



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

Lake Erie Works
2012 Annual Toxics Reduction Report
(O. Reg. 455/09)

Issued May 24, 2013

Basic Facility Information

Section 1 – Facility Information	
Owner	US Steel Canada
Facility name	Lake Erie Works
Address	General Delivery
City	Nanticoke
Province	Ontario
Postal Code	N0A 1L0
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)	Petar Kolundzija
Title	Environmental Coordinator
Phone	(519) 587 – 4541 ext 5403
Fax	(519) 578 – 7706
Email address	PKolundzija@uss.com

Basic Facility Information (Cont.)

Lake Erie Works was commissioned in 1980 making it the most modern integrated steel mill in North America. The plant is located on 1660 hectares of land on the north shore of Lake Erie. Lake Erie Works is an integrated steel plant and produces approximately 2.5 million tonnes of steel per year. Process operations at the plant include Cokemaking, Ironmaking, Basic Oxygen Furnace Steelmaking, Continuous Casting, Hot Strip Rolling and Pickling. There are no finishing operations at the plant.

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 vapourized 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 reheat furnaces in the Hot Strip Mill. The liquid 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 7,000 tonne/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 Lake Erie Works are rolled in the Hot Strip Mill although some are shipped to other U. S. Steel facilities or sold.

The hot strip rolling facility reheats the slabs to the desired rolling temperature for converting them into strip. The slab is rolled to a finished thickness of 2-16 millimetres. The strip is then cooled and coiled for sale or further processing off-site. A portion of the hot-rolled strip is processed at the Lake Erie Works Pickle Lines where hydrochloric acid is used to remove iron oxide from the steel surface to produce Pickled & Oiled hot-rolled sheet.

The plant has extensive environmental control measures. Water is recycled extensively and treated before exiting the plant. Air cleaning equipment is used at the Coke Ovens, Blast Furnace and Basic Oxygen Furnaces to minimize emissions. In addition, a detailed landscaping plan was implemented during construction. This includes earthen berms up to 10 meters high surrounding the plant, water filled lagoons and extensive tree planting.

List of Toxic Substances at the Facility

Substance	Chemical Abstracts Service Number
Acenaphthylene	208-96-8
Arsenic	**
Benzene	71-43-2
Benzo(a)anthracene	56-55-3
Benzo(a)phenanthrene	218-01-9
Benzo(a)pyrene	50-32-8
Benzo(b)fluoranthene	205-99-2
Benzo(g,h,i)perylene	191-24-2
Benzo(j)fluoranthene	205-82-3
Benzo(k)fluoranthene	207-08-9
Butane	**
Butene	25167-67-3
Cadmium	**
Calcium Fluoride	7789-75-5
Carbon Monoxide	630-08-0
Chlorine	7782-50-5
Chromium	**
Copper	**
Dibenzo(a,h)anthracene	53-70-3
Dibenzo(a,i)pyrene	189-55-9
Ethylene	74-85-1
Fluoranthene	206-44-0
Hydrochloric Acid	7647-01-0
Hydrogen Sulphide	7783-06-4
Indeno(1,2,3-c,d)pyrene	193-39-5
Lead	**
Manganese	**
Mercury	**
Methanol	67-56-1
n-Hexane	110-54-3
Nickel	**
Nitrogen Oxides (as NO ₂)	11104-93-1
Particulate Matter	**
Perylene	198-55-0
Phenanthrene	85-01-8
PM10	**
PM2.5	**
Propane	74-98-6
Propylene	115-07-1
Pyrene	129-00-0
Selenium	**
Sulphur Dioxide	7446-09-5
Toluene	108-88-3
Total Reduced Sulphur	**
Vanadium	7440-62-2
Volatile Organic Compounds	**
Zinc	**

** No single CAS number applies to this substance

Summary: Tracking and Quantification

Substances	Usage	Creation	Destruction	Releases to Water
	tonnes	tonnes	tonnes	tonnes
Acenaphthylene	0	> 100 to 1000	0	0
Arsenic	> 10 to 100	0	0	0
Benzene	0	> 1,000 to 10,000	0	> 0 to 1
Benzo(a)anthracene	0	> 100 to 1000	0	> 0 to 1
Benzo(a)phenanthrene	0	> 100 to 1000	0	> 0 to 1
Benzo(a)pyrene	0	> 100 to 1000	0	> 0 to 1
Benzo(b)fluoranthene	0	> 100 to 1000	0	> 0 to 1
Benzo(g,h,i)perylene	0	> 1 to 10	0	> 0 to 1
Benzo(j)fluoranthene	0	> 10 to 100	0	> 0 to 1
Benzo(k)fluoranthene	0	> 100 to 1000	0	> 0 to 1
Butane	> 100 to 1000	> 0 to 1	> 100 to 1000	0
Butene	0	> 1 to 10	0	0
Cadmium	> 1 to 10	0	0	> 0 to 1
Calcium Fluoride	> 100 to 1000	> 10 to 100	> 100 to 1000	> 10 to 100
Carbon Monoxide	0	> 1,000,000	>1,000,000	0
Chlorine	> 100 to 1000	0	> 100 to 1000	> 0 to 1
Chromium	> 100 to 1000	0	0	> 0 to 1
Copper	> 100 to 1000	0	0	> 0 to 1
Dibenzo(a,h)anthracene	0	> 100 to 1000	0	> 0 to 1
Dibenzo(a,i)pyrene	0	> 100 to 1000	0	> 0 to 1
Ethylene	0	> 1 to 10	0	0
Fluoranthene	0	> 100 to 1000	0	> 0 to 1
Hydrochloric Acid	> 1,000 to 10,000	0	0	0
Hydrogen Sulphide	0	> 10 to 100	> 10 to 100	0
Indeno(1,2,3-c,d)pyrene	0	> 10 to 100	0	> 0 to 1
Lead	> 10 to 100	0	0	> 0 to 1
Manganese	> 10,000 to 100,000	0	0	0
Mercury	> 0 to 1	0	0	0
Methanol	0	> 1 to 10	0	0
n-Hexane	> 100 to 1000	0	> 100 to 1000	0
Nickel	> 1,000 to 10,000	0	0	0
NOx (as NO2)	0	> 1,000 to 10,000	0	0
Particulate Matter	0	> 1,000 to 10,000	> 1,000 to 10,000	0
Perylene	0	> 10 to 100	0	> 0 to 1
Phenanthrene	0	> 100 to 1000	0	> 0 to 1
PM10	0	> 1,000 to 10,000	> 1,000 to 10,000	0
PM2.5	0	> 1,000 to 10,000	> 1,000 to 10,000	0
Propane	> 100 to 1000	> 0 to 1	> 100 to 1000	0
Propylene	0	> 1 to 10	0	0
Pyrene	0	> 100 to 1000	0	> 0 to 1
Selenium	> 10 to 100	0	0	0
Sulphur Dioxide	0	> 1,000 to 10,000	0	0
Toluene	0	> 100 to 1000	0	0
Total Reduced Sulphur	0	> 10 to 100	> 10 to 100	0
Vanadium	> 10 to 100	0	0	0
VOCs	> 1,000 to 10,000	10,000 to 100,000	10,000 to 100,000	0
Zinc	> 1,000 to 10,000	0	0	> 0 to 1

