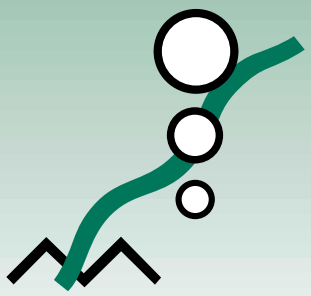

Guide for Reporting to the National Pollutant Release Inventory

1999

Canadian Environmental Protection Act

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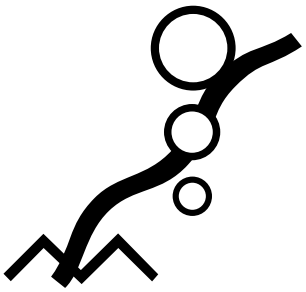

Guide for Reporting to the National Pollutant Release Inventory

1999

Canadian Environmental Protection Act

Environment Canada Environnement Canada

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Table of Contents

Preface

The National Pollutant Release Inventory (NPRI) is at the centre of the Government of Canada's efforts to track toxic substances. It is the only nationwide, publicly-accessible program of its type in Canada, providing information on pollutants being released to air, water and land and on substances transferred for disposal, treatment and recycling. Since its inception in 1992, the role of the NPRI has expanded to include the collection of information on recycling and pollution-prevention activities. For 1999, facilities are required to report on 73 additional substances, 20 of which are deemed toxic under the *Canadian Environmental Protection Act*.

This document enables facility owners or operators to review the NPRI reporting criteria and determine if they are required to report to the NPRI for the 1999 reporting year. It also provides guidance for completing the reporting form and filing a report with Environment Canada.

Cette publication est aussi disponible en français sous le titre de « Guide de déclaration à l'Inventaire national des rejets de polluants – 1999 ».

Highlights and Important Changes for 1999

Report Due Dates

Reporting deadlines for the NPRI are subject to change and should be verified each year.

Canada Gazette Notice	Reporting Year	Due Date
February 13, 1999	**1999**	**June 1, 2000**

NPRI Summary Report Pre-publication Notices

Facilities identified in the annual NPRI Summary Report are notified before its publication so that they may prepare for any media or public inquiries. Correspondence from the NPRI will be addressed to the company coordinator. If there is no coordinator, correspondence will be sent to the technical contact. Failure to provide correct telephone and facsimile numbers for the contacts could delay receipt of the pre-publication notice. See Section 2 – A4.0, A6.0 and A8.0.

Substances Added to the 1999 NPRI List

The most important change for the 1999 reporting year has been the addition of 73 substances to the NPRI (*Canada Gazette*, April, 1999). These additions were made following public consultations and acceptance of certain recommendations of the multi-stakeholder Ad-hoc Working Group on Substances. Appendix 3 lists the new substances and provides some information on their commercial and industrial uses and which industrial sectors are likely to manufacture, process or otherwise use these substances. Appendices 1 and 2 list all of the NPRI substances in alphabetical order and in order of their Chemical Abstracts Service (CAS) registry numbers.

Dun and Bradstreet (D-U-N-S®) Number

D-U-N-S is a nine-digit number that Dun and Bradstreet uses to identify companies in its financial database. The D-U-N-S number will allow the NPRI to identify the corporate structures relating facilities to their parent companies. It will also allow researchers to use the NPRI data with other financial and economic information. A large organization is likely to have many D-U-N-S numbers, linking their various headquarters, subsidiaries, branches and facilities. If your D-U-N-S number is not available from your facility's treasurer or financial officer or to obtain a new one, call the Dun and Bradstreet Customer Service Centre at 1-800-463-6362, or (416) 463-6362, Fax: (905) 568-5815. For more information, you can visit the Dun and Bradstreet Web site at <**www.dnb.com**>.

CD-ROM Reporting Package

The new CD-ROM reporting package is a simple way to provide reporters with more information about the NPRI than could be conveniently distributed in printed materials. The CD-ROM includes both the MS DOS® reporting software and the new Windows® reporting software. This guide, the *Canada Gazette* notices and many other documents on the CD-ROM are provided in the Adobe Acrobat® portable document format (PDF), so that you may view and print them with virtually the same graphics, typography and layout as the original printed versions. The PDF files can be viewed or printed using the Adobe Acrobat Reader which is also available on the CD-ROM.

Contact your regional NPRI office to obtain the MS DOS or Windows reporting software on 3.5″ diskettes or a printed copy of the Guide for Reporting to the National Pollutant Release Inventory – 1999.

NPRI Reporting Software for Windows 95/98/NT®

For the first time, the NPRI reporting software is available as a 32-bit application for computers running Microsoft Windows 95, 98 or NT. The software retains the familiar design and layout of the original MS DOS program, but is more convenient to install and use with Windows. The software features context-sensitive help, improved printing of reports, improved performance with Windows NT and networks, and the ease of Windows' graphical user interface. The software is completely compatible with the MS DOS version. The CD-ROM reporting kit contains both the MS DOS and the Windows software. Contact your regional NPRI office if you need either version of the reporting software on 3.5″ diskettes.

Acetone

Acetone is no longer on lists of substances of concern used by the NPRI, which have been compiled using scientific screening criteria for toxicity and environmental impacts, such as the U.S. Toxics Release Inventory (TRI). Following an independent assessment of information, commissioned by Environment Canada, and consultations with stakeholders, acetone has been removed from the NPRI list of substances for the 1999 reporting year (*Canada Gazette*, December, 1999). Environment Canada will, however, continue to monitor ambient air for acetone to track any increases.

Xylene (mixed isomers)

The individual xylene isomers (*m*-xylene, *o*-xylene and *p*-xylene) were deleted from the NPRI list of substances (*Canada Gazette*, February, 1999). The 1998 data for the individual isomers will not be uploaded into the 1999 report. Instead, aggregate the data for the individual isomers and complete a single report for xylene (mixed isomers). The total quantity of all isomers must be used in calculating the 10-tonne threshold quantity for xylene.

Common Errors

- **Units are Metric Tonnes**
  The most serious error made is when a facility reports values in kilograms or pounds rather than in metric tonnes. This over-estimates releases or transfers by a factor of 1 000 which has led to errors in the analysis and presentation of the NPRI data. **All values entered in the electronic reporting form are in metric tonnes (1 000 kg).**

- **Statement of Certification**
  A number of facilities neglected to provide a signed Statement of Certification. This renders the report incomplete.

- **NPRI Identification Number**
  A number of facilities did not report the NPRI identification number that had been assigned to the facility. Your assigned NPRI ID number is provided in your NPRI correspondence. NPRI ID numbers are between 1 and 9999. Contact your regional NPRI office if you cannot find your ID number.

- **Industrial Classification**
  Many facilities report industrial classification codes that are inconsistent with their industrial activities. Facilities must verify that the Canadian SIC, U.S. SIC and NAICS Canada codes that they report best describe their activities. The NPRI software provides pick-lists for the Canadian SIC, U.S. SIC and NAICS codes. While there may be several choices because of differences in the classification systems, be certain to choose the classification that best describes the facility. If you have any doubts about selecting industrial classification codes, please contact your regional NPRI office.

- **Software Problems**
  Some facilities do not install and test the NPRI reporting software sufficiently in advance of the June 1 reporting deadline. Technical problems encountered in installing or running the software may result in submission of a late report. Facilities are urged to ensure that the software is correctly installed well in advance of the reporting deadline. Facilities are also urged to assess their risk of potential problems related to the Year 2000 to ensure that they will meet their reporting deadlines.

Introduction

The National Pollutant Release Inventory (NPRI) was created in 1992 to provide Canadians with information on pollutants released to their environment. NPRI data also support a wide range of environmental initiatives, including pollution prevention and abatement.

On February 13, 1999, a "Notice with Respect to Substances in the National Pollutant Release Inventory for 1999" was published under the authority of subsection 16(1) of the *Canadian Environmental Protection Act (CEPA)*, in the *Canada Gazette*, Part I (*Canada Gazette*, February, 1999). This notice specified that any person owning or operating a facility that manufactured, processed or otherwise used any of the specified substances, under the conditions prescribed in the notice, provide this information to the Minister of the Environment no later than **June 1, 2000**. Notices are published annually in the *Canada Gazett*e, Part I. Changes may be made to the notice from year to year.

Environment Canada subsequently added 73 substances to the NPRI (*Canada Gazett*e, April, 1999) following public consultations and acceptance of certain recommendations of the multi-stakeholder Ad-hoc Working Group on Substances. Appendix 3 lists the new substances and provides some information on their commercial and industrial uses and which industrial sectors are likely to manufacture, process or otherwise use these substances.

More information on the NPRI is available on Environment Canada's Web site at <**www.ec.gc.ca/pdb/npri**>.

This guide will assist facility owners or operators in determining whether they are required to report to the 1999 NPRI and in completing the electronic reporting form.

Reporting to the NPRI is a two-step process, as illustrated in Figure 1. First, determine if **all** reporting criteria have been met for each NPRI substance manufactured, processed or otherwise used at the facility. When calculating the 10-tonne reporting threshold for an NPRI substance, include only the quantity of the NPRI substance in concentrations equal to or greater than 1% that is manufactured, processed or otherwise used at the facility, **plus** the quantity of the same NPRI substance that is considered a by-product. The reporting criteria are explained in Section 1 of this guide.

In the second step, provide information on all releases and transfers of each NPRI substance that met the reporting criteria, **regardless of concentration or quantity**, including "zero" releases and transfers. Section 2 of this guide explains what information is required and how to complete the electronic reporting form.

If you have any difficulties interpreting the requirements of the NPRI notice, please consult the Questions and Answers in Section 5 or contact your regional NPRI office listed inside the front cover of this guide.

Figure 1
1999 NPRI Process

Step 1

see Section 1

Meeting the Reporting Criteria

The threshold criteria are used only to determine if a facility is required to report to the NPRI for an individual NPRI substance.

- ✔ Facility is not exempt
- ✔ Employees worked 20 000 hours or more
- ✔ Manufactures, processes or otherwise uses an NPRI substance
- ✔ Exceeds 10-tonne reporting threshold. Include NPRI substances
  - equal to or greater than 1% concentration by weight
  - PLUS by-products at less than 1% concentration

Step 2

see Section 2

Completing the NPRI Report

All on-site releases and all off-site transfers of each NPRI substance meeting the above reporting criteria must be reported regardless of the concentration or quantity.

- ✔ **Facility Identification**
  - facility name and location
  - Dun and Bradstreet (D-U-N-S) number
  - industrial classification (NAICS/SIC) codes
  - public, technical and company contacts
  - parent companies
  - company coordinator
- ✔ **Substance Information**
  - substance name
  - manufacture, process and other use activities
  - on-site releases
  - off-site transfers for disposal
  - off-site transfers for recycling
  - anticipated releases and transfers
  - pollution-prevention activities
  - production ratio or activity index (optional)
- ✔ **Off-site Facilities**
  - receiving transfers for disposal
  - receiving transfers for recycling
- ✔ **Surface Water Bodies**
  - receiving discharges of NPRI substances

Section 1 – Criteria for Reporting to the National Pollutant Release Inventory

General Reporting Criteria

In general, any person who owns or operates a facility must submit an NPRI report for a substance listed in Appendix 1 **only** if **all** three of the following criteria are met:

- employees worked a total of 20 000 hours or more during 1999, which is equivalent to 10 full-time employees, **and**
- the facility manufactured, processed or otherwise used 10 tonnes (10 000 kg) or more of an NPRI substance in the 1999 calendar year, **and**
- the NPRI substance was manufactured, processed or otherwise used at a concentration greater than or equal to 1% by weight, with the exception of NPRI substances considered to be by-products. The total weight of by-products must also be included in the calculation of the 10-tonne threshold for each NPRI substance.

Figure 2 illustrates the steps to follow to determine if your facility is required to submit an NPRI report for a given substance. A facility must meet **all the reporting criteria** before it is required to report on-site releases and transfers off site for disposal or recycling of an NPRI substance.

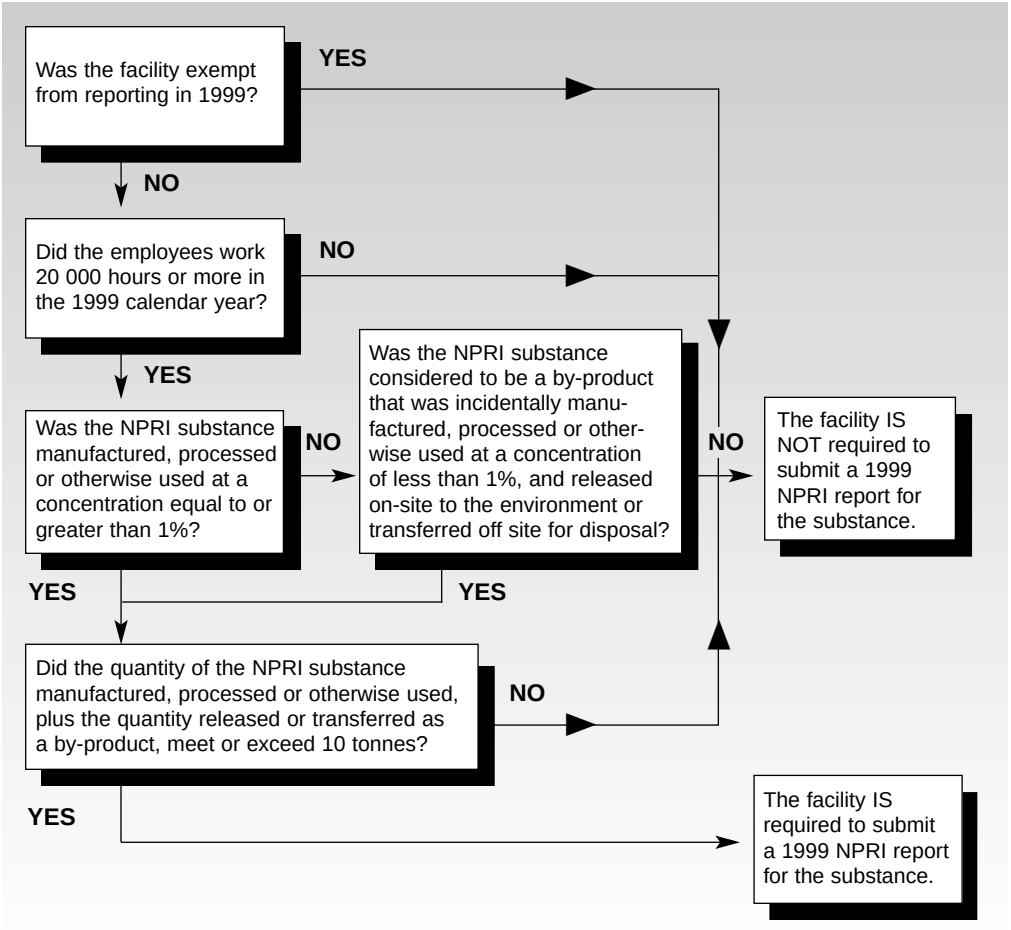


Figure 2
Criteria for Reporting to the 1999 NPRI

Once you have determined that your facility is required to file a report for an NPRI substance, all on-site releases and all transfers off site for disposal or recycling of that substance are reportable, whatever their concentration or quantity (including "zero" releases and transfers).

The *Canada Gazette* notice of February 13, 1999, states that the information required by the NPRI need only be reported to the Minister of the Environment if the facility owner or operator possesses the information or may reasonably be expected to have access to the information. **Consequently, the NPRI does not require additional monitoring or measurement of the quantities or concentration of substances released to the environment, beyond those already required under the provisions of other laws or regulations.** You are, however, required to show "due diligence" in obtaining the information required by the *Canada Gazette* notice.

Exempt Facilities

Certain facilities are currently **exempt** from reporting to the NPRI. These are identified in the *Canada Gazette* notice as facilities used exclusively for:

- educating or training students, such as universities, colleges and schools
- research or testing
- the maintenance and repair of transportation vehicles, such as automobiles, trucks, locomotives, ships or aircraft
- the distribution, storage or retail sale of fuels
- the wholesale or retail sale of articles or products which contain NPRI substances, provided that the substances are not released to the environment during normal use at the facility
- the retail sale of NPRI substances
- growing, harvesting or managing renewable natural resources, such as fisheries, forestry or agriculture, **but not** those facilities that process or otherwise use their products
- mining, **but not** those facilities engaged in further processing of mined materials
- drilling or operating wells to obtain oil and gas products, **but not** those facilities engaged in further processing of these oil and gas products.

Total Employee Hours Worked

If the total number of hours worked by all employees is less than 20 000, your facility does not have to report to the NPRI. The total number of hours worked includes paid vacation and sick leave. Owners, students, part-time and contract employees are included in this calculation. This criterion depends specifically on the number of hours worked by all employees at the facility during the calendar year and not on the number of persons working. When reporting to the NPRI, 10 "full-time employees" is equivalent to 20 000 hours worked.

Identifying NPRI Substances at a Facility

73 substances have been added to the 1999 NPRI. Refer to Appendix 3 for information on their commercial and industrial uses.

The most important change for the 1999 reporting year has been the addition of 73 substances to the NPRI (*Canada Gazette*, April, 1999). These additions were made following public consultations and acceptance of certain recommendations of the multi-stakeholder Ad-hoc Working Group on Substances. Appendix 3 lists the new substances and provides some information on their commercial and industrial uses and which industrial sectors are likely to manufacture, process or otherwise use these substances.

The next step is to confirm that one or more of the 245 substances listed in the 1999 NPRI are manufactured, processed or otherwise used at the facility. The 1999 NPRI substances are listed in alphabetical order in Appendix 1. Most of the substances have Chemical Abstracts Service (CAS) registry numbers associated with them. The NPRI substances are listed by CAS numbers in Appendix 2. Substances that do not have a unique CAS number are noted with an asterisk (*).

Some groups of substances and individual substances are qualified in terms of their specific physical or chemical form, state or particle size. These qualifiers will affect the decision about whether your facility will be required to report for a given substance.

- **fume or dust**
  This qualifier for aluminum and vanadium refers to solids with particle diameters of 0.001 to 1 micron for fumes and 1 to approximately 100 microns for dust particles.
- **fibrous forms**
  This qualifier, applied to aluminum oxide, excludes the more common granular, powdered or fumed forms of alumina.
- **salts**
  Weak acids and bases are listed with this qualifier. Although the CAS number that appears on the NPRI list is specific to the acid or base, all salts of these listed substances must be reported as an equivalent weight of the acid or base.
- **compounds**
  Thirteen elements have this qualifier: antimony, arsenic, cadmium, chromium, cobalt, copper, lead, manganese, mercury, nickel, selenium, silver and zinc. The pure element and any substance, alloy or mixture must be reported as the equivalent weight of the element. No CAS number is provided for these substances.

  Note that tetraethyl lead is one of the substances added to the 1999 NPRI. Exclude tetraethyl lead when completing a report for lead and its compounds. Complete a separate report for tetraethyl lead. Apply the reporting criteria to each substance separately. See Appendix 3 for more information about tetraethyl lead and other substances added to the 1999 NPRI.
- **friable form**
  Asbestos is the general name for several fibrous minerals and products. Only asbestos that is brittle and readily crumbled should be reported.
- **mixed isomers**
  This qualifier is used for mixtures of isomers which have the same chemical formula but different chemical structures. The substances with this qualifier are: cresol, dinitrotoluene, *n*-nonylphenol, toluenediisocyanate and xylene. Substances with this qualifier are usually found as mixtures. The total quantity of all isomers must be used in calculating the 10-tonne threshold quantity. Do

not apply the 10-tonne reporting threshold to each individual isomer, unless the pure isomer alone is manufactured, processed, otherwise used or is an NPRI by-product. See Appendix 3 for more information about nonylphenols and other substances added to the 1999 NPRI.

Note that for 1999, the individual xylene isomers (*m*-xylene, *o*-xylene, *p*-xylene) were deleted from the NPRI list of substances. The 1998 data for the individual isomers will not be uploaded into the 1999 report. Instead, aggregate the data for the individual isomers and complete a single report for xylene (mixed isomers). The total quantity of all isomers must be used in calculating the 10-tonne threshold quantity for xylene.

- **all isomers**
  This qualifier is applied to three hydrochlorofluorocarbons: HCFC-122, HCFC-123 and HCFC-124. Each HCFC is reported as an aggregate of the individual isomers that have the same chemical formula but different chemical structures. The total quantity of all isomers must be used in calculating the 10-tonne threshold quantity. See Appendix 3 for more information about these and the other substances added to the NPRI.
- **ionic**
  This qualifier, applied to cyanides, includes the salts of hydrogen cyanide but excludes organocyanides, nitriles and organometallic cyanide compounds such as ferrocyanide. In the mining industry, ionic cyanide is equivalent to “weak acid dissociable” cyanide.
- **total**
  For aqueous solutions of ammonia, this means both NH_3 and NH_4+ expressed as ammonia.
- **yellow or white**
  This qualifier is the general description for the common allotropes of elemental phosphorus.
- **in solution at a pH of 6.0 or greater**
  This distinguishes nitrate ion in neutral or basic solution from nitric acid (pH less than 6.0). If nitric acid is neutralized to a pH of 6.0 or greater, you must file a report for both nitric acid and for nitrate ion in solution. Your release or transfer of nitric acid would be “zero” and your release or transfer of nitrate ion would reflect the quantity of neutralized nitric acid reported as nitrate ion in solution at a pH of 6.0 or greater.

In most cases, consider only the substances and the CAS numbers listed. For example, “styrene” is listed with its corresponding CAS number “100-42-5”. The chemical description which corresponds to this CAS number does not include “polystyrene”. There are no polymers on the NPRI list, only monomers.

Material Safety Data Sheets (MSDS) are an important source of information on the composition of purchased products. Suppliers of hazardous materials are required, as part of the Workplace Hazardous Material Information System (WHMIS), to supply MSDS on request.

Activities

The terms “manufacture”, “process” and “other use” are defined in Schedule IV of the *Canada Gazette* notice. These activities are part of the reporting criteria. An NPRI substance at a concentration equal to or greater than 1% or an NPRI by-product at a concentration of less than 1%, are only included in the calculation of the 10-tonne reporting threshold if they had been manufactured, processed or otherwise used. An NPRI report does not have to be submitted for a substance if that substance was never manufactured, processed or otherwise used at the facility during the reporting year.

Manufacture

The term “manufacture” means to produce, prepare or compound an NPRI substance. It also includes the incidental production of an NPRI substance as a *by-product* resulting from the manufacture, processing or other use of other substances.

The production of chlorine dioxide by a chemical plant is an example of manufacturing. The production of hydrochloric acid during the manufacture of chlorofluorocarbons is an example of incidental production.

Process

The term “process” means the preparation of an NPRI substance, after its manufacture, for distribution in commerce. Processing includes preparation of a substance with or without changes in physical state or chemical form. The term also applies to the processing of a mixture or formulation that contains an NPRI substance as one component, as well as the processing of “articles” (see “Other Definitions”).

The use of chlorine (an NPRI substance) to manufacture hypochloric acid (not an NPRI substance) is an example of processing of chlorine. The use of toluene and xylenes to blend paint solvent mixtures is an example of processing without changes in chemical form.

Other Use

The terms “other use” and “otherwise used” encompass any use of an NPRI substance at a facility that does not fall under the definitions of “manufacture” or “process”. This includes the use of the substance as a chemical processing aid, manufacturing aid or some other ancillary use. The use of trichloroethylene in the maintenance of equipment used for manufacturing and processing is considered an “other use”. “Other use” does not include routine janitorial or facility grounds maintenance.

By-products

In 1995, the reporting criteria were changed to include by-products in the calculation of the 10-tonne reporting threshold. The reason for this change was to identify large-volume, low-concentration releases and transfers which normally would not trigger the reporting requirements of the NPRI. This change affects facilities that release to the environment or transfer for disposal large quantities of NPRI substances, but at concentrations of less than 1%. Some examples of affected sectors include, but are not limited to, power generation, aluminum smelting, and pulp and paper production.

Normally, only NPRI substances in concentrations equal to or greater than 1% are included in the threshold calculations. The 1% concentration limit is consistent with the reporting requirements under the WHMIS. Minor constituents (with some exceptions) are not included on MSDS. **However, NPRI by-products at less than 1% concentration by weight must be included in the calculation of the 10-tonne reporting threshold.**

A “by-product” is an NPRI substance that is incidentally manufactured, processed or otherwise used at a facility and is released on site to the environment or transferred off site for disposal.

The NPRI applies to any person who possesses or who may reasonably be expected to have access to the types of information requested. This reasonable expectation limits the reporting liability of facilities which cannot easily determine minor amounts of NPRI substances in their feedstock or process.

To determine if a substance is a by-product, you need to consider all of the elements of the by-product definition.

> A "by-product" is an NPRI substance that is incidentally manufactured, processed or otherwise used at the facility at a concentration of less than 1% by weight, and is released on site to the environment or transferred off site for disposal.

The NPRI substance is not relevant to the manufacture, process or other use of substances at the facility. It may be the product of an unwanted side-reaction or an impurity in a feedstock material. If the NPRI by-product was absent, there would be no effect on the process. As with substances reportable to the NPRI, it must have been manufactured, processed or otherwise used at the facility.

The substance was manufactured, processed or otherwise used at a concentration of less than 1% by weight.

Substances which meet the above criteria are only considered by-products if they are released to the environment or transferred off site for disposal. Substances that are recycled or that remain in the final product are excluded from the by-products definition.

Example 1
Hydrogen fluoride is incidentally manufactured during aluminum smelting. For some large facilities, more than 10 tonnes may be released to the atmosphere at concentrations of less than 1%. The weight of the hydrogen fluoride by-product must be used in the calculation of the 10-tonne reporting threshold.

Example 2
Chromium, nickel and mercury are incidentally present in coal. During combustion, a portion of these metals is concentrated in the ash which is transferred off site for disposal and a portion of the metals is released in stack emissions. The weight of the heavy metal by-products must be included in the calculation of the 10-tonne reporting threshold.

Example 3
An NPRI substance is present in trace amounts in a product that is repackaged for retail sale. The quantity of this substance released through spillage or through fugitive air emissions cannot be determined because the formulation of the product is proprietary or the substance concentration is not listed on the MSDS and more detailed information cannot be obtained from the supplier or manufacturer. Although this NPRI substance is considered a by-product, it is not included in the calculation of the 10-tonne reporting threshold because it is an unreasonable expectation that the facility could obtain information on the substance identity, concentration or quantity.

Other Definitions

Facility

A "facility" includes all buildings, equipment, structures or other stationary items that are located on a single site or on contiguous or adjacent sites and that are owned by the same company and operated as a single integrated site.

Article

An "article" is defined as a manufactured item that does not release an NPRI substance under the normal conditions of processing or use. When articles such as metal sheets and bars are processed (punched, cut or sheared) and there are no releases, or the releases such as metal shearings or pieces are recycled 100% or with due care, the NPRI substances in that article need not be included in the threshold calculation. Exercising "due care" in ensuring 100% recycling means that the facility generates less than 1 kg of the NPRI substance as waste in a calendar year. Materials that are welded lose their article status since there are releases from the article during welding.

Calculating the 10-tonne Reporting Threshold

The 10-tonne reporting threshold is based on the quantity of an NPRI substance manufactured, processed or otherwise used at the facility at concentrations equal to or greater than 1% **plus** the quantity of the same NPRI substance, at less than 1% concentration, that is considered to be a by-product which is released on site to the environment or transferred off site for disposal.

When calculating the 10-tonne reporting threshold, **include** the quantity of an NPRI substance that is:

- manufactured at a concentration equal to or greater than 1%
- processed at a concentration equal to or greater than 1%
- otherwise used at a concentration equal to or greater than 1%
- a by-product, at less than 1% concentration, released on site to the environment
- a by-product, at less than 1% concentration, transferred off site for disposal.

Any NPRI substances that are recycled off site and returned to the facility should be treated as the equivalent of newly-purchased material for the purposes of NPRI threshold determinations. Since an NPRI substance may undergo many processes in a facility, care should be taken not to double-count process streams when calculating the reporting threshold.

Exclusions

In calculating the quantity of an NPRI substance that is manufactured, processed or otherwise used at your facility, **do not include** the quantity of the substance that is:

- **contained in articles that are processed or otherwise used**
- **contained in materials used as structural components of the facility –** The exclusion of structural components of the facility from the reporting threshold is limited to buildings and other fixed structures but does not include process equipment.
- **contained in materials used in routine janitorial or facility grounds maintenance –** The maintenance of processing equipment is not considered "routine janitorial" or "facility grounds" maintenance. For example, if manufacturing or processing equipment is cleaned with a solvent, the amount

of NPRI substance(s) contained in the solvent should be included in the threshold calculation.

- **contained in materials used for personal use by employees or other persons**
- **used for the purpose of maintaining motor vehicles operated by the facility**
- **present in intake water or intake air –** This refers to water used for process cooling or air used either as compressed air or for combustion.

NPRI Substances Equal to or Greater than 1% Concentration

The total quantity of an NPRI substance manufactured, processed or otherwise used at concentrations greater than or equal to 1%, at any time or in any part of the facility, **must** be used in the calculation of the 10-tonne reporting threshold.

The quantity of a substance received by a facility at 30% concentration and then diluted to less than 1% for use, is included in the threshold calculation. The same would apply for a substance received at the facility at less than 1% and subsequently concentrated to 5%.

Facilities that blend or formulate NPRI substances such as solvents, must include the total quantity of the substance blended or mixed in the reporting threshold calculation since blending, mixing and formulating are considered processing, which is a reportable activity.

Facilities that repackage or transfer NPRI substances between containers need only consider the total quantity of substance repackaged or transferred if there are releases during the transfer or repackaging processes. **The exemption for wholesaling only applies if there are no releases or wastes produced during the operation.**

If only a range of concentrations is available for a substance present in a mixture, use the average of the range for threshold determinations.

NPRI Substances of Less than 1% Concentration

The total quantity of a by-product released on site to the environment or transferred off site for disposal **must** be used in the calculation of the 10-tonne reporting threshold. This is the only circumstance where the quantity of an NPRI substance at a concentration of less than 1% is used in calculating the 10-tonne reporting threshold. **However, once the reporting criteria have been met, all on-site releases and all off-site transfers for disposal or recycling must be reported, regardless of the substance's concentration.** The following examples illustrate the application of the by-product definition:

Example 1
A facility uses a pre-polymer mixture which contains unreacted di-*n*-octyl phthalate monomer at a concentration of less than 1%. The monomer remains in the final product after the processing is complete. The polymer is used to make articles which are sold for distribution. The unreacted monomer is not released and remains in the product distributed in commerce and, therefore, is not included in calculating the 10-tonne threshold.

Example 2
Gases produced during coking of coal are recovered and used to supply heat and are therefore not considered by-products. The quantity produced at concentrations of less than 1% should not be used in the calculation of the reporting threshold.

Example 3
Many industrial processes involve separation but not all of these processes create by-products. Distillation of crude oil, for example, produces a number of secondary substances which are intended for distribution in commerce or further use. These are not by-products for the purpose of reporting to the NPRI.

Example 4
Metal cuttings, transferred off site for disposal, contain alloyed chromium at a concentration of less than 1%. The chromium is an essential component of the alloy, therefore it is not incidentally processed and is not considered to be a by-product. The chromium in the metal cuttings is not included in the calculation of the 10-tonne reporting threshold.

Example of Calculating the Reporting Threshold

The following example illustrates the calculation of the 10-tonne reporting threshold. This facility has several processes in which an NPRI substance is manufactured, processed or otherwise used.

1. In the first process, NPRI substance "A" is present at 5% concentration and is included in the threshold calculation.
2. In the second process, a raw material added to the process is pure substance "A". It is also included in the threshold calculation, regardless of any subsequent dilution in the process. The opposite would hold true for a substance received at the facility at less than 1% which is subsequently concentrated to more than 1% in the process.
3. The weight of substance "A" in the raw material used in process 3 is not included in the threshold calculation because the concentration is less than 1%. Note, however, that since the facility in this example must report because it meets the 10-tonne reporting threshold, it is required to take into account and report releases and transfers from all processes including those, such as process 3, which were not used in the threshold calculations.
4. The weight of substance "A" produced and released from process 4 is included in the calculation because it is a by-product. The concentration criterion does not apply to by-products.

MATERIAL CONTAINING SUBSTANCE "A"	TOTAL WEIGHT OF MATERIAL CONTAINING SUBSTANCE "A"	CONCENTRATION OF SUBSTANCE "A" IN THE MATERIAL	NET WEIGHT OF SUBSTANCE "A"
Process stream 1	150 tonnes	5.00%	7.5 tonnes
Raw material in process 2	2 tonnes	100.00%	2.0 tonnes
Raw material in process 3	45 tonnes	0.20%	n/a
By-product released from process 4	10 000 tonnes	0.01%	1.0 tonne
		Total weight of substance "A"	10.5 tonnes

If you have concluded that you are not required to report, advise your regional NPRI office listed on the inside front cover.

In this example, the facility would be required to file a report to the NPRI (assuming it also meets the 10-employee threshold) because the total amount of substance "A" manufactured, processed or otherwise used at the facility exceeds 10 tonnes for a given calendar year.

Note that the facility must file a report even if the on-site releases or off-site transfers for disposal or recycling of substance "A" are zero.

These threshold calculations do not need to be reported to the NPRI. Their purpose is to determine the substance for which a facility is required to report on-site releases and transfers off site for disposal or recycling. Keep this information in your files.

If You Are Not Required to Report

If you have concluded that you are not required to report for your facility, either because it is an exempt facility or it does not meet all the reporting criteria, advise your regional NPRI office (listed on the inside front cover) to update our records and mailing lists.

If You Are Required to Report

If you have concluded that you are required to report for your facility, use the electronic reporting form provided to file your report. Send your report on disk and a signed Statement of Certification to your regional NPRI office (listed on the inside front cover), postmarked or courier-dated no later than **June 1, 2000**. If you do not have access to a computer, a paper reporting form can be requested from your regional NPRI office. Extra copies of the reporting package can also be ordered from your regional NPRI office. The reporting package is available as:

- a CD-ROM containing the MS DOS and Windows reporting software and guidance documents,
- the MS DOS and Windows reporting software on 3.5″ IBM-compatible diskettes, and
- the printed version of the "Guide for Reporting to the National Pollutant Release Inventory – 1999".

Section 2 – Completing the Reporting Form

Introduction

The most important change for the 1999 reporting year has been the addition of 73 substances to the NPRI. These additions were made following public consultations and acceptance of certain recommendations of the multi-stakeholder Ad-hoc Working Group on Substances. Appendix 3 lists the new substances and provides some information on their commercial and industrial uses and which industrial sectors are likely to manufacture, process or otherwise use these substances.

