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Commissioner of the Environment and Sustainable Development

to the House of Commons

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Chapter 3
National Pollutant Release Inventory

Office of the Auditor General of Canada

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Chapter

3

National Pollutant Release Inventory

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National Pollutant Release Inventory

Main Points

What we examined

The National Pollutant Release Inventory (NPRI) is a national, legislated, publicly accessible inventory that provides Canadians with information about the releases and transfers of key pollutants in their communities. Created in 1992, it is maintained by Environment Canada under the authority of the *Canadian Environmental Protection Act, 1999* (CEPA 1999). It is the only inventory of its kind in Canada.

Industrial, institutional, and commercial facilities that meet certain reporting thresholds and criteria are required to report annually to Environment Canada on their releases and transfers of pollutants. Facilities may choose from a variety of methods to estimate and report their releases. They are not required to use the same method every year. Environment Canada makes the information it receives from facilities available to the public through the NPRI, which can be accessed and searched through an online database. In 2007, over 8,500 facilities reported on their releases, disposals, and transfers for recycling of the 347 specific substances or substance groups listed under the NPRI.

We examined what Environment Canada does to manage the quality of the data contained and published in the NPRI. Data quality is a function of its fitness for use, that is, the data's relevancy to its intended purpose and its users. It is also based on the interrelationship between six dimensions of quality—accuracy, completeness, understandability, reliability, timeliness and accessibility. Audit work for this chapter was substantially completed on 12 June 2009.

Why it's important

Pollution tracking and environmental monitoring are critical activities, given the potential for serious and irreversible damage to human health and the environment from pollution. The NPRI is an information tool maintained by the federal government for public use to help identify and monitor sources of pollution in Canada. The Inventory covers a wide variety of pollutants that are released and transferred in Canada each year such as lead, mercury, and benzene—which are listed as toxic under CEPA 1999. It is used by individuals, organizations, and governments for many different purposes, such as

tracking progress in reducing pollutant releases, informing policy and regulatory decisions, researching environmental issues, evaluating and reporting on facility or sector performance, and providing the general public with information about pollutants in their communities.

What we found

- While Environment Canada has carried out some activities to ensure that the data in the NPRI is relevant to the information's intended purposes and users, it does not have a consistent approach to determining the information needs of users, which is important for identifying trends in user needs and progress in meeting them.
- Environment Canada is working to improve NPRI data quality and makes the data accessible to users in a variety of ways on a timely basis. However, it does not have adequate systems and practices overall to ensure that data in the NPRI is fit for its intended uses. The Department is unable to assess the accuracy and completeness of the data, nor does it adequately state the limitations of the data so that users understand its nature and are aware of what the data can be used for and where caution needs to be applied. This has a critical impact on the reliability of comparisons and trend analysis.

The Department has responded. The Department agrees with our recommendations. Its detailed responses follow each recommendation throughout the chapter.

Introduction

3.1 The National Pollutant Release Inventory (NPRI) is a Canada-wide, legislated, and publicly accessible inventory of specific substances that are released into the air, water, and land. The NPRI also includes disposals and off-site transfers for recycling by industrial, institutional, and commercial sources. In essence, the NPRI provides Canadians with information about pollutant releases and transfers in their communities. The first NPRI report was released in 1995, based on data from 1993. For the 2007 reporting year, over 8,500 facilities submitted information on their releases, disposals, and transfers for recycling of the 347 specific substances or substance groups listed in the NPRI.

3.2 In its 1990 Green Plan, the federal government made a commitment to build a national database that would list releases of pollutants. The aim of the database was to make information available on the nature and quantity of toxic substances being released in Canada. In 1991, Environment Canada created a multi-stakeholder advisory committee composed of representatives from industry, environmental groups, labour, and the federal and provincial governments to develop a framework for the NPRI.

3.3 In its 1992 report, the committee said that the purpose of the NPRI was to provide comprehensive national data on releases of specified substances. The committee stated that benefits of the NPRI would include

- identifying priorities for action,
- encouraging voluntary action to reduce releases,
- tracking the progress of reductions in releases,
- improving public awareness and understanding of substances released into the environment, and
- supporting targeted initiatives for regulating the release of substances.

3.4 The committee set out a number of guiding principles for the NPRI. Among other things, these principles included the following:

- that coverage be comprehensive,
- that reporting be as simple as possible so that it would not burden reporting facilities unreasonably,

- that the database and annual report present as complete a picture as possible,
- that the database facilitate public access to information about releases, and
- that the database evolve in response to public, government, and industry needs.

3.5 The NPRI is one of many pollutant release and transfer inventories around the world. The advisory committee modelled the NPRI, in part, on the United States' Toxics Release Inventory (TRI), which was developed in 1986 under the *Emergency Planning and Community Right-to-Know Act* in response to serious chemical releases in the mid-1980s.

