

Canadian Environmental Protection Act

Report for the Period

April 1996 to March 1997

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At the end of each fiscal year, Environment Canada publishes an annual report for Parliament on the *Canadian Environmental Protection Act* (CEPA). This report covers the period from April 1, 1996 to March 31, 1997.

For more information on CEPA, please contact:

The CEPA Office
Environmental Protection Service
Environment Canada
Ottawa, Ontario
K1A 0H3

Voice: (819) 953-0142
Fax: (819) 997-0449

This document is also available on the Internet at:

<http://www.ec.gc.ca/CEPA/etitles.html>

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Minister's Message

I am pleased to present to Parliament the Annual Report of the *Canadian Environmental Protection Act* for the fiscal year ending March 31, 1997.

The priority for this year has once again been the renewal of the Act that will guide us into the new millennium. The efforts and recommendations of parliamentarians that, last year, resulted in a Government Response were combined into a Bill, C-74, that was tabled in the House in December.

Meanwhile, activity under the Act has not stopped. During the year four new regulations were published bringing the total number to 25. This year's regulations were for:

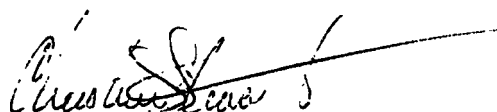
- * The sulphur content of diesel fuel;
- * The registration of petroleum storage tanks on federal lands;
- * The export of PCB wastes, ensuring that they could not be land-filled; and
- * The notification, by manufacturers and importers, of new biotechnology products.

Programs already established under the Act continued to be productive. For instance:

- * 23 biochemicals and 22 micro-organisms were added to the Domestic Substances List;
- * Over 2400 substances were added to the Non-Domestic Substances List;
- * Over 1200 new substances were reviewed and assessed;
- * Nearly 6000 notices for the import, export and transit of hazardous wastes in Canada were registered;
- * 92 permits were issued representing 5.2 million tonnes of waste for disposal at sea;
- * 700 inspections were carried out and five prosecutions commenced; and
- * Seven agreements, with provincial and territorial governments for inspection and enforcement of the Act, were administered.

The Report also outlines the numerous international agreements and protocols, that cover a wide variety of issues important to Canada, and the progress being made in pollution prevention across the country. As members of a science-based Department, my scientists and those of my colleague at Health Canada, have published 300 papers this year.

The dedication of my officials to fulfilling the mandate of the Act have held us and the environment in good stead during this year.



Christine Stewart
Minister of the Environment

Canadian Environmental Protection Act

The *Canadian Environmental Protection Act* (CEPA) is an Act respecting the protection of the environment and human life and health. It is divided into seven Parts, which include powers to:

- Undertake environmental research and develop guidelines and codes of practice;
- Regulate toxic substances and wastes, import and export of hazardous wastes and fuels;
- Regulate nutrients;
- Regulate the environmental effects of federal operations;
- Regulate international air pollution;
- Regulate ocean dumping; and
- Enforce regulations, as well as agreements with provinces and territories.

Environment Canada administers the Act on behalf of the federal government, but develops regulations for toxic substances and international air pollution and guidelines jointly with Health Canada.

Environment Canada supports the principle that protection and conservation of the environment are a shared responsibility among all Canadians and by all jurisdictions. The Department continues to reaffirm the importance of public consultation in the design of its policies, in the development of its programs and in the delivery of its services.

CEPA Review and Renewal

Section 139 requires the review of CEPA after five years. A renewed CEPA has been drafted, and was tabled for First Reading in the House of Commons on December 10, 1996 as Bill C-74. The Bill represents the best balance achievable after long and hard discussion. The philosophical basis of the renewed Act is:

- Pollution prevention;
- The ecosystem approach;
- Protection of biological diversity;
- Science and the precautionary principle;
- User/producer responsibility;
- Economic responsibility; and
- Intergovernmental cooperation.

The shift to pollution prevention as the priority approach for protection of the environment and human health will bring Canada into line with countries that are already reaping the economic benefits of clean, competitive, innovative industries. Pollution prevention legislation has been in place in the United States since 1990. Therefore, it is essential for Canadian activities under the North American Free Trade Agreement (NAFTA) and the North American Agreement on Environmental Co-operation that Canada remains in harmony with its most important partners. A renewed CEPA would also include an improved enforcement toolbox. Second Reading for Bill C-74 had not taken place by March 31, 1997.

Advisory Committees

Section 5 provides for the Minister to seek advice from experts on relevant issues. No such Advisory Committees existed during 1996-97, except for the Federal-Provincial Advisory Committee (FPAC) required under Section 6.

Federal-Provincial Advisory Committee

The FPAC consists of provincial/territorial environmental members as well as federal environmental and health representatives. The Committee's main purpose is to ensure early and effective collaboration and consultation for environmental protection and toxic management initiatives. It also provides a forum for open sharing of information on various environmental initiatives between the federal, provincial and territorial governments.

During 1996-97, members were kept apprised of a number of issues of mutual interest. These include:

- The work done on the evolution of a renewed CEPA;
- Progress on the management of toxic substances particularly those on the Priority Substances List (see p 13).

Other activities include:

- The Federal-Provincial Task Force on Dioxins and Furans, which is to prepare an inventory of Canadian sources of these pollutants resulting from human activities;
- The Working Group on Air Quality Objectives and Guidelines (see p. 7).

Finally, FPAC has dealt with a number of other issues during the year including:

- The PCB Waste Export Regulations;
- The Benzene and Sulphur Regulations; and
- The Global Program of Action on the Protection of the Marine Environment from Land-Based Activities.

Part I: Environmental Quality

Research and Monitoring

Part I, Section 7, authorizes the Minister to:

- Establish environmental monitoring stations;
- Collect and publish data on environmental quality;
- Conduct research and studies on pollution control and environmental contamination;
- Formulate pollution control plans; and
- Publish information on the state of the Canadian environment.

The following six Environment Canada science institutes undertake research that is related to CEPA.

Environmental Technology Centre

During the 1996-97 fiscal year, the Centre continued to coordinate the operations of the National Air Pollution Surveillance Network, dealing with ambient air quality by:

- Preparing and distributing quality control/assurance guidelines to the Network;
- Measuring acid aerosols;
- Maintaining an extensive ambient air toxics sampling network; and
- Publishing an annual report of air quality in comparison to the National Air Quality Objectives for the year 1993.

Other initiatives undertaken by the Centre during the 1996-97 reporting period include:

- Witnessing of the emission tests at the Cape Breton Municipal Solid Waste Incinerator;
- Witnessing the compliance tests on the refining kettles and reverberatory furnace at the Canada Metal secondary lead smelter;
- Development of a method for sulphur dioxide (SO₂), carbon monoxide (CO) and oxides of nitrogen (NO_x) emissions in support of the Guidelines for Stationary Gas Turbines and Reciprocating Engines;
- Development of a sampling method for measuring methane leaks from natural gas distribution and transmission stations; and
- Distribution of an Auditing and Witnessing Guide for Inspectors.

The Centre also tests vehicle emissions. During 1996-97, the Centre's laboratory measured emissions from diesel engines and various alternative fuels. As well, the Centre improved methods to measure complex and hazardous chemicals such as poly nuclear aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs) and ozone-depleting substances. Research on technologies that prevent and control spills of hydrocarbons and other hazardous chemicals was also performed.

The Centre helped to develop regulatory Reference Methods to measure toxic substances, and implemented associated quality assurance programs. For example:

- The Centre also licensed a company to use the patented Microwave-Assisted Process (MAP™);
- Completing two Reference Methods, two Analytical Methods for chemical and biological testing, and one Reference Method on quality control/assurance; and
- Selecting methods for the benzene in gasoline regulation.

Wastewater Technology Centre

The Composite Correction Program assists in optimizing the performance of water and sewage treatment plants. Work conducted at plants in Ontario and Atlantic Canada demonstrated the ability to meet discharge objectives without the need for expansion, by transferring skills to plant operations and management staff. On the basis on this program, the Department of National Defence has expanded its wastewater optimization program.

The Centre also undertook various other studies, including:

- The biological treatment of sediments from Thunder Bay contaminated with PAHs, PCBs, dioxins and furans;
- Guidelines for quality control and field practice for contaminated sediment treatment;
- An *in situ* approach to degrade chlorinated compounds and operate a facility that uses photo-oxidation to degrade chlorinated compounds in extracted groundwater;
- Demonstration of a self-sealing, self-healing barrier, known as the EcoBarrier, at a Falconbridge site in Northern Ontario. The barrier is being applied as a cover for sulphidic mine tailings and prevents the acid leaching of metals from contaminating the environment;
- Investigations on the occurrence of lead in mini-blinds; and
- Investigation of *in situ* sulphide-reducing treatment that removes copper, lead and other metals from groundwater.

The Centre is developing an innovative technology to extract and destroy PCBs (and other chlorinated organics) in soil (and other contaminated material). The technology uses a surfactant to remove the PCBs and a proprietary technology to destroy the extracted compounds. The Centre is also examining bio-slurry reactors to remediate soils and sediments contaminated with PAHs. The reactors rely on physical, chemical and biological processes to degrade contaminants. These closed reactors can also be used to evaluate genetically modified micro-organisms designed to treat contaminants.

Canadian Clean Technology Centre

The Centre focuses on the development and implementation of cost-effective technologies and alternative processes for reducing waste, optimizing resources and improving production efficiency. The Centre is evaluating:

- The recovery and re-use of process wastewater without chemical treatment;
- Alternative solvent extraction processes;
- Ion exchange and absorption in process streams that recover specific chemicals; and
- The recovery and regeneration of industrial cleaning solutions that will extend their useful life.

National Hydrology Research Institute

During 1996-97, the Institute started a program on indicators of ecological effects in river ecosystems. The effects of pollutants on simple or complex food chains are measured in an artificial stream as well as the effects of changes in nutrients or contaminants on bottom-dwellers. Stable radioactive isotopes are used for determining contaminant pathways.

The Institute completed a study of organic contaminants in the Great Slave Lake ecosystem. This study concluded that the influence of the Slave River on contaminant loading and biomagnification is significant. The River is an additional source of organochlorines and PAHs to the Lake. The Institute continues to concentrate its analytical expertise on the fate and transport of substances on the Priority Substances List (see p. 13) in aquatic ecosystems. Current work includes development of a mechanism for removal of amines and other contaminants in natural wetlands.

National Water Research Institute

During 1996-97, the Institute concentrated on unraveling the mechanisms causing reproductive problems in fish exposed to effluents from pulp and paper mills, and steel mills. Although the specific compounds responsible for reproductive dysfunction are unknown, comparisons to estrogens suggests that pulp mill effluents act differently. Recovery in reproductive performance downstream of some pulp mills indicates that process and treatment changes can eliminate the responsible compounds. Short-term reproductive tests are being developed to help identify the specific process or treatment changes.

