

## Air Emission Summary

The air contaminant sources listed below comprise the Permit to Install for Wheeling Pittsburgh Steel located in Jefferson County. The sources listed below shall not exceed the emission limits/control requirements contained in the table. This condition in no way limits the applicability of any other state or federal regulations. Additionally, this condition does not limit the applicability of additional special terms and conditions of this permit.

<u>Ohio EPA Source #</u>	<u>Source ID/Description</u>	<u>BAT Determination</u>	<u>Applicable Federal and OACRules</u>	<u>Permit Allowable Mass Emissions and/or Control and Usage Requirements</u>
P905	Blast furnace #5, skip hoist, vents, bleeders, casthouse and dust catcher with 4500 tons/day (max) of molton iron production	*	3745-31-05 3745-17-07(A)** 3745-17-07(B)** 3745-17-08(B)** 3745-17-11** 3745-17-13 3745-15-06 3745-15-07 3745-18-06**	<u>#5 Casthouse***</u> PM: 5.63 lbs/hr and 22.99 tpy (fugitive); 1.86 lbs/hr and 8.14 tpy (baghouse) PM <sub>10</sub> : 2.87 lbs/hr and 11.73 tpy (fug.); 1.86 lbs/hr and 8.14 tpy (bags.) SO <sub>2</sub> : 0.65 tpy (fug.); 3.18 lbs/hr and 12.37 tpy (bags.) NO <sub>x</sub> : 1.15 tpy (fug.); 5.34 lbs/hr and 21.84 tpy (bags.) VOC: 2.79 lbs/hr and 10.85 tpy (bags.); 0.57 tpy (fug.) Pb: 0.002 lb/hr and 0.009 tpy (fug.); 0.0005 lb/hr and 0.002 tpy (bags.) <u>#5 Stove Stack</u> PM: 2.95 lbs/hr and 12.92 tpy PM <sub>10</sub> : 2.95 lbs/hr and 12.92 tpy SO <sub>2</sub> : 27.00 lb/hr and 118.26 tpy NO <sub>x</sub> : 76.1 lbs/hr and 333.31 tpy VOC: 0.15 lb/hr and 0.67 tpy CO: 46.50 lbs/hr and 203.68 tpy <u>#5 Blast furnace flare</u> PM: 1.63 lbs/hr and 7.14 tpy PM <sub>10</sub> : 1.63 lbs/hr and

7.14 tpy  
 NOx: 46.92 lbs/hr and  
 172.5 tpy  
 CO: 27.91 lbs/hr and  
 102.75 tpy  
 SO<sub>2</sub>: 27.84 lb/hr and  
 65.25 tpy  
Skip Car  
 PM/PM<sub>10</sub>:  
 0.36 lbs/hr and  
 1.47 tpy

\* Evacuated trough hood and cover for closing and casting furnace, tight runner covers and evacuated hood over tilting runner and openings into torpedo RR cars, evacuated sliding slag runner inside building, fabric filter, blast furnace gas flare, small bell and large bell charging, air curtain at iron trough and flame suppression at torpedo cars as needed. Daily hot metal production limit for blast furnaces number 1 and 5 (previously # 1, 3 and 5) shall not exceed 7,700 tons.

\*\* less stringent rules

\*\*\* based upon an estimated 95% capture rate

Summary  
 Total PTI Allowable Emissions

<u>Pollutant</u>	<u>Blast furnace # 5 Tons/year</u>	<u>Blast furnaces #1, #3 and #5 Tons/year</u>	<u>Project Net Increase/Decrease Tons/year</u>
PM	52.86		
PM <sub>10</sub>	39.93	73.76	(15.79)
SO <sub>2</sub>	77.64	401.49	15.74
NOx	507.55	802.89	5.33
VOC	12.09	28.94	13.8
CO	306.43	461.48	20.86
Pb	0.011		

### ADDITIONAL TERMS AND CONDITIONS

#### I. Emissions Limitations and Control Requirements

A. See Air Emission Summary section and the other terms of this permit for complete emissions limits, restrictions and control requirements, in addition to the following.

#### B. Visible Emission Limitation For Casthouse

- 1) For the emissions associated with the opening of a tap hole, twenty percent opacity as a three-minute average for not more than one three-minute period during any period of sixty consecutive minutes.
- 2) For the emissions associated with the closing of a tap hole, twenty percent opacity as a three-minute average for not more than one three-minute period during any period of sixty consecutive minutes.
- 3) For the emissions associated with changing of torpedo cars, twenty percent opacity as a one minute average for not more than one minute period during any period of sixty consecutive minutes.
- 4) Five percent opacity as a six-minute average at all other times.