3.6 The legal authority for the NPRI is the *Canadian Environmental Protection Act, 1999* (CEPA 1999). Subsection 46(1) contains information-gathering provisions, including provisions that allow the Minister of the Environment to request information on certain substances. Section 48 states that the Minister shall establish a national inventory of releases of pollutants, and section 50 says that this inventory shall be published in any manner that the Minister considers appropriate.

3.7 Environment Canada is responsible for the ongoing development and maintenance of the NPRI. The Pollution Data Division within the Science and Technology Branch manages the NPRI with an annual budget of approximately $6.3 million, which includes compiling comprehensive air emission inventories, trends, and projections as well as collecting and publishing information from facilities.

3.8 Owners or operators of facilities that manufacture, process, or use one or more NPRI-listed substances and that meet reporting thresholds and other requirements must report their pollutant releases, disposals, and transfers for recycling to the NPRI once a year. It is a contravention of CEPA 1999 if companies or persons required to report fail to do so, or if they knowingly submit false or misleading information; such companies or persons may face penalties listed under the Act.

Use of National Pollutant Release Inventory (NPRI) data

3.9 Environment Canada sees the data in the NPRI as important because it helps the Department's efforts to reduce releases and transfers of substances that can have a negative effect on the

environment and on the health of Canadians. Environment Canada uses NPRI data to

- track the progress of industrial facilities in reducing releases of pollutants;
- track progress in preventing pollution, evaluate releases and transfers for recycling of substances of concern, identify and take action on environmental priorities, and implement policy initiatives and risk-management measures;
- identify concerns of specific sectors;
- develop comprehensive inventories of air emissions for **criteria air contaminants** and other substances of concern; and
- support the **Chemicals Management Plan**.

Criteria air contaminants—A group of air pollutants that cause smog, acid rain, and other health hazards. These contaminants include sulphur dioxide, nitrogen oxides, volatile organic compounds, particulate matter, and carbon monoxide.

Launched in 2006, the **Chemicals Management Plan** is managed jointly by Health Canada and Environment Canada. The activities identified in the plan focus on the assessment and safe management of chemical substances, including action on key threats to health and the environment.

3.10 Environment Canada also uses NPRI data to report on Canada's performance within multilateral environmental agreements. For example, in 2002, the Government of Canada expanded the NPRI to include emissions of criteria air contaminants. This expansion was done to support the government's Clean Air Strategy and to meet the government's reporting obligations for the agreement on Long-Range Transboundary Air Pollution and the Ozone Annex of the Canada–United States Air Quality agreement.

3.11 The NPRI provides Canadians with information about pollutant releases and transfers in their communities. Because the NPRI is a national inventory, a variety of organizations across Canada use it. These groups include industry associations, individual companies, government officials (federal, provincial, and municipal), Aboriginal organizations, and non-governmental organizations. International organizations, such as the Commission for Environmental Cooperation (CEC) and the Organisation for Economic Co-operation and Development (OECD), also refer to the NPRI.

The quality of information

3.12 Quality information is generally recognized as information that meets the needs of clients and other stakeholders, both in the public domain and within the federal government. Many statistical agencies, including Statistics Canada, where the quality of information is defined in terms of its "fitness for use," embrace this concept. Fitness for use also applies to the NPRI, since it is a national inventory that has a range of users.

3.13 The quality of information is based on a number of attributes of quality information that overlap and are interrelated. Statistical agencies, such as Statistics Canada, note that these attributes must be managed adequately if information is to be fit for use. These attributes are summarized in the Government of Canada's quality information guideline, a draft document developed in support of its former Policy on Management of Government Information (2003). The guideline, which provided initial direction to federal entities for managing the quality of information, identified seven attributes of quality information and defined them by how useful they are for the information's intended purpose and audience. These attributes are relevancy, accuracy, completeness, understandability, reliability, timeliness and currency, and accessibility. These attributes are consistent with Statistics Canada's dimensions of quality. Statistics Canada also states that in managing the quality of information, objectives must be balanced against the evolving needs of clients and users as well as the constraints of financial and human resources.

Focus of the audit

3.14 The focus of our audit was to determine whether Environment Canada has adequate quality assurance systems and practices in place for the National Pollutant Release Inventory, so that the Department is assured that the data in the NPRI is fit for the intended uses of its clients.

3.15 More details on the audit objective, scope, approach, and criteria are in **About the Audit** at the end of this chapter.

Observations and Recommendations

User needs

Environment Canada is assessing user needs in an inconsistent way

3.16 Data quality is a function of its fitness for use—the data's relevancy to its intended purpose and audience. We expected Environment Canada to identify key users of the National Pollutant Release Inventory (NPRI), assess their information needs and associated requirements for data quality, and use this assessment to manage the quality of NPRI information.

3.17 Many groups both within and outside the federal government use the NPRI. Environment Canada has a number of methods for finding out the information needs of users. One method of communicating with users is the multi-stakeholder working group.

