U.S. Steel Corporation

March 21, 2012

U.S. Steel's Vision - Making Steel. World Competitive. Building Value. - is supported by a series of core values within the company. One of those core values is environmental stewardship. We recognize that the earth is a shared and finite resource that we all must safeguard for generations to come. It is our commitment to sustainability that drives our operations to adopt management systems and best practices that foster continuous improvement in our processes; preserving vital resources and ensuring the future of the industry.

We do this because U.S. Steel is more than a global leader in the steel industry; we are your friends, neighbors and community partners. We breathe the same air, drink the same water and share the same hopes and dreams for our families.

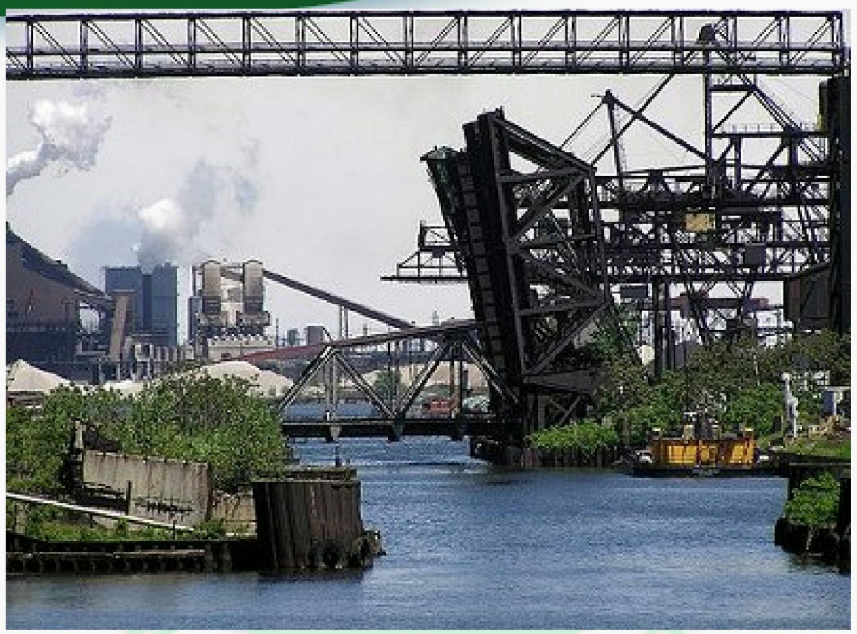
As a company, U.S. Steel articulates its core value of environmental stewardship through four basic principles which are the responsibility of all of our operations and our employees. They are:

- Compliance with all environmental laws and regulations
- Continuous improvement in environmental and resource management
- Continued reduction of emissions
- Community partnerships to protect and preserve natural resources

Source: http://www.uss.com/corp/environment/overview.asp

Investigative Actions

- Gary Works, Great Lakes Works and Granite City Works
- Investigated 2006-2009
  - Inspections
  - Information requests
- NOV/FOVs issued
  - Gary: 6/25/08, 4/9/09 and 6/17/11
  - Great Lakes: 9/30/09 and 6/17/11
  - Granite City: 9/30/09



Gary Works - Gary, IN

Gary Works

New Source Review

Regulatory Framework – NSR

- A project triggers NSR if:
  - Major source
  - Makes a modification
    - Physical change, or
    - Change in method of operation
  - Net emission increase is significant
    - 25 TPY PM; 15 TPY PM10; 40 TPY SO_2
- NSR Permitting
  - BACT/LAER and modeling

Gary Works - NSR

- 1990 Blast Furnace #4
  - Reengineered/redesigned cooling system
  - Changes to furnace would have reduced downtime and increased production
  - At least 10% increase in production and rated capacity; increased emissions exceed “significant” threshold

Gary Works - NSR

- 2005 Blast Furnace #13/14
  - Substantial redesign, including charging system, refractory, stoves, cooling system
  - U.S. Steel increased production; increased emissions exceed “significant” threshold

Gary Works

Opacity

Gary Works Opacity

- 326 IAC 6.8-10-3, 326 IAC 5-1-2, NESHAP Subpart FFFFF – Fugitive Opacity
  - Slag Pit #8
  - Smoking bottle cars
  - QBOP Shop
  - Blast Furnaces #4 & 8 loading enclosure
  - Blast Furnaces #6, 8 & 14 casthouse monitor
  - BOP Shop roof monitor
  - BOP Shop north baghouse

Gary Works Opacity (cont.)

