

Action Plan to Enhance the Comparability of Pollutant Release and Transfer Registers (PRTRs) in North America

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1. Introduction

Many North Americans are conscious of the potential for pollutants to affect their health or the environment. Pollutant Release and Transfer Registers (PRTRs) are publicly available databases that contain information on the quantities of pollutants released annually from industrial facilities to air, water and land, or otherwise managed as waste throughout a given country or region. The data are updated and published on a cyclical basis (usually annually) and organized by facility, with information on the facility's industrial sector, associated pollutants, and geographic location. To date, more than thirty PRTRs exist around the world, including regional systems such as the E-PRTR in Europe, the Central American PRTR, and others.

A key purpose of a PRTR is to increase the public's knowledge of, and access to, information on the releases and transfers of industrial pollutants in their communities. This information enables citizens and other stakeholders, such as governments and industry, to make informed decisions regarding the consequences of such dispositions and to support environmental sustainability efforts—for example, by providing baseline data to support the development of pollution prevention strategies.

1.1 PRTRs and Data Comparability

The collection of PRTR data is generally achieved by requiring facilities that meet the specified criteria to report their pollutant releases and transfers, usually on an annual basis. The criteria typically include the sectors and substances subject to reporting, as well as reporting thresholds (e.g., minimum amount of a substance manufactured, processed or otherwise used, or managed or released). In order to track industrial pollution to support environmental sustainability efforts, data and information across sectors and facilities must be comparable and integrated (or “be miscible”)—hence the existence of standard national PRTR reporting criteria.

Similarly, the ability to track industrial pollution and promote sustainability at the regional or continental level requires comparable data and information. In recent years there has emerged a growing interest worldwide in the development of PRTRs, corresponding to the need to evaluate environmental management and sustainable development on a regional or global scale. Integrated and comparable PRTR data can be used for a variety of applications—for example, to review the potential regional impacts of substances discharged into a shared watershed, or the potential global impacts of the long-range transport of air pollutants.

The rationale for tracking industrial pollutants to address their potential impacts is set out in the OECD's decision of February 1996 to implement PRTRs, which outlines the principles underlying the establishment of such registers,¹ and specifically, that:

- PRTR systems should provide data to support the identification and assessment of possible risks to humans and the environment by identifying sources and amounts of potentially harmful releases and transfers to all environmental media
- PRTR data should be used to promote prevention of pollution at the source, e.g., by encouraging implementation of cleaner technologies

¹ OECD. 28 May 2003. Recommendation of the Council on Implementing Pollutant Release and Transfer Registers (PRTRs): acts.oecd.org/Instruments/ShowInstrumentView.aspx?InstrumentID=44&InstrumentPID=41&Lang=en&Book=False.

- PRTR systems should include coverage of an appropriate number of substances that may be potentially harmful to humans and/or the environment, and that are released or transferred
- PRTR systems should allow as far as possible comparison and co-operation with other national PRTR systems and possible harmonization with similar international databases.

These statements indicate that in order for PRTR data to support the identification and assessment of possible risks to human health or the environment, they need to be comparable and (ideally) miscible, as well as reliable (i.e., quality-assured). The principles also underscore the need for comprehensive coverage of the pertinent sources and types of pollutants.

1.2 The CEC's North American PRTR Project

The establishment in 1994 of the North American Free Trade Agreement (NAFTA) and increased regional trade created the potential for increased cross-border movements of pollutants, and more reason to track these movements. This led to the establishment of the North American Agreement on Environmental Cooperation (NAAEC) and the creation of the CEC and the North American PRTR Project. The main purpose of this project is to compile, integrate and disseminate data and information reported by industrial facilities to the PRTRs of North America. In 1994, only two mandatory PRTR programs existed in the region, the United States' Toxics Release Inventory (TRI) and Canada's National Pollutant Release Inventory (NPRI). Mexico's *Registro de Emisiones y Transferencia de Contaminantes* (RETC) followed a decade later.

Each of the North American PRTRs has been developed to meet national needs, and each has a unique set of pollutants and sectors subject to reporting, with reporting thresholds that differ somewhat from those of the other two countries. Changes in PRTR reporting requirements have also tended to evolve separately over time, reflecting national priorities and circumstances. Thus, while the programs share many similarities, their differences make it challenging to aggregate and compare data in order to be able to address regional environmental issues.

Recognizing that each program has its own processes for the collection and modification of reporting requirements, the CEC Council signed a Resolution in June 1997 to promote comparability among the PRTRs in North America.² The Resolution called upon the three Parties and the Secretariat, with the input of other relevant stakeholders, to develop joint strategies for technical cooperation and information sharing in order to improve national databases and information systems relative to toxic chemicals, given that:

“...the broadest possible awareness of chemical risks is a prerequisite for achieving chemical safety... and a higher degree of data comparability is necessary for a more accurate representation of North American environmental quality.”

In July 2000 the Council adopted a related Resolution, outlining the basic elements of PRTRs,³ including a commitment to:

“...a continued exchange of information and expertise of relevance to the effective implementation and further development of the respective national PRTR programs

² CEC. 12 June 1997. Council Resolution 97-04: Promoting Comparability of Pollutant Release and Transfer Registers (PRTRs):

www.cec.org/Page.asp?PageID=122&ContentID=1168&SiteNodeID=278&AA_SiteLanguageID=1>

³ CEC. 13 June 2000. Council Resolution 00-07: Pollutant Release and Transfer Registers:

www.cec.org/Page.asp?PageID=122&ContentID=1141&SiteNodeID=275&BL_ExpandID=>

including, *inter alia*, guidance on estimation techniques and lists of substances and reporting thresholds, with a view toward promoting cooperation and enhancing comparability among the North America PRTR systems.”

The Action Plan for Enhancing the Comparability of Pollutant Release and Transfer Registers in North America was developed in response to these resolutions and the expressed need for trilateral coordination. It is the result of collaboration among the CEC, the three PRTR programs, and representatives from various stakeholder groups including industry, nongovernmental organizations, citizens, academia, and the media. The benefits of comparable, complete, and accurate PRTR data for North America include having:

- Reliable information about industrial pollution for use by industry, government and citizens as indicators to help improve human health and environmental outcomes
- Public transparency in the management and use of pollutants by industrial facilities, leading to accountability and sustainable environmental management practices on a continental scale.

