

**CONSTRUCTION PERMIT
OFFICE OF AIR MANAGEMENT**

**U.S. Steel - Gary Works
One North Broadway
Gary, Indiana 46402**

is hereby authorized to construct

- (a) hydrogen atmosphere batch annealing furnaces including three fixed burner bases and two movable heating hoods, with a total heat input capacity of 10.26 million British Thermal Units per hour;
- (b) one (1) plate mill heat treatment furnace with a maximum heat input capacity of 56.5 million British Thermal Units per hour.

This permit is issued to the above mentioned company (herein known as the Permittee) under the provisions of 326 IAC 2-1 and 40 CFR 52.780, with conditions listed on the attached pages.

Construction Permit No.: CP-089-8606-00121	
Issued by: Paul Dubenetzky, Branch Chief Office of Air Management	Issuance Date:

Construction Conditions

General Construction Conditions

1. That the data and information supplied with the application shall be considered part of this permit. Prior to any proposed change in construction which may affect allowable emissions, the change must be approved by the Office of Air Management (OAM).
2. That this permit to construct does not relieve the permittee of the responsibility to comply with the provisions of the Indiana Environmental Management Law (IC 13-11 through 13-20; 13-22 through 13-25; and 13-30), the Air Pollution Control Law (IC 13-17) and the rules promulgated thereunder, as well as other applicable local, state, and federal requirements.

Effective Date of the Permit

3. That pursuant to IC 13-15-5-3, this permit becomes effective upon its issuance.
4. That pursuant to 326 IAC 2-1-9(b)(Revocation of Permits), the Commissioner may revoke this permit if construction is not commenced within eighteen (18) months after receipt of this approval or if construction is suspended for a continuous period of one (1) year or more.
5. That notwithstanding Construction Condition No. 6, all requirements and conditions of this construction permit shall remain in effect unless modified in a manner consistent with procedures established for modifications of construction permits pursuant to 326 IAC 2 (Permit Review Rules).

First Time Operation Permit

6. That this document shall also become a first-time operation permit pursuant to 326 IAC 2-1-4 (Operating Permits) when, prior to start of operation, the following requirements are met:
 - (a) The attached affidavit of construction shall be submitted to the Office of Air Management (OAM), Permit Administration & Development Section, verifying that the facilities were constructed as proposed in the application. The facilities covered in the Construction Permit may begin operating on the date the Affidavit of Construction is postmarked or hand delivered to IDEM.
 - (b) If construction is completed in phases; i.e., the entire construction is not done continuously, a separate affidavit must be submitted for each phase of construction. Any permit conditions associated with operation start up dates such as stack testing for New Source Performance Standards (NSPS) shall be applicable to each individual phase.
 - (c) Permittee shall receive an Operation Permit Validation Letter from the Chief of the Permit Administration & Development Section and attach it to this document.
 - (d) The operation permit will be subject to annual operating permit fees pursuant to 326 IAC 2-1-7.1(Fees).

- (e) The Permittee has submitted their Part 70 permit on December 13, 1996 for the existing source. The equipment being reviewed under this permit shall be incorporated in the submitted Part 70 application.

Local Agency Requirement

7. That an application for an operation permit must be made ninety (90) days before start up to:

Gary Local Agency
Division of Air Pollution Control
504 Broadway, Suite 1012
Gary, Indiana 46402

and

IDEM/Northwest Indiana Office
Gainer Bank Building
504 North Broadway, Suite 418
Gary, Indiana 46402-1921

The operation permit issued by the Gary Local Agency shall contain as a minimum the conditions in the Operation Conditions section of this permit.

8. That when the facility is constructed and placed into operation the following operation conditions shall be met:

Operation Conditions

General Operation Conditions

1. That the data and information supplied in the application shall be considered part of this permit. Prior to any change in the operation which may result in an increase in allowable emissions exceeding those specified in 326 IAC 2-1-1 (Construction and Operating Permit Requirements), the change must be approved by the Office of Air Management (OAM).
2. That the permittee shall comply with the provisions of the Indiana Environmental Management Law (IC 13-11 through 13-20; 13-22 through 13-25; and 13-30), the Air Pollution Control Law (IC 13-17) and the rules promulgated thereunder.

