



Environment and
Climate Change Canada

Environnement et
Changement climatique Canada

Canada

Canadian Environmental Protection Act, 1999



ANNUAL REPORT

FOR APRIL 2016 TO MARCH 2017

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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, 2016, to March 31, 2017. 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 general steps followed to address each risk can 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 Registry is 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. It can be found online at www.canada.ca/en/environment-climate-change/services/canadian-environmental-protection-act-registry.html.

In December 2016, Part 7, Division 1 (Nutrients) of CEPA was amended when Bill C-13 *An Act to amend the Food and Drugs Act, the Hazardous Products Act, the Radiation Emitting Devices Act, the Canadian Environmental Protection Act, 1999, the Pest Control Products Act and the Canada Consumer Product Safety Act and to make related amendments to another Act* received Royal Assent. The amendment provides the regulation-making authority to exempt goods in transit from the prohibition in section 117 and to distinguish among classes of cleaning products or water conditioners. This amendment will enable Canada to comply with the World Trade Organization's Agreement on Trade Facilitation.

2. ADDRESSING KEY RISKS

2.1 TOXIC SUBSTANCES HARMFUL TO HUMAN HEALTH OR THE ENVIRONMENT

Parts 4, 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 were 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 UPDATE

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, 2017, assessments were published for 3,073 of those 4,300 substances. When substances are assessed as "toxic", the Government of Canada takes action to address the risks to health and the environment. In 2016–2017, 16 risk management instruments were published, including the proposed *Microbeads in Toiletries Regulations* and the *Code of Practice to ensure the Environmentally Sound Management of End of Life Lamps Containing Mercury*.

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. In 2016–2017, 473 notifications to manufacture or import new substances were received from industry and assessed within targeted timelines. The Chemical Substances website at www.canada.ca/en/health-canada/services/chemical-substances.html provides more information on the CMP and its related activities.

2.1.1 Monitoring

Monitoring and surveillance activities are essential to identify and track levels and trends of chemicals in the environment and human exposure to those chemicals. A broad range of monitoring activities for chemicals was conducted to support a number of domestic programs including 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. Monitoring activities also support Canada's contribution to international efforts, such as the 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.

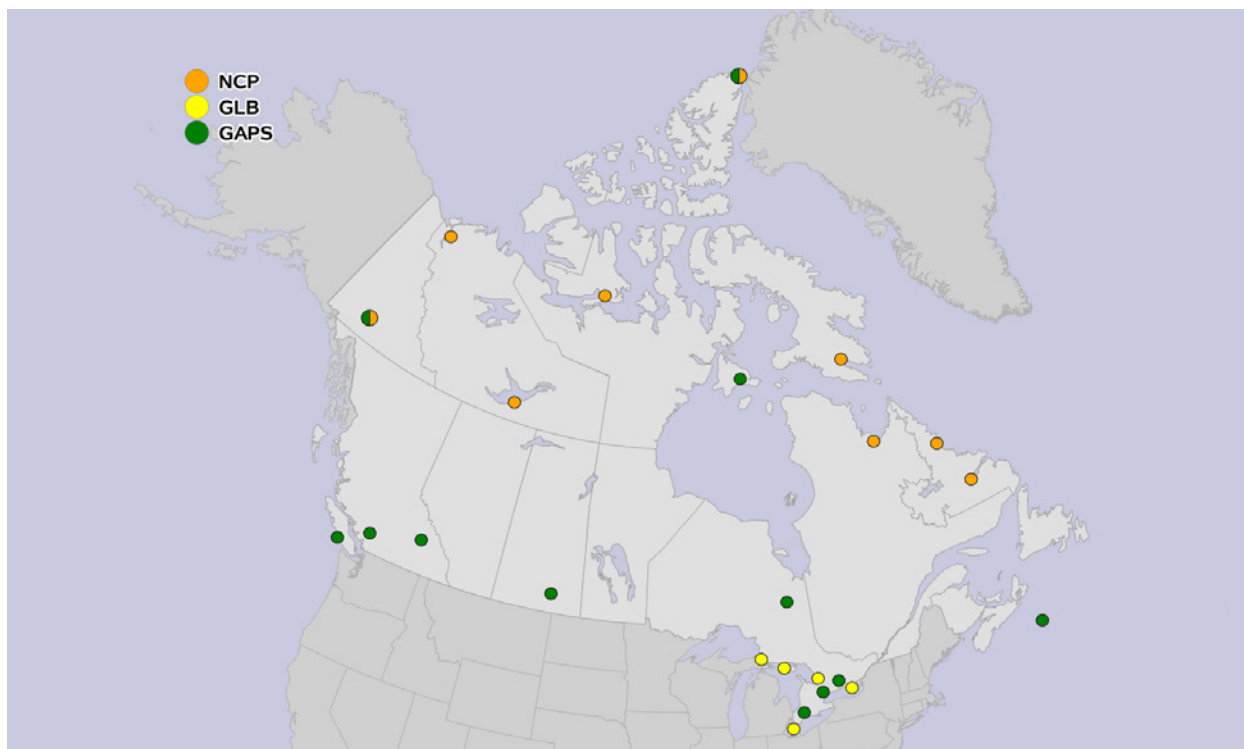
The CMP Environmental Monitoring and Surveillance Program involves the collection of data on the concentration of chemical substances in environmental compartments at locations across Canada. Environmental compartments include surface water, sediment, air, aquatic biota and wildlife. Wastewater system 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 2016–2017 included polybrominated diphenyl ethers (PBDEs), organophosphate ester 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 naphthalenes (PCNs), siloxanes, triclosan, bisphenol A (BPA), nonylphenol and its nonylphenol ethoxylates (NP/NPEs), short chain chlorinated paraffins, and metals, such as mercury, cadmium, cobalt and selenium.

Through other initiatives, environmental monitoring continued 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.

ECCC also monitors hazardous airborne chemicals through the Great Lakes Monitoring Program, the Global Atmospheric Passive Sampling network (GAPS), and the atmospheric component of the Northern Contaminants Program (NCP) (Figure 2). Air and precipitation monitoring in the Great Lakes Basin measures persistent organic pollutants (POPs), other priority chemicals and trace metals to determine the atmospheric loadings of these substances to the Great Lakes. GAPS uses cost-effective and simple passive air samplers designed by ECCC scientists to collect data on POPs and other priority chemicals. The atmospheric component of NCP conducts long-term monitoring of POPs and other priority chemicals in the Canadian Arctic to evaluate trends and to assess the influence of long-range atmospheric transport.

Figure 2. Map of hazardous air pollutant monitoring sites



Health Canada (HC) funded seven health CMP monitoring and surveillance projects in 2016–2017. Monitoring activities continued to focus on human exposure to contaminants, including biomonitors of selected novel flame retardants and synthetic musks, measurements of various Volatile Organic Compounds (VOCs), metabolites in urine, and measurements of halogenated flame retardants in blood of children recruited from a large birth cohort study.

HC continued analysis and publication of biomonitors results from the Maternal-Infant Research on Environmental Chemicals (MIREC) Research Platform. In 2016–2017, six MIREC journal articles were published including biomonitors results for organophosphate (OP) pesticides, perfluoroalkyl substances (PFASs) and other persistent organic pollutants (POPs), metals (lead, cadmium, arsenic, mercury and manganese) and chemical mixtures. Extension of the MIREC Research Platform has been approved to measure additional chemicals such as glyphosate, additional phthalates, bisphenol A substitutes, OP flame retardants and the organic solvents N-Methyl-2-pyrrolidone (NMP) and N-Ethyl-2-pyrrolidone (NEP) in biobanked maternal samples.

HC's human biomonitors (HBM) efforts continued in 2016–2017 with the Canadian Health Measures Survey (CHMS), measuring environmental chemical exposures in Canadians aged 3 to 79. Laboratory analyses for cycle 4 (2014–2015) were completed and data analysis was underway for the Fourth Report on Human Biomonitors of Environmental Chemicals in Canada, to be published in 2017–2018. In addition, sample collection for cycle 5 (2016–2017) continued. New priority chemicals for inclusion in cycle 7 (2020–2021) and beyond were identified through stakeholder outreach and laboratory consultations. In 2016–2017, three CHMS journal articles were published including an overview of the initial six cycles of the CHMS and the first set of Canadian reference values (RV95) for metals and persistent organic pollutants. CHMS data also contributed to the recent assessment reports for triclosan and ethylbenzene and has been proposed for use in the biomonitors based approach planned for molybdenum, silver, thallium and vanadium.

CASE STUDY

The Canadian Health Measures Survey

As a component of the CMP, the CHMS is an ongoing cross-sectional direct measures survey implemented in two-year cycles in Canada. The objectives of CHMS regarding HBM is to determine nationally-representative concentrations of environmental chemicals in biological specimens (blood, urine, and hair) and provide biomonitoring data to elucidate temporal trends of chemical exposure, to facilitate data comparison among sub-populations in Canada and other countries, and to identify any potential exposure sources (e.g., smoking leading to increased blood levels of benzene, toluene, ethylbenzene, and xylenes, collectively known as BTEX)¹.

Currently, CHMS biomonitoring data have been used to achieve the following: (1) establish baseline concentrations of chemicals in the general Canadian population, (2) inform chemical risk assessment and risk assessment activities, (3) assess effectiveness of regulatory and risk management actions, and (4) fulfill national and international reporting requirements. HBM data for CHMS cycles 1–3 (i.e. from 2007 to 2013) are published and available online.² HC was highlighted at the second international Human Biomonitoring Conference in April 2016 (Berlin, Germany) and two staff were invited as experts for the launch of the European Human Biomonitoring Initiative in December 2016 (Brussels, Belgium).

Both ECCC and HC contribute to the Northern Contaminants Program (NCP) led by Indigenous and Northern Affairs Canada (INAC). ECCC has been a major contributor in monitoring abiotic media, aquatic biota and wildlife, as well as Arctic ecosystem health. In 2016–2017, HC completed six human biomonitoring (HBM) and health projects under the Northern Contaminants Program (NCP). HC partners with Indigenous and Northern Affairs Canada 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. INAC and HC continued work on a Canadian Arctic Contaminants Assessment Report (CACAR) on Human Health, which was initiated in 2015 and will be published in 2017–2018.

ECCC scientists have co-led and contributed to the Arctic Council's Arctic Monitoring and Assessment Programme (AMAP) report (2015) on temporal trends in persistent organic pollutants in the Arctic (www.amap.no/documents/doc/amap-assessment-2015-temporal-trends-in-persistent-organic-pollutants-in-the-arctic/1521), which was published in December 2016.

More information about monitoring activities is available online at www.canada.ca/en/environment-climate-change/services/canadian-environmental-protection-act-registry/monitoring-reporting-research/monitoring.html.

2.1.2 Research

During 2016–2017, research on chemicals was carried out by both departments under a number of programs, including the CMP, the NCP, the Strategic Technology Applications of Genomics in the Environment Program, Genome Canada 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, complex

¹ Haines, D.A. and Murray, J. 2011. Human biomonitoring of environmental chemicals—early results of the 2007-2009 Canadian Health Measures Survey for males and females. *Int. J. Hyg. Environ. Health*.

² Haines, 2016 www.canada.ca/en/health-canada/services/environmental-workplace-health/environmental-contaminants/human-biomonitoring-environmental-chemicals/canadian-health-measures-survey.html

environmental mixtures, 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.

Nineteen (19) CMP research projects at HC were funded in 2016–2017 on a number of subjects, such as, the distribution of chemical substances in the dust of Canadian houses and the effects of flame retardants and other chemicals on endocrine, reproductive systems and adipogenesis (fat cell formation), as well as their potential developmental neurotoxicity. Research projects addressed knowledge gaps on: 1) the effects of exposure of priority substances to humans and the environment, including on environmental fate and effects, and toxicology; 2) identification and characterization of sources, pathways and levels of exposure, and; 3) the development of tools, testing and analytical methodologies.

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. For example, research was conducted on refining the assessment of exposures to engineered nanomaterials (ENMs) through improved sampling and analytical methods, and characterizing dermal exposure to nanomaterials from cosmetic products.

Under the CMP, focused research took place in order to develop quantitative approaches for improved regulatory evaluation & risk assessment of genotoxic substances, as well as case studies on the application of integrated testing strategies in human health risk assessment.

CASE STUDY

Avian 'in vitro' evaluation of Bisphenol A (BPA) alternatives

Avian toxicological evaluations of chemicals that could replace BPA have been conducted in the molecular toxicology laboratory at the National Wildlife Research Centre using in vitro, high throughput screening techniques (automation) and toxicogenomics³ to elucidate pathway-based effects. The goal of the research is to assist regulators in identifying appropriate and safe alternatives to BPA given the restrictions on its use.

One of the potential BPA alternative chemicals altered several toxicologically-relevant genes, while another replacement alternative was slightly less toxic. Research is ongoing to further understand the toxic modes of action and whether these replacement chemicals truly represent safe alternatives.

CASE STUDY

Rare Earth Elements, Uranium and Thorium in the Canadian House Dust Study

The Canadian House Dust Study was designed to provide a national baseline of concentrations of chemical substances in settled dust, against which changes in indoor environmental quality may be monitored over time.

³ A field of science that deals with the collection, interpretation, and storage of information about gene and protein activity within a particular cell or tissue of an organism, in response to toxic substances

Rare earth elements are in high demand because they are used in electronics and high-performing speakers, as tiny magnets in MP3 players and ear buds and as colours in flat screen TVs and monitors. Rare earth elements are also used in green technologies such as hybrid car batteries, wind turbines and solar panels.

Results were published in an Indoor Air article in 2017, which reported on nationally representative indoor dust concentrations and surface loadings of rare earth elements, plus uranium and thorium. Interesting correlations suggest primary indoor sources of the study elements, including:

- uranium and thorium in cat litter, caused by geological impurities in bentonite clay
- lighter flints in homes of smokers, which are made of a combustible mixture of rare earth elements called “mischmetal”, and
- hardwood floor coatings, which incorporate rare earth elements such as pigments and drying agents.

The study used a rigorous random sampling approach to collect settled dust samples from 1025 urban homes across 13 cities with a population greater than 100,000.

The next step is to determine whether rare earth elements in indoor particles pose an inhalation health risk, by investigating their solubility in the human lung. This research will inform risk assessments under the Chemicals Management Plan, slated to be complete by 2020.

Research projects were also carried out by ECCC under the CMP on flame retardants, persistent organic pollutants (POPs), polycyclic aromatic compounds (PACs), pesticides and advances in air sampling tools and applications:

- Flame retardant research included investigating levels and possible sources of organophosphate and brominated flame retardants in the Arctic; and assessing levels and human exposure in outdoor air and indoor dust.
- Persistent organic pollutants (POPs) research included assessing changes in cycling, fate and trends of POPs in the Northern Hemisphere and the Arctic under the influence of climate change; a review of air quality monitoring data to assess the effectiveness of the Stockholm Convention; investigating the use of tree cores as a source of historic data on POPs in the atmosphere; and measuring concentrations and loading of organochlorine pesticides, polychlorinated biphenyls, PAHs and flame retardants in the Canadian Great Lakes Basin.
- Polycyclic aromatic compounds research included a review of the effectiveness of air monitoring under the Stockholm Convention; and work on PACs in the oil sands region, including developing indicators for toxicity of PACs in the atmosphere and assessing deposition of PACs in snow.
- Pesticides research included analysis of pesticide concentrations in melt ponds on Arctic sea ice; and assessing dicofol concentrations in the air.

During the fiscal year 2016–2017, four research projects funded under the CMP helped in the understanding of the occurrence and fate of specific pharmaceuticals in Canadian wastewater treatment systems and in agricultural soil.

Research projects also developed and validated biotechnology-based assays for use in the assessment of risks from chemical substances, as well as enhanced scientific capacity for risk assessment for the pathogenicity potential of microorganisms associated with biotechnology (see further details in 2.2.1).

In 2016–2017, assessments of the toxic potencies of benzotriazoles and benzothiazoles to fish cell lines were also completed and published. Effects from exposure to pesticides on plants, algae, frogs, amphipods and grasshoppers using laboratory/greenhouse or outdoor mesocosm experiments (controlled conditions) were completed and published in 2016–2017.

Under the CMP, ECCC scientists published approximately 80 research papers and HC scientists also published approximately 80 research papers related to these projects in 2016–2017.

2.1.3 Information gathering

Section 71 mandatory surveys

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

From April 1, 2016 to March 31, 2017, the following three notices for mandatory information gathering initiatives were published:

- 2017 Inventory Updates (published on January 14, 2017) – to gather information on approximately 1430 chemical and polymers to inform activities in priority setting, risk assessment and risk management programs at ECCC and HC.
- Asbestos (published on December 17, 2016) – to gather information on the manufacture, import, export and use of asbestos (seven substances) and products containing asbestos for the 2013, 2014 and 2015 calendar years as well as socio-economic information from companies. The data will be used to support the development of additional regulatory measures for asbestos under CEPA and inform the cost-benefit analysis of any future regulatory instrument.
- Hydrofluorocarbons (published on June 11, 2016) – to gather information on hydrofluorocarbons (20 substances) manufactured, imported or exported in bulk, whether alone or in a mixture, during the 2015 calendar year. The data are needed to understand the use of these substances and bulk quantities in Canadian commerce and assess the need for domestic control strategies as well as international actions.

In addition, a total of four voluntary data gathering initiatives on 45 organic groupings and 14 inorganic groupings were conducted in the summer and fall of 2016 to inform assessments.

Maintaining up-to-date knowledge of commercial activities of chemical substances in Canada continues to be important for the delivery of the Government's domestic and international commitments. While information received during the first and second phases of the Inventory Update (IU) was critical to inform priority setting, the 2017 IU was designed to support decision making for work beyond the current risk assessment plan. Emerging science, evolving domestic and international programs and chemical market fluctuations will continue to be considered in order to ensure future priorities are reflective of Canada's dynamic market.

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 2016–2017, 473 new substance notifications were received pursuant to sections 81 and 106 of CEPA and the *New Substances Notification Regulations* (Chemicals and Polymers) and the *New Substances Notification Regulations* (Organisms). Some of these notifications were related to products also regulated under the *Food and Drugs Act* (FDA), and to nanomaterials and substances that have the potential to be manufactured in the nanoscale.

