NORTH AMERICAN POLLUTANTS RELEASE
INVENTORY INFORMATION PROJECT

PUTTING THE PIECES TOGETHER

The Status of Pollutant Release and Transfer Registersin North America

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COOPÉRATION ENVIRONNEMENTALE

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COOPERACIÓN AMBIENTAL

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ENVIRONMENTAL COOPERATION

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A North American Approach to Environmental Concerns

Three nations working together to protect the environment

The Commission for Environmental Cooperation (CEC) was established by Canada, Mexico and the United States in 1994 to address transboundary environmental concerns in North America. While the idea to create such a commission originated during the negotiations of the North American Free Trade Agreement (NAFTA), it derives its formal mandate from the North American Agreement on Environmental Cooperation (NAAEC).

The NAAEC builds upon and complements the environmental provisions established in NAFTA. It creates a North American framework whereby goals related to trade and the environment can be pursued in an open and cooperative way.

In broad terms, the NAAEC sets out to protect, conserve and improve the environment for present and future generations. How? The parties to the Agreement set out the following objectives:

- to protect the environment through increased cooperation;
- to promote sustainable development based on mutually supportive environmental and economic policies;
- to support the environmental goals of NAFTA and avoid creating trade distortions or new trade barriers;
- to strengthen cooperation on the development of environmental laws and enhance their enforcement; and
- to promote transparency and public participation.

In signing the NAAEC, the governments of Canada, Mexico and the United States committed themselves to a core set of actions, including:

- reporting on the state of the environment;
- striving for improvement of environmental laws and regulations;
- effective enforcement of environmental law; and
- publication and promotion of information.

Mission Statement

The CEC facilitates cooperation and public participation to foster conservation, protection and enhancement of the North American environment for the benefit of present and future generations, in the context of increasing economic, trade and social links between Canada, Mexico and the United States.

Overview and Acknowledgements

This is the first of a series of documents comprising a North American Report on Pollutant Releases and Transfers prepared by the Secretariat of the Commission for Environmental Cooperation (CEC). This first document provides an overview of the status and compatibility of the Pollutant Release and Transfer Register programs in Canada, the United States and Mexico. The second document, expected to be published at the end of 1996, will analyze the 1994 data reported to Canada and the US, and profile the pilot project in Mexico. The CEC Secretariat intends to publish an annual report which will analyze the publicly available data reported to the North American governments.

In the development of this report, the CEC Secretariat invited over 30 interested persons throughout North America to comment on the draft work products. The CEC Secretariat wishes to thank everyone who assisted in this report and who provided extensive reviews of the materials, especially:

- Environment Canada: François Lavallée;
- Instituto Nacional de Ecología: Luis Sánchez Cataño; and
- Environmental Protection Agency: Susan Hazen and John Harman.

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This report is also available electronically through the CEC homepage at: http://www.cec.org.

The information contained herein does not necessarily reflect the views of the governments of Canada, Mexico, or the United States.

Lisa Nichols
Project Manager, Technical Cooperation
Commission for Environmental Cooperation

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Acronyms

CAS	Chemical Abstracts Service
CEC	Commission for Environmental Cooperation
CEFIC	European Chemical Industry Council
CEPA	Canadian Environmental Protection Act
CERES	Coalition for Environmentally Responsible Economies
CMA	Chemical Manufacturers' Association (US)
CMAP	*Clasificación Mexicana de Actividades y Productos* Mexican Classification of Activities and Products
EPA	US Environmental Protection Agency
GNC	*Grupo Nacional Coordinador* National Coordinating Group
INE	*Instituto Nacional de Ecología* National Institute of Ecology
NAAEC	North American Agreement on Environmental Cooperation
NERM	National Emissions Reduction Masterplan of the Canadian Chemical Producers' Association
NGO	Non governmental organization
NOM	*Normas Oficiales Mexicanas* Mexican official standards
NPRI	National Pollutant Release Inventory (PRTR for Canada)
OECD	Organization for Economic Cooperation and Development
OSHA	Occupational Safety and Health Act (US)
PERI	Public Environmental Reporting Initiative
POTWs	Publicly-Owned Treatment Works (US)
Profepa	*Procuraduría Federal de Protección Ambiental* Federal Environmental Attorney General
PRTR	Pollutant Release and Transfer Register
RETC	*Registro de Emisiones y Transferencia de Contaminantes* (PRTR for Mexico)
RTK NET	US "Right to Know" Computer Network, run by Unison Institute, Washington
SIC	Standard Industrial Classification
TRI	Toxic Release Inventory (PRTR for US)
UNEP	United States Environment Programme
UNITAR	United Nations Institute for Training and Research
US	United States of America
WHO	World Health Organization

33/50 Program: A voluntary program of the EPA encouraging reductions of TRI releases and transfers of 17 chemicals by 33 percent from 1988 to 1992 and by 50 percent from 1988 to 1995 through pollution prevention and other means.

Chemical category: A group of closely-related individual chemicals that are counted together for purposes of PRTR reporting thresholds, as well as release and transfer calculations. The chemicals are reported to the PRTR under a single name.

Energy recovery: The combustion or burning of a chemical to produce heat.

Environmental management hierarchy: The types of waste management plus source reduction that are prioritized as to environmental desirability. In order of preference, the one most beneficial to the environment is source reduction (pollution prevention at the source), followed by recycling, energy recovery and treatment; disposal is the least desirable option.

Environmental media: The air, bodies of water such as oceans, rivers, lakes and streams; land areas; and areas underground.

Incineration: A method of treating solid, liquid or gaseous wastes by burning.

Materials accounting: Data that describe the flow of a chemical through an industrial facility. Includes the amount of the chemical brought on-site, put into inventory or removed from it, the amount produced and/or consumed (transformed) during the production process, the amount shipped as or in a product, and the amount generated as waste.

Materials balance: Calculations relating to an entire industrial process that "balance" inputs and outputs.

Inputs	Outputs
Brought on-site	Consumed in product
From inventory	To inventory
Produced on-site	Shipped in product
Recycled	Waste (includes recycled)

Non-production-related waste: Waste that is generated as a one-time event, including large accidental spills, waste from a remedial action to clean up environmental contamination from past disposal practices, or other wastes not occurring as a routine part of production operations. This does not include spills occurring as a routine part of production operations that could be reduced or eliminated by improved handling, loading or unloading procedures.

Off-site transfers: Chemicals in waste that are moved off the grounds of the facility. Includes transfers of waste sent to other facilities or other locations, such as hazardous waste treatment facilities, municipal sewage treatment plants or landfills.

On-site: Within the boundaries of the facility, including areas where wastes may be stored, treated or disposed of that are separate from the production processes but still within the boundaries of the reporting facility.

Point source: The origin of known or deliberate environmental releases from fixed points such as smokestacks and wastewater discharge pipes.

Polynuclear aromatic hydrocarbons (PAHs): A family of organic chemicals based on the chemical structure of benzene. This family includes a number of petroleum products and products of combustion processes.

Production ratio/activity index: The ratio of the production level associated with the chemical in the current reporting year to the previous year's level.

Production-related waste: Chemical waste that is generated as a result of routine production and could potentially be reduced or eliminated by improved handling, more efficient processes, change in product or product quality, or change in raw materials. This does not include spills resulting from large-scale accidents or waste from remedial actions to clean up contamination.

Recycling: Extraction of a chemical from a manufacturing process stream that would otherwise have been treated as waste, with the extracted chemical being reused in the original production process, in another production process, or sold as a separate product.

Releases: Quantities of a chemical in waste released on-site to air, water, land or underground injection.

Source reduction: A strategy for reducing pollution that involves preventing the generation of waste in the first place, rather than cleaning it up, treating it, or recycling it after it has been produced.

Source reduction activity: The types of activities undertaken to accomplish source reduction. The term includes equipment or technological modifications, process or procedure modifications, reformulations or redesign of products, substitution of raw materials, as well as improvements in housekeeping, maintenance, training or inventory control.

Tonnes: A metric tonne, which is 1000 kg, 1.1023 short tons, or 0.9842 long tons.

Transfers: Chemicals in waste that are sent from the reporting facility to a facility that treats or disposes of the chemical. Transfers include chemicals sent off-site for recycling and energy recovery, under the TRI definition of wastes and transfers.

Treatment: A variety of processes that change the chemical in waste into another substance.

Use: The amount of chemical that is used as an input to or manufacturing aid during the production process or is produced at a facility. (For RETC, the definition of "use" does not include chemicals produced.)

Waste: The amount of chemical not converted into product, and not consumed or transformed during the production process. PRTRs differ as to whether materials destined for recycling or recovery are included or not in their definition of waste.

Worldwide, people increasingly are seeking information about environmental conditions in their communities. Corporations are responding by publishing environmental reports on their operations. Governments are creating publicly accessible, national data banks called Pollutant Release and Transfer Registers (PRTRs), that list pollutants released into the air, land and water; injected underground; or transferred off-site. PRTRs are a new and innovative environmental tool that can be used for an ever-growing number of purposes.

Tracking of environmental pollutants through PRTRs is essential to:

- enhance environmental quality;
- increase public and industry understanding of the types and quantities of toxic chemicals or pollutants released into the environment and transferred off-site as waste;
- encourage industry to prevent pollution, reduce the generation, release and transfer of waste, and assume responsibility for chemical use;
- track environmental progress; and
- assist in identifying government priorities.

The oldest PRTR in North America, the US Toxic Release Inventory (TRI), reflects the idea that citizens can play an important role in helping communities achieve tangible results to protect human health and the environment. In 1993, more than 23,000 industries reported releasing more than 1,000,000 kilograms of pollutants to the TRI, and more than 2,000,000 kilograms were transferred to off-site locations. Also in 1993, the first year of reporting to the new Canadian National Pollutants Release Inventory, close to 1,500 industries reported releasing approximately 225,000 kilograms of pollutants to the environment, while almost 150,000 kilograms were transferred off-site.

To help fulfill its commitments to the Organization for Economic Cooperation and Development (OECD) and Agenda 21, Mexico is developing its Pollutant Release and Transfer Register, to be known as *Registro de Emisiones y Transferencia de Contaminantes (RETC)*. This spring, approximately 80 industries in the state of Querétaro reported their releases and transfers in a case study designed to test the proposed national register.

The TRI, NPRI and proposed *RETC* share many characteristics. They are intended for regular and active public dissemination, and they all report:

- on individual chemicals;
- on individual facilities;
- on releases and transfers;
- on an annual basis; as well as
- using computerized data management; and
- allowing for limited trade secrecy.

The uses of the TRI and NPRI databases continue to grow, often in ways that were not contemplated at the start of the inventories. Companies have used pollutant release and transfer data to review their operations, set voluntary reduction targets and report to the public. Now, banks, insurance companies and real estate brokers use the release and transfer data as a method to assess a company's operations. Based on PRTR data, governments can encourage pollutant reductions, set technical assistance priorities, and measure progress. As a measure of public interest in the databases, an estimated 21,000 searches of the TRI data were made in 1995 using the Right-to-Know Computer Network (RTK NET).

The Commission for Environmental Cooperation (CEC) is interested in helping citizens fit together information

from the North American PRTRs so as to give a picture of pollutant releases and transfers across North America.

This report describes the three North American PRTRs along with their similarities and differences, so that appropriate and effective data comparisons can be made. The second report in this series, expected in February 1997, will analyze publicly available 1994 data from American and Canadian registers and summarize the experience from the Mexican pilot project. This ground-breaking analysis will assist in leading the way for other countries to share and compare their data.

The TRI, NPRI and proposed *RETC* also have differences that can make data comparisons difficult. They differ in the:

- chemicals to be reported;
- thresholds for reporting;
- type of facilities required to report;
- industrial classification system; and
- classification of small releases and transfers.

Chapter 1.0: Introduction

A small plume of air rises from the neighborhood factory. What pollutants are in this plume? For eight years, American citizens have been able to get answers to these questions from the Toxic Release Inventory (TRI), a computerized database listing pollutants that are released and transferred into the air, land and water or else injected underground. For the past year, Canadians have asked similar questions of the National Pollutant Release Inventory (NPRI). Mexico is currently designing its new system, the *Registro de Emisiones y Transferencia de Contaminantes (RETC)*, which plans to collect data on pollutant releases and transfers in 1997.

The Commission for Environmental Cooperation (CEC) recognizes the importance of pollutant release and transfer registers, such as the TRI, NPRI and proposed *RETC* as a method of enhancing the quality of the North American environment. The CEC was set up under the North American Agreement on Environmental Cooperation (NAAEC). It facilitates cooperation and public participation to foster conservation, protection and enhancement of the North American environment for the benefit of present and future generations, in the context of increasing economic, trade, and social links between Canada, the US and Mexico.

At the Second Annual Regular Session of the CEC, the Environment Ministers of the three North American countries resolved to establish a North American Pollutants Release Inventory as noted in the communiqué:

> *"This past year, the NAFTA partners began to examine their common need for an inventory of pollutant emissions. We have decided to create a North American Pollutant Release Inventory that will bring together, for the first time, existing national public information about emissions and long-range transportation of pollutants. This vital tool for improving the quality of the environment will be the result of harmonized methods of reporting on pollutant emissions of mutual concern."*

1.1 What are Pollutant Release and Transfer Registers (PRTRs)?

PRTRs, such as TRI, NPRI and the proposed *RETC*, provide detailed data on types, locations and amounts of pollutants released on-site and transferred off-site by industrial facilities. The federal governments then provide annual reports, which are released to the public along with the database. Many corporations also use the data to publicly report on their environmental performance. PRTRs are an innovative tool that can be used for a variety of purposes.

Tracking of environmental pollutants through PRTRs is essential to:

- enhance environmental quality;
- increase public and industry understanding of the types and quantities of pollutants released into the environment and transferred off-site as waste;
- encourage industry to prevent pollution; to reduce waste generation, releases and transfers; as well as to assume responsibility for chemical use;
- track environmental progress; and
- assist in the identification of government priorities.

Many companies have responded to PRTR results by conducting an internal environmental review and setting goals for waste reductions. For example, after reviewing some of its first TRI results, Monsanto both committed to and achieved a 90 percent reduction in air emissions.

PRTR data are also a useful method to track environmental progress. Experience with American TRI data has shown a 43 percent reduction in pollutant releases reported from 1988 to 1993.

Government priorities can shift based on situations revealed in the PRTR data. New programs or enforcement measures can be tailored to accomplish specific goals, such as reducing the pollutants released in greatest quantities or targetting chemical releases in a particular region. For example, in 1991, the EPA launched the 33/50 Program, seeking voluntary reductions in the releases and transfers of 17 chemicals on the TRI list. The result is that industry surpassed the national goal of a 33 percent reduction by 1992 (based on 1988 levels) and is expected to exceed the 50 percent reduction by 1995. TRI data are also being used to set enforcement priorities and to target industries for technical assistance.

1.2 Why is a North American Report on PRTRs Needed?

North Americans are increasingly asking questions such as:

- What pollutants are being released in the greatest quantities in North America?
- Which companies and industries are making the most progress in reducing their wastes?
- Are most pollutants released to the air, land or water in North America?
- How do pollutant releases compare among the US, Canada and Mexico?
- Are more pollutants recycled in the US, Canada or Mexico?
- What pollutants, in what quantities, are being released near the borders or transferred across the borders of each country?
- What pollutants could be subject to long-range transportation to areas such as the Arctic?
- How do estimates from different pollutant databases compare?

The CEC wishes to assist citizens in integrating the existing information in Canada, US and Mexico to answer these and other questions. Some answers can be found in toxic release and transfer reports from Canada and the United States. But these systems also have important differences such that superficial comparisons are not useful.

How can apples-to-apples comparisons be made? The citizen, policy maker, scientist or worker seeking answers would currently have to review reports from each of the three countries, study the different pollutant lists, and compare the differences between the two established systems and the third developing system to determine what adjustments were required to make the comparisons valid.

The goals of the North American Report Series on Pollutant Releases and Transfers are:

- to increase public access and understanding of pollutant releases and transfers in North America; and
- to stimulate compatibility across North America for basic information from PRTRs.

1.3 Report Focus

This report describes each of the North American PRTRs and describes their similarities and differences so that valid data comparisons can be made. The report also puts the PRTRs into an international context and describes potential uses of the data. With the aid of this report and

the second, forthcoming one summarizing the Mexican pilot project data, a North American analysis of pollutant releases and transfers will be possible for the first time. Hopefully, this series of reports will also increase communication and cooperation between the three governments on PRTRs.

systems. The Council also instructed its Environment Policy Committee to consider how the OECD can assist non-member countries establish PRTRs.

While the development of the US Toxic Release Inventory (TRI) and the Canadian National Pollutant Release Inventory (NPRI) preceded the Rio Declaration, the proposed Mexican *Registro de Emisiones y Transferencia de Contaminantes (RETC)* is one of many national initiatives taken since the adoption of the Rio Declaration. It may become the first PRTR to follow the Declaration and, as such, it may serve as an example for other rapidly industrializing countries.

Other international agreements contribute to the fundamental need for the PRTR concept. The proposal that countries should both collect and make public information on chemical emissions has been gaining steady acceptance. Article 4 of the 1992 United Nations Framework Convention on Climate Change[2] includes a commitment from the parties to establish, update, publish and provide national inventories of human-generated emissions of greenhouse gases to the Conference of Parties in accordance with national legislation. Article 6 further states that the parties shall facilitate public access to information concerning climate change.

The Montreal Protocol on Substances that Deplete the Ozone Layer[3] was adopted in 1987 and amended in 1990, 1991 and 1992. It commits the Parties to provide statistical data on the production, importation and exportation of ozone-depleting substances. Reference may also be made to the 1989 Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal.[4] This requires the Parties to obtain information on transboundary movements of wastes and to cooperate in the dissemination of the information. The 1979 Geneva Convention on Long-Range Transboundary Air Pollution[5] was signed by Canada and the United States. It contains similar provisions under which the Parties agree to share information on air pollution emissions, but remains silent on public access to this data.

In 1983, the US and Mexico bilaterally signed the La Paz Agreement.[6] Its Annex IV provides for the monitoring of sulphur dioxide emissions from copper smelters and the exchange of monitoring data between the Parties. Article 16 of the La Paz Agreement stipulates that information gathered under the Agreement may be made available to third parties by mutual consent of the signatory nations.

The 1991 Agreement Between Canada and the US on Air Quality[7] provides for the exchange of information on air emissions between the Parties and the preparation of biannual data reports. Article VIII stipulates that these reports shall be made public. In the areas of water pollution control, the US and Canada signed the 1978 Great Lakes Water Quality Agreement,[8] which provides for the development of water pollution control plans, publication of periodic reports, and public release of these reports. These bilateral agreements contain provisions which are compatible with the development of PRTRs. However, the PRTR concept is unique. It is an integrated, multimedia report designed to provide public information and to achieve accountability and pollution reduction objectives.

The development of a North American report combining PRTR data from Canada, the US and Mexico is a measure designed to implement subparagraph (a),

North American Pollutant Release and Transfer Registers (PRTRs) are on the forefront of a worldwide trend toward increased collection and public disclosure of industrial data on pollutants.