- 326 IAC 6.8-10-3, 326 IAC 5-1-2, NESHAP Subpart FFFFF – Fugitive Opacity
  - Blast furnace #4 bell leaks
  - Blast furnace #6, 8 & 14 relief valve openings
  - Iron beaching
  - Coke processing equipment
  - Coke Battery #2 underfire stack
  - Coke Battery #5 underfire stack
  - Coke Battery #7 underfire stack

Gary Works Opacity (cont.)

- 326 IAC 6.8-9-3, NESHAP Subpart CCCCC – Coke Ovens
  - Coke Batteries #2, 5 & 7 pushing
  - Coke Batteries #5 & 7 door leaks
- 326 IAC 11-3-2 for Coke Ovens
  - Coke Battery #2 offtakes

Gary Works

Operations

Gary Works Operations

- Blast Furnace #14
  - Removal of suction from one tap hole when opening another
- Blast furnace flares
  - Failure to have pilot flame present
- Blast furnace relief valve openings
  - Failure to permit as emission source
- Operation and Maintenance Plans - NESHAP
  - Failure to set damper positions
  - Sinter plant operated without VOC monitoring system

Granite City Works

Granite City, IL

Granite City Works

New Source Review

Granite City Works - NSR

- 1994 Blast Furnace B
  - Reengineered/redesigned cooling system
  - Changes to furnace would have reduced downtime and increased production
  - Approximately 12% increase in production; increased emissions exceeded “significant” threshold

Granite City Works

Opacity

Granite City Works - Opacity

- NESHAP Subpart FFFFF
  - Blast Furnace B casthouse monitor
  - BOP Shop roof monitor

Granite City Works

Operations

Granite City Works - Operations

- NESHAP Subpart FFFFF and Title V
  - Operational violations
    - Failure to meet fan amp limits and damper positions
    - Failed inspection, monitoring and recordkeeping
    - Failure to meet minimum requirements in Operation and Maintenance Plans
  - Blast Furnace B relief valve openings

Great Lakes Works - Ecorse, MI

ENTIAL PROTECTED

Great Lakes Works

Opacity

Great Lakes Works - Opacity

- R 336.1358, R 336.1201(3), NESHAP Subpart FFFFF
  - Blast Furnace B2 casthouse monitor
  - BOF Shop roof monitor due to slag skimming
  - BOP Shop roof monitor
- R 324.5524(2)
  - Blast Furnaces B2 & D4 slag pits
  - Iron beaching
- R 336.1301
  - Blast Furnaces B2 & D4 relief valves

Great Lakes Works

Operations

Great Lakes Works - Operations

- NESHAP Subpart FFFFF and Title V
  - Over 200 operational violations
    - Opacity exceedances
    - Failure to capture/control emissions
    - Failed inspection, monitoring and recordkeeping
    - Failure to meet minimum requirements in Operation and Maintenance Plans

Great Lakes Works - Operations

- NESHAP Subpart FFFFF and Title V
  - Blast furnace bells - continuing operation during period of malfunction
  - Blast Furnace D4 bleeder openings
    - Much higher than Blast Furnace B2 and company average
- Title V
  - Operating during inspection without runner covers

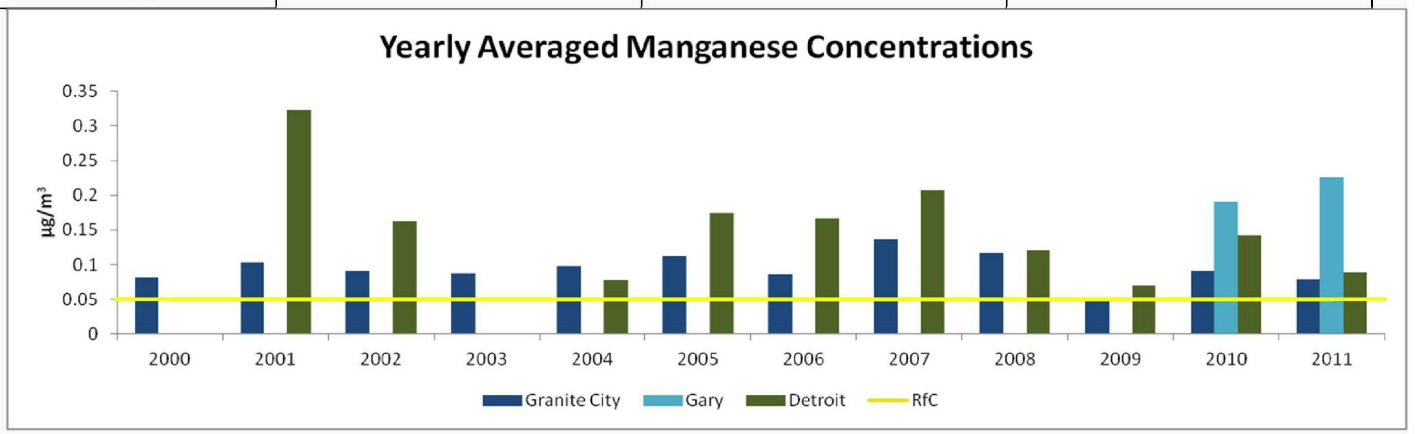
End of Violations

Manganese

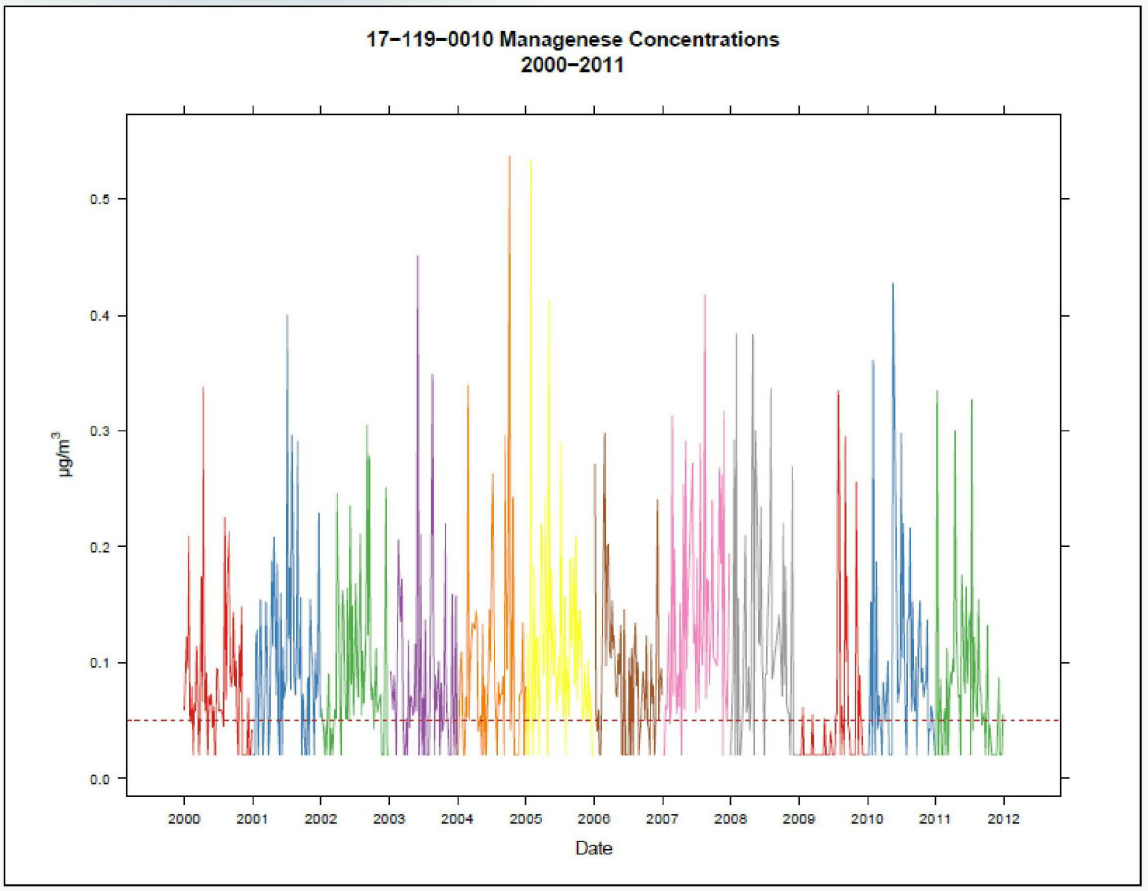
- **Manganese**
  - HAP
  - Main health effect is impairment of neurological function
- EPA's **Integrated Risk Information System (IRIS)**
  - Human health assessment program
- The EPA-IRIS **Reference Concentration (RfC)**
  - Maximum continuous inhalation exposure with no appreciable risk of negative effects
  - RfC for Manganese: **0.05 µg/m^3**

Manganese Concentrations

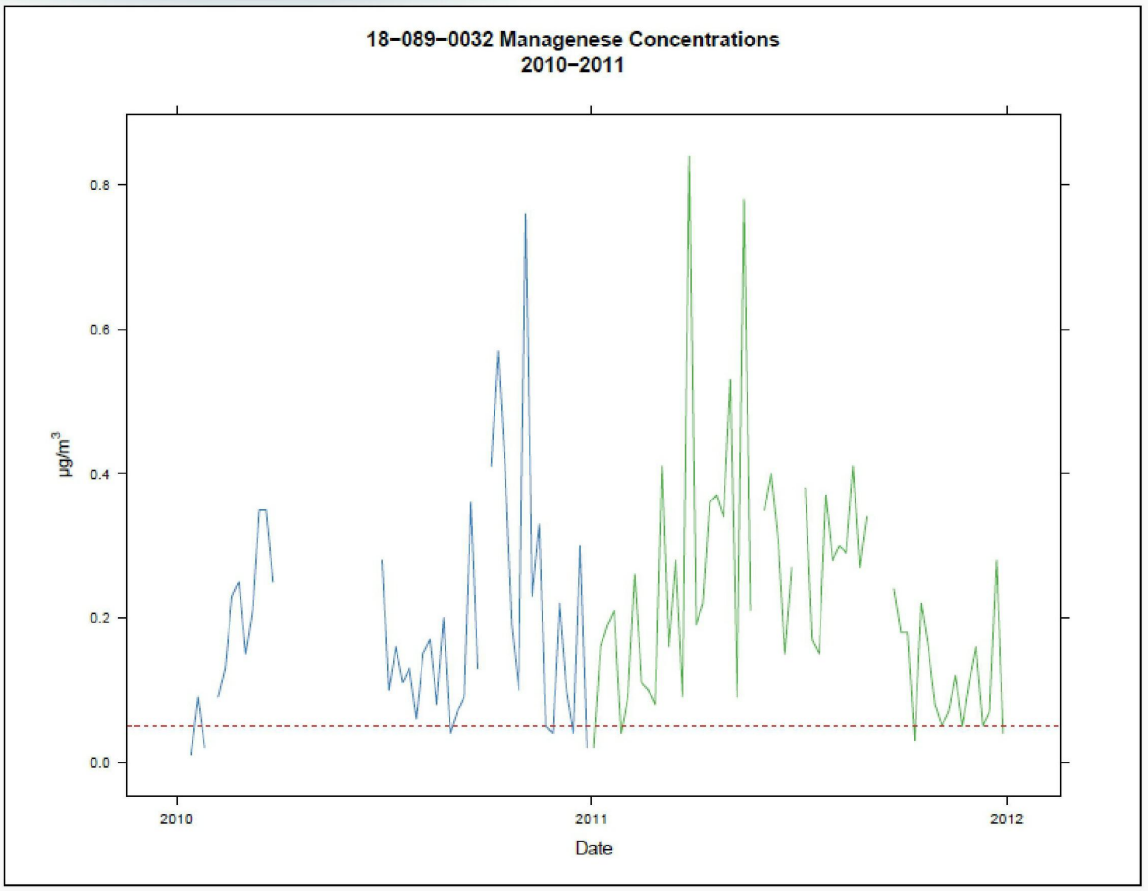
	Granite City	Gary	Detroit
Averages µg/m³	2000-2011	2010-2011	2001-2011
	0.09	0.21	0.16
Percentage of RfC	189%	422%	314%



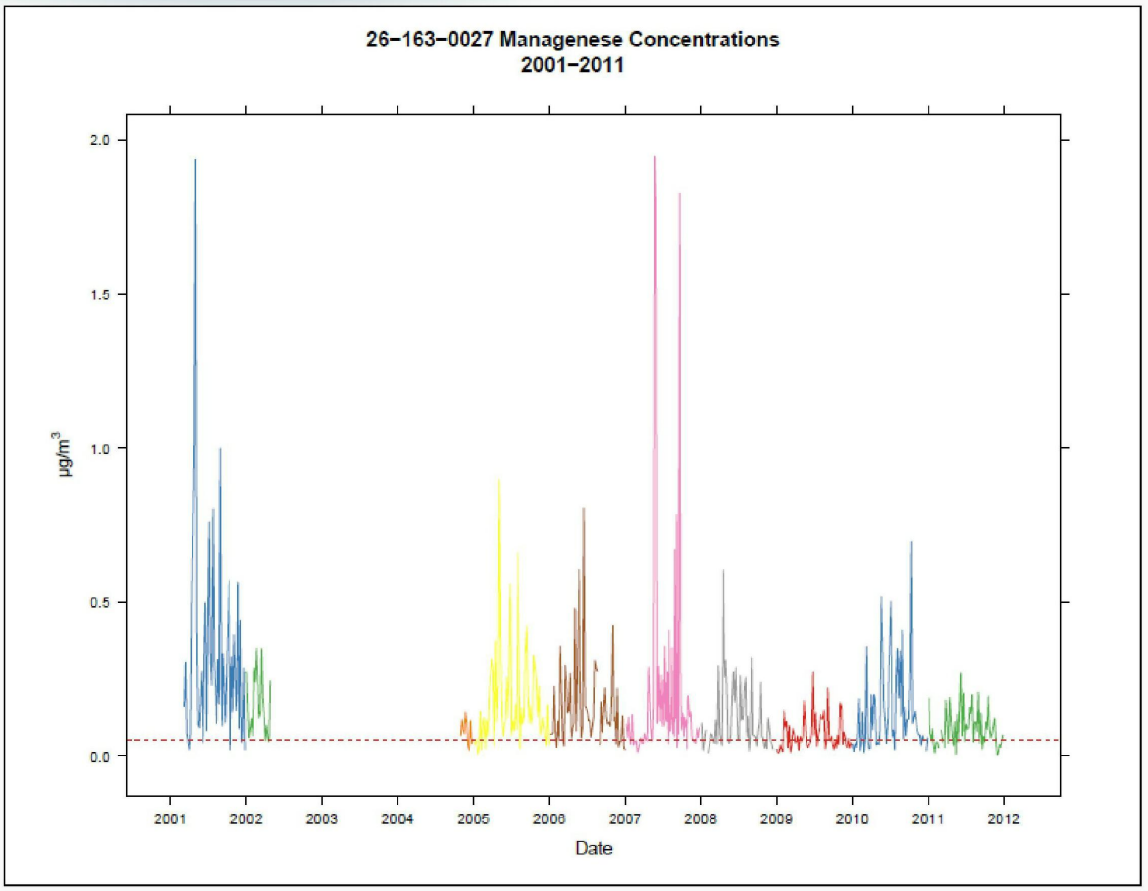
Time Series Analysis
Granite City



Time Series Analysis
Gary



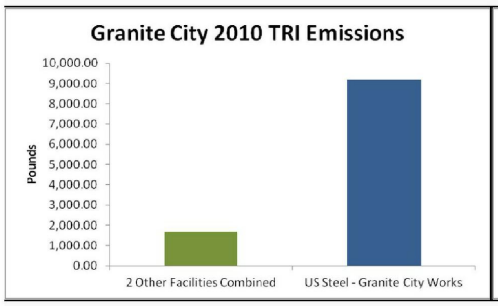
Time Series Analysis
Detroit

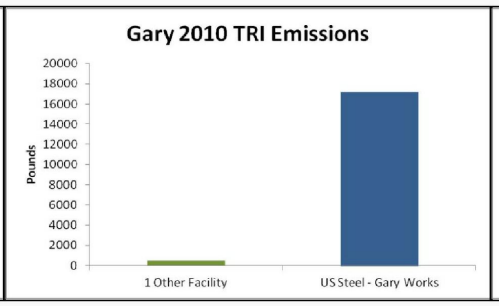


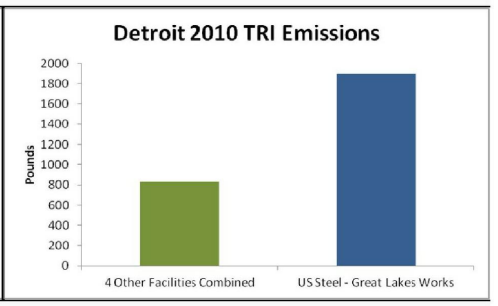
Manganese Emissions Data

TRI (Toxics Release Inventory) data for all facilities reporting manganese air emissions within a 2 mile radius of the monitor recording elevated concentrations

Granite City	Gary	Detroit

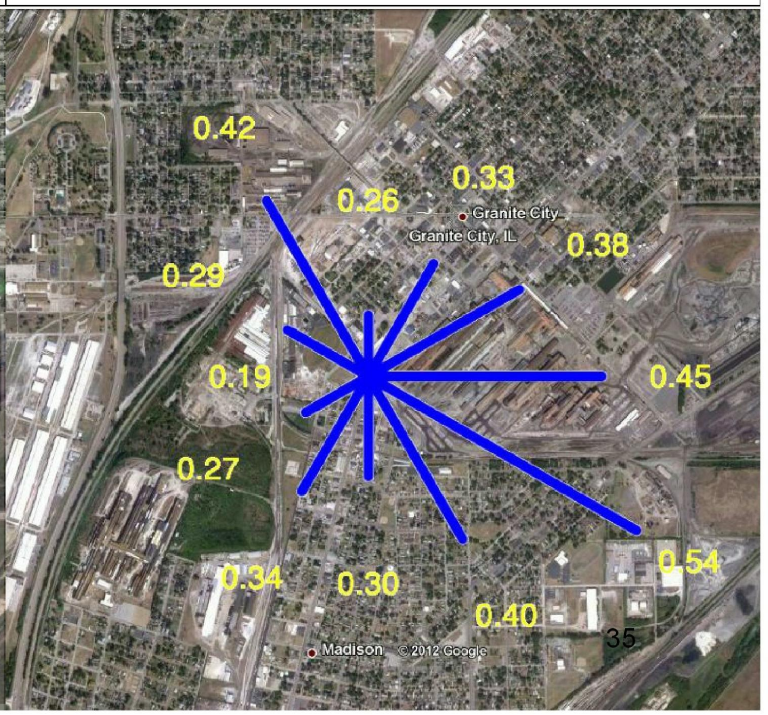






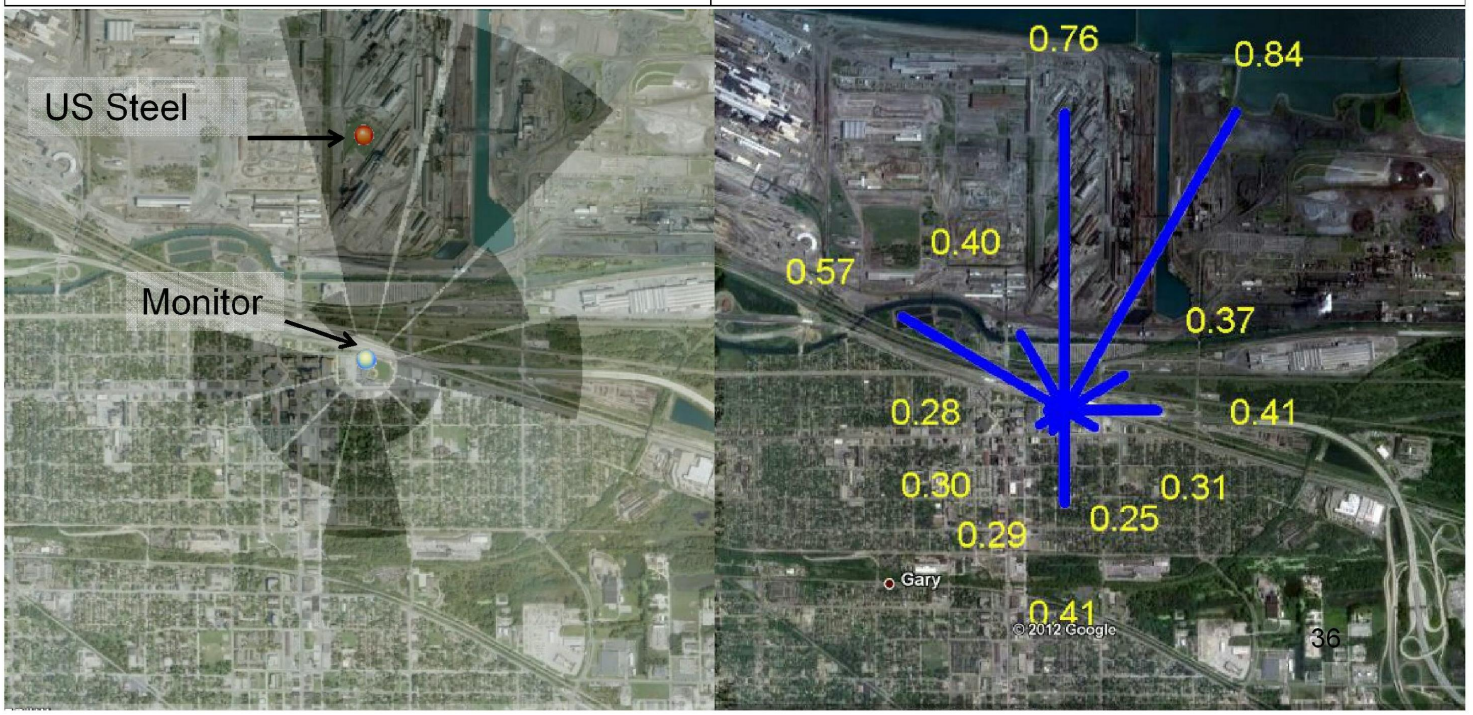
Granite City Wind Directions for Elevated Manganese

Frequency of manganese concentrations > 5 times RfC by wind direction	Maximum manganese concentration by wind direction

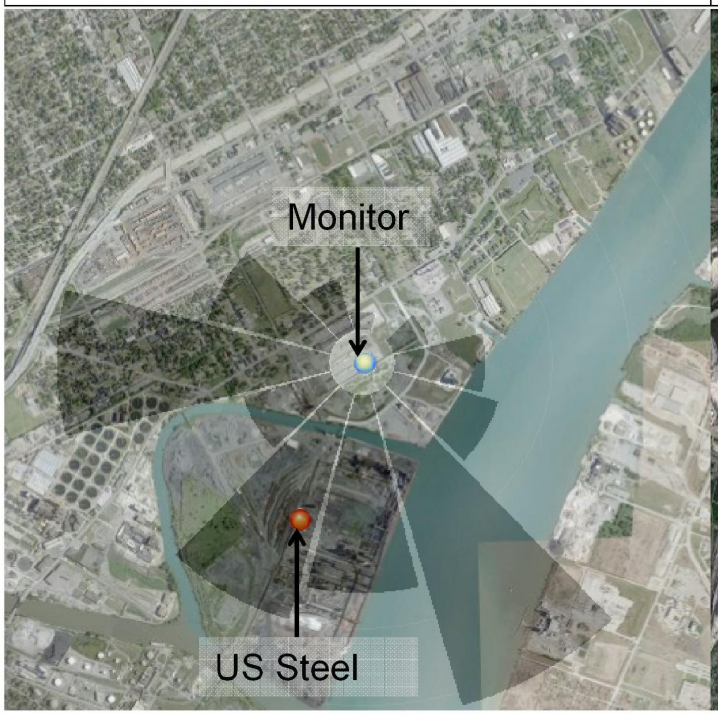
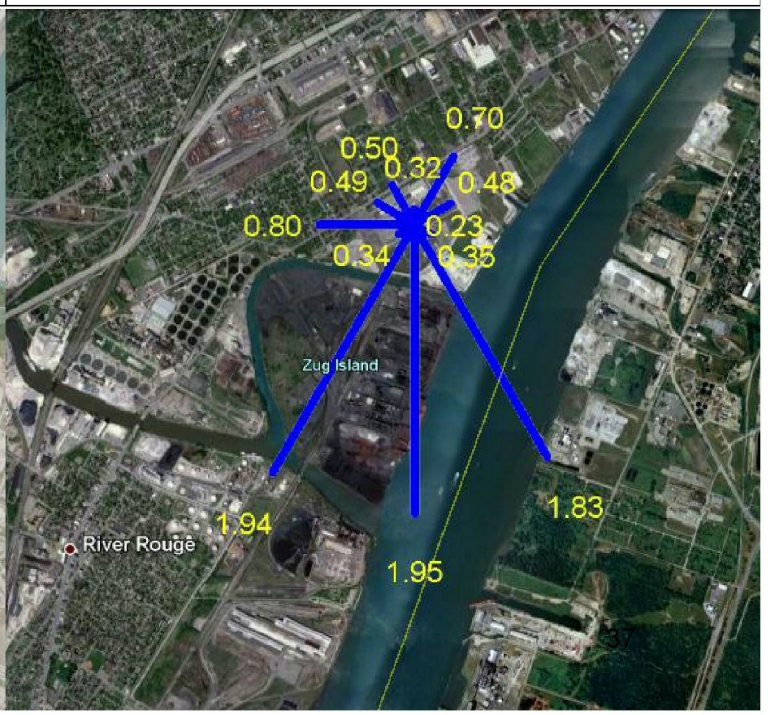


Gary Wind Directions for Elevated Manganese

Frequency of manganese concentrations > 5 times RfC by wind direction	Maximum manganese concentration by wind direction



Detroit Wind Directions for Elevated Manganese

Frequency of manganese concentrations > 5 times RfC by wind direction	Maximum manganese concentration by wind direction
	

Potential Manganese Reduction Measures

- LMF - operational and equipment improvements
  - Reductions expected from:
    - Ensuring control device working and dampers open at all times
    - Minimizing gap around electrodes
    - Dry Sorbent Injection prior to baghouse

Remedies

Operational Violations

- All mills
- Violations not listed individually
- Remedies to include
  - Modify SOPs
  - Update monitoring/sampling plans
  - Train operators
  - Comply with Fugitive Emissions Plan, including roadway spraying
  - Others, as appropriate

Remedies

Gary Works

Gary Works – New Equipment

- Blast Furnaces #4, #6 & #8 casthouse active controls
  - Hoods at trough, dam and iron spout
  - Fans
  - Common baghouse
  - Dry sorbent injection to capture SO_2 on common fume capture system, or provide alternative means of SO_2 reduction

Gary Works – New Equipment

- Blast Furnaces #4, #6 & #8 slag pits
  - Install partial cover or large hood over slag spout area, directing emissions to a common wet scrubber, or provide alternative means of PM/SO_2 reduction
  - Equipment and procedures to minimize dust, including during slag removal

Gary Works – New Equipment

- Blast Furnace #14
  - Increase airflow through existing control system to retain capture at two holes
  - Dry sorbent injection to capture SO_2 on common fume capture system, or provide alternative means of SO_2 reduction

Gary Works – New Equipment

- #5, #7 Coke ovens and quench towers, either:
  - Commit to shutdown ovens/towers
  - Structure settlement to require improvements commensurate with operation/shutdown decisions
    - The decision to operate long term triggers substantial investment e.g. #7 pushing baghouse, #5 & 7 doors
- #2 Coke oven
    - 3rd party evaluation of pusher scrubber car
    - Submit offtake piping replacement plan

Gary Works – Work Practices: Permit Conditions

- Bell leaks – repair as soon as detected
  - Repairs to commence within 48 hours once any single opacity reading exceeds 10%
- Blast furnace slips - identify ways and write SOP designed to limit slips from Blast Furnaces #4, 6 & 8
  - Limit on number of slips per month
- Blast furnace relief valves – identify improvements to limit relief valve open time and prevent opacity during planned openings
  - 10% opacity limit, 3-min average (for planned openings)

Gary Works – Work Practices

- BOF Shop - identify operational and equipment improvements to reduce roof monitor emissions
  - Submit 'Evaluation, Findings, and Recommendations' from independent consultant to EPA
- Bottle cars - Kaewool covers over car openings
- QBOP Shop - identify ways to improve slag skimming dust capture; close openings shop so opacity exits the shop at the roof monitor
  - Submit 'Evaluation, Findings, and Recommendations' from internal evaluation to EPA

Gary Works – Work Practices (cont.)

- Beaching – develop and submit beaching procedures and evaluate their effect on opacity outside of the partial enclosure

Remedies

Granite City Works

Granite City – New Equipment

- Blast Furnace B casthouse
  - Capture particulate from entire length of trough and from dam; extend trough hood over dam or install new hood over dam
    - Increase airflow to accommodate additional capture
  - Dry sorbent injection to capture SO_2 on fume capture system, or provide alternative means of SO_2 reduction

Granite City – New Equipment

- Blast Furnace B slag pits
  - Install partial cover or large hood over slag spout area, directing emissions to a wet scrubber, or provide alternative means of PM/SO_2 reduction
  - Equipment and procedures to minimize dust, including during slag removal

Granite City – Work Practices: Permit Conditions

- Bell leaks – repair as soon as detected
  - Repairs to commence within 48 hours once any single opacity reading exceeds 10%
- Blast furnace slips - identify ways and write SOP designed to limit slips from blast furnaces
  - Limit on number of slips per month
- Blast Furnace relief valves – identify improvements to limit relief valve open time and prevent opacity during planned openings
  - 10% opacity limit, 3-min average (for planned openings)

Granite City – Work Practices (cont.)

- Blast Furnace casthouse maintenance
  - Modify SOP to define “active work” and limit length of time before and after work that covers can be off

Remedies

Great Lakes Works

Great Lakes – New Equipment

- Blast Furnace Slag Pits
  - Install partial cover or large hood over Blast Furnaces B2 and D4 slag spout area, directing emissions to a wet scrubber, or provide alternative means of PM reduction
  - Equipment and procedures to minimize dust, including during slag removal

Great Lakes –

Work Practices: Permit Conditions

- Bell leaks – repair as soon as detected
  - Repairs to commence within 48 hours once any single opacity reading exceeds 10%
- Blast furnace slips - identify ways and write SOP designed to limit slips from blast furnaces
  - Limit on number of slips per month
- Blast furnace relief valves – identify improvements to limit relief valve open time and prevent opacity during planned openings
  - 10% opacity limit, 3-min average (for planned openings)

Great Lakes – Work Practices (cont.)

- Blast furnace casthouse maintenance
  - Modify SOP to define “active work” and limit length of time before and after work that covers can be off
  - Maintain spare runner covers
  - Internal review of improvement opportunities
- BOP Shop roof monitor
  - Increase Method 9 VE readings to confirm adequacy of new controls
  - Internal review of improvement opportunities at slag skimming

Great Lakes Remedy – Work Practices (cont.)

- Perform holistic review of Title V inspection, monitoring and recording procedures; utilize computer tracking similar to Gary Works
- Beaching – perform in BOF Shop with SOP designed for minimizing emissions

End of Remedy

Environmental Justice

- All three mills in Environmental Justice communities
- Future discussion needed

Proposed Resolution Process

Settlement Approach

- Multi-facility settlement
- Expedited negotiations
- Settlement document

Elements of Consent Decree

- Injunctive relief
- Penalty
- Permitting
- Reporting requirements
- Stipulated Penalties
- Other appropriate standard provisions

Next Steps

- US Steel to decide whether to participate in the settlement process
- US Steel to respond to governments' proposal
- Set a date for next meeting or conference call