.

A detailed source for the emission factors and the calculation methodology are cited as either footnotes or reference documents in Appendix E or attached as 'Exhibits' in the CAAPP permit renewal application forms. Additionally, the calculations are segregated in a detailed fashion to have a better understanding of the process operations at GCW and also as an effort to aid the IEPA in their review process.

Additionally, Appendix E has the updated list of equipment for which the emissions were calculated as summarized in Table 3.2 as shown below. An overview of the process description, the associated emission calculation methodology, and a summary of any changes from the current CAAPP permit is summarized in Table 3.2 below.

Table 3-2. Emission Estimation Methods

Process Description	Emission Calculation Methodology	Changes from Previous Application
5.0 Cooling Towers	AP-42; Site-Specific TDS	All towers are included
7.1 Material Handling	AP-42; Site-Specific Test Data	None
7.2 Coke Production	AP-42; Site-Specific Test Data	None
7.3 Byproduct Recovery	AP-42; Site-Specific Test Data	None
7.4 Blast Furnaces	AP-42; Site-Specific Test Data	New Pollutant Data from Recent ICR Testing; Updates to AP-42 Natural Gas Emission Factors
7.5 Basic Oxygen Processes	AP-42; Site-Specific Test Data	New Pollutant Data from Recent ICR Testing; Updates to AP-42 Natural Gas Emission Factors
7.6 Continuous Casting	AP-42; Site-Specific Test Data	New Pollutant Data from Recent ICR Testing; Added Slab Scarfing Emissions
7.7 Hot Strip Mill	AP-42; Site-Specific Test Data	New Pollutant Data from Recent ICR Testing; Updates to AP-42 Natural Gas Emission Factors
7.8 Finishing Operations	AP-42; Site-Specific Test Data	Updates to AP-42 Natural Gas Emission Factors
7.9 Wastewater Treatment	SIMS Process Model	None
7.10 Boilers	AP-42; Site-Specific Test Data	New Pollutant Data from Recent ICR Testing; Updates to AP-42 Natural Gas Emission Factors
7.11 Internal Combustion Engines	AP-42	None
7.12 Gasoline Storage and Dispensing	TANKS 4.09	None
7.13 Fugitive Dust	AP-42; Site-Specific Data	None

4. UPDATES TO THE CAAPP PERMIT

USS proposes updates to the CAAPP permit to accurately reflect the current operations at the Granite City Works facility. USS seeks to reconcile inaccurate representations of current equipment, and also seeks to revise and refine terms or conditions in order to seek greater consistency in monitoring, recordkeeping, and reporting facility sources and the best currently available data. USS proposes several updates to overall source conditions in section 5.0 and unit-specific conditions in section 7.0 of the CAAPP permit, along with other general updates to reflect the current operations at the Granite City Works facility. The proposed changes are listed below.

4.1. UPDATES TO OVERALL SOURCE CONDITIONS AND SIGNIFICANT ACTIVITIES

As mentioned above, USS seeks to make several changes to the CAAPP permit to streamline review and the process of achieving compliance. The detailed list of changes with respect to the CAAPP permit conditions are provided in Appendix B of this application. USS requests the following changes as part of this CAAPP renewal application.

- USS seeks to provide emission point ID's for all emission units in Section 7.1 to 7.13. A more detailed configuration on these ID's has been provided in Appendix E of this application. These emission units and their corresponding IDs are also depicted on the process flow diagrams included in Appendix C.
- Update incorrect equipment names or designations as described in Appendix D.
- USS requests that certain emission limits and/or emission factors referenced in Sections 5.0 and 7.1 – 7.13 be revised based on the PTE calculations in Section 3 and Appendix E of this application. These emission limits were calculated based on updated standard emission factors from AP-42, WEBFIRE database, site-specific stack testing data, and/or engineering estimates from extensive file review and research of historical records at USS. Some of the current emission limits are based on either outdated emission factors or stack tests that are obsolete, and therefore should be updated to reflect the best data currently available.
- The requirements of 40 CFR 61, Subpart FF, National Emission Standard for Benzene Waste Operations (BWON), for the Coke Byproduct Recovery operation in section 7.3 includes the requirements for sources with a Total Annual Benzene (TAB) quantity greater than 10 megagrams per year (Mg/yr), greater than 1.0 Mg/yr but less than 10 Mg/yr, and less than 1.0 Mg/yr. USS proposes to streamline these requirements by specifying the applicable requirements for the TAB quantity in the Byproduct recovery plant facility waste and removing those which do not apply.
- USS proposes to remove and consolidate repetitive permit conditions, and either elaborate upon or delete vague permit conditions from Sections 7.1 – 7.13. In particular, several emission limits established in construction permits are repeated in two or more sections of the CAAPP permit, numerous equipment specific emission limits in Illinois' State Implementation Plan (SIP) or established in construction permits have the same or very similar requirements to federal emission standards in 40 CFR 60 or 63, and several conditions have no specific compliance requirements of their own but rather require compliance with other permit conditions. The proposed revisions are detailed in Appendix F.
- Streamline reporting requirements by removing 30-day or quarterly deviation reporting requirements from 7.1-7.13 where not specifically required by existing regulations. USS proposes these reports be addressed on a semi-annual basis following the timelines in CAAPP permit condition 8.6.1.
- For the "Internal Combustion Engine" process (CAAPP permit section 7.11), USS discovered several sources not previously identified in the initial CAAPP application. USS seeks to add these emission units to the CAAPP permit in this renewal application. In addition, the COG Booster engine is no longer in service at the facility, and should be removed from the permit.
- Remove requirements for initial notification that have been completed or whose compliance date has otherwise passed.

- Compliance Assurance Monitoring applicability is addressed for emission units in CAAPP permit sections 7.1-7.13. The applicability of this regulation is discussed in detail in Section 5.1.4 and required forms are included in Appendix A.
- Update the process flow diagrams to accurately represent the current operations at GCW. Current flow diagrams are included in Appendix C.

4.2. OTHER GENERAL UPDATES TO CAAPP PERMIT

The other factors that need to be addressed as part of this renewal application are as follow.

- USS was issued a Consent Order (No. 05-CH-750) in January 2008 and all associated compliance requirements of this consent order were met. Therefore, compliance requirements with respect to this consent order should have been previously addressed in the CAAPP permit before the issue date of September 3, 2009.
- The Fugitive Dust Plan for GCW was most recently updated in January 2013, and no further updates are necessary as part of this CAAPP permit renewal application.

5. REGULATORY APPLICABILITY

This section addresses and summarizes the new applicable requirements that have either become effective or have been promulgated since the September 2009 CAAPP was issued. Additionally, non-applicability of regulations not addressed in the current CAAPP permit are discussed in this section. Regulations currently listed in the CAAPP permit which remain applicable to GCW have been incorporated by reference into this permit renewal application.

5.1. FEDERAL REGULATORY APPLICABILITY

This section of the application covers applicability and non-applicability of certain rules promulgated under the Code of Federal Regulations (CFR). Specifically, New Source Performance Standards (NSPS) codified under 40 CFR 60, Maximum Achievable Control Technology (MACT) standards codified under 40 CFR 63, and various additional regulations are addressed in this section.

5.1.1. 40 CFR Part 63, Subpart DDDDD - National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters

40 CFR 63, Subpart DDDDD, National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters (Boiler MACT) applies to boilers and process heaters providing heat through indirect transfer to a process material or heat transfer material. Though the current revised CAAPP permit was issued on March 4, 2013, the language in the current CAAPP permit reflects an earlier version of the regulation and must be updated with the provisions of final rule published in the Federal Register on January 31, 2013. The applicability of this rule for different processes is discussed below.

5.1.1.1. CAAPP Permit Section 7.10 - Boilers

USS currently operates two boilers (Boilers 11 and 12) each rated at 225 million British thermal units per hour (MMBtu/hr), a Power Boiler #1 which is nominally rated at 505 MMBtu/hr, and four portable boilers #1-#4. Boilers 11 and 12 are potentially[1] subject to the provisions of Boiler MACT, whereas Power Boiler #1 and the portable boilers are exempt from the Boiler MACT requirements, as discussed below.

Boilers 11 and 12 have the physical capability to combust various combinations of natural gas, coke oven gas (COG) and blast furnace gas (BFG). As such, these boilers may be subject to various emission limits, operating limits, work practice standards, reporting requirements, and recordkeeping requirements for affected boilers under Boiler MACT. USS is currently evaluating its compliance options and obligations under Boiler MACT, and will be in compliance with any applicable requirements prior to the major source compliance date of January 31, 2016. The current conditions of the CAAPP permit reference the requirements an earlier published version of the Boiler MACT regulations, which have been superseded by the final January 31, 2013 regulations. USS requests the Boiler MACT requirements for Boilers 11 and 12 be updated to reflect the final version of the regulation.

Power Boiler #1 is not subject to the requirements of Boiler MACT because it receives 90 percent or more of its total annual gas volume from blast furnace gas, thereby meeting the definition of a blast furnace gas fired boiler in 40 CFR 63.7575. Blast furnace gas fired boilers are exempt from the requirements of Boiler MACT pursuant to 40 CFR 63.7491(k).

[1] If the boilers meet the definition of BFG-fired boilers per 40 CFR 63.7575 as of the compliance date, the provisions of this regulation will not apply.

Portable Boilers #1 through 4 are not subject to the requirements of Boiler MACT because they are designed to and are capable of being moved from one location to another, thereby meeting the definition of temporary boilers in 40 CFR 63.7575. Temporary boilers are exempt from the requirements of Boiler MACT pursuant to 40 CFR 63.7491(j). In order to remain classified as temporary boilers, the portable boilers may not be attached to a foundation, remain in one location within the facility or be replaced by another boiler performing the same function for more than 12 consecutive months, or be moved from one location to another within the facility but continue to perform the same function and serve the same steam system in attempt to circumvent the residency time requirements of this definition.

5.1.1.2. CAAPP Permit Section 7.7 - Hot Strip Mill Reheat Furnaces - Not Applicable

The steel slabs are heated in the four slab reheat furnaces to allow further formation in the hot strip mill. All four furnaces burn natural gas and COG alone or in combination. Because the furnaces operate as direct fire units rather than providing heat through indirect transfer, the reheat furnaces do not meet the definition of process heater in 40 CFR 63.7575. As such, the provisions of Boiler MACT do not apply to the slab reheat furnaces.

5.1.1.3. CAAPP Permit Section 7.8 - Finishing Operations

The finishing process operation contains two furnaces (#7A and #8) as well as miscellaneous heaters on Galvanizing Line #8 which combust natural gas only. As such, the furnaces meet the definition of "units designed to burn gas 1" subcategory per 40 CFR 63.7575. As such, these are units are subject to the associated work practice standards, reporting, and recordkeeping requirements for gas 1 fired heaters. The current conditions of the CAAPP permit reference the requirements an earlier published version of the Boiler MACT regulations, which have been superseded by the final January 31, 2013 regulations. USS requests that the Boiler MACT requirements for these heaters be updated to reflect the final regulation.

5.1.2. 40 CFR Part 63, Subpart ZZZZ - National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines

40 CFR 63, Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE MACT) applies to stationary reciprocating internal combustion engines (RICE) operating at major and area sources of HAP. USS operates several insignificant stationary RICE, as well as one significant stationary RICE: and a stationary emergency RICE with a site rating of 3,500 horsepower (hp).[2] This Emergency Backup Diesel Generator is an existing stationary RICE pursuant to 63.6590(a)(1)(i), as it was constructed in 2001 and has not been reconstructed as defined in 40 CFR 63.2. As this unit is an emergency stationary RICE with a site rating greater than 500 hp located at a major source of HAP emissions, it does not have to meet the emission and operating requirements of the RICE MACT, pursuant to 40 CFR 63.6590(b)(3)(iii). However, since the unit operates as an emergency RICE, it must satisfy the emergency stationary RICE definition pursuant to 40 CFR 63.6675, which requires compliance with the applicable requirements specified in 40 CFR 63.6640(f) in order to be considered emergency stationary RICE. Pursuant to the conditions 40 CFR 63.66440(f)(2) and (3), the emergency engine may be operated for a total of 100 hours per year for maintenance and testing, emergency demand response, and 50 hours of non-emergency demand response which is included in the 100 hours of non-emergency operation.

GCW operates 6 insignificant stationary emergency RICE with a rated capacity less than 500 hp. Each of these engines is subject to the requirements of RICE MACT for emergency stationary CI RICE in 40 CFR 63.6602 and

[2] Note that the #4 COG Booster engine (840 hp) is no longer in service.

6640(f). Pursuant to §6602, each emergency engine must be inspected according to the schedules listed in Table 2c of Subpart ZZZZ. Pursuant to §6640(f), each emergency engine may be operated for a total of 100 hours per year for maintenance and testing, emergency demand response, and 50 hours of non-emergency demand response which is included in the 100 hours of non-emergency operation. USS requests the emission limits and work practice standards for these engines be added to the CAAPP permit sections 3.0 – Insignificant Activities and 5.0 – Overall Source Conditions as listed in Appendix A.

GCW operates several non-road RICE, as defined in 40 CFR 1068.30. As they are not stationary engines as described in 40 CFR 63.6585(a) and the definitions in 40 CFR 63.6675, these RICE are exempt from the requirements of RICE MACT.

5.1.3. 40 CFR Part 63, Subpart EEEE - National Emission Standards for Hazardous Air Pollutants: Organic Liquid Distribution (Non-Gasoline) - *Not Applicable*

40 CFR 63, Subpart EEEE, National Emission Standards for Hazardous Air Pollutants: Organic Liquids Distribution (Non-Gasoline) (OLD MACT) applies to storage tanks, transfer racks, equipment leaks, and loading of transport vehicles and containers in organic liquid service. The definition of "Organic Liquid" pursuant to 40 CFR 63.2406 is as follows:

Organic liquid means:
(1) Any non-crude oil liquid or liquid mixture that contains 5 percent by weight or greater of the organic HAP listed in Table 1 to this subpart, as determined using the procedures specified in §63.2354(c).
(2) Any crude oils downstream of the first point of custody transfer.
(3) Organic liquids for purposes of this subpart do not include the following liquids:
(i) Gasoline (including aviation gasoline), kerosene (No. 1 distillate oil), diesel (No. 2 distillate oil), asphalt, and heavier distillate oils and fuel oils;
(ii) Any fuel consumed or dispensed on the plant site directly to users (such as fuels for fleet refueling or for refueling marine vessels that support the operation of the plant);
(iii) Hazardous waste;
(iv) Wastewater;
(v) Ballast water: or
(vi) Any non-crude oil liquid with an annual average true vapor pressure less than 0.7 kilopascals (0.1 psia).

By definition, the gasoline that is consumed by the plant users or fleet directly for its operation is not an organic liquid for purposes of OLD MACT. Thus, USS is not subject to the provisions of the OLD MACT.

5.1.4. 40 CFR Part 64 - Compliance Assurance Monitoring (CAM) Plan

40 CFR Part 64, Compliance Assurance Monitoring (CAM), applies to emission units at a major source required to obtain a CAAPP permit if the unit is subject to an emission limit or standard or a regulated air pollutant or surrogate, the unit uses an emission control technology to achieve compliance with the limit, and the unit has potential pre-control emissions of the regulated air pollutant greater than 100 percent of the amount required to be a major source. However, these requirements do not apply to emission limits proposed after November 15, 1990, pursuant to Section 111 or 112 of the Clean Air Act, Stratospheric ozone protection requirements under Title VI of the Clean Air Act, Acid Rain Program Requirements, emission limits established solely under an emissions trading program, or emission limits or standards for which the CAAPP permit specifies a continuous compliance requirement. USS did not address the requirements of CAM at the time of issuance of the initial CAAPP permit, because the application was submitted prior to CAM reporting deadline of April 20, 1998, pursuant to 40 CFR 64.5(a)(1).

Exhibits to the 464-CAAPP Forms included in Appendix A contain information detailing CAM applicability for each significant emission unit at GCW and the reason for applicability or non-applicability, including control technology used, pre-control emission rates in comparison to the major source thresholds, and applicable post-1990 NSPS or NESHAP requirements. As shown in Appendix A, the emission units subject to CAM requirements are as follows:

- Thermal Oxidizer (Byproduct-S006): Controls emissions from the Claus Sulfur Recovery Unit
- Baghouse #1 (BOP-S007): Controls emissions from the LMF Conveyors and Storage Bins, Caster Steel Deslagging Station, Slag Dispensing Station, Alloy Material Handling, Tripper Conveyor
- Fume Baghouse #2 (BOP-S008): Controls emissions from the Argon Stirring Station, fuming from hot metal and additives

The 464-CAAPP forms outlining proposed CAM for each of these units are attached in Appendix A. Exhibit 464-6a summarizes the CAM applicable units and requirements. Exhibit 464-6b summarizes non-applicability of emission units for which it has been determined that CAM does not apply.

5.1.5. 40 CFR Part 60, Subpart Y - Standards of Performance for Coal Preparation and Processing Plants - *Not Applicable*

40 CFR 60 Subpart Y, Standards of Performance for Coal Preparation and Processing Plants (NSPS Y) applies to thermal dryers, pneumatic coal-cleaning equipment, coal processing and conveying equipment including breakers and crushers, and coal storage systems, transfer, and loading systems at coal preparation plants processing over 200 tons per day which commenced construction, modification, or reconstruction after October 27, 1974. The coal processing equipment at GCW is not subject to the provision of NSPS Y because the coal crusher, two coal pulverizers, and coal conveyors were constructed prior to October 27, 1974, and have not undergone modification or reconstruction since the applicability date.

5.1.6. 40 CFR Part 60, Subpart N - Standards of Performance for Primary Emissions from Basic Oxygen Process Furnaces for Which Construction is Commenced after June 11, 1973 - *Not Applicable*

40 CFR 60 Subpart N, Standards of Performance for Primary Emissions from Basic Oxygen Furnaces (NSPS N) apply to emissions of particulate matter generated during the steel production cycle and captured by the primary control system at a BOF that commenced construction or modification after June 11, 1973. The BOF vessels at GCW are not subject to the provisions of NSPS N because the furnaces BOF #1 and BOF #2 were constructed prior to June 11, 1973. Steam rings were installed on the two existing basic oxygen furnaces under Construction Permit No. 10080021. The installation of the steam rings was part of a control project which reduced the amount of particulate matter from these furnaces during the "oxygen blow" or refining phase when oxygen was being fed into furnaces. This change does not meet the definition of "modification" provided in 40 CFR 60.2 and 40 CFR 60.14(e)(5). This definition reads as follows:

"Modification means any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted into the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) into the atmosphere not previously emitted."

Because the steam ring project did not trigger an increase in emissions or emissions of any new pollutants that were not previously permitted, the project is not considered a modification.

5.1.7. 40 CFR Part 60, Subpart Na - Standards of Performance for Secondary Emissions from Basic Oxygen Process Steelmaking Facilities for Which Construction is Commenced After January 20, 1983 - *Not Applicable*

40 CFR 60 Subpart N, Standards of Performance for Secondary Emissions from Basic Oxygen Steelmaking Facilities (NSPS Na) apply to top-blown BOFs and hot metal transfer stations and skimming stations used with bottom-blown or top-blown BOFs that commenced construction or modification after January 20, 1983. The BOFs, reladling facility, and slag skimming at GCW are not subject to the provisions of NSPS Na because the furnaces BOF #1 and BOF #2, reladling station, and slag skimming facility were constructed prior to January 20, 1983. The installation of the steam rings of the BOFs is not a modification, as explained in the non-applicability of NSPS N above (Section 5.1.5). A secondary baghouse was installed in addition to the existing ESP under the Construction Permit No. 11050006. Installation of the baghouse does not constitute a modification of BOF #1 or BOF #2 pursuant to 40 CFR 60.14(e)(5), as the project has the primary function of reducing emissions.

5.2. STATE OF ILLINOIS REGULATORY APPLICABILITY

This section of the application covers the applicability of Illinois state regulations codified in Section 35 of the Illinois Administrative Code (35 IAC).

5.2.1. 35 IAC Part 217, Subpart Q - Stationary Reciprocating Internal Combustion Engines and Turbines

35 IAC 217 Subpart Q, Stationary Reciprocating Internal Combustion Engines and Turbines, established the standards and limitations for emission of NO_X from stationary reciprocating internal combustion engines located in the Chicago or Metro-East areas. This standard is being addressed in this CAAPP renewal application as it became effective after the current CAAPP permit was issued. GCW is located in Madison County, which is part of the Metro-East area, as stated in 35 IAC 217.386(a)(2). Pursuant to 35 IAC 217.386(a)(2)(A), the provisions of this rule are applicable to stationary reciprocating internal combustion engines (RICE) and turbines with a nameplate capacity greater than or equal to 500 brake horsepower (bhp) output which are located at a source with a PTE of 100 tpy of NO_X.

As discussed above, there are three RICE at GCW having a nameplate capacity greater than 500 hp: the Emergency Backup Diesel Generator, a stationary emergency RICE with a site rating of 3,500 bhp; the EQC railcar engines, and two non-emergency diesel engines mounted on the EQC railcars.

Pursuant to 35 IAC 217.386(b)(1), the Emergency Backup Diesel Generator is not subject to the rule as it is used as an Emergency or Standby Unit as defined under 35 IAC 211.1920.

As discussed in the RICE MACT applicability, GCW operates two non-road engines at the EQC railcars. These engines have rated capacities of 950 and 860 bhp on an output basis. Although these engines meet the definition of non-road engines for purposes of the federal RICE standards, they meet the Illinois definition of stationary Reciprocating Internal Combustion Engines pursuant to 35 IAC 211.6360, which reads as follows:

> *"Stationary reciprocating internal combustion engine" means any internal combustion engine, except a gas turbine, that is not self-propelled. It may, however, be mounted on wheels for portability.*

The exemption criteria pursuant to 35 IAC 217.386(b)(5)states that engines with a nameplate capacity rated at less than 1,500 bhp (1,118 kW) output, mounted on a chassis or skids, designed to be moveable, and moved to a different source at least once every 12 months are not subject to provisions of 35 IAC Part 217 Subpart Q. These

engines are mounted on the EQC railcars, which operate in continuous motion transporting coke from the battery to the quench station. As such, the requirements of 35 IAC 217 Subpart Q do not apply to the EQC railcar engines.

6. PERMIT SHIELD REQUEST

A CAAPP application may include a request for a "permit shield" in the permit whereby compliance with the condition(s) of the permit shall be deemed equivalent to compliance with the applicable requirement(s) which is/are applicable as of the date of the release of the proposed permit in accordance with 40 CFR 70 and any amendments thereunder. With this renewal application, USS is requesting a permit shield for the entire source.

PRODUCTION INCREASE PERMIT

U.S. STEEL CORPORATION GRANITE CITY WORKS

Application to Modify

Permit No. 95010001

IEPA - DIVISION OF RECORDS MANAGEMENT
RELEASABLE
MAY 07 2014
REVIEWER EAV

Prepared for

U.S. Steel Corporation Granite City Works
1951 State Street
Granite City, Illinois 62040

RECEIVED
STATE OF ILLINOIS
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Environmental Protection Agency
BUREAU OF AIR

January 29, 2008

URS Corporation
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Project #20236935.00400

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The United States Steel Corporation Granite City Works (the Facility) is herein making application to modify Permit No. 95010001 known as the Production Increase Permit. The Facility is an integrated iron and steel manufacturing plant located in Granite City, Illinois as seen in **Figure 1-1** Site Location Map. The Facility is a major source as defined by 35 IAC 203.206.

This application to modify is to correct the emission factors used to develop the original application and permit in light of newly identified information on emissions and emission factors. The proposed permit modification will increase SO_2 emission factors for the combustion of BFG and CO and VOM emission factors for the combustion of natural gas. No physical changes to the operations at the facility are proposed. This modification strictly addresses deficiencies in the emission factors used in the original Production Increase Permit application and the Illinois Environmental Protection Agency (IEPA) issued permit (Permit No. 95010001).

This application includes a general facility description below. Section Two includes a discussion of relevant processes at the Granite City Works and the resulting changes to Permit No. 95010001 as a result of the proposed emission factors. Section Three contains a revised emissions analysis for the Production Increase Permit. Section Four includes an analysis of the regulatory requirements resulting from the revised Production Increase Permit emission factors. Section Five includes an updated and revised analysis of Best Available Control Technology (BACT) that takes into account the revised emissions estimates. The revised air quality modeling performed for the Production Increase Permit is presented in Section Six. Section Seven includes the additional impact analysis required as part of a Prevention of Significant Deterioration (PSD) application.

1.1 GENERAL FACILITY DESCRIPTION

The United States Steel – Granite City Works is located in Madison County, Illinois. The largest city near the facility is St. Louis, Missouri, which is located approximately 15 kilometers southwest of the Granite City mill. The latitude and longitude of the mill are approximately 38:41:55 and 90:08:42. The facility occupies approximately 1,100 acres of land in an area primarily used for industrial and agricultural purposes. A site location map is provided in **Figure 1-1**. A site map is provided in **Figure 1-2.**

The United States Steel – Granite City Works is owned and operated by United States Steel Corporation. The responsible official is David Rintoul, General Manager of Granite City Works.

The primary contact for questions regarding this application is Mr. Larry Siebenberger, Manager of Environmental Quality Control. His telephone number is 618-451-3391. The secondary contact for questions regarding this application is Mr. Robert Ribbing who may be reached at 618-451-4026.

The street address for the Facility is:

United States Steel – Granite City Works
1951 State Street
Granite City, Illinois 62040

In general, the Granite City Works receives raw materials by rail and truck, and produces steel coils of various sizes and finishes to meet customer needs. Products are shipped from the mill by rail and truck.

The Standard Industrial Classification (SIC) Code for the facility is 3312.

1.2 PERMITTING HISTORY

The Granite City Works submitted an application for a Clean Air Act Permit Program (CAAPP) permit in February 1996. IEPA is currently preparing the Facility's draft CAAPP Permit. Until the Granite City Works CAAPP permit is finalized the Facility operates under 30 separate operating permits for various units. Relevant operating permits are detailed below.

IEPA Permit Nos. 72080034 and 72080036 limit operations at the "A" and "B" Blast Furnaces, the Blast Furnace Casthouse, the BFG Scrubber and the Iron Spout and Casthouse Baghouses. These two permits allow the injection of intermediate light oil from the By-Products Plant and recycled oil from operations in the plant to be injected into both blast furnaces as alternative carbon sources.

In 1994 Granite City Works obtained a SO_2 Federally Enforceable State Operating Permit (FESOP) for combustion of Coke Oven Gas (COG) in certain fuel combustion units. The SO_2 FESOP (IEPA Permit No. 94120017) limited SO_2 emissions from COG combustion at all COG combustion units. SO_2 ambient air quality modeling for this application is dependent on the SO_2 limits in the SO_2 FESOP.

In late 1994, Granite City Works submitted a PSD permit application for a production increase at the Granite City Works. The Production Increase Permit Application showed the project would result in a significant increase in SO_2 and CO. The project netted out of PSD review for NO_x, PM, PM_{10} and VOC. The Production Increase Permit (IEPA Permit No. 95010001) was issued in 1996. This permit sets SO_2 emission limits for the Casthouse Baghouse (422 tons SO_2 per year), the uncaptured Casthouse Fugitives (21.94 tons SO_2 per year), the Slag Pits (15.83 tons SO_2 per year), and Iron Spout Baghouse (13.89 tons SO_2 per year).

2.1 BLAST FURNACES

The Facility has two blast furnaces, "A" Blast Furnace and "B" Blast Furnace. The blast furnace process is used to transform iron ore into raw molten iron. In the process iron ore, scrap and other metallics, coke and other carbon containing materials, limestone, and other fluxes (referred to as the burden) are loaded into the blast furnace where they slowly descend. Near the bottom of the furnace through the tuyeres, blast air is blown into the furnace and rises up through the burden. Blast air is high temperature air blown into the furnace in high volumes supporting the burden. At times, liquid materials such as oils or natural gas can be injected through the tuyeres with the hot blast as an additional source of carbon.

In the furnace, the hot blast air and the carbon in coke, oils, or natural gas react to form carbon monoxide. In the presence of carbon monoxide, the iron oxide in the iron ore reduces to metallic iron. In general, the reactions occurring in the Blast Furnace are described as follows:

$$Fe_2O_3 + 3\ CO \rightarrow 2\ Fe + 3\ CO_2$$

$$CO_2 + C \rightarrow 2\ CO$$

The result is molten iron, molten slag (calcium oxides and impurities), and a by-product gas rich in carbon monoxide called BFG. The BFG is collected at the top of the Blast Furnace and cleaned in a dust catcher and gas cleaning system. BFG is then utilized as a high volume, low heat content fuel at the Facility. BFG combustion is further described in Section 2.3 below.

Impurities in the Blast Furnace process include silica and sulfur. The majority of these materials are carried out of the process in the slag. Based on recent testing, US Steel estimates that approximately 80 % of the sulfur in the Blast Furnace Burden is bound up in the slag and transferred to the slag pits. Another 8 % of the sulfur remains in the iron and is removed prior to conversion of the iron to steel in the Basic Oxygen Furnace (BOF) Shop. Another 4 % of the sulfur is carried out in the flue dust and is removed by the dust catcher. An additional 8-9 % of the sulfur is removed in the BFG with 4 % being cleaned by the gas cleaning system and 4 to 5 % remaining in the BFG.

2.2 BLAST FURNACE CASTING

Iron and slag are cast through a tap hole drilled in the bottom of the furnace. Molten iron and slag pours through the tap hole into the trough. The iron and slag is separated and then flows through runners in the casthouse floor. Some of the runners are covered to minimize emissions. The runners direct the iron to a spout where the iron is poured into an iron ladle. The iron ladle is transported via train to the steel shop for conversion to steel. This process is called casting.

The molten slag flows through slag runners and is directed to a pit. While in the pit the slag is cooled using a water spray. Cooled slag is loaded via front-end loader to a truck and shipped off-site as a by-product material.

2.3 BLAST FURNACE GAS COMBUSTION

BFG has a low heat content ranging from under 60 to more than 100 million British thermal units per standard cubic foot of gas (MMBtu/scf). At the Granite City Works, BFG is permitted to be combusted in the Blast Furnace Stoves, Boilers 1-12, and the BFG Flare. Any BFG the Facility is unable to combust for usable heat in the Blast Furnace Stoves or Boilers is combusted in the BFG Flare. The Facility does not store or ship BFG off-site.

The BFG collected at the top of the Blast Furnaces is piped to a dust catcher and a gas cleaning system to remove particulate from the BFG. The Blast Furnace Permits (IEPA Nos. 72080034 & 72080036) require the dust removal system remove particulate to less than 0.01 grains per dry standard cubic foot (gr/dscf). After the bulk of the dust is removed, the BFG is piped to various combustion devices in the facility to be used as a fuel.

BFG has small amounts of sulfur bearing compounds that cause the creation of SO_x compounds during combustion. Analysis of BFG fuel samples indicates BFG sulfur levels currently range from 20 to 50 ppmv of sulfur compounds. As described previously, recent testing of the relationship between sulfur in the Blast Furnace burden and sulfur in the BFG indicates that as much as 5 % of the sulfur in the burden ends up in the BFG after the dust cleaning system. Based on typical sulfur levels for the Blast Furnaces, this results in emissions of SO_x of 16 lbs. per MMcf of BFG combusted.

2.4 CHANGES REQUIRED IN THE PRODUCTION INCREASE PERMIT

The Production Increase Permit (IEPA Permit No. 95010001) allows the facility to combust up to 30,800 million cubic feet (MMcf) of BFG per month and 185,030 MMcf of BFG per year resulting in up to 615.22 tons per year of SO_2 from all BFG combustion units. This limitation was based on an emission factor used for an ACME Steel Permit. Based on US Steel's own recent testing, US Steel now believes the ACME Steel emission factor does not accurately represent the nature of SO_2 emissions from BFG combustion at the Granite City Works either now or at the time of the permit issuance.

The ACME Steel SO_2 emission factor was used as the best available estimate of BFG SO_2 emissions available at the time. However, based on recently developed data, the ACME SO_2 factor underestimated both the actual emissions and the proposed emission increase identified in the Production Increase Permit application. Therefore, US Steel seeks to revise the Production

Increase Permit (95010001) to account for US Steel's revised method for calculating the SO_2 emission rate from BFG combustion. This will increase the total allowable emissions of SO_2 on an annual basis from the combustion of BFG in the Production Increase Permit.

In accordance with this request for modification of the Production Increase Permit, US Steel has included a revised calculation of SO_2 emission increases from BFG combustion and a revised analysis of BACT. Revised ambient air quality modeling for the Production Increase Permit Application is presented in Section Six.

3.1 AFFECTED EMISSION UNITS

This application includes emission estimates for the seven (7) BFG combustion sources listed below:

BFG Combustion Sources

- Blast Furnace "A" Stoves
- Blast Furnace "B" Stoves
- Boilers 1-7
- Boilers 8-10
- Boiler 11
- Boiler 12
- Blast Furnace Gas Flare.

These sources will require changes to the BFG Combustion emission limit in the Production Increase Permit (IEPA Permit No. 95010001).

3.2 EMISSION FACTORS / PERMITTED LIMITS

The Production Increase Permit limits SO_2 emissions from the Blast Furnace Casting Sources as well as from the combined combustion of all BFG at the facility. The existing SO_2 limits in the Production Increase Permit are detailed below:

- Casthouse Baghouse — 422 tons SO_2 per year
- Uncaptured Casthouse Fugitives — 21.94 tons SO_2 per year
- Slag Pits — 15.83 tons SO_2 per year
- Iron Spout Baghouse — 13.89 tons SO_2 per year
- BFG Combustion (185,030 MMcf/yr) — 615.22 tons SO_2 per year

As discussed in Section 2.4, US Steel requests to revise the Production Increase Permit emission limits based on recent testing that shows that approximately 5 % of sulfur in the blast furnace burden travels with the BFG through the gas cleaning devices. Based on this calculation method, the Production Increase Permit should have based SO_2 emissions from BFG combustion on an emission factor of 16 lbs. SO_x / MMcf of BFG combusted. This emission factor is representative of the typical sulfur burden in the blast furnaces prior to and after the issuance of the Production Increase Permit.

3.3 EMISSIONS INCREASES

Average actual BFG combustion volumes prior to the Production Increase Permit Application were 121,039 million cubic feet (MMcf). The Production Increase Permit limits the total volume of BFG combustion to 185,030 MMcf. Using the recently calculated emission factor for BFG combustion of 16 lbs. SO_x per MMcf results in a potential emission increase of 511.93 tons SO_x per year from the combustion of BFG. This is the corrected increase for BFG combustion from the original Production Increase Permit Application of which 212.77 tons was previously accounted for in the Production Increase Permit. US Steel believes that the 16 lbs. SO_x per MMcf emission factor used here to develop the revised BFG emission increase should have been used in the 1994 Production Increase Permit and the associated increase has already occurred.

Using the revised emission factor and the permitted BFG consumption rate, the proposed Production Increase Permit limit for BFG combustion emissions of SO_2 is 1,480.24 tons per year.

An analysis of the actual BFG combustion SO_x emissions that have occurred since the Production Increase Permit indicates that the actual emissions increases are much lower than the 511.93 tons of SO_x per year potential increase. In fact, the actual emission increase that has occurred at the Granite City Works is lower than the 212.77 ton per year increase that was permitted in 1995. The table below compares the actual emissions since the Production Increase Permit (PIP) compared to the Pre-Production Increase Permit levels.

CO and VOM emission factors for the combustion of NG identified in the Production Increase Permit are from earlier revisions of AP-42. AP-42 factors for CO and VOM have increased to 84 and 5.5 lbs/MMscf. Based on the NG throughput permit limit in the Production Increase Permit of 1,346 MMscf per year, emissions of CO and VOM would be 56.53 and 3.70 tons per year, respectively. Even without considering baseline emissions, this would not result in a significant increase in either pollutant. Therefore, US Steel requests the permit be modified to include the revised emission factors and new permit limits.

Table 3-1: Revised Analysis of SO_x Emissions Changes Resulting from Production Increase Permit

Analysis Year	BFG Prod. (MMscf)	SO_x Emission Factor (lbs./mmscf)	SO_x Emissions (tpy)	Actual Annual Change from Pre PIP Levels (tpy)
Pre-PIP	121,039	16.00	968.31	Baseline
1997	137,590	16.00	1100.72	132.41
1998	137,165	16.00	1097.32	129.01
1999	128,556	16.00	1028.45	60.14
2000	132,857	16.00	1062.86	94.54
2001	131,058	16.00	1048.46	80.15
2002	134,842	16.00	1078.74	110.42
2003	131,642	16.00	1053.14	84.82
2004	127,539	16.00	1020.31	52.00
2005	127,165	16.00	1017.32	49.01
2006	123,930	16.00	991.44	23.13

Note: BFG Production based on US Steel Granite City Works utility distribution spreadsheet for the years 1997 to 2006.

This section analyzes the federal and state air quality regulations potentially applicable to the Production Increase Permit application being revised. It also includes those regulatory exemptions that make potentially applicable rules inapplicable.

4.1 PRODUCTION INCREASE PERMIT APPLICATION

The change to the BFG combustion SO_2 emission rate in the Production Increase Permit application does not alter the applicable regulatory requirements analyzed in the original application. Based on the revised SO_2 emission increase calculation detailed in Section Three, this application contains all necessary information for a revised PSD analysis of the SO_2 emissions resulting from increased BFG production due to the production increase. As stated in Section One, the information required for the PSD analysis includes the analysis of BACT in Section Five and the additional impact analysis contained in Section Six. Ambient air quality modeling results are presented in Section Six.

Best Available Control Technology (BACT) is defined in 40 CFR 52 Subpart A Paragraph 52.21(b)(12) as an emissions limitation based on the maximum degree of reduction for each pollutant subject to regulation under the Act which would be emitted from any proposed major stationary source or major modification which the Administrator, on a case by case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant. In no event shall application of BACT result in emissions of any pollutant, which would exceed the emissions allowed by any applicable standard under 40 CFR Parts 60 and 61. If the Administrator determines that technological or economic limitations on the application of measurement methodology to a particular emissions unit would make the imposition of an emissions standard infeasible, a design, equipment, work practice, operational standard, or combination thereof, may be prescribed instead to satisfy the requirement for the application of BACT. Such standard shall, to the degree possible, set forth the emissions reduction achievable by implementation of such design, equipment, work practice or operation, and shall provide for compliance by means which achieve equivalent results.

BACT is required for each regulated pollutant emitted from a major source in excess of significant emission rates. Individual BACT determinations are to be performed for each new or modified emission unit emitting the PSD pollutant. The BACT determination must address, for each regulated pollutant with a significant emission increase at the source, air pollution control technologies capable of reducing emissions of the pollutant.

Preparation of the BACT analysis included in this document incorporates the most recent "top-down" BACT guidance (EPA,1990) by United States Environmental Protection Agency (EPA) for PSD permit determinations. That is, for each pollutant, the most stringent emission limit potentially applicable for a given pollutant was considered and then compared to the proposed project to determine its technical and economic feasibility.

When the most stringent technically feasible emission limitation is not selected as BACT, justification must be provided in terms of adverse economic, environmental, or energy impacts. Several other factors may be considered in justification of rejecting more stringent controls, including:

A showing that utilizing the control would adversely impact the project's financial viability.

A showing that the costs associated with the control are significantly higher for this specific project than for other similar projects that have installed this control system or in general for controlling the pollutant.

A showing that those economic considerations outweigh the energy and environmental benefits.

5.1 SO_2 CONTROL TECHNOLOGY REQUIREMENTS AND APPLICABILITY

The sources of SO_2 emissions impacted by the revised production increase analysis include the Blast Furnace Stoves, the Blast Furnace Flare and Boilers 1 –12.

5.2 INHERENTLY LOWER-EMITTING PROCESSES/PRACTICES

5.2.1 Blast Furnace Gas Combustion Units

Under the Production Increase Permit, increased amounts of BFG combustion were identified as a by-product of the increased production of iron in the blast furnaces. The original Production Increase Permit was based on the BACT analysis showing that BFG is a low sulfur fuel as a result of the natural removal of sulfur in the blast furnace process (see Section Two). The revised estimate of SO_2 concentrations in BFG identified in this application does not alter that finding. BFG is still a low sulfur fuel with concentrations of H_2S on the order of 30 parts per million on a volume basis (ppmv) in the fuel. This is equivalent to less than 0.02 grains of H_2S per dry standard cubic foot of BFG (gr/dscf). For comparison pipeline natural gas (NG) has

sulfur levels of 0.002 gr/scf of NG, raw coke oven gas (COG) has sulfur levels of around 4 gr/dscf and desulfurized COG has sulfur levels of around 0.25 gr/dscf.

Due to the low concentrations of SO_2 and other pollutants in BFG and NG, these fuels are considered clean burning fuels. Although BFG emits higher levels of SO_2 than NG, substituting NG at combustion units burning BFG such as the Blast Furnace Stoves or Boilers results in the combustion of additional BFG at the flare. By combusting BFG at the Blast Furnace Stoves and Boilers in the largest quantities that operating conditions allow, the facility minimizes SO_2 emissions by limiting NG and fuel oil combustion requirements. Therefore, combustion of the BFG in the Blast Furnace Stoves and Boilers is inherently the lowest emitting practice on a plant-wide basis.

5.3 SO_2 CONTROL TECHNOLOGY OPTIONS

When dealing with SO_2 control in combustion devices the most widely utilized add-on controls are fuel sulfur removal technologies and post-combustion SO_2 removal technologies. However, because of the unique nature of BFG, there are no add-on SO_2 control technologies currently in use in the steel industry for SO_2 control at combustion units using process BFG.

In addition to BFG being a low sulfur fuel, BFG is a low Btu fuel (approximately 80 Btu/cubic feet). Because of its low Btu value, large volumes of BFG are necessary to produce the same amount of heat input as higher heat content fuels such as NG or fuel oil. The BFG produced by Granite City Works is produced and consumed in large volumes (approximately 500 MMscf per day at rated capacity) with low concentrations of sulfur compounds and low heat content. The high volume and low Btu value make the processing of this fuel or its exhaust very difficult.

As a result, no known use of fuel sulfur removal technologies have been identified for low sulfur fuels such as BFG. Because of the high volumes and low concentration of H_2S in BFG, the additional removal of fuel sulfur would be prohibitively expensive.

Additionally, due to the low heat value for BFG and the low H_2S concentration of the uncombusted fuel, exhaust gases from BFG combustion typically contain less than fifty (50) ppmv of SO_2. No instances of SO_2 control of exhaust gases has been identified for such low concentrations of SO_2 in stack gases.

Based on a review of the BACT/LAER clearinghouse, information obtained from the U.S. EPA Control Technology Group, and literature from the U.S. EPA Office of Air Quality Planning and Standards, no add-on BACT determination has been made for SO_2 emissions at BFG combustion sources. Due to the low concentrations of H_2S in BFG and SO_2 in combustion stacks, control of SO_2 emissions at BFG combustion units is not practiced in the steel industry.

A review of BACT determinations for other in-plant by-product fuel sources indicates that refinery fuel gas BACT determinations for four (4) refinery fuel gas combustion devices were based on the use of low sulfur fuel with H_2S concentrations of 0.1 gr/dscf or greater. No fuel sulfur removal technologies or post combustion controls were required for these BACT determinations. The refinery by-product fuels permitted in these BACT determinations all have higher fuel sulfur levels than BFG. These BACT determinations are shown in the table below.

Table 5-1: Previous BACT Determinations

RBLC ID	Fuel	Date	SO_2 limit (lb/mmBtu)	Additional Limit Information
TX-0415	Refinery Gas	3/4/1999	0.0035	Refinery gas limit: 160 PPMV hydrogen sulfide
TX-0375	Petro Refinery Gas	3/14/2002	0.025	Low S fuel: fuel gas with H_2S content no more than 0.1 gr/dscf over a 3 hr rolling basis
LA-0166	Refinery Gas	1/10/2002	0.027	Low sulfur refinery fuel gas equivalent to approximately 0.1 gr/dscf based on TX-0375
LA-0149	NG and Refinery Gas	10/21/1999	0.04	Use of low sulfur fuel equivalent to greater than 0.1 gr/dscf based on TX-0375

5.3.1 Infeasible Control Options

The permitted production increase resulted in increased BFG generation and corresponding increased BFG combustion in the BFG combustion sources. BFG and NG are considered clean fuels and are the preferred supplemental fuels for the increased combustion needs based on inherently lower emitting practices.

Because BFG is produced and consumed on-site in the Blast Furnace Stoves, Boilers or in the Blast Furnace Flare, substitution of BFG with a lower sulfur fuel in the Blast Furnace Stoves or Boilers is deemed infeasible. Substituting a lower sulfur fuel such as NG in these units does not reduce BFG combustion at the facility. All BFG produced at the Granite City Works is combusted. Substituting NG for BFG results in additional SO_2 emissions from NG combustion at those units and shifts SO_2 emissions from BFG combustion to the Blast Furnace Flare. Therefore, fuel substitution is considered infeasible.

Because of the high volumes and low concentrations of sulfur compounds in the BFG, fuel sulfur removal is deemed infeasible. No BACT analysis of by-product fuels has determined that fuel sulfur removal is feasible for a fuel sulfur level less than 0.1 gr/dscf. BFG has a fuel sulfur level of less than 0.02 gr/dscf and the removal of sulfur below this level is deemed infeasible.

Post combustion control of SO_2 from BFG combustion is deemed infeasible due to the high exhaust volumes and low SO_2 concentrations in stack gases. Removal of SO_2 at levels below the

existing fifty (50) ppmv could not be accomplished in an economical manner due to the extremely high exhaust volumes.

5.4 SELECTED BACT – SO_2

The BACT selected is the use of the inherently lower emitting practice of combusting BFG to the extent possible at BFG combustion units. No post combustion or fuel sulfur removal technologies are required.

6.1 INTRODUCTION

Under the New Source Review (NSR) process, major stationary sources must demonstrate that undergoing a major modification will not cause or significantly contribute to an exceedance of the National Ambient Air Quality Standards (NAAQS). NSR also requires the source to demonstrate that emissions of specific pollutants such as SO_2 will not deteriorate the existing air quality above incremental amounts established by the Clean Air Act (CAA).

The Prevention of Significant Deterioration (PSD) program is a part of the NSR process that states have implemented for major new and modified sources of air pollution in regions currently in attainment of the NAAQS. An air quality impact assessment is one of the requirements which must be completed in order to receive a PSD permit to modify a source. The air quality analysis presented in this section satisfies the requirements in the Code of Federal Regulation 40 CFR 52.21(k) and 40 CFR 52.21(m).

6.2 HISTORY

The air quality impact assessment for the Production Increase Permit was performed for the SO_2 emission increase plant-wide in the original permit application as required under PSD. That air quality impact assessment has been revised for this application for a permit modification to show that no adverse air quality impacts have occurred or will occur as a result of the revised BFG combustion SO_2 emission rate proposed for the Production Increase Permit. Consequently, this section shows that despite the erroneous SO_2 emission rate identified in the original permit application, the Production Increase Project did not cause or significantly contribute to any exceedance of the NAAQS nor did it result in a deterioration of existing air quality above incremental amounts established by the CAA.

The permit application for the original Production Increase Permit relied in part on extensive dispersion modeling conducted by the Illinois Environmental Protection Agency (IEPA) in and around the Granite City Works (GCW). The purpose of the IEPA modeling was to demonstrate NAAQS attainment for SO_2 and particulate matter. The IEPA modeling successfully demonstrated NAAQS compliance based on Federally Enforceable State Operating Permit (FESOP) SO_2 emission rates for the Granite City Works. SO_2 emission rates included in the Production Increase Permit for the combustion of BFG (IEPA Permit No. 95010001) were no greater than the SO_2 FESOP limits (IEPA Permit No. 94120017) and therefore did not affect the SO_2 attainment demonstration modeling conducted by the IEPA. For this reason, the 1995 Production Increase Permit Application did not need to demonstrate NAAQS attainment for SO_2.