Preventive Maintenance Plan

3. That pursuant to 326 IAC 1-6-3 (Preventive Maintenance Plans), the Permittee shall prepare and maintain a preventive maintenance plan, including the following information:
- (a) Identification of the individual(s) responsible for inspecting, maintaining, and repairing emission control devices.
- (b) A description of the items or conditions that will be inspected and the inspection schedule for said items or conditions.

- (c) Identification of the replacement parts which will be maintained in inventory for quick replacement.

The preventive maintenance plan shall be submitted to IDEM, OAM upon request and shall be subject to review and approval.

Transfer of Permit

4. That pursuant to 326 IAC 2-1-6 (Transfer of Permits):

- (a) In the event that ownership of this steel mill is changed, the Permittee shall notify OAM, Permit Branch, within thirty (30) days of the change. Notification shall include the date or proposed date of said change.
- (b) The written notification shall be sufficient to transfer the permit from the current owner to the new owner.
- (c) The OAM shall reserve the right to issue a new permit.

Permit Revocation

5. That pursuant to 326 IAC 2-1-9(a)(Revocation of Permits), this permit to construct and operate may be revoked for any of the following causes:

- (a) Violation of any conditions of this permit.
- (b) Failure to disclose all the relevant facts, or misrepresentation in obtaining this permit.
- (c) Changes in regulatory requirements that mandate either a temporary or permanent reduction of discharge of contaminants. However, the amendment of appropriate sections of this permit shall not require revocation of this permit.
- (d) Noncompliance with orders issued pursuant to 326 IAC 1-5 (Episode Alert Levels) to reduce emissions during an air pollution episode.
- (e) For any cause which establishes in the judgment of IDEM, the fact that continuance of this permit is not consistent with purposes of 326 IAC 2-1 (Permit Review Rules).

Availability of Permit

6. That pursuant to 326 IAC 2-1-3(l), the Permittee shall maintain the applicable permit on the premises of this source and shall make this permit available for inspection by the IDEM, Gary Local Agency, or IDEM Northwest Office or other public official having jurisdiction.

Emission Offset Minor Source Limit

7. That the input natural gas to the heat treatment furnace shall be limited to 140.5 million cubic feet per year, rolled on a daily basis. This production limitation is equivalent to NOx emissions of 12.3 tons per 365-day period, rolled on a daily basis. The input natural gas to the annealing furnaces shall be limited to 3.1 million cubic feet per month. This production limitation is equivalent to NOx emissions of 0.22 tons per month. Therefore, the Emission Offset rules, 326 IAC 2-3, will not apply.

During the first 365 days of operation, the input natural gas to the heat treatment furnace shall be limited such that the total usage divided by the accumulated days of operation shall not exceed 384,931 cubic feet per day.

The following table shows the NOx and VOC emissions increases due to modifications at Gary Works during the five-year period prior to and including 1997 (i.e. 1993 through 1997).

Pollutant	VOC (tons/year)	NOx (tons/year)
New Plate Mill Treatment Furnace	0.20	12.3
New South Sheet Mill Hydrogen Atmosphere Batch Annealing Furnaces	0.10	2.64
Previous No. 2 Q-BOP Shop Modification Project	0.098	5.80
New 84-inch Hot Strip Mill Sludge Dryer	23.62	2.56
Totals	24.02	23.3
Offset de minimis level	25	25

NOx and VOC emissions increases over the past 5 years are less than the de minimis levels of 25 tons per year, therefore, 326 IAC 2-3 (Emission Offset) does not apply.

Annual Emission Reporting

8. That pursuant to 326 IAC 2-6 (Emission Reporting), the Permittee must annually submit an emission statement for the source. This statement must be received by April 15 of each year and must comply with the minimum requirements specified in 326 IAC 2-6-4. The annual statement must be submitted to:

Indiana Department of Environmental Management
Data Support Section, Office of Air Management
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015

and

Gary Local Agency
Division of Air Pollution Control
504 Broadway, Suite 1012
Gary, Indiana 46402

and

IDEM/Northwest Indiana Office
Gainer Bank Building
504 North Broadway, Suite 418
Gary, Indiana 46402-1921

The annual emission statement covers the twelve (12) consecutive month time period starting December 1 and ending November 30.

