Environment Canada Environnement Canada

NPRI Pollutants in Canada

National Pollutant Release Inventory 2001

November 2003
2001 Data, updated on November 8, 2002
EPSM-508

Canada 2001
2618 facilities

Pollutants Releases (on-site):
181 007 tonnes

Disposal
Final disposal (on-site):
181 681 tonnes

Final disposal (off-site):
38 208 tonnes

Off-site transfers for treatment prior to final disposal:
39 849 tonnes

Off-site transfers for Recycling and Energy Recovery:
1 126 461 tonnes

More information on the NPRI may be obtained by contacting:
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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. The NPRI is the only legislated, nationwide, publicly accessible inventory of its kind in Canada. The data collected also support a wide range of prevention and abatement activities.

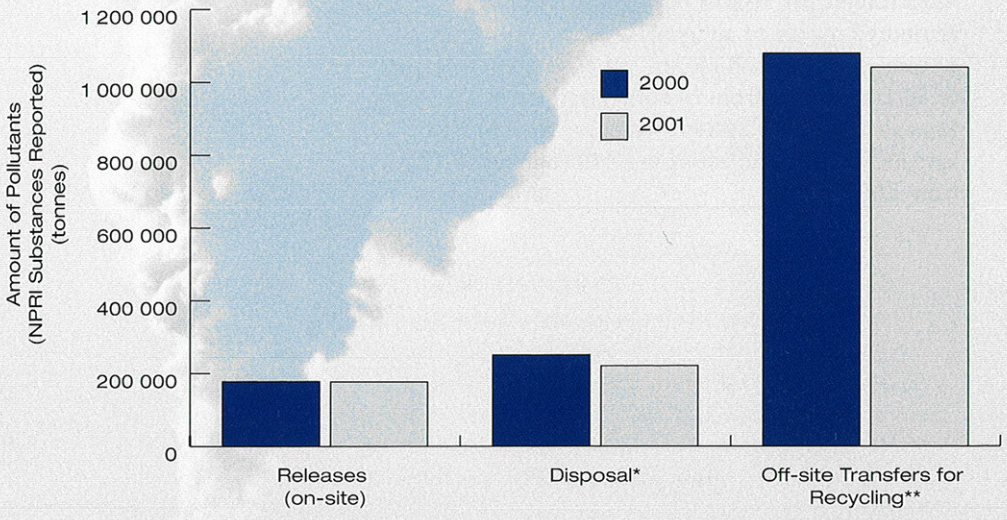
This fact sheet presents a summary of NPRI data collected in 2001 from facilities in Canada. The data presented are current as of November 8, 2002.

More information on the NPRI may be found on Environment Canada's Web site at **www.ec.gc.ca/npri/**

HIGHLIGHTS

- More NPRI substances are being recycled and used for energy recovery than are being released to air, land, and water.
- In total, 2618 facilities submitted 11 810 substance reports for 202 of the 265 NPRI substances.
- As demonstrated in the chart below, between 2000 and 2001, facilities reported small decreases (<6%) in the amounts of NPRI substances released on site, sent for final disposal or for treatment prior to final disposal, and transferred off-site for recycling and energy recovery.

Comparison of 2000 and 2001 Data



* Disposal includes on-site final disposal, off-site final disposal, and off-site transfers for treatment prior to final disposal.

** Recycling includes recycling of various materials and energy recovery.

2001

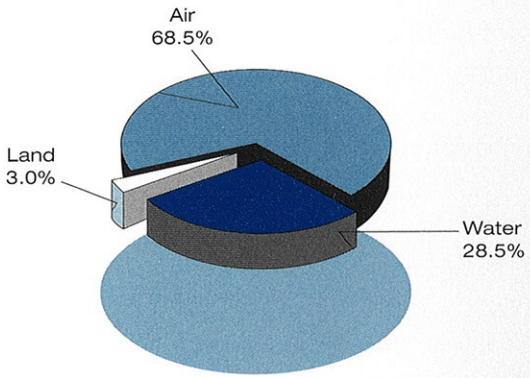
Canada

2001 RELEASES

ON-SITE RELEASES

Facilities reported an estimated 181 007 tonnes of NPRI-listed pollutants released on site in 2001, a decrease of 1923 tonnes from 2000. Releases to air accounted for an estimated 124 017 tonnes (68.5%), releases to water totalled 51 601 tonnes (28.5%), and releases to land totalled 5390 tonnes (3.0%).

On-site Releases in 2001



Releases of NPRI-listed pollutants to air decreased by an estimated 6394 tonnes (or -4.9%) from 2000. However, releases to water increased by an estimated 4023 tonnes (or +8.5%) from 2000. This can be attributed mainly to an increase in the quantities of total ammonia and nitrate ion in solution released to surface waters from facilities classified in the Water, Sewage and Other Systems category. Releases to land increased by an estimated 448 tonnes (+9.1%) from 2000.