Bioassays for measuring the induction of the egg-yolk protein *vitellogenin* in fish were used to screen effluents from pulp mills and petroleum refineries for the presence of these estrogen mimics. Bioassays are also being developed to assess the immuno-toxic effects of pure chemicals and industrial effluents in fish. Further headway was made in the identification of the agents responsible for the induction of elevated liver detoxification enzymes in fish. The Institute also completed a reference program in the Fraser River on the sediments and bottom-dwelling community.

The St. Lawrence Centre

Under the joint federal-provincial action plan, St. Lawrence Vision 2000, the mass balance of some 100 chemical contaminants has been established. Also the analytical procedures for trace metals and organics have been improved. Bioassays have been developed that determine genotoxicity and teratogenicity in municipal and industrial discharges and are now being made more efficient and cost effective. Another bioassay uses trout hepatocyte for various sublethal parameters. Work is also proceeding to develop environmental indicators using the physical characteristics of bottom-dwellers. The chemical contamination of six species of fish is also being studied.

Canadian Wildlife Service

The National Wildlife Research Centre, together with the regional offices of the Canadian Wildlife Service, have been monitoring the long-term trends of contaminants in seabird eggs on the Atlantic and Pacific coasts since the late 1960s. In 1996, seabird eggs from six colonies in the Quebec and the Atlantic Regions were collected. The Herring Gull Monitoring Program continues to track declining long-term trends of contaminants in the Great Lakes. The long-term trends of PCBs in Lake Ontario herring gull egg data fluctuate and are, at least partially, due to weather-related dietary changes. Herring gulls eat more fish during cold winters and, therefore, have higher PCB concentrations in their eggs the following spring. Based on the 1988-1995 National Wild Foods Survey, Health Canada recommended that waterfowl in Canada are safe to eat.

The impact of pulp mill contaminants on aquatic wildlife in the Fraser and Columbia River Basins of B.C. have been determined by using swallows and ospreys as indicator species. High levels of chlorinated substances in bald eagles in the Strait of Georgia were related to the poor breeding success of a sub-population near a Kraft pulp mill. Other work on monitoring selenium and cadmium levels in scoter from Quebec for evaluation as a wild food is nearing completion. Baseline data were collected on contaminants in bald eagles in Placentia Bay and seabird eggs from the Gulf of St. Lawrence. The data will be used to assess future impacts of the Voisey's Bay Nickel Smelter and Refinery at Argentia and raising of the Irving Whale, respectively.

Other investigations include:

- Effects of historical use of DDT in Okanagan orchards using the robin as an indicator;
- Possible feminization and other effects of organochlorines in reproductive organs of mink and otter from Nova Scotia and British Columbia watersheds;
- Impact of pulp mill effluents and oil sand run-off on the hormonal alterations and immuno-competency of birds in Alberta;
- Snapping turtles and tree swallows at various sites on the Great Lakes;
- Comparative laboratory studies showing that the common tern, which is declining in some areas of the Great Lakes, is much more sensitive to environmental extracts of endocrine disrupting substances than the herring gull;
- The effects of PCBs and PAHs on mudpuppies and the great blue heron in the St. Lawrence; and
- Measurements of PAH metabolites in bile of wild species (amphibians, birds, and small mammals).

The Centre is investigating the effects of persistent organic compounds on the immune function and hormone levels of common terns and herring gulls and the cause of feminization in roseate terns nesting in some areas along the Atlantic coast. An ecological risk assessment of PCB contamination in an Atlantic Canada watershed predicted severe impacts on mink survival and loon reproduction. An international study on the distribution of organochlorine in polar bear fat has shown high PCB levels in polar bears from the Arctic Ocean near Prince Patrick Island in the

Canadian Arctic. Additionally, an ongoing survey indicates a wide range of mercury accumulation in the liver and kidneys of free-living loons. High levels of mercury in loons, and their preferred prey (yellow perch), have been found in Kejimikujik National Park, Nova Scotia.

The Centre provided the scientific basis for banning the use of lead shot for migratory game bird hunting in all National Wildlife Areas and for waterfowl in wetlands across Canada until 1999 when the ban will apply everywhere. The Centre is now playing a major role in its implementation. Research is continuing to assess levels of lead in American woodcock, which will determine if the ban is to be extended to upland bird hunting. Levels of lead in woodcock are highest in the Atlantic Region.

Climate and Atmospheric Research Directorate

Research and monitoring continued toward a greater understanding of toxic substances and international air pollution. With respect to toxic substances, investigations included:

- Measurement and modeling of toxic substances in the Canadian atmosphere, as well as their deposition to other environmental media;
- Method development for the measurement of toxic substances; and
- Improvement in the understanding of sources of toxic substances to Canada.

Canada is particularly vulnerable to the effects of international air pollution by virtue of its large area and corresponding exposure to air masses from many parts of the globe. Such atmospheric transport brings toxic substances, ozone-depleting substances and chemicals implicated in the creation smog, acid deposition and climate change. Investigations of issues affected by international air pollution include:

- Measurement and modeling efforts regarding tropospheric ozone;
- Assessment of emission controls for atmospheric compounds associated with smog;
- Assessment of measures to control acid deposition;
- Measurement of atmospheric compounds associated with climate change;
- Modeling of aerosols to determine their impact on climate change;
- Improving meteorological models for contaminant movement through the atmosphere; and
- Improving understanding of the sources of atmospheric pollutants.

Objectives, Guidelines and Codes of Practice

Section 8 requires the creation of a wide range of non-regulatory tools, including guidelines and codes for environmentally sound practices, and objectives setting levels of environmental quality. Considerable effort is given to the development of such instruments, which provide industries and regulators with recommendations on the reduction of emissions, effluents and wastes.

New non-regulatory instruments that will appear shortly in the *Canada Gazette* Part I include:

- Code of Practice for the Reduction of Fluorocarbon Emissions from Refrigeration and Air Conditioning;
- Code of Practice for the Reduction of Halon Emissions in the Practices of the Fire Protection Industry; and
- Ambient air quality objectives for carbon monoxide and hydrogen fluoride.

Federal-Provincial Working Group on Air Quality Guidelines and Objectives

The Working Group of the Federal Provincial Advisory Committee (see p. 2), consists of environment and health representatives from both federal and provincial agencies. It published a *Protocol for the Development of National Ambient Air Quality Objectives Part 1: Science Assessment Document and Derivation of the Reference Level(s)*, which outlines the process used to review and evaluate the science. *Part 2: Rationale Document and Derivation of the Air Quality Objective(s)* is under preparation. It describes how the science is utilized in making the recommendations. These *Protocols* will result in a formalized process for reviewing scientific information, and will improve the scientific credibility of air quality objectives.

The scientific assessment for hydrogen fluoride was published and that for carbon monoxide completed. The Working Group continued the scientific reviews for particulate matter of both less than ten micrometres and less than 2.5 micrometres, as well as total reduced sulphur compounds and nitrogen dioxide. These assessment documents will form the basis for new or revised air quality objectives. The health and vegetation reviews of the impact of ground-level ozone for the Science Program on Oxides of Nitrogen and Volatile Organic Compounds (NO_x/VOC Science Program) have been peer-reviewed and will form the basis for developing recommendations for revisions to the ozone air quality objective by the Working Group.

Environmental Quality Guidelines and Objectives

National environmental quality guidelines (water, sediment, soil and tissue) and objectives established under Part I allow federal, provincial and territorial authorities to assess and manage environmental quality issues. This work is usually undertaken with the Canadian Council of Environment Ministers (CCME). During 1996-97, nine water quality guidelines for toxic substances were completed. Guidelines for eight other toxic substances are currently in progress. Selected water quality guidelines for the Fraser River are also being developed based on toxicity testing conducted by the National Water Research Institute.

Interim Sediment Quality Guidelines are being finalized for CCME approval. The National Water Research Institute, in collaboration with the Pacific and Yukon Region, continued to develop biological sediment quality guidelines for the Fraser River watershed during the 1996-97 fiscal year. Development of biological sediment guidelines for the Great Lakes continued.

Recommended Canadian Soil Quality Guidelines for 20 substances were published. Soil quality guidelines were also drafted for three additional substances. In addition, technical documents for copper and pentachlorophenol were published as well as technical appendices to the framework for ecological risk assessment.

National Tissue Residue Guidelines for three candidate substances targeted for virtual elimination under the Toxic Substances Management Policy (see p. 12) have been developed and are awaiting final CCME approval. The 1987 Canadian Water Quality Guidelines are being revised to incorporate all media. Completion is expected in November 1998.

The St. Lawrence Centre published a document that provides case studies from several regions in Canada on programs that utilize the ecosystem approach for environmental management.

Environmental ChoiceTM Program

This is Canada's voluntary eco-labelling program, which develops guidelines that allow consumers to identify products and services that significantly reduce the burden on the environment. The EcoLogoTM is used to identify those products and services, which meet stringent environmental criteria.

As of August 4, 1995, Terra Choice Environmental Services Inc., through a licensing arrangement with Environment Canada assumed operational responsibility for the program. Environment Canada has retained broad ownership, control and management of the program and of the EcoLogoTM. As of February 1997, interim funding has ended and the program is expected to be self-sufficient.

During 1996-97, eight new guidelines were finalized and 20 sets of certification criteria developed through the Panel Review and Certification Process. Sixty applications for certification were received this year. So far, 40 have been reviewed and 33 certifications made. As a result of significant market and technological developments, five categories of guideline were revoked and six others revised. Similar revisions are scheduled for the upcoming year. A new initiative, which has generated considerable interest, is the development of the EcoBuyer Catalogue. This is the official catalogue of EcoLogoTM products and services and has proven an effective way to increase interest in them. There is also international interest in the program, and methods for mutual recognition and equivalency are being explored.

Cooperative Initiatives

Part I of the Act allows the Minister to enter into cooperative initiatives with the provinces and territories and with interested groups or individuals, for the betterment of the environment.

The Ontario Region led extensive negotiations on the Great Lakes Bi-National Toxics Strategy with the United States to virtually eliminate persistent, bioaccumulative toxic substances from the Great Lakes. Canada and the U.S. have accepted agreement on the final wording, and the agreement will be signed April 8, 1997.

In Atlantic Canada, mercury concentrations in precipitation were measured at Kejimikujik National Park in Nova Scotia and St. Andrews, New Brunswick beginning in July 1996 in cooperation with the U.S. Mercury Deposition Network. Mercury concentrations in precipitation over the six-month sampling period were substantial: total annual deposition estimates indicate that over 10 micrograms per square metre per year of mercury is deposited to regional ecosystems via precipitation.

