



NPRI Pollutants in Canada

The National Pollutant Release Inventory — 1999

Canada 1999

2 190 Facilities



All pollutants

Total releases:
327 695 tonnes



Air releases:
127 312 tonnes



Water releases:
20 790 tonnes



Land releases:
43 834 tonnes



Underground injection:
135 562 tonnes



Transfers off-site for
disposal:
131 925 tonnes



Transfers off-site for
recycling:
1 080 951 tonnes



Toxic and carcinogenic pollutants

Total releases:
31 639 tonnes



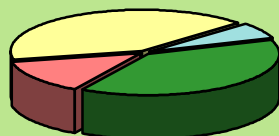
Transfers off-site for
disposal:
34 551 tonnes



Distribution of On-Site Releases (all data)

Underground Injection 41% Water 6%

Land 13% Air 39%



The National Pollutant Release Inventory (NPRI) was established in 1992 to collect data on substances of concern in Canada for the primary purpose of providing Canadians with access to pollutant release information for facilities located in their communities. All data collected by the NPRI is made public to provide Canadians with information on pollutants being released into the environment. The NPRI is the only legislated, nation-wide, publicly-accessible inventory of its kind in Canada.

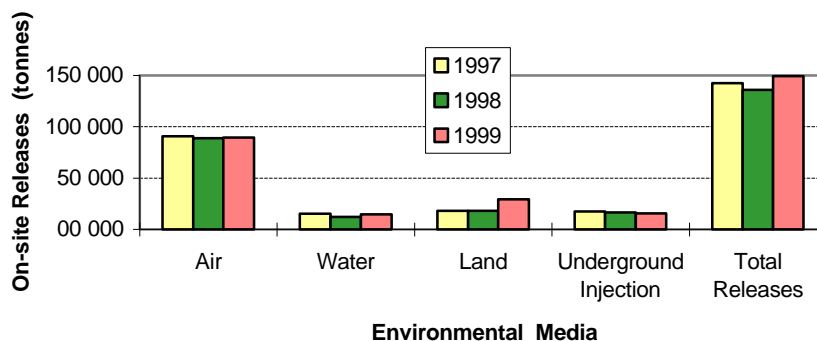
This fact sheet presents a summary of NPRI data collected in 1999 from facilities in Canada. The data presented is current as of February 5, 2001.

More information on the NPRI may be found on Environment Canada's web site at <http://www.ec.gc.ca/pdb/npri/>

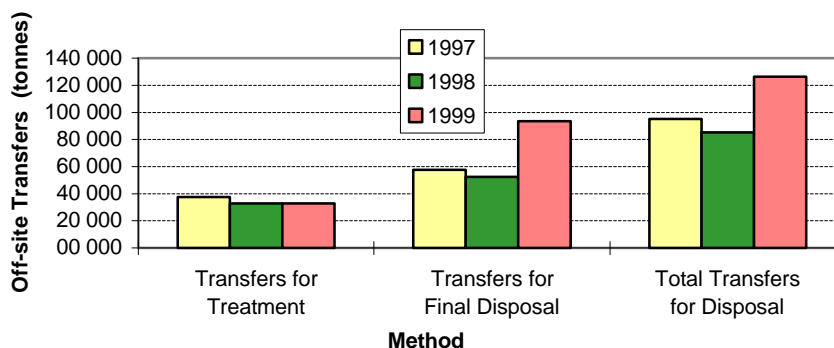
Highlights

- ◆ More NPRI substances are being recycled and used for energy recovery than are being released to air, land and water.
- ◆ 73 substances were added to the NPRI substance list, including CFCs, hydrogen sulphide, and tetraethyl lead.
- ◆ 424 facilities submitted 621 reports on the newly-added NPRI substances.
- ◆ "Matched data" analyses on the 172 consistent substances from 1997–1999 are featured in this backgrounder.
- ◆ Improved reporting from the Pulp and Paper sector (see page 4 for more information).

Trends in On-site Releases (1997–1999) - (matched data)



Trends in Off-site Transfers for Disposal (1997–1999) - (matched data)





On-site Releases

The NPRI defines an on-site release as a discharge of a pollutant to the environment within the boundaries of a reporting facility. This includes emissions to air, discharges to surface waters, and on-site releases to land.

