

Environment Canada Environnement

Canadian Environmental Protection Act : report
t for the period ...
Date: 1992/93

30143581
CIRC # 1

DOFF

Canadian Environmental Protection Act



Report for the Period April 1992 to March 1993

KE
3619
C36313
1992/93





Canadian Environmental Protection Act



**Report for the Period
April 1992 to March 1993**





At the end of each fiscal year, Environment Canada's Environmental Protection Directorate publishes an annual report on the *Canadian Environmental Protection Act (CEPA)* for Parliament. This report covers the period from April 1, 1992 to March 31, 1993.

To obtain the Act or other CEPA publications, please contact:

The Enquiry Centre
Environment Canada
Ottawa, Ontario
K1A 0H3
Phone: 1-800-668-6767 or (819) 997-2800 in the National Capital Region

For more information on CEPA regulations, please contact:

Director General
CEPA Office
Environmental Protection
Environment Canada
Ottawa, Ontario
K1A 0H3
Phone: (819) 953-7928

© Minister of Supply and Services Canada 1993
Catalogue No.: En 40-11/22/1993E
ISBN: 0-662-22249-0



Table of Contents

<i>Minister's Message</i>	1
<i>Canadian Environmental Protection Act</i>	2
Sharing our Responsibility for the Environment	2
CEPA's Channels for Cooperative Action	3
Advisory Panels	3
Federal-Provincial Advisory Committee	3
Agreements with the Provinces and Territories	4
<i>Health Canada's Contributions under CEPA</i>	6
Environmental Quality (CEPA Part I)	6
Regulating Toxic Substances (CEPA Part II)	6
Toxic Substances	9
<i>CEPA Across Canada</i>	11
Atlantic Region	11
Quebec Region	12
Ontario Region	13
Western and Northern Region	14
Pacific and Yukon Region	14
<i>CEPA Part I: Environmental Quality</i>	16
Research and Monitoring	16
Environmental Technology Centre	16
Wastewater Technology Centre	17
National Water Research Institute	18
Canadian Wildlife Service	19
National Hydrology Research Institute	20
Publishing Results	21
State of the Environment	21
Reporting	21
Ecological Monitoring	22
Environmental Indicators	22
Environmental Information Network	22
SOE Products	22
Non-regulatory Instruments	23
Environmental Quality Guidelines	23
The Environmental Choice Program	24
<i>CEPA Part II: Regulating Toxic Substances</i>	26
The Priority Substances List	26
Assessing Priority Substances	27
Collecting Information	28
Confidentiality Requests	28
Disclosing Information	28
The Domestic Substances List	29
The Non-domestic Substances List	29
New Substances	30



Table of Contents

Creating Regulations	31
Strategic Options Reports	32
Immediate Action through Interim Orders	32
Recently Developed Regulations	34
Ozone-Depleting Substances Regulations	36
Release of Toxic Substances	37
Recovery of Reasonable Costs	37
Export and Import of Hazardous Wastes	38
The Basel Convention	38
CEPA Part III: Nutrients	39
CEPA Part IV: Controls on Government Organizations	40
The Federal Code of Environmental Stewardship	40
CEPA Part V: International Air Pollution	41
Sulphur Dioxide Protocol	41
NOx and VOCs Protocols	41
Canada-United States Air Quality Agreement	42
CEPA Part VI: Controlling Substances at Sea	43
Permits for Ocean Dumping	43
Research to Support Ocean Dumping Regulations	46
International Activities	47
Ocean Dumping Action Plan	47
Amendments to the Ocean Dumping Regulations	47
CEPA Part VII: General Information	48
Notices of Objection and Boards of Review	48
Enforcement and Compliance	48
Stronger Enforcement Mechanisms	48
Creation of the Office of Enforcement	49
Inspections	49
Investigations	49
Uniform Enforcement Guidelines	50
National Inspection Plan	50
National Training Program	51
Computerized Information System	51
Enforcement Activities	51
CEPA Part VIII: Amendments and Repeal	56
Regulations Rolled Over to CEPA	56
The Miscellaneous Statute Law Amendment Act	56
Amendment to CEPA	56
Appendix A: Publications Related to CEPA	57
Appendix B: CEPA Expenditures	65



Minister's Message

In presenting this fourth annual report to Parliament, I wish to acknowledge the skills and dedication of the many individuals in Environment Canada for their pioneering work in implementing the *Canadian Environmental Protection Act* (CEPA), and establishing its scientific foundation. Thanks also are due to the staff of Health Canada for their valuable contribution to CEPA initiatives.

With this solid base of experience to build on, I look forward to the upcoming CEPA Parliamentary Review — a process that will engage the public in a wide-ranging discussion of what CEPA has accomplished and where Canadians want it to go. The government is firmly committed to making pollution prevention a national goal and to improving the enforcement of federal pollution standards.

The federal and provincial governments have also set as a top priority the harmonizing of environmental programs everywhere in Canada. This will eliminate overlap, and make legislation and regulations more consistent across the country.

In addition, the 44 priority substances assessment reports completed under CEPA provide us with an important basis for action to reduce toxics in the environment. However, governments alone cannot eliminate pollution through laws and regulations; they continue to depend on the private sector sharing the responsibility. Progressive Canadian companies have become international leaders in producing innovative products and services to support Canada's environmental well-being. To this end, we will be seeking a strong partnership with environmental industries and other stakeholders to develop and implement an environmental industry strategy for Canada.

Environmental protection means preventing problems before they occur. It is also an important vehicle for economic growth. We should be encouraged by our progress to date to meet the challenges that lie ahead.

Sheila Copps
Deputy Prime Minister and
Minister of the Environment



Canadian Environmental Protection Act

The *Canadian Environmental Protection Act* (CEPA) is designed to protect the health of Canadians and the quality of our air, land and waters. As part of the government's initiative to integrate environmental legislation, CEPA incorporates previous toxic substances regulations. As well, a number of other related Acts complement CEPA, such as those preserving our heritage, parks, wildlife, natural resources and threatened regions.

CEPA's comprehensive mandate covers toxic substances throughout the ecosystem and controls any stage of a product's life cycle, from development and manufacture to transportation and disposal. Its primary focus is prevention—averting environmental problems before they occur. Preventive measures include strong regulations and enforcement mechanisms, non-regulatory approaches such as environmental guidelines, codes of practice and incentives with industry, as well as development and transfer of pollution measurement and control technologies.

Through CEPA, the federal government recognizes and encourages the shared stewardship of the environment with businesses, consumers and other levels of government, both national and international. Environment Canada and Health Canada develop CEPA regulations and guidelines, while Environment Canada's Environmental Protection Directorate administers the Act on behalf of the federal government.

During the upcoming year, CEPA will be reviewed and evaluated as required under Section 139.

Sharing our Responsibility for the Environment

Environment Canada has a long tradition of involving Canadians in the design of its policies, development of its programs and delivery of its services. The principle of all Canadians sharing responsibility for the environment has reaffirmed the importance of public consultation and partnership, enabling Canadians to make more informed environmental decisions.

CEPA is just one of many tools available to Environment Canada to help protect the environment. This report deals solely with programs directly related to CEPA. In addition, however, there are many programs that help CEPA reduce pollution or protect the environment, often in cooperation with the Canadian Council of Ministers of the Environment (CCME). These include the National Contaminated Sites Remediation Program, the NOx/VOCs Management Plan, and Environmental Citizenship, as well as programs that deal with CFC education, pollution prevention in the Great Lakes and many voluntary actions taken by industry.



CEPA's Channels for Cooperative Action

CEPA's structure provides opportunities for governments and experts in relevant disciplines to consult and to coordinate their efforts. Mechanisms for this consultation and coordination include advisory panels, the Federal-Provincial Advisory Committee and its working groups, and agreements with the provinces and territories.

Advisory Panels

The Ministers of the Environment and Health appoint experts from interest groups, industry and the academic community to advisory panels. One of these, the Priority Substances Advisory Panel advised the Ministers on CEPA's first Priority Substances List (PSL1) in 1988-89. The list identifies 44 potentially toxic substances that most urgently require assessment.

The government will publish a revised Priority Substances List (PSL2) in 1994, and on a continuing basis every three years after. The government will also appoint an Advisory Panel to review the PSL and recommend inclusions.

Federal-Provincial Advisory Committee

Representatives from Environment Canada, Health Canada, and each of the provinces and territories comprise the Federal-Provincial Advisory Committee (FPAC). This group ensures that the federal and provincial governments consult with each other and take action together to protect the environment from the effects of toxic substances. FPAC also aims to achieve nationally consistent environmental standards.

At their June 1992 meeting, FPAC members discussed federal-provincial administrative agreements and the CEPA Parliamentary Review. Among other issues, they were also consulted on several regulatory initiatives, including air quality guidelines and objectives, the National Pollutant Release Inventory, and Strategic Options Reports. During the year, they commented on several draft regulations and proposed amendments, and draft Environmental Choice guidelines.

Periodically, FPAC also establishes working groups to examine and report on specific toxic substances issues.

The Federal-Provincial Working Group on Controls Harmonization (Ozone-Depleting Substances)

FPAC created the Federal-Provincial Working Group on Controls Harmonization with the mandate of developing a coordinated national strategy to eliminate ozone-depleting substances in Canada. Information exchange among all levels of government is one of this working group's main goals.



The working group developed the National Action Plan for the Recovery, Recycling and Reduction of CFCs. This plan will minimize emissions from existing equipment, reduce the demand for new CFCs by managing the existing supply, and maintain an adequate amount of CFCs for essential uses after CFCs are phased out. Canada's Environment Ministers, who consider CFC recovery and recycling a high priority, agreed that all jurisdictions would begin implementation of this plan by the end of 1992.

The Federal-Provincial Working Group on Air Quality Guidelines and Objectives

Over the past year, the Federal-Provincial Working Group on Air Quality Guidelines and Objectives developed several draft air quality objectives. The objectives cover the "maximum desirable and acceptable concentrations" for nitrogen dioxide and hydrogen fluoride. A report on the "maximum acceptable and tolerable concentrations" for reduced sulphur compounds was set aside for review.

In association with the NOx/VOCs Management Plan, the group is also developing a rationale for revising ground-level ozone objectives for the protection of health and vegetation. The group agreed to continue developing an air quality objective for fine particulate matter.

The Federal-Provincial Working Group on CEPA Partnerships

At its June 1991 meeting, FPAC created a working group of three provinces and the federal government to study and recommend solutions for some of the outstanding issues that have arisen during negotiations of administrative and equivalency agreements. At its June 1992 meeting, FPAC approved the final report of the working group, which recommended solutions for most issues, including equivalency criteria, provisions, sanctions, confidential business information, and testing techniques. Federal-provincial negotiating teams have profited from the group's work and are continuing to negotiate agreements on a bilateral basis.

Agreements with the Provinces and Territories

Within CEPA's framework, the federal government may enter into administrative and equivalency agreements with the provinces and territories. While none have been signed to date, these agreements promise to be an important link between the federal government and the provinces and territories in the years to come. They will help governments make the best use of available resources and provide a single window to industry. At the same time, they will ensure that environmental standards remain consistent.



Administrative Agreements

Administrative agreements will allow governments to share the work of administering regulations, and may cover a wide range of activities, from inspection and enforcement to monitoring and reporting. Under an administrative agreement, the federal government would remain accountable to the Canadian people and report on the agreement annually to Parliament.

Over the past year, the federal government has worked closely with most provinces to develop draft agreements. These include, for example, the general administration of CEPA and agreements for the administration of pulp and paper regulations. Negotiations are advancing as anticipated.

Equivalency Agreements

Equivalency agreements would suspend the application of a federal CEPA regulation in a province or territory by recognizing an equivalent provincial or territorial regulation. The federal government would still apply its federal regulations to federal lands, works and undertakings, and report annually on the administration of equivalency agreements to Parliament.

In effect, an equivalency agreement is a contract between the federal Minister and his or her provincial or territorial counterpart for the cooperative delivery of a national environmental standard, including national reference methods for pollution sampling and analysis. A separate equivalency agreement must be negotiated with each province. Negotiations are under way with some provinces on draft equivalency agreements for several federal regulations.



Health Canada's Contributions under CEPA

While CEPA's general intent, and the joint achievements of Environment Canada and Health Canada have been fully described elsewhere in this report, the following section summarizes Health Canada's major achievements under CEPA during the past year. Most of the work has been undertaken by the staff of the Environmental Health Directorate of the Health Protection Branch (HPB).

CEPA clearly defines Health Canada's responsibilities, which centre on preventing harmful effects on human health from the environment. In general, Health Canada is responsible for assessing and managing the risks to human health from toxic substances, and CEPA includes detailed provisions for dealing with potential health risks from existing and new substances, as well as from hazardous wastes.

While many sections of CEPA assign responsibility to a specific Minister, in many others, both the Minister of the Environment and the Minister of Health share responsibilities. The Minister of the Environment usually addresses any environmental concerns, while asking Health Canada to examine any potential effects on human life or health.

Environmental Quality (CEPA Part I)

Section 8 of CEPA, which deals with ensuring the quality of the environment, gives the Minister of the Environment responsibility for formulating environmental quality objectives, guidelines and codes of practice. The Minister of Health has similar authority to preserve and improve public health under Section 9.

As part of this mandate, Environment Canada and Health Canada are working together to develop National Ambient Air Quality Objectives for a number of air pollutants. Through the Federal-Provincial Working Group on Air Quality Objectives and Guidelines, draft objectives have been developed for sulphur dioxide (SO₂), nitrogen dioxide (NO₂), carbon monoxide and ozone.

The Working Group has also proposed that new objectives be published for gaseous fluorides and reduced sulphur compounds. And, in association with the NO_x/VOCs Management Plan, the Working Group is reviewing objectives for ground-level ozone and fine particulate matter.

Regulating Toxic Substances (CEPA Part II)

Priority Substances

Health Canada has made a major contribution to the Priority Substances Assessment Program of CEPA (Sections 12 and 13). In 1992-93, the Department completed human health risk assessments for 28 of the 44 substances on the first Priority Substances List (PSL1), and drafted background health sections for an additional 11 substances.

A paper outlining the basis for determining "toxic" to human health under CEPA has been completed and is included in the publications list.



In preparation for the second Priority Substances List (PSL2), HPB helped to compile a list of 544 candidate substances, selected from already existing databases of potentially harmful substances. With Environment Canada, Health Canada drafted screening criteria for candidate substances, and screened a pilot list of 30 compounds.

Under CEPA Section 15, the Environmental Health Directorate has acquired supplementary experimental laboratory data for several priority substances. Staff conducted research studies on a number of priority substances, including: hexachlorobenzene, chlorinated paraffin waxes, trichlorobenzene, tetrachlorobenzenes, di-n-octyl phthalate, bis-(2-ethylhexyl) phthalate, polycyclic aromatic hydrocarbons, chlorinated wastewater effluents, chlorinated diphenyl ethers.

Priority Substances for which Health Canada completed health assessments in 1992-93:

- Arsenic;
- Benzidine;
- Bis(chloromethyl ether);
- Chlorinated paraffin waxes;
- Chloromethyl methyl ether;
- Dibutyl phthalate;
- 3,3-dichlorobenzidine;
- 3,5-dimethylaniline;
- Di-n-octyl phthalate;
- Hexachlorobenzene;
- Methyl methacrylate;
- Organotins;
- Tetrachlorobenzenes;
- 1,1,2,2-tetrachloroethane;
- Tetrachloroethylene;
- Trichlorobenzenes; and
- Trichloroethylene.

The first Priority Substances List contains 44 substances, of which 17 are listed here. In addition to the above, health assessments were completed for 11 priority substances before April 1 1992. Thus, Health Canada completed health assessments for a total of 28 priority substances by March 31 1993.

Background health sections have also been drafted for 11 of the remaining 16 substances, and Health Canada will contribute minor sections on health aspects for five substances (pulp mill effluents, creosote impregnated waste materials, chlorinated wastewater effluents, waste crankcase oils and 1,1,1-trichloroethane).

Collecting Information

In carrying out the provisions of CEPA Section 17, Environment Canada forwards all data and samples it has collected concerning the production, applications and importation of potentially toxic substances to Health Canada for assessment. Health Canada has received a total of 404 such submissions under CEPA to date (see table below), most of them dealing with hazard data obtained from toxicological studies. The Environmental Health Directorate prepared





summaries of the toxicological data supplied with 394 of these submissions, and made preliminary evaluations of 88 to determine whether they are "CEPA-toxic" or not.

A system for classifying submissions allocates resources to those with highest priority, and sets benchmarks for the completion of reviews. In consultation with Environment Canada, Health Canada is developing draft guidelines for Section 17 submissions review.

Section 17 Submission Tracking

Year	Received	Summarized	Preliminary Evaluation
1989	3	3	3
1990	11	11	11
1991	25	25	25
1992	355	355	49
1993	10	0	0

New Substances

Under sections 25 to 32 of CEPA (substances new to Canada), Health Canada and Environment Canada are developing new substances notification regulations. Their work is concentrated in two main areas: chemical and polymer regulations, and biotechnology regulations.

Chemicals and Polymers

Health Canada has made major contributions to the following joint activities with Environment Canada:

- publication of *Guidelines for the notification and testing of New Substances - chemicals and polymers*;
- preparing a draft guidance manual to assist Health Canada staff in their internal assessment of new chemicals and polymers;
- providing advice on changes to the notification regulations and definitions suggested by the Privy Council Office, as well as providing a detailed cost-analysis for preparing a notification for the Regulatory Impact Analysis Statement (RIAS) for the regulations; and
- preparing communications materials and organizing information sessions for industry on the New Substances Notification Regulations.

Products of Biotechnology (Organisms)

The Environmental Health Directorate has continued to work with Environment Canada to develop regulations governing the use of new micro-organisms in commerce. The notification scheme for the contained use of micro-organisms, including a quantity exemption for research and development, has been completed. As well, the information requirements for the health assessment of micro-organisms, biochemicals and biopolymers have been finalized, and are included in draft notification regulations for biotechnology products. Background documentation supporting the draft regulations has been prepared to



serve as the basis for reporting guidelines. A multi-stakeholder consultation held in December 1992 revised and approved most of these health information requirements.