In 2016–2017, five 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 149 waivers of information requirements were granted and published in the *Canada Gazette*. One hundred and thirty-four (134) were for new chemical and polymer substances and 15 for new living organisms.

Substances in products regulated under the FDA are subject to the new substances provisions in CEPA. For new substances in products regulated under the FDA, 29 notifications for chemical/polymer substances and living organisms were received in 2016–2017. Substances in products regulated under the FDA between 1987 and 2001 that are on the administrative *Revised in Commerce List* (~3500), were prioritized for further consideration. Substances identified for further consideration will be assessed to determine whether they meet or are capable of meeting any of the criteria set out in section 64 of CEPA.

Existing substances assessment

ECCC and HC conduct risk assessments 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 2016–2017, the Minister of Health and the Minister of the Environment published 23 draft screening assessment reports covering 358 substances. In addition, 21 final screening assessment reports were published covering 1162 substances. Of the 1520 substances assessed, 32 meet or are proposed to meet one or more of the criteria set out in section 64 of CEPA.

In addition, two State of the Science documents were published for three substances from the Certain Organic Flame Retardants Substance Grouping (one report was published for benzene, 1,3,5-tribromo-2-(2-propenyloxy)-, also known as ATE, and another report was published for 2-ethylhexyl 2,3,4,5-tetrabromobenzoate, also known as TBB, and bis(2-ethylhexyl) 3,4,5,6-tetrabromophthalate, also known as TBPH).

Four Science Approach documents were also published covering 749 low concern substances. Conclusions for these substances will be published in screening assessment reports at a later date.

Table 1 lists the 2016–2017 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).

Table 1: Summary of existing substance assessment decisions published from April 2016 to March 2017
(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*
Hexachloroethane (1)	No	NFA	February 8, 2014	April 30, 2016
Ethylbenzene (1)	No	NFA	February 8, 2014	April 30, 2016
Stream 4 Heavy Fuel Oils (7)	No	NFA	September 6, 2014	April 30, 2016
Ethene (1)	No	NFA	January 25, 2014	May 21, 2016
BDPT (1)	No	NFA	January 25, 2014	May 21, 2016
Certain Azo Basic Dyes of the Aromatic Azo and Benzidine-based Substance Grouping (33)	No	NFA	July 26, 2014	May 28, 2016
Certain Aromatic Amines of the Aromatic Azo and Benzidine-based Substance Grouping (16)	No	NFA	July 26, 2014	May 28, 2016
Internationally Classified Substance Grouping – Cresol Substances (4)	No	NFA	July 19, 2014	May 28, 2016
Internationally Classified Substance Grouping – AEEA (1)	No	NFA	July 19, 2014	May 28, 2016
Internationally Classified Substance Grouping – Ethyl Carbamate (1)	Yes	NFA	July 19, 2014	May 28, 2016
Certain Azo Solvent Dyes of the Aromatic Azo and Benzidine-based Substance Grouping (22)	No	NFA	November 2, 2013	May 28, 2016
Certain Monoazo Pigments of the Aromatic Azo and Benzidine-based Substance Grouping (33)	No	NFA	November 2, 2013	May 28, 2016
Distillate Aromatic Extracts (3)	No	NFA	June 4, 2016	
Asphalt and Oxidized Asphalt (2)	No	NFA	June 4, 2016	
Coal Tars and their Distillates (6)	Yes	Add to Schedule 1	June 11, 2016	
Petrolatum and Waxes (3)	No	NFA	March 7, 2015	June 11, 2016
Certain Azo Acid Dyes of the Aromatic Azo and Benzidine-based Substance Grouping (52)	No	NFA	October 25, 2014	June 18, 2016
Rapid Screening of Polymers identified from Phase Two of the Domestic Substances List Inventory Update (275)	No	NFA	February 28, 2015	June 18, 2016
Boric Acid, its Salts and Precursors Substance Grouping (14)	Yes	Add to Schedule 1	July 23, 2016	
Rapid Screening of Substances from Phase Two of the Domestic Substances List Inventory Update (612)	No	NFA	February 28, 2015	August 27, 2016
Certain Organic Flame Retardants Substance Grouping – Melamine (1)	No	NFA	October 8, 2016	
Certain Organic Flame Retardants Substance Grouping – TCP (1)	No	NFA	October 8, 2016	
Certain Organic Flame Retardants Substance Grouping – DP (1)	Yes	Add to Schedule 1	October 8, 2016	

Certain Organic Flame Retardants Substance Grouping – TCPP and TDCPP (2)	Yes (TCPP only)	Add to Schedule 1 (TCPP); NFA (TDCPP)	October 8, 2016	
Certain Organic Flame Retardants Substance Grouping – EBTBP (1)	No	NFA	October 8, 2016	
Certain Organic Flame Retardants Substance Grouping – DBDPE (1)	Yes	Add to Schedule 1	October 8, 2016	
Nineteen Substances on the Domestic Substances List Associated with Pesticidal Uses (19)	No	NFA	June 6, 2015	October 15, 2016
Triclosan (1)	Yes	Add to Schedule 1	March 31, 2012	November 26, 2016
Alkyl Sulfates and a-Olefin Sulfonate group (4)	No	NFA	December 10, 2016	
Substituted Diphenylamine Substance Grouping (14)	No	NFA	December 10, 2016	
Chloral Hydrate (1)	No	NFA	December 17, 2016	
Natural Gas Condensates (3)	Yes	Add to Schedule 1	October 11, 2014	December 31, 2016
Formic Acid and Formates Substance Group (4)	No	NFA	December 31, 2016	
Acetic Anhydride (1)	No	NFA	January 28, 2017	
Short-chain Alkanes (5)	No	NFA	January 28, 2017	
Sulfurized Lard Oil (1)	No	NFA	February 4, 2017	
NMP and NEP (2)	No	NFA	February 4, 2017	
2-MBS (1)	No	NFA	February 11, 2017	
Liquefied Petroleum Gases (2)	Yes	Add to Schedule 1	October 11, 2014	February 25, 2017
4-Vinylcyclohexene (4-VCH) (1)	No	NFA	February 25, 2017	
Ethylene Glycol Ethers Group (7)	No	NFA	March 4, 2017	
Certain Azo Disperse Dyes of the Aromatic Azo and Benzidine-based Substance Grouping (74)	Yes (Disperse Yellow 3 only)	Add to Schedule 1 (Disperse Yellow 3); NFA (73)	November 2, 2013	March 11, 2017
Second phase of Polymer Rapid Screening (283)	No	NFA	March 18, 2017	
Calcium 2-Ethylhexanoate and 2-Ethylhexyl-2-Ethylhexanoate (2)	Yes (2-Ethylhexyl-2-Ethylhexanoate only)	Add to Schedule 1 (2-Ethylhexyl-2-Ethylhexanoate)	March 25, 2017	

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

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.

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.

The substances or groups of substances that the Ministers proposed to be added to Schedule 1 of CEPA in 2016–2017 are listed in Table 2.

Table 2: Proposed orders adding substances to Schedule 1 of CEPA 1999 from April 2016 to March 2017

SUBSTANCE	DRAFT ORDER
Fuel Oil No. 2	April 23, 2016
Triclosan	December 10, 2016
Natural Gas Condensates	February 18, 2017

The substances or groups of substances that were added to Schedule 1 in 2016–2017 are listed in Table 3.

Table 3: Orders adding substances to Schedule 1 of CEPA 1999 from April 2016 to March 2017

SUBSTANCE	FINAL ORDER
Microbeads	June 29, 2016
4 Industry-restricted petroleum and refinery gases and 40 site-restricted petroleum and refinery gases	October 5, 2016
DEHA, PREPOD and Solvent Red 23	December 14, 2016

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 2016-2017, the following six scope documents were published:

- boric acid, its salts and its precursors
- coal tars and their distillates
- DBDPE, DP and TCPP from Certain Organic Flame Retardants substance grouping, and
- 2-ethylhexyl-2-ethylhexanoate.

Similar to the risk management scopes, when the final screening assessment report concludes that a substance is “toxic” under CEPA and proposed for addition to Schedule 1 of the Act, 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.

In 2016–2017, risk management approach documents were published for the following substances:

- ethyl carbamate,
- triclosan,
- natural gas condensates,
- liquefied petroleum gases, and
- azo disperse yellow 3.

Under the CMP a wide range of risk management instruments are used, including regulations, pollution prevention planning notices, environmental performance agreements, 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.

Regulations

On June 1, 2016, ECCC and HC published in *Canada Gazette*, Part II, the *Regulations Repealing the Vinyl Chloride Release Regulations, 1992*. These Regulations repealed the *Vinyl Chloride Release Regulations, 1992* and certain provisions in the *Regulations Designating Regulatory Provisions for Purposes of Enforcement (Canadian Environmental Protection Act, 1999)*. Only one facility producing PVC operates in Canada and it is subject to Ontario Ministry of the Environment regulations, which establish emission requirements that adequately protect human health.

The *Prohibition of Certain Toxic Substances 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. On October 5, 2016, ECCC published the *Regulations Amending the Prohibition of Certain Toxic Substances Regulations, 2012* in the *Canada Gazette*, Part II, resulting in the addition of 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, its salts and its precursors (collectively referred to as PFOS).

On November 5, 2016, ECCC published the proposed *Regulations Amending the Prohibition of Certain Substances Regulations, 2012* to modify the *Prohibition of Certain Toxic Substances Regulations, 2012* to revise existing controls on benzenamine, N-phenyl-, reaction products with styrene and 2,4,4-trimethylpentene (BNST). Subsequently, on December 10, 2016, ECCC published a Consultation Document on the CEPA Registry for a 60-day public comment period to inform stakeholders of the Department's regulatory plan for the substance BNST.

Also on November 5, 2016, ECCC published the proposed *Microbeads in Toiletries Regulations*. The Regulations would prohibit the manufacture, import, sale or offer for sale of toiletries that contain plastic microbeads, including non-prescription drugs and natural health products. The types of toiletries covered include products used for exfoliating or cleansing, such as bath and body products, skin cleansers and toothpaste.

On December 15, 2016, the Government of Canada announced the Government-wide strategy to manage asbestos in Canada. A key element of the strategy is the development of new regulations under CEPA to prohibit asbestos and products containing asbestos. A Notice of Intent was published in the *Canada Gazette* in December 2016, stating that the Department of the Environment and the Department of Health are initiating the development of proposed regulations under CEPA. The proposed *Prohibition of Asbestos and Asbestos Products Regulations* was published in *Canada Gazette*, Part I on January 6, 2018. The final regulations are expected to be published by the end of 2018 and would prohibit all future activities, including the manufacture, use, sale, offer for sale, import and export of asbestos and products containing asbestos.

On January 10, 2017, ECCC published a consultation document outlining proposed amendments to the *Concentration of Phosphorus in Certain Cleaning Products Regulations*. The amendments would align the Regulations with the requirements of the World Trade Organization's Agreement on Trade Facilitation by exempting goods in transit; clarify language of the regulatory text and; provide consistency and standardization of the laboratory accreditation provisions with other regulations under CEPA.

During 2016–2017, ECCC and HC furthered the development of draft regulations addressing releases of VOCs, including Stream 1 and 2 petroleum and refinery gases and Stream 4 liquefied petroleum gases. Key elements of the proposed regulations included a leak detection and repair program, preventive equipment requirements and fence-line monitoring. ECCC and HC continued to consult with stakeholders on these elements in 2016–2017. This included the distribution of a regulatory framework discussion document and detailed cost-benefit analysis assumptions in April 2016.

The *Ozone-Depleting Substances Regulations, 1998* had established phased out measures for the manufacture and consumption of ozone-depleting substances, including Chlorofluorocarbons (CFCs) and Hydrochlorofluorocarbons (HCFCs). As a first step to more comprehensive measures on HFCs, the Government of Canada introduced in June 2016, the *Ozone-depleting Substances and Halocarbon Alternatives Regulations*, which repealed and replaced the 1998 Regulations. The new regulations introduced a permitting and reporting system to monitor quantities of HFCs imported, manufactured, and exported, with reporting to begin in 2018 for activities that took place in the 2017 calendar year.

The *Regulations Amending the Ozone-depleting Substances and Halocarbon Alternatives Regulations* proposed in November 2016 will control HFCs through the phase-down of consumption of bulk HFCs complemented by controls on specific products containing or designed to contain HFCs, including refrigeration and air-conditioning equipment, foams and aerosols. Approximately 100 permits and authorizations were issued in accordance with the Regulations.

The purpose of the *Federal Halocarbon Regulations, 2003* (FHR 2003) is to reduce and prevent emissions of halocarbons to the environment from refrigeration, air conditioning, fire extinguishing and solvent systems that are located on aboriginal or federal lands or are owned by federal departments, boards and agencies, Crown corporations, or federal works and undertakings. In 2016–2017, 14 permits to charge a fire-extinguishing system with a halocarbon were issued by the Minister of Environment under the FHR 2003.

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 Export Control List.

In 2016–2017, 67 export notices were submitted to the Minister of the Environment. However, no permits were requested or issued by the Minister.

An Order amending Schedule 3, the Export Control List, to the Act was published in the *Canada Gazette, Part II* on January 11, 2017, to include "Mixtures that contain elemental mercury (CAS 7439-97-6) at a concentration of 95% or more by weight". The *Regulations Amending the Export of Substances on the Export Control List Regulations* were published in the *Canada Gazette, Part II* on February 22, 2017 with new comprehensive controls on the export of mercury. Together, these amendments put Canada in a position to ratify the Minamata Convention on Mercury, which occurred on April 7, 2017.

Environmental quality guidelines

Environmental quality guidelines provide benchmarks for the quality of the ambient environment as required under section 54. They may be developed nationally through the Canadian Council of Ministers of the Environment (CCME) as Canadian Environmental Quality Guidelines (CEQGs) or federally under section 54 of CEPA as Federal Environmental Quality Guidelines (FEQGs).

Table 4 lists the CEQGs that were being developed nationally through CCME in 2016–2017. During the same period, ECCC finalized 2015–2016 work on several FEQGs for various CMP substances (Table 5).

Table 4: Canadian Environmental Quality Guidelines under development in 2016–2017

ENVIRONMENTAL COMPARTMENT	SUBSTANCE
Water*	<ul style="list-style-type: none"> • Manganese • Zinc • Carbamazepine • Nickel
Soil	<ul style="list-style-type: none"> • Methanol • Zinc • Lead • perfluorooctane sulfonate (PFOS)
Groundwater	<ul style="list-style-type: none"> • Over 100 organic and soluble substances
Soil Vapour	<ul style="list-style-type: none"> • Approximately 40 organic and volatile substances

*More details are in the Water Quality section, Table 14.

Table 5: Federal Environmental Quality Guidelines in 2016–2017

ENVIRONMENTAL COMPARTMENT	FINALIZED*	UNDER DEVELOPMENT
Water	<ul style="list-style-type: none"> • Chlorinated alkanes (chlorinated paraffins) • Hexabromocyclododecane (HBCD) • Tetrabromobisphenol A (TBBPA) • Vanadium 	<ul style="list-style-type: none"> • Bisphenol A • Perfluorooctane sulfonate (PFOS) • Triclosan • Chromium (hexavalent) • Iron • Lead • Copper • Cobalt • RDX (energetic material) • Selenium • Quinoline
Sediment	<ul style="list-style-type: none"> • Chlorinated alkanes (chlorinated paraffins) • Hexabromocyclododecane (HBCD) 	<ul style="list-style-type: none"> • Bisphenol A
Fish Tissue	<ul style="list-style-type: none"> • Chlorinated alkanes (chlorinated paraffins) 	<ul style="list-style-type: none"> • Hexabromocyclododecane (HBCD) • Tetrabromobisphenol A (TBBPA) • Perfluorooctane sulfonate (PFOS) • Selenium
Wildlife Diet	<ul style="list-style-type: none"> • Chlorinated alkanes (chlorinated paraffins) • Tetrabromobisphenol A (TBBPA) 	<ul style="list-style-type: none"> • Bisphenol A • Perfluorooctane sulfonate (PFOS)
Bird Egg		<ul style="list-style-type: none"> • Perfluorooctane sulfonate (PFOS)

Soil

- Hexabromocyclododecane (HBCD)
- Tetrabromobisphenol A (TBBPA)
- Perfluorooctane sulfonate (PFOS)
- Perfluorooctanoic acid (PFOA)
- Quinoline

Groundwater

- Perfluorooctane sulfonate (PFOS)
 - Quinoline
-

*Published in *Canada Gazette* in May 2016.

Links to the Environmental Quality Guidelines can be found at www.canada.ca/en/environment-climate-change/services/canadian-environmental-protection-act-registry/guidelines-objectives-codes-practice/guidelines-objectives.html#toc4.

Codes of Practice

The provisions within Part 3 of CEPA (Information Gathering, Objectives, Guidelines and Codes of Practice) require 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.

In November 2016, HC published in the *Canada Gazette*, Part I, the final Code of Practice for a Recommended Concentration of 2-(2-Methoxyethoxy) Ethanol (DEGME) in Surface Coating Materials Available to Consumers in Canada. The risk management objective was to further protect human health by reducing the concentration of DEGME in products available to consumers that are surface coating materials.

On February 11, 2017, ECCC published, in the *Canada Gazette*, Part I, the Code of Practice for the Environmentally Sound Management of End-of-life Lamps Containing Mercury, which is designed to encourage collectors, transporters and recyclers to incorporate best practices in their management of end-of-life mercury-containing lamps, to prevent releases of mercury to the environment. Recognizing that northern and remote regions often face unique challenges that can make it difficult to collect and manage end-of-life mercury-containing lamps, the Code includes additional information on diversion and end-of-life management options that can be used to facilitate the implementation of the best practices.

On February 25, 2017, the final Code of Practice for the Reduction of Volatile Organic Compound (VOC) Emissions from Cutback and Emulsified Asphalt was published in the *Canada Gazette*, Part I. The main objective of this Code of Practice is to protect the environment and the health of Canadians while maintaining road safety by recommending best practices that encourage, when suitable, the use of low VOC emitting asphalt. It is anticipated that compliance with the Code would result in annual VOC emission reductions of up to 5000 tonnes from the use of asphalt.

In 2016–2017, ECCC reviewed the implementation report submitted by the one facility that is subject to the Code of Practice for the Management of Tetrabutyltin in Canada. The Department's review indicated that the facility had continued to implement the procedures and practices identified in the Code of Practice that was put in place in 2011.