Opacity Limitations

9. That pursuant to 326 IAC 5-1-2 (Visible Emission Limitations) except as provided in 326 IAC 5-1-3 (Temporary Exemptions), the visible emissions shall meet the following:
- (a) Visible emissions shall not exceed an average of 20% opacity in 24 consecutive readings.
 - (b) Visible emissions shall not exceed 60% opacity for more than a cumulative total of 15 minutes (60 readings) in a 6-hour period.

Reporting Requirements

10. That a log of information necessary to document compliance with operation permit condition no. 7 shall be maintained. These records shall be kept for at least the past 36 month period and made available upon request to the Office of Air Management (OAM).
- (a) A quarterly summary shall be submitted to:
- Indiana Department of Environmental Management
Compliance Data Section, Office of Air Management
100 North Senate Avenue, P.O. Box 6015
Indianapolis, Indiana 46206-6015
- and
- Gary Local Agency
Division of Air Pollution Control
504 Broadway, Suite 1012
Gary, Indiana 46402
- and
- IDEM/Northwest Indiana Office
Gainer Bank Building
504 North Broadway, Suite 418
Gary, Indiana 46402-1921
- within thirty (30) calendar days after the end of the quarter being reported in the format attached. These reports shall include the natural gas usage in the heat treatment furnace and the natural gas usage in the annealing furnaces.
- (b) Unless otherwise specified in this permit, any notice, report, or other submissions required by this permit shall be timely if:
- (i) Postmarked on or before the date it is due; or
- (ii) Delivered by any other method if it is received and stamped by IDEM, OAM and Gary Local Agency and IDEM Northwest Office, on or before the date it is due.
- (c) All instances of deviations from any requirements of this permit must be clearly identified in such reports.
- (d) Any corrective actions taken as a result of an exceedance of a limit, an excursion from the parametric values, or a malfunction that may have caused excess emissions must be clearly identified in such reports.
- (e) The first report shall cover the period commencing the postmarked submission date of the Affidavit of Construction.

- Open Burning
11. That the permittee shall not open burn any material except as provided in 326 IAC 4-1-3, 326 IAC 4-1-4 or 326 IAC 4-1-6.

- Emergency Reduction Plans
12. Pursuant to 326 IAC 1-5-2 (Emergency Reduction Plans; Submission):
- (a) The Permittee prepared and submitted written emergency reduction plans (ERPs) consistent with safe operating procedures on December 13, 1996.
 - (b) If the ERP is disapproved by IDEM, OAM, Gary Local Agency, or IDEM Northwest Office, the Permittee shall have an additional thirty (30) days to resolve the differences and submit an approvable ERP. If after this time, the Permittee does not submit an approvable ERP, IDEM, OAM, Gary Local Agency, or IDEM Northwest Office, shall supply such a plan.
 - (c) These ERPs shall state those actions that will be taken, when each episode level is declared, to reduce or eliminate emissions of the appropriate air pollutants.
 - (d) Said ERPs shall also identify the sources of air pollutants, the approximate amount of reduction of the pollutants, and a brief description of the manner in which the reduction will be achieved.
 - (e) Upon direct notification by IDEM, OAM, Gary Local Agency, or IDEM Northwest Office, that a specific air pollution episode level is in effect, the Permittee shall immediately put into effect the actions stipulated in the approved ERP for the appropriate level. [326 IAC 1-5-3]

Indiana Department of Environmental Management
Office of Air Management
and
Gary Local Agency
and
IDEM Northwest Office

Technical Support Document (TSD) for New Construction and Operation

Source Background and Description

Source Name: U.S. Steel - Gary Works
Source Location: One North Broadway, Gary, Indiana 46402
County: Lake
Construction Permit No.: CP-089-8606-00121
SIC Code: 3312
Permit Reviewer: Nisha Sizemore

The Office of Air Management (OAM) has reviewed an application from U.S. Steel - Gary Works relating to the construction and operation of annealing furnaces and a heat treat furnace, consisting of the following equipment:

- (a) hydrogen atmosphere batch annealing furnaces including three fixed burner bases and two movable heating hoods, with a total heat input capacity of 10.26 million British Thermal Units per hour;
- (b) one (1) plate mill heat treatment furnace with a maximum heat input capacity of 56.5 million British Thermal Units per hour.

