

GREAT LAKES, GREAT POLLUTION:

*CANADIAN POLLUTANT RELEASES
AND TRANSFERS TO THE GREAT LAKES*

PollutionWatch

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Canadian Environmental
Law Association

*l'association canadienne
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Executive Summary

Executive Summary

Nearly 30 years after Canadian and American governments signed the *Great Lakes Water Quality Agreement* (GLWQA), pollution in the Great Lakes basin remains a significant problem. The Great Lakes are under threat from pollutants from industry, agriculture, cities and disposal sites. Yet, governments continue to tell a 'good news' story about the health of the Great Lakes, most recently in the joint Environment Canada/United States Environmental Protection Agency report, *Our Great Lakes: What is happening to them, what it means and what you can do to help keep them great* (2005).

Data collected by the federal government through the National Pollutant Release Inventory (NPRI) show that large amounts of pollutants are released and transferred in the Great Lakes basin. In 2002, Canadian facilities in the Great Lakes basin reported:

- Releasing about half of the total toxic air pollution in Canada.
- Releasing and transferring more than 1.1 billion kilograms of pollutants to air, water, land, underground injection and various types of treatment.
- Releasing over 1 billion kilograms of pollutants into the air; most pollutants released to the air are suspected respiratory toxins.
- Releasing about 28 million kilograms of pollutants into the water.
- Generating 36 million kilograms of pollutants that were transferred to other facilities for treatment, sewage treatment, energy recovery and underground injection.

NPRI facilities in the Lake Erie basin reported the largest air releases on the Canadian side of the Great Lakes, mainly due to the air emissions from Ontario Power Generation's coal burning Nanticoke Generating Station, owned by the province of Ontario.

Releases to the air were the largest source of pollution on the Canadian side of the Great Lakes in 2002, and NPRI data show facilities have made no significant reductions in air pollution. Analyzing the last five years of data, (1998 to 2002), air releases of core chemicals from core facilities - those chemicals and facilities that have been consistently reported - have remained virtually unchanged with a reduction of less than 1%.

Because NPRI data reflect only a portion of pollution in the Great Lakes basin in Canada, the analyses in this report are very conservative estimates of the total amount of pollution affecting the Great Lakes. Urgent action is required to protect the Great Lakes basin from the on-going harmful effects of pollution.

Recommendations

1. Immediate action should be taken by the Canadian federal and provincial governments to reduce and eliminate pollution levels of both toxic pollutants and criteria air pollutants in the Great Lakes basin. Further to this end, the federal and provincial governments should:

- a. accelerate timelines for the virtual elimination of persistent, bioaccumulative toxics by 2010 and provide assurance that targets under the Canada-Ontario Agreement and the GLWQA are met on time;
- b. aim to virtually eliminate all carcinogens and endocrine disrupting substances by 2015. There should be at a minimum a 50% reduction of endocrine disrupting and carcinogenic substances within five years;

Part 1: Great Lakes: Overview of Releases and Transfers of Pollutants from Facilities in the Canadian Great Lakes Basin

- c. develop or accelerate reduction and elimination targets for all other pollutants released and transferred in the Great Lakes basin; and,
 - d. require that the targets be met through pollution prevention methods.
2. The upcoming review of the *Great Lakes Water Quality Agreement* should review and strengthen the pollution prevention and elimination targets.
 3. The NPRI program should be improved to include:
 - a. an expansion of its reporting requirements to include other sectors, such as the mining sector, and require reporting by facilities to report uses, releases and transfers on a larger number of pollutants, in particular on persistent toxic substances; and,
 - b. biennial reporting by governments to monitor and review progress in reducing and eliminating releases and transfers from facilities in the Great Lakes basin.

1. Introduction

About one-third of Canadians call the Great Lakes home. These massive lakes, the largest fresh water lakes in the world, provide us with drinking water, food, recreation and transportation. Yet, pollution is a continuing problem. Now citizens can track pollution in the Great Lakes on the PollutionWatch web site at www.PollutionWatch.org. Visitors to the PollutionWatch site can search for a specific facility,

industrial sector, chemical or time trend in the Great Lakes.

This Great Lakes report uses analysis from the updated PollutionWatch web site to provide an overview of releases and transfers of pollutants reported to Canada's National Pollutant Release Inventory (NPRI) by 2,698 Canadian facilities in the Great Lakes basin and the St. Lawrence River basin in 2002 (about 58% of the total number of NPRI facilities in Canada).

At present, no reporting is routinely undertaken and made available to the public that outlines the level of pollutants released and transferred by Great Lakes facilities. The data presented in this report therefore may be useful to the governments of Canada and the United States as they prepare to review the *Great Lakes Water Quality Agreement* in the fall of 2005. The agreement, first signed in 1972 and revised again in 1978 and 1987, aims to restore and protect the water quality of the Great Lakes and to virtually eliminate persistent toxic substances.

Because pollutants can often travel long distances, some of the pollutants that originate in the Great Lakes basin may be carried to other regions. Similarly, pollution generated outside of the Great Lakes basin may travel to the Great Lakes. The NPRI data generally provide information from larger industrial facilities; the data do not cover all pollutants, all sources or all facilities (see Appendix A).

The Great Lakes - Superior, Michigan, Huron, Erie and Ontario - and their connecting channels form the largest fresh water system on Earth with their water and land area that drains into the lakes covering 766,000 square kilometres. The Great Lakes hold 80% of the lake and river water in North America, providing a source of drinking water for 24 million people (Environment Canada and United States Environmental

Protection Agency, 2005).

The basin produces 75% of Canada's manufacturing output and 16% of the gross domestic product of the North American Free Trade Agreement, including over \$200 billion in trade between Canada and the United States annually (Environment Canada, 2004).

About the *Great Lakes Water Quality Agreement*

The 1978 *Great Lakes Water Quality Agreement* (GLWQA) reaffirms a commitment, first made by Canada and the United States in 1972, to restore and protect the water quality of these lakes. The 1978 agreement includes specific objectives to enhance and maintain ecosystem quality, as well as a goal to virtually eliminate toxic substances, which persist in the environment, from entering the lakes. To reach this goal and to restore, preserve and protect the Great Lakes basin, the agreement calls for an ecosystem approach that considers the interaction of air, land, water, and living things, including humans. It calls for cooperation among the federal, provincial and state governments to define the total impact of persistent toxic substances and to develop control programs for the use, transport and disposal of pesticides, industrial wastes, petroleum products, and sludge and dredge spoils (International Joint Commission, 2004).

Under the GLWQA, the governments of Canada and the United States are to review the effectiveness of the agreement after every third biennial report of the International Joint Commission (IJC). Hence, when the IJC issued its last report in September of 2004, a review of the agreement was triggered.

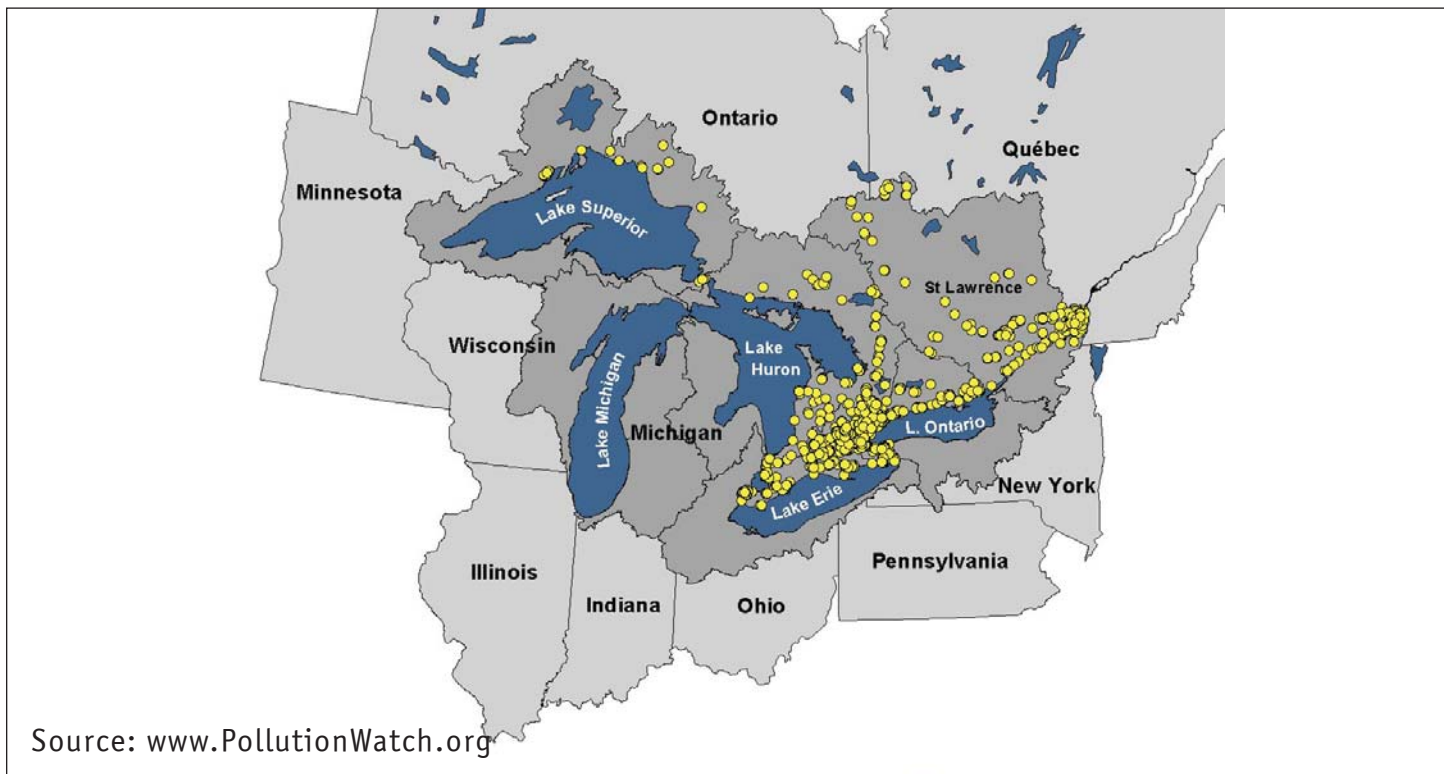
This review is an excellent opportunity for governments within the Great Lakes basin and the public to ask direct questions as to why pollution levels remain so high and

have not decreased significantly. The review process should be thorough, inclusive and include a review of the agreement, the operations and roles of the parties as well as the IJC.

A copy of the *Great Lakes Water Quality Agreement* is available online at www.ijc.org.



Figure 1: Locations of facilities in the Great Lakes basin that report to NPRI

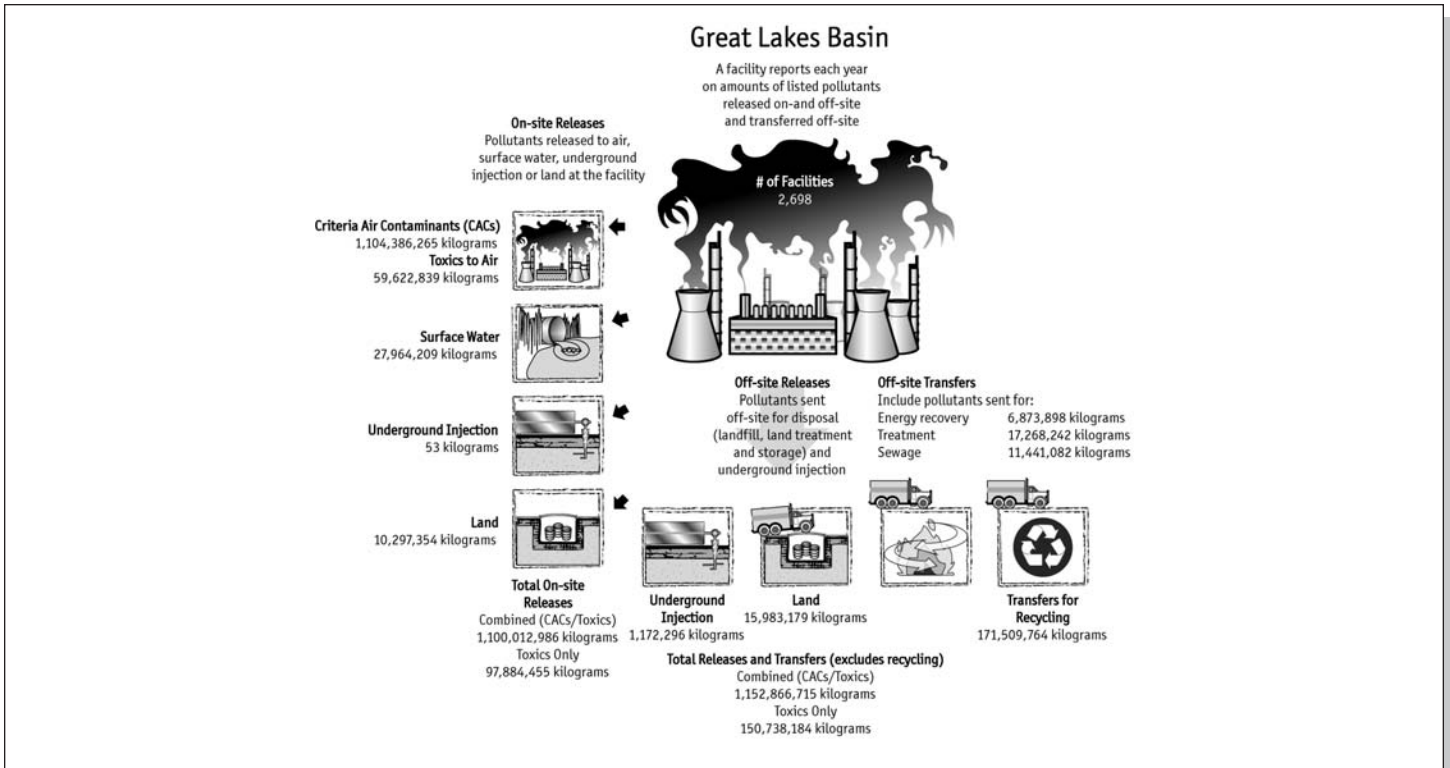


2. Pollutant Levels in the Great Lakes Basin in Canada

Over 151 million kilograms of toxic pollutants were released into the air, water, and land and transferred from NPRI facilities in the Great Lakes basin in 2002. These releases include pollutants such as lead, mercury and hydrochloric acid, some of which are persistent toxic compounds, carcinogens, or reproductive and developmental toxic substances. In addition to these pollutants, another 1,104 million kilograms of criteria air contaminants (such as sulphur dioxide and particulate matter that contribute to smog, acid rain and haze) were released into the air from NPRI facilities in the Great Lakes basin.