The permit limits included in the SO_2 FESOP limited SO_2 emissions from the combustion of coke oven gas (COG) at each COG combustion unit. Because COG combustion results in higher SO_2 emissions than BFG combustion on an equivalent heat input basis, this permit effectively limited total SO_2 emissions from the facility. Replacing COG with BFG at emission units that burn both COG and BFG results in lower SO_2 emissions from those units because BFG has a much lower sulfur content. Because the Production Increase Permit affected only BFG production and BFG emissions and did not affect COG production or COG emissions, there was no need to repeat the SO_2 FESOP modeling NAAQS demonstration.

Although the revised SO_2 emission rates for BFG combustion in this application are higher than those rates used for developing limits in the Production Increase Permit, the revised BFG SO_2 emission rates are still much lower than the COG SO_2 emission rates on a lb/MMBtu basis. Therefore the BFG SO_2 emission rates will not affect the SO_2 emission limits in the SO_2 FESOP as COG combustion will still result in higher emissions than BFG. However, after preliminary discussions with IEPA, it was determined that a NAAQS demonstration would be required to modify the BFG SO_2 emission limit in addition to a revised PSD Increment analysis. As a result, this section of the application details the NAAQS demonstration and the PSD Increment analysis conducted.

In the discussion below, Granite City Works details the air quality modeling analysis that was conducted to demonstrate that the revised emission rates for the Production Increase Permit will not result in significant contributions to violations of the National Ambient Air Quality Standard nor any deterioration of existing air quality above SO_2 increment levels for Class II areas. The applicable SO_2 NAAQS and Class II area SO_2 increment levels are detailed in Table 6-1 below.

Table 6-1: National Ambient Air Quality Standards for SO_2 ($\mu g/m^3$)

Significance Level Or NAAQS	Averaging Period		
	3-hour	24-hour	Annual
Significance Level	25	5	1
NAAQS	1300	365	80
Class II Increment	512	91	20

6.2.1 Air Quality Analysis

The dispersion model used for assessing the air quality impacts from the facility is the USEPA's AERMOD (version 07026), which is incorporated into Beeline Software's modeling package BEEST (version 9.60a).

The AERMOD model was selected primarily for the following reasons:

- The EPA and IEPA have approved the general use of the model for air quality dispersion analysis because the model assumptions and methods are consistent with those in *Appendix W to Part 51 – Guideline of Air Quality Models* (EPA, 2005).
- The model calculates plume rise as a result of momentum, buoyancy, and variations of wind speed with height.
- Building downwash and wake effects as well as stack tip downwash are calculated and incorporated into the model.
- The AERMOD model is capable of predicting the impacts from stack, area, and volume sources that are spatially distributed over large areas and located in flat or gently rolling terrain.
- The outputs of the AERMOD model are appropriate for addressing compliance with NAAQS and PSD increments.

The model calculates concentrations due to point, area, and volume sources based on using the steady-state Gaussian plume equation for a continuous source in the horizontal and vertical stable conditions, and the non-Gaussian probability density function in the vertical dimension for unstable conditions.

AERMOD operates in three units. The first is AERMET, a meteorological data preprocessor that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts as discussed in Section 1.1. The next is AERMAP, a terrain data preprocessor that incorporates complex terrain using United States Geological Survey (USGS) Digital Elevation Data as discussed in Section 1.2. The final unit, AERMOD, is the air dispersion modeling unit as discussed in Section 1.3.

6.3 METEOROLOGICAL DATA PREPROCESSING

6.3.1 Dispersion Coefficients/Land Use Classification

The surface data collection point, St. Louis Lambert Airport, and the anchor location, US Steel – Granite City Works, are categorized as having urban and rural land characteristics for a 3 km

radius at each site according to *Appendix W to Part 51- Guideline on Air Quality Models* (EPA, 2005). The procedure to determine land-use sectors is described below:

> *Land Use Procedure: (1) Classify the land use within the total area, A_0, circumscribed by a 3 km radius circle about the source using the meteorological land use typing scheme proposed by Auer; (2) if land use types I1, I2, C1, R2, and R3 account for 50 percent or more of A_0, use urban dispersion coefficients; otherwise, use appropriate rural dispersion coefficients.* (Appendix W to Part 51- Guideline on Air Quality Models, USEPA, 2005)

Based on aerial photos, the area surrounding Lambert Airport was classified as possessing urban and rural characteristics. This area is categorized into two sectors. The first sector is to the east-southeast, which includes the runway. The area in this sector has a decreased surface roughness, a medium albedo, and a medium bowen ratio. The second sector appears to be more urban in nature and therefore has a high surface roughness, a medium albedo, and a high bowen ratio.

The basic site characteristics for US Steel – Granite City Works are similar to the Lambert site characteristics and both can be split into two sectors. One sector, to the east-southeast from 105 to 135 degrees, has a decreased surface roughness, a medium albedo, and a medium bowen ratio. The urban land-use albedo values, and the average of the bowen ratio and surface roughness values for urban and cultivated land use were selected for the first wind sector. The second sector was classified as urban with a high surface roughness, a medium albedo, and a high bowen ratio. Urban surface characteristics were selected for the second sector.

Tables 4-1 through 4-3 from the *User's Guide for the AERMOD Meteorological Preprocessor (AERMET)* identify surface characteristics by season. Section 4.7.7 of the guide identifies the seasons as on a latitude and vegetative growing cycle.

> *Spring refers to the period when vegetation is emerging or partially green and applies to the 1-2 months after the last killing frost. The term summer applies to the period when vegetation is lush. The term autumn refers to the period of the year when freezing conditions are common, deciduous trees are leafless, soils are bare after harvest, grasses are brown and no snow is present. Winter conditions apply to snow-covered surfaces and subfreezing temperatures.*

Therefore, the seasons were identified as the following months for the facility:

- Spring: March, April and May
- Summer: June, July, August, and September

- Autumn: October and November
- Winter: December, January and February.

Table 6-2 shows the surface albedo, bowen ratio, and surface roughness for each month and each sector of the 3 km radius from the facility.

Table 6-2: Dispersion Coefficient Input Parameters

Time Frequency	Wind Sector	Surface Albedo	Bowen Ratio	Surface Roughness
January	1	0.35	1.5	0.505
January	2	0.35	1.5	1
February	1	0.35	1.5	0.505
February	2	0.35	1.5	1
March	1	0.14	0.65	0.515
March	2	0.14	1	1
April	1	0.14	0.65	0.515
April	2	0.14	1	1
May	1	0.14	0.65	0.515
May	2	0.14	1	1
June	1	0.16	1.25	0.6
June	2	0.16	2	1
July	1	0.16	1.25	0.6
July	2	0.16	2	1
August	1	0.16	1.25	0.6
August	2	0.16	2	1
September	1	0.16	1.25	0.6
September	2	0.16	2	1
October	1	0.18	1.35	0.525
October	2	0.18	2	1
November	1	0.18	1.35	0.525
November	2	0.18	2	1
December	1	0.35	1.5	0.525
December	2	0.35	1.5	1

6.3.2 Meteorological Data

The *Guideline on Air Quality Models* (EPA, 2005) recommends the use of representative meteorological data for use in air quality modeling from the most recent readily available 5-year period.

Surface meteorological data was retrieved from www.webmet.com for the St. Louis Lambert Airport Weather Station, WBAN 13994, in SCRAM format for the years 1987 to 1991. The station location description is 38.752° latitude and 90.374° longitude.

The St. Louis Lambert Airport Weather Station is approximately 11 miles north northwest of the facility. Because of the proximity, similar terrain, prevailing wind direction, and similar climate of this station compared to the facility, the St. Louis Lambert Airport Weather Station meteorological data is considered representative of meteorological conditions occurring at the facility.

Upper air data was retrieved from www.webmet.com for the Peoria Airport, WBAN 14842, in TD 6201 format for the years 1987 to 1991. The station location description is 40.667° latitude and 89.684° longitude.

Surface meteorological data was reviewed for quality assurance and quality control purposes in accordance with recommendations in the *Guideline on Air Quality Models* (EPA, 2005). Calm wind conditions were observed in the upper air meteorological data, however, no adjustment to wind data is required for the input of surface meteorological data into AERMOD. According to the guideline, "None of the observed wind speeds in a measured wind profile that are less than the threshold speed are used in construction of the modeled wind speed profile in AERMOD."

Meteorological Monitoring Guidance for Regulatory Modeling Applications (EPA, 2000) provides information for the treatment of missing or invalid data. Meteorological data must be 90% complete before substitution of any missing data. AERMET reviewed the surface meteorological variables of dry bulb temperature, wind direction, and wind speed for completeness and exceedance of upper and lower data limits. The surface meteorological data was more than 90% complete for all years and variables reviewed. No variables were missing for the surface meteorological data, however a limited amount of data did exceed upper and lower boundary limits. It was not necessary to treat the data that exceeded upper and lower limits since AERMET flags the data for processing in AERMOD.

AERMET reviewed the upper air meteorological variables of dry bulb temperature, wind speed, and dew point for completeness and exceedance of upper and lower data limits. As part of the QA AERMET also checks for calm winds, zero wind speeds, dew point greater than dry bulb temperature, and unusual (though possibly valid) lapse rates. Several variables were missing for the upper air data. However, the reviewed guidance is not applicable to upper air data, and therefore, missing and invalid upper air data was not treated. AERMET flags the missing and invalid upper air data for processing in AERMOD.

6.4 TERRAIN DATA PROCESSING

Terrain data was obtained in DEM format from Micropath Corporation. This data was selected for use in AERMAP to calculate the base elevations for the sources, buildings, and receptors in UTM coordinates (zone 15 NAD 83 datum). AERMAP also calculates the local terrain maximum for the receptors based on the highest node exceeding the 10% slope from the receptor. The local terrain maximum and the base elevation of the receptor set a Gaussian terrain profile for the AERMOD calculations.

6.5 AERMOD OPTIONS

EPA regulatory default options including final plume rise, stack tip downwash, buoyancy-induced dispersion, default wind profile exponents, default temperature gradients, and calms processing were used for all model runs. The modeling runs were setup to include consideration of potential downwash effects in accordance with the algorithms used in the AERMOD model.

6.5.1 Downwash Considerations

The Building Profile Input Program Plume Rise Model Enhancement (BPIP-Prime) was used to calculate the downwash using wind direction specific building dimensions for the nearby buildings. Downwash considerations take into account air downwash caused by winds hitting nearby buildings and increasing pollutant concentrations near the source.

The building dimensions were obtained from US Steel – Granite City Works facility drawings or measured by Granite City Works personnel. When multiple buildings were in sufficient proximity to each other to create only narrow paths between large building complexes, only one building was modeled with an average building height to keep the complexity of the model to a minimum. Granite City Works provided stack heights.

6.5.2 Receptor Grid

For the AERMOD model runs, the receptor grid consisted of receptors spaced every 50 meters along the fence line of the plant property. In addition, a Cartesian receptor grid with the following spacing was developed:

- 100 meter spaced grid surrounding fenceline out to 400 meters from the east and west fencelines and 200 meters from the north and south fencelines.

- 500 meters spacing from the fenceline out to approximately 3 kilometers (km) from the source.
- 1000 meter spacing from the fenceline out to the distance where the pollutant concentrations continually decrease.

6.6 NAAQS MODELING SOURCE PARAMETERS

6.6.1 U.S. Steel – Granite City Works Sources

Granite City Works' source stack parameters for point sources included in the NAAQS modeling are detailed in Table 6-3. Parameters for area sources included in the NAAQS modeling are detailed in Table 6-4. Stack parameters for each source were identified from previous modeling, engineering calculations, and stack test data as available. Sources venting through roof vents and open pits were modeled as area sources. Stack and area source locations were determined by super-imposing facility drawings on USGS quadrangles and verified using a handheld GPS unit when needed.

The initial modeled SO_2 rates are based on several conservative assumptions. Modeled SO_2 emission rates initially assume COG production is sufficient to meet maximum allowable inputs for all units using COG. It also assumes unlimited BFG production. Short term COG SO_2 emission rates also assume 454 grains H_2S per 100 SCF of COG which is assumed to be worst case non-desulfurized gas. Because of the conservative COG production assumptions, USS has modeled 2.8 times the amount of COG it can produce at maximum coke production levels. The detailed calculation of the emission rates used in the NAAQS demonstration modeling is included as Appendix C.

Table 6-3: Point Source Stack Parameters

Stack No.	Description	Easting (m)	Northing (m)	Base elevation (m)	Stack Height (m)	Stack Temp (K)	Exit Velocity (m/s)	Stack Diameter (m)
BF0007S	BFAStove	749824	4286804	126.5	70.6	533.2	26.8	2.1
BF0011S	BFGFlare	749794	4286836	126.5	45.7	1273.0	20.0	6.1
BF0111S	Newflare	749820	4286852	127.0	46.0	1273.0	20.0	6.0
BF0012S	BFBStove	749682	4286717	126.5	72.0	533.2	18.6	2.7
UT0053S	blrs1to7	749759	4286829	126.5	68.6	460.9	10.1	3.9
UT0054S	blrs8t10	749709	4286787	126.5	61.0	460.9	8.2	2.8
UT0059S	boil11	749885	4286880	126.5	46.9	510.0	21.8	1.9
UT0064S	boil12	749901	4286884	126.5	46.5	510.0	13.7	2.4
BP0097S	COGflare	749983	4286983	126.5	32.0	1273.0	20.0	4.3
CO0071S	BatAfire	750101	4286983	126.0	76.2	529.3	7.2	3.4
CO0092S	BatBfire	750110	4286988	126.0	76.2	529.3	7.2	3.4
FIN0016S	slabfur1	747734	4286764	126.2	27.6	616.5	19.0	2.4
FIN0028S	slabfur4	747701	4286703	126.5	58.5	781.0	18.1	4.2

Table 6-3: Point Source Stack Parameters

Stack No.	Description	Easting (m)	Northing (m)	Base elevation (m)	Stack Height (m)	Stack Temp (K)	Exit Velocity (m/s)	Stack Diameter (m)
FIN0020S	slabfur2	747721	4286747	126.3	27.6	616.5	19.0	2.4
FIN0024S	slabfur3	747707	4286734	126.4	27.4	616.5	19.0	2.4
BF0010S	Csthsbgh	749635	4286730	126.5	9.1	338.7	22.5	3.4
BF0150S	Ironspot	749840	4286813	126.5	19.2	323.7	13.1	2.1
BOF0149S	Ladldryr	748385	4286647	126.6	61.0	460.9	0.0	0.1
CC0084S	slabcut1	748622	4286606	126.5	16.8	460.9	0.0	0.1
CC0145S	slabcut2	748571	4286569	126.5	39.6	460.9	0.0	4.6
CO0069S	BatAPush	750080	4286982	126.0	6.0	326.5	30.3	1.2
CO0090S	BatBPush	750118	4287005	126.0	6.0	326.5	30.3	1.2

Table 6-4: Area Source Model Parameters

Stack No.	Description	Easting m	Northing m	Base Elevation m	Release Height m	Easterly Length m	Northerly Length m	Angle from North degrees	Vertical Dimension m
BF008S	BFAfugit	749710	4286731	126.49	70.62	37.00	4.57	-31.00	0.61
BF0013S	BFBfugit	749765	4286762	126.49	70.62	37.00	4.57	-31.00	0.61
BF0126S	slagpits	749697	4286749	126.49	0.00	101.00	10.00	-31.00	5.00

6.6.2 Illinois Background Sources

IEPA provided two SO_2 background source datasets to USS for inclusion in the NAAQS modeling. One dataset was for short-term modeling and the second dataset contained annualized emission rate data. Some of the data provided by IEPA was in UTM Zone 16 coordinates based on the NAD 27 coordinate datum. Previous modeling data developed for USS sources was based on the contemporary NAD 83 coordinate system using UTM Zone 15 coordinates because the Facility is located in Zone 15. Therefore, all IEPA background sources were changed to Zone 15 coordinates in the NAD 83 coordinate system to coincide with the USS data. The conversions to Zone 15 coordinates were verified using Google Earth when stacks could be identified and adjustments to stack locations were made if appropriate. The Illinois background sources and their short-term and long-term model parameters are detailed in Tables 6-5 and 6-6 below.

Table 6-5: IEPA Short-Term Background Source Data

Stack No.	Easting (m)	Northing (m)	Base elev. (m)	Stack Height (m)	Stack Temp. (K)	Exit Velocity (m/s)	Stack Diam. (m)	SO_2 Hourly (lb/hr)
8	747581	4307489	143.3	30.5	394.3	1.2	7.4	49.6
19	817745	4325793	179.8	152.4	449.3	17.3	8.8	93675.9
38	748685	4305573	131.0	106.7	416.5	19.8	4.6	7097.4
39	748685	4305573	131.0	76.2	449.8	15.4	4.7	541.0
40	748685	4305573	131.0	76.2	427.6	8.5	5.2	1924.0
41	770545	4231443	126.2	184.4	426.5	26.8	5.9	34008.7
42	770542	4231383	125.9	184.4	423.7	26.8	5.9	34062.5
44	770543	4231322	125.6	184.4	425.4	26.8	5.9	33488.6
51	705323	4369075	134.1	61.9	322.0	11.9	1.8	1668.0
97	747701	4281167	127.1	10.7	505.4	16.6	0.8	15.1
98	747701	4281167	127.1	10.1	505.4	14.3	0.9	15.1
101	746591	4276418	125.9	30.5	644.3	18.1	0.2	74.2
103	746690	4276292	124.7	14.3	338.7	0.0	0.6	44.2
106	746677	4276387	125.9	44.5	810.9	13.1	0.1	64.0
112	745515	4283326	125.0	13.7	745.9	15.6	4.3	14.9
114	745515	4283326	125.0	9.1	727.6	0.1	0.1	3.4
122	748603	4287235	128.5	14.6	449.8	3.0	0.8	1.6
123	748608	4287240	128.5	14.6	533.2	5.4	1.4	3.2
124	746451	4285723	126.5	18.3	505.4	9.3	0.6	4.4
126	750566	4282318	123.4	6.1	339.3	3.1	1.0	2.4
127	750566	4282318	123.4	7.9	710.9	26.3	0.3	0.7
128	750566	4282318	123.4	7.9	710.9	26.3	0.3	0.7
129	750566	4282318	123.4	7.9	710.9	26.3	0.3	0.7
130	750566	4282318	123.4	6.1	1255.4	17.4	0.2	0.3
131	750566	4282318	123.4	3.1	775.9	26.4	0.1	0.6
147	754993	4302512	135.0	76.2	555.4	9.8	4.6	80.8
148	754991	4302604	135.0	106.7	472.0	11.4	4.6	200.7
149	754991	4302604	135.0	106.7	672.0	1.6	4.6	54.0
150	754578	4302683	135.0	23.8	538.2	10.1	1.0	196.7
151	754991	4302604	135.0	106.7	672.0	14.3	4.6	184.4
152	755178	4302796	135.0	30.5	838.7	9.9	2.1	165.9
153	755073	4303009	135.1	45.7	699.8	7.2	2.3	86.9
155	754394	4303110	135.0	45.7	433.2	6.1	2.0	56.0
156	754394	4303110	135.0	56.4	432.6	6.7	2.4	93.5
157	754578	4302683	135.0	45.7	602.6	8.6	1.3	57.2
158	754495	4302990	135.0	95.1	472.0	10.9	4.3	3953.1
160	754595	4302900	135.0	45.7	649.8	8.0	1.8	120.0
166	754578	4302683	135.0	42.4	504.8	16.2	2.2	2249.1
170	754776	4302505	135.0	45.4	644.3	4.4	1.9	49.4
171	754776	4302505	135.0	54.6	605.4	7.3	1.9	87.4
175	754985	4302789	135.0	40.2	491.5	13.2	2.1	47.7
184	755187	4302487	135.0	45.7	699.8	8.8	2.4	49.0

Table 6-5: IEPA Short-Term Background Source Data

Stack No.	Easting (m)	Northing (m)	Base elev. (m)	Stack Height (m)	Stack Temp. (K)	Exit Velocity (m/s)	Stack Diam. (m)	SO_2 Hourly (lb/hr)
185	755187	4302487	135.0	45.7	672.0	8.2	2.4	208.8
186	755187	4302487	135.0	45.7	672.0	4.3	2.4	121.0
193	754991	4302604	135.0	106.7	483.7	0.3	4.6	253.2
196	754495	4302990	135.0	95.1	483.7	0.4	4.3	196.1
208	754578	4302683	135.0	4.9	319.3	4.8	2.7	172.4
209	754598	4302463	133.8	41.5	799.8	7.7	3.2	116.8
210	754581	4302683	135.0	12.2	588.7	14.3	2.3	1553.4
211	754598	4302463	133.8	41.5	799.8	7.7	3.2	118.7
212	754598	4302463	133.8	10.1	294.0	0.1	0.1	57.9
221	762473	4266691	152.5	21.3	505.4	1.4	1.4	58.9
222	746418	4276345	125.9	29.3	315.4	15.2	0.8	630.2
228	747467	4287532	129.3	22.9	463.7	19.8	0.8	1.2
229	746360	4289240	125.9	9.1	294.0	0.1	0.1	1.0
251	748933	4286043	126.8	10.1	455.9	8.2	1.1	17.2
266	747087	4287451	129.2	11.6	394.3	9.3	2.5	4.0
267	747087	4287451	129.2	11.6	394.3	9.3	2.5	4.0
268	747087	4287451	129.2	24.1	672.0	2.2	0.9	1.7
269	747070	4287670	128.6	30.8	394.8	10.6	3.0	0.3
270	747087	4287451	129.2	25.0	535.9	9.6	1.9	0.2
272	754159	4283243	128.3	9.8	388.7	25.5	1.2	36.3

Table 6-6: IEPA Long-Term Background Source Data

Stack No.	Easting (m)	Northing (m)	Base elev. (m)	Stack Height (m)	Stack Temp. (K)	Exit Velocity (m/s)	Stack Diam. (m)	SO_2 Hourly (g/s)
19	817745	4325793	179.8	152.4	449.3	17.3	8.8	7305.5
38	748685	4305573	131.0	106.7	416.5	19.8	4.6	818.4
39	748685	4305573	131.0	76.2	449.8	15.4	4.7	20.9
40	748685	4305573	131.0	76.2	427.6	8.5	5.2	230.5
41	770545	4231443	126.2	184.4	426.5	26.8	5.9	4026.6
42	770542	4231383	125.9	184.4	423.7	26.8	5.9	3703.8
44	770543	4231322	125.6	184.4	425.4	26.8	5.9	4207.8
51	705323	4369075	134.1	61.9	322.0	11.9	1.8	189.4
101	746591	4276418	125.9	30.5	644.3	18.1	0.2	9.3
103	746690	4276292	124.7	14.3	338.7	0.0	0.6	5.6
106	746677	4276387	125.9	44.5	810.9	13.1	0.1	8.0
112	745515	4283326	125.0	13.7	745.9	15.6	4.3	1.9
122	748596	4287435	128.5	14.6	449.8	3.0	0.8	0.0
123	748601	4278440	128.5	14.6	533.2	5.4	1.4	0.0
124	746451	4285723	126.5	18.3	505.4	9.3	0.6	0.6

Table 6-6: IEPA Long-Term Background Source Data

Stack No.	Easting (m)	Northing (m)	Base elev. (m)	Stack Height (m)	Stack Temp. (K)	Exit Velocity (m/s)	Stack Diam. (m)	SO_2 Hourly (g/s)
126	750566	4282318	123.4	6.1	339.3	3.1	1.0	0.3
127	750566	4282318	123.4	7.9	366.5	26.3	0.3	0.1
128	750566	4282318	123.4	7.9	699.8	26.3	0.3	0.1
129	750566	4282318	123.4	7.9	699.8	26.3	0.3	0.1
130	750566	4282318	123.4	6.1	1255.4	7.3	0.2	0.0
131	750566	4282318	123.4	3.1	775.9	26.4	0.1	0.1
147	754993	4302512	135.0	76.2	555.4	9.8	4.6	10.2
148	754991	4302604	135.0	106.7	472.0	11.4	4.6	25.2
149	754991	4302604	135.0	106.7	672.0	1.6	4.6	6.8
150	754578	4302683	135.0	23.8	538.2	10.1	1.0	24.7
151	754991	4302604	135.0	106.7	672.0	14.3	4.6	23.2
152	755178	4302796	135.0	30.5	838.7	9.9	2.1	20.8
153	755073	4303009	135.1	45.7	699.8	7.2	2.3	10.9
155	754394	4303110	135.0	45.7	433.2	6.1	2.0	7.0
156	754394	4303110	135.0	56.4	432.6	6.7	2.4	11.8
157	754578	4302683	135.0	45.7	602.6	8.6	1.3	7.2
158	754495	4302990	135.0	95.1	472.0	10.9	4.3	496.7
160	754595	4302900	135.0	45.7	649.8	8.0	1.8	15.1
166	754578	4302683	135.0	42.4	504.8	16.2	2.2	138.4
170	754776	4302505	135.0	45.4	644.3	4.4	1.9	6.2
171	754776	4302505	135.0	54.6	605.4	7.3	1.9	11.0
175	754985	4302789	135.0	40.2	491.5	13.2	2.1	6.0
184	755187	4302487	135.0	45.7	699.8	8.8	2.4	6.2
185	755187	4302487	135.0	45.7	672.0	8.2	2.4	26.2
186	755187	4302487	135.0	45.7	672.0	4.3	2.4	15.2
193	754991	4302604	135.0	106.7	483.7	0.3	4.6	31.8
196	754495	4302990	135.0	98.1	483.7	0.4	4.3	56.2
208	754578	4302683	135.0	4.9	319.3	4.8	2.7	21.7
209	754598	4302463	133.8	41.5	799.8	7.7	3.2	14.7
210	754581	4302683	135.0	12.2	588.7	14.3	2.3	178.1
211	754598	4302463	133.8	41.5	799.8	7.7	3.2	14.9
212	754598	4302463	133.8	10.1	294.0	0.1	0.1	7.3
222	746418	4276345	125.9	29.3	315.4	15.2	0.8	76.1
228	747467	4287532	129.3	22.9	463.7	19.8	0.8	0.2
229	746360	4289240	125.9	9.1	294.0	0.1	0.1	0.1
266	747087	4287451	129.2	11.6	394.3	9.3	2.5	0.4
267	747087	4287451	129.2	11.6	394.3	9.3	2.5	0.4
268	747087	4287451	129.2	24.1	672.0	1.4	0.9	0.2
269	747070	4287670	128.6	30.8	394.8	10.6	3.0	0.0
270	747087	4287451	129.2	25.0	535.9	9.6	1.9	0.0

6.6.3 Missouri Background Sources

Missouri background sources were requested from the Missouri Department of Natural Resources (MDNR). MDNR provided information on background sources in the out-state regions, however, MDNR indicated that modeling data on sources in the city and county of St. Louis would have to be provided separately by St. Louis City and St. Louis County. USS requested that St. Louis City and St. Louis County provide background and increment consuming SO_2 sources for PSD modeling and received only information on background sources. Background sources for St. Louis City and St. Louis County were then reviewed to screen out sources which did not meet IEPA's 10d=Q screening criteria.

The stack locations were verified using Google Earth when stacks could be identified and adjustments to stack locations were made if appropriate. Background sources located in the City of St. Louis meeting the IEPA screening criteria are shown in Table 6-7 below along with model data for both short term and long term averaging periods.

Table 6-7: City of St. Louis Background Source Data

Stack No.	Plant Name	Easting (m)	Northing (m)	Base elev. (m)	Stack Height (m)	Stack Temp. (K)	Exit Velocity (m/s)	Stack Diam. (m)	SO_2 Hourly (lb/hr)
MO000381	AB	742763	4275613	147.0	6.1	422.0	21.3	0.3	195.4
M0003151	AB	742763	4275613	147.0	53.3	373.7	9.3	2.0	0.0
M0003S15	AB	742763	4275613	147.0	53.3	373.7	9.3	2.0	63.8
M0003S05	AB	742763	4275613	147.0	68.6	449.8	5.6	3.0	115.3
M0003S01	AB	742763	4275613	147.0	68.6	438.7	6.5	3.0	974.5
M0003S02	AB	742763	4275613	147.0	68.6	460.9	5.8	3.0	1145.6
M0003S3A	AB	742763	4275613	147.0	22.9	449.8	143.7	0.9	155.2
M000305B	AB	742763	4275613	147.0	68.6	449.8	5.6	3.0	117.7
M0017F1	Mallinckrodt	744174	4283340	129.0	0.3	422.0	0.0	0.0	0.0
M0017F1A	Mallinckrodt	744174	4283340	129.0	0.3	422.0	0.0	0.0	1.5
M0017238	Mallinckrodt	744174	4283340	129.0	4.9	298.2	0.0	0.1	1.4
M001738A	Mallinckrodt	744174	4283340	129.0	4.9	298.2	0.0	0.1	0.0
M0017X3	Mallinckrodt	744174	4283340	129.0	13.7	338.7	21.3	0.6	0.0
M0017X2	Mallinckrodt	744174	4283340	129.0	13.7	338.7	21.3	0.6	0.0
M0017C02	Mallinckrodt	744174	4283340	129.0	27.4	522.0	4.1	1.5	59.8
M0017514	Mallinckrodt	744174	4283340	129.0	30.5	335.9	19.1	1.4	0.0
M0017F1B	Mallinckrodt	744174	4283340	129.0	0.3	422.0	0.0	0.0	0.0
M001751A	Mallinckrodt	744174	4283340	129.0	30.5	335.9	19.1	1.4	0.0
M0017C2A	Mallinckrodt	744174	4283340	129.0	27.4	522.0	4.1	1.5	0.2
M0017507	Mallinckrodt	744174	4283340	129.0	24.4	294.3	18.6	0.3	0.0
M0017X1	Mallinckrodt	744174	4283340	129.0	13.7	338.7	21.3	0.6	0.0
M0017F1C	Mallinckrodt	744174	4283340	129.0	0.3	422.0	0.0	0.0	3.0
M0017Z02	Mallinckrodt	744174	4283340	129.0	0.3	422.0	0.0	0.0	1.5

Table 6-7: City of St. Louis Background Source Data

Stack No.	Plant Name	Easting (m)	Northing (m)	Base elev. (m)	Stack Height (m)	Stack Temp. (K)	Exit Velocity (m/s)	Stack Diam. (m)	SO_2 Hourly (lb/hr)
M0017260	Mallinckrodt	744174	4283340	129.0	3.1	691.5	0.0	0.1	1.8
M0017250	Mallinckrodt	744174	4283340	129.0	13.1	298.2	2.5	0.0	0.2
M0017C01	Mallinckrodt	744174	4283340	129.0	33.5	560.9	5.6	1.5	0.0
M001750A	Mallinckrodt	744174	4283340	129.0	24.4	294.3	18.6	0.3	0.0
M001750B	Mallinckrodt	744174	4283340	129.0	24.4	294.3	18.6	0.3	0.0
M0017UNK	Mallinckrodt	744174	4283340	129.0	0.3	422.0	0.0	0.0	1.5
M0017UNB	Mallinckrodt	744174	4283340	129.0	0.3	422.0	0.0	0.0	1.2
M0017C3B	Mallinckrodt	744174	4283340	129.0	53.3	427.6	1.1	2.7	116.4
M0017G02	Mallinckrodt	744174	4283340	129.0	0.3	422.0	0.0	0.0	0.8
M00386	Trigen	749013	4280218	129.0	54.9	444.3	2.6	3.2	207.2
M00385	Trigen	749013	4280218	129.0	56.7	444.3	2.6	4.0	173.4
M0038003	Trigen	749013	4280218	129.0	56.7	444.3	2.6	4.0	207.2
M00405	WashU	783300	4279600	165.0	21.0	440.9	15.6	1.1	17.0
M00401	WashU	783300	4279600	165.0	67.1	435.4	1.1	2.3	18.1
M00401A	WashU	783300	4279600	165.0	67.1	435.4	1.1	2.3	20.7
M00402	WashU	783300	4279600	165.0	53.3	455.4	3.5	2.7	31.6
M0053006	Bisselpoint	743527	4286283	130.0	21.0	449.8	10.8	1.2	0.0
M0053008	Bisselpoint	743527	4286283	130.0	6.7	422.0	3.7	0.7	0.0
M0053	Bisselpoint	743527	4286283	130.0	0.3	422.0	0.0	0.0	0.0
M0053001	Bisselpoint	743527	4286283	130.0	68.6	310.9	3.4	3.7	2.2
M0053007	Bisselpoint	743527	4286283	130.0	3.1	294.3	0.0	0.0	0.0
M0053009	Bisselpoint	743527	4286283	130.0	7.3	449.8	0.0	0.3	0.0
M005300A	Bisselpoint	743527	4286283	130.0	68.6	310.9	3.4	3.7	8.5
M0053004	Bisselpoint	743527	4286283	130.0	20.4	449.8	5.4	2.4	0.0
M005304A	Bisselpoint	743527	4286283	130.0	20.4	449.8	5.4	2.4	0.0
M005301A	Bisselpoint	743527	4286283	130.0	68.6	310.9	3.4	3.7	1.6
M005301B	Bisselpoint	743527	4286283	130.0	68.6	310.9	3.4	3.7	31.7
M005301C	Bisselpoint	743527	4286283	130.0	68.6	310.9	3.4	3.7	1.0
M005304B	Bisselpoint	743527	4286283	130.0	20.4	449.8	5.4	2.4	0.0
M005301D	Bisselpoint	743527	4286283	130.0	68.6	310.9	3.4	3.7	1.3
M0056S2	VA Medical Center	740795	4280645	158.0	15.2	410.9	10.7	0.6	26.4
M0056S3	VA Medical Center	740795	4280645	158.0	15.2	410.9	10.7	0.6	26.4
M007096	Astaris	737988	4270069	125.0	12.8	444.3	11.5	1.2	96.4
M007013	Astaris	737988	4270069	125.0	17.1	477.6	4.9	1.2	68.1
M00871	St. Louis State Hospital	736929	4276364	177.0	70.1	552.6	0.0	2.1	48.8
M00872	St. Louis State Hospital	736929	4276364	177.0	70.1	552.6	0.0	2.1	51.7
M0096NA	The PD George Co.	743180	4284976	128.0	0.3	422.0	0.0	0.0	0.0

Table 6-7: City of St. Louis Background Source Data

Stack No.	Plant Name	Easting (m)	Northing (m)	Base elev. (m)	Stack Height (m)	Stack Temp. (K)	Exit Velocity (m/s)	Stack Diam. (m)	SO_2 Hourly (lb/hr)
M009637	The PD George Co.	743180	4284976	128.0	10.7	365.9	1.8	0.5	0.0
M009620S	The PD George Co.	743180	4284976	128.0	0.3	422.0	0.0	0.0	0.0
M02003	St. Alexius Hospital	741572	4274960	159.0	3.1	422.0	0.0	1.5	0.8
M0204	BJC	737962	4279881	153.0	28.4	477.6	0.6	1.8	61.7
M020401	BJC	737962	4279881	153.0	61.0	405.4	5.4	0.9	66.1
M0204A	BJC	737962	4279881	153.0	28.4	477.6	0.6	1.8	135.0
M0391S12	Hermann Oak Leather Co.	743650	4284000	162.0	3.7	422.0	0.0	0.5	0.0
M0391	Hermann Oak Leather Co.	743650	4284000	162.0	0.3	422.0	0.0	0.0	0.0
M0391S8	Hermann Oak Leather Co.	743650	4284000	162.0	9.1	422.0	0.0	0.8	0.0
M0391S7	Hermann Oak Leather Co.	743650	4284000	162.0	0.3	422.0	0.0	0.0	0.0
M0391S6	Hermann Oak Leather Co.	743650	4284000	162.0	0.3	422.0	0.0	0.0	0.0
M0391S5	Hermann Oak Leather Co.	743650	4284000	162.0	11.6	422.0	17.6	0.5	0.0
M08093	PQ Corporation	739205	4285226	147.0	16.8	672.0	3.4	1.3	28.2
M13632	National Linen Service	745124	4276024	131.0	11.3	449.8	7.8	0.9	25.3
M13631	National Linen Service	745124	4276024	131.0	11.3	449.8	7.8	0.9	25.7
M15051	The Energy Center, SLU MS	740405	4278327	153.0	67.1	449.8	30.5	1.5	62.9
M15051A	The Energy Center, SLU MS	740405	4278327	153.0	67.1	449.8	30.5	1.5	26.0
M15051B	The Energy Center, SLU MS	740405	4278327	153.0	67.1	449.8	30.5	1.5	28.3

Table 6-7: City of St. Louis Background Source Data

Stack No.	Plant Name	Easting (m)	Northing (m)	Base elev. (m)	Stack Height (m)	Stack Temp. (K)	Exit Velocity (m/s)	Stack Diam. (m)	SO_2 Hourly (lb/hr)
M15051C	The Energy Center, SLU MS	740405	4278327	153.0	67.1	449.8	30.5	1.5	62.3
M15051D	The Energy Center, SLU MS	740405	4278327	153.0	67.1	449.8	30.5	1.5	62.3
M15051E	The Energy Center, SLU MS	740405	4278327	153.0	67.1	449.8	30.5	1.5	66.0
M15051F	The Energy Center, SLU MS	740405	4278327	153.0	67.1	449.8	30.5	1.5	26.0
M15051G	The Energy Center, SLU MS	740405	4278327	153.0	67.1	449.8	30.5	1.5	62.3
M1505H	The Energy Center, SLU MS	740405	4278327	153.0	67.1	422.0	30.5	1.5	26.0
M15051I	The Energy Center, SLU MS	740405	4278327	153.0	67.1	449.8	30.5	1.5	28.3
M15051J	The Energy Center, SLU MS	740405	4278327	153.0	67.1	449.8	30.5	1.5	68.1
M17611	Nestle Purina Petcare Company	743952	4277911	147.0	24.4	466.5	0.0	0.6	26.1
M2013S2	Midco Industries, Inc.	740474	4279247	147.0	2.4	422.0	62.2	0.2	227.8
M2501	Metro Materials, Inc.	744309	4284455	147.0	0.3	422.0	0.0	0.0	0.0
M2802S1	SSM Cardinal Glennon Children's Hospital	738930	4278275	153.0	12.2	366.5	0.0	0.9	69.4

Background sources located in St. Louis County meeting the IEPA screening criteria are shown in Table 6-8 below along with model data for both short term and long term averaging periods. The stack locations were verified using Google Earth when stacks could be identified and adjustments to stack locations were made if appropriate.

Table 6-8: County of St. Louis Background Source Data

Stack No.	Plant Name	Easting (m)	Northing (m)	Base elev. (m)	Stack Height (m)	Stack Temp. (K)	Exit Velocity (m/s)	Stack Diam. (m)	SO_2 Hourly (lb/hr)
MO00101	Ameren UE	732717	4253746	125.0	76.2	422.0	27.3	3.4	1458.2
MO00102	Ameren UE	732717	4253746	125.0	76.2	422.0	27.3	3.4	1445.5
MO00103	Ameren UE	732717	4253746	125.0	106.7	422.0	30.8	4.3	2975.4
MO00104	Ameren UE	732717	4253746	125.0	106.7	422.0	33.2	4.9	3471.3
MO00106	Ameren UE	732717	4253746	125.0	9.8	366.5	31.6	3.7	455.3
MO001525	Ford	729612	4294972	162.0	22.3	422.0	1.5	2.3	127.2
MO001526	Ford	729612	4294972	162.0	22.3	422.0	1.5	2.3	127.2
MO00231	Ameren UE	713307	4284244	134.0	9.8	422.0	2.5	2.7	373.7
MO0042H1	Wash U	733589	4281264	165.0	53.3	422.0	1.5	2.7	16.9
MO0042H2	Wash U	733589	4281264	165.0	19.2	422.0	12.0	0.9	16.9
MO0042H3	Wash U	733589	4281264	165.0	14.9	422.0	9.0	0.6	16.9
MO004232	Wash U	733589	4281264	165.0	14.9	422.0	9.0	0.6	16.9
MO004233	Wash U	733589	4281264	165.0	14.9	422.0	9.0	0.6	16.9
MO0042H5	Wash U	733589	4281264	165.0	15.2	422.0	1.8	0.8	16.9
MO00651A	Lambert	727630	4292359	165.0	8.5	422.0	6.8	1.2	26.5
MO00651B	Lambert	730191	4290777	165.0	10.1	422.0	6.8	1.2	20.9
MO00652C	Lambert	727630	4292359	165.0	8.5	422.0	4.4	1.2	26.5
MO00652D	Lambert	730191	4290777	165.0	10.1	422.0	3.8	1.2	20.9
MO00653E	Lambert	727630	4292359	165.0	8.5	422.0	7.4	1.2	26.5
MO00653F	Lambert	730191	4290777	165.0	10.1	422.0	6.8	1.2	20.9
MO023001	Boeing	728612	4293255	165.0	24.7	422.0	11.8	0.8	53.5
MO023002	Boeing	728612	4293255	165.0	24.7	422.0	11.8	0.8	53.5
MO10291	DePaul Hospital	708045	4251188	135.0	13.7	422.0	6.7	0.9	572.4
MO129901	IBM	728564	4294449	165.0	9.1	366.5	48.9	0.5	56.9
MO129902	IBM	728564	4294449	165.0	9.1	366.5	48.9	0.5	56.9
MO129903	IBM	728564	4294449	165.0	9.1	366.5	48.9	0.5	56.9
MO129904	IBM	728564	4294449	165.0	9.1	366.5	48.9	0.5	56.9
MO129905	IBM	728564	4294449	165.0	9.1	366.5	48.9	0.5	56.9
MO129907	IBM	728564	4294449	165.0	0.6	366.5	48.9	0.5	56.9

The MDNR provided background source data was identified as for both short term and long term averaging periods. The MDNR background source model parameters are detailed in Table 6-9 below.

Table 6-9: Missouri Background Source Data

Stack No.	Plant Name	Easting (m)	Northing (m)	Base elev. (m)	Stack Height (m)	Stack Temp. (K)	Exit Velocity (m/s)	Stack Diam. (m)	SO_2 Hourly (lb/hr)
HERCP8	Doe Run 8	729600	4237680	125.0	167.6	350.4	17.7	6.1	10714.5
AMRIP1	Ameren Rush Island	739688	4223980	117.3	213.4	405.3	25.0	8.8	3799.3
AMRIP2	Ameren Rush Island	739688	4223980	117.3	76.2	577.5	7.6	1.5	3737.4
AMLAS1	Labadie	688436	4270455	148.0	213.4	444.2	28.0	6.2	3580.1
AMLAS2	Labadie	688436	4270455	148.0	213.4	444.2	28.0	6.2	3599.9
AMLAS3	Labadie	688436	4270455	148.0	213.4	444.2	28.0	6.2	3609.1
AMLAS4	Labadie	688436	4270455	148.0	213.4	444.2	28.0	6.2	3551.5
AMSPS1	Ameren Sioux	734264	4309907	130.0	182.9	427.5	29.3	5.8	8022.4
AMSPS2	Ameren Sioux	734264	4309907	130.0	182.9	427.5	29.3	5.8	7544.3
AMSPS3	Ameren Sioux	734264	4309907	130.0	64.6	435.9	15.2	1.4	84.0
MLC1	Mississippi Lime	756750	4205955	205.5	38.1	505.0	10.3	2.1	84.9
MLC2	Mississippi Lime	756750	4205955	205.5	38.1	505.0	10.3	2.1	84.9
MLC3	Mississippi Lime	756750	4205955	205.5	38.1	505.0	10.3	2.1	84.9
MLC4	Mississippi Lime	756750	4205955	205.5	38.1	505.0	10.3	2.1	84.9
GST700	GM	689495	4298990	128.0	76.2	458.1	0.1	3.0	653.3
HLCM049	Kiln	740331	4221466	128.6	158.5	384.2	14.0	5.6	595.2
HLCM115	Coal mill	740331	4221475	128.6	158.5	384.2	14.0	1.0	99.2

6.7 BACKGROUND SO_2 CONCENTRATIONS

Background SO_2 concentrations were developed from USEPA monitoring data available from the USEPA AirData website. Background SO_2 concentrations are based on average values for the second highest monitored 3-hour and 24-hour values over the 2004-2006 period from a monitoring site located in Wood River, IL (54 N. Walcott). Background for the annual averaging period was also determined from the mean annual concentrations for 2004-2006 at this monitor.

This location was chosen due to its proximity to Granite City, Il. Other potential monitoring sites which were excluded from use included the Wood River site at 1710 Vaughn Rd., South Roxana, IL (Michigan St.), the Granite City site and the East St. Louis Site. The Vaughn Rd. Wood River site was excluded due to its location to the north of a major petroleum refinery.

Likewise, the Michigan St. South Roxana site was not used to develop background SO_2 concentrations due to its location southeast of the same refinery. Because winds in the St. Louis region are predominantly out of the south and the west, these locations are largely downwind from the refinery. Therefore, the refinery is believed to affect the monitor values at these locations. Additionally, the refinery sources were included in the background sources supplied by IEPA. They were therefore included in the modeling and inclusion of these monitors to develop background concentrations may result in double counting resultant concentrations. The Granite City monitoring site was not chosen because that site was discontinued in 2001. The East St. Louis monitoring site was not chosen as it is believed to be influenced by a zinc refinery and chemical plants to the south which have been included in the background sources for the modeling.

The relevant monitor values and the resultant background values are shown in Table 6-10.

Table 6-10: Background Monitor Values and Proposed Background Values

Monitor Location	Year of Data	Monitor Values (ppm)		
		3-hr (high)	24-hr (High)	Annual Mean
54 N. Walcott	2004	0.041	0.018	0.004
54 N. Walcott	2005	0.052	0.016	0.004
54 N. Walcott	2006	0.037	0.011	0.003
	Average	0.046	0.015	0.004
	Background ($\mu g/m^3$)	119	40	11
	Standard ($\mu g/m^3$)	1300	365	80

6.8 NAAQS MODELING RESULTS

The detailed results of each of the model runs are included in the sections below. USS GCW was able to meet SO_2 and NAAQS results for all three averaging periods.

6.8.1 NAAQS 3-Hour Averaging Period Model Results

The modeling was split into two runs in order to improve model run time. The near-field modeling contained the 100m and 500m grids described in section 6.5.2. The far-field modeling contained the 1000m grids described in section 6.5.2.

The results of the 3-hour model runs indicate that the Facility will not cause or significantly contribute to an exceedance of the 3-hour SO_2 ambient air quality standard when Slab Furnace 4 (Stack No. FIN0028s) is limited to 1,800 lbs. / 3-hours.

Using the conservative emission rate assumptions discussed in section 6.6.1 modeling of the 3-hour averaging period resulted in three receptors in the far-field receptor grid exceeding the 3-hour SO_2 NAAQS standard (1300 $\mu g/m^3$) in one or more years.

The model was run again with only the offending receptors. Each year was modeled individually in order to run the Events Model within AERMOD. The Events Model tracks any violation of a user-defined threshold concentration at any receptor, and then calculates individual contributions from each source to that violation, or "event." In this case the threshold was set at 1181 $\mu g/m^3$ (3-hour NAAQS standard of 1300 $\mu g/m^3$ minus background).

The Events Model output includes the contributions from each GCW source to each event. These contributions were summed to compare to the significance level. The significance level for the 3-hour NAAQS standard is 25 $\mu g/m^3$. Results of the 3-hour events modeling show no event had a GCW contribution greater than the significance level. Results from the 3-hour modeling are shown in Table 6-11.

Table 6-11: 3-hour Model Results ($\mu g/m^3$)

Year	Model Results High 2nd High	H2H with Background	NAAQS	Highest GCW Contribution to an Exceedance	Significance Level
1991	1877	1996	1300	< 1	25
1990	1876	1995	1300	< 1	25
1989	1961	2080	1300	< 1	25
1988	1915	2034	1300	< 1	25
1987	1953	2072	1300	< 1	25

6.8.2 24-Hour Averaging Period Model Results

The modeling was split into two runs in order to improve model run time. The near-field modeling contained the 100m and 500m grids described in section 6.5.2. The far-field modeling contained the 1000m grids described in section 6.5.2.