#### C. Netting Summary

Combined new allowable for blast furnaces # 1, 3 and 5, based upon the production cap\*:

<u>Source</u>	<u>PM<sub>10</sub></u>	<u>SO<sub>2</sub></u>	<u>NO<sub>x</sub></u>	<u>CO</u>	<u>VOC</u>
stoves	24.48	299.96	588.23	358.73	
8.0					
casthouse furnaces	31.30	23.89	42.16	020.94	
flare	7.14	77.64	172.5	102.75	0
baghouse	8.14	0	0	0	0
skipcar	2.70	0	0	0	0
Emissions increases from other units involved in contemporaneous netting:					
<u>Source</u>	<u>PM<sub>10</sub></u>	<u>SO<sub>2</sub></u>	<u>NO<sub>x</sub></u>	<u>CO</u>	<u>VOC</u>
material handling	4.73				
south boilers	26.28				
other PTIs	1.92				
<b>Total:</b>	106.69	401.49		802.89	
461.48	28.94				
Past Actual					
(1993/1994):	122.48	385.75		797.56	
440.62	15.14	<b>Net Change:</b>	(15.79)	15.74	5.33
20.86	13.8				

\* Based on the worst case emissions scenario, with maximum production at the blast furnace with the highest emission rate and a hot metal production limit of 7700 tons/day from blast furnaces 1, 3 and 5 (# 1 furnace at 3,500 tons/day and #5 furnace at 4200 tons/day).

Originally, furnaces number one and number three were in operation when number five was rebuilt and began operation. Shortly after, number three furnace was idled. Furnaces number one and five constitute the worst-case operating scenario for emissions generation. The netting calculations give the same result for the scenario with all 3 furnaces, and numbers 1, 3 and 5 are required to comply with the operational restrictions of this permit to install, during the time period that the three furnaces were in operation. Number 3 furnace shall not be operated without first obtaining a permit modification or a new permit to install, whichever is required by Ohio EPA.

## II. Operational Restrictions

### A. Production Restrictions

The total, combined maximum daily production rate of hot metal for blast furnaces numbered 1, 3 and 5 shall not exceed seven thousand seven hundred net tons of metal per day.

### B. Flare Restriction

The excess blast furnace gas flare annualized flare capacity shall not exceed 15,000 MM cubic feet. A level of 163 mmBtu/hr is the new capacity of the flare, which now serves only unit #5. Blast furnace #3, which previously used this same flare, will not operate, therefore, the flare's capacity is reduced (as are PM<sub>10</sub>, NO<sub>x</sub>, SO<sub>2</sub> and CO emissions) due to the units it serves.

### C. Boiler Restriction

These boilers operate on oil, coke oven gas (COG), blast furnace gas (BFG) and natural gas (NG). The permittee shall maintain and operate the Steubenville South boilers such that the maximum fuel consumption shall not exceed the following amounts, over a rolling 12-month period:

- 1,491,000 gallons of fuel oil @ 0.65 Sulfur (or PM<sub>10</sub> emissions equivalent combination of gallons of oil and sulfur content)
- 1,900 million cubic feet of COG
- 27,430 million cubic feet of BFG
- 1,788.1 million cubic feet of NG

This restriction limits the emissions to 26.28 tons/year PM<sub>10</sub>, a net decrease of 15.69 tons/year PM<sub>10</sub> from past actual emissions for these boilers. These fuel usage amounts are based upon the following calculation:

$$(1,491,000 \text{ gallons of fuel oil/yr}) \times (7.87 \text{ lbs PM}_{10}/10^3\text{gal}) \times (1 \text{ ton}/2000 \text{ lbs}) +$$

$(1,900 \text{ million feet}^3 \text{ of COG/yr}) \times (6.48 \text{ lbs PM}_{10}/\text{mmcf}) \times (1 \text{ ton}/2000 \text{ lbs}) +$   
 $(27,430 \text{ mm feet}^3 \text{ of BFG/yr}) \times (0.0068 \text{ lbs PM}_{10}/\text{mmbtu}) \times (95 \text{ btu}/\text{cf}) \times (1 \text{ ton}/2000 \text{ lbs}) +$   
 $(1,788.1 \text{ mm cubic feet of NG/yr}) \times (6.2 \text{ lbs PM}_{10}/\text{mmcf}) \times (1 \text{ ton}/2000 \text{ lbs}) = 26.28 \text{ tpy PM}_{10}$

In order to ensure federal enforceability, for the first twelve calendar months of operations, the permittee shall not exceed the following fuel usage limits for the Steubenville South boilers as indicated for the specified time periods. The permittee shall be permitted to substitute cleaner burning gaseous fuels in place of fuel oil.