2.1 International Agreements

The PRTR concept is unique in that it brings together two principles that have been recognized by international environmental accords:

- citizens should have access to environmental information; and
- industries should provide information on emissions of toxic substances into the environment.

These two underlying principles, embodied separately in recent agreements, jointly represent the fundamental need for PRTRs.

As such, there are no international agreements that provide specifically for the preparation of national, bilateral or multilateral PRTRs. The three North American Free Trade countries are not party to an international agreement specifically mandating the development of PRTRs. However, the countries are signatories of several international conventions and bilateral agreements that provide some basis for certain components of PRTRs.

The three North American Free Trade countries are parties to several international instruments and bilateral agreements that either advocate the preparation of PRTRs or implement certain components of PRTRs.

Certainly, the most prominent multilateral statement supporting the development of PRTRs is the Rio Declaration on the Environment and Development,[1] adopted by the United Nations Conference on the Environment and Development held in Rio de Janeiro in June 1992. This Declaration was adopted together with Agenda 21, an action plan designed to implement the Declaration itself. Canada, the US and Mexico supported the resolution adopting both the Rio Declaration and Agenda 21. These instruments have established the most recent and up-to-date standards for international environmental conduct.

In the Rio Declaration, Principle 10 establishes the principle of public participation in environmental decision-making. This principle affirms the right of each citizen to have access to environmental information held by national public authorities. It stresses the duty of States to facilitate citizen participation by providing that information to the public. Of particular importance to the recent international movement towards the development of PRTRs is Chapter 19 of Agenda 21. Section 19.50 of Agenda 21 encourages industry to recognize its responsibility to provide information on potential risks and waste management practices associated with the trade of chemical products. It also encourages industry to adopt voluntary programs recognizing the community's right to environmental information, including the preparation of reports on annual releases of toxic chemicals into the environment. Other sections of Chapter 19 in Agenda 21 — such as 19.40 (b), 19.44. 19.49 (b) and 19.61 (a) — all encourage governments directly or indirectly to implement emissions inventories.

Pursuant to Agenda 21, the Council of the Organization for Economic Cooperation and Development (OECD) issued a recommendation in February 1996 that its member countries implement PRTR

paragraph 5 of Article 10 in the 1993 North American Free Trade Agreement on Environmental Cooperation. This stipulates that the Council of the CEC shall promote and, as appropriate, develop recommendations regarding:

> *"(a) public access to information concerning the information that is held by public authorities of each Party, including information on hazardous materials and activities in its communities, and opportunity to participate in decision-making processes related to such public access…"*

2.2 Activities of International Agencies

The strong recommendations of Chapter 19 in Agenda 21 have resulted in numerous activities to stimulate the development of national PRTRs. One of the most important activities is the development of a PRTR guidance document for governments by the OECD through a series of broadly attended workshops. The final *OECD Guidance Manual for Governments: A Tool for Environmental Policy and Sustainable Development* (OENE/GD(96)32) includes discussion on:

- the usefulness of instituting a national PRTR;
- developing a list of chemicals;
- data management and estimation;
- dissemination and use of PRTR data and results; and
- formulating a practical PRTR.

The OECD has also passed a recommendation in February 1996 suggesting that member countries adopt a PRTR. This resolution will further the encourage the development and implementation of new PRTRs.

The United Nations Environment Programme (UNEP) has recently developed a prototype international PRTR web page on the Internet (http://irptc.unep.ch/prtr/welcome.html.) Designed to provide information on international, governmental, industrial, and non governmental organization (NGO) PRTR activities, the page will be fully implemented in the near future. Furthermore, the United Nations Institute for Training and Research (UNITAR) is supporting pilot projects in three countries, including Mexico. To assist the pilot projects and other interested countries, UNITAR has developed a set of guidance and training materials, complementary to the OECD Guidance for Governments manual, on the process of developing a national PRTR system as well as on specific aspects of PRTR design and implementation. Other international organizations, such as the International Program on Chemical Safety, the United Nations Industrial Development Organization, and UNEP, are also actively involved.

Mexico and the US co-chaired the March 1996 meeting of the Intersessional Group of the Intergovernmental Forum on Chemical Safety, which reviewed the present status of PRTRs and highlighted Mexico's recent progress on them. The Group also recommended that a discussion and draft recommendations on PRTRs be reviewed by the full membership of the Intergovernmental Forum at the upcoming 1997 meeting.

2.3 PRTR Program Approaches in Other Countries

PRTRs in other countries are based on significantly different approaches than the three North American PRTRs. The

Netherlands' registry, for example, began as an effort to compile comprehensive information on air pollution sources. This included assessments of industrial facility emissions, but also engineering estimates of small diffuse sources. More recently, this inventory has been expanded by the addition of water discharge data, and the addition of waste data is being considered. Thus, it is far more comprehensive with respect to some sources than the North American PRTRs, but is not fully multimedia in its scope.

Great Britain's PRTR is based on its permit system, which is being integrated across all environmental media. Reporting is determined by permit requirements. This mode of reporting is directly useful in the British pollution control system, more so than the North American PRTRs, which include many chemicals but no regulatory limits. However, unlike the North American systems, the British system contains data on chemical releases only to the environment media for which permits have been issued. Thus, data are not consistent from one facility to the next and often do not include all media at a particular facility. In addition, many of the substances reported in the United Kingdom are not individual chemicals but rather complex mixtures (e.g., volatile organic hydrocarbons) or environmental engineering parameters (e.g., biological oxygen demand).

Other countries' reporting systems differ in other ways. The Swedish PRTR pilot project includes chemical use data, Norway's PRTR tracks only 40 chemicals and the proposed second phase of a Czech Republic inventory includes both use and waste generation data. The Australian PRTR may collect different data in each of its states, reflecting its particular governmental structure and the diversity of sources and environmental priorities across the country.

2.4 Private-sector Initiatives

Complementing these international activities for greater disclosure of environmental information is a movement towards increased self-auditing and third-party auditing of companies' environmental performance, with the results made publicly available. Because a PRTR can provide a measure of corporate performance, this auditing movement contributes to the impetus for PRTRs. Several major private-sector initiatives to increase public disclosure of environmental data have recently been undertaken, as follows.

- The Public Environmental Reporting Initiative (PERI),[9] initiated in 1994 by ten major multinational corporations, outlines the type of information that signatories agree to make public for their worldwide operations.
- The Coalition for Environmentally Responsible Economies (CERES)[10] asks companies to respond to questions on specific social and environmental issues.
- The European Chemical Industry Council (CEFIC) published Guidelines on Environmental Reporting for the European Chemical Industry.[11]
- The National Emissions Reduction Masterplan, initiated by the Canadian Chemical Producers' Association, requires reporting of releases and transfers as a condition of membership.
- Corporate environmental reports are prepared and widely distributed by well over 100 major multinational companies.
- Development of environmental management consensus standards (especially the International Standards Organization's 14000 Series) is ongoing.

These private-sector initiatives, combined with international, bilateral and national activities, all increase the availability of environmental information to citizens.

Endnotes

[1] *Rio Declaration on Environment and Development*. United Nations Conference on Environment and Development, United Nations Doc. A/CONF.151/5/Rev.1, 1992.

[2] United Nations Framework Convention on Climate Change. Reprinted in *International Environment Reporter*, Bureau of National Affairs, Reference File 21:3901, 1992.

[3] Montreal Protocol on Substances that Deplete the Ozone Layer. Reprinted in *International Environment Reporter*, Bureau of National Affairs, Reference File 21:3101, 1987.

[4] The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal. United Nations Environment Program Doc. I. G.80/3. Reprinted in *International Environment Reporter,* 47–60, May 1994.

[5] Convention on Long-Range Transboundary Air Pollution.18 I.L.M. 1442, 1979.

[6] Agreement Between the United States of America and the United States of Mexico on Cooperation for the Protection and Improvement of the Environment in the Border Area, T.I.A.S. No. 10827, August 14, 1983.

[7] Agreement Between Canada and the United States on Air Quality. Reprinted in *International Environmental Reporter*, Bureau of National Affairs, Reference File 31: 0701, 1991.

[8] Agreement Between the United States and Canada on Great Lakes Water Quality. Reprinted in *International Environmental Reporter*, Bureau of National Affairs, Reference File 31: 0601, 1978.

[9] Public Environmental Reporting Initiative (PERI) Guidelines, May 1994.

[10] 1992 Coalition for Environmentally Responsible Economies (CERES) Environmental Performance Report Form for CERES Principle Signatories, June 1993.

[11] Adopted by the Board on June 18, 1993. European Chemical Industry Council (CEFIC), Brussels, Belgium.

Chapter 3.0: Comparative Review of Pollutant Release and Transfer Programs in North America

This chapter provides an overview and examines the comparability of the pollutant release and transfer programs in the United States, Canada, and the proposed program in Mexico.

3.1 North American Pollutant Release and Transfer Registers (PRTRs)

3.1.1 The US Toxic Release Inventory (TRI)

The US TRI, the oldest of the three North American PRTRs, first collected information on releases and transfers from manufacturing facilities in 1987. Additional data for on-site waste generation were first reported for the year 1991. Facilities owned by the federal government reported for the year 1994.

The US TRI reporting is part of the Emergency Planning and Community Right-to-Know Act, which is based on the principle that citizens have a "right-to-know" about hazardous and toxic chemicals in their communities. The data are reported to the federal and state governments. Some states supplement their TRI reports with more detailed data, including data on chemical use and source reduction.

> The primary purpose of the TRI is "community right-to-know". When informed about toxic chemicals, citizens can play an important role in helping their communities achieve tangible results in protecting public health and the environment.

The recent Presidential State of the Union address supported the principles of "community right-to-know" regarding toxic chemicals. President Clinton said: "We must strengthen community right-to-know laws requiring polluters to disclose their emissions, but you have to use the information to work with business to cut pollution. People do have a right to know that their air and water are safe".

The list of toxic chemicals to be reported to the TRI was compiled from state lists of hazardous chemicals used in manufacturing. The original list had 309 chemicals and 20 categories. Chemical categories are groups of closely-related chemicals, such as zinc compounds, that are reported as a single amount. Substances have been added and deleted from the list as the EPA reassesses chemicals based on acute human health effects, carcinogenicity or other chronic human health effects, and/or their adverse effects on the environment. For the 1994 list, 346 chemicals and 22 chemical categories were reported (see Appendix A).

TRI Expansion

The EPA has developed a three-phase expansion approach. Phase One was implemented in November 1994 when the EPA issued a final rule (40 CFR 372.65, 59 Federal Register 61431) adding 286 chemicals to the TRI list, including 160 pesticides. To develop the new list of chemicals for this first phase, the EPA examined lists of chemicals previously regulated or identified as being of concern under several environmental statutes. Initial reporting on these chemicals is required for the year 1995 with reports due by 1 July 1996.

The expansion to include new chemicals in TRI reporting has been under attack in Congress and elsewhere. A bill (S. 343), sponsored by Senators Robert Dole, J. Bennett Johnston and Trent Lott, proposed to drop the 286 new chemicals unless EPA could prove that dropping them would jeopardize human health or the environment. This would require EPA to perform a risk assessment on each chemical within 60 days. The bill remains

under discussion. In September 1995, the Chemical Manufacturers' Association filed a lawsuit challenging the EPA's application of screening criteria in the selection of 156 of the 286 chemicals added to TRI. Three other chemical industries filed suits challenging the specific listing of three chemicals. An April 1996 decision ruled in EPA's favour and dismissed the lawsuits. Reporting for the 286 chemicals remains effective for the 1995 reporting year.

Phase Two of the expansion proposes to increase the number of industries required to report. For the first time, non-manufacturing industries, which may include those involved in energy production, materials distribution, materials extraction and waste management, would report to TRI. The proposed approach would add "sectors" within these industrial categories that are related to manufacturing and are responsible for significant releases of toxic chemicals. Phase Two is still under discussion.

Phase Three would expand the type of information gathered. Options for this phase include a full or partial "materials accounting", adding a data element such as the quantity of source reduction, or doing nothing. Full materials accounting would require an industry to report on the:

- amount of chemical brought on-site, and the amount put into or removed from inventory;
- amount of pollutant produced and/or consumed during the production process;
- amount of chemical shipped in or incorporated as product; and
- amount generated as waste.

Partial materials accounting would require some but not all of this information to be reported. Phase Three is still under discussion.

In addition to the TRI expansion, EPA has established an "alternative threshold for facilities with low annual reportable amounts" in an effort to make it easier for small businesses to comply (40 CFR 372.10, 372.22, 372.25, 372.27, 372.95, 59 Federal Register 61488). A facility that does not exceed 500 pounds of production-related waste of a chemical and does not manufacture, process, or otherwise use more than 1 million pounds of that chemical does not have to report for it. This rule is also effective for the 1995 reporting year with reports due by 1 July 1996.

3.1.2 The Canadian National Pollutant Release Inventory (NPRI)

The Canadian NPRI is a national, publicly accessible database of pollutant releases and transfers from industrial and transportation sources. Under NPRI, facilities were first required to submit information on releases and transfers of 178 pollutants for the year 1993. The first summary report was issued in April 1995.[1]

According to the Multi-stakeholder Committee, the purpose of the NPRI is to help:

- identify priorities for action;
- encourage voluntary action to reduce releases;
- track progress in reducing releases;
- improve public understanding; and
- support targetted regulatory initiatives.[1]

[1] *National Pollutant Release Inventory for Canada*. Final Report. Multistakeholder Advisory Committee. Environment Canada. December, 1992.

The 178 chemicals and 14 chemical categories to be reported under NPRI (see Appendix A) were selected following a review of the lists used by the TRI and the Canadian Chemical Producers' Association's National Emissions Reduction Masterplan (NERM). Substances already

regulated or scheduled for bans and phase-outs were deleted. Substances appearing in quantities of less than one tonne on the Domestic Substances list, which identifies all substances in commercial use in Canada, were also deleted. An additional ten lists from other regulatory programs were also reviewed, and 78 "candidate" substances were identified for possible inclusion in future years.

Of the 178 listed substances on the NPRI list, 53 were not released or transferred in sufficient quantities to require reporting in 1993. Environment Canada will review these substances before proposing changes to the list.

Having analyzed the first year of reported data, Environment Canada is anticipating smoother data verification procedures this year. The responsibility for collecting and verifying the data has shifted from the national to the regional offices. Similar to the experience with TRI, the most common errors noted in 1993 NPRI reporting were inaccurate latitude and longitude (40 percent of the locations), confusion between recycling and transfers in waste, and unnecessary reporting of mineral acid releases at high pHs.

Several changes have been made to the 1994 NPRI reporting requirements:

- addition of public liaison and company coordinators;
- clarification of information to be submitted on the parent company;
- use of only one Canadian and US Standard Industry Classification (SIC) Code, compared to up to five codes in the past;
- reporting on reuse, recovery, and recycling was made optional;
- addition of two new transfer treatment methods — biological and chemical treatment;
- clarification of the definition of "waste";
- improved location codes to indicate errors; and
- deletion of chloromethyl methyl ether and the addition of i-butyl alcohol.

Review of the Canadian Environmental Protection Act (CEPA)

Potential reform to NPRI is part of the review of the primary federal environmental legislation, CEPA. CEPA has been the subject of extensive consultations and a review by the federal Standing Committee on the Environment and Sustainable Development.[2] In December 1995, the federal government issued a response to the Standing Committee's recommendations. The public was invited to comment on the government's CEPA proposals during a 90-day period that ended in March 1996. Based on comments received, the renewed CEPA legislation is planned for introduction in the fall of 1996. Several of the government's proposals may affect NPRI. These are:

- shifting the focus towards minimizing or avoiding the creation of pollutants and wastes;
- broadening NPRI to provide a means for industry to report on pollution prevention activities;
- creating an explicit statutory basis for NPRI; and
- creating a multi-stakeholder consultative process to guide the further development of NPRI.[3]

The Standing Committee's view was that NPRI could play a key role in pollution prevention efforts. NPRI would be broadened considerably to require information on:

- pollutants released into the waste stream prior to being treated, recycled or incinerated;
- pollutants transferred off-site for treatment, storage or disposal;

- quantities of pollutants generated, used and stored at facilities; and
- details of the pollution prevention initiatives undertaken with respect to the listed pollutants, including pollution prevention plans and source reduction strategies.

The Standing Committee noted industry's general support of the current NPRI and its objections to expanding it. Industry suggested that reporting throughout the lifecycle of a substance may not have any relationship to environmental improvements, and that adding additional elements may make NPRI less comprehensible to the public and more costly and complex for industry and government.

The Committee also made a number of other recommendations, including:

- requiring specialized reporting on key pollutants such as pesticides, ozone depleters, and climate change gases;
- lowering the reporting threshold to 4.5 tonnes;
- gradually phasing-out exemptions; and
- harmonizing the NPRI as much as possible with the TRI.

In the government's response to the Standing Committee's report, only the pollution prevention recommendation was addressed. The government proposes to revise the NPRI to provide a means for industry to report on pollution prevention activities.

The authority for implementing NPRI is currently Section 16 of CEPA. However, the multi-stakeholder committee that first designed NPRI and the Standing Committee both recommended a specific legislative authority for NPRI. The government proposes to enshrine the NPRI in CEPA through the use of a new Ministerial power to gather a variety of information. This change would clarify rules governing operation of NPRI, be more appropriate for an inventory with an annual reporting cycle and remove some of the limitations of NPRI.

The multi-stakeholder committee and the Standing Committee recommended that additional discussion on NPRI be pursued through a consultation procedure. In response, the government proposes to use multi-stakeholder consultation for changes in NPRI. The changes in NPRI which may be the subject of consultation include: reviewing changes to the list of substances, reviewing the criteria for reporting, determining how to incorporate pollution prevention activities, and reviewing the voluntary reporting of material sent for off-site recycling.

Other Activities

In January 1996, Environment Canada released a comparison between 1993 NPRI and 1992 TRI data in the Great Lakes Basin.[4] The major findings of the report were a total release of 173,092 tonnes of pollutants to the Basin, with approximately 70 percent originating in the US and 30 percent from Canadian industry. Over 70 percent of the total releases were to air. Land releases accounted for 15 percent and underground injection approximately 8 percent, with water releases making up the smallest component, at approximately 3 percent. The top 25 facilities generated approximately 40 percent of all releases within the Basin, and were mainly from the primary metals, and the chemical and allied-products sectors. The top 15 pollutants accounted for approximately 73 percent of the total Basin releases.

The environmental staff of Canada, the US and Mexico are exchanging informa-

tion to increase understanding and compatibility among the three systems. For example, Mexican staff recently visited Canada to learn more about software reporting systems.