Using the conservative emission rate assumptions discussed in section 6.6.1, initial modeling of the 24-hour average SO_2 concentrations resulted in 15 receptors in the far-field grid violating the 24-hour NAAQS standard in one or more of the five years modeled. The model was run again with 500m grids around the offending receptors, resulting in 73 receptors. Each year was modeled individually in order to run the Events Model. In this case the threshold was set at 324 $\mu g/m^3$ (24-hour NAAQS standard of 365 $\mu g/m^3$ minus background). These initial results are presented in Table 6-12.

Table 6-12: Initial 24-hour Model Results (µg/m³)

Year	Model Results High 2nd High	H2H with Background	NAAQS
1991	1305.3	1345.3	365
1990	1167.3	1207.3	365
1989	1115.2	1155.2	365
1988	1177.3	1217.3	365
1987	1240.1	1280.1	365

The Events Model output includes the contributions from each Granite City Works source to each event. These contributions were summed to compare to the significance level. The significance level for the 24-hour NAAQS standard is 5 µg/m³. Reviewing the results of the 24-hour events model shows that of the 73 receptors exceeding NAAQS, 15 receptors had GCW contributions exceeding the significance level during events that exceeded the NAAQS standard.

Because initial modeling using the overly conservative assumptions described in section 6.6.1 resulted in modeling exceedances, USS developed less conservative assumptions for additional model runs. Additional model runs for the 24-hour averaging period were developed to remove the overly conservative assumption of unlimited COG availability. Because USS wishes to maintain the ability to shift COG to any unit modeling must show the worst case impacts from COG fuel use at this facility. In order to show the worst case impacts, four scenarios were developed, each containing the maximum potential COG production over a 24-hour period of 31.5 MMscf of COG. All four scenarios operate the coke oven batteries (A and B) at maximum COG underfire because this is necessary for maximum COG production. Scenario 1 diverts the remaining COG to the blast furnace stoves and the ladle dryer. Scenario 2 apportions the remaining COG to boilers 1-10. Scenario 3 distributes COG to the slab furnaces. Scenario 4 sends the remaining COG to boilers 11 and 12. The highest SO_2 emissions occur in scenario 3 because it maximizes BFG usage and minimizes NG usage (COG is approximately constant over the four scenarios). Since BFG has a higher sulfur contents than NG this results in the highest emissions. The emissions scenarios are presented in Table 6-13 (a) – (d).

Table 6-13: Emissions Scenarios for GCW Facility

(a) Scenario 1

Scenario 1	COG mmcf/day	BFG mmcf/day	NG mmcf/day
BFAStove	8.04	63.43	
BFGFlare		216.00	
BFGFlare2		216.00	
BFBStove	8.04	80.83	
blrs1to7		126.00	
blrs8to10		54.00	
boil11		67.50	
boil12		67.50	
COGflare			
BatAfire	7.50		
BatBfire	7.50		
slabfur1			7.73
slabfur4			9.12
slabfur2			7.73
slabfur3			7.73
Csthsbgh			
Ironspot			
Ladldryr	2.27		1.13
slabcut1			0.01
slabcut2			0.01
total:	33.34	891.27	33.45

(b) Scenario 2

Scenario 2	COG mmcf/day	BFG mmcf/day	NG mmcf/day
BFAStove		119.70	
BFGFlare		216.00	
BFGFlare2		216.00	
BFBStove		137.10	
blrs1to7	11.54	45.19	
blrs8to10	4.95	19.37	
boil11		67.50	
boil12		67.50	
COGflare			
BatAfire	7.5		
BatBfire	7.5		
slabfur1			7.73
slabfur4			9.12
slabfur2			7.73
slabfur3			7.73
Csthsbgh			
Ironspot			
Ladldryr			2.40
slabcut1			0.01
slabcut2			0.01
total:	31.49	888.36	34.72

(c) Scenario 3

Scenario 3	COG mmcf/day	BFG mmcf/day	NG mmcf/day
BFAStove		119.70	
BFGFlare		216.00	
BFGFlare2		216.00	
BFBStove		137.10	
blrs1to7		126.00	
blrs8to10		54.00	
boil11		67.50	
boil12		67.50	
COGflare			
BatAfire	7.5		
BatBfire	7.5		
slabfur1	2.6		6.25
slabfur4	9.7		3.71
slabfur2	2.6		6.25
slabfur3	2.6		6.25
Csthsbgh			
Ironspot			
Ladldryr			2.40
slabcut1			0.01
slabcut2			0.01
total:	32.58	1003.80	24.87

(d) Scenario 4

Scenario 4	COG mmcf/day	BFG mmcf/day	NG mmcf/day
BFAStove		119.70	
BFGFlare		216.00	
BFGFlare2		216.00	
BFBStove		137.10	
blrs1to7		126.00	
blrs8to10		54.00	
boil11	8.37	8.93	
boil12	8.37	8.93	
COGflare			
BatAfire	7.50		
BatBfire	7.50		
slabfur1			7.73
slabfur4			9.12
slabfur2			7.73
slabfur3			7.73
Csthsbgh			
Ironspot			
Ladldryr			2.40
slabcut1			0.01
slabcut2			0.01
total:	31.73	886.77	34.72

The model was put through four more iterations, each representing one of these GCW emissions scenarios. Results from modeling with 500m resolution grids around offending receptors were analyzed to identify which receptors had events with both a NAAQS exceedance and a GCW contribution greater than significance. This narrowed the receptor grid down to 15 receptors for the scenario modeling. Each year and each scenario were modeled, utilizing the Events Model to obtain individual source contributions for every exceedance of the NAAQS standard. Source contributions from all GCW emissions units were summed for each exceedance in each scenario. Scenario modeling results are presented in Table 6-14.

Table 6-14: 24-hour Scenario Modeling Results – Maximum GCW Contribution to NAAQS Exceedance Events (µg/m^3)

Year	Scenario 1	Scenario 2	Scenario 3	Scenario 4
1991	3.2	3.1	3.3	3.3
1990	4.1	3.9	4.3	4.5
1989	2.8	2.8	2.9	2.9
1988	2.7	2.6	3.0	2.9
1987	3.7	3.6	3.3	4.1

Even though there are receptors which violate the NAAQS standard, using these emission scenarios the GCW facility does not have a contribution to those exceedances beyond the designated significance level.

6.8.3 Annual Averaging Period Model Results

The modeling was split into two runs in order to improve model run time. The near-field modeling contained the 100m and 500m grids described in section 6.5.2. The far-field modeling contained the 1000m grids described in section 6.5.2.

Modeling of the far receptor grid in the annual averaging period results in eight receptors exceeding the standard of 80 µg/m^3. At each receptor exceeding the annual standard the GCW contribution was compared to the significance level of 1 µg/m^3. GCW source contributions at all offending receptors remain less than the significance level. A summary of annual average modeling results is presented in Table 6-15.

Table 6-15: Annual Average Model Results (µg/m^3)

Year	Annual average	Annual average with background	NAAQS	GCW Contribution	Significance Level
1991	188	199	80	< 1	1
1990	185	196	80	< 1	1
1989	201	212	80	< 1	1
1988	209	220	80	< 1	1
1987	208	219	80	< 1	1

6.9 INCREMENT MODELING SOURCE PARAMETERS

Granite City Works' source emissions in the increment modeling are based on the incremental increase in emissions from the pre-Production Increase Permit SO_2 emission levels. The Production Increase Permit resulted in increases in SO_2 emissions from four (4) process sources. These sources were the Casthouse Baghouse, the Blast Furnace Casthouse uncaptured roof fugitives, the slag pits, and the Iron Spout Baghouse. Each of these sources saw incremental increases in SO_2 emissions as a result of the Production Increase Permit and was included in the increment modeling. Because these process sources are not affected by the revised emission factor, they were modeled using the same incremental emission rates as were modeled originally.

For BFG combustion sources affected by the increase in BFG production and the revised emission factor, emission rates were based on the difference between emissions at the revised BFG combustion SO_2 emission rate and the pre-Production Increase Permit BFG combustion levels. Under the Production Increase Permit, BFG combustion is limited to 185,030 MMcf per year. At the revised emission rate of 16.00 lbs. SO_2 per MMscf, 185,030 MMscf per year equates to 337.95 lbs. SO_2 per hour for 8,760 hours. At the pre-Production Increase Permit BFG combustion levels of 121,039 MMcf per year and the revised SO_2 emission rate, SO_2 emissions were 221.08 lbs. SO_2 per hour for 8,760 hours. Taking the difference between these SO_2 emission rates results in an increase of 116.88 lbs. SO_2 per hour (14.73 grams per second).

Because of the difficulty in dividing this increase between all BFG combustion emission sources, the full increase of 116.88 lbs. SO_2 per hour was attributed to each BFG combustion emission source for initial model runs. Because there are seven (7) BFG combustion stacks, this is the equivalent of modeling an incremental increase seven times what is proposed in this application. Using this method, the air quality increment consumption modeling will grossly over-predict the incremental impact of the BFG SO_2 combustion sources. This initial modeling resulted in exceedances of the PSD increment for the 24 hour averaging period at a limited number of receptors in the years 1987 and 1991.

Additional modeling was then performed for these receptors and these years to determine the worst case increment consumption under less conservative assumptions than made during the initial 24-hour model. The additional model runs included all GCW process sources and IL and MO increment consuming sources. Additionally it was assumed that either the boilers, Blast Furnace Stoves, or the Blast Furnace Flare would consume all the excess BFG. The results of this modeling are detailed in the section below.

The increment consuming emission rates are shown with the stack information in tables 6-16 and 6-17 below.

Table 6-16: Initial Point Source Modeled Stack Parameters

Stack Number	Description	Easting m	Northing m	Base Elevation m	Stack Height m	Temp K	Exit Velocity m/s	Stack Diameter m	SO_2 Emission Rate g/s
BF0007S	BF A Stove	749824	4286804	126.49	70.62	533	26.84	2.13	14.727
BF0011S	BFG Flare	749794	4286837	126.49	45.72	1273	20	6.12	14.727
BF0012S	BF B Stove	749682	4286717	126.49	71.95	533	18.56	2.74	14.727
UT0053S	Boiler 1-7	749759	4286829	126.49	68.58	461	10.08	3.88	14.727
UT0054S	Boiler 8-10	749709	4286788	126.49	60.96	461	8.18	2.82	14.727
UT0059S	Boiler 11	749885	4286881	126.49	46.9	510	21.82	1.93	14.727
UT0064S	Boiler 12	749901	4286884	126.49	46.45	510	13.65	2.44	14.727
BF0010S	Casthouse Baghouse	749635	4286730	126.49	9.144	339	22.52	3.35	6.20
BF0150S	Iron Spout Baghouse	749840	4286814	126.49	19.2	324	13.12	2.13	0.18
BOF0149S	Ladle dryer	748385	4286647	126.56	60.96	461	0	0.09	0.06

Table 6-17: Area Source Modeled Parameters

Stack Number	Description	Easting m	Northing m	Base Elevation m	Release Height m	Easterly Length m	Northerly Length m	Angle from North deg.	Vertical Dimension m	SO_2 Emission Rate g/s
BF008S	BF A roof	749710	4286732	126.49	70.62	37	4.57	-31	0.61	0.16
BF0013S	BF B roof	749765	4286763	126.49	70.62	37	4.57	-31	0.61	0.16
BF0126S	Slag pits	749697	4286750	126.49	0	101	10	-31	5	0.16

6.9.1 IEPA and MDNR Increment Consuming Sources

At the time of the original application of the Production Increase Permit, no previous increment consuming sources had been identified. For this modification, stack and emission data on all increment consuming SO_2 sources were requested from IEPA and MDNR for the increment analysis. IEPA and MDNR have provided increment source data, however, the City and County Air Pollution Control Agencies' representatives refused to provide increment consuming source data. Based on multiple conversations with MDNR and county representatives, increment consuming source data would have to be developed independently by individually reviewing city and county air permits to determine what sources consumed increment.

URS reviewed lists of St. Louis City and St. Louis County Air Permits issued since the SO_2 baseline date (December 30, 1982) provided by IEPA. The permit listings were cross-referenced by permit date and permitted unit to facilities meeting IEPA screening criteria. Only facilities

with permitted SO_2 increases that met the IEPA screening criteria were included in the increment modeling. These sources are shown in the tables for Missouri Sources below.

Tables 6-18, 6-19 and **6-20** include information for Illinois and Missouri (short term and long term), respectively, on increment consuming sources for their jurisdictions included in the PSD increment analysis.

Table 6-18: Illinois Increment Consuming Source Parameters

IEPA Source No.	Easting m	Northing m	Base Elevation m	Stack Height m	Temp K	Exit Velocity m/s	Stack Diameter m	SO_2 Emission Rate g/s
23	754159	4283243	128.3	9.75	388.7	25.52	1.19	4.57
100	745515	4283326	125	44.81	477.6	14.92	0.7	1.12
188	746360	4289240	125.9	9.14	294	0.1	0.1	0.13
P0506	745606	4283663	125.1	18.29	720	31.5	2.9	8.21
P0507	745607	4283653	125	18.29	720	31.5	2.9	8.21

Note: All increment consuming source parameters were provided by the state of Illinois and as requested by IEPA, permitted emission rates were modeled for increment consuming emission rates for this analysis.

Table 6-19: Missouri Short-Term Increment Consuming Source Parameters

Stack No.	Description	Easting m	Northing m	Base elev m	Stack height m	Temp K	Exit Velocity m/s	Stack diam m	SO_2 g/s
MO023001	Boeing	728092	4293232	165	7.5	422.0	710.2	0.81	6.74
MO023002	Boeing	728092	4293232	165	7.5	422.0	710.2	0.81	6.74
MO023003	Boeing	728092	4293232	165	7.9	422.0	868.7	0.91	33.00
MO023004	Boeing	728092	4293232	165	7.9	422.0	868.7	0.91	33.00
MO023005	Boeing	728092	4293232	165	7.9	422.0	868.7	0.91	33.00
M0017X3	Mallinckrodt Inc.	744174	4283340	129	4.2	338.7	1275.6	0.61	0.00
M0017X2	Mallinckrodt Inc.	744174	4283340	129	4.2	338.7	1275.6	0.61	0.00
M0017C02	Mallinckrodt Inc.	744174	4283340	129	8.4	522.0	243.8	1.52	7.53
M0017514	Mallinckrodt Inc.	744174	4283340	129	9.3	335.9	1143.0	1.37	0.01
M001751A	Mallinckrodt Inc.	744174	4283340	129	9.3	335.9	1143.0	1.37	0.01
M0017C2A	Mallinckrodt Inc.	744174	4283340	129	8.4	522.0	243.8	1.52	0.03
M0017507	Mallinckrodt Inc.	744174	4283340	129	7.4	294.3	1114.3	0.30	0.00
M0017X1	Mallinckrodt	744174	4283340	129	4.2	338.7	1275.6	0.61	0.00

Table 6-19: Missouri Short-Term Increment Consuming Source Parameters

Stack No.	Description	Easting m	Northing m	Base elev m	Stack height m	Temp K	Exit Velocity m/s	Stack diam m	SO_2 g/s
	Inc.								
M0017250	Mallinckrodt Inc.	744174	4283340	129	4.0	298.2	151.5	0.05	0.03
M0017C01	Mallinckrodt Inc.	744174	4283340	129	10.2	560.9	333.8	1.52	0.01
M001750A	Mallinckrodt Inc.	744174	4283340	129	7.4	294.3	1114.3	0.30	0.00
M001750B	Mallinckrodt Inc.	744174	4283340	129	7.4	294.3	1114.3	0.30	0.00
M0017C3B	Mallinckrodt Inc.	744174	4283340	129	16.3	427.6	66.1	2.74	14.67
M00386	Trigen-St Louis Energy Corporation	749013	4280218	129	16.7	444.3	153.9	3.20	26.11
M00385	Trigen-St Louis Energy Corporation	749013	4280218	129	17.3	444.3	153.9	3.96	21.84
M0038003	Trigen-St Louis Energy Corporation	749013	4280218	129	17.3	444.3	153.9	3.96	26.11
M13632	National Linen Service	745124	4276024	131	3.4	449.8	470.9	0.91	3.18
M13631	National Linen Service	745124	4276024	131	3.4	449.8	470.9	0.91	3.24
AMSPS	Amerensioux	734994	431086	130	182.9	428.0	29.3	5.79	152.97
MLC1	misslime1	756750	4205955	205.5	23.2	519.0	4.0	3.23	6.43
MLC2	misslime2	756750	4205955	205.5	23.2	469.0	5.7	3.35	6.43
HLCM049	Kiln	740331	4221466	128.6	158.5	384.0	14.0	5.63	75.00
HLCM115	coalmill	740331	4221475	128.6	158.5	384.0	14.0	1.03	12.50

Table 6-20: Missouri Long-Term Increment Consuming Source Parameters

Stack No.	Description	Easting m	Northing m	Base elev m	Stack height m	Temp K	Exit velocity m/s	Stack diam m	SO_2 g/s
MO023001	Boeing	728092	4293232	165	7.5	422.0	710.2	0.81	6.74
MO023002	Boeing	728092	4293232	165	7.5	422.0	710.2	0.81	6.74
MO023003	Boeing	728092	4293232	165	7.9	422.0	868.7	0.91	33.00
MO023004	Boeing	728092	4293232	165	7.9	422.0	868.7	0.91	33.00
MO023005	Boeing	728092	4293232	165	7.9	422.0	868.7	0.91	33.00
M0017X3	Mallinckrodt Inc.	744174	4283340	129	4.2	338.7	1275.6	0.61	0.00

Table 6-20: Missouri Long-Term Increment Consuming Source Parameters

Stack No.	Description	Easting m	Northing m	Base elev m	Stack height m	Temp K	Exit velocity m/s	Stack diam m	SO_2 g/s
M0017X2	Mallinckrodt Inc.	744174	4283340	129	4.2	338.7	1275.6	0.61	0.00
M0017C02	Mallinckrodt Inc.	744174	4283340	129	8.4	522.0	243.8	1.52	7.53
M0017514	Mallinckrodt Inc.	744174	4283340	129	9.3	335.9	1143.0	1.37	0.01
M001751A	Mallinckrodt Inc.	744174	4283340	129	9.3	335.9	1143.0	1.37	0.01
M0017C2A	Mallinckrodt Inc.	744174	4283340	129	8.4	522.0	243.8	1.52	0.03
M0017507	Mallinckrodt Inc.	744174	4283340	129	7.4	294.3	1114.3	0.30	0.00
M0017X1	Mallinckrodt Inc.	744174	4283340	129	4.2	338.7	1275.6	0.61	0.00
M0017250	Mallinckrodt Inc.	744174	4283340	129	4.0	298.2	151.5	0.05	0.03
M0017C01	Mallinckrodt Inc.	744174	4283340	129	10.2	560.9	333.8	1.52	0.01
M001750A	Mallinckrodt Inc.	744174	4283340	129	7.4	294.3	1114.3	0.30	0.00
M001750B	Mallinckrodt Inc.	744174	4283340	129	7.4	294.3	1114.3	0.30	0.00
M0017C3B	Mallinckrodt Inc.	744174	4283340	129	16.3	427.6	66.1	2.74	14.67
M00386	Trigen-St Louis Energy Corporation	749013	4280218	129	16.7	444.3	153.9	3.20	26.11
M00385	Trigen-St Louis Energy Corporation	749013	4280218	129	17.3	444.3	153.9	3.96	21.84
M0038003	Trigen-St Louis Energy Corporation	749013	4280218	129	17.3	444.3	153.9	3.96	26.11
M13632	National Linen Service	745124	4276024	131	3.4	449.8	470.9	0.91	3.18
M13631	National Linen Service	745124	4276024	131	3.4	449.8	470.9	0.91	3.24
AMSPS	Amerensioux	734994	431086	130	182.9	427.5	29.3	5.79	1.15
MLC1	misslime1	756750	4205955	205.5	23.2	519.2	4	3.23	6.42
MLC2	misslime2	756750	4205955	205.5	23.2	468.7	5.7	3.35	6.42
HLCM49	Kiln	740331	4221466	128.6	158.5	384.15	14	5.63	75.00
HCM115	coalmill	740331	4221475	128.6	158.5	384.15	14	1.03	12.50

6.9.2 PSD Increment Consumption Model Results

The results of the PSD increment consumption modeling analysis show that the SO_2 increments are not exceeded in the 3-hour or annual averaging periods when modeling is performed utilizing the revised production increase BFG SO_2 emission rate. The highest high concentration modeled for each averaging period and for each year is shown in Table 6-21 below compared to the allowable Class II SO_2 increment levels.

Table 6-21: Initial PSD SO_2 Increment Modeling Results

Year	Maximum Modeled SO_2 Concentrations ($\mu g/m^3$)		
	3-hr Ave.	24-hr Ave.	Annual Ave.
1987	143	94	14
1988	210	87	15
1989	143	90	13
1990	142	86	17
1991	141	91	14
Increment	512	91	20

Because a limited number of receptors in the 1987 and the 1991 model runs met or exceeded the 24-hour increment, additional runs were conducted for those receptors and those years. The additional model runs assumed the full incremental increase in SO_2 was emitted from each source in a group of sources instead of all sources as was modeled in the initial model run. Source groups modeled were the boilers, blast furnace stoves and the blast furnace flare. These groups were combined with the incremental emissions from the GCW process sources and the MO and IL increment consuming sources. The source groups and the modeled emission rates are shown in Table 6-22.

Table 6-22: Additional PSD Increment Modeling SO_2 Emission Rates

Group	Stack Number	Description	SO_2 Emission Rate g/s
Blast Furnace Stove Group	BF0007S	BF A Stove	14.727
	BF0012S	BF B Stove	14.727
Boiler Group	UT0053S	Boiler 1-7	14.727
	UT0054S	Boiler 8-10	14.727
	UT0059S	Boiler 11	14.727
	UT0064S	Boiler 12	14.727
BFG Flare Group	BF0011S	BFG Flare	14.727

Results from modeling using the above grouped source approach are shown in Table 6-23.

Table 6-23: Additional 24-hour PSD Increment Modeling Results

Year	Highest 24-Hour Increment Model Result ($\mu g/m^3$)		
	Boiler Group	Blast Furnace Group	BFG Flare Group
1991	79	60	60
1987	80	55	55
Increment	91	91	91

The results in Table 6-23 show the revised Production Increase Permit BFG emission rates will not result in exceedances of the 24-hour PSD increment.

The electronic modeling files are included in this application under Appendix D of this application in two CDs. The modeling files or this project have been separated into folders based on averaging periods, receptor grids, and details of the model runs. A description of the model runs in each folder is below.

SO2 NAAQS and PSD increment modeling files

FOLDERS:

- 3hr
  - SO2 modeling at the 3-hour averaging time
  - Using the near-field receptor grid

- 3hr-far
  - SO2 modeling at the 3-hour averaging time
  - Using the far-field receptor grid

- 24hr
  - SO2 modeling at the 24-hour averaging time
  - Using the near-field receptor grid

- 24hr-far
  - SO2 modeling at the 24-hour averaging time
  - Using the far-field receptor grid

- 24hr-far events
  - Subset of the 24hr-far modeling, utilizing a 500m grid around receptors exceeding NAAQS
  - Used Events Modeling to look at individual source contributions to exceedances

- 24hr-far-scenarios
  - Scenario modeling of SO2 at the 24-hr averaging period
  - Four different GCW emissions scenarios based on maximum COG production levels
  - Used Events Modeling to look at individual source contributions to NAAQS exceedances

- Annual
  - SO2 modeling of annual average concentrations
  - Using the near-field receptor grid

- Annual-far
  - SO2 modeling of annual average concentrations
  - Using the far-field receptor grid

- Increment modeling
  - SO2 increment modeling of the 3hr, 24hr and annual averaging periods
  - Both near and far grids in same model run

- Incrmt24
  - Additional modeling of the 24hr averaging period based on maximum increase in BFG production

FILE EXTENSION: DESCRIPTION

.BST: BEEST session file

.BND: contains information about fencelines, building and stack names for display

.DTA: model input data file

.GRF: master graphics file for display

.LST: model output list file

.MAX: maxi file specified in BEEST

.PRW: source and building data for BPIP-PRIME

.RUN: contains runtime information needed by AerMod

.SO: output file from BPIP-PRIME

.SUM: summary form of .SO file

.TAB: verbose form of .SO file

.USF: summary of model output created by BEEST

The original Production Increase Permit application concluded that the Production Increase Permit would not produce any adverse affects. It based this conclusion on the analysis required under 40 CFR 52.21(o). That analysis included a review of the additional impacts on the following:

1. Impacts on soils and vegetation that would result from the modification.
2. Impacts on air quality and visibility in Class I areas within 100 km of the project.
3. Impacts on endangered species.
4. Socioeconomic Impacts.

The analysis of these additional impacts resulting from the production increase has been reanalyzed in this application to determine to what extent, if any, it has been affected by the revised BFG combustion emission rate requested in this permit modification application. The review of the conclusions in the original Production Increase Permit application indicates that no additional adverse impacts would result from the requested revision of the IEPA issued Production Increase Permit. The analysis is detailed in the sections below.

7.1 SOILS AND VEGETATION ANALYSIS

Soils and vegetation analysis applies only to those areas in which there is vegetation of significant commercial or recreational value. There are no vegetation or soil types in the Granite City area which would be harmed by the proposed incremental increase in concentrations of SO_2 below the NAAQS. Therefore, no soils or vegetation analysis are required for the proposed revisions to the Production Increase Permit.

7.2 CLASS I AREA AIR QUALITY IMPACT ANALYSIS

The nearest Federal Class I area to the Granite City Works is the Mingo Junction National Wilderness Area approximately 210 km southwest of the facility. The next closest Class I area is Hercules-Glades approximately 330 km southwest of the Granite City Works mill. The distances from these Class I areas to the facility is greater than 100 km. Therefore, no air quality impact is to be expected and no analyses were performed to evaluate air quality impacts within the wilderness areas.

7.3 CLASS I AREA VISIBILITY IMPACT ANALYSIS

The nearest Federal Class I area to the Granite City Works is the Mingo Junction National Wilderness Area approximately 210 km southwest of the facility. The next closest Class I area is Hercules-Glades approximately 330 km southwest of the Granite City Works mill. The distances

from these Class I areas to the facility is greater than 200 km. Therefore, no visibility impact is to be expected and no analyses were performed to evaluate visibility impacts within the wilderness areas.

7.4 IMPACTS ON ENDANGERED SPECIES

Twenty-one (21) species are listed as endangered (11 species) or threatened (10 species) which are local to Madison County Illinois. These species are listed in **Table 7-1** below. None of these species are known, likely, or presumed to have habitat in or near this industrial facility. Because the proposed modification to the Production Increase Permit is a result of an error in the emission factor used to calculate the original permitted limit, the emissions changes resulting from the proposed modification have already occurred in the project area. No impacts to threatened or endangered species are known to have occurred since the permit was issued as a result of the SO_2 emissions from the facility. As a result, no impacts are expected to occur to any endangered or threatened species as a result of this permit modification.

Table 7-1: Illinois Endangered Species Specific to Madison County, IL

SCIENTIFIC NAME	COMMON NAME	ENDANGERED OR THREATENED
Acipenser fulvescens	Lake Sturgeon	Endangered Fish
Ammocrypta clarum	Western Sand Darter	Endangered Fish
Boltonia decurrens	Decurrent False Aster	Threatened Plant
Crotalus horridus	Timber Rattlesnake	Threatened Reptile
Egretta caerulea	Little Blue Heron	Endangered Bird
Ellipsaria lineolata	Butterfly	Threatened invertebrate
Falco peregrinus	Peregrine Falcon	Threatened Bird
Gallinula chloropus	Common Moorhen	Threatened Bird
Haliaeetus leucocephalus	Bald Eagle	Threatened Bird
Ixobrychus exilis	Least Bittern	Threatened Bird
Notropis boops	Bigeye Shiner	Endangered Fish
Nyctanassa violacea	Yellow-crowned Night Heron	Endangered Bird
Nycticorax nycticorax	Black-crowned Night Heron	Endangered Bird
Pseudacris streckeri illinoensis	Illinois Chorus Frog	Threatened Amphibian
Scaphirhynchus albus	Pallid Sturgeon	Endangered Fish
Silene regia	Royal Catchfly	Endangered Plant
Sistrurus catenatus	Eastern Massassauga	Endangered Reptile
Spiranthes vernalis	Spring Ladies' Tresses	Endangered Plant
Tradescantia bracteata	Prairie Spiderwort	Threatened Plant
Tropidoclonion lineatum	Lined Snake	Threatened Reptile
Xanthocephalus xanthocephalus	Yellow-headed Blackbird	Endangered Bird

7.5 SOCIOECONOMIC IMPACTS

The production increase at the Granite City Works has had a positive economic impact for the facility and the surrounding community. The industrial infrastructure surrounding the facility has been established over the many years of operation of the facility and will be unaffected by the proposed modification to the Production Increase Permit. Although the modification will not result in any additional employment or other positive socioeconomic impacts, no negative impacts are expected to result from the additional SO_2 emissions allowable under the proposed modification.

Illinois Environmental Protection Agency
Division Of Air Pollution Control -- Permit Section
P.O. Box 19506
Springfield, Illinois 62794-9506

R006309

Application For Construction Permit (For CAAPP Sources Only)

For Illinois EPA use only
ID number:
Permit number:
Date received:

This form is to be used by CAAPP sources to supply information necessary to obtain a construction permit. Please attach other necessary information and completed CAAPP forms regarding this con struction/modification project

Source Information

1. Source name. United States Steel Corporation - Granite City Works		
2. Source street address: 1951 State Street		
3. City: Granite City		4. Zip code: 62040
5. Is the source located within city limits? ☒ Yes ☐ No		
6. Township name: Granite City	7. County: Madison	8. ID number: 119813AAI

Owner Information

9. Name. United States Steel Corporation		
10. Address: 600 Grant Street		
11. City: Pittsburg	12. State: PA	13. Zip code: 15219

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Environmental Protection Agency
BUREAU OF AIR

Operator Information (if different from owner)

14. Name		
15. Address:		
16. City:	17. State:	18. Zip code:

Applicant Information

19. Who is the applicant? ☒ Owner ☐ Operator	20. All correspondence to. (check one) ☐ Owner ☐ Operator ☒ Source
21. Attention name and/or title for written correspondence: Larry Siebenberger/ Environmental Manager	
22. Technical contact person for application: Larry Siebenberger	23. Contact person's telephone number: (618) 451-3391

This Agency is authorized to require and you must disclose this information under 415 ILCS 5/39. Failure to do so could result in the application being denied and penalties under 415 ILCS 5 et seq. It is not necessary to use this form in providing this information. This form has been approved by the forms management center.

Summary Of Application Contents

24.	Does the application address whether the proposed project would constitute a new major source or major modification under each of the following programs: a) Non-attainment New Source Review - 35 IAC Part 203; b) Prevention of Significant Deterioration (PSD) - 40 CFR 52.21; c) Hazardous Air Pollutants: Regulations Governing Constructed or Reconstructed Major Sources - 40 CFR Part 63?	☒ Yes ☐ No
25.	Does the application identify and address all applicable emissions standards, including those found in the following: a) Board Emission Standards - 35 IAC Chapter 1, Subtitle B; b) Federal New Source Performance Standards - 40 CFR Part 60; c) Federal Standards for Hazardous Air Pollutants - 40 CFR Parts 61 and 63?	☒ Yes ☐ No
26.	Does the application include a process flow diagram(s) showing all emission units and control equipment, and their relationship, for which a permit is being sought?	☒ Yes ☐ No
27.	Does the application include a complete process description for the emission units and control equipment for which a permit is being sought?	☒ Yes ☐ No
28.	Does the application include the information as contained in completed CAAPP forms for all appropriate emission units and air pollution control equipment, listing all applicable requirements and proposed exemptions from otherwise applicable requirements, and identifying and describing any outstanding legal actions by either the USEPA or the Illinois EPA? Note: The use of "APC" application forms is not appropriate for applications for CAAPP sources. CAAPP forms should be used to supply information.	☒ Yes ☐ No
29.	If the application contains TRADE SECRET information, has such information been properly marked and claimed, and have two separate copies of the application suitable for public inspection and notice been submitted, in accordance with applicable rules and regulations?	☐ Yes ☐ No ☒ Not Applicable, No TRADE SECRET information in this application

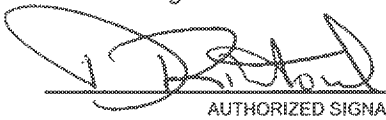
Note 1 - Answering "No" to any of the above may result in the application being deemed incomplete.

Signature Block

This certification must be signed by a responsible official. Applications without a signed certification will be returned as incomplete.

30. I certify under penalty of law that, based on information and belief formed after reasonable inquiry, the statements and information contained in this application are true, accurate and complete.

Authorized signature:

BY: 

AUTHORIZED SIGNATURE

General Manager

TITLE OF SIGNATORY

David J. Rintoul

TYPED OR PRINTED NAME OF SIGNATORY

01 / 31 / 2008

DATE

Note 2- An operating permit for the construction/modification permitted in a construction permit must be obtained by applying for the appropriate revision to the source's CAAPP permit, if necessary.

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL -- PERMIT SECTION
P.O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

R006311

FEE DETERMINATION FOR CONSTRUCTION PERMIT APPLICATION

FOR AGENCY USE ONLY	
ID NUMBER:	
PERMIT #:	
COMPLETE ☐ INCOMPLETE ☐	DATE COMPLETE:
CHECK #:	ACCOUNT NAME:

THIS FORM IS TO BE USED BY ALL SOURCES TO SUPPLY FEE INFORMATION THAT MUST ACCOMPANY ALL CONSTRUCTION PERMIT APPLICATIONS. ***THIS APPLICATION MUST INCLUDE PAYMENT IN FULL TO BE DEEMED COMPLETE.*** MAKE CHECK OR MONEY ORDER PAYABLE TO THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY. SEND TO THE ADDRESS ABOVE. DO NOT SEND CASH. REFER TO INSTRUCTIONS (197-INST) FOR ASSISTANCE.

SOURCE INFORMATION

1) SOURCE NAME: US Steel-Granite City Works	
2) PROJECT NAME: Production Increase Mod	3) SOURCE ID NO. (IF APPLICABLE): 119813AAI
4) CONTACT NAME: Larry Siebenberger	5) CONTACT PHONE NUMBER: (618) 451-3391

FEE DETERMINATION

6) FILL IN THE FOLLOWING THREE BOXES AS DETERMINED IN SECTIONS 1 THROUGH 4 BELOW:

$ 0	+	$ 8,000	=	$ 8,000
SECTION 1 SUBTOTAL		SECTION 2, 3 OR 4 SUBTOTAL		GRAND TOTAL

SECTION 1: STATUS OF SOURCE / PURPOSE OF SUBMITTAL

RECEIVED
STATE OF ILLINOIS
FEB 04 2008
Environmental Protection Agency
BUREAU OF AIR

7) YOUR APPLICATION WILL FALL UNDER ONLY ONE OF THE FOLLOWING SIX CATEGORIES DESCRIBED BELOW. CHECK THE BOX THAT APPLIES, ENTER THE CORRESPONDING FEE IN THE BOX TO THE RIGHT AND COPY THIS FEE INTO THE SECTION 1 SUBTOTAL BOX ABOVE. PROCEED TO APPLICABLE SECTIONS.

FOR PURPOSES OF THIS FORM:

- ***MAJOR SOURCE*** IS A SOURCE THAT IS REQUIRED TO OBTAIN A CAAPP PERMIT.
- ***SYNTHETIC MINOR SOURCE*** IS A SOURCE THAT HAS TAKEN LIMITS ON POTENTIAL TO EMIT IN A PERMIT TO AVOID CAAPP PERMIT REQUIREMENTS (E.G., FESOP).
- ***NON-MAJOR SOURCE*** IS A SOURCE THAT IS NOT A MAJOR OR SYNTHETIC MINOR SOURCE.

☒ EXISTING SOURCE WITHOUT STATUS CHANGE OR WITH STATUS CHANGE FROM SYNTHETIC MINOR TO MAJOR SOURCE OR VICE VERSA. ENTER $0 AND PROCEED TO SECTION 2.	$ 0 SECTION 1 SUBTOTAL
☐ EXISTING NON-MAJOR SOURCE THAT WILL BECOME SYNTHETIC MINOR OR MAJOR SOURCE. ENTER $5,000 AND PROCEED TO SECTION 4.	
☐ EXISTING MAJOR OR SYNTHETIC MINOR SOURCE THAT WILL BECOME NON-MAJOR SOURCE. ENTER $4,000 AND PROCEED TO SECTION 3.	
☐ NEW MAJOR OR SYNTHETIC MINOR SOURCE. ENTER $5,000 AND PROCEED TO SECTION 4.	
☐ NEW NON-MAJOR SOURCE. ENTER $500 AND PROCEED TO SECTION 3.	
☐ AGENCY ERROR. IF THIS IS A TIMELY REQUEST TO CORRECT AN ISSUED PERMIT THAT INVOLVES ONLY AN AGENCY ERROR AND IF THE REQUEST IS RECEIVED WITHIN THE DEADLINE FOR A PERMIT APPEAL TO THE POLLUTION CONTROL BOARD, THEN ENTER $0. SKIP SECTIONS 2, 3 AND 4. PROCEED DIRECTLY TO SECTION 5.	

SECTION 2: SPECIAL CASE FILING FEE

8) FILING FEE. IF THE APPLICATION ONLY ADDRESSES ONE OR MORE OF THE FOLLOWING, CHECK THE APPROPRIATE BOXES, ENTER $500 IN THE SECOND BOX UNDER FEE DETERMINATION ABOVE, SKIP SECTIONS 3 AND 4 AND PROCEED DIRECTLY TO SECTION 5. OTHERWISE, PROCEED TO SECTION 3 OR 4, AS APPROPRIATE.

- ☐ ADDITION OR REPLACEMENT OF CONTROL DEVICES ON PERMITTED UNITS
- ☐ PILOT PROJECTS/TRIAL BURNS BY A PERMITTED UNIT
- ☐ APPLICATIONS ONLY INVOLVING INSIGNIFICANT ACTIVITIES UNDER 35 IAC 201.210 (MAJOR SOURCES ONLY)
- ☐ LAND REMEDIATION PROJECTS
- ☐ REVISIONS RELATED TO METHODOLOGY OR TIMING FOR EMISSION TESTING
- ☐ MINOR ADMINISTRATIVE-TYPE CHANGE TO A PERMIT

THIS AGENCY IS AUTHORIZED TO REQUIRE AND YOU MUST DISCLOSE THIS INFORMATION UNDER 415 ILCS 5/39. FAILURE TO DO SO COULD RESULT IN THE APPLICATION BEING DENIED AND PENALTIES UNDER 415 ILCS 5 ET SEQ. IT IS NOT NECESSARY TO USE THIS FORM IN PROVIDING THIS INFORMATION. THIS FORM HAS BEEN APPROVED BY THE FORMS MANAGEMENT CENTER.

APPLICATION PAGE _____

R006312

SECTION 3: FEES FOR CURRENT OR PROJECTED NON-MAJOR SOURCES

9) IF THIS APPLICATION CONSISTS OF A SINGLE NEW EMISSION UNIT OR NO MORE THAN TWO MODIFIED EMISSION UNITS, ENTER $500.		9)
10) IF THIS APPLICATION CONSISTS OF MORE THAN ONE NEW EMISSION UNIT OR MORE THAN TWO MODIFIED UNITS, ENTER $1,000.		10)
11) IF THIS APPLICATION CONSISTS OF A NEW SOURCE OR EMISSION UNIT SUBJECT TO SECTION 39.2 OF THE ACT (I.E., LOCAL SITING REVIEW); A COMMERCIAL INCINERATOR OR A MUNICIPAL WASTE, HAZARDOUS WASTE, OR WASTE TIRE INCINERATOR; A COMMERCIAL POWER GENERATOR; OR AN EMISSION UNIT DESIGNATED AS A COMPLEX SOURCE BY AGENCY RULEMAKING, ENTER $15,000.		11)
12) IF A PUBLIC HEARING IS HELD (SEE INSTRUCTIONS), ENTER $10,000.		12)
13) SECTION 3 SUBTOTAL (ADD LINES 9 THROUGH 12) TO BE ENTERED ON PAGE 1.		13)

SECTION 4: FEES FOR CURRENT OR PROJECTED MAJOR OR SYNTHETIC MINOR SOURCES

Application Contains Modified Emission Units Only	14) FOR THE FIRST MODIFIED EMISSION UNIT, ENTER $2,000.	14) 2000	
	15) NUMBER OF ADDITIONAL MODIFIED EMISSION UNITS = 0 X $1,000.	15) 0	
	16) LINE 14 PLUS LINE 15, OR $5,000, WHICHEVER IS LESS.		16) 2000
Application Contains New And/Or Modified Emission Units	17) FOR THE FIRST NEW EMISSION UNIT, ENTER $4,000.	17) 0	
	18) NUMBER OF ADDITIONAL NEW AND/OR MODIFIED EMISSION UNITS = _____ X $1,000.	18) 0	
	19) LINE 17 PLUS LINE 18, OR $10,000, WHICHEVER IS LESS.		19) 0
Application Contains Netting Exercise	20) NUMBER OF INDIVIDUAL POLLUTANTS THAT RELY ON A NETTING EXERCISE OR CONTEMPORANEOUS EMISSIONS DECREASE TO AVOID APPLICATION OF PSD OR NONATTAINMENT NSR = 0 X $3,000.		20) 0
Additional Supplemental Fees	21) IF THE NEW SOURCE OR EMISSION UNIT IS SUBJECT TO SECTION 39.2 OF THE ACT (I.E., SITING); A COMMERCIAL INCINERATOR OR OTHER MUNICIPAL WASTE, HAZARDOUS WASTE, OR WASTE TIRE INCINERATOR; A COMMERCIAL POWER GENERATOR; OR ONE OR MORE OTHER EMISSION UNITS DESIGNATED AS A COMPLEX SOURCE BY AGENCY RULEMAKING, ENTER $25,000.		21) 0
	22) IF THE SOURCE IS A NEW MAJOR SOURCE SUBJECT TO PSD, ENTER $12,000.		22) 0
	23) IF THE PROJECT IS A MAJOR MODIFICATION SUBJECT TO PSD, ENTER $6,000.		23) 6000
	24) IF THIS IS A NEW MAJOR SOURCE SUBJECT TO NONATTAINMENT (NAA) NSR, ENTER $20,000.		24) 0
	25) IF THIS IS A MAJOR MODIFICATION SUBJECT TO NAA NSR, ENTER $12,000.		25) 0
	26) IF APPLICATION INVOLVES A DETERMINATION OF CLEAN UNIT STATUS AND THEREFORE IS NOT SUBJECT TO BACT OR LAER, ENTER $5,000 PER UNIT FOR WHICH A DETERMINATION IS REQUESTED OR OTHERWISE REQUIRED. _____ X $5,000.		26) 0
	27) IF APPLICATION INVOLVES A DETERMINATION OF MACT FOR A POLLUTANT AND THE PROJECT IS NOT SUBJECT TO BACT OR LAER FOR THE RELATED POLLUTANT UNDER PSD OR NSR (E.G., VOM FOR ORGANIC HAP), ENTER $5,000 PER UNIT FOR WHICH A DETERMINATION IS REQUESTED OR OTHERWISE REQUIRED. _____ X $5,000.		27) 0
	28) IF A PUBLIC HEARING IS HELD (SEE INSTRUCTIONS), ENTER $10,000.		28)
29) SECTION 4 SUBTOTAL (ADD LINES 16 AND LINES 19 THROUGH 28) TO BE ENTERED ON PAGE 1.			29) 8000

SECTION 5: CERTIFICATION

NOTE: APPLICATIONS WITHOUT A SIGNED CERTIFICATION WILL BE DEEMED INCOMPLETE.

30) I CERTIFY UNDER PENALTY OF LAW THAT, BASED ON INFORMATION AND BELIEF FORMED AFTER REASONABLE INQUIRY, THE INFORMATION CONTAINED IN THIS FEE APPLICATION FORM IS TRUE, ACCURATE AND COMPLETE.

BY: _____ (SIGNATURE) General Manager (TITLE OF SIGNATORY)

David Ristow (TYPED OR PRINTED NAME OF SIGNATORY) 01, 31, 2008 (DATE)

APPLICATION PAGE _____

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197-FEE

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL -- PERMIT SECTION
P.O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

FOR APPLICANT'S USE
Revision #: _____ R006313
Date: ____ / ____ / ____
Page ____ of ____
Source Designation:
BFG Combustion

FUEL COMBUSTION EMISSION UNIT DATA AND INFORMATION

FOR AGENCY USE ONLY
ID NUMBER:
EMISSION POINT #:
DATE:

SOURCE INFORMATION

1) SOURCE NAME:
United States Steel - Granite City Works

2) DATE FORM PREPARED:

3) SOURCE ID NO. (IF KNOWN): 119813AAI

GENERAL INFORMATION

4) NAME OF EMISSION UNIT:
BFG Combustion Units (Boilers, Blast Air Stoves, and Flare)

5) NAME OF PROCESS:
BFG Combustion

6) DESCRIPTION OF PROCESS:
BFG Combustion to produce usable heat or flare when necessary

7) DESCRIPTION OF ITEM OR MATERIAL PRODUCED OR ACTIVITY ACCOMPLISHED:
Produce steam or usable heat

8) FLOW DIAGRAM DESIGNATION OF EMISSION UNIT:
BFG Combustion Units

9) MANUFACTURER OF EMISSION UNIT (IF KNOWN):
Various

10) MODEL NUMBER (IF KNOWN):

11) SERIAL NUMBER (IF KNOWN):

12) DATES OF COMMENCING CONSTRUCTION, OPERATION AND/OR MOST RECENT MODIFICATION OF THIS EMISSION UNIT (ACTUAL OR PLANNED)

a) CONSTRUCTION (MONTH/YEAR):
Various

b) OPERATION (MONTH/YEAR):

c) LATEST MODIFICATION (MONTH/YEAR):

13) DESCRIPTION OF MODIFICATION (IF APPLICABLE):
Revise BFG Combustion SO2 limit in Production Increase Permit based on new data indicating previous emission factor used to develop limit was incorrect.

THIS AGENCY IS AUTHORIZED TO REQUIRE THIS INFORMATION UNDER ILLINOIS REVISED STATUTES, 1991, AS AMENDED 1992, CHAPTER 111 1/2, PAR. 1039.5. DISCLOSURE OF THIS INFORMATION IS REQUIRED UNDER THAT SECTION. FAILURE TO DO SO MAY PREVENT THIS FORM FROM BEING PROCESSED AND COULD RESULT IN THE APPLICATION BEING DENIED. THIS FORM HAS BEEN APPROVED BY THE FORMS MANAGEMENT CENTER.

FOR APPLICANT'S USE

14) DOES THE EMISSION UNIT HAVE MORE THAN ONE MODE OF OPERATION? ☐ YES ☒ NO

IF YES, EXPLAIN AND IDENTIFY WHICH MODE IS COVERED BY THIS FORM (NOTE: A SEPARATE PROCESS EMISSION UNIT FORM 240-CAAPP MUST BE COMPLETED FOR EACH MODE):

15) PROVIDE THE NAME AND DESIGNATION OF ALL AIR POLLUTION CONTROL EQUIPMENT CONTROLLING THIS EMISSION UNIT, IF APPLICABLE (FORM 260-CAAPP AND THE APPROPRIATE 260-CAAPP ADDENDUM FORM MUST BE COMPLETED FOR EACH ITEM OF AIR POLLUTION CONTROL EQUIPMENT):

None

16) WILL EMISSIONS DURING STARTUP EXCEED EITHER THE ALLOWABLE EMISSION RATE PURSUANT TO A SPECIFIC RULE, OR THE ALLOWABLE EMISSION LIMIT AS ESTABLISHED BY AN EXISTING OR PROPOSED PERMIT CONDITION? ☐ YES ☒ NO

IF YES, COMPLETE AND ATTACH FORM 203-CAAPP, "REQUEST TO OPERATE WITH EXCESS EMISSIONS DURING STARTUP OF EQUIPMENT".