Other methods include periodic surveys (for example, focus groups and user-based studies), workshops and information sessions, and analysis of inquiries. While these could help the Department identify trends in user needs and its progress in meeting them, Environment Canada does not use these methods on a consistent or regular basis.

3.18 New terms of reference for the multi-stakeholder working group. The working group, which has been in place since the beginning of the NPRI, includes representatives from industry, non-governmental organizations, Aboriginal organizations, and various levels of government. Its primary focus is on process and the requirements for collecting data. Environment Canada usually sets the agenda by asking for input on specific topics. The working group may also suggest topics.

3.19 Each year, the working group or topic-specific sub-groups research the topic, propose solutions, and make recommendations to Environment Canada. Some members of the working group have expressed concerns about a number of issues:

- the lack of leadership and the absence of a formal decision-making process for the working group,
- the lack of feedback to the working group on how the Department has acted on the group's suggestions, and
- the overall time it takes to move forward on a topic.

Since 2008, the number of meetings of the working group has decreased. Some members have expressed concerns about the Department's level of commitment to the working group.

3.20 In June 2009, the Department proposed new terms of reference for the working group, along with priority setting and the establishment of a work plan. According to the draft terms-of-reference document, Environment Canada stated that there is a consensus among members that the input from stakeholders should be broadened. Under the updated mandate, the working group will discuss and provide recommendations on issues such as

- modifying and streamlining NPRI requirements,
- identifying and resolving data gaps,
- addressing data quality issues,
- improving access to pollutant data, and
- harmonizing NPRI requirements with other initiatives that collect data on pollutants.

3.21 **Surveys and focus groups are other methods used for determining user needs.** In 2007, the Department commissioned a survey asking for reporting facilities' and data users' views on the NPRI. Data users in this survey suggested tailoring the reporting criteria to listed substances, lowering the thresholds for reporting pollutants, increasing the number of substances reported, and increasing the number of facilities that report. Users generally were satisfied with the accessibility and timeliness of data, but were less satisfied with trend data, comparisons, and information describing the quality of NPRI data.

3.22 These types of surveys could reach more users than the multi-stakeholder working group, but Environment Canada officials said that they have no plans to carry out regular surveys. They added that future surveys may not be comprehensive but focused on specific issues.

3.23 NPRI program managers said that they discuss the internal use of NPRI data with Environment Canada sector managers who are responsible for areas such as chemicals management, comprehensive monitoring of air emissions, and the Clean Air Regulatory Agenda, but these discussions are informal in nature.

3.24 **Recommendation.** Environment Canada should set up regular processes to get information on the needs of both internal users of NPRI data (Environment Canada sector managers) and external users, particularly those who are not part of the multi-stakeholder working group.

The Department's response. Agreed. Work has already started on improved engagement with external bodies through our refined terms of reference, clarified responsibilities and accountabilities, as well as the creation of a work plan for our external Stakeholder Working Group.

Internally, we are engaging in sector working groups to ensure that our work is integrated into program decision making and policy development that exists under the Chemicals Management Plan and Turning the Corner Initiative, to name two.

The new processes and operations will be documented and incorporated in a comprehensive strategy for data collection and management, including objectives, targets, and timelines and with a focus on the quality and accuracy of the data. This strategy and plan will be in place by spring 2010.

Managing the quality of NPRI data

3.25 In managing data quality, objectives must be balanced against the evolving needs of users and the constraints of financial and human resources. We expected that Environment Canada would have quality assurance systems and practices for the National Pollutant Release Inventory (NPRI), including systems and practices that apply to the attributes of accuracy, completeness, understandability, reliability, timeliness and currency, and accessibility.

Environment Canada is unable to assess the overall accuracy of NPRI data

3.26 Users expect data reported in the NPRI to be accurate. Two factors affect data accuracy—the information is self-reported and estimation methods vary.

3.27 **NPRI data is self-reported.** As required by the *Canadian Environmental Protection Act, 1999* (CEPA 1999), owners and operators of facilities that meet the criteria for NPRI reporting must report to Environment Canada information on their pollutant release and transfer. This self-reporting approach places the responsibility on facilities. They must be aware that they may be required to report, assess whether their facility meets the reporting thresholds, choose an estimation method, and calculate and report their pollutant release, disposal, and transfer estimates.

3.28 Facilities are not required to carry out additional monitoring or measurement beyond what information is available and what is already required under the provisions of other legislation or bylaws. As a result, there is little incentive for facilities to improve data quality.

3.29 **Estimation methods may vary by facility, within sectors, and over time.** Estimation methods can vary by type of substance being measured and by operational processes of the facility. Facilities may use any of the six allowable methods to estimate how much of a particular substance is released, transferred, disposed of, or recycled. These methods are summarized in Exhibit 3.1.