<u>MONTH</u>	<u>TOTAL ALLOWABLE USAGE</u>			
	<u>Fuel Oil (gal @ 0.65 % S)</u>	<u>COG (mmcf)</u>	<u>BFG (mmcf)</u>	<u>NG (mmcf)</u>
1-3	372,750	475	6,857.5	447.1
1-6	745,500	950	13,715.0	894.1
1-9	1,118,250	1425	20,572.5	1341.1
1-12	1,491,000	1,900	27,430.0	1788.1

After the first twelve months of operation, the permittee shall conform with limitations and reporting requirements of this condition.

D. The permittee shall maintain and employ the blast furnace number 1 (P911) stoves stacks such that allowable particulate matter emission rate for PM<sub>10</sub> does not exceed 0.012 lb/MM Btu.

E. Blast Furnace Fuel Use Limitation

The permittee shall limit the consumption of coke oven gas at the blast furnace number 1 stove to no more than 1500 MM cubic feet per rolling 12-month total. Blast furnace #5 will use no coke oven gas, therefore this restriction limits number 1 furnace to 100.69 tons/year SO<sub>2</sub>.

The permittee shall limit the consumption of natural gas at blast furnace numbered 1 and 5 stoves to no more than 5,000 MM cubic feet per 12-month rolling total. This restriction limits the combined VOC emissions to 8.0 ton/year VOC.

In order to ensure federal enforceability, for the first twelve calendar months of operations, the permittee shall not exceed the following usage limits for coke oven gas and natural gas for blast furnace stoves as indicated for the specified time periods.

<u>MONTH</u>	<u>TOTAL ALLOWABLE USAGE</u>	
	<u>#1 STOVE COKE OVEN GAS (mmcf)</u>	<u>#1 &amp; #5 STOVES NATURAL GAS (mmcf)</u>
1-3	375	1250
1-6	750	2500
1-9	1125	3750
1-12	1500.0	5000.0

After the first twelve months of operation, the permittee shall conform with limitations and reporting requirements of this condition.

F. Baghouse Operational Restrictions

The pressure drop across the baghouse shall be maintained within the range of 2-10 inches of water while the emissions unit is in operation. If a performance test demonstrating compliance shows another range to be satisfactory, then that range shall become the required pressure drop value.

G. Flare Pilot Flame Operational Restriction

A pilot flame shall be maintained at all times in the flare's pilot light burner.

III. Monitoring and Record keeping

- A. Beginning as soon as qualified observers can obtain certification or contracted with, but no later than thirty days after issuance of the permit, the permittee shall perform visible emission readings of the fugitive emissions from the casthouse roof monitor which is employed for blast furnace #5. The visible emission readings shall be performed by certified smoke readers in accordance with the procedures contained in paragraph (B)(1) of OAC Rule 3745-17-03.

Readings taken during one entire cast shall be performed at least once per calendar month and shall be recorded on forms which have been approved by the Director. Observations shall commence when tapping occurs.

- B. The permittee shall maintain daily records of the flare gas flow and provide quarterly reports within 30 days of the end of the quarter of all excursions of the limit.
- C. The permittee shall maintain daily records of the coke oven gas and natural gas consumed in the number 1 Blast furnace stoves, numbers 1 and 5 Blast furnace stoves combined, and total fuel amount of each fuel consumed at the south plant boilers.

The permittee shall maintain daily records of the following information:

- (a) The fuel usage rates (COG and NG) for furnace #1, and for furnaces #1 and #5 combined for each day.
- (b) The fuel usage rates (oil, COG, BFG and NG) for the south boilers for each day.
- (c) Beginning after the first 12 months of operation, the rolling, 12-month summation of the fuel usage rates.

Also, during the first 12 calendar months of operation, the permittee shall record the cumulative fuel usage rates for each calendar month.

D. Hydrogen Sulfide Monitor

The permittee shall operate and maintain existing equipment to continuously monitor

and record hydrogen sulfide concentration of the coke oven gas unit in units of the applicable standard. Such continuous monitoring and recording equipment shall comply with the requirements specified in 40 CFR Part 60.13.