1.3 Progress to Date

Much progress towards North American PRTR comparability has been made since the Council Resolution of 1997 and the publication of the original Action Plan in 2002. Perhaps the most significant achievement is that the national PRTRs have developed within a context of regular public consultations, which have grown to be a driving force behind improvements in a number of areas. This approach reflects the “right-to-know” paradigm, as well as ongoing advances in information technology and a corresponding increase in access to information about industrial activities and the pollutants associated with them. A brief summary of the milestones that have marked PRTR development in North America is provided below.

In 2002 the CEC Secretariat published the first Action Plan,⁴ with a status of the comparability of the North American PRTRs (which at the time comprised the US TRI and Canadian NPRI; Mexico had a voluntary reporting program only). The Action Plan was oriented towards encouraging the establishment of a mandatory PRTR in Mexico. It recommended the adoption of the North American Industry Classification System (NAICS) codes for reporting facilities, and the addition of specific pollutant groups (e.g., persistent, bioaccumulative and toxic substances—or PBTs) to the existing PRTR lists. The Action Plan also stressed the value of PRTR data for improving the understanding of off-site and cross-border transfers of pollutants.

The Council resolution adopting the Action Plan (and included at the beginning of that document) instructed the Parties to the NAAEC to track and promote reductions in releases of pollutants of common concern across the region (such as PBTs). It also called upon them to explore ways of fostering reductions in releases and transfers of these substances—for instance, through a trilateral challenge program similar to the United States’ 33/50 Program and the Canadian Accelerated Reduction/Elimination of Toxics (ARET) program.

The implementation of the 2002 Action Plan spurred some important PRTR developments, including:

⁴ CEC. June 2002. Action Plan to Enhance the Comparability of Pollutant Release and Transfer Registers in North America: <www3.cec.org/islandora/en/item/11481-action-plan-enhance-comparability-pollutant-release-and-transfer-registers-in-north-en.pdf>.

- Significant progress in awareness-raising, among Mexican industry and the public, of the importance of a mandatory PRTR program in that country.
- For the 2002 reporting year, Canada's NPRI program lowered certain PBT reporting thresholds (e.g., lead), expanded the list of pollution prevention reporting categories, and added petroleum bulk terminals to the industrial activities subject to reporting.
- A greater level of comparability between the NPRI and TRI in transfer reporting categories, the reporting of accidental spills, and reporting of reasons for year-to-year changes.

In 2005, an updated version of the Action Plan was published.⁵ By then, Mexico had adopted a regulation for the establishment of a mandatory PRTR, similar to the Canadian NPRI and the US TRI, and the key elements of the Mexican program were outlined in the Action Plan. The plan also proposed a number of actions for enhancing PRTR comparability in the areas of reporting thresholds, pollutants, facility and parent company identification, and so on. Since 2005, Mexico has established its mandatory PRTR, the *Registro de Emisiones y Transferencia de Contaminantes* (RETC), with data available online. Many other developments have occurred over this time period, with some having positive impacts on the level of data comparability—for example:

- In 2006 the US TRI implemented the use of NAICS codes for TRI reporting, making the data more comparable with Canada's NPRI data. For the 2012 reporting year Mexico's RETC has required facilities to report the NAICS code(s) under which they are classified (to date, Mexican facilities have reported according to the *Clasificación Mexicana de Actividades y Productos* (CMAP) industrial classification codes, which the PRTR program subsequently maps to NAICS codes).
- The development of Mexico's RETC program coincided with that country's signing of the Kyoto Protocol in 2005, and it is the only PRTR program in North America to require reporting of releases of greenhouse gases (GHG). However, facility-based GHG data from Canada's GHG reporting program, reported since 2004, are now accessible through the NPRI website; and GHG data reported by US facilities since 2011 are available online from the U.S. EPA's GHG Reporting Program.
- Since 2005, a number of substances have been added to the NPRI list (e.g., nine polycyclic aromatic hydrocarbons), some of which are subject to reporting under the US TRI. NPRI also modified the requirement for reporting of dioxins and furans as a group, to reporting of the 17 individual congeners, similar to US TRI reporting requirements.
- For the 2011 reporting year, the US EPA added to the TRI chemical list 16 chemicals that are reasonably anticipated to be human carcinogens. One of these, isoprene, is also subject to reporting under NPRI. For the 2012 reporting year, TRI reinstated the reporting requirements for hydrogen sulfide, a pollutant that is also subject to reporting under the Canadian and Mexican PRTRs.
- In 2013 Mexico's RETC program expanded its list of substances subject to reporting, from 104 pollutants (or pollutant groups) to 200. This brings the number of pollutants common to the three PRTR programs to 71 (up from 60).

⁵ CEC. September 2005 (Update). Action Plan to Enhance the Comparability of Pollutant Release and Transfer Registers in North America: <www3.cec.org/islandora/en/item/2234-action-plan-enhance-comparability-pollutant-release-and-transfer-registers-in-en.pdf>.

Notwithstanding these significant advances, important gaps remain in the picture of industrial pollution in North America. Therefore, as stipulated in the 1997 Council Resolution, the CEC undertook to update the Action Plan to provide a current status of comparability and identify issues needing to be addressed. A public meeting of the North American PRTR Project was convened in October 2012 in Toronto, Canada, with participants representing all stakeholder groups: industry, government, non-governmental organizations (NGOs), academia, media, and the public. Participants reviewed the OECD principles underlying the establishment of PRTRs, with a focus on the three North American programs in particular. The discussion centered on the themes of data completeness and quality, national regulatory framework, and public disclosure and communication of information.⁶ Participants then identified related issues and possible approaches to address them. Following the meeting, the CEC and officials from the three North American PRTR programs met to explore these ideas and provide additional feedback. The information gathered from these meetings provides the basis for the recommendations and specific actions proposed in this document.

2. Status of North American PRTR Comparability: Issues

Currently, differences in reporting requirements among the three PRTR programs create challenges in comparing and aggregating data at the continental level. The gaps in the North American picture of industrial pollution resulting from these differences are highlighted in the work of the CEC's North American PRTR Project and especially, in its *Taking Stock Online* integrated and searchable database, and the data analyses presented in the *Taking Stock* report.

The table in Annex 1, entitled "Status of North American PRTR Comparability," describes the main areas of PRTR reporting in North America, key differences among the programs, and the resulting status of comparability across the region. The issues identified in relation to a lack of comparability among the three PRTRs are discussed below.