On-site Releases — Top Six NPRI Pollutants

Substance	Releases (tonnes)	% of total
Ammonia (total)	40 915	22.6
Nitrate ion in solution (at pH ≥6.0)	22 501	12.4
Methanol	20 428	11.3
Hydrochloric acid	16 595	9.2
Sulphuric acid	9 387	5.2
Hydrogen sulphide	7 234	4.0

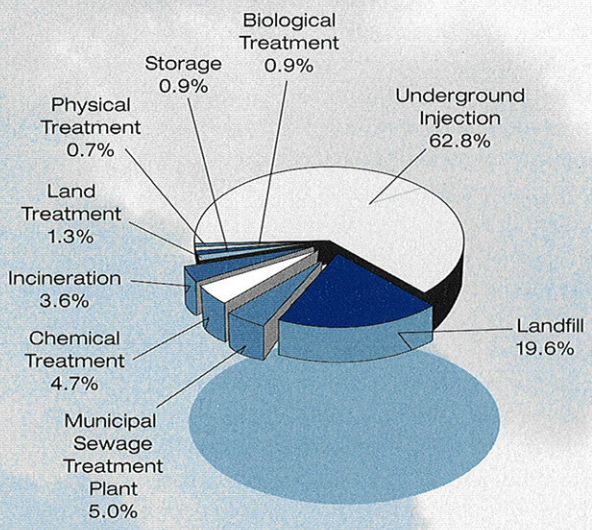
Top Five Industrial Sectors Reporting the Largest On-site Releases of NPRI Pollutants

Industrial sector	Releases (tonnes)	% of total
Water, Sewage and Other Systems	39 654	21.9
Pulp, Paper and Paperboard Mills	30 693	17.0
Electricity Generation, Transmission and Distribution	19 744	10.9
Pesticide, Fertilizer and Other Agricultural Chemical Manufacturing	10 102	5.6
Oil and Gas Extraction	9 816	5.4

2001 DISPOSAL

Facilities reported an estimated 259 379 tonnes of NPRI-listed pollutants sent for disposal in 2001, a decrease of 15 891 tonnes from 2000.

2001 Disposal



Disposal — Top Six NPRI Pollutants

Substance	Disposal (tonnes)	% of total
Hydrogen sulphide	140 696	54.2
Calcium fluoride	15 877	6.1
Zinc (and its compounds)	15 522	6.0
Ammonia (total)	13 606	5.2
Methanol	9 689	3.7
Manganese (and its compounds)	7 975	3.1

As noted above, hydrogen sulphide was disposed of in the largest quantity — an estimated 140 696 tonnes, or 54.2% of the national total. This quantity was attributed to underground injection by facilities in the Oil and Gas Extraction (124 386 tonnes) and Support Activities for Mining and Oil and Gas Extraction (16 260 tonnes) industrial sectors. In 2000, these sectors reported an estimated 148 392 tonnes of hydrogen sulphide disposal. This resulted in a decrease of an estimated 7746 tonnes (or -5.2%) from these two sectors from 2000.

Top Five Industrial Sectors Reporting the Largest Disposals of NPRI Pollutants

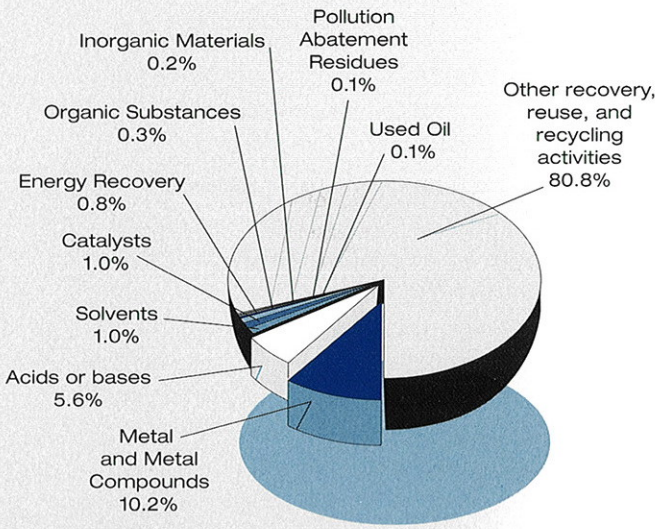
Industrial sector	Disposal (tonnes)	% of total
Oil and Gas Extraction	131 927	50.9
Support Activities for Mining and Oil and Gas Extraction	16 763	6.5
Alumina and Aluminum Production and Processing	14 942	5.8
Waste Treatment and Disposal	13 652	5.3
Basic Chemical Manufacturing	11 321	4.4

2001 RECYCLING

RECYCLING AND ENERGY RECOVERY

Facilities reported an estimated 1 126 461 tonnes of NPRI-listed substances sent for recycling and energy recovery in 2001, a decrease of 3911 tonnes from 2000.