Stack Summary

Stack ID	Operation	Height (feet)	Diameter (feet)	Flow Rate (acfm)	Temperature (°F)
S-1	heat treatment furnace	125	4.92	6970	870

Recommendation

The staff recommends to the Commissioner that the construction and operation be approved. This recommendation is based on the following facts and conditions:

Information, unless otherwise stated, used in this review was derived from the application and additional information submitted by the applicant.

A complete application for the purposes of this review was received on May 20, 1997.

Emissions Calculations

See Appendix A (Emissions Calculation Spreadsheets) for detailed calculations (4 pages).

Total Potential and Allowable Emissions

Indiana Permit Allowable Emissions Definition (after compliance with applicable rules, based on 8,760 hours of operation per year at rated capacity):

Pollutant	Potential Emissions (tons/year)
Particulate Matter (PM)	4.0
Particulate Matter (PM10)	4.0
Sulfur Dioxide (SO ₂)	0.1
Volatile Organic Compounds (VOC)	0.9
Carbon Monoxide (CO)	9.6
Nitrogen Oxides (NO _x)	39.1
Single Hazardous Air Pollutant (HAP)	0.00
Combination of HAPs	0.00

Allowable emissions (as defined in the Indiana Rule) of NO_x are greater than 25 tons per year. Therefore, pursuant to 326 IAC 2-1, Sections 1 and 3, a construction permit is required.

County Attainment Status

- (a) Volatile organic compounds (VOC) and oxides of nitrogen are precursors for the formation of ozone. Therefore, VOC and NO_x emissions are considered when evaluating the rule applicability relating to the ozone standards. Lake County has been designated as nonattainment for ozone. Therefore, VOC and NO_x emissions were reviewed pursuant to the requirements for Emission Offset, 326 IAC 2-3.

- (b) Lake County has been classified as nonattainment for TSP, PM10, CO, and SO₂. Therefore, these emissions were reviewed pursuant to the requirements for Emission Offset, 326 IAC 2-3.

Source Status

Existing Source PSD, Part 70 or FESOP Definition (emissions after controls, based on 8,760 hours of operation per year at rated capacity and/ or as otherwise limited):

Pollutant	Emissions (ton/yr)
PM	1680
PM10	1680
SO ₂	6150
VOC	4620
CO	1010
NO _x	4460

- (a) This existing source is a major stationary source because at least one pollutant is emitted at a rate of 100 tons per year or greater.
- (b) These emissions were based on the Facility Quick Look Report.

Proposed Modification

PTE from the proposed modification (based on 8,760 hours of operation per year at rated capacity including enforceable emission control and production limit, where applicable):

Pollutant	PM (ton/yr)	PM10 (ton/yr)	SO ₂ (ton/yr)	VOC (ton/yr)	CO (ton/yr)	NO _x (ton/yr)
Proposed Modification	1.2	1.2	0.0	0.3	2.9	14.9
PSD or Offset Significant Level	25	15	40	25	100	25

- (a) This modification to an existing major stationary source is not major because the emissions increase is less than the Emission Offset significant levels. Therefore, pursuant to 326 IAC 2-3, the Emission Offset requirements do not apply.
- (b) The NO_x emissions are limited to 14.9 tons per year, therefore, the Emission Offset requirements do not apply. This limit is equivalent to 11.4 million cubic feet of natural gas usage in the heat treatment furnace and 3.1 million cubic feet of natural gas usage in the annealing furnaces.

Part 70 Permit Determination

326 IAC 2-7 (Part 70 Permit Program)

This existing source has submitted their Part 70 (T-089-7663-00121) application on December 13, 1996. The equipment being reviewed under this permit shall be incorporated in the submitted Part 70 application.

Federal Rule Applicability

There are no New Source Performance Standards (326 IAC 12) and 40 CFR Part 63 applicable to this facility.

State Rule Applicability

326 IAC 2-6 (Emission Reporting)

This facility is subject to 326 IAC 2-6 (Emission Reporting), because the source emits more than 10 tons per year of VOC. Pursuant to this rule, the owner/operator of this facility must annually submit an emission statement of the facility. The annual statement must be received by April 15 of each year and must contain the minimum requirements as specified in 326 IAC 2-6-4.