This section describes the information required and the procedures to follow to comply with the notice published in the *Canada Gazette*. Electronic reporting forms for MS DOS and Windows were developed to facilitate data input for reporters, to provide on-line help to the person completing the report and to reduce errors in data transcription. For ease of reference, this section follows the same order, titles and numbering system as the electronic reporting form.

A typical procedure, as shown in Figure 3, is to install the 1999 reporting software, re-index all database files and upload the data from your 1998 report if it is available. Next, update the information on reporting facilities, substances, off-site facilities and surface water bodies. Use the software's "error check" function to verify that the report is free of errors and then create an NPRI report disk. Finally, submit the report disk with a Statement of Certification signed by an official of the company (usually identified in field A16.0) to Environment Canada.

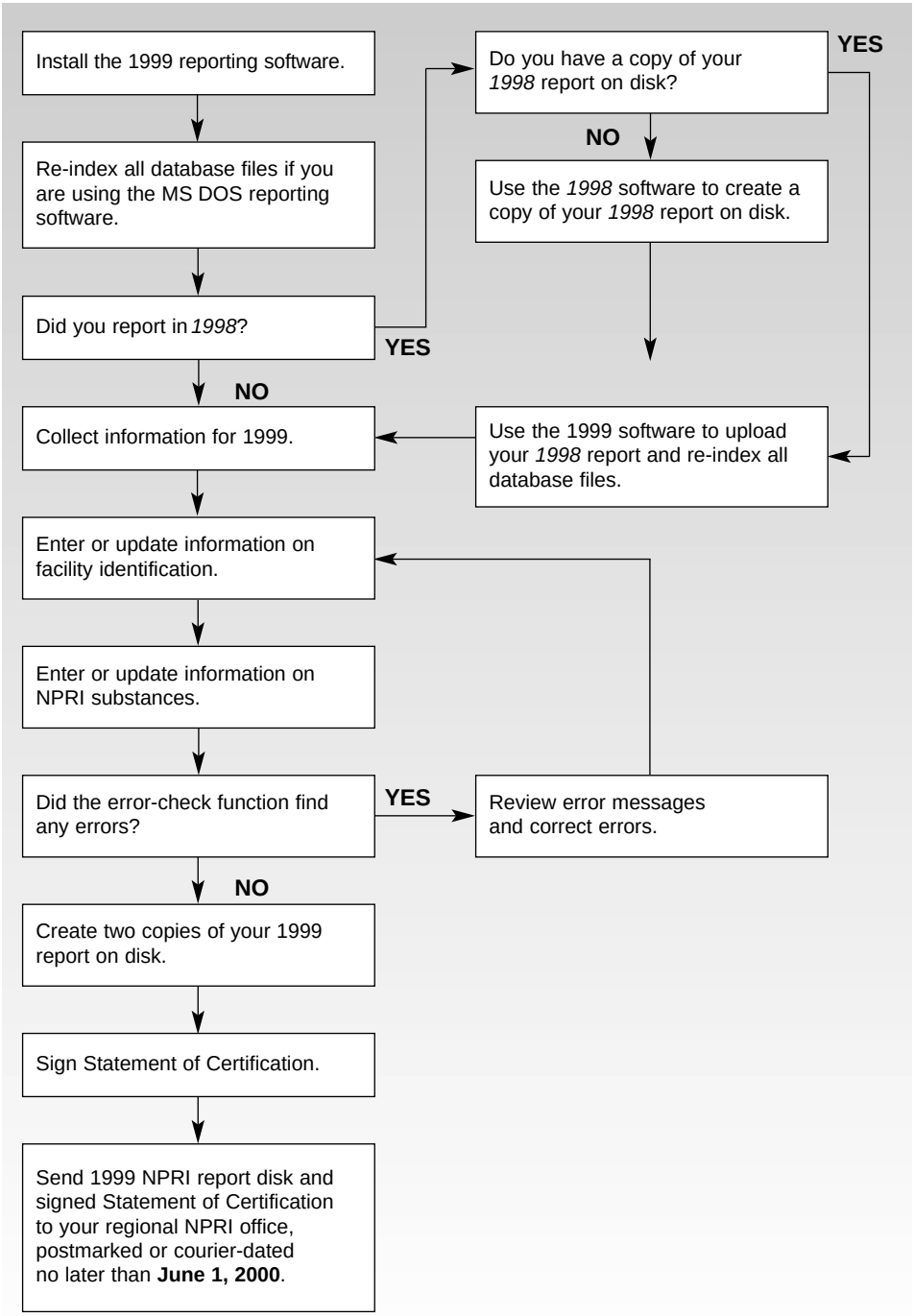
The NPRI electronic reporting form, and this section of the guide, are organized as follows:

- Section A1 Facility Identification
- Section B1 Substance Information
- Section B10 On-site Releases to the Environment
- Section B20 Off-site Transfers for Disposal or Recycling
- Section B30 Pollution-Prevention Activities
- Section B40 Production Ratio and Activity Index

Please review the explanations provided for these sections before completing your 1999 NPRI report.

The reporting software has many error-checking routines to help ensure that the information provided is complete. The MS DOS software identifies errors as you move from field to field. The Windows software completes its error check when leaving a screen. All warnings in the reporting form can be overridden to allow you to complete the form. However, the NPRI report must be error-free before the software will allow a disk to be copied for submission to Environment Canada. See Section 3 – "Returning Information to Environment Canada".

Figure 3
Completing the 1999 NPRI Report



Facility Identification

From the "Main Menu" of the NPRI software, select the "View/Enter/Edit Data" menu and then select "Reporting Facilities". The electronic reporting form allows NPRI reports for more than one facility to be created. This is useful for company coordinators who are filing NPRI reports for several facilities. You can add, delete or edit a facility record from the facility list.

At any time while completing the report, you can save the information you have entered or abandon the changes you have made. Save your work often to avoid losing data if the hardware or software fail.

A1.0 NPRI ID, Web Site Address, Dun and Bradstreet Number

The "Reporting Year" field cannot be changed. This is the calendar year for which you are required to report to the NPRI and for which you will be providing information.

A1.1 NPRI ID

If an NPRI report was previously filed for your facility, it was assigned a **permanent** NPRI identification number. The NPRI ID is specific to the facility and does not change even if the ownership of the facility has changed. You will find this number on the mailing label of the 1999 NPRI package or on the correspondence sent to your company/facility. If you cannot find your NPRI ID number, call your regional NPRI office (listed inside the front cover).

If this is your first year of reporting, place the cursor in the NPRI ID field marked "NEW REPORT" and generate a temporary identification number (Windows users: click on "Generate a temporary NPRI ID" button; MS DOS users: press **[F4]**). A permanent NPRI ID for your facility will be assigned by Environment Canada at a later date.

A1.2 Language

Correspondence from Environment Canada will be in the language identified, i.e., English or French. The language code determines which language is used by the software when printing reports.

A1.4 Web Site Address

This is an optional field for you to provide the Web site address of your facility or parent company. The address you provide will become part of the on-line NPRI database and will allow visitors to link directly to your Web site for more information.

A1.5 Dun and Bradstreet (D-U-N-S) Number

D-U-N-S is a nine-digit number that Dun and Bradstreet uses to identify companies in its financial database. This will allow the NPRI to identify the corporate structures relating facilities to their parent companies. A large organization is likely to have many D-U-N-S numbers, linking their various headquarters, subsidiaries, branches and facilities. Report the D-U-N-S number of the facility. This number may be available from your facility's treasurer or financial officer. If the facility doesn't have a D-U-N-S number, but the parent company does, report that number in field A3.0 "Identification of Parent Companies". If you need to verify your D-U-N-S number or obtain a new one, call the Dun and Bradstreet Customer Service Centre at 1-800-463-6362, or (416) 463-6362; Fax: (905) 568-5815. For more information, you can visit the Dun and Bradstreet Web site at <**www.dnb.com**>.

Report the D-U-N-S number(s) of the facility. This will allow the NPRI to identify the corporate structures relating facilities to their parent companies.

A2.0 Facility Identification and Site Address

The NPRI database fully supports uppercase/lowercase text entry which improves legibility. DATA ENTRY IN ALL UPPERCASE CHARACTERS IS DISCOURAGED. Please take the time to correctly enter your facility identification as you wish it to appear in the publicly-accessible database. This information will be used to identify your facility in all Environment Canada reports and data products and should therefore be selected carefully to ensure that your facility is correctly identified.

Geographic coordinates for facilities are determined by Environment Canada. Facilities may be asked to provide the information needed to determine the geographic coordinates of the facility.

A2.1 Company Name

Enter your company name. This field is mandatory. If your company owns more than one reporting facility, please ensure that the company name is used consistently.

A2.2 Facility Name

Enter the name of the facility or any other information which, in addition to the "Company Name", completely identifies the facility. You may omit the "Facility Name" if the "Company Name" alone completely identifies the facility.

COMPANY NAME	FACILITY NAME
Specialty Pharmaceuticals	Liquids Plant
Trans Canada Airlines	Calgary
Canadian Refineries	Alberta Processing Plant
International Manufacturing	ABC Manufacturing Division

A2.3 and A2.4 Street Address

The "Street Address" is the site address of the facility. **Do not use a post office box or mailing address as the street address.** A mailing address can be given when identifying a public contact, technical contact or company coordinator. Enter the street name and number and other identifiers such as suite number or building designation. For rural addresses, where a street address is not available, enter the lot and concession numbers, and the township or its equivalent.

A2.5 City/District

Enter the name of the city, town, village, district or township where the facility is located.

A2.6 Province or Territory

Enter the name of the province or territory where the facility is located. Choose the name or abbreviation from the pick-list that is available while the cursor is in the "Province" field.

A2.7 Postal Code

Enter the postal code. It will be formatted automatically (e.g., V7M 3H7).

A3.0 Identification of Parent Companies

For the purposes of the NPRI, a parent company is defined as the highest level company or group of companies that directly control your facility. If your company is not owned or controlled by another parent company, answer **N** for "No" to the question in field A3.1, "Is the facility controlled by another company or companies?" Otherwise enter **Y** for "Yes" in field A3.1. This opens the "Identification of Parent Companies"

screen in which you can report the names, addresses and percent ownership of controlling parent companies. The Dun and Bradstreet (D-U-N-S) number identifies the parent company and its corporate relationship to the reporting facility. Complete this field as described in A1.5. The province, territory or U.S. state codes can be found in pick-lists available while the cursor is in these fields. Field P1.8 "Zip Code or Other" is provided for addresses in the U.S. or in other countries. The "Country" field (P1.10) must be completed only if the address is outside Canada or the U.S.

A4.0 Facility Public Contact

Enter the name, position title, e-mail address, telephone and facsimile numbers of the facility's public contact. The public contact does not have to be the same person who prepares the report or signs the Statement of Certification and does not necessarily need to be someone at the reporting facility. But this person should be able to answer questions from the public about the report. A position title alone, such as "Environmental Coordinator", can be used to identify the public contact. The facility public contact will be identified in the NPRI database available to the public. **If these fields are left blank, the technical contact (in field A6.0) will be listed as the public contact in the NPRI database.**

A5.0 Facility Public Contact Address

Complete this field if the mailing address for the public contact is different from the facility's site address (A2.0). The province, territory or U.S. state names can be found in pick-lists while the cursor is in these fields. Field A5.9 "Zip Code/Other" is provided for addresses in the U.S. or in other countries. The "Country" field (A5.10) must be completed only if the address is outside Canada or the U.S.

A6.0 Facility Technical Contact

Enter the name, position title, e-mail address, telephone and facsimile numbers of a technical representative who can be contacted by Environment Canada for clarification of the report. This person should be familiar with the details of the report and be able to answer questions about the information provided. **The technical contact will be listed as the public contact in the NPRI database if a public contact is not named in field A4.0.** Unless a company coordinator is identified in field A8.0, the technical contact will receive all information, mailings and inquiries from Environment Canada. **A consultant can be the technical contact as long as a company coordinator is identified in field A8.0.**

A7.0 Facility Technical Contact Address

If the mailing address for the technical contact is different from the facility's site address (A2.0), complete this field as described in A5.0.

A8.0 Company Coordinator

In addition to a facility technical contact, some companies may coordinate reports for several facilities through a central contact. If you answer "Yes" to the question "Would you like to have information sent to a central contact?", provide the name, position title, e-mail address, telephone and facsimile numbers for the company coordinator (fields A8.1 to A8.8). Correspondence from Environment Canada will be addressed to the company coordinator. If there is no coordinator, correspondence will be sent to the technical contact.

If a facility's public contact is not identified in A4.0, the technical contact will be listed as the public contact in the NPRI database.

A9.0 Company Coordinator Address

If the mailing address for the company coordinator is different from the facility's site address (A2.0), complete this field as described in A5.0.

A10.0 Industrial Classification Codes

Industrial classifications are a means of identifying different types of businesses and industries. The NPRI has adopted the North American Industry Classification System (NAICS Canada) as the standard for identifying industrial sectors to enable better comparisons of NPRI data with similar inventories in the U.S. and Mexico. This year, the NPRI will also continue to collect Canadian and American Standard Industrial Classification (SIC) data to retain continuity with historical data.

North American Industry Classification System (NAICS)

The NAICS was developed by Statistics Canada, the U.S. Office of Management and Budget and Mexico's Instituto Nacional de Estadistica Geografia e Informatica, to enable the respective national agencies to collect comparable statistical data (Statistics Canada, 1998). Between 1997 and 2000, Statistics Canada will replace the 1980 Standard Industrial Classification (SIC) codes with NAICS Canada. The NAICS will be implemented by the U.S. and Mexico in a comparable time frame. Statistics Canada has provided complete details of NAICS Canada on its Web site at <**www.statcan.ca/english/Subjects/Standard/index.htm**>.

You can order a copy of the NAICS Canada Manual (printed version, Catalogue No. 12-501-XPE; CD-ROM, Catalogue No. 12-501-XPB) on-line, toll free at 1-800-700-1033 (voice) or 1-800-889-9734 (fax), or through Statistics Canada Regional Reference Centres.

The NAICS Canada consists of 20 sectors, 99 subsectors, 321 industry groups, 734 industries and 921 national industries. Industries within these sectors are grouped according to their production processes rather than the goods or services produced. The numbering system that has been adopted is a six-digit code, of which the first five digits are used by the three countries to produce comparable data. The first two digits designate the sector, the third digit designates the subsector, the fourth digit designates the industry group and the fifth digit designates industries. For example, the first two digits "21" designate the utilities sector comprised of industries engaged in operating gas, electrical and water utilities. The four-digit NAICS code "2111" refers to the electric power generation, transmission and distribution industry group. Within this group, "21111" refers specifically to electric power generation while "21112" is electric power transmission, control and distribution. The sixth digit is used to designate national industries. At this level, the respective national agencies are free to define classifications relevant to their own economies. In this example, hydro-electric, fossil-fuel-electric and nuclear-electric power generation have the NAICS Canada codes "211111", "211112", and "211113", respectively.

Sector and subsector NAICS classifications and their corresponding two-, three- and four-digit codes are listed in Appendix 5. The electronic reporting form provides a pick-list of the NAICS codes. If you are unsure about the correct NAICS code for your facility, please contact your regional NPRI office.

Standard Industrial Classification (SIC) Codes

Standard Industrial Classification (SIC) codes are numerical identifiers for different types of businesses and industries (Statistics Canada, 1989). The first two digits of a four-digit SIC code define a major business sector, while the last two denote a facility's specialty within that sector. For example, the first two digits (37) of the Canadian SIC code "3751" represent the chemical industry in general, and the last two digits (51) represent the paints and varnishes industry. Code "3741" represents the same major

sector but denotes the pharmaceutical industry. Two-digit Canadian and American SIC codes are listed in Appendices 6 and 7, respectively. The electronic reporting form provides a pick-list of two-digit Canadian SIC codes. The software also provides concordance tables of four-digit Canadian SIC codes and their corresponding U.S. SIC codes. If you are unsure about the correct SIC code for your facility, please contact your regional NPRI office.

A10.1 Two-digit Canadian SIC Code

Enter the two-digit Canadian SIC code that best represents your facility as found in Appendix 6 or access the pick-list and choose the appropriate number. Your facility may be engaged in several different activities that are described by more than one SIC code. If so, use the SIC code that describes the activity having the greatest value.

A10.2 Four-digit Canadian SIC Code

Based on the two-digit code entered in field A10.1, the software will provide a pick-list of four-digit codes associated with your industrial sector. Select the most appropriate Canadian SIC code for your facility according to the description provided.

A10.3 Four-digit U.S. SIC Code

Based on the Canadian SIC code entered in field A10.2, the software will provide a pick-list of corresponding four-digit U.S. codes. As some Canadian classifications are broader than the U.S. codes, there may be more than one U.S. code for each Canadian code. **A common error is to select the first choice offered by the software.** Be certain to select the appropriate U.S. SIC code for your facility.

A10.4 Two-digit NAICS Code

Choose the two-digit code or range of codes which best describes the industrial sector in which your facility operates. A pick-list of two-digit codes is available or you may refer to the NAICS codes in Appendix 5. Note that some sectors, such as manufacturing (31-33), span several two-digit codes. Use the pick-list to select the correct range of two-digit NAICS codes.

A10.5 Four-digit NAICS Code

Based on the two-digit NAICS code entered in field A10.4, the software will provide a pick-list of four-digit NAICS codes for the corresponding subsectors. A list of four-digit NAICS codes is also given in Appendix 5.

A10.6 Six-digit NAICS Canada Code

Finally, based on the four-digit NAICS code entered in field A10.5, the software will provide a pick-list of six-digit NAICS Canada codes for the corresponding national industries.

A11.0 Full-time Employees

Enter the number of full-time (or equivalent) employees at your facility. One “full-time employee” (or equivalent) is defined as 2 000 worker-hours per year (including paid vacation, overtime and sick leave). The definition depends on the number of hours worked by all employees at the facility during the calendar year and not on the number of persons working.

To determine the number of full-time employees (or equivalent) working for your facility during the calendar year, total the hours worked by all employees, including the time worked by students, part-time and contract employees and sales and support staff at the facility, and divide the total by 2 000 hours. If the owner works at the facility, his/her time must also be included in the full-time employee calculation. Working hours spent by sales people must be included in the calculation if they have an office on site, even though they may spend part of their time away from the facility. Time spent by contract workers at the facility must also be included in the calculation.

A12.0 Other Environmental Regulations or Permits (optional)

This optional field identifies other government organizations, agencies or programs to which you report environmental data. These identifiers may be municipal, provincial, territorial or regional operating permit numbers, certificates of approval or numbers used to identify your facility for a survey on releases or transfers to the environment.

If you wish to provide the environmental identification numbers that exist for your facility, place a **Y** for "Yes" in the response box to question A12.1, "Do you report under other environmental regulations or permits?" The electronic form will present a pop-up screen after responding "Yes" to this question. Enter the identification number or permit number in the column entitled "ID Number" and the government and program requesting the data in the column entitled "Government Department, Agency or Program Name".

If you do not report under any other environmental regulations, enter **N** for "No". If you choose not to complete this field, select "Decline to answer". If you are using MS DOS software, enter an asterisk (*) in field A12.1.

Example 1
In **Ontario**, include the *Ontario Hazardous Waste Generator Registration Number* (OHWGRN). The OHWGRN is a nine-digit alphanumeric number (e.g., ON1234500) assigned to each facility under Ontario Regulation 347 (*Environmental Protection Act of Ontario*).

Example 2
Facilities located in **Alberta** handling hazardous waste have to register for, and may have more than one, provincial ID number(s), assigned by Alberta Environmental Protection. Facilities receiving, consigning or transporting hazardous wastes are assigned provincial ID numbers. The ID number is an eight-digit alphanumeric number (e.g., ABR09999).

A15.0 Comments

A15.1 Comments (Facility)

This field is for comments regarding the facility information provided in this section or on any issue pertaining to your NPRI report in general. For example:

- an explanation of why a substance is no longer reported to the NPRI
- details of a plant closure that resulted in reduced releases and transfers of all substances reported by the facility, or
- details of a one-time site remediation program which dramatically increased the off-site transfers of several substances.

These comments will appear in the NPRI database available to the public and are your opportunity to provide context for the information reported to the NPRI. Comments specific to a substance being reported should be provided in the "Substances" report.

A15.2 Comments (Pollution Prevention)

In addition to the pollution-prevention (P2) activities reported for a specific substance in B30.0, information on general P2 activities such as water- and energy-conservation initiatives can be provided in this comment field. Facilities are encouraged to provide additional information describing the P2 initiatives they have implemented and the results achieved (e.g., environmental results, economic benefits, etc.).

A16.0 Company Official Certifying this Submission

A "Statement of Certification" can be printed through the "Reports Menu". **If you are unable to print a Statement of Certification, contact your regional NPRI office immediately.** A brief summary of the NPRI report is printed as part of the Statement of Certification. It lists the reporting facilities, their substances and the total quantities of substances released on site and/or transferred off site for disposal or recycling.

The NPRI report submitted to Environment Canada must include a Statement of Certification signed by an official of the company.

The NPRI report submitted to Environment Canada must include a Statement of Certification signed by an official of the company. Normally, the company official is the person identified in field A16.0. This person must have delegated powers to accept legal responsibility for the information provided. Some facilities may choose a CEO, the environmental coordinator or the plant manager. The person who signs this statement acknowledges that:

- he/she has reviewed the documents
- he/she has exercised due diligence to ensure that the information is true and complete, and
- the amounts and values are accurate, based on reasonable estimates using available data.

The name of the company official will not appear in the public database.

A17.0 Company Official Address

If the mailing address for the company official contact is different from the facility's site address (A2.0), complete this field as described in A5.0.

This is the end of the first section of the reporting form. You have the options of saving the facility information, cancelling the changes or returning to the facility report.

Return to the "View/Enter/Edit Data" menu. From this menu you can:

- report on NPRI substances
- identify surface water bodies to which NPRI substances are discharged, or
- identify off-site facilities to which you transfer NPRI substances for disposal or recycling.

Surface Water Bodies

If you are reporting the release of an NPRI substance to surface waters (streams, rivers, lakes, bays, inlets, etc.), you must identify the receiving water body. To ensure that water bodies are consistently identified, a list of names was assembled from data in the NPRI and from the *Gazetteer of Canada*. The names in this initial list cannot be modified. However, if you cannot find the name of a water body, you can add a new geographic feature to the list. From the "Main Menu" of the NPRI reporting software, select "View/Enter/Edit Data" and choose "Surface Water Bodies". This opens the "Identification of Surface Water Bodies" table. The water body names in this table are used in a pick-list in field B12.3 when reporting releases to surface waters.

Do not add a new surface water body name unless it will be associated with at least one discharge to surface waters identified in field B12.3, otherwise the software will generate an "orphan water body" error. There are two ways to edit the "Identification of Surface Waters" table:

- select "Surface Water Bodies" in the "View/Enter/Edit Data" menu, or
- select the "Water Codes" column in field B12.3, then select "Add a new water body to the pick-list".

Off-site Facilities and MSTPs

The NPRI identifies three different types of off-site facilities:

- facilities to which the reported substance is sent for final disposal or treatment prior to final disposal
- municipal sewage treatment plants (MSTPs) to which your facility discharges an **effluent** containing the reported substance, and
- facilities to which **materials** containing the reported substance are sent for **recycling**.

Discharges to sanitary sewers are reported as off-site transfers for disposal to an MSTP, regardless of the type or level of treatment offered at the MSTP.

If your facility transfers an NPRI substance off site for disposal or recycling, you must identify the receiving facility. From the "Main Menu" of the NPRI reporting software, select "View/Enter/Edit Data" and choose "Off-site Facilities". Enter the name and address of the site(s) in the "Identification of Off-site Facilities and MSTPs" table. The off-site facilities in this table will be used in a pick-list in fields B22.1 and B25.1 to identify each site without having to re-enter the full name and location of the facility.

Do not identify an off-site facility unless it will be associated with at least one substance transfer, otherwise the software will generate an "orphan facility" error. There are two ways to edit the "Identification of Off-site Facilities and MSTPs" table:

- select "Off-site Facilities" in the "View/Enter/Edit Data" menu, or
- select the "Locations" column in field B22.1 or field B25.1 and then "Add an off-site facility to the pick-list".

Substance Information

The most important change for the 1999 reporting year has been the addition of 73 substances to the NPRI. These additions were made following public consultations and acceptance of certain recommendations of the multi-stakeholder Ad-hoc Working Group on Substances. Appendix 3 lists the new substances and provides some information on their commercial and industrial uses and which industrial sectors are likely to manufacture, process or otherwise use these substances. Appendices 1 and 2 list all of the NPRI substances in alphabetical order and in order of their Chemical Abstracts Service (CAS) registry numbers.

You must report on each NPRI substance that exceeds the 10-tonne reporting threshold, regardless of its concentration. Section 1 of this document contains instructions on how to determine which substances must be reported.

To add or modify a substance report, choose "Substances" from the "View/Enter/Edit Data" menu. A substance report consists of the following sections:

- Section B1 Substance Information
- Section B10 On-site Releases to the Environment
- Section B20 Off-site Transfers for Disposal or Recycling
- Section B30 Pollution-Prevention Activities
- Section B40 Production Ratio and Activity Index

B1.0 Substance Identity

Enter the name of the NPRI substance and its Chemical Abstracts Service (CAS) registry number. The reporting software provides pick-lists for the NPRI substances and their CAS numbers. Appendix 1 lists the NPRI substances alphabetically and Appendix 2 lists the NPRI substances by CAS number. Appendix 3 lists the substances that were added to the NPRI and provides information to assist facilities in recognizing if they potentially manufacture, process or otherwise use these substances.

Report only NPRI substances. For example, if you use silver nitrate, do not report silver nitrate with its corresponding CAS number because the NPRI does not list silver nitrate as an individual compound. Report this substance as "silver (and its compounds)". The reporting software will only accept the names and the CAS numbers of substances on the NPRI list.

The NPRI reporting form can be used to complete reports for the National Emissions Reduction Masterplan (NERM) of the Canadian Chemical Producers' Association and for the Accelerated Reduction/Elimination of Toxics (ARET) program of Environment Canada. From the "Main Menu", choose "Report Additional Substances" to enable reporting of substances on the NERM and ARET lists. The pick-lists in field B1.0 will include the NERM and ARET substances in addition to the NPRI substances. Indicators next to the CAS number will show if the substance is an NPRI, NERM or ARET substance.

B1.1 CAS Registry Number

Enter the CAS number of the NPRI substance you are reporting. A pick-list of NPRI substances, listed numerically by CAS number, is available. Once the CAS number is identified and selected in the pick-list, the program will automatically place the CAS number in field B1.1 **and** the substance name in field B1.2. Some NPRI substances, such as "ammonia (total)" or "(element) and its compounds", do not have unique CAS numbers and are identified by "NA" on the pick-list. Indicators next to the CAS number will show if the substance is an NPRI, NERM or ARET substance. The pick-list also indicates if the substance is an acid.

B1.2 Substance Name

If you do not know the CAS number of the substance you are reporting, you can choose from a pick-list of substance names. The CAS number will automatically be inserted into field B1.1. The program will enter "NA" in the CAS number field for groups of NPRI substances which do not have unique CAS numbers, such as "zinc (and its compounds)".

B2.0 Nature of Activities

Indicate whether the NPRI substance is manufactured, processed or otherwise used, and the nature of such activities and uses at the facility during the calendar year. For each substance, you may identify more than one activity and type of activity.

B2.1 Manufacture the Substance

The term "manufacture" means to *produce, prepare or compound* an NPRI substance. This also includes the incidental production of an NPRI substance as a by-product as the result of the manufacture, processing, other use or treatment of other substances, products or materials. For example, certain NPRI substances may be manufactured as a result of wastewater treatment or other treatment processes.

Example of Manufacturing Activity

Your facility purchases chlorine and reacts it with sodium chlorite to form chlorine dioxide. Therefore, your company *processes* chlorine and *manufactures* chlorine dioxide. Both are NPRI substances. You are required to report both substances if you meet the reporting criteria. Refer to "Calculating the Reporting Thresholds" in Section 1.

Example of Incidental Manufacturing of By-products

Your facility manufactures aluminum. During the smelting process, hydrogen fluoride (HF) is released. The concentration of HF is 2 ppm but the quantity exceeds 10 tonnes per year. You are required to report your releases of HF because it is *produced as a by-product* and not subject to the 1% concentration criterion. You are not required to report solid aluminum because it is not an NPRI substance. You may have to report "aluminum (fume or dust)", as well as other NPRI substances, if all other reporting criteria are met. Refer to "Calculating the Reporting Threshold" in Section 1.

If you manufacture the substance being reported, select at least one of the categories that follow:

B2.1.a **For on-site use/processing** – The substance is manufactured and then further processed or used at the same facility.

B2.1.b **For sale/distribution** – The substance is manufactured specifically for sale or distribution outside the facility. For example, a mine mill processes metal ore on site to manufacture ore concentrates, and then sells the metal concentrate(s) outside the facility.

B2.1.c **As a by-product** – The substance is produced incidentally and is released to the environment or transferred off site for disposal. See Section 1 for a complete discussion of NPRI by-products.

B2.1.d **As an impurity** – The substance is produced incidentally and remains in the product destined to be distributed in commerce.

B2.2 Process the Substance

The term "process" means the *preparation* of a listed substance, after its manufacture, for distribution in commerce, or the *use* of a listed substance as part of a chemical or physical process. Processing includes the preparation of a substance **with or without change** in physical or chemical form. The term also applies to the processing of materials, mixtures or formulations that contain a listed substance as one component. During processing, the substance is generally not separated from the product.

If your facility processes the substance, select at least one of the following:

B2.2.a **As a reactant** – An NPRI substance used in chemical reactions for the manufacture or processing of another substance or product. This includes, but is not limited to, feedstock, raw materials, intermediates, catalysts and nutrients added to wastewater treatment systems.

B2.2.b **As a formulation component** – A substance that is added to a product (or product mixture) before further distribution of the product. Examples of substances used in this capacity include, but are not limited to, additives, dyes, reaction diluents, initiators, solvents, inhibitors, emulsifiers, surfactants, lubricants, flame retardants and rheological modifiers.

B2.2.c **As an article component** – A substance that becomes an integral component of an article distributed for industrial, trade or consumer use. An example is ethylene glycol added to vehicle radiators during assembly.

B2.2.d **Repackaging only** – Processing or preparation of a substance (or product mixture) for distribution in commerce. This also includes transferring NPRI substances to or from bulk containers.

B2.2.e **As a by-product** – The NPRI substance is incidentally processed and is released to the environment or is transferred off site for disposal. See Section 1 for a complete discussion of NPRI by-products.

B2.3 Otherwise Use the Substance

"Otherwise use" encompasses any use of an NPRI substance that is relevant to the purposes of the facility that does not fall under the definitions of "manufacture" or "process". As an example, your facility cleans equipment with a listed solvent; it *otherwise uses* the substance (ancillary or other use). Note that such an activity is not considered "routine janitorial" or "facility grounds" maintenance.

If your facility otherwise uses the substance, select at least one of the following:

B2.3.a **As a physical or chemical processing aid** – A substance that is added to a reaction mixture to aid in the manufacture or synthesis of another substance but is not intended to remain in or become part of the product or product mixture. Examples of such substances include, but are not limited to, process solvents, catalysts, inhibitors, initiators, reaction terminators and buffers.

B2.3.b **As a manufacturing aid** – A substance that aids the manufacturing process but does not become part of the resulting product and is not added to the reaction mixture during the manufacture or synthesis of another substance. Examples include process lubricants, metal-working fluids, coolants, refrigerants and hydraulic fluids.

B2.3.c **Ancillary or other use** – A substance in this category that is used at a facility for purposes other than as a chemical processing aid or manufacturing aid. This includes, but is not limited to, equipment cleaners, degreasers, fuels, flocculants and substances used for treating wastes.

B2.3.d **As a by-product** – The NPRI substance is incidentally present in a material that is otherwise used at the facility and is released to the environment or is transferred off site for disposal. See Section 1 for a complete discussion of NPRI by-products.

On-site Releases to the Environment

If the reporting criteria are met for an NPRI substance, then **all** releases of that substance must be reported **regardless of the concentration or amount**.

All values entered in the electronic reporting form are in metric tonnes (1 000 kg).

All values entered in the electronic reporting form are in metric tonnes (1 000 kg).

B10.0 Do You Release This Substance On Site?

To report the on-site releases of an NPRI substance, enter **Y** for "Yes" in field B10.1. If you enter **N** for "No", the program brings you automatically to field B14.0 "Reasons for Changes in Quantities Released from Previous Year".

B11.0 Releases of Less than One Tonne

If the total of all your releases for a substance to all media is less than one tonne, you have the option of reporting releases by environmental medium (B12.1 to B12.4 for releases to air, water, land and underground injection) or reporting only the total release to all media (B12.5). To report total releases to all media of less than one tonne of a substance, enter **Y** for "Yes" in field B11.1. The program will proceed directly to field B12.5 "Total Releases". Otherwise, enter **N** in the response box and enter specific releases to each environmental medium.

B12.0 On-site Releases of the Substance to the Environment

If your releases are greater than one tonne, you must account for total releases of the substance from your facility to each environmental medium (air, water, land and underground injection). **Report the "net" release of the substance, not the total release of a mixture containing the substance.** Some NPRI substances are listed as "(element) and its compounds". For these substances, report only the total amount of the element in the compounds released rather than the total amount of the compounds that contain the element. Total releases (B12.5) from your facility do not include transfers of the substance to off-site locations for disposal or recycling.

"Basis of Estimate" Codes

For each release by medium, enter a "Basis of Estimate" code. There are four methods for estimating releases. Reference documents that may assist you with your estimates are listed in the Bibliography and examples of each estimation method are given in Appendix 8. The following are the "Basis of Estimate" codes, listed in declining order of expected accuracy:

- monitoring or direct measurement (Code M)
- mass balance (Code C)
- emission factors (Code E), and
- engineering estimates (Code O).

Selecting "NA" (Not applicable) for the "Basis of Estimate" field indicates that there are no releases from your facility to this medium. Enter the letter code identifying the method that applies to the largest portion of the estimated releases. A pick-list is available for choosing the "Basis of Estimate" codes.

Quantity Codes

There are two ways to report on-site releases of less than one tonne – a quantity code, or a measured or calculated number. For releases greater than one tonne, quantity codes are not available. **The "Quantity Codes" (A, B, C, D, E) represent a range of**

Discharges to an MSTP are considered off-site transfers for disposal and not direct discharges to surface waters.

values used for reporting releases of less than one tonne (see below). When a code is used, the electronic form will automatically enter the midpoint of the chosen range into the "Releases" column. For example, entering code "B" in the "Quantity Code" column will place the quantity "0.3 tonnes" in the "Releases" column. If quantity codes are used, it is possible that total releases by medium could total more than one tonne. This is acceptable and should not be corrected to total one tonne. For all other cases, the "Quantity Code" should be "NA" (Not applicable), which is the default value of this field.