North American PRTR Comparability: Current Issues

- 2.1 Differences in the industrial sectors and activities subject to reporting
- 2.2 Inconsistent application of North American Industrial Classification System (NAICS) codes
- 2.3 Differences in the pollutants subject to reporting
- 2.4 Inconsistent PRTR terminology and definitions
- 2.5 Lack of harmonization among local, state/provincial and federal programs
- 2.6 Inconsistent data quality and reliability

2.1 Differences in the Industrial Sectors and Activities Subject to Reporting

The PRTRs of Canada, Mexico and the United States have differing reporting requirements relative to industrial sectors that result in important gaps in information across the region. These gaps relate to the following:

⁶ CEC. 2012. Public Meeting of the North American PRTR Project (October 30-31): www3.cec.org/islandora/en/item/11053-public-meeting-north-american-prtr-project-en.pdf.

- Sectors excluded from reporting: These include two key North American sectors associated with important pollutant releases and transfers, oil and gas extraction and public wastewater treatment facilities. These sectors are subject to reporting under the RETC⁷ and NPRI, but not under the US TRI.
- Excluded activities within reporting sectors: In 2009 Canada's NPRI removed the exemption for the reporting of mining waste rock and tailings, retroactive to 2006. However, differences remain among the three PRTR systems in regard to what is reported by metal mining facilities (e.g., in Mexico, only "beneficiation" is included under the RETC, while other extraction activities are excluded).
- Reporting thresholds: The standard 10-employee threshold under TRI and NPRI was established as a burden reduction measure. Under NPRI, for certain activities where facilities with a small number of employees may have significant releases, the employee threshold has been removed or replaced with an output or production threshold. There is no employee threshold under Mexico's RETC.

While the stated reporting requirements relative to industrial sectors and activities vary among the three countries, the underlying rationale and criteria for their inclusion are largely similar, and based on the assumption that industrial activities have the potential to release pollutants that can cause harm to human health or the environment.

The following is a brief summary of the industrial sectors or activities subject to reporting in each country:

- Canada's NPRI requires reporting from almost all industrial sectors and activities (with some exceptions and subject to certain thresholds).
- Mexico's RETC requires reporting from all 11 industrial sectors under federal jurisdiction, as well as any discharge of pollutants to a national water body.
- Under the US TRI, three factors are to be considered for the inclusion of an industrial activity or sector: whether TRI-listed chemicals are reasonably anticipated to be present at facilities in the sector; whether facilities manufacture, process, or otherwise use these chemicals; and whether reporting from these facilities can reasonably be anticipated to increase the amount of information available.⁸

Both Mexico and Canada have recently undertaken assessments of their PRTR program coverage: In Mexico, RETC reporting requirements were evaluated for their coverage of air pollutants associated with the industrial activities subject to reporting. The conclusion was that key substances were not being captured by the PRTR program. Among the sectors or activities in Mexico being examined more closely for inclusion are municipal sewage treatment plants (associated with releases of methane); and combustion activities (related to releases of hazardous air pollutants and criteria air contaminants).

In Canada, in the context of the ongoing development of new regulations for hazardous air pollutants and greenhouse gases, NPRI reviewed 15 major sectors to assess the level of compliance with reporting requirements and to determine if facilities were reporting on the

⁷ In Mexico, any facility discharging pollutants to national water bodies is subject to RETC reporting.

⁸ EPA. 1997. 40 CFR Part 372 [OPPTS-400104D; FRL-5578-3] RIN 2070-AC71 Addition of Facilities in Certain Industry Sectors; Revised Interpretation of Otherwise Use; Toxics Release Inventory Reporting; Community Right-to-Know AGENCY: US Environmental Protection Agency (EPA). ACTION: Final rule. Available at: [yosemite1.epa.gov/ee/epa/ria.nsf/vwAN/IR00003212.pdf/\\$file/IR00003212.pdf](http://yosemite1.epa.gov/ee/epa/ria.nsf/vwAN/IR00003212.pdf/$file/IR00003212.pdf).

pollutants associated with those processes. NPRI is also undertaking a review of reporting requirements for the upstream oil and gas sector, including considering changes that would capture additional information on oil and gas activities and facilities.

2.2 Inconsistent Application of North American Industrial Classification System Codes

Canada's NPRI, the US TRI and Mexico's RETC require reporting of the North American Industry Classification System (NAICS) code that best represent the industry sector to which a facility belongs and the activity or activities undertaken at the facility. In order to understand the sources of industrial pollutants across the region, it is essential for PRTR data to accurately reflect the nature of the industrial activities occurring at the facilities that report them. However, while trilateral use of the NAICS makes data reported by sectors more comparable across the region, issues remain—e.g.:

- Discrepancies in the national NAICS codes used for a given sector, or different descriptions for the same code: For example, the Mexican NAICS code for water and wastewater treatment facilities is 222, whereas the code for similar facilities in Canada and the United States is 221.
- Incorrect NAICS codes reported by facilities: NAICS codes comprise up to 6 digits, with the 6-digit code providing the greatest level of detail about a facility's activities. However, facilities in the three countries undertaking very similar activities sometimes report using incorrect or invalid 5- and 6-digit NAICS codes.
- NAICS codes are reviewed and updated every five years, via a collaborative process involving statistical agencies in the three countries. However, as mentioned above, there are differences in the codes and descriptions used by each country. In addition, the PRTR programs are not synchronized in their use of the most recent version of the NAICS, which results in inconsistencies among the three PRTR systems in the codes used in certain years.

2.3 Differences in the Pollutants Subject to Reporting

Each country's PRTR pollutant list was established for different reasons and via different mechanisms. As a result, substantial differences exist among the three programs relative to the pollutants subject to reporting and their reporting thresholds (see Annex 1). For example, the three programs have thresholds for "manufacturing, processing or otherwise using" a substance; in addition, Mexico's RETC specifies a "release" threshold and facilities have to report if they meet or exceed either threshold. In general, RETC thresholds are lower than those of TRI and NPRI. For some pollutants (e.g., PBTs), the reporting thresholds are much lower, based on special concerns relative to the substances' significant potential to affect human health or the environment.

As mentioned in section 2.1 above, efforts have been undertaken by the North American PRTR programs to ensure that reporting requirements for industrial sectors and facilities adequately reflect the potential risks from the pollutants associated with these industrial activities. Each program also periodically assesses substances as potential candidates for addition to (or deletion from) their lists, or for lower reporting thresholds.⁹ Pollutant categories prioritized under one or

⁹ The three PRTRs specify the criteria by which a pollutant can be listed (or de-listed). Canada: decision factors for inclusion of substances, <<http://www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=EF5F32DD->

more of the three PRTRs include: persistent organic pollutants under the Stockholm Convention; reproductive and/or developmental toxicants (including endocrine disruptors¹⁰); known or suspected carcinogens; greenhouse gases; criteria air contaminants; and hazardous air pollutants.