17) PROVIDE ANY LIMITATIONS ON SOURCE OPERATION AFFECTING EMISSIONS OR ANY WORK PRACTICE STANDARDS (E.G., ONLY ONE UNIT IS OPERATED AT A TIME):

BFG Combustion facility wide limited to 185,030 million cubic feet per year.

OPERATING INFORMATION

18) ATTACH THE CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSION RELATED, FROM WHICH THE FOLLOWING OPERATING INFORMATION, MATERIAL USAGE INFORMATION AND FUEL USAGE DATA WERE BASED AND LABEL AS EXHIBIT 240-1. REFER TO SPECIAL NOTES OF FORM 202-CAAPP.

19a) MAXIMUM OPERATING HOURS	HOURS/DAY: 24	DAYS/WEEK: 7	WEEKS/YEAR: 52
b) TYPICAL OPERATING HOURS	HOURS/DAY: 24	DAYS/WEEK: 7	WEEKS/YEAR: 52

20) ANNUAL THROUGHPUT	DEC-FEB(%):	MAR-MAY(%):	JUN-AUG(%):	SEP-NOV(%):

FIRING RATE INFORMATION

21a) RATED OR DESIGN HEAT INPUT CAPACITY (MILLION BTU/HR):

Various

b) IS MORE THAN ONE FUEL FIRED AT A TIME? ☒ YES ☐ NO

IF YES, EXPLAIN:

21c) IF HEAT INPUT CAPACITY IS 100 MILLION BTU/HOUR OR GREATER, PROVIDE FURNACE VOLUME (CUBIC FEET)
NOTE: FURNACE VOLUME IS DEFINED AS THAT VOLUME BOUNDED BY THE FRONT FURNACE WALL WHERE THE BURNER IS LOCATED, THE FURNACE SIDE WATERWALL, AND EXTENDING TO THE LEVEL JUST BELOW OR IN FRONT OF THE FIRST ROW OF CONVECTION PASS TUBES.

	NATURAL GAS	FUEL OIL	COAL	OTHER
d) SINGLE FUEL (MAXIMUM - MILLION BTU/HOUR)				
e) SINGLE FUEL (TYPICAL - MILLION BTU/HOUR)				
f) COMBINED FUEL (TYPICAL - MILLION BTU/HOUR) (IF APPLICABLE)				

NATURAL GAS FIRING

22a) CURRENT ORIGIN OF NATURAL GAS:
☐ PIPELINE (FIRM CONTRACT) ☐ BY-PRODUCT, SPECIFY ORIGIN:
☐ PIPELINE (INTERRUPTIBLE SUPPLY CONTRACT) ☐ OTHER, - SPECIFY: _____

b) TYPICAL HEAT CONTENT (BTU/SCF):
1000

c) MAXIMUM CONSUMPTION	SCF/MONTH:	SCF/YEAR:
d) TYPICAL CONSUMPTION	SCF/MONTH:	SCF/YEAR:

OIL FIRING

23a) OIL TYPE (CHECK ONE):
☐ NO. 1 ☐ NO. 2 ☐ NO. 4 ☐ NO. 5 ☐ NO. 6
☐ OTHER, SPECIFY (INCLUDE GENERATOR OR SUPPLIER): _____

b) TYPICAL HEAT CONTENT: _____ ☐ BTU/LB - OR - ☐ BTU/GAL	c) IS OIL USED ONLY AS A RESERVE FUEL? ☐ YES ☐ NO
d) TYPICAL SULFUR CONTENT AS FIRED (WT %):	e) TYPICAL ASH CONTENT AS FIRED (WT %):

f) MAXIMUM CONSUMPTION	GAL/MONTH:	GAL/YEAR:
g) TYPICAL CONSUMPTION	GAL/MONTH:	GAL/YEAR:

h) FIRING DIRECTION:
☐ HORIZONTAL ☐ TANGENTIAL ☐ OTHER, SPECIFY:

SOLID FUEL FIRING

*24a) SOLID FUEL TYPE (CHECK ALL THAT APPLY): ☐ SUB-BITUMINOUS COAL ☐ LIGNITE COAL ☐ BITUMINOUS COAL ☐ ANTHRACITE COAL ☐ OTHER, SPECIFY:

b) TYPICAL HEAT CONTENT AS FIRED (BTU/LB):	c) TYPICAL MOISTURE CONTENT AS FIRED (WT %):
d) TYPICAL SULFUR CONTENT AS FIRED (WT %):	e) TYPICAL ASH CONTENT AS FIRED (WT %):
f) TYPICAL FINES CONTENT (% LESS THAN 1/8 INCH):	g) IS THE COAL CLEANED? ☐ YES ☐ NO

h) HOW MUCH COAL REFUSE IS IN THE FUEL? (WT %):

i) MAXIMUM CONSUMPTION	TON/MONTH:	TON/YEAR:
j) TYPICAL CONSUMPTION	TON/MONTH:	TON/YEAR:

k) FIRING TYPE (CHECK ONE):
☐ TRAVELING GRATE ☐ SPREADER STOKER % REINJECTION:
☐ CYCLONE ☐ PULVERIZED, TYPE (CIRCLE ONE): WET BOTTOM DRY BOTTOM
☐ HORIZONTALLY OPPOSED ☐ OTHER, SPECIFY:

*NOTE: IF REQUIRED, SUBMIT COPIES OF THOSE PORTIONS OF COAL SUPPLY CONTRACTS WHICH SET FORTH THE SPECIFICATIONS OF THE FUEL AND THE DURATION OF THE CONTRACT. IF THE ACTUAL FUEL FIRED IS A BLEND OF COAL, SUBMIT APPROPRIATE PORTIONS OF ALL FUEL CONTRACTS AND STATE THE MANNER BY WHICH THE FUELS ARE BLENDED AND ACTUALLY FIRED. ATTACH AND LABEL AS EXHIBIT 240-2.

OTHER FUEL FIRING

25a) OTHER FUEL FIRING

	TYPE	SUPPLIER
a)	Blast Furnace Gas	By-Product Fuel (GCW)
b)		

b) TYPICAL HEAT CONTENT (SPECIFY UNITS): a) 80	c) TYPICAL NITROGEN CONTENT AS FIRED (WT %):
d) TYPICAL SULFUR CONTENT AS FIRED (WT %): a) 0.00005	e) TYPICAL ASH CONTENT AS FIRED (WT %):

f) MAXIMUM CONSUMPTION	(SPECIFY UNITS/MONTH): 30800 MMcf (all units)	(SPECIFY UNITS/YEAR): 185030 MMcf (all units)
g) TYPICAL CONSUMPTION	(SPECIFY UNITS/MONTH):	(SPECIFY UNITS/YEAR):

APPLICABLE RULES

26) PROVIDE ANY SPECIFIC EMISSION STANDARD(S) AND LIMITATION(S) SET BY RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT (E.G., PARTICULATE MATTER, IAC 212.206, <= 0.10 LBS/MMBTU):

REGULATED AIR POLLUTANT(S)	EMISSION STANDARD(S)	REQUIREMENT(S)

27) PROVIDE ANY SPECIFIC RECORDKEEPING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	RECORDKEEPING RULE(S)	REQUIREMENT(S)

28) PROVIDE ANY SPECIFIC REPORTING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	REPORTING RULE(S)	REQUIREMENT(S)

29) PROVIDE ANY SPECIFIC MONITORING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	MONITORING RULE(S)	REQUIREMENT(S)

30) PROVIDE ANY SPECIFIC TESTING RULES AND/OR PROCEDURES WHICH ARE APPLICABLE TO THIS EMISSION UNIT :

REGULATED AIR POLLUTANT(S)	TESTING RULE(S)	REQUIREMENT(S)

R006317

31) DOES THE EMISSION UNIT QUALIFY FOR AN EXEMPTION FROM AN OTHERWISE APPLICABLE RULE? ☐ YES ☒ NO

IF YES, THEN LIST BOTH THE RULE FROM WHICH IT IS EXEMPT AND THE RULE WHICH ALLOWS THE EXEMPTION. PROVIDE A DETAILED EXPLANATION JUSTIFYING THE EXEMPTION. INCLUDE DETAILED SUPPORTING DATA AND CALCULATIONS. ATTACH AND LABEL AS EXHIBIT 240-3, OR REFER TO OTHER ATTACHMENT(S) WHICH ADDRESS AND JUSTIFY THIS EXEMPTION.

COMPLIANCE INFORMATION

32) IS THE EMISSION UNIT IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS? ☒ YES ☐ NO

IF NO, THEN FORM 294-CAAPP "COMPLIANCE PLAN/SCHEDULE OF COMPLIANCE – ADDENDUM FOR NON COMPLYING EMISSION UNITS" MUST BE COMPLETED AND SUBMITTED WITH THIS APPLICATION.

33) EXPLANATION OF HOW INITIAL COMPLIANCE IS TO BE, OR WAS PREVIOUSLY, DEMONSTRATED:

Stack Testing

34) EXPLANATION OF HOW ONGOING COMPLIANCE WILL BE DEMONSTRATED:

Fuel Sulfur Content Testing and Engineering Calculations

TESTING, MONITORING, RECORDKEEPING AND REPORTING

35a) LIST THE PARAMETERS THAT RELATE TO AIR EMISSIONS FOR WHICH RECORDS ARE BEING MAINTAINED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE. INCLUDE THE UNIT OF MEASUREMENT, THE METHOD OF MEASUREMENT, AND THE FREQUENCY OF SUCH RECORDS (E.G., HOURLY, DAILY, WEEKLY):

PARAMETER	UNIT OF MEASUREMENT	METHOD OF MEASUREMENT	FREQUENCY
BFG flow	MMcf	flowmeter	monthly

35b) BRIEFLY DESCRIBE THE METHOD BY WHICH RECORDS WILL BE CREATED AND MAINTAINED. FOR EACH RECORDED PARAMETER INCLUDE THE METHOD OF RECORDKEEPING, TITLE OF PERSON RESPONSIBLE FOR RECORDKEEPING, AND TITLE OF PERSON TO CONTACT FOR REVIEW OF RECORDS:

PARAMETER	METHOD OF RECORDKEEPING	TITLE OF PERSON RESPONSIBLE	TITLE OF CONTACT PERSON
BFG Flow	Log		

c) IS COMPLIANCE OF THE EMISSION UNIT READILY DEMONSTRATED BY REVIEW OF THE RECORDS? ☒ YES ☐ NO

IF NO, EXPLAIN:

d) ARE ALL RECORDS READILY AVAILABLE FOR INSPECTION, COPYING AND SUBMITTAL TO THE AGENCY UPON REQUEST? ☒ YES ☐ NO

IF NO, EXPLAIN:

36a) DESCRIBE ANY MONITORS OR MONITORING ACTIVITIES USED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE:

None

b) WHAT PARAMETER(S) IS(ARE) BEING MONITORED (E.G., OPACITY)?

c) DESCRIBE THE LOCATION OF EACH MONITOR (E.G., IN STACK MONITOR):

36d) IS EACH MONITOR EQUIPPED WITH A RECORDING DEVICE? ☐ YES ☐ NO

IF NO, LIST ALL MONITORS WITHOUT A RECORDING DEVICE:

e) IS EACH MONITOR REVIEWED FOR ACCURACY ON AT LEAST A QUARTERLY BASIS? ☐ YES ☐ NO

IF NO, EXPLAIN:

f) IS EACH MONITOR OPERATED AT ALL TIMES THE ASSOCIATED EMISSION UNIT IS IN OPERATION? ☐ YES ☐ NO

IF NO, EXPLAIN:

37) PROVIDE INFORMATION ON THE MOST RECENT TESTS, IF ANY, IN WHICH THE RESULTS ARE USED FOR PURPOSES OF THE DETERMINATION OF FEES, RULE APPLICABILITY OR COMPLIANCE. INCLUDE THE TEST DATE, TEST METHOD USED, TESTING COMPANY, OPERATING CONDITIONS EXISTING DURING THE TEST AND A SUMMARY OF RESULTS. IF ADDITIONAL SPACE IS NEEDED, ATTACH AND LABEL AS EXHIBIT 240-4:

TEST DATE	TEST METHOD	TESTING COMPANY	OPERATING CONDITIONS	SUMMARY OF RESULTS
None				

38) DESCRIBE ALL REPORTING REQUIREMENTS AND PROVIDE THE TITLE AND FREQUENCY OF REPORT SUBMITTALS TO THE AGENCY:

REPORTING REQUIREMENTS	TITLE OF REPORT	FREQUENCY
None		

(39)EMISSION INFORMATION

REGULATED AIR POLLUTANT		☒ [1]ACTUAL EMISSION RATE / ☐ [1]UNCONTROLLED EMISSION RATE					ALLOWABLE BY RULE EMISSION RATE			[2]PERMITTED EMISSION RATE	
		LBS PER HOUR (LBS/HR)	TONS PER YEAR (TONS/YR)	[3]OTHER TERMS	[3]OTHER TERMS	[4]DM	[5]RATE (UNITS)	APPLICABLE RULES	TONS PER YEAR (TONS/YR)	RATE (UNITS)	TONS PER YEAR (TONS/YR)
CARBON MONOXIDE (CO)	MAXIMUM:						( )	G 9			
	TYPICAL:						( )				
LEAD	MAXIMUM:						( )				
	TYPICAL:						( )				
NITROGEN OXIDES (NOx)	MAXIMUM:						( )				
	TYPICAL:						( )				
PARTICULATE MATTER (PART)	MAXIMUM:						( )				
	TYPICAL:						( )				
PARTICULATE MATTER <= 10 MICROMETERS (PM10)	MAXIMUM:						( )				
	TYPICAL:						( )				
SULFUR DIOXIDE (SO2)	MAXIMUM:		1480.24				( )				1480.24
	TYPICAL:		1100.00				( )				
VOLATILE ORGANIC MATERIAL (VOM)	MAXIMUM:						( )				
	TYPICAL:						( )				
OTHER, SPECIFY:	MAXIMUM:						( )				
	TYPICAL:						( )				
EXAMPLE: PARTICULATE MATTER	*MAXIMUM:*	*5.00*	*21.9*	*0.3 GR/DSCF*		*1*	*6.0 (LBS/HR)*	*212.321*	*26.28*	*5.5 LBS/HR*	*22*
	TYPICAL:	*4.00*	*14.4*	*0.24 GR/DSCF*		*4*	*5.5 (LBS/HR)*	*212.321*	*19.60*		

IMPORTANT: ATTACH CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH EMISSIONS WERE DETERMINED AND LABEL AS EXHIBIT 240-6.

[1]CHECK UNCONTROLLED EMISSION RATE BOX IF CONTROL EQUIPMENT IS USED. OTHERWISE CHECK AND PROVIDE THE ACTUAL EMISSION RATE TO ATMOSPHERE, INCLUDING INDOORS. SEE INSTRUCTIONS.
[2]PROVIDE THE EMISSION RATE THAT WILL BE USED AS A PERMIT SPECIAL CONDITION. THIS LIMIT WILL BE USED TO DETERMINE THE PERMIT FEE.
[3]PLEASE PROVIDE ANY OTHER EMISSION RATE WHICH IS COMMONLY USED, REQUIRED BY A SPECIFIC LIMITATION OR THAT WAS MEASURED (E.G. PPM, GR/DSCF, ETC.)
[4]DM - DETERMINATION METHOD: 1) STACK TEST, 2) MATERIAL BALANCE, 3) STANDARD EMISSION FACTOR (AP-42 OR AIRS), 4) ENGINEERING ESTIMATE, 5) SPECIAL EMISSION FACTOR (NOT AP-42 OR AIRS)
[5]RATE - ALLOWABLE EMISSION RATE SPECIFIED BY MOST STRINGENT APPLICABLE RULE.

8006321

(40) HAZARDOUS AIR POLLUTANT EMISSION INFORMATION

HAP INFORMATION		☐ [1]ACTUAL EMISSION RATE ☐ [1]UNCONTROLLED EMISSION RATE				ALLOWABLE BY RULE	
NAME OF HAP EMITTED	[2]CAS NUMBER		POUNDS PER HOUR (LBS/HR)	TONS PER YEAR (TONS/YR)	[3]OTHER TERMS	[4]DM	[5]RATE OR STANDARD	APPLICABLE RULE
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
EXAMPLE:		MAXIMUM:	*10.0*	*1.2*		*2*	*98% by wt control device*	*CFR 61*
Benzene	*71432*	TYPICAL:	*8.0*	*0.8*		*2*	*leak-tight trucks*	*61.302(b) (d)*

IMPORTANT: ATTACH CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH EMISSIONS WERE DETERMINED AND LABEL AS EXHIBIT 240-6.

[1]PROVIDE UNCONTROLLED EMISSIONS IF CONTROL EQUIPMENT IS USED. OTHERWISE, PROVIDE ACTUAL EMISSIONS TO THE ATMOSPHERE, INCLUDING INDOORS. CHECK BOX TO SPECIFY.
[2]CAS - CHEMICAL ABSTRACT SERVICE NUMBER.
[3]PLEASE PROVIDE ANY OTHER EMISSION RATE WHICH IS COMMONLY USED, REQUIRED BY A SPECIFIC LIMITATION OR THAT WAS MEASURED (E.G., PPM, GR/DSCF, ETC.).
[4]DM - DETERMINATION METHOD: 1) STACK TEST, 2) MATERIAL BALANCE, 3) STANDARD EMISSION FACTOR (AP-42 OR AIRS, 4) ENGINEERING ESTIMATE, 5) SPECIAL EMISSION FACTOR (NOT AP-42 OR AIRS).
[5]RATE - ALLOWABLE EMISSION RATE OR STANDARD SPECIFIED BY MOST STRINGENT APPLICABLE RULE.

R006322

EXHAUST POINT INFORMATION

THIS SECTION SHOULD NOT BE COMPLETED IF EMISSIONS ARE EXHAUSTED THROUGH AIR POLLUTION CONTROL EQUIPMENT.

41) FLOW DIAGRAM DESIGNATION OF EXHAUST POINT:

42) DESCRIPTION OF EXHAUST POINT (STACK, VENT, ROOF MONITOR, INDOORS, ETC.). IF THE EXHAUST POINT DISCHARGES INDOORS, DO NOT COMPLETE THE REMAINING ITEMS.

43) DISTANCE TO NEAREST PLANT BOUNDARY FROM EXHAUST POINT DISCHARGE (FT):

44) DISCHARGE HEIGHT ABOVE GRADE (FT):

45) GOOD ENGINEERING PRACTICE (GEP) HEIGHT, IF KNOWN (FT):

46) DIAMETER OF EXHAUST POINT (FT): NOTE: FOR A NON CIRCULAR EXHAUST POINT, THE DIAMETER IS 1.128 TIMES THE SQUARE ROOT OF THE AREA.

47) EXIT GAS FLOW RATE	a) MAXIMUM (ACFM):	b) TYPICAL (ACFM):
48) EXIT GAS TEMPERATURE	a) MAXIMUM (°F):	b) TYPICAL (°F):

49) DIRECTION OF EXHAUST (VERTICAL, LATERAL, DOWNWARD):

50) LIST ALL EMISSION UNITS AND CONTROL DEVICES SERVED BY THIS EXHAUST POINT:

	NAME	FLOW DIAGRAM DESIGNATION
a)		
b)		
c)		
d)		
e)		

THE FOLLOWING INFORMATION NEED ONLY BE SUPPLIED IF READILY AVAILABLE.

51a) LATITUDE:	b) LONGITUDE:	
52) UTM ZONE:	b) UTM VERTICAL (KM):	c) UTM HORIZONTAL (KM):

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL -- PERMIT SECTION
P.O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

FOR APPLICANT'S USE
Revision #: _____ R006324
Date: ____ / ____ / ____
Page _____ of _____
Source Designation: Boilers 1-10

FUEL COMBUSTION EMISSION UNIT DATA AND INFORMATION

FOR AGENCY USE ONLY
ID NUMBER:
EMISSION POINT #:
DATE:

SOURCE INFORMATION

1) SOURCE NAME: United States Steel - Granite City Works

2) DATE FORM PREPARED:

3) SOURCE ID NO. (IF KNOWN): 119813AAI

GENERAL INFORMATION

4) NAME OF EMISSION UNIT: NG Combustion Units (Boilers, Blast Air Stoves, Ladle Dryers and BFG Flare)

5) NAME OF PROCESS: NG Combustion

6) DESCRIPTION OF PROCESS: NG Combustion to produce usable heat

7) DESCRIPTION OF ITEM OR MATERIAL PRODUCED OR ACTIVITY ACCOMPLISHED: Produce steam or usable heat

8) FLOW DIAGRAM DESIGNATION OF EMISSION UNIT: NG Combustion Units

9) MANUFACTURER OF EMISSION UNIT (IF KNOWN):

10) MODEL NUMBER (IF KNOWN):

11) SERIAL NUMBER (IF KNOWN):

12) DATES OF COMMENCING CONSTRUCTION, OPERATION AND/OR MOST RECENT MODIFICATION OF THIS EMISSION UNIT (ACTUAL OR PLANNED)

a) CONSTRUCTION (MONTH/YEAR): ~1920s

b) OPERATION (MONTH/YEAR):

c) LATEST MODIFICATION (MONTH/YEAR):

13) DESCRIPTION OF MODIFICATION (IF APPLICABLE): Revise NG combustion emission factors for VOM and CO used to develop limits in Production Increase Permit to reflect changes in AP-42 emission factors.

THIS AGENCY IS AUTHORIZED TO REQUIRE THIS INFORMATION UNDER ILLINOIS REVISED STATUTES, 1991, AS AMENDED 1992, CHAPTER 111 1/2, PAR. 1039.5. DISCLOSURE OF THIS INFORMATION IS REQUIRED UNDER THAT SECTION. FAILURE TO DO SO MAY PREVENT THIS FORM FROM BEING PROCESSED AND COULD RESULT IN THE APPLICATION BEING DENIED. THIS FORM HAS BEEN APPROVED BY THE FORMS MANAGEMENT CENTER.

FOR APPLICANT'S USE

14) DOES THE EMISSION UNIT HAVE MORE THAN ONE MODE OF OPERATION? ☐ YES ☒ NO

IF YES, EXPLAIN AND IDENTIFY WHICH MODE IS COVERED BY THIS FORM (NOTE: A SEPARATE PROCESS EMISSION UNIT FORM 240-CAAPP MUST BE COMPLETED FOR EACH MODE):

15) PROVIDE THE NAME AND DESIGNATION OF ALL AIR POLLUTION CONTROL EQUIPMENT CONTROLLING THIS EMISSION UNIT, IF APPLICABLE (FORM 260-CAAPP AND THE APPROPRIATE 260-CAAPP ADDENDUM FORM MUST BE COMPLETED FOR EACH ITEM OF AIR POLLUTION CONTROL EQUIPMENT):

None

16) WILL EMISSIONS DURING STARTUP EXCEED EITHER THE ALLOWABLE EMISSION RATE PURSUANT TO A SPECIFIC RULE, OR THE ALLOWABLE EMISSION LIMIT AS ESTABLISHED BY AN EXISTING OR PROPOSED PERMIT CONDITION? ☐ YES ☒ NO

IF YES, COMPLETE AND ATTACH FORM 203-CAAPP, "REQUEST TO OPERATE WITH EXCESS EMISSIONS DURING STARTUP OF EQUIPMENT".

17) PROVIDE ANY LIMITATIONS ON SOURCE OPERATION AFFECTING EMISSIONS OR ANY WORK PRACTICE STANDARDS (E.G., ONLY ONE UNIT IS OPERATED AT A TIME):

BFG Combustion facility wide limited to 185,030 million cubic feet per year.
NG combustion in the boilers, BF Stoves, Ladle Dryers and BFG flare limited to 1,346 million cubic feet per year.

OPERATING INFORMATION

18) ATTACH THE CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSION RELATED, FROM WHICH THE FOLLOWING OPERATING INFORMATION, MATERIAL USAGE INFORMATION AND FUEL USAGE DATA WERE BASED AND LABEL AS EXHIBIT 240-1. REFER TO SPECIAL NOTES OF FORM 202-CAAPP.

19a) MAXIMUM OPERATING HOURS	HOURS/DAY: 24	DAYS/WEEK: 7	WEEKS/YEAR: 52
b) TYPICAL OPERATING HOURS	HOURS/DAY: 24	DAYS/WEEK: 7	WEEKS/YEAR: 52

20) ANNUAL THROUGHPUT	DEC-FEB(%):	MAR-MAY(%):	JUN-AUG(%):	SEP-NOV(%):

FIRING RATE INFORMATION

21a) RATED OR DESIGN HEAT INPUT CAPACITY (MILLION BTU/HR):

60 each

b) IS MORE THAN ONE FUEL FIRED AT A TIME? ☒ YES ☐ NO

IF YES, EXPLAIN:

Units can fire NG or BFG. During BFG firing, NG or COG is required for pilot flame to maintain combustion.

21c) IF HEAT INPUT CAPACITY IS 100 MILLION BTU/HOUR OR GREATER, PROVIDE FURNACE VOLUME (CUBIC FEET)
NOTE: FURNACE VOLUME IS DEFINED AS THAT VOLUME BOUNDED BY THE FRONT FURNACE WALL WHERE THE BURNER IS LOCATED, THE FURNACE SIDE WATERWALL, AND EXTENDING TO THE LEVEL JUST BELOW OR IN FRONT OF THE FIRST ROW OF CONVECTION PASS TUBES.

	NATURAL GAS	FUEL OIL	COAL	OTHER
d) SINGLE FUEL (MAXIMUM - MILLION BTU/HOUR)				
e) SINGLE FUEL (TYPICAL - MILLION BTU/HOUR)				
f) COMBINED FUEL (TYPICAL - MILLION BTU/HOUR) (IF APPLICABLE)				

NATURAL GAS FIRING

22a) CURRENT ORIGIN OF NATURAL GAS:
☒ PIPELINE (FIRM CONTRACT) ☐ BY-PRODUCT, SPECIFY ORIGIN:
☐ PIPELINE (INTERRUPTIBLE SUPPLY CONTRACT) ☐ OTHER, - SPECIFY:

b) TYPICAL HEAT CONTENT (BTU/SCF):
1000

c) MAXIMUM CONSUMPTION	SCF/MONTH: 225,000,000	SCF/YEAR: 1,346,000,000
d) TYPICAL CONSUMPTION	SCF/MONTH:	SCF/YEAR:

OIL FIRING

23a) OIL TYPE (CHECK ONE):
☐ NO. 1 ☐ NO. 2 ☐ NO. 4 ☐ NO. 5 ☐ NO. 6
☐ OTHER, SPECIFY (INCLUDE GENERATOR OR SUPPLIER):

b) TYPICAL HEAT CONTENT: ☐ BTU/LB - OR - ☐ BTU/GAL	c) IS OIL USED ONLY AS A RESERVE FUEL? ☐ YES ☐ NO
d) TYPICAL SULFUR CONTENT AS FIRED (WT %):	e) TYPICAL ASH CONTENT AS FIRED (WT %):

f) MAXIMUM CONSUMPTION	GAL/MONTH:	GAL/YEAR:
g) TYPICAL CONSUMPTION	GAL/MONTH:	GAL/YEAR:

h) FIRING DIRECTION:
☐ HORIZONTAL ☐ TANGENTIAL ☐ OTHER, SPECIFY:

SOLID FUEL FIRING

*24a) SOLID FUEL TYPE (CHECK ALL THAT APPLY): ☐ SUB-BITUMINOUS COAL ☐ LIGNITE COAL ☐ BITUMINOUS COAL ☐ ANTHRACITE COAL ☐ OTHER, SPECIFY:

b) TYPICAL HEAT CONTENT AS FIRED (BTU/LB):	c) TYPICAL MOISTURE CONTENT AS FIRED (WT %):
d) TYPICAL SULFUR CONTENT AS FIRED (WT %):	e) TYPICAL ASH CONTENT AS FIRED (WT %):
f) TYPICAL FINES CONTENT (% LESS THAN 1/8 INCH):	g) IS THE COAL CLEANED? ☐ YES ☐ NO

h) HOW MUCH COAL REFUSE IS IN THE FUEL? (WT %):

i) MAXIMUM CONSUMPTION	TON/MONTH:	TON/YEAR:
j) TYPICAL CONSUMPTION	TON/MONTH:	TON/YEAR:

k) FIRING TYPE (CHECK ONE):
☐ TRAVELING GRATE ☐ SPREADER STOKER % REINJECTION:
☐ CYCLONE ☐ PULVERIZED, TYPE (CIRCLE ONE): WET BOTTOM DRY BOTTOM
☐ HORIZONTALLY OPPOSED ☐ OTHER, SPECIFY: _____

*NOTE: IF REQUIRED, SUBMIT COPIES OF THOSE PORTIONS OF COAL SUPPLY CONTRACTS WHICH SET FORTH THE SPECIFICATIONS OF THE FUEL AND THE DURATION OF THE CONTRACT. IF THE ACTUAL FUEL FIRED IS A BLEND OF COAL, SUBMIT APPROPRIATE PORTIONS OF ALL FUEL CONTRACTS AND STATE THE MANNER BY WHICH THE FUELS ARE BLENDED AND ACTUALLY FIRED. ATTACH AND LABEL AS EXHIBIT 240-2.

OTHER FUEL FIRING

25a) OTHER FUEL FIRING

	TYPE	SUPPLIER
a)		
b)		

b) TYPICAL HEAT CONTENT (SPECIFY UNITS): a) 80	c) TYPICAL NITROGEN CONTENT AS FIRED (WT %):
d) TYPICAL SULFUR CONTENT AS FIRED (WT %): a) 0.00005	e) TYPICAL ASH CONTENT AS FIRED (WT %):

f) MAXIMUM CONSUMPTION	(SPECIFY UNITS/MONTH):	(SPECIFY UNITS/YEAR):
g) TYPICAL CONSUMPTION	(SPECIFY UNITS/MONTH):	(SPECIFY UNITS/YEAR):

APPLICABLE RULES

26) PROVIDE ANY SPECIFIC EMISSION STANDARD(S) AND LIMITATION(S) SET BY RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT (E.G., PARTICULATE MATTER, IAC 212.206, <= 0.10 LBS/MMBTU):

REGULATED AIR POLLUTANT(S)	EMISSION STANDARD(S)	REQUIREMENT(S)

27) PROVIDE ANY SPECIFIC RECORDKEEPING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	RECORDKEEPING RULE(S)	REQUIREMENT(S)

28) PROVIDE ANY SPECIFIC REPORTING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	REPORTING RULE(S)	REQUIREMENT(S)

29) PROVIDE ANY SPECIFIC MONITORING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	MONITORING RULE(S)	REQUIREMENT(S)

30) PROVIDE ANY SPECIFIC TESTING RULES AND/OR PROCEDURES WHICH ARE APPLICABLE TO THIS EMISSION UNIT :

REGULATED AIR POLLUTANT(S)	TESTING RULE(S)	REQUIREMENT(S)

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31) DOES THE EMISSION UNIT QUALIFY FOR AN EXEMPTION FROM AN OTHERWISE APPLICABLE RULE? ☐ YES ☒ NO

IF YES, THEN LIST BOTH THE RULE FROM WHICH IT IS EXEMPT AND THE RULE WHICH ALLOWS THE EXEMPTION. PROVIDE A DETAILED EXPLANATION JUSTIFYING THE EXEMPTION. INCLUDE DETAILED SUPPORTING DATA AND CALCULATIONS. ATTACH AND LABEL AS EXHIBIT 240-3, OR REFER TO OTHER ATTACHMENT(S) WHICH ADDRESS AND JUSTIFY THIS EXEMPTION.

COMPLIANCE INFORMATION

32) IS THE EMISSION UNIT IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS? ☒ YES ☐ NO

IF NO, THEN FORM 294-CAAPP "COMPLIANCE PLAN/SCHEDULE OF COMPLIANCE – ADDENDUM FOR NON COMPLYING EMISSION UNITS" MUST BE COMPLETED AND SUBMITTED WITH THIS APPLICATION.

33) EXPLANATION OF HOW INITIAL COMPLIANCE IS TO BE, OR WAS PREVIOUSLY, DEMONSTRATED:

Engineering Calculations

34) EXPLANATION OF HOW ONGOING COMPLIANCE WILL BE DEMONSTRATED:

TESTING, MONITORING, RECORDKEEPING AND REPORTING

35a) LIST THE PARAMETERS THAT RELATE TO AIR EMISSIONS FOR WHICH RECORDS ARE BEING MAINTAINED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE. INCLUDE THE UNIT OF MEASUREMENT, THE METHOD OF MEASUREMENT, AND THE FREQUENCY OF SUCH RECORDS (E.G., HOURLY, DAILY, WEEKLY):

PARAMETER	UNIT OF MEASUREMENT	METHOD OF MEASUREMENT	FREQUENCY
NG flow	MMcf	flowmeter	monthly

35b) BRIEFLY DESCRIBE THE METHOD BY WHICH RECORDS WILL BE CREATED AND MAINTAINED. FOR EACH RECORDED PARAMETER INCLUDE THE METHOD OF RECORDKEEPING, TITLE OF PERSON RESPONSIBLE FOR RECORDKEEPING, AND TITLE OF PERSON TO CONTACT FOR REVIEW OF RECORDS:

PARAMETER	METHOD OF RECORDKEEPING	TITLE OF PERSON RESPONSIBLE	TITLE OF CONTACT PERSON
NG Flow	Log		

c) IS COMPLIANCE OF THE EMISSION UNIT READILY DEMONSTRATED BY REVIEW OF THE RECORDS? ☒ YES ☐ NO

IF NO, EXPLAIN:

d) ARE ALL RECORDS READILY AVAILABLE FOR INSPECTION, COPYING AND SUBMITTAL TO THE AGENCY UPON REQUEST? ☒ YES ☐ NO

IF NO, EXPLAIN:

36a) DESCRIBE ANY MONITORS OR MONITORING ACTIVITIES USED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE:

None

b) WHAT PARAMETER(S) IS(ARE) BEING MONITORED (E.G., OPACITY)?

c) DESCRIBE THE LOCATION OF EACH MONITOR (E.G., IN STACK MONITOR):

36d) IS EACH MONITOR EQUIPPED WITH A RECORDING DEVICE? ☐ YES ☐ NO

IF NO, LIST ALL MONITORS WITHOUT A RECORDING DEVICE:

e) IS EACH MONITOR REVIEWED FOR ACCURACY ON AT LEAST A QUARTERLY BASIS? ☐ YES ☐ NO

IF NO, EXPLAIN:

f) IS EACH MONITOR OPERATED AT ALL TIMES THE ASSOCIATED EMISSION UNIT IS IN OPERATION? ☐ YES ☐ NO

IF NO, EXPLAIN:

37) PROVIDE INFORMATION ON THE MOST RECENT TESTS, IF ANY, IN WHICH THE RESULTS ARE USED FOR PURPOSES OF THE DETERMINATION OF FEES, RULE APPLICABILITY OR COMPLIANCE. INCLUDE THE TEST DATE, TEST METHOD USED, TESTING COMPANY, OPERATING CONDITIONS EXISTING DURING THE TEST AND A SUMMARY OF RESULTS. IF ADDITIONAL SPACE IS NEEDED, ATTACH AND LABEL AS EXHIBIT 240-4:

TEST DATE	TEST METHOD	TESTING COMPANY	OPERATING CONDITIONS	SUMMARY OF RESULTS

38) DESCRIBE ALL REPORTING REQUIREMENTS AND PROVIDE THE TITLE AND FREQUENCY OF REPORT SUBMITTALS TO THE AGENCY:

REPORTING REQUIREMENTS	TITLE OF REPORT	FREQUENCY

(39)EMISSION INFORMATION

☒ [1]ACTUAL EMISSION RATE
☐ [1]UNCONTROLLED EMISSION RATE

REGULATED AIR POLLUTANT		LBS PER HOUR (LBS/HR)	TONS PER YEAR (TONS/YR)	[3]OTHER TERMS	[3]OTHER TERMS	[4]DM	ALLOWABLE BY RULE EMISSION RATE: [5]RATE (UNITS)	APPLICABLE RULES	TONS PER YEAR (TONS/YR)	[2]PERMITTED EMISSION RATE: RATE (UNITS)	TONS PER YEAR (TONS/YR)
CARBON MONOXIDE (CO)	MAXIMUM:		56.532								56.54
	TYPICAL:										
LEAD	MAXIMUM:										
	TYPICAL:										
NITROGEN OXIDES (NOx)	MAXIMUM:										
	TYPICAL:										
PARTICULATE MATTER (PART)	MAXIMUM:										
	TYPICAL:										
PARTICULATE MATTER <= 10 MICROMETERS (PM10)	MAXIMUM:										
	TYPICAL:										
SULFUR DIOXIDE (SO2)	MAXIMUM:										
	TYPICAL:										
VOLATILE ORGANIC MATERIAL (VOM)	MAXIMUM:		3.702								3.71
	TYPICAL:										
OTHER, SPECIFY:	MAXIMUM:										
	TYPICAL:										
EXAMPLE: PARTICULATE MATTER	*MAXIMUM:*	*5.00*	*21.9*	*0.3 GR/DSCF*		*Y*	*6.0 (LBS/HR)*	*212.321*	*26.28*	*5.5 LBS/HR*	*22*
	TYPICAL:	*4.00*	*14.4*	*0.24 GR/DSCF*		*4*	*5.5 (LBS/HR)*	*212.321*	*19.80*		

IMPORTANT: ATTACH CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH EMISSIONS WERE DETERMINED AND LABEL AS EXHIBIT 240-5.

[1]CHECK UNCONTROLLED EMISSION RATE BOX IF CONTROL EQUIPMENT IS USED, OTHERWISE CHECK AND PROVIDE THE ACTUAL EMISSION RATE TO ATMOSPHERE, INCLUDING INDOORS. SEE INSTRUCTIONS.
[2]PROVIDE THE EMISSION RATE THAT WILL BE USED AS A PERMIT SPECIAL CONDITION. THIS LIMIT WILL BE USED TO DETERMINE THE PERMIT FEE.
[3]PLEASE PROVIDE ANY OTHER EMISSION RATE WHICH IS COMMONLY USED, REQUIRED BY A SPECIFIC LIMITATION OR THAT WAS MEASURED (E.G. PPM, GR/DSCF, ETC.)
[4]DM - DETERMINATION METHOD: 1) STACK TEST, 2) MATERIAL BALANCE, 3) STANDARD EMISSION FACTOR (AP-42 OR AIRS), 4) ENGINEERING ESTIMATE, 5) SPECIAL EMISSION FACTOR (NOT AP-42 OR AIRS)
[5]RATE - ALLOWABLE EMISSION RATE SPECIFIED BY MOST STRINGENT APPLICABLE RULE.

0006332

(40) HAZARDOUS AIR POLLUTANT EMISSION INFORMATION

HAP INFORMATION		☐ [1]ACTUAL EMISSION RATE ☐ [1]UNCONTROLLED EMISSION RATE				ALLOWABLE BY RULE	
NAME OF HAP EMITTED	[2]CAS NUMBER		POUNDS PER HOUR (LBS/HR)	TONS PER YEAR (TONS/YR)	[3]OTHER TERMS	[4]DM	[5]RATE OR STANDARD	APPLICABLE RULE
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
EXAMPLE:		MAXIMUM:	*10.0*	*1.2*		*2*	*98% by wt control device*	*CFR 61.302(b),(d)*
Benzene	*71432*	TYPICAL:	*8.0*	*0.8*		*2*	*leak-tight trucks*	

IMPORTANT: ATTACH CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH EMISSIONS WERE DETERMINED AND LABEL AS EXHIBIT 240-6.

[1]PROVIDE UNCONTROLLED EMISSIONS IF CONTROL EQUIPMENT IS USED. OTHERWISE, PROVIDE ACTUAL EMISSIONS TO THE ATMOSPHERE, INCLUDING INDOORS. CHECK BOX TO SPECIFY.
[2]CAS - CHEMICAL ABSTRACT SERVICE NUMBER.
[3]PLEASE PROVIDE ANY OTHER EMISSION RATE WHICH IS COMMONLY USED, REQUIRED BY A SPECIFIC LIMITATION OR THAT WAS MEASURED (E.G., PPM, GR/DSCF, ETC.).
[4]DM - DETERMINATION METHOD: 1) STACK TEST, 2) MATERIAL BALANCE, 3) STANDARD EMISSION FACTOR (AP-42 OR AIRS, 4) ENGINEERING ESTIMATE, 5) SPECIAL EMISSION FACTOR (NOT AP-42 OR AIRS).
[5]RATE - ALLOWABLE EMISSION RATE OR STANDARD SPECIFIED BY MOST STRINGENT APPLICABLE RULE.

R006333

EXHAUST POINT INFORMATION

THIS SECTION SHOULD NOT BE COMPLETED IF EMISSIONS ARE EXHAUSTED THROUGH AIR POLLUTION CONTROL EQUIPMENT.

41) FLOW DIAGRAM DESIGNATION OF EXHAUST POINT:

42) DESCRIPTION OF EXHAUST POINT (STACK, VENT, ROOF MONITOR, INDOORS, ETC.). IF THE EXHAUST POINT DISCHARGES INDOORS, DO NOT COMPLETE THE REMAINING ITEMS.

43) DISTANCE TO NEAREST PLANT BOUNDARY FROM EXHAUST POINT DISCHARGE (FT):

44) DISCHARGE HEIGHT ABOVE GRADE (FT):

45) GOOD ENGINEERING PRACTICE (GEP) HEIGHT, IF KNOWN (FT):

46) DIAMETER OF EXHAUST POINT (FT): NOTE: FOR A NON CIRCULAR EXHAUST POINT, THE DIAMETER IS 1.128 TIMES THE SQUARE ROOT OF THE AREA.

47) EXIT GAS FLOW RATE	a) MAXIMUM (ACFM):	b) TYPICAL (ACFM):
48) EXIT GAS TEMPERATURE	a) MAXIMUM (°F):	b) TYPICAL (°F):

49) DIRECTION OF EXHAUST (VERTICAL, LATERAL, DOWNWARD):

50) LIST ALL EMISSION UNITS AND CONTROL DEVICES SERVED BY THIS EXHAUST POINT:

	NAME	FLOW DIAGRAM DESIGNATION
a)		
b)		
c)		
d)		
e)		

THE FOLLOWING INFORMATION NEED ONLY BE SUPPLIED IF READILY AVAILABLE.

51a) LATITUDE:	b) LONGITUDE:	
52) UTM ZONE:	b) UTM VERTICAL (KM):	c) UTM HORIZONTAL (KM):

FINAL DRAFT/PROPOSED CAAPP PERMIT
U. S. Steel Corporation - Granite City
I.D. No.: 119813AAI
Application No.: 96030056
October 7, 2003

217/782-2113

REVISED
OPERATING PERMIT

PERMITTEE

U.S. Steel Granite City
Attn: Larry Siebenberger
Route 203 and 20th Street
Granite City, Illinois 62040

Application No.: 95010001 I.D. No.: 119813AAI
Applicant's Designation: Date Received: April 29, 2002
Subject: Production Increase, Renewal
Date Issued: June 25, 2002 Expiration Date: June 25, 2007
Location: Southeastern Granite City

Permit is hereby granted to the above-designated Permittee for an increase in the allowable production rate of iron (from 2,372,500 to 3,165,000 net tons per year) and steel (from 2,774,000 to 3,580,000 net tons per year) as described in the above-referenced application. This permit is subject to standard conditions attached hereto and the following special conditions:

1. Prior to issuance of this permit, a draft of this permit has undergone a public notice and comment period, and a public hearing was held.

BLAST FURNACE OPERATIONS

2a. Total combined production of hot metal (a.k.a., iron) from blast furnaces A and B shall not exceed 9,849 net tons per day, averaged over any calendar month, and;

b. Total combined production of hot metal from blast furnaces A and B shall not exceed 3,165,000 net tons per year.

3a. Particulate emissions from the blast furnace casthouse baghouse and iron spout baghouse shall not exceed 0.010 gr/dscf, pursuant to 35 Ill. Adm. Code 212.445(b)(1).

b. The opacity of emissions from the blast furnace casthouse baghouse and the iron spout baghouse shall not exceed 10% on a 6 minute rolling average basis, pursuant to 35 Ill. Adm. Code 212.445(b)(1).

4a. Emissions of particulate matter from any opening in the blast furnace casthouse shall not exceed 20% opacity on a 6-minute rolling average basis beginning from initiation of the opening of the tap hole up to the point where iron and slag stops flowing in the troughs, pursuant to 35 Ill. Adm. Code 212.445(a)(2).

5. Emissions from Blast Furnace operations shall not exceed the limits in attached Tables 1 and 5.

BASIC OXYGEN FURNACE SHOP

6a. Total combined production of liquid steel from the Basic Oxygen Furnaces (BOFs) shall not exceed 11,000 net tons per day, averaged over any calendar month, and;

b. Total combined production of liquid steel from the BOFs shall not exceed 3,580,000 net tons per year.

7. The emissions of PM-10 from the BOF ESP stack for the total of all BOF processes (i.e., operations from the beginning of the charging process through the end of the tapping process) shall not exceed 60.0 lbs/hr and 0.225 lbs per ton of steel in process, pursuant to 35 Ill. Adm. Code 212.458(b)(23).

8. Visible emissions from any opening in the BOF shop (e.g., roof monitor) shall not exceed 20% on a 3 minute rolling average basis.

9a. The Permittee shall determine the opacity from the openings BOF shop on at least a weekly basis. Observations shall be conducted for at least an hour or the entire BOF cycle, whichever is greater.

b. The Permittee shall determine the opacity from the BOF ESP stack for at least one hour on any normal work day (i.e., Monday through Friday) that the continuous opacity monitor on the BOF ESP stack has an outage that exceeds two consecutive hours and is still down. The readings shall commence as soon as possible after the opacity monitor has been down for two consecutive hours. If meteorological conditions or lack of visibility preclude these observations from being conducted, then this shall be noted in the log book.

c. The opacity shall be determined in accordance with the observation procedures set out in 40 CFR Part 60, Appendix

A, Method 9 including the requirement that readings be taken by a certified observer.

d. These determinations shall be recorded in a log book, which at a minimum shall include the date and time of observations, name and title of observer, individual opacity readings, calculated opacity so as to determine compliance with Section 212.123, and calculated opacity relative to 20% opacity on a three minute rolling average basis.

10. The Permittee shall follow the BOF operating procedures and requirements specified in attachment A. These requirements are designed to ensure proper operation of the BOF control system. These procedures shall be posted in the BOF pulpit (a.k.a., control room).

11. Flame suppression shall be used and maintained during the entire tapping process.

12a. The stack gas pulpit set point of the BOF ESP control system shall be set in accordance with the following, so as to establish sufficient particulate matter capture efficiency of the charging and primary hoods:

i. Set point requirements while only a single BOF vessel is in operation;

A. Minimum set point during charging process: 550,000 cfm;

B. Minimum set point during refining process: 650,000 cfm;

C. Minimum set point during tapping process: 200,000 cfm (until one minute after completing alloy addition);

b. i. During dual operation of BOF vessels (a.k.a., overlapping BOF operation) the minimum set point shall be 700,000 cfm.

iii. Overlapping operations of the BOF vessels is allowed under the following conditions:

A. The hot metal charge of the second vessel shall be initiated and completed during the time between completion of the blow and start of tap on the first vessel while sufficient

draft at the ESP capture system is established and maintained for both vessels.

B. The charge and/or blow on one vessel shall not begin until sufficient draft has been established at the associated ESP capture system (a.k.a., doghouse) and the alloy addition at the vessel tapping has been completed for a least 1 minute.

C. Sufficient draft at the ESP capture system of the vessel being tapped shall be maintained for at least 1 minute after alloy addition has been completed. After such period, the capture system draft may be transferred over to the other vessel in order to satisfy condition (A) above.

D. Only overlapping of the hot metal charge of the second vessel after the end of blow and prior to onset of tap of the first vessel and overlapping of tapping of the first vessel, after alloy addition, and the hot metal charge and/or blow on the second vessel are allowed.