CODE	RANGE	MIDPOINT
A	> 0 to < 0.2 tonnes	0.1 tonnes
B	0.2 to < 0.4 tonnes	0.3 tonnes
C	0.4 to < 0.6 tonnes	0.5 tonnes
D	0.6 to < 0.8 tonnes	0.7 tonnes
E	0.8 to < 1.0 tonnes	0.9 tonnes
NA	Not applicable	—

Using the pick-list, you can select one of the above codes to automatically enter this code in the "Quantity Code" column.

B12.1 Air Releases

Report all air emissions of the NPRI substance and the basis of the estimate. Quantity codes may be used to estimate releases of less than one tonne. "Basis of Estimate" and "Quantity Codes" are described in B12.0. Both routine releases, such as fugitive releases to air, and accidental or non-routine releases, such as a relief valve opening due to process upset, should be included in your estimate of the quantity released.

B12.1.a Stack or point releases – Total releases from stack or point sources including stacks, vents, ducts, pipes or other confined process streams. Releases to air from pollution-control equipment generally fall into this category.

B12.1.b Storage or handling releases – The quantity of releases to air from storage or handling of a listed substance should be entered in this field.

B12.1.c Fugitive releases – Fugitive releases are the total of all releases to air that are **not released through confined process streams**. These releases include:

- fugitive equipment leaks from valves, pump seals, flanges, compressors, sampling connections, open-ended lines, etc.
- evaporative losses from surface impoundments and spills
- releases from building ventilation systems, and
- any other fugitive or non-point air emissions from land treatment, mine tailings, storage piles, etc.

B12.1.d Spills – Any accidental releases to air that do not qualify as point or non-point air releases should be entered in this field.

B12.1.e Other non-point releases – Any other non-point air releases not estimated in one of the above air-related release types should be entered in this field.

B12.2 Underground Injection

Report the quantity of the NPRI substance injected **on site** and the basis of the estimate. Quantity codes may be used to estimate releases of less than one tonne. "Basis of Estimate" and "Quantity Codes" are described above in B12.0.

B12.3 Releases to Surface Waters

Report all releases of the NPRI substance to surface waters and the basis of the estimate. Quantity codes may be used to estimate releases of less than one tonne. "Basis of Estimate" and "Quantity Codes" are described above in B12.0.

B12.3.a Direct discharges – Direct discharges **do not include discharges to a municipal sewage treatment plant (MSTP) or other off-site wastewater treatment facilities**. These discharges are considered off-site transfers for disposal which are reported in field B22.1.f.

B12.3.b Spills – Spills into surface waters include any accidental releases which may have occurred at your facility.

B12.3.c Leaks – A leak to surface waters differs from a spill in terms of the time required for an event. Spills normally occur over a period of hours or days, whereas a leak is a chronic event which occurs over periods of days or months.

For each surface water discharge, you must identify the receiving water bodies. Select the "Water Codes" column. This opens the "Surface Water Body Entry Codes" table where you identify the surface water bodies that receive the discharge, as well as the quantity discharged to each surface water body. The software provides a pick-list of standard water body names that is drawn from the NPRI database and the *Gazetteer of Canada*. The pick-list is sorted by province.

You may add the names of new surface water bodies to the pick-list if it is incomplete. There are two ways to edit the pick-list of surface water body names:

- select "Surface Water Bodies" in the "View/Enter/Edit Data" menu, or
- select the "Water Codes" column in field B12.3, then select "Add a new water body to the pick-list".

If your total discharge to all media is less than one tonne, you are not required to report your releases by environmental media and may report only a total discharge. Do not include water bodies that receive the general plant waste stream if this waste stream does not contain an NPRI substance or if reportable acids in the waste stream have been neutralized to a pH of 6.0 or greater prior to release.

B12.4 Releases to Land

Report all releases of the NPRI substance to land within the boundaries of your facility and the basis of the estimate. Quantity codes may be used to estimate releases of less than one tonne. "Basis of Estimate" and "Quantity Codes" are described above in B12.0. Do not report land disposal at an off-site location in this field. Transfers of the substance for disposal are reported in B20.0.

B12.4.a Landfill – For the purposes of the NPRI, **on-site** landfilling is classified as a release. If the substance is transferred off site for disposal, enter the quantity in field B22.1.e "Containment/Landfill".

B12.4.b Land treatment – Land treatment is a disposal method in which a waste containing a listed substance is applied onto or incorporated into soil. If the substance is transferred off site for disposal, enter the quantity in field B22.1.h "Land Treatment".

B12.4.c Spills – Releases classified as spills include any accidental release of a listed substance to land at your facility.

B12.4.d Leaks – Leaks differ from spills in that they are chronic events that occur over a comparatively long time. This includes leaking underground storage tanks.

B12.4.e Other – Releases to land could occur in forms other than those already specified above, for example, encapsulation prior to on-site landfill.

B12.5 Total Quantity Released (tonnes)

The electronic form will calculate the sum of the on-site releases reported in fields B12.1 through B12.4 and place this total into field B12.5. If you chose to report only a total release of less than one tonne to all media (B11.1), enter the quantity and the basis of the estimate. Quantity codes may be used to estimate releases of less than one tonne. "Basis of Estimate" and "Quantity Codes" are described in B12.0.

B13.0 Yearly Breakdown of Releases by Percentage in Each Quarter

This field is intended for facilities that have seasonal fluctuations in their releases. Releases for the four quarters must total 100%.

B14.0 Reasons for Changes in Quantities Released from Previous Year

Select one or more reasons why the on-site releases of the NPRI substance changed since 1998. This section must be completed, even if there are no on-site releases. You may use the "Comments" field to elaborate on your reasons. If this is your first reporting year, select B14.1.i "Not applicable". Some of the reasons for change may also be considered as pollution-prevention activities. If you have selected B14.1.c "Pollution-prevention activities", you must also complete Section B30.0 – "Pollution-Prevention Activities".

B14.1.a Changes in production levels – A change in on-site releases may be the result of changes in production levels or some other activity at the facility. Changes in production levels can be caused by increased sales, a change in the economy affecting the facility, a strike or other plant closure, expansion or conversion of the facility, etc. Other examples are given in Section B40.0 – "Production Ratio and Activity Index", where you have the opportunity to provide a quantitative measure of the year-to-year fluctuations in production levels and on-site releases.

B14.1.b Changes in estimation methods – Choose this item if there was a change in the method of estimating the quantity of the NPRI substance transferred off site. For example, engineering estimates may have been replaced by direct measurement. Or, the engineering calculations were updated or corrected.

B14.1.c Pollution-prevention activities – If chosen, you must describe the pollution-prevention activities in Section B30.0. Refer to that section for examples of pollution-prevention activities. Pollution prevention does not include on-site treatment (pollution control) or off-site recycling or disposal.

B14.1.d Changes in on-site treatment – Examples include modification or addition of new pollution-control devices, redirection or elimination of waste streams, expanded on-site recycling and other changes in on-site waste treatment.

B14.1.e Changes in off-site transfers for disposal – If chosen, you must report the off-site transfers for disposal in fields B20.0, B21.0, B22.0, B23.0 and B24.0.

B14.1.f Changes in off-site transfers for recycling – If chosen, you must report the off-site transfers for recycling in fields B20.0, B21.0, B25.0, B26.0 and B27.0.

B14.1.g Other – Some examples include accidents, spills or breakdowns. Provide details in field B14.2 "Comments".

B14.1.h No significant change or no change – Choose this item if there has been no change or if the change was less than 10% from the previous year.

B14.1.i Not applicable – Choose this item if this is the first year you are reporting this substance.

B14.2 Comments (Releases)

Comments specific to the releases of this substance may be provided in this field. For example, the details of a spill which dramatically affected the release of this substance. The comments will appear in the NPRI database available to the public and are an opportunity to provide context for the information reported to the NPRI.

B15.0 Anticipated Releases

Enter your estimates of total releases to all environmental media, in tonnes, for the years 2000, 2001 and 2002. Estimates for the years 2003 and 2004 are optional (select "Not applicable"). Factors that should be considered when making these estimates include future production levels, product or process changes, pollution-prevention measures, addition of pollution-control equipment, etc.

Off-site Transfers for Disposal or Recycling

Disposal and recycling activities are considered together under the common heading of off-site transfers. The reporting categories are based on the International Waste Identification Code (IWIC) (Environment Canada, 1993) developed by the Organization for Economic Cooperation and Development (OECD). Reporting is limited to those categories which are most applicable to NPRI reporters. People who report under the *Export and Import of Hazardous Wastes Regulations (EIHWR) (Canada Gazette*, 1992) will immediately recognize the format. Even if you do not handle hazardous wastes, the reporting format will enable you to describe your transfers more accurately.

"Disposal" is final disposal of the material (e.g., landfill) or storage and treatment (e.g., stabilization) prior to final disposal. "Recycling" refers to activities that keep a material or a component of the material from becoming a waste destined for final disposal. Recyclable materials may be reprocessed to their original specifications and reused for their original purpose or used for an entirely different purpose. Components may be recovered from the recyclable material or the material may be used as a fuel for energy recovery. The recyclable material may be used in the manufacture of another product. For the purposes of the NPRI, recycling also includes substances sent back to the manufacturer or supplier for reprocessing, repackaging, resale or for credit or payment.

B20.0 Transfers of the Substance to Off-site Locations

Indicate if you transfer the NPRI substance to off-site locations for disposal or recycling by entering either **Y** or **N** in fields B20.1 and B20.2, respectively. Depending on your reply, the software will automatically skip certain sections of the report. However, even if you do not transfer NPRI substances off site, you must still provide reasons for changes in quantities disposed/recycled and anticipated transfers for disposal/recycling (B23.0, B24.0, B26.0 and B27.0). You will also be able to provide comments on your transfers for disposal and your recycling activities in fields B23.2 and B26.2.

B21.0 Reasons why Substances were Transferred Off Site for Disposal or Recycling

Select one or more reasons why the NPRI substance or why a material containing the NPRI substance was transferred off site for disposal or recycling. **This category does not include on-site disposal or recycling.** For convenience, the equivalent IWIC Q-codes are listed in brackets after each item. Choose one or more of the following reasons:

B21.1.a Production residues – These are, for example, residues of industrial processes such as slags and still bottoms, residues from raw material processing such as mining residues and oil field slop. [Corresponds to codes Q1, Q8 and Q11 in the IWIC]

B21.1.b Off-specification products – These are products that are not suitable for commercial distribution or that cannot be used by the facility and are destined for final disposal or reuse or recycling by another facility. [Corresponds to code Q2 in the IWIC]

B21.1.c Expiration date passed – Products for which the date for appropriate use has expired and that are transferred off site for final disposal or reuse or recycling by another facility. [Corresponds to code Q3 in the IWIC]

B21.1.d Contaminated materials – For example, materials spilled or having undergone other mishap, including any materials contaminated as a result of the mishap; materials contaminated or soiled as a result of planned actions such as residues from cleaning operations, packing materials, containers, etc.; contaminated substances that no longer perform satisfactorily such as contaminated acids, solvents, exhausted tempering salts, etc.; adulterated materials. [Corresponds to codes Q4, Q5, Q7 and Q12 in the IWIC]

B21.1.e Unusable parts or discards – Describes items such as reject batteries, exhausted catalysts, etc. [Corresponds to code Q6 in the IWIC]

B21.1.f Pollution abatement residues – Materials such as scrubber sludges, baghouse dusts, spent filters, etc., generated by pollution controls and on-site waste treatment. [Corresponds to code Q9 in the IWIC]

B21.1.g Machining or finishing residues – This includes lathe turnings, grinding dusts, sheet metal cuttings, mill scales, etc. [Corresponds to code Q10 in the IWIC]

B21.1.h Site remediation residues – Materials, substances or products resulting from remedial actions with respect to contaminated land. [Corresponds to code Q15 in the IWIC]

B21.1.i Other – Any materials, substances or products that are not described above.

B22.0 Off-site Transfers for Disposal

In this field, report the quantity of the NPRI substance transferred to off-site locations for final disposal or storage and treatment prior to final disposal. If the reporting criteria are met for a listed substance, **all** off-site transfers of that substance for disposal must be reported **regardless of the concentration or amount**. Report the weight, **in metric tonnes**, of the NPRI substance that is sent to an off-site treatment facility and not the total weight of the mixture containing that substance. Report transfers to the first off-site location only. You are not required to report any subsequent transfers by the waste disposal company. However, you must report the disposal method used. Disposal includes storage and treatment (e.g., stabilization) prior to final disposal. Do not report materials containing the NPRI substance which are recycled off site; they are reported in field B25.0.

Do not report off-site transfers of mineral acids if the acid has been neutralized to a pH of 6.0 or greater before its transfer off site for final disposal.

Do not report off-site transfers of mineral acids if the acid has been neutralized to a pH of 6.0 or greater *prior to* its transfer off site for final disposal. In the case of nitric acid, the quantity of neutralized nitric acid would be reported as “nitrate ion in solution at a pH of 6.0 or greater”.

“Basis of Estimate” Codes

For each disposal activity chosen, enter a “Basis of Estimate” code. There are four methods for estimating transfers, listed here in declining order of expected accuracy:

- monitoring or direct measurement (Code M)
- mass balance (Code C)
- emission factors (Code E), and
- engineering estimates (Code O).

Selecting “NA” (Not applicable) for the “Basis of Estimate” field indicates that there are no transfers from your facility for this disposal activity. Enter the letter code identifying the method that applies to the largest portion of the estimated transfers. A pick-list is available in each field for choosing the “Basis of Estimate” codes.

B22.1 Disposal Method

Eight major off-site disposal methods are identified. Report the exact amounts of the NPRI substance transferred for that disposal method and the basis of that estimate. Facilities can obtain information about the ultimate treatment/disposal of their transfers by looking at their invoices, waybills, waste manifests or by contacting the transfer facility.

B22.1.a Physical treatment – e.g., drying, evaporation, encapsulation or vitrification.

B22.1.b Chemical treatment – e.g., precipitation, stabilization or neutralization.

B22.1.c Biological treatment – e.g., bio-oxidation or composting.

B22.1.d Incineration/thermal – This differs from energy recovery. Incineration occurs when the substance or the material containing the substance does not have sufficient fuel value to contribute toward energy recovery.

B22.1.e Containment – Two forms of containment are identified:

i) landfill

ii) other storage

B22.1.f Municipal Sewage Treatment Plant (MSTP) – Report discharges of the NPRI substance to a municipal sewer system, regardless of the level of treatment provided by the MSTP.

B22.1.g Underground injection – Report quantity injected underground at an off-site location.

B22.1.h Land treatment – Report the quantity transferred off site for the purpose of land application or land farming.

You must identify the off-site facilities which receive the NPRI substance for disposal. If the transfer is split among several off-site facilities, specify the quantity of the NPRI substance that is transferred to each facility. Select the “Locations” column to open the “Off-site Facilities and MSTP Entry Codes” table. The software provides a pick-list of previously identified off-site facilities. The pick-list can be edited if it is incomplete or inaccurate. The pick-list of off-site facilities and MSTPs is based on the information provided in the table “Identification of Off-site Facilities and MSTPs”. There are two ways to edit the table:

- select “Off-site Facilities” in the “View/Enter/Edit Data” menu, or
- select the “Locations” column in field B22.1 and then “Add an off-site facility to the pick-list”.

B22.2 Total Quantity Disposed (tonnes)

The reporting software calculates the sum of the entries made in field B22.1 and places the result into this field.

B23.0 Reasons for Changes in Quantities Disposed from Previous Year

Select one or more reasons why off-site transfers for disposal of the NPRI substance have changed since 1998. This section must be completed, even if there are no off-site transfers. You may use the “Comments” field to elaborate on your reasons. If this is your first reporting year, select B23.1.i for “Not applicable”. Some of the reasons for change may also be considered as pollution-prevention activities. If you have selected B23.2.c “Pollution-prevention activities”, you must also complete Section B30.0 – “Pollution-Prevention Activities”. The reasons for changes include:

B23.1.a Changes in production levels – A change in off-site transfers for disposal may be the result of changes in production levels or some other activity at the facility. Changes in production levels can be caused by increased sales, a change in the economy affecting the facility, a strike or other plant closure, expansion or conversion of the facility. Other examples are given in Section B40.0 – "Production Ratio and Activity Index," where you have the opportunity to provide a quantitative measure of the year-to-year fluctuations in production levels and on-site releases.

B23.1.b Changes in estimation methods – Choose this item if there was a change in the method of estimating the quantity of the NPRI substance transferred off site. For example, engineering estimates may have been replaced by direct measurement or the engineering calculations may have been updated or corrected.

B23.1.c Pollution-prevention activities – If chosen, you must describe the pollution-prevention activities in Section B30.0. Refer to that section for examples of pollution-prevention activities. Pollution prevention does not include on-site treatment (pollution control) or off-site recycling or disposal.

B23.1.d Changes in on-site treatment – Examples include modification or addition of new pollution-control devices, redirection or elimination of waste streams, expanded on-site recycling and other changes in on-site waste treatment.

B23.1.f Changes in off-site transfers for recycling – If chosen, you must report the off-site transfers for recycling in fields B20.0, B21.0, B25.0, B26.0 and B27.0.

B23.1.g Other – Some examples include site remediation, accidents, spills or breakdowns which affect the quantity of the NPRI substance transferred off site for disposal. Provide details in field B23.2 "Comments".

B23.1.h No significant change or no change – Choose this item if there has been no change or if the change was less than 10% from the previous year.

B23.1.i Not applicable – Choose this item if this is the first year reporting this substance.

Report only the net weight of the NPRI substance transferred off site for recycling, and not the total amount of the mixture containing the substance.

B23.2 Comments (Disposal)

Comments specific to the off-site disposal of this substance may be provided in this section. For example, the details of a one-time site remediation which dramatically affected the off-site transfers of this substance. The comments will appear in the NPRI database available to the public and are an opportunity to provide context for the information reported to the NPRI.

B24.0 Anticipated Disposals

Enter your estimate of total transfers of the listed substance for disposal to off-site facilities, in tonnes, for the years 2000, 2001 and 2002. Years 2003 and 2004 are optional fields (select "Not applicable"). Factors that should be considered when making these estimates include future production levels, product or process changes, pollution-prevention measures, addition of pollution-control equipment, site remediations, etc. This section must be completed, even if there are no off-site transfers.

B25.0 Off-site Transfers for Recycling

"Recycling" refers to activities that keep a material or a component of the material from becoming a waste destined for disposal. Recyclable materials may be cleaned, regenerated or reprocessed to their original specifications and reused for their original purpose. They may also be used for an entirely different purpose without any

pretreatment or modification. Components may be recovered or reclaimed from the recyclable material or the material may be used as a fuel for energy recovery. The recyclable material may be used in the manufacture of another product. For the purposes of the NPRI, recycling also includes substances sent back to the manufacturer or supplier for reprocessing, repackaging, resale or for credit or payment. Report only the net weight of the NPRI substance transferred off site for recycling, and **not the total amount of the mixture containing the substance**. For example, your facility submits an NPRI report for zinc. It sends zinc-coated steel for recycling to an off-site recycler. In this case, you must report the net weight of the zinc and not the total weight of the zinc-coated steel.

Ten types of recycling operations are listed, based on those set out in Part II of Schedule III of the *Export and Import of Hazardous Wastes Regulations* and are used as part of the IWIC code to classify hazardous recyclables. Choose the recycling operation which best describes how the NPRI substance or material containing the NPRI substance was recycled. The NPRI substance is considered to be recycled even when only a portion of the material in which it is contained is recycled. This recognizes the fact that recycling may only recover certain valuable components. For example, only the valuable metals may be recovered from a wastewater treatment sludge from an electroplating operation.

"Basis of Estimate" Codes

For each recycling activity chosen, enter a "Basis of Estimate" code. There are four methods for estimating transfers, listed here in declining order of expected accuracy:

- monitoring or direct measurement (Code M)
- mass balance (Code C)
- emission factors (Code E), and
- engineering estimates (Code O).

Selecting "NA" (Not applicable) for the "Basis of Estimate" field indicates that there are no transfers from your facility for this recycling activity. Enter the letter code identifying the method that applies to the largest portion of the estimated transfers. A pick-list is available in each field for choosing the "Basis of Estimate" codes.

B25.1 Recycling Activity

Ten major off-site recycling activities are identified. Report the net amounts of the NPRI substance transferred for that recycling activity and the basis of that estimate.

B25.1.a Energy recovery – The NPRI substance or the material containing it has sufficient energy content (BTU value) to allow its use as a fuel for energy recovery. If there has been no attempt to recover energy from the material, report it as an off-site transfer for incineration. [Corresponds to code R1 in the IWIC]

B25.1.b Recovery of solvents – The recovery or regeneration of NPRI substances or materials containing NPRI substances that have been used as solvents. For example, distillation of methanol after solvent extraction to recover pure solvent methanol. [Corresponds to code R2 in the IWIC]

B25.1.c Recovery of organic substances (not solvents) – Recovery of other organic substances that are not used as solvents. [Corresponds to code R3 in the IWIC]

B25.1.d Recovery of metals and metal compounds – Choose this recycling activity when a pure metal or a metal compound is being recovered. The NPRI list of substances includes 17 metals: aluminum, antimony, cadmium, chromium, cobalt, copper, lead, manganese, mercury, molybdenum, nickel, selenium, silver, thorium, titanium, vanadium and zinc. Some are listed as "(elements) and their compounds" while others are listed as specific inorganic or qualified inorganic compounds. [Corresponds to code R4 in the IWIC]

B25.1.e Recovery of inorganic materials (not metals) – The NPRI list of substances contains the inorganic substances: ammonia, arsenic, asbestos, boron trifluoride, bromine, carbon disulphide, chlorine, chlorine dioxide, fluorine, hydrazine, hydrogen sulphide, ionic cyanides, nitrate ion, phosphorus and sulphur hexafluoride. [Corresponds to code R5 in the IWIC]

B25.1.f Recovery of acids or bases – The following mineral acids are on the NPRI list: hydrochloric acid, nitric acid, phosphoric acid and sulphuric acid. This recycling activity also applies to the recovery of acids or bases that contain other NPRI substances as contaminants. [Corresponds to code R6 in the IWIC]

B25.1.g Recovery of catalysts – Choose this item if a catalyst containing an NPRI substance is transferred off site to be recovered, reactivated, regenerated or otherwise refurbished for reuse as a catalyst. Recovery of catalysts does not include the destruction of the catalyst to recover separate components. Choose B25.1.d if the catalyst is transferred off site for recovery of the metals in the catalyst. [Corresponds to code R8 in the IWIC]

B25.1.h Recovery of pollution abatement residues – This includes the recycling of residues from pollution controls or site-remediation activities. [Corresponds to code R7 in the IWIC]

B25.1.i Refining or reuse of used oil – Lubricating oils are not on the NPRI list of substances. However, used oils are sometimes contaminated with NPRI substances, such as zinc additives. Choose this recycling activity if used oils containing NPRI substances are transferred off site for refining or reuse. If used oil is used as a fuel, choose B25.1.a. [Corresponds to code R9 in the IWIC]

B25.1.j Other – Other recovery, reuse and recycling activities not described above.

You must identify the off-site facilities which receive the NPRI substance for recycling. If the transfer is split among several off-site facilities, specify the quantity of the NPRI substance that is transferred to each facility. Select the "Locations" column to open the "Off-site Facilities and MSTP Entry Codes" table. The software provides a pick-list of previously identified off-site facilities. The pick-list can be edited if it is incomplete or inaccurate. The pick-list of off-site facilities is based on the information provided in the table "Identification of Off-site Facilities and MSTPs". There are two ways to edit the table:

- select "Off-site Facilities" in the "View/Enter/Edit Data" menu, or
- select the "Locations" column in field B25.1 and then "Add an off-site facility to the pick-list".

B25.2 Total Quantity Recycled (tonnes)

The reporting software calculates the sum of the entries made in field B25.1 and places the result into this field.

B26.0 Reasons for Changes in Quantities Recycled from Previous Year

Indicate the changes, since 1998, in off-site transfers for recycling. This section must be completed, even if there are no off-site transfers. If this is your first reporting year, select B26.1.i for "Not applicable". Otherwise, select at least one of the following reasons for changes in quantities transferred. If you have selected B26.1.c "Pollution-prevention activities", you must complete Section B30.0 – "Pollution-Prevention Activities". The reasons for changes include:

B26.1.a Changes in production levels – See field B23.1.a.

B26.1.b Changes in estimation methods – See field B23.1.b.

B26.1.c Pollution-prevention activities – See field B23.1.c.

B26.1.d Changes in on-site treatment – See field B23.1.d.

B26.1.e Changes in off-site transfers for disposal – If chosen, you must report the off-site transfers for disposal in fields B20.0, B21.0, B22.0, B23.0 and B24.0.

B26.1.g Other – See field B23.1.g.

B26.1.h No significant change – No change or a change of less than 10% from the previous year.

B26.1.i Not applicable – First year reporting this substance.

B26.2 Comments (Recycling)

Comments specific to the recycling of this substance may be provided in this section. The comments will appear in the NPRI database available to the public and are an opportunity to provide context for the information reported to the NPRI.

B27.0 Anticipated Recycling

Enter your estimate of total transfers of the listed substance for recycling, in tonnes, for the years 2000, 2001 and 2002. Years 2003 and 2004 are optional fields (select "Not applicable"). This section must be completed, even if there are no off-site transfers.

Pollution-Prevention Activities

In this section, facilities that have taken measures to prevent the generation of NPRI pollutants and wastes are required to indicate what pollution-prevention activities they have implemented.

Pollution prevention is defined as "the use of processes, practices, materials, products or energy that avoid or minimize the creation of pollutants and waste, and reduce the overall risk to human health or the environment" (Environment Canada, 1995). Pollution prevention seeks to eliminate the causes of pollution rather than managing it after it has been created. It encourages the kinds of changes that are likely to lead to lower production costs, increased efficiencies and more effective protection of the environment. **Pollution prevention does not include on-site treatment (pollution control) activities or off-site recycling and disposal activities.**

Report measures that have been taken to prevent the generation of NPRI pollutants and wastes. Measures applied after pollutants or wastes are generated are not pollution-prevention activities.

What Is Not a Pollution-Prevention Activity?

Measures applied only after pollutants or wastes are generated are not considered pollution-prevention activities. Rather, they are waste-management measures. Some examples follow:

- **Off-site recycling** – Off-site recycling (e.g., solvent recovery at a central distillation facility) is an excellent waste management option that is vastly preferable to other forms of waste handling because it helps to preserve raw materials and reduces the amount of material that will require disposal. However, it does create pollution during transport and during the recycling procedure. Compared with closed-loop recycling (or reuse), performed at the production site, there is likely to be more residual waste that will require disposal.
- **Waste treatment** – Waste treatment involves changing the form or composition of a waste stream through controlled reactions to reduce or eliminate the amount of pollutant. Waste treatment prior to disposal reduces the toxicity and/or disposal-site space requirements but does not prevent the creation of pollutants or eliminate all pollutant materials. Examples include volume reduction (e.g., dewatering), dilution, detoxification, incineration, decomposition, stabilization, and solidification or encapsulation.
- **Transferring hazardous or toxic constituents from one environmental medium to another** – Many waste management, treatment and control practices used to date have simply collected pollutants and moved them from one environmental medium (air, water or land) to another. For example, bag houses are often used to collect particulates from waste streams. The collected particulate is often sent to landfill. This pollution control measure reduces the potential for exposure and therefore the risk posed by the waste compared to a release to air, but it does not eliminate risk or reduce the amount of waste generated. Sending this material off site for recycling is preferable to landfill, but it too has risks associated with recovery operations and is not considered pollution prevention.

B30.0 Pollution-Prevention (P2) Activities

Qualitative reporting of pollution-prevention activities is a mandatory reporting requirement of the NPRI. If you have not implemented a pollution-prevention program at your facility, choose item B30.1.i. Otherwise, identify one or more of the pollution-prevention activities you have undertaken during the reporting year. If you selected "Pollution-prevention activities" in fields B14.1.c, B23.1.c or B26.1.c as a reason for changes in quantities released or transferred off site for disposal or recycling, you **must** identify the activity in this section.

B30.1.a Materials or feedstock substitution – e.g., using aqueous-based cleaners rather than solvent-based cleaners; using a non-toxic detergent to clean glassware rather than using chromic acid.

B30.1.b Product design or reformulation – e.g., reduce or eliminate the use of toxic substances by changing product specifications; modifying design or composition of products.

B30.1.c Equipment or process modifications – e.g., changing to mechanical stripping/cleaning devices from solvents; using more efficient spray-paint systems; instituting recirculation within a process.

B30.1.d Spill and leak prevention – e.g., measures to prevent releases such as installing splash guards and drip trays around equipment, such as solvent sinks, hot tanks and jet-spray washers, to collect and return drainage and contain leaks and spills.

B30.1.e On-site reuse, recycling or recovery – e.g., using a small distillation unit to reclaim solvents; recovering metals by ion exchange, reverse osmosis.

B30.1.f Improved inventory management or purchasing techniques – e.g., avoiding the unnecessary generation of waste by ensuring that materials do not stay in inventory beyond shelf life; instituting a clearinghouse to exchange materials that would otherwise be discarded.

B30.1.g Good operating practices or training – e.g., changing production schedules to minimize equipment and feedstock changeovers; improved maintenance scheduling; training staff to recognize pollution-prevention opportunities.

B30.1.h Other – Specify the pollution-prevention activities in field B30.2 "Comments".

B30.1.i No pollution-prevention activities

B30.2 Comments (Pollution Prevention)

Facilities are encouraged to provide additional information describing the pollution-prevention initiatives they have implemented during the year, including results achieved (e.g., environmental results, economic benefits, etc.). The comments will appear in the NPRI database available to the public and are an opportunity to provide context for the information reported to the NPRI. Information on general P2 activities, such as water- and energy-conservation initiatives, should be entered in the facility P2 "Comments" field (A15.2).

Production Ratio and Activity Index

This section allows facilities, on a voluntary basis, to show the relationship between year-to-year fluctuations of their production levels and the relative decrease or increase in the sum of their on-site releases plus off-site transfers of the reported substance.

A "production ratio" is the ratio of "reporting-year production" to "prior-year production" that will permit year-to-year comparisons of changes in the total on-site releases plus off-site transfers. An "activity index" is based on a variable, other than production, that is the primary influence on the total, and that will in turn permit comparison of changes from year to year. While the use of a production ratio or activity index is not practical for some facilities, it does provide a means for facilities to report useful information to better understand trends in on-site releases and off-site transfers in a simple numerical format. Because changes in total on-site releases and off-site transfers may be the result of changes in production levels, a production ratio or activity index would help indicate, relatively speaking, whether a facility has, in fact, improved (or worsened) its environmental performance.

Provide a "ratio" of reporting-year production to prior-year production, or an "activity index" based on a variable other than production.

B40.0 Production Ratio and Activity Index (optional)

In this section, you are encouraged to provide a "ratio" of reporting-year production to prior-year production, or an "activity index" based on a variable other than production that was the primary influence on the total quantity of the reported substance released on site or transferred off site for final disposal or recycling. The ratio or index should be reported to two decimal places (i.e., two digits to the right of the decimal point). If the manufacture, processing or other use of the reported substance began during the current reporting year, enter **NA** ("Not applicable") as the production ratio or activity index.

It is important to realize that if your facility reports more than one substance, the production ratio or activity index may vary between substances. For facilities that manufacture the reported substance, the quantities produced in the current and previous year provide a good basis for the ratio because that is the primary business activity associated with the substance. However, in most cases, the production ratio or activity index must be based on some variable of production or activity rather than on the amount of substance manufactured, processed or otherwise used.

Select from the following examples, the production ratio or activity index that is the most appropriate method of adjusting the sum of on-site releases plus off-site transfers of the reported substance. If your facility reports more than one NPRI substance, the production ratio or activity index may vary from substance to substance. However, for a given substance, the same method of calculating a production ratio or activity index must be used from year to year to allow comparison. If the substance is used in more than one production process, you must use a production ratio that is based on a weighted average of the individual production ratios. If this is the first year reporting a substance, enter **NA** ("Not applicable") in field B40.1.

Determining a Production Ratio

The production ratio must be based on the variable that most directly affects the quantities of the substance released on site or transferred off site for final disposal or recycling. Examples of methods available include:

- amount of the substance manufactured divided by the amount of the substance manufactured in the preceding year, or
- amount of product produced divided by the amount of product produced in the preceding year.

Example 1
Your facility manufactures the reported NPRI substance and you have instituted a pollution-prevention program to reduce the fugitive emissions of the substance during manufacture, storage, packaging and shipping. An appropriate production ratio is simply the amount of the substance manufactured during the reporting year divided by the amount manufactured in the previous year.

Example 2
Your facility's only use of toluene is as a paint carrier for a painting operation. You painted 12 000 refrigerators in the current reporting year and 10 000 refrigerators during the preceding year. In this case, the production ratio for toluene is 1.2 (12 000 ÷ 10 000) because the number of refrigerators produced is the primary factor determining the quantity of toluene to be reported.

Example 3
A facility manufactures inorganic pigments, including titanium dioxide. Hydrochloric acid is produced as a waste during the production process. An appropriate production ratio for hydrochloric acid is the annual titanium dioxide production, not the amount of hydrochloric acid generated. During the reporting year, 20 tonnes of titanium dioxide was manufactured. If the facility produced 26 tonnes in the preceding year, the production ratio would be 0.77 (20 ÷ 26).

Determining an Activity Index

In some situations, an activity other than production is the primary influence on the total quantity of the reported substance released on site or transferred off site for final disposal or recycling.

Example 1
Your facility manufactures organic dyes in a batch process. Different colours of dyes are manufactured and, between colour changes, all equipment must be thoroughly cleaned with solvent containing glycol ethers to reduce colour carryover. During the preceding year, the facility manufactured four different colours in separate batches, totalling 15 tonnes. During the reporting year, the facility manufactured two colours, in separate batches, totalling 20 tonnes. Since the main activity affecting usage of the glycol ether is the cleaning associated with colour changeovers, the activity index would be 0.5 (2 colour changeovers in reporting year ÷ 4 colour changeovers in previous year). The total quantity of dye manufactured has no bearing on the usage of the glycol ethers and, therefore, is inappropriate for normalizing your facility's annual changes in releases and transfers.

Example 2
A facility that manufactures thermoplastic composite parts for aircraft uses toluene as a wipe solvent to clean moulds. The moulds are cleaned on an as-needed basis that is not necessarily a function of the parts' production rate. Operators cleaned 5 200 moulds during the reporting year, but only cleaned 2 000 moulds in the previous year. An activity index of 2.6 (5 200 ÷ 2 000) represents the activities involving toluene usage in the facility. If the moulds were cleaned regularly after every 1 000 parts were manufactured, the production ratio would be equal to the activity index and either could be used.