Examples of recent changes to the North American PRTR lists based on pollutant assessments include:

- NPRI reporting thresholds for toluene diisocyanates, acrylonitrile, and a number of other chemicals considered toxic under the Canadian Environmental Protection Act (CEPA) have been lowered as of the 2014 reporting year.
- The recent addition of 16 substances to the TRI chemical list is based on the U.S. National Toxicology Program's (NTP) assessment showing these substances to be likely human carcinogens; therefore, they meet at least one of the criteria for adding substances to the TRI list. Similarly, the lifting of the administrative ban imposed on hydrogen sulfide reporting in 1994 was based on EPA's findings that hydrogen sulfide can cause chronic health effects in humans and because of its toxicity and potential to cause significant adverse effects in aquatic organisms.

Differences among the three programs also relate to the reporting of certain substances together with their compounds (e.g., lead and its compounds). These differences result in gaps in information about potentially very toxic pollutants that, depending on the PRTR, cannot be dissociated from less-toxic compounds within the same group (e.g., hexavalent chromium compounds grouped with other chromium compounds). Until very recently, only 60 pollutants (or pollutant groups) have been common to the three PRTRs. Among these common substances, reporting thresholds in one country might have been lowered over time (e.g. cadmium), but remain unchanged in another. This reflects the fact that while each program periodically makes changes (including additions and deletions) to its substance list, these actions are primarily to address national needs and generally are not coordinated among the North American programs.

However, recent changes to Mexico's PRTR substance list highlight the utility of implementing a mechanism for sharing information relative to pollutants across the region. Following an extensive toxicological review of substances that involved collaboration and exchanges of information among the three PRTR programs,¹¹ Mexico recently adopted new RETC legislation, effective for the 2014 reporting year, requiring reporting on 96 additional substances, bringing the total number of pollutants to 200. This action brings the number of pollutants common to the three PRTRs to 71. Increasing trilateral sharing of information about substances, and taking into account recent or planned changes in the other two programs when making additions or modifications to their own, could increase the amount of comparable data at the North American level.

1>; United States: EPCRA Section 313(d) and TRI, <www2.epa.gov/toxics-release-inventory-tri-program/tri-listed-chemicals>; and Mexico: RETC NOM-165-SEMARNAT-2013, <www.dof.gob.mx/nota_detalle_popup.php?codigo=5330750>.

¹⁰ EPA. 1997. EPA Activities on Endocrine Disruptors: Background Paper (Summary). Last edited: February 3, 1997. Office of Prevention, Pesticides and Toxic Substances (7407). Available at: <www.iatp.org/files/EPA_Activities_on_Endocrine.htm>.

¹¹ The toxicological assessment was based on the Ontario Ministry of the Environment's Risk Scoring System.

2.4 Inconsistent PRTR Terminology and Definitions

Differences among the three PRTRs in the terminology and definitions used can confound efforts to compare and integrate, as well as interpret, PRTR data. Examples of the lack of inconsistency include:

- Differences between NPRI and TRI in the definitions and categorization of land application/land farming and more broadly, releases versus disposals.
- Aggregated reporting of quantities from certain activities under RETC (e.g., data for underground injection combined with transfers to treatment), while the data for these activities are reported separately under TRI and NPRI.
- Varying definitions and level of detail among the three programs relative to reporting of pollution prevention activities.

The process of integrating and analyzing North American PRTR data for the *Taking Stock* effort has highlighted key differences and areas for harmonization (e.g., release and transfer terminology). In addition, analyses of anecdotal comments supplied by facilities relative to pollution prevention activities and other factors affecting year-to-year changes (e.g., changes in emissions factors used; slowdown in production) yields valuable information and lends important context to the reported data. Comparability in PRTR terminology, definitions, and scope of the information provided would greatly enhance users' ability to interpret the data.

2.5 Lack of Harmonization among Local, State or Provincial, and Federal Programs

Differences among the three countries in terms of jurisdiction over certain industrial activities affect the availability and comparability of PRTR data across the region. For example, the food manufacturing sector is subject to reporting under the US TRI and Canada's NPRI, but because the sector is under state-level jurisdiction in Mexico, it is not covered by the federal RETC program. Similarly, the petroleum sector in that country encompasses subsectors under federal jurisdiction, and others that are under state jurisdiction. While these industrial activities might be subject to reporting under Mexican state-level PRTRs (where they exist), the data are not integrated into the national program, let alone at the continental level. The resulting gaps in information could be minimized by increased harmonization of reporting requirements and data sharing among jurisdictions.

Other pollution tracking programs have been developed at the subnational level. These programs differ in scope from the federal PRTRs in various ways (e.g., in the pollutants subject to reporting; lower reporting thresholds; requirement to develop pollution management plans). As a result, data are obtained from facilities not required to report to the federal PRTRs. Examples at the state or provincial level include Massachusetts' Toxics Use Reduction Act¹² and Ontario's Toxics Reduction Act¹³; and at the municipal level, Toronto's ChemTRAC¹⁴ program.

While the establishment of these subnational programs is an important development in the tracking of pollutants and can provide data about activities and pollutants not covered by the

¹² See <www.mass.gov/eea/agencies/massdep/toxics/tur/>.

¹³ See <www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_09t19_e.htm#BK0>.

¹⁴ See <www1.toronto.ca/wps/portal/contentonly?vgnextoid=8e00ebfc2bb31410VgnVCM10000071d60f89RCRD>.

national PRTRs, they each have unique reporting requirements that are not harmonized with their federal counterparts. Developing a strategy to harmonize reporting requirements and/or mechanisms to share and integrate the data from different levels of jurisdiction (and possibly from other national programs, such as air emissions inventories) would leverage existing resources and achieve cost efficiencies. It would also reduce facilities' reporting burden and provide important additional information to complete the North American picture of industrial pollution.