The Wastewater Technology Centre completed a three-year program demonstrating bio-solids land application technology to the Guanajuato State Water Authority in Mexico. Highlights of this project included a public education field day and preparation of draft strategy and proposal guidelines for bio-solids land application in Guanajuato State.

State of the Environment

The *State of Canada's Environment – 1996*, Canada's national five-year report, was tabled in Parliament in December 1996. Versions are available on CD-ROM and the Internet. A printed version is now being produced by popular demand and will be available in the fall of 1997. The 1996 report will be the last edition in the five-year series. A new approach to State of the Environment Reporting is being developed to take advantage of:

- Scientific assessments for issues of concern;
- New technologies for integrating and disseminating information; and
- Partnerships that share the reporting.

Canada uses bulletins to report regularly on a national set of environmental indicators. Seven indicator bulletins were published in 1996:

- Updates for Energy Consumption;
- Climate Change;
- Canadian Passenger Transportation;
- Urban Water, Municipal Water Use and Wastewater Treatment;
- Stratospheric Ozone Depletion;
- Urban Air Quality; and
- A New Acid Rain Indicator.

All are accessible on the Internet. Other indicators are being developed, notably for:

- Biodiversity;
- Urbanization; and
- Sustaining Canada's forests, agricultural soils, and marine resources.

A multi-phased initiative is also underway to refine a framework and indicators for urban sustainability indicators, and to incorporate these into a computerized tool that will help local governments and communities assess and monitor their progress towards sustainable development. In addition, a pilot study to test the application of sustainability indicators for regional decision-making was completed in 1996. Progress toward development of a national water quality index continued with CCME.

There is continuing demand for the *National Ecological Framework for Canada* to help integrate information about ecosystems across Canada. The application and use of this framework was enhanced in 1996 by the release of CD-ROM and Internet versions (see Green Lane below). Digital eco-zone, eco-region and eco-district maps and their

related data sets are now available. In addition, maps were completed which will help the Commission for Environmental Cooperation promote a common vehicle for understanding continental environment and resource issues.

There are now over 100 organizations involved in the approximately 85 monitoring sites of the National Ecological Monitoring and Assessment Network. A directory of sites has been prepared along with a listing of the goals, objectives and deliverables for the sites. The centerpiece of ecological monitoring and assessment is the annual National Science Meeting, which, in January 1997, brought together over 300 participants to discuss research findings and explore how these sites could be integrated for broad ecosystem assessments.

Green Lane

Environment Canada has established an environmental information network on the Internet <http://www.ec.gc.ca/envhome.html> to help Canadians make informed decisions and take action on environmental issues and sustainable development. The network is comprised of eight World Wide Web servers located in Vancouver, Edmonton, Winnipeg, Burlington, Toronto, Hull, Montreal and Dartmouth. Anyone with access to the Internet may log onto the Green Lane and get up-to-date information on Environment Canada's activities and, in particular, its CEPA-related endeavours. CEPA-related information such as state of the environment data, the National Pollutant Release Inventory, pollution prevention activities, releases and enforcement can be found on the Green Lane. As well, regional sites contain updates on numerous region-specific CEPA-related activities, such as the Fraser River Action Plan, the Great Lakes Remedial Action Plan, the St. Lawrence River Action Plan and the Atlantic Coastal Action Plan. In general, national information is made available through the Department's home page which offers links to the home pages of regional offices.

CEPA-Related Publications

Under Part I, the Minister may authorize the publication of information related to the research and monitoring activities. A listing of publications produced during 1996-97 can be obtained by contacting the CEPA Office.

Part II: Toxic Substances

Part II of the Act provides the legislative and regulatory authority to reduce the risks posed by new and existing substances in Canada, and to implement some of the international agreements to which Canada is a party. Part II contains provisions that determine which of these substances should be evaluated, authority to evaluate them and provisions to implement control measures applicable to any aspect of the life cycle for any assessed as *toxic* under the *Act*. In addition, efforts under this Part influence Canadian contributions to international initiatives of the Organization for Economic Cooperation and Development (OECD), Intergovernmental Forum on Chemical Safety and United Nations Environmental Program (UNEP) that relate to the assessment and management of toxic chemicals.

In addition, Part II contains authorities to regulate the import and export of hazardous wastes as well as the composition of fuels.

New Substances Program

Domestic Substances List

The Domestic Substances List is an inventory of more than 23,000 substances manufactured in, or imported into, Canada on a commercial scale between 1984 and 1986. It was published in May 1994 in the *Canada Gazette* Part II. In 1996-97 seven amendments to the List were published in *Canada Gazette* Part II, adding 387 substances.

The List is the sole basis for determining whether a substance is *new* to Canada and also whether substances require notification or assessment before they are manufactured or imported into the country. Substances on this List are exempt from new substances notification, as they are considered to be *in use* in Canada. However, existing substances that could cause adverse environmental or health effects can be assessed to determine whether or not they are toxic or capable of becoming toxic as defined under the Act. Following a revision of the eligibility criteria for the incorporation of living organisms on the List, 23 biochemicals and 22 micro-organisms have been added.

Non-Domestic Substances List

There are over 43,000 substances on the Non-Domestic Substances List that are known to be commercially available elsewhere in the world but not in Canada. When these substances are manufactured or imported to Canada for the first time, less detailed information is required than for a substance that is *new*. The initial List appeared in the *Canada Gazette* Part I on January 26, 1991. A revision was published in the *Canada Gazette* Part I on January 6, 1996, and added 1,723 substances to the non-confidential portion as well as 65 substances to the confidential portion. A second revision was published in *Canada Gazette* Part I on August 24, 1996 and added a further 711 substances.

Progress on New Substances Notification Regulations

Notification and assessment are required before new substances can be manufactured in or imported into Canada. The New Substances Notification Regulations prescribe the information required from manufacturers and importers.

Chemicals and Polymers

These regulations came into effect July 1, 1994 and require manufacturers and importers to supply specified information, including:

- Chemical identity;
- Toxicological and environmental effects data;
- Manufacturing, processing and use data; and
- The volumes proposed for manufacture and import.

The Government of Canada may require additional information or testing, may impose controls, or ban the manufacture or import of the substance if it suspects it is toxic. Reviews were completed on 750 transitional substances and 500 new substances during 1996-97. These reviews resulted in six substances having various controls imposed on them.

Biotechnology Products

An amendment to the New Substances Notification Regulations was published in the *Canada Gazette* Part I on August 17, 1996 and in *Canada Gazette* Part II on March 5, 1997 with an implementation date of September 1, 1997. This amendment requires manufacturers and importers of biotechnology products to supply prescribed information for the purposes of an environmental and human health assessment. In addition, the amendment, along with the regulations under four Agriculture and Agri-Food Acts, firmly establishes the legal basis for regulating biotechnology products. As a consequence, all biotechnology products in Canada will be assessed for toxicity, prior to release into the environment.

Good Laboratory Practice

This program is designed to support the requirements of the New Substances Notification Regulations. Accordingly, laboratory practices and procedures followed in the development of test data are consistent with the OECD: *Principles of Good Laboratory Practice* and *Guidelines for the Testing of Chemicals*, respectively.

Major activities in 1996-1997 included the continuation of consultation with testing facilities on an interim inspection program, release of a list of service and testing suppliers, and the re-inspection of two laboratories. OECD activities included:

- The second expert group meeting on revision of the *Principles*;
- Participation in two working groups and two meetings of the OECD Panel;
- Training of four inspectors at an OECD course on the inspection of computerized laboratory systems; and
- Participation in an OECD accession workshop in South Korea.

The provision of information on data quality to scientific evaluators was explored, and will continue as a major thrust during the coming year.

Toxic Substances Management Policy

The federal government's policy was announced in Parliament on June 2, 1995. The policy provides a science-based framework for the management of toxic substances. The key management objectives in the policy are:

- Virtual elimination from the environment of toxic substances that are persistent and bioaccumulative and are present in the environment due to human activity such as manufacturing, use or waste disposal (Track 1); and
- Management of other toxic substances and substances of concern throughout their life cycle to prevent or minimize their release into the environment (Track 2).

The policy provides directional guidance in selecting management objectives for those substances declared to be toxic. Draft scientific justifications for 13 Track 1 substances have been published and their availability for public comment was announced in the *Canada Gazette* Part 1 on March 22, 1997. The following candidate substances have been identified for management under Track 1:

Aldrin	Endrin	PCBs	Chlordane	
Heptachlor	PCD-dioxins	Chlorinated paraffins	Hexachlorobenzene	
PCD-furans	DDT	Mirex	Toxaphene	Dieldrin

Under the 1994 Canada-Ontario Agreement, the Ontario Region is working to achieve virtual elimination of 13 persistent, bioaccumulative toxic substances in the Great Lakes. These are almost identical to those proposed above. Profiles, identifying the 10 major contributing sources to the Great Lakes, have been up-dated. The Region is promoting preventive action that will achieve a 90% reduction of the 13 priority substances by the year 2000. A similar program exists in the Quebec Region and targets cleanup of toxic contamination in the St. Lawrence River.

Priority Substances Assessment Program

CEPA requires the establishment of the Priority Substances List (PSL) containing those substances which merit immediate investigation and assessment. Substances on this list are assessed to determine whether or not they are toxic or capable of becoming toxic, as defined under CEPA. A substance on the PSL is examined to determine if it is entering or may enter the environment in a quantity, or concentration, or under conditions:

- Having or that may have an immediate or long-term harmful effect on the environment;
- Constituting or that may constitute a danger to the environment on which human life depends; or
- Constituting or that may constitute a danger in Canada to human life or health.

Environment Canada manages the program, while Health Canada has the responsibility for providing human health risk assessments.

Progress on Priority Substances List 1 (PSL1)

Of the 44 substances on the first Priority Substances Lists (PSL 1), Environment Canada and Health Canada assessed that 25 were toxic or capable of becoming toxic. Fourteen groups of stakeholders called Issue Tables have been established to determine control options (Activities chart - below). Three Issue Tables (dry cleaning, solvent degreasing and benzidine/3,3'-dichlorobenzidine) have completed their reports, and the recommendations were accepted by the Minister. Work is underway to implement the recommendations (through regulations, and environmental performance agreements). Three Issue Tables (refractory ceramic fibers, steel manufacturing and electric power generation) completed their reports and the recommendations will be submitted to Ministers. The remaining eight Issue Tables are still underway and are expected to complete their reports during 1997-98.

A revised draft report summarizing the issue of chlorinated wastewater effluents, from identification and assessment, through consultation, conclusions and recommendations, was prepared and presented to the FPAC members in 1996. It was proposed that each jurisdiction issue a letter of intent outlining plans for reducing and/or eliminating the use of chlorine as a wastewater disinfectant. This letter should be finalized in the summer of 1997.