326 IAC 2-3 (Emission Offset Minor Source Limit)

Pursuant to this rule, the input natural gas to the heat treatment furnace shall be limited to 11.4 million cubic feet per month. The input natural gas to the annealing furnaces shall be limited to 3.1 million cubic feet per month. These production limitations are equivalent to NOx emissions of 1.24 tons per month. Therefore, the Emission Offset rules, 326 IAC 2-3, will not apply.

The following table shows the NOx and VOC emissions increases due to modifications at Gary Works during the five-year period prior to and including 1997 (i.e. 1993 through 1997).

Pollutant	VOC (tons/year)	NOx (tons/year)
New Plate Mill Treatment Furnace	0.20	12.3
New South Sheet Mill Hydrogen Atmosphere Batch Annealing Furnaces	0.10	2.64
Previous No. 2 Q-BOP Shop Modification Project	0.098	5.80
New 84-inch Hot Strip Mill Sludge Dryer	23.62	2.56
Totals	24.02	23.3
Offset de minimis level	25	25

NOx and VOC emissions increases over the past 5 years are less than the de minimis levels of 25 tons per year, therefore, 326 IAC 2-3 (Emission Offset) does not apply.

326 IAC 5-1-2 (Visible Emission Limitations)

Pursuant to this rule, except as provided in 326 IAC 5-1-3 (Temporary Exemptions), the visible emissions shall meet the following:

- (a) Visible emissions shall not exceed an average of 20% opacity in 24 consecutive readings.
- (b) Visible emissions shall not exceed 60% opacity for more than a cumulative total of 15 minutes (60 readings) in a 6-hour period.

326 IAC 4-1 (Open Burning)

Pursuant to this rule, the permittee shall not open burn any material except as provided in 326 IAC 4-1-3, 326 IAC 4-1-4 or 326 IAC 4-1-6.

326 IAC 1-5-2 (Emergency Reduction Plans; Submission)

Pursuant to this rule, the following conditions shall apply:

- (a) The Permittee shall prepare written emergency reduction plans (ERPs) consistent with safe operating procedures.
- (b) These ERPs shall be submitted for approval to:

Indiana Department of Environmental Management
Compliance Branch, Office of Air Management
100 North Senate Avenue, P.O. Box 6015
Indianapolis, Indiana 46206-6015

within 180 calendar days from the date on which this source commences operation.

- (c) If the ERP is disapproved by IDEM, OAM, Gary Local Agency and IDEM Northwest Office, the Permittee shall have an additional thirty (30) days to resolve the differences and submit an approvable ERP. If after this time, the Permittee does not submit an approvable ERP, IDEM, OAM, Gary Local Agency, and IDEM Northwest Office, shall supply such a plan.
- (d) These ERPs shall state those actions that will be taken, when each episode level is declared, to reduce or eliminate emissions of the appropriate air pollutants.
- (e) Said ERPs shall also identify the sources of air pollutants, the approximate amount of reduction of the pollutants, and a brief description of the manner in which the reduction will be achieved.
- (f) Upon direct notification by IDEM, OAM, Gary Local Agency, or IDEM Northwest Office, that a specific air pollution episode level is in effect, the Permittee shall immediately put into effect the actions stipulated in the approved ERP for the appropriate level. [326 IAC 1-5-3]

Air Toxic Emissions

Indiana presently requests applicants to provide information on emissions of the 189 hazardous air pollutants set out in the Clean Air Act Amendments of 1990. These pollutants are either carcinogenic or otherwise considered toxic and are commonly used by industries. They are listed as air toxics on the Office of Air Management (OAM) Construction Permit Application Form Y.

None of these listed air toxics will be emitted from this proposed construction.

Conclusion

The construction of this heat treat furnace and annealing furnaces will be subject to the conditions of the attached proposed **Construction Permit No. CP-089-8606-00121**.

