Environment and Climate Change Canada | Environnement et Changement climatique Canada

Canadian Environmental Protection Act, 1999

ANNUAL REPORT

FOR APRIL 2015 TO MARCH 2016

Canada

Canadian Environmental Protection Act, 1999

ANNUAL REPORT

FOR APRIL 2015 TO MARCH 2016

Revised March 2017: Please note that section 2.4.3 Risk Management Activities related to water quality was omitted from the original publication of this report.

Print version
Cat. No.: En81-3E
ISSN 1918-8765

PDF
Cat. No.: En81-3E-PDF
ISSN 1926-4135

Environment and Climate Change Canada
Public Inquiries Centre
7th Floor, Fontaine Building
200 Sacré-Cœur Boulevard
Gatineau QC K1A 0H3
Telephone: 819-997-2800
Toll Free: 1-800-668-6767 (in Canada only)
Email: ec.enviroinfo.ec@canada.ca

Front cover photo:

Storage tanks are regulated under the Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations © Environment and Climate Change Canada

Aussi disponible en français

TABLE OF CONTENTS

1. INTRODUCTION

This annual report provides an overview of the activities conducted and results achieved under the *Canadian Environmental Protection Act, 1999* (CEPA) from April 1, 2015, to March 31, 2016. This report responds to the statutory requirement in Section 342 of the Act to provide annual reports to Parliament on the administration and enforcement of the Act.

CEPA provides authority for the Government of Canada to take action on a wide range of environmental and health risks—from chemicals to pollution to wastes. For the most part, it functions as an enabling statute, providing a suite of instruments and measures for identifying, assessing and addressing the risks. The Minister of the Environment and the Minister of Health jointly administer the task of assessing and managing the risks associated with toxic substances.

The general steps followed to address each risk can typically be organized into a management cycle: information is collected to understand risks and inform decisions; risks are assessed to determine if action is required; risk management instruments are put in place to reduce or eliminate risks to the environment and/or human health; these instruments may require compliance promotion and enforcement; and information is once again collected to monitor progress and determine if additional action is required. At each stage in the cycle, stakeholders are engaged, the public has the opportunity to be involved, the government works closely with provincial, territorial and Aboriginal counterparts, and information is reported to the public.

Figure 1: The CEPA management cycle

This report provides information on all stages of the CEPA cycle. Section 2 – Addressing Key Risks covers information gathering, research and monitoring, risk assessment, and risk management for toxics, air pollution and greenhouse gases, water quality, and waste. Section 3 – Administration, Public Participation, and Reporting covers reporting, stakeholder engagement, public rights and inter-jurisdictional relationships. Section 4 – Compliance Promotion and Enforcement describes compliance promotion and enforcement activities.

The CEPA Environmental Registry is also a comprehensive source of information about activities taking place under the Act, including proposed and existing policies, guidelines, codes of practice, government notices and orders, agreements, permits, and regulations. You can find it online at www.ec.gc.ca/lcpe-cepa/default.asp?lang=En&n=D44ED61E-1.

2. ADDRESSING KEY RISKS

2.1 Toxic Substances Harmful to Human Health or the Environment

Parts 5 and 6 of CEPA include specific provisions for data collection, assessment and management for controlling toxic substances. Substances include both chemicals and living organisms (specific information on living organisms begins in section 2.2). For chemicals, the Minister of the Environment and the Minister of Health are required to sort through, or "categorize", the substances on the original Domestic Substances List (DSL), an inventory of approximately 23,000 substances manufactured in, imported into or used in Canada. The categorization process identified the need for a more detailed assessment of approximately 4,300 substances that:

- were suspected to be inherently toxic to humans or to the environment, and are persistent (take a very long time to break down) or bioaccumulative (collect in living organisms and end up in the food chain); or
- present the greatest potential for exposure to Canadians.

The Chemicals Management Plan (CMP) is a program developed to protect Canadians and their environment from exposure to toxic substances. At its core is a commitment to assess by 2020, these 4,300 substances of potential concern that were already in commerce in Canada during the development of a pre-market new substance notification system under CEPA. As of March 31, 2016, drafts of final decisions have been published for 2,740 of those 4,300 substances and are available online at www.chemicalsubstances.gc.ca. In February 2016, a notice of intent was published to seek early stakeholder engagement to help inform the plan to address the remaining substances under the CMP.

Under the CMP, the government also conducts pre-market assessments of health and environmental effects of approximately 500 substances that are new to Canada each year. The Chemical Substances website at www.chemicalsubstances.gc.ca provides more information on activities related to the CMP.

2.1.1 Monitoring

Monitoring and surveillance activities are essential to identify and track levels and trends related to chemicals in the environment and human exposure to those chemicals.

In 2015–2016, a broad range of chemicals monitoring activities were conducted to support the CMP, the Northern Contaminants Program, the Freshwater Quality Monitoring Program, the Great Lakes Water Quality Agreement, the Great Lakes Herring Gull Contaminants Monitoring Program and the St. Lawrence Action Plan. These monitoring activities also support Canada's contribution to multilateral cooperation under the Arctic Council's Arctic Monitoring and Assessment Programme and the United Nations Economic Commission for Europe Convention on Long-range Transboundary Air Pollution, and helped Canada fulfill its obligations under the United Nations Environment Programme Stockholm Convention on Persistent Organic Pollutants.

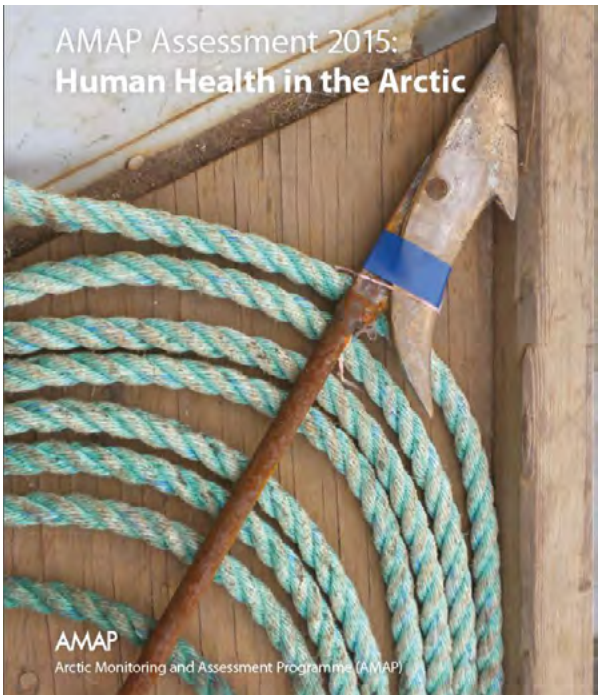
The CMP Environmental Monitoring and Surveillance Program involves the collection of data on the concentration of chemical substances in environmental compartments at locations across Canada. Environmental compartments include surface water, sediment, air, aquatic biota and wildlife. Wastewater system influent, effluent and biosolids are also monitored at select locations representing a range of input and treatment system types.

Through the program many priority substances have been monitored to provide environmental data for risk assessment and risk management decision making. Priority substances for 2015–2016 included polybrominated diphenyl ethers (PBDEs), organophosphate and non-PBDE halogenated flame retardants, phthalates, substituted diphenyl amines (SDPAs), perfluorinated compounds and other poly and perfluoroalkyl substances (including PFOS, PFOA and PFCAs), polychlorinated napthalenes (PCNs), siloxanes, triclosan, bisphenol A (BPA), nonylphenol and its nonylphenol ethoxylates (NP/NPEs), short chain chlorinated paraffins, and metals.

Through other initiatives, environmental monitoring continued to occur for current use pesticides, including neonicotinoids, and legacy chemicals such as, polyaromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), dioxins and furans, to inform on performance of risk management actions.

Health Canada (HC) completed 13 two-year monitoring and surveillance studies in 2015–2016 under the following broad themes: targeted population studies, biomonitoring supportive research, and targeted environmental monitoring studies. HC's monitoring activities continued to focus on human exposure to contaminants, including national baseline measurement of organic and inorganic chemicals in household dust under the Canadian House Dust Study; volatile organic compounds (VOCs) in drinking water to support national estimates in Canada; and national estimates of VOCs in indoor air of Canadian residences under the National Indoor Air Survey project.

HC's human biomonitoring efforts continued in 2015–2016 with the Maternal-Infant Research on Environmental Chemicals (MIREC) study and the Canadian Health Measures Survey (CHMS). The MIREC study continued to monitor mothers and infants by measuring their exposure to environmental chemicals. In 2015–2016, eight MIREC journal articles were published on the results of BPA, phthalates, triclosan, perfluoroalkyl substances, metals and organophosphate pesticides. Several non-PBDE emerging flame retardants were also measured in paired human milk and blood serum samples. HC continued work on the CHMS and published human biomonitoring data from cycle 3 in July 2015. Sample collection for cycle 4 was completed in December 2015. Sample collection for cycle 5 began in January 2016 and will continue until December 2017.



In 2015–2016, eight human biomonitoring and health projects were completed under the Northern Contaminants Program (NCP). HC partners with Indigenous and Northern Affairs Canada (INAC) on the human health component of the NCP, which addresses concerns about human exposure to elevated levels of contaminants in wildlife species important to the traditional diets of northern Indigenous peoples. In 2015, INAC and HC initiated a Canadian Arctic Contaminants Assessment Report (CACAR) on Human Health, which will be published in 2016. Biomonitoring data and human health research generated through the NCP was used to support HC's international involvement in the Arctic Monitoring Assessment Programme (AMAP), a working group under the Arctic Council. The AMAP Human Health Assessment Group, co-led by HC, published a human health assessment report addressing contaminant exposure and health effects in the circumpolar Arctic (AMAP 2015 Assessment Report: Human Health in the Arctic) in December 2015.

More information about monitoring activities is available online at www.ec.gc.ca/lcpe-cepa/default.asp?lang=En&n=F79B71E4-1.

2.1.2 Research

During 2015–2016, research on chemicals was carried out by both departments under a number of programs, including the CMP, the Northern Contaminants Program, the Strategic Technology Applications of Genomics in the Environment Program and the Great Lakes Action Plan.

ECCC and HC conduct a wide range of research to help inform assessments of the risks associated with toxic substances to human health or the environment. This research is designed primarily, among other uses, to fill data gaps in risk assessments; evaluate the impact of toxic substances and other substances of concern on the environment and human health; determine the extent of ecological and human health exposure to contaminants; and investigate the effects of chemicals on endocrine systems. In addition, HC undertakes research to support the development of regulations, guidelines and air quality objectives with the goal of reducing population exposures to pollutants and improving human health.

Research projects were initiated under the CMP in 2015–2016 on a number of subjects, including the development of genetic toxicity testing strategies for prioritized data-poor CMP chemicals; a toxicokinetics study of four rare earth metals to develop methods to interpret biomonitoring measures; a study to develop biomonitoring equivalents for organics and inorganics; a study to analyze exposure to selected flame retardants and chlorinated paraffins using the Canadian House Dust Study samples; and an *in vitro* pharmacokinetics study for high throughput data interpretation, the characterization of exposure and toxicity of CMP priority chemicals, such as flame retardants, benzotriazoles and benzothiazoles, bisphenol A replacement alternatives, antioxidants, hindered phenols, phthalates, inorganics, nanomaterials, pharmaceuticals and personal care products. These studies were initiated to help the risk assessment program meet the 2020 CMP commitments. Assessments of the toxic potencies of benzotriazoles and benzothiazoles to fish cell lines were also completed and published. An investigation of the tumour- inducing potency benzothiazoles in fish was initiated using 2-mercaptobenzothiazole as a model compound.

In addition, HC is continuing research on the development of testing methodologies to detect and characterize nanomaterials in products as well as to investigate the toxicity of nanomaterials; examining a series of case studies on the application of new integrated testing strategies that are more efficient and less expensive in human health risk assessment in order to evaluate the relevance and reliability of resulting genomics and high-throughput screening data compared with outputs from traditional toxicity testing methods. These new testing strategies are being developed for use in the evaluation of data-poor chemicals. In particular, a technical guide for applications of gene expression profiling in human health risk assessment of environmental chemicals was developed. The paper was recognized by the Society of Toxicology as one of top 10 best published papers in 2015 for advancing the science of risk assessment.

Under the CMP, ECCC scientists published 49 research papers and HC scientists published approximately 70 research papers related to these projects in 2015–2016 http://www.sciencedirect.com/science/article/pii/S027323001500080X.

2.1.3 Information Gathering

Section 71 Mandatory Surveys

Mandatory surveys (or data gathering notices) issued under section 71 of CEPA gather information needed to support risk assessment and, if necessary, risk management activities.

In August 2015, 4 notices under section 71 of CEPA were published on:

- Microbeads – to gather information on microbeads imported, exported or used in certain applications products in Canada in 2014, as well as information related to the size and revenues of companies involved. The data that is being gathered is needed to identify uses and sources of microbeads used in certain personal care applications that may be released to water and to ensure that future decision making is based on the best available information.
- Petroleum substances – to gather qualitative information about the import and blending/ formulation activities of a subset of the 210 remaining priority petroleum substances. The notice will support a triage activity, as well as help to better identify stakeholders for further engagement.
- Polymers – to obtain additional information from importers and manufacturers in order to inform future risk assessment for approximately 300 of the polymers reported to be in commerce.
- Nanomaterials – to determine the commercial status of the 206 nanomaterials suspected to be in Canada for the 2014 calendar year. The data collected will be used to inform prioritization activities and decision making on any further actions. EC and HC are developing a consultation document on a proposed prioritization approach for nanoscale forms of substances on the DSL, which will be presented at a stakeholder consultation meeting in June 2016.

2.1.4 Risk Assessment Activities

New Substances Risk Assessment

Substances that are not on the DSL are considered to be new to Canada. In 2015–2016, 581 new substance notifications were received pursuant to sections 81 and 106 of the Act and the *New Substances Notification Regulations (Chemicals and Polymers)* and the *New Substances Notification Regulations (Organisms)*. Some of these are related to products also regulated under the *Food and Drugs Act*, and to nanomaterials and substances that have the potential to be manufactured in the nanoscale.

In 2015–2016, eight new assessment report summaries for new chemical and polymer substances were published. These summaries cover substances for which the risk assessment has been completed, a restriction has been imposed and the restriction was published in the *Canada Gazette*. During the same period, a total of 103 waivers of information requirements were granted and published in the *Canada Gazette*. Seventy-seven (77) were for new chemical and polymer substances and 26 for new living organisms.

Substances in products regulated under the *Food and Drugs Act* are subject to the new substances provisions in CEPA. For new substances in products regulated under the *Food and Drugs Act*, 59 notifications for chemical/polymer substances and 7 notifications for living organisms were received in 2015–2016.

Existing Substances

Screening assessments are conducted to determine whether existing substances meet or are capable of meeting any of the criteria set out in section 64 of CEPA. The results of the screening assessments are published in draft form on the Chemical Substances website, and the Ministers of the Environment and of Health publish a notice in the *Canada Gazette*, Part I to indicate that the draft assessments are available for comment. Interested parties can submit written comments during a 60-day public comment period. After taking into consideration comments received, the Ministers publish final assessment reports.

During 2015–2016, the Minister of Health and the Minister of the Environment published a draft screening assessment report for 29 selenium-containing substances, 19 pesticides via the rapid screening approach and two final screening assessment reports for 75 aromatic azo- and benzidine-based substances. Of the 123 assessed substances from the Substance Groupings Initiative, 29 are being proposed to meet one of more of the criteria in section 64 of CEPA.

In addition, in August 2015, the Proposed Approach for Cumulative Risk Assessment of Phthalates was published for a 60-day public comment period, along with other related documents, including four State of the Science reports.

Table 1 lists the 2015–2016 existing substances assessment publications and proposed measures, if applicable (note that information on assessments of living organisms is included in section 2.2 of this report).

Under the CMP, ECCC and HC continued to complete the ecological and human health assessments assessment of substances that are part of the Groupings Initiative. They also continued data collection and assessment work as part of Petroleum Sector Stream Approach Initiative and the Rapid Screening Approach. As of March 2016, risk assessments were published on approximately 2,740 of the 4,300 substances prioritized under the CMP.

Along with the results of the screening assessment, the Ministers must publish in the *Canada Gazette* their final decision by choosing one of the following three “measures”: recommending to the Governor in Council the adding of the substance to Schedule 1 of CEPA (the List of Toxic Substances); adding it to the Priority Substances List for further assessment; or proposing no further action in respect of the substance.

Table 1: Summary of existing substance assessment decisions published from April 2015 to March 2016
(NFA = no further action)

Substances (and Number of Substances)	Meet s. 64 Criteria	Proposed Measure	Publication Date of Draft Notice*	Publication Date of Final Notice*
Selenium and its compounds (29 substances)	Yes	Add to Schedule 1	Jul 18, 2015	–
Nineteen substances on the Domestic Substances List associated with pesticidal uses (19 substances)	No	NFA	Jun 6, 2015	–
Certain Azo direct and reactive dyes (69 substances)	No	NFA	Mar 29, 2014	April 04, 2015
Certain Azo metal complexes and other azo substances (6 substances)	No	NFA	May 17, 2014	April 04, 2015
Microbeads	Yes	Add to schedule 1		August 1, 2015
4 State of the science reports on Phthalates and Proposed Approach for the Cumulative Risk Assessment of Phthalates (146 substances)	N/A	N/A	N/A	August 1, 2015

* The dates are those on which the draft and final notices were published in the *Canada Gazette*, Part I.

Ministers may recommend the addition of a substance to Schedule 1 of CEPA if a screening assessment shows that a substance meets one or more of the criteria set out in section 64 of CEPA. The Governor in Council may then approve an order specifying its addition to Schedule 1. The decision to recommend adding a substance to Schedule 1 obliges the Ministers to develop a "regulation or instrument respecting preventive or control actions" within specific time periods.

During 2015–2016, a proposed order to add microbeads to the List of Toxic Substances in Schedule 1 of CEPA was published as a result of the House of Commons unanimous vote to take immediate measures to add microbeads to Schedule 1. Also, a proposed order to add compounds to the list of excluded VOCs (available at: http://www.gazette.gc.ca/rp-pr/p1/2015/2015-05-02/html/reg2-eng.php) was published. There were no substances added to Schedule 1 during this time.

Microbeads in a facewash scrub
Photo: vwPix © Thinkstock

Review of Decisions of Other Jurisdictions

Section 75 of CEPA calls for co-operating and developing information exchange procedures with Canadian provinces, territories and Indigenous governments and with Member countries of the Organisation for Economic Co-operation and Development (OECD). The procedures focus on the exchange of

information on substances that are prohibited or substantially restricted by the legislation of those jurisdictions for environmental or health reasons. In addition, decisions made by these other jurisdictions to prohibit or substantially restrict substances are to be reviewed to determine whether the substances are "toxic" or capable of becoming "toxic" as defined under CEPA. This process is designed to complement the existing process for assessing the environmental and health impacts of substances. On April 1, 2016, the Government of Canada published a document entitled Implementing Section 75 of CEPA for a 60-day public comment period.

Emerging Issues

ECCC published a science summary on microbeads, which concludes that microbeads are harmful to the environment, which can be found at http://www.ec.gc.ca/ese-ees/default.asp?lang=En&n=ADDA4C5F-1.

2.1.5 Risk Management Activities

In general, when a draft risk assessment proposes a conclusion that the substance is "toxic" under CEPA, a risk management scope is developed under the CMP and published at the same time as the draft assessment report. Risk management scopes are used as discussion documents to engage stakeholders on potential risk management actions. A scope briefly describes the health or environmental concern, the activities potentially impacted and the type of risk management actions being considered. In 2015–2016, a risk management scope was published for the selenium and its compounds grouping.

Similar to the risk management scopes, when the final screening assessment report concludes that a substance is "toxic" under CEPA, a risk management approach document is developed and published at the same time as the final risk assessment report. The risk management approach document provides a more detailed description of the risk management being considered. It builds on the risk management considerations outlined in the risk management scope and considers new information received during the above-mentioned 60-day comment period. In 2015–2016, no risk management approach documents were published,

CEPA Instruments for Risk Management

The CMP uses a wide range of risk management instruments, including regulations, pollution prevention plans, environmental performance agreements, permits, substance lists, guidelines, codes of practice and significant new activity notification provisions. These instruments can address any aspect of the substance's life cycle, from the research and development stage through manufacture, use, storage, transport and ultimate disposal or recycling.

In addition to implementing existing risk management instruments during the reporting period, the CMP published six proposed risk management instruments to address ten toxic substances or groups of substances, as well as one final risk management instrument to address one substance, as described below.

There are approximately 160 petroleum substances that were identified under the CMP as priorities for action through the categorization process and that are being addressed in a sectoral approach. A large portion of high-priority petroleum substances are used or manufactured during petroleum refining or bitumen/heavy crude oil upgrading activities. During 2015–2016, ECCC and HC developed risk management approaches for natural gas condensates and liquefied petroleum gases in consultation with other government departments. They also furthered regulatory development addressing Stream 1 and 2 Petroleum and Refinery Gases, including, but not limited to, informal consultations and incorporated input.

Regulations

In 2015–2016, ECCC and HC published in *Canada Gazette*, Part I, the proposed *Regulations Repealing the Vinyl Chloride Release Regulations, 1992* for a 60-day public comment period. The proposal would repeal the *Vinyl Chloride Release Regulations, 1992* (hereafter referred to as the VCRR). The proposed Regulations also make consequential amendments to the *Regulations Designating Regulatory Provisions for Purposes of Enforcement* under CEPA, and to the *Contraventions Regulations* under the *Contraventions Act*, which impose limits on the release of vinyl chloride from both vinyl chloride production facilities and polyvinyl chloride (PVC) production facilities under the authority of CEPA. Since 2009, only one PVC manufacturing facility continues to operate in Canada. Air emissions of vinyl chloride from this

facility, located in Ontario, are regulated by the VCRR and by provincial regulations. The Ontario Ministry of the Environment regulations establish emission requirements that adequately protect human health.

On April 4, 2015, ECCC published the proposed *Regulations Amending the Prohibition of Certain Toxic Substances Regulations, 2012* in the *Canada Gazette*, Part I, which would add five substances to the Regulations: hexabromocyclododecane (HBCD); perfluorooctanoic acid, its salts, and its precursors (collectively referred to as PFOA); long-chain perfluorocarboxylic acids, their salts, and their precursors (collectively referred to as LC-PFCAs); polybrominated diphenyl ethers (PBDEs); and perfluorooctane sulfonate (PFOS). The Prohibition Regulations 2012 prohibit the manufacture, use, sale, offer for sale, or import of specified toxic substances and products that contain these substances, with some exemptions.

In June 2015, ECCC consulted on the administrative burden of the *Federal Halocarbon Regulations, 2003* and their proposed revisions through a voluntary survey. This information was gathered to support the development of revisions to the Regulations through the calculation of the administrative burden, as required by the *Red Tape Reduction Regulations*.

On August 1, 2015, the Department published a Notice of Intent indicating that the development of proposed regulations under CEPA had been initiated to prohibit the manufacture, import, sale and offer for sale of personal care products containing microbeads that are used to exfoliate or cleanse. On February 9, 2016, ECCC published a consultation document for public comment on the key elements of the proposed microbeads regulations. Feedback from over 2000 stakeholders received during the public comment period (which ended on March 10, 2016), suggests that there is substantial support for prohibiting microbeads.

The *Products Containing Mercury Regulations* came into force on November 8, 2015. These Regulations prohibit the manufacture and import of products containing mercury or any of its compounds, with some exemptions for essential products that have no technically or economically viable alternatives.

Export Control List

The Export Control List (ECL) in Schedule 3 of CEPA includes substances whose export from Canada is controlled because their use in Canada is prohibited or restricted, or because Canada has agreed, through an international agreement, such as the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (Rotterdam Convention), to control their international trade and requires notification or consent of the country of destination before export. CEPA requires exporters to submit prior notice of export with respect to substances on the ECL. In 2015–2016, 75 export notices were submitted to the Minister of the Environment and Climate Change Canada. Certain exports of substances on the ECL require an export permit. In 2015–2016, three permits were issued by the Minister.

Environmental Quality Guidelines

Environmental quality guidelines provide benchmarks for the quality of the ambient environment. They may be developed nationally through the Canadian Council of Ministers of the Environment (CCME) as Canadian Environmental Quality Guidelines (CEQGs) or federally as Federal Environmental Quality Guidelines (FEQGs). Table 2 lists the CEQGs that were being developed nationally through the CCME in 2015–2016. Canadian Water Quality Guidelines for Silver were published September 2015. Canadian Soil quality Guideline for Zinc was published October 2015.

Table 2: Canadian Environmental Quality Guidelines under development in 2015–2016

Environmental Compartment	Substance
Water	• Manganese • Silver • Zinc • Carbamazepine
Soil	• Glycols • Methanol • Nickel • Zinc • Amines

During the same period, ECCC developed draft FEQGs for various CMP substances (Table 3).

Table 3: Federal Environmental Quality Guidelines under development in 2015–2016

Environmental Compartment	In Progress
Water	• Bisphenol A • Chlorinated alkanes (chlorinated paraffins) • HBCD • PFOS • TBBPA • Triclosan • Vanadium • Chromium (hexavalent) • Iron • Lead • Copper • Cobalt • RDX (energetic) • Selenium • Quinoline
Sediment	• Bisphenol A • Chlorinated alkanes • HBCD • TBBPA
Fish Tissue	• Chlorinated alkanes • HBCD • PFOS • Selenium
Wildlife Diet	• Bisphenol A • Chlorinated alkanes • HBCD • PFOS • TBBPA
Bird Egg	• PFOS
Soil	• HBCD • PFOS • TBBPA • PFOA • Quinoline
Groundwater	• PFOS • Quinoline

Note: Hexabromocyclododecane (HBCD), perfluorooctane sulfonate (PFOS), tetrabromobisphenol-A (TBBPA), perfluorooctanoic acid (PFOA), RDX (Research Department explosive or 1,3,5-Trinitroperhydro-1,3,5-triazine).

Links to the Environmental Quality Guidelines can be found at http://www.ec.gc.ca/lcpe-cepa/default.asp?lang=En&n=E9DBBC31-1#s5.

Codes of Practice

The provisions within Part 3 of CEPA (Information Gathering, Objectives, Guidelines and Codes of Practice) allow the Minister of the Environment and the Minister of Health to publish codes of practice. Codes of practice are voluntary instruments that identify recommended procedures and practices or environmental controls relating to works, undertakings and activities, including any subsequent monitoring activities with an objective of limiting releases of the substance(s) in question. These set out official national standards that companies and organizations should follow. Further information on codes of practice is available online at https://www.ec.gc.ca/lcpe-cepa/default.asp?lang=.

On March 5, 2016, a proposed *Code of Practice for the Reduction of Volatile Organic Compound Emissions from the Use of Cutback and Emulsified Asphalt* Notice was published in the *Canada Gazette*, Part I, for a 60-day consultation. The intent of the Code is to provide guidance to the asphalt sector regarding actions that can contribute to the reduction of VOC emissions from the use of cutback asphalt and emulsified asphalt in order to reduce health and environmental concerns in Canada while maintaining road safety.

On May 9, 2015, ECCC and HC published a proposed *Code of Practice for a Recommended Concentration of 2-(2-methoxyethoxy) Ethanol (DEGME) in Surface Coating Materials Available to Consumers in Canada*. A threshold of 10,000 mg/kg (also expressed as 1.0 % (w/w)) was developed through an analysis of levels of DEGME used as surface coat-

ing materials in consumer products that would be protective of human health while minimizing harmful impacts from Canadian industry. The proposed Code is available at http://hc-sc.gc.ca/ewh-semt/consult/_2015/degme-emdeg/degme-emdeg-eng.php.

In 2015–2016, ECCC reviewed the implementation report submitted by the facility that is subject to the *Code of Practice for the Management of Tetrabutyltin in Canada* (Code of Practice) to determine if the facility continued to implement the Code of Practice. The review indicated that the facility had continued to implement the procedures and practices that were put in place in 2011. The Code of Practice is available online at www.ec.gc.ca/lcpe-cepa/default.asp?lang=En&n=B5292A55-1.

A *Code of Practice for the Elimination of Fluorocarbon Emissions from Refrigeration and Air Conditioning Systems* was published on April 18, 2015 for the purpose of replacing the 1996 Code of Practice of the same name. The Code covers the design, installation and servicing of stationary and mobile refrigeration and air conditioning systems. It also covers training requirements. The Code is a complement to federal, provincial and territorial measures with a goal to minimize and eliminate emissions of certain halocarbons by introducing best practices in the cooling industry. The proposed Code of Practice is available online at http://www.ec.gc.ca/lcpe-cepa/default.asp?lang=En&n=D918C063-1.

Air-conditioning units fall under a new Code of Practice designed to reduce and prevent emissions of halocarbons into the environment. Photo: Fernand Comeau © Environment and Climate Change Canada

Pollution Prevention Planning Notices

The provisions in Part 4 of CEPA (Pollution Prevention) allow the Minister of the Environment to issue a "notice" to require designated persons to prepare, implement and report on pollution prevention (P2) plans for toxic substances. P2 Planning Notices provide the flexibility for industry to determine the best methods within their processes and activities to meet the risk management objective within the Notice. Further information on P2 planning is available online at www.ec.gc.ca/planp2-p2plan/default.asp?lang=En&n=F7B45BF5-1.

During 2015–2016, there were six active P2 Planning Notices covering inorganic chloramines and chlorinated wastewater effluent; polyurethane and other foam sector (except polystyrene) —toluene diisocyanates; cyclotetrasiloxane, octamethyl (siloxane D4) in industrial effluents; BPA; dental amalgam waste; base metals smelters and refineries and zinc plants; and synthetic rubber manufacturing—isoprene.

- In Progress

  In 2015–2016, ECCC reviewed the reports submitted by the six industrial facilities using the siloxane D4 and that are currently subject to the P2 Planning Notice. This review showed that two of the facilities have already achieved their reduction target, and four are working towards achieving it. The P2 Notice was introduced in 2012 to reduce industrial releases of siloxane D4 to the aquatic environment, and specify facility reduction targets to be met by mid-2017.

  In October 2015, ECCC published a performance report summarizing the information that has been reported by facilities for the third year of the implementation of the P2 notice for Polyurethane and other foam sector (except polystyrene)—toluene diisocyanates. More information is available online at https://www.ec.gc.ca/planp2-p2plan/B88E6C97-3D62-46BB-88FC-8B95B3AA57E4/PerformanceReport3-P2TDI-Eng.pdf.

- Proposed Notices

  On April 18, 2015, ECCC published a Proposed Pollution Prevention Planning Notice in Respect of Halocarbons Used as a Refrigerant in the

Canada Gazette Part I, for a 60-day public comment period. The objective of this Pollution Prevention Planning Notice is to have halocarbon refrigerants managed by stewardship programs in an environmentally sound manner throughout their life-cycle.

On April 18, 2015, ECCC also published a Proposed Pollution Prevention Planning Notice for Hydrazine, which relates to the electricity sector.

- Final Reports

  In March 2015, ECCC received the final report submitted by the industrial facilities subject to the P2 Planning Notice on toluene diisocyanates. The review of the effectiveness of the P2 Planning Notice is currently underway.

  In June 2015, ECCC published a final performance report on the implementation of the *Notice Regarding Pollution Prevention Planning in Respect of Mercury Releases from Dental Amalgam Waste*. The report concluded that the national risk management objective of 95% national reduction in mercury releases into the environment from dental amalgam waste, from a base year of 2000, has been achieved. The report is available online at: http://ec.gc.ca/Publications/default.asp?lang=En&xml=2112BA70-28A9-4F01-9187-9D62BA327868.

More information on these notices is available online at www.ec.gc.ca/planp2-p2plan/default.asp?lang=En&n=BCAA1E50-1.

Environmental Performance Agreements

An Environmental Performance Agreement (EPA) is negotiated around the key principles and design criteria outlined in ECCC's Policy Framework for EPAs to achieve specified environmental results. The new *Environmental Performance Agreement 2015–2020 Respecting the Use of Tin Stabilizers in the Vinyl Industry*, established in March 2015, calls for the implementation of the Guideline for the Environmental Management of Tin Stabilizers in Canada (the Guideline). In 2015–2016, verifications at four facilities were conducted by a verification team, confirming that all these facilities had implemented the practices and procedures outlined in the Guideline. Furthermore, the other facilities using tin stabilizers reported having implemented the Guideline. The new Agreement is available online at www.ec.gc.ca/epe-epa/default.asp?lang=En&n=2F52E977.

Other active agreements include the EPA on production of hydrochlorofluorocarbons in Canada with E.I. DuPont Canada Company; the EPA respecting PFCAs and their precursors in perfluorinated products sold in Canada; the Refractory Ceramic Fibre EPA; and the EPA Respecting Bisphenol A in Paper Recycling Mill Effluents. Detailed information about these agreements is available online at www.ec.gc.ca/epe-epa/default.asp?lang=En&n=0D8C879E-1.

Other Risk Management Tools

Significant New Activity Requirements

A Significant New Activity (SNAc) requirement is applied when a substance has been assessed and there is a suspicion that new activities may pose a risk to human health and/or the environment. When it is applied, any major changes in the way it is used must be reported to the government. This ensures that departmental experts can evaluate whether the new use of a substance poses a new or increased risk to human health or the environment, and determine if risk management should be considered as a result of the new use.

Of the 581 notifications for new substances that were assessed under CEPA in 2014–2015, the Minister issued three SNAc notices (Table 4) on new chemicals and polymers. One SNAc that had previously been in place for an existing substance on the DSL was rescinded based on new information received (Table 5).

Table 4: Significant New Activity Notices for new substances from April 2015 to March 2016

Substance	Publication Date*
9-decenamide, *N*, *N*-dimethyl-, CAS Registry No. 1356964-77-6	May 20, 2015
Ethanedioic acid, manganese(2++) salt (1:1), CAS Registry No. 640-67-5	Aug. 12, 2015
Hexanedioic acid, mixed 4-methyl-2-propylhexyl and 5-methyl-2-propylhexyl and 2-propylheptyl esters, CAS Registry No. 1043888-25-0	Feb. 10, 2016

*The dates are those on which the final notices or orders were published in the *Canada Gazette*, Part I or Part II.

Table 5: Significant New Activity Notices and Orders rescinded between April 2015 and March 2016

Substance	Publication Date*
Quinoline, CAS Registry No. 91-22-5	Apr. 22, 2015

*The dates are those on which the final notices or orders were published in the *Canada Gazette*, Part I or Part II.

Table 6: Significant New Activity Orders for existing substances from April 2015 to March 2016

Substance	Publication Date*
Quinoline, CAS Registry No. 91-22-5	Apr. 22, 2015

*The date is that on which the final order was published in the *Canada Gazette*, Part II.

ECCC and Health Canada continued with their review of all SNAc notices and orders in force to ensure consistencies with current policies, including the Policy on the Use of Significant New Activity Provisions of CEPA (published in December 2013). SNAc notices and orders are being reviewed between 2014 and 2017 in groups of similar chemistry (e.g., nanomaterials) or common elements (e.g., notices and orders with consumer product references). SNAc review groups include:

- aromatic azo- and benzidine-based substances;
- nanomaterials;
- new and existing substances with consumer product wording;
- high hazard substances, not in commerce substances; and
- remaining new and existing substances.

As a result of the review, SNAc notices or orders may be rescinded, amended or left unchanged. More information on the SNAc review is available online at http://chemicalsubstanceschimiques.gc.ca/plan/approach-approche/snac-nac/group-eng.php.

Conditions and Prohibitions on New Substances

When the assessment of a new substance identifies a risk to human health or the environment, CEPA empowers the Minister of the Environment to intervene prior to or during the earliest stages of its introduction into Canada. In this case, there are three actions that may be taken. The Minister may:

- permit the manufacture or import of the substance subject to specified conditions; or
- prohibit the manufacture or import of the substance; or
- request additional information considered necessary for the purpose of assessment. The notifier shall not manufacture or import the substance until supplementary information or test results have been submitted and assessed.

Of 581 notifications for new substances received in 2015–2016, the Minister issued 7 Ministerial Conditions (Table 7), and no prohibitions.

Table 7: Notices of Ministerial Conditions for new substances from April 2015 to March 2016

Substance	Publication Date*
Actinosynnema pretiosum, strain #3-459	Apr. 25, 2015
1,2-Propanediol, dibenzoate, CAS Registry No. 19224-26-1	Oct. 17, 2015
1,2-cyclohexanedicarboxylic acid, 1-butyl 2-(phenylmethyl) ester, CAS Registry No. 1200806-67-2	Oct. 17, 2015
1,2-Benzenedicarboxylic acid, mixed C8-11-alkyl and 2-ethylhexyl and hexyl and isononyl diesters., CAS Registry No. 1415043-91-2	Oct. 17, 2015
Alcohols, C_{12-18}, ethoxylated, reaction products with 1,6-diisocyanatohexane and polyethylene-polypropylene glycol, CAS Registry No. 72968-35-5	Oct. 17, 2015
Poly(oxy-1,2-ethanediyl), α, α'-(iminodi-2,1-ethanediyl)bis[ω-hydroxy-, *N*-[3-(C10-16-alkyloxy)propyl] derivs., di-Et sulfate-quaternized, CAS Registry No. 70983-58-3	Feb. 6, 2016
Indeno[4,5-d]-1,3-dioxin, 4,4a,5,6,7,8,9,9b-octahydro-7,7,8,9,9-pentamethyl-, CAS Registry No. 365411-50-3	Mar. 5, 2016
1,2-cyclohexanedicarboxylic acid, 1-butyl 2-(phenylmethyl) ester, CAS Registry No. 1200806-67-2	Mar. 19, 2016

*The dates are those on which the final notices or orders were published in the *Canada Gazette*, Part I or Part II.

2.2 Living Organisms

Products of biotechnology that are living organisms are regulated for health and safety purposes by a variety of federal departments and agencies across the government. For example, the Canadian Food Inspection Agency is an important regulator of crop plants and micro-organisms used in animal feeds. CEPA sets the federal standard for assessment and risk management of new and existing living organisms. Other Canadian legislation meeting this standard is listed in Schedule 4 of CEPA. Living organisms imported or manufactured for a use regulated under a Schedule 4-listed Act are exempted from the New Substances provisions in CEPA. Living organisms manufactured or imported for a use not covered by Schedule 4-listed Acts are regulated under CEPA. These include naturally occurring and genetically modified organisms (such as bacteria, fungi, viruses and higher organisms such as fish or pigs) used for various environmental, industrial and commercial purposes.

CEPA establishes an assessment process for living organisms that are new animate products of biotechnology, which mirrors provisions in Part 5 of CEPA respecting new substances that are chemicals or polymers. In addition, paragraph 74(*b*) of the Act requires that all living organisms on the DSL (about 68 existing micro-organisms) undergo a screening assessment to determine whether the living organism is toxic or capable of becoming toxic.

2.2.1 Research

Government research on living organisms focuses on determining hazardous characteristics and the pathogenicity potential of various biotechnology microbes in order to support screening assessments. The research is coordinated jointly with regulators at HC and ECCC and focuses mainly on micro-organisms on the CEPA DSL.

As the timeline for completing screening assessments of CEPA DSL micro-organisms was accelerated to March 2016 (originally set for March 2020), research conducted in 2015–2016 continued to focus on supporting the efficient screening assessment of these micro-organisms. This was done through application of rapid genomic methods for confirming micro-organism identity; by conducting organism-specific testing for determining potential pathogenicity characteristics; and by conducting exposure assays for toxicity assessment. Data summary reports were completed on several organisms, including fungi/yeast (*Aspergillus*, *Saccharomyces*, Candida) and bacteria (*Bacillus*, *Delftia, Pseudomonas*, *Chaetomium* and *Sphingobium*). Most of these results have already been incorporated in screening assessment reports as supporting data.

In addition, research continued on a number of subjects, including assessing the viability and identification of a mixture of micro-organisms (consortium) in artificial and commercial products using genomic tools; animal models to identify opportunistic pathogens; and cell-based immunology/toxicology methods to reduce animal usage.

2.2.2 Risk Assessments

Risk Assessment of New Animate Products of Biotechnology

During 2015–2016, 40 notifications of new animate products of biotechnology were received and of those, 10 were accepted pursuant to the New Substances Notification Regulations (Organisms). ECCC supported notifiers by providing advice on completing their notification dossiers. In addition, two notifications of new activities were received. All notifications that are accepted are assessed within the statutory assessment period.

During 2015–2016, eight pre-notification consultations were held to help companies better understand the notification requirements for their specific organism before submitting a Notification.

Risk Assessment of Existing Animate Products of Biotechnology

ECCC and HC jointly perform the screening assessment of micro-organisms listed on the DSL. In 2015–2016, draft screening assessments for seven micro-organisms were published in the *Canada Gazette*, Part I for a 60-day public comment period. Final screening assessments for 18 micro-organisms were also published in the *Canada Gazette*, Part I (see Table 8). Work continues on the remaining screening assessments for several other DSL micro-organisms. Since most of the work on these micro-organisms has been completed, the Technical Expert Group, which provided advice on the process and validated the scientific basis of screening assessments and their conclusions, has been discontinued.

2.2.3 Risk Management Activities

Significant New Activity Requirements

In 2015–2016, no final orders or notices of intent to apply the SNAc provisions were published for existing living organisms.

In 2015–2016, no new living organisms were subjected to a SNAc Notice or a Ministerial prohibition. One new living organism was subjected to Ministerial Conditions.

2.3 Air Pollutants and Greenhouse Gases

Air pollutants and greenhouse gas (GHGs) originate from numerous domestic sources, such as industry and transportation, as well as transboundary transport of air pollution from other countries.

Table 8: Summary of existing living organisms assessment decisions published from April 2014 to March 2015 (NFA = no further action)

Substances (and Number of Substances)	Meet s. 64 Criteria	Proposed Measure	Draft Notice*	Final Notice*
Candida utilis (1 micro-organism)	No	NFA	May 23, 2015	–
Pseudomonas sp. (1 micro-organism)	No	NFA	May 23, 2015	–
Aspergillus oryzae (1 micro-organism)	No	NFA	Mar 19, 2016	–
Pseudomonas putida (4 micro-organism)	No	NFA	Mar 19, 2016	–
DSL *Bacillus licheniformis/ subtilis group of Priority A and B* (11 micro-organisms)	No	NFA	Jan. 28, 2015	Aug. 1, 2015
Escherichia hermannii of Priority A (1 micro-organism)	No	NFA	Jan. 28, 2015	Aug. 1, 2015
Paenibacillus polymyxa of Priority B (3 micro-organisms)	No	NFA	Jan. 24, 2015	Aug. 1, 2015
Pseudomonas fluorescens	No	NFA**	Dec. 7, 2013	Feb. 14, 2015
Micro-organisms in Lot 2 of Priority C (2 micro-organisms)	No	NFA	Dec. 7, 2013	Feb. 14, 2015

*The dates are those on which the draft and final notices were published in the *Canada Gazette*, Part I.

2.3.1 Monitoring

Monitoring and reporting activities are important for identifying and tracking levels and trends related to air pollutants that impact both the environment and human health.

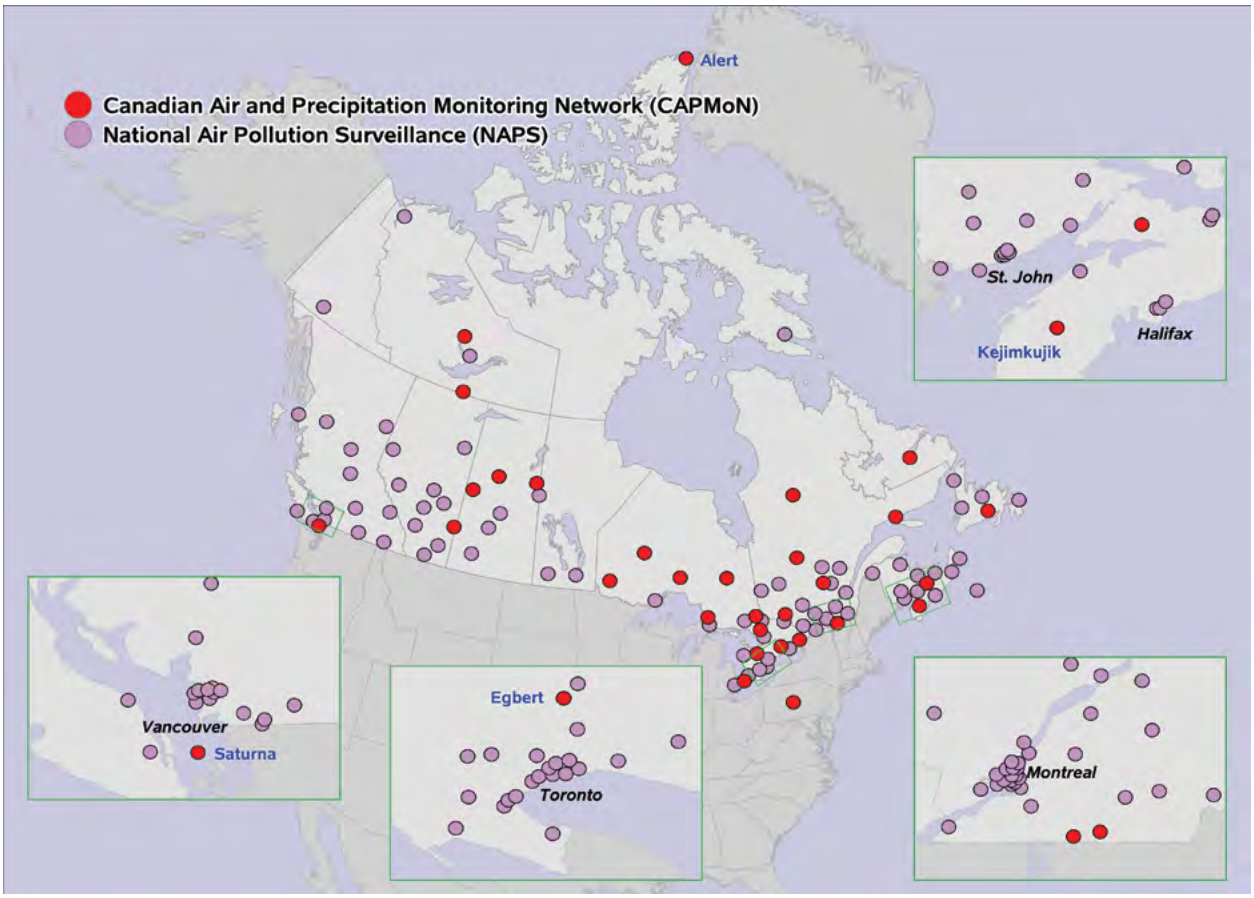
Ambient (outdoor) air quality monitoring informs air quality management in Canada, including the evaluation of progress relative to the Canadian Ambient Air Quality Standards (see below) for health research, for validation of numerical air quality prediction models, for evaluating the benefits of control measures and for assessments of the impact of air pollution on Canadians and the environment.

In Canada, ambient air quality monitoring is carried out across the country through two complementary networks known as the National Air Pollution Surveillance (NAPS) program and the Canadian Air and Precipitation Monitoring Network (CAPMoN) (Figure 2).

The NAPS program is managed by Environment and Climate Change Canada via a cooperative agreement with the provinces, territories and some municipalities in order to provide accurate and long-term air quality data of a uniform standard from primarily urban and rural sites across Canada. There are 286 NAPS sites in 203 communities located in every province and territory.

The Canadian Air and Precipitation Monitoring Network (CAPMoN) provides information on regional patterns and trends of atmospheric pollutants in both air and precipitation and identifies emerging issues. There are over 30 CAPMoN sites located in remote regionally representative areas across Canada that contribute to understanding of atmospheric issues, including how long range transport impacts the Canadian environment.

Figure 2: Map of NAPS and CAPMoN monitoring sites



The information compiled from these monitoring sites is available at http://www.ec.gc.ca/rnspa-naps/default.asp?lang=En&n=8BA86647-1 and http://www.ec.gc.ca/rs-mn/default.asp?lang=En&n=6C8C66C5-1.

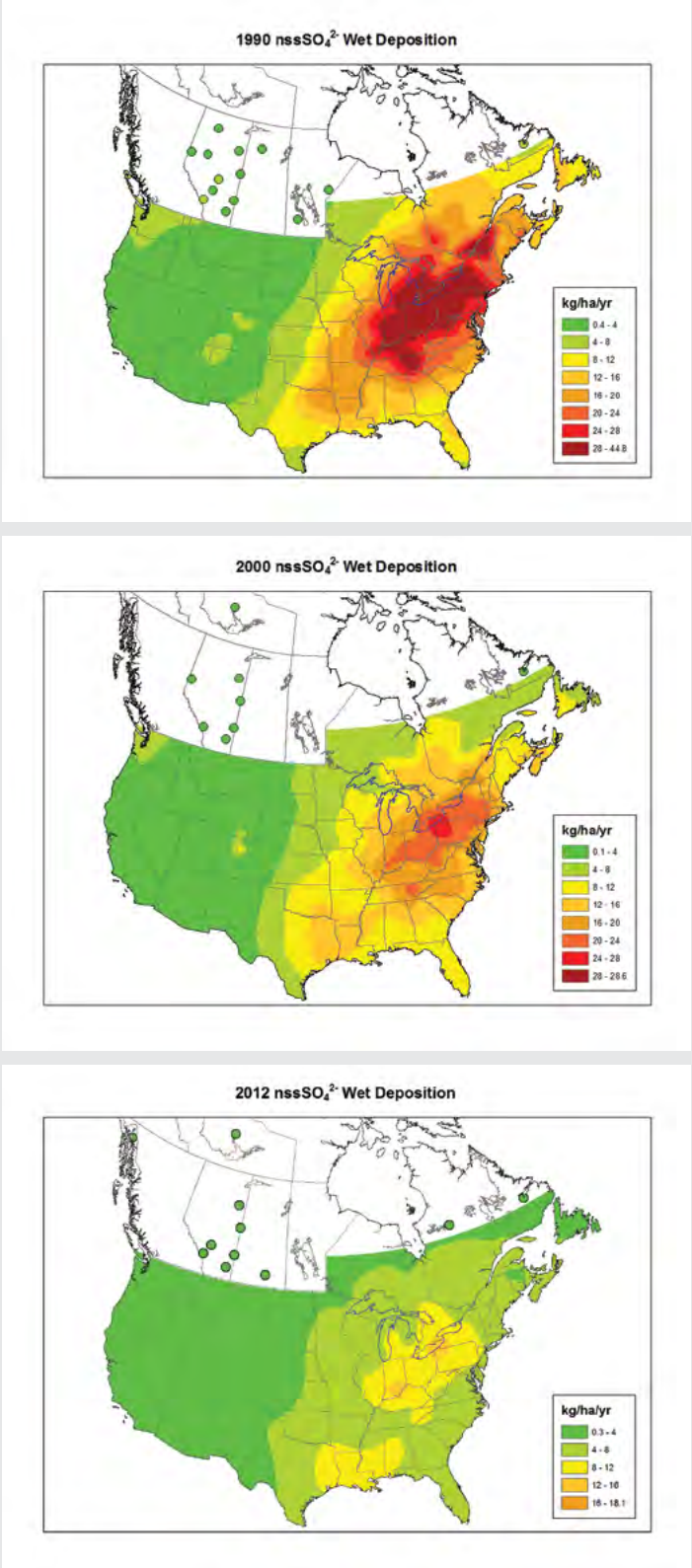
A success story: reduced emissions of NOx and SO_2 resulted in changes in acidic wet deposition

Over the past few decades, Canada and the U.S. have established commitments and taken various actions to reduce the emissions of sulphur dioxide (SO_2) and nitrogen oxides (NOx), the main precursor gases resulting in acid deposition. Both substances were added to the List of Toxic Substances (Schedule 1 of CEPA) in 2003.

In Canada, these actions have resulted in the reduction of SO_2 emissions to approximately 1.3 million tons in 2012, a decrease of 58% from total emissions in 1990. The resulting trend in acid deposition reflects this decrease in SO_2 emissions. As seen in the figure, the wet deposition of sulphate (i.e., deposition to the Earth's surface via rain and snow) has decreased from 1990 to 2000 and then 2012, in both the eastern United States and eastern Canada.

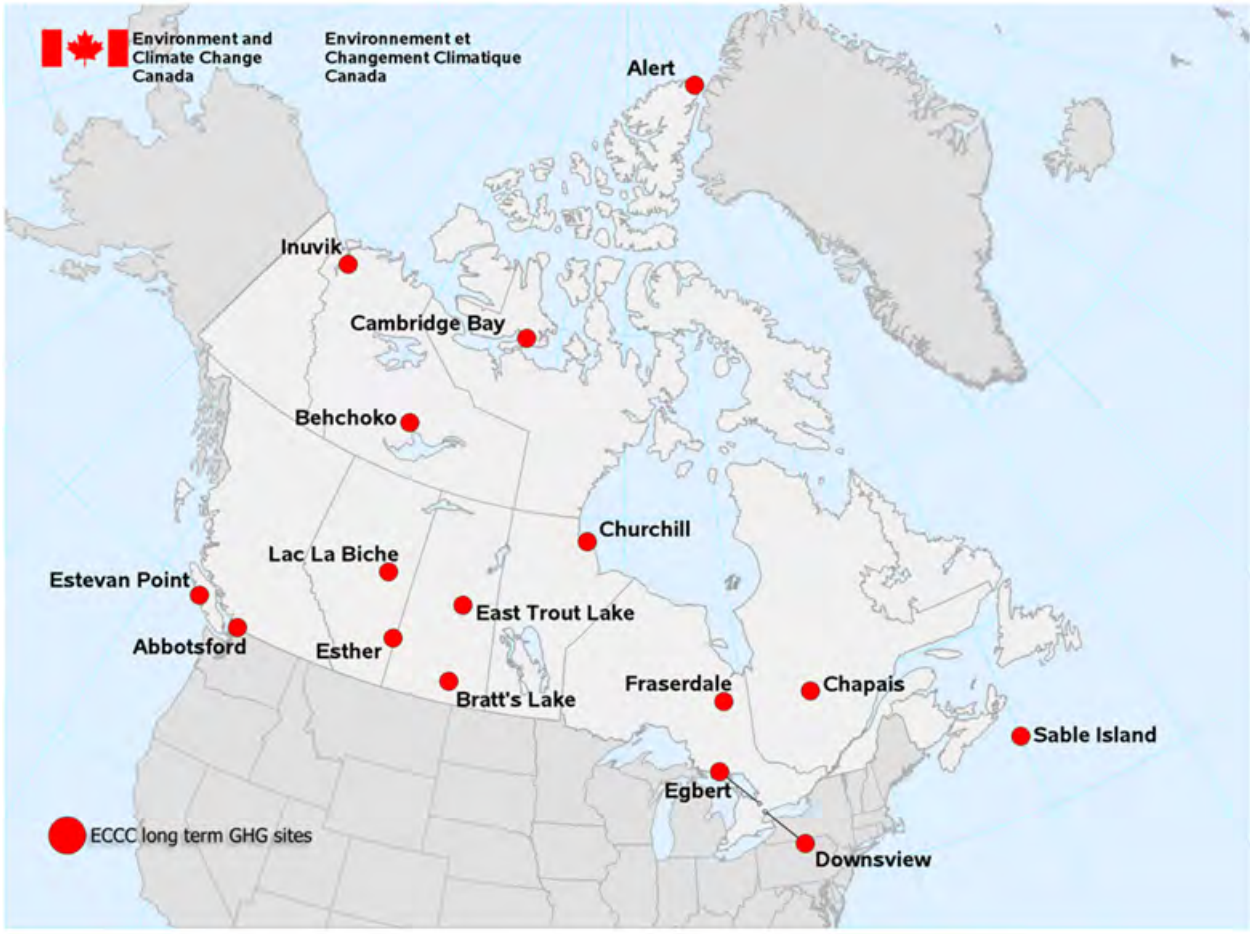
Parallel decreases in emissions of NOx have been achieved in both countries, resulting in similar patterns in wet nitrate deposition from 1990 to 2012 (not shown here).

In spite of the decreases in emissions and accompanying decreases in deposition of both SO_2 and NOx, there continues to be exceedances in the ecosystem critical loads (the amount of acid deposition a region can receive without being adversely affected). As well, there are gaps in our knowledge over ecosystem recovery following reductions in emissions, as not all recover at the same rate or in the same way. Some unanswered questions remain, which are the focus of current scientific research and monitoring efforts.



Shown here is wet deposition (kilograms per hectare per year) for non sea salt (nss) SO_4^{2-} in 1999, 2000 and 2012.

Figure 3: Canadian Greenhouse Gas Measurement Program monitoring sites



The Canadian Greenhouse Gas Monitoring Program includes observations of carbon dioxide and other GHGs from 15 long-term measurement sites across Canada (Figure 3). Among the sites is the Alert Global Atmosphere Watch Observatory. Alert serves as one of three global greenhouse gas inter-comparison sites to ensure consistent measurement of carbon dioxide (CO_2) and other greenhouse gas concentrations across the world. Measurements of atmospheric CO_2 began in March 1975 at Alert, NU (Figure 4). The seasonal decline in late May to early June is due to the transport of air from southern latitudes that is depleted in CO_2 from photosynthetic uptake. The annual average CO_2 value at Alert in 2015 was 402.1 parts per million (ppm); the first year in which the annual mean exceeded 400 ppm. The annual average CO_2 values were 399.7 and 397.9 ppm in 2013 and 2014 respectively.

ECCC also runs a long-term atmospheric monitoring program for methane. Measurements of atmospheric methane (CH_4) began in August 1985 at Alert, NU (Figure 5). Globally, approximately 40% of the CH_4 emitted to the atmosphere is from natural sources such as wetlands. The remaining emissions are due to anthropogenic (human caused) sources such as cattle ranching, agriculture, fossil fuels and landfills. The annual average CH_4 value at Alert in 2015 was 1917.8 parts per billion (ppb), the highest recorded value at Alert and more than 10 ppb higher than the 1905.9 ppb recorded value in 2014. The annual increase in CH_4 steadily declined since the late 1980s and hovered around zero from 1999 to 2006, reflecting a near balance between emissions and removal by atmospheric chemical processes. Since 2007, CH_4 has increased every year on average by 6 ppb per year.

ECCC makes its atmospheric monitoring data available to the public through national and international databases, e.g. the Government of Canada Open Data Portal; World Meteorological Organization (WMO); World Data Centres for GHGs; WMO World Data Centre for Precipitation Chemistry; and the WMO World Ozone and Ultraviolet Data Centre, which is operated by the Meteorological Service of Canada.

Figure 4: Atmospheric carbon dioxide measured at Alert, Nunavut

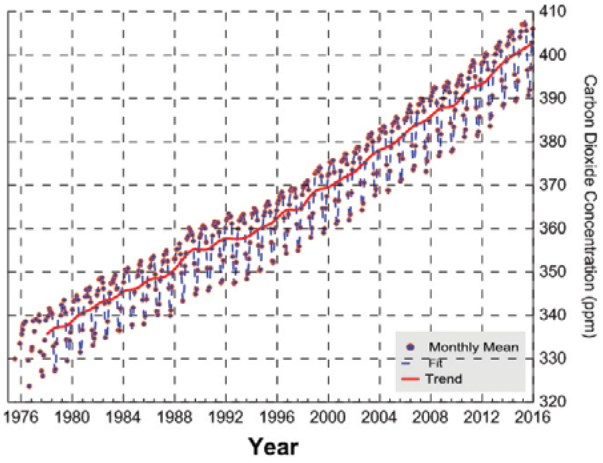
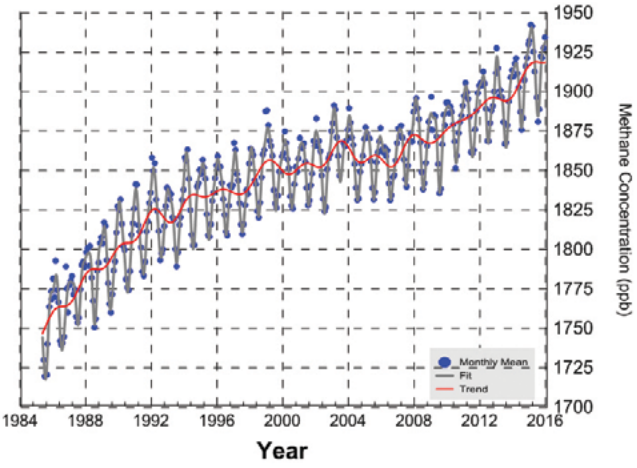


Figure 5: Atmospheric methane measured at Alert, Nunavut

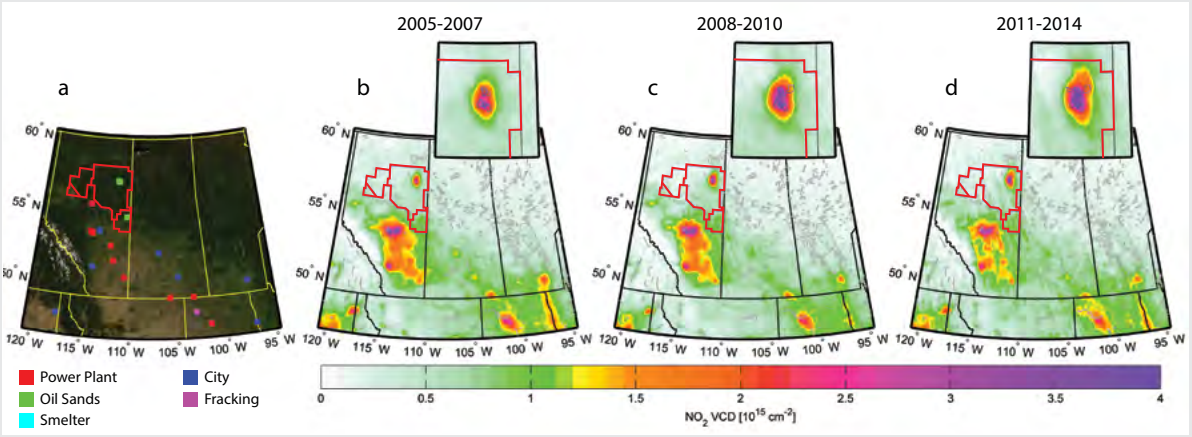


Air quality monitoring from space – an emerging tool

ECCC also monitors air quality and air pollutant emissions from space using satellite-based instrumentation. Satellites measure air pollution by comparing light intensity levels at many different wavelengths (or colour 'shades'). Emissions can be derived by combining the satellite data with wind information, and retrieving this data by way of new retrieval algorithms developed by ECCC researchers. This research undertaken by the Department has enabled the clarification of trends in ambient levels of nitrogen dioxide and sulphur dioxide (listed as toxic substances on CEPA Schedule 1) and helped identify and quantify emission sources for these pollutants across the country.

For example, a decade (2005-2014) of measurements was used to examine changes in nitrogen dioxide (NO_2) and sulphur dioxide (SO_2) concentrations over western Canada and the northern United States. This work has included trends in pollutants over the Canadian oil sands region, as part of the Canada-Alberta Joint Oil Sands Monitoring Program.

NO_2 was seen to increase by as much as 10% per year in the oil sands area, while SO_2 concentrations remained constant. By contrast, other locations in the region show a reduction in both pollutants, which is likely due to the implementation of several pollution control measures implemented in Canada and the US. These images demonstrate how ECCC air quality science and research supports and links to policy and regulatory actions.



Satellite observations of NO_2 over western Canada and the northern United States from 2005 to 2014 reveal an increase in emissions from the oil sands region, as well as the positive impact of emission control regulations on other locations.

More information about monitoring activities is available online at www.ec.gc.ca/lcpe-cepa/default.asp?lang=En&n=F79B71E4-1.

Research

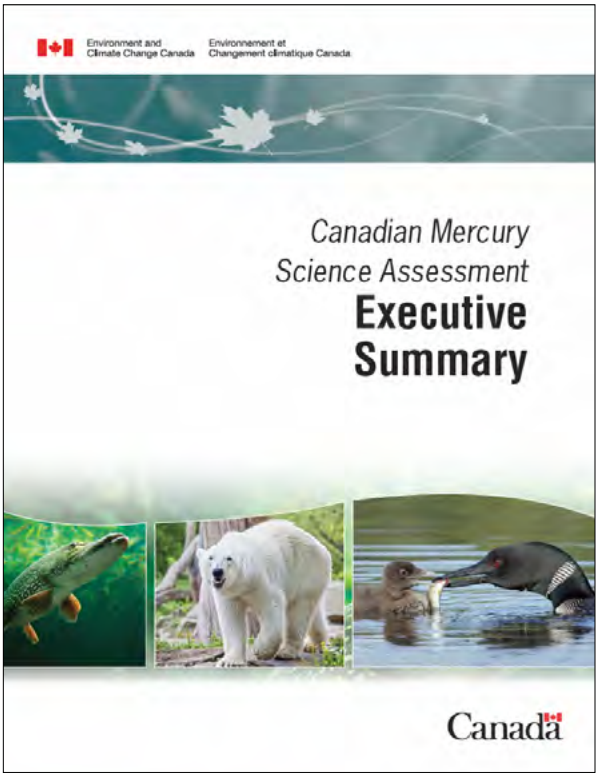
Air quality research efforts help quantify priority air pollutants and determine trends, improve and validate air quality predictions both in the near term and into the future within the national and global context, as well as enhance understanding of the impacts of air pollutant sources on Canadians and the environment.

ECCC scientists published more than 100 research papers related to air pollutants and GHGs in peer-reviewed scientific journals. Environmental research topics included satellite measurements of emissions; development and validation of high-resolution air quality forecasting models; the carbon cycle in the Earth system; and engine or traffic emissions (furthering understanding of sources and impacts).

Researchers sort invertebrates at Nancy Green Lake for the Clean Air Regulatory Agenda Mercury Science Program
Photo: Johan Wickland © Environment and Climate Change Canada

Ongoing research by ECCC continued on a wide range of air pollution and GHG topics, including development of a better method to model dry deposition of atmospheric particles; characterization and measurement of atmospheric aerosols; GHG sources and sinks; transport and deposition of ammonia and mercury; understanding and predicting air quality at high resolution in airsheds of particular interest from an environmental perspective (e.g., urban); conducting on-board measurements of exhaust emissions from vessels carrying cargo to northern communities; impacts of maritime shipping emissions in the Canadian Arctic; understanding the impact of specific emissions sources on air quality; renewable fuels operation in cold temperature; and non-criteria exhaust emissions from new engine technologies.

ECCC scientists also led the development and publication of the *Canadian Mercury Science Assessment*, the first comprehensive evaluation of mercury in the Canadian environment. The two summary documents have been published and are available on the ECCC web site. The Canadian Mercury Science Assessment is available at https://ec.gc.ca/mercure-mercury/default.asp?lang=En&n=A2D7E54F-1.



Research also continued on atmospheric mercury in the Arctic; long term trends and long-range transport of persistent organic pollutants (POPs) in Arctic air; long term trends of organochlorine pesticides and PCBs in the Canadian Great Lakes Basin; trends of flame retardants and organochlorine pesticides in air in the western sub-Arctic; atmospheric composition, transport and deposition of mercury and deposition of organophosphate flame retardants; determination of hindered phenolic antioxidants (HPAs) in exhaust emissions from light-duty vehicles; and poly- and perfluoroalkyl substances in indoor dust and food packaging materials.

Showcasing Air Quality Science at the 2015 Pan Am and Parapan Am Games

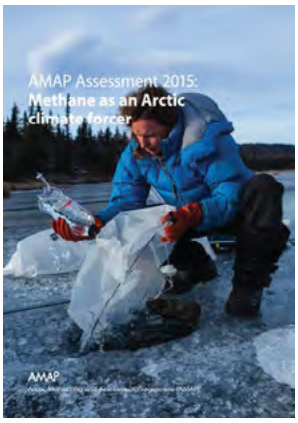
During the 2015 Pan Am and Parapan Am Games, held in Toronto, ECCC scientists collected data related to air quality and weather and used this data to evaluate and improve the "next generation" air quality forecasting model. The model is being designed to better simulate the conditions experienced in urban environments. In collaboration with other research groups, data was collected to help validate the upgraded research models, inform policy strategies related to ambient air quality standards and urban environments, and inform the development of new chronic exposure mapping strategies for Toronto.

Enhanced services made available to the public during the Pan Am and Parapan Am Games included hourly actual and forecast values of the Air Quality Health Index (AQHI), a risk communication tool designed to inform citizens about the current health risks associated with air pollution. Web-traffic and stakeholder feedback indicated that the public was very interested in enhanced forecasting. Consequently, hourly forecasts will be rolled out nationally.

The Toronto Island air quality station was added to the National Air Pollution Surveillance (NAPS) program network for the Pan Am and Parapan Am Games. Data from this station are being used to study ozone over-prediction over lakes. Photo: © SOCAAR, University of Toronto

An initial assessment was also completed by ECCC comparing ambient concentrations of 63 air toxics measured in Canada to provincial ambient air quality guidelines.

In addition, ECCC scientists led or contributed to the development and publication of the Arctic Monitoring and Assessment Programme (AMAP) Assessment 2015: Black carbon and ozone as Arctic climate forcers and the AMAP Assessment 2015: Methane as an Arctic climate forcer.



2.3.2 Risk Management Activities

The Air Quality Management System (AQMS), implemented by federal, provincial and territorial environment ministers in 2012, supports a comprehensive approach to reducing air pollution in Canada. Canadian Ambient Air Quality Standards are the driver for air quality management under AQMS. CEPA provides authorities with the tools to regulate reductions in releases of air pollutants and GHGs.

Transportation Sector

ECCC has implemented six vehicle and engine regulations and nine fuel regulations under CEPA.

Consistent with the Canada-U.S. Regulatory Cooperation Council's Joint Forward Plan (2015), ECCC and the U.S. Environmental Protection Agency continued to collaborate closely under the framework of the Canada U.S. Air Quality Committee towards the development of aligned vehicle and engine emission standards and their coordinated implementation.

Air Pollutant Emissions Regulations

On July 29, 2015, ECCC published amendments to the *On-Road Vehicle and Engine Emission Regulations* and the *Sulphur in Gasoline Regulations* in the *Canada Gazette*, Part II. The regulations further limit emissions of smog-forming air pollutants from new passenger cars, light trucks, SUVs and certain heavy-duty vehicles (such as delivery vans) and reduce the allowable sulphur content of gasoline, in alignment with the U.S. Environmental Protection Agency's "Tier 3" vehicle and fuel standards. The more stringent emission standards apply to 2017 and later model year vehicles, and the lower sulphur limits take effect beginning in 2017. Specifically, the amendments to the *Sulphur in Gasoline Regulations* reduce the allowable annual average sulphur content of gasoline to 10 parts per million from the current level of 30 parts per million, beginning in 2017. This will enable the effective operation of advanced emission control technologies needed to comply with the more stringent vehicle air pollutant emission standards.

Lower levels of sulphur in gasoline will also reduce air pollutant emissions from vehicles already on the road and enable new vehicle technologies or strategies to improve vehicle greenhouse gas emission performance. The regulations are expected to result in air quality improvements in Canada and deliver significant health and environmental benefits to Canadians.

Renewable Fuels Regulations

The *Renewable Fuels Regulations* are a part of the Government's approach to reducing greenhouse gas (GHG) emissions by reducing emissions from the transportation sector. The Regulations require petroleum producers and importers (primary suppliers) to have an average of at least 5% renewable fuel content in their gasoline produced and imported and 2% renewable fuel content in their distillate fuel produced and imported. On February 29, 2016, ECCC published the first performance report for the Regulations that provided an analysis of the performance of the Regulations for the period December 2010 to December 2012. The results of the assessment indicate that the Regulations are on track to meeting their objective of reducing GHG emissions. GHG reductions of approximately 7.0 Mt were estimated to have accrued in the first two compliance periods representing an annual average reduction of approximately 3.7 Mt/yr. The report is available here: http://www.ec.gc.ca/energie-energy/default.asp?lang=En&n=3B70EEBF-1.

Regulatory Administration of the Transportation Regulations

ECCC administers a compliance program under the transportation regulations. This includes processing of regulatory reports, importation declarations, managing defects and recalls and testing of selected vehicles and engines to verify compliance with the regulations.

Some of the transportation regulations require companies to submit annual reports documenting fleet performance or the quantity of products. During 2015–2016, the Department received over 280 regulatory reports. ECCC also continued with updates to its on-line reporting tool, the Vehicle and Engine Emissions Reporting Registry, which enables automobile manufacturers to submit their annual automobile GHG performance report along with fuel consumption data utilized by Natural Resources Canada for its Fuels Consumption Labelling Program.

In 2015–2016, ECCC processed almost 400 Canada-unique submissions and almost 800 importation declarations for vehicles and engines. Additionally, the Department processed 51 notices of defect and recall notifications covering over 200,000 vehicles

and engines. Of those, ECCC influenced five campaigns covering over 15,000 vehicles and engines.

The regulatory administration of the transportation regulations is supported by ECCC laboratory emissions testing on vehicles and engines in order to verify compliance with the regulations. Additional on-road testing methodologies using portable emissions measurement technology were implemented in 2015–2016. ECCC also conducts testing on vehicles and engines to verify compliance with the regulations. In 2015–2016, the Department conducted 75 rounds of testing.

Additionally, the Department responds to inquiries from regulatees and prospective regulatees. During 2015–2016, ECCC responded to over 1400 inquiries regarding these regulations.

More information on ECCC's vehicle, engine and fuel regulations is available online at www.ec.gc.ca/air/default.asp?lang=En&n=F963E49C-1.

Electricity Sector

The performance standard set under the *Reduction of Carbon Dioxide Emissions from Coal-fired Generation Electricity Regulations* (the Regulations) came into effect on July 1, 2015. The stringent performance standard allows 420 tonnes of CO_2/GWh of electricity produced for new coal-fired electricity generation units and for existing units once they reach a defined period of operating life under the regulations. The Regulations are estimated to result in a net reduction of approximately 214 Mt CO_2 equiv. of GHG emissions over the period 2015–2035.

Industrial Sector

The Environmental Performance Agreement with Rio Tinto Alcan concerning air emissions of PAHs ended in December 2014. A final public report is being prepared and will be published by ECCC in 2016. Information about the agreement and updates is available online at www.ec.gc.ca/epe-epa/default.asp?lang=En&n=5BE979CD-1#X-201006160806394.

Consumer and Commercial Products

ECCC has been targeting the reduction of emissions of VOCs from consumer and commercial products. VOCs are a contributing factor in the creation of air pollution.

On March 5, 2016, a proposed *Code of Practice for the Reduction of Volatile Organic Compound Emissions from the Use of Cutback and Emulsified Asphalt* Notice (available at http://www.gazette.gc.ca/rp-pr/p1/2016/2016-03-05/html/notice-avis-eng.php#nl2) was published in the *Canada Gazette*, Part I, for a 60-day consultation. The intent of the Code is to provide guidance to the asphalt sector regarding actions that can contribute to the reduction of VOC emissions from the use of cutback asphalt and emulsified asphalt in order to reduce health and environmental concerns in Canada while maintaining road safety.

On May 2, 2015, a proposed order to exclude specific compounds from the list of VOCs on Schedule 1 of CEPA (available at http://www.gazette.gc.ca/rp-pr/p1/2015/2015-05-02/html/reg2-eng.php) was published in the *Canada Gazette*, Part I. The objective of the proposed order is to exclude VOCs from the List of Toxic Substances in Schedule 1 of CEPA that do not contribute significantly to the formation of ground-level ozone. The proposed order will also align with the list of compounds excluded from the regulatory definition of VOCs in the United States.

2.4 Water Quality

Photo: Ottawa River © Environment and Climate Change Canada

Water quality is affected in many ways, including by nature's own patterns. The water quality of rivers and lakes changes with the seasons and geographic areas, even when there is no pollution present. It is also affected by human development, including disposal of human wastes, animal wastes and chemical substances into the environment.

Water quality is a shared responsibility with provinces and territories. The federal government addresses water quality under various statutes, including the *Fisheries Act*. Work on water quality under CEPA includes scientific research, monitoring and leadership on the development of guidelines for water quality.

2.4.1 Monitoring

In 2015–2016, ECCC's Fresh Water Quality Monitoring program continued to implement the risk-based adaptive management framework in conjunction with statistical power analyses to better evaluate the risks of contaminants and human activities in Canadian watersheds. The approach has been used to optimize monitoring locations and adjust monitoring frequencies relative to the environmental risks and to inform on changes in environmental condition.

Trace metals sampling is done as part of Great Lakes Surveillance on board the CCGS Limnos.
Photo: Alice Dove © Environment and Climate Change Canada

In addition to data collection and reporting on a wide range of environmental issues, monitoring efforts in 2015–2016 included continued upgrades to monitoring technologies and improved data reporting and database infrastructure. In addition, the ECCC initiated a plan that contributes to the Government of Canada's commitment to Open Data. More information on ECCC monitoring activities is available online at www.ec.gc.ca/lcpe-cepa/default.asp?lang=En&n=F79B71E4-1.

2.4.2 Research

Both Health Canada and ECCC continued their water quality research activities. Health Canada conducts research on drinking water quality in support of the Guidelines for Canadian Drinking Water Quality.

ECCC's research included method development for analytes in wastewater treatment plant influent and effluent; assessing the environmental fate of azo benzidine compounds and their transformation products; investigating organophosphorus flame retardants in a variety of environmental compartments; biotoxins identification in algal blooms in the St. Lawrence River; analytical methods development for the identification of degradation products from pharmaceuticals in surface waters; multiple biological impacts of municipal effluents on wild fish in the St. Lawrence River; and assessing bioaccumulation and toxicity of dysprosium and palladium under varying water quality parameters.

In 2015–2016, Health Canada conducted research on disinfection by-products from source waters containing nano-silver. The results were used to inform the World Health Organization Water Quality and Health Joint Expert Meeting. Further method development was completed for ground water testing of contaminants including volatile and semivolatile aromatic hydrocarbons, PAHs and alkylphenols, potentially associated with shale gas production. These new methods will improve analytical capability for future drinking water surveys. In addition, new tools, including databases and worksheets, have been developed to support data accessibility for inorganic compounds identified as priorities for risk assessment under the CMP. The databases, worksheets and related training tools were provided to and tested by risk assessment groups.

2.4.3 Risk Management Activities

Drinking Water Quality Guidelines

Health Canada works in collaboration with the provinces and territories to develop the Guidelines for Canadian Drinking Water Quality and their technical documents. Health-based guidelines are developed for contaminants that could be found in drinking water supplies across Canada at levels that could lead to adverse health effects. Guidance documents are also developed under the Guidelines for Canadian Drinking Water Quality to provide general operational or management guidance related to specific drink-

ing water issues (such as boil-water advisories) or to make risk assessment information available when a guideline is not deemed necessary (such as potassium from water softeners).The Guidelines for Canadian Drinking Water Quality are used by all provinces and territories as a basis to establish their own regulatory requirements regarding the quality of drinking water in their jurisdictions.

Table 8.1 lists the guidelines that were completed or in progress in 2015–2016.

Table 8.1: Guidelines/guidance documents for Canadian drinking water quality from April 2015 to March 2016.

Finalized	In Progress
• pH • Benzo(a)pyrene • Chromium • Trihalomethane	• Bromate • Cyanobacterial toxins • Manganese • Lead • PFOA • PFOS • Enteric protozoa • Uranium • Enteric viruses • QMRA • Copper • Natural organic matter • 1,4-Dioxane • 2,4-D • Atrazine

2.5 Waste

Waste generally refers to any material, non-hazardous or hazardous, that has no further use, and which is managed at recycling, processing or disposal sites or facilities.

In Canada, the responsibility for managing and reducing waste is shared between the federal, provincial, territorial and municipal governments. Municipal governments are responsible for collecting and managing waste from homes for recycling, composting and disposal, while provincial and territorial authorities are responsible for the approval, licensing and monitoring of waste management operations.

For its part, ECCC exercises responsibilities with respect to disposal at sea of specified materials, as well as the international and interprovincial movements of hazardous waste and hazardous recyclable material.

2.5.1 Monitoring

Disposal at Sea Site Monitoring Program

As required by CEPA, representative disposal at sea (DAS) sites are monitored to verify that permit conditions are met, and that scientific assumptions made during the permit review and site selection process are correct and sufficient to protect the marine environment. By monitoring disposal sites, ECCC is able to verify that the permitting of disposal is sustainable and that permit holders can have continued access to suitable sites. Where monitoring indicates a problem or where the site has reached its capacity over time, management action in the form of closing, moving or altering the site use can occur.

In 2015–2016, 13 monitoring projects were completed at 11 ocean disposal sites nationally (or 9% of the 123 actively used sites this fiscal year).

In the Pacific and Yukon Region (PYR), monitoring was conducted at four DAS sites. In June 2015, field monitoring was conducted at the Kitimat Arm disposal site in British Columbia. Sediment sampling activities included sediment grab sampling for chemistry analysis, toxicity testing and benthic macroinvertebrate survey. Surficial sediment samples were analyzed for trace metals, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), particle size, moisture, nutrients including total organic carbon (TOC) and total organic nitrogen (TON), dioxins, and furans and sulphides. Sediment toxicity testing included both acutely lethal and sublethal lethal endpoints. Benthic invertebrate identification was conducted by certified taxonomists to the lowest possible taxonomic level. The results of all the analyses, tests and assessments are pending. In October 2015, PYR conducted monitoring at the Five Finger Island, Point Grey and Porlier Pass disposal sites. A multi-beam bathymetric survey was conducted at each site. As well, sediment sampling activities included sediment grab sampling for chemistry analysis and toxicity testing. The same physicochemical parameters and toxicity tests used for the June 2015 Kitimat Arm monitoring study were also used for the October 2015 monitoring study.

In the Prairie and Northern Region (PNR), the data from pre-2007 and post-2012 disposal bathymetric studies at the Pangnirtung disposal site were reprocessed. The intent of the study was to compare the surveys to determine if the disposal activities were carried out in accordance with the conditions of the

DAS permit. Specifically, the study was designed to verify that the material was disposed of in the appropriate location and the quantity of material disposed did not exceed what was permitted.

In the Quebec Region (QR), hydro-acoustic surveys were conducted at four DAS sites in the Magdalen Islands. The objective of these studies was to obtain data on the Depot E disposal site, which is a major DAS site, and three other frequently used disposal sites, L'Île-d'Entrée (IE-6), Pointe Basse (PBCM-1) and Grosse-Ile (GI-2). The survey results were used to determine if the disposal activities were carried out in accordance with the conditions of the DAS permits issued. Specifically, the studies assessed the locations of the disposals and the quantities disposed. The survey at the L'Île-d'Entrée (IE-6) site also allowed the department to determine the capacity of the disposal site and confirm that this site has capacity to receive additional dredged material. The monitoring confirmed that no remedial management actions were needed at any of the sites monitored in 2015–2016.

In the Atlantic Region (AR), four monitoring studies were conducted in 2015–2016. In Newfoundland and Labrador a post-disposal video survey was conducted at the Bull Arm fabrication facility disposal site. In New Brunswick, three related studies were conducted for the Black Point disposal site located near Saint John. These studies included a preliminary site capacity study, a geophysical survey and a sediment sampling study.

The post-disposal video survey at Bull Arm was a pilot study to provide habitat-scale knowledge of the site and to provide information for the design of future monitoring studies. For the Black Point site, the preliminary site capacity study was conducted to determine an approximate life expectancy and to inform future site use. The geophysical survey and sediment sampling of an area in the south of the disposal site, where previously disposed dredged material had slumped, were conducted. The objective of this study was to provide a baseline for future long-term sampling in this area. Lastly, high resolution/ultra–trace level PCB analysis was done to establish the presence or absence of PCBs in the slump area.

2.5.2 Risk Management Activities

In addition to the activities listed below, risk management actions described in section 2.1.5 on toxic substances also contribute to the overall improvement of waste management.

Disposal at Sea

Under CEPA, most types of disposal of waste at sea in areas of the sea within Canadian jurisdiction and by Canadian ships in Canadian jurisdiction and in international waters requires a permit issued by ECCC.

The CEPA DAS rules implement two treaties; the London Convention and the Protocol to the London Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter. A permit for disposal at sea will generally be issued only if it is the environmentally preferable and practical option. CEPA provides additional controls on disposal at sea, including:

- a prohibition on the export of a substance for disposal in an area of the sea under the jurisdiction of a foreign state or in its internal waters;
- a similar prohibition on the import of a substance for disposal at sea;
- a list of six types of substances for which a disposal at sea permit can be obtained (Schedule 5 of CEPA);
- an assessment framework for reviewing permit applications based on a precautionary approach, which must be followed (Schedule 6 of CEPA); and
- a statutory obligation to monitor selected sites.

Canada and other parties to the London Convention and Protocol are finalizing a new five-year strategic plan prioritizing increased membership in the newer and more stringent treaty – the London Protocol. Workshops, guidance and technical assistance are offered to countries to aid their accedence to the London Protocol or compliance with it. In 2015, Canada was re-elected to serve as Vice-Chair to the Compliance Group, a small sub-group of the London Protocol that is responsible for encouraging and supporting compliance with the treaty.

Canada is in the second of four years chairing the Scientific Groups, which are sub-groups of the Convention and Protocol that advise the treaties about science and technical issues. Canada participates actively in the development of international guidance relevant to disposal at sea and the prevention of marine pollution. Current projects include developing

guidance on action levels for dredged material disposal, as well as continuing work on best practices for disposal related to offshore mining wastes. A desktop review of the data supporting the continued ban of the disposal of radioactive waste at sea is complete and a recommendation is expected to be finalized next year.

In 2013, an amendment to the London Protocol was adopted to further regulate ocean fertilization and create the ability to address other forms of marine geo-engineering where there is potential to cause harm to the marine environment. Canada is continuing to look at ratifying the amendment within the next few years to ensure domestic consistency with the London Protocol.

Canada is also considering the possible ratification of other amendments to the Protocol that would enable a permit system for the storage of carbon dioxide streams from industrial processes in subseabed geological formations. This could add a tool to the portfolio of options for reducing atmospheric levels of greenhouse gases.

Disposal at Sea Permits

In 2015–2016, 75 permits were issued in Canada for the disposal of 5.7 million tonnes of waste and other matter (tables 9 and 10), compared to 90 permits for the disposal of almost 5 million tonnes in 2014–2015. Most of the material permitted for disposal was dredged material that was removed from harbours and waterways to keep them safe for navigation. Also permitted was excavated native till (geological matter) that is disposed of at sea in the lower mainland of British Columbia, where on-land disposal options for clean fill are extremely limited. Fish-processing waste is also permitted in remote communities where there is no access to reuse-and-recycling opportunities.

Table 9: Disposal at sea quantities permitted (in tonnes) and permits issued in Canada from April 2015 to March 2016

Material	Quantity Permitted	Permits Issued
Dredged material	4 557 800*	40
Geological matter	1 105 000*	5
Fisheries waste	55 965	30
Vessels	–	0
Organic matter	–	0
Total	**5 718 765**	**75**

* Dredged material and geological matter were converted to tonnes using an assumed density of 1.3 tonnes per cubic metre.

The number of permits issued has decreased slightly in 2015–2016 after almost a decade of relatively stable permit numbers, largely due to a smaller number of fish waste permits being requested (Figure 6). The quantities permitted continue to fluctuate from year to year, showing a slight trend towards increasing quantities, particularly for dredged material (Figure 7). The trend may be due to infrastructure spending in support of ports and port infrastructure, and new major projects with marine terminal project elements.

Table 10: Disposal at sea quantities permitted (in tonnes) and permits issued by region from April 2015 to March 2016

Material	Atlantic		Quebec		Prairie and Northern		Pacific and Yukon	
	Quantity Permitted	Permits Issued	Quantity Permitted	Permits Issued	Quantity Permitted	Permits Issued	Quantity Permitted	Permits Issued
*Dredged material**	1,318,200	9	152 100	13	0	0	3 087 500	18
*Geological matter**	0	0	0	0	0	0	1 105 000	5
Fish waste	54 815	27	1 150	3	0	0	0	0
Vessels	–	–	–	–	–	–	–	0
Organic matter	–	–	–	–	–	–	–	–
Total	**1 373 015**	**36**	**153 250**	**16**	**0**	**0**	**4 192 500**	**23**

* Dredged material and geological matter were converted to tonnes using an assumed density of 1.3 tonnes per cubic metre.

Figure 6: Number of disposal at sea permits issued

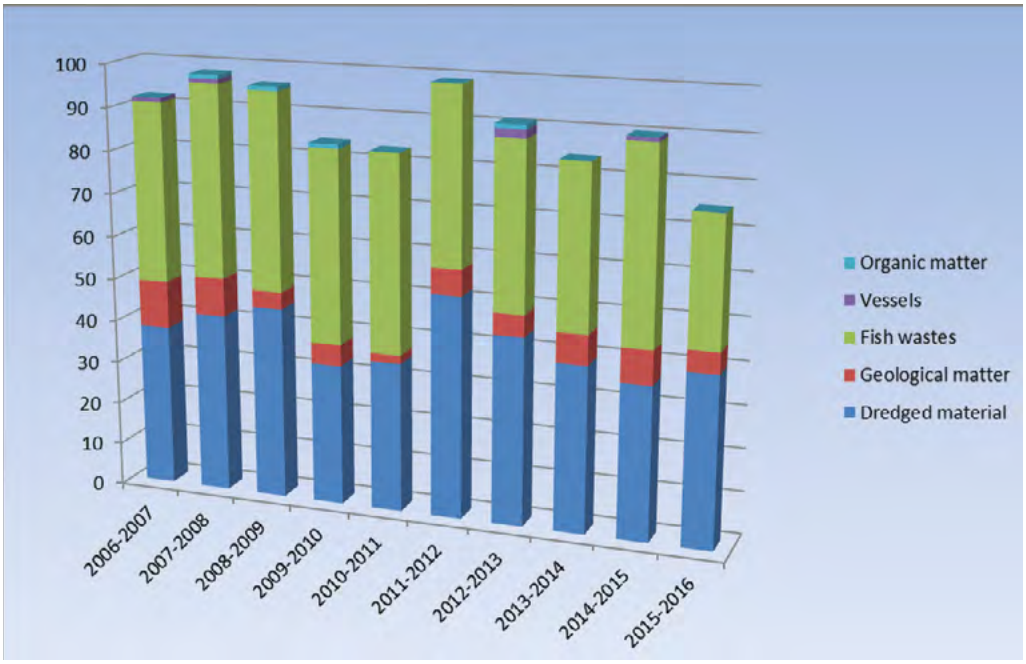
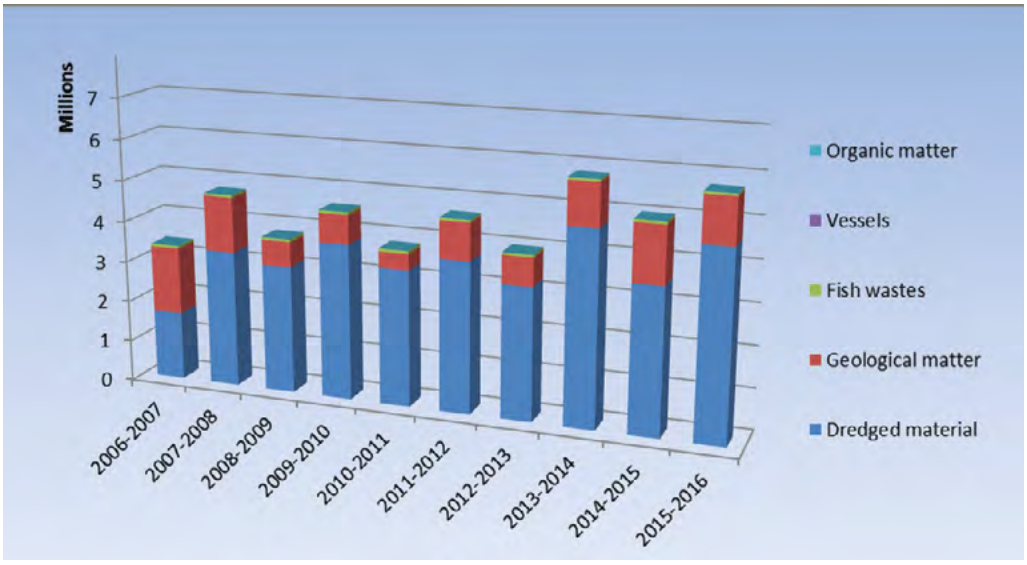


Figure 7: Annual disposal at sea quantities permitted (in millions of tonnes)[1]



Further information on disposal at sea is available online at www.ec.gc.ca/iem-das.