Further information on Codes of Practice is available online at:

www.canada.ca/en/environment-climate-change/services/canadian-environmental-protection-act-registry/guidelines-objectives-codes-practice/codes-of-practice.html

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. Pollution Prevention 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.

In Progress

- In May 2016, a P2 Planning Notice was published outlining the requirements for preparation and implementation of pollution prevention plans in respect of halocarbons used as a refrigerant.
- A P2 Planning Notice published in 2012 to reduce industrial releases of cyclotetrasiloxane, octamethyl- (siloxane D4) to the aquatic environment required the preparation and implementation of a P2 plan by June 2016. As of the end of the 2016–2017 administrative period, most facilities either met the reduction target after implementing their P2 plan, or were confident that they would meet it.
- In November 2016, ECCC published an Interim Performance Report summarizing the results achieved by facilities during the implementation of the P2 Notice for BPA in industrial effluents for the 2012 to 2015 time frame. In January 2017, ECCC received declarations of implementation from facilities subjected to the Notice. The review of the declarations is currently underway to determine whether or not additional risk management measures are required.
- Final Reports
 - In March 2017, ECCC published its final report summarizing the performance of the P2 Planning Notice for the polyurethane and other foam sector (except polystyrene) in respect of toluene diisocyanates (TDIs). Results indicate that 100% of the reporting facilities have implemented the actions identified in their P2 plan and they have met the risk management objective of the Notice.

More information on these notices is available online at www.canada.ca/en/environment-climate-change/services/pollution-prevention/planning-notices/performance-results.html.

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.

In 2016–2017, under the Environmental Performance Agreement 2015–2020 Respecting the Use of Tin Stabilizers in the Vinyl Industry, a verification team consisting of the Vinyl Council of Canada and ECCC representatives conducted reverification of facilities to determine whether the practices and procedures identified in the Guideline for the Environmental Management of Tin Stabilizers in Canada are being implemented or continue to be implemented to prevent the releases of tin stabilizers into the aquatic environment. The verifications confirmed that all four facilities had implemented

or continued to implement the practices and procedures outlined in the Guideline. All the other facilities using tin stabilizers also reported having continued to implement the Guideline. The 2015–2020 Agreement is available online at www.canada.ca/en/environment-climate-change/services/environmental-performance-agreements/results/tin-stabilizers-vinyl-industry-overview.html

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.

ECCC and HC continued with their review of all SNAC notices and orders in force to ensure consistencies with current policies. 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 (www.canada.ca/en/health-canada/services/chemical-substances/chemicals-management-plan/initiatives/significant-new-activity-orders-notices/review-groups.html).

In 2016–2017 under CEPA:

- the Minister of the Environment issued 5 SNAC Notices for new substances (Table 6).
- twenty-five (25) SNAC Notices and Orders were rescinded (Table 7).
- three (3) SNAC Notices were issued for existing substances (Table 8).
- nineteen (19) SNAC Notices of Intent were issued for existing substances (Table 9).

Table 6: Significant New Activity Notices for new substances from April 2016 to March 2017

SUBSTANCE	PUBLICATION DATE*
Boron Phosphate (B(PO ₄)), CAS Registry No. 13308-51-5	June 25, 2016
Fatty acids, C12-20, 1, 2,2,6,6-pentamethyl-4-piperidinyl esters, CAS Registry No. 1357160-95-2	August 20, 2016
Heteromonocycle, 2-methyl-, polymer with oxirane, carboxymethyl hexadecyl ether, Confidential Accession No. 19101-3	February 18, 2017
Heteromonocycle, 2-methyl-, polymer with oxirane, carboxymethyl octadecyl ether, Confidential Accession No. 19100-2	February 18, 2017
2-propanol, 1-[bis(2-hydroxyethyl)amino]-, CAS Registry No. 6712-98-7	March 4, 2017

* The dates are those on which the Final Notices or Orders were published in the *Canada Gazette*, Part I.

Table 7: Significant New Activity Notices and Orders rescinded between April 2016 and March 2017

SUBSTANCE	PUBLICATION DATE*
2-Naphthalenol, 1-(1-naphthalenylazo)-, CAS Registry No. 2653-64-7	October 19, 2016
Pyridinium, 1-[2-[[4-[(2-chloro-4-nitrophenyl)azo]phenyl]ethylamino]ethyl]-, acetate, CAS Registry No. 59709-10-3	October 19, 2016
2-Naphthalenesulfonic acid, 5-[[4-(4-cyclohexylphenoxy)-2-sulfophenyl]azo]-6-[[2,6-dimethylphenyl]amino]-4-hydroxy-, disodium salt, CAS Registry No. 71720-89-3	October 19, 2016
3-Pyridinecarbonitrile, 5-[[4-[(2,6-dichloro-4-nitrophenyl)azo]-2,5-dimethoxyphenyl]azo]-2,6-bis[(2-methoxyethyl)amino]-4-methyl-, CAS Registry No. 73528-78-6	October 19, 2016
1,7-Naphthalenedisulfonic acid, 6-[[2-(4-cyclohexylphenoxy)phenyl]azo]-4-[[2,4-dichlorophenoxy]acetyl]amino]-5-hydroxy-, disodium salt, CAS Registry No. 83027-51-4	October 19, 2016
1,7-Naphthalenedisulfonic acid, 6-[[2-(2-cyclohexylphenoxy)phenyl]azo]-4-[[2,4-dichlorophenoxy]acetyl]amino]-5-hydroxy-, disodium salt, CAS Registry No. 83027-52-5	October 19, 2016
2-Naphthalenecarboxamide, 4-[[2,4-dinitrophenyl]azo]-3-hydroxy-N-phenyl-, CAS Registry No. 85005-63-6	October 19, 2016
3-Pyridinecarbonitrile, 5-[[2-chloro-4-(phenylazo)phenyl]azo]-2,6-bis[(3-methoxypropyl)amino]-4-methyl-, CAS Registry No. 85392-21-8	October 19, 2016
Benzenesulfonic acid, 5-amino-2,4-dimethyl-, diazotized, coupled with diazotized 2,4-, 2,5- and 2,6-xylidine and 4-[[2,4-dihydroxyphenyl]azo]benzenesulfonic acid, sodium salts, CAS Registry No. 90218-20-5	October 19, 2016
2,7-Naphthalenedisulfonic acid, 5-amino-4-hydroxy-3-[[6-sulfo-4-[[4-sulfo-1-naphthalenyl]azo]-1-naphthalenyl]azo]-, diazotized, coupled with diazotized 4-nitrobenzenamine and resorcinol, potassium sodium salts, CAS Registry No. 90459-02-2	October 19, 2016
2-Naphthalenecarboxamide, N-(2-ethoxyphenyl)-3-hydroxy-4-[[2-nitrophenyl]azo]-, CAS Registry No. 94199-57-2	October 19, 2016

1-Naphthalenediazonium, 4-[[4-[(4-nitro-2-sulfophenyl)amino]phenyl]azo]-6-sulfo-, chloride, reaction products with formaldehyde and salicylic acid, ammonium sodium salts, CAS Registry No. 114910-04-2	October 19, 2016
Pigment Yellow 60, CAS Registry No. 6407-74-5	October 19, 2016
Solvent Yellow 18, CAS Registry No. 6407-78-9	October 19, 2016
Solvent Red 3, CAS Registry No. 6535-42-8	October 19, 2016
Pigment Red 251, CAS Registry No. 74336-60-0	October 19, 2016
Cyclopentane, 1,1,2,2,3,3,4-heptafluoro-, CAS Registry No. 15290-77-4	February 11, 2017
Difluoromethane, CAS Registry No. 75-10-5	February 22, 2017
Pentafluoroethane, CAS Registry No. 354-33-6	February 22, 2017
1,1,1,3,3-pentafluorobutane, CAS Registry No. 406-58-6	February 22, 2017
1,1,1-trifluoroethane, CAS Registry No. 420-46-2	February 22, 2017
1,1,1,2,3,3,3-heptafluoropropane, CAS Registry No. 431-89-0	February 22, 2017
Propane, 1,1,1,3,3-pentafluoro-, CAS Registry No. 460-73-1	February 22, 2017
1,1,1,3,3,3-hexafluoropropane, CAS Registry No. 690-39-1	February 22, 2017
Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro-, CAS Registry No. 138495-42-8	February 22, 2017

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

Table 8: Significant New Activity Orders for existing substances from April 2016 to March 2017

ASSESSMENT	MEET S. 64 CRITERIA	NUMBER OF SUBSTANCES	NOTICE OF INTENT ^A	FINAL ORDER ^B
Ethanol, 2-[(2-aminoethyl)amino]-, CAS Registry No. 1111-41-1	No	1	June 25, 2016	Pending
Nineteen Substances on the Domestic Substances List Associated with Pesticidal Uses	No	25	November 12, 2016	Pending
Rapid Screening of Substances from Phase One and Phase Two of the Domestic Substances List Inventory Update	No	54	December 3, 2016	Pending

^A The date is that on which the Notices of Intent and Final Orders were published in the *Canada Gazette*, Part I or Part II, respectively.

^B Six of the substances in this Notice of Intent are currently subject to the SNAc requirements of CEPA and are being reviewed; the Final Order will amend the SNAc requirements for these substances.

Table 9: Significant New Activity Notices of Intent for existing substances from April 2016 to March 2017

SUBSTANCE	PUBLICATION DATE*
DES (diethyl sulfate)	January 14, 2017
methyloxirane	January 14, 2017
DMS (dimethyl sulfate)	January 14, 2017
benzyl chloride	January 14, 2017
ethyloxirane	January 14, 2017
epichlorohydrin	January 14, 2017
hydroquinone	January 14, 2017
thiourea	January 14, 2017
2-nitropropane	January 14, 2017
TCEP (ethanol, 2-chloro-, phosphate (3:1))	January 14, 2017
Michler's ketone	January 14, 2017
methyl eugenol	January 14, 2017
vanadium pentoxide (V2O5)	January 14, 2017
pigment red 3	January 14, 2017
n-BGE	January 14, 2017
TGOPE	January 14, 2017
potassium bromate	January 14, 2017
DTBSBP	January 14, 2017
MAPBAP acetate	January 14, 2017

* The date is that on which the Notices of Intent and Final Orders were published in the *Canada Gazette*, Part I or Part II, respectively.

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:

- a. permit the manufacture or import of the substance subject to specified conditions; or
- b. prohibit the manufacture or import of the substance; or
- c. 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 473 notifications for new substances received in 2016–2017, the Minister issued three Ministerial Conditions (Table 10).

Table 10: Notices of Ministerial Conditions for new substances from April 2016 to March 2017

SUBSTANCE	PUBLICATION DATE*
1-propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N(C8-18 and C18-unsatd. acyl) derivs., inner salts	April 30, 2016
1,2-cyclohexanedicarboxylic acid, 1-butyl 2-(phenylmethyl) ester	October 22, 2016
1-propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N-C8-18 acyl derivs., inner salts	December 24, 2016

* The dates are those on which the notices were published in the *Canada Gazette*.

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.

Research conducted during 2016–2017 focused on data analysis to support the assessment on the remaining Domestic Substances List micro-organisms, such as: the microbial consortium; detection of virulence and pathogenicity of industrial *Saccharomyces* strains; and the characterization and exposure of cleaning products that contain micro-organisms as the active ingredients.

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 2016–2017, 22 notifications of new animate products of biotechnology were received and of those, 19 were assessed as new animate products under the *New Substances Notification Regulations* (Organisms). All notifications that are accepted as new animate products are assessed within the statutory assessment period.

During 2016–2017, three 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 2016–2017, draft screening assessments for eight micro-organisms were published in the *Canada Gazette, Part I* for a 60-day public comment period. Final screening assessments for five micro-organisms were also published in the *Canada Gazette, Part I* (see Table 11). None of these organisms met the criteria in section 64 of the Act, therefore no further action was proposed.

Table 11: Summary of existing living organisms assessment decisions published from April 2016 to March 2017

(NFA = no further action)

SUBSTANCES (AND NUMBER OF SUBSTANCES)	MEET S. 64 CRITERIA	PROPOSED MEASURE	DRAFT NOTICE*	FINAL NOTICE*
<i>Saccharomyces cerevisiae</i> strain F53 (1)	No	NFA	April 9, 2016	January 21, 2017
<i>Candida utilis</i> strain ATCC 9950 (1)	No	NFA	May 23, 2015	May 28, 2016
<i>Pseudomonas</i> species strain ATCC 13867 (1)	No	NFA	May 23, 2015	May 28, 2016
<i>Bacillus circulans</i> strain ATCC 9500 (1)	No	NFA	January 21, 2017	
<i>Bacillus megaterium</i> strain ATCC 14581 (1)	No	NFA	January 21, 2017	
<i>Chaetomium globosum</i> strain ATCC 6205 (1)	No	NFA	January 21, 2017	
<i>Micrococcus luteus</i> strain ATCC 4698 (1)	No	NFA	January 21, 2017	
<i>Pseudomonas putida</i> strains ATCC 12633, ATCC 31483, ATCC 31800 and ATCC 700369 (4)	No	NFA	March 19, 2016	January 21, 2017
<i>Aspergillus oryzae</i> strain ATCC 11866 (1)	No	NFA	March 19, 2016	January 21, 2017
<i>Trichoderma reesei</i> strain ATCC 74252 (1)	No	NFA	February 4, 2017	
<i>Arthrobacter globiformis</i> strain ATCC 8010 (1)	No	NFA	February 18, 2017	
<i>Cellulomonas biazotea</i> strain ATCC 486 (1)	No	NFA	February 18, 2017	

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

2.2.3 Risk management activities

Significant New Activity requirements

A Final Order applying the SNAC provisions to one new living organism was published in June 2016 (Table 12).

Table 12: Significant New Activity Notices for new living organisms from April 2016 to March 2017

ASSESSMENT	PUBLICATION DATE*
Saccharomyces cerevisiae expressing pyruvate formate lyase activating enzyme, pyruvate formate lyase, and bifunctional acetaldehyde-CoA/alcohol dehydrogenase from Bifidobacterium adolescentis and a glucoamylase from Saccharomycopsis fibuligera	June 25, 2016

* The dates are those on which the Notices were published in the *Canada Gazette*, Part I.

In 2016–2017, a Final Order applying the SNAC provisions to one existing living organism and a Notice of Intent to apply the SNAC provisions for two existing living organisms were published (Table 13).

Table 13: Significant New Activity Notices of Intent and Orders for existing living organisms from April 2016 to March 2017

ASSESSMENT	NUMBER OF STRAINS	NOTICE OF INTENT*	FINAL ORDER*
Pseudomonas fluorescens ATCC 13525	1	February 14, 2015	July 13, 2016
Aspergillus oryzae ATCC 11866	1	January 21, 2017	Pending
Pseudomonas putida	4	January 21, 2017	Pending

* The date is that on which the Notices of Intent and Final Orders were published in the *Canada Gazette*, Part I or Part II, respectively.

2.3 AIR POLLUTANTS AND GREENHOUSE GASES

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

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.

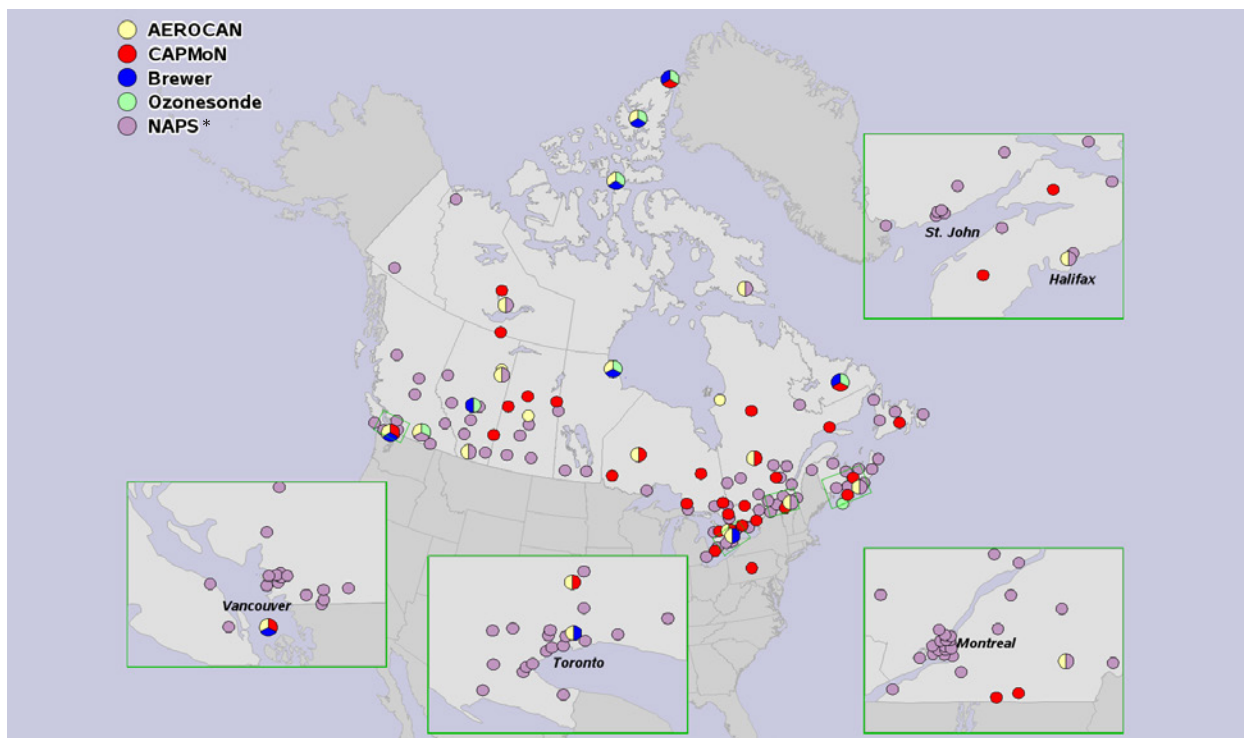
Ambient (outdoor) air quality monitoring informs air quality management in Canada, including the evaluation of progress relative to the Canadian Ambient Air Quality Standards. The data is used for validation of numerical air quality prediction models, and for evaluating the benefits and effectiveness of control measures, as well as for assessments of the impact of air pollution on Canadians and the environment.