About 28 million kilograms of pollutants were released into the water from NPRI facilities in the Great Lakes basin in 2002. About 10 million kilograms were land-filled on facility sites and 16 million kilograms were sent mainly to landfill sites at other locations. Facilities in the Great Lakes basin also generated another 36 million kilograms of pollutants that were transferred to other facilities - 11 million kilograms to sewage treatment plants, 17 million kilograms to treatment, 7 million kilograms to energy recovery and 1 million kilograms to underground injection. Facilities also reported sending over 171 million kilograms of materials to recycling (Figure 2).

Figure 2: Releases and transfers of pollutants from facilities in the Great Lakes basin in 2002 (as reported to NPRI)



Most pollutants are still released into the air. Over 1 billion kilograms of air pollutants were released in the Great Lakes basin in 2002, equivalent to the weight of almost 13 million people. Of that total, over 59 million (59,622,839) kilograms released were toxic air pollutants and more than 1 billion (1,104,386,265) kilograms were criteria air contaminants. Toxic pollutants released to the air contributed almost 40% of the total amount of toxic pollutants released and transferred in the Great Lakes basin.

Facilities in the Great Lakes basin accounted for about 45% of the total toxic air pollutants released in Canada in 2002 (131,006,448 kilograms). In other words, almost half of the air pollutants released in Canada were emitted in the Great Lakes basin.

Many of the air pollutants released into the Great Lakes are suspected respiratory toxic substances. **Over 1 billion kilograms of pollutants suspected of causing respiratory illnesses were released into the air in 2002 from NPRI facilities in the Great Lakes basin** (about 25% of Canada's total).

About 80 of the 273 pollutants tracked by NPRI are considered toxic under the *Canadian Environmental Protection Act* (CEPA). Canada's national pollution law, CEPA, seeks to protect the environment and human health from the risks associated with pollutants. **In 2002, NPRI facilities in the Great Lakes basin released about 828 million kilograms of pollutants considered CEPA toxic to the air** (including criteria air contaminants) and 13 million kilograms of CEPA toxics into the water (both about one-third of Canada's total).

Some of the pollutants released by facilities are also considered carcinogens, with **3 million kilograms of carcinogens released to the air of the Great Lakes basin** (almost half of Canada's total) and **0.05 million kilograms of carcinogens into the water** (about one-third of Canada's total) in 2002.

Although the five Great Lakes and the St. Lawrence River basin are part of the same system, they differ widely in the amount of releases and transfers of pollutants (Table 1).

Table 1: Summary of pollutants released and transferred from NPRI facilities in each Lake in the Great Lakes basin in 2002 (kilograms as reported to NPRI).

Great Lake	Number of NPRI Facilities	On-site Releases to Air (combined; no VOCs)	On-site Releases to Air (Toxics only)	On-site Releases to Water	On-site Releases to Land	On-site Releases to Underground Injection	Off-site Releases to Land
St. Lawrence	578	160,683,997	9,127,594	3,926,964	1,159,963	1	3,965,770
Lake Ontario	1,274	158,562,387	17,238,100	17,388,844	1,837,830	0	8,241,417
Lake Erie	586	348,040,605	22,832,355	4,044,075	7,125,065	52	2,727,748
Lake Huron	225	318,424,649	6,066,342	1,545,439	152,706	0	724,105
Lake Superior	35	76,039,732	4,358,448	1,058,887	21,790	0	324,139
Total for Great Lakes	2,698	1,061,751,370	59,622,839	27,964,209	10,297,354	53	15,983,179
Total for Canada	4,652	3,868,302,111	131,006,448	77,012,135	32,468,894	167,004,303	36,419,796
Great Lakes total as percentage of Canada	58%	27%	45%	36%	32%	3%	44%
Great Lake	Off-site Releases to Underground Injection	Off-site Transfers to Energy Recovery	Off-site Transfers to Sewage	Off-site Transfers to Treatment	On-and Off-site Releases (adjusted for double-counting)	Total Releases and Transfers Combined	Recycling
St. Lawrence	0	1,399,846	2,044,235	5,060,485	169,756,195	178,263,224	18,540,462
Lake Ontario	1,171,848	4,641,683	8,737,363	5,933,231	186,983,345	206,571,938	61,889,032
Lake Erie	448	718,871	450,836	5,893,641	361,195,946	369,029,247	41,076,572
Lake Huron	0	113,498	208,638	366,687	320,612,513	321,542,995	49,701,557
Lake Superior	0	0	10	14,198	77,445,103	77,459,311	302,141
Total for Great Lakes	1,172,296	6,873,898	11,441,082	17,268,242	1,115,993,102	1,152,866,715	171,509,764
Total for Canada	9,010,654	8,922,616	16,027,359	29,252,671	4,187,866,272	4,244,614,425	1,226,532,508
Great Lakes total as percentage of Canada	13%	77%	71%	59%	27%		14%

Please note that Lake Michigan is not included in this table as it is located outside of Canadian boundaries.

Of all the Great Lakes, facilities in the Lake Erie basin have the largest releases to the air (both toxic pollutants and criteria air contaminants), mainly due to the releases from Nanticoke Generating Station, operated by Ontario Power Generation and owned by the Province of Ontario. Facilities in the Lake Erie basin also have the largest releases to landfill, mainly from the hazardous waste management site, Clean Harbors Inc. in Corunna, Ontario (formerly Safety Kleen).

Facilities in the Lake Ontario basin have the largest releases of pollutants to water (mainly ammonia from sewage treatment plants) and largest amount of pollutants transferred off-site to landfills (and other methods), underground injection, energy recovery, sewage, treatment and recycling.

Of all the NPRI facilities releasing air pollutants (toxic and criteria air contaminants) to the Great Lakes basin, two facilities stand out - Inco Ltd.'s Copper Cliff Smelter Complex and Ontario Power Generation's Nanticoke Generating Station. These two facilities

Table 2: The 10 facilities in the Great Lakes basin with the largest air releases of pollutants considered toxic under the *Canadian Environmental Protection Act* in 2002 (kilograms as reported to NPRI)

Rank	Facility	Company Name	Air release of CEPA toxics (kg)	National Ranking	Province	Great Lake Basin
1	Copper Cliff Smelter Complex	Inco Limited	239,345,582	1	ON	Lake Huron
2	Nanticoke Generating Station	Ontario Power Generation	130,497,667	2	ON	Lake Erie
3	Fonderie Horne	Noranda Inc.	62,504,310	8	QC	St. Lawrence River
4	Lambton Generating Station	Ontario Power Generation	47,787,094	12	ON	Lake Erie
5	Smelter Complex	Falconbridge Limited	39,211,348	15	ON	Lake Huron
6	Sarnia Refinery Plant	Imperial Oil	28,226,994	20	ON	Lake Erie
7	Lakeview GS	Ontario Power Generation	19,481,487	25	ON	Lake Ontario
8	Sarnia Manufacturing Centre	Shell Canada Limited	14,999,707	29	ON	Lake Erie
9	Thunder Bay Generating Station	Ontario Power Generation	12,834,059	31	ON	Lake Superior
10	Woodstock Plant	Lafarge Canada Inc.	10,317,431	37	ON	Lake Erie
Total for all Great Lakes		827,686,923 kilograms				

accounted for 390 million kilograms or about 37% of the total air releases reported from all NPRI facilities in the Great Lakes basin. Both facilities reported large amounts of sulphur dioxide, which contributes to acid rain, smog and haze, respiratory illness (especially in children and the elderly) and aggravates existing heart and lung diseases (Environmental Protection Agency, 2003). These two facilities - Inco Ltd.'s Copper Cliff Smelter

Complex and Ontario Power Generation's Nanticoke Generating Station - also accounted for over one-quarter of all the air releases of CEPA toxics on the Canadian side of the Great Lakes basin (Table 2).

Table 3: The 10 facilities in the Great Lakes basin with the largest water releases of pollutants considered carcinogens in 2002 (kilograms as reported to NPRI)

Rank	Facility	Company Name	Water releases of carcinogens (kg)	National Ranking	Province	Great Lake Basin
1	Central Mills	Inco Limited	25,866	1	ON	Lake Huron
2	Site de Témiscaming	Tembec	3,127	9	QC	St. Lawrence River
3	Woodward Avenue Wastewater Treatment Plant	City of Hamilton	2,812	10	ON	Lake Ontario
4	Station de purification des eaux usées	Ville de Montreal	2,742	12	QC	St. Lawrence River
5	Sudbury Mines/Mill Business Unit	Falconbridge Limited	1,715	21	ON	Lake Huron
6	Georgetown Waste Water Treatment Plant	Regional Municipality of Halton	1,682	22	ON	Lake Ontario
7	Smelter Complex	Falconbridge Limited	1,619	24	ON	Lake Huron
8	Bruce Power	Bruce Power Limited Partnership	1,383	28	ON	Lake Huron
9	Espanola Mill	Domtar Inc.	1,227	32	ON	Lake Huron
10	Ashbridges Bay Treatment Plant	City of Toronto	1,050	34	ON	Lake Ontario
Total for all Great Lakes		312,696 kilograms				

Note: Some of these facilities are sewage treatment plants which receive wastes from other industries, homes and businesses.

2.1 Persistent, Bioaccumulative Toxic Substances Released into the Great Lakes Basin

One of the priorities for the Great Lakes is the reduction of mercury, a persistent, bioaccumulative neurotoxin. About 21% of the advice given for eating sport fish from the Great Lakes suggests limiting fish consumption, mainly because of mercury (Government of Ontario, 2004). Canadian and American governments have committed to the virtual elimination of the discharge of any or all persistent toxic chemicals, including mercury, under the *Great Lakes Water Quality Agreement*. Mercury is also targeted for reduction

under the *United States/Canadian Great Lakes Binational Toxics Strategy*. As part of the renewed *Canada-Ontario Agreement Respecting the Great Lakes Ecosystem*, signed in 2002, Canada and Ontario also committed to an 85% reduction in mercury releases by 2005 and a 90% reduction by 2010, from 1988 baseline levels (13,930 kilograms).

Facilities in the Great Lakes basin released about 1,847 kilograms of mercury and its compounds to the air in 2002 (Table 4). About 130 kilograms of mercury and its compounds were released into the water.

Table 4: The 10 facilities in the Great Lakes basin with the largest releases of mercury and its compounds to the air in 2002 (kilograms as reported to NPRI)

Rank	Facility	Company Name	Air releases of mercury and its compounds (kg)	National Ranking	Province	Great Lake Basin
1	Nanticoke Generating Station	Ontario Power Generation	241	3	ON	Lake Erie
2	Fonderie Horne	Noranda Inc.	178	5	QC	St. Lawrence River
3	Clean Harbors Mercier, inc.	Clean Harbors Inc.	165	6	QC	St. Lawrence River
4	Lambton Generating Station	Ontario Power Generation	130	8	ON	Lake Erie
5	Station de purification des eaux usées	Ville de Montréal	130	9	QC	St. Lawrence River
6	Dofasco Hamilton	Dofasco Inc.	95	16	ON	Lake Ontario
7	Lambton Facility	Clean Harbors Inc.	94	17	ON	Lake Erie
8	Picton	ESSROC Canada Inc	93	18	ON	Lake Ontario
9	Whitby	Gerdau AmeriSteel Corporation	73	21	ON	Lake Ontario
10	Thunder Bay Generating Station	Ontario Power Generation	72	22	ON	Lake Superior
Total for all Great Lakes		1,847 kilograms				

2.2 Trends in Releases and Transfers in the Great Lakes Basin between 1995 and 2002

NPRI since 1995, and does not include criteria air contaminants, reported for the first time in 2002.

Air releases of toxic substances from Canadian facilities in the Great Lakes basin increased by 8% between 1995 and 2002 (Table 5). This trend is based on 160 chemicals (called core chemicals) that have been reported to

Table 5: Releases and transfers of core chemicals from all facilities in the Great Lakes basin between 1995 and 2002 (kilograms as reported to NPRI).

Year	Releases and Transfers of Core Chemicals	Air Releases	Water Releases	Land on-site	Land off-site	Underground Injection (On & Off-site)	Transfers for Sewage	Transfers for Treatment
1995	84,503,911	45,337,009	5,780,4124,	6,657,3033,	13,169,491	850	5,582,448	7,866,178
1996	88,015,907	45,905,564	308,505	746,002	17,561,202	15,866	6,745,667	9,629,973
1997	128,882,772	47,574,358	12,841,411	5,107,719	35,982,237	722,798	8,840,127	17,710,671
1998	116,212,236	46,226,000	9,195,306	3,551,032	34,264,175	816,296	7,754,022	14,311,213
1999	140,537,910	47,822,100	11,165,773	15,814,237	42,036,145	813,227	7,689,464	15,106,594
2000	117,501,785	50,718,085	15,156,793	7,133,147	17,900,620	838,639	9,155,610	16,516,239
2001	113,638,513	45,115,554	18,774,730	9,935,022	13,104,190	1,090,184	10,487,879	15,037,598
2002	123,735,509	49,191,822	27,863,425	8,150,412	11,751,072	942,152	10,979,973	14,758,688
% change 1995-2002	46%	9%	382%	22%	-11%	110741%	97%	88%

This increasing trend in air releases includes all facilities in the Great Lakes basin that report to NPRI. Over time, the number of facilities reporting to NPRI has increased, and some of the changes may be a result of the increased number of facilities reporting, changes in reporting methods or changes in production. For this reason, PollutionWatch also analyzed the trends in releases and transfers using core chemicals and core facilities², which are only those NPRI facilities in the Great Lakes basin that have reported in both 1995 and 2002. There are about 1,000 core facilities in the Great Lakes basin, about half of the total number of all Great Lakes facilities that reported to NPRI in 2002.