1 Note: Figure 7 data values for 2014–2015 quantities have been reviewed and adjusted from those reported in the 2014–2015 CEPA annual report.

Controlling the Movement of Hazardous Waste and Hazardous Recyclable Material

CEPA provides authority to make regulations governing the export, import and transit of waste (including both hazardous and prescribed non-hazardous waste) and hazardous recyclable materials. It also provides authority to establish criteria for refusing an export, import or transit permit, should the hazardous waste or hazardous recyclable material not be managed in a manner that will protect the environment and human health.

Canada implements its international obligations as a party to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel Convention), the Organisation for Economic Co-operation and Development Decision on the Control of Transboundary Movement of Wastes Destined for Recovery Operations, and the Canada–United States Agreement on the Transboundary Movement of Hazardous Waste through the *Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations* (EIHWHRMR) and the *PCB Waste Export Regulations, 1996*.

In 2015,[2] ECCC processed approximately 2,500 notices for proposed imports, exports and transits of hazardous wastes and hazardous recyclable materials under the EIHWHRMR. The notices received covered 22,191 waste streams, which exhibited a range of hazardous properties such as being flammable, acutely toxic, oxidizing, corrosive, dangerously reactive and environmentally hazardous. Approximately 37,000 individual transboundary shipments of hazardous waste and hazardous recyclable material were reported in movement documents received by ECCC.

Almost all imports (99.9%) and exports (97.8%) of hazardous waste and hazardous recyclable materials occurred between Canada and the United States. The remaining imports and exports occurred with Nigeria, France, Columbia, Mexico, Venezuela, Brazil and Ecuador. The quantity of hazardous recyclable material and hazardous waste imported into Canada was 367,726 tonnes (t) in 2015. This represents a decrease of 12,636 t or 3.3% less than the total quantity imported in 2014. Shipments destined for recycling totaled 249,323 t and represented about 68% of all imports in 2015.

Cathode ray tubes in old computer monitors and TVs are banned from export to certain countries under the Basel Convention. Photo: Allison Grant © Environment and Climate Change Canada

Hazardous recyclable materials imported into Canada in the greatest quantities were:

- hydraulic fluids;
- batteries filled with acid;
- waste liquors from the pickling of metals;
- wastes (excluding metal wastes in massive form) having metals as constituents or contaminants;
- waste non-halogenated organic solvents and;
- glass wastes from cathode-ray tubes and other activated glass.

Of the 118,403 t of Hazardous wastes imported into Canada, the greatest quantities included:

- waste tarry residues (excluding asphalt cements) arising from the refining, distillation and any pyrolytic treatment of organic materials;
- wastes having as constituents or contaminants: metal carbonyls, hexavalent chromium compounds;
- waste halogenated or non-halogenated non-aqueous distillation residues arising from organic solvent recovery operations;
- wastes containing, consisting of, or contaminated with inorganic cyanides or organic cyanides and;
- wastes (excluding metal wastes in massive form) having metals as constituents or contaminants.

2 Export and import quantities set out in this section of the report represent actual movement values that took place during the 2015 calendar year (from January 1, 2015, to December 31, 2015).

Table 11: Hazardous waste and hazardous recyclable material, imports, 2006–2015 (tonnes)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Recyclables	164,903	237.141	262,337	221,778	217,663	243,491	243,434	245,110	221,354	249,323
Total imports	408,839	497,890	532,727	490,169	364,162	394,786	345,230	435,951	380,362	367,726

Table 12: Hazardous waste and hazardous recyclable material, exports, 2006–2015 (tonnes)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Recyclables	374,024	358,896	365,468	315,631	357,627	374,207	413,614	422,388	436,608	429,391
Total exports	474,538	460,497	482,680	420,865	428,367	460,707	505,461	516,174	531,209	516,014

Please note that data are revised periodically as new information becomes available. Therefore, information presented here may differ from information published in other reports.

The quantity of hazardous waste and hazardous recyclable materials exported was 516,014 t in 2015. This represents a decrease of approximately 15,200 t or 3% from 2014. Shipments exported for recycling totaled 429,391 t and represented about 83% of all exports in 2015. The majority of hazardous recyclable material exported abroad for recycling includes:

- waste acidic or basic solutions;
- treated wood wastes;
- wastes lead-acid batteries;
- wastes (excluding metal wastes in massive form) having metals as constituents or contaminants;
- wastes from oil/water or hydrocarbon/water mixtures and;
- waste containing, consisting of, or contaminated with inorganic cyanides or organic cyanides.

Of the 86,623 t of hazardous wastes exported, the greatest quantities included:

- waste acidic or basic solutions;
- wastes from oil/water or hydrocarbon/water mixtures;
- clinical and related waste;
- wastes (excluding metal wastes in massive form) having metals as constituents or contaminants;
- waste non-halogenated organic solvents and;
- wastes consisting of (or containing) off-specification or outdated chemicals.

Imports of hazardous recyclable material were shipped to five provinces: Ontario, Quebec, New Brunswick, British Columbia and Alberta. Except for New Brunswick, all of these provinces also receive waste for final disposal. Exports of hazardous recyclable materials originated from eight provinces: Ontario, Quebec, Saskatchewan, New Brunswick, Manitoba, British Columbia, Alberta and Nova Scotia. Exports of hazardous wastes for final disposal also originated from these same provinces, except for Saskatchewan.

Tables 11 and 12 list the quantities imported and exported from 2006 to 2015.

2.6 Environmental Emergencies

Part 8 (Environmental Matters Related to Emergencies) of CEPA addresses the prevention of, preparedness for, response to and recovery from uncontrolled, unplanned or accidental releases into the environment of substances that pose potential or immediate harm to the environment or danger to human life or health.

Part 8 provides the authority, among other things, for making regulations, guidelines and codes of practice. Part 8 also establishes a regime that makes the person who owns or has the charge, management or control of such a substance liable for restoring the damaged environment and for the costs and expenses incurred in responding to an environmental emergency.

The *Environmental Emergency Regulations* (referred to as the E2 Regulations) are made under Part 8 of CEPA. The E2 Regulations require any person who owns, manages, or has the control of a regulated substance at a place in Canada, at or above the established threshold, to notify ECCC when this quantity threshold is met or when the maximum container capacity meets or exceeds this threshold.

If the total quantity and container capacity thresholds are both met, there is an additional requirement to prepare and exercise an environmental emergency (E2) plan. The E2 plan ensures that any individual that owns, manages, or controls specific hazardous substances equal to or above a certain threshold has a plan for prevention, preparedness, response and recovery in the event of an environmental emergency.

Propane storage facility regulated by the E2 Regulations. Photo: Gerard Chisholm © Environment and Climate Change Canada

The Environmental Emergencies website (www.ec.gc.ca/ee-ue/default.asp?lang=En&n=8A6C8F31-1) includes implementation guidelines for E2 plans, a common issues section and online notice filing. The website also provides public access to a database containing basic information about persons or places (e.g., company names and addresses) that are subject to the Regulations.

As of March 31, 2016, there were approximately 4,500 regulatees from various sectors under the E2 Regulations. Of these regulatees, approximately 2,850 were required to prepare E2 plans. The seven most commonly identified substances requiring E2 plans are propane, anhydrous ammonia, butane, pentane, gasoline, hydrochloric acid and chlorine.

In 2015–2016, ECCC's regional activities associated with the implementation of the E2 Regulations included conducting site visits and delivering presentations to the regulated community, covering prevention, preparedness, and response and recovery aspects for chlorine, among other substances. As a result of targeted efforts to increase the implementation of E2 plans by regulated parties, approximately 95% of those regulated parties which require E2 plans have fully implemented and tested their plans.

Throughout 2015–2016, the Department continued the process to update the E2 Regulations. Included in the updates is the proposed addition of 49 new hazardous substances to the E2 Regulations, clarification of certain existing provisions, and an amendment to reporting requirements.

3. ADMINISTRATION, PUBLIC PARTICIPATION AND REPORTING

3.1 Federal, Provincial, Territorial Cooperation

Part 1 of CEPA (Administration) requires the Ministers to establish the National Advisory Committee, composed of one representative for the federal Minister of the Environment and one for the federal Minister of Health, representatives from each province and territory, and not more than six representatives of Aboriginal governments from across Canada.

Part 1 also allows the Minister of the Environment to negotiate an agreement with a provincial or territorial government, or an Aboriginal people, with respect to the administration of the Act. It also allows for equivalency agreements, which allow the Governor in Council to suspend the application of federal regulations in a province or territory that has equivalent regulatory provisions. The intent of an equivalency agreement is to eliminate the duplication of environmental regulations.

National Advisory Committee

The National Advisory Committee provides a forum for provincial, territorial and Aboriginal governments to advise the Ministers on certain actions being proposed under the Act, enables national cooperative action, and seeks to avoid duplication in regulatory activity among governments. The committee is provided opportunities to advise and comment on initiatives under the *Act*. More information on the

committee is available online at https://www.ec.gc.ca/lcpe-cepa/default.asp?lang=En&n=C97D3802-1.

To carry out its duties in 2015–2016, the CEPA National Advisory Committee (NAC) held two teleconference meetings, and the NAC Secretariat corresponded regularly with committee members regarding various initiatives implemented under CEPA 1999. These initiatives included opportunities to comment on and be informed of:

- various risk assessment activities under the CMP, including:
  - the publication of 5 draft screening assessments which included 19 pesticides, 29 selenium-containing substances, and approximately 5 living organisms; and
  - the publication of 5 final screening assessments which included 2 chemical substance groupings covering 75 aromatic azo- and benzidine-based substances and 12 living organisms.
- the publication of the Proposed Approach for Cumulative Risk Assessment of Phthalates and four State of the Science reports on 14 phthalates;
- a proposed order to amend the definition of volatile organic compounds listed on Schedule 1, and to add microbeads to Schedule 1;
- an order to apply a SNAc provision to quinolone;
- a notice of intent to develop regulations for microbeads;
- a proposed pollution prevention plan for hydrazine in the electricity sector;
- proposed regulations dealing with issues such as vehicle and engine emission limits, microbeads in personal care products, repealing the vinyl chloride release regulations, fuels and storage tank systems;
- proposed codes of practice for addressing DGEME, and volatile organic compounds from the use of asphalt;
- a final code of practice for fluorocarbon emissions from refrigeration and air conditioning;
- the National Pollutant Release Inventory Reporting Requirements for 2016 and 2017;
- the publication of Reviewed 2014 National Pollutant Release Inventory Data;
- obligations under the Minamata Convention on Mercury;
- the policy for implementing section 75 of the Act;
- the release of the Third Report on Human Biomonitoring of Environmental Chemicals in Canada;
- an opportunity to provide input on future cycles of the Canadian Health Measures Survey; and
- information gathering notices on certain petroleum substances, certain polymers, nanomaterials, and hydrofluorocarbons in bulk.

In addition, members were provided an opportunity to advise on proposed regulatory initiatives related to ozone-depleting substances and the prohibition of certain toxic substances.

Federal-Provincial/Territorial Agreements

Canada–Ontario Agreement Respecting the Great Lakes Basin Ecosystem

Since 1971, Canada and Ontario have worked together through the Canada–Ontario Agreement Respecting the Great Lakes Basin Ecosystem (www.ec.gc.ca/grandslacs-greatlakes/default.asp?lang=En&n=B903EE0D-1). This agreement guides the efforts of Canada and Ontario in achieving a healthy, prosperous and sustainable Great Lakes Basin ecosystem. It is also an important mechanism for implementing Canada's obligations under the Canada–United States Great Lakes Water Quality Agreement (www.ec.gc.ca/grandslacs-greatlakes/default.asp?lang=En&n=45B79BF9-1).

In 2015–2016, Canada and Ontario collaborated to develop recommendations on technical approaches for the management of contaminated sediments in Great Lakes Areas of Concern (AOCs) including the St. Clair River, and in the implementation of the Randle Reef Sediment Remediation Project in Hamilton Harbour.

In addition, during 2015–2016, a range of chemical risk management initiatives were delivered under the CMP, as described elsewhere in this report, that supported implementation of the draft Harmful Pollutants Annex Goals under the new COA. These included continuing efforts towards the sound management of chemicals in the Great Lakes through the reduction of releases and the enhancement of knowledge to mitigate risk.

Memorandum of Understanding between Canada and Quebec

Administrative Agreements concerning the pulp and paper sector have been in place between Quebec and the Government of Canada since 1994. The parties currently cooperate through a memorandum of understanding for data collection that is in effect until March 2018, whereby Quebec continues to provide a single data-entry portal for regulatees for the following federal regulations:

- *Pulp and Paper Mill Effluent Chlorinated Dioxins and Furans Regulations* made pursuant to CEPA;
- *Pulp and Paper Mill Defoamer and Wood Chip Regulations* made pursuant to CEPA; and
- *Pulp and Paper Effluent Regulations* made pursuant to the *Fisheries Act*.

Canada–Nova Scotia Equivalency Agreement

The final order for an equivalency agreement between the Minister of the Environment and the Province of Nova Scotia with regard to the federal *Reduction of Carbon Dioxide Emissions from Coal-fired Generation Electricity Regulation* took effect in July 2015. It was first published in December 2014. The agreement indicates that the provincial GHG emissions cap on electricity producers would achieve the same or better effects than the federal regulation. In accordance with the five-year term limit in CEPA, the agreement is set to terminate at the end of 2019.

Further to this agreement, the Governor in Council adopted an order suspending the application of the federal regulation in Nova Scotia.

Nova Scotia Environment reported no enforcement actions between July 2015 and March 2016. More information about these agreements is available online at www.ec.gc.ca/lcpe-cepa/default.asp?lang=En&n=5CB02789-1.

Canada–Alberta Equivalency Agreement

As a result of the 1994 Agreement on the Equivalency of Federal and Alberta Regulations for the Control of Toxic Substances, the following CEPA regulations, or parts thereof, do not apply in Alberta:

- *Pulp and Paper Mill Effluent Chlorinated Dioxins and Furans Regulations* (all sections);
- *Pulp and Paper Mill Defoamer and Wood Chip Regulations* [4(1), 6(2), 6(3)(*b*), 7 and 9]; and
- *Secondary Lead Smelter Release Regulations* (all sections).

Alberta Environment indicated that, in 2015–2016, there were no reported violations by the four pulp and paper mills regulated under the provincial pulp and paper regulations.

Environmental Occurrences Notification Agreements

Federal, provincial and territorial laws require, in most cases, notification of the same environmental emergency or environmental occurrence, such as an oil or chemical spill. To reduce duplication of effort, ECCC and Fisheries and Oceans Canada entered into environmental occurrences notification agreements with the governments of British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, the Northwest Territories and Yukon.

These notification agreements are supported by the *Release and Environmental Emergency Notification Regulations* under CEPA and the *Deposit out of the Normal Course of Events Notification Regulations* under the *Fisheries Act*.

The purpose of the notification agreements is to establish a streamlined notification system for persons required to notify federal and provincial/territorial governments of an environmental emergency or environmental occurrence. Under these notification agreements, 24-hour authorities operating for the provinces and territories receive notifications of environmental emergencies or environmental occurrences, on behalf of ECCC, and transfer this information to the Department.

In 2015–2016, ECCC continued to work with provincial and territorial counterparts to implement the notification agreements. This work included the establishment of management committees and the development of standard operating procedures for the collection and processing of notifications of environmental occurrences. Further, ECCC continued its work with the governments of British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, the Northwest Territories and Yukon with a view to renewing the notification agreements for another five years. The notification agreements are available online at www.ec.gc.ca/lcpe-cepa/default.asp?lang=En&n=5200AB4B-1.

3.2 Public Participation

CEPA Environmental Registry

Part 2 of CEPA (Public Participation) provides for the establishment of an environmental registry, whistleblower protection, and the right of an individual to request an investigation and pursue court action.

The CEPA Environmental Registry was launched on ECCC's website when the Act came into force on March 31, 2000. Continuous efforts are made to increase the Registry's reliability and ease of use. The Registry encompasses thousands of CEPA-related documents and references. It has become a primary source of environmental information for the public and private sectors, both nationally and internationally, and has been used as a source of information in university and college curricula.

From April 2015 to March 2016, the CEPA Registry website had 196,364 visits, making it the third-largest area visited on the ECCC website, after Weather and Ice. There were approximately 277 public enquiries made concerning CEPA in the last fiscal year. These requests were related to information on various substances, regulations, permits and enforcement.

The CEPA Registry is available online at www.ec.gc.ca/lcpe-cepa.

Public Consultations

During 2015–2016, there were 24 opportunities posted on the Environmental Registry for stakeholders and the public to consult. This is a decrease from previous years, most likely due to the federal election.

Please see CEPA Registry public consultations, available online at http://ec.gc.ca/lcpe-cepa/eng/participation/default.cfm?n=FBC634F3-1.

CMP-related Committees

The CMP Stakeholder Advisory Council met in November 2015 for the last meeting under the second mandate. The renewed Council was established in March 2016 for a five-year mandate and met for the first time in April 2016. New membership reflects priorities under this phase of the CMP. Under this new Council, a communications sub-committee was formed to expand and increase communications with key stakeholders and the public. The purpose of the Council is to get stakeholder input on the implementation of the CMP, and to foster dialogue on topics pertaining to the CMP between stakeholders and government, and among different stakeholder groups.

The CMP Science Committee held its third meeting in June 2015. The Science Committee ensures a strong science foundation to CMP by providing external, scientific expertise to Health Canada and ECCC on scientific issues. The Risk Assessment Toolbox was presented at this meeting. Members engaged in constructive discussions as they continued developing the committee's scientific input for the Government of Canada.

National Pollutant Release Inventory Consultation

The National Pollutant Release Inventory (NPRI) Multi-Stakeholder Work Group is the primary consultation mechanism for the NPRI program, with representatives from industry associations, environmental groups and indigenous organizations providing input on changes to the requirements and other aspects of the program such as tools to access the data. Consultations during 2015–2016 included a face-to-face meeting in February 2016, as well as a number of teleconferences and paper-based consultations on proposed changes to the program requirements. Users of NPRI data are also engaged to get input on how the NPRI can better meet their needs. The NPRI Consultation and Engagement Framework at www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=5FA7E914-1 outlines these activities.

3.3 Reporting

Canadian Pollution Prevention Information Clearinghouse

Part 4 of CEPA provides the authority for the establishment of a national pollution prevention information clearinghouse to facilitate the collection, exchange and distribution of information regarding pollution prevention.

The Canadian Pollution Prevention Information Clearinghouse (CPPIC) is a public website that provides Canadians with links to over 1,200 resources containing comprehensive information and tools from

Canada and around the world to strengthen their capacity to prevent pollution. In 2015–2016, 60 new records were added to the clearinghouse. Twenty-five percent (25%) percent of the new records are Canadian, and 8% are bilingual. Twenty-seven percent (27%) of new records are applicable to manufacturing sectors, while another 20% are applicable to private households. Overall, CPPIC records were viewed just under 33,000 times in 2015–2016.

State of the Environment Reporting

The Canadian Environmental Sustainability Indicators (CESI) program provides data and information to track Canada's performance on key environmental sustainability issues including climate change and air quality, water quality and availability, and protecting nature. It conveys the state of Canada's environment in a straightforward and transparent manner. CESI is used to inform citizens and Parliamentarians about current environmental status and trends, and provide policy makers and researchers with comprehensive, unbiased and authoritative information about key environmental issues. The indicators are also the prime vehicle used to measure and report on the progress towards the goals and targets of the Federal Sustainable Development Strategy (www.ec.gc.ca/dd-sd/default.asp?lang=En&n=CD30F295-1), which provides a whole-of-government view of environmental priorities at the federal level, with goals, targets, and implementation strategies.

The indicators are prepared by ECCC with the support of other federal departments, including HC, Statistics Canada, Natural Resources Canada, Agriculture and Agri-Food Canada, and Fisheries and Oceans, as well as relevant provincial and territorial counterparts. The high-quality data used to calculate indicators originate from a variety of sources, including surveys, measurement networks and other research initiatives that are expected to be maintained and updated for the foreseeable future. Through close collaboration with science and data experts across the federal government, CESI provides results and information on key issues including air quality, water quality, toxic substances and exposure to substances of concern.

The indicators are published on the CESI website (www.ec.gc.ca/indicateurs-indicators), showing national and regional results along with the methodology explaining each indicator and links to related socio-economic issues and information.

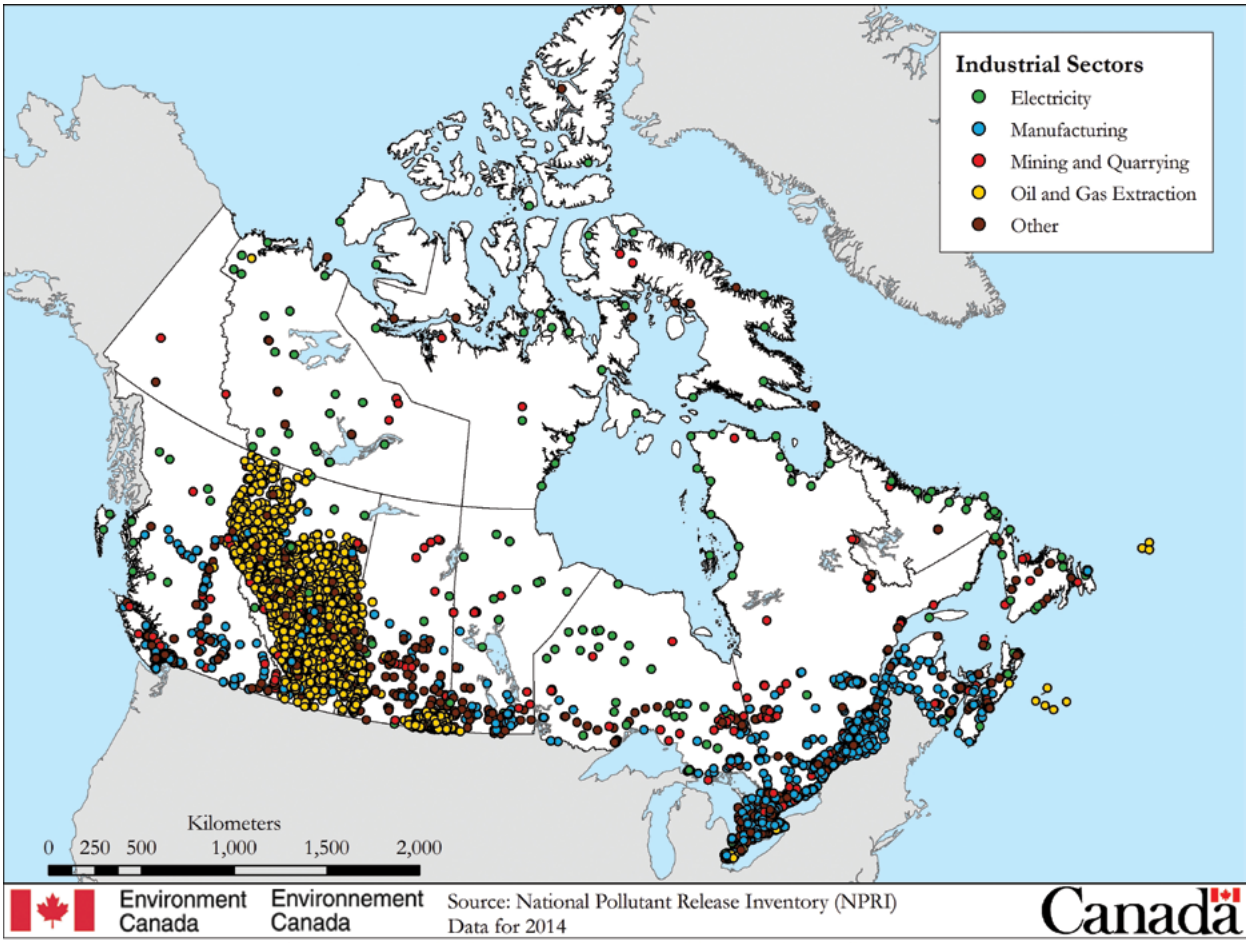
National Pollutant Release Inventory

The National Pollutant Release Inventory (NPRI) is Canada's legislated, publicly accessible national inventory of pollutant releases (to air, water and land), disposals and transfers for recycling. The NPRI includes information reported by industrial and other facilities that meet specified criteria and provides the main input to Canada's comprehensive Air Pollutant Emissions Inventory (APEI). Over 7,700 facilities, located in every province and territory, reported to the NPRI for the 2014 reporting year (see Figure 6).

The NPRI supports the identification and management of risks to the environment and human health, including the development of policies and regulations on toxic substances and air quality. Public access to the NPRI data through an annual summary report, an online data search tool and downloadable datasets encourages industry to prevent and reduce pollutant releases, and improves public understanding about pollution and environmental performance in Canada.

Frozen Maples against the Ottawa sky
Photo: © Environment and Climate Change Canada

Figure 8: Location of facilities that reported to the NPRI for the 2014 reporting year



*This map shows NPRI reporting facilities for 2014 (7720 facilities), but excludes those that did not meet the reporting criteria (852 facilities).

NPRI data for the 2014 reporting year was published in preliminary form in July 2015 and in reviewed form in December 2015.

The NPRI reporting requirements for the 2016 and 2017 reporting years were published in the *Canada Gazette* in February 2016 and included a number of modifications to NPRI requirements. For example, the reporting threshold was reduced for cobalt (and its compounds), 21 substances that did not meet the NPRI criteria for listing were removed, and a requirement was added to report contextual information such as concentration for water releases.

ECCC undertook a number of initiatives to respond to the needs of NPRI data users during 2015–2016. For example, the Department held consultations on proposed changes to NPRI reporting requirements and increased variety and improved accessibility of datasets to facilitate analysis by data users. Further information on the NPRI is available online at www.ec.gc.ca/inrp-npri.

Black Carbon Emission Inventory

In February 2015, ECCC, with the Air Pollutant Emission inventory, published its first national inventory of Black Carbon emissions. The Black Carbon inventory reported emission estimates from industrial sources, residential wood combustion and mobile sources in 2013, largely relying on information in the Air Pollutant Emission inventory. The Black Carbon inventory was developed as part of Canada's commitments under the Arctic Council and was voluntarily submitted to the UN Economic Commission for Europe.

Black Carbon emission data are also available on the departmental data catalogue. Further informa-

tion on the Black Carbon Inventory is available online at http://www.ec.gc.ca/pollution/default.asp?lang=En&n=D9D3F803-1.

Greenhouse Gas Emissions Reporting Program

ECCC requires annual reporting of GHG emissions from facilities (mostly large industrial operations) through its Greenhouse Gas Emissions Reporting Program (GHGRP). The GHGRP is part of ECCC's ongoing effort to develop, in collaboration with the provinces and territories, a nationally consistent, mandatory GHG reporting system, in order to meet the GHG reporting needs of all jurisdictions and to minimize the reporting burden for industry and government.

Key objectives of the GHGRP are to provide Canadians with consistent information on facility-level GHG emissions, to support regulatory initiatives, and to validate industrial emission estimates presented in the National GHG Inventory. The data collected are also shared with provinces and territories.

In April 2015, the 2013 facility-reported data and related overview report were made publicly available as part of a broader departmental release of GHG information products, which also included the latest National GHG Inventory and updated CESI GHG indicators.

Further information on the GHGRP is available online at www.ec.gc.ca/ges-ghg/default.asp?lang=En&n=040E378D-1.

Environmental Offenders Registry and Enforcement Notifications

The Environmental Offenders Registry contains information on convictions of corporations obtained under certain federal environmental laws including CEPA. The Registry contains convictions obtained for offences committed since June 18, 2009—when the *Environmental Enforcement Act* received Royal Assent. This tool allows the media and the public to search for corporate convictions using the name for the corporation, its home province, the province where the offence occurred, or the legislation under which the conviction was obtained. Keywords can also be used to search the registry.

The Enforcement Notifications contain information about successful prosecutions across Canada under the acts and regulations administrated by ECCC or involving ECCC enforcement officers (including CEPA).

The Environmental Offenders Registry and Enforcement Notifications can be found online at www.ec.gc.ca/alef-ewe/default.asp?lang=En&n=1F014378-1 and www.ec.gc.ca/alef-ewe/default.asp?lang=En&n=8F711F37-1, respectively.

4. COMPLIANCE PROMOTION AND ENFORCEMENT

Compliance promotion relates to the planned activities that are undertaken to increase awareness, understanding and compliance with the law and its regulations. Through these activities, compliance promotion officers provide information to regulated communities on what is required to comply with the law, the benefits of compliance and the consequences of non-compliance. The goal is to achieve desired environmental results more efficiently.

CEPA provides enforcement officers with a wide range of powers to enforce the Act, including the powers of a peace officer. Enforcement officers can carry out inspections to verify compliance with the Act; conduct investigations of suspected violations; enter premises, open containers, examine contents and take samples; conduct tests and measurements; obtain access to information (including data stored on computers); stop and detain conveyances; search, seize and detain items related to the enforcement of the Act; secure inspection warrants to enter and inspect premises that are locked and/or abandoned or where entry has been refused; seek search warrants; and arrest offenders. CEPA analysts can enter premises when accompanied by an enforcement officer and can exercise certain inspection powers.

A wide range of enforcement measures are available to respond to alleged violations. Many are designed to achieve compliance without resorting to a formalized legal process such as prosecutions or seeking an injunction. These measures include directions, tickets, prohibition orders, recall orders, detention orders for ships, and environmental protection compliance orders. Measures to compel a return to compliance through court action include injunctions to stop or prevent a violation and prosecutions. In addition, once charges have been laid, environmental protection alternative measures agreements may be negotiated with the alleged offender in lieu of pleading guilty.

4.1 Compliance Promotion Priorities

In 2015–2016, ECCC worked on compliance strategies and compliance promotion plans for 28 risk management instruments going through the *Canada Gazette* Parts I and II, including the federal government's priority sector approach to the proposed *Multi-Sector Air Pollutants Regulations* (MSAPR). The Department continued to focus compliance promotion efforts on geographically dispersed, hard to reach, small and medium-sized enterprises (MSE) (less than 500 employees), Indigenous peoples, and federal departments.

The Department added over 11,000 facilities and their contacts to the national compliance promotion database during this fiscal year, improving knowledge of the regulated community. Information for additional 50,000 facilities and contacts were updated, ensuring high efficiency and accuracy when reaching the regulated community.

4.2 Compliance Promotion Activities

ECCC delivered compliance promotion activities for new and existing regulations and codes of practice under CEPA.

Table 13: High and medium priority instruments for which compliance promotion was provided

Multiple approaches were used to reach the regulated communities, including workshops, information sessions, presentations, information package emails/mail-outs and through technology such as videos, Twitter and Web banner advertising. Many of these activities were carried out in collaboration with provincial and territorial governments, as well as non-governmental organizations.

Responding to Inquiries

Compliance promotion officers continued to raise awareness and understanding of the Department's regulatees by responding to over 3,400 inquiries on 14 compliance promotion priority risk management instruments. Two thirds of inquiries came in via email or fax, while the remainder came in via letter and telephone.

Promoting Compliance to Indigenous People and within the Federal Government

In 2015–2016, ECCC continued to work closely with Indigenous people. Workshops, information sessions and compliance promotion materials were delivered to Indigenous peoples throughout Canada to increase awareness of their obligations to comply with instruments under CEPA as well as their responsibilities under the *Fisheries Act*. The instruments promoted included the *Environmental Emergency Regulations,* the *PCB Regulations;* the *Renewable Fuels Regulations;* the *Storage Tank Systems for Petroleum Products* and *Allied Petroleum Products Regulations;* the *Gasoline and Gasoline Blend Dispensing Flow Rate Regulations*; and *Fisheries Act* [subsection 36(3)].

Table 13: High and medium priority instruments for which compliance promotion was provided

High Priority Instruments	Medium Priority Instruments
PCB Regulations	Code of Practice for the Environmental Management of Road Salts
Products Containing Mercury Regulations	*Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations*
Prohibition of Certain Toxic Substances Regulations, 2012	*Federal Halocarbon Regulations, 2003*
Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations	*Benzene in Gasoline Regulations*
Tetrachloroethylene (Use in Dry Cleaning and Reporting Requirements) Regulations	*Sulphur in Diesel Fuel Regulations*
Volatile Organic Compound Concentration Limits for Architectural Coatings Regulations	*Gasoline and Gasoline Blend Dispensing Flow Rate Regulations*
Renewable Fuels Regulations	*Gasoline and Gasoline Blend Dispensing Flow Rate Regulations*
Sulphur in Gasoline Regulations	

Compliance promotion to federal government department and agency regulatees included individual communications, campaigns and multi-instrument activities on the *Federal Halocarbon Regulations*, the *Petroleum and Allied Petroleum Products Storage Tank Regulations*, the *Environmental Emergencies Regulations*, the *PCB Regulations*, the *Volatile Organic Compound Concentration Limits for Architectural Coatings Regulations*, the *Code of Practice for* the *Environmental Management of Road Salts*; the *Gasoline and Gasoline Blend Dispensing Flow Rate Regulations*; the *Export and Import of Hazardous Waste and Hazardous Recyclable Materials Regulations*; and the *Wastewater Systems Effluent Regulations*, and *Fisheries Act subsection 36(3).*

Promoting compliance with transportation sector emission regulations

Imported "Yamma" engines are being destroyed after failing to meet Canadian emission standards.
Photo: Allison Grant © Environment and Climate Change Canada

There are six Regulations[3] covering on-and off-road vehicles and engines that apply to manufacturers in Canada and to persons importing prescribed products into Canada. During 2015–2016, regulatory program officers received over 750 technical inquiries from regulatees and prospective regulatees seeking clarifications related to the transportation sector regulations. Additionally, mail outs are regularly used to remind regulatees of forthcoming reporting deadlines. Supplemental guidance was posted to inform regulatees of the process related to informing the Department and owners of an emissions-related defect /recall.

Promoting Compliance with Small and Medium-sized Enterprises

Multi-instrument compliance-promotion activities provide an opportunity for stakeholders to obtain information regarding Acts and risk management instruments affecting their activities, in an efficient and effective way. Regulatees also benefit from the knowledge and experience of the on-site compliance promotion officers, the distribution of printed materials on the legislation, and the identification of contacts for further inquiries. In 2015–2016, ECCC reached small and medium-sized enterprises through over 45 campaigns on the 14 compliance promotion priority regulations, through multi-instrument activities, and on a per regulation basis.

In order to bring awareness to importers of products containing mercury, the Department provided an information package developed to provide specific information and present the benefits of engaging with ECCC, to around 2,000 potential importers in the regulated community. Additional efforts undertaken in British Columbia and Yukon to provide personalised information in the packages resulted in a 50% response rate from importers. The information garnered from the responses received and follow-up conversations has enabled ECCC to further its understanding of this community and will enable the Department to provide tailored information for the importer sector, when promoting compliance with the *Products Containing Mercury Regulations*. This importer engagement work also resulted in some reaction in the Twittersphere, leading some customs brokers and freight companies to tweet some of the Department's information to their clients.

3 The Regulations include: *Marine Spark-Ignition Engine, Vessel and Off-Road Recreational Vehicle Emission Regulations; Off-Road Compression-Ignition Engine Emission Regulations; Off-Road Small Spark-Ignition Engine Emission Regulations; On-Road Vehicle and Engine Emission Regulations; Passenger Automobile and Light Truck Greenhouse Gas Emission Regulations;* and *Heavy-duty Vehicle and Engine Greenhouse Gas Regulations*.

4.3 Enforcement Priorities

Each year, ECCC develops a National Enforcement Plan (NEP) that sets out the enforcement activities to be carried out in that fiscal year, including activities to address non-compliance with CEPA. Factors that influence the identification of priority activities include the risk to the environment and human health represented by the regulated substance or activity, suspected non-compliance issues, recent publication of new and amended regulations, operational complexity and capacity, and domestic and international commitments and obligations.

In 2015–2016, the NEP projects and priorities were carried out under the following CEPA instruments:

- *Tetrachloroethylene (Use in Dry Cleaning* and *Reporting Requirements) Regulations;*
- *Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations;*
- *PCB Regulations;* and
- *Off-road Compression-Ignition Engines Emission Regulations*

The number of planned inspections carried out under the NEP is supplemented by a large number of unplanned inspections resulting from responses to complaints, notifications from partners, intelligence or departmental referrals, reported spills and incidents, or other information. In addition, a number of regulations are identified for focus by specific regions. The focus placed on regulations in each region is influenced by a number of factors, including geography, the prevalence of the regulated sectors, region specific issues or concerns, and provincial and territorial environmental sensitivities.