ECCC monitors ambient air quality 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 3). NAPS is managed by ECCC via a cooperative agreement with the provinces, territories and some municipalities in order to provide long-term air quality data

from populated regions of Canada. CAPMoN provides information on regional patterns and trends of atmospheric pollutants in both air and precipitation at rural and remote sites.

Additional air pollutant monitoring carried out by ECCC includes AEROCAN, a member of NASA's global AERONET satellite network, which takes optical readings of solar radiation in order to measure atmospheric aerosols. The Canadian Brewer Spectrophotometer Network measures total column ozone and spectral UV radiation, providing long-term stratospheric ozone data. The Canadian Ozonesonde Network measures vertical column ozone from ground level up to 36 km altitude by launching weekly ozonesondes affixed to balloons, providing long-term ozone data.

Figure 3: Map of air pollutant monitoring sites



* Some NAPS sites may not be visible in places where they are close together.

The Canadian Greenhouse Gas Monitoring Program includes observations of carbon dioxide and other GHGs from 16 long-term measurement sites across Canada (Figure 4). Among the sites is the Alert Global Atmosphere Watch Observatory. Alert serves as one of three global GHG inter-comparison sites to ensure consistent measurement of carbon dioxide (CO₂) and other greenhouse gas concentrations across the world. The information compiled from these monitoring sites is available: www.canada.ca/en/environment-climate-change/services/air-pollution/monitoring-networks-data/national-air-pollution-program/results.html.

Figure 4: Canadian Greenhouse Gas Measurement Program monitoring sites



Measurements of atmospheric CO₂ began in March 1975 at Alert (Figure 5). The seasonal decline in late May to early June is due to the transport of air from southern latitudes that is depleted in CO₂ from photosynthetic uptake. The annual average CO₂ values at Alert in 2016 was 404.3 parts per million (ppm). The annual average CO₂ value at Alert in 2015 was 402.1 ppm; the first year in which the annual mean exceeded 400 ppm. The annual average CO₂ values were 399.7 and 397.9 ppm in 2013 and 2014, respectively.

In addition to CO₂, ECCC also conducts measurements of atmospheric methane (CH₄), which began in August 1985 at Alert, Nunavut (Figure 6). The annual average CH₄ value at Alert in 2016 was 1925.7 parts per billion (ppb). The rate in the annual increase in CH₄ had steadily declined since the late 1980s and hovered around zero from 1999 to 2006, reflecting a near global balance between emissions and removal by atmospheric chemical processes. However, since 2007, CH₄ has increased every year on average by 6 ppb per year.

Figure 5: Atmospheric carbon dioxide measured at Alert, Nunavut

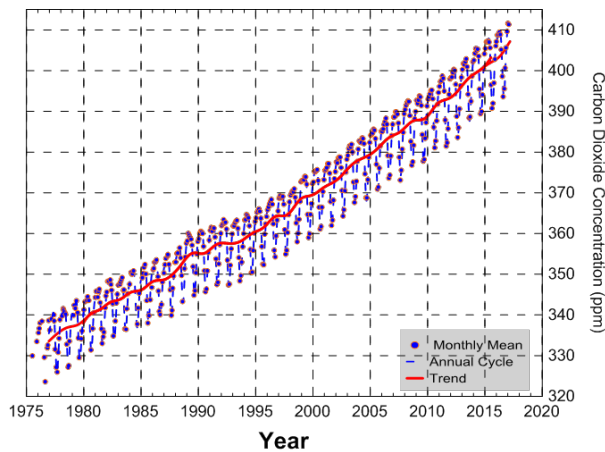
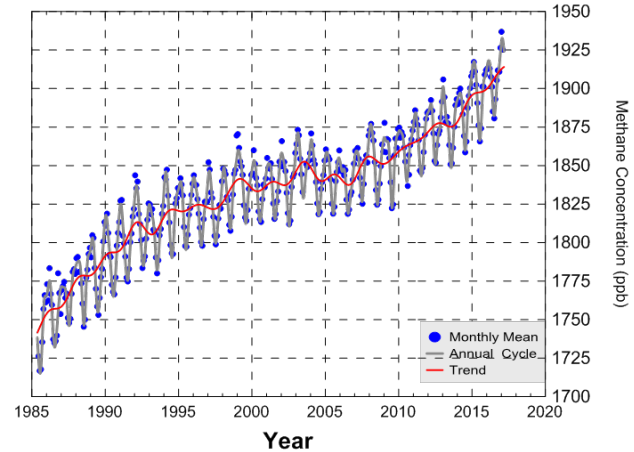


Figure 6: Atmospheric methane measured at Alert, Nunavut



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.

More information about monitoring activities is available online at www.canada.ca/en/environment-climate-change/services/canadian-environmental-protection-act-registry/monitoring-reporting-research/monitoring.html.

2.3.2 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. The research also tackles emerging issues and underpins and informs evidence-based policy decision-making, to help ensure policymakers focus their efforts appropriately.

During 2016–2017, research was carried out by ECCC under the Climate Change and Air Pollution (CCAP) and Joint Oil Sands Monitoring (JOSM) programs. In addition, ongoing research by ECCC continued on a wide range of air pollution and GHG topics. This included improving understanding of GHG sources and sinks; utilizing surface and satellite GHG observations; characterization and measurement of atmospheric aerosols, including black carbon; and measuring the impact of ship emissions in the Arctic environment. It also included reported research results on topics such as atmospheric mercury, nitrogen oxides (NO_x), sulphur dioxide (SO₂), volatile organic compounds (VOCs), tropospheric and stratospheric ozone, particulate matter and aerosols, air pollution from forest fires, air pollutants in the transportation sector and more. ECCC scientists published approximately 85 research papers related to air pollutants and GHGs in peer-reviewed scientific journals.

CASE STUDY

New technique for detecting global sulphur dioxide emissions⁴

ECCC scientists, in collaboration with NASA and Canadian and American universities, have developed a new technique for using satellite measurements to quantify sulphur dioxide (SO₂) emissions from large sources. Previously unidentified sources of SO₂ emissions are being detected.

SO₂ is designated as a criteria air contaminant in Canada because of the risk it poses to human health and the environment. SO₂ in the atmosphere forms sulphuric acid and fine particulate matter, which are significant contributors to smog and acid deposition. Traditionally, SO₂ emissions were measured by industry and reported to governments.

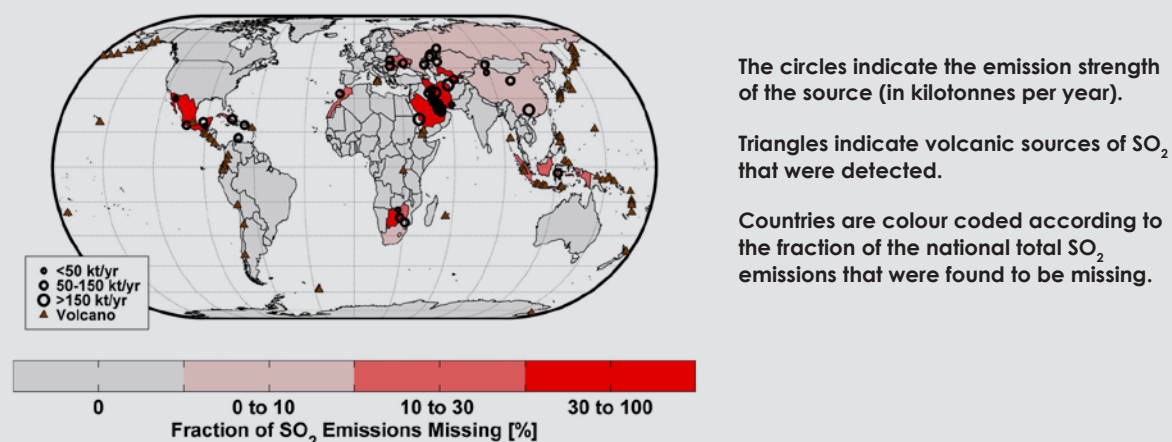
The new technique was applied to observations from the Ozone Monitoring Instrument (OMI) aboard NASA's Aura satellite. This analysis identified 39 large, previously unreported, major anthropogenic sources of SO₂ emissions which rank among the world's 500 largest. These unreported sources are distributed across the globe (as shown in Figure 7), but also clustered in some regions such as the Middle East, Russia and parts of Eastern Europe.

By combining all OMI-derived emissions, ECCC researchers developed the first space-based emissions inventory, encompassing all significant continuously emitting point sources of SO₂ globally, of which there were 491. This inventory also includes emissions from over 75 volcanoes (see Figure 7),

many of which had been previously unmeasured. It also revealed gaps in the accuracy of reported SO₂ emissions, both from the missing sources and from sources whose emissions appeared to be underreported.

In Canada, total SO₂ emissions were found to have decreased by 67% between 2005 and 2014, providing an independent verification of the efficacy of recent regulations and emissions reporting procedures. The use of space-based monitoring to verify emission inventories has the potential to be extended to other pollutants such as carbon monoxide, particulate matter, methane and carbon dioxide, and ECCC researchers are actively assessing this exciting technology.

Figure 7: Map of all missing, or previously unreported, sources of SO₂



⁴ McLinden, C.A., Fioletov, V., Shephard, M., Krotkov, N., Li, C., Martin, R.V., Moran, M., Joiner, J. Space-based detection of missing sulfur dioxide sources of global air pollution. (2016) *Nature Geoscience*, 9, 496-500.

Fioletov, V. E., C. A. McLinden, N. Krotkov, C. Li, J. Joiner, N. Theys, and M. D. Moran, A global catalogue of large SO₂ sources and emissions derived from the Ozone Monitoring Instrument, *Atmos. Chem. Phys.*, 16, 11497-11519, doi:10.5194/acp-16-11497-2016, 2016

Atmospheric mercury research included a review of transport models, measurement methods and calculations to quantify mercury dry deposition; source apportionment and receptor model analysis of mercury sources to Canada; mechanisms driving spatiotemporal variations in environmental mercury levels; atmospheric mercury cycling in high latitudes; and a new modelling approach for determining the transport and fate of mercury in the oceans.

Research on the subject of nitrogen oxides included improvements to the approach used to derive nitrogen dioxide (NO₂) levels from the Ozone Monitoring Instrument (OMI) observations. Sulphur dioxide research included identification of large point emission sources using OMI satellite observations, review of SO₂ trends in the first decade of OMI observations, and evaluation of vertical column SO₂ measurements over the oil sands from the OMI satellite.

CASE STUDY

ECCC Carbon Assimilation System⁵

Scientists at Environment and Climate Change Canada (ECCC) are actively studying the sources of greenhouse gases across Canada and the rest of the Earth. Fossil fuel emissions and industrial production are the major anthropogenic sources of CO₂, but there are also natural sources and sinks from the biosphere and the oceans, as well as from forest fires.

A model can be used to simulate greenhouse gas concentrations based on estimates of emissions and observations. By comparing the simulated and measured concentrations, the sources and sinks that contribute to a specific observation station can be estimated. This process of combining atmospheric model output and measurements in a physical-statistical way is known as "data assimilation".

The ECCC Carbon Assimilation System uses greenhouse gas observations from a variety of platforms (ground based, aircraft, and satellite) to allow scientists to better understand greenhouse gas sources and sinks (Figure 7). With the Carbon Assimilation System, we can:

- Provide maps of carbon dioxide (CO₂) and methane (CH₄) in the recent past
- Estimate natural sources and sinks of CO₂ and CH₄, and their uncertainties
- Perform virtual experiments to determine the optimal locations of our ECCC measurement network

The basis of the Carbon Assimilation System is ECCC's operational weather forecast model (Global Environmental Multi-scale). The animation can be viewed at www.canada.ca/en/environment-climate-change/services/climate-change/science-research-data/greenhouse-gases-aerosols-monitoring/carbon-assimilation-system.html

Volatile and semi-volatile organic compounds research included indoor and outdoor concentration ratios; comprehensive measurements of concentrations in the springtime Arctic to inform forecasting; and an assessment of VOC emissions from the oil sands was completed that revealed significant differences between the study's aircraft-based measurements and emissions rates reported using current estimation techniques.

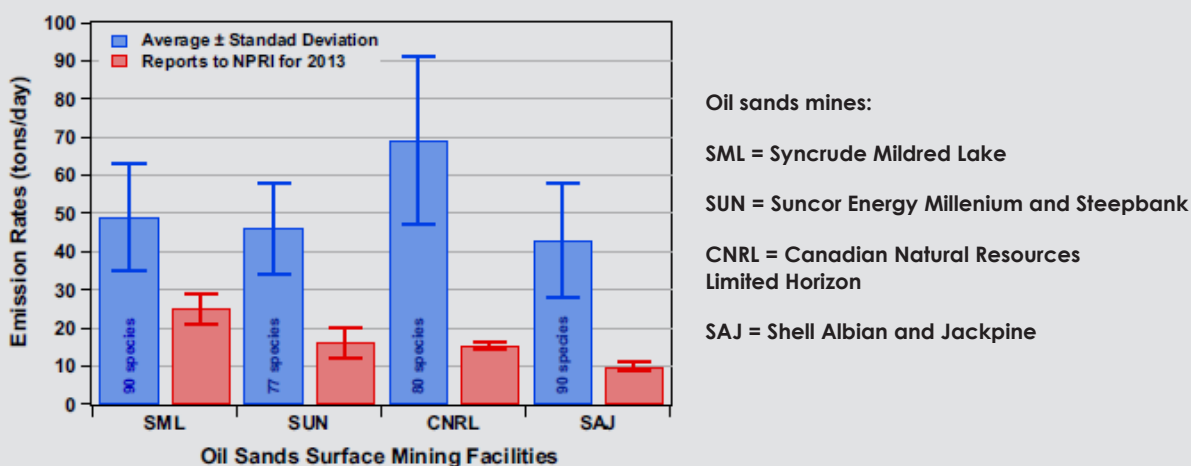
⁵ Reference: Polavarapu, S. M., Neish, M., Tanguay, M., Girard, C., de Grandpré, J., Semeniuk, K., Gravel, S., Ren, S., Roche, S., Chan, D., and Strong, K.: Greenhouse gas simulations with a coupled meteorological and transport model: the predictability of CO₂, *Atmos. Chem. Phys.*, 16, 12005-12038, doi:10.5194/acp-16-12005-2016, 2016.

CASE STUDY

Comparing observed and reported volatile organic compounds emissions from oil sands facilities in Alberta⁶

In Canada, large-scale industrial activities, such as the oil sands operations in Alberta, which meet reporting requirements, are legally required to report the magnitude of pollution emissions to the National Pollutant Release Inventory (NPRI) using the most appropriate estimation methods. ECCC scientists recently published the findings from a study that compared VOC emissions rates measured from four major oil sands surface mining operations with the VOC emissions these facilities reported to the NPRI using these estimation methods.

Figure 8: VOC emissions rates for four surface mining facilities in the oil sands region compared to facility total VOC emission rates reported to the NPRI for 2013 (species refers to VOC species)



Airborne measurements of an extensive set of air pollutants over the Athabasca oil sands region in Alberta were conducted during a four week period in the summer of 2013 in support of the Joint Oil Sands Monitoring Program. Instrumentation was installed aboard a Convair-580 research aircraft provided by the National Research Council of Canada. The aircraft flew 22 flights over oil sands surface mining facilities during the study period.

The research used the data collected for hundreds of VOCs during flight. After emissions from other sources were accounted for, the analysis found that both the total and individual VOC emissions were being underestimated by the surface mining facilities in their reports to the NPRI, in some cases by a large margin (Figure 8). This suggested that the currently accepted estimation methods for VOC emissions need to be improved. The research shows that multipollutant emissions reports from large and complex facilities need to be more carefully examined to ensure accuracy and completeness before being meaningfully used to assess the environmental and health impacts from such emissions.

⁶ Li, S.-M., Leithead, A., Moussa, S.G., Liggio, J., Moran, M.D., Wang, D., Hayden, K., Darlington, A., Gordon, M., Staebler, R., Makar, P.A., Stroud, C.A., McLaren, R., Liu, P.S.K., O'Brien, J., Mittermeier, R.L., Zhang, J., Marson, G., Cober, S.G., Wolde, M. and Wentzell, J.J.B. Differences between measured and reported volatile organic compound emissions from oil sands facilities in Alberta, Canada (2017) Proceedings of the National Academy of Sciences of the United States of America, 114 (19), pp. E3756-E3765.

Ozone research included re-evaluating and improving the dataset of long-term tropospheric and stratospheric ozonesonde⁷ measurements, evaluating the effects of observational sampling bias, and climate variability, on trends; assessing satellite ozone data records; and comparing ground-based ozonesonde and stratospheric ozone lidar⁸ measurements.

Particulate matter and aerosols⁹ research included assessing the effects of particle size on summertime Arctic cloud formation; secondary organic aerosols formation from biogenic sources and oil sands operations; use of satellite data to monitor trends in aerosol optical depth in oil sands region; and a study looking at dimethyl sulfide mixing ratios and cloud formation in the summertime Arctic atmosphere. Research results were also published through collaborations supported by the Natural Sciences and Engineering Research Council Climate Change and Atmospheric Research initiative NETCARE (Network for the Characterization of Aerosols in Remote Environments), looking at the impact of seabird emissions of ammonia on particle formation in the Arctic.

ECCE researchers have measured pollutants over the Canadian oil sands region as part of the Canada-Alberta Joint Oil Sands Monitoring Program. Oil sands operations were found to be a large source of secondary organic aerosols. Secondary Organic Aerosol (SOA) is formed from the oxidation of hydrocarbon gases in the atmosphere, becoming a large component of fine particulate matter (PM_{2.5}) in the oil sands and globally. PM_{2.5} has been linked to negative impacts on air quality, human health and climate. Researchers found that the SOA downwind of the oil sands to be dominated by the oxidation products of bitumen vapour, likely released during open air mining and/or processing. During the study period, the rates of production of SOA were estimated at 45-84 tonnes per day. These are comparable to the rates produced by the Greater Toronto Area.

Research on air pollution from forest fires included a project to assess the impact on air quality from long-range transport of forest fire smoke, as well as an assessment of the FireWork¹⁰ air quality forecasting system.