Statistics Canada, with its counterparts in the US and Mexico, is developing a North American Industry Classification System, which would standardize the industrial SIC codes used to describe facilities. Thirty-one agreements with US and Mexico are now being finalized (available at http://www.stats.ca). For some sectors, such as construction, utilities and waste management, consensus was not possible, and no common North American Code could be developed. For other sectors, a four-digit code, along with a fifth digit for national detail, is suggested. Canada and the US plan to use the codes starting with the annual business surveys in 1997, with Mexico implementing the system in 1998 to 2000.

1993 Data from NPRI and TRI

Releases and transfers for 1993 from NPRI and TRI data are presented in Table 1. Table 2 presents releases and transfers for a set of chemicals and industries common to both NPRI and TRI.

The common set of industries are a combination of American and Canadian industries reporting a US SIC code between 20-39.

3.1.3 The Mexican *Registro de Emisiones y Transferencia de Contaminantes (RETC)*

Mexico is in the exciting process of developing its own PRTR system, the *RETC*. This chapter reflects the status of that development as of March 1996.

The basis for the *RETC* is found in Chapter 19 of Agenda 21 of the Earth Summit, signed by Mexico in 1992. Mexico

Table 1. Releases and Transfers for 1993 NPRI and TRI Data

	NPRI		TRI	
	Number	**% of Total**	**Number**	**% of Total**
Total facilities	1,437		23,321	
Total forms	5,234		79,987	
Releases (in kg)				
Total air emissions	94,674,129	25.4	758,334,574	22.2
Surface water discharges	107,611,823	28.8	122,971,820	3.6
Underground injection	9,363,156	2.5	261,353,847	7.7
On-site releases to land	13,962,889	3.7	131,089,606	3.8
Total releases	225,611,997	60.4	1,273,749,847	37.4
Transfers (in kg)				
Recycling, reuse, recovery	58,997,078	15.8	1,695,939,664	49.7
Treatment, destruction	7,772,570	2.1	148,786,473	4.4
Sewage, to POTWs	2,542,745	0.7	142,562,773	4.2
Disposal, containment	78,402,261	21.0	148,331,889	4.4
Total transfers	147,714,654	39.6	2,135,620,800	62.6
Total releases & transfers	**373,326,651**	**100.0**	**3,409,370,647**	**100.0**

Note: Numbers are for all chemicals and all industrial categories required to report to each Inventory. "Recycling, reuse, recovery" is "Recycling" plus "Energy recovery" for TRI. "Disposal, containment" is "Disposal" plus "Other" for TRI. Because of changes in the definition of waste, the quantity of substances reported under "Recycling, reuse and recovery" in Canada may not reflect

Table 2. Releases and Transfers for 1993 NPRI and TRI Data for a Common Set of Chemicals and Industries

	NPRI		TRI	
	Number	**% of Total**	**Number**	**% of Total**
Total facilities	1,133		21,846	
Total forms	4,204		72,336	
Releases (in kg)				
Total air emissions	91,378,784	35.3	684,749,048	20.8
Surface water discharges	86,169,326	33.3	122,597,766	3.7
Underground injection	8,193,259	3.2	258,705,898	7.9
On-site releases to land	10,472,994	4.0	127,684,154	3.9
Total releases	196,214,363	75.8	1,193,736,867	36.3
Transfers (in kg)				
Recycling, reuse, recovery	42,326,776	16.3	1,672,220,154	50.9
Treatment, destruction	7,497,704	2.9	141,716,201	4.3
Sewage, to POTWs	2,480,847	1.0	136,465,849	4.2
Disposal, containment	10,389,265	4.0	141,143,978	4.3
Total transfers	62,694,592	24.2	2,091,546,182	63.7
Total releases and transfers	**258,908,955**	**100.0**	**3,285,283,048**	**100.0**

Note 1: Numbers are for all chemicals and all industrial categories required to report to each Inventory. "Recycling, reuse, recovery" is "Recycling" plus "Energy recovery" for TRI. "Disposal, containment" is "Disposal" plus "Other" for TRI. Because of changes in the definition of waste, the quantity of substances reported under "Recycling, reuse, and recovery" in Canada may not reflect the total quantity.

Note 2: The common set of chemicals is the list of 178 chemicals reported to NPRI with the exception of 2-Ethoxyethyl acetate (111-15-9), n-Dioctyl phthlate (117-84-0) (removed from TRI list for 1993 etc.), 2-Methoxyethyl acetate (110-49-6), Butyl benzyl phthlate (85-68-7) (removed from TRI list for 1994 etc.), Acetone (67-64-1) (removed from TRI list for 1994 etc.).

is participating with the United Nations Institute for Training and Research (UNITAR) to establish and assess the feasibility of developing PRTR systems. Egypt and the Czech Republic are also participating with UNITAR. A UNITAR advisor, stationed in the offices of the *Instituto Nacional de Ecología (INE)*, National Institute for Ecology, provides technical support. In Mexico, the *INE* is responsible for implementing the *RETC*. The institute is leading the *Grupo Nacional Coordinador (GNC)*, National Coordinating Group, a group of approximately 80 government agencies, industry representatives, academicians, and NGOs charged with developing the *RETC*.

This project will, among other benefits, stimulate discussion in industry and government on the prevention and control of pollution, provide the public with information on substances with potential human health and environmental impacts, and serve as an important tool for environmental policy planning.

The development of the *RETC* is scheduled to be completed by July 1996 (see Table 3).

In the first half of 1996, the proposed *RETC* was tested in the State of Querétaro. This trial evaluated the operation of all technical, administrative and operational aspects involved in a PRTR including the:

- list of substances subject to reporting;
- reporting forms and data collection;
- public use of collected information;

Objectives of the Mexican *RETC:*

- Provide information on the emissions of chemical substances posing risks to human health and the environment, and facilitate risk assessment and its disclosure.
- Provide a database of reliable and updated information quantifying releases and transfers of specific pollutants to air, water and soil to assist in decision making and the formulation of environmental policies in Mexico.
- Allow follow-up and quantification of progress in reducing releases and transfers of pollutants to environmental media (air, water and soil).
- Simplify industrial reporting requirements and information gathering concerning the release and transfer of specific pollutants.
- Provide additional information to assist industries in making decisions that complement their processes and environmental management priorities.
- Enable Mexico to better meet its international commitments on environmental information.
- Develop a pollutant-emissions information system to serve as the basis for information reports that are accessible and available to the general public.

- necessary hardware/software infrastructure;
- medium of data dissemination and public consultation;
- required level of inter-ministerial cooperation;
- industry participation; and
- operative costs for government and industry.

The State of Querétaro was chosen for the case study because of its well-developed industrial and environmental management infrastructure. The state's industrial census was used to select industries. These were then formally invited to participate in January 1996. The list of participating industries is presented in Appendix B.

At present, there is no legal requirement to submit the *RETC* information, so the case study relied on voluntary participation of the invited industries. A workshop to assist industries in reporting was held in February 1996. Another one for state government officials was at the same time with the support of UNITAR, with representatives from the EPA and the State of New Jersey participating and providing guidance to the Mexican officials.

Table 3. Schedule for the Implementation of the *RETC*

Activities	Completion Time
List of chemical substances subject to *RETC* reporting	December 1995
Design reporting form	December 1995
Design database management	January–March 1996
Case study at Querétaro	April–June 1996
Design use and communication of *RETC* information	March–April 1996
Definition of future directions to expand *RETC* functions and uses	May–June 1996
Design for the legal implementation of *RETC*	May–September 1996
Complete executive proposal and start the process of national implementation of the *RETC*	September 1996

The reporting form for the case study has been adapted from the US TRI, the Canadian NPRI forms, and the World Wildlife Fund Benchmark. A guidance document has also been prepared. The version of the reporting format that was utilized in the case study is presented in Appendix C.

The selection of the substances for the *RETC* case study first took into account chemicals that were already regulated under the *Normas Oficiales Mexicanas (NOMs)*, official standards. *NOMs* establish the maximum allowable emissions to the air, water or as components of hazardous wastes. Substances listed under other PRTR programs, such as the NPRI, TRI, the Swedish Sunset Project for Chemicals (KEMI Report), and the priority lists of some OECD countries, were then reviewed for possible inclusion. These two steps yielded a list of 407 substances.

Criteria relating to toxicity, environmental persistence and the bioaccumulation of these substances were applied, reducing the number of chemicals on the list. Other substances were added, named in international agreements signed by Mexico as well as in industrial operating permits and licences, and in greenhouse gases. A list of 132 chemicals and 17 categories reached by consensus of the *GNC* members was used for the case study (see Appendix A). Many of the chemicals released in greatest quantities in the US and Canada are not included on the Mexican list. Some chemicals released in high volumes, such as methyl ethyl ketone, that appear on the American and Canadian lists, do not appear on the Mexican list because they do not meet Mexico's specific toxicity, bioaccumulation and persistence criteria.

The *GNC* agreed that reporting thresholds would not apply to the case study. Industries were expected to report on each listed pollutant that is released or transferred. Existing material on data-estimation methods produced by the EPA, UNITAR, and World Health Organization (WHO) was used as guidance during the case study. For the national *RETC*, special manuals will be developed.

Data gathered in the case study will be used to conduct a general assessment of releases and transfers of chemical substances by industry, and their potential impacts in the State of Querétaro. The information could be used to evaluate current environmental policies and establish priority actions.

A report analyzing the data was presented to the *GNC* in July 1996 to assist in the development of the *RETC*. Based on this data and experience, threshold limits may be designated, the list of substances and the report format modified, the size and type of industries required to report determined, and other elements of the national *RETC* reconsidered.

3.2 Comparative Overview of North American PRTRs

The North American PRTRs collect data on the releases and transfers of chemicals on an annual basis.

The major elements of the North American PRTRs are:

- identification of facilities and chemicals;
- reporting thresholds;
- type of releases reported;
- type of transfers reported;
- chemicals in waste; and
- other data elements, including source reduction activities.

This section compares the major elements of a PRTR in each country. Table 4 shows how the major data elements are reported under each country's PRTR.

Note: *CMAP* refers to the *Clasificación Mexicana de Actividades y Productos (CMAP),* Mexican Classification of Activities and Products.

3.3 Comparability of the Data

This section compares the PRTRs in each country and proposes ways to fit the pieces of information together.

3.3.1 Comparability of Identification and Threshold Reporting Identification of Facilities

Individual facilities are identified by location and industrial sector. Each of the three PRTRs require the facility name, address and a type of SIC code (see below) and the name of the parent company. However, facility and parent-company names and addresses are not standardized. Slight differences in spelling or abbreviation make it difficult to compare parent-company data across North America.

All three countries also ask for other identification numbers assigned by government programs. This helps to link the release/transfer data to other types of environmental data and expands the usefulness and scope of the PRTR. Identification numbers also help to match data on a facility or parent company basis.

Industrial Classification

Standard industrial classification (SIC) codes are used to group and compare similar facilities. All three countries require reporting of the type of SIC code for a facility, but the codes are different in each country. For example, the Canadian SIC code for the Industrial Inorganic Chemicals Industry is 3711, whereas the closest American match is US SIC code 2819 (also defined as Industrial Inorganic Chemicals). American and Canadian data can be compared because the Canadian NPRI requires reporting of both country's SIC codes. The American code can then be compared with TRI data.

The Mexican industry classification system is the *Clasificación Mexicana de Actividades y Productos (CMAP),* Mexican Classification of Activities and Products. Although this industrial classification system is similar in concept to those in Canada and the US, it is not directly comparable, just as the Canadian system is not comparable to the American one. Two conditions need to be overcome before Mexican data can be combined with American and Canadian data: development of a concordance table between Mexican *CMAP* and US SIC codes, and adding of the requirement to report the latter on the Mexican form. Without the two events happening, Mexican data cannot be easily used with other North American data.

In addition to the differences between the systems in the type of SIC code used, each system also requires different types of industries to report. NPRI covers any facility manufacturing, processing, or using a listed chemical. Exemptions exist for research, mining and extraction operations, as well as wholesale and retail sales of products containing the substances. The TRI covers only manufacturing and federal facilities. Mexico is still discussing the type of industries that will be required to report. A North America-wide data analysis could be based only on the set of

facilities common to the three systems, which presently would be drawn mainly from the manufacturing sector.

The TRI requires reporting of all SIC codes applicable to the operations involving the listed chemicals. The Canadian NPRI used this same system in 1993, but has subsequently changed to a single SIC code that "describes the highest value of activities" at the facility. The proposed Mexican *RETC* contemplates reporting only one CMAP code as well.

The change to reporting only one SIC code will make a North American analysis even more difficult. For example, in the 1993 TRI, facilities with operations covering more than one major SIC code (such as an oil refinery and chemical manufacturing plant combined at one location), represent 6 percent of releases and 10 percent of transfers. Assigning releases and transfers to just one SIC code would increase the apparent releases and transfers of that one SIC code while underestimating another. The Canadian NPRI allows large refining and petrochemical sites, which are adjacent to and owned by the same company but operated as different business units, to report separately. This would reduce the assigning of releases and transfers to an incorrect SIC code.

Activity and/or Use Indicator

Reporting how a substance is used at a facility is useful because releases and

Table 4. Comparison of PRTRs in North America

Major Data Elements	US Toxic Release Inventory (TRI)	Canadian National Pollutants Release Inventory (NPRI)	Mexican *Registro de Emisiones y Transferencia de Contaminantes (RETC)* (proposed)
Identification			
Type of facilities reporting	Manufacturing facilities; federal facilities	Any facility manufacturing or using a listed chemical, with a few exceptions	Not yet decided
Industry classification	All US SIC codes applicable to facility operations	Canadian and US SIC code, one primary SIC code only	Mexican *CMAP* code, (one code only)
List of chemicals	Chemicals used in manufacturing (346 plus 22 categories for 1994)	Chemicals used or manufactured in sufficient quantities (178 for 1994)	Chemicals meeting toxicity, bioaccumulation, persistence criteria (132 plus 17 categories proposed)
Reporting Thresholds			
Number of employees	10 or more	10 or more	Not yet decided
Use of chemical	Manufacture/process more than 25,000 pounds or use more than 10,000 pounds	Manufacture, process or use 10 tonnes or more (22,050 pounds)	Not yet decided
Concentration of chemical in mixtures	Concentrations equal to or greater than 1% (0.1% for carcinogens)	Concentrations equal to or greater than 1%	Not yet decided
Type of Data Reported			
Units	Based on estimates; small amounts reported by range code; (units in pounds) for totals only or by range	Based on estimates; small amounts reported code; (units in tonnes)	Based on estimates; (units in kilograms)
Releases			
Air emissions	Fugitive and point source, includes leaks and spills, not separately identified	Fugitive, point source, leaks and spills separately identified	Air emissions from production processes including fugitive; spills reported separately

(cont.)

Table 4. Comparison of PRTRs in North America (cont.)

Major Data Elements	US Toxic Release Inventory (TRI)	Canadian National Pollutants Release Inventory (NPRI)	Mexican *Registro de Emisiones y Transferencia de Contaminantes (RETC)* (proposed)
Surface water discharges	Includes leaks and spills not separately identified	Discharges, leaks, spills separately identified	Discharges and spills reported separately
On-site land releases	Landfills, land application, surface impoundments	Landfills, land application, spills, leaks	Landfills, land treatment, surface impoundments, land disposal, spills reported separately
Underground injection	Amount reported	Amount reported	Not reported since no such wells used in Mexico
Accidental spills	Reported as single number for all media, also included in release and transfer amounts	Reported for separate media	Reported as single number for all media
Transfers			
Transfers to public sewage	Total amount reported	Total amount reported	Total amount reported
Other off-site transfers	Reported by method of treatment/disposal; reported for each transfer location	Reported by method of treatment/disposal; total only reported, not for each transfer location	Reported by method of treatment/disposal; reported for each transfer location
Chemicals in waste			
Management by treatment, disposal	On-site and off-site by type of management	Off-site transfers only	Off-site transfers only
Recycling/reuse/recovery	On-site and off-site reported	Reporting voluntary only	Off-site reported
Other Data Elements			
Type of on-site waste treatment	Type for each method used	Not reported	Type for each method used
Projections	Two years following for on-site and off-site wastes	Three years following for total releases and total transfers	One year following for total releases
Source reduction	Type of source reduction activities	Not reported	Type of source reduction activities

transfers can be dependent on how that substance is used within a facility. For example, higher volumes of releases and transfers would be expected from a plant where a chemical is used as solvent rather than being manufactured. All three systems ask a facility to indicate how each reported chemical is used. Since the definitions of "manufactured, processed, or otherwise used" are the same, the Canadian, US, and proposed Mexican data can be compared.

Chemical Classification

All three North American PRTRs are based on reporting amounts for individual chemicals which are identified by a Chemical Abstracts Service (CAS) number. The CAS number is an important identifier: although chemicals have only one number, they can have several different names. (See Appendix A for a comparison of the three lists of chemicals.) Using the CAS number, chemical comparisons among the three systems can be made.

In addition, each country groups similar individual chemicals into categories. Each country has different categories: the US has 22 categories, Canada has 14 and Mexico is proposing 17. A North American analysis can be made by regrouping the individual chemicals into common categories.

Threshold for Reporting

Both the US and Canada require reporting if specific threshold quantities are exceeded.

If these are met, then all releases and transfers must be reported. Mexico is still discussing thresholds for the *RETC* and has agreed that no threshold will be used for the case study. This allows data to be collected to help determine the final threshold. However, the thresholds differ between the US and Canada. Under the US system, a report must be submitted if the chemical is manufactured or processed in excess of 25,000 pounds (11.34 tonnes) or otherwise used in excess of 10,000 pounds (4.54 tonnes). Under the Canadian system, a report must be submitted if the facility has manufactured, processed, or otherwise used 10 tonnes (22,050 pounds) or more of the substance. Both systems exempt facilities that employ the equivalent of fewer than ten full-time employees.

In addition, beginning with the 1995 reporting year, the TRI will have an "alternate threshold" that will exempt facilities from reporting a chemical that does not exceed 500 pounds (0.226 tonnes) in waste. This criteria applies if the facility does not manufacture, process or otherwise use in excess of 1 million pounds (454 tonnes) of the chemical.

Both countries also have exemptions for a chemical present in a mixture. If the substance is present in concentrations greater than or equal to 1 percent by weight, it must be reported. The US requires, in addition, reporting of certain listed substances at the *de minimis* level of 0.1 percent if the chemical meets the US Occupational Safety and Health Act (OSHA) carcinogen standard. Thus, in general, US facilities will meet the threshold requirements at lower levels of chemical activity and/or use than Canadian ones.

The difference in threshold requirements is hard to account for when comparing the two systems. If one country has more small- and medium-sized industries that do not reach the threshold for reporting, then each PRTR will represent a different percentage of the total releases and transfers.

The US has estimated that changing to a higher 10-tonne, "otherwise used" threshold, similar to the Canadian system, would reduce reported releases by only 2 percent.[5] On the other hand, the Canadian analysis of NPRI and TRI data in the Great Lakes Basin considered that the higher US "manufacture and process" thresholds cause that country's releases and transfers to be "marginally under-estimated."[6] The effect of the lower US alternate threshold and lower carcinogen threshold is also hard to judge. In the North American analysis, the difference in thresholds between the systems will be pointed out as a reason to interpret the data carefully.