Research continues to fill gaps in knowledge of PSL1 substances. For instance, there are few data on environmental levels of chlorinated paraffins in Canada. The National Water Research Institute has initiated a survey of their occurrence in the vicinity of major cities in the Great Lakes - St. Lawrence River basin. Water, sediments, sewage and sewage plant effluent and sludge, fish and Beluga whale samples are being analyzed. Preliminary results of the sewage samples and natural waters yielded no detectable chlorinated paraffins. Analysis of sludge samples and biological material will continue in 1997-98. The Institute also continued its work on the determination of aniline, benzidine and 3,3'-dichlorobenzidine in the environment downstream from dye manufacturing plants in Ontario and Quebec. All three substances were detected in the influent of an Ontario sewage treatment plant. Their concentrations varied markedly with season. However, the substances were not detected in the final effluent of the sewage treatment plants, indicating that they are removed during the treatment process. No benzidines were detected in sewage flowing into plants in Quebec.

PSL 1 Toxic Substances: 1996-97 Activities

1 - Substances for which Issue Tables have been Established

Substance SOPs (94/95 and continuing)

Benzidine / 3,3'-dichlorobenzidine (5,3)*
Refractory Ceramic Fibres (23)
Chlorinated Paraffins (8)

Substance SOPs (95/96 and continuing)

1,2-dichloroethane (2)
Dichloromethane (11)
Ethylhexyl phthalate (14)
Hexachlorobenzene (16)

Sector SOPs (94/95 and continuing)

Dry Cleaning (24)*
Solvent Degreasing (24,25)*
Wood Preservation (10,12,16,17,18,22)

Sector SOPs (95/96 and continuing)

Iron and Steel (4,12,17,18,19,20,21,22) Metal Finishing (17,19,21)
Base Metal Smelting (18,19,21)

Electric Power Generation (17,18,19,20,21)

2 - Other

Dealt with through CEPA FPAC

Chlorinated Wastewater Effluents (9)

PSL1 Substances

- 1,1,1-trichloroethane *
- 1,2-dichloroethane
- 3,3'-dichlorobenzidine
- Benzene
- Benzidine
- bis(chloromethyl) ether*
- chloromethyl methyl ether*
- Chlorinated paraffins
- Chlorinated wastewater effluents
- Creosote impregnated wastes
- Dichloromethane
- Dioxins *
- Effluents from pulp & paper mills using bleach *
- Ethylhexyl phthalate
- Furans *
- Hexachlorobenzene
- Hexavalent chromium compounds
- Inorganic arsenic compounds
- Inorganic cadmium compounds
- Inorganic fluorides
- Oxidic, sulphidic, soluble inorganic nickel compounds
- PAHs
- Refractory ceramic fibres
- Tetrachloroethylene
- Trichloroethylene

* Already regulated

* Completed and submitted to Minister

SOP = Strategic Options Process

Progress on Ozone-depleting Substances (ODS) Regulations

Ozone-depleting substances were not on the PSL because they were assessed as toxic on the basis of international assessments. The Montreal Protocol on Substances that Deplete the Ozone Layer, signed in September 1987, is designed to prevent a global environmental and health problem from reaching the crisis stage. Canada subsequently has put regulations in place enabling us to meet our commitments under this treaty. Canada has met its commitments for halons, carbon tetrachloride, methyl chloroform, methyl bromide and chlorofluorocarbons (CFCs) as well as hydrochlorofluorocarbons (HCFCs). Consumption of methyl bromide has been frozen and will be reduced by 25 percent in 1998 (except for quarantine and pre-shipment applications and for feedstock use). Canada froze consumption of HCFCs beginning January 1, 1996 at the agreed level. Total consumption of HCFCs will be reduced by 35 percent in 2004; 65 percent in 2010; 90 percent in 2015; and will be eliminated in 2020.

Strengthening of Canada's Ozone Layer Protection Program

During 1995, consultations recommended improvements that could be made to the national ozone protection program. Regulations implementing some of the recommendations are expected during 1997. An environmental code of practice for the reduction of CFC and HCFC emissions from refrigeration and air conditioning systems was updated in 1996 to reflect new technical developments and practices and to include other refrigerants such as HCFCs. A code of practice on the management of halons, for halon owners and users, provides guidance on managing halon stocks that takes into consideration the environmental concerns of the ozone layer. Nearly 75,000 service technicians have taken a course on the proper handling, recovery and recycling of CFC refrigerants since its inception.

Priority Substances List 2 (PSL 2)

The second PSL of 25 substances (PSL 2) was published in the *Canada Gazette* Part I on December 16, 1995. Environmental and human health risk assessments are underway by Environment Canada and Health Canada, respectively. A guidance manual, *Guidance 97*, to provide evaluators with a consistent approach for assessing the environmental risks of PSL2 substances was published in March 1997. A second policy and process document outlining the steps in assessment is expected to be published in late 1997.

Environmental Resource Groups of technical experts from academia, government, non-government organizations and industry are being solicited to participate in the environmental assessment process. In addition, liaison groups are being kept up to date on the assessment activities for their specific substance of interest. Environment Canada has completed the problem formulations (scope of the assessment and key knowledge gaps) for most of the 25 substances. An extensive literature review is underway and voluntary notices have been sent to industry seeking use and release information on PSL2 substances.

The National Water Research Institute developed methods for determining nonylphenol ethoxylates and their metabolites in sewage effluents and sludge. A survey of their occurrence in natural waters and textile mill, pulp mill, and municipal sewage treatment plant effluents all showed measurable quantities. After treatment effluents from most sewage plants still have detectable levels. Levels of metabolites in the sludge was three to four times higher than in the corresponding raw sewage and treated effluents. Sewage plants receiving textile wastes have higher concentrations in their raw sewage.

Data Collection

Sections 15 through 18 allow the federal government to collect information, conduct investigations to support the assessment of existing substances, and to support the development of management options for substances considered toxic. Three notices and surveys were issued to obtain information on commercial trade and use patterns for HCFCs and HFCs, di-(2-ethylhexyl)phthalate, and 21 substances and classes of substances listed on PSL2. Under section 17, companies submitted 22 responses.

National Pollutant Release Inventory (NPRI)

The Inventory is a national, publicly accessible database of pollutants released to the Canadian environment from industrial sources. The first annual Inventory was published in March 1995 reporting on the 1993 releases and transfers in wastes of NPRI-listed pollutants from over 1,400 facilities located across Canada. The report for 1994 was made available in the fall of 1996. The 1995 summary will include facilities that release large quantities at low concentrations and is scheduled to be published in the fall of 1997. These reports will also be available on the Internet. Information required for the 1996 reporting year is similar to that required for 1995. All regional offices collected and validated the data submitted by facilities within their respective areas prior to that information being included in the report. Regions also responded to enquiries from the public and media and gave training sessions. Public consultations are planned during the coming year respecting proposed changes to the Inventory. NPRI reports are available on the Internet at <http://www.ec.gc.ca/pdb/npri.html>.

Priority Substances List 2

- Acetaldehyde
- Acrolein
- Acrylonitrile
- Aluminum chloride, aluminum nitrate, aluminum sulphate
- Ammonia in the aquatic environment
- 1,3-Butadiene
- Butylbenzylphthalate (BBP)
- Carbon disulfide
- Chloramines
- Chloroform
- N,N-Dimethylformamide (DMF)
- Ethylene glycol
- Ethylene oxide
- Formaldehyde
- Hexachlorobutadiene (HCBD)
- 2-Methoxy ethanol, 2-Ethoxy ethanol, 2-Butoxy ethanol
- N-Nitrosodimethylamine (NDMA)
- Nonylphenol and its ethoxylates (NPE)
- Phenol
- Releases from primary and secondary copper smelters and copper refineries
- Releases from primary and secondary zinc smelters and zinc refineries
- Releases of radio nuclides from nuclear facilities (impacts on non-human species)
- Respirable particulate matter less than or equal to 10 microns
- Road salts
- Textile mill effluents

Disclosing Information

In 1996-97, Environment Canada received 51 requests under the *Access to Information Act* for information related to CEPA. Requests were made on the following subjects:

- Canada wide ban on landfilling of PCB wastes;
- Compliance with CEPA agreements;
- Contamination of the Pacific Coast;
- Environmental Choice program;
- Export of PCB Wastes - PCB Interim order;
- Hamilton area environmental conditions;
- Illegal dumping of chemicals and waste products;
- Raising of the sunken ship, Irving Whale;
- Leaking underground storage tanks;
- Accidental releases of emissions at the Swan Hills hazardous waste management facility;
- Underground storage of PCB wastes; and
- Environmental compliance.

Information was released, in whole or in part, for 19 requests. The information did not exist for 15 requests. Ten requests were abandoned and one request was treated informally. One request could not be processed, as the applicant was not a Canadian citizen. Five requests are still being processed.

Informal requests were also received for DSL Reports.

Environmental Compliance Requests

Twenty-eight of the above-mentioned requests concerned the environmental compliance status of facilities. Compliance with respect to all Acts administered by Environment Canada, were included in the search. Information did not exist for 14 requests; documents were located in seven requests. The remaining seven requests were abandoned by the applicants, treated informally or we were unable to process.

Confidentiality Requests

Three companies requested confidential status of information submitted to the 1995 National Pollutant Release Inventory. These companies were asked to support their claim for confidentiality using the criteria under the *Access to Information Act*. After verification, the information of all three companies was released.

Under the New Substances Notification Regulations, the claims for confidential identity of 95 were accepted and published on the DSL according to the Masked Names Regulations.

Pollution Prevention

Pollution prevention has become the federal government's preferred strategy for protecting the environment and pollution prevention is enshrined as a guiding principle within the renewed CEPA. Implementation of the *Federal Pollution Prevention Strategy* continues while CCME released *A Strategy to Fulfill the CCME Commitment to Pollution Prevention* in May 1996. The CCME has identified pollution prevention as the strategy of choice for protecting the environment and improving economic competitiveness. It also ensures that the governments of Canada work together to ensure that barriers and disincentives to pollution prevention are removed and to provide opportunities to promote pollution prevention.

In Ontario Region a series of Memoranda of Understanding have been signed with key industries to stimulate pollution prevention. Accomplishments thus far include:

- *Printing and Graphics* - first progress report, 18 participating companies have reduced the use of priority toxics by approximately 11.5 tonnes, a pollution prevention planning framework, a facility reporting protocol, a training and technical assistance program,
- *Canadian Vehicle Manufacturers Association* - the fourth progress report, over 6,700 tonnes of priority toxics have been reduced or eliminated in Ford, Chrysler and GM facilities in Ontario;
- *Auto Parts Manufacturing Association* - second progress report, six participating companies have reduced the use of priority toxics by about three tonnes;
- *Metal Finishing* - 17 participating companies reduced the use of priority toxics by 258 tonnes; and
- *Medical Services Sector* – extended to include more than mercury reduction, training provided to 85 hospitals.