On-site releases are categorized as follows:

- ▶ Air: stacks and other point sources, storage and handling, fugitive emissions, spills or other non-point sources.
- ▶ Surface water: discharges, spills, and leaks.
- ▶ Land: landfill, land treatment, spills, leaks, underground injection and other land releases.

Surface water releases do not include discharges to municipal wastewater treatment plants. These are reported under off-site transfers for treatment.

Landfills designed to accept industrial waste are required to have appropriate permits and operate under strict guidelines for use as final disposal sites. In most cases, permitted landfills are managed to minimize the release of pollutants to the natural soil.

Trends in on-site releases from 1998 to 1999 for the matched data show an increase in total releases from 1998 to 1999. This increase is attributable to a 61% increase in releases to land as a result of one facility reporting substantial releases of zinc (and its compounds).

Twenty-five NPRI Pollutants Released On-site in the Largest Quantities (values in tonnes) (all data)

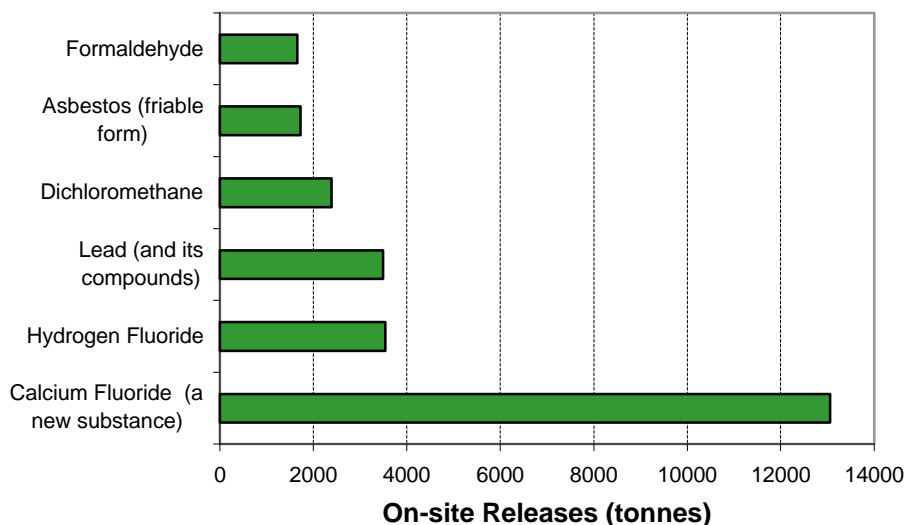
Substance	Air	Underground Injection	Water	Land	Total
Hydrogen sulphide	7 976.5	119 871.8	18.8	0.0	127 868.7
Ammonia (total)	17 314.1	8 397.7	11 154.6	409.7	37 280.4
Methanol	20 566.7	4 238.2	1 844.7	111.4	26 775.2
Zinc (and its compounds)	709.8	0.1	206.9	15 744.6	16 669.5
† Calcium fluoride	19.5	0.0	0.0	13 035.7	13 056.2
Hydrochloric acid	11 630.6	0.0	20.8	9.6	11 665.8
Sulphuric acid	9 369.2	0.0	62.6	19.8	9 456.8
Toluene	7 191.4	72.0	2.4	10.5	7 289.5
Xylene (mixed isomers)	6 909.7	46.3	3.6	5.4	6 977.9
Nitrate ion in solution at pH >= 6.0	71.8	191.9	6 274.1	230.1	6 769.8
Methyl ethyl ketone	5 079.7	790.0	0.0	0.0	5 876.3
Carbon disulphide	4 245.1	0.0	0.0	0.0	4 246.1
Manganese (and its compounds)	143.3	0.0	790.2	3 196.3	4 141.9
† Hydrogen fluoride	3 541.0	0.0	0.0	0.0	3 542.0
† Lead (and its compounds)	481.5	0.0	14.3	2 995.2	3 495.3
n-Hexane	3 405.2	15.3	0.4	1.8	3 428.9
Ethylene glycol	283.7	532.3	28.1	1 804.2	2 653.2
† Dichloromethane	2 387.5	0.0	0.0	0.0	2 388.9
Ethylene	2 167.4	0.0	0.0	0.0	2 168.5
Styrene	2 093.0	0.4	0.0	0.0	2 097.9
Isopropyl alcohol	1 953.3	8.4	0.9	0.0	1 970.4
† Asbestos (friable form)	0.0	0.0	0.0	1 725.1	1 725.7
† Formaldehyde	1 610.7	4.7	36.4	2.4	1 656.3
2-Butoxyethanol	1 566.0	0.0	0.0	0.0	1 567.9
† Benzene	1 424.4	93.0	1.1	0.6	1 523.1
Largest On-site Releases	112 141.0	134 262.0	20 459.7	39 302.4	306 292.1
National Total	127 311.8	135 562.2	20 789.7	43 833.5	327 694.9
% of National Total	88.1	99.0	98.4	89.7	93.5