For core facilities and core chemicals, air releases of toxic pollutants decreased by 4% between 1995 and 2002 (Table 6), a small reduction over eight years. Analyzing the last five years of NPRI data (1998 to 2002), the amount of air releases of core chemicals

from core facilities has remained virtually unchanged with a reduction of less than 1%. Clearly, these figures show that governments and industry are not making much progress overall in reducing air releases by Canadian facilities in the Great Lakes basin.

Releases of pollutants into the water increased by 382% for all facilities and 127% for core facilities between 1995 and 2002. Much of this increase is due to increased reporting of ammonia and other pollutants from sewage treatment plants. Some of the increase may also be due to new guidance manuals and improvements in NPRI reporting.

Table 6: Releases and transfers of core chemicals from core facilities (those facilities reported in both 1995 and 2002) in the Great Lakes basin between 1995 and 2002 (kilograms as reported to NPRI)

Year	Releases and Transfers of Core Chemicals	Air Releases	Water Releases	Land on-site	Land off-site	Underground Injection (On & Off-site)	Transfers for Sewage	Transfers for Treatment
1995	78,674,076	42,839,561	5,766,725	5,499,760	12,806,087	850	5,305,023	6,456,070
1996	80,650,299	42,998,359	4,247,767	2,857,074	16,874,112	13,114	6,421,222	7,238,651
1997	94,052,238	43,313,462	10,006,789	3,704,947	22,984,249	266,738	6,557,239	7,218,814
1998	83,942,889	41,526,470	6,508,710	3,205,472	20,086,810	178,756	5,904,120	6,532,551
1999	95,828,309	41,885,944	8,357,739	15,703,770	17,784,049	48,177	5,680,700	6,367,930
2000	91,847,947	44,882,114	10,478,880	7,049,767	13,856,402	87,199	7,152,794	8,340,791
2001	74,952,170	39,404,648	12,143,148	6,565,569	9,337,770	148,480	7,352,555	0
2002	85,462,095	41,153,497	13,112,171	7,750,798	7,739,717	448	7,678,237	8,027,227
% change 1995-2002	9%	-4%	127%	41%	-40%	-47%	45%	24%
% change 1998-2002	2%	-0.9%	101%	142%	-61%	-100%	30%	23%

3. Conclusions

Despite the fact that toxic pollution has been recognized as a threat to the Great Lakes for more than 30 years, this report clearly demonstrates that the problem is far from being resolved.

1. Over 151 million kilograms of toxic pollutants (excluding criteria air contaminants) were released and transferred from Canadian sources alone in 2002, an underestimate of actual pollution still entering the Great Lakes.
2. Over 1 billion kilograms of air pollutants (including criteria air contaminants) were released into the Great Lakes by Canadian facilities in 2002.
3. Large amounts of persistent toxic substances are still entering the Great Lakes from Canada despite the 1978 obligation from the *Great Lakes Water Quality Agreement* to virtually eliminate persistent toxic substances.
4. Progress on reducing pollution on the Canadian side of the Great Lakes has been slow and pollution levels remain unacceptably high. The data point to complacency both with respect to federal and provincial governments and the lack of priority for Great Lakes issues.

4. Recommendations

1. Immediate action should be taken by the Canadian federal and provincial governments to reduce and eliminate pollution levels of both toxic pollutants and criteria air pollutants in the Great Lakes basin. Further to this end, the federal and provincial governments should:
 - a. accelerate timelines for the virtual elimination of persistent, bioaccumulative toxics by 2010 and provide assurance that targets under the *Canada-Ontario Agreement* and GLWQA are met on time;
 - b. aim to virtually eliminate all carcinogens and endocrine disrupting substances by 2015. There should be at a minimum a 50% reduction of endocrine disrupting and carcinogenic substances within five years;
 - c. develop or accelerate reduction and elimination targets for all other pollutants released and transferred in the Great Lakes basin; and,
 - d. require that the targets be met through pollution prevention methods.
2. The upcoming review of the *Great Lakes Water Quality Agreement* should review and strengthen the pollution prevention and elimination targets.
3. The NPRI program should be improved to include:
 - an expansion of its reporting requirements to include other sectors, such as the mining sector, and require reporting by facilities to report uses, releases and transfers on a larger number of pollutants, in particular on persistent toxic substances; and,
 - biennial reporting by governments to monitor and review progress in reducing and eliminating releases and transfers from facilities in the Great Lakes basin.

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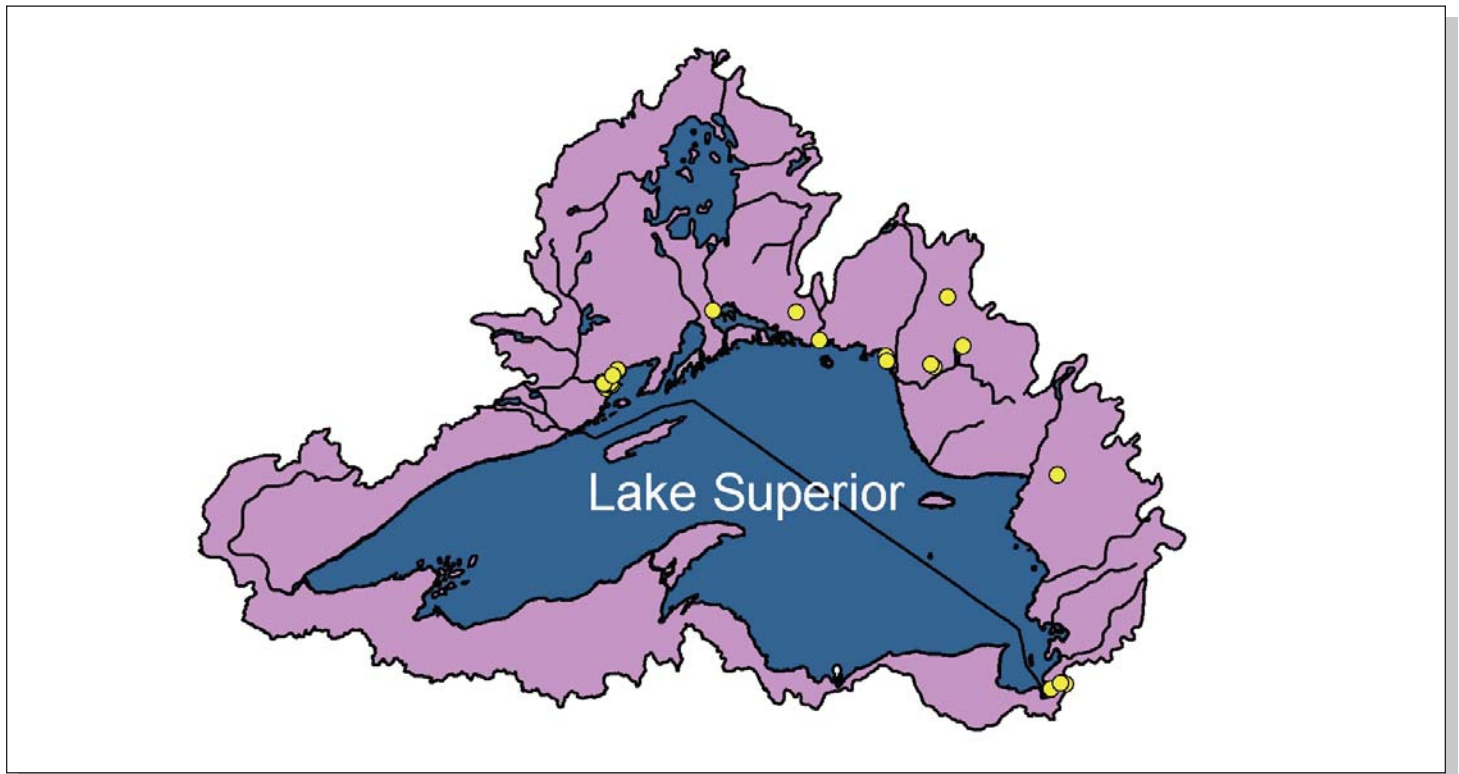
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Part 2: Lake Superior Fact Sheet

Figure 3: Locations of facilities in the Lake Superior basin that report to NPRI



Lake Superior is the largest freshwater lake in the world. There is enough water in Lake Superior to fill all the other Great Lakes and still have water left over to fill three Lake Eries. Lake Superior is also the largest, deepest (average depth of about 150 metres) and coldest of all the Great Lakes. It has the longest retention time of all the Great Lakes at 191 years. The lake stretches approximately 500 kilometres from west to east, and 250 kilometres north to south, with a shoreline almost 4,500 kilometres long. The drainage basin, totaling over 125,000 square kilometres, encompasses parts of Ontario, Michigan, Minnesota and Wisconsin. Most of the Superior basin is sparsely populated, and heavily forested, with little agriculture because of a cool climate and poor soils (Environment Canada, 1995).

1. Releases and Transfers of Pollutants in the Lake Superior Basin in Canada

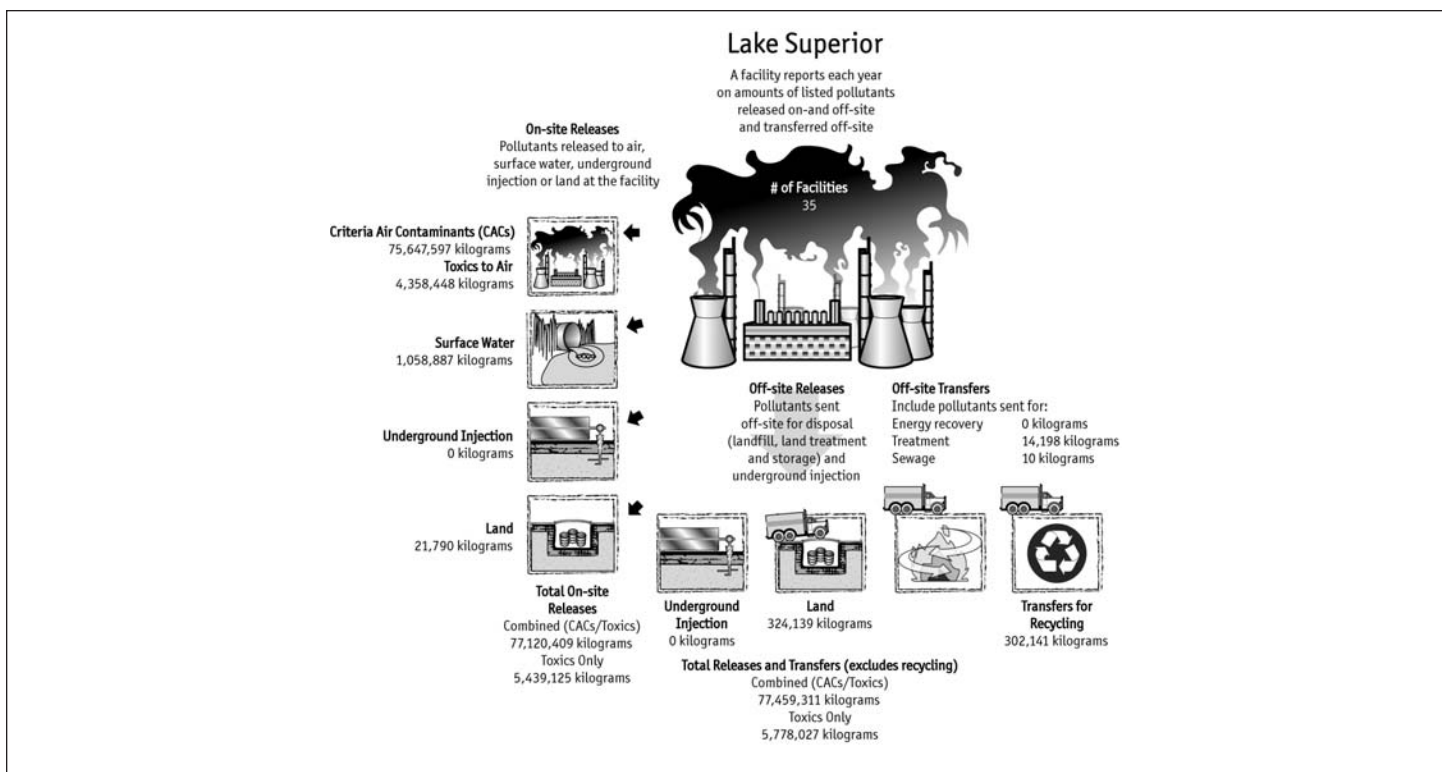
In 2002, a total of 35 Canadian facilities in the Lake Superior basin reported to NPRI (Figure 4). NPRI data do not cover all pollutants, all sources or all facilities.

In 2002, over 4 million kilograms of toxic pollutants and 76 million kilograms of criteria air contaminants were released into the air from facilities in the Lake Superior basin, the smallest amounts of all the Great Lakes. About 1 million kilograms of pollutants were released into the water and about 22,000 kilograms were landfilled on facility sites, the smallest amount of all the Great Lakes. Facilities in the Lake Superior basin also generated 324,000 kilograms of pollutants that

were transferred to other facilities, mainly for land disposal. Lake Superior had the smallest on- and off-site releases of all the Great Lakes at 361 million kilograms. Another 14,000 kilograms were transferred to other

facilities - 10 kilograms to sewage treatment plants and 14,000 kilograms to treatment. Facilities also reported sending over 300,000 kilograms of materials to recycling (Figure 4).