The Canadian Clean Technology Centre has helped develop and deliver training on pollution prevention practices in several industry sectors including: metal finishing, auto parts, printing and graphic arts, and the food and beverage industries. In addition, the Centre actively supported the development of protocols and procedures for environmental technology verification, life cycle analyses and ISO 14000 certification for Canadian industry. Technology for the recovery of phenols from aqueous industrial wastes, minimization of oily bilge water and recovery of proteins from fish processing wastes were evaluated and technology demonstrated for the recovery of caustic cleaning and sanitizing solutions used in the dairy and brewing industries.

The Pacific and Yukon Region continued to work closely with specific industrial sectors in the Fraser Basin. The Region completed pollution prevention guidelines for numerous industries including: dry bulk terminals, asphalt preparation, automobile recycling, fruits and vegetables and golf courses. Each guideline contains technical information to enable companies to plan pollution prevention and minimize waste.

In the Quebec Region, between 1988 and 1995 the St. Lawrence Action Plan reported a 96% reduction in toxics released in the effluent of 50 industrial plants. In 1996, 56 new industries were added to the list for reducing toxic releases. As well, 11 persistent bioaccumulative substances have been identified for virtual elimination. In addition:

- A new response strategy for the restoration of contaminated marine sites was successfully applied in the Port of Montreal; and
- Several pollution prevention projects, including a closed loop system, were initiated with a chlor-alkali plant and the pulp and paper and metal casting industries.

A simplified audit process that allows small and medium-sized enterprises to self diagnose their process operations has been developed. This was demonstrated at a roofing tar specialty plant and the results indicated an overall improvement in productivity and environmental performance.

In the Atlantic Region the focus was on awareness, training and evaluation for small to medium-sized enterprises. In addition:

- Nova Scotia launched its Pollution Prevention Strategy;
- The Halifax Regional Municipality started its Pollution Prevention Program; and
- Based on regional work, UNEP published its "*Guide to Environmental Management of Industrial Estates*".

Participants of the Accelerated Reduction/Elimination of Toxics Program have significantly decreased their emission of toxic substances into the environment. The program is voluntary and non-regulatory and targets 117 toxic substances. Results to date indicate that 278 facilities have participated and reduced toxic emissions by approximately 17,500 tonnes. A second progress report, *Environmental Leaders 2*, was released in 1997.

Related Research

Health Canada continues to develop screening methods for determining both the endocrine disrupting as well as reproductive and developmental effects of priority contaminants. A battery of *in vitro* screening methods have been used to evaluate the endocrine disruption potential of an array of priority environment contaminants and studies have been completed that evaluated the effects of a number of toxic substances on male reproductive physiology.

Studies have been initiated to determine the effects of mixtures of toxic substances on reproductive development. A pilot study to determine the exposure of subjects from the general population living in Toronto to 29 priority substances through air, water and food was undertaken. Also completed was a pilot study on exposure from a variety of sources to a number of PSL2 compounds. A follow-up survey was initiated.

Health Canada has completed studies on the systemic effects of benzothiophene and acridine, candidates for any future PSL. In addition, the development of a gene-expression technique to assess tumour promotion was studied. A mouse gene mutation assay was used to evaluate the mutagenic potential of a number of environmental contaminants, including dinitropyrene. Studies have also been carried out on the mutagenicity of methylcyclopentadienyl manganese tricarbonyl (MMT) and its combustion products. The use of molecular biology was used to quantify human and environmental exposure to microbial biotechnology products. Physiologically based pharmacokinetic modeling, a research tool that can minimize uncertainties in extrapolations and risk assessments, was applied to benzo(a)pyrene, a PSL1 chemical. Research continues on the biochemical mechanism of toxicity of priority contaminants, and on the development and application of biomarkers for hepatic, renal and pulmonary effects.

The National Hydrology Research Institute continues to concentrate its analytical expertise on the fate and transport of toxic substances in aquatic ecosystems. This includes development of a mechanism for the removal of amines and other contaminants in gas condensates by natural wetlands. Also analyzed were the degradation products that result from broad-spectrum photolysis and ultra-violet irradiation of contaminants. Other projects investigated the fate and distribution of agricultural chemicals in prairie surface and ground waters, their atmospheric transport and deposition, and the role of organisms in the containment and reduction of contaminants in groundwaters. Stable radioactive isotopes of carbon, nitrogen and sulphur are being used to find how pulp mill effluents are incorporated into food webs. The development and application of these methods can help improve the understanding of the pathways through which contaminants accumulate.

The National Water Research Institute continued its program for the management and remediation of groundwater contaminated by toxic substances. Pilot-scale studies were initiated on a technique to remove petroleum from contaminated groundwater using humic acids (acids derived from composting). Research continued on the application of vitamin B-12 to remove solvents from contaminated groundwater. The occurrence of the gasoline additive, MMT, in the environment was investigated. This included air samples in underground car parks, highway junctions, gasoline stations, roadside dirt, storm runoff, water and sediments near production plants on the St. Clair and St. Lawrence Rivers. A portable unit consisting of a ceramic head metering pump and a solid trap has been developed for air sampling in the field. Trialkyl and triaryl phosphates, which are used as flame retardant plasticizers, fire retardant hydraulic fluids, lubricants, adhesives and coatings, were searched for in aquatic environments. They are found in sediments and fish because of their chemical properties, which are similar to PCBs. In fact, they appear to be ubiquitous in aquatic environments. Sewage, sewage effluent and natural water samples from Ontario and Quebec have been analyzed for 20 of these substances.

In B.C., the Pacific and Yukon Region assessed for the presence of some PSL1 and PSL2 substances in the atmosphere, water, sediment, and biota in the Fraser River Basin. A concerted effort has also been made to assess the impacts of pulp mill effluents on the aquatic ecosystem in the basin. This assessment is supported by a research program which is evaluating impacts of altered fish liver enzyme levels, wildlife reproduction and bottom-dweller community structure. The toxicity of selected chlorophenols on young white sturgeon is also being investigated. A pilot survey was conducted in partnership with U.S. Geological Survey on the presence of 166 contaminants, including PSL1 and PSL2 substances, in groundwaters of the Abbotsford Aquifer near the U.S. border. Also a comprehensive inventory of trace air contaminants for British Columbia was compiled which, for the first time, covered atmospheric releases of over a thousand trace air contaminants from industrial, mobile and area sources. The substances, organized under 30 chemical groupings, include persistent organic pollutants, heavy metals, and substances on the National Pollutant Release Inventory. As well, the inventory contains information on total particulate and inhalable particulate emissions. In addition, destruction and conversion of CFCs by chemical means was investigated. Using various combinations of catalytic substrates and temperatures, results showed that chemical conversion works for CFCs but not for halons.

In Quebec a lot of work has been completed on hazardous air pollutants. In order to determine regional priorities a monitoring program for PSL substances and others already considered toxic was conducted on the metallurgical industry. Also, under a cooperative arrangement with industry, ambient concentrations of hazardous air pollutants

and volatile organic compounds in greater Montreal were measured. This program was expanded this year to include more industrial associations and the province. A preliminary inventory of hazardous air pollutants has been produced and will be finalized next year.

In the Atlantic Region, an ecological risk assessment of PCB contamination at Five Island Lake, Nova Scotia was completed. Further field assessment has focused on possible PCB impacts on mink, river otter and raccoons that will be completed in 1997-98. A study of contaminants in white suckers near a landfill in Sackville, Nova Scotia was conducted to determine the potential for bioaccumulation of contaminants, including mercury, in fish. Few persistent organic and inorganic contaminants were detected; those that were detected, including mercury, were not significant. A study to assess heavy metal concentrations in four species of fish in the Richibucto, New Brunswick watershed was conducted. The remediation of the Muggah Creek Watershed, the largest hazardous waste site in Canada containing the Sydney Tar Ponds, coke ovens, a municipal dump and 38 sewage outlets, was revitalized and will be carried out over three phases and take at least 10 years to complete. The ecological risk assessment of textile mill effluents in Atlantic Canada was initiated. Three years of mussel contaminant monitoring data, 1993 to 1995, were compiled and released. These reports provide summaries of toxic contaminant concentrations measured in mussels from the five Canadian/U.S. jurisdictions bordering the Gulf of Maine. They identify the spatial distribution of toxic contaminants throughout the Gulf; measure physiological effects on mussels, and interpret the data in the context of environmental health and guidelines for human consumption. A human health risk assessment of the exposures of the Pictou Landing First Nation associated with Boat Harbour, Nova Scotia was conducted. Finally, an aquatic food chain model, used in the assessment, identified a potential problem beyond 2005 associated with regular consumption of fish from Boat Harbour.

Hazardous Wastes

Export and Import of Hazardous Wastes Regulations

During 1996-97, 1,408 notices for proposed exports of hazardous wastes, 4,914 notices for imports and 500 notices for shipments in transit through Canada were processed. During the same period, 33,500 manifests were received for the tracking of shipments approved under the above-noted notices. A new computerized tracking system, which includes a new client-server system, and integrated voice response was put into full operation. In support of compliance and enforcement for these regulations, a 24-hour hazardous waste response line for Canada Customs exists in all regions of Canada. The Pacific and Yukon Region initiated two investigations in B.C. and one in Yukon of alleged violations of the regulations, but these investigations are not complete and no charges have been laid.

To satisfy the requirements of Section 45 of CEPA, after receiving a notice for proposed imports, exports and transits of hazardous wastes, the names of the Canadian importer, exporter, or notifier as well as the name and origin or destination of the waste in question must be published. This information is published semi-annually in the newsletter RESILOG, which is available on the Internet at <http://www.ec.gc.ca/resilog/resinews.htm>.

Basel Convention

The purpose of this international Convention is to manage the transboundary movement of hazardous wastes. It also supports the continued application of bilateral and multilateral agreements that promote environmentally sound management of hazardous wastes. The third meeting of the Parties to the Convention, in 1995, resulted in the call for an amendment to the agreement. This would result in an immediate ban on the export of hazardous wastes from developed to developing countries for final disposal as well as the phase out of exports for recycling from developed to developing countries by December 31, 1997. A number of technical meetings was subsequently held to better define which materials the amendment would cover. Canada indicated that it would be unable to consider ratification of the amendment until the completion of this work, which will be presented for consideration at the Fourth Conference of Parties, scheduled for October 1997.

Fuels

A number of initiatives was undertaken in 1996-97 that will result in regulations concerning fuels. Regulations are now in place restricting lead in gasoline and sulphur in diesel fuels. A regulation restricting benzene in gasoline will be completed in 1997. A working group following up on the CCME *Cleaner Vehicles and Fuels Task Force Report* will soon recommend appropriate levels of sulphur in gasoline. In addition, fuel standards may be modified as PSL2 assessments are completed.