Health Canada staff participated in three task forces established to resolve outstanding issues dealing with consortia and wastewater treatment, data to be collected in field trials, and fate and effects testing. These activities laid the groundwork for consultations held in July 1993.

Products of Biotechnology (Biochemicals and Biopolymers)

Health Canada is working with Environment Canada in the following areas:

- preparing draft information requirements for the notification regulations for biochemicals and biopolymers, as well as sections for the accompanying background document and notification guidelines;
- developing the reporting guidelines for a Domestic Substances List (DSL) for biotechnology products; and
- holding multi-stakeholder consultations on the proposed notification regulations for biochemicals and biopolymers.

In addition, as part of the regulatory program on new substances, HPB has developed models for use in:

- predicting human exposure to new substances for which no monitoring data exist; and
- predicting the major routes by which surfactant chemicals enter the human body, as well as the human exposure levels for such chemicals.

Toxic Substances

Control of Toxic Substances

Under Section 34 of CEPA, both Ministers have the authority to establish wide-ranging controls for toxic substances, however, the Minister of Health's particular responsibility is to ensure that exposure to such chemicals poses minimal risk to Canadians' health.

During 1992-93, the Environmental Health Directorate of Health Canada addressed the following issues in planning implementation of the risk management process for toxic substances:

- the regulatory responsibilities of the Minister of Health in the risk management process under CEPA;
- the role of science in the risk management process; and
- the nature of public participation in the strategic options process.

A detailed report examining these and other relevant issues was completed. As well, Health Canada collaborated with Environment Canada to prepare a draft report on strategic options, and participated in the Toxic Substances Subcommittee of the CEPA Management Committee.



Fuels

In accordance with Sections 46 and 47 of CEPA (prohibition and regulation of fuels), as well as with the monitoring provisions of the Act, Health Canada completed a study to estimate city dwellers' maximum exposure to manganese oxides derived from the gasoline octane booster methylcyclopentadienyl manganese tricarbonyl (MMT).

International Air Pollution

Under Section 61 of CEPA (Part V), and the mandate of the Canada-United States Air Accord, Environment Canada, Health Canada and the U.S. Environmental Protection Agency are working together to evaluate the appropriate science and methodologies for establishing air quality objectives and emission targets.





CEPA Across Canada

Environment Canada offices across the country are instrumental in the administration of CEPA and have been involved in activities featured throughout this report.

Although Canada's five regions share many of the same pollution problems, differences in their geography, natural resources and economies create separate environmental concerns. Regional offices bring these perspectives to the national environmental agenda. This is particularly important in the area of compliance, the Regions' first area of responsibility. Within the framework of the annual National Inspection Plan, they can target specific threats directly concerning people in their areas.

Regional offices also perform scientific research and keep a close watch on problems in their areas, becoming involved, for example, in assessing materials on the Priority Substances List.

To round out their support of federal activities, the Regions deal directly with the public and often represent the Department in negotiations with the provinces on environmental issues.

Atlantic Region

In 1992-93, Environment Canada's Atlantic Region continued to collaborate with the Atlantic Provinces to control air pollution. Together, the governments audited progress under the federal-provincial sulphur dioxide (SO₂) reduction agreements. Negotiations were started on amendments to the agreements to reduce SO₂ limits and to extend applications of the agreements. New agreements were concluded with New Brunswick and Nova Scotia, and negotiations continued with Newfoundland and Prince Edward Island. As well, an emissions inventory for the Atlantic Provinces was completed, updating emissions of common air pollutants and greenhouse gases.

Atlantic Region also initiated negotiations with the provinces to develop bilateral agreements under the NO_x/VOCs Management Plan. Negotiations were delayed by the pending Comprehensive Federal-Provincial Air Quality Agreement; however, the development of control initiatives with New Brunswick is under way.

Public Works Canada agreed to lead the regional PCB destruction program, evaluating potential sites for a mobile PCB destruction facility, while Environment Canada continued its regulatory role. Atlantic Region conducted a survey to assess government and industry commitment to the removal and destruction of in-use PCBs in the near future. PCB equipment owners were informed about the program, as well as decommissioning services available for the safe transportation of PCB wastes.

In its research and monitoring efforts, Atlantic Region:

- continued to assess long-term trends in toxic chemical contamination of the marine environment, wildlife at risk from toxic chemicals, and the effects of toxic contaminants on species such as eagles and osprey;



- monitored for cadmium, lead and zinc in the Saint John and St. Croix Rivers as part of an ongoing international program, and sampled for cadmium, lead, zinc, arsenic and chlorophenols in regional drinking water supplies; and
- expanded the ground-level ozone-monitoring network in the Region and supported international activities with the United States related to the transboundary movement of ground-level ozone and smog.

The Region also completed various projects related to toxic substances management, including:

- an inventory of biotechnology companies in preparation for the New Substance Notification Regulations for Biotechnology Products;
- a study that determined there is limited commercial use of regional pulp and paper chemical by-products; and
- an investigation determining that municipal chlorine-treated wastewater effluents in the Region are toxic and affect the aquatic environments receiving them.

Atlantic Region conducted 135 inspections in 1992-93, monitoring compliance with fuel regulations, Chlorobiphenyl Regulations, PCB Material Storage Regulations, Ozone-Depleting Substances Regulations, Chloro-Alkali Mercury Regulations, Chlorinated Dioxin and Furan Regulations, and Wood Chip Defoamer Regulations. The Region also helped develop an inspector's training package for the Export and Import of Hazardous Waste Regulations, and provided extensive training programs for inspectors in other areas of enforcement and compliance.

As part of its ocean dumping program, Atlantic Region conducted 34 inspections on ocean dumping operations to ensure compliance. From these, one legal action was initiated. In support of CEPA Part VI, the Region carried out environmental impact assessments and quality control assurances on 15 projects. As well, the staff conducted numerous public meetings and media interviews to explain the regional ocean dumping program.

Regional staff also assisted other federal departments and agencies to implement CEPA IV guidelines and regulations affecting their facilities. Considerable effort spent on improving Cape Breton Development Corporation operations helped to minimize acid mine drainage and other environmental problems.

Quebec Region

In 1992-93, a total of 370 inspections were carried out in support of CEPA, resulting in 32 warnings and 20 investigations. Thirteen cases were eventually brought before the courts, and penalties such as fines, community service and donations for environmental projects were imposed.

Promotional activities were increased to enforce regulations and promote prevention. Particular attention was paid to regulations on petrol, substances thinning the ozone layer, and the import and export





of dangerous waste. A pilot project was carried out with the Quebec Ministry of the Environment to provide computerized follow-up of dangerous waste imports. As well, the technical and legal training of officers applying the regulations remained a priority.

Regulations concerning dioxins and furans as they apply to the pulp and paper sector were also enforced in 1992-93. The Region is negotiating an administrative agreement with the Quebec Ministry of the Environment on the joint applications of regulations applying to this sector.

The first of a series of stations to measure airborne toxic substances in the Quebec Region was put into operation this year. As well, the Region pursued a study of polycyclic aromatic hydrocarbons (PAHs), a priority substance under CEPA for which the Region is responsible. A draft report on environmental assessment of the substance is being revised.

Finally, as part of a commitment to "Starting in Our Own House," the Region sent a questionnaire to senior environment officials of other departments asking them about their activities and needs with respect to the environment. A five-year plan will be drafted based on their replies to ensure consultation and support for environmental initiatives.

Ontario Region

Over the past year, Ontario Region continued its discussions with the Ontario Ministry of the Environment on a PCB waste equivalency agreement. Although they have yet to conclude an agreement, discussions have resulted in working arrangements that reduce duplication in inspection and reporting, and encourage consistent federal and provincial approaches to regulation in this area. The Region also continued discussions with the province for a pulp and paper administrative agreement pertaining to CEPA and the *Fisheries Act*. Its audit of wood preservation facilities in Ontario is still ongoing.

In 1992-93, the Region conducted an active inspection program by establishing a division for inspection and technical services. In its first year, the division has been successful in providing quicker and more effective response to regional and national priorities, better use of personnel, equipment and funds, and greater work variety for staff. Inspection priorities for the year included Ozone-Depleting Substances Regulations, the Storage of PCB Wastes Interim Order, Chlorobiphenyls Regulations, Vinyl Chloride Release Regulations, the Pulp and Paper Mill Effluent Chlorinated Dioxins and Furans Regulations, Chlor-Alkali Mercury Release Regulations, and Secondary Lead Smelter Release Regulations. A total of 272 inspections were conducted under CEPA. These resulted in 16 violations for which warnings and directions were issued. Other enforcement action included the initiation of 21 investigations into suspected violations of CEPA. Three convictions were registered, and eight warning letters were issued. The convictions resulted from violations of the Ozone-Depleting Substances Regulations, one of which ended with the highest fine to date under CEPA: \$100,000.





As well, Ontario Region hosted several workshops for federal departments on PCBs, underground storage tanks and contaminated sites as part of a program to promote compliance. Regional staff developed and distributed promotional bulletins, and made presentations to several federal departments on compliance. They also worked closely with federal departments and agencies on site-specific compliance problems. To disseminate compliance messages to federal departments, the Region is now using an electronic bulletin board called ENVIRONET.

Western and Northern Region

In 1992-93, Western and Northern Region completed an audit of wood preservation facilities in Manitoba, Saskatchewan and Alberta. Conducted in conjunction with the provincial governments in the Region, the audits established the state of the industry and its level of conformance with Environment Canada recommendations.

The Region also inspected approximately 200 federal petroleum storage facilities across Saskatchewan, assessing their compliance with provincial regulations and labelling tanks to ensure delivery by provincially regulated carriers. The program increased awareness of issues related to underground fuel storage and led to upgrades of some facilities.

As well, Western and Northern Region compiled and published a pamphlet on ozone-depleting substances regulations. It has distributed the publication to wholesalers, electrical supply houses and refrigeration service companies across the region to increase their awareness of this vital issue.

Western and Northern Region Enforcement and Compliance Officers conducted 108 inspections and 12 investigations, sent three warning letters, and laid two charges. One charge was laid under the Gasoline Regulations, and the other under Ozone-Depleting Substances Regulations No. 3.

Pacific and Yukon Region

As in other parts of the country, monitoring continues to be an important gauge of environmental quality in the Pacific and Yukon Region. Accordingly, sampling for dioxins, furans and chlorinated phenolic compounds in suspended sediment and water continues at sites upstream and downstream from pulp mills in the Fraser Basin. As well, as part of the Fraser River Estuary Management Program (FREMP) Water Quality Plan, chlorophenols, chloroguaicols and chlorocatechols are being monitored in water collected from three sites in the lower Fraser River in British Columbia.



This year, a toxic chemical committee was established by the federal and provincial governments to address the lifecycle management of toxic chemicals and promote cooperative programs between the two levels of government.

A review of the ship-building and repair industry's environmental management practices was undertaken to assess releases to the environment of spent abrasive grits, solvents and coatings. The same review was also undertaken for the environmental practices of on-site commercial vessel painting operators. Historical releases of spent grits, solvents and coatings have contaminated marine sediments with metals and organic compounds. A recommended environmental management document scheduled for completion in 1994 will provide operational guidance and specify control measures to prevent releases of these substances.

In the lower Fraser Valley, eastern Vancouver and some locations of the B.C. interior, lead poisoning of bald eagles has been found to be a problem. Eagles are exposed to lead when they capture and eat waterfowl either wounded by lead shot or with lead shot in their gizzards. As a result, the federal and B.C. governments plan to expand the limited-area ban on the use of lead shot for waterfowl hunting to the whole province in 1995.

An investigation of fish contamination in Lake Laberge, requested by three Yukon residents in 1991 under Section 108 of CEPA, remains open. While the Department concluded there was no evidence of a CEPA violation at that time, the investigation remains open to any new evidence revealed by scientific data.

An inventory of ozone-depleting substances (ODS) at federal facilities was completed. The information will provide guidance for the development of a phase-out strategy for ODS-containing equipment.

As well, the Region's study of the leaching of wood preservatives continues. A set of environmental management practices scheduled for completion in 1993 will provide guidance on the design and operation of chemical application facilities, and on the prevention and control of chemical releases to the environment.

Inspection programs focussed on the Ocean Dumping Regulations, Pulp and Paper Mill Effluent Chlorinated Dioxin and Furan Regulations, Pulp and Paper Mill Defoamer and Wood Chip Regulations, Storage of PCB Material Regulations/Interim Order, Chlorobiphenyl Regulations, Gasoline Regulations, and Ozone-Depleting Substances Regulations. Investigations into violations were launched under the Ocean Dumping Regulations and Ozone-Depleting Substance Regulations No. 3. Two successful prosecutions were completed.





CEPA Part I: Environmental Quality

Research and Monitoring

To establish fair restrictions and foster the development of new technologies to meet them, the federal government supports research and monitoring activities. The scientific information gained from these activities helps to verify the progress of regulations, agreements and other non-regulatory instruments, and provides the public with accurate environmental information. For this reason, the publication of results is important.

CEPA Part I mandates Environment Canada to undertake research on a variety of fronts. As a major science department, Environment Canada has five research institutes that make direct contributions to CEPA. Research not related to CEPA is not reported here.

Like Environment Canada, Health Canada also conducts toxicology research that identifies hazardous substances and confirms their links to adverse health effects.

Environmental Technology Centre

The Environmental Technology Centre near Ottawa coordinates the National Air Pollution Surveillance Network (NAPS), a system of 130 monitoring stations in 52 urban centres across Canada that measures ambient air quality. In 1992-93, the Centre provided technical assistance to NAPS stations throughout the system and gave ongoing support to various air sampling programs. In cooperation with the Atmospheric Environment Service and Health Canada, five sampler sites for the Acid Aerosol Measurement Program were also established.

The Centre also operates a vehicle exhaust emissions testing laboratory. During the past year, the laboratory completed:

- a temperature-controlled vehicle emissions test cell to be used with the Canadian Gas Association and others to study the effects of cold-temperature conditions on exhaust from vehicles using alternative and reformulated fuels;
- a joint program with the Canadian Coast Guard and the Transport Canada Development Centre to measure exhaust emissions from Canadian marine vessels and develop emission factors as a part of an international study under the International Maritime Organization (IMO); and
- a joint program with the Ontario Ministry of Transportation, Natural Resources Canada, Detroit Diesel, and the Ottawa Transit Authority to determine the effectiveness of diesel-emission particulate traps in old and new technology buses. Preliminary results showed the traps were 65 to 85 per cent efficient.



As well, the Centre staff helped to develop reference methods and associated quality assurance programs for measuring toxic substances. This was done in support of CEPA and CCME guidelines. For example, they:

- implemented an agreement with the Canadian Association of Environmental Analytical Laboratories (CAEAL) for the certification of public and private sector laboratories for anions and metals on air filters, and for PCB-in-oil;
- published the *Quality Assurance Requirements for the Analysis of Dioxins in Environmental Samples*;
- participated in a joint government-industry task force to amend the existing vinyl chloride reference method;
- neared completion of a program to develop a quick method for inspectors to test compliance with federal asbestos emissions regulations;
- neared completion of a program to develop a protocol for the real-time measurement of emissions of NO_x, SO₂, CO₂ or O₂ from thermal power generating plants;
- submitted updated lead and particulate reference methods for consultations with stakeholders; and
- studied methods of separating PCBs from oil to develop a PCB reference method for CEPA regulations.

Finally, the Centre contributed to volatile organic compound (VOC) and air toxics sampling programs. Among their activities this year were operating the toxics air monitoring network and increasing the number of sites from 25 to 30; providing data related to VOC implicated in ground-level ozone formation to the NO_x/VOCs Control Program; and developing a new method for measuring polar VOC to begin in the summer of 1993.

Wastewater Technology Centre

The Wastewater Technology Centre in Burlington, Ontario, established 20 years ago, has become the foremost Canadian facility for treatment and disposal technologies for municipal and industrial wastewaters and residues. The Centre is currently in a 33-month trial as the first government-owned, contractor-operated research and technology development facility designed to accelerate the commercialization of new technologies.

In 1992-93, the Centre's researchers worked toward finding cost-effective and innovative ways to remove nutrients, in particular phosphorus, to very low levels from municipal sewage treatment plants; to develop new techniques to treat wastewater from pulp and paper manufacturing; and to optimize the operation of sewage treatment plants. They also searched for new ways to dispose of organic and inorganic residues safely, and established protocols for evaluating and regulating the disposal of solidified wastes.

Also during the year, much research effort was devoted to developing and evaluating innovative technologies for the remediation of contaminated sites. Included were developing technologies to





remove contaminants from groundwater, soils and sediments, and establishing guidelines for decommissioning industrial sites that have been shut down.

The Centre is currently shifting its research emphasis from "end-of-the-pipe" treatment technologies to pollution prevention technologies in line with the recent national direction. Here, the focus is on the metal finishing, automotive parts manufacturing, and printing and graphic arts industrial sectors.

National Water Research Institute

The National Water Research Institute (NWRI) in Burlington, Ontario, is Canada's largest freshwater research establishment. In partnership with Canadian and international freshwater scientists, NWRI conducts a national program of research and development in the aquatic sciences to address current and emerging water quality problems in Canada.

This year, CEPA funded NWRI research in the areas of quality assurance and control, chlorophenolics in bleached kraft mill effluent, and the fate of polynuclear aromatic hydrocarbons (PAH). Work is continuing on the generation of quality assurance and control reference sediment samples for dioxins and octachlorostyrene. Several chlorinated phenolics (in the form of guaiacols and vanillins) were identified as abiotic hydrolysis products of high molecular weight chlorinated organic material in bleached kraft mill effluent. A study of the photodegradation of the nitrogen-containing PAH quinoline in water showed the half-life was less than one day. Ultimate products of photodegradation were polar compounds, probably not aromatic.

NWRI is continuing its research to close information gaps identified in the CEPA Assessment of Effluents from Pulp Mills Using Bleaching. The research program has involved Environment Canada, the Department of Fisheries and Oceans, Industry Canada, the Pulp and Paper Research Institute of Canada (PAPRICAN), several pulp mills and three Canadian universities. As part of this research program, new methods have been developed to test effluents for their capacity to cause sub-lethal effects in fish.