2.6 Inconsistent Data Quality and Reliability

Most of the chemical mass quantities reported to PRTR programs are estimated, although some quantities are measured. Currently, there exists a wide range of methods used by facilities to quantify their releases and transfers. While the quality of PRTR data and related information is the responsibility of the reporting facilities, the three North American PRTR programs have invested substantial resources in quality control and assurance efforts, as well as guidance and tools to assist facilities in submitting data that are as accurate as possible. These include the development of industry-specific and chemical-specific technical guidance documents, as well as detailed reporting forms and instructions; sponsoring training workshops and consultation opportunities; conducting in-house data quality reviews; and so on.

The documents providing guidance for estimating PRTR reportable quantities vary from country to country in terms of scope and level of detail, pointing to a need for more involvement by industry with respect to PRTR data quality—for instance, through the development of sector pollutant profiles. Industrial facilities and sectors can conduct assessments of measurement methods and technologies and develop uncertainty thresholds. The Canadian aluminum smelting sector, which has a small number of facilities in the provinces of Québec and British Columbia, has developed a data quality assurance protocol and works closely with the NPRI to identify reporting issues. Recently, both NPRI and RETC reviewed the emissions factors used by industry in their respective countries; and the US EPA has conducted an assessment of releases of hydrogen cyanide from petroleum refineries, which previously were thought to be a much less significant source of this pollutant.

Another factor to be considered is the differing levels of experience of the facility personnel who estimate the releases and transfers and complete the reporting forms. The resulting issues include inconsistent, incomplete or incorrect reporting of release and transfer data, as well as locational and other facility data. Examples include the use of wrong PRTR identification numbers, incorrect geographic coordinates and off-site transfer locations, invalid NAICS codes, use of incorrect units of measure, and so on.

The CEC's North American PRTR Project and the *Taking Stock* report and online database have provided support for trilateral information exchanges aimed at enhancing data quality, through the identification of issues via the process of compiling and integrating PRTR data at the regional level. Accurate PRTR data can facilitate benchmarking for facilities while enabling use of the data in combination with other information to support a sustainable environment.

3. Recommendations for Enhancing North American PRTR Comparability

The identified issues in PRTR comparability can be attributed to the diversity of national factors and circumstances that have influenced the development of each program over time. As a result, some of these issues, in whole or in part, will be easier to address than others. The recommendations put forth in this document are the product of discussions about core PRTR

principles and what might constitute the “ideal” PRTR, with the goal being to obtain complete and accurate information about industrial pollution across the region to address regional environmental issues and promote sustainability efforts.

For the Action Plan to be effective, it must take into account what is achievable within the constraints of capacity (knowledge, experience, time, budget), the structural framework (legal, jurisdictional) of each country, and national priorities. In translating the recommendations for enhancing North American PRTR comparability into specific actions, factors considered included:

- The information/technical, human and financial resources required;
- Challenges that might be encountered relative to jurisdictional or legal issues, statutory differences and limitations, national priorities, and availability of resources;
- Current or planned activities; and
- Time frame (short-, medium- and long-term) for specific actions.

An efficient approach would be to leverage the required human, technical and financial resources across various areas of the Action Plan. This is the approach that will be adopted when planning the further development of actions proposed in this document and in particular, those applying to more than one recommendation.

3.1 Identify Gaps in the Application of Stated Criteria for the Reporting of Sectors and Activities

Recommended Actions

1. Review and compare national criteria for the inclusion of industrial sectors and activities to identify those that would meet the criteria, but which are currently not required to report.
2. Establish a mechanism to share information on PRTR sector coverage analyses or similar reviews undertaken at the national level, and information on changes to sector inclusion that are being considered in each country.
3. Conduct sector-based workshops or other activities involving counterparts from the three countries to:
 - review PRTR data and assess gaps relative to reporting requirements;
 - identify other data sources for the sector or activity, and additional information needs for the sector; and
 - evaluate the costs and benefits relative to requiring reporting.
4. Adopt a phased-in approach for consideration of reporting by, or integrating other information sources for, the identified sectors and activities.

3.2 Develop Consistency in the Application of NAICS Codes

Recommended Actions

1. Undertake a coordinated review, involving the three PRTR programs and national statistical agencies, of sector definitions and assignments of NAICS codes to identify inconsistencies and areas for harmonization and improved comparability.¹⁵

¹⁵ During the five-year NAICS review cycle, proposals for changes to industry classifications can be submitted if they demonstrate that there is sufficient justification—see:

2. Develop a consistent cross-walk for different NAICS codes used among the three countries.
3. Agree upon the timing for adoption of an updated version of NAICS codes for PRTR reporting to the three countries.
4. Work with the three PRTR programs to share best practices aimed at ensuring facility reporting of correct NAICS codes.

3.3 Share Information Relative to the Substances of Common Interest and Meeting the Criteria for Inclusion

Recommended Actions

1. Review and compare national criteria for the listing of substances on each PRTR, to improve understanding about the reasons for differences in substances required to be reported under the three PRTRs.
2. Review and compare national PRTR reporting requirements (listed substances and reporting thresholds) to identify substances that are not common to all three countries, with a focus on:
 - substances of common concern and/or prioritized through national reviews and assessments;
 - pollutants associated with specific industrial activities of interest (based on PRTR data available in at least one country, or on other data sources—e.g., national GHG reporting programs); and
 - substances that are subject to reporting under one or two PRTRs, but not all three.
3. Establish a mechanism to exchange toxicological assessment information among the three PRTR programs relative to the identified pollutants of common concern, as well as exchange of other information related to changes to substance listings or thresholds being considered in each country.
4. Adopt a phased-in approach for consideration of expanded reporting of identified pollutants, starting with those deemed to be of highest priority.
5. Explore opportunities to assess and expand comparability, in cases where the substance listings and thresholds remain different due to national needs and circumstances.

3.4 Develop Consistent PRTR Terminology and Definitions

Recommended Actions

1. Undertake a coordinated review of national PRTR terminology and definitions to identify areas requiring clarification of terms.
2. Establish an equivalent PRTR nomenclature through the publication of a consistent cross-walk.
3. Assess particular reporting elements (e.g., pollution prevention data) where an expanded scope of information would provide better information or enable a more accurate interpretation of the data.

<https://www.census.gov/eos/www/naics/reference_files_tools/NAICS_Update_Process_Fact_Sheet.pdf>;
and <www.statcan.gc.ca/subjects-sujets/standard-norme/naics-scian/notice-avis/naics-scian-05-eng.html>.