E. Condition B and C above shall be part of the Standard Operating Procedure (SOP) of the BOF vessels.

c. The BOF capture system shall be operated at the above minimum set points until and unless the Agency approves a lower minimum set point based on a demonstration that a better level of particulate matter control will occur, except for purposes of emissions testing as related to the set point.

d. The Permittee shall calibrate, operate, and maintain a continuous strip chart recorder of the ESP stack gas flow rate as measured by the stack gas flow meter during ESP use.

e. The Permittee shall record for each steel production cycle the various stack gas flow rates for each process (i.e., for each charge, each refine, each tap) of each steel production cycle. That is, the Permittee shall be able to distinguish the measured flow rate of stack gas during each production cycle.

f. The stack gas flow meter shall be calibrated on at least a quarterly basis.

13a. The Permittee shall operate and maintain the waste gas suction monitor system that continually measures and records for each process (i.e., for each charge, each refine, each tap) of each steel production cycle the static pressure in the main downcommer duct of the ESP emissions capture and transport system.

b. The waste gas suction monitoring system shall be used as a mechanism to ensure sufficient draft is maintained in the emissions capture hoods and transport ducts so as to maximize emissions capture and transport and minimize uncaptured emissions and emission leaks.

c. The monitoring system shall be operated and maintained to ensure accurate and useful data.

d. The Permittee shall continuously record the static pressure in the main downcommer duct of the ESP emissions capture and transport system.

14a. The Permittee shall visually inspect at least monthly all visible BOF vessel enclosures, hooding and ducts used to capture and transport emissions for the BOF ESP control system.

b. A log shall maintained of these inspections which includes observations of the physical appearance of the capture system and any noted deficiencies (e.g., the presence of any holes in ductwork or hoods, flow constrictions caused by dents or accumulated dust in ductwork, and fan erosion).

c. Any leaks or areas otherwise noted to be in need of repair, shall be repaired as soon as practicable.

15a. The Permittee shall operate, maintain, and repair the BOF ESP in a manner that assures compliance with the conditions of this permit.

b. An adequate inventory of spare parts for the BOF ESP shall be maintained.

16. Written operating procedures for the BOF ESP shall be maintained and updated describing proper normal process and equipment operating parameters, monitoring and instrumentation for measuring control equipment operating

parameters, control equipment inspection and maintenance practices, and the availability of spare parts from inventory, local suppliers and other sources.

17. The Permittee shall keep operating records, a maintenance log, and inspection log for the BOF ESP and associated control systems which includes the following:

a. Operating time of the BOF;

b. Operating time of the capture systems and performance parameters, including air flow and fan amperage through the fan motors, gas temperature at inlet to ESP, damper settings, and steam injection rate;

c. Operating time of the ESP and performance parameters, including voltage and amperage of each transformer/rectifier set, number of sections in use;

d. All routine and nonroutine maintenance performed, including dates and duration of outages, inspection schedule and findings, leaks detected, repair actions, and replacements.

18. Emissions from the BOF Shop shall not exceed the limits in attached Tables 2 and 5.

Note: For purposes of this permit, a BOF cycle is defined as the period from the beginning of the charging process through the end of the tapping process. The cycle is comprised of three main processes which are charging, refining, and tapping.

CONTINUOUS CASTING OPERATIONS

19. The continuous casting operations shall comply with 35 Ill. Adm. Code 212.450 and 212.458(b)(8).

20. Emissions from the continuous casting operations shall not exceed the limits in Tables 3 and 5.

FUEL COMBUSTION

21. Total fuel usage for blast furnace stoves (A and B), boiler house boilers (1-10), blast furnace boilers (11 and 12), ladle drying preheaters and blast furnace gas flares shall not exceed the following limits:

a. Natural Gas usage: 225 million ft^3 per month and 1,346 million ft^3 per year;

b. Blast Furnace Gas (BFG) usage: 30,800 million ft^3 per month and 185,030 million ft^3 per year;

c. Fuel Oil usage: 60 thousand gallons per month and 365 thousand gallons per year.

22. Emissions from the fuel combustion units listed above shall not exceed the limits in Tables 4 and 5.

ON-SITE FUGITIVE DUST CONTROL

(Refer to Attachment B for a table which summarizes the required on-site fugitive dust roadway control measures and maps indicating the referred to road segments)

23. The Permittee shall immediately initiate and maintain the on-site fugitive dust control measures specified in this permit so as eliminate dust spillage on in-plant and out-of-plant roadways.

24a. The Permittee shall sweep or flush at least every day the paved access area below the BOF ESP where ESP dust collection bags are used, stored and transported.

b. The Permittee shall implement a housekeeping program for the non-roadway areas below and around the BOF ESP. This program shall, at a minimum, contain the following:

i. The ground and other accessible areas where dust may gather shall be swept or cleaned at least every day;

ii. Cleaning shall be performed in such a manner as to minimize the escape of dust into the atmosphere;

iii. Dust collection bags shall be inspected at least daily for rips, tears, or insecure connection to the discharge chutes of the ESP hoppers;

iv. Dust collection bags shall be inspected after removal from, and connection to, the discharge chutes of the ESP hoppers;

v. Ripped or torn bags shall be taken out of service and transported as soon as practicable in a covered truck.

25. Fugitive emissions of particulate matter from any roadway or parking area shall not exceed an opacity of 5%, pursuant to 35 Ill. Adm. code 212.316(e)(1).

26a. UNPAVED ROADS: On unpaved roads that are part of normal traffic patterns as identified in attachment B (including roads B, C, E, N, F-F, and CS(2)) the Permittee shall apply a chemical dust suppressant at least three times a month, with the following exceptions:

i. Road segment G-G, which shall be sprayed at least quarterly;

ii. Road segments P, V, Z, D-D, E-E, and H, which shall be sprayed at least 4 times per month until paving is completed. Paving shall be completed on these roads no later than July 31, 1996;

iii. Road segment L, which shall be sprayed at least 4 times per month.

b. All other unpaved roads shall be treated as necessary.

c. Applications of suppressant may be less frequent than specified above if weather conditions, i.e., precipitation or temperature, interfere with the schedule for spraying, provided each such instance shall be recorded in accordance with the daily records for on-site fugitive dust control required by this permit.

27a. PAVED ROADWAYS AND AREAS: Paved roadways and areas shall be maintained in good condition.

b. On paved roadways and other areas, the Permittee shall sweep or flush as follows:

i. Road segments D, K, M, F, G, J, R, and O shall be swept or flushed at least daily;

ii. Road segments P, V, W, X, Z, D-D, E-E, and CS(1) shall be swept or flushed at least five days per week;

iii. Road segments S and T shall be swept or flushed at least every other day;

iv. Road segments A and H shall be swept or flushed at least once per month;

v. All gate areas leading from the Steelworks area shall be swept or flushed at least daily;

vi. All gate areas leading from the iron making area shall be swept or flushed at least five times per week.

28. The above on-site dust control measures shall be conducted to maximize their effectiveness by performing said measures when the roads or areas are not normally obstructed by parked vehicles and by preferentially using filter sweeping (e.g., Enviro-Whirl sweeper) for the gate areas, the roads and areas surrounding the BOF and BOF ESP, and other key areas.

29. The Permittee shall maintain daily records relative to the on-site fugitive dust control program which includes the following information as a minimum:

a. The date (and time for the gate areas) each road or area was treated;

b. The manner in which the road or area was treated (i.e., filter sweep, conventional sweep, suppressant spray or flush);

c. Detailed information for use of dust suppressant, including but not limited to the application rate, dilution ratio, type of suppressant used, and the number of gallons of suppressant applied;

d. Observations, if any, concerning the condition of the roadway, e.g., presence of parked vehicles, detection of potholes;

e. The amount of precipitation and temperature recorded for each day, and if determination was made to suspend application of suppressant, include name and title of person who made determination to suspend application and explanation;

f. Any and all suspensions or deviations from the designated control procedures, with date, description, and explanation for suspension of application.

OFF-SITE FUGITIVE DUST CONTROL

30. The Permittee or the Permittee's Agent shall sweep or flush the following Granite City street road areas:

a. At least weekly, the quarter mile segment of Madison Avenue in front of the 16th street gate (i.e., 1/8 of a mile in either direction);

b. At least weekly, segment of 20th street between Lee and Quincy roads;

c. At least monthly, segment of 20th street between Madison and Route 203 (a.k.a. Edwardsville Road).

PM-10 CONTINGENCY MEASURES

31. The Permittee shall comply with the additional control measures (e.g., PM-10 contingency plan) required by 35 Ill Adm. Code Part 212 Subpart U.

COMPLIANCE DETERMINATIONS

32a. Compliance with the daily limits of this permit shall be determined from a monthly total of the relevant daily data divided by the number of days in the month.

b. Compliance with the monthly limits of this permit (e.g., fuel usage) shall be determined by direct comparison of monthly data to the applicable limit.

c. i. Compliance with the annual limits of this permit shall be determined based on a calendar year.

ii. A. Compliance with the production limits in conditions 2(b) and 6(b) shall also be determined on a month by month basis by showing that the actual production of iron and steel from the plant did not exceed the scheduled rate of production for a month given in the most recent production schedule provided to the Agency that shows compliance with the following requirements.

B. If no production schedule is submitted to the Agency by the Permittee for a particular year, the scheduled monthly production of iron and steel shall be set at one twelfth of the

annual production limits in conditions 2(b) and 6(b).

C. 1. The Permittee may submit a schedule for iron and steel production for each month of the calendar year. Such schedule shall provide the scheduled monthly iron and steel production for each month and the total of such scheduled production shall not exceed the annual production limits in conditions 2(b) and 6(b). This schedule shall be submitted each year no later than December 15th of the preceding year.

2. During the course of the year, the Permittee may submit a revised production schedule which accounts for actual production levels which were below that scheduled for the previous months, provided that in no case shall the scheduled production for prior months in such a revised schedule be lowered to less than actual production levels or raised. Such revised schedule shall be submitted to the Agency no later than 15 days after the first day of the month for which scheduled production has been raised. Such schedule shall be accompanied by data on actual production in preceding months.

33a. Compliance with opacity limits and measurements of opacity shall be made by opacity readings taken in accordance with the observation procedures set out in 40 CFR Part 60, Appendix A, Method 9.

b. The Permittee shall have at least two employees or agents experienced in making opacity readings to the extent that it is reasonably possible to do so, who shall be able to make the opacity readings required by this permit.

34a. Blast furnace hot metal production shall be measured at the BOF hot metal transfer station, and adjusted by documented slag and iron losses.

b. BOF liquid steel production shall be initially measured by a scale equipped crane and adjusted based upon documented steel production analysis of the continuous casters.

c. BFG usage shall be calculated based on the total BFG produced per net ton hot metal (NTHM) derived by the following formula and adjusted per analysis of documented BFG consumptions:

$$\text{mmft}^3 \text{ BFG per month} = \frac{(4.585277 \text{ NTHM/day} + 498.191)}{80} \times \begin{pmatrix} \text{Number of} \\ \text{days in} \\ \text{that month} \end{pmatrix}$$

d. Natural gas usage shall be determined by metered volumes.

e. Fuel oil usage shall be determined by tank height differentials.

RECORD KEEPING

35. The Permittee shall keep records of the following items and such other items which may be appropriate to allow the Agency to review compliance:

a. Blast Furnace hot metal production (total combined daily, monthly and annual in tons), including documentation on iron and slag losses;

b. BOF liquid steel production (total combined daily, monthly and annual in tons), including documentation on adjustments made due to production analysis and losses;

c. Fuel usage as follows; Usage of natural gas and BFG (total combined million ft^3 per month and year, each) and fuel oil (total combined gallons/month and year) for the blast furnace stoves (A and B), boiler house boilers (1-10), blast furnace boilers (11 and 12), ladle drying preheaters and blast furnace gas flares.

36. All records and logs required by this permit shall be retained at a readily accessible location at the source for at least three years from the date of entry and shall be made available for inspection and copying by the Agency and USEPA upon request. Any records retained in a computer shall be capable of being retrieved and printed on paper during normal source office hours so as to be able to respond to an Agency request for records during the course of a source inspection.

TESTING

37. The special conditions of this permit supplement the special conditions of any existing operating permits for this source, and supersede such conditions in cases where a conflict exists.

38a. The following tests shall be performed by no later than August 6, 1997 to demonstrate compliance with the conditions of this permit.

i. Fuel Combustion Units testing: The emissions of particulate matter from boiler #12 while burning blast furnace gas shall be measured. This test shall be designed to verify compliance with the requirements of this permit and the emission factor used (i.e., 2.9 lbs particulate emitted per mmcf BFG burned);

b. The test shall be performed by an approved independent testing service during conditions which are representative of maximum emissions and at the maximum production rates allowed, or as close to such rates as reasonable if the Permittee demonstrates to the Agency prior to testing that testing at such production rates within the time constraints of an Agency request to test is not practicable.

c. i. The following methods and procedures shall be used for the testing, unless another method is approved by the Agency: Refer to 40 CFR 60, Appendix A for USEPA test methods;

Location of sample points	USEPA Method 1
Gas flow and velocity	USEPA Method 2
Particulate Matter	USEPA Method 5

ii. All particulate measured shall be considered PM-10 unless emissions are tested by an appropriate USEPA test method for measurement of PM-10, as specified in 35 Ill. Adm. Code 212.110(e).

d. At least 30 days prior to the actual date of testing, a written test plan shall be submitted to the Agency for review and approval. This plan shall be describe the specific procedures for testing, including as a minimum:

i. The persons who will be performing sampling and analysis and their experience with similar tests;

ii. The specific conditions under which testing will be performed including a discussion of why these conditions will be representative of maximum emissions and the means by which operating parameters for the source and the emissions capture and control system will be determined;

iii. The specific determinations of emissions and operation which are intended to be made, including sampling and monitoring locations;

iv. The test methods which will be used, with the specific analysis methods;

v. Any proposed use of an alternative test method, with detailed justification;

vii. The format and content of the Source Test Report.

e. The Agency shall be notified before these tests to enable the Agency to observe these tests. Notification for the expected date of testing shall be submitted a minimum of thirty (30) days prior to the expected date. Notification of the actual and expected time of testing shall be submitted a minimum of five (5) working days prior to the actual date of the test. The Agency may at its discretion accept notifications with shorter advance notice provided that the Agency will not accept such notifications if it interferes with the Agency's ability to observe testing.

f. The Final Report of these tests shall include as a minimum:

i. A tabular summary of results which includes:

- Process weight rate and/or fuel usage rate
- Production rate
- Allowable emission limit
- Measured emission rate
- Determined emission factor
- Compliance demonstrated - Yes/No
- Any other pertinent information

ii. Description of test methods and procedures used, including description of sampling train, analysis equipment, and test schedule;

iii. Detailed description of test conditions, including,

- Pertinent process information (e.g. fuel or raw material consumption)

- Control equipment information, i.e. equipment condition and operating parameters during testing;

iv. Data and calculations, including copies of all raw data sheets and records of laboratory analyses, sample calculations, and data on equipment calibration;

g. Copies of the Final Report for these tests shall be submitted to the Agency within 14 days after the test results are compiled and finalized.

h. Submittals of information shall be made as follows:

i. Notice of Test - one copy to Source Emission Test Specialist, one copy to Regional Office, and one copy to Permit Section;

ii. Final Report - one copy to Source Emission Test Specialist, one copy to Regional Office, and one copy to Permit Section.

Pertinent Addresses are:

Illinois Environmental Protection Agency
Division of Air Pollution Control
9511 West Harrison
Des Plaines, Illinois 60016

Illinois Environmental Protection Agency
Division of Air Pollution Control
Regional Office
2009 Mall Street
Collinsville, Illinois 62234

Illinois Environmental Protection Agency
Division of Air Pollution Control
Attn: Permit Section
P.O. Box 19506

Springfield, Illinois 62794-9506

REPORTING

39. If there is an exceedance of the requirements of this permit as determined by the records required by this permit, the Permittee shall submit a report to the Agency's Compliance Unit in Springfield, Illinois within 30 days after the exceedance. The report shall include the emissions released in accordance with the record keeping requirements, a copy of the relevant records, and a description of the exceedance or violation, cause of the exceedance, and efforts to reduce emissions and future occurrences. This report shall be sent to:

Illinois EPA
Bureau of Air
Compliance Section (#40)
P.O. Box 19276
Springfield, Illinois 62794-9276

40. The Permittee shall submit the following additional information from the prior calendar year with the Annual Emissions Report, due May 1st of each year:

a. Iron and steel production (tons/month and tons/yr, each);

b. Natural gas and BFG usage ($mmft^3$/month and $mmft^3$/yr, each);

c. Fuel oil usage (thousand gallons/month and thousand gallons/yr, for each type of oil).

APPLICABILITY OF MAJOR SOURCE RULES

41a. As a consequence of the above conditions, this permit is issued based upon the following changes in emissions, as further described in Table 6, accompanying increased production as allowed by this permit:

i. The increases in emissions of lead and VOM are not significant under 35 Ill. Adm. Code Part 203 or 40 CFR 52.21 - Prevention of Significant Deterioration;

ii. The increase in emissions of NO_x are being accompanied by contemporaneous emission decreases provided by the shutdown of equipment and operations such that the net emissions change is not significant under 35 Ill.

Adm. Code Part 203 or 40 CFR 52.21 - Prevention of Significant Deterioration.

iii. The increase in emissions of PM and PM-10 are being accompanied by contemporaneous emission decreases provided by additional road dust control and BOF capture and control such that the net emissions change is not significant under 35 Ill. Adm. Code Part 203 or 40 CFR 52.21 - Prevention of Significant Deterioration.

Also, the Permittee has agreed to provide further additional dust control consisting of the sweeping of Granite City public streets and housekeeping measures in the area below and surrounding the BOF ESP. Attachment C is a listing of the emission reductions provided by these control measures.

b. The increases in emissions of SO_2 and CO are significant under 40 CFR 52.21 - Prevention of Significant Deterioration (PSD). Accordingly, the project is considered a major modification and must comply with the requirements of PSD. These requirements include a demonstration of best available control requirements for affected SO_2 and CO emission units, an analysis of air quality impacts, an analysis of the impacts of the project on visibility, vegetation's and soils, and the application and proposed permit must undergo a public participation. The Agency has determined that these additional requirements have been met.

c. The changes in emissions pertinent to this project are summarized as follows:

Units = tons/year

* Emission increases which could occur from the project:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
51.6	- 52.0	238.8	476.0	5,685	59.3	0.54

* Creditable contemporaneous actual emission decreases:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
58.0	58.0	226.5	0.38	23.31	32.8	0.0

* Other contemporaneous emission increases:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
20.7	20.3	26.0	0.25	11.8	1.6	0.0

* Net emission changes:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
+14.3	-89.2	+38.3	+475.9	+5,673	+28.1	+0.54

* Significant Levels:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
15	25	40	40	100	40	0.6

d. This revised operating permit issued January 5, 1999 is issued such that the net increase in emissions of PM, PM_{10}, SO_2, NO_x and VOM resulting from increased natural gas combustion are not significant under 35 Ill. Adm. Code Part 203 or 40 CFR 52.21 - Prevention of significant Deterioration. The accounting of the increases in emissions are shown in Tables 7, 8 and 9 of the attachments.

e. The changes in emissions pertinent to the revised operating permit issued January 5, 1999 are summarized as follows:

* Emission increase from increased natural gas combustion:

PM-10	PM	NO_x	SO_2	CO	VOM
3.43	3.43	205.94	0.40	26.92	1.88

* Natural gas combustion baseline emissions (average of 1996 and 1997 actuals):

PM-10	PM	NO_x	SO_2	CO	VOM
2.9	2.9	174.11	0.34	22.76	1.59

* Net emission changes:

PM-10	PM	NO_x	SO_2	CO	VOM

0.53	0.53	31.83	0.06	4.16	0.29

* Significant levels:

PM-10	PM	NO_x	SO_2	CO	VOM
15	25	40	40	100	40

Explanatory Note:

PM	=	Particulate matter = particulate;
PM-10	=	Particulate matter less than or equal to 10 micrometers in size;
SO_2	=	Sulfur dioxide;
NO_x	=	Nitrogen oxides;
VOM	=	Volatile organic material;
CO	=	Carbon monoxide;
mm	=	Million;
gr/dscf	=	Grains per dry standard cubic foot;
acfm	=	Actual cubic feet per minute;
mmcf	=	Million cubic feet;
Mgal	=	Thousands of gallons.

If you have any questions on this permit, please call Kevin Smith at 217/782-2113.

Donald E. Sutton, P.E.
Manager, Permit Section
Division of Air Pollution Control

DES:KLS:jar

cc: IEPA, FOS Region 3

FINAL DRAFT/PROPOSED CAAPP PERMIT
U. S. Steel Corporation - Granite City
I.D. No.: 119813AAI
Application No.: 96030056
October 7, 2003

TABLE 1

BLAST FURNACE OPERATIONS

Maximum Hot Metal Production = 3,165,000 net tons per year

1. Casthouse Baghouse (furnace tapping)- captured emissions ducted to baghouse, uncaptured emissions emitted through roof, other openings, etc.

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.0703	111.19
PM-10	0.0703	111.19
SO_2	0.2006	422.0
NO_x	0.0144	22.79
VOM	0.0946	149.68

2. Blast Furnace - Uncaptured fugitives

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.031	49.06
PM-10	0.0155	24.53
SO_2	0.0104	21.94
NO_x	0.0007	1.14
VOM	0.0047	7.42

3. Blast Furnace Charging
Maximum pellets charged = 4,308,581 tons/yr

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.0024	5.17
PM-10	0.0024	5.17

4. Slag Pits

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.00417	6.60
PM-10	0.00417	6.60
SO_2	0.0100	15.83

5. Iron Spout Baghouse- captured emissions controlled by iron spout baghouse.

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.02548	40.32
PM-10	0.02548	40.32
SO_2	0.0073	13.89

6. Iron Pellet Screen
Maximum pellets charged = 4,308,581 tons/yr

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.00279	6.01
PM-10	0.00279	6.01

2. TABLE 2

BOF SHOP

Maximum Liquid Steel Production = 3,580,000 net tons per year

1. BOF ESP Stack (charge, refine, tap)

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.16	262.80
PM-10	0.16	262.80
NO_x	0.0389	69.63
VOM	0.0060	10.74
CO	8.993	16,097.47
Lead	0.1934 lbs/hr	1.26 tons/yr

2. BOF Roof Monitor

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.0987	176.71
PM-10	0.06614	118.40
Lead	0.0129 lbs/hr	0.08 tons/yr

3. Desulfurization and Reladling - Hot Metal Transfer

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.03721	58.88
PM-10	0.03721	58.88
VOM	0.0010	1.58
Lead	0.0133 lbs/hr	0.09 tons/yr

4. BOF Additive System (i.e., fluxes) with Baghouse, a.k.a., BOF hopper baghouse

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.00032	0.57
PM-10	0.00032	0.57

5. Flux conveyor & transfer pits, bin floor

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.0016	2.86
PM-10	0.0016	2.86

6. Hot metal charging ladle slag skimmer

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.0050	7.94
PM-10	0.0050	7.94

3. TABLE 3

CONTINUOUS CASTING OPERATIONS

Maximum Liquid Steel Throughput = 3,580,000 net tons per year

1. Argon Stirring Station and Material Handling Tripper (Ladle Metallurgy)

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.00715	12.80
PM-10	0.00715	12.80

2. Deslagging Station and Material HS.

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.00355	6.35
PM-10	0.00355	6.35

3. Caster Molds - Casting

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.006	10.74
PM-10	0.006	10.74
NO_x	0.050	89.50

4. Casters Spray Chambers

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.00852	15.25
PM-10	0.00852	15.25

5. Slab Cut-off

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.0071	12.71
PM-10	0.0071	12.71

6. Slab Ripping

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.00722	12.92
PM-10	0.00722	12.92

TABLE 4

CERTAIN FUEL COMBUSTION UNITS

1. 10 boilers (#'s 1 - 10)

2. 2 boilers (#'s 11 - 12)

3. Blast Furnace Stoves A & B.

4. BFG Flares

5. Ladle Drying Preheaters (5 heaters).

Total combined fuel usage from affected units (i.e., Boilers, BF stoves, BF Flares, ladle drying preheaters)

	Maximum Usage ($mmft^3/Yr$)
NATURAL Gas (Total)	1,346
BFG	185,030
Fuel Oil	365 thousand gallons/yr

1. Natural Gas

Pollutant	Emission Factor (Lbs/mmcf)	Maximum Emissions (Tons/Yr)
PM	5.1	3.43
PM-10	5.1	3.43
SO_2	0.6	0.40
NO_x	306	205.94
VOM	2.8	1.88
CO	40	26.92

2. BFG

Pollutant	Emission Factor (Lbs/mmcf)	Maximum Emissions (Tons/Yr)
PM	2.9	268.29
PM-10	2.9	268.29
SO_2	6.65	615.22
NO_x	5.28	488.48
CO	13.7	1,267.46

3. Fuel Oil

Pollutant	Emission Factor (Lbs/Mgal)	Maximum Emissions (Tons/Yr)
PM	9.72	1.77
PM-10	9.72	1.77
SO_2	141.3	25.79
NO_x	55	10.04
VOM	0.28	0.05
CO	5.0	0.91
Lead	0.336	0.06 (waste oil)

4. TABLE 5

LIMITS ON EMISSIONS FROM MAJOR PROCESSES AND ACTIVITIES

Units = tons/year

	PM	PM-10	SO_2	NO_x	VOM	CO	Lead
Blast Furnace Operations	218	194	474	24	157	----	---
BOF Shop	510	451	---	70	12	16,097	1.43
Continuous Casting Operations	71	71	---	90	---	----	---
Certain Fuel Combustion Units[A]	274	274	641	706	2	1,295	0.06
Roadways	27	27	---	---	---	----	---
Material Handling	2	2	---	---	---	----	---
Total	1,102	1,019	1,115	890	171	17,392	1.49

[A] Blast furnace stoves (A and B), boiler house boilers (1-10), blast furnace boilers (11 and 12), ladle drying preheaters and blast furnace gas flares.

FINAL DRAFT/PROPOSED CAAPP PERMIT
U. S. Steel Corporation - Granite City
I.D. No.: 119813AAI
Application No.: 96030056
October 7, 2003

TABLE 6

EMISSIONS SUMMARY

Units = tons/year

* Emission increases which could occur from the project:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
51.6	-52.0	238.8	476.0	5,685	59.3	0.54

* Creditable contemporaneous actual emission decreases:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
58.0	58.0	226.5	0.38	23.31	32.8	0.0

* Other contemporaneous emission increases:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
20.7	20.3	26.0	0.25	11.8	1.6	0.0

* Net emission changes:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
+14.3	-89.2	+38.3	+475.9	+5,673	+28.1	+0.54

* Significant Levels:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
15	25	40	40	100	40	0.6

TABLE 7

Change in Emissions from Increased Natural Gas Combustion

Baseline Emissions (Average of 1996 and 1997 Actuals)

Pollutant	Emissions (Tons/Yr)
PM	2.9
PM-10	2.9
SO_2	0.34

NO_x	174.11
VOM	1.59
CO	22.76

Potential Emissions from Natural Gas Usage of 1,346 $mmft^3/Yr$

Pollutant	Emissions (Tons/Yr)
PM	3.43
PM-10	3.43
SO_2	0.40
NO_x	205.94
VOM	1.88
CO	26.92

Net Emission Change

Pollutant	Emissions (Ton/Yr)	Significant Emissions Level (Tons/Yr)
PM	0.53	25
PM-10	0.53	15
SO_2	0.06	40
NO_x	31.83	40
VOM	0.29	40
CO	4.16	100

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TABLE 8

1996 Actual Emissions from Natural Gas Usage of 1,131 $mmft^3/Yr$

Pollutant	Emissions (Tons/Yr)
PM	2.88
PM-10	2.88
SO_2	0.34
NO_x	173.04
VOM	1.58
CO	22.62

TABLE 9

1997 Emissions from an Allowable Natural Gas Usage of 1,145 $mmft^3/Yr$

Pollutant	Emissions (Tons/Yr)
PM	2.92
PM-10	2.92
SO_2	0.34
NO_x	175.19
VOM	1.60
CO	22.9

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ATTACHMENT A

PROCEDURES TO ENSURE PROPER OPERATION
OF BOF ESP CONTROL SYSTEM

1. The emissions control operator shall:

   a. Check on a regular basis and report to the emissions control foreman or melter:

      i. Any ESP fields down;

      ii. Any ESP fields in which the meter readings are showing no current or a fault;

   b. Check on a regular basis that doors on all hopper screws are closed;

   c. Inspect on a regular basis the fans and motors for unusual sounds and/or visual problems. Any abnormalities will be immediately reported to the melter or maintenance foreman for investigation.

2. The melter shall:

   a. Check on a regular basis and report to the emissions control foreman or the area electrician any fields which the pulpit precipitator field short indicators shows as having a short and is able to reset;

b. Check on a regular basis and report to the emissions control foreman or the maintenance foreman any draft or fan problems;

c. Check the ESP stack opacity monitor on a regular basis and initiate the following in the event that the stack opacity level, as determined by the opacity monitor, exceeds 30% opacity on a six minute average:

i. Check the pulpit indicators for proper operation of the steam and spray water system. Report any problems to emission control foreman or maintenance foreman;

ii. Check the stack gas pulpit set point for proper setting;

iii. Call the emissions control operator who shall perform the following steps;

A. Check the AVC operation and power level. Report any problems to electrical maintenance foreman or area electrician;

B. Check to ensure that doors on all hopper screws are closed;

d. Check oxygen blow rates and adjust, if necessary;

e. Check hot metal chemistry;

f. A log shall be maintained of the above checks and any actions taken as a result.

3. The emission control foreman shall:

a. Check on a regular basis the opacity monitor exceedances and trends. The control specialist shall be contacted to correct any problems;

b. Check on a regular basis the draft rate set points;

c. Check on a regular basis primary and secondary damper settings;

d. Check on a regular basis ESP operation, including the following:

i. Fields down;

ii. Fields indicating shorts and unable to reset;

iii. Hopper screw doors are closed;

e. Check on a regular basis blow rates;

f. Check on a regular basis spray water system operation;

g. Check on a regular basis steam injection rate;

h. Contact the area manager regarding electrical maintenance and to schedule the ESP repair work;

i. Contact the area manger for mechanical maintenance to schedule the isolation of the ESP channel by closing the inlet and outlet gates of that chamber and opening the top hatches for entry into the chamber;

j. Notify the emissions control operator and melter when isolation work begins;

k. A log shall be maintained of the above checks and any actions taken as a result.

4. The crane operator shall use the following procedures, as appropriate, to minimize emissions and maximize emissions capture by the hoods:

a. Use controlled pouring of the hot metal into the BOF vessel;

b. Use careful positioning of the hot metal ladle with respect to the hood face and furnace mouth;

c. Use the most beneficial furnace tilt angle;

d. These procedures shall be posted in the crane operator booth.

ATTACHMENT B

ON-SITE FUGITIVE DUST ROADWAY CONTROL MEASURES AND MAPS SHOWING THE ROAD SEGMENTS

This appendix details the emission rate calculations utilized for the ambient air quality modeling conducted. The emission rates modeled are based on the potential to emit of various sources at the facility. The modeled emission rates are based on the maximum potential of each source to emit SO_2 taking into consideration permit limitations and physical limitations of each source.

Table C-1 details the existing and permitted (but not constructed) emission units at the Facility that have potential SO_2 emissions. Table C-1 also details the SO_2 emission limits in the SO_2 FESOP (Permit No. 94120017) and the Production Increase Permit (Permit No. 95010001). SO_2 limits detailed in the SO_2 FESOP Permit are limitations on COG combustion from specific units or groups of units. SO_2 emissions from combusting other fuels are not limited under the SO_2 FESOP permit. The Production Increase Permit limits SO_2 emissions from process emission units and fugitive emission points. SO_2 emission limits shown in Table C-1 for proposed sources such as the BFG boiler and the COG desulfurization system are based on either proposed emission rates or permit limitations for these sources.

Because SO_2 limits in the SO_2 FESOP do not include emissions from BFG or NG, modeled emission rates were adjusted up from the COG SO_2 limit to account for the maximum BFG or NG SO_2 emissions possible when burning more than one fuel. For all other units and all other averaging periods, modeled SO_2 emission rates were based on the maximum SO_2 emissions for that averaging period. Calculations for the modeled SO_2 emission rate for each emission unit are detailed below.

SO_2 emission rates were calculated utilizing the SO_2 emission factors detailed in Table C-2 and the heat capacities for the individual fuels (560 MMBtu/MMscf for COG, 80 MMBtu/MMscf for BFG, and 1000 MMBtu/MMscf for NG).

Table C- 1: Facility SO_2 Emission Limits

Stack Number	Description	Throughput	Maximum Design Rate	Design Rate Units	SO_2 Emission Limits		
					3-hour (lb/3-hr)	24-hour (lbs./day)	Annual (tpy)
BF0007S	BF A Stove	COG/BFG/NG	399.00	MMBtu/hr		19,774	3,609
BF0012S	BF B Stove	COG/BFG/NG	457.00	MMBtu/hr			
BF0011S	BFG Flare	BFG	720.00	MMBtu/hr			
BF0111S	BFG Flare 2	BFG	720.00	MMBtu/hr			
UT0053S	Boiler 1 to 7	COG/BFG/NG	420.00	MMBtu/hr		20,285	3,702
UT0054S	Boilers 8 to 10	COG/BFG/NG	180.00	MMBtu/hr			
UT0059S	Boiler 11	COG/BFG/NG	225.00	MMBtu/hr		20,584	3,756
UT0064S	Boiler 12	COG/BFG/NG	225.00	MMBtu/hr			
BP0097S	COG flare	COG	661.80	MMBtu/hr			
CO0071S	Battery A Underfire	COG/NG	175.00	MMBtu/hr			
CO0092S	Battery B Underfire	COG/NG	175.00	MMBtu/hr			
FIN0016S	HS Slab Furnace 1	COG/NG	322.00	MMBtu/hr	2,299	9,754	987
FIN0020S	HS Slab Furnace 2	COG/NG	322.00	MMBtu/hr			
FIN0024S	HS Slab Furnace 3	COG/NG	322.00	MMBtu/hr			
FIN0028S	HS Slab Furnace 4	COG/NG	380.00	MMBtu/hr		11,873	1,204
BF0010S	Casthouse Baghouse	Iron	9,849	tons per day		3,430	422
BF0150S	Ironspout Baghouse	Iron	9,849	tons per day		170	13.89
BOF0149S	Ladle Dryers	COG/NG	100.00	MMBtu/hr	555	2,786	509
CC0084S	Slab Cutting 1	NG	0.30	MMBtu/hr			
CC0145S	Slab Cutting 2	NG	0.30	MMBtu/hr			
CO0069S	Battery A Pushing	coke	454,000	tons per year			
CO0090S	Battery B Pushing	coke	454,000	tons per year			
BF008S	BF A Fugitives	Iron	4,925	tons per day			21.94
BF0013S	BF B Fugitives	Iron	4,925	tons per day			
BF0126S	Slagpits	Iron	9,849	tons per day			15.83
CC0073P	Slab Ripping	NG	3.11	MMBtu/hr			
Desulf	COG Desulfurization Unit	COG	25	MMcf/day			

Limits in red are from the SO2 FESOP (Permit No. 941200017)
Limits in blue are from the Production Increase Permit (Permit No. 95010001)

Table C-2: SO_2 Emission Factors

Unit Type	Throughput	SO_2 Emission Factor	Emission Factor Units
Combustion	COG	1230.00	lbs/MMscf
Combustion	BFG	16.00	lbs/MMscf
Combustion	NG	0.60	lbs/MMscf
Combustion	Desulfurized COG	177.54	lbs/MMscf
Casthouse Baghouse	Iron	0.20	lbs/ton
Coke Oven Pushing	Coke	0.10	lbs/ton
Iron Spout Baghouse	Iron	0.01	lbs/ton
Blast Furnace Production	Iron	0.01	lbs/ton
Slabcut	NG	0.60	lbs/MMscf
Slab Ripping	NG	0.60	lbs/MMscf
Slag Pits	Iron	0.01	lbs/ton

BF0007S – Blast Furnace 'A' Stoves

The BF Stoves utilize BFG, COG, and NG as fuels and have 24 hour and annual SO_2 limits. Modeled emission rates for the 3-hour averaging period are based on the maximum SO_2 emission rate. Emission rates for the 24-hour period are based on the COG limit for both Blast Furnace stove stacks divided by 2 and the potential BFG contribution at max COG. The annual rate is based on the potential emissions from desulfurized COG as a result of the reduced allowable emissions under the COG desulfurization permit.

Maximum Design Rate = 399 MMBtu/hour

Max. SO_2 emission rate = 399 * 1230 (lbs. SO_2 / MMscf) / 560 (MMBtu / MMscf) = 876.38 lbs. / hr.

24-hr emission rate (lbs./hour) = Limit (lbs./day) / 24 (hours/day) / 2 (stoves)+ {399-[limit/24/2(lbs/hour)*560 (MMBtu/MMscf) / 1230 (lbs/MMscf)]} * 16 lbs./MMscf / 80 (MMBtu/MMscf) = 411.96 + 42.35 = 454.31 lbs./hr

Annual emission rate (lbs./hour) = 399 (MMBtu / hour) * 177.54 (lbs/MMscf) / 560 (MMBtu/MMscf) = 126.50 lbs./hr

BF0012S – Blast Furnace 'B' Stoves

The BF Stoves utilize BFG, COG, and NG as fuels and have 24 hour and annual SO_2 limits. Modeled emission rates for the 3-hour averaging period are based on the maximum SO_2 emission rate. Emission rates for the 24-hour period are based on the COG limit for both Blast Furnace

stove stacks divided by 2 and the potential BFG contribution at max COG. The annual rate is based on the potential emissions from desulfurized COG as a result of the reduced allowable emissions under the COG desulfurization permit.

Maximum Design Rate – 457 MMBtu/hour

Max. SO_2 emission rate = 457 * 1230 (lbs. SO_2 / MMscf) / 560 (MMBtu / MMscf) = 1003.77 lbs. / hr.

24-hr emission rate (lbs./hour) = Limit (lbs./day) / 24 (hours/day) / 2 (stoves)+ {457-[limit/24/2(lbs/hour)*560 (MMBtu/MMscf) / 1230 (lbs/MMscf)]} * 16 lbs./MMscf / 80 (MMBtu/MMscf) = 411.96 + 53.95 = 465.91 lbs./hr

Annual emission rate (lbs./hour) = 457 (MMBtu / hour) * 177.54 (lbs/MMscf) / 560 (MMBtu/MMscf) = 144.89 lbs./hr

BF0011S & BF0111S – Blast Furnace Gas Flares

The BFG Flares combust excess BFG that can not be burned in BFG combustion units. The flares do not have any SO_2 limits except emissions from the second flare are limited to burning BFG not combusted by the BFG boiler (Cogen1). Modeled emission rates for all averaging periods are based on the maximum SO_2 emission rates for both flares and do not take into account limits on the second flare for simplicity reasons.

Maximum Design Rate – 720 MMBtu/hour

Max. SO_2 emission rate = 720 * 16 (lbs. SO2 / MMscf) / 80 (MMBtu / MMscf) = 144.00 lbs. / hr.

UT0053S – Boilers 1 through 7

Boilers 1 through 7 utilize BFG, COG, and NG as fuels and have 24-hour and annual SO_2 limits. Modeled emission rates for the 3-hour averaging period are based on the maximum SO_2 emission rate. Emission rates for the 24-hour period are based on the COG limit for Boilers 1 through 7 and 8 through 10 combined prorated based on 7 out of 10 boilers exhausting through this stack and the potential BFG contribution at max COG. The annual rate is based on the potential emissions from desulfurized COG as a result of the reduced allowable emissions under the COG desulfurization permit.

Maximum Design Rate – 420 MMBtu/hour (7 boilers @ 60 MMBtu / hour each)

Max. SO_2 emission rate = 420 * 1230 (lbs. SO_2 / MMscf) / 560 (MMBtu / MMscf) = 922.50 lbs. / hr.

24-hr emission rate (lbs./hour) = Limit (lbs./day) / 24 (hours/day) / 10 (boilers)* 7 + {420-[limit/24*7/10 (lbs/hour)*560 (MMBtu/MMscf) / 1230 (lbs/MMscf)]} * 16 lbs./MMscf / 80 (MMBtu/MMscf) = 591.65+30.21 = 621.86 lbs./hr

Annual emission rate (lbs./hour) = 420 (MMBtu / hour) * 177.54 (lbs/MMscf) / 560 (MMBtu/MMscf) = 133.15 lbs./hr

UT0054S – Boilers 8 through 10

Boilers 8 through 10 utilize BFG, COG, and NG as fuels and have 24-hour and annual SO_2 limits. Modeled emission rates for the 3-hour averaging period are based on the maximum SO_2 emission rate. Emission rates for the 24-hour period are based on the COG limit for Boilers 1 through 7 and 8 through 10 combined prorated based on 3 out of 10 boilers exhausting through this stack and the potential BFG contribution at max COG. The annual rate is based on the potential emissions from desulfurized COG as a result of the reduced allowable emissions under the COG desulfurization permit.

Maximum Design Rate = 180 MMBtu/hour (3 boilers @ 60 MMBtu / hour each)

Max. SO_2 emission rate = 180 * 1230 (lbs. SO_2 / MMscf) / 560 (MMBtu / MMscf) = 396.00 lbs. / hr.

24-hr emission rate (lbs./hour) = Limit (lbs./day) / 24 (hours/day) / 10 (boilers)*3 + {180-[limit/24*3/10 (lbs/hour)*560 (MMBtu/MMscf) / 1230 (lbs/MMscf)]} * 16 lbs./MMscf / 80 (MMBtu/MMscf) = 253.56 + 12.95 = 266.51 lbs./hr

Annual emission rate (lbs./hour) = 180 (MMBtu / hour) * 177.54 (lbs/MMscf) / 560 (MMBtu/MMscf) = 57.07 lbs./hr

UT0059S & UT0064S – Boilers 11 & 12

Boilers 11 &12 utilize BFG, COG, and NG as fuels and have 24-hour and annual SO_2 limits. Modeled emission rates for the 3-hour averaging period are based on the maximum SO_2 emission rate. Emission rates for the 24-hour period are based on the COG limit for Boilers 11 & 12 combined divided by 2 and the potential BFG contribution at max COG. The annual rate is

based on the potential emissions from desulfurized COG as a result of the reduced allowable emissions under the COG desulfurization permit.

Maximum Design Rate = 225 MMBtu/hour

Max. SO_2 emission rate = 225 * 1230 (lbs. SO_2 / MMscf) / 560 (MMBtu / MMscf) = 494.20 lbs. / hr.

24-hr emission rate (lbs./hour) = Limit (lbs./day) / 24 (hours/day) / 2 boilers + {225 -[limit/24 (lbs/hour) / 2 (boilers) *560 (MMBtu/MMscf) / 1230 (lbs/MMscf)]} * 16 lbs./MMscf / 80 (MMBtu/MMscf) = 428.83 + 6.02 = 434.85 lbs./hr

Annual emission rate (lbs./hour) = 225 (MMBtu / hour) * 177.54 (lbs/MMscf) / 560 (MMBtu/MMscf) = 71.33 lbs./hr

NOTE: The second component of the 24-hr emission rate equation equals 5.95 as written, but appears as 6.02 due to rounding in the calculations.

BP0097S – COG Flare

Because more COG is accounted for in the modeling than can be combusted at any time at the GCW, no emissions are accounted for at the COG Flare.

CO0071S & CO0092S – Coke Oven Battery Underfire

Coke Oven Battery Underfire utilizes COG and a small amount of NG as fuels and has no SO_2 limits. Modeled emission rates for the short term (3-hour and 24-hour) averaging periods are based on the maximum SO_2 emission rate. Because the potential contribution of SO_2 from NG is less than 0.01 lbs./ hr for both batteries combined, emissions from NG are considered insignificant for this unit and excluded from the analysis. The annual rate is based on the potential emissions from desulfurized COG as a result of the reduced allowable emissions under the COG desulfurization permit.

Maximum Design Rate = 175 MMBtu/hour

Max. SO_2 emission rate = 175 * 1230 (lbs. SO_2 / MMscf) / 560 (MMBtu / MMscf) = 384.38 lbs. / hr.

Annual emission rate (lbs./hour) = 175 (MMBtu / hour) * 177.54 (lbs/MMscf) / 560 (MMBtu/MMscf) = 55.48 lbs./hr

FIN0016S, FIN0020S & FIN0024S – Hot Strip Slab Furnaces 1 through 3

Slab Furnaces 1 through 3 utilize COG and NG as fuels and have 3-hour, 24-hour and annual SO_2 limits. Modeled emission rates for the 3-hour, 24-hour and the annual averaging period are based on the COG limit for Hot Strip Slab Furnaces 1 through 3 combined divided by 3 and the potential NG contribution at max COG.

Maximum Design Rate – 322 MMBtu/hour

3-hr emission rate = Limit (lbs./3hrs) / 3 (hours/3hrs) / 3 furnaces + {322-[limit/3/3 (lbs/hour) * 560 (MMBtu/MMscf) / 1230 (lbs/MMscf)]} * 0.6 lbs./MMscf / 1000 (MMBtu/MMscf) = 255.44 + 0.12 = 255.56 lbs./hr

24-hr emission rate (lbs./hour) = Limit (lbs./day) / 24 (hours/day) / 3 furnaces + {322-[limit/24 (lbs/hour) / 3 * 560 (MMBtu/MMscf) / 1230 (lbs/MMscf)]} * 0.6 lbs./MMscf / 1000 (MMBtu/MMscf) = 135.47 + 0.16 = 135.63 lbs./hr

Annual emission rate (lbs./hour) = Limit (tpy) * 2000 (lbs./ton) / 8760 (hours/year) / 3 furnaces + {322-[limit*2000/8760 (lbs/hour) / 3 * 560 (MMBtu/MMscf) / 177.54 (lbs/MMscf)]} * 0.6 lbs./MMscf / 1000 (MMBtu/MMscf) = 75.11 + 0.05 = 75.16 lbs./hr

FIN0028S – Hot Strip Slab Furnace 4

Slab Furnace 4 utilizes COG and NG as fuels and has a 24-hour and an annual SO_2 limit. Modeled emission rates for the 3-hour and the 24-hour averaging period are based on the COG limit for Hot Strip Slab Furnace 4 and the potential NG contribution at the COG limit. The annual rate is based on the potential emissions from desulfurized COG as a result of the reduced allowable emissions under the COG desulfurization permit.

Maximum Design Rate – 380 MMBtu/hour

3-hr emission rate = 600 lbs./hour ***Note: This emission rate was set to ensure that the facility can comply with ambient air quality standards.***

24-hr emission rate (lbs./hour) = Limit (lbs./day) / 24 (hours/day) + {380-[limit/24 (lbs/hour) * 560 (MMBtu/MMscf) / 1230 (lbs/MMscf)]} * 0.6 lbs./MMscf / 1000 (MMBtu/MMscf) = 494.71 + 0.09 = 494.80 lbs./hr

Annual emission rate (lbs./hour) = 380 (MMBtu / hour) * 177.54 (lbs/MMscf) / 560 (MMBtu/MMscf) = 120.47 lbs./hr

BF0010S– Casthouse Baghouse

The Casthouse Baghouse controls emissions from Blast Furnace Casting operations on both 'A' and 'B' Blast Furnaces. The baghouse controls particulate emissions, however, because the casting operation emits SO_2, the baghouse emits SO_2 also. Modeled emission rates for all averaging periods are based on the annual Production Increase Permit emission rate limit for emissions from this unit. This limit was set based on the permitted maximum production rate for the blast furnaces and the emission factor in Table A-2.

SO_2 emission rate = 422 (tpy) * 2000 (lbs./ton) / 8760 (hrs/yr) = 96.35 lbs./hr.