3.3.2 Comparability of Reporting Categories

Facilities meeting the threshold criteria for any listed chemical are required to report estimates of releases and the amount of the chemical in off-site transfers of waste. Amounts can be estimated using direct measurements, mass balance, emission factors, or engineering estimates. Each country's PRTR directs the facility to indicate how release estimates were made, using the same estimation categories.

The amounts of pollutants are reported in tonnes to the Canadian NPRI (allowing for quantities as small as one kilogram), in pounds to the US TRI, and in kilograms to the proposed Mexican *RETC*. The amounts will be converted to kilograms in a comparative analysis by the CEC.

Estimates of On-site Releases

Table 4 shows the types of releases reported under each country's system. While the total releases are divided into different subcategories, total air emissions, surface water discharges, and on-site land releases can be compared. Canada and the US also report on on-site underground injection. The proposed Mexican *RETC* does not have this category since there are no underground injection wells in Mexico.

Accidental spills are treated differently in each country. For the Canadian system, they are reported as a separate item for each type of release. Under the US TRI, accidental spills are included in each type of release but not broken-out. In a separate section of the American form are reported the total volumes from all non-production leaks and spills, as well as wastes from remedial actions. Under the proposed Mexican system, accidental spills would be considered separately from normal operating releases. If these spills were added to the total releases, it would mask some of the pollution-prevention activities affecting the normal releases. Also, spills often involve more than one medium, so the proposed Mexican form has accidental spills reported separately by medium. A North America-wide analysis will include spills when comparing releases.

In addition to the differing release categories, both the American and Canadian systems use a series of range codes that can be chosen for small releases. Small releases are defined as less than one tonne (2,205 pounds) under NPRI, and less than 1,000 pounds (0.45 tonnes) under TRI. When adding these releases to the other quantities, the midpoint of the range is used in both the NPRI and the TRI summary reports. In addition, the NPRI allows releases amounting to less than one tonne (2,205 pounds) to be totalled without any breakdown between air, water, land, or underground injection. The actual amount (or estimate) of all releases are to be reported under the proposed Mexican *RETC*. This differing treatment of small releases could affect comparisons made between the two databases if the subsets being compared had only small releases. However, over the entire database the effect is small. In the Canadian database, for example, small air releases accounted for less than 0.03 percent of the total releases. In the TRI the reports with range codes represent 0.01 percent of the fugitive air emissions reported.

Estimates of Off-site Transfers

Off-site transfers of chemicals in waste are reported for each chemical. Only the quantity of the pollutant in the waste is reported, rather than the total quantity of waste material.

All three systems require reporting the name and address of the off-site transfer location. However, while the US and Mexican systems require the amount of the transfers to be reported for each transfer site, the Canadian one does not; it requires only a total amount according to method of treatment or disposal. Therefore, it is not possible to get amounts of Canadian transfers sent to various geographical points within and from Canada, for example, the amounts sent to the US from Canada. However, it will be possible to know the amounts of transfers sent from the US to Canada or Mexico, and from Mexico to the US or Canada. But, since there is no standardization of placenames or addresses it will require checking of individual reports to analyze where wastes are going.

While each country's system has different categories for reporting the type of transfer,

they can be summed up into broad categories: transfers to public sewage systems, transfers to treatment, transfers to disposal. In addition, since 1991 both the American and the Mexican systems require reporting of transfers to recycling and energy recovery facilities. Because of difficulties with the NPRI definition of waste in 1993, and with companies using different waste definitions, the quantity of substances reported under recycling, reuse, and recovery will not be an accurate estimate. For 1994, the definition of waste has been clarified as "material that is sent for final disposal or treatment prior to disposal". Therefore, recycled, reused, or recovered materials are not considered a waste, and are not required to be reported to NPRI. A facility may wish to provide this information voluntarily, but unlike TRI and the proposed *RETC*, reporting on recycling, reuse, and recovery is not obligatory. Therefore, any comparisons of the two systems will have to separate the type of off-site transfers. This is already done in the annual TRI report and also in the Canadian report for 1993.

Chemicals in Waste Managed On-site

Since 1991, under the Pollution Prevention Act, the TRI has required reporting of chemicals in waste that is managed on-site. This includes chemicals that are recycled, used for energy recovery, and treated on-site. This section of the TRI was added to reflect the environmental management hierarchy of priorities for addressing industrial waste problems. This hierarchy has prevention of pollution at the source as its top priority, followed by recycling and/or recovery, and waste treatment, with waste disposal as the least desirable management option.

The Canadian NPRI does not require reporting of chemicals in any waste managed on-site, so comparison of these amounts is not possible. The proposed Mexican *RETC* includes on-site waste management by type of treatment and physical state, but does not ask for chemical amounts in on-site treated wastes. On-site recycling, reuse, and recovery are considered waste treatment methods in Mexico.

Future Projections

Both the American and Canadian systems require projections of the amounts of releases and transfers. The US TRI has projections only for the next two years while the Canadian database projects three years into the future, with fourth and fifth years being optional. The developing Mexican *RETC* has projections for the next year. The Canadian projections are in two parts, total releases and total transfers. The US projections have seven categories: total releases plus transfers to disposal as one number, on-site and transfers to treatment, on-site and transfers to recycling, and on-site and transfers to energy recovery. In addition, the US projections specifically exclude amounts for spills, leaks or remedial actions. The proposed Mexican projections are for total releases only.

To compare projections, an assumption must be made about how Canadian facilities project spills and leaks. One assumption could be that they assume a constant level, in which case the amount of spills and leaks reported in the current year could be subtracted as a constant from all future projections. Another approach would be to make no changes to the projections and note that they may differ because of this reporting difference.

Source Reduction

The TRI requires reporting what types of source reduction activities were undertaken during the reporting year. Data are not

collected concerning the amount of chemicals in waste that may have been reduced due to these activities. The proposed Mexican *RETC* also reports on types of source reduction activities using somewhat different activity categories, but without giving amounts.

The Canadian NPRI does not require any reporting on source reduction activities or amounts of waste reduced due to source reduction. It does ask for general reasons why the releases and transfers changed from the previous year. However, there are four choices in answer to this question: changes in production levels, changes in estimation levels, other, and no significant change. None of these specifically indicates changes due to source reduction activity and "other" is defined as "accidents, spills, breakdowns".

An indication of how the level of production has changed from the prior year to the current year can be given as an activity index. The actual level of production involved with the chemical is not reported. This type of data is requested because the information on releases and transfers does not take into account the amount of production at the facility. A large facility will have greater releases than a smaller facility if both are operating at the same rate of release per unit of production. This lack of consideration of the rate of release per unit of production precludes an assessment of environmental efficiency of the facility and management. However, it should be noted that some sources of releases, such as fugitive equipment leaks from petroleum refineries, are not sensitive to production levels so that a production activity index would not be appropriate for such releases.

The TRI requires a facility to report a production activity index for each chemical substance. The production activity index is the ratio of the production associated with the chemical in the current year to the previous year's production level. This index indicates how production levels have changed without reporting actual levels of production. The developing Mexican *RETC* appears to be similar to the TRI that reports on the production activity index; the Canadian NPRI does not ask for an index.

3.3.3 Requests for Confidentiality

PRTRs include provisions that give a facility an opportunity to protect data it views as confidential. Under the US TRI, the only type of "trade secret" claim that can be made is for the identity of the chemical substance. All data on amounts of releases, transfers or wastes must be supplied and are part of the public database. In the public database, a generic name is supplied for the chemical that is claimed as a trade secret. Claiming trade secrecy is not widespread — for 1993, only 14 out of almost 80,000 reports were accepted trade-secret claims. The EPA routinely reviews all claims for trade secrecy under four criteria:

1. the information has not already been disclosed (other than to designated officials);
2. the information is not required to be disclosed under any other law;
3. the information is not readily identifiable through reverse engineering; and
4. the claimant can show that disclosure of the information is likely to harm the firm's competitive position.

Under the Canadian NPRI system, any person may submit a written request that the information provided be treated as confidential. Documentation justifying the request is reviewed to see if it meets the criteria for confidentiality under the federal Access to Information Act. These criteria are:

- the trade secrets pertain to a third party;
- financial, commercial, scientific or technical information has been supplied by a third party and is treated consistently in a confidential manner by the third party;
- the information could reasonably be expected to result in material financial loss or gain or prejudice the competitive position of a third party; and
- the information could reasonably be expected to interfere with the contractual standing or negotiations of a third party.

All information may then be held confidential, in contrast to the TRI where only the name of the chemical can be claimed as trade secret. For the 1993 NPRI reporting year, there were 31 trade secret forms out of approximately 5,200 reporting forms.

At present, the *GNC* has not reached a final decision on confidentiality provisions for the Mexican database. The case study results are expected to discuss the extent of permissible disclosure of information.

3.3.4 Communication of Data

Both the US TRI and the Canadian NPRI data are available to the public in a variety of formats, including annual summary reports as well as data tables and databases in electronic form, including the Internet (see Section 4.2, Figure 2, for Internet addresses). The *RETC* information will be available to government and academic institutions, industry, non-governmental organizations, and the public. However, the level and detail of the information to be made public has not yet been decided.

3.4 Context of the Data

The American, Canadian, and proposed Mexican systems do have many common data elements which make comparisons of releases and transfers possible. When putting the data together across North America, it is important to consider its context. As discussed below, most PRTR systems do not provide estimates of:

- all releases and transfers from a facility;
- pollutants released from non-point sources such as transportation;
- pollutants released from small sources;
- pollutants released from a full range of industrial facilities;
- chemical use;
- factors responsible for changes in releases and transfers;
- releases and transfers of all chemicals of concern;
- chemical exposure or risk; and
- normalized comparisons.

Accounting of All Releases and Transfers from a Facility

One major impetus for establishing the first PRTRs was to get an accounting of all releases and transfers from a facility. Without reporting on releases to all environmental media, it was not possible to know if a reduction in, for example, land disposal was not accompanied by an increase in air emissions from an incinerator. With the advent of PRTRs, these changes are noted as shifts in the release from one media to another rather than reductions. On the other hand, the Canadian NPRI does allow exemptions from mandatory reporting for off-site transfers of chemicals destined for recycling and energy recovery, so a shift in the type of transfer could be seen as a reduction.

Full Accounting of Releases and Transfers

The North American PRTRs require reporting from industrial facilities, with the Canadian NPRI having a broader base than the US system, which only requires reports from manufacturing facilities. Less than 70 percent of releases and transfers reported by facilities to the Canadian NPRI are from the equivalent of the manufacturing type of facilities that report to the US TRI.

Another significant source of chemical releases is non-point sources, particularly transportation vehicles and equipment. Information on these chemicals is not included in TRI or the proposed *RETC* databases. The Canadian report on the NPRI for 1993 included release estimates for 10 NPRI substances from mobile sources, such as automobiles, trucks, aircraft, boats, and from fuel distribution, which were ten times as great as the amounts reported to NPRI. The thresholds require that only the largest users of chemicals report to the US TRI and the Canadian NPRI. Smaller users that often do not meet the threshold requirements, such as dry-cleaning establishments, may be large sources of pollutants if taken as a whole or in a particular locale. However, PRTR data can be used together with other monitoring and permit data to obtain a fuller picture of an individual facility.

Use Data

Chemical use data include the amount of chemicals brought on-site, the amount produced on-site, the amount used from inventory, the amount recycled as input to the industrial process, the amount consumed during the production process and the amount shipped in products produced by the industrial process. Chemical use data are not required under the TRI, NPRI, or the proposed *RETC*.

Reporting on the use of chemicals at industrial facilities can serve many purposes. Use data can be combined with data on wastes to provide a complete picture of the flow of a particular chemical through a facility. Use data can also provide information on chemicals in products, such as ozone-destroying CFCs. It can provide information on potential worker exposure. Also, progress in reducing waste and chemicals in products can be tracked.

Some companies are concerned that making "use data" public will disclose confidential information about their processes, products, market share, manufacturing capacity, the marginal cost of production, or business plans. Such information could then be used to damage a company's competitive position. When a company develops a new process or product, for example, the release of such information could enable another company to adopt the process or product without having to expend the development costs. However, the North American PRTRs have provisions that give a company the opportunity to protect data it views as confidential. Some American states that have supplemented the TRI system with their own use reporting have found few trade-secrecy claims. Such claims under New Jersey's system, which collects information on the full materials balance, have been filed by no more than 5 facilities out of about 700 (0.7 percent) since 1987.

Tracking Reductions in Releases and Transfers

PRTR data can track reductions in the releases and transfers from year to year.

However, reductions can be a combination of source reduction, production level changes, pollution control and changes in estimation methods. Several methods can be used to investigate changes, but

current PRTR reporting does not indicate how much of the change was due to what factor. To track the reduction in releases and transfers due to source reduction activities, this information needs to be reported by the company. None of the North American PRTRs collect this data. However, the State of New Jersey does have some experience in reporting source reduction activities through its supplement to TRI.

Production level changes can change the amount of releases and transfers, increasing the total even in the face of source reduction or pollution controls. The TRI and the proposed Mexican *RETC* do require the reporting of a production activity index, but this number requires careful interpretation and is not applicable to all types of industrial operations.

Changes in the methods of estimating releases and transfers can change the quantities reported. To reduce the cost to industry of reporting, the data given are estimates; facilities are not required to make precise measurements of their releases or transfers. These estimates can be based on monitoring data, materials balance calculations, or best engineering judgement. The type of estimation method used may change from year to year. If it does, then the amounts reported may alter without any change in the actual release.

Data on Exposure and Risk

PRTRs do not collect data on either exposure to or risk associated with chemical releases. Strictly speaking, these types of analysis are dependent on specific geographic and population characteristics at the site, but PRTRs can provide some of the data needed to make them. For example, public health agencies can use the data on releases from local facilities as one piece of information to compile a picture of local exposure.

Normalized Comparisons

A number of factors need to be considered when reviewing the total amounts of chemicals released and transferred: size and type of the industrial base, possible use of pollution control equipment, and production levels. Some experts have suggested that "normalizing" the data (expressing it as total amounts of chemicals per unit of production, per job or per energy use) would increase understanding. For example, the US may have high total releases and transfers because of its large manufacturing sector. Expressing the releases as chemicals per unit of production or per job would allow a comparison adjusted for the size of the industry. Others have suggested that these "normalized" measures have built-in assumptions that may not be valid. The US, Canadian, and proposed Mexican systems do not use normalized measures.

3.5 Conclusions

The US TRI and the Canadian NPRI contain enough comparable information in common that meaningful compilations of North American data are possible. As far as identification and classification are concerned, they have similar reporting requirements, they both require geographical location data, the lists of chemicals overlap, the Canadian system provides the US SIC codes, and they require reporting on an annual basis.

For the amounts of the substances in releases and transfers, the systems each provide different details, but releases can be summarized into air, water, land and underground injection categories, and transfers summarized as transfers to public sewage, treatment and disposal. The proposed Mexican system can also be compared if an industry classification scheme that translates to the US SIC code is adopted.

Comparisons of releases and transfers will be based on the set of chemicals that are reported to both systems, or all three systems, once data is available from the Mexican *RETC*. Substances listed as carcinogens on the TRI list and, therefore, subject to a lower reporting threshold should be highlighted in a comparison analysis and the differences noted, because the exact effect of the threshold is not possible to determine.

For comparable chemical sets, the greatest difference is in the facilities with small amounts of chemicals in releases and transfers. Each system treats these differently, but the quantities involved do not represent a significant portion of the total database. However, if only a subset is being compared, the analysis must determine whether the subset has been produced by a disproportionate number of facilities with small releases or transfers.

Endnotes

[1] *National Pollutants Release Inventory*. Summary Report. Environment Canada. Supply and Services. ISBN 0662-232356, 1995.

[2] *It's About Our Health! Towards Pollution Prevention*. Report on the Standing Committee on the Environment and Sustainable Development. Issue 81, June 13, 1995.

[3] The Government Response. Environmental Protection Legislation Designed for the Future — A Renewed CEPA: A Proposal. CEPA Review. Response to the Recommendations of the Standing Committee on Environment and Sustainable Development outlined in its Fifth Report, *It's About Our Health! Towards Pollution Prevention*. Catalogue No. En 21-141/1995E ISBN 0-662-23913-X. Minister of Supply and Services Canada, 1995.

[4] Industrial Releases within the Great Lakes Basin. Evaluation of NPRI and TRI Data. Environment Canada, January 1996.

[5] Ibid.

[6] Toxic Release Inventory Small Source Exemptions Issue Paper. United States Environmental Protection Agency. Appendix B-3, January 1994.

4.1 Uses of Canadian National Pollutant Release Inventory (NPRI) Data

The early uses and users of the first year of data released under NPRI mirrors the early TRI years. Generally, the users of NPRI data fall into three main groups: industry, government, as well as academicians and NGOs.

4.1.1 Industrial Use of NPRI

As had been true of TRI, the data collected under NPRI gave some companies the first comprehensive picture of chemical releases and transfers they had ever had. Often the results were surprising. For example, Sunworthy Wallcoverings found it released and transferred 862 metric tonnes of pollutants, and is now taking action to capture 90 percent of the volatile chemical solvents in its wallpaper inks. Other companies, such as members of the Canadian Chemical Producers' Association, had already started an emission reporting system and so were more prepared for the results. Some industrial associations, such as the Canadian Petroleum Products Institute, expressed concern over the large discrepancies between releases and transfers of its members, and are working to improve consistency in estimating releases. Industrial groups in Canada, as in the US, have created a number of programs that benefit from NPRI data. Two of these, the Responsible Care and the Accelerated Reduction/Elimination of Toxic (ARET) programs, are described below.

The Canadian Chemical Producers' Association requires companies to report emissions publicly as a condition of membership. The CCPA system predates NPRI, has a broad list of chemicals to report (369 chemicals in 1994), a 1 kilogram reporting threshold for persistent, bioaccumulative and toxic compounds, and a five year projection. In 1994, the members achieved approximately a 35 percent reduction in emissions compared to 1993, and a 50 percent reduction compared to 1992. Members are projecting that total emissions for 1999 will be 72 percent lower than amounts reported in 1992. Results are publicly released in an annual report.[1]

The second industry-supported program, the ARET is designed to reduce or eliminate toxic substance releases quickly through voluntary action.[2] The ARET process has identified 101 chemicals and placed these on one of five lists: A1 chemicals are persistent, bioaccumulative and toxic; A2 chemicals are those for which there is no ARET consensus on how to characterize them; whereas the three subsets of B chemicals meet the toxicity criteria, in addition to some criteria for persistence or bioaccumulation. The goal for the 30 A1 chemicals is virtual elimination, beginning with a 90 percent reduction in releases by the year 2000. The goal for the two A2 chemicals and 69 B chemicals is the reduction in releases to levels which are insufficient to cause harm. The challenge for A2 and B chemicals is a 50 percent reduction in releases by the year 2000.