3.5 Work towards Local, State or Provincial and Federal Data Integration or Harmonization

Recommended Actions

1. For certain industry sectors that are regulated or have information reporting requirements under multiple jurisdictions, explore strategies to harmonize reporting requirements.
2. Explore potential avenues of cooperation with counterparts of local, state/provincial and federal programs to determine strategies or mechanisms for sharing data—possibly via integration of data under the CEC’s North American PRTR Project (*Taking Stock Online* database).

3.6 Share Information on Data Quality Assurance Methodologies and Tools

Recommended Actions

1. Conduct a coordinated review and comparison of national PRTR data quality control and quality assurance activities and guidance documents for quantifying releases and transfers, in order to identify gaps and opportunities for improvement.
2. Develop a prioritized list of data quality issues that impact on comparability and the ability to integrate North American PRTR data, and a collaborative strategy aimed at addressing these issues.
3. Conduct a series of sector-based workshops (with trilateral participation) involving a training component, or other activities, to increase compliance, quality and consistency of PRTR reporting, and develop a culture of quality assurance.
4. Establish links and partnerships with other agencies for the sharing and use of sector-based data to support continuous improvements in PRTR reporting.

4. Additional Recommendations

This section includes four additional recommendations made by North American PRTR Project stakeholders at the public meeting in Toronto. These recommendations relate to the broad theme of linking PRTR data to sustainable development, and as such are not directly associated with specific elements of PRTR reporting. However, these recommendations can be viewed as supporting, complementing, or resulting from enhanced comparability and integration among the three PRTR programs, and some of the actions proposed herein are linked to recommendations in the preceding section.

4.1 Establish a North American “Challenge” Program for Industry Champions of Environmental Performance

The CEC and the three PRTR programs could jointly establish a regional “challenge” program, comprising specific criteria and guidelines, for the public acknowledgement of industrial facilities in relation to environmental performance. As noted earlier, the development of such a program is explicitly called for in the 2002 CEC Council resolution adopting the 2002 *Action Plan*. The program could involve the development of an electronic system and set of standards, methodologies and indicators, as well as a training and education component, and could be related to the establishment of an incentive program with grants for facilities to implement pollution prevention or mitigation activities, particularly for pollutants that have been prioritized for the region.

This “challenge” program would promote a culture of environmental sustainability within industry and the development of best practices, including green chemistry alternatives to the use of toxic substances in manufacturing processes. This program would also promote continuous improvements in facility PRTR reporting, leading to more reliable data.

Recommended Action

1. Design a pilot acknowledgement or incentive program for facilities to implement pollution prevention and reduction activities, particularly for high-priority pollutants.

4.2 Ensure More Accessible and Usable Information through Spatial Representation of PRTR Data, Added Context and Combination with Other Data

This recommendation focuses on engaging PRTR data users and understanding their needs, in order to present PRTR data and relevant contextual information in a meaningful and useful way. The PRTR programs could collaborate on the development of applications that would respond to these needs, such as combining PRTR data with other information in a mapping application to increase users’ understanding of specific environmental issues in North America.

This recommendation is related to issues mentioned in the preceding section, such as the quality of PRTR data and the adequacy of coverage of industrial activities and pollutants. These issues can be approached from the perspective of the end users of the data—for example, complete, accurate and comparable PRTR data can support the development of regulations and public health analyses (e.g., epidemiological studies). Understanding the potential uses of the data can thus inform many of the actions proposed in this document. Presenting PRTR data and related information in various ways can also ensure the continuous improvement of data quality, as a result of feedback from engaged users.

Recommended Actions

1. Through the CEC, develop PRTR data user surveys to better understand users’ needs and capabilities and solicit feedback on existing platforms and data.
2. Identify other data and information that could be used in combination with PRTR data.
3. In collaboration with statistical and mapping agencies, develop pilot platforms and data layers that would support the use of PRTR data, as well as additional contextual information to enhance users’ understanding and interpretation of industrial pollution data.

4.3 Establish Partnerships among Scientific Organizations, Health and Environmental Journalists, Industry Associations, Academic Institutions, and Others

This recommendation focuses on enhancing outreach activities and promoting collaboration to address the need for a better understanding of PRTR data and their relationship to North Americans’ health and the environment; and to encourage environmental sustainability efforts within industry.

The establishment of partnerships and increased consultations with pertinent groups across North America would also involve media training to create more publicity about PRTRs and the CEC’s NAPRTR Project, to make the data relevant and understandable for media and their audiences through concrete illustrations, stories, and data analyses. A component of this strategy would be to develop incentives and challenges to encourage industry efforts towards environmental

sustainability, and recognition for the use of PRTR data by media or NGOs in raising awareness about the data and their relevance to human health and the environment.

Recommended Actions

1. Encourage feedback from users on data needs and areas of common concern.
2. Develop partnership programs and identify resources to strengthen consultation opportunities.
3. Develop a plan for training of journalist associations, industry and scientific organizations, academic institutions, and the public, relative to PRTR data, digital tools, and story ideas.
4. Develop methods to recognize the use of PRTR data by industry, media or NGOs.

4.4 Develop Sustainable Development Plans, Policies, and Programs

The development, at all relevant levels (e.g., government, industry), of sustainable development initiatives related to industrial pollution should continue to be promoted. Even with the current gaps in North American PRTR data, a great deal of information already exists to allow for the prioritization of certain industrial activities and pollutants, as shown by recent actions in the region (e.g., the development of regulations on mercury emissions from fossil fuel-based power plants). The development of sustainability initiatives could occur in parallel with efforts to enhance comparability—for instance, through the establishment of national action plans for industrial activities and pollutants that have been prioritized across the region.

Recommended Actions

1. Identify sustainable development priorities, at various levels, and examine how PRTR data could support the development of action plans or performance measurement of such plans.
2. Develop a mechanism, through the North American PRTR Project, for sharing of best practices and successes in implementing sustainable practices among facilities, sectors and countries.

The benefits accruing from these actions would include public recognition of improved social, health and safety outcomes within North American industry and the establishment of a culture of environmental sustainability and leadership. Developing plans and programs with clear and measurable objectives and results would also facilitate the establishment of best practices and result in reduced facility costs relative to material inputs and waste management.