The permittee shall maintain records of all data obtained by the continuous hydrogen sulfide monitoring system including, but not limited to parts per million hydrogen sulfide on an instantaneous (one-minute) basis, emissions of hydrogen sulfide in units of the applicable standard in the appropriate averaging period (e.g., hourly, hourly rolling, 3-hour, daily, 30-day rolling, annual, etc.), results of daily zero/span calibration checks, and magnitude of manual calibration adjustments.

Pursuant to OAC rules 3745-15-04, 3745-35-02, and ORC sections 3704.03(I) and 704.031 and 40 CFR Parts 60.7 and 60.13(h), the permittee shall submit reports within thirty (30) days following the end of each calendar quarter to the appropriate Ohio EPA District Office or local air agency. These reports shall contain the date, commencement and completion times, duration, instances of twelve hour average hydrogen sulfide emission rates in excess of the limitations specified in 40 CFR Part 60 or any limitations specified in the terms and conditions of this permit, and corrective actions taken (if any). These reports shall also contain the total hydrogen sulfide emissions for the calendar quarter (in tons).

E. Baghouse Pressure Drop Monitoring and Record keeping Requirements

The permittee shall properly install, operate, and maintain equipment to monitor the pressure drop across the baghouse while the emissions unit is in operation. The monitoring equipment shall be installed, calibrated, operated, and maintained in accordance with the manufacturer's recommendations, instructions, and operating manual(s). The permittee shall record the pressure drop across the baghouse on daily basis.

F. Flare Monitoring and Record keeping Requirements

The permittee shall properly install, operate, and maintain a device to continuously monitor the pilot flame when the emissions unit is in operation. The monitoring device and recorder shall be installed, calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

The permittee shall record the following information each day:

- (a) All periods during which there was no pilot flame.
- (b) The operating times for the flare, monitoring equipment, and the associated emissions unit.

G. Daily iron production estimates for each blast furnace cast and the total combined iron production for all operating blast furnaces shall be recorded and maintained. The daily estimates shall be reconciled on the following day with actual weigh records produced at the BOF reladle stations. Daily records shall be maintained for each

furnace and the total, combined production rate to document compliance with this production restriction. These records shall be maintained by the owner or operator for a period of not less than five years.

#### IV. Reporting Requirements

##### A. Molten Iron Production

On a quarterly basis, the permittee shall submit to the Ohio EPA field office the daily hot metal production for each furnace and the daily total hot metal production for all operating blast furnaces. Each quarterly report shall be submitted by the last day of the month following the calendar quarter and shall cover the previous calendar quarter.

##### B. Flare Gas

The permittee shall provide quarterly reports by the last day of the month following the end of the quarter, of all excursions of the flare gas flow limit.

##### C. Fuel Limitations

The permittee shall submit quarterly deviation (excursion) reports that identify all exceedences of the rolling, 365-day fuel usage rate limitations and, for the first 12 calendar months of operation, all exceedences of the maximum allowable cumulative fuel usage amounts, by the last day of the month following the end of the calendar quarter providing an indication of all exceedences of the oil and gas fuel consumption limits.

##### D. Hydrogen Sulfide

The permittee shall submit reports within thirty (30) days following the end of each calendar quarter to the appropriate Ohio EPA District Office or local air agency documenting any continuous hydrogen sulfide monitoring system downtime while the emissions unit was on-line (date, time, duration and reason) along with any corrective action(s) taken. The permittee shall provide the emissions unit operating time during the reporting period and the date, time, reason and corrective action(s) taken for each time period of source and control equipment malfunctions. The total operating time of the emissions unit and the total operating time of the analyzer while the emissions unit was on line shall be included in the quarterly report.

If there are no excess emissions during the calendar quarter, then the permittee shall submit a statement to that effect along with the emissions unit and monitor operating times. These quarterly excess emission reports shall be submitted by February 1, May 1, August 1, and November 1 of each year and shall address the data obtained during previous calendar quarters.

##### E. Baghouse Pressure Drop

The permittee shall submit pressure drop deviation (excursion) reports that identify all

periods of time during which the pressure drop across the baghouse did not comply with the allowable range specified above. These quarterly excursion emission reports shall be submitted by February 1, May 1, August 1, and November 1 of each year and shall address the data obtained during previous calendar quarters.

F. Visible Emission

On a quarterly basis, the permittee shall submit to the Ohio EPA field office the visible emission readings performed. Each report shall be submitted by the last day of the month following the calendar quarter, and shall cover the previous calendar quarter.