Figure 4: Releases and transfers of pollutants from facilities in the Lake Superior basin in 2002 (as reported to NPRI)



2. Top Facilities in the Lake Superior Basin in Canada

Some of these pollutants are considered toxic under the *Canadian Environmental Protection Act* (CEPA). In 2002, NPRI facilities in the Lake Superior basin released about 41 million kilograms of pollutants considered CEPA toxic to the air (including criteria air contaminants) and 0.6 million kilograms of CEPA toxics into the water. Some of these pollutants are also con-

sidered carcinogens, with 240,000 kilograms of carcinogens released to the air of the Lake Superior basin and 2,740 kilograms of carcinogens into the water. Because pollutants can often travel long distances, some of the pollutants that originate in the Lake Superior basin may be carried to other regions. Similarly, pollution generated outside of the Lake Superior basin may travel to Lake Superior.

Table 7: The 10 facilities in the Lake Superior basin with the largest air releases of pollutants considered toxic under the *Canadian Environmental Protection Act* in 2002 (kilograms as reported to NPRI)

Rank	Facility	Company Name	Air release of CEPA toxic substances (kg)	National Ranking	Location	Province
1	Thunder Bay Generating Station	Ontario Power Generation	12,834,059	31	Thunder Bay	ON
2	Algoma Steel Inc	Algoma Steel Inc	10,081,776	39	Sault Ste. Marie	ON
3	Atikokan Generating Station	Ontario Power Generation	6,536,901	63	Atikokan	ON
4	KIMBERLY- CLARK INC.	Kimberly-Clark Corporation	3,642,950	111	Terrace Bay	ON
5	Thunder Bay Operations	Bowater Canadian Forest Products Inc.	2,982,219	123	Thunder Bay	ON
6	Marathon Pulp Inc.	Marathon Pulp Inc.	2,200,172	154	Marathon	ON
7	Red Rock Division	Norampac Inc.	1,113,606	212	Red Rock	ON
8	Wawa OSB	Weyerhaeuser Canada Limited	585,290	302	Wawa	ON
9	Sault Sainte Marie Plant	G-P Flakeboard Company	166,185	585	Sault Ste.Marie	ON
10	Thunder Bay Mill	Smurfit-Stone Container (Canada) Inc.	121,100	663	Thunder Bay	ON
Total Air Releases of CEPA toxics in the Lake Superior basin				40,860,409 kilograms		
Total for all Great Lakes				827,686,923 kilograms		

Table 8: The 10 facilities in the Lake Superior basin with the largest water releases of pollutants considered toxic under the *Canadian Environmental Protection Act* in 2002 (kilograms as reported to NPRI)

Rank	Facility	Company Name	Water releases of CEPA toxic substances (kg)	National Ranking	Location	Province
1	Water Pollution Control Plant	City of Thunder Bay	381,000	23	Thunder Bay	ON
2	Kimberly- Clark Inc.	Kimberly-Clark Corporation	82,788	66	Terrace Bay	ON
3	Thunder Bay Operations	Bowater Canadian Forest Products Inc.	72,303	74	Thunder Bay	ON
4	Cascades Fine Papers Group Thunder Bay Inc.	Cascades Fine Papers Group Thunder Bay Inc.	24,000	124	Thunder Bay	ON
5	Williams Mine	Williams Operating Corporation	22,900	128	Marathon	ON
6	Marathon Pulp Inc.	Marathon Pulp Inc.	15,691	144	Marathon	ON
7	Golden Giant Mine	Newmont Canada Limited	13,625	153	Marathon	ON
8	Algoma Steel Inc	Algoma Steel Inc.	13,399	155	Sault Ste. Marie	ON
9	Fort William Division	Abitibi Consolidated Company of Canada	6,910	186	Thunder Bay	ON
10	Red Rock Division	Norampac Inc.	3,682	211	Red Rock	ON
Total water releases for CEPA toxics in the Lake Superior basin				636,299 kilograms		
Total water releases for CEPA toxics in all Great Lakes				12,666,361 kilograms		

Note: Some of these facilities are sewage treatment plants which receive wastes from other industries, homes and businesses. Some of the pollutants released include ammonia and nitrates.

One of the priorities for the Great Lakes is the reduction of mercury, a persistent, bioaccumulative neurotoxin. Canadian and American governments have committed to the virtual elimination of the discharge of any or all persistent toxic chemicals, including mercury, under the *Great Lakes Water Quality Agreement*. About 25% of the advice given for sport fish from Lake Superior suggests limiting fish consumption, mainly because of

mercury and toxaphene (Government of Ontario, 2004). As part of the renewed *Canada-Ontario Agreement Respecting the Great Lakes Ecosystem*, signed in 2002, Canada and Ontario also committed to an 85% reduction in mercury releases by 2005 and a 90% reduction from 2010, from 1988 baseline levels.

The total amount of mercury and its compounds released to the air from NPRI facilities in the Lake Superior basin was approximately 132 kg in 2002. The six facilities listed account for all the total mercury air releases to the Lake Superior basin (as reported to NPRI) (Table 9).

References

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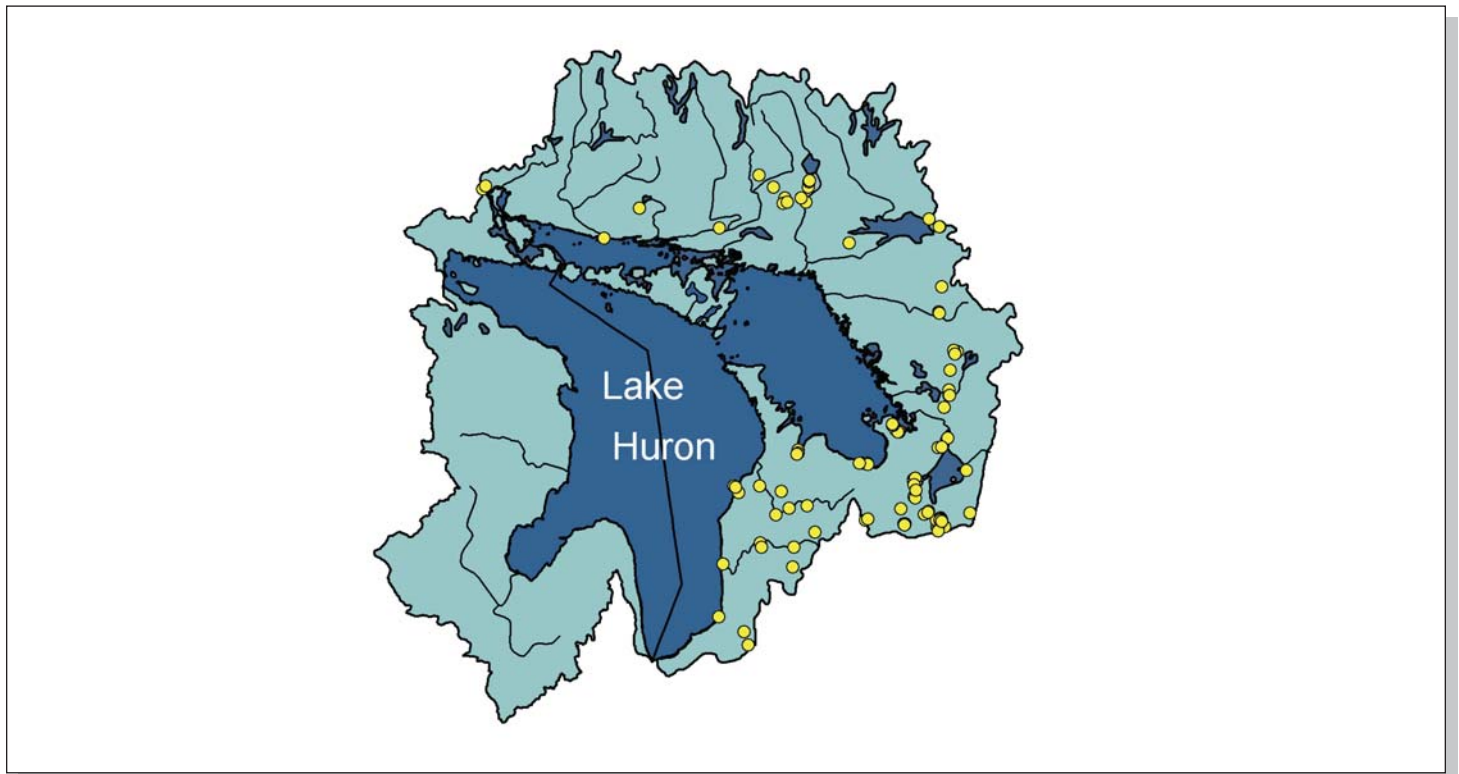
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Table 9: The facilities in the Lake Superior basin with the largest releases of mercury and its compounds to the air in 2002 (kilograms as reported to NPRI)

Rank	Facility	Company Name	Air releases of mercury and its compounds (kg)	National Ranking	Location	Province
1	Thunder Bay Generating Station	Ontario Power Generation	72	22	Thunder Bay	ON
2	Atikokan Generating Station	Ontario Power Generation	38	31	Atikokan	ON
3	Golden Giant Mine	Newmont Canada Limited	15	55	Marathon	ON
4	Thunder Bay Operations	Bowater Canadian Forest Products Inc.	4	101	Thunder Bay	ON
5	Red Rock Division	Norampac Inc.	2	118	Red Rock	ON
6	Williams Mine	Williams Operating Corporation	1	124	Marathon	ON
Total air releases of mercury and its compounds in the Lake Superior basin					132 kilograms	
Total air releases of mercury and its compounds in all Great Lakes					1,847 kilograms	

Part 3: Lake Huron Fact Sheet

Figure 5: Locations of facilities in the Lake Huron basin that report to NPRI



Lake Huron has over 30,000 islands and the longest shoreline (over 6,000 kilometres) of any lake in the world. Lake Huron also has the largest drainage basin (134,100 square kilometres) of all the Great Lakes. It has the third longest retention time of all the Great Lakes at 22 years. The lake stretches approximately 330 kilometres from west to east, and 250 kilometres north to south, and contains parts of Ontario and Michigan. (Environment Canada, 1995).

1. Releases and Transfers of Pollutants in the Lake Huron Basin in Canada

In 2002, 225 Canadian facilities in the Lake Huron basin reported to NPRI (Figure 6). NPRI data do not cover all pollutants, all sources or all facilities.

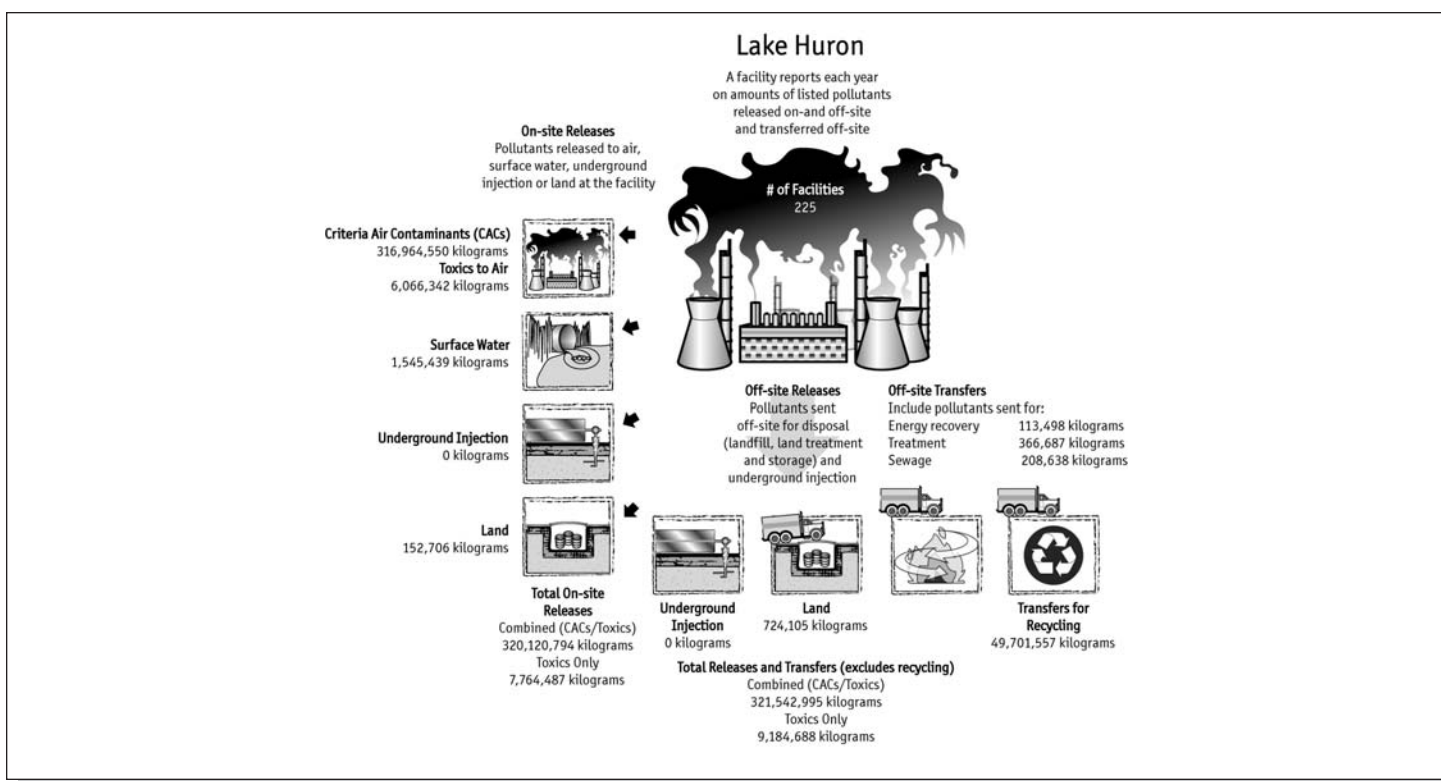
In 2002, over 6 million kilograms of toxic pollutants and 317 million kilograms of criteria air contaminants were released into the air from facilities in the Lake Huron basin, the second largest amount of all criteria air contaminants in the Great Lakes. One facility, Inco Ltd.'s Copper Cliff Smelter Complex in Copper Cliff, accounted for 3.8 million kilograms of toxic pollutants and 239 million kilograms of criteria air contaminants, or about three-quarters of the total air releases to the Lake Huron basin.