Example 3
A facility manufactures surgical instruments and cleans the metal parts with 1,1,1-trichloroethane in a vapour degreaser. The degreasing unit is operated in a batch mode and the metal parts are cleaned according to an irregular schedule. The activity index can be based upon the total time the metal parts are in the degreasing operation. If the degreasing unit operated 3 900 hours during the reporting year and 3 000 hours the previous year, the activity index is 1.3 (3 900 ÷ 3 000).

Determining a Production Ratio Based on a Weighted Average

At many facilities, an NPRI substance is used in more than one production process. In these cases, a production ratio or activity index can be estimated by weighting the production ratio for each process based on the respective contribution of each process to the quantity of the substance released or transferred off site for final disposal or recycling.

Example

Your facility paints bicycles with paint containing toluene. Sixteen thousand (16 000) bicycles were produced in the reporting year and 14 500 were produced in the previous year. There were no significant design modifications that changed the total surface area to be painted for each bike. The bicycle production ratio is 1.1 (16 000 ÷ 14 500). You estimate that 12.5 tonnes of toluene were released on site or transferred off site for final disposal or recycling as a result of bicycle production. Your facility also uses toluene as a solvent in a glue that is used to make components and add-on equipment for the bicycles. Thirteen thousand (13 000) components were manufactured in the reporting year, compared to 15 000 during the previous year. The production ratio for the components using toluene is 0.87 (13 000 ÷ 15 000). You estimate that 1.0 tonne of toluene was released on site or transferred off site for final disposal or recycling as a result of components' production. A production ratio can be calculated by weighting each of the production ratios based on the relative contribution each has on the quantities of toluene (13.5 tonnes during the reporting year) released on site or transferred off site for final disposal or recycling. The production ratio is calculated as follows:

$$\text{Production ratio} = \left(\frac{12.5}{13.5} \times 1.1\right) + \left(\frac{1.0}{13.5} \times 0.87\right) = 1.08$$

You now have completed the 1999 reporting form for this substance. You have the options of saving the substance information, cancelling the changes or returning to the substance report.

Return to the "View/Enter/Edit Data" menu. From this menu, you can enter more substances for this facility or enter other facilities and other substances.

When all information concerning all of your facilities and all of your substances has been entered, **you must run the "Check for Reporting Errors" function** in the "Check Errors/Create Report" menu. Otherwise, the program will not allow you to copy the NPRI report to disk for submission to Environment Canada. See Section 3 – "Returning Information to Environment Canada".

Section 3 – Returning Information to Environment Canada

Copying an NPRI Report to Disk

Check for Errors

This is an essential step. The reporting software will not export an NPRI report to a disk until this function reports that no errors were detected. From the "Main Menu" select "Check Errors/Create Report" and then run the "Check for Reporting Errors" function to verify that all sections of the NPRI report were completed correctly. A status screen will indicate the number of facility and substance records being verified and the number of warnings and errors being found. The reporting software provides warnings if the reported releases and transfers are unusually large. These warnings, unlike errors, will not prevent the NPRI report from being exported to a disk.

If errors are found, you will be prompted to view the error and warning messages. The list of error messages explains what errors were found and in which fields of the report they occurred. At any time, you can view or print the error messages to help find and correct errors in the report. Correct the errors that were reported and run the "Check for Reporting Errors" function again. This will clear the error codes and allow you to export your NPRI report to a disk. The most common problem encountered when creating a disk is that the "Check for Reporting Errors" function is not run again and previous error codes are not cleared.

Copy the NPRI Report to Disk

You must use the NPRI software to export a report, otherwise the data on the disk cannot be accepted by Environment Canada. From the "Main Menu" select "Check Errors/Create Report" and then select "Copy NPRI Report to Disk". Before copying the NPRI report to disk, you will be shown a summary of your facility and substance reports. Review the summary for accuracy. Ensure that a blank, formatted disk has been inserted into disk drive "A" or "B".

You should also create a copy of your report on disk for your files. Essential information from this report can be imported into next year's reporting software. Do not use other database programs to alter the data after export. This will result in your disk being rejected and will require a resubmission of your report.

Although rare, computer viruses have been detected on report disks submitted to the NPRI. If your disk is infected, you will be required to resubmit your report.

After making a copy on disk, slide the tab to open the "write protect" window on the corner of your 3.5″ disk.

Indicate on your disk the name of your facility, NPRI ID number (provided with the reporting package) and the date of submission. First-time reporters who have not received a permanent NPRI ID number can use the temporary ID number (e.g., 9000000001) generated by the software.

If you are submitting your report by e-mail, send the signed Statement of Certification by fax to the same NPRI office to which you sent the e-mail.

Complete the Statement of Certification

Your disk must be accompanied by a signed Statement of Certification. The statement should be signed by the same person identified as the "company official" for the facility in field A16.0.

From the "Main Menu" open the "Reports Menu" and choose "Print Statement of Certification". If you are unable to print from the software, please contact your regional NPRI office to obtain a Statement of Certification. See Appendix 4 for details on printing reports.

Return the NPRI Report to Environment Canada

Send the disk and the signed Statement of Certification to your regional NPRI office, postmarked or courier-dated, **no later than June 1, 2000**. It is not necessary to provide a printed copy of the report along with your disk.

Where disks contain reports for facilities in different regions of Canada, company coordinators are reminded that they are only required to send one report to the NPRI office in their region. For example, a company coordinator in Montreal, reporting for facilities in Edmonton, Vancouver and Toronto, is asked to send the reports to the NPRI regional office in Montreal.

If you need assistance, contact your regional NPRI office listed on the inside front cover.

Submitting an NPRI Report by E-mail

If you choose to submit your NPRI report by e-mail:

- Use the NPRI software to export the NPRI report to a floppy disk or a hard disk folder. Do not copy the files that are in the NPRI software directory. A complete NPRI report consists of the following eight Dbase (*.DBF) files and one disk ID file:

disk.id	address.dbf	comments.dbf
dr_trans.dbf	facility.dbf	other_id.dbf
streams.dbf	substanc.dbf	substran.dbf

  NOTE: Files with the same names in the directories where the MS DOS or Windows software was installed are part of the NPRI reporting software. Do not use these software files in your electronic submission.

- Send these nine files as attachments in an e-mail to your regional NPRI office. In the subject line, clearly indicate that it is an NPRI report and include the NPRI ID number for your facility and the name of your company. Company coordinators are reminded that they are only required to send one report to the NPRI office in their region. In the your e-mail message, include your name, address, telephone and facsimile numbers and e-mail address. Retain a copy of this e-mail for future reference.
- A signed Statement of Certification must accompany your NPRI report. Send a copy by facsimile to the same NPRI office to which you sent the e-mail. Keep the original signed Statement of Certification on file for future reference.

Reports submitted by e-mail and the signed Statement of Certification must be received by Environment Canada **no later than June 1, 2000**. NPRI regional contacts, their e-mail addresses, telephone and facsimile numbers are listed on the inside front cover of this guide and on the NPRI Web site.

Section 4 – Confidential Business Information

Request for Confidentiality

Pursuant to subsection 19(1) of the *Canadian Environmental Protection Act (CEPA)*, any person who provides information to the NPRI may submit a written request that it be treated as confidential. For each facility and each substance reported, the request for confidentiality must clearly identify each field for which a request is being made. **The written request must accompany the report.**

It is recommended that you include with your request for confidential treatment, documentation that would be required to justify that the information submitted should be confidential as per the criteria outlined in subsection 20(1) of the *Access to Information Act (ATIA)* (see below). If substantiation is not provided, Environment Canada will advise the person requesting confidentiality that it intends to disclose the information as permitted under subsection 20(3) of the *CEPA*. The procedures for using this power are described in sections 27 and 28 of the *ATIA*.

To be treated as confidential, the company must demonstrate that it treats the information as confidential and wishes to continue to do so. It must also demonstrate that this information is not available to the general public through legal means, such as obtaining a public copy of a provincial waste permit.

A request for confidentiality will be denied if the data are already in the public domain.

Necessary precautions should be taken when submitting an NPRI report for which a request for confidentiality is being made. This includes, but is not limited to, the following:

- confidential materials are to be sent in double envelopes, excluding the courier outer envelope
- the outside envelope should be unmarked except for mailing and return addresses, and postage, and
- the inside envelope should be stamped on both sides with wording such as “Contains Confidential Information”.

A request for confidentiality is not determinative. A determination of whether the information is confidential will be based on an objective analysis of the facts. The final decision as to what information is eligible for confidential treatment rests with the *ATIA* Information Commissioner.

Should you have any questions concerning confidentiality requests, please call your regional NPRI office listed on the inside front cover.

Access to Information Act

The following excerpt from the *ATIA* provides guidance on the type of third-party information which would be considered confidential business information:

20(1) *Subject to this section, the head of a government institution shall refuse to disclose any record requested under this Act that contains:*

- ***(a)*** *trade secrets of a third party;*
- ***(b)*** *financial, commercial, scientific or technical information supplied to a government institution by a third party and is treated consistently in a confidential manner by a third party;*
- ***(c)*** *information the disclosure of which could reasonably be expected to result in material financial loss or gain to, or could reasonably be expected to prejudice the competitive position of, a third party;*
- ***(d)*** *information the disclosure of which could reasonably be expected to interfere with contractual or other negotiations of a third party.*

Index

Subject **Question Number**

Section 5 – Questions and Answers

Questions and Answers

1. Is a facility meeting the criteria described in the *Canada Gazette* notice required to report if there were no releases of NPRI substances during the calendar year?

Yes. The requirements for reporting are based only on quantity processed, manufactured or otherwise used, number of employees and concentration of NPRI substances. Once you meet the criteria, you must report regardless of the amounts released or transferred.

2. Our facility closed part way through the calendar year. Are we required to submit an NPRI report?

Yes. If your facility met the reporting criteria and was in operation during any portion of the calendar year, you are required to report.

3. In British Columbia, several fish processors have factories on ships. They use ammonia and chlorine in their fish-processing operations. Is each ship considered a "facility" under the *Canada Gazette* notice or is the whole group of ships (assume one company) a facility?

A facility is defined as all buildings, equipment, structures, and other stationary items which are located at a single site or adjacent or contiguous sites owned or operated by the same person. A ship is not a facility as defined under the notice. It is not stationary and it is not located on a single site. Therefore, there is no requirement to report.

4. A barge-repair facility cleans barges by vacuuming out residual products containing listed substances and recycling them. Must the facility report?

The facility is processing the chemicals. If the threshold criteria for reporting are met, the facility must file a report. Releases during vacuuming must be reported as well as releases from related activities such as spills and equipment cleaning.

Routine cleaning of the exterior of the barge is considered maintenance of a transportation vehicle and is therefore exempt.

5. Does the determination of a full-time employee "equivalent" include the hours worked by sales staff whose offices are located in the same building as the production staff, or who work outside the facility?

Yes. All staff employed at a facility, regardless of function or location, count toward the employee threshold determination.

6. Would a facility with nine full-time employees and four part-time employees be required to report to the NPRI?

Total the hours worked by all people, including contractors, who are performing work related to the operations of the facility. If the total is 20 000 hours or more per year, the criterion for the number of full-time employees has been met.

7. When calculating the total number of hours worked by all employees during the calendar year, should overtime, and vacation and sick leave used be included toward the 20 000-hour threshold?

Yes. The facility must include all overtime, and paid vacation and sick leave toward the 20 000-hour threshold.

8. When should an individual's time spent working at a facility be counted for purposes of determining whether or not a facility meets or exceeds the 20 000-hour threshold?

If an individual is employed by the facility or by the facility's parent company to work at the facility, then all of the hours worked by the individual must be counted toward the 20 000-hour threshold.

Contractors performing work related to the operations of the facility must also be included.

If an individual both owns and works for the facility, that individual's hours must also be applied toward the 20 000-hour threshold.

9. Is the owner or the operator responsible for reporting?

The notice requires a person who owns or operates a facility to report information to which the person has access or can reasonably be expected to have access. This is usually the operator. However, both the owner and the operator are subject to the Section 16 Notice. If no report is received from a facility that meets the reporting requirements, both persons may be held liable.

10. Who is the parent company for a 50/50 joint venture?

The reporting form allows a number of parent companies to be entered with the percentage of ownership for each.

11. A facility had been operating its manufacturing processes in a leased warehouse. In July, they bought their own warehouse and moved the manufacturing operations. These two locations are neither adjacent nor contiguous. The company did not shut down or close during this time. How should the facility make threshold determinations and report to the NPRI?

The company must consider the locations as two separate facilities because the operations were carried out at two distinctly separate physical sites. Threshold determinations must be made for the period of time during which each facility operated.

A new NPRI ID number will be assigned to the new facility.

12. Acme Plastics is a wholly-owned subsidiary of a major chemical company which is a wholly-owned subsidiary of XYZ Oil Corp. Which is the parent company?

XYZ Oil Corp. is the parent company because it is the highest level company that directly controls Acme Plastics.

13. Two manufacturing facilities, owned by the same company, are divided by a public railway. Is this considered adjacent facilities or two separate facilities?

Two facilities owned or operated by the same company that function as a single integrated site, but are separated by a railway, would be considered adjacent sites since they are physically adjacent to one another except for a public right-of-way. Therefore, reporting thresholds would be determined by the combined quantities of substances processed, manufactured or otherwise used at both facilities. The 20 000-hour threshold would be determined by the sum of hours worked at both facilities.

14. A Vancouver-based company has a plant in Alberta which processes 12 tonnes of methanol, a plant in Ontario which processes 8 tonnes of methanol and a plant in Quebec which processes 11 tonnes of methanol. Do the three plants have to report as a company or can they report as separate facilities?

A report is required for each facility that meets the reporting criteria; their activities cannot be combined. In this case, the plant in Ontario is not required to report but the other two are if they meet the other reporting criteria. The company may choose to report for each of the facilities meeting the reporting criteria on one disk, or to have each facility submit their report separately.

15. When contractors working at a facility supply their own materials and supplies such as solvents containing NPRI substances, should these substances be included in the threshold determination and reported by the facility?

Yes. The owner or operator of the facility must include the quantities of NPRI substances used by contractors in their threshold calculations if those uses are relevant to the purpose of the facility.

16. An NPRI substance is the working fluid in our heat transfer equipment. Must the quantity of the NPRI substance be accounted for in determining the reporting threshold?

Yes. The fluid within the heat transfer equipment is considered to be an “other use” of the NPRI substance, relevant to the purposes of the facility as defined in the *Canada Gazette* notice. All of the NPRI substance in the heat transfer equipment must be included in the threshold calculation.

17. Our company disposes of some of its waste in a landfill site which belongs to the company but is in a different location. Is this an off-site transfer or a release?

This would be an off-site transfer for disposal if the landfill is not adjacent or contiguous with the facility; otherwise it would be a release.

18. Our company sorts scrap metal and compresses it into bales to be sold to secondary metal producers. Most of the metal we recover contains some NPRI substances (Zn, Cr) in excess of 1% concentration. The process does not release any NPRI substances; it only compresses the pieces into bales. Are we required to file a report?

No. In this case, the items being handled would retain their status as articles as long as there are no on-site releases to the environment or off-site transfers for disposal.

19. At what point in the processing of ore must mining companies report?

The exemption for mining is for activities related to the actual removal of ore, rock or overburden, up to and including primary crushing. Any NPRI substances used in the further processing of the rock or ore, such as milling, concentrating, smelting and refining, would be reportable if the thresholds are met. This would include, but not be limited to, NPRI substances found in the processed ore, solvents, acids, flotation agents, flocculation agents, and fuels used in power generation. Listed substances in tailings are not reported unless they leave the tailings impoundment or other forms of on-site containment.

20. If a substance is spilled one year, and will result in air emissions over time in the following year, how should it be reported?

The portion of the spill not cleaned up must be reported as a release the year the spill occurred. It must be reported as a release to the environmental media affected (air, water, land). Further migration between media does not need to be reported.

21. Can a facility use its own software to report electronically to the NPRI?

Environment Canada supplies the software required for reporting and strongly recommends that this be used to submit a report to the NPRI.

However, if you choose to use other software and the report submitted cannot be read and verified by Environment Canada's own reporting software, the report will be considered incomplete and be returned for correction.

Environment Canada reserves the right to change its software and file structure at any time.

22. We use a 50% methanol solution in one part of the plant. The annual consumption of methanol exceeds 10 tonnes. In another part of the plant, a completely separate process produces a few tonnes of methanol which are released through a stack. Do we have to estimate methanol releases from the stack even if they are from a different process?

Yes. Because your facility uses more than 10 tonnes of methanol, it is required to report all its releases of methanol, regardless of the process stream.

23. We have a provincial waste permit to discharge sulphuric acid at a pH between 5.8 and 6.6. How do we report our releases of sulphuric acid if we meet all the reporting requirements?

Releases of mineral acids at a pH of 6.0 or greater are considered neutralized and must be reported as zero (0). The portion of acid discharged at a pH less than 6.0 will constitute a reportable release and must be calculated and reported.

24. We send an NPRI substance to an outside company for recovery. The recovered substance is then sent back to us for reuse. Does the recovered substance count toward the threshold calculation?

Yes, if the recovered substance is being processed or used it would have to be included in the threshold calculation since it is no different than new material being processed or used.

25. A company engaged in electroplating is using equipment and lead anodes purchased and installed before the current reporting year. Fifteen tonnes of lead anodes were originally installed in the plating tanks. The lead anodes dissolve over time and the lead ends up in the sludge and the wastewater. During the calendar year, the company replaced 7 tonnes of lead anodes. Does the company have to submit an NPRI report for lead?

Yes. The entire electrode assembly is considered to be an "other use" of lead, relevant to the purposes of the facility as defined in the *Canada Gazette* notice. The entire quantity of lead in the electrode assembly (15 tonnes), must be used in the threshold calculation, not just the 7 tonnes consumed in the process.

26. When do metal parts, sheets or wire containing NPRI substances lose their status as articles?

Metal parts, sheets or wire lose their article status when there are releases to the environment or transfers for disposal.

If all materials removed during processing, such as turnings or blanks, are completely recycled and due care has been exercised to ensure that the materials are 100% recycled within the facility, the materials retain their article status.

Due care is considered to have been exercised if no more than 1 kg (0.001 tonne) of an NPRI substance is released in a given year as a result of the processing or other use of an article.

Typical metal processing activities that violate article status include welding, torch cutting, quenching, etching and dry grinding.

Typical metal processing activities that do not violate article status (assuming "due care" is exercised in ensuring 100% recycling of materials) include cutting, stamping, bending, punching, machining, shearing, soldering and cold extrusion.

27. Our company purchases metal parts and then welds them together using welding rods. We then paint them and glue other parts to them. What would be reportable in this case?

The original parts would lose their status as articles during welding because the welding process releases emissions to the air. The quantity of NPRI substances contained in the parts would be used to calculate the reporting threshold. The quantity of NPRI substances in the welding rods would also be included in the calculation of the reporting threshold.

The NPRI substances contained in the paints and glues would be reportable if the threshold criteria are met.

28. Is the use of fuel exempt from reporting?

No. The use of fuel is not implicitly exempt from reporting. Use of fuel in a stationary system, such as for power generation, would be reportable if the threshold criteria are met.

Retail sale and fuel distribution are exempt. Refueling of motor vehicles is also covered by this exemption even if the vehicle is refueled from a tank on company property. Mobile sources such as vehicles and earth-moving equipment are not stationary items considered part of a facility. They are not to be included in the calculation of the reporting threshold.

29. Chromated copper arsenate (CCA), is used in the wood-treatment industry but is not on the NPRI substance list. Do we have to report?

While CCA is not an NPRI substance, copper, chromium, arsenic and their compounds are on the list. A threshold calculation must be performed for each individual substance.

A typical bulk solution of CCA (50% concentrate) contains 12.3% Cr, 7.39% Cu, and 11.09% As, by weight. A company would have to use 81.3 tonnes of 50% concentrate of CCA to render Cr reportable. In this situation, As and Cu would not be reportable since they do not exceed the 10-tonne threshold.

30. Should fugitive dust from tailings dams and tailings impoundments be reported to the NPRI as releases?

Yes. NPRI substances that are released as fugitive emissions must be reported. The deposit of NPRI substances contained in the mineral portion of the ore or rock to a tailings impoundment is not reportable, but releases from the impoundment or dam are.

31. Our mine operates a wastewater treatment system for a tailings impoundment effluent. The treatment process generates a metal hydroxide sludge containing two NPRI substances. The sludge is pumped back into the tailings impoundment. Are the NPRI substances in the sludge considered releases?

Substances that are pumped back into a tailings impoundment are not considered releases. The amount of substances leaving the tailings impoundment would be reported as a release.

32. Should hydraulic backfill pumped underground and used for filling open stopes for ground control be reported?

No. Stope filling for ground control is part of the extraction process and is therefore exempt under the mining exemption.

33. We use zinc in our primary crusher as backing for concaves and shells. Is it reportable?

No. The mining exemption is for extraction up to and including primary crushing.

34. Do NPRI substances contained in a refractory brick furnace have to be reported?

No. Refractory bricks would retain their status as articles as long as they do not release any NPRI substances during normal use. However, the refractory bricks lose their article status if during normal conditions of use they degrade and release NPRI substances. In that event, the total quantity of NPRI substances in the refractory lining must be used in the calculation of the 10-tonne reporting threshold.

35. Our ore-processing facility uses greases and fuels to operate the many machines used in the benefaction of the ore. Are NPRI substances in these greases and fuels reportable?

Yes. Process equipment maintenance using materials such as grease, oils or lubricants, disinfectants or paint, etc., is not exempt and must be considered for the purposes of NPRI reporting.

The use of greases and fuels in this situation would be considered “other use”.

36. We use more than 10 tonnes of sodium cyanide in our flotation beds. The substance is entirely consumed and transformed to non-ionic cyanides in the process. We meet all other reporting criteria. Are we required to report?

Yes. Reporting to the NPRI is based on quantity manufactured, processed or otherwise used, not on quantities released. You must perform your threshold calculations based on the amount of cyanide ion used or processed and file a report if you meet or exceed 10 tonnes. Since non-ionic forms of cyanide are not on the NPRI substance list, you would report a zero release of cyanide ion.

37. We use copper sulphate as a reagent. During the process, it attaches itself to other compounds and remains with the concentrate. There are no releases. Is it reportable?

Yes, if the amount of copper meets or exceeds the threshold reporting requirements, you would file a report for "Copper (and its compounds)" and report a release of zero for this process. All other releases of copper from your facility would also have to be reported.

38. We use zinc sulphate, zinc oxide and zinc stearate. How do we handle reporting of all these different metal compounds?

Report only the zinc portion of the compounds under the substance name "Zinc (and its compounds)".

39. Is fuel used for fire-training purposes reportable to the NPRI?

A facility used for the education or training of sudents is exempt from reporting. Therefore the use of fuels does not need to be reported.

40. We store products in our warehouse that don't belong to us. We do not use these products in the operation of our warehouse. Some of these products contain NPRI substances. Are we required to report?

No. A warehouse is not required to report if it does not manufacture, process or otherwise use NPRI substances. Transfer of NPRI substances between containers is considered processing.

Wholesale distribution is exempt provided there are no releases of NPRI substances.

41. We buy bulk NPRI substances in tanks and drums. Some of these substances are simply repackaged in smaller containers (e.g., tanks to drums, drums to 4-litre plastic bottles). However, some of the substances are mixed together and then repackaged. Are we required to report?

Transfer of substances between containers is considered processing and those quantities must be included in the threshold calculation.

Mixing substances together prior to packaging is considered processing.

42. We use an NPRI substance in our process that meets all the reporting criteria. Unfortunately, we have no data on possible releases and we cannot find any estimation factors. Is a release of zero acceptable in this case?

Yes. In this case, as indicated in the *Canada Gazette*, you are required to report the information that you possess. You must report your facility information and identify the substances for which a report is required. A release of zero will be accepted, but the comment section must include a statement that releases and transfers could not be estimated.

43. We purchased 12 tonnes of an NPRI substance to prepare a solution for our new metal-cleaning baths. The baths will be used this year. How do we calculate the "otherwise use" threshold for this year and the following years?

The metal-cleaning bath is considered to be an "other use" of NPRI substance, relevant to the purposes of the facility as defined in the *Canada Gazette* notice. The entire quantity of the NPRI substance in the metal-cleaning bath plus any quantity used to top up the bath must be used in the threshold calculation, not just the quantity consumed in the process.

44. Are vinyl chloride and polyvinyl chloride (PVC) the same compound?

No. Polyvinyl chloride is a polymer made from vinyl chloride. It is not the same substance and is not listed on the NPRI, therefore it is not reportable. Only free vinyl chloride monomer is reportable. Some formulations of pre-polymers may contain a percentage of free monomer. If you purchase pre-polymers which contain free vinyl chloride monomer, add this to the threshold calculation.

45. Asbestos is listed with the CAS number 1332-21-4. We use asbestos with the following names and CAS numbers: Azbolen (17068-78-9), Actinolite (77536-66-4), Amosite (12172-73-5), Anthropylite (77536-67-5), Tremolite (77536-68-6) and Serpentine. Are we required to report?

The CAS number 1332-21-4 is defined as: "Asbestos, a greyish, non-combustible fibrous material. It consists primarily of impure magnesium silicate". Asbestos with the CAS number 1332-21-4 is the general CAS number for a number of specific types of asbestos including those mentioned. Those types of asbestos would be reportable as long as they are in friable form.

46. A facility coats materials using a vacuum deposition process. When it uses aluminum for coating, is it required to report for aluminum fumes?

In vacuum deposition, the metal is converted to a vapour state under low pressure. The vapour condenses on the material to be coated. Vapours are not fumes. A metal fume consists of finely-divided particulate matter dispersed in a gas (like smoke). Because vapours and fumes are different, this process would not be considered a reportable activity unless the condensation creates fumes or dust.

47. What types of routine maintenance are exempt?

Routine janitorial or other facility grounds maintenance activities that may use NPRI substances which would be contained in cleaners, fertilizers or pesticides is exempt.

Process equipment maintenance using materials such as grease, oils or lubricants, disinfectants or paint, etc., is not exempt and must be considered for the purposes of NPRI reporting.

48. Our process uses metal grinding wheels which suffer regular abrasion. Would NPRI substances in these wheels be reportable?

Yes. Items such as grinding wheels are, by their nature and use, intended to wear down and release substances. They are designed to be replaced and are subject to reporting.

49. Are degreasers used in a plant's maintenance shop reportable?

Yes. Degreasing of equipment for maintenance is not considered routine maintenance and is not exempt. It would be reported as "otherwise used".

50. Is our quality control laboratory exempt from reporting under the research and testing exemption?

Yes, assuming that the laboratory does not perform pilot-plant scale studies or specialty chemical production.

51. Are photo development laboratories exempt?

No. The laboratory exemption includes research facilities which perform auxiliary functions to the manufacturing or processing activities of a facility. Photo development laboratories do not perform auxiliary functions but perform activities which are essential to the development of their products (photographs, films, etc.).

52. We buy more than 10 tonnes of chlorine gas and use it in a reaction vessel to produce more than 10 tonnes of chlorine dioxide. We then dilute the chlorine dioxide to less than 1% concentration. What do we have to report?

Because you meet the reporting threshold for chlorine gas, you are required to report any releases and transfers of chlorine gas. Because you manufacture chlorine dioxide at a concentration greater than 1%, you are required to report any releases and transfers of chlorine dioxide. The subsequent dilution of the chlorine dioxide does not affect the threshold calculation.

53. How do we treat a solvent sent off site for distillation and then shipped back to us?

A solvent received from a recycling operation located off-site counts as new material and must be included in the threshold calculation. The quantity sent off site for distillation must be reported as material sent for recycling.

54. We use a paint thinner that contains toluene. We also use toluene in another part of our plant. In total, more than 10 tonnes of toluene are used annually. The waste thinner is sent to an off-site facility for blending in fuels. How do we report this activity?

NPRI substances sent off site for fuel blending or that add energy to a heat recovery activity must be reported as a transfer for energy recovery. Other releases or transfers of toluene must also be reported.

55. Are NPRI substances used in maintenance activities, such as paint booth cleaning, reportable?

Paint booth cleaning is not considered a routine janitorial activity and would be reportable under the classification “other use”.

56. How does the NPRI definition of a facility apply to a multi-plant site?

“Facility” is defined in the *Canada Gazette* notice. It includes all buildings or structures located on a single site or on adjacent sites which are owned or operated by the same person and function as a single integrated site.

Plants must report separately if they manufacture or process unrelated products and if they do not share common manufacturing or processing operations. For example, a battery plant and a vehicle-assembly plant, located side-by-side, are two distinct manufacturing operations that have different SIC codes. In the case of the battery plant, it also ships products to other installations. Other examples are smelters and fertilizer plants, a refinery and a chemical plant.

57. Is reporting to the NPRI mandatory under the *Canadian Environmental Protection Act (CEPA)*? If so, how will it be enforced?

It is the responsibility of each person who owns or operates a facility to determine whether they are required to report after examining the *Canada Gazette* notice and the *CEPA*. There is an enforcement and compliance policy under the *CEPA* which dictates how regulations and notices are enforced.

58. A facility that previously reported to the NPRI has been split up and is now owned and operated by two separate companies. How should they report to the NPRI?

If the companies are owned by the same parent company AND function as a single integrated facility, they must report as one facility. If they do not meet both of these conditions, they must perform separate threshold calculations and report separately.

59. Are substances regulated under other legislation (e.g., *Pest Control Products Act*) exempt from reporting under the NPRI?

There is no exemption for substances regulated under other legislation.

60. Is a solid waste landfill required to report to the NPRI?

Solid waste landfills process NPRI substances. If the facility meets the other threshold criteria, it is required to report.

Additionally, landfills can generate, as a consequence of their process, by-products such as ammonia in their leachate.

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Publications of the U.S. Environmental Protection Agency

The Office of Pollution Prevention and Toxics of the U.S. Environmental Protection Agency (U.S. EPA) has developed many individual guidance manuals on how to estimate releases for different industries reporting to the Toxics Release Inventory (TRI). These manuals could also be used for reporting to the NPRI.

1. "Estimating Chemical Releases from Monofilament Fiber Manufacturing", EPA 560/4-88-004a (January, 1988).
2. "Estimating Chemical Releases from Printing Operations", EPA 560/4-88-004b (January, 1988).
3. "Estimating Chemical Releases from Electrodeposition of Organic Coatings", EPA 560/4-88-004c (January, 1988).
4. "Estimating Chemical Releases from Spray Application of Organic Coatings", EPA 560/4-88-004d (January, 1988).
5. "Estimating Chemical Releases from Semi-Conductor Manufacturing", EPA 560/4-88-004e (January, 1988).
6. "Estimating Chemical Releases from Formulation of Aqueous Solutions", EPA 560/4-88-004f (March, 1988).
7. "Estimating Chemical Releases from Electroplating Operations", EPA 560/4-88-004g (January, 1988).

8. "Estimating Chemical Releases from Textile Dyeing", EPA 560/4-88-004h (February, 1988).
9. "Estimating Chemical Releases from Presswood and Laminated Wood Products Manufacturing", EPA 560/4-88-004i (March, 1988).
10. "Estimating Chemical Releases from Roller, Knife, and Gravure Coating Operations", EPA 560/4-88-004j (February, 1988).
11. "Estimating Chemical Releases from Paper and Paperboard Production", EPA 560/4-88-004k (February, 1988).
12. "Estimating Chemical Releases from Leather Tanning and Finishing", EPA 560/4-88-0041 (February, 1988).
13. "Estimating Chemical Releases from Wood Preserving Operations", EPA 560/4-88-004p (February, 1988).
14. "Estimating Chemical Releases from Rubber Production and Compounding Operations", EPA 560/4-88-004q (March, 1988).
15. "Issue Paper – Clarification and Guidance for the Metal Fabrication Industry", (January, 1990).
16. "Guidance for Food Processors", EPA 560/4-90-014 (June, 1990).
17. "Guidance for Reporting Aqueous Ammonia", EPA 745-R-95-012 (July, 1995).
18. "List of Toxic Chemicals Within The Water Dissociable Nitrate Compounds Category and Guidance for Reporting – Revised", EPA-745-R-96-004 (May, 1996).
19. "Industry Guidance for Coal Mining Facilities", EPA 745-B-99-002 (January,1999).
20. "Industry Guidance for Electricity Generating Facilities", EPA 745-B-99-003 (January, 1999).
21. "Industry Guidance for Metal Mining Facilities", EPA 745-B-99-001 (January,1999).
22. "Industry Guidance for Chemical Distribution Facilities", EPA 745-B-99-005 (January,1999).
23. "Industry Guidance for RCRA Subtitle C TSD Facilities and Solvent Recovery Facilities", EPA 745-B-99-004 (January,1999).
24. "Guidance for Reporting Sulfuric Acid (acid aerosols including mists, vapors, gas, fog, and other airborne forms of any particle size)", EPA 745-R-97-007 (November, 1997 and updated March, 1998).
25. "Industry Guidance for Petroleum Terminals and Bulk Storage Facilities", EPA 745-B-99-006 (January,1999).
26. "EPCRA Section 313 Questions and Answers – Revised 1998 Version", EPA 745-B-98-004 (December,1998).
27. "EPCRA Section 313 Reporting Guidance For Food Processors (Update)", EPA 745-R-98-011 (September, 1998).
28. "EPCRA Section 313 Reporting Guidance for Spray Application and Electrodeposition of Organic Coatings", EPA 745-R-98-014 (December,1998).
29. "EPCRA Section 313 Reporting Guidance for Semiconductor Manufacturing", EPA 745-R-99-007 (July,1999).

Locating and Estimating (L&E) Documents

To assist groups interested in preparing inventories of air emissions of various potentially toxic substances, the U.S. EPA Office of Air Quality and Planning Standards has prepared a series of L&E documents that compiles available information on sources and emissions of these substances. Documents in this series are listed below.