Another of NWRI's important CEPA initiatives is its assessment of substances on the first Priority Substances List (PSL1). In 1992-93, NWRI staff completed assessments for non-pesticidal organotin compounds, 3,5-dimethylaniline, benzidine and 3,3'-dichlorobenzidine. As well, they completed assessment of aniline, which awaits the Health Canada contribution, and continued the assessments of nickel and chromium. NWRI staff are involved in planning for the second Priority Substances List.

NWRI research on CEPA priority substances addresses data gaps and research priorities identified in CEPA assessments and by regional staff. Its research also identifies candidate substances for priority substances lists and advances the understanding of fundamental physical, chemical and biological processes in freshwater ecosystems.



Canadian Wildlife Service

The Canadian Wildlife Service (CWS) conducts CEPA research and monitoring at its National Wildlife Research Centre and regional offices. By detecting and measuring the effects of toxic substances on wildlife, researchers can assess the overall health of species, predict the impact of pollutants, and provide an early warning system for potential environmental and human health problems.

During 1992-93, CWS was involved in several major research, monitoring and assessment projects aimed at assessing effects of contaminants on wildlife and their ecosystems throughout Canada. The primary focus of this year's evaluations was completing assessments of the risks to wildlife of 41 substances on the Priority Substances List.

In the Arctic, by collaborating with the University of Stockholm, CWS positively identified potentially toxic methylsulfone metabolites in polar bears, and co-developed a quantitative way to measure them with Carleton University. With the University of British Columbia, CWS also characterized enzymes in polar bear livers, enzymes which may be useful for measuring exposure to contaminants. With the United States, Greenland and Norway, CWS completed a western hemisphere survey of chlorinated hydrocarbon contaminants in fat from over 500 polar bears. Levels of most contaminants, corrected for age and sex, were relatively evenly distributed with a slight tendency to increase from west to east.

In the Yukon and Northwest Territories, CWS measured cadmium levels in caribou and muskoxen tissues. Although the concentrations were high compared with most other wild mammals, they were comparable with levels reported in Norway in 1986 and Quebec in 1989. In British Columbia, monitoring of dioxin and furan levels in herons and cormorants from the Strait of Georgia showed that levels continued to remain low after enhanced pollution control at pulp and paper plants. The environmental threat is not over, however; dioxin and furan concentrations will continue to be monitored to confirm that the lowering trend remains consistent.

In Alberta, CWS initiated studies to assess contaminant levels in mink and mergansers in cooperation with Alberta's Northern River Basins Study to determine the environmental effects of pulp mills. In Manitoba and Saskatchewan, CWS mapped the geographical distribution of mercury levels in fish to determine the potential exposure of fish-eating birds to mercury.

CWS also tested mercury levels in blood and feathers from loons from 24 Ontario lakes with a range of fish mercury concentrations. These tests confirmed that loons breeding on high mercury lakes experience high mercury concentrations that can be sufficient to cause concern for reproductive impairment. However, CWS's preliminary research results suggested that the causes of reproductive failure of Herring Gulls nesting near a bleached kraft pulp mill on Lake Superior are not directly related to contamination. A Great Lakes basin-wide health assessment of fish-eating birds showed there are highly





significant differences in immune function among sites for Herring Gull and Caspian Tern chicks. Biochemical analyses of other health indicators for these birds continued. As well, shorebirds were collected at representative stopover points in their migratory path in Canada at James Bay, the Bay of Fundy and Central Manitoba, and at locations in South America to determine the significance of contaminant exposure at these sites.

In Quebec, as part of a program to develop long-term indicators of contaminant trends and wildlife health in the St. Lawrence River, CWS tested the mudpuppy and snapping turtle and found them to be promising indicator species. Investigations of mercury in reservoirs for hydroelectric power in northern Quebec revealed that both young and adult osprey contain high levels of mercury from fish. No evidence of reproductive failure, however, was found.

Finally, in the Atlantic Region, monitoring of contaminant levels in sea bird eggs over two decades has identified which chemicals are on the rise and fall in the marine environment, leading to investigations of potential contaminant sources. This year, with provincial wildlife agencies, CWS collected waterfowl from 62 sites throughout the Region for chemical analysis as part of a national CWS assessment of the toxic contaminant levels in wild foods. Also in partnership with the provincial wildlife agencies, a program was started to collect eagle and osprey eggs to assess the risk of toxic chemicals to these species in the Region.

National Hydrology Research Institute

Located in Saskatoon, the National Hydrology Research Institute focuses its research on issues relevant to the sound management of Canada's aquatic resources, particularly western and northern aquatic ecosystems.

In 1992-93, NHRI completed a major study to determine the levels of contaminant trace elements and nutrients carried by blowing snow to the arctic treeline. The quantities of sulphates, which contribute to snow acidity, were found to be as high along the treeline as in rural areas of southern Ontario.

The Institute also began to investigate the effects of the herbicide Triallate on bacterial and algal activity in prairie lakes that border on cultivated fields where herbicides and fertilizers are regularly used.

Groundwater contamination is a costly and increasing problem, both in Canada and abroad. Although expensive clean-up technologies have been developed, prevention techniques are the best long-term solution to this serious water-resource problem. NHRI groundwater scientists for the Prairie Provinces Water Board recently developed a technique, initially for use in western Canada, but suitable for application in many other geographic areas, called the aquifer vulnerability index (AVI). The AVI is a preventive method for mapping the vulnerability of aquifers to surface contamination, and can be used to help define groundwater protection zones or as a screening tool for land-use selection. A 3100 km² area along the Saskatchewan-Alberta boundary has been mapped, and the project continues along the Saskatchewan-Manitoba border.



As part of a groundwater research program to find improved methods for monitoring the movement of agrochemicals from the soil surface into groundwater, NHRI developed a large-scale model aquifer in which the movement of toxic chemicals can be researched and monitored in a "natural" controlled environment.

Publishing Results

CEPA provides for the continued collection, processing, correlation and publication of results as part of its research and monitoring mandate. Documents released over the past year to support environmental regulations and guidelines are listed in Appendix A.

State of the Environment

CEPA requires the federal government to report periodically to Canadians on the state of the country's environment. The goal of state of the environment reporting is to provide Canadians with credible, timely and comprehensive information on environmental trends and conditions, linked with social and economic considerations, to help them make informed choices leading toward sustainable development.

In accordance with CEPA's legislative mandate, Environment Canada's State of the Environment Reporting (SOER) organization is now working to meet the following commitments:

- publish a national report on the state of Canada's environment at regular intervals;
- establish a long-term SOE monitoring and assessment capability to study resources at risk, ecosystem response and the impact of major disruptions to ecosystems;
- develop and release on a regular basis a comprehensive national set of environmental indicators; and
- establish computer services and a state-of-the-art national environmental information network to provide all Canadians with "one-window" access to the latest available SOE information.

Reporting

In April 1992, *The State of Canada's Environment*, the country's second national SOE report, was released. The report was prepared over a four-year period with contributions from participants representing a broad range of stakeholders.

To determine the extent to which the SOE report is meeting its objectives and to plan a strategy for the next report, SOE Reporting undertook an evaluation of *The State of Canada's Environment* soon after its release. This evaluation involved interviews with participants in the report's preparation to obtain their feedback, a user survey questionnaire, 18 commissioned reviews by experts in various professional categories, and country-wide consultations with the provinces and territories. Drawing on preliminary results of this evaluation, SOER began to plan for the next report in 1996 and prepared a draft table of contents.



Ecological Monitoring

In 1992-93, alliances or partnerships to develop a common national ecological framework were put in place with all of Canada's provinces and territories, as well as Environment Canada's three services and the departments of Natural Resources, Agriculture, Fisheries and Oceans, and Indian Affairs and Northern Development. Refinements of the terrestrial framework were completed, and a draft marine framework was produced.

A strategy for establishing a network of ecological science centres was also completed, and regional consultations and scientific workshops are continuing. To facilitate this initiative, a database containing information from 22 federal and provincial monitoring networks has been completed.

Environmental Indicators

In August 1992, a workshop was held with representatives of environmental non-government organizations from across Canada to obtain their feedback on the preliminary national set of environmental indicators released in 1991.

Consultations with other federal government departments are ongoing, and agreements have been reached with Natural Resources Canada and the Department of Fisheries and Oceans to share indicator research and development, and to co-produce indicator bulletins. Consultations with the provinces and territories are also being pursued through a number of mechanisms, including the Canadian Council of Ministers of the Environment, bilateral meetings and workshops.

Regular reporting on environmental indicators has been initiated through a new series of publications called Environmental Indicator Bulletins. These bulletins deliver concise, understandable, timely, scientifically based information on the environment to decision makers and the general public. The first in this series was released in November 1992.

Environmental Information Network

SOER is currently working toward the establishment of the Environmental Information Network. The network is being developed in two phases. The first phase will meet the internal needs of SOER; the second will make it available to the public.

In 1992-93, an analysis and inventory of 57 existing environmental information systems was completed to identify current information gaps. Possible architecture options were also investigated. The network will follow a modular design and rely on commercially available software.

SOE Products

In addition to the national report and environmental indicator bulletins, many products were released by SOE Reporting in 1992-93. They are listed in Appendix A.



Non-regulatory Instruments

CEPA Part I, particularly Section 8, gives the federal government responsibility for a wide range of non-regulatory actions.

Researchers are devoting considerable effort to developing guidelines and codes of practice to give industries and regulators clear directions on how to reduce emissions, effluents and wastes.

Recently Developed Non-regulatory Instruments

- Environmental Codes of Practice for Steam Electric Power Generation - Operations Phase and Decommissioning Phase

Planned Non-regulatory Instruments for 1993-94

- Guidelines for the Notification and Testing of New Substances: Chemicals and Polymers
- Guidelines for the Notification and Testing of New Substances: Biotechnology Products
- Interim Guidelines for the Preparation and Submission of CEPA, Section 17 Notices

Environmental Quality Guidelines

Section 8 of CEPA gives the Minister the authority to formulate environmental quality guidelines and objectives. Federal, provincial and territorial agencies use these non-regulatory devices in their efforts to assess and manage environmental quality issues.

In 1992-93, Environment Canada, in conjunction with the Canadian Council of Ministers of the Environment (CCME), completed water quality guidelines for the following chemicals on the Priority Substances List: tetrachloroethylene, aniline, 3,5-dimethylaniline, bis(2-ethylhexyl) phthalate, di-n-octyl phthalate, and dibutyl phthalate. At the same time, work continued on water quality guidelines for the following: polycyclic aromatic hydrocarbons (PAHs), cadmium, dioxins and furans, styrene, and methyl tertiary-butyl ether.

Work on sediment quality guidelines (marine and freshwater) continued for cadmium, PAHs, mercury, and dioxins and furans. Work on tissue residue guidelines continued for cadmium, and dioxins and furans. Environmental quality guidelines will describe the conditions necessary to safeguard aquatic life and the wildlife predators of aquatic biota, as well as to protect the water used for livestock watering and irrigation. They will also form the basis for future assessments and control measures.

In 1992-93, Environment Canada with the CCME published *The Development of Canadian Marine Environmental Quality Guidelines*, *Protocols for Determining Water Quality Guidelines for the Protection of Agricultural Water Uses*, and continued work on publications outlining protocols for the derivation and use of water, sediment and tissue guidelines.



In addition, Environment Canada with the CCME began preparing a national protocol on the derivation of soil quality criteria. In 1992-93, the development of soil quality criteria was initiated for cadmium, pentachlorophenol, mercury, benzene, ethylbenzene, trichloroethylene, arsenic, toluene, xylene and tetrachloroethylene. Plans were also made to develop criteria for lead, copper, chromium, cyanide and benzo(a)pyrene in 1993-94. Related guidance documents for these guidelines, as well as "Recommended Framework for Ecological Risk Assessment at Contaminated Sites," "Recommendations for the Development of Site-Specific Environmental Quality Objectives," and "Whole Organism Bioassays for Assessing Soil, Sediment and Freshwater Quality" were produced. Work is also under way on a review of soil ingestion rates for livestock and wildlife, Canadian reference soil, bioaccumulation models for terrestrial biota, and development of site-specific environmental quality objectives for contaminated sites.

The Environmental Choice Program



Environment Canada's voluntary eco-labelling program, the Environmental Choice Program[™] (ECP) helps consumers identify products and services that reduce the burden on the environment. The EcoLogo[™], three doves intertwined to form a maple leaf symbolizing Canadian government, business and consumers working together for the environment, certifies products and services that meet the ECP's stringent environmental criteria.

Internationally, the ECP is seen as a leader and is a model for several other countries now establishing their own labelling programs. In Canada, the EcoLogo is being well received in the marketplace and generating more and more interest from both consumers and industry.

Environmental Choice, EcoLogo, and the EcoLogo symbol are official marks of Environment Canada and are protected under the *Trade Marks Act*. These marks may be used only under licence or through authorization from the Program.

Government, non-profit groups and charitable groups qualify to use the EcoLogo free of charge. The ECP also receives requests from business organizations who wish to use the EcoLogo to identify publications printed on ECP-certified paper stocks. In response, the ECP established the EcoLogo Authorized Use Program in November 1992. Generally, the ECP refers business organizations to licensed printers, but when a licensed printer is not available, the ECP may grant the interested party authorization to use the EcoLogo on their publications for a fee and under strict conditions. This new initiative is expected to increase exposure of the EcoLogo and boost demand for ECP-certified paper products, making it a beneficial venture for both the Program and its licensees.



By the end of March 1993, the Environmental Choice Program had finalized 25 guidelines for the following products:

- re-refined motor oil;
- construction materials made from wood-based cellulose fibre;
- products made from recycled plastic;
- batteries;
- water-based paint;
- fine paper from recycled paper;
- miscellaneous products from recycled paper;
- newsprint from recycled paper;
- heat-recovery ventilators;
- reusable cloth diapers;
- automotive fuels;
- composting systems for residential waste;
- reusable shopping bags;
- major household appliances;
- diaper services;
- non-rechargeable batteries;
- energy-efficient lamps;
- water-conserving products;
- compost;
- laundry detergents;
- automatic dishwashing detergents;
- non-rechargeable batteries;
- domestic water heaters;
- dry cleaning services; and
- toner cartridges.

More than 700 products and services from 144 companies have been certified and are now displaying the EcoLogo. Guidelines for many other products are now under development.



CEPA Part II: Regulating Toxic Substances

Part II of CEPA focuses on the regulation of toxic substances. For this regulation, Environment Canada has developed comprehensive inventories as a way of classifying thousands of substances:

- the **Domestic Substances List**, comprised of all chemicals known to be in use in Canada;
- the **Non-domestic Substances List**, comprised of substances not in use in Canada but used elsewhere; and
- the **Priority Substances List**, comprised of 44 chemical substances currently in use in Canada recommended for priority assessment.

The Priority Substances List

Compiled in 1988-89 by the Ministers of the Environment and Health, the Priority Substances List (PSL) comprises 44 substances given priority for assessment of whether they are toxic or capable of becoming toxic, as defined under Section 11 of CEPA.

According to CEPA, a substance is toxic 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.

About one third of the substances on the list are families of chemicals or effluents, some of which may comprise up to several hundred substances. For those substances deemed toxic as defined by CEPA, the government will prepare a Strategic Options Report in consultation with stakeholders to determine the most appropriate response.

The PSL will be expanded to 100 substances to be assessed by the year 2000, thanks to additional resources under the initiative "Keeping Toxics Out of the Environment."

Assessment of the 44 substances on the first Priority Substances List (PSL1) will be completed by February 1994, and the compilation of the second PSL is under way. After 1994, a revised list will be developed every three years with the objective of completing the assessments for 100 substances by the year 2000.

As a direct result of completed assessments, the Pulp and Paper Defoamer and Wood Chip Regulations and the Chlorinated Dioxins and Furans Release in Pulp and Paper Mill Effluents Regulations came into effect in 1992.



Assessing Priority Substances

Priority substances task groups, appointed by Environment Canada and Health Canada, are completing the assessments of the remaining substances on the PSL1 in order to meet the 1994 deadline. The timetable for completing scientific assessments and assessment reports is as follows:

Assessment Reports Released

Polychlorinated Dibenzodioxins
Polychlorinated Dibenzofurans
Effluents from Pulp Mills Using Bleaching
Monochlorobenzene
Toluene
Methyl Tertiary-Butyl Ether

Scientific Assessments Completed in 1992-93

Benzene
Methylmethacrylate
bis (2-Chloroethyl) Ether
bis (Chloromethyl) Ether
Chloromethyl Methyl Ether
Chlorinated Paraffin Waxes
Hexachlorobenzene
Chlorinated Wastewater Effluents
Creosote-Impregnated Wastes
3,5-Dimethylaniline
3,3'-Dichlorobenzidine
Arsenic
Benzidine
Organotin Compounds
1,1,2,2-Tetrachloroethane

Scientific Assessments to be Completed in 1993-94

Trichlorobenzenes
Waste Crankcase Oils
1,2-Dichlorobenzene
1,4-Dichlorobenzene
Xylenes
Tetrachlorobenzene
Pentachlorobenzene
Dibutyl Phthalate
Di-n-octyl Phthalate
bis (2-ethyl hexyl) Phthalate
1,2-Dichloroethane
Dichloromethane
Polycyclic Aromatic Hydrocarbons
Inorganic Fluorides
Cadmium
Styrene
Trichloroethylene
Tetrachloroethylene
Aniline
Chromium and its Compounds
Nickel and its Compounds
Mineral Fibres

Note: 1,1,1-Trichloroethane has been added to the List of Toxic Substances under CEPA and is subject to the Regulations of Ozone-Depleting Substances (Montreal Protocol)



Collecting Information

Sections 16 through 18 of CEPA allow the federal government to collect data and samples concerning the production, application and importation of substances.

National Pollutant Release Inventory

In March 1993, the federal government established a National Pollutant Release Inventory (NPRI) under the CEPA provisions for collecting information. Developed jointly by Environment Canada and a multi-stakeholder advisory committee, the NPRI will help meet the goal of "Improving Our Understanding of Toxic Substances and their Health Risks," more specifically to "Develop a Better Understanding of the Nature and Quantity of Toxic Substances Released in Canada." The NPRI will focus on substances that are used in large volumes and are potentially harmful to the environment or human health.