In 1994, ARET challenged selected companies and government departments to achieve these reduction targets. In its recent update, 207 organizations have pledged support to the program, and some have committed to a reduction in ARET releases of approximately 9,800 tonnes by the year 2000. Companies reported reductions of almost 11,000 tonnes of

ARET substances at the start of the ARET challenge. Companies submit public action plans to ARET detailing how emission reduction will be achieved.

ARET differs from NPRI in several ways: it has no reporting threshold, its intent is a voluntary reduction of releases, companies chose their own base year, and its list of chemicals is based on a scientific review of environmental and health criteria. About half of the ARET substances are on the NPRI list. Some companies use NPRI data to report to ARET. NPRI is also used as a method of tracking progress on ARET goals.

NPRI is also starting to be used in a variety of other ways. Real estate, banks and other companies are checking a facility's environmental record before purchasing land or lending. Legal and engineering firms are using NPRI data in environmental audits on a facility as part of an environmental management system. Industrial associations are examining the records of their members, and vendors of pollution prevention or control technology use the NPRI to identify prospective clients.

4.1.2 Government Use of NPRI

The data from NPRI are used by various departments of the federal and provincial governments. For example, some chemicals were reconsidered under the priority substances listing process of the CEPA because of the higher than expected emissions shown in NPRI. Environment Canada uses NPRI to target key industrial sectors for pollution prevention efforts. NPRI data are also fed into discussions of air issues. Government departments such as Transport Canada are checking their own releases and transfers, and formulating reduction plans with the aid of the data. Even politicians have used NPRI data to determine releases and transfers from facilities in their constituencies.

Regional offices of Environment Canada also review NPRI data for facilities in their area, and identify priorities for action. For example, the Ontario office of Environment Canada has prepared a summary of total releases and loadings to the Great Lakes Basin using NPRI and TRI data. This report will assist the development of Lakewide Management Plans by providing an indication of pollutant loadings to each of the Great Lakes.

Provincial governments use NPRI data in different ways. Some governments, such as Ontario, use the data to generate pictures of chemical loadings to the Great Lakes. The Ontario and federal governments also use NPRI data to help track progress in reducing chemical releases under memoranda of understanding with industrial groups.

4.1.3 Academic, NGO, and Public Use of NPRI

Environment Canada receives thousands of inquiries on the Internet and over the telephone from universities, schools, NGOs, and the public. One school group asked for specific information on which companies were emitting a particular chemical, because they wished to ask them detailed questions about their reduction plans. From April to December 1995, 3,416 queries were received on the Internet database. Inquiries have come from all over the globe: Australia, Mexico and Great Britain.

Many newspapers across the country ran a story on NPRI when the first year of data were released. As had been the experience with TRI, many papers customized the results to report on facilities in their locale.

NPRI data were also used by the largest newspaper in the country to produce an award-winning special section on Lake Ontario, and another report on the Great Lakes.

In summary, even with only one year of data reported under NPRI, uses of NPRI data are diverse and numerous. Uses and users are expected to increase as additional years of data become available and familiarity with the database increases. (See Figure 1 for information about accessing NPRI.)

Figure 1. Public Access to NPRI Data and Information

NPRI is the first publicly accessible inventory of its kind in Canada.

Information on the NPRI, the annual report and the databases can be obtained from Environment Canada's regional and national offices:

British Columbia and Yukon
Tel.: (604) 666-6711
Fax: (604) 666-6800

Alberta, Saskatchewan, Manitoba, and Northwest Territories
Tel.: (403) 951-8726
Fax: (403) 495-2615

Ontario
Tel.: (416) 739-5890/1
Fax: (416) 739-4251

Quebec
Tel.: (514) 283-0193
Fax: (514) 496-6982

New Brunswick, Nova Scotia, Prince Edward Island, Newfoundland, and Labrador
Tel.: (902) 426-4482
Fax: (902) 426-3897

Headquarters
Tel.: (819) 953-1656
Fax: (819) 953-9542

NPRI data is accessible on the Internet at: http://www.doe.ca/pdb/npri.html

4.2 Uses of US Toxic Release Inventory (TRI) Data

The TRI is widely regarded as the EPA's most important, most frequently used environmental database. The Canadian NPRI and the proposed Mexican *RETC* databases are likely to grow to similar importance. TRI was created to be publicly available, but even with public accessibility as its foundation, it is probably safe to assume that no one in government or industry anticipated the current level of interest in TRI data (see Figure 2). As soon as the EPA was given the responsibility to collect and disseminate TRI data, it sought to identify the key users and uses for the data. However, it was rapidly realized that the users and their uses for TRI data were too numerous and far reaching to summarize. Therefore, the EPA built a highly structured database with common identifiers for most entries (i.e., standardized geographical and chemical names). The result has been uses that were not even contemplated when TRI was first enacted.

Over the eight years that TRI data have been collected, its uses have evolved from exposure and confrontation to the beginnings of cooperation between stakeholders. These stakeholders include industry, government, communities, and other organizations concerned with protecting human health and the environment. This chapter illustrates only a few of the many uses of TRI data to date. More are emerging each year.

4.2.1 Industry and TRI Reporting

For many companies, the 1987 TRI was their first comprehensive record of releases and transfers. Prior to 1987, in addition to Toxic Substances Control Act data, facilities reported various environmental

Figure 2. Public Access to TRI Data and Information

TRI was the first environmental database mandated by statute to be accessible electronically to the public. TRI data were first made available in 1989, both in a summary report and through the US National Library of Medicine's Toxnet computer system (301-496-6531 to register). Also in 1989, the Right-to-Know Computer Network (RTK NET) was established by two public interest organizations at the Unison Institute to provide additional access to environmental databases. While the EPA distributes thousands of paper copies of national summary reports each year and has made such reports available on the Internet, the National Library of Medicine and RTK NET continue to be the two major national electronic sources of TRI data. Both allow searches on a number of geographic, chemical and other identifiers, and their user patterns give a glimpse of the popularity and utility of TRI data. Other information on use and user profiles is available from the EPA, which maintains user telephone support of TRI, and from organizations publishing analyses of and guides to TRI data.

Online Data Access

RTK NET (202-234-8494 for information on free access to TRI data, or online at 202-234-8570) has approximately 3,000 subscribers: 50 percent of users are NGOs, 30 percent are from representatives of the business community who are seeking to market their services to companies submitting reports to TRI, and the remaining 20 percent are from government, the press and academia. RTK NET estimates that it hosted more than 21,000 TRI data searches in 1995. The RTK NET web page is on the Internet at http://www.rtk.net.

TRI Telephone Support

The EPA's TRI User Support (TRI-US) (800-533-0202 within the US and 202-260-1531 outside the US) provides TRI technical support in the form of general information, reporting assistance and data requests. The EPA reports that requests come from a mix of industry, NGOs, and individuals with specific concerns.

Publications

A number of publications explaining the uses of TRI data have been available since 1989, including guides produced by the EPA[1] and Chrysler Corporation.[2]

[1] DuPont Chambers Works Waste Minimization Project. Environmental Protection Agency. EPA/600/R-93/203, 1993.

[2] Bindbeutel, Mark A., et al. "Pollution Prevention/ Life Cycle Management: A Pollution Prevention Approach for Continued Growth in the World Market." Chrysler Corporation, 1994.

data to separate offices within EPA, mostly on surface water discharges and hazardous waste generation. No comprehensive source on facility-wide releases and transfers of specific chemicals was available. Some companies may have estimated all releases and transfers before 1987, but these were internal estimates. TRI added public accountability.

Industry has come to see the value in public inventory reporting, and the very fact that TRI is public is the factor most responsible for the decrease in TRI releases and transfers since 1987. Industry groups, companies and facilities have created a number of programs linked directly to TRI data which thus provide a publicly accessible and verifiable baseline that would not otherwise be available.

In 1988, the Chemical Manufacturers' Association (CMA) began its Responsible Care Program, an initiative to integrate improved environmental management practices into all areas of operation in the American chemical industry. Two of Responsible Care's Codes of Management Practices relate to TRI: The Community Awareness and Emergency Response Code explicitly acknowledges the right-to-know principle. The Pollution Prevention Code

Figure 3. Examples of American Companies with Voluntary Reduction Goals Measurable by TRI Data as Stated in Corporate Environmental Reports[1]

Arco Chemical: 50 percent reduction in TRI air emissions by 1995 from 1992 levels.

Dow Chemical: 50 percent reduction in TRI releases by 1995 from 1988 levels.

DuPont: 60 percent reduction in air emissions by 1993 from 1987 levels; 90 percent reduction in carcinogenic air emissions by 2000 from 1987.

General Electric: 100 percent reduction in releases, transfers, and production-related waste of tetrachloroethylene and trichloroethylene by 1 January 1998.

Gillette: 50 percent reduction in TRI releases by 1997 from 1987 levels.

Hoechst Celanese: 75 percent reduction in TRI releases by 1996 from 1988 levels.

Merck: 90 percent reduction in air emissions of known or suspected carcinogens by 1991 from 1987 levels, with 100 percent reduction by 1993; 90 percent reduction in all TRI releases by 1995 from 1987 levels.

Monsanto: 90 percent reduction in TRI air emissions by 1992 from 1987 levels; eliminate underground injection of TRI chemicals by the end of 1999.

Sunoco: 50 percent reduction in TRI releases by 1995 from 1987 levels.

Union Carbide: 55 percent reduction in releases and off-site transfers (not including energy recovery) of all TRI chemicals by 1995 from 1987 levels.

[1] Does not include goals under the EPA's 33/50 Program or goals for ozone-depleting chemicals/CFCs that are to be eliminated under the Montreal Protocol.

"promotes industry efforts to protect the environment by generating less waste and reducing pollutant emissions."[3] The Code of Management Practices, approved in 1990, requires members to implement a pollution prevention program that leads to ongoing reductions in releases and waste generation, and requires them to submit their TRI data to CMA each year for review and compilation. By publishing release totals each year, CMA uses TRI data to measure progress.

Responsible Care does not require members to adopt numerical TRI reduction goals; however, many companies are using TRI reporting to create voluntary reduction goals. Many American company reports contain summaries of TRI data, and at least ten companies have set forth reduction goals linked explicitly to TRI data (see Figure 3). These goals are in addition to those made for EPA's 33/50 Program.

Companies have developed publicly-available environmental reports as a means of providing context and explanation for environmental activities, especially those not readily visible in yearly TRI totals. The Public Environmental Reporting Initiative (PERI) recognizes the importance of TRI data as an indicator of a company's environmental status, and although the PERI guidelines[4] do not require companies to provide TRI data in their reports, PERI encourages them to do so. Another environmental reporting initiative, the Coalition for Environmentally Responsible Economies (CERES)[5] asks explicitly for TRI data and information on reduction strategies.

Companies and industries find uses for TRI other than public reporting. It provides a convenient measure for releases and transfers that, when combined with other available information such as production levels and number of employees, helps to set an industry standard. In turn, this allows companies to compare their environmental performance and formulate competitive initiatives. A recent survey by the Minnesota Center for Survey Research asked facilities which information sources they used to analyze processes and operations.[6] Eighty-three percent

reported using TRI data for these purposes, more than any other measure such as environmental audits or materials accounting records. Companies often cite emissions reduction projects as money savers.[7] TRI provides a way for facilities to identify process and operations generating the most emissions.

4.2.2 Government Use of TRI Data

Although US facilities had to submit various release and hazardous waste data to federal and state agencies before the advent of TRI, this data is unique in that facilities submit a single form for each chemical. Having all the information in one database is an important step in setting national priorities, and TRI has resulted in a number of governmental initiatives.

The 33/50 Program is a voluntary EPA initiative to reduce releases and transfers of 17 priority pollutants 33 percent by 1992 and 50 percent by 1995, based on 1988 TRI data. Companies are allowed to formulate any reduction goal for any chemical; in fact, setting a goal is not a requirement for participation. The EPA selected the 17 chemicals based on toxicity and released amounts, so TRI was used in formulating the program as well as providing measurement. To date, the 33/50 Program has over 1,200 participating companies pledging some 350 million pounds in reductions of releases and transfers, and industry is expected to achieve its 50 percent reduction in 1994, one year ahead of schedule.

The EPA regional offices and state governments use TRI as a source of data for reduction and technical assistance initiatives. The Merit Program in southern California is an EPA initiative to reduce TRI emissions. EPA officials work with facilities to identify areas for reduction and to develop reduction goals. Two additional programs, the Great Lakes Initiative and the Chesapeake Bay Program, both have TRI reduction components that allow measurement of progress. The EPA also considers facilities' TRI data in assessing penalties for compliance violations: several companies have reported decreased fines based on demonstrated TRI reductions.[8]

States use TRI data in a number of ways, from setting environmental filing fees to using TRI as the basis for collecting additional data on materials accounting and use. New Jersey and Massachusetts have both expanded on TRI reporting and require facilities to supply additional data. In addition, both states have instituted pollution-prevention planning requirements that seek reductions in TRI production-related waste. Minnesota has its own 33/50-type reduction program called "Minnesota-50", and requires facilities to develop pollution prevention plans using TRI data as a baseline.

Local governments are finding TRI to be an indicator of environmental performance that can be used in a number of decision-making processes. Since most Publicly Owned Treatment Works (POTWs) are run by municipalities, local governments find the TRI POTW data useful as a supplement to their own operating data. In addition, many governments are linking companies' proposed expansion plans and changes in operation to demonstrated TRI reductions by basing approval of building permits, zoning changes, and investment of funds in infrastructure improvement on performance as measured by TRI.

4.2.3 Academic, NGO and Public Use of TRI data

TRI has probably been of most benefit to communities and individuals who use the data to learn more about sources of chem-

icals in their environment. Initially, government and industry questioned if anyone was really interested in the amount of detail required by TRI. Every year, however, major American newspapers print articles after the EPA releases the new TRI data, creating a flurry of interest in facilities that top the list. However, beyond these national glimpses, most interest in TRI is at the local level, and the EPA no longer doubts the usefulness of TRI data to communities and individuals. In a recent presentation to representatives of other countries considering PRTR reporting, Susan Hazen of EPA affirmed that, "an informed public protects the environment".

From questions about odours coming from the factory at the end of the street to concerns about environmental justice, citizens and NGOs have many uses for TRI data. While the stories that make news are usually accounts of confrontation, TRI's most important use is in providing the basis for informed discussion between interested parties seeking common solutions.

In 1994, for example, a neighborhood group in Columbus, Ohio, voiced its concern about lead use at a local facility manufacturing television picture tubes. Facility representatives were initially reluctant to meet with the neighborhood group, and issued statements that the facility was in compliance with all regulations. The neighborhood group contacted Ohio Citizens' Action, which determined that the facility's TRI data showed no abnormal level of releases. This information became the basis of discussion between the citizens' group and the facility. The end result was a series of articles in the local newspaper describing improvements at the plant, and an agreement to meet on a regular basis and discuss neighborhood concerns.[9] A small specialty chemical manufacturer in New Jersey reports that local residents monitor their TRI data every year, and the data form a basis for dialogue between the facility and the neighborhood.

Facilities sometimes find that addressing neighborhood concerns leads to financial savings. Residents in Flat Rock, Michigan, contacted the Ecology Center in Ann Arbor to ask about odours from a local automobile manufacturing plant. The plant's TRI data indicated an eight-fold increase in toluene air emissions over a two-year period. The residents' complaints were an important factor in the facility's decision to install a solvent recovery system that will save money as well as address the neighborhood odour problem.[10]

4.3 CONTACTS FOR ADDITIONAL INFORMATION ON THE MEXICAN *REGISTRO DE EMISIONES Y TRANSFERENCIA DE CONTAMINANTES (RETC)*

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4.4 Conclusions

The uses of PRTR data are broad and continue to evolve significantly. Today, the TRI data are being used in ways never imagined by its initial proponents. From lifecycle analysis to community-based risk assessment, academic and social studies, or linkage with a host of other databases on population, demographics, employment, and financial earnings, TRI has become the pre-eminent environmental database in the United States. The Canadian NPRI and proposed Mexican *RETC* are likely to be of similar value as they become known to potential users. And, as more countries develop PRTRs, uses for the data will increase. To the extent that the data are able to provide comparable information, PRTRs from different countries can provide insights into regional and global environmental issues. Just as the uses of TRI data have evolved over the past eight years, so too will uses for international data.

Endnotes

[1] Reducing Emissions. A Responsible Care Initiative. 1994 Emissions Inventory and 5 Year Projections. Canadian Chemical Producer's Association, 1995.

[2] ARET Update: Addendum to Environmental Leaders 1, December 1995. ARET Secretariat, March 1996.

[3] Preventing Pollution in the Chemical Industry: Five Years of Progress. Chemical Manufacturers' Association, 1994.

[4] Public Environmental Reporting Initiative (PERI) Guidelines, May 1994.

[5] 1992 Coalition for Environmentally Responsible Economies (CERES) Environmental Performance Report Form for CERES Principle Signatories, June 1993.

[6] Kiesling, Frances. Minnesota Pollution Prevention Planning Survey: Results and Technical Report (94-3). Minnesota Office of Waste Management, March 1994.

[7] "Early Findings of the Pollution Prevention Program," New Jersey Department of Environmental Protection, March 1995.

[8] Hampshire Research Interview with White Consolidated Industries, September 19, 1995.

[9] Personal communication, Kurt Waltzer, Executive Director of Ohio Citizen Action, February 1995.

[10] "The Right Stuff: Using the Toxics Release Inventory." OMB-Watch and Unison Institute, July 1995.

Chapter 5.0: Summary

This report has described the NPRI, TRI, and proposed *RETC* systems and has suggested ways to fit the pieces of information from the individual systems together into a picture with pan-North American significance. In fact, the NPRI, TRI and proposed *RETC* share many key PRTR characteristics that increase the ability to compare data.

However, the NPRI, TRI and the proposed *RETC* also have differences which must be taken into account when comparing data. The decisions made in designing the *RETC* will determine the final degree of compatibility between the forthcoming Mexican PRTR and the other two North American systems.

The North American PRTRs are intended for active and regular public dissemination. They will all report:

- on individual chemicals;
- on individual facilities;
- on releases and transfers;
- on an annual basis; as well as
- using computerized data management; and
- allowing for limited trade secrecy.

The PRTR systems in all three countries are evolving. There are proposed legislative changes to the NPRI in Canada, a major expansion to the TRI list of chemicals, along with other proposals to expand the number of reporting industries and the content of such reports in the US, and the completion of a case study in Mexico.

The eight years of TRI data have been used in countless ways by a wide array of users in the public, academia, media, industry and government, from tracking environmental performance to estimating risks, setting priorities, and taxing pollution. Each year sees new uses. Data from the more recently enacted NPRI are starting to gain a similarly broad application.

The North American PRTRs will have:

- different chemical lists with only a portion of the chemicals overlapping;
- different reporting thresholds;
- different treatment of small releases and transfers;
- different types of facilities required to report, with the majority of the facilities overlapping; and
- choice of different industrial classification systems.