G. Flare Pilot Flame

The permittee shall submit deviation (excursion) reports that identify all periods during which the pilot flame was not functioning properly. The reports shall include the date, time, and duration of each such period. Each quarterly report shall be submitted to the Ohio EPA field office by the thirtieth day of the month following the calendar quarter and shall cover the previous calendar quarter.

V. Testing Requirements

A. Emissions Testing

The permittee shall conduct, or have conducted, emission testing for this blast furnace number 5 stove stack and casthouse fabric filter in accordance with the following requirements:

1. The emission testing shall be conducted every 2.5 years.
2. The emission testing shall be conducted to demonstrate compliance with the particulate emission limitation.
3. The following test method(s) shall be employed to demonstrate compliance with the allowable mass emission rate(s): Method 1-5 - if applicable. Alternative U.S. EPA approved test methods may be used with prior approval from the Ohio EPA.
4. The test(s) shall be conducted while the emissions unit is operating at or near its maximum capacity.
5. Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the appropriate Ohio EPA District Office or local air agency. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of the test(s), and the person(s) who will be conducting the test(s). Failure to submit such notification for review and approval prior to the test(s) may result in the Ohio EPA District Office's or local air agency's refusal to accept the results of the emission test(s).
6. Personnel from the appropriate Ohio EPA District Office or local air agency shall be

permitted to witness the test(s), examine the testing equipment, and acquire data and information necessary to ensure that the operation of the emissions unit and the testing procedures provide a valid characterization of the emissions from the emissions unit and/or the performance of the control equipment.

7. A comprehensive written report on the results of the emissions test(s) shall be signed by the person or persons responsible for the tests and submitted to the appropriate Ohio EPA District Office or local air agency within 30 days following completion of the test(s). The permittee may request additional time for the submittal of the written report, where warranted, with prior approval from the appropriate Ohio EPA District Office or local air agency.

B. Compliance with the pounds per hour and tons per year emission limitation(s) in Air Emissions Summary page of this permit to install shall be determined in accordance with the following method(s):

**Emission Limitation**

Cast house lbs/hr

**Applicable Compliance Method**

<b><u>Pollutant</u></b>	<b><u>Emission Factor lb/ton</u></b>	<b><u>Production ton/hr</u></b>	<b><u>Pounds per hour</u></b>
PM	0.6 @ 5% hood loss	187.5	5.63(fug.)
PM	9.9E-03	187.5	1.86(baghs.)
PM <sub>10</sub>	0.6 @5%hood loss *.51 particle size	187.5	2.87(fug.)
PM <sub>10</sub>	9.9E-03	187.5	1.86(baghs.)
SO <sub>2</sub>	1.7E-02	187.5	3.18(baghs.)
NOx	2.7E-02	187.5	5.34(baghs.)
VOC	1.3E-02	187.5	2.79(baghs.)
Pb	2.67E-04 @ 95% hood capt.	187.5	0.0005(baghs.)
Pb	2.67E-04 @ 5% hood loss	187.5	0.002(fug.)

SO<sub>2</sub> emission factor based on WPSC stack test (fugitive number based on 95% capture). VOC emission factor based on results of SO<sub>2</sub> stack test (fugitive number based on 95% capture). All other emission factors from AP-42. Emission factors for PM and PM<sub>10</sub> are multiplied by hood loss of 5%. Allowable=110% actual (baghouse PM, PM<sub>10</sub>). PM and PM<sub>10</sub> EF's based on 1995 stack test (baghouse). Lead from baghouse (99% efficient) dust concentration of 450 ppm (0.00045\*0.6=2.67 E-04 lb/ton) multiplied by hood loss of 5%/hood capture 95% . NOx emissions are based on 95% capture.

**Emission Limitation**

Cast house tons/year

**Applicable Compliance Method**

<b><u>Pollutant</u></b>	<b><u>Emission Factor lb/ton</u></b>	<b><u>Production ton/yr</u></b>	<b><u>Tons per year</u></b>
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PM	0.6 @ 5% hood loss		1,533,000	22.99(fug.)
PM	1.062E-02	1,533,000		8.14(baghs.)
PM <sub>10</sub>	0.6 @5%hood loss *.51 particle size		1,533,000	11.73(fug.)
PM <sub>10</sub>	1.062E-02	1,533,000		8.14(baghs.)
SO <sub>2</sub>	1.7E-02@95% hood capt.		1,533,000	12.37(baghs.)
SO <sub>2</sub>	1.7E-02@5% hood loss		1,533,000	0.65(fug.)
NOx	3.0E-02@95% hood capt.		1,533,000	21.84(baghs.)
NOx	3.0E-02@5% hood loss		1,533,000	1.15(fug.)
VOC	1.49E-02@95% hood capt.		1,533,000	10.85(baghs.)
VOC	1.49E-02@5% hood loss		1,533,000	0.57(fug.)
Pb	2.67E-04@95% hood capt.		1,533,000	0.002(baghs.)
Pb	2.67E-04@5% hood loss		1,533,000	0.009(fug.)