The NPRI Multi-stakeholder Advisory Committee made recommendations on the design and reporting procedures for a national database on releases of 178 specified substances into the air, water and land. The Advisory Committee also identified the need for comprehensive and publicly accessible information on the release of these substances.

Implementation of the NPRI began this year, following notification under Section 16 of CEPA, gazetted in March 1993. Those who own or operate a facility meeting the reporting requirements will be legally required to supply information to Environment Canada on the release of any of the 178 NPRI-listed substances during the 1993 calendar year. Release information will be made available to the public late in 1994.

Confidentiality Requests

In some circumstances, a person may submit a written request for confidentiality when providing information on toxic substances (Section 19). Section 20 provides for the non-disclosure of information that has been submitted with a request for confidentiality. Such requests are subject to certain terms and conditions.

Disclosing Information

Information collected under CEPA may be disclosed if it consists of:

- general data on uses of a substance;
- safe handling precautions;
- recommended methods for disposal and elimination of a substance;
- safety measures to be taken in case of accidents involving a substance;
- physical and chemical data that do not reveal the identity of a substance;
- health and safety data;
- occupational exposure studies;
- toxicological, clinical and ecological studies of a substance;
- tests performed under CEPA; and





- test methods and results of product or environmental testing when carried out by, or on behalf of, a government institution, unless it was done for a fee as a service to other than a federal government institution.

In 1992-93, Environment Canada received three requests under the *Access to Information Act* for information related to CEPA. The first was a request for a copy of CEPA; the second was abandoned by the person making the request; and the third was fulfilled in part.

The Domestic Substances List

The Domestic Substances List is an inventory of more than 21,000 substances manufactured in or imported into Canada on a commercial scale between 1984 and 1986. The first list was published in the January 1991 edition of the *Canada Gazette Part I*, and Environment Canada foresees publishing a revised list in the *Canada Gazette Part II* in December 1993. Deletions, additions and corrections to the 1991 publication will be incorporated.

This list is the sole basis for determining whether a substance is "existing" or "new" to Canada. Environment Canada relies on it to determine whether substances require pre-notification or assessment before they are manufactured in Canada or are imported into the country. Substances on this list are considered to be "in use" in Canada and are exempt from CEPA's New Substances provisions. However, existing substances that could cause adverse environmental or health effects are covered by Priority Substances List assessments.

In a new development, Environment Canada plans to include biotechnology products as part of the Domestic Substances List. Canadian manufacturers and importers have been advised about this initiative, and a provisional list of micro-organisms and products of organisms that meet the criteria for inclusion on the Domestic Substances List will be gazetted in the fall of 1993.

The Non-domestic Substances List

The Non-domestic Substances List includes 41,000 substances known to be commercially available around the world, but not on the Canadian market between 1984 and 1986.

The intent of this list is to recognize substances that are not new to world commerce. For these substances, the government requires less detailed information than for those new to Canada and other countries.

As a basis for this list, Environment Canada chose the United States' 1985 Toxic Substances Control Act Inventory. All substances on Canada's Domestic Substances List were deleted from the non-confidential portion of the U.S. inventory to produce the Non-domestic Substances List.

The list appeared in the *Canada Gazette Part I* on January 26, 1991, along with the Domestic Substances List. Environment Canada plans to update this list annually beginning in 1995.





New Substances

Substances not on the Domestic Substances List require notification and assessment before they can be manufactured in or imported into Canada. The information required from manufacturers and importers for this notification will be prescribed in the New Substances Notification Regulations.

New Substances Notification Regulations: Chemicals and Polymers

The New Substances Notification Regulations for chemicals and polymers were finalized for publication in the May 1, 1993 edition of the *Canada Gazette Part I*. These Regulations mark the beginning of CEPA's New Substances Notification Program, and will require manufacturers and importers to supply specified information on new commercial substances. This information includes chemical identity; toxicological and environmental effects data; manufacturing, processing and use data; and the volumes proposed for manufacture and import. Substances on the Non-domestic Substances List, however, will have fewer notification requirements than other new substances.

New substances are organized into different categories, such as site-limited intermediates, export only, and research and development chemicals. The information required about new substances reflects the characteristics of each category and any anticipated concerns. If a substance is suspected to be toxic, the government may require additional information or testing, and may impose controls or ban the manufacture or importation of the substance.

The proposal of these Regulations in the *Canada Gazette Part I* begins a 60-day period for public comment. Publication in the *Canada Gazette Part II* is anticipated for April 1994.

Regulatory Impact Analysis Statement

A Regulatory Impact Analysis Statement was developed for the New Substances Notification Regulations to evaluate potential costs and benefits associated with their implementation. The analysis examined such factors as annual costs to notifiers, administrative costs to industry, impacts on innovation, cost to the government and anticipated benefits. It concluded that the increase in regulatory costs should not be a significant financial burden to industry and will result in various benefits for society.

Guidelines for the Notification and Testing of New Substances

The Guidelines for the Notification and Testing of New Substances: Chemicals and Polymers were completed following the proposal of the Regulations in the *Canada Gazette Part I*. The guidelines explain why a substance is subject to notification, and identify the applicable information requirements. As well, they provide step-by-step instructions for preparing notification documentation, identify appropriate test procedures and practices, and outline how confidential information must be treated.





New Substances Notification Regulations: Biotechnology

Following public review, recommendations on New Substances Notification Regulations for Biotechnology Products included:

- clarifying the scope of the regulations;
- adding biotechnology products to the Domestic Substances List;
- reviewing the information requirements; and
- making regulations "risk-based," rather than "stage-of-development-based."

These recommendations were included in draft New Substance Notification Regulations and a background document for biotechnology products prepared for a multi-stakeholder consultation in December 1992. Following the consultation, consensus changes were made to the draft regulations, and multi-stakeholder task forces were formed to address consortia, waste treatment, and fate and effects testing. Task force reports and the revised draft regulations will be the subject of a second consultation in July 1993. Following this, a Regulatory Impact Analysis Statement for the New Substance Notification Regulations dealing with biotechnology products will be drafted.

Confidential Business Information

Draft regulations have been developed for confidential business information submissions and for masking chemical names published on the Domestic Substances List and the Non-domestic Substances List for reasons of confidentiality. These regulations will be submitted for public comment in the summer of 1993.

Creating Regulations

CEPA regulations pass through many stages before they have the force of law, allowing time for public comment and close examination of their implications. For hazards requiring immediate action, however, the government may issue interim orders and temporarily bypass the public consultation system.

Regulations typically begin with an assessment report that establishes a scientific basis for control. The government considers a number of options before pursuing regulations, but where regulations are the preferred course of action, draft versions are developed and sent to a Cabinet committee following public consultation.

Proposed regulations appear in the *Canada Gazette Part I* with a Regulatory Impact Analysis Statement (RIAS) summarizing the purpose of the regulations, alternatives, benefits and costs, consultation, and enforcement and compliance. Following a 60-day period set aside for public comment, the government finalizes the proposed regulations. After regulations are registered, they are in force and are published in the *Canada Gazette Part II*.





The government's approach to regulation takes socio-economic issues into account throughout the decision-making process for all environmental protection initiatives. This includes:

- evaluating and quantifying the benefits of environmental protection;
- developing socio-economic background studies; and
- assessing alternative instruments to achieve environmental protection objectives.

These considerations should provide for more informed decision making and improve the quality of the RIAs.

Strategic Options Reports

Following through on its commitment to anticipate environmental protection issues rather than "react and cure" them, Environment Canada drafted a guidance document for developing Strategic Options Reports. The document was prepared in consultation with other federal departments, industry, provincial agencies and non-government organizations, and proposes a process to integrate federal programs for "toxic" and other substances contributing to pollution. As well, it aims at setting priorities by industry sector, increasing cooperation with the provinces, increasing public consultation, and exploring a broad range of control options.

Strategic options might include: voluntary controls, process changes, substitutions, economic measures, control by other federal or provincial agencies, federal regulations, guidelines or codes of practice, or a combination of these options. Their aim is to prevent or reduce the release of toxic substances to the environment.

Immediate Action through Interim Orders

When a substance is believed to be toxic, or when a substance specified on the List of Toxic Substances is not adequately regulated and represents a significant danger to the environment, human life or health, CEPA gives the Minister of the Environment, with the concurrence of the Minister of Health, the authority to take immediate action in the form of an interim order (CEPA Section 35).

Interim orders typically develop into regulations, as was the case with the following, issued since CEPA came into force in 1988:

- Contaminated Fuel Interim Order;
- Asbestos Mines and Mills Release Interim Order;
- Chlor-alkali Mercury Release Interim Order;
- Chlorobiphenyls Interim Order;
- Chlorofluorocarbon Interim Order;
- Mirex Interim Order;
- Polychlorinated Terphenyl Interim Order;
- Release of Lead from Secondary Lead Smelters Interim Order;
- Vinyl Chloride Release Interim Order;
- Polybrominated Biphenyls Interim Order; and
- Storage of PCB Wastes Interim Order.





CEPA Regulations

Regulation

Publication in Canada Gazette Part II

Export and Import of Hazardous Waste Regulations	December 1992
Toxic Substances Export Notification Regulations	December 1992
Vinyl Chloride Release Regulations (revision)	December 1992
Pulp and Paper Mill Defoamer and Wood Chip Regulations	May 1992
Pulp and Paper Mill Effluent Chlorinated Dioxin and Furan Regulations	May 1992
Storage of PCB Materials Regulations	May 1992
Contaminated Fuels Regulations	August 1991
Chlorobiphenyls Regulations (rollover to CEPA from the <i>Environmental Contaminants Act</i>)	March 1991
Secondary Lead Smelter Release Regulations (rollover to CEPA from the <i>Clean Air Act</i>)	March 1991
Ozone-Depleting Substances Regulations No. 2 (freeze consumption of halons)	September 1990
Ozone-Depleting Substances Regulations No. 3 (prohibit certain uses of CFCs and halons)	September 1990
PCB Waste Export Regulations	August 1990
Asbestos Mines and Mills Release Regulations (rollover to CEPA from the <i>Clean Air Act</i>)	July 1990
Gasoline Regulations	May 1990
Chlor-Alkali Mercury Release Regulations (rollover to CEPA)	February 1990
Mirex Regulations (rollover to CEPA)	February 1990
Polychlorinated Terphenyl Regulations (rollover to CEPA)	February 1990
Chlorofluorocarbon Regulations (rollover to CEPA)	February 1990
Polybrominated Biphenyl Regulations (rollover to CEPA)	February 1990
Federal Mobile PCB Treatment and Destruction Regulations	January 1990
Phosphorus Concentration Regulations (rollover to CEPA)	November 1989
Ocean Dumping Regulations (rollover to CEPA)	November 1989
Ozone-Depleting Substances Regulations No. 1 (reduce consumption of CFCs)	July 1989
Fuels Information Regulations No. 1 (continue to be in force under CEPA; previously under the <i>Clean Air Act</i>)	August 1977





Recently Developed Regulations

Twenty-four regulations are currently in place under CEPA. Over the past year, the Department brought five new regulations into force, made major revisions to one release regulation, and continued work on several other regulatory initiatives. The government also introduced an Omnibus Amendment Order during the year. It allows departments to make minor, non-contentious amendments with no policy implications through a streamlined process. Through the use of this Order, one regulation was amended and amendments to five other regulations were proposed.

Toxic Substances Export Notification Regulations

The Toxic Substances Export Notification Regulations fulfil Canada's international commitments as a member of the United Nations Environment Programme to inform importing countries of control measures taken in Canada on the product being imported.

Export and Import of Hazardous Wastes Regulations

These regulations ensure better management of hazardous wastes at Canadian border points. As well, they ensure that Canada is able to meet its obligations under the United Nations Basel Convention governing the transboundary movement of hazardous wastes.

Vinyl Chloride Release Regulations

Amendments to the Vinyl Chloride Release Regulations improve malfunction reporting and establish monitoring programs and new reporting requirements.

Pulp and Paper Mill Defoamer and Wood Chip Regulations

The Pulp and Paper Mill Defoamer and Wood Chip Regulations specify maximum concentrations of dibenzodioxins and dibenzofurans in defoamers, and prohibit wood chips that are made from wood treated with polychlorinated phenols. The regulations apply to the manufacture, offering for sale and use of these products.

Pulp and Paper Mill Effluent Chlorinated Dioxins and Furans Regulations

The Pulp and Paper Mill Effluent Chlorinated Dioxins and Furans Regulations require all Canadian pulp and paper mills using chlorine bleaching to ensure that dioxins and furans in their effluents are not measurable. This requirement prevents the presence of dioxins and furans in the bleaching process.

Storage of PCB Material Regulations

These regulations replace the Storage of PCB Wastes Interim Order. On a national scale, they ensure PCB material is stored in a manner and under conditions that do not pose any threat to the environment, human life or health.

Omnibus Amendment Order

The Gasoline Regulations were amended to revoke the requirement for a quarterly report of lead contained in additives purchased, used, disposed of, lost or stored for each refinery.



Timetable of Planned Regulations

Regulatory Initiative and Expected Year of Publication in Canada Gazette Part II

1993-94

Ocean Dumping Regulations, 1988, Amendment – Phase I
New Substances Notification Regulations (Part I – New substances other than biotechnology products or polymers, and Part II – Polymers)
Masked Name Regulations
Ozone-Depleting Substances Regulations No. 1, Amendments (Consumption of CFCs)
Ozone-Depleting Substances Regulations No. 2, Amendments (Consumption of Halons)
Ozone-Depleting Substances Regulations No. 3, Amendments (Import of certain products from non-parties to the Montreal Protocol)
Ozone-Depleting Substances Regulations No. 4, Amendments (Consumption of Methyl Chloroform and Carbon tetrachloride)
PCB Regulations, Amendments
Confidential Information Regulations
Export and Import of Hazardous Waste Regulations, Amendments
Environmental Protection Boards of Review Rules
Non-hazardous Solid Waste Incinerators at Federal Facilities
Omnibus Amendment Order

- Pulp and Paper Mill Effluent Chlorinated Dioxins and Furans Regulations
- Federal Mobile PCB Treatment and Destruction Regulations
- Asbestos Mines and Mills Release Regulations
- Chlor-Alkali Mercury Release Regulations
- PCB Waste Export Regulations
- Secondary Lead Smelter Release Regulations
- Pulp and Paper Mill Defoamer and Wood Chip Regulations
- List of Toxic Substances Requiring Export Notification

1994-95

New Substances Notification Regulations (Part III – Biotechnology Products)
Asbestos Mines and Mills Release Regulations, Amendments
Secondary Lead Smelter Release Regulations, Amendments

Unscheduled

Good Laboratory Practice Regulations
Hazardous Waste Management at Federal Facilities
Ocean Dumping Regulations, Amendments - Phase II
Spill Reporting Regulations
Ozone-Depleting Substances Regulations, No. 3, Amendments (Utilization of CFCs)
Ozone-Depleting Substances Regulations No. 3, Amendments (Ban halons in fire extinguishers)





Ozone-Depleting Substances Regulations

The Montreal Protocol

Canada joined 24 nations in September 1987 in signing the United Nations Environment Programme Montreal Protocol on Substances that Deplete the Ozone Layer. As of June 24, 1993, 118 countries had signed the Protocol, recognizing that CFCs, halons and other substances deplete the atmosphere's ozone layer. By implementing domestic regulations to control these substances, they are working together to prevent a global environmental and health crisis. In 1990, the Montreal Protocol was amended to accelerate the phase-out schedule for CFCs and halons to the year 2000, to add methyl chloroform and carbon tetrachloride to the list of controlled substances, and to create financial assistance mechanisms for helping developing countries phase out ozone-depleting substances.

In November 1992, parties to the Montreal Protocol met in Copenhagen, Denmark, where they agreed on further acceleration of phase-out schedules. Consumption and production of halon will be phased out by January 1, 1994, and consumption and production of CFCs, methyl chloroform and carbon tetrachloride by January 1, 1996. Canada had already announced it would phase out production and consumption of carbon tetrachloride by December 31, 1994.

The parties also added three categories of chemicals to the list of substances to be controlled: hydrobromofluorocarbons (HBFCs), hydrochlorofluorocarbons (HCFCs) and methyl bromide. Canada chaired a sub-committee to develop a list of acceptable destruction procedures for ozone-depleting substances. The final report was tabled and accepted at the Copenhagen meeting.

Domestic Regulations to Support International Commitments

Additional funds support Canada's efforts to reduce ozone depletion. More than \$9 million of this money is earmarked to accelerate the phaseout of ozone-depleting substances.

Under CEPA, Environment Canada regulates the production, import and export of ozone-depleting substances, including CFCs, halons, methyl chloroform and carbon tetrachloride, as well as certain products containing CFCs. Four active Ozone-Depleting Substances Regulations are currently in place.

The first and second regulations came into force in 1989 and 1990 respectively, to fulfil Canada's international commitment to reduce consumption of CFCs and halons, and to implement Canadian policy to:

- freeze consumption of CFCs at the 1986 level by July 1989;
- reduce consumption of CFCs by 20 per cent by July 1993;
- reduce consumption of CFCs by 50 per cent by July 1998; and
- freeze consumption of halons at 1986 levels by January 1992.

The third set of regulations, in place since 1990, prohibit the use of CFCs in less important products or those for which alternatives are available, leaving limited supplies of these compounds for more important uses. They prohibit the manufacture, import, sale and



offer for sale of plastic foam packaging material in which any CFC has been used as a foaming agent; and most pressurized containers with 10 kilograms (kg) or less of CFCs, including aerosols, small cans of refrigerant, party streamers and fog horns. Health-care products are exempted. As required by the Montreal Protocol, the third regulations will be amended in 1993 to prohibit the import of certain certain products containing ozone-depleting substances from non-parties to the Protocol.

In 1993, the first, second and fourth regulations will be combined. The fourth regulations came into force on April 27, 1993 and reflect the Montreal Protocol amendments of 1990, which added methyl chloroform (MCF) and carbon tetrachloride (CCl₄) to the list of controlled substances. ODS Regulations No. 4:

- freeze production and consumption of MCF at 1989 levels starting in January 1993;
- reduce production and consumption of MCF by 85 per cent by January 1995;
- phase out production and consumption of MCF by the year 2000; and
- phase out production and consumption of CCl₄ by January 1995, except for feedstock use, analytical use, and use as a diluent in chlor-alkali plants.

The combination of these regulations will permit a more consistent approach to ozone-depleting substance production, import and export control, and reflect the accelerated reduction and phase-out schedules adopted in Copenhagen.

The development of strategic options reports for HCFCs and methyl bromide, including the use of market-based instruments, is ongoing. Consultations on control options took place in June 1993 for HCFCs, and in November 1993 for methyl bromide.

Release of Toxic Substances

The dangers posed by the release of toxic substances into the ecosystem are addressed in Sections 36 through 38. CEPA provides for reporting and precautionary measures, including the notification of inspectors by any member of the public who may be adversely affected by the impending threat.

Recovery of Reasonable Costs

CEPA makes provisions for the recovery of costs when the Department must step in to control the release of toxic substances. Under Sections 39 and 77, when polluters fail to take preventive measures to correct their contravention of a CEPA regulation or interim order, the federal government may take action and reclaim expenses. Environment Canada has not yet had reason to invoke these Sections.





Export and Import of Hazardous Wastes

Section 43 of CEPA defines the term "hazardous waste" as a waste dangerous good within the meaning of the *Transportation of Dangerous Goods Act* and Regulations, as well as those substances compiled by the Minister of the Environment on the list of hazardous wastes requiring export and import notifications. This section also gives the Minister of the Environment authority to:

- compile a list of hazardous wastes requiring export and import notification;
- develop a list of hazardous waste authorities to whom notification should be given; and
- set regulations prescribing the contexts of the notice, and conditions under which a person may export or import a hazardous waste.

The Export and Import of Hazardous Wastes Regulations came into force in November 1992. They set the conditions for the export from, import to and transit in Canada of hazardous wastes destined for recycling or disposal. They also allow Canada to meet its international obligations to control the transboundary movement of hazardous wastes.

In the fall of 1992, a comprehensive training program on the regulations was held for Environment Canada and Canada Customs inspectors. As well, Environment Canada has implemented programs to inform regulated industries of their responsibilities under the new regulations.

The Basel Convention

The Basel Convention on the Transboundary Movements of Hazardous Wastes and their Disposal came into force in Canada in November 1992 with the introduction of the Export and Import of Hazardous Wastes Regulations. Its key objectives are to:

- reduce the generation of hazardous waste;
- dispose of hazardous waste in the country of generation, where possible;
- establish better controls on exports and imports of hazardous waste;
- prevent exports to countries lacking the legal, administrative and technical capacity to manage and dispose of hazardous waste in an environmentally sound manner;
- prohibit exports to countries that have banned imports; and
- encourage information exchange, technology transfer, and harmonization of standards, guidelines and codes.

As well, the Basel Convention supports the continued application of bilateral agreements that do not detract from the principle of environmentally sound management of hazardous wastes. One example is the Canada-United States Agreement on the Transboundary Movement of Hazardous Wastes, which governs most Canadian hazardous waste shipments to and from the United States.

In late 1992, Canada attended the first meeting of the parties to the Basel Convention in Uruguay to start implementing the Convention's objectives.



CEPA Part III: Nutrients

Sections 49 to 51 of CEPA define and help to regulate cleaning agents, nutrients and water conditioners.

Over the past year, Environment Canada's Atlantic Region conducted a national brand laundry detergents sampling program in support of the Phosphorous Concentration Control Regulations, the only set of regulations under CEPA Part III. A total of 36 laundry detergent samples were collected from various locations across Canada, and no samples exceeded the phosphorous pentoxide limit the regulations allow.





CEPA Part IV: Controls on Government Organizations

Part IV of CEPA gives the Minister of the Environment the authority to regulate waste handling and disposal practices, and emissions and effluents from federal department, Crown corporation and federal agency activities. It also gives the Minister the authority to make regulations and guidelines that apply to federal lands, works and undertakings where no other Act of Parliament applies.

For 1993, the following Part IV initiatives are planned:

- glycol guidelines for de-icing practices at federal airports;
- technical guidelines for federal underground storage tanks; and
- registration guidelines or regulations for federal storage tanks.

Agriculture Canada, the Department of National Defence and Transport Canada have signed Memoranda of Intent with Environment Canada to participate as property custodians in the Federal Sites Component of the National Contaminated Sites Remediation Program. Under this program, 113 of the 1037 identified sites are currently undergoing assessment, have been remediated or have had remediation activities initiated.

The Federal Code of Environmental Stewardship

Under this 1992 initiative, federal government departments were directed to conform to the requirements of CEPA and other federal environmental legislation, and to make their operations compatible with other levels of government. Various federal departments are developing environmental action plans.

In support of environmental stewardship, the following regulatory initiatives under CEPA IV have been under review:

- atmospheric emission controls for boilers at federal facilities;
- non-hazardous solid waste incinerators at federal facilities;
- spill reporting;
- contingency planning at federal facilities;
- landfill operations on federal lands and at federal facilities; and
- wastewater management on federal lands and at federal facilities.



CEPA Part V: International Air Pollution

CEPA Part V governs domestic sources of international air pollution. The Minister of the Environment may regulate sources of pollution that violate international agreements or create air pollution in other countries. This authority can be exercised only if the provinces neglect to control pollution sources, and has not been necessary to date because the provinces have responded effectively.

Sulphur Dioxide Protocol

During the year, Canada continued to implement its sulphur dioxide (SO₂) control program and cut national emissions of SO₂ to below 3.2 million tonnes in 1993. This level is 30 per cent below the 4.6 million tonnes emitted in 1980 as called for in the Protocol.

In 1991, Canada's emissions were already very close to the Protocol target, and estimates for 1993 are below the target. To achieve this result, Canada relied heavily on coordinated action between the federal and provincial governments. The provinces set enforceable emissions limits for new and existing major sources of SO₂, principally non-ferrous smelters and power plants, while the federal government established national emission standards for new power plants and sought reductions in transboundary pollutant flows from the United States. In general, Canadian standards require major new emission sources to use advanced control technologies.

NOx and VOCs Protocols

Canada is dedicated to reducing the transboundary flow of pollutants that cause ground-level ozone. In support of this objective, the government has entered into two international agreements: the Nitrogen Oxides (NO_x) Protocol and the Volatile Organic Compounds (VOCs) Protocol, reached under the United Nations Economic Commission for Europe.

At a November 1990 meeting of the Canadian Council of Ministers of the Environment, the provinces indicated their support for Canadian ratification. Negotiations with the provinces to develop bilateral agreements under the NO_x/VOCs Management Plan were initiated but delayed as a result of the pending Comprehensive Federal/Provincial Air Quality Agreement. Inventories and forecasts are now being prepared to support ratification by the provinces, and funds have been devoted to the federal government's part in the Federal-Provincial NO_x/VOCs Management Plan.





Canada-United States Air Quality Agreement

The Canada-United States Air Quality Agreement is a framework for protecting both countries from transboundary air pollution. Essentially, the Agreement codifies what Canada is obligated to do under Part V of CEPA, and what the United States is obligated to do under the international air pollution provisions of its *Clean Air Act*.

As well, the Air Quality Agreement establishes a bi-national forum for verifying and reporting progress on air quality issues, and improves monitoring, reporting, research and development on air problems and control measures. The Agreement also sets out clear obligations for both Canada and the United States to:

- reduce and cap national emissions of SO₂ at a level 30 per cent below 1980 levels by the year 2000;
- implement more stringent vehicle emissions standards;
- harmonize the gathering and reporting of emissions data;
- ensure that each party is notified of projects, actions or activities that could cause significant transboundary air pollution, to assess, and as appropriate, mitigate; and
- develop reciprocal programs to protect each country from air quality degradation due to pollution flowing across the border.

Canada is progressing well in its actions to fulfil the obligations of the Agreement. Emissions estimates for 1993 are below the 3.2 million tonne target set for the year 2000. A first progress report on the Agreement was published in the spring of 1992 and submitted to the International Joint Commission for public review and comment. Since then, the Commission's comments have been published and will be incorporated when the the next report is drafted.





CEPA Part VI: Controlling Substances at Sea

The government is committed to stringent and effective controls on ocean dumping. CEPA Part VI, formerly the *Ocean Dumping Control Act*, regulates:

- the disposal of all types of material at sea, including destruction at sea by incineration; and
- the loading of wastes on ships, aircraft, platforms, or other fabricated structures for disposal at sea.

Through CEPA, the federal government implements the provisions of the *London Convention 1972* and supports the initiative to ban the disposal of industrial wastes at sea.

Permits for Ocean Dumping

A system of permits and inspections administered by Environment Canada is used to regulate the disposal of wastes at sea. All Canadian ships, aircraft, platforms or fabricated structures require permits in marine waters other than the internal waters of other countries. Similarly, foreign vessels require permits if they wish to dump in Canadian waters. The terms and conditions of permits vary with the type of material to which they apply.

Permits typically govern timing, handling, storing, loading, placement at the disposal site, and monitoring requirements. Environment Canada will not grant a permit if the proposed disposal activity is prohibited under any Act of Parliament, or if a licence or permit required under any other Act has not been obtained. These regulations ensure the federal government is taking a comprehensive approach to waste management.

Anyone applying for a permit from Environment Canada must publish a notice of intent in a newspaper of general circulation in the vicinity of the proposed operation. This notice must outline the type of material, and the intended location for the loading and dumping. The applicant then submits this published announcement with a permit application. The notice of intent allows interested people to voice their concerns and have them addressed as part of Environment Canada's permit assessment procedure. In addition, all ocean disposal permits and amendments to permits must be published in the *Canada Gazette* before they come into force.

Environment Canada considers a number of factors before granting a permit, including:

- alternatives to ocean disposal;
- potential environmental impacts;
- hazards, such as the risk of accidents associated with treatment, packaging, transport and disposal of wastes; and
- conflicts with other legitimate uses of the sea.

The Department uses physical and chemical characteristics of waste to develop biological tests that are being incorporated into the waste characterization process. When material fails these tests, the company or industrial sector will not be issued a permit, and the material cannot be disposed of at sea.

Environment Canada staff inspect dumping operations to verify compliance with the terms and conditions of permits issued.



Permits Granted in 1992-93

Over the past year, Environment Canada issued 214 permits for the disposal of an estimated 6.9 million metric 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.

Almost 38 per cent of the permits issued were for the disposal of dredged material such as rocks, gravel, sand, silt, clay and wood wastes. The number of permits issued for dredged wastes decreased slightly from 86 in the previous year, to 80 in 1992-93. However, the volume approved for dumping increased by 33 per cent from 4.8 million tonnes in 1991-92 to 6.9 million tonnes this year. The quantity of dredged material approved for disposal varies each year with the number of dredging projects that exceed 100,000 cubic metres (m³).

Another 56 per cent of the permits issued covered the disposal of fisheries waste, including offal, shells, herring waste and fish processing wastewater or "stick water." While fisheries waste accounted for 120 permits, the quantity approved for dumping amounted to only 101,085 tonnes or about 1.4 per cent of the total waste approved for disposal.

Although the Department expected a 30 per cent reduction in fish waste permits in 1992-93 because of the cod moratorium in Newfoundland, the number of permits remained stable. However, the quantity of waste permitted for disposal declined by 26 per cent, reflecting a reduction in the quantity of fish processed.

Excavation material such as soils and rocks accounted for only three permits, or 1.4 per cent of all permits issued, and made up about 0.4 million tonnes or 5.9 per cent of the waste approved for disposal.

Other permits issued in 1992-93 included seven for vessels, two for concrete blocks, one for an artificial reef and one for scrap metal. These permits accounted for 5.2 per cent of those issued and 0.2 per cent (12, 193 tonnes) of the total quantity of waste approved for disposal.

The tables and figures on the following page provide national and regional statistics and illustrations.

Permits Screened or Rejected in 1992-93

This year, eight applications required additional testing for physical and chemical characteristics of waste. Testing may consist of physical measurements, chemical analysis or biological assays. Material failing these tests cannot be disposed of at sea.

Environment Canada rejected nine permits in the past year for various reasons. One application in the Atlantic Region indicated that the proposed dumping of fish waste would have a negative impact on fish stocks. Eight applications for dredge materials were rejected in the Pacific and Yukon Region due to levels of polycyclic aromatic hydrocarbons (PAHs), PCBs, dioxins that were in excess of current rejection levels for those chemicals.

The tables and figures on the following page summarize the number of permits issued and quantities of various waste approved for disposal both nationally and regionally.





Quantities for Permits Issued, 1992-93

Material	Quantity Permitted (tonnes)	Permits Issued	Percentage of Permits	Percentage of Quantity
Dredged Material	6,407,658	80	37.38	92.48
Fisheries Waste	101,085	120	56.07	1.46
Vessels	5,418	7	3.27	0.08
Concrete	5,690	2	0.94	0.08
Excavated Material	407,550	3	1.40	5.88
Scrap Metal	406	1	0.47	0.01
Artificial Reef	679	1	0.47	0.01
Total	6,928,486	214	100	100

Notes:

Figures for dredged and excavated material are calculated assuming an average density of 1.3 tonnes per cubic metre.
 Figures for fisheries waste do not include 4 "load only" permits issued to control the loading activities for these wastes.

Quantities Permitted by Region, 1992-93

Material	Atlantic Region		Pacific Region		Quebec Region		Northern Region	
	No. of Permits	Permit Quantity	No. of Permits	Permit Quantity	No. of Permits	Permit Quantity	No. of Permits	Permit Quantity
Dredged Material	23	1,129,463	25	4,164,095	32	1,114,100	0	0
Fisheries Waste	113	101,026	0	0	3	59	0	0
Vessels	5	2,798	1	2,370	0	0	1	250
Concrete	1	3,690	1	2,000	0	0	0	0
Excavated Material	1	1,690	2	405,860	0	0	0	0
Scrap Metal	0	0	0	0	0	0	1	406
Artificial Reef	0	0	0	0	1	679	0	0
Total	143	1,238,667	29	4,574,325	36	1,114,838	2	656

Notes:

Figures for dredged and excavated material are calculated assuming an average density of 1.3 tonnes per cubic metre.
 Figures for fisheries waste do not include 4 "load only" permits issued to control the loading activities for these wastes.





Regional Forecasts for 1993-94

In the Atlantic Region, the number of permits for dredging is expected to increase as construction begins on the causeway linking Prince Edward Island and the mainland. As well, the historical ten-year dredging cycle in the Region is expected to begin, resulting in a greater need to dispose of dredged material. For fisheries waste, a 60 per cent drop in the permits issued is expected because of the continuing cod and capelin moratorium. As well, once the Phase I amendments are in force, the increased fee of \$2,500 (from \$50) should further reduce the demand for fish waste permits; it would become more economical for a number of fish plants to recycle their waste through fish meal plants.

In the Quebec Region and the Pacific and Yukon Region, moderate increases in maintenance dredging is expected to make up for projects postponed because of the slow economy. In each case, the amount of increased dredging will also be linked to the economy.

No dredging applications are expected in the Western and Northern Region because of the decrease in offshore oil and gas activities and reduced government spending.

Research to Support Ocean Dumping Regulations

In an effort to better understand the possible environmental effects of ocean disposal, Environment Canada continues to improve the tools it uses to assess the materials intended for disposal at sea. Bioassays are becoming standard assessment tools to gauge the effects of potentially contaminated materials on the marine environment. Researchers have already developed several standard protocols to assess the quality of municipal and industrial effluents, and are now working on standardized protocols for sediments.

Three new Canadian sediment bioassays to evaluate crustacean mortality, sea urchin reproduction and photoreactive bacteria have been completed and published. A sediment test for bioavailability of trace contaminants is being developed in cooperation with the United States. As well this year, work began on a bioassay to examine changes in the growth of marine worms. Eventually, results from these tests will indicate the possible effects on marine life from materials proposed for ocean disposal.

Researchers have completed a draft protocol for marine sediment quality guideline development and are developing guidelines for PAHs, cadmium and mercury. These guidelines will allow the Department to establish contaminant screening levels at the safe or "no-effect" concentration. Ocean disposal would usually be allowed for sediments with contaminants below screening levels. Above screening levels, bioassays would be used to evaluate the suitability of sediments for ocean disposal. Eventually, Environment Canada will establish rejection levels or levels above which adverse effects have been demonstrated to occur. Above rejection levels, no ocean dumping would be allowed.



International Activities

Canada has not allowed incineration at sea of noxious liquid wastes, and supports the *London Convention 1972* resolution with a view to eliminating this practice by the end of 1994. As well, Canada does not allow dumping of radioactive waste at sea and supports the voluntary *London Convention 1972* moratorium on this practice.

Canada also supports the Convention's resolution banning the ocean dumping of industrial waste by the end of 1995. Wastes generated by manufacturing or processing operations are considered "industrial wastes." Canada issued only one permit a year for waste gypsum, a practice that will be incorporated into a recycling program by late 1993.

In June 1992, Canada participated in the Earth Summit in Rio de Janeiro, Brazil. At Rio, Canada committed to the principles of Agenda 21, including promoting sustainable development of coastal and marine areas, integrated policy and decision making on marine environment issues, and preventive and precautionary approaches in project management and planning.

Ocean Dumping Action Plan

In November 1991, Environment Canada established the Ocean Dumping Control Action Plan. This initiative devotes additional resources over the next six years to safeguarding the marine environment. Specifically, funds will be directed towards:

- revision of the regulations;
- improved monitoring;
- improved support for science;
- research; and
- a plastic debris program.

Since the implementation of this plan, the Department has developed interim monitoring guidelines for physical and chemical parameters, and is working toward development of biological monitoring guidelines. Researchers are developing new marine quality guidelines and biological assessment tools. An integrated network linking existing monitoring activities within Environment Canada and other federal departments is being developed to improve monitoring of status and trends for marine environmental quality. A research and information program to address persistent plastic debris in the marine environment has also been initiated.

Amendments to the Ocean Dumping Regulations

In February 1992, Environment Canada began public consultations on amendments to the Ocean Dumping Regulations. In March 1993, the government published the Phase I regulatory amendments in the *Canada Gazette Part I*. These amendments include an increase in application fees, a new application form to replace five previous forms, and requirements for additional information with each application.

Eventually, Phase II amendments will be developed to further strengthen existing regulations by incorporating new assessment procedures and standards.





CEPA Part VII: General Information

Notices of Objection and Boards of Review

The public may file a "notice of objection" to a decision or proposed regulation.

Because CEPA is organized by subject areas, guidelines for notices of objection appear in numerous sections of the Act. For example, notices dealing with nutrients are covered in Section 51(2), those related to controls on international air pollution are detailed in Section 62(2), and objections related to ocean dumping permits are addressed in Section 74. Each subject area has its own administrative requirements for notices of objection.

Upon receiving a notice of objection, the Ministers may establish a board of review to examine the complaint under procedures set out in Sections 89 to 97 of CEPA. While some notices of objection have been filed under the Act since it first came into force, the federal government has not established any boards of review.

Environment Canada has developed procedural rules to govern matters such as administration, written submissions, evidence, confidentiality of documents, public access, conduct of hearings, and reporting. "Administrative Rules for Environmental Protection Boards of Review," were published in the *Canada Gazette Part I* on December 19, 1992. Final rules are anticipated to be published in the fall of 1993.

Enforcement and Compliance

To be effective, enforcement must be fair and consistent. In order to ensure compliance and encourage reporting of suspected violations, everyone who shares the responsibility for protecting the environment must know what is expected of them. These are among the guiding principles of Environment Canada's Enforcement and Compliance Policy. Developed in cooperation with the Department of Justice, this policy guides the Department in the enforcement of CEPA regulations. Designated enforcement officers conduct inspections to verify compliance with the regulations. They follow the Enforcement and Compliance Policy and determine how to respond to a violation by considering, among other things, the nature of the offence, the violator's willingness to comply and the violator's past compliance history.

Stronger Enforcement Mechanisms

In December 1991, the Minister of the Environment announced the Enhanced Enforcement Program, an initiative to strengthen the government's ability to enforce environmental laws. The program provides additional resources to enforcement activities, which will be used to help implement CEPA regulations and the pollution prevention provisions of the *Fisheries Act*.

The funds will also enable Environment Canada to negotiate agreements and work-sharing arrangements with the provinces, territories and other federal departments; develop specialized training



courses; and create an integrated, computerized information system to support enforcement.

Creation of the Office of Enforcement

To respond to increasing enforcement demands and ensure consistency and uniformity in enforcement actions across the country, Environment Canada created the Office of Enforcement in July 1991.

Some of this office's responsibilities include:

- providing overall functional direction for investigations, inspections and other enforcement actions;
- delivering the annual National Training Program to inspectors and investigators;
- developing courses;
- developing and monitoring the annual National Inspection Plan;
- reviewing new regulations; and
- developing a management information system.

Inspections

Inspectors verify compliance with CEPA and accompanying regulations. Verification might include inspections; sampling substances, effluents and emissions; witnessing compliance tests; checking records, files and other documents required by regulation to be maintained; and checking the data and reports filed with Environment Canada.

Investigations

Both inspectors and investigators examine cases of suspected violations. When they conclude that a violation has occurred, they take enforcement action in accordance with the CEPA Enforcement and Compliance Policy.

In 1992-93, enforcement action most commonly consisted of **warnings** when the degree of harm or potential harm to the environment, human life or human health appeared to be minimal.

Enforcement officers use **directions** when there is an actual or potential release of a substance in contravention of CEPA regulations. CEPA requires enforcement officers to take reasonable emergency measures to remedy any dangerous condition, or to reduce any danger to the environment, human life or human health that resulted, or may result, from a release. Accordingly, inspectors or investigators issue directions when parties owning, managing or controlling the substance fail to take necessary measures to protect the public.

Enforcement officers undertake investigations leading to **prosecutions** when an alleged violation meets the criteria of the CEPA Enforcement and Compliance Policy.

Progress in Ticketing Legislation

In October 1992, Parliament passed the "Contraventions Act," a federal statute developed by Environment Canada and the Department of Justice to create a ticketing procedure for minor regulatory offences. The act has not yet been proclaimed in force, but the Royal Canadian Mounted Police and 11 federal departments and agencies are participating in the development of the ticketing program.





In 1992-93, Environment Canada submitted a list of CEPA regulatory offences to the Privy Council Office for inclusion in the schedule of offences under the "Contraventions Act." Listed offences involve failure to follow administrative procedures, such as the proper filing of reports, submission of data, maintenance of records and use of certain test procedures. An individual or corporation receiving a ticket would have the opportunity to:

- plead guilty and pay the fine;
- plead guilty and request a court hearing to seek a reduced fine or an extended time frame for paying the fine; or
- plead not guilty and request a court hearing.

While ticketing offers another enforcement tool to investigators and inspectors, the Department can still prosecute the above offences.

CEPA Section 108: Applications for Investigations

Encouraging people to report suspected violations to enforcement officers is one of the guiding principles of CEPA's Enforcement and Compliance Policy.

Section 108 of CEPA states that any two residents of Canada (18 years of age or older) who believe that an offence has been committed under CEPA may apply to the Minister of the Environment for an investigation of the alleged offence.

Section 108 also sets out the conditions precedent for the investigation of alleged offences. If the alleged offence meets these conditions, CEPA Section 109 requires that an investigation take place to determine the facts relating to the alleged offence. The Minister of the Environment must report to the applicants within 90 days on the progress of the investigation and the proposed action. During the past year, one investigation was pursued under Section 108.

Uniform Enforcement Guidelines

In 1992-93, Environment Canada drafted Uniform Enforcement Guidelines for several regulations. The guidelines will outline more precisely which enforcement measures are most appropriate for which violations and will complement CEPA's Enforcement and Compliance Policy. They will also further Environment Canada's goal of consistent, uniform, fair and predictable enforcement of federal environmental legislation.

National Inspection Plan

The National Inspection Plan is an annual work plan that identifies the number and types of inspections to be carried out under CEPA regulations. Staff at Environment Canada's headquarters and regional offices collaborate to produce the plan with a target-oriented approach that concentrates on the most serious environmental threats in each region. In support of the regions, Environment Canada:

- reviews and comments on compliance testing, proposals and plans;
- provides technical support, including auditing guides and on-site witnessing;
- evaluates compliance testing results; and
- provides support in court cases, as required.



National Training Program

Training is an essential component of Environment Canada's enhanced enforcement program, and for that reason, has been a major focus for departmental staff. The National Training Program has been expanded to ensure that enforcement officers and analysts are trained in duties ranging from basic inspection and investigation skills, to very specialized regulation-specific enforcement activities.

In 1992-93, 60 Environment Canada inspectors, as well as a number of other government enforcement officers from the Royal Canadian Mounted Police, the Department of Fisheries and Oceans, and the Department of Indian Affairs and Northern Development, were trained in inspection and investigation techniques. Environment Canada also delivered courses on:

- Storage of PCB Material and PCB Treatment and Destruction;
- Export and Import of Hazardous Wastes;
- Three Pulp and Paper Regulations: the Pulp and Paper Mill Defoamer and Wood Chip Regulations under CEPA; the Pulp and Paper Mill Effluent Chlorinated Dioxins and Furans Regulations under CEPA; and the Pulp and Paper Liquid Effluent Regulations under the *Fisheries Act*; and
- Expert Witness.

As well, Environment Canada began the development of a health and safety reference book and safety training program, and established a federal-provincial working group to study ways of combining training and resources.

On the international front, Environment Canada delivered a one-week enforcement course to Mexican environmental officers in March 1993 as part of the agreement on environmental cooperation between the government of Canada and the government of the United Mexican States.

Computerized Information System

The Office of Enforcement is developing a computer system to keep track of enforcement activities. In June 1992, a committee with members from the regions and headquarters was formed to provide advice and guidance on enforcement activities, and to ensure regional participation as development of the system proceeds.

In January 1993, the Office of Enforcement began a feasibility study into the development of an enforcement activities tracking system. The study is organized into the following four sections:

- understanding of the current systems in the enforcement program;
- determining user requirements for the system;
- analyzing system alternatives; and
- recommending action.

The first three areas were completed before the end of 1992-93, and the last one will be completed in April 1993.

Enforcement Activities

The following tables show 1992-93 enforcement activities under CEPA. They do not include related offences under the *Fisheries Act*; however, this information is available from the Office of Enforcement.





Enforcement Activities (1992-93)

<i>Regulations</i>	<i>Inspections</i>	<i>Investigations</i>	<i>Warnings</i>	<i>Directions</i>	<i>Prosecutions</i>	<i>Convictions</i>
PCB Waste Storage	281	5	30	1	2	1
PCB Regs.	228	19	2	2		1
PCB Waste Export Regs.	7					
PCB Destruction	4		1			
Secondary Lead	47					
Vinyl Chloride	13			1		
Asbestos Mines and Mills	30		1			
Chlor-Alkali Mercury	23					
Chlorofluorocarbon	18					
Domestic Substances List	1					
Gasoline	139	12	7		6	1
Contaminated Fuel	10					
Fuels Info Reg.	10					
Ozone-Depleting Substances Regs. No. 1	9	3	1		4	7
Ozone-Depleting Substances Regs. No. 2	4					
Ozone-Depleting Substances Regs. No. 3	204	48	50		8	4
Ocean Dumping	116	5	3		2	3
Export-Import Hazardous Waste	11		1			
Phosphorus Concentration Regs.	15					
Dioxins and Furans	36	1	7			
Defoamer and Wood Chips	37		2			
<i>Total</i>	1,233	93	105	4	22	17



Prosecutions (April 1, 1992-March 31, 1993)

Company Name and Address	Status	Offence Date and Location	Date Charged	Sections / Offence	Court Date	Result	Penalty	Notes
Atlantic Region								
Daley Brothers Ltd. and Aiden Daley P.O. Box 40 St. Joseph's, St. Mary's Bay, Nfld.	Concluded	92/03/31 St. Joseph's, Nfld.	93/02/08	CEPA Ocean Dumping 1 Count Company loaded fish offal onto a barge for the purpose of dumping without a permit	93/05/18	Conviction	\$1,000 fine for the company; \$500 fine for the plant manager	The Crown successfully demonstrated to the Court the intent of the defendant to dump fish offal.
H.W. MacLauchlan Ltd. and Harry MacLauchlan Charlottetown, P.E.I.	Stayed	92/01/30 & 92/08/28 Charlottetown, P.E.I.	92/11/10	CEPA 36(5) PCB Storage Interim Order 12 Counts	TBA	Charges stayed		
Moosehead Breweries Ltd. Saint John, N.B.	Concluded	92/02/14 & 92/04/28 Saint John, N.B.	92/07/21	CEPA Ozone Depleting #1 2 Counts Two shipments of CFC-115 and HCFC-22 ordered and received from the U.S.	92/09/09	Guilty Plea	Absolute Discharge	Seven 22.7 kg. canisters of CFCs (value of approx. \$2,500) were forfeited by the company.
Ralph Dobbin St. Joseph's, Nfld.	Concluded	91/05/14 St. Joseph's, Nfld.	92/04/30	CEPA Ocean Dumping 1 Count Ocean Dumping Permit Violation	92/05/25	Guilty Plea	\$500 fine.	
Quebec Region								
Ventes Techniques Labcor inc. 7565 Av. M.B. Jodoin, Anjou, Quebec	For Trial	92/04/06-28 (offer for sale) 92/04/16-21 (importation) Montreal and Laval	93/01/29	CEPA Ozone Depleting #3 Illegal importation, offer for sale and sale of products containing CFC's	TBA			Pro Forma appearance.
Lou-Lee Ltée and Frank Guinta 1130 Chemin de Ruisseau Sud, St-Mathieu-de-Beloeil, Quebec	For Trial	1) Cowansville, Quebec 2) St. Jean, Quebec 3) Quebec City, Quebec	91/07/30-92/05/08 91/07/13-92/05/27 91/07/29-92/06/30	CEPA Gasoline Regulations 3 Counts for illegal importation at Cowansville 3 Counts for illegal importation at St. Jean 7 Counts for illegal sale of gasoline at Quebec	at 1) TBA at 2) on 93/04/20 at 3) 93/09/13			Charges of illegal sale were laid against both the company and Frank Guinta.
Höesch Canada Inc. Willowdale, Ontario and 4045 Côte Vertu, Montreal, Quebec	Concluded	89/08/01-90/08/31 Toronto and Ontario	92/10/22	CEPA Ozone Depleting #1 2 Counts under Section 3 & Section 5. Importation of unauthorized amounts of CFC-113 in 1989 and 1990	92/12/18	Guilty Plea	\$35,000 fine for one count	Investigation conducted by Quebec region; charges laid by Ontario region for Quebec. The second count was withdrawn.



Company Name and Address	Status	Offence Date and Location	Date Charged	Sections / Offence	Court Date	Result	Penalty	Notes
121412 Canada Inc. and Les Entreprises Therrien Enrg. 1000 Boul. Lemire Drummondville, Quebec	Concluded	May 1991 at Lacolle, Quebec and April 1992 at Drummondville, Quebec	92/10/21	CEPA Gasoline Regulations 4 Counts; 2 Counts for illegal sale of gas at Drummondville 2 Counts for illegal importation of gas at Lacolle	93/01/12	Guilty Plea by 121412 Canada Inc. to two counts of illegal importation	Fine of \$10,000 (\$5,000 for two counts)	The charges against Les Entreprises Therrien for illegal sale of leaded gasoline at Drummondville were withdrawn by the Crown.
Friefeld, Litwin, Levitsky, Feldman 1010 Sherbrooke St. W., Suite 2101, Montreal, Quebec	For Trial	91/04/11-91/05/09 Montreal, Quebec	92/10/07	CEPA Ozone Depleting #3 1 Count Sale of products containing CFCs	93/05/20			
Les Encanteurs Continentals liée 478 McGill St. Montreal, Quebec	For Trial	91/05/08 Montreal and Chambly, Quebec	92/10/07	CEPA Ozone Depleting #3 1 Count Sale of products containing CFCs	93/05/20			Plea of not guilty entered on 92/10/23.
Distributions Johnson inc. 8945 Boul. Industriel Chambly, Quebec	For Trial	91/09/25 91/11/19 Chambly and elsewhere in the Province of Quebec	92/10/07	CEPA Ozone Depleting #3 6 Counts Sale of products containing CFCs	93/06/17			
ECG Canada inc. 1928 Boul. St-Regis Dorval, Quebec H9P 1H6	Concluded	92/04/02 Dorval, Quebec	92/08/27	CEPA Ozone Depleting #3 3 Counts Offered to sell imported cans containing CFCs	93/01/20	Guilty Plea to first count	Fine of \$3,000 for one count plus confiscation of all seized CFCs.	Two counts were withdrawn.
A & C American Chemicals 3010 rue De Beane Montreal, Quebec	Concluded	89/11/07 Stanhope, Quebec	92/07/25	CEPA Ozone Depleting #1 1 Count Importation of CFCs	93/05/17	Guilty Plea	Fine of \$3,000 plus costs	
Ontario Region								
Kirkey Racing Fabrication Inc. and Stephen Patrick Kirkey St. Andrews West, Ontario	For Pre-trial	Throughout 1992 St. Andrews West, Ontario	93/01/20	CEPA Gasoline Regulations 22 Counts of illegal importation and sale of gas	93/04/14 93/06/15			Charges laid against the company and its president. Pro Forma court appearance in Cornwall, Ontario.
T.G. Hammond St. Mary's, Ontario	For Trial	Spring and Summer, 1992 St. Mary's, Ontario	92/11/24	CEPA Gasoline Regulations 35 Counts of illegal importation and sale of gas	93/06/28			Pro Forma appearance.



Company Name and Address	Status	Offence Date and Location	Date Charged	Sections / Offence	Court Date	Result	Penalty	Notes
Drummond Fuels Nepean, Ontario	Stayed	Spring and Summer, 1992 Nepean, Ontario	92/11/17	CEPA Gasoline Regulations 2 Counts Charges laid for illegal sale of two types of leaded fuel	93/01/15	Charges stayed		After initially approving the charges, the Crown stayed the charges.
Ontario Competition Fuels Mississauga, Ontario	For Pre-trial	1991-92 Mississauga, Ontario	92/11/12	CEPA Gasoline Regulations 59 Counts of illegal importation and sale of gas	93/07/05			
Radio Shack Barrie, Ontario	For Trial	1992 Barrie, Ontario	92/10/13	CEPA Ozone Depleting #3 36 Counts under Section 3(2)	93/07/19-23	Preliminary trial		
Western and Northern Region								
Mohawk Gas Hut and Service Centre, Supersport Classics Inc. & Steve Eisenberg Calgary, Alberta	For Trial	91/09/09 Coutts, Alberta	92/10/06 92/10/28	CEPA Gasoline Regulations 10 Counts Import of approximately 19,000 litres of leaded gas. Offer for sale and sale of leaded gasoline.	93/12/06			
Ephraim Haas & Heights Transportation Services Ltd. Medicine Hat, Alberta	Concluded	92/04/26 Medicine Hat, Alberta	92/07/31	CEPA Ozone Depleting #3 1 Count Imported, sold and offered to sell banned ozone-depleting substances.	93/05/04	Charges dismissed		An appeal is being considered.
Deutz-Allis Corporation (Canada) Ltd., Regina, Saskatchewan	Concluded	91/07/30 North Portal, Saskatchewan	92/07/30	CEPA Ozone Depleting #1 and #3 17 Counts Importation of ozone-depleting substances	92/09/30	Guilty plea	\$5,000 Fine	\$2,500 for one count under Section 3 and \$2,500 for one count under Section 3(1)(a). 15 counts were withdrawn.
Pacific and Yukon Region								
Peter Finn Kamloops, British Columbia	Concluded	92/04/ Kamloops Indian Reserve	92/09/31	CEPA PCB Waste Storage 5 Counts Charged for burning PCB-containing fluorescent lights ballasts	92/12/18	Guilty plea	Suspended sentence plus 150 hours of community service (possibly in recycling industry)	
Island-Sea Marine Ltd. and Mr. Kenneth Higgs Victoria, British Columbia	For Trial	91/08, 91/09, 91/10, 92/04, 92/05	92/09/11	CEPA 67(1) & 68(4) Ocean Dumping 8 Counts Dumping of gyprock	93/05/05-06			
Columbia Valley Towing Limited #1 Front Street New Westminster, British Columbia	Concluded	91/09/25	92/02/05	CEPA 69(1) & 67(1) Ocean Dumping 6 Counts	93/03/06	Guilty Plea	\$1,000 Fine plus court order to pay \$20,000 to support research into the ecological use and disposal of wood debris.	Charges were laid against the company and its director. Five of the charges including those against the company director, were stayed. Environment Canada will be the scientific authority and will oversee implementation of the court order.



CEPA Part VIII: Amendments and Repeal

Regulations Rolled Over to CEPA

CEPA subsumes and takes over the *Environmental Contaminants Act*, the *Clean Air Act*, the *Ocean Dumping Control Act*, the nutrient provisions of the *Canada Water Act*, and Section 6(2) of the *Department of the Environment Act*.

Several regulations controlling substances made under these repealed Acts have been "rolled over" to continue in force under CEPA.

The Miscellaneous Statute Law Amendment Act

Non-controversial, minor changes to CEPA (such as typographical or consistency errors, and amendments to the English and French versions) are covered under the *Miscellaneous Statute Law Amendment Act 1991*, passed on February 28, 1992. This Act corrects anomalies, inconsistencies, archaisms and errors in the Statutes of Canada.

Amendment to CEPA

With the creation of CEPA, the List of Toxic Substances (Schedule I) was simply transferred from the *Environmental Contaminants Act*. However, the wording of CEPA Sections 33 and 34 was imprecise, and there remained a legal uncertainty as to whether regulations could be made for substances already appearing on the schedule. This included regulations to be transferred from previous Acts and rolled over into CEPA.

Consequently, an amendment to CEPA was given Royal Assent on June 29, 1989. To ensure that all existing regulations had the force of law, interim orders were made on February 20, 1989 for the nine substances included in the List of Toxic Substances (Schedule I) of CEPA, namely chlorobiphenyls, mirex, polybrominated biphenyls, CFCs, polychlorinated terphenyls, asbestos, lead, mercury and vinyl chloride.



Appendix A: Publications Related to CEPA

Canadian Wildlife Service

- Ahlborg, U.G. et al. "Impact of polychlorinated dibenzo-p-dioxins, dibenzofurans, and biphenyls on human and environmental health, with special emphasis on application of the toxic equivalency factor concept." *European Journal of Pharmacology* 228 (1992): 179-199.
- Bergman, A. et al. "PCB and DDE methyl sulphones in mammals from Canada and Sweden." *Environmental Toxicology and Chemistry*, 1993.
- Bishop, C.A. et al. *An atlas of contaminants in eggs of colonial fish-eating birds of the Great Lakes (1970-1988). Accounts by location.* CWS Technical Report No. 152, 1992.
- Bishop, C.A. et al. *An atlas of contaminants in eggs of colonial fish-eating birds of the Great Lakes (1970-1988). Accounts by chemical.* CWS Technical Report No. 153, 1992.
- Comba, M.E. et al. "A Lake Ontario - Gulf of St. Lawrence dynamic mass balance for mirex." *Environmental Science & Technology*, 1993.
- Dewailly, E. et al. "Human exposure to polychlorinated biphenyls through the aquatic food chain in the Arctic." *Environmental Health Perspectives.* (Submitted, 1993)
- Dickson, K.M. and A.M. Scheuhammer. "Concentrations of lead in wing bones of three species of ducks in Canada." In *Lead shot contamination of waterfowl and their habitats in Canada*, pp. 6-28. Edited by J.A. Kennedy and S. Nadeau. CWS Technical Report 164, 1993.
- Elliott, J.E. and P.A. Martin. "Chlorinated hydrocarbons and shell thinning in eggs of Accipiter hawks in Ontario, 1986-1989." *Environmental Pollution.* (Accepted, 1993)
- Elliott, J.E. and D.G. Noble. "Chlorinated hydrocarbon contaminants in marine birds of the temperate North Pacific." In *The status, ecology and conservation of marine birds of the North Pacific*, pp. 241-253. Edited by K. Vermeer, K.T. Briggs and K.H. Morgan. CWS Special Publication, 1993.
- Elliott, J.E. et al. "Patterns and trends of organic contaminants in Canadian seabird eggs, 1968-1990." In *Persistent Pollutants in Marine Ecosystems*, pp. 181-194. Edited by C.H. Walker and D.R. Livingstone. SETAC Special Publications Series, 1992.
- Elliott, J.E. et al. *Incidence of lead poisoning in Bald Eagles and lead shot in waterfowl gizzards from British Columbia, 1988-91.* CWS Progress Notes No. 200, 1992.
- Elliott, J.E. and L. Shutt. "Monitoring organochlorines in blood of Sharp-shinned hawks (*Accipiter striatus*) migrating through the Great Lakes." *Environmental Toxicology and Chemistry* 12 (1993): 241-250.
- Ewins, P.J. et al. "Geographical distribution of contaminants and productivity measures of Herring Gulls in the Great Lakes: Lake Huron 1980." *Journal of Great Lakes Research* 18 (1992): 316-330.
- Ewins, P.J. et al. "Evaluating the suitability of Ospreys as indicators of contaminant effects in the Great Lakes." *Abstracts of the 54th Midwest Fish and Wildlife Conference.* Toronto, December 1992.
- Ewins, P.J. et al. "The diet of Herring Gulls (*Larus argentatus*) during winter and early spring on the lower Great Lakes." *Hydrobiologia*, 1993.
- Ewins, P.J. et al. "Evaluating the suitability of Ospreys as monitors of contaminant-related biological effects on the Great Lakes." *Abstracts of the Third Expert Consultation Meeting on Bald Eagles in the Great Lakes Basin.* Windsor, February 1992.
- Ford, C.A. et al. "Development of a semi-automated method for non-ortho PCBs: application to Canadian Arctic marine mammal tissues." *Chemosphere.* (Submitted, 1993)
- Fox, G.A. "What have biomarkers told us about the effects of contaminants on the health of Great Lakes wildlife." *Journal of Great Lakes Research*, 1993.
- Gamberg, M. and A.M. Scheuhammer. "Cadmium in caribou and muskoxen from the Canadian Yukon and Northwest Territories." *Science of the Total Environment*, 1993.





- Harfenist, A. et al. *Food chain sources of polychlorinated dioxins and furans to Great Blue Herons (Ardea herodias) foraging in the Fraser River estuary, British Columbia.* CWS Technical Report No. 169, 1993.
- Henshel, D.S. et al. "Morphometric and histological changes in brains of Great Blue Heron hatchlings exposed to PCDDs: Preliminary analysis." In *Environmental Toxicology and Risk Assessment, ASTM STP No. 1179*, 1992. Edited by M. Lewis et al.
- Jarman, W.M. et al. "Global distribution of tris(4-chlorophenyl)methanol in high trophic level birds and mammals." *Environmental Science & Technology* 26 (1992): 1770-1774.
- Jarman, W.M. et al. "Identification and geographical distribution of chlordane compounds, their metabolites and other organochlorines in peregrine falcon, prairie falcon eggs and clapper rail eggs from the U.S.A." *Environmental Pollution* 81 (1993): 127-136.
- Jarman, W.M. et al. "Determination of PCDDs, PCDFs and PCBs in California peregrine falcons (*Falco peregrinus*), their eggs and selected prey species." *Environmental Toxicology and Chemistry* 12 (1993): 105-114.
- Kennedy, S.W. et al. "Ethyoxoresorufin-O-deethylase (EROD) and porphyria induction in chicken embryo hepatocyte cultures - a new bioassay of PCB, PCDD related chemical contamination in wildlife." *Chemosphere* 25 (1992): 193-196.
- Kennedy, S.W. and C.A. James. "Improved method to extract and concentrate porphyrins from liver tissue for analysis by high-performance liquid chromatography." *Journal of Chromatography Biomedical Applications*, 1993.
- Kennedy, S.W. et al. "A rapid and sensitive cell culture bioassay for measuring ethoxyresorufin-O-deethylase (EROD) activity in cultured hepatocytes exposed to halogenated aromatic hydrocarbons extracted from wild bird eggs." *Chemosphere* 27 (1993): 367-373.
- Kennedy, S.W. et al. "Ethoxyresorufin-O-deethylase and porphyrin analysis in chicken embryo hepatocyte cultures with a fluorescence plate reader." *Analytical Biochemistry* 211 (1993): 102-112.
- Macdonald, C.R. et al. "Application of pattern recognition techniques to assessment of biomagnification and sources of polychlorinated multicomponent pollutants, such as PCBs, PCDDs and PCDFs." *Chemosphere* 25 (1992): 129-134.
- Muir, D.C.G. et al. "Arctic Marine Ecosystem Contamination." *Science of the Total Environment* 122 (1992): 75-134.
- Muir, D.C.G. et al. "Geographical Variations of Organochlorine Contaminants in Canadian Arctic Marine Food Chains." *Proceedings of 7th International Conference, Comité Arctique International*. Oslo, Sept. 18-22, 1989. (In press, 1992)
- Noble, D.G. et al. *Environmental contaminants in Canadian raptors, 1967-1989: levels and effects.* CWS Technical Report No. 91, 1993.
- Norstrom, R.J. et al. "Indications of P450 monooxygenase activities in Beluga (*Delphinapterus leucas*) and narwhal (*Monodon monoceros*) from patterns of PCB, PCDD and PCDF accumulation." *Marine Environmental Research* 34 (1992): 267-272.
- Outridge, P.M. and A.M. Scheuhammer. "Bioaccumulation and toxicology of chromium: Implications for wildlife." *Reviews of Environmental Contamination and Toxicology* 130 (1992): 31-77.
- Outridge, P.M. and A.M. Scheuhammer. "Bioaccumulation and toxicology of nickel: Implications for wild mammals and birds." *Environmental Reviews*, 1993.
- Sanderson, J.T. et al. "Biological effects of polychlorinated dibenzodioxins, dibenzofurans and biphenyls in double-crested cormorant chicks." *Journal of Toxicology and Environmental Health*. (Accepted, 1993)
- Scheuhammer, A.M. and P.J. Blancher. "Potential risk to common loons (*Gavia immer*) from methylmercury exposure in acidified lakes." *Hydrobiologia*, 1993.
- Servisi, J.A. et al. "Effects of bio-treated bleached Kraft mill effluent on fingerling chinook salmon (*Oncorhynchus tshawytscha*)." *Canadian Journal of Fisheries and Aquatic Sciences*. (Submitted, 1993)
- Struger, J. et al. "Environmental contaminants in snapping turtle eggs from the Great Lakes-St. Lawrence River Basin of Ontario, Canada (1981, 1984)." *Journal of Great Lakes Research*, 1992.
- Thomas, D.J. et al. "Arctic Terrestrial Ecosystem Contamination." *Science of the Total Environment* 122 (1992): 75-134.
- Vermeer, K. et al. "Elevated polychlorinated dibenzodioxin and dibenzofuran concentrations in grebes, ducks and their prey near Port Alberni, British Columbia, Canada." *Marine Pollution Bulletin*, 1993.



Vermeer, K. et al. "Population, nesting habitat and reproductive success of American Black Oystercatchers *Haematopus bachmani* on the west coast of Vancouver Island, B.C." In *Ecology and status of marine and shoreline birds on the west coast of Vancouver Island*, pp. 65-70. Edited by K. Vermeer, R.W. Butler and H. Freeland. CWS Occasional Paper 75, 1992.

Environmental Quality Guidelines

Environment Canada. CCME Canadian Water Quality Guideline for Aniline and 3,5-Dimethylaniline. In press, 1993.

Environment Canada. CCME Canadian Water Quality Guideline for Halogenated Methanes. March 1992.

Environment Canada. CCME Canadian Water Quality Guideline for Organotins. March 1992.

Environment Canada. CCME Canadian Water Quality Guideline for Tetrachloroethylene. In press, 1993.

Environment Canada. CCME Canadian Water Quality Guideline for Three Phthalate Esters. In press, 1993.

Gaudet, C. et al. *Review and Recommendations for a Framework for Ecological Risk Assessment at Contaminated Sites*. Environment Canada, Scientific Series 199, 1993.

Keddy, C. et al. *A Review of Whole Organism Bioassays for Assessing the Quality of Soil, Freshwater Sediment and Fresh Water in Canada*. Environment Canada, Scientific Series 198, 1993.

MacDonald, D.D. et al. *The Development of Canadian Marine Environmental Quality Guidelines*. Environment Canada, Marine Environmental Quality Series 1, 1992.

Environmental Technology Centre

Quality Assurance Requirements for the Analysis of Dioxins in Environmental Samples. Report EPS 1/RM/23, October 1992.

Reference Method for the Determination of Polychlorinated Dibenzo-para-dioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) in Pulp and Paper Mill Effluents. Report EPS 1/RM/19, February 1992.

Health Canada

Armstrong, V.C. "Canadian Approach to Metals Toxicity (Hazards Identification, Risk Assessment and Risk Management)." *Metals Toxicity Colloquium*. Energy, Mines & Resources Canada, September 17, 1992, Camsall Hall, Ottawa, Ontario.

Armstrong, V.C. and R.C. Newhook. "Assessing the Health Risks of Priority Substances under the Canadian Environmental Protection Act." *Regulatory Toxicology and Pharmacology* 15: 111-121.

Chu, I. et al. "In vitro percutaneous absorption and metabolism of four hydrophilic compounds in the hairless guinea pigs." *7th American Association of Pharmaceutical Scientific Annual Meeting*. San Antonio, Texas, November 17, 1992.

Chu, I. and J. Withey. "Implications of physiologically-based modeling for regulation of environmental chemicals." *International Workshop on physiologically based pharmacokinetic modeling and risk assessment*. Colorado State University, Fort Collins, Colorado, August 3-21, 1992.

Chu, I. et al. "Subchronic toxicity of PCB 118 and 77 in the rat." *Dioxin Meeting*. Helsinki, Finland, August 17-22, 1992.

Chu, I. et al. "Comparative metabolism of phenanthrene in the rat and guinea pig." *Journal of Environmental Science and Health*, B27: 729-749.

Environmental Health Directorate. *Determination of "toxic" under Paragraph 11c of the Canadian Environmental Protection Act*. 1st Edition. Bureau of Chemical Hazards, Environmental Health Directorate, Health and Welfare Canada. November 1992.

Health Canada. *Guidelines for the Notification and Testing of New Substances: Chemicals and Polymers: Pursuant to the New Substances Notification Regulations of the Canadian Environmental Protection Act*. Government of Canada, Environment Canada, Health Canada, 1993.



Ku, L. and I. Chu. "A physiologically based pharmacokinetic model for phenanthrene." *International Workshop on physiologically-based pharmacokinetic modeling and risk assessment*. Colorado State University, Fort Collins, Colorado, August 3-21, 1992.

Meek, M.E. and M. Bourgeau. *IPCS Environmental Health Criteria Document on Selected Synthetic Organic Fibres*. World Health Organization, Geneva, 1992.

Meek, M.E. and K. Hughes. "Arsenic in the General Environment: Evaluation of Risks to Health." *Proceedings, International Seminar on Arsenic in the Environment and its Incidence on Health*. University of Chile, Santiago, May 25-29, 1992: 173-181.

Meek, M.E. et al. "Hazard and Risk Assessment for Inhaled Pollutants." *Proceedings of the IPCS/ILSI Symposium on Respiratory Toxicology and Risk Assessment*. October 6-9, 1992, Hanover, Germany.

Myres, A.W. "Protecting Human Health Under the Canadian Environmental Protection Act." *Environmental Health Review* 36 (1992): 20-23.

Myres, A.W. and R. Hickman. "Assessing and Managing Health Risks from Environmental Contaminants: Principles and Practice. I. Risk Assessment. II. Risk Management. III. Applications to Priority Substances under CEPA." *Technical Nucleus Meeting: Toxic Substances in Surface Water*. March 8-14, 1992, PAHO, Mexico City.

Ng, K.M.E. et al. "In vitro and in vivo percutaneous absorption/metabolism of hydrophobic compounds." *Annual Meeting of the Society of Toxicology*. Dallas, Texas, February 25-March 11, 1991.

Ng, K. et al. "Percutaneous absorption/metabolism of pyrene, benzo(a)pyrene, and DEHP: Comparison of in vitro and in vivo results in the hairless guinea pig." *Toxicology and Applied Pharmacology* 115 (1992): 216-223.

Poon, R. et al. "Stimulation of urinary L-ascorbic acid excretion in rats after exposure to 2,4,4'-trichlorobiphenyl, 3,3',4,4',5-pentachlorobiphenyl or 2,2',4,4',5,5'-hexachlorobiphenyl." *4th North American Meeting of the International Society for the study of xenobiotics*. Bar Harbor, Florida, Nov 2-6, 1992.

Poon, R. et al. "Toxicity of PCB #126 in the rat after after a 21-day repeated oral exposure." *American Society of Toxicology 13th Annual Meeting*. San Francisco, October 22-24, 1992.

Poon, R. et al. "Polychlorinated diphenyl ether (PCDE) congeners: A structure-activity relationship (SAR) study." *Annual Meeting of the American College of Toxicology*. Savannah, Georgia, 1991.

Sitwell, J. and D.M. Kane. "Assessment of Human Exposure to New Chemicals in Canada." *13th Annual Meeting of the Society for Environmental Toxicology and Chemistry*. November, 8-12, 1992, Cincinnati, Ohio.

Villeneuve, D.C. et al. "Subchronic toxicity of PCB#126 in the rat." *Annual Society of Toxicology meeting*. Seattle, Feb 23-27, 1992.

National Hydrology Research Institute

Elliot, J.A. et al. *Leaching of fall-applied pesticides under an irrigated field; Outlook, Saskatchewan*. NHRI Contribution Series CS-92023.

Kwong Y.T.J. and W.G. Whitley. *Natural acid rock drainage at Macmillan Pass, Yukon*. NHRI Contribution Series CS-92046.

Kwong, Y.T.J. and W.G. Whitley. *Assessment of the impact of acid rock drainage on the water quality of the South Macmillan River, Yukon Territory*. NHRI Contribution Series CS-91042.

Lawrence, J.R. et al. *Degradation and mobility of diclofop-methyl in a model groundwater system: Final report to PESTFUND for 1990-91*.