BF0150S– Ironspout Baghouse

The Ironspout Baghouse controls emissions from Blast Furnace Casting operations on both 'A' and 'B' Blast Furnaces. The baghouse controls particulate emissions, however, because the casting operation emits SO_2, the baghouse emits SO_2 also. Modeled emission rates for all averaging periods are based on the annual Production Increase Permit emission rate limit for emissions from this unit. This limit was set based on the permitted maximum production rate for the blast furnaces and the emission factor in Table A-2.

SO_2 emission rate = 13.89 (tpy) * 2000 (lbs./ton) / 8760 (hrs/yr) = 3.17 lbs./hr.

BOF0149S– Ladle Drying Preheaters

The Ladle Drying Preheaters are combustion emission sources using COG and NG to heat iron ladles prior to use in the BOF. Emissions from the ladle dryers are based on the SO_2 limits in the SO_2 FESOP for the short term averaging periods. The annual rate is based on the potential emissions from desulfurized COG as a result of the reduced allowable emissions under the COG desulfurization permit.

Maximum Design Rate – 100 MMBtu/hour

3-hr emission rate (lbs./hour) = Limit (lbs./3-hr) / 3 (hours) + {100 -[limit/3 (lbs/hour) *560 (MMBtu/MMscf) / 1230 (lbs/MMscf)]} * 0.6 lbs./MMscf / 1000 (MMBtu/MMscf) = 185.00 + 0.01 = 185.01 lbs./hr

24-hr emission rate (lbs./hour) = Limit (lbs./day) / 24 (hours/day) + {100 -[limit/24 (lbs/hour) * 560 (MMBtu/MMscf) / 1230 (lbs/MMscf)]} * 0.6 lbs./MMscf / 1000 (MMBtu/MMscf) = 116.08 + 0.03 = 116.11 lbs./hr

Annual emission rate (lbs./hour) = 100 (MMBtu / hour) * 177.54 (lbs/MMscf) / 560 (MMBtu/MMscf) = 31.70 lbs./hr

CC0084S & CC0145S– Slab Cutting

The Slab Cutting emission units are combustion emission sources using NG to cut slabs after casting. Emissions from the slab cutters are insignificant based on the use of NG and the very low design rate of the units.

SO_2 emission rate = 0.3 (MMBtu/hr) * 0. 6 (lbs./MMscf) / 1000 (MMBtu/MMscf) = 0.00018 lbs./hr.

CO0069S & CO0090S – Coke Oven Battery Pushing Operations

Coke Oven Battery Pushing Operations consist of the pushing of hot coke from the battery into the quench car for travel to the quench tower. SO_2 emissions are released during the pushing operation as fugitives. Modeled emission rates for all averaging periods are based on the maximum coal processing rate and an older draft AP-42 emission factor for SO_2 from pushing shown in Table A-2. It should be noted that AP-42 no longer reports an SO_2 emission factor for pushing operations and the use of this factor should therefore be considered a conservative estimate.

Maximum Design Rate – 454,000 tons of coal per year per battery

Max. SO_2 emission rate = 454000 (tpy) / 8760 (hrs/yr) * 0.1 (lbs. SO2 / ton coal) (MMBtu / MMscf) = 5.18 lbs. / hr.

BF0008S & BF0013S – Blast Furnace Casting Fugitives

The Blast Furnace Casting Fugitives includes the uncontrolled casting emissions. Modeled emission rates for all averaging periods are based on the annual SO_2 limits for casting fugitives contained in the Production Increase Permit divided between the two Blast Furnaces.

Annual SO_2 limit from casting fugitives = 21.94 tpy

Max. SO_2 emission rate = 21.94 (tpy) * 2000 (lbs. / ton) / 8760 (hrs / yr) / 2 furnaces = 2.50 lbs. / hr.

BF0126S – Blast Furnace Slag Pit Fugitives

The Blast Furnace Slag Pit Fugitives includes the uncontrolled SO_2 emissions emanating from the Blast Furnace Slag Pit. Modeled emission rates for all averaging periods are based on the annual SO_2 limit for slag pit fugitives contained in the Production Increase Permit.

Annual SO_2 limit from slag pit fugitives = 15.83 tpy

Max. SO_2 emission rate = 15.83 (tpy) * 2000 (lbs. / ton) / 8760 (hrs / yr) = 3.61 lbs. / hr.

CC0085S– Slab Ripping

The Slab Ripping emission units are combustion emission sources using NG to rip slabs after casting. Emissions from the slab rippers are insignificant based on the use of NG and the very low design rate of the units.

SO_2 emission rate = 3.17 (MMBtu/hr) * 0.6 (lbs./MMscf) / 1000 (MMBtu/MMscf) = 0.0019 lbs./hr.

Desulf – COG Desulfurization System Stack

The COG desulfurization system stack emits SO_2 emissions during operation of the system at a maximum rate of 66.5 lbs./hr. However, because short term modeled emission rates assume undesulfurized COG, the system stack is not modeled in the short term averaging periods. The modeled emission rate for the annual averaging period assumes maximum continuous operation.

Scenario Modeling

Emissions calculations for the emission scenarios described in section 6.8.2 are outlined in detail below. A table of fuel inputs for each scenario is shown in Table 6-13 (a) – (d). Maximum design rates, emission factors and heat capacities are identical to those used above and shown in Tables C-1 and C-2. These emissions were only used for the 24-hour scenario modeling discussed in section 6.8.2. For emissions that remain the same in multiple scenarios, the calculations are referenced rather than repeated. Modeled emission rates for each scenario are shown in Tables C3-C6. Small variances in emission rates may exist between the calculations and the tables. This is strictly due to rounding differences in the model when converting between g/s and lb/hr.

SCENARIO 1

- Battery A and Battery B at full COG underfire
- Remaining COG to Blast Furnace Stoves "A" and "B" and Ladle Dryer

BF0007S – Blast Furnace "A" Stoves

Maximum Design Rate = 399 MMBtu/hr

COG throughput = 8.04 MMCF/day

BFG throughput = {399 (MMBtu/hr) – 8.04 (MMCF COG/day) / 24(hr/day)* 560 (MMBtu/MMCF)} * 24 (hr/day) / 80 (MMBtu/MMCF)

= 63.43 MMCF/day

COG emissions = 8.04 MMCF/day / 24 (hr/day) * 1230 (lb SO_2 / MMCF)

= 411.96 lb SO_2/hr

BFG emissions = 63.43 MMCF/day / 24 (hr/day) * 16 (lb SO_2 / MMCF)

= 42.29 lb SO_2/hr

SO_2 emission rate = 411.96 + 42.29 = 454.25 lb/hr

BF0012S – Blast Furnace "B" Stoves

Maximum Design Rate = 457 MMBtu/hr

COG throughput = 8.04 MMCF/day

BFG throughput = {457 MMBtu/hr – 8.04 (MMCF COG/day) / 24(hr/day)* 560 (MMBtu/MMCF)} * 24 (hr/day) / 80 (MMBtu/MMCF)

= 80.83 MMCF/day

COG emissions = 8.04 MMCF/day / 24 (hr/day) * 1230 (lb SO_2 / MMCF)

= 411.96 lb SO_2/hr

BFG emissions = 80.83 MMCF/day / 24 (hr/day) * 16 (lb SO_2 / MMCF)

= 53.89 lb SO_2/hr

SO_2 emission rate = 411.96 + 53.89 = 465.85 lb/hr

BF0011S & BF0111S – Blast Furnace Gas Flares

Maximum Design Rate = 720 MMBtu/hr

SO_2 emission rate = BFG emissions = 720 (MMBtu/hr) * 16 (lbs. SO_2 / MMscf) / 80 (MMBtu / MMscf) = 144.00 lb/hr

UT0053S – Boilers 1 -7

Maximum Design Rate = 420 MMBtu/hr

SO_2 emission rate = BFG emissions = 420 (MMBtu/hr) / 80 (MMBtu/MMCF) * 16 (lb SO_2/MMCF) = 84.00 lb/hr

UT0054S – Boilers 8 – 10

Maximum Design Rate = 180 MMBtu/hr

SO_2 emission rate = BFG emissions = 180 (MMBtu/hr) / 80 (MMBtu/MMCF) * 16 (lb SO_2/MMCF) = 36.00 lb/hr

UT0059S & UT0064S – Boilers 11 & 12

Maximum Design Rate = 225 MMBtu/hr (each)

SO_2 emission rate = BFG emissions = 225 (MMBtu/hr) / 80 (MMBtu/MMCF) * 16 (lb SO_2/MMCF) = 45.00 lb/hr (each)

BP0097S – COG Flare

No emissions modeled

CO0071S & CO0092S – Coke Oven Battery Underfire

Maximum Design Rate = 175 MMBtu/hr (each)

SO_2 emission rate = COG emissions = 175 (MMBtu/hr) / 560 (MMBtu/MMCF) * 1230 (lb SO_2 / MMCF) = 384.38 lb/hr (each)

FIN0016S, FIN0020S, FIN0024S – Hot Strip Slab Furnaces 1-3

Maximum Design Rate = 322 MMBtu/hr (each)

SO_2 emission rate = NG emissions = 322 (MMBtu/hr) / 1000 (MMBtu/MMCF) * 0.6 (lb SO_2/MMCF) = 0.19 lb/hr (each)

FIN0028S – Hot Strip Slab Furnace 4

Maximum Design Rate = 380 MMBtu/hr

SO_2 emission rate = NG emissions = 380 (MMBtu/hr) / 1000 (MMBtu/MMCF) * 0.6 (lb SO_2/MMCF) = 0.23 lb/hr

BOF0149S – Ladle Drying Preheaters

Maximum Design Rate = 100 MMBtu/hr

COG throughput = 2.27 MMCF/day

NG throughput = {100 (MMBtu/hr) – 2.27 (MMCF COG/day) / 24 (hr/day) * 560 (MMBtu/MMCF)} * 24 (hr/day) / 1000 (MMBtu/MMCF)

=1.13 MMCF/day

COG emissions = 2.27 (MMCF/day) / 24 (hr/day) * 1230 (lb SO_2 / MMCF)

= 116.08 lb/hr

NG emissions = 1.13 MMCF/day / 24 (hr/day) * 0.6 (lb SO_2 / MMCF)

= 0.03 lb/hr

SO_2 emission rate = 116.08 + 0.03 = 116.11 lb/hr

CC0084S & CC0145S – Slab Cutting

Maximum Design Rate = 0.3 MMBtu/hr

SO_2 emission rate = 0.3 (MMBtu/hr) / 1000 (MMBtu/MMCF) * 0.6 (lb SO_2/MMCF) = 1.8x10(-4) lb/hr

SCENARIO 2

- Battery A and Battery B at maximum COG underfire
- Remaining COG to boilers 1 -10

BF0007S – Blast Furnace "A" Stoves

Maximum Design Rate = 399 MMBtu/hr

SO_2 emission rate = BFG emissions = 399 (MMBtu/hr) / 80 (MMBtu/MMCF) * 16 (lb SO_2/MMCF) = 79.8 lb/hr

BF0012S – Blast Furnace "B" Stoves

Maximum Design Rate = 457 MMBtu/hr

SO_2 emission rate = BFG emissions = 457 (MMBtu/hr) / 80 (MMBtu/MMCF) * 16 (lb SO_2/MMCF) = 91.4 lb/hr

BF0011S & BF0111S – Blast Furnace Gas Flares

Same as Scenario 1

UT0053S – Boilers 1 -7

Maximum Design Rate = 420 MMBtu/hr

COG throughput = 11.54 MMCF/day

BFG throughput = {420 (MMBtu/hr) – 11.54 (MMCF COG/day) / 24 (hr/day) * 560 (MMBtu/MMCF)} * 24 (hr/day) / 80 (MMBtu/MMCF)

= 45.19 MMCF/day

COG emissions = 11.54 MMCF/day / 24 (hr/day) * 1230 (lb SO_2/MMCF)

= 591.65 lb/hr

BFG emissions = 45.19 MMCF/day / 24 (hr/day) * 16 (lb SO_2/MMCF)

= 30.13 lb/hr

SO_2 emission rate = 591.65 + 30.13 = 621.78 lb/hr

UT0054S – Boilers 8 – 10

Maximum Design Rate = 180 MMBtu/hr

COG throughput = 4.95 MMCF/day

BFG throughput = {180 (MMBtu/hr) – 4.95 (MMCF COG/day) / 24 (hr/day) * 560 (MMBtu/MMCF)} * 24 (hr/day) / 80 (MMBtu/MMCF)

= 19.37 MMCF/day

COG emissions = 4.95 (MMCF/day) / 24 (hr/day) * 1230 (lb SO_2/MMCF)

= 253.56 lb/hr

BFG emissions = 19.37 (MMCF/day) / 24 (hr/day) * 16 (lb SO_2/MMCF)

= 12.91 lb/hr

SO_2 emission rate = 253.56 + 12.91 = 266.47 lb/hr

UT0059S & UT0064S – Boilers 11 & 12

Same as Scenario 1

CO0071S & CO0092S – Coke Oven Battery Underfire

Same as Scenario 1

FIN0016S, FIN0020S, FIN0024S – Hot Strip Slab Furnaces 1-3

Same as Scenario 1

FIN0028S – Hot Strip Slab Furnace 4

Same as Scenario 1

BOF0149S – Ladle Drying Preheaters

Maximum Design Rate = 100 MMBtu/hr

NG throughput = 100 (MMBtu/hr) * 24 (hr/day) / 1000 (MMBtu/MMCF)

=2.4 MMCF/day

SO_2 emission rate = NG emissions = 100 (MMBtu/hr) / 1000 (MMBtu/MMCF) * 0.6 (lb SO2/MMCF) = 0.06 lb/hr

CC0084S & CC0145S – Slab Cutting

Same as Scenario 1

SCENARIO 3

- Battery A and Battery B at maximum COG underfire
- Remaining COG to slab furnaces 1-4

BF0007S – Blast Furnace "A" Stoves

Same as Scenario 2

BF0012S – Blast Furnace "B" Stoves

Same as Scenario 2

UT0053S – Boilers 1 -7

Same as Scenario 1

UT0054S – Boilers 8 – 10

Same as Scenario 1

UT0059S & UT0064S – Boilers 11 & 12

Same as Scenario 1

CO0071S & CO0092S – Coke Oven Battery Underfire

Same as Scenario 1

FIN0016S, FIN0020S, FIN0024S – Hot Strip Slab Furnaces 1-3

Maximum Design Rate = 322 MMBtu/hr (each)

COG throughput = 2.64 MMCF/day

NG throughput = {322 (MMBtu/hr) – 2.64 (MMCF COG/day) / 24 (hr/day) * 560 (MMBtu/MMCF)} * 24 (hr/day) / 1000 (MMBtu/MMCF) = 6.25 MMCF/day

COG emissions = 2.64 (MMCF/day) / 24 (hr/day) * 1230 (lb SO_2/MMCF)

= 135.47 lb/hr

NG emissions = 6.25 (MMCF/day) / 24 (hr/day) * 0.6 (lb SO_2/MMCF)

= 0.16 lb/hr

SO_2 emission rate = 135.47 + 0.16 = 135.63 lb/hr

FIN0028S – Hot Strip Slab Furnace 4

Maximum Design Rate = 380 MMBtu/hr

COG throughput = 9.7 MMCF/day

NG throughput = {380 (MMBtu/hr) – 9.7 (MMCF COG/day) / 24 (hr/day) * 560 (MMBtu/MMCF)} * 24 (hr/day) / 1000 (MMBtu/MMCF) = 3.71 MMCF/day

COG emissions = 9.7 (MMCF/day) / 24 (hr/day) * 1230 (lb SO_2/MMCF)

= 494.71 lb/hr

NG emissions = 3.71 (MMCF/day) / 24 (hr/day) * 0.6 (lb SO_2/MMCF)

= 0.09 lb/hr

SO_2 emission rate = 494.71 + 0.09 = 494.8 lb/hr

BOF0149S – Ladle Drying Preheaters

Same as Scenario 2

CC0084S & CC0145S – Slab Cutting

Same as Scenario 1

SCENARIO 4

- Battery A and Battery B at maximum COG underfire
- Remaining COG to boilers 11 and 12

BF0007S – Blast Furnace "A" Stoves

Same as Scenario 2

BF0012S – Blast Furnace "B" Stoves

Same as Scenario 2

UT0053S – Boilers 1 -7

Same as Scenario 1

UT0054S – Boilers 8 – 10

Same as Scenario 1

UT0059S & UT0064S – Boilers 11 & 12

Maximum Design Rate = 225 MMBtu/hr (each)

COG throughput = 8.37 MMCF/day

BFG throughput = {225 (MMBtu/hr) – 8.37 (MMCF COG/day) / 24 (hr/day) * 560 (MMBtu/MMCF)} * 24 (hr/day) / 80 (MMBtu/MMCF) = 8.93 MMCF/day

COG emissions = 8.37 (MMCF/day) / 24 (hr/day) * 1230 (lb SO_2/MMCF)

= 428.83 lb/hr

BFG emissions = 8.93 (MMCF/day) / 24 (hr/day) * 16 (lb SO_2/MMCF)

= 5.95 lb/hr

SO_2 emission rate = 428.83 + 5.95 = 434.79 lb/hr

CO0071S & CO0092S – Coke Oven Battery Underfire

Same as Scenario 1

FIN0016S, FIN0020S, FIN0024S – Hot Strip Slab Furnaces 1-3

Same as Scenario 1

FIN0028S – Hot Strip Slab Furnace 4

Same as Scenario 1

BOF0149S – Ladle Drying Preheaters

Same as Scenario 2

CC0084S & CC0145S – Slab Cutting

Same as Scenario 1

Scenario Emission Rates

Table C-3: Scenario 1

Unit	Description	SO_2 lb/hr
BF0007S	BFAStove	454.29
BF0011S	BFGFlare	143.97
BF0111S	Newflare	143.97
BF0012S	BFBStove	465.88
UT0053S	blrs1to7	83.97
UT0054S	blrs8to10	36.03
UT0059S	boil11	45.00
UT0064S	boil12	45.00
BP0097S	COGflare	0.00
CO0071S	BatAfire	384.37
CO0092S	BatBfire	384.37
FIN0016S	slabfur1	0.16
FIN0028S	slabfur4	0.24
FIN0020S	slabfur2	0.16
FIN0024S	slabfur3	0.16
BF0010S	Csthsbgh	96.35
BF0150S	Ironspot	3.17
BOF0149S	Ladldryr	116.11
CC0084S	slabcut1	0.00
CC0145S	slabcut2	0.00
CO0069S	BatAPush	5.18
CO0090S	BatBPush	5.18

Table C-4: Scenario 2

Unit	Description	SO_2 lb/hr
BF0007S	BFAStove	79.76
BF0011S	BFGFlare	143.97
BF0111S	Newflare	143.97
BF0012S	BFBStove	91.43
UT0053S	blrs1to7	621.76
UT0054S	blrs8to10	266.51
UT0059S	boil11	45.00
UT0064S	boil12	45.00
BP0097S	COGflare	0.00
CO0071S	BatAfire	384.37
CO0092S	BatBfire	384.37
FIN0016S	slabfur1	0.16
FIN0028S	slabfur4	0.24
FIN0020S	slabfur2	0.16
FIN0024S	slabfur3	0.16
BF0010S	Csthsbgh	96.35
BF0150S	Ironspot	3.17
BOF0149S	Ladldryr	0.08
CC0084S	slabcut1	0.00
CC0145S	slabcut2	0.00
CO0069S	BatAPush	5.18
CO0090S	BatBPush	5.18

Scenario Emission Rates

Table C-5: Scenario 3

Unit	Description	SO_2 lb/hr
BF0007S	BFAStove	79.76
BF0011S	BFGFlare	143.97
BF0111S	Newflare	143.97
BF0012S	BFBStove	91.43
UT0053S	blrs1to7	83.97
UT0054S	blrs8to10	36.03
UT0059S	boil11	45.00
UT0064S	boil12	45.00
BP0097S	COGflare	0.00
CO0071S	BatAfire	384.37
CO0092S	BatBfire	384.37
FIN0016S	slabfur1	135.64
FIN0028S	slabfur4	494.77
FIN0020S	slabfur2	135.64
FIN0024S	slabfur3	135.64
BF0010S	Csthsbgh	96.35
BF0150S	Ironspot	3.17
BOF0149S	Ladldryr	0.08
CC0084S	slabcut1	0.00
CC0145S	slabcut2	0.00
CO0069S	BatAPush	5.18
CO0090S	BatBPush	5.18

Table C-6: Scenario 4

Unit	Description	SO_2 lb/hr
BF0007S	BFAStove	79.76
BF0011S	BFGFlare	143.97
BF0111S	Newflare	143.97
BF0012S	BFBStove	91.43
UT0053S	blrs1to7	83.97
UT0054S	blrs8to10	36.03
UT0059S	boil11	434.77
UT0064S	boil12	434.77
BP0097S	COGflare	0.00
CO0071S	BatAfire	384.37
CO0092S	BatBfire	384.37
FIN0016S	slabfur1	0.16
FIN0028S	slabfur4	0.24
FIN0020S	slabfur2	0.16
FIN0024S	slabfur3	0.16
BF0010S	Csthsbgh	96.35
BF0150S	Ironspot	3.17
BOF0149S	Ladldryr	0.08
CC0084S	slabcut1	0.00
CC0145S	slabcut2	0.00
CO0069S	BatAPush	5.18
CO0090S	BatBPush	5.18

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19506, SPRINGFIELD, ILLINOIS 62794-9506 – (217) 782-2113

PAT QUINN, GOVERNOR DOUGLAS P. SCOTT, DIRECTOR

October 26, 2010

USEPA, Region 5, A-18J
Attn: Ms. Cheryl Newton
77 West Jackson Boulevard
Chicago, Illinois 60604-3507

Re: Proposed Changes to a PSD Approval for United States Steel
Request to Initiate Consultation Under the Endangered Species Act

Dear Ms. Newton:

By this letter, the Illinois EPA is requesting that the USEPA initiate appropriate consultation under the federal Endangered Species Act for an application submitted by the United States Steel - Granite City Works ("US Steel"), for proposed changes to a PSD Approval for a Production Increase Project.

US Steel has applied to the Illinois EPA for a revision to the Construction Permit/PSD Approval originally issued on January 25, 1996, for a project to increase iron and steel production at the plant. The requested revision would correct SO_2 emission rates for byproduct blast furnace gas, which is used as a fuel at the plant. US Steel also applied for revisions to the permit to correct VOM and CO emission rates for combustion of natural gas. No additional increases in production or physical modifications are being requested by the applicant.

Because the current application involves corrections to the emission information originally provided for the project, the requested revisions are being evaluated using the NSR rules that applied for the original application in January 1996. At that time, Granite City was designated nonattainment for ozone and PM_{10} and attainment for all other pollutants.

Accordingly, with the corrected emission rates for SO_2 and CO, which are higher than in the original application and current PSD approval, this project is still subject to a PSD review as a major modification for SO_2 and CO emissions.

An electronic copy of the application for this project will be e-mailed to Rachel Rineheart and Constantine Blathras of your staff.

If individuals at USEPA have questions about this project or require any assistance from the Illinois EPA in carrying out appropriate consultation, please contact Jason Schnepp at 217/524-3724 or Jason.Schnepp@Illinois.gov.

Sincerely,

Edwin C. Bakowski

Edwin C. Bakowski, P.E.
Manager, Permit Section
Division of Air Pollution Control

cc: P. Blakley
C. Blathras
Jeff Sprague, Illinois EPA
Application File95010001
ID File 119813AAI

RECEIVED
OCT 26 2010
Illinois Environmental Protection Agency
BUREAU OF AIR
STATE OF ILLINOIS

Statement of Basis
for the Planned Issuance of a
Revised Clean Air Act Permit Program (CAAPP) Permit
for:

United States Steel Corporation
Granite City Works
20th & State Streets
Granite City, Illinois

Source I.D. No.: 119813AAI
Permit No.: 96030056

Permitting Authority:
Illinois Environmental Protection Agency
Bureau of Air, Permit Section
PO Box 19276
1021 N. Grand Avenue East
Springfield, Illinois

February 4, 2013

INTRODUCTION

This document is the Statement of Basis that has been prepared in conjunction with the planned issuance of a revised Clean Air Act Permit Program ("CAAPP") permit to United States Steel Corporation for its Granite City Works ("US Steel"). A Statement of Basis is a support document that is meant to provide a narrative discussion of the legal and factual basis underlying the planned issuance of a CAAPP permit. As a Statement of Basis is only an informational document, it is not a part of the CAAPP permit and it does not create any binding or enforceable rights or duties independent of the permit.

US Steel operates an integrated iron and steel mill in Granite City, Illinois. Because of the mill's emissions of various pollutants, US Steel is required to obtain an operating permit for the mill under Illinois' CAAPP.

The CAAPP generally requires that major stationary sources of regulated air pollutants apply for and obtain a CAAPP permit for their operations. The CAAPP is administered by the Illinois EPA. CAAPP permits contain conditions identifying all applicable requirements under the federal Clean Air Act ("CAA") and Illinois' Environmental Protection Act ("Act"). Testing, monitoring, compliance procedures, recordkeeping and reporting requirements are also established, as required or necessary, to assure compliance and accomplish the purposes of the CAAPP and the Act. The terms and conditions of a CAAPP permit are enforceable by the Illinois EPA, USEPA and the public.

The Illinois EPA previously issued a revised CAAPP permit to US Steel on May 2, 2011.[1] A petition was filed on August 16, 2011 with USEPA by Washington University School of Law on behalf of the American Bottom Conservancy (ABC) requesting that USEPA object to this permit. On December 3, 2012, USEPA took final action on this petition, granting it in part and denying it in part.

Following review of USEPA's response to the petition, the Illinois EPA has elected to make certain revisions to the current CAAPP permit issued to US Steel. Before making these revisions to the permit, the Illinois EPA is holding a 10-day comment period in accordance with Section 39.5(9)(g) of the Act. The draft of the revised CAAPP permit that the Illinois EPA plans to issue and this Statement of Basis are being mailed to those persons who participated in the previous public comment periods on the CAAPP permit for this source.[2] These and other relevant documents are also being placed in public repositories located at the Six Mile Regional Library District, 2001 Delmar Avenue, Granite City, and at the Illinois EPA's Offices at 2009 Mall St., Collinsville, and 1340 N. Ninth St., Springfield.

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[1] The revised CAAPP permit issued on May 2, 2011 underwent two subsequent administrative amendments, with amendments to the permit issued by the Illinois EPA on October 5, 2011 and May 3, 2012. The first amendment corrected various typographical errors in the permit. The second amendment included a new recordkeeping provision in the permit for emissions of certain pollutants from particular basic oxygen furnace processes. The new provision had been in the draft of the revised CAAPP permit but was inadvertently omitted when the final version of the revised permit was prepared and issued. This correction to the May 2011 permit, by including new Condition 7.6.5(f), answered one point in the current petition, as recognized by USEPA in its December Order which held that this point was now moot. In particular, the CAAPP permit now requires recordkeeping for relevant emissions of the basic oxygen furnace processes, including certain records related to the emission factors that US Steel used for this purpose.

[2] The comment period on the original CAAPP permit issued to US Steel for the Granite City Works ran from October 2006 through February 2007. The prior 10-day comment period on the revised CAAPP permit issued to US Steel in May 2011 occurred in March 2011.

I. General Information

A. Applicant/Permittee and Source Information

US Steel Corporation
Granite City Works
20th and State Streets
Granite City, Illinois 62040

Source ID No: 119813AAI

SIC Code: 3312 - Integrated Steel Mill

County: Madison

Responsible Official

Richard E. Veitch, General Manager
(618)451-3456

B. Facility Description

US Steel Corporation's ("US Steel" or "source") Granite City Works is an integrated iron and steel mill producing flat rolled steel products. The principal operations at this facility are: (1) Coke Production (Coke Ovens and Coke Byproduct Plant), (2) Iron Production (Blast Furnaces), (3) Steel Production (Basic Oxygen Process Shop), (4) Steel Finishing, (5) Boilers, and (6) Handling and Processing of Bulk Materials. In addition, the roadways at the facility and nearby public roadways serving the facility emit fugitive dust. More detailed descriptions of the various operations and emission units at the facility are found in the conditions of the current CAAPP permit that provide "Descriptions" of units.[1]

Coke Production (Coke Ovens and Coke Byproducts Plant)

Coke is manufactured at the facility for use in the blast furnaces in which iron is produced. Coke is an essential raw material for the blast furnaces, as

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[1] The permitting action that is now contemplated would, again, not involve the CAAPP permits for the following facilities, which are owned and operated by companies other than US Steel but meet the criteria of the CAAPP to be considered a single stationary source with US Steel's Granite City Works. Although considered part of the Granite City Works, it remains appropriate that each of these other facilities, with their different responsible officials, to be permitted individually under the CAAPP. This approach is consistent with Illinois EPA's past permitting practice, as well as available USEPA guidance on single source permitting under the Title V program.

- Stein Steel Mill Services (I.D. 119012AAD) located at 20th Street and Edwardsville road in Granite City - Handling of Basic Oxygen Furnace slag.
- Granite City Slag, LLC (I.D. 119040ACP) located at 20th Street and Edwardsville Road in Granite City - Handling of blast furnace slag.
- RMJ Industries, Inc. (I.D. 119040ASB) located at 20th Street and Edwardsville Road in Granite City - Processing by-product stream from the by-product recovery plant.
- Oil Technology, Inc. (I.D. 119040ATC) located onsite of US Steel (Route 203) in Granite City - Processing recovered waste oil for recycling.
- Pace City, IXS (I.D. 119040ATL) located at 2500 East 23rd Street in Granite City - Handling of scrap metals.
- Gateway Energy & Coke Co., LLC (I.D. 119040ATM) located at 2525 Edwardsville Road in Granite City - Production of coke in new heat recovery coke oven batteries.

is is the reducing agent that converts iron ore to iron and also serves as the fuel that provides heat to the furnaces.

Coke is produced by "cooking" appropriate coal at an elevated temperature to drive off the volatile fraction of the coal. US Steel operates two batteries of byproduct recovery ovens. In byproduct recovery coking, the combustible byproduct gas from the coking process is sent to a byproduct plant to recover certain chemicals in the gas. The processed gas is then used as fuel, both for the coke ovens themselves and at other units at the facility. Coke is produced in the coke ovens, in batches, in four steps: 1) The charging of coal into a hot oven; 2) The actual coking of the coal in the oven; 3) The removal or pushing of the finished coke from the oven; and 4) The cooling or quenching of the hot coke with water in a separate quench station.

By-product coke ovens are indirectly heated through combustion flues in the refractory brickwork around each of the ovens. The flues from all the ovens exhaust through a common "main stack" or combustion stack. The principal fuel used to heat the ovens is coke oven gas. At this facility, the coke oven gas may be supplemented with natural gas and blast furnace gas, a byproduct from the blast furnaces. Emissions from heating the coke ovens are controlled by work practices to avoid leaks in the brickwork that enable some of the raw coke oven gas to go directly into the flues, bypassing the byproduct plant. Heating emissions are also controlled as raw coke oven gas and blast furnace gas are processed or cleaned to remove entrained particulate before being used as fuel. At this facility, coke oven gas is also normally further processed in a Desulfurization System to remove sulfur, lowering the SO_2 emissions that accompany its use as fuel.

In addition to combustion emissions from heating the ovens, each of the steps in the production cycle in coke ovens poses issues for emissions. The ovens are charged by pouring coal into the ovens through ports on the top of the ovens. Emissions are minimized by equipment design and work practices that reduce the escape of coal dust. While the coal is being coked, leaks in the seals around doors and ports on the ovens will result in emissions. This is because the ovens are designed to operate at a slight positive pressure to prevent air from entering the ovens and to facilitate collection of the raw coke oven gas for processing in the byproduct plant. The emissions from leaks are minimized by the design features of the ovens and work practices to prevent and plug leaks. The emissions from pushing coke are minimized by practices to ensure that the coal is fully coked before being removed from an oven. Pushing emissions are also controlled by a mobile control system, with hooding and an associated scrubber that travel along with the coke receiving car. Emissions from quenching are controlled by requirements for the quality of quench water and a quench tower over the quench station, with a row of baffles to capture particulate matter.

At the byproduct plant, the collected coke oven gas from the ovens is processed to recover certain chemicals for sale, including coal tar, benzene, and ammonium sulfate. Emissions of vapors from the various vessels in the byproducts plants are generally controlled by gas blanketing systems. These systems exhaust back into the raw coke oven gas stream, so that vapors are ultimately controlled by combustion when the gas is used as fuel.

Any excess coke oven gas, which cannot be used as fuel at the facility, is managed by combusting it in a flare. This controls the organic compounds in the gas and converts the sulfur in the gas, which is normally present as hydrogen sulfide, to less noxious SO_2. There are also two emergency bypass

flares, one on each of the coke oven batteries. Like the flare at the byproducts plant, these flares are safety devices. In the event of an upset, they are used to maintain the pressure in the coke oven gas collection system at a safe level by combusting some of the coke oven gas.

Iron Production (Blast Furnaces)

Blast furnaces are tall, cylindrical, stationary furnaces. The charge materials (iron ore, coke, limestone and other flux material) are fed into the furnace at the top through a double-bell lock system. Heated air is blown into the furnace through nozzles or tuyeres near the bottom of the furnaces. In the furnaces, the coke undergoes partial combustion to carbon monoxide providing the heat to melt the charge as well as reducing the iron ore to elemental iron. Molten iron and slag accumulate at the bottom of the furnace and are removed periodically by tapping the furnace. The hot, carbon monoxide rich exhaust from the furnace, known as blast furnace gas, goes into a duct at the top of the furnace, to be cooled and cleaned prior to use as fuel at the facility. Any excess blast furnace gas, which cannot be used as fuel, is flared.

Emissions occur from blast furnaces during the periodic tapping of the furnaces, when molten iron and slag are exposed to the atmosphere as they drain from a furnace and flow in troughs to vessels for transport. Covers and other measures are used to reduce the formation of emissions during tapping. At this facility, emissions are also controlled as tapping occurs in the casthouse, a covered area between the two blast furnaces, which is equipped with fabric filters or baghouses. The casthouse itself is exhausted to the large Casthouse Baghouse. Additional hooding is present at the iron spouts, where molten iron is poured into the "torpedo" rail cars, which are used to transport molten iron to the Basic Oxygen Process Shop. The hooding over the iron spouts exhaust to another baghouse, the Iron Spout Baghouse.

Emissions also occur from the stoves that heat the blast air going into the furnaces. These stoves are fired with blast furnace gas. The blast furnace gas is cleaned to remove entrained dust before it is used as fuel. Otherwise, this dust would accumulate and interfere with the operation of the stoves.

Steel Production (Basic Oxygen Furnace (BOF) Shop and Continuous Casters

Iron produced at the blast furnaces is converted to steel in the Basic Oxygen Process Furnace (BOPF) or Basic Oxygen Furnace (BOF) Shop. The BOF Shop houses the hot metal desulfurization station, the basic oxygen furnaces (BOF), the ladle metallurgy furnace and the argon stirring stations. The steel is then cast into slabs in associated continuous casters.

At the BOF Shop, molten iron is first processed at the desulfurization station to reduce its sulfur content. This occurs in batches using desulfurization agents, such as lime, that react with sulfur dissolved in the molten iron. Molten iron from the blast furnace in torpedo cars is transferred to a ladle. The agents are then added to the molten iron with a lance. The sulfur-laden slag that is formed floats on the surface of the iron and is skimmed off the iron into a slag pot. The particulate emissions from the transfer of molten iron to ladles and the desulfurization and slag skimming processes are controlled by separate baghouses.

The desulfurized iron then goes to the BOF furnaces for conversion to steel. This occurs when oxygen injected into the molten metal reacts with carbon and silicon dissolved in the iron, driving these materials out of the metal,

converting it to steel. Iron is processed in these furnaces in batches or heats that last less than an hour. The first step in a heat is charging a furnace. Scrap metal is emptied into the furnace from large buckets. Molten iron is then poured into the furnace from a ladle. The emissions associated with charging are currently controlled by large hoods located above the charging area that capture particulate matter, which are ducted to an electrostatic precipitator ("ESP"). The next step is the actual conversion into steel, when oxygen is blown into the molten metal. An oxygen lance is introduced through a port in the roof over the furnace. The associated emissions are directly controlled as the furnace is exhausted through a second port in the roof that is ducted to the ESP. The next step in a heat, when the "blow" is complete, is tapping the furnace. The furnace is tilted in the direction opposite that for charging, and the steel is drained into a transfer ladle. Tapping emissions are currently captured by the roof on the furnaces, which also extends over the pouring area. The capture of emissions from the furnaces is facilitated as the roof over the furnaces is open to the atmosphere only through a roof monitor at the peak of the roof.

At the ladle metallurgy furnace and argon stirring stations, final adjustments are made to the composition of the molten steel from the BOFs. After the composition of the metal is analyzed, appropriate amounts of alloy material are added to achieve the desired composition. This occurs in the ladle metallurgy furnace if the steel has cooled and must be brought back up to temperature. Otherwise, alloy materials are added at the argon stirring stations, where the steel is then "stirred" by injecting inert argon gas into the steel to disperse the alloy materials in the molten steel and maintain a uniform temperature. Emissions from these stations are controlled by a baghouse.

In the continuous caster, molten steel is formed into solid slabs, which may be sold or further processed in finishing operations at the facility. Molten steel from the ladle metallurgy station is poured into the continuous caster and steel slabs of the desired cross-section and length are produced. This is accomplished by passing the molten steel through a water-cooled die, further cooling the steel strand leaving the die with water sprays, and finally cutting the strand into sections of the desired length. The design of the continuous casting process reduces emissions because it minimizes exposure of molten steel to the atmosphere.

Finishing Operations (Reheat Furnaces, Rolling Mills and Galvanizing):

In the finishing departments, slabs are heated and then rolled or milled into sheet metal that is sold in large coils. The slabs are first heated in gas-fired "reheat furnaces" to a temperature at which the steel is malleable and can be readily processed in a rolling mill. Low- NO_x combustion techniques are employed at the reheat furnaces to control emissions of NO_x.

In the rolling mills, the hot steel slabs are reduced in thickness by being repeatedly passed through a series of heavy rollers to form sheet metal of the desired thickness and width. This sheet metal may then undergo galvanization, with the application of a thin film of zinc to the surfaces of the metal to prevent corrosion.

Utility Operations (Boilers)

Boilers at the facility provide the steam needed for certain process operations at the facility, as well as for some space heating. Two older boilers produce low-pressure steam and are fired by natural gas, coke oven gas, and blast

furnace gas. A new "Cogeneration Boiler" (also known as Power Boiler 1) began operation in 2009. This boiler produces high-pressure steam used to generate electricity for the facility, with the low-pressure steam from the turbine-generators then being available for process operations and heating. The emissions from the boilers are generally minimized through fuel quality and good combustion practices.

Handling and Processing of Bulk Materials

Various bulk materials involved in the production of iron and steel are handled at the facility, including iron ore, scrap iron, coal, coke and limestone. These materials must be unloaded, held in storage piles or silos, and moved around the plant by various conveyor systems. Certain materials, like coal for coke ovens, must be processed by screening and crushing, before use. Slag from furnaces must also be handled and processed for use as construction aggregate or disposal. The particulate emissions from these emission units are controlled by various measures, specific to the unit, that act to minimize emissions. Baghouses are also used to control emissions from some emission units, such as the pulverizer used for final grinding of the coal feed to the coke ovens.

Vehicle Traffic on Roadways

Vehicle traffic on roadways, including the heavy equipment used to transport slag, around the facility results in emissions of fugitive dust. On paved roadways, these emissions are minimized by vacuum sweeping on a regular basis to remove silt from the road surface. On unpaved roadways and open areas, emissions are minimized by regular applications of water and surfactants.

C. Area Classification

Madison County, Illinois is currently designated as marginal nonattainment for the 2008 8-hour ozone National Ambient Air Quality Standard (NAAQS) and as nonattainment (annual standard) for the NAAQS for $PM_{2.5}$ (particulate matter less than 2.5 micrograms). Granite City Township and Venice Township in Madison County are nonattainment for the 2008 lead NAAQS. The area is in attainment with or not classifiable under the NAAQS for all other criteria pollutants.

D. Major Source Status

This source is a major source based on emissions of various regulated pollutants, including NO_x, PM, SO_2, VOM, CO, hazardous air pollutants ("HAPs"), and greenhouse gases ("GHG").

E. Chronology of Events

Initial CAAPP Permit

In March 1966, the Illinois EPA received a CAAPP application for the Granite City Division of the National Steel Corporation, who was then the owner and operator of the facility. This application was timely submitted in accordance with the requirements of the CAAPP, which had become effective in Illinois following USEPA's interim approval of the program on March 15, 1995.

The Illinois EPA received over 700 initial applications for CAAPP permits from subject sources in Illinois. The application for the source was one of the late initial CAAPP applications reviewed and processed by the Illinois EPA. In

the intervening years, the source was purchased by US Steel Corporation and the pending CAAPP application originally submitted for the source was transferred to US Steel as the new owner and operator of the Granite City Works.

The Illinois EPA subsequently prepared a draft CAAPP permit for US Steel and the public comment period for the draft permit commenced in mid October 2008. A public hearing was held on December 2, 2008. After the close of the comment period and a review of the public comments, the Illinois EPA prepared a proposed CAAPP permit and sent it to USEPA in mid June 2009 for a 45-day review, during which USEPA did not object to the proposed CAAPP permit. The Illinois EPA then prepared its formal response to comments raised by the public and US Steel during the public comment period on the draft CAAPP permit. The Illinois EPA issued the CAAPP permit on September 3, 2009.

Petition to USEPA to Object and USEPA Order on the Initial CAAPP Permit

The American Bottom Conservancy ("ABC") filed a Petition to Object ("Petition") with the USEPA in October 2009 requesting that USEPA object to the CAAPP permit issued to US Steel. The Petition asserted that the CAAPP permit failed to incorporate all "applicable requirements," including terms and conditions of prior state construction permits, failed to include the requisite Periodic Monitoring requirements and lacked required compliance schedules. The Petition also claimed that the CAAPP permit inappropriately allowed excess emissions during malfunction/breakdown and startup events[4], failed to include compliance assurance monitoring, and contained terms and conditions that are not practically enforceable.

On January 31, 2011, the USEPA responded to the Petition, denying in part and granting in part, on the arguments made by ABC. In its Order responding to the Petition ("Order"), USEPA refused to object to certain aspects of the issued CAAPP permit challenged by ABC.[5] The Order also granted the Petition with respect to certain aspects of the permit. Concerning periods of startup, malfunction and breakdown based on the Illinois State Implementation Plan (SIP), the USEPA required the Illinois EPA to either explain in the Statement of Basis how it had determined in advance that the Permittee met the requirements of the Illinois SIP at 35 IAC 201.262 or to otherwise make appropriate changes to the permit that continued operation during startup, malfunction or breakdown would only be authorized on a case-by-case basis if the source met the requirements of the SIP. USEPA also found that the CAAPP permit failed to include specific "applicable requirements" derived from conditions contained within certain preconstruction permits. Additionally, USEPA found that the CAAPP permit failed to adequately identify certain plans and/or plan requirements that were incorporated by reference into the permit and, further, that the CAAPP permit failed to contain enforceable steps and milestones for the terms of an existing consent order. USEPA also concluded that it could not determine whether the CAAPP permit established sufficient

[4] ABC originally asserted that the Illinois EPA had provided automatic exemptions from emission limits during malfunction/breakdown or startup events without first performing an evaluation of their impacts. In so doing, ABC claimed that nine permit terms illegally allowed for excess exemptions from permit requirements during these periods based on state law, and that Illinois EPA's response to comments fell short of adequately explaining why these exemptions were legally or factually justified.

[5] For example, USEPA concluded that a compliance schedule was not necessary to address pending Notices of Violations involving US Steel. USEPA also generally denied ABC's argument that the issued CAAPP permit improperly exempted certain emission units from NESHAP standards during periods of startup, shutdown and malfunctions ("SSM").

Periodic Monitoring requirements for numerous emission units. Citing a lack of sufficient explanation in the Illinois EPA's response to comments, the Order directed the Illinois EPA to address this issue with greater specificity and analysis.

Illinois EPA Action in Response to the Initial USEPA Order

The Illinois EPA followed the USEPA's Order on the initial CAAPP Permit by substantially revising certain portions of the initial CAAPP identified by the Order or providing a more detailed justification of the conditions set forth in the permit. In response to the Order, the Illinois EPA provided an explanation in the Statement of Basis of Illinois's SIP concerning startup, malfunction and breakdown and how the permit ensured compliance with these requirements. Illinois EPA explained that the sole determinations made in advance are whether the source requested permission to continue to operate during a startup, malfunction or breakdown event in its CAAPP application, and whether the CAAPP application satisfied the application content of the SIP and provided proof sufficient to enable Illinois EPA to afford the source a potential prima facie defense to an enforcement action.

The Illinois EPA also explained in significantly greater detail in the Statement of Basis for that action both the practical and technological reasons justifying the inclusion of certain Periodic Monitoring requirements established in the CAAPP permit, including the approach to and use of selected emission factors for certain emission limits that originated in construction permits. At the same time, various enhancements or supplements were made to monitoring, testing recordkeeping and reporting requirements so that Periodic Monitoring under US Steel's CAAPP permit would be sufficient to assure compliance with applicable requirements.[5]

The Illinois EPA issued a revised CAAPP permit on May 2, 2011. Given US Steel did not petition the Illinois Pollution Control Board (Board) for review of this permit, this permit became final and effective at that time.

Petition to USEPA to Object to the Revised CAAPP Permit

ABC filed a second Petition to Object ("Second Petition") with the USEPA on August 16, 2011 requesting that USEPA object to the revised CAAPP permit issued on May 2, 2011. The Second Petition asserted that: a) the permit's use of emission factors failed to provide Periodic Monitoring designed to ensure compliance with permit limits and lacks practical enforceability; b) several permit limits lacked adequate Periodic Monitoring requirements to ensure compliance with applicable limits; c) the permit failed to appropriately address excess emissions associated with startup, breakdown, and malfunctions;

[5] The Illinois EPA also made a number of other revisions to the CAAPP permit in response to USEPA's order. Consistent with the Order's discussion concerning the meaning of the term "applicable requirements", the revised CAAPP permit included updated terms from a previous consent order, in addition, the revised CAAPP permit reflected requirements from construction permits issued by the Illinois EPA. Other changes were made to follow current USEPA guidance regarding the "incorporation by reference" of certain plans or programs.

[6] For the first time, ABC asserts that US Steel's application material requesting authorization to make a claim of malfunction/breakdown or startup was inconsistent with the Illinois SIP, 35 IAC 201.149, or that Illinois EPA's advance authorization to US Steel to make such claims was somehow inconsistent with the Illinois SIP. 35 IAC 201.262.

and d) the permit failed to include applicable requirements from a related construction permit for Gateway Energy & Coke Company.

USEPA Petition Response to Second Petition on the CAAPP Permit

On December 2, 2013, the USEPA responded to the Second Petition, denying in part and granting in part. To summarize USEPA's response to the Petition ("Second Order"), USEPA refused to object to certain aspects of the issued CAAPP permit that were challenged. For example, USEPA concluded that the Illinois EPA's use of the term "emission factors" in the May 2011 CAAPP permit would not compromise the enforceability of these terms in the permit. USEPA also denied the argument that the May 2011 CAAPP permit generally lacked adequate periodic monitoring for the coke oven gas flare, the uncaptured blast furnace casthouse, the blast furnace gas flares, and the slab reheat furnaces. Finally, USEPA denied the claim that the May 2011 CAAPP permit must include requirements from the construction permit issued for the new coke production facility developed and operated by Gateway Energy & Coke Company.