Modifications to the fuels provisions in the renewed CEPA will result in improved regulatory powers. These include the use of formulas, which will give flexibility in meeting a fuel standard and permit a range of specifications. Fuels could have specifications that would allow them to be compatible with new engine technology. A National Fuels Mark could be created and like a trademark, could be used to control the quality of fuels that are involved in both inter-provincial and international trade.

Part III: Nutrients

Part III of CEPA regulates the nutrient content of cleaning agents and water conditioners. When the Act was created, the Phosphorus Concentration Regulations, previously under the *Canada Water Act*, were incorporated under Part III. During the 1960s, one of the major concerns regarding the degradation of the Great Lakes focused on nutrient enrichment or excessive growth of vegetation preventing use of waters by humans, plants and animals. Phosphorus was identified as the controlling element and, in 1972, controls were placed on the phosphorus content of household detergents. During the same period, programs were implemented at major municipal treatment plants in the Great Lakes Basin to control effluent phosphorus levels.

The National Water Research Institute continued its assessment of changing nutrient discharges from sewage treatment plants in basins such as Hamilton Harbour and Severn Sound. The Institute also examined the confounding effects of exotic species, like zebra mussels, as well as metals in Lake Erie and the Bay of Quinte in Ontario.

The Wastewater Technology Centre is currently evaluating low-cost alternatives for enhancing nutrient removal from biological sewage treatment plants. The technologies currently being demonstrated include:

- The installation of biomass support media as a low cost alternative to upgrade for ammonia removal;
- A modification from continuous to intermittent aeration that will result in complete nitrogen removal as well as energy savings;
- The installation of simple secondary clarifiers to enhance plant capacity for nutrient removal; and
- The retrofit of a sewage treatment plant for complete biological nitrogen and phosphorous removal.

National Hydrology Research Institute has completed a three-year project to assess the effects of stressors on the Fraser River in British Columbia. A particularly successful aspect of this research initiative has been the development of a citizens' program for monitoring water quality. Using simple sampling techniques, local residents are able to use bottom-dwelling invertebrates as indicators of the health of the aquatic ecosystem. The Institute also began a new research program to determine the relationships between the quantity of added nutrients and the response of bottom-dwelling organisms. The cumulative effects of long-term nutrient loading and the consequences of interactions between nutrients and toxic substances will be determined.

Part IV: Controls on Government Operations

Part IV of the Act, contains the authority to regulate waste handling and disposal practices as well as emissions and effluents from the operations of federal departments, Crown corporations and federal agencies.

During 1996-97, the following were undertaken to assist federal government operations:

- Regulations respecting the registration of storage-tank systems for petroleum and allied petroleum products on federal lands were put in place;
- Drafting of Federal Halocarbon Regulations;
- Development of Technical Guidelines for Aboveground Storage Tank Systems containing Petroleum Products;
- Development of a training course to assist facility managers in meeting new federal requirements for storage tanks;
- A series of workshops on the management of federal contaminated sites, sponsored across Canada by the Contaminated Sites Management Working Group;
- Publication of two manuals *Site Remediation Technologies: A Reference Manual* and *Preventing Site Contamination at Federal Facilities: A Guidance Manual*;
- Development of a manager's compliance guide and staff brochure as well as a manager's guide to Regina v Regina were developed;
- Creation of a working group to coordinate and advise on issues relating to the "regulatory gap" in Part IV; and
- Signing of a Memorandum of Understanding on Compliance with Public Works and Government Services Canada was signed.

Federal Code of Environmental Stewardship

The Federal Code of Environmental Stewardship commits federal government departments to conform with the requirements of federal environmental legislation, and to make their operations compatible with other levels of government where appropriate. In support of environmental stewardship, the following initiatives were undertaken:

- Workshops on *Greening Government Operations: The New Imperative* were held in six cities across Canada. Some 700 attendees were able to learn first hand how to green their department, what amendments to the *Auditor General Act* meant to them, and what to expect from the Commissioner of the Environment and Sustainable Development;
- The Auditor General's Report on the implementation of the Federal Environmental Stewardship Program was published; and
- Workshops on environmental management systems and greening government operations, greening the automotive fleet, energy and water efficiency, green facility management and effective environmental communications were held.

Part V: International Air Pollution

Part V of the Act covers activities related to domestic sources of air contaminants that create air pollution in other countries or violate international agreements.

Sulphur Dioxide (SO₂) Protocols

Canada has signed two protocols for managing SO₂ emissions under the *United Nations Economic Commission for Europe Convention on Long-Range Transboundary Air Pollution*. Canada has exceeded its commitments for both protocols.

In 1995, national SO₂ emissions were estimated to be 2.6 million tonnes, or 19 percent below the agreed-upon national cap of 3.2 million tonnes. Emissions in a region of southeastern Canada referred to as the Sulphur Oxides Management Area were estimated to be 1.3 million tonnes, or 26 percent below the cap set at 1.75 million tonnes for the year 2000. These emissions reductions were largely achieved as a result of the Eastern Canada Acid Rain Program, which capped provincial SO₂ emissions in the seven easternmost provinces. Provincial regulations have ensured that the caps were met on time. Some western provinces also set stringent emission requirements on certain major new sources, such as natural gas plants, to minimize the growth in emissions. However, even with full implementation of both the Eastern Canada Acid Rain Program and the U.S. Acid Rain Program, Canada will continue to receive harmful levels of acid deposition. As a result, a new National Strategy on Acidifying Emissions to further protect the environment and human health is anticipated during 1997.

Oxides of Nitrogen (NO_x) and Volatile Organic Compound (VOC) Protocols

Under United Nations agreements, Canada has signed protocols for both NO_x and VOC reductions. Canada has met the commitments of the First Nitrogen Protocol when, beginning in 1994, it froze NO_x emissions at 1987 levels. The VOC Protocol commits Canada, beginning in 1997, to a freeze on VOC emissions at 1988 levels and to a 30 percent reduction in the Lower Fraser Valley of B.C. as well as the Windsor-Quebec Corridor. Canadian VOC emissions are being reduced and additional control measures are being developed to further reduce emissions. However, a majority of the ozone smog in Canada is the product of pollutants transported from the United States. Therefore, Canada is closely following U.S. actions to cut smog-producing emissions, as well as working with the U.S. to move towards bi-national actions on smog.

Progress is also being made on implementing an open market Pilot Emission Reduction Trading Program for NO_x emission sources. There may also be an opportunity for Canada to link with an interstate trading framework for large stationary sources. The framework was developed by the 37-state Ozone Transport Assessment Group in the United States.

Implementation of the CCME cleaner vehicles and fuels initiative will harmonize Canadian control standards for vehicles with those in the U.S. and introduce low-emission vehicle technology and reformulated vehicle fuels to the Canadian market.

National and Regional Smog Management Plans

As originally anticipated in the Phase I 1990 NO_x/VOC Management Plan, a second phase of measures is needed to meet the objective of 82 parts per billion of ozone, and to address the issue of fine particulates. This is currently being addressed. Preliminary work has begun on the development of Regional Plans for segments of the Windsor-Quebec Corridor and the Southern Atlantic Region. The Lower Fraser Valley has had a smog reduction plan in effect for several years. A major NO_x/VOC science assessment is also being completed and publication is expected during 1997.

Canada-United States Air Quality Agreement

The Canada-United States Air Quality Agreement was signed in 1991 to protect both countries from transboundary air pollution. While the Agreement provides a framework to deal with all transboundary air pollution, it currently contains only commitments for SO₂ and NO_x emissions, aimed at reducing the acid rain problem.

The Agreement reiterates Canada's commitments to cap national SO₂ emissions at 3.2 million tonnes. It also calls for a 10 percent reduction in NO_x emissions from stationary sources by the year 2000 and NO_x emission controls on mobile sources equivalent to those in the U.S. Canada has met its SO₂ commitments, as discussed under "Sulphur Dioxide Protocols," and will achieve the NO_x commitments.

By 2010, the U.S. is committed to reducing its SO₂ emissions from 1980 levels by 40 percent and by 2000, its NO_x emissions by 10 percent. It is on track to meet these commitments.

In 1995, as per the Agreement, Canada and the U.S. completed a five-year review of the Air Quality Agreement, with input from the public. Both countries concluded that the Agreement is largely working as intended but that a few differences still remain. They also acknowledged that control of transboundary air pollution has not occurred to the extent necessary to protect the environment, particularly for acid-sensitive areas. Canada and the U.S. are currently determining what follow-up action is required. The review was published in the *1996 Progress Report on the Air Quality Agreement*.

In recognition of the transboundary nature of ground-level ozone and inhalable particulates, discussions are under way between governments with respect to future annexes under the Agreement to address these issues.

Part VI: Ocean Dumping

Though by world standards the Canadian marine environment is relatively uncontaminated, Canada's territorial waters do have some contamination problems, especially in harbours, estuaries and near-shore areas. Environment Canada regulates the disposal of substances at sea and meets its international obligations under the *London Convention 1972* by means of a system of permits under Part VI of the Act. Disposal at sea is permitted only for non-hazardous substances and where it is the environmentally preferable and practical alternative. The majority of the material disposed at sea is dredged material, which must be moved to keep shipping channels and harbours clear for navigation and commerce.

Permits for Ocean Dumping

Each application for disposal at sea is evaluated separately to determine if a permit will be issued. Permits typically govern timing, handling, storing, loading, placement at the disposal site, and monitoring requirements. Over the past year, 92 permits were issued for the disposal of an estimated 5.2 million tonnes of material. This quantity reflects the amount approved for disposal as opposed to the actual quantity disposed of at sea. Disposal activities are still ongoing for many permits issued. No applications were rejected in the past year.

Quantities Permitted and Permits Issues Nationally, 1996-97

Material	Quantity (tonnes)	Permits Issued	Percent of Quantity	Percent of Permits
Dredging	3,322,995	41	64%	45%
Excavation	1,820,000	4	35%	4%
Fish Waste	34,221	43	1%	47%
Vessels	3,008	3	>1%	3%
Other	40	1	>1%	1%
Total	5,180,264	92	100%	100%

Quantities Permitted and Permits Issued Regionally, 1996-97

Material	Atlantic		Quebec		Pacific and Yukon		Prairie and Northern	
	Quantity (tonnes)	Permits Issued	Quantity (tonnes)	Permits Issued	Quantity (tonnes)	Permits Issued	Quantity (tonnes)	Permits Issued
Dredging	1,884,870	19	65,975	10	1,372,150	12	0	0
Excavation	0	0	0	0	1,820,000	4	0	0
Fish Waste	28,731	34	5,490	9	0	0	0	0
Vessels	45	1	0	0	2,963	2	0	0
Other	40	1	0	0	0	0	0	0
Total	1,913,686	55	71,465	19	3,195,113	18	0	0

Forecasts for 1997-98

In the Atlantic and Pacific Regions, the number of permits for dredging is expected to remain stable. In the Quebec Region, maintenance dredging is expected to decline slightly because of spending reductions. No dredging applications are expected in the Prairie and Northern Region. For fisheries waste, the number of permits issued is expected to increase slightly as some plants reopen, but quantities will remain low because of the depleted fish stocks.