Later this year, the CEC will release the second report in this series, an analysis of NPRI and TRI data and an update on the Mexican case study. This analysis will be an important step towards increased understanding of North America data on the releases and transfers of toxic chemicals. It also promotes a discussion of industrial efforts to reduce waste generation, as well as releases and transfers of pollutants, and a tool to track environmental progress. It will also be an occasion for CEC to underscore important PRTR innovations in all three North American countries.

Appendix A: A Comparison of Chemicals Listed under 1994 TRI, NPRI and *RETC*

CAS Number	Chemical Name	Nombre químico	Nom chimique	TRI	NPRI	RETC
50-00-0	Formaldehyde	Formaldehido	Formaldéhyde	X	X	X
50-29-3	DDT	DDT	DDT			X
51-28-5	2,4-Dinitrophenol	2,4-Dinitrofenol	2,4-Dinitrophénol	X		X
51-75-2	Nitrogen mustard	Mostaza de nitrogeno	Moutarde azotée	X		
51-79-6	Urethane	Uretano	Uréthane	X		
52-68-6	Trichlorfon	Triclorfon	Trichlorfon	X		
53-96-3	2-Acetylaminofluorene	2-Acetilaminofluoreno	2-Acetylaminofluorène	X		
55-18-5	N-Nitrosodiethylamine	N-Nitrosodietilamina	N-Nitrosodiéthylamine	X		
55-21-0	Benzamide	Benzamida	Benzamide	X		
55-63-0	Nitroglycerin	Nitroglicerina	Nitroglycérine	X	X	
56-23-5	Carbon tetrachloride	tetracloruro de carbono	Tétrachlorure de carbone	X	X	X
56-38-2	Parathion	Paration	Parathion	X		
57-14-7	1,1-Dimethyl hydrazine	1,1-Dimetilhidracina	1,1-Diméthyl hydrazine	X		
57-57-8	beta-Propiolactone	beta-Propiolactona	bêta-Propiolactone	X		
57-74-9	Chlordane	Clordano	Chlordane	X		
58-89-9	Lindane	Lindano	Lindane	X		X
58-90-2	2,3,4,6-Tetrachlorophenol	2,3,4,6-Tetraclorofenol	2,3,4,6-Tetrachlorophénol			X
59-89-2	N-Nitrosomorpholine	N-Nitrosomorfolina	N-Nitrosomorpholine	X		X
60-09-3	4-Aminoazobenzene	4-Aminoazobenceno	4-Aminoazobenzène	X		X
60-11-7	4-Dimethylaminoazobenzene	4-Dimetilaminoazobenceno	4-Diméthylaminoazobenzène	X		
60-34-4	Methyl hydrazine	Metil hidracina	Méthyle hydrazine	X		
60-35-5	Acetamide	Acetamida	Acétamide	X		X
61-82-5	Amitrole	Amitrol	Amitrole	X		
62-53-3	Aniline	Anilina	Aniline	X	X	X
62-55-5	Thioacetamide	Tioacetamida	Thioacétamide	X		
62-56-6	Thiourea	Tiourea	Thiourée	X	X	X
62-73-7	Dichlorvos	Diclorvos	Dichlorvos	X		
62-75-9	N-Nitrosodimethylamine	N-Nitrosodimetilamina	N-Nitrosodiméthylamine	X		X
63-25-2	Carbaryl	Carbaril	Carbaryl	X		
64-17-5	Ethanol	Etanol	Éthanol			X
64-18-6	Formic acid	Acido fórmico	Acide formique	X		
64-67-5	Diethyl sulfate	Sulfato de dietilo	Sulfate de diéthyle	X	X	
67-56-1	Methanol	Metanol	Méthanol	X	X	
67-63-0	Isopropyl alcohol (manufacturing)	Alcohol isopropílico	propan-2-ol	X	X	
67-64-1	Acetone	Acetona	Acétone		X	
67-66-3	Chloroform	Cloroformo	Chloroforme	X	X	X
67-72-1	Hexachloroethane	Hexacloroetano	Hexachloroéthane	X	X	X
68-76-8	Triaziquone	Triaziquone	Triaziquone	X		
70-30-4	Hexachlorophene	Hexaclorofeno	Hexachlorophène	X		
71-36-3	n-Butyl alcohol	Alcohol n-butílico	butan-1-ol	X	X	
71-43-2	Benzene	Benceno	Benzène	X	X	X
71-55-6	1,1,1-Trichloroethane	1,1,1-Tricloroetano	1,1,1-Trichloroéthane	X		
72-20-8	Endrin	Endrin	Endrine			X
72-43-5	Methoxychlor	Metoxicloro	Méthoxychlore	X		
72-57-1	Trypan blue	Azultripan	Bleu trypan	X		
74-82-8	Methane	Metano	Méthane			X
74-83-9	Bromomethane	Bromometano	bromo-cethone	X	X	X
74-85-1	Ethylene	Etileno	Éthylène	X	X	
74-87-3	Chloromethane	Clorometano	Chlorométhane	X	X	X
74-88-4	Methyl iodide	Yoduro de metilo	Iodo méthane	X	X	
74-90-8	Hydrogen cyanide	Acido cianhídrico	Cyanure d'hydrogène	X	X	
74-95-3	Methylene bromide	Bromuro de metilo	Bromure de méthyle	X		
75-00-3	Chloroethane	Cloroetano	Chloroéthane	X	X	
75-01-4	Vinyl chloride	Cloruro de vinilo	Chlorure de vinyle	X	X	
75-05-8	Acetonitrile	Acetonitrilo	Acétonitrile	X	X	

CAS Number	Chemical Name	Nombre químico	Nom chimique	TRI	NPRI	RETC
75-07-0	Acetaldehyde	Acetaldehido	Acétaldéhyde	X	X	X
75-09-2	Dichloromethane	Diclorometano	Dichlorométhane	X	X	X
75-15-0	Carbon disulfide	Disulfuro de carbono	Disulfure de carbone	X	X	X
75-21-8	Ethylene oxide	Oxido de etileno	Oxyde d'éthylène	X	X	X
75-25-2	Bromoform	Bromoformo	Bromoforme	X		X
75-27-4	Dichlorobromomethane	Diclorobromometano	Dichlorobromométhane	X		X
75-34-3	Ethylidene dichloride	1,1-Dicloroetano	Dichloréthane	X		
75-35-4	Vinylidene chloride	Cloruro de vinilideno	Chlorure de vinylidène	X	X	X
75-44-5	Phosgene	Fosgeno	Phosgène	X	X	
75-45-6	Chlorodifluoromethane (HCFC-22)	Clorodifluorometano	Chlorodifluorométhane	X		
75-55-8	Propyleneimine	Propilenimina	Propylène-imine	X		
75-56-9	Propylene oxide	Oxido de propileno	Oxyde de propylène	X	X	
75-63-8	Bromotrifluoromethane (Halon 1301)	Bromotrifluorometano	Bromotrifluorométhane	X		
75-65-0	tert-Butyl alcohol	Alcohol terbutílico	2-méthylpropan-2-ol	X	X	
75-68-3	1-Chloro-1,1-difluoroethane (HCFC-142b)	1-Cloro-1,1-difluoroetano	1-Chloro-1,1-difluoroéthane	X		
75-69-4	Trichlorofluoromethane (CFC-11)	Triclorofluorometano	Trichlorofluorométhane	X		
75-71-8	Dichlorodifluoromethane (CFC-12)	Diclorodifluorometano	Dichlorodifluorométhane	X		
76-01-7	Pentachloroethane	Pentacloroetano	Pentachloroéthane	X		X
76-13-1	1,1,2 trichloro-1,2,2-trifluoroethane (Freon 113)	1,1,2-Tricloro-1,2,2-trifluoroetano	1,1,2-trichloro-1,2,2-trifluoroéthane		X	
76-14-2	Dichlorotetrafluoroethane	Diclorotetrafluoroetano	Dichlorotetrafluoroéthane (CFC-114)		X	
76-15-3	Monochloropentafluoroethane (CFC-115)	Cloropentafluoroetano	Chloropentafluoroéthane	X		
76-44-8	Heptachlor	Heptacloro	Heptachlore	X		X
77-47-4	Hexachlorocyclopentadiene	Hexaclorociclopentadieno	Hexachlorocyclopentadiène	X	X	X
77-78-1	Dimethyl sulfate	Sulfato de dimetilo	Sulfate de diméthyle	X	X	
78-00-2	Tetraethyl lead	Tetraetilo de plomo	Plomb tétraéthyle			X
78-83-1	i-Butyl alcohol	Alcohol i-butílico	2-méthylpropan-1-ol		X	
78-84-2	Isobutyraldehyde	Isobutiraldehido	Isobutyraldéhyde	X	X	
78-87-5	1,2-Dichloropropane	1,2-Dicloropropano	1,2-Dichloropropane	X	X	X
78-88-6	2,3-Dichloropropene	2,3-Dicloropropeno	2,3-Dichloropropène	X		
78-92-2	sec-Butyl alcohol	Alcohol sec-butilico	butan-2-ol	X	X	
78-93-3	Methyl ethyl ketone	Metil etil cetona	Méthyléthylcétone	X	X	
79-00-5	1,1,2-Trichloroethane	1,1,2-Tricloroetano	1,1,2-Trichloro-éthane	X	X	
79-01-6	Trichloroethylene	Tricloroetileno	Trichloroéthylène	X	X	X
79-06-1	Acrylamide	Acrilamida	Acrylamide	X	X	X
79-10-7	Acrylic acid	Acido acrilico	Acide acrylique	X	X	
79-11-8	Chloroacetic acid	Acido cloroacético	Acide chloroacétique	X	X	
79-21-0	Peracetic acid	Acido peracético	Acide péracétique	X	X	
79-22-1	Methyl chlorocarbonate	Clorocarbonato de metilo	Chlorocarbonate de méthyle	X		
79-34-5	1,1,2,2-Tetrachloroethane	1,1,2,2-Tetracloroetano	1,1,2,2-Tétrachloroéthane	X	X	X
79-44-7	Dimethylcarbamyl chloride	Cloruro de dimetilcarbamil	Chlorure de diméthylcarbamyle	X		
79-46-9	2-Nitropropane	2-Nitropropano	2-Nitropropane	X	X	X
80-05-7	4,4'-Isopropylidenediphenol	4,4'-Isopropilindenodifenol	4,4'-Isopropylidenediphénol	X	X	
80-15-9	Cumene hydroperoxide	Cumeno hidroperóxido	Hydropéroxyde de cumène	X	X	
80-62-6	Methyl methacrylate	Metacrilato de metilo	Méthacrylate de méthyle	X	X	X
81-07-2	Saccharin (manufacturing)	Sacarina	Saccharine	X		
81-88-9	C.I. Food Red 15	Rojo 15 alimenticio	Indice de couleur Rouge alimentaire 15	X	X	
82-28-0	1-Amino-2-methylanthraquinone	1-Amino-2-metilantraquinona	1-Amino-2-méthylanthraquinone	X		
82-68-8	Quintozene	Quintoceno	Quintozène	X		
84-66-2	Diethyl phthalate	Dietil ftalato	Phtalate de diéthyle	X	X	
84-74-2	Dibutyl phthalate	Dibutil ftalato	Phtalate de dibutyle	X	X	X
85-01-8	Phenanthrene	Fenantreno	Phénanthrène			X
85-44-9	Phthalic anhydride	Anhidrido ftálico	Anhydride phtalique	X	X	
85-68-7	Butyl benzyl phthalate	Butil bencil ftalato	Phtalate de dibutyle et de benzyle		X	
86-30-6	N-Nitrosodiphenylamine	N-Nitrosodifenilamina	N-Nitrosodiphénylamine	X	X	X
87-62-7	2,6-Xylidine	2,6-Xilidina	2,6-Xylidine	X		

CAS Number	Chemical Name	Nombre químico	Nom chimique	TRI	NPRI	RETC
87-68-3	1,1,2,3,4,4-Hexachloro-1,3-butadiene	1,2,3,4,4-Hexacloro-1,3-butadieno	1,1,2,3,4,4-Hexachloro-1,3-butadiène	X		X
87-86-5	Pentachlorophenol	Pentaclorofenol	Pentachlorophène	X		X
88-06-2	2,4,6-Trichlorophenol	2,4,6-Triclorofenol	Trichloro-2,4,6-phénol	X		X
88-75-5	2-Nitrophenol	2-Nitrofenol	2-Nitrophénol	X		
88-89-1	Picric acid	Acido pícrico	Acide picrique	X		
90-04-0	o-Anisidine	o-Anisidina	o-Anisidine	X		X
90-43-7	2-Phenylphenol	2-Fenilfenol	o-phénylphénol	X	X	X
90-94-8	Michler's ketone	Cetona Michler	Cétone de Michler	X	X	
91-08-7	Toluene-2,6-diisocyanate	Toluen-2,6-diisocianato	Toluène-2,6-diisocyanate	X	X	
91-20-3	Naphthalene	Naftaleno	Naphthalène	X	X	X
91-22-5	Quinoline	Quinoleína	Quinoline	X	X	X
91-59-8	beta-Naphthylamine	beta-Naftilamina	bêta-Naphthylamine	X		X
91-94-1	3,3'-Dichlorobenzidine	3,3'-Diclorobencidina	3,3'-Dichlorobenzidine	X		X
92-52-4	Biphenyl	Bifenilo	biphényle	X	X	X
92-67-1	4-Aminobiphenyl	4-Aminobifenilo	4-Aminobiphényle	X		X
92-87-5	Benzidine	Bencidina	Benzidine	X		X
92-93-3	4-Nitrobiphenyl	4-Nitrobifenilo	4-Nitrobiphényle	X		X
93-72-1	Silvex	Silvex	Silvex			X
94-36-0	Benzoyl peroxide	Peróxido de benzoilo	Peroxyde de benzoyle	X	X	
94-58-6	Dihydrosafrole	Dinitrosafrol	Dihydrosafrole	X		
94-59-7	Safrole	Safrol	Safrole	X	X	
94-75-7	2,4-D (acetic acid)	Acido 2,4-diclorofenoxiacético	acide dichloro-2,4-phénoxy acétique	X		X
95-47-6	o-Xylene	o-Xileno	o-Xylène	X	X	
95-48-7	o-Cresol	o-Cresol	o-Crésol	X	X	
95-50-1	1,2-Dichlorobenzene	1,2-Diclorobenceno	Dichloro-1-2-benzène	X	X	X
95-53-4	o-Toluidine	o-Toluidina	o-Toluidine	X		
95-63-6	1,2,4-Trimethylbenzene	1,2,4-Trimetilbenceno	1,2,4-Triméthylbenzène	X	X	X
95-80-7	2,4-Diaminotoluene	2,4-Diaminotolueno	2,4-diaminotoluène	X	X	
95-95-4	2,4,5-Trichlorophenol	2,4,5-Triclorofenol	Trichloro-2,4,5-phénol	X		X
96-09-3	Styrene oxide	Oxido de estireno	Oxyde de styrène	X	X	
96-12-8	1,2-Dibromo-3-chloropropane	1,2-Dibromo-3-cloropropano	1,2-Dibromo-3-chloropropane	X		X
96-33-3	Methyl acrylate	Acrilato de metilo	Acrylate de méthyle	X	X	
96-45-7	Ethylene thiourea	Etilen tiourea	Imidazolidine-2-thione	X	X	X
97-56-3	C.I. Solvent Yellow 3	Solvente de amarillo 3	Jaune pour solvant 3	X		
98-07-7	Benzoic trichloride	Benzotricloruro	Trichlorure de benzylidyne	X		
98-82-8	Cumene	Cumeno	Cumène	X	X	
98-86-2	Acetophenone	Acetofenona	Acétophénone	X		
98-87-3	Benzal chloride	Cloruro de benzal	Chlorure de benzale	X		
98-88-4	Benzoyl chloride	Cloruro de benzoilo	Chlorure de benzoyle	X	X	
98-95-3	Nitrobenzene	Nitrobenceno	Nitrobenzène	X	X	
99-55-8	5-Nitro-o-toluidine	5-Nitro-o-toluidina	5-Nitro-o-toluidine	X		
99-59-2	5-Nitro-o-anisidine	5-Nitro-o-anisidina	5-Nitro-o-anisidine	X		
99-65-0	m-Dinitrobenzene	M-Dinitrobenceno	m-Dinitrobenzène	X		
100-00-5	1-Chloro-4-nitrobenzene	1-Cloro-4-nitrobeceno	1-Chloro-4-nitrobenzène			X
100-02-7	4-Nitrophenol	4-Nitrofenol	4-Nitrophénol	X	X	X
100-25-4	p-Dinitrobenzene	p-Dinitrobenceno	p-Dinitrobenzène	X		
100-41-4	Ethylbenzene	Etilbenceno	Éthylbenzène	X	X	X
100-42-5	Styrene	Estireno	Styrène	X	X	X
100-44-7	Benzyl chloride	Cloruro de bencilo	Chlorure de benzyle	X	X	X
100-75-4	N-Nitrosopiperidine	N-Nitrosopiperidina	N-Nitrosopipéridine	X		
101-14-4	4,4'-Methylenebis (2-chloroaniline)	4,4'-Metilenobis (2-cloroanilina)	4,4'-Méthylènebis (2-chloroaniline)	X	X	X
101-61-1	4,4'-Methylenebis (N,N-dimethyl) benzeneamine	4,4'-Metilenobis (N,N-dimetil) bencenamina	4,4'-Méthylènebis (N,N-diméthyl) benzènéamine	X		X
101-68-8	Methylenebis (phenylisocyanate)	Metilenobis (fenilisocianato)	Méthylènebis (phénylisocyanate)	X	X	
101-77-9	4,4'-Methylenedianiline	4,4'-Metilenodianilina	4,4'-Méthylène dianiline	X	X	
101-80-4	4,4'-Diaminodiphenyl ether	Eter 4, 4'-diaminodifenílico	Éther 4,4'-Di-amino-di-phényle	X		