SO<sub>2</sub> emission factor based on WPSC stack test (fugitive number based on 95% capture). VOC emission factor based on results of SO<sub>2</sub> stack test (fugitive number based on 95% capture). All other emission factors from AP-42. Emission factors for PM and PM<sub>10</sub> are multiplied by hood loss of 5%. Allowable=110% actual (baghouse PM, PM<sub>10</sub>). PM and PM<sub>10</sub> EF's based on 1995 stack test(baghouse). Lead from baghouse (99%efficient) dust concentration of 450 ppm (0.00045\*0.6=2.67E-04 lb/ton) multiplied by hood loss of 5%/hood capture 95%. NOx emissions are based on 95% capture.

### Emission Limitation

Stove stack emission

### Applicable Compliance Method

	<u>EF</u>	<u>Units</u>	<u>hourly</u>	<u>units</u>	<u>lbs/hr</u>	<u>Tons/year</u>
<i>Blast furnace gas</i>						
PM	0.01	lb/MM Btu	295	MM Btu	2.95	12.92
PM <sub>10</sub>	0.01	lb/MM Btu	295	MM Btu	2.95	12.92
SO <sub>2</sub>	8.7	lb/MM CF	3.1	MM CF	26.97	118.13
NOx	23	lb/MM CF	3.1	MM CF	71.3	312.29
VOC	0	lb/MM CF	3.1	MM CF		
CO	13.7	lb/MM CF	3.1	MM CF	42.47	186.02
<i>Natural Gas</i>						
SO <sub>2</sub>	0.6	lb/MM CF	0.048	MM CF	0.03	0.13
NOx	100	lb/MM CF	0.048	MM CF	4.8	21.02
VOC	3.2	lb/MM CF	0.048	MM CF	0.15	0.67
CO	84	lb/MM CF	0.048	MM CF	4.03	17.66

The allowable is the total of natural gas and blast furnace gas, except for PM and PM<sub>10</sub>. EF's are from AP-42, with the exception of PM and PM<sub>10</sub>, which were based on 9/15/95 stack test. The permit allowable of 2.95 lb/hour PM and PM<sub>10</sub> is based upon 0.01 lb/MM Btu for the full rated capacity of the stoves (295 MM Btu/hr), as requested by the applicant.

**Emission Limitation**

Blast Furnace gas flare pounds per hour and tons per year.

**Applicable Compliance Method**

	<b><u>EF</u></b>	<b><u>Units</u></b>	<b><u>hourly</u></b>	<b><u>units</u></b>	<b><u>lbs/hr</u></b>	<b><u>Tons/year</u></b>
<i>Blast furnace gas</i>						
PM	0.01	lb/MM Btu	163	MM Btu	1.63	7.14
PM <sub>10</sub>	0.01	lb/MM Btu	163	MM Btu	1.63	7.14
NO <sub>x</sub>	23	lb/MM CF	2.04	MM CF	46.92	172.5
CO	13.7	lb/MM CF	2.04	MM CF	27.91	102.75
SO <sub>2</sub>	8.7	lb/MM CF	2.04	MM CF	27.84	65.25

EF's are from AP-42 with the exception of PM, PM10 and SO2 which are based on a 09/15/95 and 5/20/98 stack test respectively. Maximum hourly emissions rate based on hourly flare capacity of 163 mm Btu/hr divided by 80 Btu/cf=2.04 mm CF/hr. Annual emission rate based upon maximum of 15,000 MM CF blast furnace gas flared annually.

**Emission Limitation**

Skip car lbs/hr and ton/yr

**Applicable Compliance Method**

Allowable skip car emissions are determined by using the emission factor 0.001919 lb/ton of metal produced and multiplying by the appropriate time period and production rate. 4500 ton/day \* 0.001919 lb/ton \* 1day/24 hr= 0.36 lbs/hr; 4200 ton/day \* 0.001919 lb/ton \* 365 days/year \* 1 ton/2000 lbs= 1.47 ton/yr PM<sub>10</sub>.