Facilities in the Lake Huron basin also released about 1.5 million kilograms of pollutants into the water and about 0.15 million kilograms were landfilled on facility sites, the second smallest amount in the Great Lakes. Facilities in the Lake Huron basin also generated 724,000 kilograms of pollutants that were transferred

to other facilities, mainly for land disposal. Lake Huron had the second largest on- and off-site releases of all the Great Lakes at 321 million kilograms. Another 689,000 kilograms were transferred to other facilities - 208,000 kilograms to sewage treatment plants and

367,000 kilograms to treatment. Facilities also reported sending over 49 million kilograms of materials to recycling, the second highest in the Great Lakes (Figure 6).

Figure 6: Releases and transfers of pollutants from facilities in the Lake Huron basin in 2002 (as reported to NPRI)



2. Top Facilities in the Lake Huron Basin in Canada

Some of these pollutants are considered toxic under the *Canadian Environmental Protection Act* (CEPA). In 2002, NPRI facilities in the Lake Huron basin released about 297 million kilograms of pollutants considered CEPA toxic to the air (including criteria air contaminants) and 0.3 million kilograms of CEPA toxics into the water (the lowest amount in the Great Lakes). Some of these pollutants are also considered carcinogens, with 395,000 kilograms of carcinogens released to the air of the Lake Huron basin and 32,147 kilograms of carcinogens into the water (the largest in the Great Lakes).

Because pollutants can often travel long distances, some of the pollutants that originate in the Lake Huron basin may be carried to other regions. Similarly, pollution generated outside of the Lake Huron basin may travel to Lake Huron.

Table 10: The 10 facilities in the Lake Huron basin with the largest air releases of pollutants considered toxic under the *Canadian Environmental Protection Act* in 2002 (kilograms as reported to NPRI)

Rank	Facility	Company Name	Air release of CEPA toxic (kg)	National Ranking	Location	Province
1	Copper Cliff Smelter Complex	Inco Limited	239,345,582	1	Copper Cliff	ON
2	Smelter Complex	Falconbridge Limited	39,211,348	15	Falconbridge	ON
3	Copper Cliff Nickel Refinery	Inco Limited	7,268,026	55	Greater Sudbury	ON
4	Espanola Mill	Domtar Inc.	3,475,136	116	Espanola	ON
5	Works 84, Owen Sound Flat Glass Plant	PPG Canada Inc.	2,242,444	150	Owen Sound	ON
6	Sudbury Mines/Mill Business Unit	Falconbridge Limited	1,616,736	179	Greater Sudbury	ON
7	Bruce Power	Bruce Power Limited Partnership	1,113,164	213	Municipality of Kincardine	ON
8	Copper Refinery	Inco Limited	456,732	353	Copper Cliff	ON
9	Northern Lime Limited	Carmeuse North America	381,151	394	Blind River	ON
10	Goderich Mine	Sifto Canada Inc.	200,012	539	Goderich	ON
Total air releases of CEPA toxics for Lake Huron basin			297,233,406 kilograms			
Total air releases of CEPA toxics for Great Lakes basin			827,686,923 kilograms			

Table 11: The 9 facilities in the Lake Huron basin with the largest water releases of pollutants considered toxic under the *Canadian Environmental Protection Act* in 2002 (kilograms as reported to NPRI)

Rank	Facility	Company Name	Water releases of CEPA toxic substances (kg)	National Ranking	Location	Province
1	Central Mills	Inco Limited	209,273	38	Copper Cliff	ON
2	Barrie Water Pollution Control Centre	The Corporation of the City of Barrie	50,200	89	Barrie	ON
3	Sudbury Mines/Mill Business Unit	Falconbridge Limited	41,115	98	Greater Sudbury	ON
4	Espanola Mill	Domtar Inc.	4,425	203	Espanola	ON
5	Bruce Power	Bruce Power Limited Partnership	3,917	207	Municipality of Kincardine	ON
6	North Bay Site	ETI CANADA INC.	1,810	236	North Bay	ON
7	Smelter Complex	Falconbridge Limited	1,619	239	Falconbridge	ON
8	Sudbury Waste Water Treatment Plant	City of Greater Sudbury	325	272	Greater Sudbury	ON
9	St. Marys Paper Ltd.	St. Marys Paper Ltd.	13	325	Sault Saint Marie,	ON
Total water releases for CEPA toxics in Lake Huron basin			312,696 kilograms			
Total water releases for CEPA toxics in all Great Lakes			12,666,361 kilograms			

Note: Some of these facilities are sewage treatment plants which receive wastes from other industries, homes and businesses.

One of the priorities for the Great Lakes is the reduction of mercury, a persistent, bioaccumulative neurotoxin. Canadian and American governments have committed to the virtual elimination of the discharge of any or all persistent toxic chemicals, including mercury, under the *Great Lakes Water Quality Agreement*. About 21% of the advice given for sport fish from Lake Huron suggests limiting fish consumption, mainly because of mercury (Government of Ontario, 2004). As part of the renewed *Canada-Ontario Agreement Respecting the Great Lakes Ecosystem*, signed in 2002, Canada and

Ontario also committed to an 85% reduction in mercury releases by 2005 and a 90% reduction from 2010, from 1988 baseline levels.

The total amount of mercury and its compounds released to the air from NPRI facilities in the Lake Huron basin is approximately 22 kilograms in 2002, the lowest in the Great Lakes basin. The five facilities account for all the total mercury air releases to the Lake Huron (as reported to NPRI) (Table 12).

Table 12: The facilities in the Lake Huron basin with the largest releases of mercury and its compounds to the air in 2002 (kilograms as reported to NPRI)

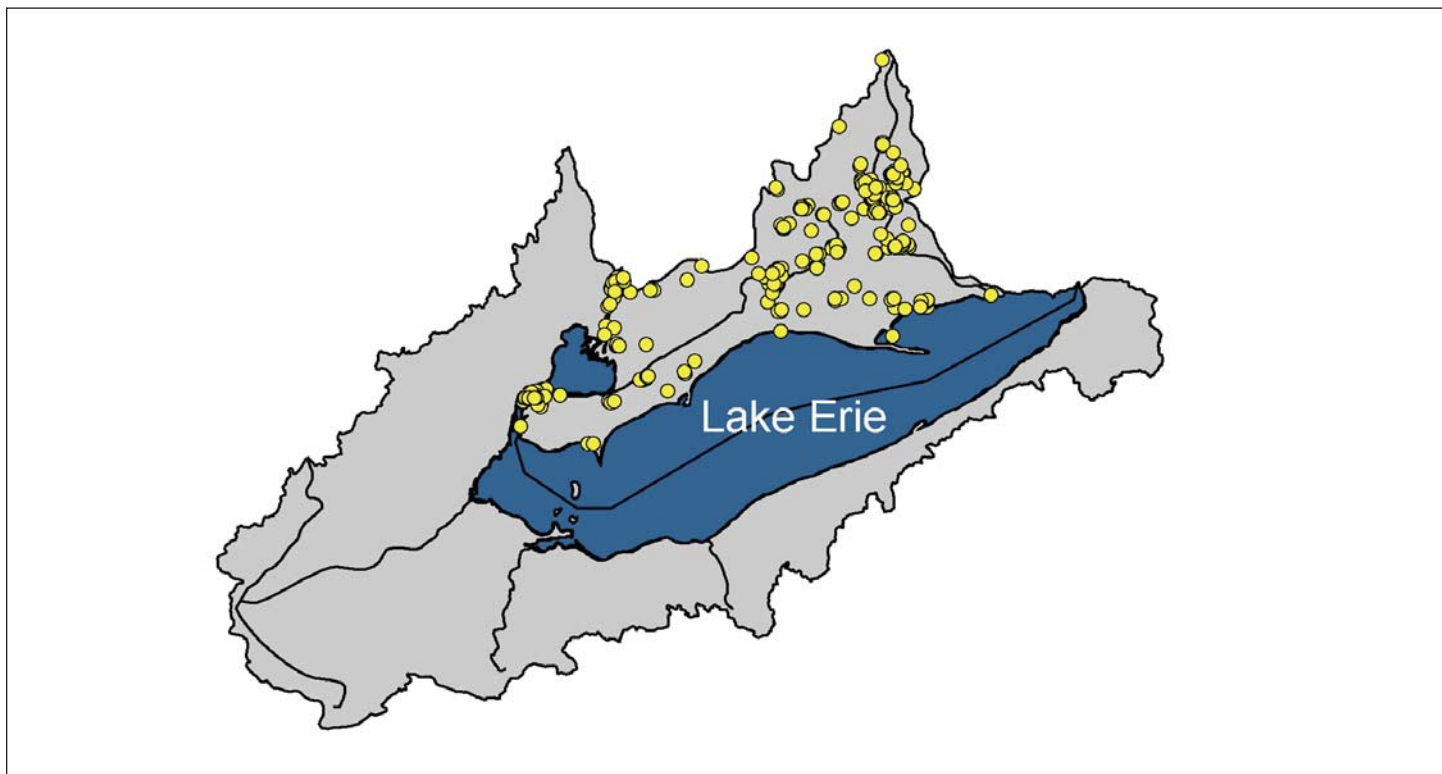
Rank	Facility	Company Name	Air releases of Mercury and its compounds (kg)	National Ranking	Location	Province
1	Copper Cliff Smelter Complex	Inco Limited	10	70	Copper Cliff	ON
2	Smelter Complex	Falconbridge Limited	9	74	Falconbridge	ON
3	Copper Cliff Nickel Refinery	Inco Limited	1	125	City of Greater Sudbury	ON
4	Bruce Power	Bruce Power Limited Partnership	1	135	Municipality of Kincardine	ON
5	Espanola Mill	Domtar Inc.	1	139	Espanola	ON
Total air releases of mercury and its compounds in Lake Huron basin					22 kilograms	
Total air releases of mercury and its compounds in all Great Lakes					1,847 kilograms	

References

Environment Canada and United States Environmental Protection Agency. 1995. Great Lakes Atlas. Available at www.epa.gov/glnpo/atlas

Part 4: Lake Erie Fact Sheet

Figure 7: Locations of facilities in the Lake Erie basin that report to NPRI



Lake Erie, the 11th largest lake in the world, is the shallowest of the Great Lakes, with an average depth of only 19 metres. Because of this shallowness, Lake Erie is the warmest and most biologically productive of the Great Lakes. Lake Erie is 388 kilometres long and 92 kilometres wide. Most of the water flowing into Lake Erie comes from the upper lakes through the Detroit River. It has the shortest retention time of all the Great Lakes, at 2.6 years. The drainage basin covers parts of Ontario, Indiana, Michigan, New York, Ohio and Pennsylvania. Lake Erie provides drinking water for 11 million people (Environment Canada, 1995).

1. Releases and Transfers of Pollutants in the Lake Erie Basin in Canada

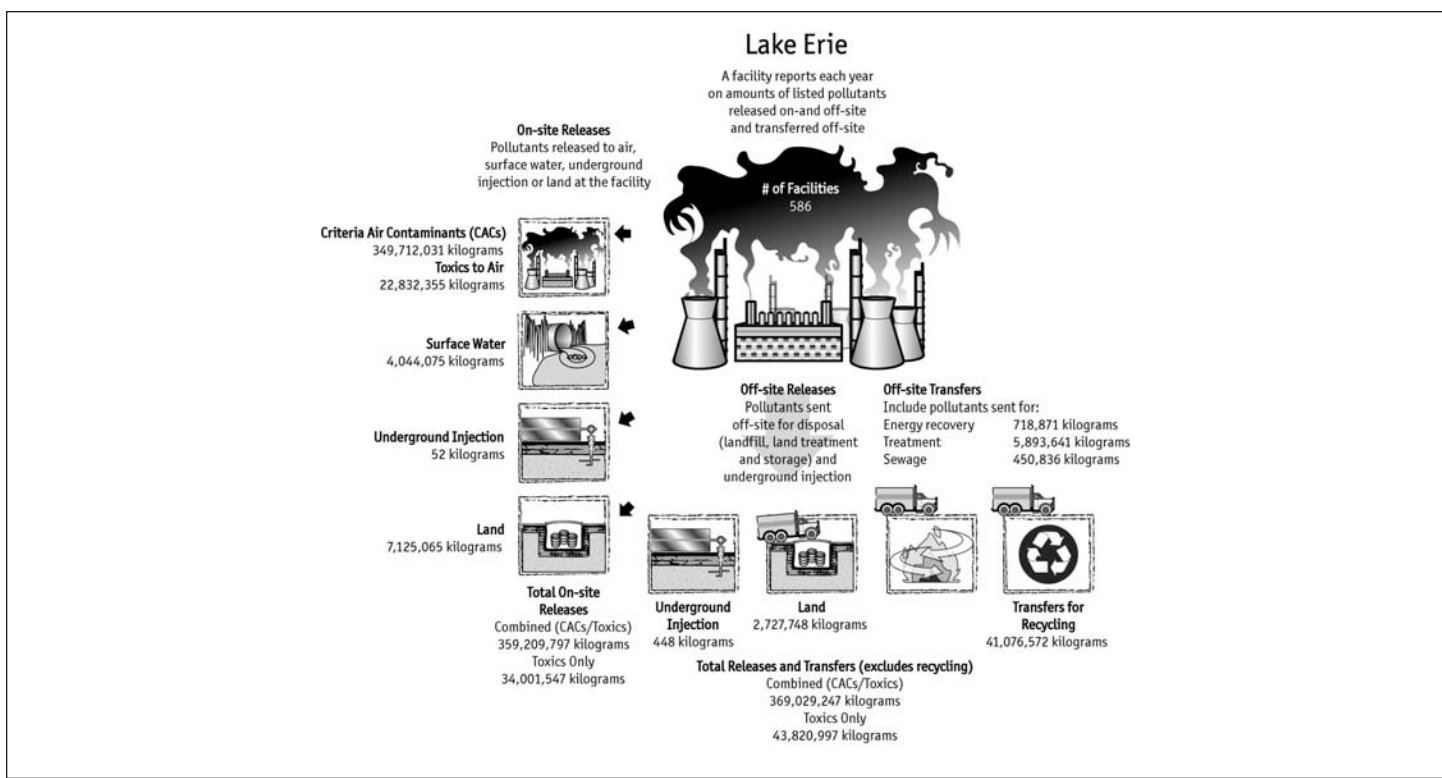
In 2002, a total of 586 Canadian facilities in the Lake Erie basin reported to NPRI (Figure 8). NPRI data do not cover all pollutants, all sources or all facilities.