CAS Number	Chemical Name	Nombre químico	Nom chimique	TRI	NPRI	RETC
103-23-1	Bis (2-ethylhexyl) adipate	Bis (2-etilhexil) adipato	Adipate de di(2-éthylhéxyle)	X	X	
104-94-9	p-Anisidine	p-Anisidina	p-Anisidine	X		
105-67-9	2,4-Dimethylphenol	2,4-Dimetilfenol	2,4-Diméthylphénol	X		
106-42-3	p-Xylene	p-Xileno	p-Xylène	X	X	
106-44-5	p-Cresol	p-Cresol	p-Crésol	X	X	
106-46-7	1,4-Dichlorobenzene	1,4-Diclorobenceno	dichloro-1-4-benzène	X	X	X
106-50-3	p-Phenylenediamine	p-Fenilenodiamina	p-Phénylènediamine	X	X	
106-51-4	Quinone	Quinona	Quinone	X	X	
106-88-7	1,2-Butylene oxide	Oxido de 1,2-butileno	1,2-époxybutane	X	X	
106-89-8	Epichlorohydrin	Epiclorohidrina	Épichlorohydrine	X	X	X
106-93-4	1,2-Dibromoethane	1,2-Dibromometano	1,2-Dibromoéthane	X		X
106-99-0	1,3-Butadiene	1,3-Butadieno	buta-1,3-diene	X	X	X
107-02-8	Acrolein	Acroleína	Acroléine	X		X
107-04-0	1-Bromo-2-chloroethane	1-Bromo-2-cloroetano	1-Bromo-2-chloroéthane			X
107-05-1	Allyl chloride	Cloruro de alilo	Chlorure d'allyle	X	X	
107-06-2	1,2-Dichloroethane	1,2-Dicloroetano	1,2-Dichloroéthane	X	X	X
107-13-1	Acrylonitrile	Acrilonitrilo	Acrylonitrile	X	X	X
107-18-6	Allyl alcohol	Alcohol alílico	Alcool allylique	X	X	
107-21-1	Ethylene glycol	Etilen glicol	Éthylène glycol	X	X	
107-30-2	Chloromethyl methyl ether	Eter clorometil metílico	Éther de chlorométhyle et de méthyle	X		
108-05-4	Vinyl acetate	Acetato de vinilo	Acétate de vinyle	X	X	
108-10-1	Methyl isobutyl ketone	Metil isobutil cetona	Méthylisobuthylcétone	X	X	X
108-31-6	Maleic anhydride	Anhidrido maleico	Anhydride maléique	X	X	
108-38-3	m-Xylene	M-Xileno	m-Xylène	X	X	
108-39-4	m-Cresol	M-Cresol	m-Crésol	X	X	
108-60-1	Bis (2-chloro-1-methylethyl) ether	Eter bis(2-cloro-1-metil etil)	Éther di (2-chloro-1-méthyléthyl)	X		X
108-88-3	Toluene	Tolueno	Toluène	X	X	
108-90-7	Chlorobenzene	Clorobenceno	Chlorobenzène	X	X	
108-95-2	Phenol	Fenol	Phénol	X	X	X
109-06-8	2-Methylpyridine	2-Metilpiridina	2-Méthylpyridine	X		X
109-77-3	Malononitrile	Malononitrilo	Malononitrile	X		
109-86-4	2-Methoxyethanol	2-Metoxietanol	2-Méthoxyéthanol	X	X	
110-49-6	2-Methoxyethyl acetate	2-Metoxietil acetato	Acétate de 2-méthoxyéthyle		X	
110-80-5	2-Ethoxyethanol	2-Etoxietanol	2-Éthoxyéthanol	X	X	X
110-82-7	Cyclohexane	Ciclohexano	Cyclohexane	X	X	
110-86-1	Pyridine	Piridina	Pyridine	X	X	X
111-15-9	2-Ethoxyethyl acetate	2-Etoxietil acetato	Acétate de 2-éthoxyéthyle		X	
111-42-2	Diethanolamine	Dietanolamina	Diéthanolamine	X	X	
111-44-4	Bis (2-chloroethyl) ether	Eter bis(2-Cloroetil)	Éther di (2-chloroéthyle)	X		X
111-91-1	Bis(2-chloroethoxy)methane	Bis (2-Cloroetoxi) metano	Méthane di (2-chloroéthoxy)	X		
112-40-3	n-Dodecane	N-Dodecano	N-Dodécane			X
114-26-1	Propoxur	Propoxur	Propoxur	X		
115-07-1	Propylene	Propileno	Propylène	X	X	
115-32-2	Dicofol	Dicofol	Dicofol	X		
117-79-3	2-Aminoanthraquinone	2-Aminoantraquinona	2-Aminoanthraquinone	X		
117-81-7	Di-(2-ethylhexyl) phthalate	Di (2-Etilhexil) ftalato	Phtalate de di (2-éthylhexyle)	X	X	X
117-84-0	n-Dioctyl phthalate	N-Dioctil ftalato	phalate de di-n-actyle		X	
118-74-1	Hexachlorobenzene	Hexaclorobenceno	Hexachlorobenzène	X		X
119-90-4	3,3'-Dimethoxybenzidine	3,3'-Dimetoxibencidina	3,3'-Diméthoxybenzidine	X		
119-93-7	3,3'-Dimethylbenzidine	3,3'-Dimetilbencidina	3,3'-Diméthylbenzidine	X		
120-12-7	Anthracene	Antraceno	Anthracène	X	X	X
120-58-1	Isosafrole	Isosafrol	Isosafrole	X	X	
120-71-8	p-Cresidine	p-Cresidina	p-Crésidine	X		
120-80-9	Catechol	Catecol	Catéchol	X	X	
120-82-1	1,2,4-Trichlorobenzene	1,2,4-Triclorobenceno	1,2,4-Trichlorobenzène	X	X	X

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120-83-2	2,4-Dichlorophenol	2,4-Diclorofenol	2,4-Dichlorophénol	X	X	X
121-14-2	2,4-Dinitrotoluene	2,4-Dinitrotolueno	2,4-Dinitrotoluène	X	X	X
121-69-7	N,N-Dimethylaniline	N,N-Dimetilanilina	N,N-Diméthylaniline	X	X	
122-66-7	1,2-Diphenylhydrazine	1,2-Difenilhidracina	1,2-Diphénylhydrazine	X		X
123-31-9	Hydroquinone	Hidroquinona	Hydroquinone	X	X	
123-38-6	Propionaldehyde	Propionaldehído	Propionaldéhyde	X	X	
123-63-7	Paraldehyde	Paraldehido	Paraldéhyde	X		
123-72-8	Butyraldehyde	Butiraldehído	Butyraldéhyde	X	X	
123-91-1	1,4-Dioxane	1,4-Dioxano	1,4-Dioxane	X	X	X
124-38-9	Carbon dioxide	Bióxido de carbono	Dioxyde de carbone			X
124-48-1	Chlorodibromomethane	Clorodibromometano	Chlorodibromométhane			X
124-73-2	Dibromotetrafluoroethane (Halon 2402)	Dibromotetrafluoroetano	Dibromotetrafluoro éthane	X		
126-72-7	Tris (2,3-dibromopropyl) phosphate	Tris (2,3-Dibromopropil) fosfato	Phosphate de tris (2,3-dibromopropyle)	X		
126-98-7	Methacrylonitrile	Metacrilonitrilo	Méthacrylonitrile	X		
126-99-8	Chloroprene	Cloropreno	Chloroprène	X		
127-18-4	Tetrachloroethylene	Tetracloroetileno	Tétrachloroéthylène	X	X	X
128-66-5	C.I. Vat Yellow 4	Amarillo 4	Jaune 4	X		
131-11-3	Dimethyl phthalate	Dimetil ftalato	Phtalate de diméthyle	X	X	
132-64-9	Dibenzofuran	Dibenzofurano	Dibenzofurane	X		
133-06-2	Captan	Captan	Captan	X		X
133-90-4	Chloramben	Cloramben	Chlorambène	X		
134-29-2	o-Anisidine hydrochloride	o-Anisidina hidrocloruro	Chlorhydrate d'o-anisidine	X		
134-32-7	alpha-Naphthylamine	alfa-Naftilamina	alpha-Naphthylamine	X		
135-20-6	Cupferron	Cupferron	Cupferron	X		
137-26-8	Thiram	Tiram	Thirame	X		X
139-13-9	Nitrilotriacetic acid	Acido nitrilotriacético	Acide nitrilotriacétique	X	X	
139-65-1	4,4'-Thiodianiline	4,4'-Tiodianilina	4,4'-Thiodianiline	X		
140-88-5	Ethyl acrylate	Acrilato de etilo	Acrylate d'éthyle	X	X	
141-32-2	Butyl acrylate	Acrilato de butilo	Acrylate de butyle	X	X	
151-56-4	Ethyleneimine	Etilenimina	Éthylène imine	X		
156-10-5	p-Nitrosodiphenylamine	p-Nitrosodifeniamina	p-Nitrosodiphénylamine	X		
156-62-7	Calcium cyanamide	Cianamida de calcio	Cyanamide calcíque	X	X	
302-01-2	Hydrazine	Hidracina	Hydrazine	X	X	X
306-83-2	2,2-Dichloro-1,1,1-trifluoroethane (HCFC-123)	2,2-Dicloro-1,1,1-trifluoroetano	Cichloro-2,2-trifluoro-1,1,1-éthane	X		
309-00-2	Aldrin	Aldrin	Aldrine	X		X
319-84-6	alpha-Hexachlorocyclohexane	alfa-Hexaclorociclohexano	alpha-Hexachlorocyclohexane			X
333-41-5	Diazinon	Diazinon	Diazinon			X
334-88-3	Diazomethane	Diazometano	Diazométhane	X		
353-59-3	Bromochlorodifluoromethane (Halon 1211)	Bromoclorodifluorometano	Bromochlorodifluorométhane	X		
354-23-4	1,2-Dichloro-1,1,2-trifluoroethane (HCFC-123a)	1,2-Dicloro-1,1,2-trifluoroetano	1,2-Dichloro-1,1,2-trifluoroéthane	X		
354-25-6	1-Chloro-1,1,2,2-tetrafluoroethane (HCFC-124a)	1-Cloro-1,1,2,2-tetrafluoroetano	1-Chloro-1,1,2,2-tétrafluoroéthane	X		
463-58-1	Carbonyl sulfide	Sulfuro de Carbonilo	Sulfure de carbonyle	X		
492-80-8	C.I. Solvent Yellow 34	Solvente amarillo 34	Jaune pour solvant 34	X		
505-60-2	Mustard gas	Gas mostaza	Gaz moutarde	X		
510-15-6	Chlorobenzilate	Clorobencilato	Chlorobenzilate	X		
528-29-0	o-Dinitrobenzene	O-Dinitrobenceno	o-Dinitrobenzène	X		
532-27-4	2-Chloroacetophenone	2-Cloroacetofenona	2-Chloroacétophénone	X		
534-52-1	4,6-Dinitro-o-cresol	4,6-Dinitro-o-cresol	4,6-Dinitro-o-crésol	X	X	X
540-59-0	1,2-Dichloroethylene	1,2-Dicloroetileno	Dichloroethylène-1-2	X		
541-41-3	Ethyl chloroformate	Etilcloroformo	Chloroformiate d'éthyle	X	X	
541-73-1	1,3-Dichlorobenzene	1,3-Diclorobenceno	Dichloro-1-3-benzène	X		X
542-75-6	1,3-Dichloropropylene	1,3-Dicloropropileno	Dichloro-1-3-propylène	X		X
542-88-1	Bis (chloromethyl) ether	Bis (clorometil) eter	Éther di (chlorométhylique)	X		X
569-64-2	C.I. Basic Green 4	Verde 4 básico	Indice de couleur vert de base 4	X	X	
576-26-1	2,6 Dimethylphenol	2,6 Dimetilfenol	Diméthyl-2-4-phénol			X

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584-84-9	Toluene-2,4-diisocyanate	Toluen-2,4-Diisocianato	Toluène-2,4-diisocyanate	X	X	X
593-60-2	Vinyl bromide	Bromuro de vinilo	Bromure de vinyle	X		X
606-20-2	2,6-Dinitrotoluene	2,6-Dinitrotolueno	2,6-Dinitrotoluène	X	X	X
615-05-4	2,4-Diaminoanisole	2,4-Diaminoanisol	2,4-Diaminoanisole	X		
621-64-7	N-Nitrosodin-propylamine	N-Nitrosodi-n-propilamina	N-Nitrosodi-n-propylamine	X		X
624-83-9	Methyl isocyanate	Isocianato de metilo	Isocyanate de méthyle	X		
630-08-0	Carbon monoxide	Monóxido de carbono	Monoxyde de carbone			X
630-20-6	1,1,1,2-Tetrachloroethane	1,1,1,2-Tetracloroetano	1,1,1,2-Tetrachloroéthane	X		
636-21-5	o-toluidine hydrochloride	o-toluidina hidrocloruro	Chlorydrate de o-toluidine	X		
680-31-9	Hexamethylphosphoramide	Hexametilfosforamida	Hexaméthylphosphoramide	X		
684-93-5	N-Nitroso-N-methylurea	N-Nitroso-N-metilurea	N-Nitroso-N-methylurée	X		
688-73-3	Tributyltin hydride	Tributil-estaño	Hydride de tributylétain			X
759-73-9	N-Nitroso-N-ethylurea	N-Nitroso-N-etilurea	N-Nitroso-N-éthylurée	X		
760-23-8	1,2-Dichloro-3-butane	1,2-Dicloro-3-butane	1,2-Dichloro-3-butane			X
764-41-0	1,4-Dichloro-2-butene	1,4-Dicloro-2-buteno	1,4-Dichloro-2-butène	X		X
812-04-4	1,1-Dichloro-1,2,2-trifluoroethane (HCFC-123b)	1,1,-Dicloro-1,2,2-trifluoroetano	1,1-Dichloro-1,2,2-trifluoroéthane	X		
842-07-9	C.I. Solvent Yellow 14	Amarillo 14 solvente	Indice de couleur Jaune de solvent 14	X	X	
924-16-3	N-Nitrosodin-butylamine	N-Nitroso-N-butilamina	N-Nitrosodi-n-butylamine	X		
959-98-8	Endosulfan	Endosulfan I	Endosulfan			X
961-11-5	Tetrachlorvinphos	Tetraclorvinfos	Tétrachlorvinphos	X		
989-38-8	C.I. Basic Red 1	Rojo 1 Basico	Indice de couleur Rouge de base 1	X	X	
1120-71-4	Propane sultone	Propano sultona	Propanesultone	X		
1163-19-5	Decabromodiphenyl oxide	Oxido de decabromodifenilo	Oxyde de décabromodiphényle	X	X	
1300-71-6	Dimethylphenol (mixed isomers)	Dimetilfenol (mezcla de isomeros)	Diméthylphénol (mélange d'isomères)			X
1313-27-5	Molybdenum trioxide	Trióxido de molibdeno	Trioxide de molybdène	X	X	
1314-20-1	Thorium dioxide	Dióxido de torio	Dioxyde de thorium	X	X	
1319-77-3	Cresol (mixed isomers)	Cresol (mezcla de isomeros)	Crésol (mélange d'isomères)	X	X	
1330-20-7	Xylene (mixed isomers)	Xileno (mezcla de isomeros)	Xylène (mélange d'isomères)	X	X	
1332-21-4	Asbestos (friable)	Asbestos	Amiante	X	X	X
1335-87-1	Hexachloronaphthalene	Hexacloronaftaleno	Hexachloronaphthalène	X		
1336-36-3	Polychlorinated biphenyls (PCBs)	Bifenilos policlorados	Biphényles polychlorés	X		
1344-28-1	Aluminum oxide (fibrous forms)	Oxido de Aluminio	Oxyde d'aluminium	X	X	
1464-53-5	Diepoxybutane	Diepoxibutano	Diépoxybutane	X		
1582-09-8	Trifluralin	Trifluralin	Trifluraline	X		X
1634-04-4	Methyl tert-butyl ether	Eter metil terbutílico	Oxide de tert-butyle et de méthyle	X	X	
1717-00-6	1,1-Dichloro-1-fluoroethane (HCFC-141b)	1,1-Dicloro-1-fluoroetano	1,1-Dichloro-1-fluoroéthane	X		
1836-75-5	Nitrofen	Nitrofen	Nitrofène	X		
1897-45-6	Chlorothalonil	Clorotalonil	Chlorthalonil	X		
1937-37-7	C.I. Direct Black 38	Negro 38	Noir direct 38	X		
2164-17-2	Fluometuron	Fluometuron	Fluométuron	X		
2234-13-1	Octochloronaphthalene	Octacloronaftaleno	Octochloronaphthalène	X		
2303-16-4	Diallate	Triallate	Diallate	X		
2602-46-2	C.I. Direct Blue 6	Azul 6	Bleu direct 6	X		
2832-40-8	C.I. Disperse Yellow 3	Amarillo 3 Disperso	Indice de couleur Jaune de dispersion 3	X	X	
2837-89-0	2-Chloro-1,1,1,2-tetrafluoroethane (HCFC-124)	2-Cloro-1,1,1,2-Tetrafluoroetano	2-Chloro-1,1,1,2-tétrafluoroéthane	X		
2921-88-2	Chlorpyrifos	Clorpirifos	Chlorpyrifos			X
3118-97-6	C.I. Solvent Orange 7	Naranja 7 Solvente	Indice de couleur vert acide 3	X	X	
3761-53-3	C.I. Food Red 5	Rojo 5	Rouge 5	X		
4549-40-0	N-Nitrosomethylvinylamine	N-Nitrosometilvinilamina	N-Nitrosométhylvinylamine	X		
4680-78-8	C.I. Acid Green 3	Verde 3 Acido	Vert acide 3	X	X	
6484-52-2	Ammonium nitrate (solution)	Nitrato de Amonio (solucion)	Nitrate d'ammonium (solution)	X	X	
7429-90-5	Aluminum (fume or dust)	Aluminio (vapor o polvos)	Aluminium (fumée ou pousière)	X	X	
7439-92-1	Lead	Plomo	Plomb	X		
7439-96-5	Manganese	Manganeso	Manganèse	X		X
7439-97-6	Mercury	Mercurio	Mercure	X		