† CEPA-toxic or Carcinogenic Pollutant

Top Five Industrial Sectors Reporting the Largest On-site Releases of NPRI Pollutants

Industrial Sector	Releases (tonnes)
Crude Petroleum and Natural Gas	132 718
Chemical and Chemical Products	63 646
Paper and Allied Products	33 830
Utilities	19 532
Primary Metal	18 815
National Total	327 695

Six CEPA-toxic or Carcinogenic Pollutants Released On-site in the Largest Quantities





Off-site Transfers

Twenty-five NPRI Pollutants Transferred Off-site for Disposal in the Largest Quantities (values in tonnes) (all data)

Substance	Treatment Prior to Final Disposal	Final Disposal	Total
Zinc (and its compounds)	1 712.5	32 785.5	34 498.1
† Lead (and its compounds)	173.0	15 100.7	15 273.6
† Cadmium (and its compounds)	6.5	12 123.7	12 130.2
† Chromium (and its compounds)	711.9	9 172.3	9 884.2
Sulphuric acid	4 582.3	2 050.4	6 632.7
Manganese (and its compounds)	357.5	6 193.0	6 550.5
Xylene (mixed isomers)	1 941.5	3 363.6	5 305.0
Methanol	2 039.0	2 926.3	4 965.3
Nitrate ion in solution at pH >= 6.0	4 028.8	712.9	4 741.7
Hydrochloric acid	4 331.9	259.9	4 591.8
Toluene	2 564.7	1 571.0	4 135.8
† Calcium fluoride	527.2	2 882.2	3 409.4
Ethylene glycol	2 287.6	424.9	2 712.5
Methyl ethyl ketone	1 131.9	580.5	1 712.4
Ammonia (total)	775.4	877.9	1 653.3
† Asbestos (friable form)	0.0	1 575.2	1 575.2
Isopropyl alcohol	1 304.6	157.2	1 461.7
Copper (and its compounds)	117.4	1 294.5	1 411.9
Nitric acid	837.0	117.1	954.0
n-Hexane	852.0	4.0	855.9
† Nickel (and its compounds)	220.0	465.0	685.0
Phosphoric acid	126.4	464.7	591.1
n-Butyl alcohol	434.5	9.4	443.9
Cyclohexane	370.1	12.9	383.0
Methyl isobutyl ketone	182.4	176.8	359.1
Largest Off-site Transfers	31 616.1	95 301.1	126 917.3
National Total	34 645.6	97 279.5	131 925.2
% of National Total	91.3	98.0	96.2

† CEPA-toxic or Carcinogenic Pollutant

Transfers for recycling or recovery include any transfers to activities which prevent a material normally destined for disposal from becoming a waste. These activities include

recovery of energy, acids, metals, solvents, organic or inorganic compounds, catalysts, pollution abatement residues, and the refining or reuse of used oil.