Annex 1: Pollutant Release and Transfer Registers in North America—Status of Comparability¹⁶

CANADIAN NPRI	MEXICAN RETC	US TRI
SECTOR REPORTING REQUIREMENTS		
Sectors Subject to Reporting		
<p>All sectors (with some activity exclusions—see "Not Subject to Reporting")</p> <p>Facilities manufacturing, processing or otherwise using a listed chemical and/or engaged in specified activities</p> <p>Any facility releasing criteria air contaminants (CACs) to air in specified quantities</p>	<p>Facilities in 11 federal sectors:</p> <ul style="list-style-type: none"> - Petroleum industry - Chemical industry - Paints & ink manufacturing - Primary & fabricated metals - Automotive industry - Pulp and paper industry - Cement and lime industry - Asbestos industry - Glass manufacturing - Electric utilities - Hazardous waste management <p>Any facility undertaking specific activities subject to federal jurisdiction, such as handling hazardous wastes or discharging pollutants to national water bodies</p>	<ul style="list-style-type: none"> - Manufacturing facilities - Federal facilities - Electric utilities (coal/oil combustion) - Mining (metal and coal) - Hazardous waste management and solvent recovery - Chemical wholesalers - Petroleum bulk terminals
Not Subject to Reporting	Not Subject to Reporting	Not Subject to Reporting
<ul style="list-style-type: none"> - Oil & gas exploration & drilling <p>Unless they satisfy conditions for reporting of CAC emissions, the following are not subject:</p> <ul style="list-style-type: none"> - Research, education, repair/maintenance of vehicles, sales - Growing and management of renewable natural resources 	<ul style="list-style-type: none"> - Mining (except for beneficiation activities) - Facilities not under federal jurisdiction (e.g., food manufacturing; textiles) 	<ul style="list-style-type: none"> - Oil and gas exploration/extraction - Coal mining extraction - Iron ore mining - Metal mining overburden - Certain maintenance activities - Public sewage treatment plants (POTWs)

¹⁶ Readers should consult the PRTR program websites for additional details. For example, Mexico's RETC reporting requirements, including the list of pollutants, are being updated for the 2014 reporting year.

CANADIAN NPRI	MEXICAN RETC	US TRI
Employee Threshold	Employee Threshold	Employee Threshold
Facilities with at least 10 full-time employees (or 20,000 hour/year equivalent) must report. The actual number of employees is reported. For certain activities and pollutants, the threshold does not apply	There is no employee threshold. Facilities report the number of employees	Facilities with at least 10 full-time employees (or 20,000 hour/year equivalent) must report. The actual number of employees is not reported
Use of North American Industry Classification System (NAICS) Codes		
Facilities report NAICS codes (NAICS 2007 version)	Facilities report CMAP codes and RETC assigns NAICS codes (NAICS 2007 version)	Facilities report NAICS codes (NAICS 2007 version)
POLLUTANTS (OR POLLUTANT GROUPS) SUBJECT TO REPORTING		
346 substances (and groups)	104 substances (and groups)	592 pollutants (and 30 groups)
Diisocyanates 6 individual substances	Diisocyanates Not subject to reporting	Diisocyanates One amount reported for the group of 20 substances
Polycyclic Aromatic Hydrocarbons (PAH)* 29 individual PAHs; 2 listed at 10-tonne MPO* threshold; for others, reporting threshold of 50 kg for incidental manufacture	Polycyclic Aromatic Hydrocarbons/Compounds (PAH/PAC)* Not subject to reporting	Polycyclic Aromatic Compounds (PAC)* One amount reported for the group of 21 substances; 2 individual PACs
Criteria Air Contaminants (CACs) 7 individual CACs: Total PM, PM _{2.5} , PM ₁₀ ; sulfur dioxide; oxides of nitrogen; carbon monoxide; and volatile organic compounds – VOCs (group)	Criteria Air Contaminants (CACs) 5 CACs reported under the COA, but only oxides of nitrogen are subject to reporting under RETC	Criteria Air Contaminants (CACs) Not subject to reporting
Greenhouse Gases (GHGs) Not subject to reporting	Greenhouse Gases (GHGs) 4 individual GHGs: carbon dioxide; methane; nitrous oxide; sulfur hexafluoride	Greenhouse Gases (GHGs) Not subject to reporting
Dioxins and Furans 17 individual congeners reported separately (in grams) or as a sum (in grams/TEQ*)	Dioxins and Furans Reported as two separate groups (in grams)	Dioxins and Furans 17 individual congeners reported separately and as a sum (in grams)

*Action Plan to Enhance the Comparability of Pollutant Release and Transfer Registers (PRTs)
in North America*

CANADIAN NPRI	MEXICAN RETC	US TRI
POLLUTANTS (OR POLLUTANT GROUPS) SUBJECT TO REPORTING (continued)		
Persistent, Bioaccumulative and Toxic Substances (PBTs) Individual PBTs listed	Persistent, Bioaccumulative and Toxic Substances (PBTs) Individual PBTs listed	Persistent, Bioaccumulative and Toxic Substances (PBTs) Individual PBTs listed
Volatile Organic Compounds (VOCs) Individual VOCs (including some as PAHs); also, total VOCs (CAC category)	Volatile Organic Compounds (VOCs) Individual VOCs listed	Volatile Organic Compounds (VOCs) Individual VOCs listed
Pollutant Reporting Thresholds		
Standard <i>MPO</i> *: 10,000 kg	Standard <i>MPO</i> : 5,000 kg	Standard <i>Manufacture/Process</i> : 11,340 kg (or 25,000 lbs)
Releases of < 1,000 kg: the release type does not need to be specified (applies to standard threshold pollutants only)	Standard <i>Release</i> : 1,000 kg	Standard <i>Otherwise Use</i> : 4,535 kg
	A facility must report if it meets or exceeds either of these thresholds	
Examples of Threshold Differences, Common Pollutants		
MPO:	MPO / Release:	MPO:
1,3-Butadiene: 10,000 kg	1,3-Butadiene: 5,000 kg /100 kg	1,3-Butadiene : 11,340 kg
Mercury [^] : 5 kg	Mercury [^] : 5 kg /1 kg	Mercury [^] : 4.5 kg
Lead [^] : 50 kg	Lead [^] : 5 kg /1 kg	Lead [^] : 45 kg
Arsenic [^] : 50 kg	Arsenic [^] : 5 kg / 1 kg	Arsenic [^] : 11,340 kg
Cadmium [^] : 5 kg	Cadmium [^] : 5 kg / 1 kg	Cadmium [^] : 11,340 kg
Chromium [^] : 10,000 kg Cr-6: 50 kg	Chromium [^] : 5 kg /1 kg	Chromium [^] : 11,340 kg
Formaldehyde : 10,000 kg	Formaldehyde : 5,000 kg/100 kg	Formaldehyde : 11,340 kg
[^] and/or its compounds	[^] and/or its compounds	[^] and/or its compounds