Summary: Tracking and Quantification (Cont.)

Substances	Releases to Air	Disposal	Recycling	Contained in Product
	tonnes	tonnes	Tonnes	tonnes
Acenaphthylene	> 0 to 1	0	0	> 100 to 1000
Arsenic	> 0 to 1	> 1 to 10	0	> 10 to 100
Benzene	> 10 to 100	0	0	> 1,000 to 10,000
Benzo(a)anthracene	> 0 to 1	0	0	> 100 to 1000
Benzo(a)phenanthrene	> 0 to 1	0	0	> 100 to 1000
Benzo(a)pyrene	> 0 to 1	0	0	> 100 to 1000
Benzo(b)fluoranthene	> 0 to 1	0	0	> 100 to 1000
Benzo(g,h,i)perylene	> 0 to 1	0	0	> 1 to 10
Benzo(j)fluoranthene	> 0 to 1	0	0	> 10 to 100
Benzo(k)fluoranthene	> 0 to 1	0	0	> 100 to 1000
Butane	> 1 to 10	0	0	0
Butene	> 1 to 10	0	0	0
Cadmium	> 0 to 1	> 1 to 10	0	> 0 to 1
Calcium Fluoride	> 0 to 1	0	0	0
Carbon Monoxide	> 1000 to 10,000	0	0	0
Chlorine	0	0	0	0
Chromium	> 0 to 1	> 10 to 100	> 100 to 1000	> 100 to 1000
Copper	> 0 to 1	> 10 to 100	> 10 to 100	> 100 to 1000
Dibenzo(a,h)anthracene	> 0 to 1	0	0	> 100 to 1000
Dibenzo(a,i)pyrene	> 0 to 1	0	0	> 100 to 1000
Ethylene	> 1 to 10	0	0	0
Fluoranthene	> 0 to 1	0	0	> 100 to 1000
Hydrochloric Acid	> 0 to 1	0	> 1,000 to 10,000	0
Hydrogen Sulphide	> 10 to 100	0	0	0
Indeno(1,2,3-c,d)pyrene	> 0 to 1	0	0	> 10 to 100
Lead	> 0 to 1	> 100 to 1000	> 1 to 10	> 1 to 10
Manganese	> 1 to 10	> 1,000 to 10,000	> 10,000 to 100,000	> 1,000 to 10,000
Mercury	> 0 to 1	> 0 to 1	> 0 to 1	> 0 to 1
Methanol	> 1 to 10	0	0	0
n-Hexane	> 1 to 10	0	0	0
Nickel	> 0 to 1	> 10 to 100	> 10 to 100	> 1,000 to 10,000
NOx (as NO2)	> 1000 to 10000	0	0	0
Particulate Matter	> 1000 to 10000	0	0	0
Perylene	> 0 to 1	0	0	> 10 to 100
Phenanthrene	> 0 to 1	0	0	> 100 to 1000
PM10	> 1000 to 10,000	0	0	0
PM2.5	> 100 to 1000	0	0	0
Propane	> 1 to 10	0	0	0
Propylene	> 1 to 10	0	0	0
Pyrene	> 0 to 1	0	0	> 100 to 1000
Selenium	> 0 to 1	> 1 to 10	> 1 to 10	> 10 to 100
Sulphur Dioxide	> 1000 to 10,000	0	0	0
Toluene	> 100 to 1000	0	0	0
Total Reduced Sulphur	> 10 to 100	0	0	0
Vanadium	> 0 to 1	> 10 to 100	> 100 to 1000	> 10 to 100
VOCs	> 100 to 1000	0	0	0
Zinc	> 0 to 1	> 1,000 to 10,000	> 100 to 1000	> 10 to 100

Comparison of Tracking and Quantification to Previous Reporting Periods

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

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 toxics reported by Lake Erie Works are either required for its products and processes, are generated as unavoidable by-products, 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.