#247

Canadian Environmental Law Association
L'Association canadienne du droit de l'environnement

517 College Street, Suite 401, Toronto, Ontario M6G 4A2
Telephone (416) 960-2284
Fax (416) 960-9392

Incorporating Pollution Prevention Into Part II Of CEPA: An Agenda For Reform

Publication #247
ISBN# 978-1-77189-484-5

Paul Muldoon*
Canadian Environmental Law Association

September 19, 1994

*Research assistance was provided Donna Bigelow and Fé de Leon

TABLE OF CONTENTS

1. Introduction

Toxic chemicals continue to pose a threat to the Canadian environment and the health of Canadians. Over the past few years, there has been a constant release of studies outlining the insidious effects of many toxic chemicals. Perhaps what is also being understood is the extent of information that science has yet uncovered of the interaction of toxic chemicals and the environment.

The Canadian Environmental Protection Act (CEPA), which was proclaimed in 1988, is the federal statute that is to provide the federal framework for the regulation of toxic chemicals. During the time since its proclamation, there has been new approaches developed to address the problems posed by toxic chemicals. Most important, regulatory regimes around the world are moving away from attempting to "controlling" chemicals to "preventing" their use, generation and release.

Although the term and thinking of the pollution prevention approach is not new, what is new is the concerted and comprehensive attempts being made to incorporate this approach into law. The integration of such an approach into CEPA would have fundamentally important benefits both with respect to the environment and with respect to the financial performance of the regulated community.

1.1 The Problem with Toxic Chemicals

Although CEPA's main focus is on the control of toxic substances, toxic contamination continues to be a major threat to the health of Canadians and their environment. Approximately 30,000[1] different toxic substances, such as mercury, lead, dioxins, furans and organochlorines are released into the Canadian environment every year. Numerous scientific studies have shown with certainty that:[2]

- A large number of human-made chemicals which have been released into the environment have the potential to disrupt the endocrine system of animals, including humans. Among these are the persistent, bioaccumulative, toxic compounds that include dioxins, furans, lead, mercury, PCBs, etc.

- Many wildlife populations are already affected by these compounds. The effects include thyroid dysfunction in birds and fish; decreased fertility in birds, fish, shellfish and mammals; decreased hatching success in birds, fish and turtles; gross birth deformities in birds, fish and turtles; metabolic abnormalities in birds, fish and mammals; behavioral abnormalities in birds; demasculinization and feminization of male birds, fish and mammals; defeminization and masculinization of female fish and birds; and

compromised immune systems in birds and mammals. In 1991, two-thirds of the eagles born along Lake Erie and an entire colony of 2,000 ring-billed gulls died. Toxic poisoning is suspected.

- The chemicals of concern may have entirely different effects on the embryo, fetus, or perinatal organism than on the adult; the effects are most often manifested in offspring, not in the exposed parent; the timing of exposure in the developing organism is crucial in determining its character and future potential; and although critical exposure occurs during embryonic development, obvious manifestations may not occur until maturity.

- Laboratory studies corroborate the abnormal sexual development observed in the field and provide biological mechanisms to explain the observations in wildlife.

- Humans have been affected by compounds of this nature and may be at risk to the same environmental hazards as wildlife. Some of the developmental impairments reported in humans are seen in adult offspring of parents exposed to synthetic hormone disrupters released in the environment. Concentrations of such substances measured in the US human population today are well within the range and dosage at which effects are seen in wildlife populations.

1.2 Purpose of the Paper

The purpose of this paper to provide an agenda of reform with the aim of incorporating pollution prevention into the provisions of CEPA. Part II is the primary component of CEPA that deals with toxic substances. Part II of CEPA contains, in effect, three regulatory regimes: regulation of substances already in use in Canada, new substances and the import and export of toxic substances and waste materials. This paper concerns itself with only the first component, the regulation of already in use. Other position papers have been formulated to address the other two components of Part II of CEPA.[3]

To this end, the next section outlines how CEPA presently works to control toxic chemicals. This section is designed to summarize the present operation of the statute and then provide some comment on its most significant weaknesses.

Section 3 of the paper provides an overview to the concept of pollution prevention. It outlines the definition of pollution prevention, the rationale for this approach and progress in other jurisdictions in implementing the approach. The section then describes how pollution prevention can be integrated into CEPA.

Finally, section 4 provide discussion on various issues with respect to the implementation of a pollution prevention regime.

2. CEPA and Toxic Chemicals: An Evaluation

2.1 How Existing Part II Works

2.1.1 Overview

The overall structure of how CEPA currently works is quite simple, although its administration and implementation is a different story. CEPA establishes an assessment regime to determine whether or not a particular substance is "toxic" as defined under the statute. A number of chemicals are prioritized for assessment (called the Priority Substances List). An assessment is carried out with specific powers given to the Ministers of Environment and Health to require information from the manufacture or user of the substance or to require that certain tests be undertaken. An assessment must be undertaken and results published within 5 years as to whether the substances are "toxic" or "not toxic."