Disposal Site Monitoring

Disposal site monitoring is an essential component of the Ocean Disposal Program and serves to provide feedback to the permit application review and help verify that our regulatory controls are adequate. Monitoring data may also guide further research. Monitoring was undertaken last year at 15 sites along three coasts, and a compendium is now produced annually summarizing these activities.

Research to Support Ocean Dumping Regulations

Bioassays are becoming standard assessment tools to evaluate the effects of contaminants in the marine environment. Three new sediment bioassays to evaluate trace chemical concentrations on crustacean mortality, sea urchin reproduction and fluorescence from photo-luminescent bacteria have been developed. In addition, the U.S. protocol to evaluate bioaccumulation using a clam species, *Macoma sp.*, is being used. Guidance to aid in the interpretation of these bioassays is being developed to ensure they are applied consistently. A pollution gradient study is under way to examine effects resulting over decreasing concentrations of pollutants from a single source. Results from the initial work of this study indicate that naturally present toxicants in sediments, such as ammonia, need to be considered when assessing results.

International Activities

The Parties to the *London Convention 1972* completed a three-year amendment process to update the *Convention* and address immediate and long-term disposal-at-sea issues by adopting the 1996 Protocol. The Protocol is open to ratification and Canada intends to ratify it as soon as possible. The renewed CEPA will be updated to reflect these changes.

Proposed Amendments to the Ocean Dumping Regulations

During 1996-97, work has continued on the proposed new environmental assessment procedures and standards that better account for effects on the marine environment. In January 1997, cross-Canada consultations took place on cost recovery to be carried out through the *Financial Administration Act*. When the renewed CEPA comes into force, the following amendments will be introduced:

- A tiered testing approach to evaluate materials for ocean disposal;
- New screening levels for chemical parameters and sediment bioassay procedures; and
- Incorporation of the Waste Assessment Framework of the *London Convention 1972*.

Part VII: General Information

Part VII of the Act is largely concerned with the enforcement of the *Act* and its regulations. Regulations can be created under many parts of the Act but enforcement powers are consolidated here. Under Section 34(6) the federal government can enter into an equivalency agreement with a province for the enforcement of a CEPA Regulation. In addition, under Section 98 the federal government can enter into administrative agreements with provinces, which include enforcement. Agreements must be reported annually in this report and are included in this section.

Regulations

Regulations are based on science and encourage innovative solutions. The potential economic impact is considered, and while they are strictly enforced, they are not inflexible. As part of a government-wide review, all CEPA regulations were reviewed during 1993 for their impact on competitiveness. The Regulatory Reform Agenda includes looking at a broader range of tools that will allow more effective and efficient mechanisms for managing environmental issues. Currently, 25 regulations are in place under the Act.

New Regulations

Diesel Fuel Regulations

On February 19, 1997, the federal government published the Diesel Fuel Regulations in the *Canada Gazette* Part II. The regulations require that, effective January 1, 1998, diesel fuel must contain less than 0.5 percent by weight of sulphur to be used by road vehicles, such as light- and heavy-duty trucks and buses.

Federal Lands Storage Tank Registration Regulations

Registration of Storage Tank Systems for Petroleum Products and Allied Petroleum Products on Federal Lands Regulations were published on January 8, 1997. These regulations require that petroleum storage tanks located on federal lands be registered with the federal operation (department, board, agency or Crown Corporation) that administers the land. Each federal operation to which the regulations apply must maintain a registration system and report annually on the status of the storage tanks on their lands. The regulations come into effect on August 1, 1997.

PCB Waste Export Regulations

The 1995 Interim Order (Section 35) which banned the export of PCBs to the U.S. was replaced by the PCB Waste Export Regulations on February 4, 1996. These regulations include stringent controls to ensure that any PCB waste that is exported is managed in an environmentally sound manner and is consistent with our international obligations and national standards. The regulations allow PCB waste to be exported to the U.S. alone for the sole purpose of its destruction. PCB waste cannot be used as landfill.

CEPA Regulations Currently in Force

- Asbestos Regulations
- Chlor-Alkali Mercury Release Regulations
- Chlorobiphenyls Regulations
- Chlorofluorocarbon Regulations, 1989
- Diesel Fuel Regulations
- Contaminated Fuel Regulations
- Export and Import of Hazardous Wastes Regulations (as amended)
- Federal Mobile PCB Treatment and Destruction Regulations
- Fuels Information Regulations No. 1
- Gasoline Regulations (as amended)
- Masked Name Regulations
- New Substances Notification Regulations (as amended)
 - Part I - New substances other than biotechnology products or polymer
 - Part II - Polymers
 - Part III - Biotechnology Products
- Ocean Dumping Regulations (as amended)
- Ozone-depleting Substances Regulations (as amended)
- Ozone-depleting Substances Products Regulations (as amended)
- PCB Waste Export Regulations, 1996
- Phosphorus Concentration Regulations
- Prohibition of Certain Toxic Substances Regulations
- Pulp and Paper Mill Defoamer and Wood Chip Regulations
- Pulp and Paper Mill Effluent Chlorinated Dioxins and Furans Regulations
- Registration of Storage Tank Systems for Petroleum Products and Allied Petroleum Products on Federal Lands Regulations
- Secondary Lead Smelter Release Regulations
- Storage of PCB Material Regulations
- Toxic Substances Export Notification Regulations
- Vinyl Chloride Release Regulations

Note: *Minor modifications to CEPA regulations have been dealt with through the Omnibus Amendment Order which allows departments to clean-up various regulations requiring minor changes or corrections.*

New Substances Notification Regulations: Biotechnology

The New Substances Notification Regulations were amended to include biotechnology products in *Canada Gazette* Part II on March 5, 1997 (see p 11).

Equivalency Agreements

Equivalency of provincial regulations to those under CEPA is assessed based on three criteria:

- Equivalent standards;
- The right of citizens to require investigation of offences; and
- Equivalent penalties and enforcement provisions.

The federal government retains its authority to report annually to Parliament on the administration of the equivalency agreements.

Agreement on the Equivalency of Federal and Alberta Regulations on the Control of Toxic Substances in Alberta

This agreement, signed on June 1, 1994, continues to operate in Alberta, where four CEPA regulations do not apply:

- Pulp and Paper Mill Effluent Chlorinated Dioxins and Furans Regulations;
- Pulp and Paper Mill Defoamer and Wood Chips Regulations;
- Secondary Lead Smelter Release Regulations; and
- Vinyl Chloride Release Regulations.

The regulated facilities continue to show a high compliance rate with their provincial operating licenses for dioxin, furan and vinyl chloride emissions.

Administrative Agreements

Administrative agreements are work-sharing partnerships that allow federal, provincial and territorial governments to streamline their work in administering regulations. They cover various activities such as monitoring, inspections, and enforcement, but they do not release the governments from their respective legislative responsibilities. Under an administrative agreement, the federal government remains accountable through Parliament, and the province or territory remains accountable through its legislature. Both levels of government are accountable to the Canadian public. Therefore, information-sharing in order to prepare annual reports is part and parcel of administrative agreements.

Agreement between the Government of Quebec and the Government of Canada in the Context of the Application in Quebec of the Federal Pulp and Paper Mill Regulations.

Even though the existing agreement expired in January 1996, both levels of government have worked in partnership under the spirit of the agreement during the negotiations. Canada and Quebec have agreed in principle to renew this agreement in order to continue to harmonize the federal and provincial regulatory requirements. The agreement will provide a single window to the industry for the application of and compliance with the two CEPA pulp and paper regulations and the pulp and paper effluent regulations under the *Fisheries Act*. The renewed agreement, that provides for enforcement and information sharing respecting all aspects of the federal regulation of the pulp and paper industry, should be signed by all parties by the end of 1997.

Administrative Agreement for the Administration of Federal-Provincial Pulp and Paper Effluent Regulations within the Province of Ontario.

This agreement is currently under negotiation. When complete, it will look at a broad base of collaboration for environmental protection issues specific to the pulp and paper regulations under CEPA and the *Fisheries Act*. This agreement will encompass inspections, environmental-effects monitoring, information-sharing and enforcement.

Canada-Saskatchewan Administrative Agreement for the Canadian Environmental Protection Act.

Under the agreement, cooperation in such activities as inspections, monitoring and reporting, and information sharing are covered. The agreement also provides for a one-window spill reporting arrangement with all reports being received by the province.

Canada-Northwest Territories Framework Agreement for Environmental Cooperation in the Northwest Territories.

The Framework Agreement continues to apply in the Northwest Territories. Work is ongoing to develop specific areas of cooperation.

The Canada-British Columbia Agreement on the Administration of Federal and Provincial Legislation for the Control of Liquid Effluents from Pulp and Paper Mills in the Province of British Columbia.

This agreement expired on March 31, 1996. The spirit of the agreement was maintained between April 1 and July 31, 1996. A new agreement is being negotiated. The proposed agreement focuses on the inspection of pulp mills.

Canada-Yukon Environmental Protection Agreement.

Progress on the development of standards for contaminated sites, spill reporting and special wastes has been made. Training was provided for the Yukon Renewable Resources Protection Officers in areas of technical and legal aspects of water/soil sampling as related to pollution incidents. Extensive cooperation has occurred in areas of information-sharing on enforcement and compliance, inspections, training, and logistic support. The Yukon Government Department of Renewable Resources has developed a regulatory role for spill-reporting and is now an active participant in responding to spills within its area of jurisdiction.

Notices of Objection and Boards of Review

The public may file a notice of objection respecting actions or regulations taken under the Act. The procedures set out in Part VII of the Act allow a Board of Review to be established to examine this notice of objection. During 1996-97, notices of objection were received on the proposed amendments to the gasoline regulations, but a Board of Review was not established.

Enforcement and Compliance

Part VII provides for enforcement powers, including powers to inspect, search for and seize evidence, issue inspector's directions, and prosecute for offenses with penalties that include fines up to \$1,000,000, jail sentences up to five years, or both, or court orders.

Enforcement and Compliance Policy

The Enforcement and Compliance Policy establishes principles for fair, predictable and consistent enforcement. It informs all parties who share responsibility for protecting the environment - governments, industry, organized labor and individuals - about what is expected of them and what to expect from the officials who promote compliance and enforce CEPA and its regulations.