Transport sector air pollution research included analysis of electric vehicle performance; characterizing exhaust emissions from various alternative fuels in a range of driving conditions; and assessment of black carbon and particulate matter emitted from vehicles under various driving conditions. During 2016–2017, ECCE also undertook a study into the state of contaminated fuels in Canada with a focus on reaching out to stakeholders that may handle such fuels.

Research also included aircraft- and ground-based studies in the Arctic to assess how well air quality models incorporate air turbulence; the use of airborne lidar to measure ozone and aerosol over the oil sands region; a study of air pollutant levels before and after the implementation of combined local and regional emissions regulations in order to assess their effectiveness to improve air quality; and an assessment of concentration trends, regional predictive models and source apportionment. Three dimensional global maps were developed based on 11 years of aircraft-based carbon monoxide measurements. An assessment was done of long-term atmospheric ammonia trends at urban, rural and remote sites across North America.

7 Lightweight, balloon-borne instrument

8 Light Detection and Ranging (a remote sensing method)

9 Liggio, J., Li, S.-M., Hayden, K., Taha, Y.M., Stroud, C., Darlington, A., Drollette, B.D., Gordon, M., Lee, P., Liu, P., Leithead, A., Moussa, S.G., Wang, D., O'Brien, J., Mittermeier, R.L., Brook, J.R., Lu, G., Staebler, R.M., Han, Y., Tokarek, T.W., Osthoff, H.D. Makar, P.A., Zhang, J., Plata, D.L., Gentner, D.R. Oil sands operations as a large source of secondary organic aerosols (2016) *Nature*, 534 (7605), pp. 91-94.

10 FireWork is an air quality prediction system that incorporates emissions from wildfires.

In 2016–2017, ECCC released the full assessment report of the current state of scientific knowledge on mercury in Canada. Together with the summary reports published the previous year, this assessment is the first comprehensive evaluation of mercury in the Canadian environment. The assessment report is structured to follow mercury through the ecosystem from source to sink. The Canadian Mercury Science Assessment Report is available at www.publications.gc.ca/site/eng/9.810484/publication.html

In 2016–2017, HC continued to conduct research on human exposure to indoor and outdoor air pollutants and their health impacts in order to guide actions to address air pollution by governments, industries, other organizations and individuals. HC scientists led or contributed to 48 studies published in peer reviewed scientific journals. These addressed issues such as the impact of air pollution exposure on respiratory disease, cardiovascular disease, cancer, pregnancy outcomes, and dementia. Others studies investigated determinants of air pollution exposure in various environments and provided information of use to local air quality management and population health studies.

More than 25 new research projects on air quality were initiated by HC. The projects will generate information that can be used to support regulatory and individual decisions. They include new approaches to measuring the potency of air pollutants, understanding mechanisms for air pollution health effects, measuring the impacts on vulnerable populations and evaluating the contributions that various sources (e.g. wood smoke) make to health outcomes.

2.3.3 Risk management activities

Different instruments are available under the authorities provided by CEPA to limit and reduce emissions of air pollutants and greenhouse gases from vehicles, engines and fuels, consumer and commercial products, and industrial sectors, as well as for establishing national ambient air quality objectives to drive air quality improvements.

The Air Quality Management System (AQMS), agreed to by federal, provincial and territorial environment ministers in 2012, provides a comprehensive approach to reducing pollution and improve the health of Canadians and the environment. The AQMS includes: 1) Canadian Ambient Air Quality Standards (CAAQS); 2) a framework for air quality management through local air zones and regional airsheds; 3) industrial emission requirements for major industries; 4) an intergovernmental working group for enhanced collaboration and the reduction of emissions from mobile sources, and; 5) reporting to Canadians. CEPA provides authorities to establish CAAQS as environmental quality objectives to be met across the country and to develop and administer regulatory and non-regulatory instruments to reduce the releases of air pollutants and GHGs.

CAAQS provide the drivers for air quality management actions across the country. ECCC leads the process under the Canadian Council of Ministers of the Environment to develop, review and amend CAAQS.

During 2016-17 work continued to develop the CAAQS for sulphur dioxide (SO₂) and work was initiated to develop CAAQS for nitrogen dioxide (NO₂).

In May 2016, a Human Health Risk Assessment for Ambient Nitrogen Dioxide was published in the *Canada Gazette*, Part I in support of the development of CAAQS for NO₂.

Federal, provincial and territorial ministers of the environment announced new CAAQS for SO₂ in the fall of 2016 and for NO₂ in the fall of 2017. CAAQS for SO₂ and NO₂ were subsequently established as environmental quality objectives under CEPA in October and December 2017, respectively.

Industrial sector emission requirements

On June 17, 2016, the *Multi-Sector Air Pollutants Regulations* came into force. These Regulations establish nationally consistent industrial emissions requirements. They limit nitrogen oxide (NO_x) emissions from large industrial boilers and heaters and stationary spark-ignition engines used in several industrial sectors, that burn gaseous fuels (like natural gas). The Regulations also limit NO_x and SO₂ emissions from kilns at cement manufacturing facilities. They will contribute significantly to reducing emissions that contribute to smog and acid rain, including 2,000 kilotonnes of NO_x emission reductions in the first 19 years.

On May 28, 2016, Environment and Climate Change Canada published the Code of Practice to Reduce Emissions of Fine Particulate Matter (PM_{2.5}) from the Primary Aluminum Sector, and the Code of Practice to Reduce Fugitive Emissions of Total Particulate Matter and Volatile Organic Compounds from the Iron, Steel and Ilmenite Sector. The Codes of Practice are available online at: www.canada.ca/en/environment-climate-change/services/canadian-environmental-protection-act-registry/guidelines-objectives-codes-practice/codes-of-practice.html.

The Environmental Performance Agreement with Rio Tinto Alcan concerning air emissions of PAHs ended in December 2014. A final public report was published by ECCC in March 2016. The Final report and Information about the agreement are available online at: www.ec.gc.ca/epe-epa/default.asp?lang=En&n=5BE979CD-1%20-%20X-201006160806394

Oil and gas sector emission requirements

Methane

Methane is a potent GHG, with a global warming potential 25 times greater than carbon dioxide. The federal government has committed to reduce methane emissions by 40-45 percent by 2025. In 2016-2017, ECCC consulted extensively with provinces, territories, industry, environmental non-governmental organizations (ENGOs) and Indigenous peoples to develop robust and cost-effective regulations. Technical information was shared to inform regulatory development, including regulatory design and underlying analysis, emissions modelling, and the cost-benefit analysis methodology. As a result of over 150 hours of discussions with partners and stakeholders, a number of important changes were made to ECCC's proposed regulatory approach to reduce costs and increase efficiency, while ensuring the methane reduction target was still met.

Regulations focusing on reducing methane emissions from upstream activities are in development. They will apply to oil and gas facilities responsible for the extraction, production, primary processing, and transportation of crude oil and natural gas. The proposed requirements target five key methane sources: 1) fugitive equipment leaks; 2) venting; 3) well completions by hydraulic fracturing; 4) compressors; and 5) pneumatic devices.

The outcome-based federal approach also provides for the establishment of equivalency agreements with provinces and territories, allowing them to develop tailored regional approaches to replace the federal regulations, so long as the provincial or territorial approaches are legally-binding and achieve equivalent methane emission reductions.

Electricity sector emissions requirements

In November 2016, ECCC's proposed regulatory initiative to develop air emission standards for new stationary diesel (compression-ignition) engines was included in ECCC's 2017-2019 Forward Regulatory Plan. These regulations are being developed under CEPA as part of the pan-Canadian efforts to reduce reliance on diesel and the department's efforts to address short-lived climate pollutants and air pollutants.

On December 17, 2016, a Notice was published to inform the public of the Government's intention to amend the *Reduction of Carbon Dioxide Emissions from Coal-fired Generation Electricity Regulations*. The amendments to accelerate the phase out of traditional coal-fired electricity would require traditional coal-fired units to meet an emissions limit of 420 tonnes of carbon dioxide (CO₂) per gigawatt hour of electricity produced (t/GWh) by no later than 2030. To support the transition away from coal towards cleaner sources of generation, regulations for natural gas-fired electricity are also being developed under CEPA. These will ensure that new natural gas-fired electricity generation is efficient and will set clear parameters around the use of boilers converted from coal to run on natural gas.

During 2016–2017, ECCC established separate agreements in principle to establish equivalency agreements under CEPA with Nova Scotia and Saskatchewan. There is Canada–Nova Scotia Equivalency Agreement on the existing coal fired regulations which took effect in July 2015 and set to terminate at the end of 2019.

The agreement in principle with Nova Scotia includes a commitment to work together to negotiate a new equivalency agreement on the amendments to existing regulations, while the agreement in principle with Saskatchewan refers to the existing regulations.

Transportation sector emission requirements

ECCC implements six vehicle and engine regulations and nine fuel regulations under CEPA.

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, related fuel quality regulations and their coordinated implementation.

Greenhouse gas emissions regulations

On March 4, 2017, ECCC proposed published amendments to the *Heavy-duty Vehicle and Engine Greenhouse Gas Emission Regulations*, in the *Canada Gazette*, Part I. The regulations would introduce more stringent GHG emission standards that begin with the 2021 model year for on-road heavy-duty vehicles and engines. The proposed amendments would also amend two other regulations (the *Passenger Automobile and Light Truck Greenhouse Gas Emission Regulations* and the *On-Road Vehicle and Engine Emission Regulations*) to ensure consistency with existing on-road vehicle and engine emission regulations and maintain alignment with U.S. regulatory provisions. The *Passenger Automobile and Light Truck Greenhouse Gas Emission Regulations* (Light-Duty Vehicle) regulations establish progressively more stringent GHG emission standards for light-duty vehicles of model years up to 2025, in alignment with the U.S. national standards.

Air pollutant emission regulations

On June 6, 2016, ECCC published proposed amendments to the *Off-Road Small Spark-Ignition Engine Emission Regulations*, in the *Canada Gazette*, Part I. The regulations would decrease exhaust and evaporative emissions of air pollutants from off-road engines using a spark plug, or other sparking device, and producing no more than 19 kW of power.

Regulatory administration of the transportation regulations

ECCC administers a compliance program under the transportation and fuels 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, the quantity of products or fuel quality parameters. During 2016–2017, the department received over 330 regulatory reports for vehicles and engines and over 750 reports for fuels.

In 2016–2017, ECCC processed about 685 Canada-unique¹¹ submissions and almost 1400 importation declarations for vehicles and engines. Additionally, the department processed 49 notices of defect and recall notifications covering over 530,000 vehicles and engines. Of those, ECCC influenced two notices of defect covering over 65,000 vehicles and engines.

The regulatory administration of the transportation regulations is supported by ECCC laboratory emissions testing on vehicles, and engines and fuel quality testing in order to verify compliance with the regulations. Additionally, the department responds to inquiries from regulatees and prospective regulatees. During 2016–2017, ECCC responded to almost 1000 inquiries regarding the vehicles and engines regulations and almost 400 regarding the fuels regulations.

In 2016–2017 ECCC expanded its capacity to verify compliance with transportation sector emission regulations and to identify devices to defeat the emission regulations. The expanded program increases opportunities to identify non-compliant regulatees and take enforcement action where required. In 2016–2017, the department conducted 72 rounds of basic testing on 95 vehicles and engines.

Starting January 1, 2017, the sulphur limits under the *Sulphur in Gasoline Regulations* were adjusted downwards according to schedule. For those companies that have elected to apply a pool average, the limit decreased from 30 mg/kg to 10 mg/kg, and for those companies that do not apply a pool average, the limit decreased from 40 mg/kg to 14 mg/kg. The sulphur compliance unit trading system also came into effect for the duration of the 2017 to 2019 compliance periods.

In June 2016, ECCC published the *Renewable Fuels Regulations Report: December 15, 2010 to December 31, 2012* which summarizes the data gathered from the first compliance periods of the Regulations, from December 15, 2010 to December 31, 2012 (gasoline compliance period) and July 1, 2011 to December 31, 2012 (distillate, diesel and heating distillate oil, compliance period).

Finally in September 2016, ECCC published *Greenhouse Gas Emissions Performance for the 2011 to 2014 Model Year Light-Duty Vehicle Fleet*, a report summarizing the overall fleet average GHG emission performance of the Canadian fleets of passenger automobiles (PA) and light trucks (LT) for the 2011–2014 model years based on data submitted by companies in their end-of-model-year reports pursuant to the *Passenger Automobile and Light Truck Greenhouse Emission Regulations*.

¹¹ A Canada-unique vehicle or engine is a vehicle or engine that is specifically listed on an EPA certificate and sold in Canada, but not sold in the United States; or a vehicle or engine that is not specifically listed on an EPA certificate.

More information on ECCC's vehicle, engine and fuel regulations is available online at www.canada.ca/en/environment-climate-change/services/air-pollution/sources/transportation.html and on ECCC's fuel regulations at www.canada.ca/en/environment-climate-change/services/managing-pollution/energy-production/fuel-regulations.html.

Clean fuel standard

On November 25, 2016, in support of the Pan-Canadian Framework on Clean Growth and Climate Change, the government announced that it would develop a Clean Fuel Standard to reduce GHG emissions throughout the fuel system. A discussion paper was published on February 24, 2017 to support consultations to help inform the development of the Clean Fuel Standard.

The Clean Fuel Standard will focus on liquid, gaseous and solid fuels used in transportation, industry, homes and buildings. It will set requirements to reduce the carbon intensities of fuels and will incentivize the use of lower carbon fuels, and alternative energy sources and technologies. The overall objective is to achieve 30 megatonnes of annual reductions in GHG emissions by 2030. In 2016–2017, ECCC held numerous consultations including general and technical webinars, two face-to-face workshops and many bilateral meetings.

Consumer and commercial products

ECCC has been targeting the reduction of emissions of Volatile Organic Compounds (VOCs) from consumer and commercial products. VOCs are a contributing factor in the creation of air pollution. Control measures have been developed that set VOC content limits in some products, which in turn reduce their emissions.

In 2016–2017, amendments to the definition of VOCs on Schedule 1 of CEPA were finalized. This amendment aligns the CEPA and the USEPA definitions.

Indoor air quality

In addition to the penetration indoors of outdoor pollutants, indoor air can be contaminated by emissions from building materials, products, and activities inside the home, and by the infiltration of naturally occurring radon from the soil under the building.

The Residential Indoor Air Quality Guidelines summarize the health risks posed by specific indoor pollutants, based on a review of the best scientific information available at the time of the assessment. They summarize the known health effects, detail the indoor sources and provide a recommended exposure level, below which health effects are unlikely to occur. When it is not feasible to establish a numeric guideline, guidance documents are developed. Both guideline and guidance documents provide recommendations on strategies to reduce exposure to pollutants.

On March 18, 2017, a Notice of Intent was published in *Canada Gazette*, Part I indicating that the Department of the Environment and the Department of Health are initiating the development of proposed regulations under CEPA 1999 respecting formaldehyde emission standards for composite wood products. These regulations would help reduce formaldehyde emissions in indoor air from certain wood products produced domestically or imported into Canada. Publication of the Notice of Intent marked the beginning of a 60-day public comment period, which ended on May 17, 2017.

On May 28, 2016, the Minister of Health published a proposed residential indoor air quality guideline for acetaldehyde in the *Canada Gazette*, Part I. HC also supported development of the Formaldehyde Emissions Standard for Composite Wood Products by the Canadian Standards Association, which was published in May 2016. In addition, HC provided health-based advice on the

protection of vulnerable populations to the Canadian Standards Association, as input to an update of their standard on carbon monoxide alarms, published in January 2017.

2.4 WATER QUALITY

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 by the release 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 monitoring, scientific research, and leadership on the development of guidelines for water quality.

2.4.1 Monitoring

ECCC's Fresh Water Quality Monitoring program continues to implement a risk-based adaptive management framework in conjunction with statistical power analyses to better target monitoring activities to 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 report on changes in environmental condition.

In 2016–2017, ECCC scientists participated in development of management options for remediation of contaminated sediments in Great Lakes Areas of Concern, including Hamilton Harbour and the St. Clair River.

In addition to data collection and reporting on a wide range of environmental issues, monitoring efforts in 2016–2017 included continued upgrades to monitoring technologies and improved data reporting and database infrastructure.

More information on ECCC monitoring activities is available online at www.canada.ca/en/environment-climate-change/services/canadian-environmental-protection-act-registry/monitoring-reporting-research/monitoring.html.

2.4.2 Research

Both HC and ECCC continued their water quality research activities.

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 2016–2017, HC provided Statistics Canada with Quality Assurance/Quality Control on the data on VOCs in drinking water in preparation of the release of the CHMS, Cycle 4 report. Two Access-based databases and worksheets, along with relevant training materials, were finalized to support data accessibility for compounds identified as priorities for risk assessment under the CMP.

2.4.3 Risk management activities

HC works in collaboration with the provinces and territories to develop the Guidelines for Canadian Drinking Water Quality and their technical documents, based on priorities also established in consultation with the provinces and territories. Health-based guidelines are developed for drinking water contaminants that are found or expected to be found in drinking water supplies across Canada at levels that could lead to adverse health effects.

Priorities for guideline development are established every 3 to 4 years, using exposure information from federal, provincial and territorial sources and up-to-date science, as well as taking into consideration jurisdictional needs. This comprehensive process was initiated in early 2017, and its results will form the basis for a five-year workplan.

As part of the guideline development process, HC routinely monitors and reviews guidelines and standards for drinking water from other key organizations, such as the European Union the World Health Organization, the United States Environmental Protection Agency and the Australia National Health and Medical Research Council. The science and decisions supporting these international standards and guidelines are taken into consideration, and included in each guideline technical document.

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 14 lists the guidelines that were completed or in progress in 2016–2017.

Table 14: Guidelines/guidance documents for Canadian drinking water quality from April 2016 to March 2017

FINALIZED	UNDERWENT PUBLIC CONSULTATION	IN PROGRESS
<ul style="list-style-type: none"> • Bromate • Cyanobacterial toxins • Manganese 	<ul style="list-style-type: none"> • Manganese • PFOA • PFOS • Lead 	<ul style="list-style-type: none"> • Enteric protozoa • Uranium • Enteric viruses • QMRA • Copper • Natural organic matter • 1,4-Dioxane • Strontium • Enterococci • Coliform • Chloramines • Barium • Boron • Cadmium

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 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 2016–2017, monitoring projects were completed at 14 ocean disposal sites nationally (11% of the 125 actively used sites this fiscal year).

In the Pacific and Yukon Region, monitoring was conducted at five Disposal at Sea (DAS) sites. In October 2016, field monitoring was conducted at the Thornbrough Channel, Watts Point, Five Finger Island, Porlier Pass, and Sand Heads disposal sites. Monitoring consisted of both sediment grab sampling for physicochemical and toxicological analyses and Sediment Profile Imaging (SPI).

- For the physicochemical analyses, sediment samples were analyzed for trace metals, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), particle size, nutrients including total organic carbon (TOC) and total organic nitrogen (TON), dioxins and furans, and acid volatile sulphides and simultaneously extracted metals (AVS/SEM).
- For the toxicological analyses, toxicity testing included lethal and sublethal testing of species representing varying trophic levels.
- SPI technology was used to collect high-resolution plan and profile images of the surface sediment to confirm that disposal material had not been deposited outside the site boundaries, to assess benthic habitat quality outside of the site boundary, and to investigate the presence of wood waste at the site.

In the Quebec Region, monitoring studies were conducted at a total of seven DAS sites: four sites in the Magdalen Islands and three sites in the Gaspé Peninsula.

- Bathymetric surveys were conducted at three Magdalen Islands sites in September and October 2016: Depot E, Point Basse (PBCM-1), and L'Île-d'Entrée (IE-6). These surveys were conducted to determine if the disposal activities had been carried out in accordance with the conditions of the issued DAS permits.
- At the IE-6 DAS site, Transport Canada wanted to ensure that the disposal mound did not pose a danger to navigation.
- At Depot D, the fourth Magdalen Islands site studied, a macrobenthic fauna community study was conducted using an underwater video survey in September 2016.

- In August 2016, in the Gaspé Peninsula, bathymetric studies were conducted at the l'Anse-à-Brillant (ABR-1), l'Anse-à-Beaufils (AB-5), and Port-Daniel (PD-6) sites. As with the surveys in the Magdalen Islands, these were conducted to determine if disposal activities had been carried out in accordance with the conditions of the issued DAS permits.

In the Atlantic Region, monitoring studies were conducted at two DAS sites.

- In Nova Scotia, two studies were conducted at the Outer False Harbour DAS site in November 2016. A geophysical survey, consisting of bathymetry and backscatter data collection, was conducted which was then followed by sediment physicochemical characterization and optical imaging studies.
- In New Brunswick, a geophysical survey was conducted at the Black Point DAS site in June 2016. The mounds from the accumulated dredged material had been determined to have exceeded a height limit for disposal mounds established in the Management Plan. The geophysical survey was also used to analyze the footprint of the disposal site to confirm that it was not expanding beyond the established disposal site boundaries.

The results of all analyses, tests, and assessments pertaining to the monitoring conducted in 2016–2017 are pending.

With respect to the 13 monitoring projects that were conducted at 11 ocean disposal sites in 2015–2016, the results of these studies have concluded that disposal activities have not resulted in marine pollution at these sites.

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

The CEPA DAS rules impose a general prohibition on the disposal of substances into waters or onto ice from activities taking place at sea. Disposal at sea activities conducted under a permit from ECCC are exempt from this prohibition and permits are only available for a short list of wastes that cannot be granted a permit unless disposal at sea is the environmentally preferable and practical option.

Implementing the CEPA DAS rules helps Canada to meet its obligations as a party to the 1972 London Convention and the more modern London Protocol. Canada reports the number of permits, quantities and types of wastes, and results of disposal site monitoring to the London Protocol Secretariat each year.

In 2016, Canada and other parties marked the 20th anniversary of the London Protocol's entry into force by adopting a strategic plan for the London Protocol and Convention. The plan promotes ratification and improved implementation of the London Protocol to make it a truly global treaty. Canada led or participated in the development of a series of "low cost, low tech" technical guidance documents, and supported workshops and technical assistance that is offered to bring implementation within reach of more countries. In 2016, Canada was elected to Chair the London Protocol Compliance Group, which encourages and supports compliance and ratification of the treaty. Canada was also re-elected to Chair the Scientific Groups of the Protocol and Convention, which address new and emerging technical issues that arise.

Disposal at sea permits

In 2016–2017, 81 permits were issued in Canada for the disposal of 7.1 million tonnes of waste and other matter (Tables 15 and 16), compared to 75 permits for the disposal of 5.7 million tonnes in 2015–2016. 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 fill (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 15: Disposal at sea quantities permitted (in tonnes) and permits issued in Canada from April 2016 to March 2017

MATERIAL	QUANTITY PERMITTED	PERMITS ISSUED
Dredged material*	6,294,600	43
Geological matter*	741,000	5
Fish waste	48,845	32
Vessels	42	1
Organic matter	-	-
Total	7,084,487	81

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

Table 16: Disposal at sea quantities permitted (in tonnes) and permits issued by region from April 2016 to March 2017

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*	1,432,600	10	438,100	13			4,423,900	20
Geological matter*							741,000	5
Fish waste	47,695	29	1150	3				
Vessels	42	1						
Organic matter								
Total	1,480,337	40	439,250	16			5,164,900	25

* 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 increased slightly in 2016–2017 (Figure 9). The quantities permitted continue to fluctuate from year to year, showing increasing quantities, particularly for dredged material, this past fiscal year (Figure 10).

Figure 9: Number of disposal at sea permits issued

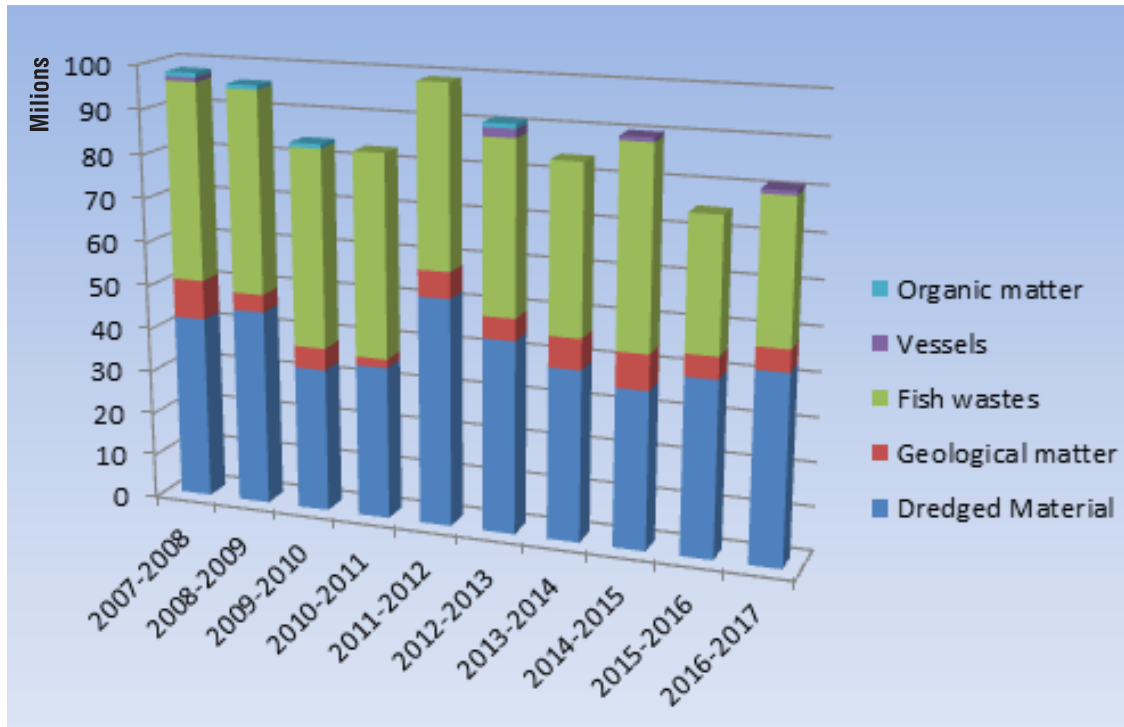
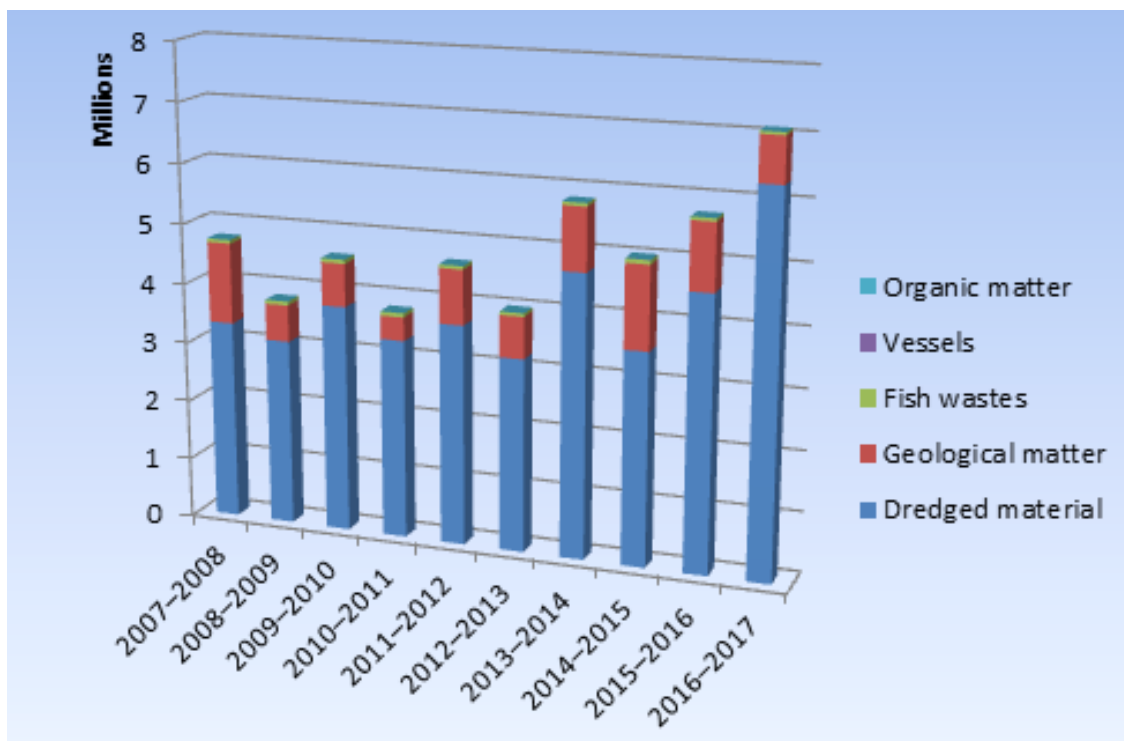


Figure 10: Annual disposal at sea quantities permitted (in millions of tonnes)



Further information on disposal at sea is available online at www.canada.ca/en/environment-climate-change/services/disposal-at-sea.html2.6.

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* and the *PCB Waste Export Regulations, 1996*.

On November 2, 2016, the *Regulations Amending the Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations* were published in *Canada Gazette, Part II* and came into force immediately. The Amendments expanded what is captured as “hazardous” under the Regulations. Waste and recyclable material, including those collected from households, will be considered hazardous for the purposes of export if they are defined as, or considered to be, “hazardous” under the legislation of the importing country or a transit country; their importation is prohibited under the legislation of the importing country; or they are one of the “hazardous wastes” or “other wastes” in the Basel Convention and the importing country is a party to the Basel Convention. The Amendments also added new provisions to address shipments of waste or recyclable material for which consent was provided by the importing and transit countries and a permit issued, but that could not be completed as planned.

In 2016,¹² ECCC processed 1 686 notices for proposed imports, exports and transits of hazardous wastes and hazardous recyclable materials under the *Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations*. The notices received covered 13,240 waste streams, which exhibited a range of hazardous properties such as being flammable, acutely toxic, oxidizing, corrosive, dangerously reactive and environmentally hazardous. In addition, 35,372 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 (97.9%) of hazardous waste and hazardous recyclable materials occurred between Canada and the United States. The remaining import exchanges occurred with Jamaica, Nigeria, Norway, Brazil, Australia and Indonesia; while the remaining exports occurred with Mexico, Belgium, Germany and Republic of Korea.

The quantity of hazardous waste and hazardous recyclable material imported into Canada was 383,741 tonnes (t) in 2016. This represents an increase of 16,015 tonnes or 4.4 % relative to 2015. Shipments imported destined for recycling totaled 263,931 tonnes and represented about 69 % of all imports in 2016. Imports of all hazardous wastes and hazardous recyclable materials in 2016 were shipped to five provinces: Ontario, Quebec, British Columbia, New Brunswick and Alberta.

¹² Export and import quantities set out in this section of the report represent actual movement values that took place from January 1, 2016, to December 31, 2016.

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

- spent lead-acid batteries;
- hydraulic fluids (used oil);
- spent sulfuric acid, corrosive liquids, waste liquors from pickling of metals;
- metal bearing waste; and
- flammable liquids.

The remaining 119,811 tonnes imported were hazardous wastes (31%) and quantities included:

- metal-bearing waste;
- organic solvents/flammable liquids;
- treated wood;
- wastes from the production, formulation and use of biocides and phytopharmaceuticals, pesticides, herbicides; and
- waste tarry residues (excluding asphalt cements) arising from the refining, distillation and any pyrolytic treatment of organic materials.

The quantity of hazardous waste and hazardous recyclable materials exported was 410 194 t in 2016. This represents a decrease of 105,820 tonnes or 20.5% from 2015. Shipments exported for recycling totaled 346,873 tonnes and represented about 85 % of all exports in 2016. Exports of hazardous recyclable materials in 2016 originated from eight provinces: Ontario, Quebec, New Brunswick, British Columbia, Saskatchewan, Manitoba, Alberta and Nova Scotia.

The majority of hazardous recyclable material exported abroad for recycling includes:

- spent sulfuric acid, corrosive liquids, waste liquors from pickling of metals;
- aluminum remelting by-products;
- treated wood;
- spent lead-acid batteries; and
- hydraulic fluids (used oil).

The remaining 63,321 t exported were hazardous wastes (15%) and quantities included:

- spent sulfuric acid, corrosive liquids, waste liquors from pickling of metals;
- hydraulic fluids (used oil and equipment contaminated with oil);
- aluminum remelting by-products;
- clinical and related waste; and
- waste paint and ink.

Tables 17 and 18 list the quantities imported and exported from 2007 to 2016.

Table 17: Hazardous waste and hazardous recyclable material, imports, 2007–2016 (tonnes)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Waste	260,749	270,390	268,391	146,499	151,295	101,796	190,841	159,008	118,403	119,810
Recyclables	237,141	262,337	221,778	217,663	243,491	243,434	245,110	221,354	249,323	263,931
Total imports	497,890	532,727	490,169	364,162	394,786	345,230	435,951	380,362	367,726	383,741

Table 18: Hazardous waste and hazardous recyclable material, exports, 2007–2016 (tonnes)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Waste	101,601	117,212	105,234	70,740	86,500	91,847	93,786	94,601	86,623	63,321
Recyclables	358,896	365,468	315,631	357,627	374,207	413,614	422,388	436,608	429,391	346,873
Total exports	460,497	482,680	420,865	428,367	460,707	505,461	516,174	531,209	516,014	410,194

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

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 (Environmental Matters Related to Emergencies). 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.

The Environmental Emergencies website (www.canada.ca/en/environment-climate-change/services/environmental-emergencies-program.html) 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, 2017, there were approximately 4600 regulatees from various sectors under the *E2 Regulations*. Of these regulatees, approximately 2900 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.

On October 8, 2016, the government published the proposed *Environmental Emergency Regulations, 2016* in the *Canada Gazette*, Part I, for a 60-day public comment period. The objective of the proposed Regulations is to strengthen environmental emergency management in Canada. Among other proposed changes, the proposed Regulations would add 49 further hazardous substances to Schedule 1 of the Regulations. This addition would require reporting on these substances, environmental emergency planning for higher-risk facilities and reporting of spills or releases involving these substances that are environmental emergencies.

In 2016–2017, ECCC's regional activities associated with the implementation of the *E2 Regulations* included conducting site visits, delivering presentations to the regulated community, and promoting and enforcing compliance with regulated persons. As a result of targeted efforts to increase the implementation of E2 plans by regulated parties, approximately 97% of those regulated parties which require E2 plans have fully implemented and tested their plans.

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.

National Advisory Committee

The National Advisory Committee (NAC) 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 www.canada.ca/en/environment-climate-change/services/canadian-environmental-protection-act-registry/general-information/national-advisory-committee.html

To carry out its duties in 2016–2017, the CEPA NAC held two teleconference meetings, and the NAC Secretariat corresponded regularly with committee members regarding various initiatives implemented under CEPA. These initiatives included opportunities to comment on and be informed of numerous actions taken under the Act.

This includes various risk assessment activities under the CMP, including:

- the publication of 22 draft screening assessments which included 297 substances, 9 groups of substances, and 18 living organisms;
- the publication of 20 final screening assessments which included 991 substances, 10 groups of substances, and 8 living organisms;
- 4 proposed orders to add 5 substances to Schedule 1, the List of Toxic Substances; and
- 2 final orders which added 44 petroleum and refinery gases, and plastic microbeads to Schedule 1.

Members were also informed of numerous risk management activities, including:

- 5 Notices of Intent to vary, apply or rescind significant new activity provisions to various substances under the Chemicals Management Plan;
- proposed environmental emergency regulations, 2016;
- proposed regulations amending the heavy-duty vehicle and engine GHG emission regulations and other regulations;
- publication of proposed regulations amending the *Off-Road Small Spark-Ignition Engine Emissions Regulations*;
- proposed environmental violations administrative monetary penalties regulations;
- proposed amendments to the Concentration of phosphorus in certain cleaning products regulations;
- proposed *Microbeads in Toiletries Regulations*;
- publication of the *Multi-Sector Air Pollutants Regulations*;
- publication of 3 codes of practice to reduce emissions of volatile organic compounds (VOC), total particulate matter and fine particulate matter (PM_{2.5});
- publication of 2 proposed codes of practice, one for 2-(2-Methoxyethoxy) ethanol (DEGME); and one dealing with end-of-life lamps containing mercury;
- information on consultations regarding the regulatory approach to prohibit the manufacture and import of lead wheel weights in Canada; and
- consultation on the development of a proposed pollution prevention plan notice for PREPOD.

Members were provided with an offer to consult on:

- federal environmental quality guidelines for certain substances under section 54 of CEPA;
- Canadian Ambient Air Quality Standards for SO₂; and
- proposed instruments to manage air pollutants from the pulp & paper sector, potash sector, aluminum sector, iron ore pellet sector, base metals smelting sector, iron, steel and ilmenite sector and natural gas-fueled stationary combustion turbines.

In addition, members were provided an opportunity to advise on proposed regulatory initiatives related to:

- ozone-depleting substances and halocarbon alternatives;
- hydrocarbons emitted from the upstream oil and gas sector; and
- the prohibition of certain toxic substances.

Members were also informed of:

- information gathering notices with respect to asbestos, and chemical substances included as part of the 2017 Inventory Update;
- upcoming meetings of the Conference of the Parties to the Stockholm, Basel and Rotterdam Conventions;
- publication of the reviewed 2015 National Pollutant Release Inventory Data;
- introduction of Bill C-13 in the House of Commons and its Royal Assent in December 2016, which will enable Canada to comply with the Agreement on Trade Facilitation under the World Trade Organization; and
- the mandatory review of the Act by the House of Commons Standing Committee on Environment and Sustainable Development.

Federal-provincial/territorial agreements

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.

Canada–Ontario Agreement on Great Lakes Water Quality and Ecosystem Health

Since 1971, Canada and Ontario have worked together through a Canada–Ontario Agreement to support the restoration and protection of the Lakes basin ecosystem. The 2014 Agreement guides the efforts of Canada and Ontario to restore, protect and conserve Great Lakes water quality and ecosystem health in order to assist in achieving the vision of a health, prosperous and sustainable region for present and future generations. It is also an important mechanism for implementing Canada's obligations under the Canada–United States Great Lakes Water Quality Agreement (www.canada.ca/en/environment-climate-change/services/great-lakes-protection/canada-united-states-water-quality-agreement.html).

In 2016–2017, construction of the Randle Reef engineered containment facility began as the first stage of this three stage project to remediate contaminated sediments in the Hamilton Harbour Area of Concern. The project is expected to be complete by 2022. Canada and Ontario are continuing to work with industry towards a solution to remediate historical contaminated sites in the St. Clair River.

Two significant Canada-Ontario Agreement commitments were delivered in 2016–2017: 1) a report summarizing past and current research, monitoring and risk management activities and achievements on chemicals identified as Tier I and Tier II was finalized and published and; 2) the first chemicals of concern in the Great Lakes basin were designated for priority action (the brominated flame retardants polybrominated diphenyl ethers and hexabromocyclododecane; lead; mercury; the perfluorinated compounds perfluorooctanoic acid, perfluorooctane sulfonate and long chain perfluorinated carboxylic acids; polychlorinated biphenyls; polycyclic aromatic hydrocarbons; and short chain chlorinated paraffins) (www.canada.ca/en/environment-climate-change/services/great-lakes-protection/canada-ontario-agreement-water-quality-ecosystem.html).

In addition, during 2016–2017, a range of continuing chemical risk management initiatives were delivered under the CMP, as described earlier in this report, that supported implementation of

the Harmful Pollutants Annex Goals under the new Canada-Ontario Agreement. 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

An equivalency agreement between the Government of Canada represented by the Minister of the Environment and the Government of Nova Scotia represented by their Minister of Environment regarding the federal Reduction of Carbon Dioxide Emissions from Coal-fired Generation of Electricity Regulations took effect in July 2015. Further to this agreement, the Governor in Council adopted an order suspending the application of the federal regulation in Nova Scotia. In accordance with the five-year term limit in CEPA, the agreement is set to terminate at the end of 2019.

Nova Scotia Environment reported no enforcement actions between April 2016 and March 2017.

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 2016–2017, 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 2016–2017, ECCC renewed the notification agreements between the Government of Canada and the Governments of Alberta, British Columbia, Manitoba, Northwest Territories, Ontario, Saskatchewan, and Yukon, and continued its work with these governments to effectively process notifications of environmental occurrences. The notification agreements are available online at www.canada.ca/en/environment-climate-change/services/canadian-environmental-protection-act-registry/agreements/occurrences-notification.html

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 2016 to March 2017, the CEPA Registry website had 178,751 visits, making it the third-largest area visited on the ECCC website, after Weather and Ice. There were approximately 300 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.canada.ca/en/environment-climate-change/services/canadian-environmental-protection-act-registry.html.

Public consultations

During 2016–2017, there were 67 opportunities posted on the Environmental Registry for stakeholders and the public to consult.

Please see CEPA Registry public consultations, available online at: www.canada.ca/en/environment-climate-change/services/canadian-environmental-protection-act-registry.html#summary-details5

CMP-related committees

The CMP Science Committee held its 5th meeting in November 2016. Considerations for integrating new approach methodologies within the CMP were presented at this meeting. Members engaged in constructive discussions as they continued developing the Committee's scientific input for the Government of Canada. The Science Committee ensures a strong science foundation to CMP by providing external, scientific expertise to Health Canada and ECCC on scientific issues. Meeting records and reports are available online (www.canada.ca/en/health-canada/services/chemical-substances/chemicals-management-plan/science-committee/meeting-records-reports.html).

The CMP Stakeholder Advisory Council met twice in 2016–2017. The purpose of the Council is to obtain stakeholder advice on the implementation of the CMP, and to foster dialogue on issues pertaining to the CMP between stakeholders and government, and also among different stakeholder groups.

In November 2016, the government hosted a multi-stakeholder workshop to engage and receive input from stakeholders on issues important to chemicals management in Canada beyond 2020.

Two issues of the CMP Progress Report were published in June and December 2016. The CMP Progress Report has been created to keep stakeholders and other interested parties up to date on the activities and programs related to the CMP. The report is produced jointly by ECCC and HC and is published twice a year.

Stakeholder awareness activities were undertaken in 2016–2017, focusing on targeted stakeholders, in order to facilitate information sharing. These activities included the continuation of the webinar series with non-industry health and environment stakeholders with sessions on risk management, public outreach, and enforcement. The regions delivered 137 stakeholder engagement activities related to chemical effects on health and approximately 15,786 brochures were distributed. The number of interactions with stakeholders was approximately 10,425 throughout the country. The renewal of regional stakeholder inventories was also undertaken to enhance information gathering, compliance promotion and industry outreach.

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 2016–2017 included a number of teleconferences and paper-based consultations, on proposed changes to the program requirements for 2018 reporting, including for polycyclic aromatic hydrocarbons, hexavalent chromium, the oil and gas extraction sector and additional contextual information for data users.

In addition to the above-mentioned consultation, the NPRI program does many activities to share information and hear ideas from stakeholders and the public. These activities include engaging users of NPRI data to get input on how to meet their needs; working collaboratively with other government programs and international organizations; and updating stakeholders regularly on the NPRI. The details of these activities can be found on the NPRI Web site at: www.canada.ca/en/environment-climate-change/services/national-pollutant-release-inventory/public-consultations.html.

Greenhouse Gas Emissions Reporting Program consultation

Environment and Climate Change Canada is proposing changes to its facility Greenhouse Gas Emissions Reporting Program (GHGRP). ECCC published the Notice of intent to inform stakeholders of upcoming consultations on proposed changes to the Greenhouse Gas Reporting Program in the *Canada Gazette* on December 10, 2016. Consultations with stakeholders (provincial and territorial governments, industry) started in early 2017.

Further information about the GHGRP consultation is available online at www.canada.ca/en/environment-climate-change/services/climate-change/greenhouse-gas-emissions/facility-reporting/consultations.html.

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 1300 resources containing comprehensive information and tools from Canada and around the world to strengthen their capacity to prevent pollution. In 2016–2017, 119 new records were added to the clearinghouse. Thirty-nine percent (39%) percent of the new records are Canadian, and 14% are bilingual. Twenty-six percent (26%) of new records are applicable to manufacturing sectors, while another 40% are applicable to private households. Overall, CPPIC records were viewed more than 30 000 times in 2016–2017.

State of the Environment Reporting

The Canadian Environmental Sustainability Indicators (CESI) program provides results and information on key environmental sustainability issues including climate change and air quality, water quality and availability, wildlife, biodiversity, toxic substances and exposure to substances of concern. 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 prepared by ECCC through close collaboration with science and data experts across the federal government, 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.

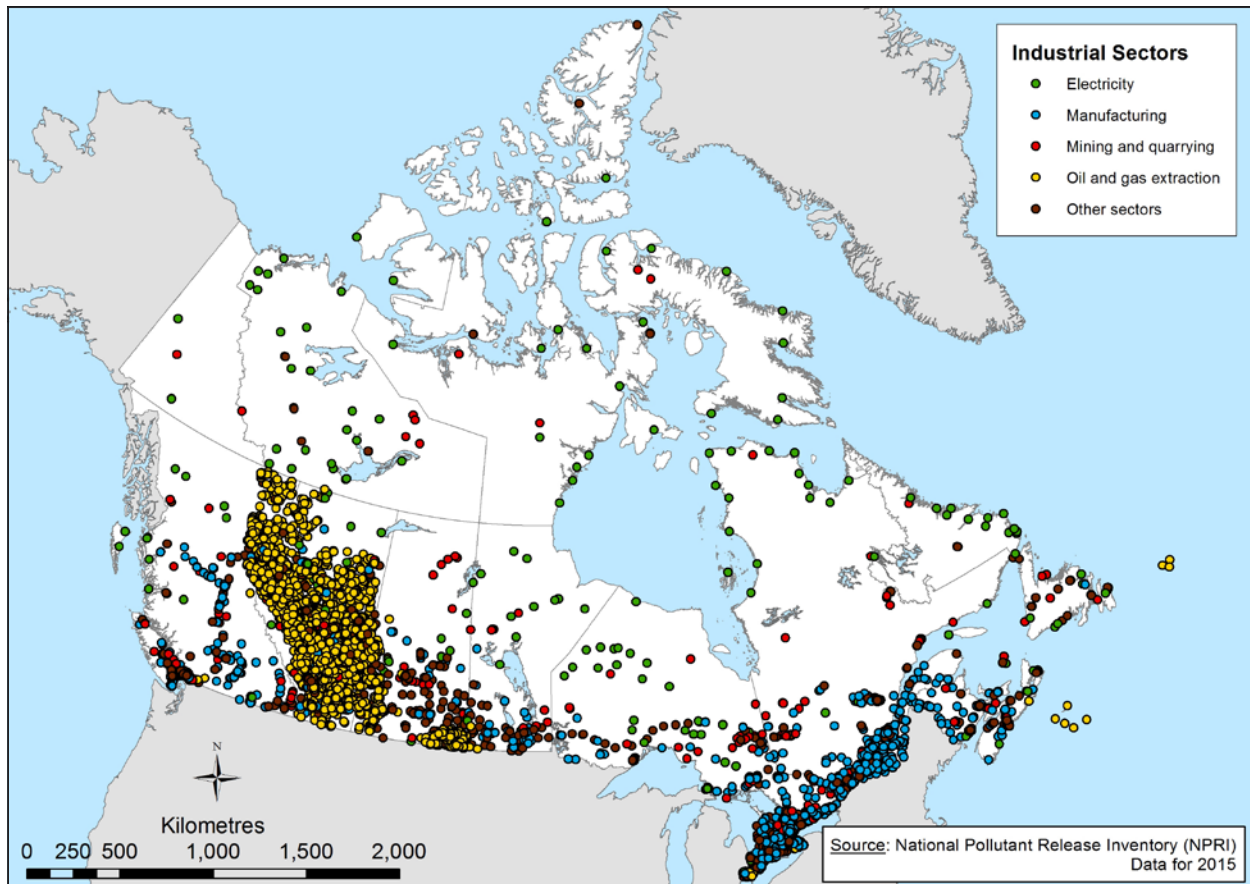
The indicators are published on the CESI website (www.canada.ca/en/environment-climate-change/services/environmental-indicators.html), showing national and regional results along with the methodology explaining each indicator and links to related socio-economic issues and information.

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 7000 facilities, located in every province and territory, reported to the NPRI for the 2015 reporting year (Figure 11).

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, location-based data for use in mapping and downloadable datasets encourages industry to prevent and reduce pollutant releases, and improves public understanding about pollution and environmental performance in Canada.

Figure 11: Location of facilities that reported to the NPRI for the 2016 reporting year



*This map shows NPRI reporting facilities for 2015 (7,284 facilities), excluding those that did not meet the reporting criteria (1,327 facilities).

NPRI data for the 2015 reporting year was published in preliminary form in July 2016 and in reviewed form in December 2016.

During 2016–2017, ECCC undertook a number of initiatives to respond to the needs of various users of NPRI data. For example, the Department held consultations on proposed changes to NPRI reporting requirements that are proposed to take effect for the 2018 reporting year, and continued to improve the accessibility of datasets to facilitate analysis by data users with the publication of 2015 data.

Pollution prevention data submitted to the NPRI is analyzed and outlined in the NPRI annual summary report. Pollution prevention activity data submitted by facilities is also summarized in ECCC's Pollution prevention in practice fact sheets. These fact sheets provide an overview of the implementation of the seven common pollution prevention activities among Canadian facilities. Visit www.canada.ca/en/environment-climate-change/services/pollution-prevention/how-canadian-companies-are-preventing.html for more information on pollution prevention data from the NPRI.

Air Pollutant Emission Inventory

Canada's Air Pollutant Emission Inventory (APEI) is a comprehensive inventory of air pollutant emissions at the national, provincial and territorial level. The APEI compiles emissions of 17 air pollutants contributing to smog, acid rain and poor air quality since 1990.

This inventory serves many purposes including fulfilling Canada's international reporting obligations under the 1979 Convention on Long-range Transboundary Air Pollution (CLRTAP) and the associated protocols ratified by Canada for the reduction of emissions of sulphur oxides (SO_x), nitrogen oxides (NO_x), cadmium (Cd), lead (Pb), mercury (Hg), dioxins and furans, and other persistent organic pollutants (POPs). The APEI also supports monitoring and reporting obligations under the Canada-U.S. Air Quality Agreement, the development of air quality management strategies, policies and regulations, provides data for air quality forecasting models, and informs Canadians about pollutants that affect their health and the environment.

Further information on the APEI is available online at: www.canada.ca/en/environment-climate-change/services/pollutants/air-emissions-inventory-overview.html

Black Carbon Emission Inventory

As a member of the Arctic Council, Canada has committed to producing an annual inventory of black carbon emissions. The associated report serves to inform Canadians about black carbon emissions and provide valuable information for the development of air quality management strategies.

With the exception of emissions from on-road vehicle, the data used to quantify black carbon emissions are taken from the Air Pollutant Emission Inventory, specifically fine particulate matter (PM_{2.5}) emissions from combustion-related sources, such as residential wood burning.

Further information on the Black Carbon Emissions Inventory is available online at www.canada.ca/en/environment-climate-change/services/pollutants/black-carbon-emissions-inventory.html

Greenhouse gas inventory

As a signatory to the United Nations Framework Convention on Climate Change (UNFCCC), Canada is obligated to prepare and submit an annual national greenhouse gas (GHG) inventory covering anthropogenic emissions by sources and removals by sinks. Environment and Climate Change Canada is responsible for preparing Canada's official national inventory with input from numerous experts and scientists across Canada. The National Inventory Report (NIR) contains Canada's annual GHG emission estimates dating back to 1990. In addition to providing GHG emission data by mandatory reporting categories, the NIR also presents emission data by Canadian economic sectors, which better support policy analysis and development.

The NIR, along with the Common Reporting Format (CRF) tables, comprise Canada's inventory submission to the UNFCCC and are prepared in accordance with the UNFCCC Reporting Guidelines on annual inventories, Decision 24/CP.19.

Further information on the GHG Inventory is available online at: www.canada.ca/en/environment-climate-change/services/climate-change/greenhouse-gas-emissions/inventory.html

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 2016, the 2014 facility-reported data and related overview report were made publicly available as part of a broader departmental release of GHG information products. The published data included total emissions, by gas, for each facility that reported to the program. Environment and Climate Change Canada also received 2015 GHG emissions information from 563 facilities. The facility-reported data is available through Canada's open data portal at <http://open.canada.ca/data/en/dataset/a8ba14b7-7f23-462a-bdbb-83b0ef629823>

In December 2016, a Notice was published in *Canada Gazette*, Part I requiring the reporting of GHG emissions for the 2016 calendar year. ECCC also announced proposed changes to the reporting requirements (starting with 2017 data), including:

- Lowering the reporting threshold from 50 kilotonnes (kt) to 10 kt. All facilities that emit the equivalent of 10 kt or more of GHGs in carbon dioxide equivalent units (CO₂ eq) per year will be required to submit a report.
- Requiring facilities to provide additional data and apply specific quantification methods to determine emissions. These new requirements will be gradually phased in.
- Identifying sectors and activities for the first phase of the expansion (2017 reported data): manufacturers of cement, lime, iron & steel and aluminum, as well as carbon capture, transport and geological storage.

Further information on the GHGRP is available online at www.canada.ca/en/environment-climate-change/services/climate-change/greenhouse-gas-emissions/facility-reporting.html

ECCC's Single Window reporting system

Initially implemented to reduce burden on industry and support the shared interest across jurisdictions of tracking and reporting progress on the reduction of GHG emissions and certain pollutant releases, ECCC's Single Window reporting system continues to expand to support electronic reporting to additional Regulations under CEPA. In 2016–2017, streamlined electronic reporting was made available for the *Products Containing Mercury Regulations*, *Environmental Effects Monitoring Program* and *Multi-Sector Air Pollutants Regulations*.

Further information on the Single Window Reporting System is available online at www.canada.ca/en/environment-climate-change/services/reporting-through-single-window.html.

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 administered by ECCC or involving ECCC enforcement officers (including CEPA).

The Environmental Offenders Registry and Enforcement Notifications can be found online at <https://environmental-protection.canada.ca/offenders-registry> and www.canada.ca/en/environment-climate-change/services/environmental-enforcement/notifications.html, 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 through education and awareness-building, which helps mitigate consequential enforcement actions.

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; enter premises, open containers, examine contents and take samples; 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.

Various enforcement measures are available to respond to alleged violations. Many are designed to achieve compliance without resorting to a formalized judicial 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. In addition, administrative monetary penalties (AMPs) under the Environmental Violations Administrative Monetary Penalties Act are now available for enforcement officers to respond to designated violations of Parts 7 and 9 of CEPA. AMPs are designed to create a financial disincentive to non-compliance with designated legislative requirements and to provide an alternative to other enforcement measures, which may not be effective or available in all situations. The Environmental Violations Administrative Monetary Penalties Regulations which came into force on June 2, 2017, complete the AMPs regime by establishing key details of this regime.

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 prosecuting the charge.

Enforcement activities are conducted in accordance with the Compliance and Enforcement Policy for CEPA (1999). It is available online at www.canada.ca/en/environment-climate-change/services/canadian-environmental-protection-act-registry/publications/compliance-enforcement-policy.html.

4.1 COMPLIANCE PROMOTION PRIORITIES

Each year, ECCC develops an annual list of priorities for delivery of compliance promotion activities on issues such as chemical management, air pollutants, and greenhouse gas emissions. Factors that influence the identification of priority activities include the recent publication of new or amended regulatory and non-regulatory instruments, new requirements coming into force, level of compliance, and need to maintain awareness, understanding, or compliance for specific requirements. The Department continues to focus compliance promotion efforts on regulatory and non-regulatory instruments that target geographically dispersed, hard-to-reach, small and medium-sized enterprises, Indigenous peoples, and federal departments. Resources are aligned with these identified compliance promotion priorities.

In 2016–2017, compliance promotion activities were carried out for the following regulatory and non-regulatory CEPA instruments:

- *Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations*
- *Products Containing Mercury Regulations*
- *Prohibition of Certain Toxic Substances Regulations, 2012*
- *Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations*
- *Tetrachloroethylene (Use in Dry Cleaning and Reporting Requirements) Regulations*
- *Volatile Organic Compound (VOC) Concentration Limits for Architectural Coatings Regulations*
- *Code of Practice for the Reduction of Volatile Organic Compound (VOC) Emissions from Cutback and Emulsified Asphalt*
- *Renewable Fuels Regulations*
- *Sulphur in Gasoline Regulations*
- *Code of Practice for the Environmental Management of Road Salts*
- *Federal Halocarbon Regulations, 2003*
- *PCB Regulations*
- *Gasoline and Gasoline Blend Dispensing Flow Rate Regulations (2000)*

ECCC also worked on planning the implementation for 20 new or amended regulatory and non-regulatory instruments published in the *Canada Gazette*, Parts I and II.

4.2 COMPLIANCE PROMOTION ACTIVITIES

Multiple approaches were used to reach the regulated communities, including workshops, information sessions, presentations, information package emails/mail-outs, articles, phone calls, and social media platforms. Many of these activities were carried out in collaboration with provincial and territorial governments, as well as non-governmental organizations and associations.

For instance, the Quebec region developed a strong working relationship with the *Association pour le Développement et l'Innovation en Chimie au Québec* which provides an opportunity for each party to focus efforts on areas of strength and expertise. An article regarding the *Prohibition of Certain Toxic*

Substances Regulations, 2012 was published in the November 2016 issue of *The Canadian Journal of Chemical Engineering* as a first step in the development and implementation of guidance for the regulated community. These, and many other successful activities, have helped to increase the awareness and contribute to the understanding of and compliance with ECCC's regulatory and non-regulatory instruments.

In addition, as communication efficiency and accuracy is important when reaching the regulated community, extra efforts were made this fiscal year to improve the data quality of the Department's compliance promotion activity database. In 2016–2017 alone, the Department added over 4000 facilities and their contacts as well as updated an additional 120,000 facilities and their contacts in the database.

Responding to inquiries

Compliance promotion officers continued to raise awareness and understanding of the Department's regulatory and non-regulatory instruments by responding to over 3200 inquiries and feedback on the 13 compliance promotion priority regulatory and non-regulatory instruments listed in section 4.1. Most inquiries and feedback were received by email, while the remainder came by fax, letter and telephone.

Promoting compliance to Indigenous people and within the federal government

In 2016–2017, ECCC continued to work closely with Indigenous peoples and the federal government by delivering individual communications and individual-instrument and multi-instrument awareness activities for compliance promotion priority regulatory and non-regulatory instruments. Workshops, tradeshows, and conferences were delivered to Indigenous Peoples throughout Canada and federal government departments to increase awareness of their obligations to comply with instruments under CEPA. These activities were delivered for compliance promotion priority instruments including the *Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations*, *Gasoline and Gasoline Blend Dispensing Flow Rate Regulations*, *PCB Regulations*, and *Federal Halocarbon Regulations, 2003*.

Promoting compliance with transportation sector emission regulations

There are six emission regulations covering on-and off-road vehicles and engines that apply to manufacturers in Canada and to persons importing prescribed products into Canada. There are also nine regulations related to fuels that apply to the manufacture, importation and sale of fuel in Canada. During 2016–2017, ECCC responded to almost 1000 inquiries regarding the vehicles and engines regulations and almost 400 regarding the fuels 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. An annual compliance promotion information package was distributed to all regulated parties regarding the fuels regulations.

Promoting compliance with small and medium-sized enterprises

Multi-instrument compliance-promotion activities provide an opportunity for regulatees to obtain information regarding legislation and regulatory and non-regulatory instruments to enable them to act environmentally responsible and avoid enforcement actions. Regulatees also benefit from the knowledge and experience of compliance promotion officers who visit their operations. In 2016–2017, ECCC conducted a total of seven mail out campaigns and reached small and medium-sized enterprises through numerous individual and multi-instrument awareness activities for the 13 compliance promotion priority regulatory and non-regulatory instruments listed in section 4.1.

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, governmental and departmental priorities, suspected non-compliance, recent publication of new and amended regulations and domestic and international commitments and obligations.

In 2016–2017, the NEP gave priority to the following CEPA instruments:

- *Off-Road Compression-Ignition Engines Emission Regulations*
- *Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations*
- *Environmental Emergency Regulations*

In addition to the planned inspections carried out under the NEP, enforcement activities under CEPA also include 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, regional issues or concerns, and provincial and territorial environmental sensitivities.

4.4 ENFORCEMENT ACTIVITIES

Enforcement activities undertaken between April 1, 2016, and March 31, 2017 are summarized in the following four tables.

- Table 19 provides the number of on-site and off-site inspections for each regulation
- Table 20 provides the breakdown of investigations for each regulation for which at least one investigation occurred and/or closed
- Table 21 provides the total number of enforcement measures resulting from inspections and investigations that were imposed for each regulation.
- Table 22 provides the number of prosecutions 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 19 outlines the number of inspections under CEPA for fiscal year 2016–2017. The total number of inspections relates to the number of regulatees inspected for compliance using the end date of the inspection for the reference period.

Table 19: Number of inspections under CEPA from April 1, 2016, to March 31, 2017

INSTRUMENT	INSPECTIONS*		
	On-Site	Off-site	Total
Canadian Environment Protection Act, 1999 - Total	2898	927	3825
CEPA - Sections	90	26	116
<i>Chromium Electroplating, Chromium Anodizing and Reverse Etching Regulations</i>	74	20	94
<i>Concentration of Phosphorus in Certain Cleaning Products Regulations</i>	15	—	15
<i>Disposal at Sea Regulations</i>	51	34	85
<i>Environmental Emergency Regulations</i>	270	107	377
<i>Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations</i>	402	24	426
<i>Federal Halocarbon Regulations, 2003</i>	150	129	279
<i>Gasoline and Gasoline Blend Dispensing Flow Rate Regulations</i>	159	—	159
<i>Marine Spark-Ignition Engine, Vessel and Off-Road Recreational Vehicle Emission Regulations</i>	24	1	25
<i>Ozone-depleting Substances Regulations, 1998</i>	72	7	79
<i>PCB Regulations</i>	392	85	477
<i>PCB Waste Export Regulations, 1996</i>	10	—	10
<i>Renewable Fuels Regulations</i>	4	4	8
<i>Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations</i>	470	45	515
<i>Tetrachloroethylene (Use in Dry Cleaning and Reporting Requirements) Regulations</i>	378	90	468
<i>Volatile Organic Compound Concentration Limits for Automotive Refinishing Products Regulations</i>	8	—	8

*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 20 describes the number of investigations under CEPA for fiscal year 2016–2017.

Table 20: Breakdown of investigations from April 1, 2016, to March 31, 2017

INSTRUMENT	INVESTIGATIONS*		
	Started before FY 2016–2017 and ongoing at the start of the year	Started in FY 2016–2017	Ended in FY 2016–2017
Canadian Environment Protection Act, 1999 - Total	104	26	40
CEPA - Sections	36	5	12
<i>Chromium Electroplating, Chromium Anodizing and Reverse Etching Regulations</i>	—	—	2

Concentration of Phosphorus in Certain Cleaning Products Regulations	1	—	—
Disposal at Sea Regulations	7	1	3
Environmental Emergency Regulations	3	1	2
Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations	3	—	—
Federal Halocarbon Regulations, 2003	2	—	—
Gasoline and Gasoline Blend Dispensing Flow Rate Regulations	1	—	—
Marine Spark-Ignition Engine, Vessel and Off-Road Recreational Vehicle Emission Regulations	—	1	1
Ozone-depleting Substances Regulations, 1998	3	—	3
PCB Regulations	11	4	4
PCB Waste Export Regulations, 1996	1	—	—
Renewable Fuels Regulations	2	—	—
Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations	14	4	7
Tetrachloroethylene (Use in Dry Cleaning and Reporting Requirements) Regulations	10	4	8
Volatile Organic Compound (VOC) Concentration Limits for Automotive Refinishing Products Regulations	2	1	—

*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 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 stop an ongoing violation from continuing, 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 regulated substances or products from the marketplace;
 - **detention orders** for ships;
- **injunctions**;
- **prosecution** at the discretion of a Crown prosecutor; and
- **environmental protection alternative measures.**

Table 21 sets out the number of enforcement measures under CEPA for fiscal year 2016–2017.

Enforcement measures for certain regulations are comparatively high for several reasons, including the following:

- In 2016–2017, national priorities were the *Environmental Emergency Regulations*, *Off-Road Compression-Ignition Engines Emission Regulations*, and the *Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations*.
- An enforcement project begun in 2015–2016 under the PCB Regulations was completed in 2016–2017, and another PCB project was being piloted for future fiscal years.
- As certain requirements of the *Chromium Electroplating, Chromium Anodizing and Reverse Etching Regulations* must be met every five years, many regulatees had obligations to meet in 2016–2017.

In 2016–2017, there were no injunctions or ministerial orders (recall orders and prohibition orders); therefore, these columns do not appear.

Table 21: Number of Enforcement Measures from April 1, 2016, to March 31, 2017

INSTRUMENT	ENFORCEMENT MEASURES FROM INSPECTIONS AND INVESTIGATIONS			
	Directions*	Written Warnings*	Number of Subjects involved in EPCOs**	EPCOs*
Canadian Environment Protection Act, 1999 - Total	2	2721	107	918
2-Butoxyethanol Regulations	—	4	—	—
CEPA - Sections	—	54	4	6
<i>Chromium Electroplating, Chromium Anodizing and Reverse Etching Regulations</i>	1	69	2	5
<i>Concentration of Phosphorus in Certain Cleaning Products Regulations</i>	—	1	—	—
<i>Disposal at Sea Regulations</i>	—	2	—	—
<i>Environmental Emergency Regulations</i>	—	470	2	6
<i>Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations</i>	—	69	—	—
<i>Federal Halocarbon Regulations, 2003</i>	—	100	1	6
<i>Fuels Information Regulations, No. 1</i>	—	3	—	—
<i>Gasoline and Gasoline Blend Dispensing Flow Rate Regulations</i>	—	13	6	6
<i>Marine Spark-Ignition Engine, Vessel and Off-Road Recreational Vehicle Emission Regulations</i>	—	13	—	—
<i>National Pollutant Release Inventory</i>	—	4	—	—
<i>Off-Road Compression-Ignition Engine Emission Regulations</i>	—	164	—	—
<i>Off-Road Small Spark-Ignition Engine Emission Regulations</i>	—	19	—	—
<i>On-Road Vehicle and Engine Emission Regulations</i>	—	40	—	—

<i>Ozone-depleting Substances Regulations, 1998</i>	—	16	—	—
<i>PCB Regulations</i>	1	120	32	115
<i>PCB Waste Export Regulations, 1996</i>	—	3	—	—
<i>Renewable Fuels Regulations</i>	—	9	1	6
<i>Solvent Degreasing Regulations</i>	—	11	—	—
<i>Sulphur in Diesel Fuel Regulations</i>	—	3	—	—
<i>Sulphur in Gasoline Regulations</i>	—	4	—	—
<i>Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations</i>	—	1271	47	741
<i>Tetrachloroethylene (Use in Dry Cleaning and Reporting Requirements) Regulations</i>	—	254	6	16
<i>Volatile Organic Compound (VOC) Concentration Limits for Architectural Coatings Regulations</i>	--	2	5	9
<i>Volatile Organic Compound (VOC) Concentration Limits for Automotive Refinishing Products Regulations</i>	--	3	1	2

*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 ultimately rests with the Director of Public Prosecution (DPP) of Canada or her delegated agent. 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 the Canadian Environmental Protection Act, 1999, another enforcement measure 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 22 outlines the number of prosecutions, tickets, and EPAMs under CEPA for fiscal year 2016–2017.

Table 22: Number of Prosecutions and new EPAMs from April 1, 2016, to March 31, 2017

INSTRUMENT	PROSECUTIONS					
	Charges laid in FY 2016–2017			Concluded in FY 2016–2017		
	Tickets	Prosecuted Subjects*	Counts**	Convicted Subjects***	Guilty Counts**	EPAMs
Canadian Environment Protection Act, 1999 - Total	43	33	221	24	87	—
CEPA - Sections	—	15	107	12	71	—
<i>Chromium Electroplating, Chromium Anodizing and Reverse Etching Regulations</i>	5	—	—	—	—	—
<i>Disposal at Sea Regulations</i>	—	3	5	2	2	—
<i>Environmental Emergency Regulations</i>	2	—	—	—	—	—
<i>Ozone-depleting Substances Regulations, 1998</i>	1	1	2	2	4	—
<i>PCB Regulations</i>	3	2	4	1	2	—
<i>Solvent Degreasing Regulations</i>	1	—	—	—	—	—
<i>Tetrachloroethylene (Use in Dry Cleaning and Reporting Requirements) Regulations</i>	31	15	103	6	7	—
<i>Volatile Organic Compound (VOC) Concentration Limits for Automotive Refinishing Products Regulations</i>	—	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 2017 but charges were laid in January 2016, 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

In 2016–2017, 33 subjects were convicted and sentenced for offences of contravening CEPA and its regulations, and \$4,579,500 was directed to the Environmental Damages Fund (EDF).

The EDF is a specified purpose account, administered by ECCC, to provide a mechanism for directing funds received as a result of fines, court orders, and voluntary payments to priority projects that will benefit our natural environment.

Below are highlights of prosecutions that occurred under CEPA and its regulations in 2016-2017.

Disposal at Sea

On December 12, 2016, a fish processing company, Barry Group Inc., was ordered to pay \$200,000 in penalties for environmental violations that occurred at fish-processing facilities in Witless Bay and Port de Grave, Newfoundland and Labrador. The company was charged with contraventions of the disposal at sea provisions of CEPA. The charges stemmed from inspections carried out in June 2015 by ECCC enforcement officers, in which they observed workers dumping crab waste outside of the authorized disposal zone.

Ozone-depleting substances

On December 5, 2016, CRC Canada Co. was sentenced and ordered to pay \$225,000 after pleading guilty to two counts of contravening the *Ozone-depleting Substances Regulations, 1998* under CEPA. The fine was directed to the EDF. Enforcement officers conducted an investigation into the import and sale by CRC Canada Co. of aerosol products containing a prohibited ozone-depleting substance, HCFC-225. Charges were laid in February 2016. In addition to the fine, CRC Canada Co. agreed to pay all costs associated with the removal and destruction of the products seized by ECCC officers during the investigation.

On December 12, 2016, Acklands-Grainger Inc. pleaded guilty to contravening the *Ozone-depleting Substances Regulations, 1998* made pursuant to CEPA. The company was fined \$500,000, which was directed to the EDF. Enforcement officers conducted an investigation into Acklands-Grainger Inc.'s sale of aerosol products containing hydrochlorofluorocarbons (HCFC), a prohibited ozone-depleting substance. The investigation determined that between 2012 and 2014 the company sold HV Switchgear Lubricant and Sprayon EL2204, which contained the prohibited HCFC.

PCBs

On December 7, 2016, the Hudson Bay Company was found guilty of six charges and was fined \$765 000 for violating the PCB Regulations and CEPA. The company was also ordered to establish an Environmental Management System, provide training on the legal consequences of violating environmental legislation to its Canadian managers, and publish an article on the facts surrounding their offences. The investigation, led by ECCC, showed that the Hudson Bay Company had committed several violations to the Regulations and to the Act, namely releasing more than 146 kg of polychlorinated biphenyls (PCBs) into the environment, exceeding the permitted amount by 146 000 times; failing to notify as soon as possible of the release; failing to take all possible measures to prevent the release of the PCBs in the environment; and failing to submit to the minister, within the deadlines, the annual reports for 2008, 2009, and 2010. The fine will be directed to the EDF.

On December 20, 2016, Tidan Inc. and seven associated companies pleaded guilty to 52 charges and were fined \$975,000 for violating CEPA and the *PCB Regulations*. This is the largest fine to date under CEPA. The investigation conducted by ECCC showed that Tidan Group did not follow

environmental protection compliance orders issued by the Department's enforcement officers and did not meet its obligations related to the use, storage and disposal of electrical equipment containing PCBs. Tidan Group also failed to submit reports on the use and storage of its electrical equipment to the Department. The fine that is collected will be paid into the EDF. The offenders were also ordered to publish an article on the facts surrounding their violations, to develop procedures to manage the contaminated electrical equipment for all of their buildings, and to provide training for their managers and staff.

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. 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.

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 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.

APPENDIX B: CONTACTS

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

CEPA Environmental Registry website
(www.canada.ca/en/environment-climate-change/services/canadian-environmental-protection-act-registry.html)

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: 819-938-3860
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