Indiana Department of Environmental Management
Office of Air Management
and
Gary Local Agency
and
IDEM Northwest Office

Addendum to the
Technical Support Document for New Construction and Operation

Source Name:	U.S. Steel - Gary Works
Source Location:	One North Broadway, Gary, Indiana 46402
County:	Lake
Construction Permit No.:	CP-089-8606-00121
SIC Code:	3312
Permit Reviewer:	Nisha Sizemore

On September 2, 1997, the Office of Air Management (OAM) had a notice published in The Gary Post Tribune, Gary, Indiana, stating that U.S. Steel - Gary Works had applied for a construction permit to construct and operate a heat treatment furnace and annealing furnaces. The notice also stated that OAM proposed to issue a permit for this installation and provided information on how the public could review the proposed permit and other documentation. Finally, the notice informed interested parties that there was a period of thirty (30) days to provide comments on whether or not this permit should be issued as proposed.

On October 7, 1997, U.S. Steel, Gary Works submitted comments on the proposed construction permit. The summary of the comments and corresponding responses is as follows:

Comment #1

U.S. Steel would prefer to have the fuel usage limit for the heat treatment furnace based on a 365 day rolling total instead of a fixed monthly limit. No change is requested for the fuel usage limitation for the annealing furnaces.

Response #1

Operation condition number 7 has been changed to the following:

Emission Offset Minor Source Limit

7. That the input natural gas to the heat treatment furnace shall be limited to 140.5 million cubic feet per year, rolled on a daily basis. This production limitation is equivalent to NO_x emissions of 12.3 tons per 365-day period, rolled on a daily basis. The input natural gas to the annealing furnaces shall be limited to 3.1 million cubic feet per month. This production limitation is equivalent to NO_x emissions of 0.22 tons per month. Therefore, the Emission Offset rules, 326 IAC 2-3, will not apply.

During the first 365 days of operation, the input natural gas to the heat treatment furnace shall be limited such that the total usage divided by the accumulated days of operation shall not exceed 384,931 cubic feet per day.

Comment #2

U.S. Steel has already submitted an Emergency Reduction Plan. An updated version was submitted with the Title V application.

Response #2

Operation condition number 12 has been changed to the following:

Emergency Reduction Plans

12. Pursuant to 326 IAC 1-5-2 (Emergency Reduction Plans; Submission):

- (a) The Permittee prepared and submitted written emergency reduction plans (ERPs) consistent with safe operating procedures on December 13, 1996.
- (b) If the ERP is disapproved by IDEM, OAM, Gary Local Agency, or IDEM Northwest Office, the Permittee shall have an additional thirty (30) days to resolve the differences and submit an approvable ERP. If after this time, the Permittee does not submit an approvable ERP, IDEM, OAM, Gary Local Agency, or IDEM Northwest Office, shall supply such a plan.
- (c) These ERPs shall state those actions that will be taken, when each episode level is declared, to reduce or eliminate emissions of the appropriate air pollutants.
- (d) Said ERPs shall also identify the sources of air pollutants, the approximate amount of reduction of the pollutants, and a brief description of the manner in which the reduction will be achieved.
- (e) Upon direct notification by IDEM, OAM, Gary Local Agency, or IDEM Northwest Office, that a specific air pollution episode level is in effect, the Permittee shall immediately put into effect the actions stipulated in the approved ERP for the appropriate level. [326 IAC 1-5-3]

two (2) new hydrogen
atmosphere batch annealing
furnaces
limited emissions

Appendix A: Emission Calculations
Natural Gas Combustion Only
MM Btu/hr 0.3 - < 10
Commercial Boiler

Company Name: U.S. Steel - Gary Works
Address City IN Zip: One North Broadway, Gary, Indiana 46402
CP: 089-8606
Plt ID: 089-00121
Reviewer: Nisha Sizemore

Heat Input Capacity
MMBtu/hr

Potential Throughput
MMCF/yr

4.3

37.7

Pollutant

	PM	PM10	SO2	NOx	VOC	CO
Emission Factor in lb/MMCF (except NOx which is lb/MMBtu)	11.9	11.9	0.6	0.1	5.3	21.0
Potential Emission in tons/yr	0.2	0.2	0.0	2.6	0.1	0.4

Methodology

MMBtu = 1,000,000 Btu

MMCF = 1,000,000 Cubic Feet of Gas

Emission Factors for NOx: uncontrolled = 100, Low Nox Burner = 17, Flue gas recirculation = 36

Emission Factors for CO: uncontrolled = 21, Low NOx Burner = 27, Flue gas recirculation = ND

Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,000 MMBtu

Emission Factors from AP 42, Chapter 1.4, Tables 1.4-1, 1.4-2 as amended 10/96, and 1.4-3, SCC #1-03-006-03

Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton

**Plate Mill Heat Treatment Furnace
Limited emissions**

**Appendix A: Emissions Calculations
Natural Gas Combustion Only
10 < MM BTU/HR <100
Small Industrial Boiler**

Company Name: U.S. Steel - Gary Works
Address City IN Zip: One North Broadway, Gary, Indiana 46402
CP: 089-8606
Plt ID: 089-00121
Reviewer: Nisha Sizemore

Heat Input Capacity
MMBtu/hr

Potential Throughput
MMCF/yr

16.0

140.5

Pollutant

	PM	PM10	SO2	NOx	VOC	CO
Emission Factor in lb/MMCF (except NOx which is lb/MMBtu)	14.0	14.0	0.6	0.175	2.8	35.0
Potential Emission in tons/yr	1.0	1.0	0.0	12.3	0.2	2.5

Methodology

MMBtu = 1,000,000 Btu

MMCF = 1,000,000 Cubic Feet of Gas

Emission Factors for NOx: Uncontrolled = 140, Low NOx Burner = 81, Flue gas recirculation = 30

Emission Factors for CO: Uncontrolled = 35, Low NOx Burner = 61, Flue gas recirculation = 37

Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,000 MMBtu

Emission Factors are from AP 42, Chapter 1.4, Tables 1.4-1, 1.4-2, as amended 10/96, and 1.4-3, SCC #1-02-006-02

Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton

two (2) new hydrogen atmosphere batch annealing furnaces

**Appendix A: Emission Calculations
Natural Gas Combustion Only
MM Btu/hr 0.3 - < 10
Commercial Boiler**

Company Name: U.S. Steel - Gary Works
Address City IN Zip: One North Broadway, Gary, Indiana 46402
CP: 089-8606
Plt ID: 089-00121
Reviewer: Nisha Sizemore

Heat Input Capacity
MMBtu/hr

Potential Throughput
MMCF/yr

10.3

89.9

Pollutant

	PM	PM10	SO2	NOx	VOC	CO
Emission Factor in lb/MMCF (except NOx which is lb/MMBtu)	11.9	11.9	0.6	0.1	5.3	21.0
Potential Emission in tons/yr	0.5	0.5	0.0	6.3	0.2	0.9

Methodology

MMBtu = 1,000,000 Btu

MMCF = 1,000,000 Cubic Feet of Gas

Emission Factors for NOx: uncontrolled = 100, Low Nox Burner = 17, Flue gas recirculation = 36

Emission Factors for CO: uncontrolled = 21, Low NOx Burner = 27, Flue gas recirculation = ND

Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,000 MMBtu

Emission Factors from AP 42, Chapter 1.4, Tables 1.4-1, 1.4-2 as amended 10/96, and 1.4-3, SCC #1-03-006-03

Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton

Plate Mill Heat Treatment Furnace

**Appendix A: Emissions Calculations
Natural Gas Combustion Only
10 < MM BTU/HR <100
Small Industrial Boiler**

Company Name: U.S. Steel - Gary Works
Address City IN Zip: One North Broadway, Gary, Indiana 46402
CP: 089-8606
Plt ID: 089-00121
Reviewer: Nisha Sizemore

Heat Input Capacity
MMBtu/hr

Potential Throughput
MMCF/yr

56.5

494.9

Emission Factor in lb/MMCF (except NOx which is lb/MMBtu)	Pollutant					
	PM	PM10	SO2	NOx	VOC	CO
	14.0	14.0	0.6	0.175	2.8	35.0
Potential Emission in tons/yr	3.5	3.5	0.1	43.3	0.7	8.7

Methodology

MMBtu = 1,000,000 Btu

MMCF = 1,000,000 Cubic Feet of Gas

Emission Factors for NOx: Uncontrolled = 140, Low NOx Burner = 81, Flue gas recirculation = 30

Emission Factors for CO: Uncontrolled = 35, Low NOx Burner = 61, Flue gas recirculation = 37

Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,000 MMBtu

Emission Factors are from AP 42, Chapter 1.4, Tables 1.4-1, 1.4-2, as amended 10/96, and 1.4-3, SCC #1-02-006-02

Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton