U. S. Steel Canada
A Subsidiary of United States Steel

# Hamilton Works
## 2012 Toxic Substance Accounting Report
(O. Reg. 455/09)

Issued May 31, 2013

**Basic Facility Information**

| Section 1 – Facility Information | |
|---|---|
| Owner | U. S. Steel Canada |
| Facility name | Hamilton Works |
| Address | 386 Wilcox St., P.O. Box 2030 |
| City | Hamilton |
| Province | Ontario |
| Postal Code | L8N 3T1 |
| **Section 2 – Owner's Mailing Address** | |
| Same as above (Y / N) | Yes |
| Address | |
| City | |
| Province | |
| Postal code | |
| **Section 3 – Owner's Technical Contact Person** | |
| Same as above (Y / N) | Andrew Sebestyen |
| Title | Manager, Environmental Affairs |
| Phone | (905) 527-8335 ext 2547 |
| Fax | (905) 777-7614 |
| Email address | asebestyen@uss.com |

## Basic Facility Information (Cont.)

Hamilton Works is located on 319 hectares of land on the shores of Hamilton Harbour. Hamilton Works is an integrated steel plant and produces approximately 2 million tonnes of steel per year. Process operations at the plant include Cokemaking, Ironmaking, Basic Oxygen Furnace Steelmaking, Continuous Casting, Cold Rolling, Finishing and Galvanizing.

Raw materials (coal and iron ore) are brought to the area by self-unloading ships. Coal is heated in the Coke Ovens, where volatile components of coal are vaporized and the remaining carbon is transformed into coke. The coke is then used as a reductant in the Blast Furnace. The gas generated during coking fuels the coking battery and is used in the Central Boiler Station to generate steam for the operation. The volatile components generated during coking are separated in an adjacent By-Products Plant and are sold.

Coke, iron ore pellets, and dolomite are conveyed to the Blast Furnace, which has a capacity to produce 6,000 tonnes/day of molten pig iron. From the Blast Furnace, molten iron is carried to the steelmaking shop in specialized railway cars where it is charged into two Basic Oxygen Furnaces. After mixing the molten iron with scrap steel, fluxes and additives, oxygen is blown into the melt to remove carbon and impurities. The molten steel is treated to adjust its composition to meet the requirements of the final product then transferred to the Continuous Casting process.

The casting complex consists of two casting strands in which the molten steel is solidified into steel slabs. Most slabs cast at Hamilton Works are rolled in the Lake Erie Works Hot Strip Mill although some are shipped to other U. S. Steel facilities or sold.

Coils from Lake Erie Works Hot Strip Mill are returned to Hamilton Works for processing in the 4-Stand Cold Rolling Mill. Some coils are further processed in the Z-Line Galvanizing line.

The plant has extensive environmental control measures. Hamilton Harbour water is used in the production of steel and is cleaned by our water filtration plant and treated before exiting the plant. Air cleaning equipment is used at the Coke Ovens, Blast Furnace and Basic Oxygen Furnaces to minimize emissions.

## List of Toxic Substances at the Facility

| Substance | Chemical Abstracts Service Number |
|---|---|
| Ammonia (total) | 7664-41-7 |
| Benzene | 71-43-2 |
| Carbon Monoxide | 630-08-0 |
| Chromium (and its compounds) | 7440-47-3 |
| Hexavalent Chromium (and its compounds) | 1333-82-0 |
| Ethylene | 74-85-1 |
| Hydrogen Sulphide | 7783-06-4 |
| Lead | 7439-92-1 |
| Manganese | 7439-96-5 |
| Mercury | 7439-97-6 |
| Naphthalene | 91-20-3 |
| N-Hexane | 110-54-3 |
| Nitrogen oxides (as NO2) | 11104-93-1 |
| PAH - 7H-dibenzo(c,g)carbazole | 194-59-2 |
| PAH - Acenaphthene | 83-32-9 |
| PAH - Acenaphthylene | 208-96-8 |
| PAH - Benzo(a)anthracene | 56-55-3 |
| PAH - Benzo(a)phenanthrene (Chrysene) | 218-01-9 |
| PAH - Benzo(a)Pyrene | 50-32-8 |
| PAH - Benzo(b)fluoranthene | 205-99-2 |
| PAH - Benzo(e)pyrene | 192-97-2 |
| PAH - Benzo(g,h,i)perylene | 191-24-2 |
| PAH - Benzo(j)fluoranthene | 205-82-3 |
| PAH - Benzo(k)fluoranthene | 207-08-9 |
| PAH - Dibenzo(a,,j)acridine | 224-42-0 |
| PAH - Dibenzo(a,h)anthracene | 53-70-3 |
| PAH - Dibenzo(a,i)pyrene | 189-55-9 |
| PAH - Fluoranthene | 206-44-0 |
| PAH - Fluorene | 86-73-7 |
| PAH - Indeno(1,2,3-c,d)pyrene | 193-39-5 |
| PAH – Perylene | 198-55-0 |
| PAH - Phenanthrene | 85-01-8 |
| PAH – Pyrene | 129-00-0 |
| Phenol (and its salts) | 108-95-2 |
| PM2.5 - Particulate Matter ≤ 2.5 Microns | ** |
| PM10 - Particulate Matter ≤ 10 Microns | ** |
| Total Particulate Matter or TSP | ** |
| Selenium (and its compounds) | 7782-49-2 |
| Sulphur Dioxide | 7446-09-5 |
| Sulphuric Acid | 7664-93-9 |
| Toluene | 108-88-3 |
| Total Reduced Sulphur (expressed as H2S) | ** |
| Vanadium | 7440-62-2 |
| VOC | ** |
| Zinc | 7440-66-6 |

** No single CAS number applies to this substance

## Indication of Changes in Methods, Significant Process Changes or Non-Routine Events

U. S. Steel Canada – Hamilton Works Blast Furnace and Steelmaking operations were idled in 2012. The Cokemaking & By-Products and the Rolling & Finishing processes were operational in 2012.

## Summary: Tracking and Quantification

| Substance | Usage, tonnes | Creation, tonnes | Destruction, tonnes | Releases to Air, tonnes | Releases to Water, tonnes | Offsite Recycling, tonnes | Disposal, tonnes | Contained in Product, tonnes |
|---|---|---|---|---|---|---|---|---|
| Ammonia (total) | 0 | > 10,000 to 100,000 | 0 | > 1 to 10 | > 10 to 100 | 0 | 0 | > 10,000 to 100,000 |
| Benzene | 0 | > 1,000 to 10,000 | > 100 to 1000 | > 10 to 100 | 0 | > 0 to 1 | 0 | > 1,000 to 10,000 |
| Carbon Monoxide | 0 | > 100 to 1000 | 0 | > 100 to 1000 | 0 | 0 | 0 | 0 |
| Chromium | > 100 to 1000 | 0 | 0 | > 0 to 1 | 0 | > 100 to 1000 | > 10 to 100 | > 1 to 10 |
| Hexavalent Chromium | > 1 to 10 | 0 | 0 | 0 | 0 | 0 | > 0 to 1 | > 1 to 10 |
| Ethylene | 0 | > 10 to 100 | 0 | > 10 to 100 | 0 | 0 | 0 | 0 |
| Hydrogen Sulphide | 0 | > 10 to 100 | > 10 to 100 | > 10 to 100 | 0 | 0 | 0 | 0 |
| Lead | > 100 to 1000 | 0 | 0 | > 0 to 1 | 0 | > 100 to 1000 | > 100 to 1000 | > 1 to 10 |
| Manganese | > 1,000 to 10,000 | 0 | 0 | > 0 to 1 | 0 | > 1,000 to 10,000 | > 1,000 to 10,000 | > 10 to 100 |
| Mercury | > 0 to 1 | 0 | 0 | > 0 to 1 | 0 | > 0 to 1 | > 0 to 1 | > 0 to 1 |
| Naphthalene | 0 | > 1,000 to 10,000 | > 1 to 10 | > 1 to 10 | 0 | > 0 to 1 | > 1 to 10 | > 1,000 to 10,000 |
| N-Hexane | 0 | > 1 to 10 | 0 | > 1 to 10 | 0 | 0 | 0 | 0 |
| Nitrogen oxides (as NO2) | 0 | > 1,000 to 10,000 | 0 | 1,391.09 | 0 | 0 | 0 | 0 |
| PAH - 7H-dibenzo(c,g)carbazole | 0 | > 0 to 1 | 0 | > 0 to 1 | 0 | > 0 to 1 | > 0 to 1 | > 0 to 1 |
| PAH - Acenaphthene | 0 | > 1 to 10 | > 0 to 1 | > 0 to 1 | 0 | > 0 to 1 | > 0 to 1 | > 1 to 10 |
| PAH - Acenaphthylene | 0 | > 1,000 to 10,000 | > 0 to 1 | > 0 to 1 | 0 | > 0 to 1 | > 0 to 1 | > 1,000 to 10,000 |
| PAH - Benzo(a)anthracene | 0 | > 100 to 1000 | > 0 to 1 | > 0 to 1 | 0 | > 0 to 1 | > 0 to 1 | > 100 to 1000 |
| PAH - Benzo(a)phenanthrene (Chrysene) | 0 | > 100 to 1000 | > 0 to 1 | > 0 to 1 | 0 | > 0 to 1 | > 0 to 1 | > 100 to 1000 |
| PAH - Benzo(a)Pyrene | 0 | > 100 to 1000 | > 0 to 1 | > 0 to 1 | 0 | > 0 to 1 | > 0 to 1 | > 100 to 1000 |
| PAH - Benzo(b)fluoranthene | 0 | > 100 to 1000 | > 0 to 1 | > 0 to 1 | 0 | > 0 to 1 | > 0 to 1 | > 100 to 1000 |
| PAH - Benzo(e)pyrene | 0 | > 10 to 100 | > 0 to 1 | > 0 to 1 | 0 | > 0 to 1 | > 0 to 1 | > 10 to 100 |
| PAH - Benzo(g,h,i)perylene | 0 | > 10 to 100 | > 0 to 1 | > 0 to 1 | 0 | > 0 to 1 | > 0 to 1 | > 10 to 100 |
| PAH - Benzo(j)fluoranthene | 0 | > 10 to 100 | > 0 to 1 | > 0 to 1 | 0 | > 0 to 1 | > 0 to 1 | > 10 to 100 |
| PAH - Benzo(k)fluoranthene | 0 | > 100 to 1000 | > 0 to 1 | > 0 to 1 | 0 | > 0 to 1 | > 0 to 1 | > 100 to 1000 |
| PAH - Dibenzo(a,,j)acridine | 0 | > 0 to 1 | > 0 to 1 | > 0 to 1 | 0 | > 0 to 1 | > 0 to 1 | > 0 to 1 |
| PAH - Dibenzo(a,h)anthracene | 0 | > 100 to 1000 | > 0 to 1 | > 0 to 1 | 0 | > 0 to 1 | > 0 to 1 | > 100 to 1000 |
| PAH - Dibenzo(a,i)pyrene | 0 | > 100 to 1000 | > 0 to 1 | > 0 to 1 | 0 | > 0 to 1 | > 0 to 1 | > 100 to 1000 |
| PAH - Fluoranthene | 0 | > 100 to 1000 | > 0 to 1 | > 0 to 1 | 0 | > 0 to 1 | > 0 to 1 | > 100 to 1000 |
| PAH - Fluorene | 0 | > 1 to 10 | > 0 to 1 | > 0 to 1 | 0 | > 0 to 1 | > 0 to 1 | > 1 to 10 |
| PAH - Indeno(1,2,3-c,d)pyrene | 0 | > 100 to 1000 | > 0 to 1 | > 0 to 1 | 0 | > 0 to 1 | > 0 to 1 | > 100 to 1000 |
| PAH - Perylene | 0 | > 100 to 1000 | > 0 to 1 | > 0 to 1 | 0 | > 0 to 1 | > 0 to 1 | > 100 to 1000 |
| PAH - Phenanthrene | 0 | 1,363.07 | > 0 to 1 | > 0 to 1 | 0 | > 0 to 1 | > 0 to 1 | > 1,000 to 10,000 |
| PAH - Pyrene | 0 | > 100 to 1000 | > 0 to 1 | > 0 to 1 | 0 | > 0 to 1 | > 0 to 1 | > 100 to 1000 |

| Substance | Usage, tonnes | Creation, tonnes | Destruction, tonnes | Releases to Air, tonnes | Releases to Water, tonnes | Offsite Recycling, tonnes | Disposal, tonnes | Contained in Product, tonnes |
|---|---|---|---|---|---|---|---|---|
| Phenol (and its salts) | 0 | > 10 to 100 | 0 | 0 | > 10 to 100 | 0 | 0 | > 0 to 1 |
| PM2.5 | 0 | > 100 to 1000 | 0 | > 100 to 1000 | 0 | 0 | 0 | 0 |
| PM10 | 0 | > 100 to 1000 | 0 | > 100 to 1000 | 0 | 0 | 0 | 0 |
| Total Particulate Matter | 0 | > 1,000 to 10,000 | 0 | > 1,000 to 10,000 | 0 | 0 | 0 | 0 |
| Selenium (and its compounds) | > 1 to 10 | 0 | 0 | 0 | 0 | 0 | > 0 to 1 | > 1 to 10 |
| Sulphur Dioxide | 0 | > 1,000 to 10,000 | 0 | > 1,000 to 10,000 | 0 | 0 | 0 | 0 |
| Sulphuric Acid | > 10 to 100 | 0 | > 10 to 100 | 0 | 0 | 0 | > 0 to 1 | 0 |
| Toluene | 0 | > 100 to 1000 | > 10 to 100 | > 1 to 10 | 0 | > 0 to 1 | 0 | > 100 to 1000 |
| Total Reduced Sulphur | 0 | > 100 to 1000 | > 10 to 100 | > 10 to 100 | 0 | 0 | 0 | > 10 to 100 |
| Vanadium | > 100 to 1000 | 0 | 0 | 0 | 0 | > 10 to 100 | > 10 to 100 | > 1 to 10 |
| VOC | 0 | > 100 to 1000 | 0 | > 100 to 1000 | 0 | 0 | 0 | 0 |
| Zinc | > 10,000 to 100,000 | 0 | 0 | > 0 to 1 | > 0 to 1 | > 1,000 to 10,000 | > 10 to 100 | > 1,000 to 10,000 |

## Comparison of Tracking and Quantification to Previous Reporting Periods

The reported toxic substances quantities were slightly higher in 2012 than in 2011 as a result of increased production of coke and cold rolled and coated steel.

Toxic substances quantities are also impacted by the disposal and recycling of secondary materials. In 2012 considerably larger quantities of secondary materials were transported offsite than in the previous year.

## Steps Taken to Achieve Objectives and Assess Effectiveness

The toxic substances reported by Hamilton Works are either required for its products and processes, are generated as unavoidable byproducts, or are incidental trace elements in raw materials. Where feasible, these toxics are managed by recycling and maintaining inventories that are as low as possible.