CANADIAN NPRI	MEXICAN RETC	US TRI
Handling of Pollutants On Site		
Releases to Air <ul style="list-style-type: none"> - Stack, point source emissions - Fugitive emissions - Storage or handling - Spills - Road dust, other emissions 	Releases to Air Facility emissions	Releases to Air <ul style="list-style-type: none"> - Point source emissions - Fugitive emissions
Releases to Water <ul style="list-style-type: none"> - Direct discharges to water - Spills and leaks - Receiving water body name 	Releases to Water Direct discharges to national water bodies	Releases to Surface Water <ul style="list-style-type: none"> - Direct discharges to water - Spills and leaks - Receiving water body name
Releases to Land Spills, leaks, or other releases	Releases to Land/Disposal (aggregate amount) <ul style="list-style-type: none"> - Releases/spills/infiltration of the soil from the facility, incidental releases - Underground injection - Land irrigation - Landfill 	Releases to Land Spills, leaks, incidental releases
Disposal <ul style="list-style-type: none"> - Landfill - Land treatment/application farming - Underground injection - Tailings, waste rock 		Disposal and other Releases <ul style="list-style-type: none"> - RCRA* or other landfills - RCRA surface or other impoundments - Land treatment - Underground injection (Class I-V wells) - Other land disposal
Handling of Pollutants Off Site		
Disposal or Treatment prior to Disposal <ul style="list-style-type: none"> - Landfill - Land treatment or farming - Underground injection - Tailings, waste rock - Storage - MSTP* prior to final disposal - Physical and chemical treatment - prior to final disposal - Incineration prior to final disposal - Biological treatment prior to final disposal 	Final Disposition, including Treatment Transfer off-site for a substance contained in hazardous waste or water discharge to a facility to prevent a release to the environment. Includes co-processing. <ul style="list-style-type: none"> - Sewage/sewage treatment plants - Physical treatment - Chemical treatment - Thermal treatment & incineration - Biological treatment 	Disposal or Other Releases; Treatment <ul style="list-style-type: none"> - RCRA landfills, other landfills - RCRA surface impoundments, other impoundments - Land treatment - Underground injection (Class I-V wells) - Other land disposal - Storage - Wastewater treatment (metals only) – not to POTW* - Metals & non-metals to POTWs - Solidification/stabilization (metals only) - Treatment: solidification/stabilization - Incineration/thermal treatment - Other/unknown/waste broker

CANADIAN NPRI	MEXICAN RETC	US TRI
Handling of Pollutants Off Site (continued)		
Recycling <ul style="list-style-type: none"> - Solvents/organics/used oil recovery - Metals recovery - Acid recovery - Inorganics recovery (not metals) - Base & catalyst recovery - Pollution abatement residue recovery - Energy recovery 	Reuse and Recycling Transfer off site of a substance contained in hazardous waste or water discharge for: <ul style="list-style-type: none"> - reuse in another process; or - recycling (transformation) for another use 	Recycling and Energy Recovery <ul style="list-style-type: none"> - Solvents/organics recovery - Metals recovery - Acid regeneration - Energy Recovery
Pollution Prevention/Source Reduction Activities		
Pollution Prevention codes reported	Pollution Prevention codes reported	Pollution Prevention codes reported
Facility must indicate if it has a pollution prevention plan		Amounts calculated for on- and off-site Total Waste Managed (energy recovery, recycling, treatment, etc.)
Comments reported (e.g., pollution prevention activities; reasons for year-to-year changes)	Facility comments reported	Comments reported (e.g., pollution prevention activities; reasons for revisions)
BASIC FACILITY DATA		
Source Facility Identification		
<ul style="list-style-type: none"> - Facility name - NPRI ID number - Address - Contact information - D-U-N-S* number - Geographical coordinates - NAICS code and description - Number of employees - Ecozone, watershed region, census area; and permit or authorization numbers -e.g., provincial emissions management areas; National Emissions Reduction Masterplan; Greater Vancouver Regional District; and permits (oil & gas extraction facilities) 	<ul style="list-style-type: none"> - Facility name - RETC ID number - Address - D-U-N-S number - Geographical coordinates - Sector description - Number of employees and administrative personnel - Federal permit and license numbers 	<ul style="list-style-type: none"> - Facility name - TRI ID number - Address - Contact information - D-U-N-S number - Geographical coordinates - NAICS code(s) and description (facilities can report up to 5 NAICS codes) - Permits or authorizations: Federal NPDES (National Pollutant Discharge Elimination System) for surface water discharges, RCRA (hazardous waste permit), and Underground Injection (UIC) ID numbers

CANADIAN NPRI	MEXICAN RETC	US TRI
Transfer Location / Facility Identification		
<ul style="list-style-type: none"> - Name - Address 	<ul style="list-style-type: none"> - Name - City and state 	<ul style="list-style-type: none"> - Name - Address - RCRA (hazardous waste permit) number - Transfer sequence number
Parent Company Information		
<ul style="list-style-type: none"> - Name - Address - D-U-N-S number - Percent ownership 	<ul style="list-style-type: none"> - Name - City, state - D-U-N-S number 	<ul style="list-style-type: none"> - Name - Address - D-U-N-S number
Data Confidentiality		
The whole report is kept confidential		Substance name is confidential ("trade secret")
Public Access / Data Communication		
<p>Facility-level data, summary reports and Google Earth file available online</p> <p>Most data elements available in downloadable Excel format; some available in Access dbase format only</p>	<p>Facility-level data and summary reports available online and downloadable in Excel format</p> <p>As per the LGEEPA*, Art. 25, basic data elements (facility name, location, releases and transfers) are made publicly available; others remain in the COA and are available upon request</p>	<p>Facility-level data and summary reports available online and downloadable as Excel files</p>

*** Notes:**

PAC is the term used in the United States; PAH is the term used in Canada

MPO: Manufacture, Process, or Otherwise use

TEQ: Toxic equivalents

RCRA: Resource Conservation and Recovery Act

MSTP: Municipal Sewage Treatment Plant (in Canada)

POTW: Publicly Owned Treatment Works (in the United States)

D-U-N-S: Data Universal Numbering System

LGEEPA: *Ley General del Equilibrio Ecológico y la Protección al Ambiente* (General Law of Ecological Equilibrium and Environmental Protection)