Over 348 million kilograms of pollutants (including criteria air contaminants) were released into the air from facilities in the Lake Erie basin in 2002, the largest amount of all the Great Lakes. About one-third of the total air releases are from one facility, Ontario Power Generation's Nanticoke Generating Station, a coal fired power plant owned by the Province of Ontario.

About 4 million kilograms of pollutants were released into the water. About 7 million kilograms were land-filled on facility sites, the largest amount in the Great Lakes, mainly as a result of one facility, Clean Harbors Inc. in Corunna, Ontario. Facilities in the Lake Erie basin also generated 2.7 million kilograms of pollutants that were transferred to other facilities, mainly for land disposal. Lake Erie had the largest on- and off-

site releases of all the Great Lakes (361 million kilograms). Another 7 million kilograms were transferred to other facilities - 0.7 million kilograms to be burnt for energy recovery, 0.4 million kilograms to sewage treatment plants and 5.9 million kilograms to treatment. Facilities also reported sending almost 41 million kilograms of materials to recycling (Figure 8).

Figure 8: Releases and transfers of pollutants from facilities in the Lake Erie basin in 2002 (as reported to NPRI)



2. Top Facilities in the Lake Erie Basin in Canada

Some of these pollutants are considered toxic under the *Canadian Environmental Protection Act* (CEPA). In 2002, NPRI facilities in the Lake Erie basin released about 282 million kilograms of pollutants considered CEPA toxic to the air (including criteria air contaminants), the second largest amount in the Great Lakes, and 0.6 million kilograms of CEPA toxics into the water. Some of these pollutants are also considered carcino-

gens, with 0.4 million kilograms of carcinogens released to the air in the Lake Erie basin and approximately 1,745 kilograms of carcinogens released into the water.

Table 13: The 10 facilities in the Lake Erie basin with the largest air releases of pollutants considered toxic under the *Canadian Environmental Protection Act* in 2002 (kilograms as reported to NPRI)

Rank	Facility	Company Name	Air releases of CEPA toxic substances (kg)	National Ranking	Location	Province
1	Nanticoke Generating Station	Ontario Power Generation	130,497,667	4	Nanticoke	ON
2	Lambton Generating Station	Ontario Power Generation	47,787,094	12	Courtright	ON
3	Sarnia Refinery Plant	Imperial Oil	28,226,994	20	Sarnia	ON
4	Sarnia Manufacturing Centre	Shell Canada Limited	14,999,707	29	Corunna	ON
5	Woodstock Plant	Lafarge Canada Inc.	10,317,431	37	Woodstock	ON
6	NOVA chemicals (Canada) Ltd.- Corunna Site	NOVA chemicals Corporation	8,524,799	44	Corunna	ON
7	Cabot Canada Ltd.	Cabot Canada Ltd.	7,140,549	56	Sarnia	ON
8	Stelco Inc.	Stelco Inc.	6,533,218	64	Haldimand	ON
9	Nanticoke Refinery	Imperial Oil	6,230,827	66	Haldimand	ON
10	Federal White Cement	Federal White Cement	4,079,430	101	Woodstock	ON
Total air releases of CEPA toxics in the Lake Erie basin			281,763,736 kilograms			
Total air releases of CEPA toxics in all Great Lakes			827,868,923 kilograms			

Table 14: The 10 facilities in the Lake Erie basin with the largest water releases of pollutants considered toxic under the *Canadian Environmental Protection Act* in 2002 (kilograms as reported to NPRI)

Rank	Facility	Company Name	Water releases of CEPA toxic substances(kg)	National Ranking	Location	Province
1	City of Brantford Water Pollution Control Plant	The Corporation of the City of Brantford	357,691	27	County of Brant	ON
2	Port Dalhousie Wastewater Treatment Plant	Regional Municipality of Niagara	68,742	81	St. Catharines	ON
3	Water Pollution Control Centre	City of Sarnia	36,700	103	Sarnia	ON
4	Terra Nitrogen	Terra International Canada Inc.	28,296	117	Courtright	ON
5	Greenway Pollution Control Centre	City of London	19,655	134	London	ON
6	The St. Thomas Water Pollution Control Plant	The Corporation of the City of St. Thomas	18,327	139	St.Thomas	ON
7	Woodstock Wastewater Treatment Plant	County of Oxford	17,863	140	Woodstock	ON
8	City of Guelph Wastewater Treatment Plant	City of Guelph	15,377	145	Guelph	ON
9	Little River Pollution Control Plant	City of Windsor	11,653	162	Windsor	ON
10	Amherstburg plant	General Chemical Canada Limited	10,800	168	Amherstburg	ON
Total water releases of CEPA toxics in the Lake Erie basin			633,189 kilograms			
Total water releases of CEPA toxics in all Great Lakes			12,666,361 kilograms			

Note: Some of these facilities are sewage treatment plants which receive wastes from other industries, homes and businesses. Many of these pollutants are ammonia and nitrates.

One of the priorities for the Great Lakes is the reduction of mercury, a persistent, bioaccumulative neurotoxin. Canadian and American governments have com-

mitted to the virtual elimination of the discharge of any or all persistent toxic chemicals, including mercury, under the *Great Lakes Water Quality Agreement*. As

part of the renewed *Canada-Ontario Agreement Respecting the Great Lakes Ecosystem*, signed in 2002, Canada and Ontario also committed to an 85% reduction in mercury releases by 2005 and a 90% reduction from 2010, from 1988 baseline levels.

The total amount of mercury and its compounds released to the air from NPRI facilities in the Lake Erie basin is approximately 546 kilograms in 2002. The top five facilities account for about 90% of the total mercury air releases to the Lake Erie basin (as reported to NPRI) (Table 15).

References

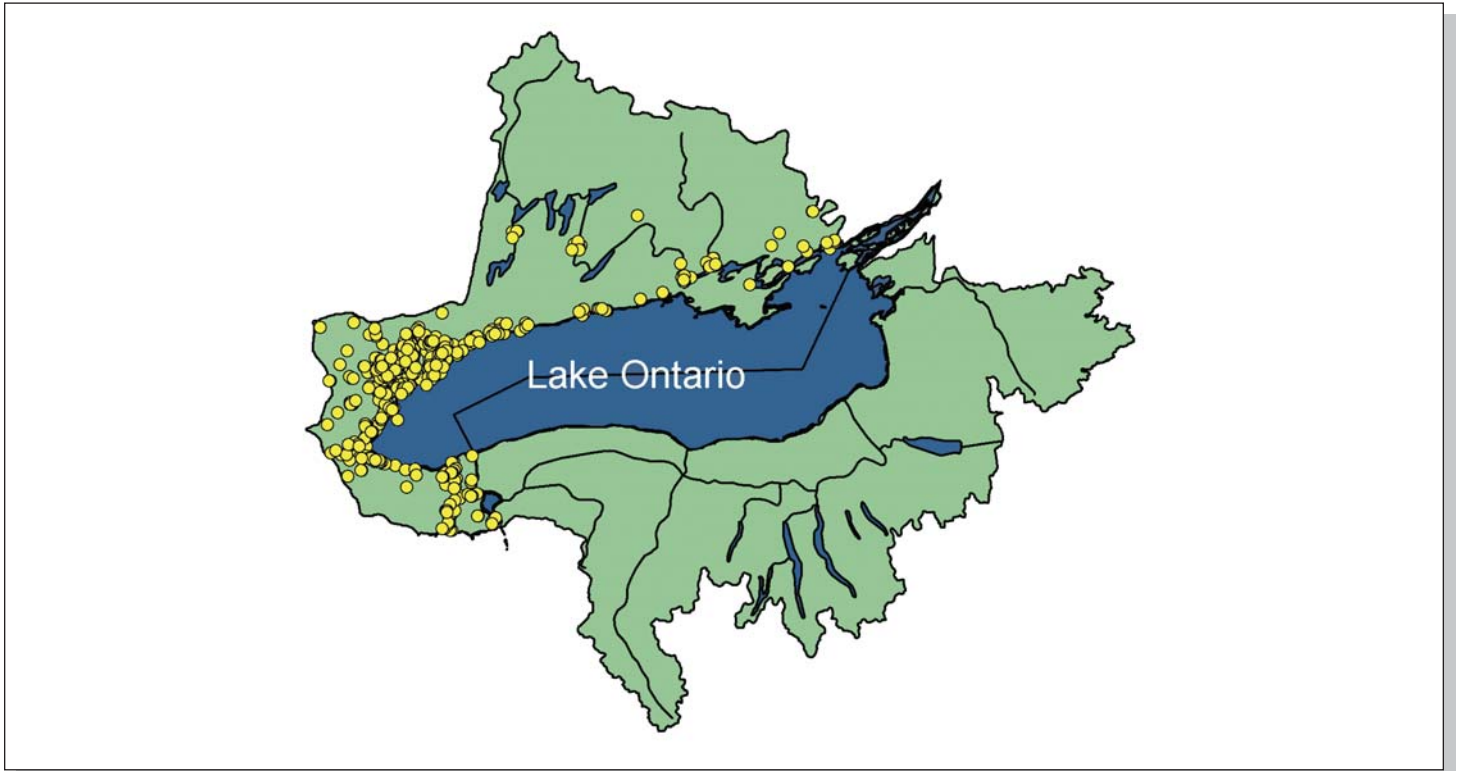
Environment Canada and United States Environmental Protection Agency. 1995. Great Lakes Atlas. Available at www.epa.gov/glnpo/atlas

Table 15: The top 5 facilities in the Lake Erie basin with the largest releases of mercury and its compounds to the air in 2002 (kilograms as reported to NPRI)

Rank	Facility	Company Name	Air releases of mercury and its compounds (kg)	National Ranking	Location	Province
1	Nanticoke Generating Station	Ontario Power Generation	241	3	Nanticoke	ON
2	Lambton Generating Station	Ontario Power Generation	130	8	Courtright	ON
3	Lambton facility	Clean Harbors Inc.	94	17	Corunna	ON
4	Stelco Inc.	Stelco Inc.	18	47	Halimand	ON
5	Gerdau AmeriSteel	Gerdau Canada	16	50	Cambridge	ON
Total air releases of mercury and its compounds in the Lake Erie basin					546 kilograms	
Total air releases of mercury and its compounds in all Great Lakes					1,847 kilograms	

Part 5: Lake Ontario Fact Sheet

Figure 9: Locations of facilities in the Lake Ontario basin that report to NPRI



Lake Ontario, the 14th largest lake in the world, is similar to Lake Erie in length and breadth (310 kilometres by 85 kilometres). Yet with its greater average depth (approximately 86 metres), Lake Ontario holds almost four times the volume of water and has a retention time of about six years. Most of the water (80%) flowing into Lake Ontario comes from Lake Erie through the Niagara River. Water leaves Lake Ontario through the St. Lawrence River to the Atlantic Ocean, over 1,500 kilometres away. The drainage basin covers parts of Ontario and New York, and a small portion of Pennsylvania. Major urban industrial centres, such as Hamilton and Toronto, are located on Lake Ontario's shore. The United States shore is less urbanized and is not intensively farmed. Since Lake Ontario is the downstream Great Lake, it is affected by pollution from all the other Great Lakes (Environment Canada, 1995).