- C. Compliance with the emission limitation(s) in Section I.B. of these terms and conditions shall be determined in accordance with the following method(s):

**Emission Limitation**

Percent opacity as a one, three and six minute average

**Applicable Compliance Method**

Compliance shall be determined by visible emission evaluations performed in accordance with OAC rule 3745-17-03(B)(4) and the appropriate averaging times using the methods and procedures specified in USEPA Method 9.

- D. Compliance with the emission limitation(s) in Section I.C. of these terms and conditions shall be determined in accordance with the following method(s):

**Emission Limitation**

Particulate matter (PM<sub>10</sub>)

### **Applicable Compliance Method**

1. Stoves allowable was determined as BF#1 at an annual capacity of 220 MM Btu/hr @ 0.012 #/MM Btu and BF#5 at a maximum capacity of 295 MM Btu/hr @ 0.010 #/MM Btu. Emissions are calculated as:  
 $(220 \times 0.012) + (295 \times 0.012) = 5.59 \text{ \#/hr or } 24.48 \text{ tpy PM10}$
2. Allowable casthouse emission for BF # 1 and BF#5  
BF# 1 = 146 tons/hr hot metal \* 0.6 #/tons \* 10% loss on flame suppression \* 0.51 particle size multiplier \* 8760/2000 or 19.57 tons/yr. BF # 5 = 175 tons/hr hot metal \* 0.6 #/ton \* 5% hood loss \* 0.51 particle size multiplier \* 8760/2000 or 11.73 tpy. Total of 31.3 ton/yr PM10.
3. BF flare has a maximum daily capacity of 307 MM Btu/hr. For purposes of the netting analysis, The permittee has agreed to an annualized capacity of 163 MM Btu/hr, which is consistent with their recent data. The allowable is selected as 0.010 #/MM Btu. The reduced allowable from 0.020 to 0.010 #/MM Btu reflects the improvement in the quality of blast furnace gas going to the flare due to the new gas cleaner on BF# 5. Allowable emissions are  $(163) \times 0.010 = 1.63 \text{ \#/hr or } 7.14 \text{ tons/year PM10}$ .
4. BF baghouse is @ 110% of actual  $(1.69 \text{ \#/hr} \times 8760/2000 \times 1.1)$  or 8.14 tpy PM10.
5. Allowable skip car emissions would be:  
BF # 5 = 4200 tpd \* (0.001919) #/ton \* 365/2000 = 1.47 tpy PM10.  
BF # 1 = 3500 tpd \* (0.001919) #/ton \* 365/2000 = 1.23 tpy PM10.

### **Emission Limitation**

Carbon monoxide

### **Applicable Compliance Method**

Allowable for BF #5 is based on a combination of BFG and NG combustion. BFG combustion is 3.1 MM CF/hr at 13.7 lbs/MM CF  $(3.1 \times 13.7) = 42.47 \text{ lbs/hr or } 186.02 \text{ tons/yr}$ . NG combustion is 0.048 MM CF/HR at 84 lbs/MM CF  $(0.067 \times 84) = 2.35 \text{ lbs/hr or } 17.66 \text{ tons per year}$ .

Allowable for BF # 1 is based on a combination of BFG and NG combustion. BFG combustion is 2.4 MM CF/hr at 13.7 lbs/MM CF  $(2.4 \times 13.7) = 32.88 \text{ lbs/hr or } 144.01 \text{ tpy}$ . NG combustion is 0.030 mmcf/hr \* 84 lbs/mmcf = 2.52 lbs/hr or 11.04 tpy CO. The total is 358.73 tons/year CO.

BF flare allowable is based on 163 MM Btu/hr annualized capacity.  $15000 \text{ MM CF/yr} \times 13.7 \text{ lbs/ MM CF divided } 2000 \text{ lbs/ton} = 102.75 \text{ tpy CO}$ .

## **Emission Limitation**

Nitrogen oxides

### **Applicable Compliance Method**

Allowable for BF # 5 is based on combination of BFG and NG combustion. BFG combustion is 3.1 MM CF/hr at 23 lbs/MM CF  $(3.1 * 23) = 71.3$  lbs/hr or 312.29 tpy. NG combustion is 0.048 MM CF/hr at 100 lbs/MM CF  $(0.048 * 100) = 4.80$  lbs/hr or 21.02 tpy.