3.30 Facilities within the same sector may use different estimation methods. Facilities may also change their estimation method from year to year. The NPRI requires that facilities report the method they used to estimate releases. If the same estimation method is used and there are changes in underlying emission factors or parameters, these may not be captured. The NPRI does not formally require that changes in estimation methods must result in more accurate estimates.

Exhibit 3.1 **Allowable estimation methods for reporting to the National Pollutant Release Inventory (NPRI)**

Release and transfer estimation methods
Reporting facilities may use any of the following estimation methods to estimate pollutant releases and transfers. • **Continuous emission monitoring systems** records samples over an extended and uninterrupted period to determine the concentration of substances in the effluent or gas stream. Annual releases of the substance can then be estimated by multiplying the substance concentration by the annual flow rate of the discharged effluent or gases in the stack or duct. • **Predictive emission monitoring** develops a correlation between substance release or emission rates and process parameters (for example, fuel usage, steam production, furnace temperature). Releases or emissions can then be calculated or predicted using process parameters. • **Source testing** involves collecting a sample of the emission or effluent, then determining the concentration of one or more substances in the sample. The concentration of the substance of interest is then multiplied by the volumetric flow rate to determine the amount of the substance emitted over time. • **Mass balance** applies the law of conservation of mass to a facility, process, or piece of equipment. If there is no accumulation, then all the materials that go into the system must come out. Releases are determined from the difference in the input and output of a unit operation. • **Site-specific and published emission factors** are available for many emission-source categories and are generally based on the results of source-sampling tests performed at one or more facilities within a specific sector. Generally, emission factors relate the quantity of substances emitted from a source to some common activity associated with those emissions. These factors can be sector- or site-specific. • **Engineering estimates** calculate pollutant releases using engineering principles and judgment, coupled with the consideration of physiochemical properties of substances involved in facility processes, and the efficiency of the processes involving these substances to produce the products, by-products, and other substances. The reliability of these estimates depends on the complexity of the process and the extent to which the above factors are understood.

Adapted from National Pollutant Release Inventory: *Where do the numbers come from?* Environment Canada website

3.31 To improve consistency and accuracy of self-reported pollutant release and transfer data, Environment Canada has worked with some industry sectors, such as the wood products industry, to develop common measurement and reporting guidelines for facilities in their sector. The Department is working with other industry sectors, such as aluminum producers, to develop similar guidance, but does not have a formal strategy and time frame to create such guidelines for all sectors. In addition to these sector-specific initiatives, the Department is also performing a series of measurement studies to help refine and update, if necessary, emission factors that may be outdated and may not reflect current technology and industrial processes.

3.32 Self-reporting and estimation are acceptable methods of data collection. However, they typically require independent checking of data, verification, and compliance promotion. Environment Canada's efforts in this area are described in the following paragraphs.

3.33 Online guidance and reporting tools make data input easier. Since the NPRI began, Environment Canada has used technology to make data input easier for facilities. In 2005, the Department introduced its online One Window to National Environmental Reporting System (OWNERS). This system has built-in quality checks, such as pre-filled fields, mandatory field completion, and data consistency, that make data entry easier. Enhancements planned for the new version to be introduced in 2010 include "report cards" that compare results between facilities in the same sector, and a holding area that allows Environment Canada to check data before it is added to the NPRI. In addition to offering online access to instructions on how to use OWNERS, the Department provides users with an NPRI Toolbox containing general information on methodologies for estimating pollutant emissions and examples of calculations, as well as some sector-specific guidance. The level of online guidance varies by sector.

3.34 To promote complete and accurate reporting to the NPRI, Environment Canada has traditionally held information sessions for data providers across the country. In the 2007–08 fiscal year, close to 1,000 people attended these sessions. For the 2008 reporting year, Department officials eliminated these information sessions, partly because there were few changes to the reporting requirements. Department officials said that future information sessions would focus on specific issues of data quality, such as emissions estimation, that data providers face.

3.35 Quality checks are in place but are largely desk-based. After receiving pollutant release and transfer data, Environment Canada carries out quality checks. These checks identify questionable, missing, and inconsistent data as well as potential duplications. The Department identifies these issues and follows up with reporting facilities and with Environment Canada sector experts in situations where data exceeds expected ranges, year-over-year variations are significant, and facilities are reporting values identical to those of previous years. The Department recently centralized activities related to the quality of NPRI data. Although this move has resulted in a decrease in the number of people directly involved with this work, the Department expects to be able to carry out the work on a more consistent and focused basis.

3.36 Environment Canada also reviews and compares sector information to identify underreporting or erroneous reporting by facilities in the same sector. The Department identifies and monitors data reported by higher-risk facilities as well. These include smaller facilities, which typically are less familiar with NPRI reporting, and facilities that are reporting for the first time. Attention is also paid to substances that are more likely to be reported inaccurately, such as volatile organic compounds and particulate matter.

3.37 Environment Canada does not routinely conduct on-site visits to verify facilities' data input and, as a result, there is limited on-site checking of data quality. For example, each year the Department visits an average of about 30 of the thousands of reporting facilities. Furthermore, the Department does not require third-party verification or other forms of professional certification on pollutant release and transfer data. Efforts to ensure that facilities comply focus largely on having them submit reports on time.

3.38 **Environment Canada does not define or communicate the level of accuracy it is trying to achieve.** Users raise concerns about the level of accuracy of NPRI data. However, Environment Canada has not defined or communicated the level of accuracy it is trying to achieve with the NPRI, nor has it stated the current level of accuracy. As noted above, the Department is making efforts to improve the accuracy of pollutant release and transfer data. But without a strategic reference point or goal for these activities, it is difficult for the Department to assess how effective these efforts are.

3.39 **Recommendation.** Environment Canada should develop a comprehensive strategy and plan for improving the accuracy of NPRI data.

The Department's response. Agreed. A comprehensive strategy will be implemented for data collection and management, including objectives, targets, and timelines and with a focus on the quality and accuracy of the data. The strategy will also include a plan that is industry sector-specific. The strategy will focus on ensuring that the data provided is relevant, the parties responsible for the data development are identified, and information on the data collection process is easily available. The strategy will also feature an element of cost recovery for data collection for third parties. This strategy and plan will be in place by spring 2010.

Environment Canada cannot verify that all facilities required to report are doing so

3.40 The National Pollutant Release Inventory does not currently capture information on all pollutants, and facilities are required to report to it only if they meet certain thresholds. Users expect Environment Canada to have systems and practices in place to ensure that all facilities required to report are doing so, and that the facilities are reporting all required substances.

3.41 **The number of substances and facilities that the NPRI covers has increased significantly.** In 1993, the first year that data was collected and reported for the NPRI, some 1,500 facilities were required to report on 178 substances. Over the years, the number of reportable substances has increased, to the point that in 2007, over 8,500 facilities reported on 347 substances or substance groups.

3.42 **Thresholds govern reporting to the NPRI.** NPRI is a self-reported database that uses a series of reporting requirements, including thresholds. In general, all facilities that meet a minimum annual "employee threshold" (20,000 hours, or approximately 10 employees) must determine whether their facility meets the "substance thresholds" for each NPRI substance. Certain specified sectors, such as waste incinerators and wood preservers, whose activities are known to release significant quantities of substances, are required to report these releases to the NPRI regardless of the employee threshold. If a facility meets the criteria for a substance, it must report how much of it is released into the air, water, and land, disposed of, and sent for recycling. The general substance threshold is lower for priority substances, such as mercury and lead. The threshold for reporting criteria air pollutants is based on how much of a substance is released.

3.43 Some facilities are not required to report to the NPRI. For example, there are exemptions from reporting on most substances for facilities in sectors such as education, research, retail sales, fishing and agriculture, and dentistry. In addition, there are exemptions for certain types of facilities in sectors that otherwise must report (for example, car repair shops and fuel marketing stations).

3.44 **Environment Canada is working to improve its understanding of NPRI sector coverage.** Environment Canada is working with Statistics Canada to better understand sector coverage (percentage of facilities in a sector that are reporting to the NPRI). For example, Statistics Canada is carrying out a survey of facilities that fall below the NPRI reporting thresholds. Using employment and establishment data from Statistics Canada, the Department determined that facilities

reporting to the NPRI accounted for a significant portion of employment and total establishments in a number of sectors. These included the following: primary metals, transportation equipment, petroleum and coal products, pulp and paper, chemicals, and cement manufacturing. This type of analysis could allow the Department

- to review thresholds for sectors where only a small percentage of facilities are currently required to report to the NPRI, and
- to focus efforts on identifying facilities that could be subject to reporting requirements.

3.45 The City of Toronto offers an illustration of sector and threshold coverage in the NPRI. In December 2008, the City adopted its Environmental Reporting, Disclosure and Innovation Program. Under this program, businesses and City operations are to report publicly their use and release of 25 hazardous chemicals. The focus of the program is on Toronto's small and medium-sized businesses. These businesses are not covered by existing pollutant release and transfer monitoring programs, such as the NPRI and Ontario's proposed Toxics Reduction Strategy. Toronto Public Health estimates that the NPRI covers about 5 percent of the city's 5,000 to 7,000 facilities of all sizes.

3.46 Environment Canada cannot determine the reporting compliance rate of facilities for all sectors. Although Environment Canada is working to gain a better understanding of NPRI sector coverage, the Department is not able to determine for all sectors whether all facilities that should be reporting are indeed reporting to the NPRI. For example, Environment Canada notes that all Canadian cement kilns currently report, but only 240 of the approximately 1,200 total Canadian facilities in the sawmills and wood preservation sector reported to the NPRI for 2007. While the Department recognizes that most of the non-reporting facilities are small operations, several of these may have more than 10 employees and may therefore meet the NPRI's general reporting threshold. Environment Canada officials were not able to state whether these non-reporting facilities should be reporting, or whether they meet the various thresholds for substance-based reporting.