The Order also granted the Second Petition with respect to certain aspects of the May 2011 CAAPP permit. For example, USEPA found that the permit lacked Periodic Monitoring to ensure compliance with emission limits and many corresponding maximum emissions limits from Construction Permit No. 95010001. USEPA also concluded that US Steel's application for authorization to continue operations during startup, breakdown, and malfunction events did not include all of the information required by 35 IAC 201.261 and 201.262, and thus Illinois' SIP. USEPA went onto find that authorization to make claims related to startup and malfunction/breakdown for certain emission units could not be granted by the Illinois EPA in the absence of all information required by the Illinois SIP.[5]

Current Permitting Action

The Illinois EPA must address the objections from the Second Petition that were granted by USEPA in its Second Order. Detailed discussions for each point are provided later in this Statement of Basis. The Illinois EPA's overall approach to Second Order is summarized below.

Consistent with the discussion in the Second Order concerning the need to include Periodic Monitoring to ensure compliance with certain emission limits, the Illinois EPA plans to make available in the current CAAPP permit the initial emission factors that US Steel intends to use to demonstrate compliance with these emission limits. The Illinois EPA provides a clear explanation in the planned revision to the CAAPP permit of how the emission factors will be used to determine compliance with the relevant limits in the permit.

As a general principle of administrative law, only those issues that have been "preserved" may be appropriately raised before an administrative tribunal. Accord., In re Avon Custom Mixing Services, Inc., 10 E.A.D. 700, 704-705 (EAB 2002) (A party seeking review must generally demonstrate that the issues were raised during the public comment period). Following this general principle affords the permitting authority notice and an opportunity to cure the alleged deficiencies in the permit prior to issuance. In re Newhall New Century Development, 11 E.A.D. 40, 46 (EAB 2003).

This is the first time that USEPA finds that US Steel did not meet the content requirements, as set forth in the Illinois SIP, in its request for authority to continue operations during startup or malfunction/breakdown events and in so doing, any approval of these requests by the Illinois EPA in the CAAPP permit was "flawed."

Additionally, the revised permit that the Illinois EPA now plans to issue would include conditions detailing how the emission factors will be reviewed and, if necessary, updated in the future to assure that the emissions factors used to determine compliance are appropriate.

The Illinois EPA has also given considerable attention to the subject of malfunction/breakdown and startup, as addressed by USEPA in the Second Order. To assist the Illinois EPA, US Steel supplied additional information to support its requests for permission to continue to operate particular emission units during malfunction/breakdown events in violation of certain state emission standards. US Steel also supplied additional information to support its requests related to startup of particular units. US Steel has provided all the information that 35 IAC 201.261 requires from a source that is requesting permission to continue operation with excess emission during a malfunction/ breakdown or startup event. The Illinois EPA has explained in this Statement of Basis why the CAAPP permit should continue to provide the requested authorizations consistent with Illinois' SIP, 35 IAC 201.262.

The Illinois EPA plans to proceed with revisions to US Steel's current CAAPP permit following the applicable procedures set forth in the CAAPP.[4] In general, this permit revision is an outgrowth of USEPA's public petition process. As set forth in the CAAPP, if a petition objecting to a CAAPP permit is granted by USEPA after the permit has already been issued, the Illinois EPA is authorized to revise and resubmit the CAAPP permit to USEPA. *See generally*, Section 39.5(9)(e)-(g) of the Act and 35 IAC 252.301.[5] This authority, which effectively allows for formal reconsideration of the issued permit, presents an opportunity for the Illinois EPA to reconcile its permitting decision with USEPA's Order. The CAAPP does not specify a time-frame for making such revisions; however, federal requirements provide that a permitting authority must act within 90 days to address USEPA's concerns relating to a petition.[6]

As required by the CAAPP, the planned revision of the CAAPP permit is being accompanied by the opportunity for further public comment by US Steel and any person who previously participated in the public comment processes. Other people that are interested may also submit comments. US Steel's initial CAAPP permit underwent the full range of procedures associated with an initial CAAPP permit proceeding, including a public comment period and a public hearing. The procedures for this permit revision under the CAAPP now consist simply of a 10-day comment period, as provided by Section 39.5(9)(g) of the Act.[7] Notice of

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[4] The CAAPP, codified in state law at Section 39.5 of the Act, was enacted by the Illinois General Assembly in 1992 to fulfill the requirements of Title V of the Clean Air Act Amendments of 1990 and USEPA's implementing regulations under 40 CFR Part 70. USEPA granted final interim approval of the CAAPP on March 7, 1995. USEPA later granted full approval of the program, effective November 30, 2001, confirming that the minimum program elements required by Title V and Part 70 had been met.

[5] The process in the CAAPP and implementing rules essentially mirrors the procedures governing public petitions in 40 CFR Part 70. *See generally*, 40 CFR 70.8(c)-(d).

[6] Under Title V of the Clean Air Act (CAA) and 40 CFR Part 70, the failure of a permitting authority to submit a revised permit within 90 days of receipt of USEPA's objection results in USEPA assuming responsibility for issuing any deficiencies with the Title V permit. *See*, Section 505(c) of the CAA; *see generally*, 40 CFR 70.8(d) and 70.7(g)(4) and (i). Courts have yet to rule as to whether the 90-day requirement is a jurisdictional requirement, though litigation is repeatedly moving forward in one or more federal district courts.

[7] The same procedures were followed for the previous revision of the CAAPP permit in response to the first Order, with a 10-day public comment period, consistent with Section 39.5(9)(g) of the Act.

the comment period has been provided to US Steel and all persons who participated in the earlier public comment periods on the CAAPP permit for this source.

F. Environmental Justice

US Steel is located in a potential environmental justice ("EJ") community.[1] Given the facility's location in such an area, as well as significant public interest in the permitting of this facility, the Illinois EPA has enhanced the level of public outreach that has accompanied processing of CAAPP permits for this facility. Prior to the initial issuance of the CAAPP permit, the Illinois EPA extended the comment period twice, so that the public had over three months to submit their written comments. Prior to issuance of a revised permit in May 2011, the Illinois EPA provided general notice of the 10-day comment period by means of a newspaper notice, to facilitate comments by individuals who had not participated in the original comment period. This step is also being followed for the current 10-day comment period. In conjunction with the issuance of the original permit and the revised permit in May 2011, detailed Responsiveness Summaries were prepared in which the Illinois EPA, to the best of its ability, responded to questions and comments raised in the comment periods. This will also occur for the revision of the CAAPP permit that is now planned.[2]

While the Illinois EPA is sensitive to the location of this facility in a potential EJ community, Title V of the CAA does not provide for substantive emission control requirements beyond those arising under the applicable regulations that currently apply to a source. Thus, when issuing a CAAPP permit for this facility, the Illinois EPA does not have the authority to impose additional emission control requirements to reduce emissions beyond the levels provided for by applicable state and federal regulations. At the same time, CAAPP permits do not allow for additional emissions. CAAPP permits serve to provide benefits for air quality, the public and the environment generally as they better address currently applicable requirements. CAAPP permits more comprehensively identify those requirements and also address the means by which sources will show that they comply with those requirements. They also require more rigorous reporting by a facility of its compliance status than was previously required under state operating permits.

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[1] The Illinois EPA's EJ-Public Participation Policy states that "a 'potential' EJ community is a community with low-income and/or minority population greater than twice the statewide average. In addition, a community may be considered a potential EJ community if the low-income and/or minority population is less than twice but still greater than the state-wide average and it has identified itself as an EJ community." (www.epa.state.il.us/environmental-justice/public-participation-policy.html)

[2] For these planned revisions to the CAAPP permit, in this Statement of Basis, the Illinois EPA is also making clear its planned response to USEPA's Second Order. With respect to certain emission limits addressed by USEPA in this order, the Illinois EPA has identified the emission factors that US Steel is currently using to demonstrate compliance with the subject limits and provided information on the basis for these factors. The process that US Steel is using to verify compliance with the subject emission limits is articulated. Further detail is also provided for how the emission factors will be reviewed and, as necessary, updated to ensure that appropriate factors are used in the determination of compliance. The Illinois EPA has also further explained the basis for granting authorization to US Steel to make claims relative to startup and malfunction/breakdown events for certain emission units.

II. Compliance and Enforcement History

A. Federal Enforcement Cases

On September 10, 2008, the USEPA issued a Notice of Violation and Finding of Violation ("NOV/FOV") for violations of the CAA, the NESHAP for Iron and Steel Manufacturing Facilities, 40 CFR Part 63 Subpart FFFFF ("Iron & Steel NESHAP"), the NESHAP for Coke Oven Batteries, 40 CFR Part 63 Subpart L ("Coke Oven NESHAP"), and Illinois' SIP. USEPA alleged that US Steel had not properly controlled emissions from its Blast Furnace Casthouse, Basic Oxygen Furnace shop and Coke Oven Battery A. In addition, USEPA alleged that the source failed to apply for and obtain the proper air pollution control permit for Blast Furnace E. Lastly, USEPA alleged that the source failed to complete all required inspections and comply with various operating and maintenance plans.

On April 23, 2010, US Steel responded to the NOV/FOV. On August 1, 2012, the Department of Justice ("DOJ") filed a complaint against US Steel in the United States District Court for the Northern District of Indiana (Case Number 2:12-CV-326), which included the alleged violations cited in the NOV/FOV and, as discussed below, included violations cited in the Illinois EPA's 2009 and 2010 violation notices.

B. State Enforcement Cases

On January 29, 2009, the Illinois EPA issued a violation notice (VN) for alleged violations of the Act, state and federal regulations, and CAAPP permit conditions. Specifically, the Illinois EPA alleged fugitive dust violations, inspection and maintenance deficiencies, excessive use of the emergency reladling station and charging of Batteries A and B off the collecting mains. On March 12, 2009, the Illinois EPA issued another VN for alleged violations of the Act, state and federal regulations, and CAAPP permit conditions. In this VN, the Illinois EPA addressed excess emissions from coke oven doors on Battery B and visible emissions from the #2 Tar Dehydrator Tank and deficiencies in the records for the leak detection and repair program for the coke by-product recovery plant. On August 30, 2010, the Illinois EPA referred the source to the Illinois Attorney General's Office ("IAGO") for the above violations.

On November 5, 2010, the Illinois EPA issued a VN for alleged violations of the Act, state and federal regulations, and CAAPP permit conditions. This VN addressed excess PM emissions from the #3 mobile control system for pushing emission and excess emissions from the coke oven doors on Battery A and Battery B. The violations alleged in this VN were referred to the IAGO on September 22, 2011 and included in the complaint referenced above.

On November 30, 2012, the Illinois EPA issued a VN for alleged violations of the Act, state and federal rules, and CAAPP permit conditions. This VN alleged excess VOM and NOx emissions from the Electrostatic Precipitator (ESP) on the BOF and opacity exceedances by the BOF. In addition, the VN alleged operation of the BOF without operational steam rings. This VN was the result, in part, of emissions testing performed by US Steel in April 2012 as required by Conditions 7.5.7(a) and (b) of the current CAAPP permit. Follow-up testing was performed by US Steel in July 2012. On July 2, 2012, the Illinois EPA received a deviation report from US Steel, as required by Condition 7.5.10(d) of the CAAPP permit, reporting that the NOx and VOM emissions from the ESP at the BOF were in excess of the applicable annual limits of in Condition 7.5.6(c) of the CAAPP permit, 69.3 and 10.74 tons/yr, respectively.

On January 3, 2013, US Steel responded to the November 30, 2012 VN requesting an initial meeting with the Illinois EPA under Section 31(a)(4) of the Act. While not yet responding to the particulars of the violations, US Steel advised the Illinois EPA that it would be submitting additional information in rebuttal to the alleged violations, as provided for by Section 31(a)(5) of the Act.

Under the process for enforcement set out by Section 31 of the Act, the initial Section 31(a)(4) meeting between US Steel and the Illinois EPA is scheduled to occur during the 10-day public comment period for the planned revisions to the current CAAPP permit. This will be the first opportunity for US Steel to respond to the alleged violations, in person, to representatives of the Illinois EPA. In this meeting, US Steel may suggest a resolution (and alternative resolutions) to the alleged violations including an appropriate implementation time frame. See, Section 31(a)(4) of the Act. After such discussion, US Steel will have yet another opportunity to provide the Illinois EPA with an additional written response that shall include any additional information in rebuttal to the alleged violations and an explanation or justification of each alleged violation; if the source would like to enter into a Compliance Commitment Agreement (CCA), a proposed CCA that includes specified time frames for achieving each commitment; and if the source elects to rely upon its initial written response, the source may state as such. See, Section 31(a)(5) of the Act. If the Illinois EPA ultimately determines that these violations cannot be resolved without the involvement of the IAGO, US Steel will be afforded an additional opportunity to meet with appropriate Illinois EPA personnel. See, Section 31(b) of the Act. As this matter is still in the initial stages of the Section 31 process, these violations have not been referred to the IAGO.

C. Compliance Schedule

The identification of non-compliance and/or the issuance of a violation notice and reference to information contained therein, alone, is not sufficient to satisfy the demonstration required under Section 502(b)() of the CAA for the inclusion of an approvable compliance schedule in a Title V permit. This alleged non-compliance is simply an early stage in the larger enforcement process of determining whether a violation, in fact, has occurred. This information noted above in the current enforcement cases is, therefore, generally insufficient to warrant a compliance schedule without further investigation by appropriate enforcement staff at the state or federal level. Such an investigation typically involves additional information gathering and exchanges that are part of the enforcement process and not a part of the permitting process. This stage in the enforcement process is a critical step of fact finding under civil litigation procedures. It affords the source its required due process. Neither the issuance of a notice of violation or a violation notice or the identification of alleged non-compliance has the force or effect of law and therefore is not subject to judicial review at this early stage.

If the Illinois EPA were to consider including this information in the planned revised CAAPP permit, other relevant considerations would need to be taken into account such as: 1) the quality and source of the information, 2) whether the facts are disputable, 3) any defenses available to the source and 4) the nature of any disputed legal arguments. These factors may not be readily discernable at this early stage and would need to be considered within the constraints of the CAAPP permitting process. Section 39.5 of the Act and 40 CFR Part 70 do not contemplate this type of judicial review in the context of CAAPP or Title V permitting and do not provide the requisite authority to proceed with such

investigation. As such, Illinois EPA must consider the potential impact that enforcement and permitting have on one another. Where there is a pending or active enforcement case at the same time as a permitting action, the source and the State of Illinois or United States could easily find themselves litigating the same matters in different venues with the risk of different and conflicting results.

Therefore, while nothing in the Act would expressly prohibit the Illinois EPA from including a compliance schedule in an initial permit or a renewal or a permit for the issues generally addressed in the current enforcement cases, as discussed above, an initial question that presents itself is whether the inclusion of a compliance schedule is mandatory, particularly when such information is available before the matter has been adjudicated and required actions to achieve compliance have yet to be resolved between the source and the enforcement authority. USEPA has stated, in a number of petition responses regarding this topic of discretionary versus mandatory compliance schedules, it is entirely appropriate for the permitting authority to allow an enforcement case to take its course and to wait to see whether an order results. At that time, the Title V permit may be reopened to include a compliance schedule.

For the VN issued by the Illinois EPA on November 20, 2012, there is an additional subject that must be considered for the alleged violations of the NOx and VOM limits for the EOF ESP. On January 31, 2013, the Illinois EPA received a proposed compliance schedule from US Steel for these violations. However, the Illinois EPA is not required to include this compliance schedule proposed by US Steel in the planned revised permit because it was not considered by USEPA in its action on a petition to object. The scope of the present permit proceeding is narrow. As set forth in the CAAPP, if a petition objecting to a CAAPP permit is granted by USEPA after the permit has already been issued, the Illinois EPA is authorized to revise the CAAPP permit in response to USEPA's order. See generally, Section 39.5(9)(e)-(g) of the Act. These provisions do not require a source to submit an appropriate, complete application as would be required under Section 39.5(5)(d) for the Illinois EPA to issue a new or revised CAAPP permit in circumstances where the Illinois EPA is not responding to a USEPA order. Indeed, Section 39.5(9)(g) specifically provides that a source will not be in violation of the requirement to have submitted a timely and complete application when the Illinois EPA is acting in response to a USEPA's objection.[1]

In addition, the proposed compliance schedule submitted by US Steel addressed violations that are at an early stage in the larger enforcement process of determining whether a violation has, in fact, occurred. As discussed above, additional exchanges that are part of Illinois' Section 31 process have yet to occur. US Steel has not yet had an opportunity to submit additional information in rebuttal to the alleged violations consistent with Section 31. Only after gathering such additional information will the Illinois EPA be able to weigh the quality of the information, disputed facts, any defenses available to the source and the nature of any disputed legal arguments.

Based on all the foregoing, it is the Illinois EPA's preliminary decision to wait until the enforcement cases identified above have been resolved and/or adjudicated before including any compliance schedule in a CAAPP permit for the

[1] This is likely due to the time constraints facing a permitting authority when seeking to revise a permit to comply with a USEPA order. While the CAAPP does not set a time-frame for making such revisions, federal requirements provide that a permitting authority must act within 90 days to address a USEPA order that grants a petition for review.

facility. In the meantime, Condition 5.1.4 would remain in the planned revised CAAPP permit, which provides that any permit shield or the revised CAAPP permit, itself, may not be used as a defense during any enforcement proceedings and that the requirements of any compliance schedule will be complied with at the appropriate time.

With respect to US Steel's recently submitted compliance schedule, the Illinois EPA intends to initiate the processing of US Steel's proposed compliance schedule as a significant modification to the CAAPP permit, in accordance with Section 39.5(14)(c)of the Act. That permitting action would potentially involve the incorporation of a yet-to-be finalized compliance schedule that would address violations of certain emission limits for the BOF. As provided by the Act, the CAAPP's procedures for significant modification must by used for "applications requesting significant modifications and for those applications that do not qualify as either minor modifications or as administrative permit amendments." A modification of a permit to include a compliance schedule would commonly be considered "significant." Section 39.5(14)(c)(i) and (ii) of the Act. As a significant modification, the modification of the CAAPP permit would be subject to requirements for public participation followed by review by USEPA in accordance with Sections 39.5(8)(a) and (9) of the Act rather than a 10-day comment period as provided for by Section 39.5(9)(g) of the Act.

III. Periodic Monitoring to Ensure Compliance with Certain Emission Limits

USEPA Order

In Section I.B-D of its Second Order, the USEPA found that the Periodic Monitoring Requirements in the current CAAPP permit for certain emission limits in the permit are inadequate. Most critically, the USEPA found that these requirements were deficient because they were not preceded by preparation of a listing of the emission factors that US Steel would initially use to determine compliance with the subject limits, with supporting information available, which would enable the public and USEPA to provide meaningful comments on these emission factors. USEPA also found that the supporting explanation for this Periodic Monitoring provided by the Illinois EPA in the record for the current permit was insufficient.

As a consequence, USEPA instructed the Illinois EPA to correct these deficiencies in the permit and its development, as follows.

> The IEPA must determine and adequately support a mechanism to determine compliance with the applicable emission limits in Conditions 7.1.6(b)(i) - (iv), 7.4.6(b) - (f), 7.5.6 (c) - (g), and 7.6.6(a) - (e). IEPA must include in the permit itself the monitoring methodology for determining compliance with these limits. If using emission factors, IEPA must propose the actual emission factors in the permit or supporting permit record, and provide supporting documentation for the accuracy and appropriateness of those emission factors, such as historical source test data or other available information. If source test data are not readily available for a specific emission unit, as IEPA asserts, other sources of emission factors (including published literature and material and energy balances) must be reviewed and cited for acceptable emission factors prior to issuing the permit.
>
> For the reasons provided above, I grant this claim and direct IEPA to specify in the permit and make available for public comment the emission factors or equations that USGM initially intends to use to demonstrate compliance with emission factor limits and maximum emission limits contained in the permit conditions identified by the Petitioner, including a clear explanation of how the emission factors will be used to determine compliance. IEPA should also specify in the permit and make available for public comment a provision on how the emission factors or equations will be updated as new emissions information becomes available for the affected operations. Alternatively, IEPA must specify an alternative periodic monitoring methodology in the permit that is adequate to demonstrate compliance with the permit limits cited by the Petitioner. Second Order, p. 12

The Illinois EPA is now proceeding as directed by USEPA in its Order, with the intent of issuing a revised permit that includes additional provisions, as required by the Order, related to the emission factors and the procedures that US Steel would use to demonstrate compliance with the subject emission limits.

Background

CAAPP permits must address emission limits set in preconstruction permits issued under regulations approved by USEPA in accordance with Title I of the

Clean Air Act (CAA) as such limits are considered "applicable requirements."[1] Preconstruction permits, commonly referred to in Illinois as construction permits, derive from the New Source Review ("NSR") permit programs required by Title I of the CAA. These programs include the two major NSR permit programs: 1) the Prevention of Significant Deterioration ("PSD") program,[2] and the nonattainment NSR program.[3] These programs also encompass state construction permit programs for projects that are not major.

The USEPA's Second Order addresses a number of emission limits that were carried over or incorporated into the CAAPP permit from Construction Permit/PSD Approval 95010001. This permit was initially issued in January 1996, to National Steel, the former owner of the Granite City Works. This permit addressed an expansion project that included increases in the production of iron from the two existing blast furnaces at this steel mill and an increase in the production of steel from the two existing BOP furnaces. The permit provided approval to undertake the project pursuant to state laws and rules governing construction and modification of sources of emissions, including the nonattainment NSR program and the PSD program.

To implement the major NSR permit programs, Illinois' construction permits must commonly include limits on the amounts of different pollutants emitted by the new or modified emission units that comprise the proposed projects addressed by the permits, defining their permitted emissions.[4] This is the case for Permit 95010001. As a general matter, the Periodic Monitoring required by the current CAAPP permit for limits on emissions established in Permit 95010001 would be provided by the Monitoring that would be required for the subject emission units related to applicable regulatory standards and other emission control requirements, together with specific recordkeeping related to their actual emissions. Emission factors would be used to determine actual emissions, with records required for the emissions factors[5] that are used to determine

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[1] See definition of applicable requirements in Section 39.5(1) of the Act.

[2] The federal PSD program, 40 CFR 52.21, applies in Illinois. The Illinois EPA administers PSD permitting for major projects in Illinois pursuant to a delegation agreement with USEPA.

[3] Illinois has a state nonattainment NSR program, Major Stationary Sources Construction and Modification ("MSSCM"), 35 IAC Part 203, pursuant to state rules, that have been approved by USEPA as part of Illinois' SIP.

[4] In Illinois' NSR permit program for non-major or "minor" projects, the amounts of pollutants that are permitted to be emitted or the "permitted emissions" from projects must be addressed during permitting. This is because the applicability thresholds for the major source NSR programs are based on annual emissions of proposed projects, in tons per year. Accordingly, construction permits for proposed projects commonly include emissions limits that establish or memorialize the permitted emissions of the various new and modified emission units that are involved in projects. These permitted emissions then serve in place of the "theoretical" potential emissions of a project when addressing NSR applicability.

Illinois' major NSR permits also have limits for the permitted emissions of the different units that comprise a project. Rather than addressing applicability of NSR, these limits serve to implement the substantive requirements of NSR, as the amount of emissions for which different emission units are permitted is a critical element of the analyses that must precede the issuance of a permit for a proposed major project.

[5] In this Statement of Basis, the term "emission factor" is generally used with its common meaning. That is, an "emission factor" is a set value for the mass of a pollutant emitted by a particular emission unit relative to the amount of material that is processed or handled by the unit, which value is generally representative of the operation and emissions of the unit.

emissions and for the "throughput" of the units (i.e., the amount of material handled by these units or hours of operation).[1] Recordkeeping would also be required for the determination of the annual emissions, for comparison to the applicable permit limits for annual emissions. The Periodic Monitoring for the operation of the subject emission units as related to other applicable requirements would verify proper operation of the units and serve to confirm that established emission factors for such units are appropriately used to determine the amount of emissions. The presence of limits on the amount of emissions from such units generally does not necessitate additional or more frequent Monitoring for the operation of these units. As emissions of the units would be calculated using emission factors, the other information needed to determine actual emissions is their throughput or amount of material that is handled, with the actual emissions being the product of the applicable emission factor and the throughput or activity of a unit. The Periodic Monitoring specifically for permit limits on the amount of emissions would entail the necessary records for the throughput of the subject units. The Monitoring would also include recordkeeping for the calculated emissions, as needed for direct comparison to the established permit limits.

When emission factors are used to determine emissions, the critical element is the factors that are selected for use. The current CAAPP permit requires the Permittee to keep a file containing the emission factors that it uses to determine actual emissions for purposes of determining compliance with the subject permit limits. These records must also include the basis or supporting documentation for the selected factors. This assures that the selected emission factors are memorialized in writing, along with the factual basis for the emission factors. This makes the relevant supporting information available to the Illinois EPA personnel as well to the source's staff, both present and future, for their review and use. The current permit also accommodates changes to "established" factors by the source if new information may become available.[2] Changes to these "established" emission factors would also be required to be documented, with explanation and supporting data, and linked to a particular date.[3] A change to the established emission factor that the source uses would be mandatory, with adoption of a new established emission

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[1] For purposes of this discussion, an emission factor may also be a set value for the maximum hourly emission rate of a unit. In such case, the annual emissions would be determined from that emission rate and the actual operating hours of the unit.

[2] The emissions of the subject emission units cannot be determined by "material balance." For example, the emissions of sulfur dioxide (SO_2) from the units do not result from use of a fuel, where, absent add-on control equipment or the presence of sorbent material in the flue gas, SO_2 emissions can be calculated from the sulfur content and usage of fuel.

[3] The simplest example of circumstances in which an established emission factor must be reevaluated is the performance of emission testing for the emission unit that is subject to the permit limit. Other circumstances would include emission testing of similar emission units, as might occur either at the facility or at other units operated by US Steel, when testing at those other units was the basis of the current factor. Established emission factors would also have to be reevaluated if USEPA revises its *Compilation of Air Pollutant Emission Factors*, AP-42, and that document was the basis of the current factor.

[4] The date that the emission factor used for a particular unit is changed may be significant. A change in an emission factor can result from a change in an emission unit or associated control equipment or control practices, so that the new emission factor would supersede the former factor on the date when the underlying change to the unit was made. A change in an emission factor can also reflect the availability of new information and better data. In such case, a change to the emission factor may have implications for the emissions of the unit, especially if the former emission factor understated actual emissions of a unit.

factor, if it is determined that the current emission factor would understate actual emissions.[5]

This approach to Periodic Monitoring for the subject emission limits is dictated by the nature of the affected emission units and the available methodology to determine the actual emissions of these units. It is also consistent with the basis by which these limits were established in the underlying permit, as they were developed using emission factors. It is not feasible or practical to conduct direct monitoring of emissions to determine compliance with the subject permit limits nor would it be reasonable to do so even if feasible.[6] [7] This is particularly true as limits are established that address uncaptured emissions or fugitive PM, as defined by 35 IAC 211.2450, such as the limits established for the roof monitor of the BOF shop. Stacks are not present as are essential for instrumental emissions monitoring. Fugitive PM emissions are routinely determined using established emission factors. Proper operation of these units and their associated control devices can be readily verified by much simpler methods. In addition, the permit limits for emissions of PM and other pollutants were generally developed from data that was considered to represent the emission rate or emission factor that would be present when a unit and its associated control measures would be operating properly.

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[5] A particular emission factor would understate actual emissions if the actual emissions would in reality be greater than would be calculated using such factor. For example, consider a unit that processes 5,000 tons of material annually. The actual or "true" emission rate of the unit, as measured by properly conducted testing, which testing continues to be representative of the operation of the unit, is 0.25 pounds/ton. If a higher emission factor, e.g., 0.40 pounds/ton, were used to calculate actual emissions for the purpose of determining whether this unit complies with a subject limit, the use of such factor would be acceptable. This is because the result would not understate actual emissions. Using a factor 0.40 pounds/ton, the calculated annual emissions would be 1.0 ton (5,000 tons x 0.40 lb/tons ÷ 2,000 lbs/ton = 1.0 ton). This is greater than the "true" emissions that would be calculated with the emission rate measured by testing, 0.625 tons (5,000 tons x 0.25 lb/tons ÷ 2,000 lbs/ton = 0.625 tons). However, the use of an emission factor that is lower than the measured rate, e.g., 0.20 pounds/ton, would understate actual emissions of this unit. The emissions calculated using a factor of 0.20 pounds/ton would be only 0.50 tons. Since this factor would understate the actual emissions of the unit, the use of such a factor would not be appropriate.

[6] The relevant criterion for a mandatory change to an established emission factor is if the factor understates actual emissions. The permit would not preclude use of emission factors that overstate actual emission factors. In particular, the source need not adjust the established emission factor after every emission test if the established emission factor has conservatively been set at a level above all the test results, e.g., at the level of the applicable emission standard.

[7] Monitoring for the mass of emissions (e.g., emissions in pounds per hour), as needed to determine compliance with emission limits set by construction permits, is more complicated than emissions monitoring. It entails not only measuring the concentration of a pollutant or loading in the exhaust but also monitoring for the flow rate of the units, as needed to determine the mass of emissions of a pollutant.

[8] As stacks are present on units that are subject to limits, technologies and procedures have not been developed for the use of continuous PM emissions monitoring systems on those units. As a technical matter, an essential prerequisite for any such PM monitoring, which is not yet satisfied for continuous PM monitoring, would be a demonstration that available monitoring technologies can be operated and maintained to provide reliable information on PM emissions when applied to the exhaust of the unit. Moreover, even if continuous PM monitoring were feasible, the effort entailed in applying current continuous PM monitoring methods, which have been developed for use on large coal-fuel fired boilers, to the subject emission units would be excessive.

As such, it is appropriate for the Periodic Monitoring for these permit limits on emissions to focus and rely upon the monitoring to verify proper operation of units and their control equipment. This is provided by the Periodic monitoring that would be provided for the regulatory emission standards and other control requirements that apply to the units. This Monitoring would require appropriate combinations of inspections, observations, emission testing and recordkeeping to verify the proper operation of different units as related to control of their emissions. As emission testing would be required as part of that Monitoring, it would also provide confirmation that the emission factors being used by the source to address emissions of a unit for purposes of emission limits are suitable and do not understate the actual emissions of the unit. This approach to Periodic Monitoring for emission units subject to permit limits on the amount of emissions, relying upon emission factors, production rates, and control efficiencies has previously been upheld by USEPA. See Order Responding to Petitioner's Request that the Administrator Object to Issuance of State Operating Permit, In the Matter of East Kentucky Power Cooperative, Inc. (USEPA, Dec. 14, 2009)[7] (where USEPA reasonably relied on emission factors along with recordkeeping to demonstrate compliance with emission limitations).[8]

It should also be clearly understood that certain subject limits pose particular concerns for Periodic Monitoring that that are not present when requirements are developed by rulemaking. This is because of the nature of NSR, which necessitates that construction permits set certain emission limits that are very different from emission standards that are established by rulemaking. Rulemakings are generally focused on regulating or controlling the emissions of particular pollutants from a particular category or categories of emission units. During rulemaking, the emission units that will actually be subject to regulation may be considered and the scope of regulation may be adjusted. The emission standards that are finally adopted will consider the nature of the emissions from the units, how they might appropriately be controlled and in what terms emission standards should be set.[9] By contrast, the scope of construction permits is set by the emission units that will comprise the particular projects and the provisions of the NSR program, which act to dictate that quantitative emission limits must be set for those units in the construction permits. Accordingly, because of the nature of construction permitting, certain terms and conditions in these permits may pose issues for Periodic Monitoring that are not present for applicable requirements that were developed by rulemaking. Construction permits must set limits for certain emission units for which testing of emissions is not feasible or impractical. Most significantly, limits must be set for certain emission units that lack

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[7] It should be recognized that this approach to the subject permit limits does not decouple the ongoing Monitoring for such limits from the actual operation of such units. This is because the appropriate emission factor used to determine actual emissions can differ based on how a unit is operated. For example, if the normal emission factor for a unit is predicated on control of PM emissions and the unit operates during a period when the capture system is damaged, it is appropriate for the emissions during such period to be calculated using a higher factor that accounts for the actual condition of the control system during such period.

For example, the NESHAP for Integrated Iron and Steel Manufacturing, 40 CFR §1 Subpart FFFF, regulates uncaptured emissions of particulate matter from units at BOF shops with standards that address the opacity of those emissions. This NESHAP does not set quantitative standards on the amounts or mass of particulate emissions, in pounds per ton of steel processed or the concentration of particulate in the exhaust, in gr/scf. This NESHAP also does not address emissions of pollutants other than particulate, such as NO_x or SO_x, from units at BOF shops.

stacks, for which it is not possible to obtain measurements of exhaust or air flow rates to measure the mass of emissions. Limits must also be set for uncaptured emissions from certain units, which bypass the stack, for which measurements of emissions are also not possible. Limits may also be set for certain units for which the emissions are negligible, either in absolute terms or relative to the emissions of the principal units and emission streams at a facility.

Planned Section I

The Illinois EPA must determine and adequately support a mechanism to determine compliance with the subject emission limits in the permit.

The use of "emissions factors" is generally an appropriate mechanism to address compliance with these emission limits. As already explained in the above discussion concerning the establishment of emission limits in construction permits, as a consequence of NSR, construction permits contain emission limits for emission units that do not have stacks. For these emission limits, direct measurement of emissions is not feasible. For emission units that do have stacks, construction permits also contain emission limits for which continuous compliance determination methods for emissions are neither feasible nor practical. In such circumstances, compliance with these emission limits set by the construction permit must be determined from values for actual emissions that are calculated using "appropriate" emission factors. For an emission factor to be appropriate, it must be representative of the actual operation and emissions of the unit whose emissions are being quantified. If source-specific emission testing is conducted for the unit, a "site-specific" emission factor must be used considering the results of that testing, instead of a "generic" emission factor, like the factors in USEPA's Compilation of Air Pollutant Emission Factors, AP-42. Since compliance is being determined with an emission limit, the emission factor that is being used must not understate the actual emissions of the unit. As further testing is conducted for a unit or other new information relevant to emissions of the unit becomes available, the emission factor that is being used for the unit must be reviewed to assure that it is appropriate and the factor updated if necessary.

The use of appropriate emission factors to determine compliance with permit limits on emissions in this manner is a well established practice. It does not act to shield an emission unit from other applicable requirements that apply to the unit. In particular, emission units must continue to comply with applicable emission standards and operational requirements, with proper operation and maintenance of units and their controls as necessary to comply with those requirements. The use of emission factors also does not preclude event-specific determinations of emissions for units as necessary because the established emission factors are not appropriate to address particular events. In this regard, the use of emission factors in this manner does not nor could it preclude the use of other credible evidence by the Illinois EPA or others to address US Steel's compliance with the subject limits. As related to use of emission factors to determine compliance with subject limits on emissions, it is significant that the Order has not suggested that use of emission factors in the manner set forth by the current CAAPP permit is not appropriate.[3] Rather, the Order identifies deficiencies in the procedures in the current permit that accompany the use of emission factors, as relevant to assuring that US Steel is

[3] It is also noteworthy that USEPA has not identified an alternative approach to these emission limits that would not rely on use of emission factors.

using appropriate emission factors and the roles of the Illinois EPA, USEPA and the public in these procedures.

Planned Action 2

The Illinois EPA must include in the permit itself the monitoring methodology for determining compliance with the subject limits. If emission factors, the Illinois EPA must propose the actual emission factors in the permit or supporting permit record and provide supporting documentation for the accuracy and appropriateness of those emission factors, such as historical source test data or other available information. If test data is not readily available for a specific emission unit, other sources of emission factors, including published literature, must be reviewed by the Illinois EPA and cited for acceptable emission factors prior to issuing the permit.

The revised CAAPP permit that the Illinois EPA now plans to issue would include the monitoring methodology for determining compliance with these emission limits, with additional enhancements to the methodology as directed by USEPA. (See new Condition 5.12 in the draft of the revised permit.) The record for the planned revision of the permit includes the documentation that currently supports the emission factors that US Steel is presently using to determine compliance with the subject limits. Emission testing that has been conducted for the affected units provides the support for the accuracy and appropriateness of many of the emission factors. For these limits, the relevant emission tests are identified in the record, along with the actual rate of emissions measured by the test. This testing generally shows that the actual emissions are well below the relevant emission factor.[1] The Illinois EPA has also reviewed available supporting data for emission factors for the specific emission units for which emission testing is not feasible or practical. The information supporting each emission factor is identified in the attachment to this Statement of Basis. Additional supporting information is included in the permit record for revision of the CAAPP permit that is now planned. For emission units for which emission testing is conducted, the relevant emission tests that have occurred are identified, along with the measured emission rates. For units for which testing is not conducted, the basis of the emission factor is provided, including a citation to relevant provisions of published documents.

Planned Action 3

The Illinois EPA must make available for public comment the emission factors that US Steel initially intends to use to demonstrate compliance with the subject emission limits.

The revised CAAPP permit that the Illinois EPA now plans to issue would include a listing of the emission factors that US Steel is currently using to determine compliance with the subject limits. (See new Attachment 3 in the draft of the revised CAAPP permit.

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[1] As previously discussed, emission testing conducted during 2012 pursuant to the current CAAPP permit showed annual rates of NOx and VOM emission from the EAF for the BOP furnaces that are greater than the rate of emissions in the permit and the emission factor that US Steel was using to determine compliance with the relevant limits for these pollutants. As a consequence, US Steel has submitted a proposed compliance scenario for these two limits, which the Illinois EPA will be processing as an application for a significant modification to the CAAPP permit for the Granite City Works, separate from the planned revision to the current CAAPP permit pursuant to USEPA's Consent Order.

Planned Action 4

The Illinois EPA must specify in the permit and make available for public comment a clear explanation of how the emission factors will be used to determine compliance.

The revised CAAPP permit that the Illinois EPA now plans to issue would include the required explanations in planned Condition 5.13, which would contain new procedures related to US Steel's use of emission factors to determine compliance with the subject emission limits. As the standard for an acceptable emission factor is that it not understate actual emissions, this would now be explicitly stated in planned Condition 5.13(a). As already explained, it is a fundamental aspect of these emission factors that they not understate actual emissions. This is because they are being used for the purpose of determining compliance with emission limits. The relevant recordkeeping provisions in the current CAAPP permit related to these emission factors already require that they not understate actual emissions.[7] However, it is appropriate for this requirement be reiterated in Condition 5.13(a) since Condition 5.13 would be added to the CAAPP permit generally dealing with US Steel's use of emission factors for the subject limits.[8]

Planned Condition 5.13(b) would explain how emission factors are to be used by US Steel to determine compliance with the applicable limits. Most importantly, the actual annual emissions of the subject emission units would be calculated using the relevant emission factors for comparison to the subject annual emission limits to determine compliance. However, if more refined calculations are needed to appropriately quantify the actual annual emissions of a unit, the calculation of the annual emissions of the unit would not be constrained to the use of a single emission factor. If US Steel has developed different factors for different modes of operation of an emission unit, the annual emissions of the unit would be determined as the sum of the emissions for each mode of operation. Also, if there are additional emissions that are not accounted for by the established emission factor(s), these "additional emission" must also be included in the calculation of actual emissions.[9] Thus, the established emission factors are merely a technique that US Steel must use to facilitate its calculation of annual emissions for purposes of determining compliance with the subject limits on annual emissions.

Planned Action 5

The Illinois EPA must specify in the permit and make available for public comment provisions setting forth how the emission factors will be updated as new information becomes available for the subject units.[10]

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[7] See Conditions 7.1.9(h)(i), 7.4.9(i)(i), 7.5.9(f)(i), and 7.6.9(c)(i).

[8] This provision will also further confirm that when US Steel is demonstrating compliance with one of the subject limits, it cannot simply "select whichever emission factor appears to demonstrate compliance," as erroneously suggested by USEPA in the Second Order.

[9] The occurrence of events that result in additional emissions, which are not adequately addressed by the relevant emission factors that have been established by USEPA, is already contemplated by the current CAAPP permit. The current CAAPP permit requires records for periods of events that would potentially be accompanied by such additional emissions, which records must also include estimates of the amount of such additional emissions during such periods. See Conditions 7.1.9(h)(ii), 7.4.9(i)(ii), 7.5.9(f)(ii) and (e), and 7.6.9(c)(ii).

[10] While the Second Order would also recommend use of "alternative periodic monitoring

The revised CAAPP permit that the Illinois EPA now plans to issue would include additional provisions required by the USEPA's Second Order. (See Conditions 5.13(c), (d) and (e) in the draft of the revised permit.)

Planned Condition 5.13(c) would address the actual review and update of emission factors by US Steel, specifically requiring US Steel to review the emission factors that it uses to determine compliance with the subject emission limits. For emission units with such limits for which emission testing is required to be conducted by the current permit, whenever such testing is conducted, US Steel would be required to review and, if necessary, update the relevant emission factors based on the results of such testing. Source-specific testing provides an authoritative statement of the actual emission rate of a particular unit. Accordingly, for the units for which testing is required to conducted, it is appropriate to only require US Steel to review and possibly update emission factors in conjunction with such testing. For those emission units with limits for which emission testing is not required to be conducted by this permit, US Steel would be required to review and, if necessary, update the relevant emission factors on at least an annual basis. This review would be required to consider new information that is relevent to the actual emissions of such units that has become available since the previous review, including revisions of USEPA's *Compilation of Air Pollutant Emission Factors*, AP-42, other information published by USEPA, information related to other emission units operated by US Steel, information presented in specific papers and reports concerning the steel industry, and other salient information. Since emission testing is not conducted for these units, which would provide authoritative confirmation of their actual emission rates, US Steel should be required to review the appropriateness of the factors for these units on a regular schedule, to consider new information that would necessitate any updates to such factors. It would be reasonable for such review to be conducted annually consistent with the timing of the annual compliance certification that US Steel must prepare and submit for the source under the CAAPP.

Reporting requirements related to US Steel's review and update of its emission factors would be addressed in planned Condition 5.13(d). Condition 5.13(d)(i) would refer back to Condition 5.9.6(c)(ii) of the current permit. Condition 5.9.6(c)(ii) already requires US Steel to submit copies of its revised records for emission factors to the Illinois EPA when these records are revised.[5] When the records for emission factors are actually revised by US Steel pursuant to the review that would be required by Condition 5.13(c), Condition 5.9.6(c)(ii) would require that the revised records that result be submitted to the Illinois EPA. As new Condition 5.13 would be added to the CAAPP permit generally dealing with US Steel's use of emission factors to determine compliance with the subject limits, it is appropriate that this existing reporting requirement in Condition 5.9.6(c)(ii) also be addressed in new Condition 5.13.

Planned Condition 5.13(d)(ii) would address another aspect of reporting for the reviews of emission factors that would be required by Condition 5.13(c). While

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methodologies" for the subject limits, which would not entail use of emission factors, the Illinois EPA is not proposing to include any such methodologies in the revised permit. As discussed, it is generally appropriate for compliance with the subject limits to be determined with emission factors, in the manner provided by the permit.

[5] Condition 5.9.6(c) was included in the current CAAPP permit in response to certain public comments when the permit was revised in May 2011. (See Comment/Response 37 in the *Response to Comments on the Planned Issuance of a Revised Clean Air Act Permit Program (CAAPP) Permit to U.S. Steel Corporation, Granite City Works*, Illinois EPA, May 3, 2011.

planned Condition 5.15(c) would require that US Steel conduct such reviews, these reviews would not necessarily always lead to updates to emission factors, so as to be followed by preparation and submittal of revised records to the Illinois EPA. Accordingly, Condition 5.15(d)(ii) would require US Steel to submit reports to the Illinois EPA related to these reviews. At a basic level, these reports would serve to provide positive confirmation that US Steel had conducted the required review of emission factors. In addition, these reports would also provide key information about the reviews that were conducted for the subject units and limits, including identification of any testing conducted during the previous year, or a description of new information that was considered, and the findings and conclusion of its review of such information.[1] These reports would also provide a summary of any updates to the relevant emission factors made by US Steel. The inclusion of this further information in the reports would be appropriate and reasonable as it will further facilitate, as well as simplify, the supervision of the use of emission factors by US Steel by the Illinois EPA and the potential involvement of the public in this process. This is especially true as the planned revised permit would now require US Steel to conduct an annual review for the emission factors that it is using. In this regard, it would be appropriate for these reports to be submitted annually, for the review conducted during the previous calendar year. The reports should also be submitted by the same date as the annual compliance certification, which also address operation and compliance of a source during the previous calendar year.

Planned Condition 5.15(e) would set forth a formal procedure to address potential circumstances in which US Steel should conduct further review of the particular emission factor(s) that it is using for certain limits. The planned condition would require US Steel to conduct such review within 45 days of written notification from the Illinois EPA or USEPA that such review is needed for particular emission factor(s). The circumstances under which US Steel would potentially need to conduct such additional review, as addressed in this planned condition, include inadequate documentation for the selected emission factor(s), inadequate explanation for updates to emission factor(s) in the reports for such updates, apparent failure to appropriately address a new mode of operation, and the need to consider other new information which appears pertinent to the emissions of a subject unit. This planned condition would respond to the concern, as generally expressed by USEPA in the Second Order, that the current CAAPP permit does not include adequate provisions for supervision by the Illinois EPA of US Steel's use of emission factors. It is not appropriate for the additional provisions related to emission factors in the CAAPP permit to require prior approval of emission factors by the Illinois EPA, since the permit would not provide US Steel with any permit shield in conjunction with the use of these factors.[2] However, it is appropriate for the revised permit to include procedural requirements that would facilitate supervision by the Illinois EPA, as well as by USEPA, of US Steel's use of emission factors. At a minimum, this is because the Act would not provide a mechanism to accomplish this other than by means of enforcement. The planned condition would provide a simpler and more direct mechanism to deal with the

[1] If the review for a particular unit would result in an update to the relevant emission factor, the detailed information for such update or revision to the emission factor should be provided in the internal records submitted to the Illinois EPA pursuant to Condition 5.5.4(c).

[2] In addition, USEPA has not suggested in the Order that it would be appropriate to provide any such shield, as would be required if the Illinois EPA were to specifically approve the emission factors that US Steel would use to determine compliance with the subject limits.

need for US Steel to conduct further review of certain emission factor(s) that it is using, when requested to do so by the Illinois EPA or USEPA. As such a mechanism would be established, it is appropriate for the planned condition to specify the circumstances in which it might be invoked. The planned condition lists the circumstances in which it is reasonable for US Steel to be required to conduct further review of particular emission factor(s).

IV. Provisions of the CAAPP Permit under State Rules for Startups and Malfunction/Breakdown Events

USEPA Order

In Section III of the Second Order, USEPA discussed ABC's allegations that the revised CAAPP permit issued in May 2011 continues to "pre-approve" US Steel's operation in excess of certain applicable emission standards. In this regard, it also addressed ABC's allegation that the Illinois EPA's interpretation in the Statement of Basis and Responsiveness Summary for the May 2011 permit relative to conditions for startup and malfunction/breakdown is not consistent with the terms of the actual permit and the relevant provisions of Illinois' State Implementation Plan (SIP).

As a preliminary matter, the Second Order found that the Illinois EPA appropriately explained that the sole determination made in advance of a malfunction/breakdown or startup event is whether a source requested permission to continue to operate during a malfunction/breakdown or startup event in its application, and that such authorization "does not shield the Permittee from enforcement for any such violation and only constitutes a prima facie defense to such enforcement action." USEPA agreed that the CAAPP permit conditions were consistently worded with the Illinois EPA's interpretation of its SIP.

Next, USEPA referred to ABC's claims that US Steel's application to continue operation during startup or malfunction/breakdown events did not comply with the Illinois SIP given it did not supply all the information required by the SIP. USEPA granted the petition on this issue finding that the Illinois EPA may not grant permission to US Steel to operate during a startup or malfunction/breakdown event absent an application from US Steel that includes all of the information required by Illinois SIP at 35 IAC 201.261 and 201.262.