Ten NPRI Substances Transferred Off-site for Recycling or Energy Recovery in the Largest Quantities (values in tonnes) (all data)

Substance	Metals Recovery	Acid or Base Recovery	Other	Total
Hydrogen sulphide	0.0	0.0	904 874.4	904 874.4
Sulphuric acid	361.0	34 421.3	3 593.0	38 375.3
Copper (and its compounds)	30 528.9	0.5	2 120.1	32 649.5
Zinc (and its compounds)	27 515.6	0.0	2 628.0	30 143.7
† Lead (and its compounds)	12 144.1	0.0	756.5	12 900.6
Manganese (and its compounds)	9 668.1	0.0	1 010.1	10 678.3
Xylene (mixed isomers)	0.0	0.0	10 621.2	10 621.2
Toluene	0.0	0.0	7 139.1	7 139.0
† Chromium (and its compounds)	4 697.4	0.0	841.1	5 538.5
† Nickel (and its compounds)	3 914.8	0.0	416.3	4 331.0

† CEPA-toxic or Carcinogenic Pollutant

The NPRI defines an off-site transfer as a shipment of a listed pollutant to an off-site location. The material may be destined for final disposal, treatment prior to final disposal, recycling, or recovery.

The NPRI requires that only the quantity of the listed pollutant in the waste be reported. Waste materials, such as sludge, are often a mixture of many compounds associated with water and other inert material.

Off-site treatment does not necessarily constitute an environmental release because the pollutant may be altered chemically or physically, and may not be ultimately released in its original form. In addition, the final disposal methods may have different environmental impacts, depending on the site and the pollutant.

Transfers for disposal are reported under the following categories:

Treatment prior to final disposal:

- ▶ physical treatment such as encapsulation and vitrification,
- ▶ chemical treatment such as stabilization and neutralization,
- ▶ biological treatment such as bio-oxidation,
- ▶ municipal sewage treatment plant (MSTP), and
- ▶ incineration or thermal treatment where energy is not recovered.

Final disposal:

- ▶ containment in a landfill,
- ▶ land application or land farming,
- ▶ Underground injection, and
- ▶ containment in other storage.

Transfers for disposal exclude substances sent for recycling or recovery.

Top Five Industrial Sectors Reporting the Largest Off-site Transfers for Disposal of NPRI Pollutants

Industrial Sector	Transfers (tonnes)
Primary Metal	70 342
Business Services	15 697
Chemical and Chemical Products	15 233
Fabricated Metal Products	9 265
Utilities	4 939
National Total	131 925



The NPRI

Reporting Requirements

Each year, the Minister of Environment publishes a Notice respecting the NPRI in the *Canada Gazette*, under the authority of section 46(1) of the *Canadian Environmental Protection Act, 1999 (CEPA, 1999)*. The Notice requires the owners or operators of facilities which meet certain criteria to file a report with Environment Canada declaring the amounts of any of the 245 NPRI pollutants released on site to the environment or transferred off site for treatment, disposal, or recycling. In general, facilities must meet all three of the following reporting criteria:

- ▶ employees at the facility work 20 000 hours or more in a calendar year;
- ▶ the facility manufactures, processes or otherwise uses 10 tonnes (10 000 kg) of an NPRI substance; and,
- ▶ the substance is at a concentration of 1% or greater, unless produced as a by-product. By-products must be reported at any concentration.

Certain activities are exempt from reporting:

- ▶ education and training of students;
- ▶ research and testing;
- ▶ management of renewable resources;
- ▶ primary extraction of ore at mines;
- ▶ drilling or operating oil or gas wells;
- ▶ maintenance of transportation vehicles;
- ▶ distribution, storage and retail sale of fuels; and,
- ▶ wholesale or retail sale of products that contain NPRI substances

Prior to 1998, reporting of off-site transfers for recycling was voluntary. In 1998 this reporting became mandatory. As a result, the 1998 and 1999 NPRI provide a clearer picture of the quantity of NPRI substances which were being diverted for recovery activities instead of being destined for release to the environment or disposal as waste.

Reports of releases and transfers that occur in a calendar year must be submitted by June 1st of the following year. Once the data has been compiled, Environment Canada publishes a summary report and provides public access to the data on the NPRI web site.

NPRI Substances

In 1999, there were 245 substances on the NPRI list, chosen through a consultation process by a multi-stakeholder committee. The committee includes representatives from public organizations, industrial associations, and government agencies. Seventy-three new substances were added and acetone was deleted in 1999 through this multi-stakeholder committee.