Pupp, C et al. *Groundwater quality in Saskatchewan: Hydrogeology, quality concerns, management*. NHRI Contribution Series CS-91028.

National Water Research Institute

Burnison, B.K. "Solubility enhancement of fenvalerate by isolated doc lakewater fractions." *Science of the Total Environment*. Sixth International Humic Substances Society Meeting, Bari, Italy, Sept. 20, 1992.





- Carey, J.H. "An introduction to advanced oxidation processes (AOP) for destruction of organics in wastewater." *Water Pollution Research in Canada* 27 (1992): 1-21.
- Chau, Y.K. et al. "Determination of butyltin species in sewage and sludge by gas chromatography-Atomic absorption spectrometry." *Analyst* 117 (1992): 1161-1164.
- Chau, Y.K. et al. "Occurrence of butyltin species in sewage and sludge in Canada." *Science of the Total Environment* 121 (1992): 271-281.
- Chau, Y.K. "Chromatographic techniques in metal speciation." *Analyst* 117 (1992): 571-575.
- Cheam, V. et al. *Laser spectroscopy: Part II- copper vapor laser-based atomic fluorescence spectrometer*. NWRI Contribution No. 93-59.
- Cheam, V. et al. "Direct determination of lead in seawaters by laser-excited atomic fluorescence spectrometry." *Journal of Analytical Atomic Spectrometry*, 1993. (NWRI Contribution No. 93-61).
- Cheam, V. et al. "Application of laser-excited atomic fluorescence spectrometer to study lead distribution in Great Lakes waters." *International Journal of Environmental Analytic Chemistry* 53 (1993): 13-27. (NWRI Contribution No. 92-22).
- Cheam, V. et al. "Development of laser-excited atomic fluorescence spectrometer and a method for direct determination of Pb in Great Lakes waters." *Analytica Chimica ACTA* 269 (1992): 129-136. (NWRI Contribution No. 92-05).
- Crowe, A.S. and J.P. Mutch. *A Review and Evaluation of Models for Assessing the Potential for Pesticides to Contaminate Groundwater*. NWRI Contribution 92-110.
- Crowe, A.S. and J.P. Mutch. "Regional analysis of pesticide contamination of groundwater using an expert system approach." *Solving Groundwater Problems with Models*. Proceedings, National Water Well Association Conference, Feb. 11-13, 1992, Dallas, Texas.
- Crowe, A.S. and J.P. Mutch. "EXPRES: an expert system for assessing the fate of pesticides in the subsurface." *Environmental Monitoring and Assessment* 23 (1992): 19-43.
- Crowe, A.S. and J.P. Mutch. *An expert systems approach for assessing the potential for pesticide contamination of groundwater*. NWRI Contribution 92-143.
- Hodson, P.V. et al. "Effects of bleached kraft mill effluent on fish in the St. Maurice River, Quebec." *Environmental Toxicology and Chemistry* 11 (1992): 1635-1651.
- Jackson, R.E. et al. "Estimating the fate of CFC-113 in groundwater." In *Groundwater Contamination and Analysis at Hazardous Waste Sites*, pp. 511-526. Edited by S. Lesage and R.E. Jackson. New York: Marcel Dekker Inc., 1992.
- Kaniansky, D. et al. *On-line isotachophoretic sample preconcentration of paraquat and diquat and their determination capillary zone electrophoresis in spiked water samples*. NWRI Contribution No. 93-69.
- Kochany, J. and R.J. Maguire. "Abiotic Transformations of Polynuclear Aromatic Hydrocarbons and Polynuclear Aromatic Nitrogen Heterocycles in Aquatic Environments." *Science of the Total Environment*, 1993.
- Kochany, J. and R.J. Maguire. *Abiotic Transformations of polynuclear aromatic hydrocarbons and polynuclear aromatic nitrogen heterocycles in aquatic environments*. NWRI Contribution 92-100.
- Lee, H.B. and T.E. Peart. "Supercritical carbon dioxide extraction of resin and fatty acids from sediments at pulp mill sites." *Journal of Chromatography* 594 (1992): 309-315. (NWRI Contribution No. 91-123).
- Lee, H.B. et al. *A new and improved method for the determination of chlorobenzenes and hexachloro-1,3-butadiene in sediments using supercritical carbon dioxide extraction*. NWRI Contribution No. 92-08.
- Lee, H.B. et al. "On-line Extraction and Derivatization of Pentachlorophenol and Related Compounds from Soils Using a Supercritical Fluid Extraction System." *Journal of Chromatography* 605 (1992): 109-113. (NWRI Contribution No. 92-01)
- Lee, H.B. et al. "In situ extraction and derivatization of pentachlorophenol and related compounds from soils using a supercritical fluid extraction system." *Journal of Chromatography* 605 (1992): 109-113. (NWRI Contribution No. 92-01).



- Lee, H.B. et al. "Supercritical carbon dioxide extraction of polycyclic aromatic hydrocarbons from sediments." *Journal of Chromatography*, 1993. (NWRI Contribution No. 93-56).
- Lesage, S. *Methods for the analysis of hazardous wastes: A review*. NWRI Contribution 92-157.
- Lesage, S. and R.E. Jackson, eds. *Groundwater Contamination and Analysis at Hazardous Waste Sites*. New York: Marcel Dekker Inc., 1992.
- Lesage, S. et al. "Degradation of CRC-113 under Anerobic Conditions." *Chemosphere* 24(9) (1992): 1225-1243.
- Lesage, S. et al. *Fate of organic solvents in landfill leachates under simulated field conditions and in anaerobic microcosms*. NWRI Contribution 92-111.
- Lesage, S. et al. *The occurrence and roles of porphyrins in the environment: Possible implications for bioremediation*. NWRI Contribution 92-136.
- Lesage, S. and R.E. Jackson. "Practical analytical chemistry for hazardous waste analysis." In *Groundwater Contamination and Analysis at Hazardous Waste Sites*, pp. 3-36. Edited by S. Lesage and R.E. Jackson. New York: Marcel Dekker Inc., 1992.
- Liber, K. et al. "Experimental designs for aquatic mesocosm studies: a comparison of the "ANOVA" and "REGRESSION" design for assessing the impact of tetrachlorophenol on zooplankton populations in limnocorrals." *Environmental Toxicology and Chemistry* 11 (1992): 61-77.
- Liu, D. et al. "Microbial degradation of polycyclic aromatic hydrocarbons and polycyclic aromatic nitrogen heterocycles." *Environmental Toxicology and Water Quality* 7 (1992): 355-372.
- Maguire, R.J. "Potential underestimation of chlorinated insecticide and PCB concentrations in fresh water." *7th International Congress Pesticide Chemistry*. Hamburg, Germany, Aug. 5-10, 1990, IUPAC, Abstr. Vol. III, 07C-17 (1992): 125.
- Maguire, R.J. *Supporting document - Environmental Section: Canadian Environmental Protection Act assessment of non-pesticidal organotin compounds*. NWRI Contribution 92-145.
- Maguire, R.J. "Aquatic environmental risk assessment for non-pesticidal organotin compounds." *204th American Chemical Society National Meeting*. Washington, D.C., USA, Aug. 23-28, 1992. *Division Environmental Chemistry* 32 (1992): 86-89.
- Maguire, R.J. "Occurrence and persistence of dyes in the Yamaska River, Quebec." *204th American Chemical Society National Meeting*. Washington, D.C. USA, Aug. 23-28, 1992. *Division Environmental Chemistry* 32 (1992): 53-56.
- Maguire, R.J. and A.M. Bobra. *Supporting document - Environmental Section: Canadian Environmental Protection Act assessment of aniline, 3,5-dimethylaniline, benzidine and 3, 3'-dichlorobenzidine*. NWRI Contribution 92-148.
- Martin, V. "The Formation of Chlorophenolics from High Molecular Weight Chlorinated Organics (>400 Daltons) Isolated from Bleached Kraft Mill Effluent." M.Sc. Thesis, University of Guelph, 1993.
- Mayer, T. and E. Nagy. "Polycyclic aromatic hydrocarbons in suspended particulates from Hamilton Harbour." *Water Pollution Research in Canada* 27(4) (1992): 807-831.
- Niimi, A.J. and H.B. Lee. "Free and conjugated concentrations of nine resin acids in rainbow trout (*Oncorhynchus mykiss*) following waterborne exposure." *Environmental Toxicology and Chemistry* 11 (1992): 1403-1407.
- Onuska, F.I. and K. Terry. "Extraction of pesticides from sediments using a microwave technique." *Chromatographia* 36 (1993): 191-194. (NWRI Contribution No. 92-20).
- Onuska, F.I., K. Terry, and B. Wilkinson. "The analysis of chlorinated dibenzofurans in municipal fly ash: Supercritical fluid extraction vs Soxhlet." NWRI Contribution No. 92-15.
- Onuska, F.I. et al. *Determination of toxaphene in soil by electron capture negative ion mass spectrometry*. NWRI Contribution No. 93-70.
- Pakdel H. et al. "Method development for the analysis of toxic chemicals in soil and ground water. The case of Ville-Mercier, Quebec." In *Groundwater Contamination and Analysis at Hazardous Waste Sites*, pp. 381-425. Edited by S. Lesage and R.E. Jackson. New York: Marcel Dekker Inc., 1992.



- Parrott, J. et al. "Toxic Equivalent Factors (TEFs) and tissue distribution for several 2,3,7,8-substituted dioxins in rainbow trout." In *Proceedings, 18th Annual Aquatic Toxicity Workshop*. Canadian Technical Reports of Fisheries and Aquatic Sciences. Burlington, Ontario: Department of Fisheries and Oceans, 1992.
- Priddle, M.W. et al. "Analysis of oxygenated solvents in groundwater by dynamic thermal stripping-GC-MSD." *International Journal of Environmental Analytic Chemistry* 49 (1992): 117-123.
- Rao, S.S. et al. "Effect of suspended aggregate sizes on the adsorption of water-soluble dyes in aquatic environments." *Environmental Toxicology and Water Quality* 7: 247-256.
- Ribet, I. et al. *The potential for metal release by reductive dissolution of weathered mine tailings*. NWRI Contribution 92-161.
- Ryan, J.F. and J. Lawrence. *Compendium of research needs identified in PSL assessments*. National Water Research Institute, February 1993.
- Servos, M. et al. "Impact of a modern bleached kraft mill on white sucker populations in the Spanish River, Ontario." *Water Pollution Research in Canada* 27 (1992): 423-437.
- Sharma, M. et al. "Migration pathways for PAHs in the urban environment." In *New Technologies in Urban Drainage UDT '91*, pp. 217-224. Edited by C. Maksimovic. London and New York: Elsevier Applied Science, 1992.
- Sherry, J.P. "Environmental chemistry: The immunoassay option." *Environmental Chemistry* 23 (1992): 217-301. (NWRI Contribution No. 92-03).
- Sherry, J.P. and A. Borgmann. "Enzyme-immunoassay techniques for the detection of atrazine in water samples: Evaluation of a commercial tube based assay." *Chemosphere* 26 (1993): 2173-2184. (NWRI Contribution No. 92-13).
- Sherry, J.P. et al. "An MSD-based method for the detection of chlorinated dibenzo-p-dioxins and chlorinated dibenzofurans in fish." *Chemosphere* 27 (1992): 651-664. (NWRI Contribution No. 92-12).
- Stokker, Y.D. and A.S.Y. Chau. *PESTMYOP report on the preparation, stability and interlaboratory assessment of acid herbicides in sediment extracts*. NWRI Report 1992.
- Stokker, Y.D. and E. Kaminski. *Summary CAPCO report: Interlaboratory study on the analysis of neutral herbicides in water*. NWRI Report 1993.
- Stokker, Y.D. and E. Kaminski. *Report on the preparation and validation of check samples for CAEAL organic studies C6 and C7 (Round II: Ocs, PCBs and PAHs)*. NWRI Report 1993.
- Walter, A.L. et al. *Modelling of multicomponent reactive transport in aquifers impacted by mine tailings effluents*. NWRI Contribution 92-164.
- Williams, T.G. et al. "Biological response monitoring of pulpmill effluent." *Proceedings, International Conference*. Stockholm, November, 1991. Edited by A. Sodergren. Swedish EPA Report 4031.
- Wilkinson, R.J. et al. *Evaluation of the method for the determination of dioxins and furans in pulp and paper industry related matrices*. NWRI Contribution No. 92-10.
- Wong, P.T.S. and Y.K. Chau. *Occurrence of butyltin compounds in Severn Sound, Ontario*. NWRI Contribution 92-119.

The Priority Substances List

Environment Canada. *Priority Substances List Assessment Report No. 3, Chlorobenzene*.

Environment Canada. *Priority Substances List Assessment Report No. 4, Toluene*.

Environment Canada. *Priority Substances List Assessment Report No. 5, Methyl tertiary-butyl Ether*.

Environment Canada, and Health and Welfare Canada. *An Invitation to Stakeholders to Comment on the Federal Government Proposals for Preparing the Second Priority Substances List under the Canadian Environmental Protection Act (CEPA)*.



Release of Toxic Substances

User's Guides:

Implementation of the Export and Import of Hazardous Wastes Regulations

Hazardous Waste Classification

Hazardous Waste Manifest

Hazardous Waste Export/Import Notice

State of the Environment Reporting

State of the Environment Fact Sheets:

Ground-level ozone in Canada. SOE Reporting. (SOE Fact Sheet No. 92-1)

Environmental implications of the automobile. SOE Reporting. (SOE Fact Sheet No. 93-1)

State of the Environment Reports:

State of the environment for the lower Fraser River Basin. Environment Canada and Ministry of Environment, Lands and Parks (Province of British Columbia). (SOE Report No. 92-1)

The status of Canada's climate: temperature change in Canada 1895-1991. Atmospheric Environment Service. (SOE Report No. 92-2)

Environmental Indicator Bulletins:

Stratospheric ozone depletion. State of the Environment Reporting. (SOE Bulletin No. 92-1)

Technical Supplements to Environmental Indicator Bulletins:

Technical Supplement to the Environmental Indicator Bulletin on: Stratospheric ozone depletion. State of the Environment Reporting. (Technical Supplement 92-1)

Occasional Paper Series:

"Proceedings of the National Ecological Monitoring and Research Workshop." State of the Environment Reporting. (Occasional Paper Series No. 1; unpublished)

Videos in VHS Format:

State of the Environment Reporting. (Time 15:25)

Earth's harmony: an argument for changing the way we think. (Time 9:38)

Western and Northern Region

Ertman K. and M. Constable. *State of the Wood Preservation Industry in Prairie Provinces. Report CP(EP)WNR 92-93-4 (amended), Edmonton, June 1993.*

Tibbatts, W.L. and D.A. Williamsom. *Water Quality Assessment of Artificial Recharge Sources for the Elie Aquifer, Manitoba, Canada. Report CP(EP)WNR 92-93-3, 1992.*





Appendix B: CEPA Expenditures

To keep pace with Canada's dedication to environmental protection on both the national and international fronts, CEPA's monetary commitment has more than tripled over the past years. The dollar value of CEPA-related initiatives has increased from approximately \$21 million in fiscal year 1988-89 to \$67 million in 1992-93.

This increase in funding has supported an increase in CEPA's scope beyond the research, monitoring and enforcement responsibilities it has always encompassed. Since 1991-92, efforts under CEPA have expanded to include regular reporting on the state of Canada's environment, as well as more-stringent monitoring of pollutants (under the National Pollutant Release Inventory), ozone-depleting substances and hazardous wastes.

As well, efforts under CEPA have accelerated in several areas of particular concern. Funding for assessments of substances on the Priority Substances List and Strategic Options Reports for those substances deemed toxic as defined by CEPA has increased steadily during the five years CEPA has been in place. Funding for Regulatory Impact Analysis Statements for proposed regulations has also increased steadily as the federal government concentrates more and more on evaluating and quantifying the benefits of environmental protection.

Fiscal year 1992-93 is the first year a report has been made on expenditures under CEPA. A similar report will now be included in each subsequent CEPA Annual Report. The following table provides a breakdown of CEPA expenditures for the past five years.





CEPA Annual Financial Report (\$000)

	1988-89	1989-90	1990-91	1991-92	1992-93	Total Cost to date
PART 1						
Research and Monitoring	X	X	X	10,200	9,513	19,713
SOE Reporting	NP	NP	NP	6,943	7,052	13,995
Guidelines and Codes	3,310	3,485	4,112	4,187	4,087	19,181
Environmental Choice				5,453	3,370	8,803
Part 1 Subtotal	3,310	3,485	4,112	26,763	24,022	61,692
PART 2						
Existing Substances	542	1,050	1,644	1,917	1,540	6,693
Priority Substances	2,016	2,016	2,016	6,545	8,755	21,348
N.P.R.I.	NP	NP	NP	713	989	1,702
New Substances	1,521	1,691	1,797	1,908	1,898	8,815 DSL
Control Opt./Regs/RIAS	7,500	7,500	7,500	8,501	12,761	43,762
Biotechnology	275	630	1,264	1,415	2,455	6,039
Ozone Depleting Substances	NP	NP	NP	2,393	2,596	4,989
Import/Export Hazardous Waste	NP	NP	NP	1,742	1,742	3,483
PCO(j) Unit	NP	NP	NP	357	357	714
CEPA Lawyers	1000	828	818	906	906	4,458
Good Lab. Practice	NP	NP	NP	40	120	160
Part 2 Subtotal	12,854	13,715	15,039	26,437	34,119	102,163
PART 3 N/A						
PART 4						
Federal Activities	NP	100	100	433	433	1,066
Part 4 Subtotal	NP	100	100	433	433	1,066
PART 5 N/A						
PART 6						
Ocean Dumping	758	758	758	1,036	1,526	4,836
Part 6 Subtotal	758	758	758	1,036	1,526	4,836
PART 7						
Enforcement—without CPS	3,762	4,314	5,070	6,796	9,200	29,142
CEPA Annual Report & Management	400	400	400	400	400	2,000
Part 7 Subtotal	4,162	4,714	54,70	7,196	9,600	31,142
GRAND TOTALS	21,084	22,772	25,479	61,865	69,700	200,900

X= Not accounted against CEPA prior to 1991
 NP= New Program funds not previously available
 DSL= DSL cost \$5M included in New Substances