1. Releases and Transfers of Pollutants to the Lake Ontario Basin in Canada

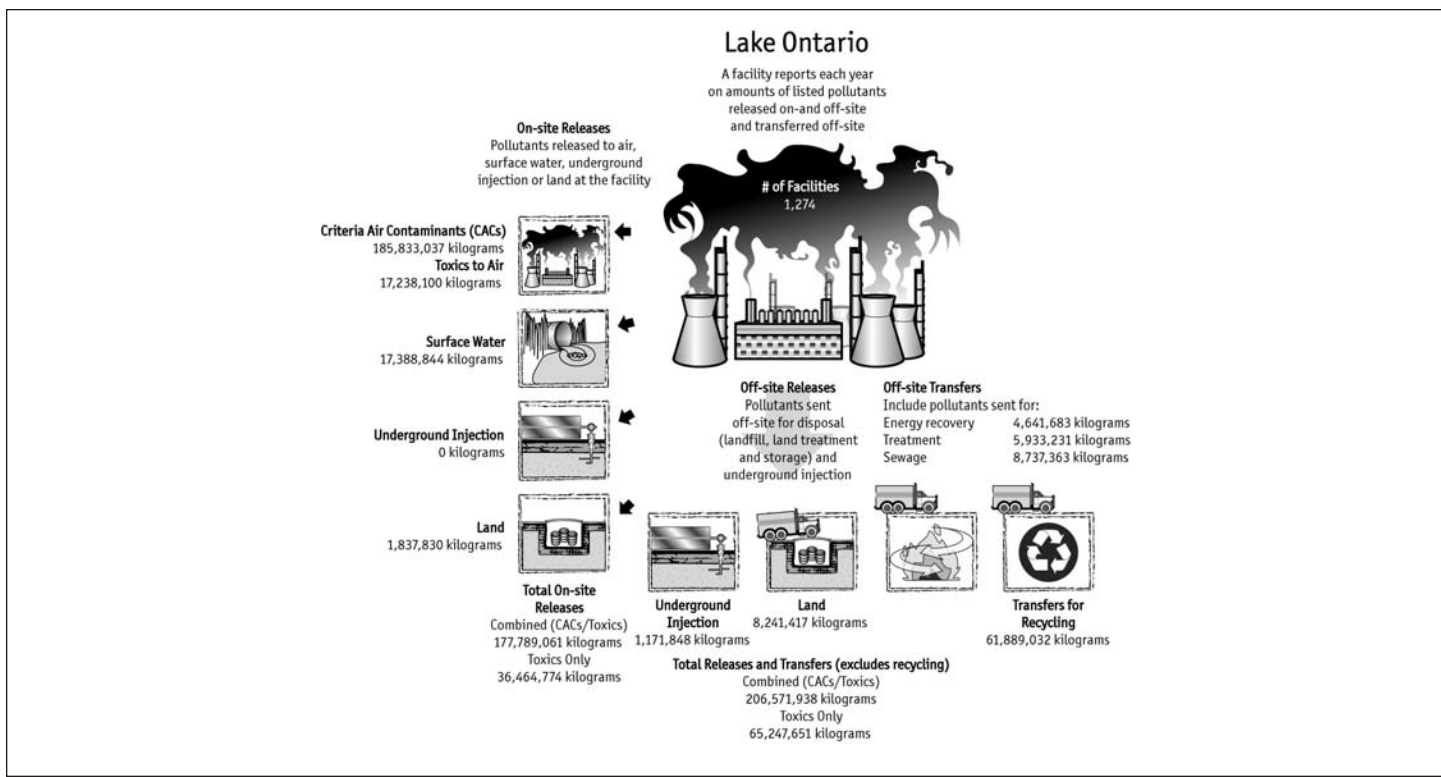
In 2002, a total of 1,274 facilities in the Lake Ontario basin reported to NPRI (Figure 10). NPRI data do not cover all pollutants, all sources or all facilities.

In 2002, over 17 million kilograms of toxic pollutants and 185 million kilograms of criteria air contaminants were released into the air from facilities in the Lake Ontario basin. About 17 million kilograms of pollutants were released into the water. Another 1.8 million kilograms were landfilled on facility sites. Facilities in the Lake Ontario basin also generated over 9 million kilograms of pollutants that were transferred to other facilities - with 8 million kilograms transferred for land

disposal and 1 million kilograms to underground injection. Another 19 million kilograms were transferred off-site - 4.6 million kilograms to be burnt for energy recovery, 8.7 million kilograms to sewage treatment

plants and 5.9 million kilograms to treatment. Facilities also reported sending almost 62 million kilograms of materials to recycling (Figure 10).

Figure 10: Releases and transfers of pollutants from facilities in the Lake Ontario basin in 2002 (as reported to NPRI)



2. Top Facilities in the Lake Ontario Basin in Canada

Some of these pollutants are considered toxic under the *Canadian Environmental Protection Act*. In 2002, NPRI facilities in the Lake Ontario basin released about 94 million kilograms of pollutants considered CEPA toxic to the air and 8 million kilograms of CEPA toxics into the water (the largest amount in the Great Lakes basin in Canada). Some of these pollutants are also

considered carcinogens, with 1.2 million kilograms of carcinogens released to the air of the Lake Ontario basin and approximately 10,200 kilograms of carcinogens into the water. Because pollutants can often travel long distances, some of the pollutants that originate in the Lake Ontario basin may be carried to other regions. Similarly, pollution generated outside of the Lake Ontario basin may travel to Lake Ontario.

Table 16: The 10 facilities in the Lake Ontario basin with the largest releases of toxic pollutants to the air in 2002 (kilograms as reported to NPRI)

Rank	Facility	Company Name	Air releases of toxic pollutants (kg)	National Ranking	Location	Province
1	Oshawa Car Assembly Plant	General Motors of Canada Limited	1,269,915	15	Oshawa	ON
2	Lakeview Generating Station *	Ontario Power Generation	1,026,551	16	Mississauga	ON
3	Woodward Avenue Wastewater Treatment Plant	City of Hamilton	798,210	30	Hamilton	ON
4	International Wallcovering Ltd	International Wallcovering Ltd	492,720	53	Brampton	ON
5	Oakville Assembly Plank	Ford Motor Company of Canada	462,178	60	Oakville	ON
6	Oshawa Truck Assembly Centre	General Motors of Canada Limited	433,939	64	Oshawa	ON
7	Stelco Hamilton	Stelco Inc.	383,419	74	Hamilton	ON
8	Crown Cork & Seal Canada Inc.- Plt.244	Crown Cork & Seal Canada Inc.	351,351	83	Concord	ON
9	Oakville Refinery	Petro-Canada	322,294	95	Oakville	ON
10	Ventra Plastics	Ventra Group Inc.	289,490	107	Peterborough	ON
Total air releases of toxic pollutants in the Lake Ontario basin				17,238,100 kilograms		
Total air releases of toxic pollutants in all Great Lakes				58,026,963 kilograms		

Note: These are sewage treatment plants which receive wastes from other industries, homes and businesses. Some of the pollutants released include ammonia and nitrates.

Table 17: The 10 facilities in the Lake Ontario basin with the largest releases of pollutants to the water in 2002 (kilograms as reported to NPRI)

Rank	Facility	Company Name	Water releases (kg)	National Ranking	Location	Province
1	Ashbridges Bay Treatment Plant	City of Toronto	3,856,950	3	Toronto	ON
2	Skyway Waste Water Treatment Plant	Regional Municipality of Halton	2,638,408	7	Burlington	ON
3	Duffin Creek WPCP	Regional Municipality of Durham	2,208,260	9	Pickering	ON
4	Woodward Avenue Wastewater Treatment Plant	City of Hamilton	1,614,204	11	Hamilton	ON
5	Humber Treatment Plant	City of Toronto	865,399	16	Toronto	ON
6	Mid-Halton Waste Water Treatment Plant	Regional Municipality of Halton	767,618	17	Oakville	ON
7	South East Oakville Waste Water Treatment Plant	Regional Municipality of Halton	731,120	23	Oakville	ON
8	Highland Creek Treatment Plant	City of Toronto	677,225	24	Toronto	ON
9	Lakeview Water Pollution Control Plant	Ontario Clean Water Agency	575,000	29	Mississauga	ON
10	Georgetown Waste Water Treatment Plant	Regional Municipality of Halton	500,104	32	Georgetown	ON
Total water releases in the Lake Ontario basin			17,388,384 kilograms			
Total water releases in all Great Lakes			27,964,209 kilograms			

One of the priorities for the Great Lakes is the reduction of mercury, a persistent, bioaccumulative neurotoxin. Over 98% of fish consumption advisories for inland lakes in Ontario are due to mercury contamination. In Lake Ontario, 41% of the advice given for eating sport fish suggest some level of restriction, often because of

PCBs, pesticides or mercury (Government of Ontario, 2004). Canadian and American governments have committed to the virtual elimination of the discharge of any or all persistent toxic pollutants, including mercury, under the *Great Lakes Water Quality Agreement*.

As part of the renewed *Canada-Ontario Agreement Respecting the Great Lakes Ecosystem*, signed in 2002, Canada and Ontario also committed to an 85% reduction in mercury releases by 2005 and a 90% reduction from 2010, from 1988 baseline levels.

The total amount of mercury and its compounds released to the air from NPRI facilities in the Lake Ontario basin is 573 kilograms in 2002, tied with the St. Lawrence River basin for the largest in the Great Lakes. The top five facilities account for about two-thirds of the total mercury air releases to Lake Ontario (as reported to NPRI) (Table 18).

References

Environment Canada and United States Environmental Protection Agency. 1995. Great Lakes Atlas. Available at www.epa.gov/glnpo/atlas

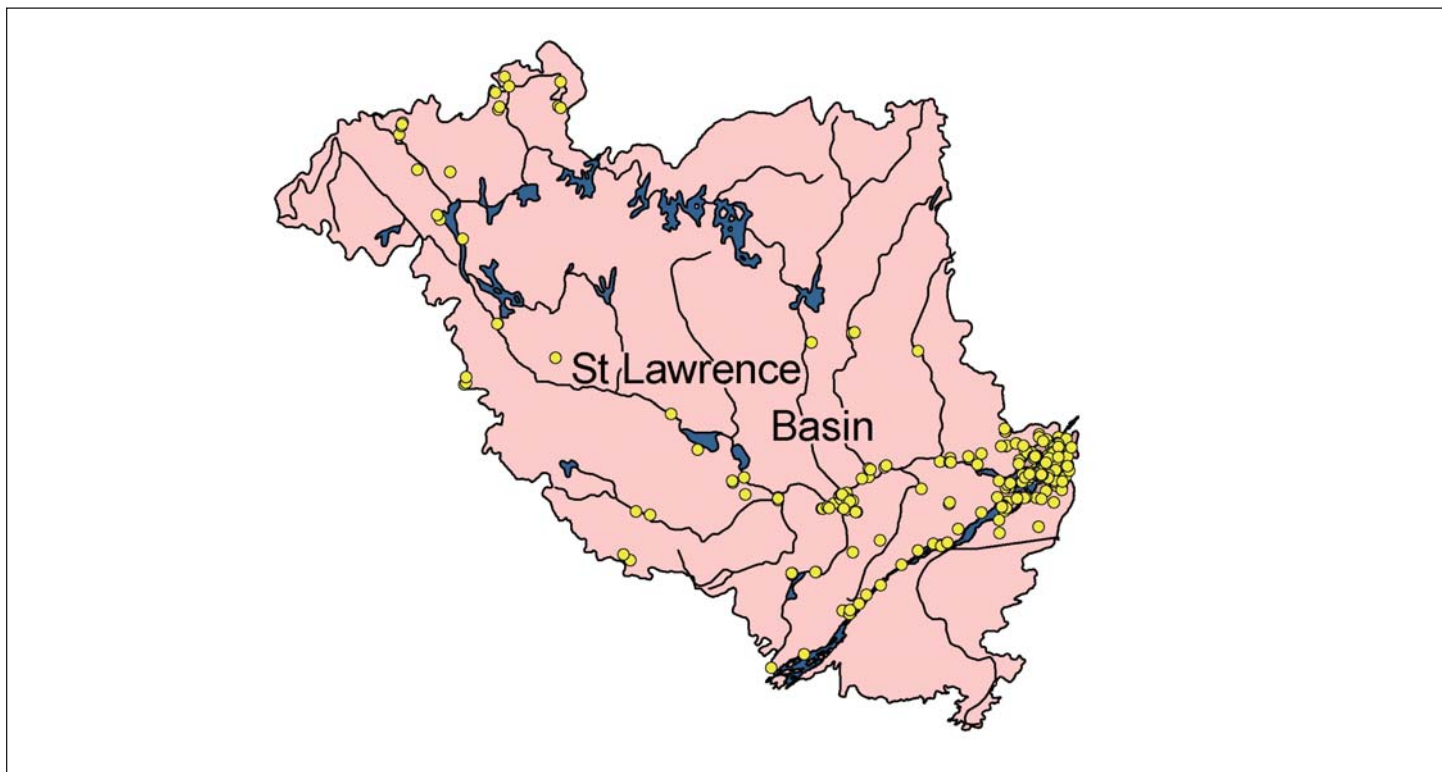
Government of Ontario. 2004. Guide to Eating Ontario Sport Fish: 2003-2004. Available at www.ene.gov.on.ca

Table 18: The top 5 facilities in the Lake Ontario basin with the largest releases of mercury and its compounds to the air in 2002 (kilograms as reported to NPRI)

Rank	Facility	Company Name	Air releases of mercury and its compounds(kg)	National Ranking	Location	Province
1	Dofasco Hamilton	Dofasco Inc.	95	16	Hamilton	ON
2	Picton	ESSROC Canada Inc.	93	18	Picton	ON
3	Whitby	Gerdau AmeriSteel Corporation	73	21	Whitby	ON
4	Duffin Creek WPCP	Regional Municipality of Durham	50	26	Pickering	ON
5	Lakeview Generating	Ontario Power Corporation	46	28	Mississauga	ON
Total air releases of mercury and its compounds in the Lake Ontario basin					573 kilograms	
Total air releases of mercury and its compounds in all Great Lakes					1,847 kilograms	

Part 6: St. Lawrence River Basin Fact Sheet

Figure 11: Locations of facilities in the St. Lawrence River basin that report to NPRI



Approximately 1,300 kilometres long, the St. Lawrence River connects the Great Lakes to the Atlantic Ocean. It can be divided into three broad sections: the freshwater river, which extends from Lake Ontario to just outside the city of Quebec; the St. Lawrence estuary, which extends from Quebec City to Anticosti Island; and the Gulf of St. Lawrence, which leads into the Atlantic Ocean (Environment Canada, 1995).

1. Releases and Transfers of Pollutants to the St. Lawrence Basin in Canada

In 2002, a total of 578 facilities in the St. Lawrence basin (as defined by Great Lakes Information Network) reported to the NPRI (Figure 12). NPRI data do not cover all pollutants, all sources or all facilities.

In 2002, over 9 million kilograms of pollutants and 176 million kilograms of criteria air contaminants were released into the air from facilities in the St. Lawrence River basin, about 15% of the total Great Lakes. About 4 million kilograms of pollutants were released into the water from facilities in the St. Lawrence River basin (about 14% of the total Great Lakes basin in Canada).