Off-site Transfers for Recycling in 2001



Off-site Transfers for Recycling and Energy Recovery — Top Six NPRI Pollutants

Substance	Disposal (tonnes)	% of total
Hydrogen sulphide	900 794	80.0
Sulphuric acid	75 753	6.7
Copper (and its compounds)	38 742	3.4
Zinc (and its compounds)	38 228	3.4
Chromium (and its compounds)	12 035	1.1
Manganese (and its compounds)	11 753	1.0

Top Five Industrial Sectors Reporting the Largest Off-site Transfers of NPRI Pollutants for Recycling and Energy Recovery

Industrial sector	Releases (tonnes)	% of total
Support Activities for Mining and Oil and Gas Extraction	900 975	80.0
Petroleum and Coal Products Manufacturing	66 835	5.9
Motor Vehicle Parts Manufacturing	35 948	3.2
Metal Ore Mining	12 242	1.1
Non-Ferrous (excluding Aluminum) Production and Processing	12 203	1.1

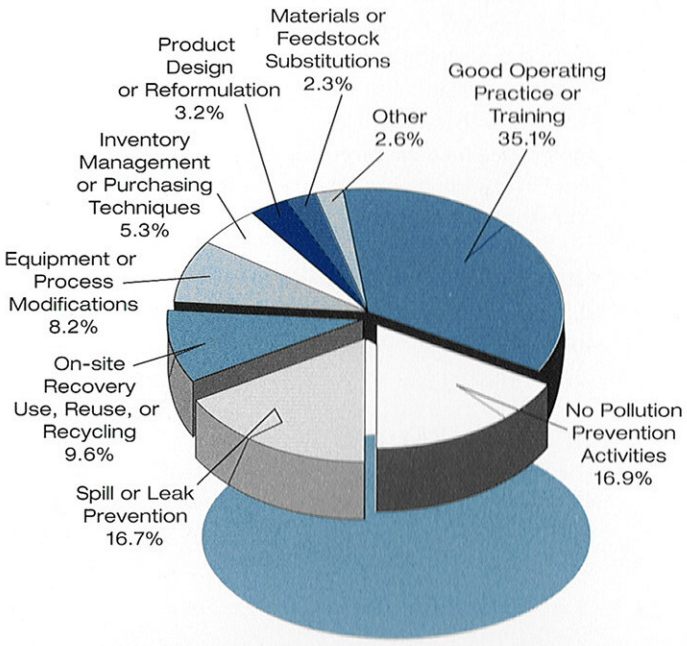
As noted above, hydrogen sulphide was transferred off-site in the largest quantities for recycling — "other" in 2001 — an estimated 900 794 tonnes, or 80.0% of the national total. This total quantity was attributed to an off-site transfer for recycling by facilities in the Support Activities for Mining and Oil and Gas Extraction industrial sector. In 2000, this sector reported an estimated 928 928 tonnes of hydrogen sulphide as an off-site transfer for recycling. This resulted in a decrease of an estimated 28 134 (or -3.0%) from 2000.

2001 POLLUTION PREVENTION

Pollution prevention (P2) is defined in the *Canadian Environmental Protection Act, 1999* (CEPA 1999) as "the use of processes, practices, materials, products, substances or energy that avoid or minimize the creation of pollutants and waste, and reduce the overall risk to the environment or human health." As the cornerstone of CEPA 1999, pollution prevention is identified throughout the Act as the priority approach for the protection of the environment and human health.

Pollution prevention seeks to eliminate the causes of pollution rather than managing it after it has been created. Beginning in 1997, qualitative reporting of P2 activities, through the use of checklists, has been required for listed substances under the NPRI program. This type of qualitative reporting can be elaborated on through appropriate comment fields. These fields can be used to indicate the extent to which P2 activities were implemented or the reductions resulting from implementation.

Pollution Prevention (P2) Activities in 2001



P2 activities may include, but are not limited to:

- materials or feedstock substitution;
- product design or reformulation;
- equipment or process modification;
- spill and leak prevention;
- on-site reuse, recovery, or recycling;
- improved inventory management or purchasing techniques; and
- good operating practice and training.

In 2001, approximately 80% of facilities reported some P2 activity. As in previous years, the majority of all P2 activity was reported in the form of "good operating practice or training."

Pollution prevention encourages the kinds of changes that are likely to lead to reductions in emissions, waste, and possible usage. Throughout the 2001 reporting form, facilities were required to identify a reason for change in their on-site releases, off-site transfers, and off-site recycling relative to the previous year. One of the possible reasons for change in these values is the implementation of P2 measures.

THE NPRI

WHO REPORTS TO THE NPRI?