In response to the Second Order, US Steel submitted additional information to the Illinois EPA to support its request for malfunction/breakdown and startup authorization consistent with the requirements of 35 IAC 201.261, Contents of Request for Permission to Operate During a Malfunction, Breakdown or Startup. Under 35 IAC 201.262, Standards for Granting Permission to Operate During a Malfunction, Breakdown or Startup, the standard for the Illinois EPA to grant continued operation during a malfunction or breakdown is that such continued operation is necessary to prevent injury to persons or severe damage to equipment. The standard for the Illinois EPA to grant continued operation during a startup event in violation of the standards or limitations is that all reasonable efforts have been made to minimize startup emissions, duration of individual startups and frequency of startups. The Illinois EPA has reviewed the information submitted by US Steel and has determined that applicable requirements would be satisfied. Accordingly, for the emission units that are the subject of US Steel's requests, the planned revised CAAPP permit would continue to authorize US Steel to make claims related to malfunction or breakdown and startup.

General Discussion

The Illinois EPA does not provide for "automatic exemptions" within CAAPP permits for operation with excess emissions during malfunction/breakdown or startups. As related to state emissions standards under the SIP, the conditions of the current CAAPP permit issued to US Steel regarding operation during periods of malfunction/breakdown and startup are consistent with the Illinois SIP and federal guidance on the subject of compliance during such

periods. An explanation of Illinois' SIP and permitting practice in this regard follows.

Section 201.149 of Illinois' SIP prohibits continued operation of an emission unit during malfunction or breakdown of the unit or associated air pollution control equipment, or startup of an emission unit or associated air pollution control equipment, if such operation would cause a violation of applicable emission standards or limitations absent express authorization in a permit. Further provisions pertaining to such authorizations are set forth in 35 IAC Part 201, Subpart I. These provisions make clear that the process in Illinois for addressing malfunction/breakdown and startup is in two steps. The first step, as set forth at 35 IAC 201.261, consists of seeking authorization by means of a permit application to prospectively make a claim related to malfunction/breakdown or startup. For malfunction/breakdown, the application shall include an explanation of why continued operation is necessary; the anticipated nature, source quantity and duration of emissions; and measures that will be taken to minimize the quantity and duration of emissions. For startup, the application shall include a description of the startup procedure, duration and frequencies of startups, type and quantity of emissions during startups, and efforts to minimize emissions, duration and frequency. These regulatory requirements are acknowledged by the CAAPP, pursuant to Section 39.5(5)(a) of the Act. Absent a request for authorization in an application for a CAAPP permit that satisfies both the requirements for application content and the standards for granting, and, after Illinois EPA review, an express grant of such authorization in a CAAPP permit issued by Illinois EPA, a CAAPP source cannot make a claim of malfunction/breakdown or startup under Illinois' rules.

The second phase of Illinois' process for operation with excess emissions during malfunction/breakdown or startup, as set forth at 35 IAC 201.262, addresses the showing that must be made in order to make a viable claim of malfunction/breakdown or startup. For malfunction/breakdown, this showing consists of a demonstration that operation was necessary to prevent injury to persons or severe damage to equipment, or was required to provide essential services. There are two elements to the required showing, "need" and "function". For startup, it shall consist of a demonstration that all reasonable efforts have been made to minimize emissions from the startup event, to minimize the duration of the event, and to minimize the frequency of such events. To a certain extent, this showing may be evaluated on past practice. However, this showing is also prospective, like the showing for malfunction/breakdown, as it relates to future events, which and whose exact circumstances are not known, and which, in fact, may not routinely occur.

Again, the Second Order found that US Steel did not meet the content requirements, as set forth in the Illinois SIP, in its request for authorization to continue operation during startup because startup emissions were not quantified. Although no specific deficiency was identified with respect to the separate requests for malfunction/breakdown, the Second Order appears to view the two sets of requests interchangeably, as the latter set was also deemed incomplete.[5] Rationalizing that any approval of the requests by Illinois EPA was contingent upon the "adequacy" of the content of those requests, USEPA found that the Illinois EPA erred in approving the requests and the resulting conditions of the CAAPP permit were therefore "flawed."

[5] The Second Order observes that the permittee did not include "anticipated quantities of emissions, among other things." (emphasis added). See, Second Order at page 35. However, this vague passage sheds little light on how US Steel allegedly failed to observe the content requirements in its requests related to malfunction/breakdown.

As a threshold matter, certain legal implications relating to the Second Order on this issue are of serious concern. The most problematic issue is the source of the legal authority through which the order suggests that part of the original CAAPP permit, issued on September 3, 2004, as it addressed continued operation during startup and malfunction or breakdown events under the Illinois' SIP is void. On the face of the order, the only purported basis for this action is an alleged SIP-related deficiency reflected in the underlying CAAPP application, which was deemed administratively complete by the Illinois EPA in 1996.

The premise of USEPA's argument suggests that the slightest inadequacy in a request for startup, breakdown or malfunction authorization, deprives the State permitting authority of its jurisdiction to approve the request and invalidates (or voids) any such approval reflected in a Title V permit, even though the SIP-based requirement is largely procedural in nature (i.e., application content) and intended only to facilitate the permit authority's review. This reasoning would appear both erroneous as a matter of law, which must necessarily involve the application of state law for any interpretative issue derived from the Illinois SIP, and overreaching with respect to USEPA's role in reviewing Title V permits.

If the content requirements of 35 IAC 201.261 are properly considered according to principles of statutory construction, the force of the language would likely be read as mandatory.[1] However, if these obligatory requirements are not met by a permit applicant, it is equally certain that subsequent agency action relating to the incomplete request would not be invalidated for that reason alone. Because the provision does not identify the consequences of noncompliance with its requirement, the Pollution Control Board and Illinois courts would likely construe this provision as being directory, not mandatory. As such, the Illinois EPA's approval of the request would not be considered jurisdictional (and therefore deemed void) on the basis of incompleteness. This result is consistent with thirty-year old judicial case precedent, which confirmed that the Illinois EPA does not lose jurisdiction under the Act to approve a permit notwithstanding that the application is incomplete under the Pollution Control Board's rules.[2] The framework of analysis set forth in the Second Order overlooks these basic, legal aspects of the issue.

Moreover, the nature of USEPA's review of the CAAPP permit seems strikingly at odds with this agency's oversight role established in the Clean Air Act.[3] For one thing, the scope of the Second Order appears to go well beyond an evaluation of whether a CAAPP permit for a particular source complies with the substantive requirements of the Title V program. In this instance, review has extended into the State's traditional province of SIP decision-making, which, for many sources, could have originated years ago in pre-Title V state construction or operating permits. That USEPA can assume this judicial role for SIP-based determinations under Title V is not readily apparent from the CAA,

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[1] Under the approach typical of most Illinois state courts, the use of the term "shall" would strongly suggest that the content requirements are to be properly construed as a command, imposing an obligation on the part of the applicant to submit the information as part of its relevant request(s).

[2] *White Fence Farm, Inc., v. Land and Lakes Company*, 424 N.E.2d 1370 (4th Dist. Ct. Appeals, 1981).

[3] The Illinois EPA does not question USEPA's Title V authority to generally oversee implementation of Title V permitting, including performing its separate duties of commenting on proposed permits or conducting quasi-judicial reviews of Title V permits challenged in the public petition process.

particularly given the framework of cooperative federalism upon which the latter is built.

Even if authority exists under Title V to warrant the scope of such intervention, the manner of USEPA's review failed to comport with the appropriate standard of review and neglected to justify its principal legal conclusion. To the extent that the Illinois EPA's permit decision-making involved the implementation of SIP-related requirements, or, similarly, reflected its technical expertise in the field of air pollution, USEPA should have reviewed the agency decision under a standard of abuse of discretion, instead of substituting its own judgment for that of the State permit authority. The Second Order also rests upon a legal premise that presumes too much, failing to take into account the differences in the broader factual requirements sought under 35 IAC 201.161 and the narrower legal criteria expressed in the standards for issuance under 35 IAC 201.262. It is not intuitively obvious that some of the more anecdotal information requested in 35 IAC 201.261 must serve as a factual predicate to every determination under 35 IAC 201.262.[1]

Notwithstanding the apparent legal flaws of the Second Order on this issue, US Steel has assisted the Illinois EPA in endeavoring to address the Second Order by providing further information to support its request. Specifically, for those emission units for which US Steel was provided malfunction/breakdown or startup authorization under Illinois' SIP, US Steel supplied additional information to supplement its prior requests related to malfunction/breakdown events and its prior requests related to startup. This provided the specific information required by the relevant state rules. Again for malfunction or breakdown, this information is an explanation of why continued operation is necessary; the anticipated nature, source, quantity and duration of emissions; and measures that will be taken to minimize the quantity and duration of emissions. For startup, it is a description of the startup procedure, the duration and frequency of startups, the type and quantity of emissions during startups, and efforts to minimize emissions, duration and frequency.

That the planned revised CAAPP permit would continue to allow US Steel to make claims related to malfunction/breakdown or startup would not equate to an "automatic exemption." Such authorizations would be fully consistent with long standing practice in Illinois for permitting and enforcement. Due to the size and complexity of certain emission units at the Granite City Works and the inability to simply shutdown equipment or the level of hazards associated with improper startup or shutdown of such units, the source may experience excess emissions due to events that cannot be readily anticipated or reasonably avoided. However, US Steel is also fully aware that it may be held accountable for any excess emissions that occur regardless of any such authorizations.

Neither the provisions in the SIP nor the provisions in the CAAPP permit delineating the elements for a viable claim of malfunction/breakdown or startup translate into any advanced determination on excess emissions. Rather, the regulations and the CAAPP permit provide a framework whereby US Steel may have an opportunity to make a claim related to malfunction/breakdown or startup, with the viability of such claim subject to specific review against the requisite requirements. Indeed, 35 IAC 201.265 directly states that violating

[1] The Second Order does not consider how the quantification of emissions is to be factored into or is relevant to the criteria for malfunction/breakdown authorization (i.e., personnel/equipment safety or essential service) or the minimization efforts that form the basis for the criterion governing startup authorization.

an applicable state standard even if consistent with any expression of authority regarding a malfunction/breakdown or startup set forth in a permit shall only constitute a prima facie defense to an enforcement action for such violation. The malfunction/breakdown or startup authorization that would be provided in the planned revised CAAPP permit would not shield US Steel from state emission standards that may be violated during such events. Rather, the source is subject to the applicable limitations and standards on any malfunction/breakdown or startup authorization as would continue to be included in the revised permit. As a result, any excess emissions during these events would constitute violations potentially subject to enforcement action.

Source-Specific Discussion for Malfunction/Breakdown

For the emission units that are the subject of US Steel's requests, the planned revised CAAPP permit would continue to provide authorization to US Steel to make claims of malfunction or breakdown. The Illinois EPA has reviewed the information submitted by US Steel to support its requests related to malfunction and breakdown considering the requirements of the applicable Illinois rules, which rules are part of Illinois' SIP.

As already discussed, for an emission unit for which such a request is made, 35 IAC 201.261 requires a source to submit information explaining why continued operation of the emission unit would be necessary during malfunction or breakdown events; the anticipated nature, source, quantity and duration of emissions; and measures that will be taken to minimize the quantity and duration of emissions from malfunction and breakdown. For each emission unit at the Granite City Works that is the subject of such a request,[1] US Steel has explained that authorization for a claim of malfunction or breakdown is necessary because continued operation during such events in certain circumstances would be required to prevent injury to personnel at the Granite City Works. US Steel has also explained that continued operation during such events would also be needed to prevent severe damage to equipment. US Steel also submitted information regarding the nature, sources, quantity and duration of emissions during malfunction and breakdown events. For this purpose, US Steel provided information for each subject emission unit relative to the specific state emission standards for which authorization to make a malfunction and breakdown claim has been requested. This information was necessarily general in nature, addressing "typical" and worst-case malfunction or breakdown events. This is because a malfunction or breakdown may involve a minor aspect of an emission unit, e.g., failure of particular component(s) or feature(s) of the unit, or a major aspect of an emission unit, e.g., failure of the fan in the control system of the unit. In addition, malfunction and breakdown events are by definition "unplanned" future events, so that the exact nature of these events, their effects on emissions and their duration cannot be specified. Concerning those measures that will be taken to minimize the quantity and duration of emissions for malfunctions and breakdowns, US Steel described the preventative measures that would be taken to avoid malfunction/breakdown events. These generally included preventative maintenance, keeping an inventory of spare parts, and standing contracts with service providers. Upon occurrence of a malfunction or breakdown event, US Steel committed to the use of overtime, expedited shipments of replacement parts where a spare may not be available, and the use of additional mobile equipment to expedite repairs.

[1] The subject emission units are the coke oven processes, the blast furnace processes, the basic oxygen processes and the ladle metallurgy furnace, and are boilers, for which malfunction and breakdown is addressed, respectively, in Conditions 7.2.5-5, 7.4.5-2(b)(i), 7.5.5-2(b)(i), 7.6.5-2(b)(i), 7.9.5-2(b)(i), and 7.10.3(j) of the current permit.

Based on the Illinois EPA's review of the information that has been provided, US Steel has satisfied the informational requirements of 35 IAC 201.261 related to malfunction and breakdown.

US Steel has submitted proof that continued operation of the subject units would be necessary to prevent injury to persons or severe damage to equipment, satisfying 35 IAC 201.262. In general, many of the subject emission units involve materials that are potentially dangerous, i.e., flammable coke oven gas and molten metal, which must be handled properly to prevent injury to operational personnel. These materials would present an immediate danger to these personnel if operation of the subject units did not continue during malfunction/breakdown events. This is because it would entail handling of these materials in a way that is inconsistent with the way that these units are designed to operate and safely handle these materials. The flow of material outside of the design process pathways would pose a direct hazard to personnel. The resulting consequences, e.g., the need to remove solidified metal from furnaces vessels and metal transport equipment and make repairs to such equipment, would pose a secondary threat of injury to personnel. For the boilers, the steam that is produced by the boilers is essential for maintaining the ongoing operation of the blast furnaces and certain other operations at the Granite City Works in a safe and proper manner. The integrated nature of the source means that any significant disruption in the major areas of the source, which would occur if the operations of the subject units did not continue operation during malfunction or breakdown, poses a threat of disruption in operation of other related areas of the source. This would then pose risks to the safety of personnel as normal operation of those other areas at the source is disrupted.

US Steel has also explained that continued operation during malfunction and breakdown events would be needed to prevent severe damage to equipment. Most obviously, continued operation is necessary to prevent molten material from solidifying in furnaces and transport vessels, with resulting damage to equipment. In the case of the processing of molten iron from the blast furnaces, ceasing operation and letting the metal solidify in a torpedo car would irreparably damage the car. Other examples of the severe damage that could occur if operation did not continue include damage to the brickwork in the coke ovens, rupture of gas collecting mains, damage to the blast air system and failure of refractory.

In summary, based on its review, the Illinois EPA has concluded that the regulatory requirements for granting US Steel authorization to make claims of malfunction and breakdown continue to be met. For the emission units that are the subject of US Steel's requests, the planned revised CAAPP permit would continue to provide authorization to US Steel to make claims of malfunction or breakdown.

Source-Specific Discussion for Startup

For the emission units that are the subject of US Steel's requests, the planned revised CAAPP permit would continue to provide authorization to US Steel to make claims related to startup. The Illinois EPA has carefully reviewed the information submitted by US Steel to support its requests related to startup considering the requirements of the applicable Illinois rules, which rules are part of Illinois' SIP.

As already discussed, for an emission unit for which such a request is made, 35 IAC 201.261 requires a source to submit information describing the startup

procedure, duration and frequency of startups, type and quantity of emissions during startups, and efforts to minimize emissions, duration and frequency of startups. For the emission units that are the subject of these requests,[5] US Steel has submitted this information. US Steel has provided a description of the startup procedures for the subject emission units. Startups of the units are planned in advance. Startups are conducted in accordance with established procedures that have been developed to safely bring units into normal operation. For the subject units, US Steel has also provided information on the duration and frequencies of startups and the type and quantity of emissions during startups. While the duration of a startup may vary based on the length of time that an emission unit has been out of service, the nature of maintenance and repairs that were conducted, and event-specific factors, a standard series of steps is followed during each startup to resume normal operation. For each emission unit at the Granite City Works that is subject to such a request, US Steel has also summarized information, as required by 35 IAC 201.261, describing its efforts to minimize emissions, duration and frequency of startups.[6] Based on the Illinois EPA's review of the information that has been provided related to startup, the Illinois EPA concludes that US Steel has satisfied the informational requirements of 35 IAC 201.261.

Consistent with 35 IAC 201.262, US Steel has affirmatively demonstrated that all reasonable efforts have been made and will be made to minimize startup emissions, duration of individual startups and frequency of startups. As such, the Illinois EPA has concluded that the regulatory standard for authorizing claims related to startups has been satisfied. For the different groups of subject units, the Illinois EPA's review relative to the provisions of 35 IAC 201.262 is discussed in further detail below.

Unit-Specific Discussion for Startup of Coke Oven Batteries

The frequency of startups of the coke oven batteries is minimized by US Steel. Startup of the coke oven batteries is a rare event because of the damage to the coke ovens that results when a battery is idled and then resumes operation. First, the cooling of the ovens, when they are idled, leads to damage to the refractory brickwork due to contraction. Steel components in parts of the ovens also suffer damage due to contraction and warping. Then, upon resumption of operation, the heating of the ovens causes further damage due to thermal expansion and warping. Once a coke oven battery is put into service, the preferred way of operating is to never idle the battery. US Steel has a substantial economic incentive to avoid the idling of coke oven batteries and their subsequently startup. Following idling of a coke oven battery, there are costs for the repairs for damage that must be conducted prior to and during the actual startup of a battery. Additional costs may also be present in the subsequent years of operation following resumption of operation after an idling event. The idling and restart of a battery may result in deterioration of the battery that only gradually appears, leading to the need for additional repairs and maintenance to the ovens to maintain them in proper condition. Given the consequences of idling a coke oven battery, US Steel's two coke oven batteries

[5] The subject emission units are the coke oven processes, the blast furnace processes, the casting furnaces in the hot strip mill and the boilers, for which startup is addressed, respectively, in Conditions 7.2.5-4, 7.4.5-4(b)(ii), 7.7.2(e) and 7.10.2(c) of the current permit.

[6] As related to the frequency of startups, US Steel has appropriately focused on the circumstances that lead to emission units being taken out of service. This is because outages of emission units are followed by startups, so that the frequency of startups is in practice determined by the frequency of outages.

at the Granite City Works are rarely idled. These batteries were last idled about three years ago, in late 2009 and early 2010, after operating for many years without ever being idled. When these batteries were idled, they were each idled for extended periods of time, with only a single startup for each battery when it was brought back into service.

The occurrence of excess emissions during startup of a coke oven battery is dictated by the inability to initially operate a coke oven battery in its normal configuration. Attempting to operate in a normal configuration would pose a significant threat to the safety of personnel and to the physical integrity of the gas collecting systems on the batteries. This is because the composition of the coke oven gas initially generated by the ovens would contain air so as to present a risk of explosion, rather than merely being flammable. In addition, a number of coking cycles are needed before the coking process in a battery is fully stabilized, with consistent temperatures and other operational conditions achieved in all of the ovens in the battery.

Emissions from startup will be minimized by appropriate measures. The procedures for startup of a coke oven battery provide for the gradual startup of a battery. Only a small number of ovens will be charged until collection of coke oven gas is initiated. Once this occurs, collection of coke oven gas from the initial ovens that are then charged will each only be delayed for short time to ensure that the level of air in the collected gas does not exceed a safe level. Startup emissions are also generally minimized by the maintenance and repair work performed prior to startup. Startup emissions are also minimized by other aspects of the startup procedures. For example, a battery will be brought as close to operating temperatures as possible by means of the underfire combustion system before coal is first charged to the battery. Emissions will also be minimized by appropriate staffing of the battery during startup, which, given the magnitude of the undertaking, necessarily involves the use of additional operating and maintenance personnel, including contract labor, and the presence of management and engineering staff to immediately address any problems as they arise. Necessary staff will initiate any and all appropriate corrective actions to reduce the magnitude and duration of excess emissions as practical. Additional equipment and supplies will also be staged as appropriate during startup. By employing extra staffing with overtime, maintaining a spare parts inventory and employing additional equipment such as cranes and other mobile equipment to expedite any necessary repairs, US Steel will also be prepared to address unforeseen developments that occur during a startup of a coke oven battery and to take appropriate actions to minimize the effect of those developments on the emissions that accompany startup of the battery.

US Steel has appropriately demonstrated for the coke oven batteries that all reasonable efforts will be made to minimize startup emissions, duration of individual startups and frequency of startups. As the regulatory standard for granting authorization to make claims of startup for the coke oven batteries continues to be met, the planned revised CAAPP permit would continue to authorize US Steel to make such claims.

Unit-Specific Discussion for Startup of Blast Furnace Processes

The frequency of startups of the blast furnaces is minimized by US Steel. Startup of a blast furnace is not a frequent event. This is because of the damage to a furnace that may result when a furnace is idled, the complexity of the startup of the furnace to bring a furnace back into production, and the interruption in routine operation of the blast furnace. US Steel has a

substantial incentive to continue operating the blast furnaces as it practical to do so. The cooling of the furnace leads to deterioration and possible damage of the refractory and other components of the furnace due to contraction. Once a blast furnace is put into service, the ideal way of operating would be to never idle the furnace, however, in practice it is necessary to periodically take blast furnaces out of service for inspections, maintenance and repair to facilitate continued safe, compliant and effective operation of the furnace, including certain regular inspections that are required as a condition of US Steel's insurance. In addition, low demand for steel will necessitate the idling of the blast furnaces if the demand for steel from the Granite City Works is below the level at which the furnaces are designed to safely and efficiently operate.

The occurrence of excess emissions during startups of the blast furnaces is a natural consequence of the design and operation of these furnaces. Until the furnace is brought up to normal operating temperature and pressures and the smelting process in the furnace is fully established, the furnace will not operate in a stable fashion. This must occur gradually. The rate at which a furnace can be brought up to normal operation is constrained by the need to let the physical structure of the furnace adjust to the increase in temperature and pressure. Otherwise, the stresses in various components of the furnace may cause damage to those components. It is also necessary to coordinate the operation of the various systems that are involved in the operation of the furnaces, including the stoves and blowers for the blast air and the charging systems for ore and flux. This also dictates a gradual startup, so that operational stability and control is maintained during startup. However, until the smelting process is fully established, such stable operation of the furnace at normal operating conditions, excess emissions may occur. These emissions may occur directly from the furnace, e.g., the relief vents on the furnace. Excess emissions also may occur indirectly, e.g., the normal separation of iron, slag and dissolved gases in the tapped material has not been completed, leading to the generation of additional emissions during tapping. These occurrences cannot be readily avoided during the startup of the furnace.

Emissions during startup of the blast furnaces are minimized by startup procedures that are designed to avoid the conditions that lead to excess emissions, as well as to provide the safe return of a furnace to normal service. Control equipment and control measures for the furnaces, including the control measures for tapping, are fully operational during startup. The furnaces are equipped with instrumentation to detect problems in the operation of the furnaces. This enables corrective measures to be promptly implemented. The regular preventative maintenance and repairs that US Steel conducts for the furnaces and their instrumentation facilitates consistent startups of the furnaces in accordance with established procedures.

US Steel has appropriately demonstrated for the blast furnace processes that all reasonable efforts will be made to minimize startup emissions, duration of individual startups and frequency of startups. As the regulatory standard for granting authorization to take claims of startup for these processes continues to be met, the planned revised CAAPP permit would continue to authorize US Steel to make such claims.

Unit-Specific Discussion for Startup of Hot Strip Mill (Reheat Furnaces)

The frequency of startups of the reheat furnaces is minimized by US Steel. While these furnaces are designed to be routinely taken in and out of service, each shutdown and subsequent cycle contributes to wear on a furnace. The

contraction and expansion that accompanies cooling and reheating of a furnace places stresses on the refractory and other components of the unit. Reheat furnaces, like those at the Granite City Works, are taken out of service when it is necessary or reasonable to do so. Reheat furnaces are taken out of service when they are not needed or cannot be efficiently operated to meet the production schedule of the rolling mill. These schedules are developed on a weekly basis. In circumstances when a reheat furnace would not be needed, continued operation of the furnace, without a shutdown and subsequent startup, would not act to minimize emissions, since the continued operation of the furnace with its associated emissions would be unnecessary. Reheat furnaces are also taken out of service to perform routine inspections, maintenance and repair and for other repairs that are necessary for the continued safe and proper functioning of the unit. While it is in US Steel's interest to manage outages for this purpose, reheat furnaces necessarily require relatively frequent maintenance, typically about every six weeks. This is because the furnaces heat heavy steel slabs to the elevated temperatures at which rolling is conducted. Heating is conducted in a series of zones to efficiently achieve a uniform temperature profile in each steel slab that is introduced into the furnaces. Regular maintenance is needed for the proper operation of the burners and combustion systems and the mechanisms that move the slabs through the furnace, as well as to repair refractory that has deteriorated or been damaged.

The occurrence of excess emissions during startups of the reheat furnaces at the Granite City Works is a natural consequence of the design of these units, even though only fired with gaseous fuels. Excess emissions occur during startup because the temperatures in these furnaces must be gradually increased or "ramped up" during startup. Excess emissions also occur during startup due to the inability of the burners in the furnaces to operate efficiently at the low firing rates that are present during startup. The rate at which these furnaces can be brought up to normal operation is constrained by the need to let the physical structure of the furnaces adjust to the increase in temperatures. Otherwise, the levels of thermal stress in the various components of a furnace may cause damage to those components. It is also necessary to coordinate the operation of the various burners in the different sections of these furnaces. This also dictates a gradual startup, so that operational stability is maintained during startup while the furnace transitions from initial operation to normal operation. Attempting to "immediately" begin operating a furnace within its design range for firing rate would pose a threat to the safety of personnel and to the physical integrity of the furnace. The physical integrity of the furnace would directly be put at risk. As the operational stability would be put at risk, an indirect threat would be posed to personnel and the furnace. The further consideration for the startup of these furnaces is that the burners in the furnaces are designed, appropriately, to function most effectively when they are operating in their normal operating range. It is inconsistent with such design for the burners to be as effective when operating below the normal range as necessarily occurs during startup of these furnaces. However, as already explained, operation below the normal operating range is inherent in the startup of these furnaces.

Emissions during startup of the reheat furnaces are minimized by startup procedures that facilitate good combustion during startup. In addition, the duration of startups is minimized by keeping as much heat as possible in the furnace after a shutdown. This acts to shorten the duration of the subsequent startup, also reducing the amount of fuel that must be fired during startup. Each furnace is equipped with appropriate operational instrumentation relative to combustion, including instrumentation for fuel flows, flame temperatures, tap temperature, and oxygen level in the exhaust. The operation of burners is

automatically adjusted to avoid loss of flame and flame safety trips, which would act to extend the duration of startup. Operation is also automatically adjusted to maintain good combustion. Transitions between fuels are staged to maintain stability of combustion in the furnace. Startup is overseen by operating personnel, who make adjustments to maintain proper combustion during startup. The regular preventative maintenance that US Steel conducts for the furnaces and their instrumentation facilitates consistent startups of the furnaces in accordance with established procedures.

US Steel has appropriately demonstrated for its reheat furnaces that all reasonable efforts will be made to minimize startup emissions, duration of individual startups and frequency of startups. As the regulatory standard for granting authorization to make claims of startup for these furnaces continues to be met, the planned revised CAAPP permit would continue to authorize US Steel to make such claims.

Unit-Specific Discussion for Startup of Boilers

The frequency of startups of boilers is minimized by US Steel. While boilers are designed to be routinely taken in and out of service, each shutdown and startup cycle contributes to wear on the boiler. While boilers do not operate at extreme temperatures, the contraction and expansion that accompanies cooling and reheating of a boiler places stresses on the refractory and other components of the boiler. Industrial boilers, like those at the Granite City Works, are taken out of service when it is necessary or reasonable to do so. Boilers are taken out of service to perform routine inspections, maintenance and repair and for other repairs that are necessary for the continued safe and proper functioning of a boiler. Boilers are also taken out of service when they are not needed or cannot be effectively or efficiently operated to meet the current steam requirements of the facility. In these circumstances, continued operation of the boiler, without a shutdown and subsequent startup, would not act to minimize emissions, since the continued operation of the boilers with its associated emissions would be unnecessary.

The occurrence of excess emissions during startups of the three boilers at the Granite City Works, is a natural consequence of the design of larger boilers, even when only fired with gaseous fuels. The boilers are fairly large, one having a design capacity of about 500 mmBtu/hr and the others each having a capacity of about 100 mmBtu/hr. Excess emissions occur during startup because the temperatures in and the load on the boilers must be gradually "ramped up" or increased during startup and because the burner systems in the boilers operate less efficiently at the low firing rates that are present during startup. The rate at which these boilers can be brought up to normal operation is constrained by the need to let the physical structure of the boiler adjust to the increase in temperatures. Otherwise, the levels of thermal stress in various components of the boiler may cause damage to those components. It is also necessary to coordinate the operation of the fuel, combustion air and feed water systems on a boiler. This also dictates a gradual startup. Operational stability must be maintained during startup while the boiler transitions from initial operation to normal operation, with firing of natural gas and coke oven gas and/or blast furnace gas. Attempting to "immediately" begin operating a boiler within its design range for firing rate and steam load would pose a significant threat to the safety of personnel and to the physical integrity of the boiler. The physical integrity of the boiler would directly be put at risk. As the operational stability would be put at risk, an indirect threat would be posed to personnel and the boiler. The further consideration for the startup of the boilers is that the combustion system in the boilers are designed,

appropriately, to function most effectively when a boiler is operating in its normal operating range. It follows that the burners will be less effective when operating below the normal range as necessarily occurs during startup of a boiler.[1] However, as already explained, operation below the normal operating range is inherent in the startup of a larger boiler.

Emissions during startup of the boilers are minimized by startup procedures that facilitate good combustion during startup. The boilers are equipped with instrumentation, including fuel flow meters, flame safeties, and oxygen meters, that enable good combustion to be maintained during startup. Startup is overseen by operating personnel, who make adjustments to maintain proper combustion during startup. The regular periodic maintenance for the boilers, including their instrumentation, facilitates consistent startups of the boilers in accordance with established procedures.

US Steel has appropriately demonstrated for the boilers that all reasonable efforts will be made to minimize startup emissions, duration of individual startups and frequency of startups. As the regulatory standard for granting authorization to make claims of startup for the boilers continues to be met, the planned revised CAPP permit would continue to authorize US Steel to make such claims.

[1] It is also not practical to have separate smaller burners for startup, which are efficient at such lower loads. It would still be necessary to transition from those burners to the main burners during startup and the presence of those burners would further complicate and likely prolong the startup of a boiler.

ATTACHMENT: EMISSION FACTORS AND SUPPORTING INFORMATION

Material Handling - Section 7.1

Permit Condition 7.1.6(b)(i) and 7.6.6(a) - Ladle Metallurgy Material Handling

	Pollutant: PM/PM$_{10}$
Emission Factor:	0.00235 lbs/ton of steel
Control Device:	Baghouse #1
Origin of EF:	Calculation from AP-42, Fourth Edition, Table 7.5.1, Iron and Steel Production, Page 13.2.4-4, Fugitive Uncontrolled emissions, with a 99.5% control efficiency. a. 50% of Hot Metal transfer factor (0.19), b. EAF Charging, tapping and slagging (1.4), c. Conveyors #4, 5 and 6 (0.0286).
Update Methodology:	Refer to Conditions 7.1.7(a), 7.1.9(f), 7.6.9(c), 5.9.6(c) and 5.13 of the permit.

Additional Emissions Testing:
This baghouse will be tested in the future whereby this emission factor will be reviewed and may be updated.

Permit Condition 7.1.6(b)(ii) - Basic Oxygen Furnace Additive System

	Pollutant: PM/PM$_{10}$
Emission Factor:	0.00032 lbs/ton of steel
Control Device:	Trackhopper Baghouse
Origin of EF:	Calculated from AP-42, Page 13.2.4-4, Fugitive uncontrolled emissions, with a 99.9% control efficiency.
Update Methodology:	Refer to Conditions 7.1.7(a), 7.1.9(f), 5.9.6(c) and 5.13 of the permit.

Additional Emissions Testing:
This baghouse will be tested in the future whereby this emission factor will be reviewed and may be updated.

Permit Condition 7.1.6(b)(iii) - Flux Conveyor Operations

	Pollutant: PM/PM$_{10}$
Emission Factor:	0.0016 lbs/ton of steel
Control Device:	Bin Floor Baghouse
Origin of EF:	Calculated from AP-42, Page 13.2.4-4, Fugitive controlled emissions with a 99.5% control efficiency.
Update Methodology:	Refer to Conditions 7.1.7(a), 7.1.9(f), 5.9.6(c) and 5.13 of the permit.

Additional Emissions Testing:
This baghouse will be tested at a point in the future whereby this emission factor will be reviewed and may be updated.

Material Handling - Section 7.1 (continued)

Permit Condition 7.1.6(b)(iv) - Iron Pellet Screening

	Pollutant: PM/PM-10
Emission Factor:	0.00279 lbs/ton of iron pellets
Origin of EF:	Calculation from AP-42, Page 13.2.4-4, Fugitive Uncontrolled emissions.
Update Methodology:	Refer to Conditions 7.1.9(i), 5.5.6(c) and 5.13 of the permit.

Iron Production - Section 7.4

Permit Condition 7.4.6(b) - Blast Furnace Casthouse Baghouse Exhaust

Pollutant: PM/PM

Emission Factor: 0.0703 lbs/ton of iron
Control Device: Casthouse Baghouse
Origin of EF: Calculated from AP-42, Table 7.5-1, Fourth Edition, Iron and Steel Production, with an overall 95% control efficiency.
Update Methodology: Refer to Conditions 7.4.7(a) and (c), 7.4.9(i), 5.9.6(c) and 5.13 of the permit.

Additional Emissions Testing:
January 2010 Emissions Testing, measured rate of 0.0041 lbs/ton iron.
March 2012 ICR Emissions Testing, measured rate of 0.0105 lbs/ton iron.

Pollutant: SO2

Emission Factor: 0.2006 lbs/ton of iron
Origin of EF: July 1993 Emissions Testing.
Update Methodology: Refer to Conditions 7.4.7(a) and (c), 7.4.9(i), 5.9.6(c) and 5.13 of the permit.

Additional Emissions Testing:
March 2012 ICR Emissions Testing, measured rate of 0.1903 lbs/ton iron.

Pollutant: NOx

Emission Factor: 0.0144 lbs/ton of iron
Origin of EF: July 1993 Emissions Testing.
Update Methodology: Refer to Conditions 7.4.7(a) and (c), 7.4.9(i), 5.9.6(c) and 5.13 of the permit.

Additional Emissions Testing:
This pollutant will be tested prior to the expiration of the permit whereby this emission factor will be reviewed and may be updated.

Pollutant: VOC

Emission Factor: 0.0946 lbs/ton of iron
Origin of EF: July 1993 Emissions Testing.
Update Methodology: Refer to Conditions 7.4.7(a) and (c), 7.4.9(i), 5.9.6(c) and 5.13 of the permit.

Additional Emissions Testing:
This pollutant will be tested prior to the expiration of the permit whereby this emission factor will be reviewed and may be updated.

Permit Condition 7.4.6(c) - Blast Furnace Uncaptured Emissions

Pollutant: PM

Emission Factor: 0.031 lbs/ton of iron
Origin of EF: Calculated from AP-42 Table 7.5-1, Fourth Edition, Iron and Steel Production, with a 95% capture efficiency and an adjustment factor for the presence of local hoods.
Update Methodology: Refer to Conditions 7.4.9(i), 5.9.6(c) and 5.13 of the permit.

Iron Production - Section 7.4 (continued)

	Pollutant: PM
Emission Factor:	0.0155 lbs/ton of Iron
Origin of EF:	Calculated from AP-42, Table 7.5-2, Fourth Edition, Iron and Steel Production, using PM_{10}/TSP ratio = 50 %.
Update Methodology:	Refer to Conditions 7.4.9(i), 5.9.6(c) and 5.13 of the permit.

	Pollutant: SO
Emission Factor:	0.0004 lbs/ton of Iron
Origin of EF:	July 1993 Emissions Testing on Casthouse baghouse, with a 95% capture efficiency.
Update Methodology:	Refer to Conditions 7.4.9(i), 5.9.6(c) and 5.13 of the permit.

	Pollutant: NO$_x$
Emission Factor:	0.0007 lbs/ton of Iron
Origin of EF:	July 1993 Emissions Testing on Casthouse baghouse, with a 95% capture efficiency.
Update Methodology:	Refer to Conditions 7.4.9(i), 5.9.6(c) and 5.13 of the permit.

	Pollutant: VOM
Emission Factor:	0.0047 lbs/ton of Iron
Origin of EF:	July 1993 Emissions Testing on Casthouse baghouse, with a 95% capture efficiency.
Update Methodology:	Refer to Conditions 7.4.9(i), 5.9.6(c) and 5.13 of the permit.

Permit Condition 7.4.6(d) - Blast Furnace Charging

	Pollutant: PM/PM$_{10}$
Emission Factor:	0.0024 lbs/ton of Iron pellets
Origin of EF:	AIRS Emissions Inventory, SCC #3-03-008-021.
Update Methodology:	Refer to Conditions 7.4.9(i), 5.9.6(c) and 5.13 of the permit.

Permit Condition 7.4.6(e) - Slag Pits

	Pollutant: PM/PM$_{10}$
Emission Factor:	0.00417 lbs/ton of iron
Origin of EF:	Calculated from EPA Assessment of Atmospheric Emissions from Quenching of Blast Furnace Slag. Also, AP-42, Table 13.2.4-4, Fugitive Uncontrolled emissions. Summation of the following emission factors: a. Slag Quenching = 0.0026 lbs/ton iron, b. Slag Digging = 0.00157 lbs/ton iron.
Update Methodology:	Refer to Conditions 7.4.9(i), 5.9.6(c) and 5.13 of the permit.

Iron Production - Section 7.4 (continued)

Pollutant: SO

Emission Factor:	0.01 lbs/ton of Iron
Origin of EF:	Calculated from EPA Assessment of Atmospheric Emissions from Quenching of Blast Furnace Slag.
Update Methodology:	Refer to Conditions 7.4.9(i), 5.5.6(c) and 5.13 of the permit.

Permit Condition 7.4.6(f) - Blast Furnace Iron Spout Baghouse Exhaust

Pollutant: PM/PM$_{10}$

Emission Factor:	0.02546 lbs/ton of Iron
Control Device:	Iron Spout Baghouse
Origin of EF:	Calculated from AP-42, Fourth Edition, Table 7.5-1, Iron and Steel Production, with an overall 98% capture efficiency.
Update Methodology:	Refer to Conditions 7.4.7(a) and (c), 7.4.9(i), 5.5.6(c) and 5.13 of the permit.

Additional Emissions Testing:
September 2009 Emissions Testing, measured rate of 0.00434 lbs/ton iron.
January 2010 Emissions Testing, measured rate of 0.00334 lbs/ton iron.
December 2010 Emissions Testing, measured rate of 0.00822 lbs/ton iron.
March 2012 ICR Emissions Test, measured rate of 0.00507 lbs/ton iron.

Pollutant: SO

Emission Factor:	0.0073 lbs/ton of Iron
Origin of EF:	July 1993 Emissions Testing.
Update Methodology:	Refer to Conditions 7.4.7(a) and (c), 7.4.9(i), 5.5.6(c) and 5.13 of the permit.

Additional Emissions Testing:
March 2012 ICR Emissions Test, measured rate of 0.0004 lbs/ton iron.

Steel Production - Section 7.5

Permit Condition 7.5.6(c) - Basic Oxygen Furnace ESP Exhaust

Pollutant: PM/PM

Emission Factor:	0.16 lbs/ton of steel
Control Device:	Electrostatic Precipitator
Origin of EF:	Average of March 1989, July 1990 and August 1993 Emissions Testing results.
Update Methodology:	Refer to Conditions 7.5.7(a) and (b), 7.5.9(f), 5.9.6(c) and 5.13 of the permit.

Additional Emissions Testing:
October 2009 Emissions Testing, measured rate of 0.0264 lbs/ton steel.
July 2012 Emissions Testing, measured rate of 0.035 lbs/ton steel.

Pollutant: NO$_x$

Emission Factor:	0.0389 lbs/ton of steel
Origin of EF:	August 1993 Emissions Testing.
Update Methodology:	Refer to Conditions 7.5.7(a) and (b), 7.5.9(f), 5.9.6(c) and 5.13 of the permit.

Additional Emissions Testing:
April 2012 Emissions Testing, measured rate of 0.1273 lbs/ton steel.

Pollutant: VOM

Emission Factor:	0.006 lbs/ton of steel
Origin of EF:	AIRS Emissions Inventory, SCC Codes 3-03-009-013, 3-03-009-016, 3-03-009-017 and 3-03-009-023.
Update Methodology:	Refer to Conditions 7.5.7(a) and (b), 7.5.9(f), 5.9.6(c) and 5.13 of the permit.

Additional Emissions Testing:
July 2012 Emissions Testing, measured rate of 0.0153 lbs/ton steel.

Pollutant: CO

Emission Factor:	8.993 lbs/ton of steel
Origin of EF:	August 1993 Emissions Testing.
Update Methodology:	Refer to Conditions 7.5.7(a) and (b), 7.5.9(f), 5.9.6(c) and 5.13 of the permit.

Additional Emissions Testing:
July 2012 Emissions Testing, measured rate of 3.761 lbs/ton steel.

Pollutant: Lead

Emission Factor:	0.1934 lbs/hour
Control Device:	Electrostatic Precipitator
Origin of EF:	AIRS Emissions Inventory, SCC Code 3-03-009-013 with a control efficiency of 99.9%.
Update Methodology:	Refer to Conditions 7.5.7(a) and (b), 7.5.9(f), 5.9.6(c) and 5.13 of the permit.

Additional Emissions Testing:
July 2012 Emissions Testing, measured rate of 0.0370 lbs/hour.

Steel Production - Section 7.5 (continued)

Permit Condition 7.5.6(d) - Basic Oxygen Furnace Roof Monitor

Pollutant: PM_{10}

Emission Factor:	0.066145 lbs/ton of steel
Origin of EF:	Calculated from AP-42, Fourth Edition, Table 7.5-1, Iron and Steel Production, with the following capture efficiencies: a. Charging = 95%, b. Refining = 99.9%, c. Tapping = 95%.
Update Methodology:	Refer to Conditions 7.5.9(f), 5.9.6(c) and 5.13 of the permit.

Pollutant: PM

Emission Factor:	0.0987 lbs/ton of steel
Origin of EF:	Calculated from AP-42, Fourth Edition, Table 7.5-1, Iron and Steel Production, as above using PM_{10}/TSP ratio = 67%.
Update Methodology:	Refer to Conditions 7.5.9(f), 5.9.6(c) and 5.13 of the permit.

Pollutant: Lead

Emission Factor:	0.0129 lbs/hour
Origin of EF:	AIRS Emissions Inventory, SCC Code 3-03-009-013, with a capture efficiency of 99.99%.
Update Methodology:	Refer to Conditions 7.5.9(f), 5.9.6(c) and 5.13 of the permit.

Permit Condition 7.5.6(e) - Desulfurization/Hot Metal Transfer Baghouse Exhaust

Pollutant: PM/PM_{10}

Emission Factor:	0.03721 lbs/ton of iron
Control Device:	Baghouse (Soda Ash)
Origin of EF:	Calculated from AP-42, Fourth Edition, Table 7.5-1, Iron and Steel Production, with an overall control efficiency of 96.6%.
Update Methodology:	Refer to Conditions 7.5.7(a) and (b), 7.5.9(f), 5.9.6(c) and 5.13 of the permit.

Additional Emissions Testing:
October 2009 Emissions Testing, measured rate of 0.0021 lbs/ton iron.
May 2012 MACT Emissions Testing, measured rate of 0.00127 lbs/ton iron.

Pollutant: VOM

Emission Factor:	0.001 lbs/ton of iron
Origin of EF:	AIRS Emissions Inventory, SCC Code 3-03-009-013.
Update Methodology:	Refer to Conditions 7.5.7(a) and (b), 7.5.9(f), 5.9.6(c) and 5.13 of the permit.

Additional Emissions Testing:
May 2012 MACT Emissions Testing, measured rate of 0.00057 lbs/ton iron.

Steel Production – Section 7.5 (continued)

	Pollutant: Lead
Emission Factor:	0.0123 lbs/hour
Control Device:	Zeeneose (Soda Ash)
Origin of EF:	AIDS Emissions Inventory, SCC Code 3-03-009-012, with AP overall control efficiency of 96.5%.
Update Methodology:	Refer to Conditions 7.5.7(a) and (b), 7.5.9(i), 5.9.6(c) and 5.13 of the permit.

Additional Emissions Testing:
May 2012 MACT Emissions Testing, measured rate of 0.00167 lbs/hour.

Permit Condition 7.5.6(f) – Slag Skimming Baghouse Exhaust

	Pollutant: PM/PM$_{10}$
Emission Factor:	0.005 lbs/ton of iron
Origin of EF:	Calculated from AP-42, Fourth Edition, Table 7.5-1, Iron and Steel Production, with a control efficiency of 97.5%.
Update Methodology:	Refer to Conditions 7.5.7(a) and (b), 7.5.9(i), 5.9.6(c) and 5.13 of the permit.

Additional Emissions Testing:
September 2009 Emissions Testing, measured rate of 0.00042 lbs/ton iron.
May 2012 MACT Emissions Testing, measured rate of 0.006 lbs/ton iron.
December 2012 Emissions Testing, measured rate of 0.0008 lbs/ton iron.

Permit Condition 7.5.6(g) – Argon Stir/LMF/Material Handling Baghouse Exhaust

	Pollutant: PM/PM$_{10}$
Emission Factor:	0.00715 lbs/ton of steel
Control Device:	Baghouse #2
Origin of EF:	Calculated from AP-42, Fourth Edition, Table 7.5-2, Electric Arc Furnace Melting and Refining, with a control efficiency of 99.9%.
Update Methodology:	Refer to Conditions 7.5.9(i), 5.9.6(c) and 5.13 of the permit.

Additional Emissions Testing:
October 2009 Emissions Testing, measured rate of 0.000388 lbs/ton steel.
May 2012 ICR Emissions Testing, measured rate of 0.000436 lbs/ton steel.

Continuous Casting - Section 7.6

Permit Condition 7.6.6(a) - Ladle Metallurgy Material Handling

Pollutant: PM/PM_{10}

Refer to the discussion for Permit Condition 7.1.6(b)(1).

Permit Condition 7.6.6(b) - Caster Molds

Pollutant: PM/PM10

Emission Factor:	0.006 lbs/ton of steel
Origin of EF:	Illinois EPA 1991 EIS PM/PM10 Report.
Update Methodology:	Refer to Conditions 7.6.9(c), 5.9.6(c) and 5.13 of the permit.

Pollutant: NO

Emission Factor:	0.06 lbs/ton of steel
Origin of EF:	AIRS Emissions Inventory, SCC Code 3-03-009-022.
Update Methodology:	Refer to Conditions 7.6.9(c), 5.9.6(c) and 5.13 of the permit.

Permit Condition 7.6.6(c) - Spray Chambers

Pollutant: PM/PM_{10}

Emission Factor:	0.00852 lbs/ton of steel
Origin of EF:	1981 Emissions Testing before a baghouse on this unit was removed (circa 1990), adjusted to not account for the baghouse based on 99.3% control efficiency.
Update Methodology:	Refer to Conditions 7.6.7(a), 7.6.9(c), 5.9.6(c) and 5.13 of the permit.

Permit Condition 7.6.6(d) - Slab Cutoff

Pollutant: PM/PM_{10}

Emission Factor:	0.0071 lbs/ton of steel
Origin of EF:	Illinois EPA 1991 EIS PM/PM_{10} Report.
Update Methodology:	Refer to Conditions 7.6.9(c), 5.9.6(c) and 5.13 of the permit.

Permit Condition 7.6.6(e) - Slab Ripping

Pollutant: PM/PM_{10}

Emission Factor:	0.00722 lbs/ton of steel
Origin of EF:	Illinois EPA 1991 EIS PM/PM10 Report.
Update Methodology:	Refer to Conditions 7.6.9(c), 5.9.6(c) and 5.13 of the permit.