Forty-eight of the NPRI substances for 1999 are classified as toxic under *CEPA, 1999*, or carcinogenic by the International Agency for Research on Cancer (IARC). In general, these pollutants pose a greater risk to the environment and human health.

1999 NPRI Reports

This year, Environment Canada will be releasing two documents summarizing the NPRI. This will include: a *National Overview* summary report; and a national fact sheet. The 1999 *National Overview* report contains additional context and data analyses not found in this fact sheet, including:

- ▶ year-to-year data comparisons;
- ▶ national data summaries;
- ▶ significant sources of all NPRI pollutants across Canada;
- ▶ summaries of quantitative pollution prevention information reported by facilities; and,
- ▶ summary data from other pollutant sources and non-NPRI inventories.

Improved Reporting from the Pulp and Paper Sector

The Forest Products Association of Canada (FPAC), together with the U.S. based National Council for Air and Stream Improvement Inc. (NCASI) developed a guidance manual for reporting to the NPRI for the pulp and paper sector.

In using the handbook, many pulp and paper facilities reported releases from more sources in 1999 than in the past, and as a consequence, higher releases of NPRI substances. However, this does not necessarily mean that releases by the pulp and paper industry have actually increased. This indicates better reporting in terms of number of substances and more accuracy in calculating releases.

Some pulp and paper mills have also re-calculated releases for previous years and have indicated so in the comments field of the NPRI reporting software.

NPRI Web Site

Access to all NPRI data and program information is provided on the NPRI web site at:

<http://www.ec.gc.ca/pdb/npri/>

From this site, users may:

- ▶ download datasets containing current and historic NPRI data;
- ▶ conduct on-line queries on NPRI data;
- ▶ download current and historic NPRI Annual Reports;
- ▶ download Reporting Guides and electronic data reporting forms;
- ▶ browse or download public consultation material on modifications to the NPRI;
- ▶ link to other pollutant release and transfer registry web sites; and,
- ▶ find out how to contact NPRI program personnel.

Using the Data

NPRI data represent only a portion of all pollutant releases and transfers to the environment in Canada. Other significant pollutants such as greenhouse gases, common air contaminants, ozone-depleting substances, and many pesticides are not

on the current NPRI list.

Risk to human health and the environment from on-site releases of pollutants cannot be determined from NPRI data alone. Risk depends on many factors such as the toxicity of the pollutant, the extent of the exposure, the type of release or transfer and the environmental medium receiving the pollutant.

Similarly, different factors must be considered before drawing conclusions on the environmental performance of specific industrial sectors. It is important to consider the relative size of the facility, the complexity of the process and the best available technologies.

Industrial facilities which report to the NPRI operate under stipulations of provincial operating permits and provincial or federal regulations or codes of practice. These permits, regulations and codes may or may not apply to emissions or discharges of all NPRI pollutants.

Facilities are required to file reports based on information to which they may be reasonably expected to have access. In some cases, facilities monitor releases of certain NPRI pollutants according to the requirements of their provincial or operating permits. However, in other cases, they must rely on other methods of estimating releases. Estimates may be based on standard emission factors, mass balance calculations, or other estimation methods.

While over 2 000 facilities from a broad range of industrial sectors report to the NPRI across Canada, not all sources of NPRI pollutants are captured by the inventory. For example, the NPRI does not include releases from mobile sources (vehicles and vessels) which are known to be major contributors of certain hazardous air pollutants on the NPRI list.

Facilities that do not meet the reporting requirements because of their size, are not required to report to the NPRI. Collectively however, releases from these sources may account for the majority of releases of some NPRI pollutants.



**national
pollutant
release
inventory**

More information on the NPRI may be obtained by contacting:
Environment Canada
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Hull, Québec
K1A 0H3

Tel.: (819) 953-1656
Fax: (819) 994-3266
E-mail: npri@ec.gc.ca
Web site: www.ec.gc.ca/pdb/npri

A list of regional NPRI contacts can be obtained at:
www.ec.gc.ca/pdb/npri/pri_offices_e.cfm

Canada 