In general, any person who owns or operates a facility in Canada was required to report to the NPRI for 2001 if the facility met or exceeded all criteria for the type of activity, the number of employees or hours worked, and, in most cases, the amount of NPRI-listed substances manufactured, processed, or otherwise used in specified amounts (referred to as "thresholds").

NPRI reports for a given calendar year must be submitted to Environment Canada by June 1 of the subsequent year.

NPRI SUBSTANCES

For the 2001 reporting year, there were 265 substances listed in the NPRI, 74 of which have been declared toxic under CEPA 1999.

The NPRI substance list is divided into four parts, each with different reporting thresholds. The original 10 tonne and 1% concentration manufacture, process or otherwise use threshold applies to 245 substances. The remaining 20 substances have alternate reporting thresholds.

The following substances were listed at alternate reporting thresholds:

- mercury (and its compounds) — manufacture, process, or otherwise use 5 kg per year;
- 17 individual polycyclic aromatic hydrocarbons (PAHs) — 50 kg of releases and transfers per year; and
- dioxins/furans and hexachlorobenzene (HCB) — from selected activities, with no quantitative threshold.

The NPRI substance list was developed through public and stakeholder consultation. Changes for the 2001 reporting year include the addition of N,N-dimethylformamide and the de-listing of phosphoric acid.

WHAT IS REPORTED TO THE NPRI?

Reporting for each NPRI substance included an indication of whether the substance was manufactured, processed, or otherwise used and the nature of such activities and uses during the year. Specifically, facilities reported:

- the quantity released on site to air, water, land, and underground injection;
- the quantity transferred off-site for disposal, and the nature of treatment, destruction, or containment;
- the quantity transferred off-site for recycling, subdivided by recovery for energy and various materials, such as solvents, catalysts, and metals;
- the reasons for changes in reported releases or transfers compared with the previous year; and
- P2 activities.

2001 NPRI REPORTS

Through work with stakeholders concerning the "reporting out" of NPRI information, a new format was established for summarizing pollutant releases and transfers from the NPRI. The following groupings were used to summarize information collected through the NPRI for the 2001 reporting year:

On-site pollutant releases:

- air
- water
- land — includes spills, leaks, and other

Final disposal:

- on-site disposal: landfill, land treatment, and underground injection
- off-site disposal: landfill, land treatment, underground injection, and storage

Off-site transfers for treatment prior to final disposal:

- physical treatment
- chemical treatment
- biological treatment
- incineration or thermal treatment where energy is not recovered
- treatment at a municipal sewage treatment plant (MSTP)

Off-site transfers for recycling and energy recovery:

- recycling
- energy recovery

This year, Environment Canada will be releasing several documents summarizing the NPRI. These will include the 2001 National Overview series, a national fact sheet, and *Informing Canadians on Pollution 2003: Highlights of the 2001 National Pollutant Release Inventory (NPRI)*.

The 2001 National Overview series is composed of the following documents:

- 2001 National Overview — Reporting Requirements, NPRI;
- 2001 National Overview — Summary of 2001 Data, NPRI;
- 2001 National Overview — Releases, NPRI;
- 2001 National Overview — Final Disposal and Off-site Transfers for Treatment Prior to Final Disposal, NPRI; and
- 2001 National Overview — Recycling and Energy Recovery, NPRI.

The 2001 National Overview was categorized in this manner to provide Canadians with more focused and concise summaries. The 2001 National Overview includes data as they appeared in the NPRI database on November 8, 2002.

USING THE DATA

NPRI data represent only a portion of all chemical releases and transfers to the Canadian environment. Other substances, such as greenhouse gases, many pesticides, and other pollutants, are not part of the current list of NPRI substances.

While the NPRI program currently collects pollutant release and transfer data from a broad range of industrial and non-industrial sectors, not all sources are captured by the NPRI. Facilities that do not meet the reporting thresholds because of their size or because they are exempt do not report to the NPRI. Other sources, such as mobile sources, commercial establishments, and households, may release small amounts of pollutants individually, but as a group account for a large portion of the releases of some pollutants.

Double counting is a factor that needs to be considered when using NPRI data. Although there is no double counting of releases and disposal on site, which can be reported only once, transfers may be counted more than once. For example, transfers from one facility for final disposal may be reported as a disposal on site or a release to the environment by another facility. Accounting for multiple reporting when adding releases and disposals on site and off-site is possible but requires extensive analysis of the NPRI database.

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. It would be incorrect to assume that facilities or industrial sectors with the largest releases or transfers are less inclined than others towards pollution prevention and control. Consideration should also be given to the fact that the NPRI list of substances and reporting criteria may change from year to year.

Risks 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 to which the pollutant is released.

More information on the NPRI may be obtained by contacting:
National Pollutant Release Inventory, Environment Canada, 9th Floor, Place Vincent Massey, 351 St. Joseph Blvd., Gatineau, QC K1A 0H3
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