SUBSTANCE	EPA PUBLICATION #	DATE
30. Acrylonitrile	EPA-450/4-84-007a	1984
31. Arsenic and Arsenic Compounds	EPA-454/R-98-013	June 1998
32. Benzene	EPA-450/4-84-007q	1988
33. Benzene (Update)	EPA-450/R-98-011	June 1998
34. 1,3-Butadiene	EPA 450/2-89-021	1989
35. 1,3-Butadiene (Update)	EPA-454/R-96-008	Nov. 1996
36. Cadmium and Cadmium Compounds	EPA-454/R-93-040	Sept. 1993
37. Carbon Tetrachloride	EPA-450/4-84-007b	March 1984
38. Chlorobenzenes	EPA-450/4-84-007m	1986
39. Chlorobenzenes (Update)	EPA-454/R-93-044	March 1994
40. Chloroform	EPA-450/4-84-007c	March 1984
41. Chromium	EPA-450/4-84-007g	July 1984
42. Chromium (Supplement)	EPA-450/2-89-002	August 1989
43. Coal and Oil Combustion Sources	EPA 450/2-89-001	1989
44. Cyanide Compounds	EPA-454/R-93-041	Sept. 1993
45. Epichlorohydrin	EPA-450/4-84-007j	March 1984
46. Ethylene Dichloride	EPA-450/4-84-007d	March 1984
47. Ethylene Oxide	EPA-450/4-84-0071	Sept.1986
48. Formaldehyde	EPA-450/4-84-007e	1984
49. Formaldehyde (Update)	EPA-450/4-91-012	March 1991
50. Lead and Lead Compounds	EPA-454/R-98-006	May 1998
51. Manganese	EPA-450/4-84-007h	1986
52. Medical Waste Incinerators	EPA-454/R-93-053	1993
53. Mercury and Mercury Compounds	EPA-453/R-93-023	1993
54. Mercury and Mercury Compounds (Update)	EPA-454/R-97-012	Dec. 1997
55. Methylene Chloride	EPA-454/R-93-006	Feb. 1993
56. Methyl Ethyl Ketone	EPA-454/R-93-046	March 1994
57. Municipal Waste Combustion	EPA-450/2-89-006	1989
58. Nickel	EPA-450/4-84-007f	1984
59. Organic Liquid Storage Tanks	EPA-450/4-88-004	1988
60. Perc and Trichloroethylene	EPA 450/2-89-013	1989
61. Phosgene	EPA-450/4-84-007i	1986
62. Sewage Sludge Incinerators	EPA 450/2-90-009	1990
63. Styrene	EPA-454/R-93-011	April 1993
64. Toluene	EPA-454/R-93-047	March 1994
65. Vinylidene Chloride	EPA-450/4-84-007k	Sept.1985
66. Xylenes	EPA-454/R-93-048	March 1994

Other Documents from the U.S. EPA

67. "Compilation of Air Pollutant Emission Factors, Vol. 1: Stationary Point and Area Sources", U.S. EPA, AP-42, 5th Edition (1996), and AP-42 Supplements (1996, 1997, 1998).
68. "Toxic Air Pollutant Emission Factors – A Compilation for Selected Air Toxic Compounds and Sources, Second Edition", U.S. EPA, EPA-450/2-90-011 (1990).
69. "Protocols for Equipment Leak Emission Estimates", U.S. EPA, EPA 453/R-95-017 (November 1995).

Copies of the U.S. EPA documents are available from:

U.S. Environmental Protection Agency
National Center For Environmental Publications and Information (NCEPI)
P.O. Box 42419
Cincinnati, OH 45242
U.S.A.

Tel: (513) 489-8190
Fax: (513) 489-8695

They can be downloaded from the U.S. Toxics Release Inventory (TRI) Web site at <www.epa.gov/opptintr/tri> or the U.S. EPA's Technology Transfer Network Web site at <www.epa.gov/ttn/chief/>.

Or, they can be ordered from:

National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161
U.S.A.

Tel: (703) 605-6000
Fax: (703) 605-6900
E-mail: orders@ntis.fedworld.gov
Web site: www.ntis.gov/

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Copies of the above reports can be ordered from:

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Order Desk
1200 L Street Northwest
Washington, DC 20005
U.S.A.

Tel: (202) 682-8375
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Attn: 313 Handbook Distribution Record

75. "Mining Association of Canada Guide for Completing the National Pollutant Release Inventory (NPRI) in 1999", Mining Association of Canada, (April, 1999).

The report can be ordered from:

Mining Association of Canada
350 Sparks Street, Suite 1105
Ottawa, ON
K1R 7S8

Tel: (613) 233-9391
Fax: (613) 233-8897

Or it can be downloaded from the Association's Web site:
<www.mining.ca/english/publications/npri99.pdf>

76. "CAPP Suggested Approach to Completing the National Pollutant Release Inventory (NPRI)", Canadian Association of Petroleum Producers (June, 1996).

The report can be ordered from:

Canadian Association of Petroleum Producers
2100, 350 – 7 Avenue S.W.
Calgary, AB
T2P 3N9

Tel: (403) 267-1100
Fax: (403) 267-4622

General Information

77. Howard, P. H. and M. Neal, *Dictionary of Chemical Names and Synonyms*, Lewis Publishers, Chelsea, MI (1992).

78. Lide, David R., *CRC Handbook of Chemistry and Physics, 75th Edition*, CRC Press, Inc., Boca Raton, FL (1995) pp 15-38, *"Characteristics of Particles and Particle Dispersoids"*.

Appendix 1 – Alphabetical Listing of the 1999 NPRI Substances

NOTE: The substances added to the NPRI on April 24, 1999, are in bold lettering.

NAME	CAS No.[1]
Acetaldehyde	75-07-0
Acetonitrile	75-05-8
Acetophenone	**98-86-2**
Acrylamide	79-06-1
Acrylic acid [2]	79-10-7
Acrylonitrile	107-13-1
Alkanes, C_{6-18}, chloro	**68920-70-7**
Alkanes, C_{10-13}, chloro	**85535-84-8**
Allyl alcohol	107-18-6
Allyl chloride	107-05-1
Aluminum [3]	7429-90-5
Aluminum oxide [4]	1344-28-1
Ammonia (total) [5]	*
Aniline [2]	62-53-3
Anthracene	120-12-7
Antimony [6]	*
Arsenic [6]	*
Asbestos [7]	1332-21-4
Benzene	71-43-2
Benzoyl chloride	98-88-4
Benzoyl peroxide	94-36-0
Benzyl chloride	100-44-7
Biphenyl	92-52-4
Bis(2-ethylhexyl) adipate	103-23-1
Bis(2-ethylhexyl) phthalate	117-81-7
Boron trifluoride	**7637-07-2**
Bromine	**7726-95-6**
1-Bromo-2-chloroethane	**107-04-0**
Bromomethane	74-83-9
1,3-Butadiene	106-99-0
2-Butoxyethanol	**111-76-2**
Butyl acrylate	141-32-2
i-Butyl alcohol	78-83-1
n-Butyl alcohol	71-36-3
sec-Butyl alcohol	78-92-2
tert-Butyl alcohol	75-65-0
Butyl benzyl phthalate	85-68-7
1,2-Butylene oxide	106-88-7
Butyraldehyde	123-72-8
C.I. Acid Green 3	4680-78-8
C.I. Basic Green 4	569-64-2
C.I. Basic Red 1	989-38-8
C.I. Direct Blue 218	**28407-37-6**
C.I. Disperse Yellow 3	2832-40-8
C.I. Food Red 15	81-88-9
C.I. Solvent Orange 7	3118-97-6
C.I. Solvent Yellow 14	842-07-9
Cadmium [6]	*
Calcium cyanamide	156-62-7
Calcium fluoride	**7789-75-5**
Carbon disulphide	75-15-0
Carbon tetrachloride	56-23-5
Catechol	120-80-9
CFC-11	**75-69-4**
CFC-12	**75-71-8**
CFC-13	**75-72-9**
CFC-114	**76-14-2**
CFC-115	**76-15-3**
Chlorendic acid	**115-28-6**
Chlorine	7782-50-5
Chlorine dioxide	10049-04-4
Chloroacetic acid [2]	79-11-8
Chlorobenzene	108-90-7
Chloroethane	75-00-3
Chloroform	67-66-3
Chloromethane	74-87-3
3-Chloro-2-methyl-1-propene	**563-47-3**
3-Chloropropionitrile	**542-76-7**
Chromium [6]	*
Cobalt [6]	*
Copper [6]	*
Cresol [2,8]	1319-77-3
m-Cresol [2]	108-39-4
o-Cresol [2]	95-48-7
p-Cresol [2]	106-44-5
Crotonaldehyde	**4170-30-3**
Cumene	98-82-8
Cumene hydroperoxide	80-15-9
Cyanides [9]	*
Cyclohexane	110-82-7
Cyclohexanol	**108-93-0**
Decabromodiphenyl oxide	1163-19-5
2,4-Diaminotoluene [2]	95-80-7
2,6-Di-*t*-butyl-4-methylphenol	**128-37-0**
Dibutyl phthalate	84-74-2
o-Dichlorobenzene	95-50-1
p-Dichlorobenzene	106-46-7
3,3'-Dichlorobenzidine dihydrochloride	**612-83-9**
1,2-Dichloroethane	107-06-2
Dichloromethane	75-09-2
2,4-Dichlorophenol [2]	120-83-2
1,2-Dichloropropane	78-87-5
Dicyclopentadiene	**77-73-6**
Diethanolamine [2]	111-42-2
Diethyl phthalate	84-66-2
Diethyl sulphate	64-67-5
Dimethylamine	**124-40-3**
N,N-Dimethylaniline [2]	121-69-7
Dimethyl phenol	**1300-71-6**
Dimethyl phthalate	131-11-3
Dimethyl sulphate	77-78-1
4,6-Dinitro-*o*-cresol [2]	534-52-1
2,4-Dinitrotoluene	121-14-2
2,6-Dinitrotoluene	606-20-2
Dinitrotoluene [8]	25321-14-6

NAME	CAS No.[1]
Di-*n*-octyl phthalate	117-84-0
1,4-Dioxane	123-91-1
Diphenylamine	**122-39-4**
Epichlorohydrin	106-89-8
2-Ethoxyethanol	110-80-5
2-Ethoxyethyl acetate	111-15-9
Ethoxynonyl benzene	**28679-13-2**
Ethyl acrylate	140-88-5
Ethylbenzene	100-41-4
Ethyl chloroformate	541-41-3
Ethylene	74-85-1
Ethylene glycol	107-21-1
Ethylene oxide	75-21-8
Ethylene thiourea	96-45-7
Fluorine	**7782-41-4**
Formaldehyde	50-00-0
Formic acid	**64-18-6**
Halon 1211	**353-59-3**
Halon 1301	**75-63-8**
HCFC-22	**75-45-6**
HCFC-122 and all isomers [10]	**41834-16-6**
HCFC-123 and all isomers [11]	**34077-87-7**
HCFC 124 and all isomers [12]	**63938-10-3**
HCFC-141b	**1717-00-6**
HCFC-142b	**75-68-3**
Hexachlorocyclopentadiene	77-47-4
Hexachloroethane	67-72-1
Hexachlorophene	**70-30-4**
***n*-Hexane**	**110-54-3**
Hydrazine [2]	302-01-2
Hydrochloric acid	7647-01-0
Hydrogen cyanide	74-90-8
Hydrogen fluoride	7664-39-3
Hydrogen sulphide	**7783-06-4**
Hydroquinone [2]	123-31-9
Iron pentacarbonyl	**13463-40-6**
Isobutyraldehyde	78-84-2
Isophorone diisocyanate	**4098-71-9**
Isoprene	**78-79-5**
Isopropyl alcohol	67-63-0
p,p'-Isopropylidenediphenol	80-05-7
Isosafrole	120-58-1
Lead [6]	*
Lithium carbonate	**554-13-2**
Maleic anhydride	108-31-6
Manganese [6]	*
2-Mercaptobenzothiazole	**149-30-4**
Mercury [6]	*
Methanol	67-56-1
2-Methoxyethanol	109-86-4
2-Methoxyethyl acetate	110-49-6
Methyl acrylate	96-33-3
Methyl *tert*-butyl ether	1634-04-4
p,p'-Methylene*bis*(2-chloroaniline)	101-14-4
1,1-Methylene*bis* (4-isocyanatocyclohexane)	**5124-30-1**
Methylene*bis*(phenylisocyanate)	101-68-8
p,p'-Methylenedianiline	101-77-9
Methyl ethyl ketone	78-93-3
Methyl iodide	74-88-4
Methyl isobutyl ketone	108-10-1
Methyl methacrylate	80-62-6
N-Methylolacrylamide	**924-42-5**
2-Methylpyridine	**109-06-8**
N-Methyl-2-pyrrolidone	**872-50-4**
Michler's ketone [2]	90-94-8
Molybdenum trioxide	1313-27-5
Naphthalene	91-20-3
Nickel [6]	*
Nitrate ion [13]	*
Nitric acid	7697-37-2
Nitrilotriacetic acid [2]	139-13-9
***p*-Nitroaniline**	**100-01-6**
Nitrobenzene	98-95-3
Nitroglycerin	55-63-0
p-Nitrophenol [2]	100-02-7
2-Nitropropane	79-46-9
N-Nitrosodiphenylamine	86-30-6
Nonylphenol	**104-40-5**
Nonylphenol hepta (oxyethylene) ethanol	**27177-05-5**
Nonylphenol, industrial	**84852-15-3**
Nonylphenol nona (oxyethylene) ethanol	**27177-08-8**
***n*-Nonylphenol [8]**	**25154-52-3**
Nonylphenol polyethylene glycol ether	**9016-45-9**
***p*-Nonylphenol polyethylene glycol ether**	**26027-38-3**
Nonylphenoxy ethanol	**27986-36-3**
2-(*p*-Nonylphenoxy) ethanol	**104-35-8**
2-(2-(*p*-Nonylphenoxy) ethoxy) ethanol	**20427-84-3**
2-(2-(2-(2-(*p*-Nonylphenoxy) ethoxy)ethoxy)ethoxy) ethanol	**7311-27-5**
Paraldehyde	**123-63-7**
Pentachloroethane	**76-01-7**
Peracetic acid [2]	79-21-0
Phenol [2]	108-95-2
p-Phenylenediamine [2]	106-50-3
o-Phenylphenol [2]	90-43-7
Phosgene	75-44-5
Phosphoric acid	7664-38-2
Phosphorus [14]	7723-14-0
Phthalic anhydride	85-44-9
Potassium bromate	**7758-01-2**
Propargyl alcohol	**107-19-7**
Propionaldehyde	123-38-6

NAME	CAS No.[1]	NAME	CAS No.[1]
Propylene	115-07-1	Titanium tetrachloride	7550-45-0
Propylene oxide	75-56-9	Toluene	108-88-3
Pyridine [2]	110-86-1	Toluene-2,4-diisocyanate	584-84-9
Quinoline [2]	91-22-5	Toluene-2,6-diisocyanate	91-08-7
p-Quinone	106-51-4	Toluenediisocyanate [8]	26471-62-5
Safrole	94-59-7	1,2,4-Trichlorobenzene	120-82-1
Selenium [6]	*	1,1,2-Trichloroethane	79-00-5
Silver [6]	*	Trichloroethylene	79-01-6
Sodium fluoride	**7681-49-4**	**Triethylamine**	**121-44-8**
Sodium nitrite	**7632-00-0**	1,2,4-Trimethylbenzene	95-63-6
Styrene	100-42-5	**2,2,4-Trimethylhexamethylene diisocyanate**	**16938-22-0**
Styrene oxide	96-09-3		
Sulphur hexafluoride	**2551-62-4**	**2,4,4-Trimethylhexamethylene diisocyanate**	**15646-96-5**
Sulphuric acid	7664-93-9		
1,1,1,2-Tetrachloroethane	**630-20-6**	Vanadium [3]	7440-62-2
1,1,2,2-Tetrachloroethane	79-34-5	Vinyl acetate	108-05-4
Tetrachloroethylene	127-18-4	Vinyl chloride	75-01-4
Tetracycline hydrochloride	**64-75-5**	Vinylidene chloride	75-35-4
Tetraethyl lead	**78-00-2**	Xylene [8]	1330-20-7
Thiourea	62-56-6	Zinc [6]	*
Thorium dioxide	1314-20-1		

* No single CAS number applies to this NPRI listing.

1 CAS Registry Number denotes the Chemical Abstracts Service Registry Number, as appropriate.

2 "and its salts" – The CAS number corresponds to the weak acid or base. However, the NPRI listing includes the salts of these weak acids and bases. When calculating the weight of these substances and their salts, use the molecular weight of the acid or base, not the total weight of the salt.

3 "fume or dust"

4 "fibrous forms"

5 "Ammonia (total)" means the total of both of ammonia (NH_3 – CAS # 7664-41-7) and the ammonium ion (NH_4^+) in solution.

6 "and its compounds"

7 "friable form"

8 "mixed isomers"

9 "ionic"

10 The isomers include, but are not necessarily limited to, HCFC-122 (CAS # 354-21-2).

11 The isomers include, but are not necessarily limited to, HCFC-123 (CAS # 306-83-2) and HCFC 123a (CAS # 90454-18-5).

12 The isomers include, but are not necessarily limited to, HCFC 124 (CAS # 2837-89-0), and HCFC 124a (CAS # 354-25-6).

13 "in solution at a pH of 6.0 or greater"

14 "yellow or white"

Appendix 2 – 1999 NPRI Substances Listed by Chemical Abstracts Service Registry Number

NOTE: The substances added to the NPRI on April 24, 1999, are in bold lettering.

NAME	CAS No.[1]
Ammonia (total) [2]	*
Antimony [3]	*
Arsenic [3]	*
Cadmium [3]	*
Chromium [3]	*
Cobalt [3]	*
Copper [3]	*
Cyanides [4]	*
Lead [3]	*
Manganese [3]	*
Mercury [3]	*
Nickel [3]	*
Nitrate ion [5]	*
Selenium [3]	*
Silver [3]	*
Zinc [3]	*
Formaldehyde	50-00-0
Nitroglycerin	55-63-0
Carbon tetrachloride	56-23-5
Aniline [6]	62-53-3
Thiourea	62-56-6
Formic acid	**64-18-6**
Diethyl sulphate	64-67-5
Tetracycline hydrochloride	**64-75-5**
Methanol	67-56-1
Isopropyl alcohol	67-63-0
Chloroform	67-66-3
Hexachloroethane	67-72-1
Hexachlorophene	**70-30-4**
n-Butyl alcohol	71-36-3
Benzene	71-43-2
Bromomethane	74-83-9
Ethylene	74-85-1
Chloromethane	74-87-3
Methyl iodide	74-88-4
Hydrogen cyanide	74-90-8
Chloroethane	75-00-3
Vinyl chloride	75-01-4
Acetonitrile	75-05-8
Acetaldehyde	75-07-0
Dichloromethane	75-09-2
Carbon disulphide	75-15-0
Ethylene oxide	75-21-8
Vinylidene chloride	75-35-4
Phosgene	75-44-5
HCFC-22	**75-45-6**
Propylene oxide	75-56-9
Halon 1301	**75-63-8**
tert-Butyl alcohol	75-65-0
HCFC-142b	**75-68-3**
CFC-11	**75-69-4**
CFC-12	**75-71-8**
CFC-13	**75-72-9**

NAME	CAS No.[1]
Pentachloroethane	**76-01-7**
CFC-114	**76-14-2**
CFC-115	**76-15-3**
Hexachlorocyclopentadiene	77-47-4
Dicyclopentadiene	**77-73-6**
Dimethyl sulphate	77-78-1
Tetraethyl lead	**78-00-2**
Isoprene	**78-79-5**
i-Butyl alcohol	78-83-1
Isobutyraldehyde	78-84-2
1,2-Dichloropropane	78-87-5
sec-Butyl alcohol	78-92-2
Methyl ethyl ketone	78-93-3
1,1,2-Trichloroethane	79-00-5
Trichloroethylene	79-01-6
Acrylamide	79-06-1
Acrylic acid [6]	79-10-7
Chloroacetic acid [6]	79-11-8
Peracetic acid [6]	79-21-0
1,1,2,2-Tetrachloroethane	79-34-5
2-Nitropropane	79-46-9
p,p'-Isopropylidenediphenol	80-05-7
Cumene hydroperoxide	80-15-9
Methyl methacrylate	80-62-6
C.I. Food Red 15	81-88-9
Diethyl phthalate	84-66-2
Dibutyl phthalate	84-74-2
Phthalic anhydride	85-44-9
Butyl benzyl phthalate	85-68-7
N-Nitrosodiphenylamine	86-30-6
o-Phenylphenol [6]	90-43-7
Michler's ketone [6]	90-94-8
Toluene-2,6-diisocyanate	91-08-7
Naphthalene	91-20-3
Quinoline [6]	91-22-5
Biphenyl	92-52-4
Benzoyl peroxide	94-36-0
Safrole	94-59-7
o-Cresol [6]	95-48-7
o-Dichlorobenzene	95-50-1
1,2,4-Trimethylbenzene	95-63-6
2,4-Diaminotoluene [6]	95-80-7
Styrene oxide	96-09-3
Methyl acrylate	96-33-3
Ethylene thiourea	96-45-7
Cumene	98-82-8
Acetophenone	**98-86-2**
Benzoyl chloride	98-88-4
Nitrobenzene	98-95-3
***p*-Nitroaniline**	**100-01-6**
p-Nitrophenol [6]	100-02-7
Ethylbenzene	100-41-4
Styrene	100-42-5

NAME	CAS No.[1]
Benzyl chloride	100-44-7
p,p'-Methylene*bis*(2-chloroaniline)	101-14-4
Methylene*bis*(phenylisocyanate)	101-68-8
p,p'-Methylenedianiline	101-77-9
Bis(2-ethylhexyl) adipate	103-23-1
2-(*p*-Nonylphenoxy) ethanol	**104-35-8**
Nonylphenol	**104-40-5**
p-Cresol [6]	106-44-5
p-Dichlorobenzene	106-46-7
p-Phenylenediamine [6]	106-50-3
p-Quinone	106-51-4
1,2-Butylene oxide	106-88-7
Epichlorohydrin	106-89-8
1,3-Butadiene	106-99-0
1-Bromo-2-chloroethane	**107-04-0**
Allyl chloride	107-05-1
1,2-Dichloroethane	107-06-2
Acrylonitrile	107-13-1
Allyl alcohol	107-18-6
Propargyl alcohol	**107-19-7**
Ethylene glycol	107-21-1
Vinyl acetate	108-05-4
Methyl isobutyl ketone	108-10-1
Maleic anhydride	108-31-6
m-Cresol [6]	108-39-4
Toluene	108-88-3
Chlorobenzene	108-90-7
Cyclohexanol	**108-93-0**
Phenol [6]	108-95-2
2-Methylpyridine	**109-06-8**
2-Methoxyethanol	109-86-4
2-Methoxyethyl acetate	110-49-6
***n*-Hexane**	**110-54-3**
2-Ethoxyethanol	110-80-5
Cyclohexane	110-82-7
Pyridine [6]	110-86-1
2-Ethoxyethyl acetate	111-15-9
Diethanolamine [6]	111-42-2
2-Butoxyethanol	**111-76-2**
Propylene	115-07-1
Chlorendic acid	**115-28-6**
Bis(2-ethylhexyl) phthalate	117-81-7
Di-*n*-octyl phthalate	117-84-0
Anthracene	120-12-7
Isosafrole	120-58-1
Catechol	120-80-9
1,2,4-Trichlorobenzene	120-82-1
2,4-Dichlorophenol [6]	120-83-2
2,4-Dinitrotoluene	121-14-2
Triethylamine	**121-44-8**
N,N-Dimethylaniline [6]	121-69-7
Diphenylamine	**122-39-4**
Hydroquinone [6]	123-31-9
Propionaldehyde	123-38-6
Paraldehyde	**123-63-7**

NAME	CAS No.[1]
Butyraldehyde	123-72-8
1,4-Dioxane	123-91-1
Dimethylamine	**124-40-3**
Tetrachloroethylene	127-18-4
2,6-Di-*t*-butyl-4-methylphenol	**128-37-0**
Dimethyl phthalate	131-11-3
Nitrilotriacetic acid [6]	139-13-9
Ethyl acrylate	140-88-5
Butyl acrylate	141-32-2
2-Mercaptobenzothiazole	**149-30-4**
Calcium cyanamide	156-62-7
Hydrazine [6]	302-01-2
Halon 1211	**353-59-3**
4,6-Dinitro-*o*-cresol [6]	534-52-1
Ethyl chloroformate	541-41-3
3-Chloropropionitrile	**542-76-7**
Lithium carbonate	**554-13-2**
3-Chloro-2-methyl-1-propene	**563-47-3**
C.I. Basic Green 4	569-64-2
Toluene-2,4-diisocyanate	584-84-9
2,6-Dinitrotoluene	606-20-2
3,3'-Dichlorobenzidine dihydrochloride	**612-83-9**
1,1,1,2-Tetrachloroethane	**630-20-6**
C.I. Solvent Yellow 14	842-07-9
N-Methyl-2-pyrrolidone	**872-50-4**
N-Methylolacrylamide	**924-42-5**
C.I. Basic Red 1	989-38-8
Decabromodiphenyl oxide	1163-19-5
Dimethyl phenol	**1300-71-6**
Molybdenum trioxide	1313-27-5
Thorium dioxide	1314-20-1
Cresol [6,7]	1319-77-3
Xylene [7]	1330-20-7
Asbestos [8]	1332-21-4
Aluminum oxide [9]	1344-28-1
Methyl *tert*-butyl ether	1634-04-4
HCFC-141b	**1717-00-6**
Sulphur hexafluoride	**2551-62-4**
C.I. Disperse Yellow 3	2832-40-8
C.I. Solvent Orange 7	3118-97-6
Isophorone diisocyanate	**4098-71-9**
Crotonaldehyde	**4170-30-3**
C.I. Acid Green 3	4680-78-8
1,1-Methylene*bis* (4-isocyanatocyclohexane)	**5124-30-1**
2-(2-(2-(2-(*p*-Nonylphenoxy) ethoxy)ethoxy)ethoxy) ethanol	**7311-27-5**
Aluminum [10]	7429-90-5
Vanadium [10]	7440-62-2
Titanium tetrachloride	7550-45-0
Sodium nitrite	**7632-00-0**
Boron trifluoride	**7637-07-2**
Hydrochloric acid	7647-01-0
Phosphoric acid	7664-38-2

NAME	CAS No.[1]
Hydrogen fluoride	7664-39-3
Sulphuric acid	7664-93-9
Sodium fluoride	**7681-49-4**
Nitric acid	7697-37-2
Phosphorus [11]	7723-14-0
Bromine	**7726-95-6**
Potassium bromate	**7758-01-2**
Fluorine	**7782-41-4**
Chlorine	7782-50-5
Hydrogen sulphide	**7783-06-4**
Calcium fluoride	**7789-75-5**
Nonylphenol polyethylene glycol ether	**9016-45-9**
Chlorine dioxide	10049-04-4
Iron pentacarbonyl	**13463-40-6**
2,4,4-Trimethylhexamethylene diisocyanate	**15646-96-5**
2,2,4-Trimethylhexamethylene diisocyanate	**16938-22-0**
2-(2-(*p*-Nonylphenoxy)ethoxy) ethanol	**20427-84-3**
***n*-Nonylphenol [7]**	**25154-52-3**
Dinitrotoluene [7]	25321-14-6
***p*-Nonylphenol polyethylene glycol ether**	**26027-38-3**
Toluenediisocyanate [7]	26471-62-5
Nonylphenol hepta (oxyethylene) ethanol	**27177-05-5**
Nonylphenol nona (oxyethylene) ethanol	**27177-08-8**
Nonylphenoxy ethanol	**27986-36-3**
C.I. Direct Blue 218	**28407-37-6**
Ethoxynonyl benzene	**28679-13-2**
HCFC-123 and all isomers [12]	**34077-87-7**
HCFC-122 and all isomers [13]	**41834-16-6**
HCFC 124 and all isomers [14]	**63938-10-3**
Alkanes, C_{6-18}, chloro	**68920-70-7**
Nonylphenol, industrial	**84852-15-3**
Alkanes, C_{10-13}, chloro	**85535-84-8**

* No single CAS number applies to this NPRI listing.

1 CAS Registry Number denotes the Chemical Abstracts Service Registry Number, as appropriate.

2 "Ammonia (total)" means the total of both of ammonia (NH_3 – CAS # 7664-41-7) and the ammonium ion (NH_4^+) in solution.

3 "and its compounds"

4 "ionic"

5 "in solution at a pH of 6.0 or greater"

6 "and its salts" – The CAS number corresponds to the weak acid or base. However, the NPRI listing includes the salts of these weak acids and bases. When calculating the weight of these substances and their salts, use the molecular weight of the acid or base, not the total weight of the salt.

7 "mixed isomers"

8 "friable form"

9 "fibrous forms"

10 "fume or dust"

11 "yellow or white"

12 The isomers include, but are not necessarily limited to, HCFC-123 (CAS # 306-83-2) and HCFC 123a (CAS # 90454-18-5).

13 The isomers include, but are not necessarily limited to, HCFC-122 (CAS # 354-21-2)

14 The isomers include, but are not necessarily limited to, HCFC 124 (CAS # 2837-89-0), and HCFC 124a (CAS # 354-25-6).

Appendix 3 – Substances Added to the 1999 NPRI List

Introduction

Seventy-three substances have been added to the NPRI's existing list of 172 substances for the 1999 reporting year. The additions were made following public consultations and acceptance of certain recommendations of the multi-stakeholder Ad-hoc Working Group on Substances. A Supplementary Notice regarding these new substances was published in the *Canada Gazette*, Part I, on April 24, 1999.

This appendix identifies the uses and sources of releases of these 73 substances, to help facilities determine if they potentially manufacture, process, or otherwise use them. Certain substances are grouped together since their uses are similar. These include two polychlorinated alkanes, four diisocyanates, 11 CFCs and HCFCs, two halons, and 12 nonylphenols and nonylphenol ethoxylates.

Each substance description includes a list of five-digit North American Industry Classification System (NAICS) codes to help identify the industrial sectors that might manufacture, process or otherwise use these substances. This information was based on Environment Canada sources and the 1996 U.S. Toxics Release Inventory database. It is recommended that the substance descriptions be considered along with the NAICS information. Sector and subsector NAICS classifications and their corresponding two-, three- and four-digit codes are listed in Appendix 5. The electronic reporting form provides a pick-list of the six-digit NAICS Canada codes.

Reporters should note that **not all** uses and sources of releases of a substance are indicated in this guide, particularly if the substance is universal in its industrial or commercial application.

Many sources of information were used to develop the substance descriptions, with the following being the most noteworthy:

1. Health and Safety Reports of the U.S. National Toxicology Program (N.T.P.)
   Web site: **ntp-support.niehs.nih.gov/htdocs/Chem_Hs_Index.html**
2. Spectrum Chemical Fact Sheets of Spectrum Laboratories Inc.
   Web site: **www.speclab.com/compound/**
3. The Environmental Defense Fund's Scorecard
   Web site: **www.scorecard.org/**
4. Information from Environment Canada sources used for Priority Substances List (PSL) assessments and other programs.

New NPRI Substances for the 1999 reporting year

NAME	CAS No.
Acetophenone	98-86-2
Boron trifluoride	7637-07-2
Bromine	7726-95-6
1-Bromo-2-chloroethane	107-04-0
2-Butoxyethanol	111-76-2
C.I. Direct Blue 218	28407-37-6
Calcium fluoride	7789-75-5
Chlorendic acid	115-28-6
3-Chloro-2-methyl-1-propene	563-47-3
3-Chloropropionitrile	542-76-7
Crotonaldehyde	4170-30-3
Cyclohexanol	108-93-0
2,6-Di-*t*-butyl-4-methylphenol	128-37-0
3,3'-Dichlorobenzidine dihydrochloride	612-83-9
Dicyclopentadiene	77-73-6
Dimethylamine	124-40-3
Dimethyl phenol	1300-71-6
Diphenylamine	122-39-4
Fluorine	7782-41-4
Formic acid	64-18-6
Hexachlorophene	70-30-4
n-Hexane	110-54-3
Hydrogen sulphide	7783-06-4
Iron pentacarbonyl	13463-40-6
Isoprene	78-79-5
Lithium carbonate	554-13-2
2-Mercaptobenzothiazole	149-30-4
N-Methylolacrylamide	924-42-5
2-Methylpyridine	109-06-8
N-Methyl-2-pyrrolidone	872-50-4
p-Nitroaniline	100-01-6
Paraldehyde	123-63-7
Pentachloroethane	76-01-7
Potassium bromate	7758-01-2
Propargyl alcohol	107-19-7
Sodium fluoride	7681-49-4
Sodium nitrite	7632-00-0
Sulphur hexafluoride	2551-62-4
1,1,1,2-Tetrachloroethane	630-20-6
Tetracycline hydrochloride	64-75-5
Tetraethyl lead	78-00-2
Triethylamine	121-44-8
POLYCHLORINATED ALKANES	
Alkanes, C_{6-18}, chloro	68920-70-7
Alkanes, C_{10-13}, chloro	85535-84-8
DIISOCYANATES	
Isophorone diisocyanate	4098-71-9
1,1-Methylene*bis* (4-isocyanatocyclohexane)	5124-30-1
2,2,4-Trimethylhexamethylene diisocyanate	16938-22-0
2,4,4-Trimethylhexamethylene diisocyanate	15646-96-5
HALONS (BROMOFLUOROCARBONS)	
Halon 1211	353-59-3
Halon 1301	75-63-8
CFCs (CHLOROFLUOROCARBONS) AND HCFCs (HYDROCHLOROFLUOROCARBONS)	
CFC-11	75-69-4
CFC-12	75-71-8
CFC-13	75-72-9
CFC-114	76-14-2
CFC-115	76-15-3
HCFC-22	75-45-6
HCFC-122 and all isomers [1]	41834-16-6
HCFC-123 and all isomers [2]	34077-87-7
HCFC 124 and all isomers [3]	63938-10-3
HCFC-141b	1717-00-6
HCFC-142b	75-68-3
NONYLPHENOLS AND NONYLPHENOL ETHOXYLATES	
Ethoxynonyl benzene	28679-13-2
Nonylphenol	104-40-5
Nonylphenol hepta (oxyethylene) ethanol	27177-05-5
Nonylphenol, industrial	84852-15-3
Nonylphenol nona(oxyethylene) ethanol	27177-08-8
n-Nonylphenol (mixed isomers)	25154-52-3
Nonylphenol polyethylene glycol ether	9016-45-9
p-Nonylphenol polyethylene glycol ether	26027-38-3
Nonylphenoxy ethanol	27986-36-3
2-(*p*-Nonylphenoxy) ethanol	104-35-8
2-(2-(*p*-Nonylphenoxy)ethoxy) ethanol	20427-84-3
2-(2-(2-(2-(*p*-Nonylphenoxy) ethoxy)ethoxy)ethoxy) ethanol	7311-27-5

1 The isomers include, but are not necessarily limited to, HCFC-122 (CAS # 354-21-2).

2 The isomers include, but are not necessarily limited to, HCFC-123 (CAS # 306-83-2) and HCFC 123a (CAS # 90454-18-5).

3 The isomers include, but are not necessarily limited to, HCFC 124 (CAS # 2837-89-0), and HCFC 124a (CAS # 354-25-6).

Acetophenone 98-86-2

Acetophenone is a colourless, slightly oily liquid with a sweet, pungent, orange blossom or jasmine-like odour. It is used as a fragrance ingredient in soaps, detergents, creams, lotions and perfumes. Acetophenone is also found in emissions from waste incineration, fuel oil and coal combustion. Other uses include:

- as a flavouring agent in foods, non-alcoholic beverages and tobacco,
- as a specialty solvent for plastics and resins,
- as a catalyst for the polymerization of olefins, and
- as a photosensitizer in organic syntheses.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
21111, 22111, 22112, 31194, 31311, 31331, 31499, 32192, 32411, 32511, 32512, 32513, 32518, 32519, 32521, 32531, 32532, 32541, 32551, 32561, 32562, 32599, 32731, 33131, 33142, 33149, 33281, 33341, 33399, 33592, 33999, 42186, 42269, 49111, 51224, 51229, 51419, 51421, 52232, 54119, 54134, 54135, 54137, 54141, 54142, 54149, 54187, 54189, 54193, 54199, 56142, 56143, 56149, 56159, 56179, 56191, 56192, 56199, 56221, 56292, 71141, 81232, 81299

Boron trifluoride 7637-07-2

Due to its potency as a Lewis acid (or electron acceptor) and its great resistance to hydrolysis, boron trifluoride is widely used as an acidic catalyst for organic synthesis reactions, such as alkylation and isomerization. Boron trifluoride can be used as a reagent for desulphurizing solvents and intermediates as well as desulphurizing cracked petroleum distillates. It is also used for separating xylene isomers or for absorbing the water of nitration. Boron trifluoride is also used in:

- brazing fluxes for metals and alloys,
- the manufacture of lube oil additives, and
- the production of high-purity boron isotopes.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
21111, 32229, 32419, 32511, 32512, 32513, 32518, 32519, 32521, 32522, 32531, 32551, 32561, 32591, 32599, 33131, 33141, 33142, 33149, 33451, 33911

Bromine 7726-95-6

Bromine is one of the few chemical elements with fire-resistant properties and is therefore used as the building block for some of the most effective flame-retarding agents available to the plastics industry. Many pharmaceuticals rely on brominated intermediates during their manufacture. Examples of these bromine-containing pharmaceutical products include halothane, naproxen, 1-bromogalanthamine, bromohexine and bromocriptine. Bromine is used in the production of high-performance drilling fluids for oil and gas recovery and in the production of the gasoline additive, dibromoethane. Bromine is often used to prepare a wide variety of inorganic bromides and organobromides, which can be used in swimming pools (spas) and industrial water treatment to control algae, bacteria and odours. Bromine-containing chemicals can also be used as the light-sensitive component of a photographic emulsion, as an ingredient in photo-developing solutions or as pesticides in the production or storage of food crops. Producers of these bromine-containing chemicals for industrial and consumer applications are therefore involved with the use of bromine.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
11199, 21111, 31111, 31121, 31123, 31134, 31142, 31161, 31182, 31183, 31191, 31192, 31193, 31194, 31199, 32411, 32511, 32512, 32513, 32518, 32519, 32521, 32522, 32531, 32532, 32541, 32551, 32552, 32561, 32562, 32591, 32599, 33131, 33141, 33142, 33149, 33211, 33231, 33232, 33281, 33331, 33441, 33451, 33991

1-Bromo-2-chloroethane 107-04-0

This substance is a halogenated alkane used as a solvent, especially for cellulose esters and ethers. It is also used in organic synthesis and as a fumigant for vegetables and fruit.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
31121, 31141, 31142, 31194, 31199, 32511, 32512, 32518, 32519, 32522

2-Butoxyethanol 111-76-2

This substance is a glycol ether widely used as a solvent in paints and protective coatings, in printing inks, in the dyeing and printing of textiles, in industrial cleaners and in the manufacturing of electronic equipment. It is also used as a solvent for nitrocellulose, natural and synthetic resins and as a de-icer in fuel and automotive brake fluids.