Allowable for BF # 1 is based on combination of BFG and COG combustion. BFG combustion is 2.4 MM CF/hr at 23 lbs/MM CF  $(2.4 * 23) = 52.2$  lbs/hr or 241.78 tons/yr. NG combustion is 0.030 mmcf/hr \* 100 lbs/mmcf = 3.00 lbs/hr or 13.14 tpy NOx. The total is 588.23 ton/yr NOx.

Hot metal production was 5558 and 5521 tons per day in 1993 and 1994, respectively, for an average of 5539.5 tons per day. NOx emissions averaged 30.33 tons for that production. Ratio of production rate  $7700/5539.5 * 30.33 = 42.16$  NOx.

BFG flare allowable is based on a limit of flow to the flare of 15,000 MM CF. NO<sub>x</sub> emissions would be  $(15,000\text{MM CF/YR} * 23 \text{ lbs/MM CF}) = 172.5$  tpy NOx.

## **Emission Limitation**

Sulfur dioxide

### **Applicable Compliance Method**

Stove allowable was determined based on limiting blast furnace #1 coke oven gas to a maximum annual usage of 1,500 MM cubic feet per year.  $134.253 \text{ lb SO}_2/\text{MM CF} * 1500 \text{ MM CF /yr} = 100.69$  ton/yr SO<sub>2</sub>.

Blast furnace gas analysis of 5/2/98 found a sulfur content of 0.005% by volume. Stoves have a combined heat rating of  $(220+295)=515$  MM Btu/hr. For a full year, this would be  $515 \text{ MM Btu/hr} * 8760 \text{ hr/yr} = 4.511 \text{ E12 Btu/yr}$ . Coke oven gas would be limited to 1,500 MM cf/yr or 8.46 E11 Btu/yr, with emissions of 100.69 tons/yr. The remainder of energy will be supplied by blast furnace gas or 3.665 E12 Btu/yr, which is 4.581 E10 cf of BFG. An emission factor of 8.7 lb SO<sub>2</sub>/MM cf yields SO<sub>2</sub> emissions of 199.27 tons/yr. Total allowable SO<sub>2</sub> is  $100.69 + 199.27 = 299.96$  tons/yr.

Stack test of SO<sub>2</sub> emissions from the blast furnace # 5 baghouse on August 1, 1995 yielded an emission rate of 2.3 lbs/hour, which is approximately 0.016 lbs SO<sub>2</sub> per ton of hot metal. Approximately 95% of the emissions are captured, so the full (stack and fugitive) emissions factor is 0.017 pounds SO<sub>2</sub> per ton hot metal. The AIRS list is 3.0 lbs/ton. Calculations use the stack test value of 0.017 lbs/ton. Allowable is  $7700 \text{ tons per day} * 0.017 \text{ lb/t} * 365 * 1/2000 = 23.89$  tpy SO<sub>2</sub>.

Flare emission are calculated based on maximum heat release of 163 MM Btu/hr.  $163 \text{ MM Btu/hr} \div 80 \text{ Btu/cf} * 8.7 \text{ lbs SO}_2/\text{MM cf} * 8760 \text{ hr/yr} \div 2000 \text{ lbs/ton} = 77.64 \text{ t/yr}$ .

Total SO<sub>2</sub> emission are  $100.69+199.98+23.89+77.64=401.49$  tons per year

### **Emission Limitation**

Volatile organic compounds

### **Applicable Compliance Method**

Stove allowable was determined based on limiting natural gas to a maximum annual usage of 5,000 MM CF per year. The allowable would be  $5,000 \text{ MM CF} * 3.2 \text{ \#/MM CF} * 1/2000 = 8.0 \text{ tpy VOC}$ .

The VOC emission factor from AIRS was prorated in proportion to the SO<sub>2</sub> stack test AIRS emission factor to 0.0149 lb/per ton. Allowable is  $7700 \text{ tons/day} * 0.0149 \text{ \#/ton of hot metal} * 365 \text{ days/year} * 1/2000 = 20.94 \text{ tpy VOC}$ .

## VI. **Miscellaneous Requirements**

### A. **Continuous Hydrogen Sulfide Monitoring - Certified Systems Statement of Certification**

A statement of certification of the existing continuous hydrogen sulfide monitoring system shall be maintained on site and shall consist of a letter from the Ohio EPA detailing the results of an Agency review of certification tests and a statement by the Agency that the system is considered certified in accordance with the requirements of 40 CFR Part 60, Appendix B, Performance Specification 7. Proof of certification shall be made available to the Director (the appropriate Ohio EPA District Office or local air agency) upon request.