3.47 Recommendation. Environment Canada should develop methods to identify non-reporting facilities that may be subject to NPRI reporting requirements. The Department should make this sector coverage information available to NPRI users and use the information in its efforts to improve completeness of NPRI data.

The Department's response. Agreed. We began work on coverage of the NPRI by sector prior to the audit that included analysis using other sources of data, such as Statistics Canada, to get a better perspective on compliance. Work will continue and results will be published by fall 2010.

3.48 **It is difficult to ensure that facilities are reporting all the substances they are required to report.** Environment Canada cannot easily ensure that facilities are reporting all the substances they should be reporting. As part of its quality checks to identify potentially unreported releases by a facility, the Department told us it does some comparisons between facilities within a sector. However, the use of different industrial processes may result in variations in reports from facilities in the same sector.

3.49 **Recommendation.** Environment Canada should determine the extent to which facilities report all substances they should report to the NPRI, and develop methods to ensure that facilities report fully.

The Department's response. Agreed. We will develop a plan to audit the completeness of the reports provided to the NPRI by December 2010. An audit of selected facilities representing a cross-section of a priority industrial sector will be conducted in fiscal year 2010–11, with two additional priority sectors per year being audited thereafter.

Users need more help to understand NPRI data

3.50 Users expect Environment Canada to provide information on the underlying concepts, variables, methodologies, limitations, accuracy, and completeness of the NPRI database so that they can use and interpret its data properly. Such information helps database users understand what substance was included, why it was included, how it was quantified, and how well it was quantified.

3.51 NPRI users have access to the guidance information on reporting thresholds, estimation methods, sector-specific information, and emission estimation factors that Environment Canada gives to reporting facilities. In its online pollution data library, the Department also gives users information on the number of facilities and substances in the NPRI. Although general guidelines about using NPRI data are not featured on the main web page of the NPRI pollution data library, the Department does give users some basic information to guide them, such as explaining the use of reporting thresholds and the risk of duplication when adding numbers.

3.52 **Environment Canada needs to better communicate the level of NPRI accuracy and completeness.** Earlier, we listed the factors in the NPRI that have an impact on data accuracy, the limitations of Environment Canada's checks for data quality, and the lack of a strategy for improving the accuracy of the data. The Department needs to better define and communicate to users how accurate NPRI data is—for example, noting which data are of high quality and which data need to be used with caution. The Department needs to explain its goals for the NPRI, its efforts to improve accuracy, and its assessment of the actual level of accuracy. For example, the Department could provide users with information such as caveats and quality statements, or give greater detail and offer statistics related to quality checks that are done.

3.53 The Department encourages reporting facilities to use the comments section in OWNERS, where facilities can add notes about their pollutant release and transfer data. Facilities can use the comments section to explain estimation factors and methods used, and highlight changes, among other things. Increased use of the comments section could provide Environment Canada with greater insight into the nature of the submitted data.

3.54 Users need to understand sector coverage so they can make an informed analysis of NPRI data. For example, if only a very small percentage of facilities in an industry sector are required to report, the reported pollutant release and transfer amounts may under-represent total releases. As noted earlier, even though Environment Canada is working to better understand sector coverage, it is not able to determine whether all eligible facilities are reporting to the NPRI. As a result, the Department is not in a position to give NPRI users sufficient information on sector coverage.

3.55 Environment Canada does not clearly explain how NPRI data can suitably be used, such as to provide information so that Canadians know about pollutant release and transfer in their communities, and where caution must be applied, such as when analyzing trend data. The Department could draw on the experience of Statistics Canada. Statistics Canada's Policy on Informing Users of Data Quality and Methodology requires that summary information on data quality, scope, and methodology accompany each statistical product.

3.56 **Recommendation.** Environment Canada should provide users with clear information on the underlying concepts, variables, methodologies, limitations, accuracy, and completeness of the NPRI database.

The Department's response. Agreed. The reporting requirements for the program and guidance to reporting facilities are already available on the NPRI website. Environment Canada will develop and publish more comprehensive information on the quality of NPRI data by July 2011. Information used to implement the above recommendations will form the basis for much of the additional information for data users.

Estimation methods and reporting thresholds make it difficult to compare data reliably and analyze trends

3.57 Since the NPRI captures pollutant release and transfer data from facilities every year, users expect that NPRI data can reliably be used to make comparisons and analyze trends. The ability to understand trends in pollutant releases and transfers is one of the underlying aims of the NPRI.