About 1 million kilograms of pollutants were landfilled at the site of the facility and almost 4 million kilograms of pollutants were sent off the site mainly for landfill. Facilities in the St. Lawrence River basin also generated another 8 million kilograms of pollutants that were sent off-site to energy recovery (1 million kilograms), sewage treatment plants (2 million kilograms), and treatment (5 million kilograms). Facilities also report-

ed sending over 18 million kilograms of materials to recycling. Because pollutants can often travel long distances, some of the pollutants that originate in the St. Lawrence River basin may be carried to other regions. Similarly, pollution generated outside of the St. Lawrence basin may travel to the river (Figure 12).

2. Top Facilities in the St. Lawrence River Basin in Canada

Some pollutants are considered toxic under the *Canadian Environmental Protection Act* (CEPA). In 2002, NPRI facilities in the St. Lawrence River basin released into the air about 114 million kilograms of pollutants considered CEPA toxic (including criteria air contaminants), the third largest amount in the Great Lakes, and 3 million kilograms of CEPA toxics into the water (the second largest amount in the Great Lakes).

Figure 12: Releases and transfers of pollutants from facilities in the St. Lawrence River basin in 2002 (as reported to NPRI)

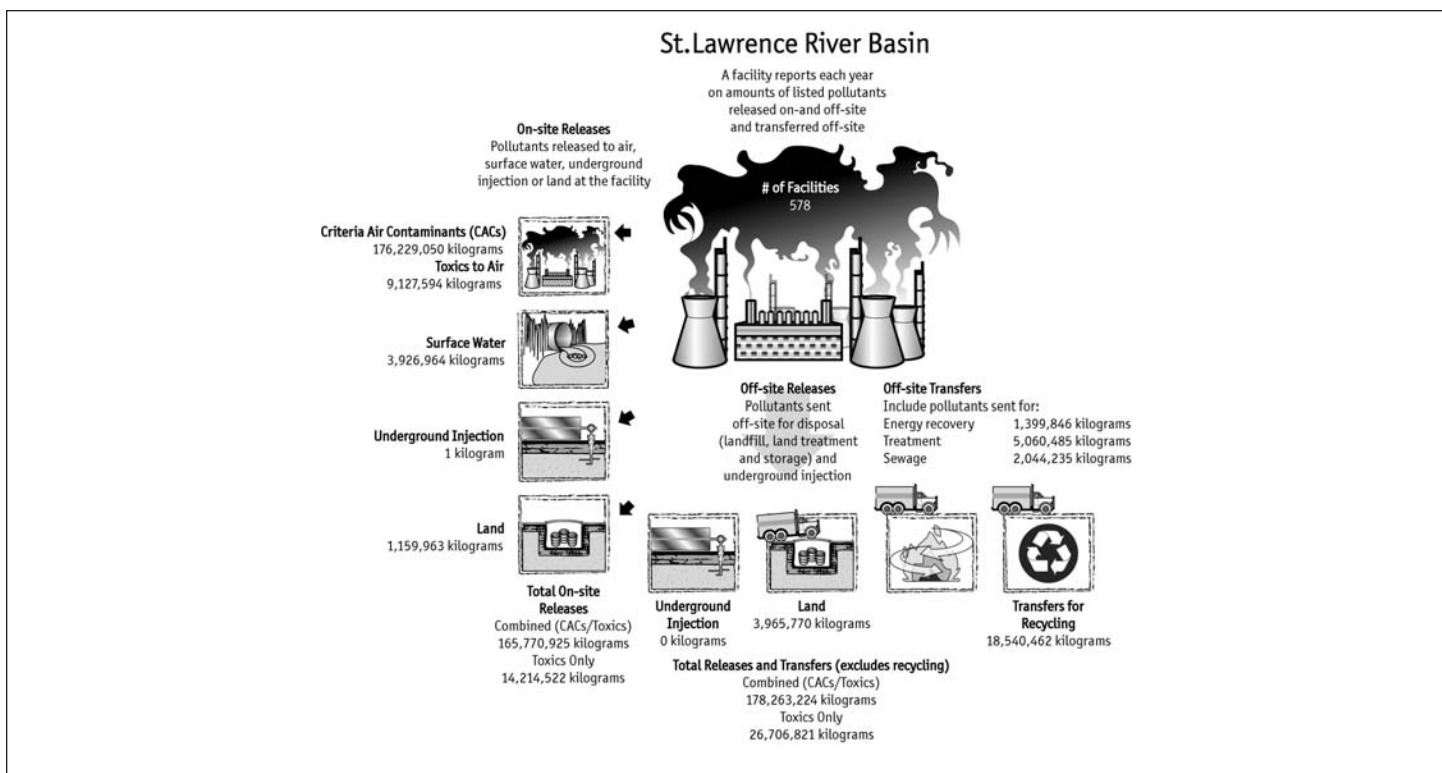


Table 19: The 10 facilities in the St. Lawrence River basin with the largest air releases of chemicals considered toxic under the *Canadian Environmental Protection Act* in 2002 (kilograms as reported to NPRI)

Rank	Facility	Company Name	Air releases of CEPA toxics (kg)	National Ranking	Location	Province
1	Fonderie Horne	Noranda Inc.	62,504,310	8	Rouyn-Noranda	QC
2	Raffinerie de Montréal-est	Shell Canada Limited	7,429,119	53	City of Montréal	QC
3	Cimenterie de Saint-Constant	Lafarge Canada Inc.	6,519,440	65	Saint-Constant	QC
4	Société en commandite Revenu Noranda	Société en commandite Revenu Noranda	5,383,817	75	Valleyfield	QC
5	Raffinerie de Montreal	Petro-Canada	4,947,839	84	City of Montréal	QC
6	Usine de bouletage	La Compagnie minière Québec Cartier	3,862,420	107	Port-Cartier	QC
7	Papiers Fraser - Pâtes Thurso	Papiers Fraser Inc.	3,190,283	121	Thurso	QC
8	Site de Témiscaming	Tembec	2,014,941	162	Témiscaming	QC
9	Kirkland Lake Generating Station	Kirkland Lake Power Corp.	1,788,100	173	Kirkland Lake	ON
10	Division Pontiac	Emballages Smurfit-Stone Canada inc.	1,391,221	190	Portage-du-Fort	QC
Total air releases of CEPA toxics in the St. Lawrence River basin				113,898,005 kilograms		
Total air releases of CEPA toxics in all Great Lakes				827,686,923 kilograms		

Table 20: The 10 facilities in the St. Lawrence River basin with the largest water releases of pollutants considered toxic under the *Canadian Environmental Protection Act* in 2002 (kilograms as reported to NPRI)

Rank	Facility	Company Name	Water releases of CEPA toxics (kg)	National Ranking	Location	Province
1	Robert O. Pickard Environmental Centre	City of Ottawa	2,608,903	3	City of Ottawa	ON
2	Usine dépuraton	Ville de Saint-Eustache	121,400	54	Saint-Eustache	QC
3	Division Pontiac	Emballages Smurfit-Stone Canada inc.	51,522	88	Portage-du-Fort	QC
4	Usine dépuraton de Vaudreuil-Dorion	Usine dépuraton de Vaudreuil-Dorion	48,250	92	Vaudreuil-Dorion	QC
5	Site de Témiscaming	Tembec	37,097	102	Témiscaming	QC
6	Papiers Fraser - Pâtes Thurso	Papiers Fraser Inc.	33,072	109	Thurso	QC
7	Usine de Gatineau	Bowater Produits Forestiers du Canada Inc.	28,498	115	Gatineau	QC
8	Raffinerie de Montreal	Petro-Canada	27,969	118	City of Montréal	QC
9	Haley	Timminco Limited	20,015	133	Haley	ON
10	La mine Doyon	Cambior Inc.	15,139	148	Rouyn-Noranda	QC
Total water releases of CEPA toxics in the St. Lawrence River basin				3,033,603 kilograms		
Total water releases of CEPA toxics in all Great Lakes				12,666,361 kilograms		

Note: Some of these facilities are sewage treatment plants that receive waste from industry, homes and businesses. Some of these pollutants include ammonia and nitrates.

The St. Lawrence River basin has the largest air releases of carcinogens in the Great Lakes. The NPRI facilities in the St. Lawrence basin released 1,230,462 kilograms of carcinogens to the air in 2002, about 35% of the total Great Lakes basin in Canada.

Table 21: The 10 facilities with the largest air releases of carcinogens in the St. Lawrence River basin in 2002 (kilograms as reported to NPRI)

Rank	Facility	Company Name	Air releases of carcinogens (kg)	National Ranking	Location	Province
1	Tube Production Unit	Sandvik Materials Technology	185,186	5	Arnprior	ON
2	Domfoam	Domfoam International Inc.	178,427	6	City of Montréal	QC
3	Fonderie Horne	Noranda Inc.	167,310	7	Rouyn-Noranda	QC
4	Foamex Montreal	Foamex Canada Inc.	108,566	11	City of Montréal	QC
5	Temple Pembroke Inc.	Temple Pembroke Inc.	96,520	14	Pembroke	ON
6	Division Québec Maniwaki	Louisiana Pacific Canada Ltd	79,806	22	Bois-Franc	QC
7	Division Mont-Laurier	Uniboard Canada Inc.	43,870	40	Mont-Laurier	QC
8	Division Trains d'atterrissage, Longueuil	Héroux-Devtek Inc.	33,350	57	Longueuil	QC
9	Site de Témiscaming	Tembec	32,386	58	Témiscaming	QC
10	Englehart Oriented Strand	Grant Forest Products Inc.	28,590	61	Englehart	ON
Total air releases of carcinogens in the St. Lawrence basin			1,230,462 kilograms			
Total air releases of carcinogens in all Great Lakes			7,007,091 kilograms			

One of the priorities for the Great Lakes is the reduction of mercury, a persistent, bioaccumulative neurotoxin. Canadian and American governments have committed to the virtual elimination of the discharge of any or all persistent toxic chemicals, including mercury, under the *Great Lakes Water Quality Agreement*.

The total amount of mercury and its compounds released to the air from NPRI facilities in the St. Lawrence River basin is approximately 574 kilograms in 2002, tied with Lake Ontario for the largest releases in the Great Lakes basin. The top five facilities account for about 94% of the total mercury air releases to the St. Lawrence River basin (as reported to NPRI) (Table 22).

References

Environment Canada and United States Environmental Protection Agency. 1995. Great Lakes Atlas. Available at www.epa.gov/glnpo/atlas

Table 22: The top 5 facilities in the St. Lawrence River basin with the largest releases of mercury and its compounds to the air in 2002 (kilograms as reported to NPRI)

Rank	Facility	Company Name	Air releases of mercury and its compounds (kg)	National Ranking	Location	Province
1	Fonderie Horne	Noranda Inc.	178	5	Rouyn-Noranda	QC
2	Clean Harbors Mercier, inc.	Clean Harbors Inc.	165	6	City of Montréal	QC
3	Station de purification des eaux usées	Ville de Montréal	130	9	City of Montréal	QC
4	Ivaco Rolling Mills Limited Partnership	Ivaco Rolling Mills Limited Partnership	38	33	Township of Champlain	ON
5	Cimenterie de Saint-Constant	Lafarge Canada Inc.	28	35	Saint-Constant	QC
Total air releases of mercury and its compounds in the St. Lawrence River basin					547 kilograms	
Total air releases of mercury and its compounds in all Great Lakes					1,847 kilograms	

Appendix A: About PollutionWatch and the National Pollutant Release Inventory

Appendix A: About PollutionWatch and the National Pollutant Release Inventory

About PollutionWatch (www.PollutionWatch.org) PollutionWatch is a collaborative project of Environmental Defence and the Canadian Environmental Law Association. The web site tracks pollutants across Canada based on data collected by Environment Canada through the National Pollutant Release Inventory (NPRI). NPRI does not include data from all pollutants or sources. Visitors to the PollutionWatch web site can identify pollution in their home towns by searching by postal code, access "quick lists" of the largest facilities releasing and transferring pollutants in the country, get trends from 1995 to 2002, or create their own ranked lists of facilities by province, industrial sector, or corporation.

About National Pollutant Release Inventory (NPRI) Data

The data used on the PollutionWatch web site and in this report are based on NPRI data submitted from facilities and annually collected by Environment Canada. These NPRI data have limitations. NPRI data:

- do not cover all potential harmful chemicals - 273 chemicals are included on the 2002 NPRI list;
- do not cover pollutants such as pesticides and greenhouse gases;
- generally do not include releases that fall below the reporting threshold of 10 tonnes manufactured, processed or otherwise used;
- do not include mobile sources such as cars, trucks and construction equipment;
- do not include natural sources such as forest fires and erosion;
- do not include sources such as dry cleaners and gas stations;
- do not include facilities that are exempted

such as schools, research facilities, forestry, fishing, agriculture or mining (processing of mined materials is included in NPRI);

- generally do not include small facilities with less than 10 employees;
- do not include information on risks of chemicals released or transferred;
- do not include information on exposures to people or the environment; and,
- do not include information on the amount of chemicals allowed to be released under permits, regulations or agreements.

Presentation of Releases and Transfers:

A facility was required to report releases and transfers of 273 chemicals to NPRI in 2002. PollutionWatch uses releases and transfers classification to present data on the web site and in this report. Please note that this method of presentation differs from Environment Canada's NPRI presentation. These different methods of presentation will yield different perspectives on the data. For more information on Environment Canada's data presentation, visit the NPRI web site at www.ec.gc.ca/pdb/npri. For more information on PollutionWatch's presentation of releases and transfers, visit www.pollutionwatch.org/tool/understandData.jsp

For more information

- About PollutionWatch (www.PollutionWatch.org)
- About the Great Lakes: Great Lakes Information Network (www.glin.net)
- About *Great Lakes Water Quality Agreement*, see the International Joint Commission (www.ijc.org)
- About the *Great Lakes Binational Toxics Strategy* (www.binational.net)



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