This substance is not listed on the U.S. Toxics Release Inventory. It is, however listed on the second Priority Substances List (PSL 2) under the *Canadian Environmental Protection Act (CEPA)*. The following NAICS codes are based on the data collected as part of the PSL assessment for toxicity.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
21111, 31194, 32419, 32511, 32512, 32513, 32518, 32519, 32521, 32551, 32552, 32561, 32591, 32599, 33131, 33611, 33612, 33621, 33631, 33632, 33633, 33634, 33635, 33639, 33699, 51111, 51112, 51113, 51223

C.I. Direct Blue 218 28407-37-6

C.I. Direct Blue 218 is a copper-chelated dye commonly used to colour cellulose, acetate, nylon, silk, wool, tissues and papers. In the textile industry, it is used for goods with a urea-formaldehyde finish.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
32211, 32212, 32213, 32222, 32511, 32512, 32513, 32518, 32519, 42269

Calcium fluoride 7789-75-5

Calcium fluoride is one of the inorganic fluorides identified as being toxic, as a result of its assessment required for the first Priority Substances List (PSL 1) under the *Canadian Environmental Protection Act (CEPA)*. The assessment has concluded that inorganic fluorides are entering the environment in quantities or under conditions that may be harmful to the environment. Fluorapatite, an important calcium fluoride-containing mineral, is used as a source of phosphates in the fertilizer industry. It is used:

- as a flux in steel, glass and enamel production,
- as the raw material for the production of hydrofluoric acid and anhydrous hydrogen fluoride, and
- as a molten electrolyte for the separation of oxygen and alumina in aluminum production.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
21111, 32419, 32513, 32518, 32531, 32599, 32711, 32721, 33111, 33122, 33131

Chlorendic acid 115-28-6

Chlorendic acid is used primarily as a chemical intermediate in the preparation of fire-retardant polyester resins and plasticizers. It also has a number of other uses, including:

- as a chemical intermediate in the manufacture of corrosion resistant polyester resins,
- in the production of polymer systems used in oil-modified paints and coatings,
- as a hardening agent for epoxy resins used in printed circuit boards,
- in the production of flame-retardant additives such as dibutyl chlorendate and dimethyl chlorendate, and
- as an extreme-pressure lubricant.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODE
32521

3-Chloro-2-methyl-1-propene 563-47-3

3-Chloro-2-methyl-1-propene is a colourless to straw-coloured, volatile liquid with a pungent odour. It is used primarily as a chemical intermediate in the production of carbofuran, a carbamate insecticide used mostly on corn. Other uses are:

- as a chemical intermediate in the production of herbicides,
- as a textile additive,
- as a perfume additive, and
- as an intermediate in the production of plastics, pharmaceuticals and other chemicals.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
21111, 31194, 32511, 32512, 32513, 32518, 32519, 32521, 32532, 32551, 32599, 33131

3-Chloropropionitrile 542-76-7

This nitrogen-containing substance is a colourless liquid used as a chemical intermediate in pharmaceutical and polymer synthesis. 3-Chloropropionitrile was listed on the U.S. Toxics Release Inventory in 1996, but there were no reports on the substance. The following NAICS codes are based on the uses described above.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
32521, 32541

Crotonaldehyde 4170-30-3

Crotonaldehyde is a colourless to straw-coloured liquid with an irritating, pungent and suffocating odour. Crotonaldehyde has many uses, including:

- as a chemical intermediate in the manufacture of butyl alcohol, butyl-aldehyde, quinaldine, crotonic acid, maleic acid, crotyl alcohol and butyl chloral hydrate,
- in polymer technology as a reaction medium, formulator, adhesive antioxidant, corrosion inhibitor and stabilizer and as a solvent for polyvinyl chloride,
- in organic synthesis in the manufacture of resins, dyestuffs, sedatives, pesticides, chemotherapeutic agents and flavouring agents,
- as a solvent for purification of mineral and lubricating oils,
- as an alcohol denaturant,
- as an odourant and warning agent in fuel gases,
- in leather tanning and the preparation of tanning materials,
- in the manufacture of surface-active agents,

- in the manufacture of rubber and rubber antioxidants and accelerators,
- in the manufacture of tear gas and chemical warfare agents, and
- in photographic emulsion as a hardening agent for gelatin.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
31521, 31522, 31523, 31529, 32511, 32512, 32513, 32518, 32519, 32521, 32522, 32531, 32541, 32591

Cyclohexanol 108-93-0

Cyclohexanol is used in the synthesis of adipic acid for nylon production. Other uses include:

- as a solvent in textile finishing, plastics and resins manufacturing and in surface coatings,
- as a paint and varnish remover, and
- as an ingredient of germicide formulation.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
21111, 31194, 32222, 32312, 32511, 32512, 32513, 32518, 32519, 32521, 32522, 32531, 32532, 32541, 32551, 32561, 32562, 32599, 32611, 32731, 33131, 33281, 33411, 33441, 33461, 33991

2,6-Di-*t*-butyl-4-methylphenol 128-37-0

This chemical is a white crystalline solid, widely used as an antioxidant and preservative in food and in the animal feed industry. It is also used for food packaging (waxed inner liners and packaging board). Other uses include:

- as an antioxidant and preservative in pharmaceutical preparations and cosmetic formulations containing fats and oils, and
- in the manufacture of rubber and petroleum products.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
31111, 31161, 32221, 32222, 32223, 32229, 32419, 32521, 32541, 32561, 32562, 32611

3,3’-Dichlorobenzidine dihydrochloride 612-83-9

This substance is a light tan-coloured powder. Most companies in Canada will not have to be concerned with reporting of 3,3’-dichlorobenzidine dihydrochloride as Environment Canada has studied it extensively and believes that there is only one company in Canada using it. The only known significant use of this substance is for the manufacture of colour pigments (used to colour printing inks, paints, textiles, plastics and crayons). Users of these pigments will not have to report.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
21111, 32419, 32511, 32512, 32513, 32518, 32519, 32521, 32531, 32532, 32541, 32551, 32599, 33131, 33712, 33721

Dicyclopentadiene 77-73-6

Dicyclopentadiene is a colourless crystal which is used as a chemical intermediate in the manufacture of insecticides, paints and varnishes. It is also used as a flame retardant in the production of plastics.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
21111, 31151, 31194, 31331, 31332, 31499, 31521, 31522, 31523, 31529, 32192, 32199, 32411, 32419, 32511, 32512, 32513, 32518, 32519, 32521, 32532, 32551, 32552, 32561, 32599, 32612, 32613, 32619, 32711, 32731, 32742, 32799, 33131, 33271, 33299, 33331, 33341, 33392, 33399, 33611, 33612, 33621, 33631, 33632, 33633, 33634, 33635, 33639, 33661, 33699, 33721, 33911, 33999, 42186, 42269, 48831, 48833, 48839, 49111, 51224, 51229, 51419, 51421, 52232, 53241, 54119, 54134, 54135, 54137, 54141, 54142, 54149, 54187, 54189, 54193, 54199, 56142, 56143, 56149, 56159, 56179, 56191, 56192, 56199, 71141, 71393, 81232, 81299

Dimethylamine 124-40-3

Dimethylamine is a colourless, flammable liquefied gas with an ammonia and fish-like odour. The uses of dimethylamine include:

- as a hairing agent in tanning,
- as an acid gas absorbent, a floatation agent, a gasoline stabilizer, or as an accelerator in the manufacture of dyes, pharmaceuticals, soaps, detergents and rubbers, and
- as an agricultural fungicide.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
21111, 31121, 31194, 31323, 31411, 32111, 32229, 32312, 32411, 32511, 32512, 32513, 32518, 32519, 32521, 32522, 32531, 32532, 32541, 32551, 32561, 32591, 32599, 32611, 33131, 33331, 33451, 33911, 42269

Dimethyl phenol (Xylenol) 1300-71-6

This chemical compound is a white, crystalline solid used in the preparation of coal tar disinfectants as well as in the manufacture of synthetic resins, polyphenylene oxide (2,6-isomer only), solvents, pharmaceuticals, insecticides and fungicides. It is also used in manufacturing plasticizers, rubber chemicals, additives for lubricants and gasolines, wetting agents and dyestuffs.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
21111, 31194, 32511, 32512, 32513, 32518, 32519, 32521, 32532, 32541, 32551, 32599, 33131

Diphenylamine 122-39-4

Diphenylamine is a white, crystalline solid used as an antioxidant in the lubricants and additives industries. Other uses are:

- in rubber as antioxidants and accelerators,
- in solid rocket propellants,
- in the manufacture of pesticides, dyes and pharmaceuticals,
- in veterinary medicine as a topical application in anti-screwworm mixtures and in tests for nitrate or nitrite poisoning,
- in the storage preservation for apples,
- as a stabilizer for nitrocellulose explosives and cellulose, and
- in analytical chemistry, for the detection of nitrates, chlorates and other strong oxidizers.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
21111, 31194, 31331, 32419, 32511, 32512, 32513, 32518, 32519, 32521, 32522, 32531, 32532, 32551, 32561, 32592, 32599, 32621, 33131, 33712

Fluorine 7782-41-4

Fluorine is a pale yellow gas and is the most powerful known oxidizing agent, reacting with virtually all organic and inorganic substances. It is used in the preparation of numerous inorganic and organic fluorine compounds of commercial importance, such as uranium hexafluoride, sulphur hexafluoride, boron trifluoride, antimony trifluoride, cobalt trifluoride, chlorine trifluoride, sodium fluoride and hydrofluoric acid.

Fluorine, which is often diluted with nitrogen, reacts with hydrocarbons to form corresponding fluorocarbons in which some, or all, hydrogen has been replaced by fluorine. The resulting compounds are usually characterized by great stability, chemical inertness and high electrical resistance. Useful plastics with non-sticking qualities, such as polytetrafluoroethylene (known by the commercial name, Teflon), are readily made from unsaturated fluorocarbons. Organic compounds containing chlorine, bromine or iodine are fluorinated to produce compounds such as dichlorodifluoromethane (CFC-12), the coolant used in most household refrigerators and air conditioners.

Fluorine is used as an oxidizer in rocket fuels as well as in the production of aluminum, glass, enamel, bricks and superphosphate fertilizers.

Since fluorine is present in the mineral matter, coal-fired power plants could be the major sources of fluorine releases.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
21111, 22111, 22112, 32312, 32511, 32512, 32513, 32518, 32519, 32521, 32599, 32616, 32712, 32733, 33131

Formic acid 64-18-6

Formic acid is used in natural and synthetic textile dyeing and finishing. It acts as a dye-exhausting agent, provides finishes to cotton and wool and is used as a compound to make fabrics shrink-proof and wrinkle-proof. Its chemical uses are as an intermediate in preparing chemicals such as formates and oxalic acid, as a strong reducing agent for acids, salts, dyes, fumigants, insecticides, refrigerants and pharmaceuticals and as a solvent for perfumes and lacquers. Formic acid is also used:

- in the leather-processing industry as a de-liming agent and neutralizer and also to tan, dehair and plump hides,
- in the rubber industry as a coagulant for natural rubber latex and form making, as well as to preserve latex,
- in the electroplating industry to control particle size and plating thickness, in silvering glass and as a reducing agent in chrome-dyeing and nickel-plating baths,
- in paper dyeing and finishing,
- in ore flotation,
- as an antiseptic in wine and beer brewing,
- as a flavour adjunct in perfumes,
- as a preservative in animal feed additives and in cleaning solution compounds,
- as a compound for stripping wire and preparing bare wires for soldering,
- as a laundry sour, and
- as an acidifying agent for oil wells.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
11199, 21111, 21221, 21222, 21223, 21229, 21232, 21239, 22111, 22112, 31121, 31134, 31142, 31182, 31183, 31191, 31192, 31193, 31194, 31199, 31311, 31321, 31324, 31331, 31332, 31499, 31519, 31521, 31522, 31523, 31529, 31599, 31611, 32111, 32121, 32191, 32192, 32199, 32211, 32212, 32213, 32221, 32222, 32223, 32229, 32312, 32411, 32419, 32511, 32512, 32513, 32518, 32519, 32521, 32522, 32531, 32532, 32541, 32551, 32552, 32561, 32562, 32591, 32599, 32611, 32614, 32615, 32619, 32629, 32721, 32791, 32799, 33122, 33131, 33142, 33149, 33211, 33221, 33243, 33251, 33261, 33281, 33291, 33299, 33331, 33341, 33399, 33422, 33431, 33441, 33512, 33521, 33593, 33611, 33612, 33621, 33631, 33632, 33633, 33634, 33635, 33636, 33639, 33699, 33712, 33721, 33911, 33992, 33993, 33999, 42269, 92119

Hexachlorophene 70-30-4

Hexachlorophene is a chlorinated bisphenol. It is a white, crystalline powder that is widely used as a disinfectant, bacteriocide and germicide against animal pathogenic bacteria and fungi. These bacteria and fungi are generally found on premises and equipment where livestock is kept, in hospitals and on hospital equipment, on surgical instruments as well as on industrial premises and industrial equipment. Because of its antibacterial characteristics, hexachlorophene is used as an agent in the manufacture of soaps and detergents and in the preparation of medicinal chemicals.

Hexachlorophene was listed on the U.S. Toxics Release Inventory in 1996, but there were no reports on the substance. The following NAICS codes are based on the uses described above.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
32541, 32561

n-Hexane 110-54-3

Normal hexane (*n*-hexane) is a clear, colourless liquid that has a faint gasoline-like odour. It is made from crude oil and is commonly used as a laboratory reagent. The major use of *n*-hexane is as a solvent to extract vegetable oils from crops such as soybeans, flax, peanuts and safflower seed. It is also used as a cleaning agent in the textile, furniture, shoemaking and printing industries (particularly rotogravure printing). *n*-Hexane is an ingredient of special glues that are used in the roofing, shoe and leather industries. It is used for binding books, shaping pills and tablets, canning, manufacturing tires and making baseballs. It is used as a catalyst carrier in the manufacture of polyolefins and certain elastomers and it assists in controlling molecular weight by dropping polymer out of a solution when a certain molecular weight is reached. It is also used to help determine the refractive index of minerals. Consumer products that contain small amounts of *n*-hexane include gasoline, rubber, cement, type-over correction fluids, non-mercury thermometers, alcohol preparations, paint thinners, degreasing agents or cleaners and aerosols in perfumes. Producers associated with these products are considered potential sources of *n*-hexane releases.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
11199, 21111, 21232, 21239, 31111, 31121, 31122, 31134, 31142, 31151, 31161, 31171, 31182, 31183, 31191, 31192, 31193, 31194, 31199, 31213, 31214, 31311, 31321, 31322, 31323, 31331, 31332, 31491, 31499, 31521, 31522, 31523, 31529, 31599, 31611, 31621, 32191, 32192, 32199, 32211, 32212, 32213, 32221, 32222, 32311, 32312, 32411, 32412, 32419, 32511, 32512, 32513, 32518, 32519, 32521, 32522, 32531, 32532, 32541, 32551, 32552, 32561, 32562, 32591, 32592, 32599, 32611, 32612, 32614, 32615, 32619, 32621, 32622, 32629, 32712, 32721, 32731, 32733, 32739, 32741, 32791, 32799, 33131, 33142, 33149, 33151, 33211, 33221, 33232, 33241, 33243, 33251, 33261, 33271, 33281, 33291, 33299, 33311, 33313, 33322, 33329, 33331, 33341, 33351, 33361, 33391, 33392, 33399, 33422, 33431, 33441, 33451, 33461, 33512, 33521, 33522, 33531, 33591, 33593, 33599, 33611, 33612, 33621, 33631, 33632, 33633, 33634, 33635, 33636, 33639, 33641, 33651, 33661, 33699, 33711, 33712, 33721, 33911, 33991, 33992, 33993, 33994, 33995, 33999, 42183, 42184, 42186, 42251, 42269, 42271, 44711, 44719, 45431, 48611, 48831, 48832, 48833, 48839, 48849, 49111, 49311, 49312, 49319, 51224, 51229, 51419, 51421, 52232, 53241, 54119, 54133, 54134, 54135, 54137, 54138, 54141, 54142, 54149, 54171, 54172, 54187, 54189, 54193, 54194, 54199, 56142, 56143, 56149, 56159, 56179, 56191, 56192, 56199, 56221, 56292, 71141, 81149, 81232, 81299, 92119

Hydrogen sulphide 7783-06-4

Hydrogen sulphide is a colourless, flammable, poisonous gas with the odour of rotten eggs. It burns in air with a pale blue flame. Hydrogen sulphide is released during the burning of sulphur-containing fuel oil and coal and also during the extraction and refining of oil and natural gas. It is released from pulp and paper plants using the kraft pulping process. It may also be generated by the leather industry, which uses sodium sulphide to remove hair from hides prior to tanning. Large quantities of hydrogen sulphide are used in the production of heavy water for nuclear reactors. Other uses are:

- in metallurgy for preparing metallic sulphides, separating metals and removing metallic impurities,
- in the manufacture of chemicals such as phosphorus-based additives for lubrication oils and greases,
- in the production of rayon textiles, and
- as an analytical reagent in chemical analysis.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
21111, 22111, 22112, 31321, 31611, 32211, 32212, 32213, 32419, 32513, 32518, 32599, 33111, 33122, 33131

Iron pentacarbonyl 13463-40-6

Iron pentacarbonyl is a yellow, viscous liquid, capable of spontaneous combustion in the presence of air. This organometallic chemical is used as a catalyst in organic synthesis. It is used to make carbonyl iron for high-frequency coils for the radio and television industry and as an anti-knock agent in motor fuels.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
32511, 32512, 32518, 32519

Isoprene 78-79-5

Isoprene is a colourless, volatile liquid used predominantly in the manufacture of synthetic and butyl rubbers. It can be used independently, or in combination with other rubbers, in the manufacture of tires and a variety of rubber articles, such as rubber footwear, sporting goods, bonding compounds and water repellents. It is also used for the manufacture of rubber articles used in the food and medical industries.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
31194, 31332, 31529, 31599, 31621, 32519, 32521, 32551, 32599, 32619, 32621, 32629, 33911, 33992, 33993

Lithium carbonate 554-13-2

Lithium carbonate is a white, soluble powder. It is used in ceramics, porcelain, varnishes, dyes and lubricating greases. As a catalyst, lithium carbonate has applications in battery alloys and semi-conductors. It is also used in aluminium smelting. Lithium carbonate is an active ingredient in pharmaceutical products, therefore it may be released into the atmosphere by medicinal chemical manufacturers.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
21111, 21232, 21239, 31194, 31611, 32419, 32511, 32512, 32513, 32518, 32519, 32521, 32532, 32541, 32551, 32552, 32561, 32599, 32619, 32711, 32712, 32721, 32731, 32733, 32739, 32742, 32791, 32799, 33122, 33131, 33142, 33149, 33221, 33241, 33261, 33281, 33291, 33299, 33311, 33322, 33329, 33331, 33399, 33512, 33521, 33531, 33599, 33641, 33712, 33993, 33999, 54171

2-Mercaptobenzothiazole 149-30-4

2-Mercaptobenzothiazole is a fine yellow powder which is commonly used as a vulcanization accelerator for the manufacture of rubber, tire treads and tire carcasses. Other uses include:

- as a copper deactivator and corrosion inhibitor in cutting oils and petroleum products, particularly in auto radiator coolants,
- as an extreme-pressure additive in greases,
- as an antioxidant/stabilizer in the manufacturing of plastics, and
- as a fungicide for preserving textiles.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
21111, 31194, 31321, 31331, 31332, 31411, 31529, 31599, 32419, 32511, 32512, 32513, 32518, 32519, 32521, 32532, 32541, 32551, 32552, 32561, 32599, 32619, 32621, 32629, 33122, 33131, 33142, 33149, 33261, 33592, 33911, 33992, 33993, 33999

N-Methylolacrylamide 924-42-5

N-Methylolacrylamide is a white, crystalline material used as an intermediate for copolymerization of vinyl acetate and acrylic acid. It is used as a polymer for coatings, varnishes, adhesives, crease-proof fabrics, wrinkle-resistant fabrics, and permanent-press textiles by irradiation bonding.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
21111, 31194, 32511, 32512, 32513, 32518, 32519, 32521, 32532, 32551, 32552, 32561, 32591, 32599, 33131, 33712, 33721

2-Methylpyridine 109-06-8

2-Methylpyridine is a colourless liquid used as a chemical intermediate in the dye and resins industries. It is also used as an organic intermediate in the manufacture of pharmaceuticals, rubber chemicals, solvents and agricultural products such as herbicides. 2-Methylpyridine is released into the atmosphere from vinyl pyridine production facilities, wastewater treatment plants, and energy-related processes such as coal gasification. It has also been discovered that tobacco smoke contains 2-methylpyridine.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
21111, 22132, 31194, 32419, 32511, 32512, 32513, 32518, 32519, 32521, 32531, 32532, 32551, 32599, 33111, 33122

N-Methyl-2-pyrrolidone 872-50-4

N-Methyl-2-pyrrolidone (NMP) is a highly polar, colourless liquid with a mild amine odour. It is widely used in the petroleum-processing industry for large-scale recovery of hydrocarbons and aromatics by extractive distillation and also in the preparation of semi-permeable membranes designed for the processes of ultrafiltration and reverse osmosis separation. There are many other uses of NMP, including:

- in the agricultural industry, as a component in the formulation of insecticides, pesticides, fungicides, herbicides and seed treatment products,
- in the plastics industry, as a solvent for natural and synthetic plastics, waxes, resins and various types of paints. It is also used in spinning fibres and yarns and to synthesize new polymers,
- in the electronics industry, as a cleaning agent for cleaning and degreasing single-crystal integrated circuits. It is also an active ingredient in water-miscible, semi-aqueous cleaners used to deflux printed wiring boards (PWBs) after wave solder or vapour-phase reflow,
- to clean engine parts (by removing oil and carbon deposits) and to remove such substances as printing ink residues, epoxies and temporary coatings from optical components,
- as a solvent for surface coatings, including acrylates, epoxies, polyurethanes, polyvinyl chlorides, polyamidimide-based wire enamels, water-based coatings and printing inks.
- as an ingredient in paint stripping products marketed for commercial and home use.

Some commercial trade names of this substance, including blends, are: M-Pyrol Solvent, “Surfadone”, LP-100 and LP-300 (N-alkylpyrrolidones), Non Meth and SP-NMP.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
11199, 21111, 21232, 21239, 31121, 31134, 31142, 31161, 31171, 31182, 31183, 31191, 31192, 31194, 31199, 31311, 31321, 31322, 31323, 31324, 31331, 31332, 31499, 31521, 31523, 31529, 31599, 31611, 32199, 32221, 32222, 32311, 32312, 32411, 32412, 32419, 32511, 32512, 32513, 32518, 32519, 32521, 32522, 32531, 32532, 32541, 32551, 32552, 32561, 32562, 32591, 32599, 32611, 32612, 32613, 32614, 32615, 32616, 32619, 32622, 32629, 32721, 32731, 32799, 33122, 33131, 33142, 33149, 33151, 33152, 33211, 33221, 33231, 33232, 33241, 33242, 33243, 33261, 33272, 33281, 33291, 33299, 33329, 33331, 33341, 33361, 33391, 33392, 33399, 33411, 33422, 33431, 33441, 33451, 33461, 33512, 33521, 33531, 33591, 33592, 33599, 33611, 33612, 33621, 33631, 33632, 33633, 33634, 33635, 33636, 33637, 33639, 33641, 33651, 33661, 33699, 33712, 33721, 33911, 33991, 33992, 33993, 33994, 33995, 33999, 42186, 42269, 42271, 42291, 44311, 44422, 44612, 44619, 45391, 45392, 45399, 45431, 48811, 48819, 48821, 49111, 51111, 51224, 51229, 51419, 51421, 52232, 53241, 54119, 54134, 54135, 54137, 54141, 54142, 54149, 54171, 54187, 54189, 54193, 54199, 56142, 56143, 56149, 56159, 56172, 56179, 56191, 56192, 56199, 56221, 56292, 71141, 81149, 81232, 81299, 92811

p-Nitroaniline 100-01-6

p-Nitroanoline is a bright yellow powder with a faint ammonia-like odour. It is used: as an intermediate in the manufacture of azo dyes, colouring agents, pharmaceuticals and pesticides,

- as an intermediate in the preparation of antioxidants, gasoline, gum inhibitors and veterinary medicines for poultry, and
- as an intermediate in the production of *p*-phenylenediamine.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
21111, 32511, 32512, 32513, 32518, 32519, 32521, 32541, 32561, 32599, 33131

Paraldehyde 123-63-7

Paraldehyde is a clear, colourless liquid used as a rubber accelerator and antioxidant. It is used as an intermediate in the manufacture of dyestuffs and many synthetic organic chemicals. It is also used as a solvent for the production of fats, oils, gums, resins and leather and as a solvent mixture for cellulose derivatives.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
21111, 31521, 31522, 31523, 31529, 32511, 32512, 32513, 32518, 32519, 32521, 32522, 32599, 33131, 33331

Pentachloroethane 76-01-7

Pentachloroethane is used as a solvent for oil and grease in metal cleaning and in separating coal from impurities by determining the density difference. Other uses include:

- as a chemical intermediate in the manufacture of tetrachloroethylene and dichloroacetic acid,
- as a solvent for cellulose acetate, as well as for certain cellulose ethers, resins and gums, and
- as a drying agent in the timber industry.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
21111, 32411, 32511, 32512, 32513, 32518, 32519, 32521, 32531, 32532, 32552, 32599, 33131

Potassium bromate 7758-01-2

Potassium bromate is a white, crystalline powder which is used:

- as a laboratory reagent,
- as a food additive, particularly as a maturing agent (conditioner) in the preparation of bread and flour,
- as a powerful brominating agent for deactivated aromatics, and
- as a mixture with aluminum and dinitrotoluene to prevent/repair concrete fracturing.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
11199, 31121, 31134, 31142, 31182, 31183, 31191, 31192, 31194, 31199

Propargyl alcohol 107-19-7

Propargyl alcohol is used as a corrosion inhibitor, a solvent stabilizer and a laboratory reagent. It is also used to prevent steel becoming brittle as a result of exposure to hydrogen and as a chemical intermediate for the synthesis of many chemicals.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
21111, 21232, 21239, 31194, 32312, 32511, 32512, 32513, 32518, 32519, 32521, 32531, 32532, 32541, 32551, 32561, 32562, 32599, 32799, 33131, 56221, 56292

Sodium fluoride 7681-49-4

Sodium fluoride is one of the inorganic fluorides identified as being toxic, as a result of the first Priority Substances List (PSL 1) assessment under the *Canadian Environmental Protection Act (CEPA)*. The assessment concluded that inorganic fluorides are entering the environment in quantities or under conditions that may be harmful to the environment.

Sodium fluoride is a white, crystalline, water-soluble powder widely used in municipal water-fluoridation systems and in many dental products. It is used in a variety of industrial applications, including: as a preservative in certain glues, in glass and enamel production, laundry soap manufacture, as a flux in steel and aluminum production, in electroplating fluxes and heat treating salt compositions. It is also used as a disinfectant for brewery apparatus, an anthelmintic in veterinary medicine, an insecticide, a wood preservative and in the removal of hydrogen fluoride from exhaust gases. Single crystals are used as windows in ultraviolet and infrared radiation-detection devices.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
22111, 22112, 22131, 32111, 32419, 32541, 32552, 32561, 32562, 32711, 32721, 33111, 33122, 33131, 33281, 33451

Sodium nitrite 7632-00-0

Sodium nitrite is a white, crystalline powder used:

- as a material for making dyestuffs, saccharin, chemical reagents and pharmaceuticals,
- as a rubber accelerator,
- as a sharp bleaching agent in the textile industry,
- in the food industry, as a colour fixative and preservative in cured meats, meat products and fish,
- in the machinery manufacturing and repairs industry, as an agent for heat-treating metals, and
- in the electroplating industry, as it is a corrosion inhibitor for steel.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
11199, 21111, 22111, 22112, 22121, 22133, 31111, 31121, 31134, 31141, 31142, 31161, 31182, 31183, 31191, 31192, 31194, 31199, 31212, 31311, 31321, 31322, 31323, 31331, 31332, 31499, 31521, 31523, 31529, 31599, 32211, 32212, 32213, 32222, 32411, 32419, 32511, 32512, 32513, 32518, 32519, 32521, 32522, 32531, 32532, 32541, 32551, 32552, 32561, 32562, 32591, 32592, 32599, 32612, 32614, 32615, 32619, 32622, 32629, 32711, 32721, 32742, 32799, 33111, 33121, 33122, 33131, 33142, 33149, 33151, 33152, 33211, 33221, 33231, 33232, 33241, 33243, 33251, 33261, 33272, 33281, 33291, 33299, 33311, 33312, 33322, 33329, 33331, 33341, 33351, 33361, 33391, 33392, 33399, 33429, 33451, 33461, 33511, 33512, 33521, 33522, 33531, 33591, 33599, 33611, 33612, 33621, 33631, 33632, 33633, 33634, 33635, 33636, 33637, 33639, 33641, 33651, 33699, 33712, 33721, 33911, 33991, 33992, 33993, 33999, 42193, 42269, 49311, 49312, 49319, 51111, 51222, 54171, 55111, 92119

Sulphur hexafluoride 2551-62-4

Sulphur hexafluoride is one of the inorganic fluorides identified as being toxic, as a result of the first Priority Substances List (PSL 1) assessment under the *Canadian Environmental Protection Act (CEPA)*. The assessment has concluded that inorganic fluorides are entering the environment in quantities or under conditions that may be harmful to the environment.

Sulphur hexafluoride is a colourless, odourless, non-flammable, liquefied gas used by the semi-conductor industry for plasma etching, prior to chemical vapour deposition. The gas is widely used in the power utility industry as an insulator for electrical switch-gear such as power circuit breakers. It is also used in cables, tubular transmission lines, electrostatic generators and transformers. Sulphur hexafluoride is used as a protective, inert gas over molten metals such as magnesium and aluminum. Therefore, magnesium producers and aluminum foundries are possible sources of sulphur hexafluoride releases. Sulphur hexafluoride is also used as a tracer gas in environmental monitoring equipment (Environment Canada believes the quantity of such use will not be sufficient to trigger the threshold for NPRI reporting).