Compliance promotion and enforcement

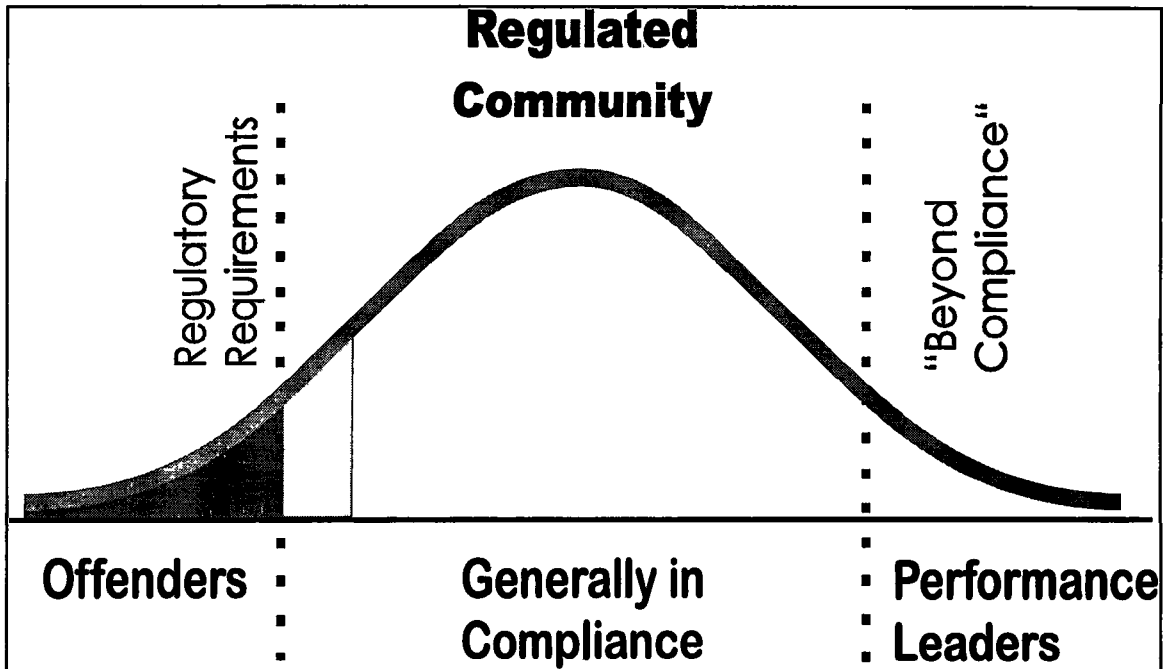


Figure 1

- It is perceived that most of the regulated community wants to be and is in compliance with environmental legislation. It needs to know the law and its requirements in order to be in compliance. This is achieved through broad-based compliance promotion activities.
- The behavior of the regulated community can be depicted as a distribution curve as shown in Figure 1. The vast majority of the regulatees maintain a level of compliance that puts them in the central portion of the curve. This group is willing, with some incentive, to comply with the legislation.
- The performance leaders category, on the right side of the curve is a small portion of the regulated community that has moved beyond simply complying with the legislation (a regulatee can be a performance leader in some areas and generally in compliance in others).
- The heavily shaded area located at the left of the curve represents the group that is out of compliance and is the focus of the enforcement program's attention. It is a generally accepted rule of thumb that 80 percent of violations are caused by 20 percent of the regulatees.
- The lightly shaded area represents that portion of the regulated community that is in compliance but which will become non-compliant if there is no deterrent. This group is influenced by the results of our enforcement activities in the "offenders" group, and by our compliance promotion activities.

Enforcement

Compliance means the state of conformity with the law. CEPA provides for a variety of mechanisms to verify compliance, including inspection, taking of samples, auditing of reports, responding to tips, self-reporting and investigations.

Inspection programs verify compliance with the laws and their regulations. Regular inspections are carried out according to an annual National Inspection Plan, which identifies the quantity and types of inspections and monitoring activities to be carried out each year. Inspections are also conducted in response to spills, tips and complaints. When violations occur, detailed investigations are undertaken to gather evidence and information in order to make a decision on the appropriate enforcement action. Action is necessary in situations where there is non-compliance with the legislation and may include:

- Oral and/or written warnings;
- Inspector's directions or orders from the Minister;
- Additional reporting requirements and inspections;
- Injunctions;
- Criminal prosecutions; and
- Civil suits by the Crown to recover costs.

Enforcement Activities Initiated during 1996-97								
Regulations	Inspections	Investigations	Warnings		Directions	Prosecutions	Convictions	Acquittals/ Withdrawals
			Govt.	Other				
	141	4	2	17	1	1	-	-
Chlorobiphenyls	104	7	-	-	1	-	-	-
PCB Waste Export	9	1	-	1	-	-	-	-
PCB Destruction	-	-	-	-	-	-	-	-
Secondary Lead	33	-	-	-	-	-	-	-
Vinyl Chloride	4	-	-	1	-	-	-	-
Asbestos Mines and Mills Release	15	-	-	-	-	-	-	-
Chlor-alkali Mercury Release	6	-	-	-	-	-	-	-
Domestic Substances List	-	-	-	-	-	-	-	-
Gasoline	4	2	-	-	-	-	-	-
Ozone-Depleting Substances	36	7	-	1	-	1	-	-
Ozone-Depleting Products	85	6	-	2	-	-	1	-
Ocean Dumping	52	6	-	-	-	1	-	-
Export/Import of Hazardous Wastes	153	19	-	4	-	2	6	4
Phosphorus Concentration	3	-	-	-	-	-	-	-
Dioxins and Furans	23	-	-	-	-	-	-	-
Defoamer and Wood Chips	12	-	-	-	-	-	-	-
Toxic Substances Export Notification	4	-	-	-	-	-	-	-
Fuels Information	2	-	-	-	-	-	-	-
New Substances Notification	15	1	-	-	-	-	-	-
Total	701	53	2	26	2	5	7	4
File Closed (includes investigations begun in previous fiscal years and closed 1996-97)	-	34	-	-	-	-	-	-

National Training Program

Training continues to be of major importance in maintaining and enhancing the continuing enforcement program. It is linked to the designation, the appointment and the competency of enforcement staff and their ability to perform various skills at expected levels. The National Training Program comprises a wide range of courses developed and delivered through the collaborative efforts of headquarters and regional staff. Participants include inspectors, investigators and analysts. Subjects range from those dealing with general skills, for example the Basic Inspectors Course, to very specialized regulation-specific responsibilities.

In 1996-97, the following courses relating to the enforcement of regulations were given:

- Surveillance and Intelligence Analysis Exercise;
- New Substance Notification Regulations - Mock Inspection;
- Contaminated Sites Course - Wastewater Technology International Corporation;
- National Special Investigations Operator/Cover Team Course;
- Expert Witness Course;
- Forensic Accounting Course;
- Basic Inspectors Course;
- Advanced Pollution Investigators Course;
- Forensic Interviewing Course;
- Multi-media Ozone-Depleting Substances Sampling Course;
- Ocean Dumping Regulations Course;
- National Pollutant Release Inventory Course.

Approximately 335 individuals received training in the above courses during the reporting period.

A catalogue of training courses offered by Environment Canada is available upon request. It also includes references to training courses offered by other recognized agencies and organizations.

International Activities

International activities include coordinating transboundary enforcement activities as well as several international conventions and agreements which Canada has signed that are related to compliance with CEPA.

The North American Agreement for Environmental Cooperation, a side-agreement to NAFTA, obliges Mexico, the U.S. and Canada to report annually to the North American Commission on Environmental Cooperation on their respective environmental enforcement activities. The second report was conveyed to the Commission in 1997. The Report covers three themes:

- The transboundary movement of hazardous wastes;
- Air issues; and
- The international trafficking of flora and fauna.

The North American Working Group on Environmental Enforcement and Compliance Cooperation was formed during in 1996. The Group attempts to monitor current developments and innovations in the field of enforcement and compliance promotion and facilitate information exchange and review of these matters - for example, the development of an enhanced North America-wide tracking system for the transboundary movement of hazardous substances.

Coordination of transboundary enforcement continued, including compliance with international conventions and agreements that Canada has signed. Canada continues to strengthen its working relationship with the U.S. Environmental Protection Agency and U.S. Customs to curtail the trafficking in CFCs.

Computerized Information Systems

An assessment of the Enforcement Activity Tracking System to increase the quality of the system and to increase user satisfaction was conducted and completed in August 1996. In response to the study recommendations, a new version of the tracking system was prepared in order to upgrade its technology and update the user interface. The development of this updated system also took into consideration links with other Environment Canada computer systems and common user interface guidelines. The new system will be deployed during the summer of 1997.

Prosecutions initiated during 1996-1997

Name of Individual or Company	Status	Offence Date and Location	Date Charged	Regulations and Alleged Offences	Court Date	Result	Penalty	Notes
Atlantic Region								
No prosecutions initiated during Fiscal Year 96-97								
Quebec Region								
Syndic Raymond, Bhabot, Fafard, Gagnon Inc.	For trial	Lachine, Quebec	97/02/20	CEPA PCB Storage 14 counts	97/04/30			
Ontario Region								
Bolton Steel Tube Company Bolton, Ontario	Concluded	Sept. 1994 to Dec. 1995	96/10/24	CEPA 12 counts Export/Import of Hazardous Wastes Regulations - 12 Counts <i>Transportation of Dangerous Goods Act</i>	97/03/25	Guilty Plea	\$10,000 fine and a court order of \$20,000	The Court order of \$20,000 was imposed to support environmental education.
Amcast Industrial Limited and Mr. Peter Clothier Burlington, Ontario This case is associated with the prosecution in Atlantic Region of Werner's Wholesale Group/DS Fraser Stores. A conviction was obtained recently in Atlantic Region.	Concluded	1993-1995	96/05/15	CEPA - 7 counts Ozone-depleting Substances Products Regulations Alleged illegal sale of a product containing restricted ozone-depleting substances (SCC20 Switch and Contact Cleaner containing CFC 113).	96/11/06	Guilty Plea	\$25,000 fine.	The company pleaded guilty to one count of illegally importing a CFC product specifically 48 cans of SCC20 Switch and Contact Cleaner. The remainder of the charges including those against the manager were stayed.
Prairie and Northern Region								
No prosecutions initiated during Fiscal Year 1996-97								
Pacific and Yukon Region								
White Pass Transportation Ltd. Employees: Paul Taylor Preston Claytor Ed Hanousek	Concluded	August 2/95	96/12/08	CEPA Export/Import of Hazardous Wastes Regulations Allegedly failed to notify of hazardous waste shipment - 2 counts	97/04/21	Guilty Plea	\$12,000 fine	For the CEPA offence, \$6,000 to be directed to Environment Canada pursuant to section 130(1) of the Act for use on environmental projects.
Miller Contracting Ltd. (Sandheads)	For trial	Dec. 12 to March 7/95 New Westminster	96/08/16	CEPA Ocean Dumping	97/10/16			

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