3.58 A number of factors that affect users' ability to compare data hinder trend analysis. For example, although changes in estimation methods or improvements in estimation methodologies may result in improvements in data for the current year, there may be a trade-off with comparability over time. In addition, the number of facilities reporting to the NPRI can vary from year to year depending on whether they meet the general or substance-specific reporting thresholds, or if there are changes in the thresholds. Environment Canada tries to identify and reconcile changes in the number of reporting facilities, but this information is not made available to users. Knowledgeable users can generate trend data. However, because the number of reporting facilities varies, this analysis may be of limited scope and may not provide a complete picture of trends in pollutant release and transfer.

3.59 Given its knowledge of NPRI data and the data's limitations, Environment Canada can offer value-added summary information and trend analysis on pollutant release and transfers. A note describing the limitations of the data, such as levels of accuracy and completeness, could help users interpret this information properly.

Environment Canada makes NPRI data accessible to users in a variety of ways and provides it on a timely basis

3.60 **Reviewed information is issued within six months.** In carrying out quality checks on the information that facilities submit, Environment Canada aims to issue raw data within one month and reviewed information within six months of receiving reports from facilities. The Department has generally met its NPRI publication

goals for the last four years. In a survey of data users' views on the NPRI, carried out for Environment Canada in October 2007, users rated timeliness as one of the top factors in terms of satisfaction, with 50 percent of respondents saying they were "very satisfied." Canada's NPRI data is published ahead of the release of information from the other North American pollutant release and transfer registries.

3.61 NPRI data is easily accessible to users. Environment Canada makes NPRI data available in a variety of formats, including the option to download the complete, detailed database. Once the data is reviewed and published, the Department also offers users online access to summarized information. Highlights and summary information describe what is new in the NPRI, list some quick facts on substances and facilities, and include summary tables by substance.

3.62 Search tools help users explore the database. Users have access to unreviewed NPRI data in the online search tool within one month of Environment Canada's receiving it. NPRI data can also be downloaded as a relational database file. Using modern mapping technology, Environment Canada recently introduced a "map layers" version of the latest reporting year's NPRI data for use with Google Earth and other virtual globe software. This feature allows users to search for reporting facilities near a specific location.

3.63 Users find the online data search tool difficult to use. An online data search tool allows users to query the database for detailed information on a specific facility's pollutant release and transfer. Searches for facilities can be filtered by substance, by geographic location, or by sector. The query interface allows for filtering, but does not currently support comparisons over years or within sectors. To produce this type of information, users must copy the detailed data into their own analytical tools. The results of the 2007 survey of data users' views on the NPRI noted these difficulties in manipulating and analyzing data. In that survey, ease of manipulation of NPRI data received a score of 33 percent user satisfaction. This result mirrors the concerns raised by members of the working group and non-governmental organizations. These users found it difficult to search the database and acquire consolidated information.

Conclusion

3.64 Data quality is a function of its fitness for use: the data's relevancy to its intended purposes and audience. Reaching an acceptable level of quality is the result of addressing, managing, and balancing over time the various dimensions of quality. As a national inventory of pollutant releases and transfers in Canada, the National Pollutant Release Inventory (NPRI) is used by a wide variety of organizations, both domestically and internationally. It provides information that tells Canadians about releases and transfers of pollutants in their communities.

3.65 Environment Canada does not have adequate systems and practices to assess the overall accuracy of NPRI data, to verify that all facilities required to report are doing so and reporting on all substances they are required to report on, or to provide enough information to help users understand NPRI data. These three dimensions of quality play a key role in users' ability to compare data reliably and to analyze trends. The range of estimation methods and the reporting thresholds that facilities use also hinder users as they work with the data.

3.66 Environment Canada makes NPRI data accessible to users in a variety of ways and provides it on a timely basis. However, given the weaknesses outlined above, we conclude that Environment Canada does not have adequate systems and practices overall to ensure that NPRI data is fit for its intended purposes and audience.

3.67 We recognize that Environment Canada is aware of problems of data quality with the NPRI and is taking certain measures to improve data quality. However, these actions must be guided by a comprehensive strategy and plan for improving NPRI data accuracy, assessing user needs more consistently, understanding sector coverage better, and enhancing communication of underlying data concepts, methodology, scope, and limitations.

3.68 As Environment Canada works to improve and enhance the quality of NPRI data, the Department should help users clearly understand the NPRI, its data, and the data's limitations regarding its completeness and accuracy. Clear communication would help users know what the NPRI data can be used for and where caution needs to be applied, so that they can interpret and use the data properly.

3.69 In place since 1992, the National Pollutant Release Inventory is recognized domestically and internationally as one of the federal government's key tools to capture and report on releases of pollutants

into the environment. Environment Canada needs to build on improvements made to date, ensure that the NPRI contains the best possible information on pollutant releases and transfers, and make this information more easily understandable.