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7440-02-0	Nickel	Níquel	Nickel	X		
7440-22-4	Silver	Plata	Argent	X		
7440-28-0	Thallium	Talio	Thallium	X		
7440-36-0	Antimony	Antimonio	Antimoine	X		
7440-38-2	Arsenic	Arsénico	Arsenic	X		
7440-39-3	Barium	Bario	Baryum	X		
7440-41-7	Beryllium	Berilio	Béryllium	X		X
7440-42-8	Boron	Boro	Bore			X
7440-43-9	Cadmium	Cadmio	Cadmium	X		
7440-47-3	Chromium	Cromo	Chrome	X		
7440-48-4	Cobalt	Cobalto	Cobalt	X		
7440-50-8	Copper	Cobre	Cuivre	X		
7440-62-2	Vanadium (fume or dust)	Vanadio	Vanadium (fumée ou pousière)	X	X	
7440-66-6	Zinc (fume or dust)	Zinc	Zinc (fumée ou pousière)	X	X	
7550-45-0	Titanium tetrachloride	Tetracloruro de Titanio	Tétrachlorure de titane	X	X	
7647-01-0	Hydrochloric acid	Acido clorhidrico	Acide chlorydrique	X	X	
7664-38-2	Phosphoric acid	Acido fosfórico	Acide Phosphorique	X	X	
7664-39-3	Hydrogen fluoride	Acido fluorhídrico	Fluorure d'hydrogène	X	X	
7664-41-7	Ammonia	Amoniaco	Ammoniac	X	X	
7664-93-9	Sulfuric acid	Acido sulfúrico	Acide sulfurique	X	X	
7697-37-2	Nitric acid	Acido nítrico	Acide nitrique	X	X	
7723-14-0	Phosphorus (yellow or white)	Fósforo (amarillo o blanco)	Phosphore (jaune ou blanc)	X	X	
7782-49-2	Selenium	Selenio	Sélénium	X		
7782-50-5	Chlorine	Cloro	Chlore	X	X	
7783-06-4	Hydrogen sulfide	Acido sulfhídrico	Hydrogène sulfuré			X
7783-20-2	Ammonium sulfate (solution)	Sulfato de amonio (solucion)	Sulfate d'ammonium (solution)	X	X	
8001-35-2	Toxaphene	Toxafeno	Toxaphène	X		X
8001-58-9	Creosote	Creosota	Créosote	X		
10024-97-2	Nitrous oxide	Oxido nitroso	Oxyde nitreux			X
10034-93-2	Hydrazine sulfate	Sulfato de hidracina	Sulfate d'hydrazine	X		
10049-04-4	Chlorine dioxide	Dióxido de cloro	Dioxyde de chlore	X	X	X
12122-67-7	Zineb	Zineb	Zinèbe	X		
12427-38-2	Maneb	Maneb	Manèbe	X		
16071-86-6	C.I. Direct Brown 95	Café 95	Brun direct 95	X		
16543-55-8	N-Nitrosonornicotine	N-Nitrosonornicotina	N-Nitrosonornicotine	X		
20816-12-0	Osmium tetroxide	Tetróxido de osmio	Tétroxyde d'osmium	X		
22967-92-6	Methylmercury	Metil mercurio	Méthylmercure			X
23950-58-5	Pronamide	Pronamida	Pronamide	X		
25321-14-6	Dinitrotoluene (mixed isomers)	Dinitrotolueno (mezcla de isomeros)	Dinitrotoluène (mélange d'isomères)	X	X	X
25321-22-6	Dichlorobenzene (mixed isomers)	Diclorobenceno (mezcla de isomeros)	Dichlorobenzène (mélange d'isomères)	X		
25376-45-8	Diaminotoluene (mixed isomers)	Diaminotolueno (mezcla de isomeros)	Diaminotoluène (mélange d'isomères)	X		
26471-62-5	Toluenediisocyanate (mixed isomers)	Toluendiisocianatos (mezcla de isomeros)	Toluène diisocyanate (mélange d'isomères)	X	X	X
29082-74-4	Octachlorostyrene	Percloroestireno	Octachlorostyrène			X
30402-15-4	Pentachlorodibenzofurans	Pentaclorodibenzofuranos	Pentachlorodibenzofuranes			X
34077-87-7	Dichlorotrifluoroethane	Diclorotrifluoroetano	Dichlorotrifluoroéthane	X		
36088-22-9	Pentachloro-p-dioxin	Pentaclorodibenzo-p-dioxina	Pentachloro-p-dioxine			X
39156-41-7	2,4-Diaminoanisole sulfate	Sulfato de 2,4-diaminoanisol	Sulfate de 2,4-diaminoanisole	X		
63938-10-3	Chlorotetrafluoroethane	Clorotetrafluoroetano	Chlorotétrafluoroéthane	X		
90454-18-5	Dichloro-1,1,2-trifluoroethane	Dicloro-1,1,2-trifluoroetano	Dichloro-1,1,2-trifluoroéthane	X		
	Antimony compounds	Compuestos de antimonio	Composés d'antimoine	X	X	
	Arsenic compounds	Compuestos de arsénico	Composés d'arsenic	X	X	X
	Barium compounds	Compuestos de bario	Composés de baryum	X		
	Beryllium compounds	Compuestos de berilio	Composés de béryllium	X		
	Cadmium compounds	Compuestos de cadmio	Composés de cadmium	X	X	X
	Chlorophenols	Clorofenoles	Chlorophénols	X		

CAS Number	Chemical Name	Nombre químico	Nom chimique	TRI	NPRI	RETC
	Chromium compounds	Compuestos de cromo	Composés de chrome	X	X	X
	Cobalt compounds	Compuestos de cobalto	Composés de cobalt	X	X	X
	Copper compounds	Compuestos de cobre	Composés de cuivre	X	X	X
	Cyanide compounds	Compuestos de cianuro	Composés de cyanure	X	X	X
	Ethylenebisdithiocarbamic acid, salts, esters	Acido etilenobisditiocarbamico, sales y esteres	Acide, sels et éthers éthylènebisdithiocarbamiques	X		
	Glycol ethers	Eteres glicólicos	Éthers glycoliques	X		
	Lead compounds	Compuestos de plomo	Composés de plomb	X	X	X
	Manganese compounds	Compuestos de manganeso	Composés de manganèse	X	X	
	Mercury compounds	Compuestos de mercurio	Composés de mercure	X	X	X
	Nickel compounds	Compuestos de niquel	Composés de nickel	X	X	X
	Nitrogen oxides (NOx)	Oxidos de nitrógeno	Oxydes d'azote			X
	Polybrominated biphenyls	Bifenilos polibromados	Biphényles polybromés	X		
	Polycyclic aromatic amines	Nitro-hidrocarburos aromáticos policíclicos	Amines aromatiques polycycliques			X
	Polycyclic aromatic	Hidrocarburos aromáticos policíclicos	Hydrocarbures aromatiques polycycliqueshydrocarbons (PAHs)			X
	Selenium compounds	Compuestos de selenio	Composés de sélénium	X	X	X
	Silver compounds	Compuestos de plata	Composés d'argent	X	X	X
	Sulfur oxides (SOx)	Oxidos de azufre	Oxydes de souffre			X
	Thallium compunds	Compuestos de talio	Composés de thallium	X		
	Uranium	Uranio	Uranium			X
	Warfarin and salts	Warfarina y sales	Warfarin et sels	X		X
	Zinc compounds	Zinc y compuestos	Composés de zinc	X	X	X

Appendix B: List of Companies Invited to Participate in the Querétaro, Mexico, Case Study, April to June 1996

Name of Company	Industrial Activity	Municipality
Acabados Especiales, S.A. de C.V.	Plating finish	Querétaro
ACERLAN, S.A. de C.V.	Smelting and moulding of metal parts	San Juan del Río
Aditivos Mexicanos, S.A. de C.V.	Manufacturing and sale of additives for lubricants	San Juan del Río
AGROGEN, S.A. de C.V.	Manufacturing and marketing of fertilizers	Querétaro
Air Products Resinas, S.A. de C.V.	Manufacturing of emulsion resins	San Juan del Río
Akim de México, S.A. de C.V.	Manufacturing and marketing of chemical specialties	Querétaro
Albek de México, S.A. de C.V.	Manufacturing of chemical products for the textile, leather and sugar industries	San Juan del Río
Alimentos Balanceados Pilgrim's Pride, S.A. de C.V.	Poultry feed	Querétaro
Alto Carbono, S.A. de C.V.	Manufacturing of hydraulic, air-driven and mechanical metal equipment	Querétaro
American Racing Manufacturas, S.A. de C.V.	Manufacturing of wheels for the automotive industry	El Marqués
Ampolletas, S.A. de C.V.	Manufacturing of ampoules, bottles, and laboratory products	Querétaro
Artlux, S.A. de C.V.	Mixing of substances used in manufacturing cleaners for the automotive industry	Querétaro
Arvin de México, S.A. de C.V.	Manufacturing and sale of exhaust systems	Querétaro
Atwood de México, S.A. de C.V.	Manufacturing of gearshift levers	Querétaro
Autopartes Walker, S.A. de C.V.	Automotive sheet stamping	Querétaro
Autornator, S.A. de C.V.	Manufacturing of aluminum automotive parts	Querétaro
Black & Decker, S.A. de C.V.	Manufacturing and sale of home appliances	Querétaro
Brass Química, S.A. de C.V.	Development, distribution and sale and purchase of chemicals	Querétaro
Bticinio de México, S.A. de C.V.	Manufacturing of electrical lighting equipment	Querétaro
Calendarios y Propaganda, S.A. de C.V.	Manufacturing, printing and sale of calendars	Querétaro
Cartones Ponderosa, S.A. de C.V.	Manufacturing of cardboard and derivatives	San Juan del Río
Celanese Mexicana, S.A. de C.V.	Manufacturing of polyester thread	Querétaro
Clymate Systems, S.A. de C.V.	Manufacturing of air conditioning system parts	El Marqués

Note: Participating companies are noted in bold type.

Name of Company	Industrial Activity	Municipality
Compañía Nestle, S.A. de C.V.	Dairy products	Querétaro
CPC Industrial, S.A. de C.V.	Manufacturing of starch, fodder, fibre and glucose	San Juan del Río
Cromos Automotrices, S.A. de C.V.	Electroplating	Querétaro
Denimex, S.A. de C.V.	Spinning, weaving and finishing	San Juan del Río
Dott Siesa, S.A. de C.V.	Injection, chrome plating and painting of metal parts	Querétaro
EKCO, S.A. de C.V.	Manufacturing of aluminum kitchenware	Querétaro
Electroforjados Nacionales, S.A. de C.V.	Manufacturing of catalytic converters and mufflers	Querétaro
Engranes y Maquinados de Querétaro, S.A. de C.V.	Manufacturing of gears	El Marqués
Fábrica Nacional de Lijas, S.A. de C.V.	Distribution and sale of coated abrasives	Querétaro
Forjas Spicer, S.A. de C.V.	Smelting of metal parts for the automotive industry	Querétaro
Frenos y Mecanismos, S.A. de C.V.	Manufacturing of brake system parts and accessories	Querétaro
Gráficas Monte Albán, S.A. de C.V.	Printing and bookbinding	El Marqués
Grammer Mexicana, S.A. de C.V.	Tractor and forklift seat manufacturing	Corregidora
Industria del Hierro, S.A. de C.V.	Manufacturing of machinery and equipment	Querétaro
Industria Envasadora de Querétaro, S.A. de C.V.	Manufacturing of carbonated and non-carbonated soft drinks	Querétaro
Johnson Mattehey de México, S.A. de C.V.	Manufacturing of catalytic converters for emission control	El Marqués
Kellogg de México, S.A. de C.V.	Manufacturing of foods (cereals)	Querétaro
Kimberly Clark, S.A. de C.V.	Manufacturing and processing of various paper products	San Juan del Río
Laboratorios Bioquimex, S.A. de C.V.	Manufacturing of food concentrates and food colouring	Querétaro
Laboratorios Columbia, S.A. de C.V.	Manufacturing of pharmaceuticals	San Juan del Río
Lubricantes Fuchs	Manufacturing of oils and lubricants	Querétaro
Mabe Refrigeradores, S.A. de C.V.	Manufacturing of refrigerators for home use	Querétaro
Manufacturas Metálicas, S.A. de C.V.	Manufacturing of metal products	El Marqués

Note: Participating companies are noted in bold type.

Name of Company	Industrial Activity	Municipality
Maquilados Tonachic, S.A. de C.V.	Manufacturing of industrial tools, dies and devices	Querétaro
Maquilas Save, S.A. de C.V.	Electroplating	Querétaro
Minas Comermín, S.A. de C.V.	Ore mining	Colón
Nacional de Recubrimientos, S.A. de C.V.	Manufacturing of powder coatings	Corregidora
New Holland, S.A. de C.V.	Design, manufacturing and assembly of tractors for agricultural use	Querétaro
PEMEX Refinación	Petrochemicals storage	Querétaro
Pinturas del Bajío, S.A. de C.V.	Manufacturing of industrial paint, varnishes and solvents	Querétaro
PITSA, San Juan, S.A. de C.V.	Production of all types of cloths	San Juan del Río
Plásticos Técnicos Mexicanos, S.A. de C.V.	Manufacturing of plastic products	San Juan del Río
Polaroid de México, S.A. de C.V.	Manufacturing of photographic materials	Querétaro
PPG Industries de México, S.A. de C.V.	Manufacturing of paint, enamel, varnish and lacquer	San Juan del Río
Procesadora de Metales Jair, S.A. de C.V.	Metal processing for the smelting industry	El Marqués
Productos Gerber, S.A. de C.V.	Manufacturing of food products	Querétaro
Productos Pensylvania, S.A. de C.V.	Manufacturing of putty, sealers and coatings	Querétaro
PROQUIMSA	Manufacturing of thinner and turpentine, sale of chemical products	Querétaro
PROTAL, S.A. de C.V.	Manufacturing of components for household goods	Querétaro
Quest International de México, S.A. de C.V.	Manufacturing of aromatic chemicals and petrochemicals	Pedro Escobedo
Química Fina Farmex, S.A. de C.V.	Chemical-pharmaceutical production	Corregidora
RR Donelly de México, S.A. de C.V.	Manufacturing, printing and finishing lithographs	San Juan del Río
SERPASA, S.A. de C.V.	Selection and packaging of recyclable paper	San Juan del Río
Sika Mexicana, S.A. de C.V.	Manufacturing of adhesives and waterproof materials	Corregidora
Singer Mexicana, S.A. de C.V.	Manufacturing of sewing machines for home use	Querétaro
Sintermex, S.A. de C.V.	Manufacturing of sintered parts	Querétaro
Taloquímia, S.A. de C.V.	Manufacturing of synthetic pine oils	San Juan del Río
Tetra Pack Querétaro, S.A. de C.V.	Manufacturing of carton packaging for liquid foods	Corregidora
Transmisiones TSP, S.A. de C.V.	Manufacturing and assembly of automotive parts	Pedro Escobedo

Note: Participating companies are noted in bold type.

Name of Company	Industrial Activity	Municipality
Transmisiones y Equipos Mecánicos, S.A. de C.V.	Manufacturing of automotive transmissions	Querétaro
Tratamiento Térmico de Querétaro, S.A. de C.V.	Metal hardening and furnace manufacturing	Querétaro
UNIROYAL, S.A. de C.V.	Manufacturing of tires and inner tubes	Querétaro
Vidriera Querétaro, S.A. de C.V.	Manufacturing of industrial glass	Querétaro
Vitro American National Can, S.A. de C.V.	Manufacturing of aluminum cans and caps	Querétaro
Willars Chemical, S.A. de C.V.	Mixing of rodenticides	Querétaro
Wocco, S.A. de C.V.	Manufacturing of rubber vibration absorbers	El Marqués
Xolox, S.A. de C.V.	Manufacturing of metal automotive parts	Querétaro
Zwanenberg de México, S.A. de C.V.	Dairy production	Corregidora

Note: Participating companies are noted in bold type.

(unofficial translation)

POLLUTANT RELEASE AND TRANSFER REGISTER *(RETC)*

Section 1. Facility Identification

			Indicate with an X whether this report is:		
				additional information	
				a correction	
1.1	**Report year**				
1.2	**Certification**	The information contained in this report is correct and based upon the estimation methods indicated in the instructions.			
	1.2.1	Name			
	1.2.2	Title			
	1.2.3	Telephone		Fax	
	1.2.4	Signature of representative			
1.3	**Facility**				
	1.3.1	Name			
	1.3.2	RETC number			
	1.3.3	Address	Street number		
			Municipality or district		
			City		
			State		
			Postal code		
	1.3.4	Number of employees			
	1.3.5	Industrial classification code			
	1.3.6	UTM North		UTM East	

1.4	**Company and parent-company**		Indicate name of company and parent-company		
	1.4.1	Company name			
	1.4.2	Parent-company name			
1.5	**Contact (technical matters)**	Indicate address if different from above			
	1.5.1	Name			
	1.5.2	Title			
	1.5.3	Telephone		Fax	
	1.5.4	Address	Street Number		
			Municipality or district		
			City		
			State		
			Postal code		
1.6	**Contact (public relations)**	Indicate address if different from above			
	1.6.1	Name			
	1.6.2	Title			
	1.6.3	Telephone		Fax	
	1.6.4	Address	Street Number		
			Municipality or district		
			City		
			State		
			Postal code		

Section 2. Chemical Substance Identification

2.1	**Substance identification**				
	2.1.1	CAS Number		Category code	
	2.1.2	Chemical name or category			
2.2	**Substance use and production**			Mark option(s) with an X	
	2.2.1	Enters into process or treatment (raw material or direct consumption)			
	2.2.2	Generated during process or treatment			
	2.2.3	Does not enter into or generate during process or treatment (indirect consumption)			
2.3	**Total amount of substance in establishment (kg/year)**				
2.4	**In situ waste treatment**				
	Pollutant stream phase code	Method code			
2.5	**Substance releases**				
				Total amount (kg)	Estimation basis
	2.5.1	Air emissions			
			Process flows		
			Others		
				Total amount (kg)	Survey basis
	2.5.2	Discharges into streams and bodies of water			
		Hydrological region number	Name of receiving body of water		

2.5.3	Soil deposits					
		Sanitary landfill				
		Soil treatment				
		Dams				
		Open-air deposits				
		Other methods				
2.5.4	Total releases					
2.5.5	All releases from accidents					
2.6	**Transfers**					
2.6.1	Transfers outside the facility					
	A)	Name of service provider				
		Address	Street Number			
			Municipality or district			
			City			
			State			
			Postal code			
		Transfer	Amount (kg)	Survey basis	Method code	
	B)	Name of service provider				
		Address	Street Number			
			Municipality or district			
			City			
			State			
			Postal code			
		Transfer	Amount (kg)	Survey basis	Method code	

2.6.2	Public Sewers				
		Discharge	Amount (kg)	Survey basis	
2.6.3	Total amount of transfers				
2.7	**Pollution prevention and control**				
2.7.1	Total releases			Amount (kg)	
		Total releases during previous year			
		Estimated total releases for the coming year			
2.7.2	Production or activity index		Estimated production or activity index for the coming year		
2.7.3	Pollution prevention and control activities	Mark option(s) with an X			
		Change in operating practices			
		Inventory control			
		Prevention of spills and leaks			
		Change of raw materials and/or input			
		Product change			
		Process modifications			
		Changes in cleaning practices			
		Pollution control equipment			
		Other			

ADDENDUM

In addition to the information requested in the report form, the Working Group is evaluating the possibility of including the following items, depending on the participants' answers.

The following are additional boxes that may be included in Section 1. If they are added, they will appear under Section 1.7.

1.7 Licences and authorizations				
	Number		Date	
		mm	dd	yy
Semarnap operating licence				
Hazardous waste generating company authorization				
Permit to discharge wastewater into federal water bodies				
Environmental impact authorization				

The following are additional questions to item 2.2 in Section 2. If they are included, they will be under Subsections 2.2.4 and 2.2.5.

2.2	**Substance production and use**	Mark option(s) with an X
2.2.4	Substance is part of final product	
2.2.5	Substance is part of byproduct	

QUESTIONNAIRE FOR EVALUATION OF THE REPORTING FORMAT

1. How many man-hours were spent completing this form? _____

2. How many people participated in completing this form? _____

3. What is the average hourly salary of persons who participated? _____

4. Were additional expenses incurred upon completing this form (such as test equipment or outside consulting services)? _____

   _____

5. What classification of personnel completed the form? _____

6. Was the hard copy of the form utilized, as opposed to the diskette that was provided? Why?

   _____

   _____

   _____

   _____

7. What are your general comments regarding the form and the instructions?

   _____

   _____

   _____

   _____

8. Do you have any suggestions?

   _____

   _____

   _____

   _____