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
33152, 33441, 33531

1,1,1,2-Tetrachloroethane 630-20-6

1,1,1,2-Tetrachloroethane is used as a chemical intermediate and solvent. It is used in the manufacture of pesticides, paints and varnishes and in laboratory reagents. Another use is as a feedstock for the production of solvents such as trichloroethylene and tetrachloroethylene.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
21111, 31194, 32312, 32411, 32511, 32512, 32513, 32518, 32519, 32521, 32522, 32532, 32541, 32551, 32552, 32599, 33131

Tetracycline hydrochloride 64-75-5

Tetracycline hydrochloride is a yellow powder which is used as an antimicrobial agent against bacteria. Releases to the environment may occur when this substance is used in pharmaceutical preparations.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
32541, 54171

Tetraethyl lead 78-00-2

Tetraethyl lead (TEL) is a colourless, oily liquid. It was used as an anti-knock agent in leaded gasoline and as a chemical intermediate for organomercury fungicides, but these applications are being phased out under environmental regulations addressing public health concerns. TEL is no longer manufactured in Canada. Gasoline containing high concentrations of TEL is still used by piston-powered airplanes and competition vehicles. TEL is currently used to make other metal alkyls and as a chemical intermediate for mixed alkyl leads for gasoline additives.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
21111, 31194, 32513, 32518, 32519, 32551, 32599, 33131

Triethylamine 121-44-8

Triethylamine is a colourless liquid with a strong ammonia-like odour. It is used:

- as a catalytic solvent in chemical syntheses,
- as an accelerator activator for rubber,
- as a corrosion inhibitor,
- as a propellant,
- as a curing and hardening agent for polymers,
- as a wetting, penetrating and waterproofing agent in the manufacture of quaternary ammonium compounds,
- in textile manufacture,
- in the desalination of seawater,
- in sewage treatment plants, and
- in natural gas production.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
11521, 21111, 21232, 21239, 22111, 22112, 22132, 23511, 31194, 31332, 31521, 31523, 31529, 31599, 31611, 32121, 32222, 32311, 32411, 32511, 32512, 32513, 32518, 32519, 32521, 32522, 32531, 32532, 32541, 32551, 32552, 32561, 32591, 32599, 32611, 32612, 32616, 32619, 32629, 32711, 32731, 32799, 33131, 33142, 33149, 33151, 33152, 33211, 33221, 33231, 33232, 33243, 33251, 33281, 33291, 33299, 33331, 33341, 33361, 33512, 33521, 33531, 33611, 33612, 33621, 33631, 33632, 33633, 33634, 33635, 33636, 33639, 33641, 33699, 33712, 33721, 33911, 33992, 33993, 33999, 42269, 44229, 45111, 48411, 48421, 48422, 48839, 54171, 54182, 56162, 56179, 56221, 56292, 56299, 61142, 61151, 71151, 71393, 81121, 81131, 81141, 81143, 81149

Polychlorinated Alkanes

SUBSTANCE	CAS Number
Alkanes, C_{6-18}, chloro	68920-70-7
Alkanes, C_{10-13}, chloro	85535-84-8

Alkanes, C_{10-13}, chloro (CAS # 85535-84-8) are chemical mixtures that fit into the definition of short-chain chlorinated paraffins category. The other substance, alkanes, C_{6-18}, chloro (CAS # 68920-70-7) may contain short-chain chlorinated paraffins, though strictly speaking it does not meet the definition because it also contains carbon chain lengths of less than 10, as well as carbon chain lengths that are greater than 13.

It is an accepted convention that short-chain chlorinated paraffins generally have a carbon chain length of between 10 and 13 carbon atoms and a chlorine content of between 40% and 70% by weight. They are considered to be more toxic than those species of intermediate or long-chain designations (carbon chain lengths of 14 or more carbon atoms).

The Chlorinated Paraffins Industry Association (CPIA) claims that, based on a recent informal survey of North American chlorinated paraffin producers, there seems to be no company currently producing a product that conforms to CAS #68920-70-7.

Chlorinated paraffins are generally meant to include products produced from the chlorination of petroleum-based paraffin fractions only. For NPRI reporting, any product conforming to the alkanes, C_{10-13}, chloro (CAS # 85535-84-8) definition should be reported.

Because of their high stability in a variety of conditions, short-chain chlorinated paraffins are widely used in numerous applications. The most common use is as an extreme-pressure, anti-wear additive in lubricants used for metal machinery (particularly cutting oils). The demand is particularly evident in the manufacture of automobiles, automobile parts and appliances.

Short-chain chlorinated paraffins are frequently used as plasticizers in plastics (including vinyls, resins and foams), paints (including enamels, polyurethanes and vinyls) and to a lesser degree in adhesives, caulks and sealants. They are also used as water repellants, as well as flame retardants in rubber and plastics.

The short-chain chlorinated paraffins are marketed under numerous trade names, such as Cereclor, Chlorez, Chlorowax, Chlorparaffin, Witaclor, Chlorflo, Paraoil and Unichlor.

The industrial sources of releases for these substances are listed below. The NAICS codes are for sectors which reported releases to the U.S. Toxics Release Inventory in 1996. It should be noted that the U.S. data represent the polychlorinated alkanes category consisting of many individual chemicals and/or mixtures, but since these two substances are believed to be part of the polychlorinated alkanes category, the same data are assumed to be applicable.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
21111, 31194, 31332, 31529, 31599, 32211, 32212, 32213, 32222, 32411, 32419, 32511, 32512, 32513, 32518, 32519, 32521, 32551, 32552, 32561, 32592, 32599, 32611, 32612, 32614, 32615, 32619, 32629, 32791, 33131, 33142, 33151, 33211, 33221, 33281, 33291, 33299, 33311, 33341, 33351, 33361, 33451, 33591, 33593, 33611, 33612, 33621, 33631, 33632, 33633, 33634, 33635, 33637, 33639, 33641, 33699, 33721, 33911, 33991, 33992, 33993, 54171

Diisocyanates

SUBSTANCE	CAS Number
Isophorone diisocyanate	4098-71-9
1,1-Methylene*bis*(4-isocyanatocyclohexane)	5124-30-1
2,2,4-Trimethylhexamethylene diisocyanate	16938-22-0
2,4,4-Trimethylhexamethylene diisocyanate	15646-96-5

These four substances are diisocyanates which share the same characteristics of high stability, resistance to light discolouration and chemical resistance. These diisocyanates are widely used as the raw materials from which all polyurethane products are made, including polyurethane foams, insulation materials, car seats, furniture, foam mattresses, under-carpet padding, packaging materials, shoes, laminated fabrics, polyurethane rubbers, etc. Their characteristic hardness, flexibility, abrasion and their chemical resistance to chalking and weathering, allows diisocyanates to be widely used in surface coatings such as paints, sealants and finishes. These diisocyanates are used in elastomers for application as flexible textile coatings and industrial wire coatings. They are also used in the manufacture of contact lenses.

The industrial sources of releases for these substances are listed below. The NAICS codes are for sectors which reported releases to the U.S. Toxics Release Inventory in 1996. It should be noted that the U.S. data represent the “diisocyanates” category of 20 substances reported as a whole, but since these four diisocyanates are part of the 20 substances included within the category, the same data are assumed to be applicable.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES

11199, 11331, 21111, 23595, 31121, 31122, 31134, 31142, 31161, 31182, 31183, 31191, 31192, 31194, 31199, 31211, 31311, 31321, 31322, 31323, 31331, 31332, 31411, 31499, 31521, 31522, 31523, 31529, 31599, 31611, 31621, 31699, 32111, 32121, 32191, 32192, 32199, 32212, 32213, 32221, 32222, 32229, 32311, 32312, 32411, 32412, 32419, 32511, 32512, 32513, 32518, 32519, 32521, 32522, 32531, 32532, 32541, 32551, 32552, 32561, 32562, 32591, 32599, 32611, 32612, 32613, 32614, 32615, 32616, 32619, 32621, 32622, 32629, 32711, 32712, 32721, 32733, 32739, 32741, 32742, 32791, 32799, 33121, 33131, 33142, 33149, 33151, 33152, 33211, 33221, 33231, 33232, 33241, 33242, 33243, 33251, 33261, 33271, 33272, 33281, 33291, 33299, 33311, 33312, 33322, 33329, 33331, 33341, 33351, 33361, 33391, 33392, 33399, 33411, 33421, 33422, 33429, 33431, 33441, 33451, 33461, 33512, 33521, 33522, 33531, 33592, 33593, 33599, 33611, 33612, 33621, 33631, 33632, 33633, 33634, 33635, 33636, 33637, 33639, 33641, 33651, 33661, 33699, 33711, 33712, 33721, 33791, 33911, 33991, 33992, 33993, 33994, 33995, 33999, 42112, 42122, 42269, 42292, 44131, 44221, 48821, 48839, 49311, 49312, 49319, 51112, 51113, 51114, 51119, 51222, 51223, 51421, 53221, 53229, 53231, 53241, 53242, 53249, 54151, 54171, 56299, 81149, 92711

Halons (bromofluorocarbons)

SUBSTANCE		CAS Number
Halon 1211	bromochlorodifluoromethane	353-59-3
Halon 1301	bromotrifluoromethane	75-63-8

Bromofluorocarbons or halons are similar to CFCs except they contain at least one bromine atom. They are inert, non-toxic and evaporate without leaving any residue. Production and import of halons were banned in Canada on January 1, 1994. Halons are still used as extinguishing agents in portable fire extinguishers and total flooding systems to protect high-value equipment such as computer centres and airplanes. Virgin material produced before 1994 as well as recovered, recycled and reclaimed halons are used to service existing equipment. The industrial sources of releases for the two different halons are listed below. The NAICS codes are for sectors which reported releases to the U.S. Toxics Release Inventory in 1996.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES

Halon-1211

31611, 32511, 32512, 32518, 32519, 32599, 32619, 33221, 33299, 33331, 33512, 33521, 33712, 33993, 33999, 42272, 42291, 44422, 92119

Halon-1301

31611, 32419, 32599, 32619, 33111, 33122, 33221, 33291, 33299, 33331, 33512, 33521, 33641, 33712, 33993, 33999, 42272, 42291, 44422, 54171, 54172, 92119

CFCs (chlorofluorocarbons) and HCFCs (hydrochlorofluorocarbons)

SUBSTANCE		CAS Number
CFC-11	trichlorofluoromethane	75-69-4
CFC-12	dichlorodifluoromethane	75-71-8
CFC-13	chlorotrifluoromethane	75-72-9
CFC-114	dichlorotetrafluoroethane	76-14-2
CFC-115	chloropentafluoroethane	76-15-3
HCFC-22	chlorodifluoromethane	75-45-6
HCFC-122 and all isomers [1]	trichlorodifluoroethane	41834-16-6
HCFC-123 and all isomers [2]	dichlorotrifluoroethane	34077-87-7
HCFC-124 and all isomers [3]	chlorotetrafluoroethane	63938-10-3
HCFC-141b	1,1-dichloro-1-fluoroethane	1717-00-6
HCFC-142b	1-chloro-1,1-difluoroethane	75-68-3

1 The isomers include, but are not necessarily limited to, HCFC-122 (CAS # 354-21-2).
2 The isomers include, but are not necessarily limited to, HCFC-123 (CAS # 306-83-2) and HCFC 123a (CAS # 90454-18-5).
3 The isomers include, but are not necessarily limited to, HCFC 124 (CAS # 2837-89-0), and HCFC 124a (CAS # 354-25-6).

CFCs are derivatives of hydrocarbons, which are composed of carbon and hydrogen atoms. In CFCs, the hydrogen atoms are replaced with chlorine and fluorine atoms, yielding an array of nontoxic, nonflammable gases which are useful in a wide variety of applications.

HCFCs are essentially CFCs that include one or more hydrogen atoms. The presence of hydrogen makes these compounds less stable. As a result HCFCs are more susceptible to photodecomposition, have much shorter atmospheric lifetimes than CFCs and, consequently, are less likely to migrate to the stratosphere where they would destroy ozone. They are, therefore, popular interim substitutes for CFCs.

Production and import of CFCs were banned in Canada on January 1, 1996. CFCs are still used as coolants in air conditioning and refrigeration systems. Virgin material produced before 1996, as well as recovered, recycled and reclaimed CFCs are used to service existing equipment.

HCFCs are used mainly as blowing agents in the production of polymers. They are used as coolants in air conditioning and refrigeration systems, as lubricant, coating or cleaning fluid for electrical or electronic equipment, as stabilizers in sterilization, as propellants or solvents in aerosols and as an extinguishing agent in portable fire extinguishers.

The industrial sources of releases for the different CFCs and HCFCs are listed below. The NAICS codes are for sectors which reported releases to the U.S. Toxics Release Inventory in 1996.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES

CFC-11
21111, 21232, 21239, 31211, 31323, 31621, 32312, 32511, 32512, 32513, 32518, 32519, 32521, 32522, 32532, 32541, 32561, 32599, 32741, 32799, 33131, 33211, 33241, 33243, 33251, 33281, 33291, 33299, 33311, 33322, 33329, 33331, 33341, 33636, 33639, 33641, 33721, 33991, 54171, 54172

CFC-12
11199, 21111, 31121, 31134, 31141, 31142, 31182, 31183, 31191, 31192, 31194, 31199, 31332, 31529, 31599, 32211, 32212, 32213, 32312, 32411, 32419, 32511, 32512, 32513, 32518, 32519, 32521, 32522, 32531, 32532, 32541, 32551, 32552, 32561, 32599, 32612, 32619, 32629, 33131, 33299, 33331, 33341, 33451, 33522, 33621, 33631, 33632, 33633, 33634, 33635, 33639, 33721, 33911, 33991, 33992, 33993, 42272, 42291, 44311, 44422, 54133, 54171, 81131, 81141, 92119, 92711, 92811

CFC-13
21111, 32511, 32512, 32513, 32518, 32519, 32599, 33131

CFC-114
21111, 31194, 32511, 32512, 32513, 32518, 32519, 32521, 32522, 32541, 32551, 32561, 32599, 32614, 32615, 33131, 42272, 42291, 44422, 92119, 92811

CFC-115
21111, 32511, 32512, 32513, 32518, 32519, 32521, 32561, 32599, 33131

HCFC-22
11199, 21111, 31121, 31122, 31133, 31134, 31142, 31151, 31152, 31161, 31181, 31182, 31183, 31191, 31192, 31194, 31199, 31323, 31331, 31332, 31499, 31529, 31599, 31611, 32199, 32211, 32212, 32213, 32229, 32312, 32411, 32419, 32511, 32512, 32513, 32518, 32519, 32521, 32522, 32531, 32532, 32541, 32551, 32552, 32561, 32591, 32599, 32612, 32614, 32615, 32619, 32629, 33122, 33131, 33141, 33142, 33149, 33211, 33221, 33231, 33232, 33243, 33251, 33261, 33281, 33291, 33299, 33329, 33331, 33341, 33391, 33392, 33399, 33411, 33422, 33429, 33441, 33451, 33461, 33512, 33521, 33522, 33621, 33631, 33632, 33633, 33634, 33635, 33636, 33639, 33641, 33712, 33721, 33911, 33991, 33992, 33993, 33999, 42173, 42186, 42271, 45431, 49111, 51224, 51229, 51419, 51421, 52232, 54119, 54133, 54134, 54135, 54137, 54141, 54142, 54149, 54171, 54172, 54187, 54189, 54193, 54199, 56142, 56143, 56149, 56159, 56179, 56191, 56192, 56199, 71141, 81232, 81299, 92711, 92811

HCFC-123 and all isomers
21111, 31194, 31611, 32312, 32411, 32419, 32511, 32512, 32513, 32518, 32519, 32521, 32532, 32541, 32551, 32552, 32561, 32599, 32611, 32619, 32721, 32791, 33131, 33221, 33299, 33331, 33341, 33441, 33512, 33521, 33593, 33639, 33712, 33993, 33999, 44311, 81131, 81141

HCFC-124 and all isomers
21111, 32229, 32511, 32512, 32513, 32518, 32519, 32521, 32522, 32541, 32561, 32599, 33131, 33299, 33451, 33911

HCFC-141b
21111, 23595, 31194, 31311, 31321, 31322, 31323, 31324, 31331, 31332, 31499, 31519, 31521, 31522, 31523, 31529, 31599, 31611, 32121, 32191, 32199, 32213, 32222, 32229, 32312, 32411, 32419, 32511, 32512, 32513, 32518, 32519, 32521, 32522, 32532, 32551, 32552, 32561, 32562, 32592, 32599, 32611, 32612, 32614, 32615, 32619, 32629, 32733, 32739, 32799, 33111, 33122, 33131, 33142, 33149, 33152, 33211, 33221, 33231, 33232, 33243, 33251, 33261, 33272, 33281, 33291, 33299, 33329, 33331, 33341, 33351, 33361, 33391, 33392, 33399, 33411, 33422, 33429, 33431, 33441, 33451, 33461, 33511, 33512, 33521, 33522, 33531, 33591, 33592, 33593, 33599, 33621, 33631, 33632, 33633, 33634, 33635, 33636, 33639, 33641, 33661, 33699, 33712, 33721, 33911, 33991, 33992, 33993, 33999, 42112, 42186, 42269, 44131, 49111, 51222, 51224, 51229, 51419, 51421, 52232, 54119, 54134, 54135, 54137, 54141, 54142, 54149, 54171, 54187, 54189, 54193, 54199, 56142, 56143, 56149, 56159, 56179, 56191, 56192, 56199, 71141, 81149, 81232, 81299

HCFC-142b
21111, 31194, 31332, 31529, 31599, 32199, 32511, 32512, 32513, 32518, 32519, 32521, 32522, 32551, 32552, 32599, 32614, 32615, 32619, 32629, 33131, 33142, 33911, 33992, 33993, 42269

Nonylphenols and nonylphenol ethoxylates

SUBSTANCE	CAS Number
Nonylphenol	104-40-5
Nonylphenol, industrial	84852-15-3
n-Nonylphenol (mixed isomers)	25154-52-3
Ethoxynonylbenzene	28679-13-2
Nonylphenol hepta(oxyethylene) ethanol	27177-05-5
Nonylphenol nona(oxyethylene) ethanol	27177-08-8
Nonylphenol polyethylene glycol ether	9016-45-9
p-Nonylphenol polyethylene glycol ether	26027-38-3
Nonylphenoxy ethanol	27986-36-3
2-(*p*-Nonylphenoxy)ethanol	104-35-8
2-(2-(*p*-Nonylphenoxy)ethoxy)ethanol	20427-84-3
2-(2-(2-(2-(*p*-Nonylphenoxy)ethoxy)ethoxy)ethoxy)ethanol	7311-27-5

Nonlyphenols and nonylphenol ethoxylates are a class of surfactants, which are used in high volumes as detergents, emulsifiers, wetting agents and dispersing agents. The other uses of these chemicals are as additives, chemical intermediates and absorbents, as catalysts, accelerators, initiators and activators and as flavouring agents for fragrances, perfumes and deodorants. They are also used as oil well treating agents, photosensitive agents, antioxidants and corrosion and tarnish inhibitors.

Products containing nonylphenol ethoxylates are used in many sectors including soap and detergent manufacturing, textile manufacturing, pulp and paper manufacturing, paints and protective coatings, plastics and resins production, petroleum production, oil and gas recovery, steel manufacturing, pest control products formulation and

manufacturing, leather processing, food and beverage processing and power generation. The products have numerous applications, including controlling deposits on machinery, cleaning equipment and scouring fibres. They are also used in dyeing, machine felt cleaning and conditioning and in product finishing.

For the textile and leather industries, the following commercial products containing nonylphenol ethoxylates (as marketed under the various trade names) are believed to be used: Cloterge CS and OE, Conco NI-40, Daraclean 6028, Div-O-Jay, Hyonic PE-100, Iconol, Igepal CO-210, Igepal CO-530, Igepal CO-710, Igepal CO-850, Igepal CO-880, Makon 4, Makon 6, Makon 8, Makon 10, Makon 12, Makon 14, Makon 30, PC 3960, Polytergent B-150, Polytergent B-200, Polytergent B-300, Polytergent B-350, Polytergent B-500, Rexol 25/1, Rexol 25/507, Rildet TD-5, Stantex, Sterox ND, Sterox NJ, Sterox NK, Sure Safe 405, Surfonic N-10, Surfonic N-31.5, Surfonic N-40, Surfonic N-60, Surfonic N-95, Surfonic N-100, Surfonic N-120, Surfonic N-300, T-DET-N-4, T-DET-N-6, T-DET-N-9.5, T-DET-N-14, Tergitol NP-4, Tergitol NP-7, Tergitol NP-9, Tergitol NP-40, Triton N-57, Triton N-111 and Versamine.

As well as being used in industry, a variety of cleaning products, degreasers and detergents containing nonylphenol ethoxylates are available for institutional or domestic use. These products, after their use, could be discharged into municipal wastewater treatment plants. These treatment plants, therefore, must be considered as a potential source of releases of nonylphenol ethoxylates to the environment.

The nonylphenols and nonylphenol ethoxylates are not listed on the U.S. Toxics Release Inventory and therefore the NAICS codes for reporting of their manufacture, processing or other use in the U.S. are not available. The following NAICS codes are based only on the uses described above.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES
21111, 22111, 22112, 22132, 31161, 31194, 31211, 31212, 31213, 31214, 31321, 31331, 31611, 32211, 32212, 32213, 32411, 32419, 32521, 32532, 32551, 32561, 33111, 33122

Appendix 4 – Software User's Guide

NPRI Reporting Software for Windows 95/98/NT

For the first time, the NPRI reporting software is available as a 32-bit application for computers running Microsoft Windows 95, 98 or NT. The software retains the familiar design and layout of the original MS DOS program, but is more convenient to install and use on computers running Windows. The software features context-sensitive help, improved printing of reports, improved performance with Windows NT and networks, and the ease of Windows' graphical user interface. The software is completely compatible with the MS DOS version.

Hardware and Software Requirements

The Windows reporting software is a 32-bit application that can only be used on computers running Microsoft Windows 95, 98 or NT. The minimum requirements for using the Windows electronic reporting form are:

- Intel 486 compatible personal computer
- Windows 95, Windows 98 or Windows NT
- CD-ROM drive or a 3.5″, high-density disk drive
- a hard disk drive with 20 or more megabytes (Mb) of available space

Installing the Windows Reporting Software

- Start Windows 95/98/NT.
- Insert the NPRI CD-ROM into your CD-ROM drive. The NPRI CD browser will automatically launch if Autorun is enabled on your system. The CD browser will allow you to install either the MS DOS or Windows version of the reporting software, as well as view the NPRI guidance documents.
- If the CD browser does not appear, open the Windows/NT Explorer, select the CD-ROM drive and double-click on the file **Setup.exe**.
- Follow the installation instructions.

NPRI Reporting Software for MS DOS

Hardware and Software Requirements

Computers that use MS DOS, Windows 3x and Windows for Workgroups can only use the MS DOS reporting software. The minimum requirements for using the MS DOS electronic reporting form are:

- Intel 80286 (IBM AT) compatible personal computer
- DOS Version 3.1 or higher
- CD-ROM drive or a 3.5″, high-density disk drive
- a hard disk drive with three (3) or more megabytes (Mb) of available space
- a printer, either HP LaserJet or Epson FX compatible
- a CONFIG.SYS or CONFIG.NT file with "FILES = 70" and "BUFFERS = 40"
- 510 Kb of free conventional memory.

Installing from Windows 95/98/NT

- Start Windows 95/98/NT.
- Insert the NPRI CD-ROM into your CD-ROM drive. The NPRI CD browser will automatically launch if Autorun is enabled on your system. The CD browser will allow you to install either the MS DOS or Windows version of the reporting software, as well as view the NPRI guidance documents.
- If the CD browser does not appear, open the Windows/NT Explorer, select the CD-ROM drive and double-click on the file **Setup.exe**.
- Follow the installation instructions.

To run the MS DOS reporting software, open the "Windows/NT Explorer" and select the drive and directory in which the software was installed (usually **C:\NPRI99**). Double-click on the shortcut file **1999NPRI** or **1999INRP**. These files allocate file handles, buffers and memory for MS DOS programs. The shortcut files will only work if the software was installed in the default directory (**C:\NPRI99**). If the software was installed elsewhere, refer to the CD-ROM distribution disk for instructions to modifying these files.

Alternately, open the "Windows Explorer", select the drive and directory in which the software was installed and double-click on **NPRI.BAT**. Or, click the "Start" button and select "Run". Enter the full path name of the NPRI batch file (e.g., **C:\NPRI99\NPRI.BAT**). Re-index all database files after installation.

Installing from Windows 3.x or Windows for Workgroups

- Start Windows.
- Insert the NPRI CD-ROM. In the following instructions, replace "D:" with the letter of your CD-ROM drive.
- In Windows, click the "File" menu of the "Program Manager" and select "Run". Type **D:\SOFTWARE\SETUP16** and press [**Enter**].
- Follow the installation instructions.

To run the program in Windows 3.x, go to "File Manager", select the drive and folder in which the software was installed and double-click on **NPRI.BAT**. Re-index all database files after installation (see "Maintain System Files").

Installing from DOS

- Insert the NPRI CD-ROM. In the following instructions, replace "D:" with the letter of your CD-ROM drive.
- From the DOS prompt, type **D:\MAKEDISK** and press [**Enter**]. This utility creates a bootable installation disk on a floppy disk in drive **A**:.
- Follow the installation instructions.

To start the NPRI software program, select the drive on which the software was installed (usually C:). At the DOS prompt, select the directory (usually **CD C:\NPRI99**) which contains the NPRI software. Once you are in the directory, type **NPRI** and press [**Enter**] to run the software program. Re-index all database files after installation (see "Maintain System Files").

DOS Error 4

The reporting software may fail and display a "DOS Error 4" message if there is insufficient memory to open all the database files the program uses. This may occur even when using a computer that has several megabytes of random access memory. It occurs because MS DOS programs are restricted to using only the first 640 Kb of memory. MS Windows, Local Area Network (LAN) programs and any "terminate and stay resident" (TSR) programs reduce available memory for the NPRI software. From the MS DOS prompt, use the MEM command to display the amount of used and free memory in your system. If the program fails and displays the error message "Low Base Memory" or "Conventional Memory Exhausted", you should do one or more of the following:

- close your LAN connection,
- close any TSR programs such as screen savers,
- exit Windows 3.x or Windows for Workgroups,
- shut down Windows 95 and reboot the computer in MS DOS mode, and/or
- reboot the computer using the "bootable" floppy disk that contains the MS DOS software installation files.

There may also be insufficient file handles or buffers to open all the database files. File handles and buffers are allocated in a configuration file. On Windows 95/98 systems, the **CONFIG.SYS** file is usually located in the root directory (**C:**). On Windows NT systems, the **CONFIG.NT** file is in the system directory (**C:\WINNT\SYSTEM32**). Open the configuration file with a text-based application such as Notepad or Wordpad. Change or append the files and buffers command to read:

```
FILES = 70
BUFFERS = 40
```

You must then restart your computer for these changes to take effect.

MS DOS Function Keys

A list of available function keys is at the bottom of every screen of the MS DOS electronic reporting form. The most commonly used function keys are:

[**F1**] Provides help on a screen or particular field in which the cursor is placed.

[**F3**] Usually used to add new entries to tables such as those listing facilities, substances, off-site facilities and water bodies.

[**F5**] Usually used to delete an entry from a table.

[**F6**] Appears at the bottom of the screen when the cursor is in a field associated with a **pick-list** or a **look-up** table. The [**F6**] key enables the search and selection of a value, name or code for this specific field.

[**F7**] Usually used to modify an entry within a table.

[**F8**] Available in the "Facilities" and "Substances" screens, this key opens the "Facility/Substance Summary" screen which provides a concise summary of on-site releases and off-site transfers.

[**F10**] Displays the universal navigation and edit keys available during data entry.

[**Esc**] Returns you to a previous menu, or restores the previous screen. The [**Esc**] key is the only way to abort a process. You can always save your NPRI report at any time by pressing [**Esc**] to save your work. The program will prompt you to "**S**ave, **C**ancel or **R**esume". Use the arrow key to highlight your choice or type the first letter of the option of your choice and press [**Enter**] to execute that option.

Main Menu

The Main Menu is the starting point in completing a report for the NPRI. Function keys provide access to the main components of the MS DOS reporting software. The Windows software has the same design and layout and uses the same function names on its buttons.

MS DOS FUNCTION KEYS		WINDOWS BUTTONS
[F1]	Help	Help
[F2]	View/Enter/Edit Data	View/Edit/Enter Data
[F3]	Reports Menu	Reports Menu
[F4]	Maintain System Files	Maintain System Files
[F5]	Check Errors/Create Report	Check Errors/Create Report
[F6]	Report Additional Substances	Report Additional Substances
[Esc]	Exit Program	Exit

A typical procedure is to first select “Maintain System Files” and upload the data from your 1998 report. Next, choose “View/Enter/Edit Data” and update the information on reporting facilities, substances and off-site facilities. Finally, choose “Check Errors/Create Report” to export an NPRI report to disk and submit it with a signed Statement of Certification to your regional NPRI office.

Maintain System Files

From the Main Menu, select “Maintain System Files”. The following options are available.

MS DOS FUNCTION KEYS		WINDOWS BUTTONS
[F1]	Help	Help
[F2]	Re-index all Database Files	n/a
[F3]	Upload Data Disks	Upload Data Disks
[F4]	Clear Database Tables	Clear Database Tables
[Esc]	Return to Main Menu	Return

Re-index all Database Files

This function is only available or necessary in the MS DOS software. Re-index all database files after installation of the MS DOS software. This ensures that all database and look-up tables are properly initialized. You should always re-index the database files:

- after installing the software,
- after loading a disk,
- after a power failure or a system shutdown (when the screen “freezes” and keyboard entry is impossible requiring a reboot),
- the program exits unexpectedly for any reason, and
- when an index file is deleted (causing a DOS[2] error).

Uploading Data into the 1999 Software

If you have a copy of your 1998 NPRI report on disk, you can upload the data into this year's electronic report form for editing. The 1999 NPRI reports from other facilities can also be uploaded. This feature is useful for company coordinators who wish to combine reports from several facilities on one reporting disk. **The 1999 software does not upload NPRI reports created before 1998.**

Select "Upload Data Disks" to begin the uploading process. Place the report disk containing your 1998 or 1999 data into the computer's disk drive. At the prompt, choose the drive letter and path name of the NPRI data. **The MS DOS program will fail if there is no disk in the drive specified.** The Windows software can upload data from any drive or folder that contains a valid NPRI report. A status screen will indicate if the data is for 1998 or 1999 and the program will list the number of facilities, substances and off-site facilities that will be uploaded. While the data are being uploaded, the program will display the number of records transferred and the number of duplicates found. The software will warn you if a duplicate facility is being uploaded and give you the option to:

- overwrite the existing record with the record on disk,
- create a new facility with a different NPRI ID,
- skip and do not import the record on disk, or
- cancel all further imports.

Clear Database Tables

This feature is designed for those, such as consultants, who report for different facilities. It allows the user to quickly delete all data for a particular reporting year and then upload new data from another disk. **Note: Once deleted, data cannot be recovered.**

View/Enter/Edit Data

From the Main Menu select the "View/Enter/Edit Data". From this screen, you can enter all of the information required by the NPRI.

MS DOS FUNCTION KEYS	WINDOWS BUTTONS
[F1] Help	Help
[F2] Reporting Facilities	Reporting Facilities
[F3] Substances	Substances
[F4] Discharges to Surface Waters	Discharges to Surface Waters
[F5] Off-site Facilities	Off-site Facilities
[Esc] Return to Main Menu	Return

Section 2 of this Guide has complete details on what information is required and how to complete these sections. **At any time, you can save the information you have entered or abandon the changes you have made.**

Reporting Facilities

Information identifying the facility is entered in fields A1.0 to A17.0 of the "Reporting Facilities" section. The electronic report form allows NPRI reports for more than one facility to be entered. This is useful for company coordinators who are filing NPRI reports for several facilities. Facility reports can be added, modified and deleted using the function keys or software buttons listed below. The "Facility/Substance Summary" screen provides a concise summary of the on-site releases and off-site transfers. This summary is also available immediately prior to exporting the NPRI report to a disk.

MS DOS FUNCTION KEYS	WINDOWS BUTTONS
[F1] Help	Help
[F3] Add a Facility	Add
[F5] Delete a Facility	Delete
[F7] Edit a Facility	Modify
[F8] Summary Listing	Summary
[Esc] Exit	Return

Substances

Information on NPRI substances is entered in fields B1.0 to B40.0 of the "Substances" report. The substance screen lists the facilities and their associated substance reports. Substance reports can be added, modified and deleted using the function keys or software buttons listed below. The "Facility/Substance Summary" screen provides a concise summary of the on-site releases and off-site transfers. This summary is also available immediately prior to exporting the NPRI report to a disk.

MS DOS FUNCTION KEYS	WINDOWS BUTTONS
[F1] Help	Help
[F3] Add a Substance	Add
[F5] Delete a Substance	Delete
[F7] Edit a Substance	Modify
[F8] Summary Listing	Summary
[Esc] Exit	Return

For each surface water discharge, you must identify the receiving water bodies. Select the "Water Codes" column. This opens the "Surface Water Body Entry Codes" table where you identify the surface water bodies that receive the discharge, as well as the quantity discharged to each surface water body. The software provides a pick-list of standard water body names that is drawn from the NPRI database and the *Gazetteer of Canada*. The pick-list is sorted by province.

You must identify the off-site facilities to which NPRI substances are transferred for disposal (B22.1) or for recycling (B25.1). To do so, select the "Locations" column of these fields to open the "Off-site Facilities and MSTP Entry Codes" table. The software provides a pick-list of previously-entered off-site facility names.

If the pick-lists described above are incomplete or inaccurate, you can add or edit a surface water body name or an off-site facility. The following two sections describe a more direct way of identifying off-site facilities and water bodies.

Surface Water Bodies

To ensure that water bodies are consistently identified, a list of names was assembled from data in the NPRI and from the *Gazetteer of Canada*. The table has a complete list of water bodies, sorted by province. The entries in this table become part of a pick-list available when in the "Water Codes" column of field B12.3 of the substances report. The names in this initial list cannot be modified. However, if you cannot find the name of a water body, you can add a new geographic feature to the list. Select "Surface Water Bodies" to open the "Identification of Surface Waters" table.

Off-site Facilities

This function opens the table "Identification of Off-site Facilities and Municipal Sewage Treatment Plants (MSTPs)". Enter the names and addresses of the facilities receiving transfers of NPRI substances for disposal or transfers of NPRI substances for recycling. Each off-site facility is assigned a unique code (e.g., 01, 02, 03...). The entries in this table become part of a pick-list which is available when in the "Locations" column of fields B22.1 and B25.1 of the "Substances" report.

Reports Menu

From the Main Menu, select the "Reports" menu. From this screen, you can set printer defaults, print your NPRI report and print a Statement of Certification. **Note, you are not required to submit a printed copy of the NPRI report with your electronic copy.**

MS DOS FUNCTION KEYS	WINDOWS BUTTONS
[F1] Help	Help
[F2] Print Facilities/Substances	Print Facilities/Substances
[F3] Print Surface Waters/Off-sites	Print Surface Water Bodies Print Off-site Facilities
[F4] Print Statement of Certification	Print Statement of Certification
[F5] Set Printer Defaults	Set Printer Defaults
[Esc] Return to Main Menu	Return
See "Facility/Substance Summary"	Print Summary Listings
See "Check Errors/Create Report"	Print Reporting Errors

Print Facilities/Substances

This report provides a detailed listing of all the information in the NPRI report. A series of check boxes allow you to select the options. By default, the report will list all of the facilities and their substances. The off-site facilities and water bodies **must** be printed separately. You have the option of listing only the facilities without their substances. Or, you can choose to print specific sections of the facility and substance reports. Use the "Print Off-sites/Surface Waters" function (see below) to obtain a list of off-site facilities and water bodies used in the NPRI report.