About the Audit

All of the audit work in this chapter was conducted in accordance with the standards for assurance engagements set by The Canadian Institute of Chartered Accountants. While the Office adopts these standards as the minimum requirement for our audits, we also draw upon the standards and practices of other disciplines.

Objective

The objective of the audit was to determine whether Environment Canada has adequate quality assurance systems and practices in place for the National Pollutant Release Inventory, so that the Department can be assured that the data contained in the Inventory is fit for the intended uses of its clients.

Scope and approach

We examined the work carried out by Environment Canada to manage the quality of the data contained in and reported through its National Pollutant Release Inventory within the context of the data's fitness for use.

Our audit approach consisted of interviews with Environment Canada staff, with partners and stakeholders, and with data users. We also reviewed relevant documentation related to Environment Canada's quality assurance and quality control procedures and practices for the Inventory.

Criteria

Listed below are the criteria that were used to conduct this audit and their sources.

Criteria	Sources
Users needs	Standards for data quality have been established by Canada's national statistical agency, Statistics Canada. These standards are generally consistent with the summary of the attributes of quality information in the Treasury Board of Canada Secretariat document, Framework for the Management of Information in the Government of Canada—Quality Information Guideline (Draft July 2004).
We expected that Environment Canada would have processes in place for assessing user information needs and data-quality requirements and that it would be using these processes to manage the quality of the National Pollutant Release Inventory (NPRI).	
Data quality	
We expected that Environment Canada would have quality assurance systems and practices in place, including those applicable to the accuracy, completeness, understandability, coherence and reliability, timeliness, and accessibility of the information held in the National Pollutant Release Inventory (NPRI).	

Management reviewed and accepted the suitability of the criteria used in the audit.

Period covered by the audit

The period audited for this chapter focused on the systems and practices in place for the National Pollutant Release Inventory 2007 and 2008 reporting years, while taking into consideration the evolution of the Inventory since its inception in 1992.

Audit work for this chapter was substantially completed on 12 June 2009.

Audit team

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Appendix List of recommendations

The following is a list of recommendations found in Chapter 3. The number in front of the recommendation indicates the paragraph number where it appears in the Chapter. The numbers in parentheses indicate the paragraph numbers where the topic is discussed.

Recommendation	Response
User needs	
3.24 Environment Canada should set up regular processes to get information on the needs of both internal users of NPRI data (Environment Canada sector managers) and external users, particularly those who are not part of the multi-stakeholder working group. **(3.16–3.23)**	Agreed. Work has already started on improved engagement with external bodies through our refined terms of reference, clarified responsibilities and accountabilities, as well as the creation of a work plan for our external Stakeholder Working Group. Internally, we are engaging in sector working groups to ensure that our work is integrated into program decision making and policy development that exists under the Chemicals Management Plan and Turning the Corner Initiative, to name two. The new processes and operations will be documented and incorporated in a comprehensive strategy for data collection and management, including objectives, targets, and timelines and with a focus on the quality and accuracy of the data. This strategy and plan will be in place by spring 2010.
Managing the quality of NPRI data	
3.39 Environment Canada should develop a comprehensive strategy and plan for improving the accuracy of NPRI data. **(3.26–3.38)**	Agreed. A comprehensive strategy will be implemented for data collection and management, including objectives, targets, and timelines and with a focus on the quality and accuracy of the data. The strategy will also include a plan that is industry sector-specific. The strategy will focus on ensuring that the data provided is relevant, the parties responsible for the data development are identified, and information on the data collection process is easily available. The strategy will also feature an element of cost recovery for data collection for third parties. This strategy and plan will be in place by spring 2010.

Recommendation	Response
3.47 Environment Canada should develop methods to identify non-reporting facilities that may be subject to NPRI reporting requirements. The Department should make this sector coverage information available to NPRI users and use the information in its efforts to improve completeness of NPRI data. **(3.40–3.46)**	Agreed. We began work on coverage of the NPRI by sector prior to the audit that included analysis using other sources of data, such as Statistics Canada, to get a better perspective on compliance. Work will continue and results will be published by fall 2010.
3.49 Environment Canada should determine the extent to which facilities report all substances they should report to the NPRI, and develop methods to ensure that facilities report fully. **(3.48)**	Agreed. We will develop a plan to audit the completeness of the reports provided to the NPRI by December 2010. An audit of selected facilities representing a cross-section of a priority industrial sector will be conducted in fiscal year 2010–11, with two additional priority sectors per year being audited thereafter.
3.56 Environment Canada should provide users with clear information on the underlying concepts, variables, methodologies, limitations, accuracy, and completeness of the NPRI database. **(3.50–3.55)**	Agreed. The reporting requirements for the program and guidance to reporting facilities are already available on the NPRI website. Environment Canada will develop and publish more comprehensive information on the quality of NPRI data by July 2011. Information used to implement the above recommendations will form the basis for much of the additional information for data users.

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