4.4 Enforcement Activities

Enforcement activities undertaken during 2015–2016 are summarized in the following four tables.

- Table 14 provides the number of **on-site and off-site** inspections for each regulation from April 1, 2015, to March 31, 2016.
- Table 15 provides the breakdown of **investigations** for each regulation for which at least one investigation occurred and/or closed from April 1, 2015, to March 31, 2016.
- Table 16 provides the total number of **enforcement measures** resulting from inspections and investigations that were imposed between April 1, 2015, and March 31, 2016, for each regulation.
- Table 17 provides the number of **prosecutions** from April 1, 2015, to March 31, 2016, for each regulation.

4.4.1 Inspections

Inspections are defined as the active process of gathering information to verify compliance with legislation. This may include site visits, examining substances, products or containers, taking samples, and analyzing records. An **on-site** inspection involves visiting a site, a border crossing, an airport or a port of entry, to conduct any activity/operation/analysis required to verify the regulatee's compliance with a regulation or permit. An **off-site** inspection is normally undertaken at the officer's place of work or in another location that is not at the regulated site and is usually limited to documentation verification.

Table 14 outlines the number of inspections under CEPA for fiscal year 2015–2016. The total number of inspections relate to the number of regulatees inspected for compliance using the end date of the inspection for the reference period.

Table 14: Number of inspections under CEPA from April 1, 2015, to March 31, 2016

	Inspections*		
Instrument	**Total**	**Off-site**	**On-site**
***Canadian Environment Protection Act, 1999* - Total**	**3,898**	**1,165**	**2,733**
2-Butoxyethanol Regulations	1	-	1
Benzene in Gasoline Started before FY 2015-16 and ongoing at the start of the year Started in FY 2015-2016 Ended in FY 2015-2016 Regulations	136	110	26
CEPA - Sections	112	52	60
CEPA Section 56 Notices – Pollution Prevention Plans	4	-	4
CEPA Section 71 Notices – Toxics	1	1	-
Chromium Electroplating, Chromium Anodizing and Reverse Etching Regulations	60	24	36
Concentration of Phosphorus in Certain Cleaning Products Regulations	7	-	7
Disposal at Sea Regulations	90	35	55
Environmental Emergency Regulations	319	88	231
Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations	340	29	311
Federal Halocarbon Regulations, 2003	293	182	111
Gasoline and Gasoline Blend Dispensing Flow Rate Regulations	194	-	194
Interprovincial Movement of Hazardous Waste Regulations	17	1	16
Marine Spark-Ignition Engine, Vessel and Off-Road Recreational Vehicle Emission Regulations	21	-	21
National Pollutant Release Inventory	24	6	18
New Substances Notification Regulations (Chemicals and Polymers)	9	1	8
New Substances Notification Regulations (Organisms)	3	1	2
Off-Road Compression-Ignition Engine Emission Regulations	22	1	21
Off-Road Small Spark-Ignition Engine Emission Regulations	50	4	46
On-Road Vehicle and Engine Emission Regulations	3	-	3
Ozone-depleting Substances Regulations, 1998	81	9	72
PCB Regulations	614	108	506
PCB Waste Export Regulations, 1996	1	-	1
Perfluorooctane Sulfonate and its Salts and Certain Other Compounds Regulations	2	1	1
Pulp and Paper Mill Defoamer and Wood Chip Regulations	14	12	2
Pulp and Paper Mill Effluent Chlorinated Dioxins and Furans Regulations	15	7	8
Renewable Fuels Regulations	11	2	9
Solvent Degreasing Regulations	11	1	10
Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations	397	25	372
Sulphur in Diesel Fuel Regulations	117	90	27
Sulphur in Gasoline Regulations	27	1	26
Tetrachloroethylene (Use in Dry Cleaning and Reporting Requirements) Regulations	894	373	521
Volatile Organic Compound Concentration Limits for Architectural Coatings Regulations	7	1	6
Volatile Organic Compound Concentration Limits for Automotive Refinishing Products Regulations	1	-	1

*Only those regulations under which an inspection occurred during the time period are listed in this table.

4.4.2 Investigations

An investigation involves gathering, from a variety of sources, evidence and information relevant to a suspected violation. An enforcement officer will conduct an investigation when he or she has reasonable grounds to believe that an offence has been committed under the Act and authorities have determined that prosecution may be the appropriate enforcement action.

Table 15 describes the number of investigations under CEPA for fiscal year 2015–2016.

Table 15: Breakdown of investigations from April 1, 2015, to March 31, 2016

	Inspections*		
Instrument	**Started before FY 2015–16 and ongoing at the start of the year**	**Started in FY 2015–2016**	**Ended in FY 2015–2016**
Canadian Environment Protection Act, 1999 - Total	**87**	**54**	**39**
CEPA - Section(s)	27	17	12
Chromium Electroplating, Chromium Anodizing and Reverse Etching Regulations	2	-	-
Concentration of Phosphorus in Certain Cleaning Production Regulations	-	1	-
Disposal at Sea Regulations	5	4	1
Environmental Emergency Regulations	4	1	-
Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations	2	2	3
Federal Halocarbon Regulations, 2003	-	2	1
Gasoline and Gasoline Blend Dispensing Flow Rate Regulations	1	-	-
Marine Spark-Ignition Engine, Vessel and Off-Road Recreational Vehicle Emission Regulations	1	-	1
Off-Road Compression-Ignition Engine Emission Regulations	3	1	1
Off-Road Small Spark-Ignition Engine Emission Regulations	5	-	-
On-Road Vehicle and Engine Emission Regulations	1	1	-
Ozone-depleting Substances Regulations, 1998	5	1	2
PCB Regulations	8	6	4
PCB Waste Export Regulations, 1996	-	1	-
Renewal Fuels Regulations	1	1	-
Solvent Degreasing Regulations	-	-	1
Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations	11	5	4
Tetrachloroethylene (Use in Dry Cleaning and Reporting Requirements) Regulations	11	8	9
Volatile Organic Compound Concentration Limits for Automotive Refinishing Products Regulations	-	2	-

* Investigations are tabulated by the number of investigation files, based on the start or end date of the investigation. One investigation may be counted under one or more regulations, therefore the data at the regulation level may not add up to the total at the legislative level.

4.4.3 Enforcement Measures

The following responses are available to address alleged violations of CEPA and its regulations:

- **warnings** to bring an alleged violation to the attention of an alleged offender, so that he or she can return to compliance, if applicable;
- **directions** to address or to prevent illegal releases of regulated substances;
- **tickets** for certain offences, such as failure to submit written reports;
- various types of orders, including
  - **environmental protection compliance orders (EPCOs)** – to put an immediate stop to illegal activity, to prevent a violation from occurring or to require action to be taken;
  - **prohibition orders** – to prohibit activity involving a substance new to Canadian commerce;
  - **recall orders** – to recall illegal substances or products from the marketplace;
  - **detention orders** for ships;
- **injunctions**;
- **prosecution** under the authority of a Crown prosecutor; and
- **environmental protection alternative measures.**

Table 16 sets out the number of enforcement measures under CEPA for fiscal year 2015–2016.

In 2015–2016 there were no injunctions and no ministerial orders (recall orders and prohibition orders); therefore these columns do not appear.

Table 16: Number of Enforcement Measures from April 1, 2015, to March 31, 2016

	Inspections*			
Instrument	**Directions***	**Written Warnings***	**Number of Subjects involved in EPCOs****	**EPCOs***
Canadian Environment Protection Act, 1999 - Total	**2**	**2,757**	**88**	**560**
CEPA - Section(s)	-	25	-	-
Chromium Electroplating, Chromium Anodizing and Reverse Etching Regulations	-	23	3	7
Disposal at Sea Regulations	-	6	-	-
Environmental Emergency Regulations	-	524	4	41
Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations	-	116	2	8
Federal Halocarbon Regulations, 2003	-	52	2	7
Gasoline and Gasoline Blend Dispensing Flow Rate Regulations	-	38	2	2
Marine Spark-Ignition Engine, Vessel and Off-Road Recreational Vehicle Emission Regulations	-	54	-	-
National Pollutant Release Inventory	-	6	-	-
Off-Road Compression-Ignition Engine Emission Regulations	-	72	-	-
Off-Road Small Spark-Ignition Engine Emission Regulations	-	96	-	-
On-Road Vehicle and Engine Emission Regulations	-	1	-	-
Ozone-depleting Substances Regulations, 1998	-	6	1	1
PCB Regulations	1	147	20	81
Renewable Fuels Regulations	-	22	-	-

Solvent Degreasing Regulations	-	6	-	-
Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations	-	1,203	38	360
Tetrachloroethylene (Use in Dry Cleaning and Reporting Requirements) Regulations	1	360	16	53

*Directions, written warnings, and EPCOs are tabulated by infractions, which are found at the section, subsection or paragraph level of a regulation. For example, if the outcome of an inspection is the issuance of a written warning that relates to three sections of a given regulation, the number of written warnings is three, even if a single letter was sent to the regulatee.

**The number of subjects involved in EPCOs is represented by the number of regulatees issued EPCOs, regardless of the number of sections. For example, if one regulatee was issued an EPCO for three sections of the PCB Regulations, the number of subjects involved is one.

4.5 Prosecutions, Tickets and EPAMs

Prosecutions

For reporting purposes, prosecutions are all instances in which charges were laid against a person (individual, company, or government department). The decision to prosecute is made with due consideration of the factors set out in the *Compliance and Enforcement Policy for CEPA (1999)* and ultimately rests with the Director of Public Prosecution (DPP) of Canada. While reviewing the data, it should be noted that prosecutions often continue through multiple fiscal years, so there may be more counts tabulated during a particular year than actual charges laid.

Tickets

Tickets can be issued under CEPA, usually where there is minimal or no threat to the environment or human health. Where an offence is designated as ticketable, enforcement officers will issue a ticket, unless they have determined that, in accordance with the criteria of the *Compliance and Enforcement Policy for CEPA (1999),* a warning is the appropriate response.

EPAMs

An Environmental Protection Alternative Measure (EPAM) is an agreement that is negotiated in order to return an alleged violator to compliance with CEPA. It can be used only after a charge has been laid and before the matter goes to trial as an alternative measure to prosecution for an alleged violation of the *Act*.

Table 17 outlines the number of prosecutions, tickets, and EPAMs under CEPA for fiscal year 2015–2016.

Table 17: Number of Prosecutions and new EPAMs from April 1, 2015, to March 31, 2016

Instrument	Prosecutions					
	Tickets	Charges laid in 2015–2016		Concluded in FY 2015–2016		EPAMs
		Prosecuted Subjects*	Counts**	Convicted Subjects	Guilty Counts	
Canadian Environment Protection Act, 1999 - Total	53	16	28	24	46	6
CEPA - Section(s)	1	7	11	9	16	1
Chromium Electroplating, Chromium Anodizing and Reverse Etching Regulations	5	-	-	-	-	3
Disposal at Sea Regulations	-	1	1	-	-	-
Environmental Emergency Regulations	-	1	1	1	1	-
Marine Spark-Ignition Engine, Vessel and Off-Road Recreational Vehicle Emission Regulations	-	-	-	1	2	-
Ozone-depleting Substances Regulations, 1998	2	-	-	-	-	-
PCB Regulations	4	2	4	1	2	2
Solvent Degreasing Regulations	-	-	-	1	2	-
Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations	-	1	1	1	1	-
Tetrachloroethylene (Use in Dry Cleaning and Reporting Requirements) Regulations	41	3	9	8	21	-
Volatile Organic Compound Concentration Limits for Automotive Refinishing Products Regulations	-	1	1	1	1	-

* Prosecuted subjects are the number of subjects charged, where the charge date falls within the reporting period. This means that the number of prosecutions launched is counted, not the number of prosecutions concluded in the reporting year. For example, if a prosecution resulted in a conviction in February 2016 but charges were laid in January 2015, it would not be counted in the columns relating to charges laid. As well, prosecuted subjects are counted by the number of parties charged. This means that if one case resulted in the prosecution of two different subjects, the number reported would be two. The number of prosecuted subjects does not necessarily correspond to the total at the legislative level, because one prosecution might be related to more than one instrument.

**Counts are the number of sections of legislation or regulations, for which there was a charge or conviction during the reporting period. For example, if one person is charged with two counts under CEPA, this is considered one charge laid against the subject and two counts.

***Convicted subjects are the number of subjects convicted during the reporting period and are based on date sentenced.

****EPAMs are counted by the number of charges laid before entering the alternative measures agreement.

4.6 Enforcement Highlights

Storage Tank Systems for Petroleum Products

The *Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations* establish technical standards for the design and installation of storage tank systems in order to reduce the risk of contaminating soil and groundwater as a result of spills and leaks of petroleum products and allied petroleum products from storage tank systems.

In 2014, 331 petroleum products storage tank systems were identified as being at high risk of leaking and contaminating soil and groundwater. A project was launched to address the issue. At the end of March 2016, 86% (283 systems of 331) had been inspected. Of those, 60% (169 of 283) were either in compliance with the regulations, or had returned to compliance. During the reporting period, 40 written warnings and 33 environmental protection compliance orders were delivered under this project. The work continues to ensure the remaining systems will be inspected and returned to compliance by the end of 2017.

Polychlorinated Biphenyls (PCBs)

PCBs are persistent, toxic substances that pose a risk to human health and the environment; and are therefore on the List of Toxic Substances in Schedule 1 of CEPA. The *PCB Regulations* set specific deadlines for ending the use of PCBs in concentrations at or above 50 mg/kg, eliminating all PCBs and equipment containing PCBs currently in storage, and limiting the period of time PCBs can be stored before being destroyed.

Equipment with PCB concentrations greater than 500 mg/kg, were set to be removed from service and sent to be destroyed by December 31, 2014. In 2015–2016, inspections were conducted at 44 companies to ensure that this equipment had been removed and destroyed or on its way to being destroyed. By March 2016, confirmation had been received regarding the removal and destruction of equipment at 89% of the facilities. Follow up will occur in fiscal year 2016–2017 to ensure compliance with the regulations at the remaining facilities.

Dry Cleaning

Tetrachloroethylene, also known as perchloroethylene and commonly called PERC or PCE, is a chemical used in Canadian dry cleaning. PERC is on the List of Toxic Substances in Schedule 1 of the *Act* as it poses a risk to environmental and human health. ECCC has developed the *Tetrachloroethylene (Use in Dry Cleaning and Reporting Requirements) Regulations* ("PERC Regulations") to reduce the release of PERC to the environment from dry cleaning facilities.

Since 2012–2013, ECCC has been working on a compliance rate project for tetrachloroethylene. In 2012–2013, inspections were conducted at 216 facilities, and the compliance rate with the environmental provisions of the regulations was found to be 51%. The project's objective was a ten percent increase from 2012–2013 levels. In 2013–2014 and 2014–2015, the Department conducted an intensive campaign to increase regulatees' awareness of the regulations.

In 2015–2016, 325 facilities were inspected. The result was a 63% compliance rate with the environmental provisions of the Regulations, yielding an increase of 11%.

4.7 International Enforcement Cooperation

Enforcement-related activities are carried out under various international and domestic agreements and organizations. ECCC actively participates in INTERPOL's Pollution Crime Working Group, which brings together member countries to work collectively on pollution crime issues. ECCC also engages in cooperative activities with its counterparts at the U.S. Environmental Protection Agency (EPA) and Mexico's PROFEPA (Federal Attorney for Environmental Protection) and SEMARNAT (Secretariat of Environment and Natural Resources) under the umbrella of the Commission for Environmental Cooperation's Enforcement Working Group (EWG). In addition, ongoing bilateral cooperation between the U.S. EPA and ECCC Enforcement supports both countries' domestic mandates, particularly in the area of cross border environmental crime.

5. APPENDIX A: REPORTING REQUIREMENTS

This report includes the following mandatory information:

- Section 2 (all subsections) provides examples of the types of research initiatives and their key contributions in the reporting period. Environment and Climate Change Canada and Health Canada scientists published numerous reports, papers, book chapters, articles and manuscripts on subjects related to CEPA. This body of work appeared in books and scientific journals that are available in libraries and from the publishers.
- Section 3.1 describes the activities of the National Advisory Committee. There were no other committees established under paragraph 7(1)(*a*) of CEPA during the reporting period.
- Section 3.1 also describes the activities under three federal-provincial agreements, including:
  - the Canada–Ontario Agreement Respecting the Great Lakes Basin Ecosystem;
  - the Canada–Alberta Equivalency Agreement;
  - the Canada–Nova Scotia Equivalency Agreement; and
  - Environmental Occurrences Notification Agreements
- There were no activities under the international air pollution provisions (Division 6 of Part 7) of CEPA during the reporting period.
- There were no activities under the international water pollution provisions (Division 7 of Part 7) of CEPA during the reporting period.

6. APPENDIX B: CONTACTS

Further information on CEPA and related activities can be found online at:

CEPA Environmental Registry website (www.ec.gc.ca/lcpe-cepa/default.asp?lang=En&n=D44ED61E-1)

Environment and Climate Change Canada's website (www.ec.gc.ca)

Health Canada's website (www.hc-sc.gc.ca)

Chemical Substances website (http://chemicalsubstanceschimiques.gc.ca/index-eng.php)

Environment and Climate Change Canada publications are available from the departmental library or the nearest regional library. Many departmental publications are also available online at www.ec.gc.ca/publications or through Environment and Climate Change Canada's Inquiry Centre:

Environment and Climate Change Canada
Public Inquiries Centre
7th Floor, Fontaine Building
200 Sacré-Coeur Boulevard
Gatineau QC K1A 0H3
Telephone: 819-997-2800
Toll Free: 1-800-668-6767 (in Canada only)
Email: ec.enviroinfo.ec@canada.ca

The following media relations contacts are also available to provide information:

Environment and Climate Change Canada
Media Relations
Toll-free within Canada: 1-888-908-8008
Outside Canada: 1-819-934-8008
Email: ec.media.ec@canada.ca

Health Canada
Media Relations
Telephone: 613-957-2983

For information about the role of the *Canada Gazette* and how to comment on proposed regulations before enactment, consult the *Canada Gazette* website at www.gazette.gc.ca or contact *Canada Gazette* general inquiries:

Email: info.gazette@pwgsc-tpsgc.gc.ca

Telephone: 613-996-1268
Toll-free: 1-866-429-3885
TTY: 1-800-926-9105
Fax: 613-991-3540