You may choose to print the report in the "language of entry". This is useful for company coordinators who consolidate NPRI reports from facilities across Canada. It allows those reports completed in English to be printed in English while reports completed in French are printed in French. Or, the report can be printed entirely in French or English, regardless of the language of entry.

Print Surface Waters/Off-sites

This report provides a simple listing of all off-site facilities and all surface water body names used in the NPRI report. In the Windows software, these are two separate reports.

Print Statement of Certification

A brief summary of the NPRI report is printed with the Statement of Certification. It lists the facilities, their substance reports and the total quantities released on site, transferred off site for disposal and recycling. The Statement of Certification includes the name and address of the company official identified in fields A16.0 and A17.0. **A signed and dated Statement of Certification must be submitted with the NPRI report.**

Set Printer Defaults

You can either print to a printer ("P") or to a file ("F"). The Windows software can use any printer on your system. The MS DOS software normally requires an HP LaserJet or Epson-compatible printer on LPT1. However, you can print to a file in cases where the printer is inaccessible. The MS DOS software will often have this problem when the printer is on a network or only accessible through Windows. The resulting file is a simple ASCII text document which can be edited in MS DOS, Notepad, WordPad or any other word processor. **For best printing results, use a fixed-pitch font such as 10-point Courier or New Courier.**

Check Errors and Create Report

From the Main Menu, select this function to check your NPRI report for errors and to create an NPRI report on disk. The options are:

MS DOS FUNCTION KEYS	WINDOWS BUTTONS
[F1] Help	Help
[F2] Check for Reporting Errors	Check for Reporting Errors
[F3] View Reporting Errors	View/Print Reporting Errors
[F4] Print Reporting Errors	
[F5] Copy NPRI Report to Disk	Copy NPRI Report to Disk
[Esc] Return to Main Menu	Return

Check for Reporting Errors

This is an essential step. The reporting software will not export an NPRI report to a disk until this function reports that no errors were detected. This function will verify that you have correctly completed all sections of the NPRI report. A status screen will indicate the number of facility and substance records being verified and the number of warnings and errors being found. The reporting software has data-verification features to provide warnings if the reported releases and transfers are unusually large. Warnings, unlike errors, will not prevent the NPRI report from being exported to a disk.

If errors are found, you will be prompted to view the error and warning messages. **Correct the errors reported by the error-check function, and run the "Check for Reporting Errors" function again to clear the previous error codes.** When you receive the message "No Errors Detected", you will be able to copy your NPRI report to a disk.

View/Print Reporting Errors

Use these functions to review the error and warning messages generated by the software. The error and warning messages identify the field where the error occurred and provide a brief description of the error or warning. For example:

YEAR	NPRI ID	COMPANY NAME	CAS NO.	SUBSTANCE	REF.	FIELD NAME
ERROR MESSAGE						
						ERRORS DETECTED
YOU MUST GENERATE A NEW LIST OF POSSIBLE ERRORS AFTER YOUR CORRECTIONS.						
1999	5199	ABC MANUFACTURING	7782-50-5	CHLORINE	B 2.0	NATURE OF ACTIVITIES
SPECIFY EITHER MANUFACTURE, PROCESS OR OTHERWISE USE OF THE SUBSTANCE.						
1999	5199	ABC MANUFACTURING	7782-50-5	CHLORINE	B14.1	REASONS FOR CHANGE
PLEASE SPECIFY EITHER A, B, C, D, E, F, G, H OR I AS A REASON FOR CHANGE.						
1999	5199	ABC MANUFACTURING	7782-50-5	CHLORINE	B30.1	POLLUTION PREVENTION
PLEASE SPECIFY EITHER A, B, C, D, E, F, G, H OR I AS A REASON FOR CHANGE.						

Copy NPRI Report to Disk

You must use the NPRI software to export a report, otherwise the data on the disk cannot be accepted by Environment Canada. This function of the reporting software is not the same as copying files using DOS or Windows commands. The software provides a summary of the on-site releases and off-site transfers immediately before exporting your NPRI report to disk. Review the information for accuracy. Ensure that a blank, formatted disk has been inserted into disk drive "A" or "B", or the software will fail.

If either NERM or ARET reporting was enabled (see "Report Additional Substances"), you will be given the opportunity to create a NERM/ARET report which contains all substance reports or an NPRI report which only includes NPRI substance reports. The "Copy NPRI Report to Disk" function can also be used to send reports to a coordinator who can then assemble all reports for a company.

Report Additional Substances

The NPRI report can be used to complete reports for the National Emissions Reduction Masterplan (NERM) of the Canadian Chemical Producers' Association and for the Accelerated Reduction/Elimination of Toxics (ARET) program of Environment Canada. From the "Main Menu", select this function to enable reporting of substances on the NERM and ARET substances lists. The pick-lists in field B1.0 will include the NERM and ARET substances in addition to the NPRI substances. Indicators next to the CAS number will show if the substance is a NERM or ARET substance.

If either NERM or ARET reporting was enabled, you will be given the opportunity to create a NERM/ARET report which contains all substance reports or an NPRI report which only includes NPRI substance reports.

Filing your Report with Environment Canada

Send a copy of your report on disk and the "Statement of Certification" signed by an official of the company to your regional NPRI office, postmarked or courier-dated **no later than June 1, 2000**. Keep a copy of your data on disk for your records and for uploading into next year's software.

Appendix 5 – Four-digit North American Industry Classification System (NAICS) Codes

11	**Agriculture, Forestry, Fishing & Hunting**
111	Crop Production
1111	Oilseed & Grain Farming
1112	Vegetable & Melon Farming
1113	Fruit & Tree Nut Farming
1114	Greenhouse, Nursery & Floriculture Production
1119	Other Crop Farming
112	Animal Production
1121	Cattle Ranching & Farming
1122	Hog & Pig Farming
1123	Poultry & Egg Production
1124	Sheep & Goat Farming
1125	Animal Aquaculture
1129	Other Animal Production
113	Forestry & Logging
1131	Timber Tract Operations
1132	Forest Nurseries & Gathering Forest Products
1133	Logging
114	Fishing, Hunting & Trapping
1141	Fishing
1142	Hunting & Trapping
115	Support Activities for Agriculture & Forestry
1151	Support Activities for Crop Production
1152	Support Activities for Animal Production
1153	Support Activities for Forestry
21	**Mining & Oil & Gas Extraction**
211	Oil & Gas Extraction
2111	Oil & Gas Extraction
212	Mining (exc. Oil & Gas)
2121	Coal Mining
2122	Metal Ore Mining
2123	Non-Metallic Mineral Mining & Quarrying
213	Support Act.- Mining & Oil & Gas Extraction
2131	Support Act.- Mining & Oil & Gas Extraction
22	**Utilities**
221	Utilities
2211	Electricity Generation, Transmission & Dist.
2212	Natural Gas Distribution
2213	Water, Sewage & Other Systems
23	**Construction**
231	Prime Contracting
2311	Land Subdivision & Land Development
2312	Building Construction
2313	Engineering Construction
2314	Construction Management
232	Trade Contracting
2321	Site Preparation Work
2322	Building Structure Work
2323	Building Exterior Finishing Work
2324	Building Interior Finishing Work
2325	Building Equipment Installation
2329	Other Special Trade Contracting
31-33	**Manufacturing**
311	Food Mfg.
3111	Animal Food Mfg.
3112	Grain & Oilseed Milling
3113	Sugar & Confectionery Product Mfg.
3114	Fruit & Veg. Preserving & Specialty Food Mfg.
3115	Dairy Product Mfg.
3116	Meat Product Mfg.
3117	Seafood Product Preparation & Packaging
3118	Bakeries & Tortilla Mfg.
3119	Other Food Mfg.
312	Beverage & Tobacco Product Mfg.
3121	Beverage Mfg.
3122	Tobacco Mfg.
313	Textile Mills
3131	Fibre, Yarn & Thread Mills
3132	Fabric Mills
3133	Textile & Fabric Finishing & Fabric Coating
314	Textile Product Mills
3141	Textile Furnishings Mills
3149	Other Textile Product Mills
315	Clothing Mfg.
3151	Clothing Knitting Mills
3152	Cut & Sew Clothing Mfg.
3159	Clothing Accessories & Other Clothing Mfg.
316	Leather & Allied Product Mfg.
3161	Leather & Hide Tanning & Finishing
3162	Footwear Mfg.
3169	Other Leather & Allied Product Mfg.
321	Wood Product Mfg.
3211	Sawmills & Wood Preservation
3212	Veneer, Plywood & Eng'rd Wood Product Mfg.
3219	Other Wood Product Mfg.
322	Paper Mfg.
3221	Pulp, Paper & Paperboard Mills
3222	Converted Paper Product Mfg.
323	Printing & Related Support Activities
3231	Printing & Related Support Activities
324	Petroleum & Coal Products Mfg.
3241	Petroleum & Coal Products Mfg.
325	Chemical Mfg.
3251	Basic Chemical Mfg.
3252	Resin, Synth. Rubber, & Fibre & Filament Mfg.
3253	Pesticide, Fertilizer & Other Agr. Chem. Mfg.
3254	Pharmaceutical & Medicine Mfg.
3255	Paint, Coating & Adhesive Mfg.
3256	Soap, Cleaning Compound & Toilet Prep. Mfg.
3259	Other Chemical Product Mfg.
326	Plastics & Rubber Products Mfg.

3261	Plastic Product Mfg.
3262	Rubber Product Mfg.
327	Non-Metallic Mineral Product Mfg.
3271	Clay Product & Refractory Mfg.
3272	Glass & Glass Product Mfg.
3273	Cement & Concrete Product Mfg.
3274	Lime & Gypsum Product Mfg.
3279	Other Non-Metallic Mineral Product Mfg.
331	Primary Metal Mfg.
3311	Iron & Steel Mills & Ferro-Alloy Mfg.
3312	Steel Product Mfg. from Purchased Steel
3313	Alumina & Aluminum Production & Processing
3314	Non-Ferrous (exc. Al) Production & Processing
3315	Foundries
332	Fabricated Metal Product Mfg.
3321	Forging & Stamping
3322	Cutlery & Hand Tool Mfg.
3323	Architectural & Structural Metals Mfg.
3324	Boiler, Tank & Shipping Container Mfg.
3325	Hardware Mfg.
3326	Spring & Wire Product Mfg.
3327	Machine Shops, Turned Product & Related Mfg.
3328	Coating, Engraving & Heat Treating Activities
3329	Other Fabricated Metal Product Mfg.
333	Machinery Mfg.
3331	Agr., Construction & Mining Machinery Mfg.
3332	Industrial Machinery Mfg.
3333	Commercial & Service Industry Machinery Mfg.
3334	Ventilation, Heating, AC & Refrig. Equip. Mfg
3335	Metalworking Machinery Mfg.
3336	Engine, Turbine & Power Transmission Mfg.
3339	Other General-Purpose Machinery Mfg.
334	Computer & Electronic Product Mfg.
3341	Computer & Peripheral Equipment Mfg.
3342	Communications Equipment Mfg.
3343	Audio & Video Equipment Mfg.
3344	Semiconductor & Electronic Component Mfg.
3345	Instruments Mfg.
3346	Mfg. & Reproducing Magnetic & Optical Media
335	Electric Equip., Appliance & Component Mfg.
3351	Electric Lighting Equipment Mfg.
3352	Household Appliance Mfg.
3353	Electrical Equipment Mfg.
3359	Other Electrical Equipment & Component Mfg.
336	Transportation Equipment Mfg.
3361	Motor Vehicle Mfg.
3362	Motor Vehicle Body & Trailer Mfg.
3363	Motor Vehicle Parts Mfg.
3364	Aerospace Product & Parts Mfg.
3365	Railroad Rolling Stock Mfg.
3366	Ship & Boat Building
3369	Other Transportation Equipment Mfg.
337	Furniture & Related Product Mfg.
3371	Household & Inst. Furniture & Cabinet Mfg.
3372	Office Furniture (including Fixtures) Mfg.
3379	Other Furniture-Related Product Mfg.
339	Miscellaneous Mfg.
3391	Medical Equipment & Supplies Mfg.
3399	Other Miscellaneous Mfg.
41	**Wholesale Trade**
411	Farm Product Whl.
4111	Farm Product Whl.
412	Petroleum Product Whl.
4121	Petroleum Product Whl.
413	Food, Beverage & Tobacco Whl.
4131	Food Whl.
4132	Beverage Whl.
4133	Cigarette & Tobacco Product Whl.
414	Personal & Household Goods Whl.
4141	Textile, Clothing & Footwear Whl.
4142	Home Ent. Equip & Hhld. Appliance Whl.
4143	Home Furnishings Whl.
4144	Personal Goods Whl.
4145	Pharmaceuticals, Toiletries & Related Whl.
415	Motor Vehicle & Parts Whl.
4151	Motor Vehicle Whl.
4152	New Motor Vehicle Parts & Accessories Whl.
4153	Used Motor Vehicle Parts & Accessories Whl.
416	Building Material & Supplies Whl.
4161	Electrical, Plumbing, Heating & AC Equip. Whl
4162	Metal Service Centres
4163	Lumber & Other Building Supplies Whl.
417	Machinery, Equipment & Supplies Whl.
4171	Farm, Lawn & Garden Machinery & Equip. Whl.
4172	Construction, Forestry & Ind'l Machinery Whl.
4173	Computer & Communications Equipment Whl.
4179	Other Machinery, Equipment & Supplies Whl.
418	Miscellaneous Wholesaler-Distributors
4181	Recyclable Material Whl.
4182	Paper & Disposable Plastic Product Whl.
4183	Agricultural Supplies Whl.
4184	Chemical (exc. Agr.) & Allied Product Whl.
4189	Other Misc. Whl.
419	Wholesale Agents & Brokers
4191	Wholesale Agents & Brokers

44-45	**Retail Trade**
441	Motor Vehicle and Parts Dealers
4411	Automobile Dealers
4412	Other Motor Vehicle Dealers
4413	Automotive Parts, Accessories & Tire Stores
442	Furniture & Home Furnishings Stores
4421	Furniture Stores
4422	Home Furnishings Stores
443	Electronics & Appliance Stores
4431	Electronics & Appliance Stores
444	Building Material & Garden Equipment Dealers
4441	Building Material & Supplies Dealers
4442	Lawn & Garden Equipment & Supplies Stores
445	Food & Beverage Stores
4451	Grocery Stores
4452	Specialty Food Stores
4453	Beer, Wine & Liquor Stores
446	Health & Personal Care Stores
4461	Health & Personal Care Stores
447	Gasoline Stations
4471	Gasoline Stations
448	Clothing & Clothing Accessories Stores
4481	Clothing Stores
4482	Shoe Stores
4483	Jewellery, Luggage & Leather Goods Stores
451	Sporting Goods, Hobby, Book & Music Stores
4511	Sport, Hobby & Musical Instrument Stores
4512	Book, Periodical & Music Stores
452	General Merchandise Stores
4521	Department Stores
4529	Other General Merchandise Stores
453	Misc. Store Retailers
4531	Florists
4532	Office Supply, Stationery & Gift Stores
4533	Used Merchandise Stores
4539	Other Misc. Store Retailers
454	Non-Store Retailers
4541	Electronic Shopping & Mail-Order Houses
4542	Vending Machine Operators
4543	Direct Selling Establishments
48-49	**Transportation & Warehousing**
481	Air Transportation
4811	Scheduled Air Transportation
4812	Non-Scheduled Air Transportation
482	Rail Transportation
4821	Rail Transportation
483	Water Transportation
4831	Deep Water Transportation
4832	Inland Water Transportation
484	Truck Transportation
4841	General Freight Trucking
4842	Specialized Freight Trucking
485	Transit & Ground Passenger Transportation
4851	Urban Transit Systems
4852	Interurban & Rural Bus Transportation
4853	Taxi & Limousine Service
4854	School & Employee Bus Transportation
4855	Charter Bus Industry
4859	Other Transit & Ground Passenger Transport
486	Pipeline Transportation
4861	Pipeline Transportation of Crude Oil
4862	Pipeline Transportation of Natural Gas
4869	Other Pipeline Transportation
487	Scenic & Sightseeing Transportation
4871	Scenic & Sightseeing Transportation, Land
4872	Scenic & Sightseeing Transportation, Water
4879	Scenic & Sightseeing Transportation, Other
488	Support Activities for Transportation
4881	Support Activities for Air Transportation
4882	Support Activities for Rail Transportation
4883	Support Activities for Water Transportation
4884	Support Activities for Road Transportation
4885	Freight Transportation Arrangement
4889	Other Support Activities for Transportation
491	Postal Service
4911	Postal Service
492	Couriers & Messengers
4921	Couriers
4922	Local Messengers & Local Delivery
493	Warehousing & Storage
4931	Warehousing & Storage
51	**Information & Cultural Industries**
511	Publishing Industries
5111	Newspaper, Periodical, Book & DB Publishers
5112	Software Publishers
512	Motion Picture & Sound Recording Industries
5121	Motion Picture & Video Industries
5122	Sound Recording Industries
513	Broadcasting & Telecommunications
5131	Radio & Television Broadcasting
5132	Pay TV, Specialty TV & Program Distribution
5133	Telecommunications
514	Information & Data Processing Services
5141	Information Services
5142	Data Processing Services
52	**Finance & Insurance**
521	Monetary Authorities - Central Bank
5211	Monetary Authorities - Central Bank
522	Credit Intermediation & Related Activities
5221	Depository Credit Intermediation
5222	Non-Depository Credit Intermediation
5223	Activities Related to Credit Intermediation
523	Securities, Commodity Contracts & Related

5231	Securities & Commodity Contracts Intermed.
5232	Securities & Commodity Exchanges
5239	Other Financial Investment Activities
524	Insurance Carriers & Related Activities
5241	Insurance Carriers
5242	Agencies, Brokerages & Other Insurance Act.
526	Funds and Other Financial Vehicles
5261	Pension Funds
5269	Other Funds and Financial Vehicles
53	**Real Estate & Rental & Leasing**
531	Real Estate
5311	Lessors of Real Estate
5312	Offices of Real Estate Agents & Brokers
5313	Activities Related to Real Estate
532	Rental & Leasing Services
5321	Automotive Equipment Rental & Leasing
5322	Consumer Goods Rental
5323	General Rental Centres
5324	Commercial & Ind'l Machinery Rental & Leasing
533	Lessors of Non-Financial Intangible Assets
5331	Lessors of Non-Financial Intangible Assets
54	**Professional, Scientific & Technical Services**
541	Professional, Scientific & Technical Services
5411	Legal Services
5412	Accounting, Tax Prep. & Bookkeeping Services
5413	Architectural, Engineering & Related Services
5414	Specialized Design Services
5415	Computer Systems Design & Related Services
5416	Mgmt., Scientific & Technical Consulting Serv.
5417	Scientific R&D Services
5418	Advertising & Related Services
5419	Other Prof., Scientific & Technical Services
55	**Management of Companies & Enterprises**
551	Management of Companies & Enterprises
5511	Management of Companies & Enterprises
56	**Admin., Support, Waste Mgmt & Remed. Services**
561	Administrative & Support Services
5611	Office Administrative Services
5612	Facilities Support Services
5613	Employment Services
5614	Business Support Services
5615	Travel Arrangement & Reservation Services
5616	Investigation & Security Services
5617	Services to Buildings & Dwellings
5619	Other Support Services
562	Waste Management & Remediation Services
5621	Waste Collection
5622	Waste Treatment & Disposal
5629	Remediation & Other Waste Mgmt. Services
61	**Educational Services**
611	Educational Services
6111	Elementary & Secondary Schools
6112	Community Colleges & C.E.G.E.P.s
6113	Universities
6114	Business Schools & Computer & Mgmt. Training
6115	Technical & Trade Schools
6116	Other Schools & Instruction
6117	Educational Support Services
62	**Health Care & Social Assistance**
621	Ambulatory Health Care Services
6211	Offices of Physicians
6212	Offices of Dentists
6213	Offices of Other Health Practitioners
6214	Out-Patient Care Centres
6215	Medical & Diagnostic Laboratories
6216	Home Health Care Services
6219	Other Ambulatory Health Care Services
622	Hospitals
6221	General Medical & Surgical Hospitals
6222	Psychiatric & Substance Abuse Hospitals
6223	Specialty (exc. Psych., etc.) Hospitals
623	Nursing & Residential Care Facilities
6231	Nursing Care Facilities
6232	Res. Developmental Handicap, etc., Facilities
6233	Community Care Facilities for the Elderly
6239	Other Residential Care Facilities
624	Social Assistance
6241	Individual & Family Services
6242	Community Food & Housing & Emerg., etc. Serv.
6243	Vocational Rehabilitation Services
6244	Child Day-Care Services
71	**Arts, Entertainment & Recreation**
711	Performing Arts, Spectator Sports & Related
7111	Performing Arts Companies
7112	Spectator Sports
7113	Promoters of Performing Arts, Sports, etc.
7114	Agents & Managers for Public Figures
7115	Independent Artists, Writers & Performers
712	Heritage Institutions
7121	Heritage Institutions
713	Amusement, Gambling & Recreation Industries
7131	Amusement Parks & Arcades

7132	Gambling Industries
7139	Other Amusement & Recreation Industries
72	**Accommodation & Food Services**
721	Accommodation Services
7211	Traveller Accommodation
7212	RV Parks & Recreational Camps
7213	Rooming & Boarding Houses
722	Food Services & Drinking Places
7221	Full-Service Restaurants
7222	Limited-Service Eating Places
7223	Special Food Services
7224	Drinking Places (Alcoholic Beverages)
81	**Other Services (exc. Public Administration)**
811	Repair and Maintenance
8111	Automotive R&M
8112	Electronic & Precision Equipment R&M
8113	Commercial & Ind'l Mach. & Equip. R&M
8114	Personal & Household Goods R&M
812	Personal & Laundry Services
8121	Personal Care Services
8122	Funeral Services
8123	Dry Cleaning and Laundry Services
8129	Other Personal Services
813	Religious, Grant-Making, Civic & Similar Orgs.
8131	Religious Organizations
8132	Grant-Making & Giving Services
8133	Social Advocacy Organizations
8134	Civic & Social Organizations
8139	Business, Prof., Labour & Other Member. Orgs.
814	Private Households
8141	Private Households
91	**Public Administration**
911	Federal Government Public Administration
9111	Defence Services
9112	Federal Protective Services
9113	Federal Labour, Employment & Immigration Serv.
9114	Foreign Affairs & International Assistance
9119	Other Fed. Government Public Administration
912	Prov. & Territorial Public Administration
9121	Provincial Protective Services
9122	Provincial Labour & Employment Services
9129	Other Prov. & Terr. Public Administration
913	Municipal Public Administration
9131	Municipal Protective Services
9139	Other Municipal Public Administration
914	Aboriginal Public Administration
9141	Aboriginal Public Administration
919	Extra-Territorial Public Administration
9191	Extra-Territorial Public Administration

Appendix 6 – Two-digit 1980 Canadian Standard Industrial Classification (SIC) Codes

01	Agricultural Industries
02	Service Industries Incidental to Agriculture
03	Fishing and Trapping Industries
04	Logging Industry
05	Forest Services Industry
06	Mining Industries
07	Crude Petroleum and Natural Gas Industries
08	Quarry and Sand Pit Industries
09	Service Industries Incidental to Mineral Extraction
10	Food Industries
11	Beverage Industries
12	Tobacco Products Industries
15	Rubber Products Industries
16	Plastic Products Industries
17	Leather and Allied Products Industries
18	Primary Textile Industries
19	Textile Products Industries
24	Clothing Industries
25	Wood Industries
26	Furniture and Fixture Industries
27	Paper and Allied Products Industries
28	Printing, Publishing and Allied Industries
29	Primary Metal Industries
30	Fabricated Metal Products Industries (except Machinery and Transportation Equipment Industries)
31	Machinery Industries (except Electrical Machinery)
32	Transportation Equipment Industries
33	Electrical and Electronic Products Industries
35	Non-metallic Mineral Products Industries
36	Refined Petroleum and Coal Products Industries
37	Chemical and Chemical Products Industries
39	Other Manufacturing Industries
40	Building Developing and General Contracting Industries
41	Industrial and Heavy (Engineering) Construction Industries
42	Trade Contracting Industries
44	Service Industries Incidental to Construction
45	Transportation Industries
46	Pipeline Transport Industries
47	Storage and Warehousing Industries
48	Communication Industries
49	Other Utility Industries
50	Farm Products Industries, Wholesale
51	Petroleum Products Industries, Wholesale
52	Food, Beverage, Drug and Tobacco Industries, Wholesale
53	Apparel and Dry Goods Industries, Wholesale
54	Household Goods Industries, Wholesale
55	Motor Vehicle, Parts and Accessories Industries, Wholesale
56	Metals, Hardware, Plumbing, Heating and Building Materials Industries, Wholesale
57	Machinery, Equipment and Supplies, Wholesale
59	Other Products and Industries, Wholesale
60	Food, Beverage and Drug Industries, Retail
61	Shoe, Apparel, Fabric and Yarn Industries, Retail
62	Household Furniture, Appliances and Furnishings Industries, Retail

63	Automotive Vehicles, Parts and Accessories, Sales and Service
64	General Retail Merchandising Industries
65	Other Retail Store Industries
69	Non-store Retail Industries
70	Deposit-accepting Intermediary Industries
71	Consumer and Business Financing Intermediary Industries
72	Investment Intermediary Industries
73	Insurance Industries
74	Other Financial Intermediary Industries
75	Real Estate Operating Industries (except Developers)
76	Insurance and Real Estate Agent Industries
77	Business Service Industries
81	Federal Government Service Industries
82	Provincial and Territorial Government Service Industries
83	Local Government Service Industries
84	International and Extra-territorial Government Service Industries
85	Educational Service Industries
86	Health and Social Service Industries
91	Accommodation Service Industries
92	Food and Beverage Industries
96	Amusement and Recreational Service Industries
97	Personal and Household Service Industries
98	Membership Organization Industries
99	Other Service Industries

Appendix 7 – Two-digit 1987 U.S. Standard Industrial Classification (SIC) Codes

01	Agricultural Production Crops
02	Agricultural Production Livestock
07	Agricultural Services
08	Forestry
09	Fishing, Hunting and Trapping
10	Metal Mining
12	Coal Mining
13	Oil and Gas Extraction
14	Non-metallic Minerals, except Fuels
15	General Building Contractors
16	Heavy Construction, except Building
17	Special Trade Contractors
20	Food and Kindred Products
21	Tobacco Products
22	Textile Mill Products
23	Apparel and Other Textile Products
24	Lumber and Wood Products
25	Furniture and Fixtures
26	Paper and Allied Products
27	Printing and Publishing
28	Chemicals and Allied Products
29	Petroleum and Coal Products
30	Rubber and Miscellaneous Plastics Products
31	Leather and Leather Products
32	Stone, Clay, and Glass Products
33	Primary Metal Industries
34	Fabricated Metal Products
35	Industrial Machinery and Equipment
36	Electronic and Other Electric Equipment
37	Transportation Equipment
38	Instruments and Related Products
39	Miscellaneous Manufacturing Industries
40	Railroad Transportation
41	Local and Interurban Passenger Transit
42	Trucking and Warehousing
43	U.S. Postal Service
44	Water Transportation
45	Transportation by Air
46	Pipelines, except Natural Gas
47	Transportation Services
48	Communications
49	Electric, Gas, and Sanitary Services
50	Wholesale Trade Durable Goods
51	Wholesale Trade Non-durable Goods
52	Building Materials and Garden Supplies
53	General Merchandise Stores
54	Food Stores
55	Automotive Dealers and Service Stations
56	Apparel and Accessory Stores
57	Furniture and Home Furnishings Stores
58	Eating and Drinking Places
59	Miscellaneous Retail
60	Depository Institutions

61	Non-depository Institutions
62	Security and Commodity Brokers
63	Insurance Carriers
64	Insurance Agents, Brokers, and Service
65	Real Estate
67	Holding and Other Investment Offices
70	Hotels and Other Lodging Places
72	Personal Services
73	Business Services
75	Auto Repair, Services and Parking
76	Miscellaneous Repair Services
78	Motion Pictures
79	Amusement and Recreation Services
80	Health Services
81	Legal Services
82	Educational Services
83	Social Services
84	Museums, Botanical, Zoological Gardens
86	Membership Organizations
87	Engineering and Management Services
88	Private Households
89	Services, n.e.c.
91	Executive, Legislative and General
92	Justice, Public Order and Safety
93	Finance, Taxation and Monetary Policy
94	Administration of Human Resources
95	Environmental Quality and Housing
96	Administration of Economic Programs
97	National Security and International Affairs

Appendix 8 – Examples of How to Estimate Releases

Direct Measurement (Code M)

This estimate method is based on measured concentrations of the substance in a waste stream and the volume/flow rate of that stream.

Example
An electroplating facility discharges its wastewater to a nearby body of water. The electroplater is required to monitor this discharge once a month for various parameters, including release of total chromium. What is the annual release of total chromium to the wastewater by this electroplater?

Step 1
Gather wastewater flow and concentration data from the monitoring results done in compliance with the municipal by-law for wastewater discharges. Analytical results for total chromium for the year are presented in the table below.

Step 2
Calculate the mass loading for those days on which a chromium analysis was performed. This is done by multiplying the daily flow by the measured chromium concentration.

Concentration of Chromium in Wastewater

DAY	WASTEWATER FLOW (10^6 L/d)	X	CHROMIUM CONCENTRATION (μg/L)	=	RELEASES (kg/d)
Jan. 8	1.57		918		1.44
Feb. 12	1.49		700		1.04
Mar. 10	1.58		815		1.28
Apr. 15	1.66		683		1.13
May 9	1.38		787		1.09
June 13	1.29		840		1.08
July 11	1.73		865		1.50
Aug. 10	1.60		643		1.03
Sept. 8	1.75		958		1.68
Oct. 12	1.56		681		1.06
Nov. 10	1.80		680		1.22
Dec. 8	1.63		627		1.02
Average					**1.22**

Step 3
Calculate annual releases.

Based on an average daily release of 1.22 kg over the year and 250 days of discharge during the year, the yearly total chromium discharged to water is:

1.22 kg/d x 250 d/yr = 305 kg/yr = 0.305 t/yr (or 0.31 t/yr after rounding)

Mass Balance Calculations (Code C)

A mass balance is an accounting of the quantity of a substance going in and out of an entire facility, process, or piece of equipment. Releases can then be calculated as the difference between input and output. Accumulation or depletion of the substance in the equipment should be accounted for in the calculation.

Example

In the example presented earlier, the same electroplating facility operates a vapour degreaser.

Suppose that 14 t of trichloroethylene are used as a degreasing agent. Spent solvent and sludge that accumulate on the bottom of the degreaser are collected in drums for shipment to an off-site solvent reclaimer. Thirteen drums of solvent were sent to the reclaimer during the past year.

A known volume of representative sample taken from the drums is weighed, allowed to evaporate, and reweighed. From this, it is determined that the density of the sludge is 1.03 kg/L and that the trichloroethylene concentration in the sludge shipped to the reclaimer is 30%.

Step 1

The entire 14 t of solvent is released from the facility either as an air emission or as a transfer in the sludge. If the quantity of spent solvent shipped to the reclaimer is known, then the quantity transferred can be calculated based on the volume of sludge and the density of the sludge as shown below:

Volume of trichloroethylene to reclaimer
= 13 drums x 210 L/drum = 2730 L

Mass of trichloroethylene to reclaimer:
= volume of sludge x density of sludge x % trichloroethylene in sludge
= 2730 L x 1.03 kg/L x 0.30
= 844 kg
= 0.84 tonnes

Step 2

The quantity of trichloroethylene emitted to air can then be calculated by mass balance by subtracting the quantity shipped in sludge to the reclaimer from the quantity purchased:

14 t (purchased) – 0.84 t (to reclaimer) = 13.16 t (or 13 t after rounding)

Emission Factor (Code E)

An emission factor is based on average measured emissions from several similar processes. Emission factors usually express releases as a ratio of quantity released to process or equipment throughput.

Example
Suppose the electroplater previously mentioned has no information about the spent solvent and sludge accumulating on the bottom of the degreaser.

Step 1
In this case, the emission factor is found in a U.S. Environmental Protection Agency Publication entitled "Toxic Air Pollutant Emission Factors – A Compilation for Selected Air Toxic Compounds and Sources" (Bibliography no. 67). For an open-top vapour degreaser without emission control equipment using trichloroethylene (TCE), the emission factor is given as 0.93 t/t TCE used.

Step 2
Calculate the annual releases to air from the vapour degreaser as follows:

14 tonnes x 0.93 tonne/tonne = 13 tonnes (after rounding)
(TCE used x emission factor (TCE released/tonne used) = TCE released)

When emission control devices are used, atmospheric releases are estimated by multiplying the "uncontrolled" emission by the quantity (1 – C/100), where C is the control device efficiency.

Engineering Calculations (Code O)

This estimate method is based on physical/chemical properties (e.g., vapour pressure) of the substance and mathematical relationships (e.g., ideal gas law).

Example
In this example, rinse water from a copper-plating unit is treated separately from other process wastewater. Sodium hydroxide is added to precipitate the copper (Cu) in the wastewater. The precipitate formed from this reaction is removed as sludge from the facility's central clarification unit. Purchasing and inventory records indicate that 0.9 t of sodium hydroxide were used for precipitating copper last year. The quantity of copper precipitated represents the quantity of copper released from this source as solid waste.

Step 1
For each mole of copper (Cu) present in the rinse water, two moles of sodium hydroxide (NaOH) must be added to precipitate the copper according to the following reaction:

$$Cu^{++} + 2(NaOH) \rightarrow Cu(OH)_2 + 2Na^{+}$$

Scientific literature indicates that this reaction would be complete at a pH of 7.7. Sodium hydroxide is added until a pH of 8 is maintained in the reaction mixture to ensure complete precipitation. It is also known that:

Molecular Weight of Cu = 63.5 tonnes/tonne-mole
Molecular Weight of NaOH = 40 tonnes/tonne-mole

Step 2
Calculate the quantity of copper released in the wastewater treatment sludge, as follows:

- 2 NaOH react with 1 Cu
- 2 tonne-moles NaOH = 1 tonne-mole Cu
- $\frac{40 \text{ tonnes NaOH}}{\text{tonne-mole NaOH}} \times 2 \text{ tonne-moles NaOH} = 1 \text{ tonne-mole Cu} \times \frac{63.5 \text{ tonnes Cu}}{\text{tonne-mole Cu}}$
- 80 tonnes NaOH = 63.5 tonnes Cu
- $\frac{80 \text{ tonnes NaOH}}{.9 \text{ tonne NaOH}} = \frac{63.5 \text{ tonnes Cu}}{A}$
- $A = \frac{9 \times 63.5 \text{ tonnes Cu}}{80}$
- A = .71 tonne Cu

The estimation method is valid only if the NaOH reacts only with the Cu present in the wastewater.