If the substance is found to be toxic, it is placed on Schedule I which, in turn, gives the Ministers broad powers to regulate it. CEPA also includes certain procedures to review or complete actions (boards of review) as well as certain enforcement powers to ensure that the regulatory controls are adhered to and complied with in an appropriate manner.

In essence, then, the regime identifies priority substances, assesses them, and if found to be toxic, holds the potential to be regulated.

2.1.2 The Definition of "Toxicity"

Part II of CEPA centres around the definition of "toxicity" since the entire assessment process is geared to the determination of whether a substance satisfies this definition.

Section 11 reads:

> "11. For the purposes of this Part, a substance is toxic if it is entering or may enter the environment in a quantity or concentration or under conditions
>
> (a) having or that may have an immediate or long- term harmful effect on the environment;
>
> (b) constituting or that may constitute a danger to the environment on which human life depends; or
>
> (c) constituting or that may constitute a danger in Canada to human life or health."

In effect, there are three thresholds under this definition. For a substance to be "toxic," the substance must:

(1) be present in the environment;

(2) in a quantity or concentration that:
(3) may have an harmful effect to the environment or may cause an endangerment to human health.

This definition is one particular to CEPA. Hence, it is common to qualify the more typical notion of toxicity by referring to this definition as "CEPA toxic."

2.1.3 Priority Substances List

The first step in the regulatory process under CEPA is to develop a Domestic Substances List (DSL). Section 25 requires the Minister of the Environment to compile an inventory of substances, called the DSL, that are considered to be "in use" in Canada. As of 1991, there were approximately 21,000 substances manufactured or imported in Canada on a commercial scale.

The second step is identification of substances on the DSL by the Ministers of Environment and Health as to which should take priority in being assessed. When these substances are identified, they are placed on the "Priority Substances List" (PSL). Section 12 outlines the procedure for this identification of the substances, notice requirements once identified, and a procedure to add and delete substances from the list.

The basic process is a somewhat flexible one. The present PSL was formulated by a multi-stakeholder committee convened in 1988. It was chaired by Dr. Ross Hume Hall. The report of this committee was submitted to the ministers in 1988. While the report submitted a list of some 50 substances, the ministers designated 44 substances to the PSL.

CEPA does not give any specific criteria as to which substances should be placed on the PSL. Although the ministers may consult, as was the case in 1988, the selection seems to be at the sole discretion of the ministers. Similarly, there is no criteria to deal with requests to add or delete substances to the PSL. CEPA only gives procedural requirements.

2.1.4 The Assessment Report

Once on the PSL, an assessment process is undertaken for each substance. That assessment process can best be described as a risk assessment process to determine whether that substance is toxic, in accordance with the definition noted above. Under section 13, the Ministers shall:

(1) undertake and prepare an assessment report;
(2) make the report available to the public;
(3) publish a summary in the Canada Gazette, including a statement of whether the ministers have found the substance is toxic and will be put on a List of Toxic Substances and

whether regulations will be made to control.

It is the intent of this Part to have the substances assessed within a five year period.

Now that the 44 PSL substances have been assessed, there is presently an event to draw-up another PSL list of substances (PSL II).

2.1.5 Regulation of Substance - List of Toxic Substances

When a substance is deemed to be "toxic," the federal cabinet can place the substance on the List of Toxic Substances (TSL) pursuant to section 33. There is also a process to delete a substance from this list. If the substance is on the TSL, the federal cabinet, on advise of the ministers, is given broad and comprehensive powers to regulate those substances under section 34.

In addition to these powers, the federal cabinet is given special powers under section 35 to issue "interim orders" to regulate substances that are not on the TSL. Before these powers can be employed, however, the ministers must believe that immediate action is required to deal with a significant danger to the environment or to human life or health.

2.1.6 Boards of Review

Under CEPA, there are no formal appeal approaches. There are circumstances, however, where a board of review can be created. A board of review is a three member panel with jurisdiction to hold certain hearings and make determinations. Two areas relevant to the above discussion where board of review are possible are:

(1) Section 13 allows anyone to file a notice of objection where a substance has not been placed on the List of Toxic Substances. In this instance, the minister has the discretion as to whether or not to create a board of review.

(2) Section 14 allows anyone to file a notice of objection where the assessments referred to above have not been made to determine the toxicity of a substance. In this instance, the minister must establish a board of review.

To date, no boards of review have been established. There are a number of outstanding notices of objection under section 14.[4]

2.1.7 Information

Section 15 to 18 outlines the powers of the minister to collect and conduct investigations with respect to a substance as

well as correlate and evaluate any data collected (section 15); require information and samples as directed by the minister (section 16); and requiring the submission of information where there is information available that reasonably supports the conclusion that the substance is or could be toxic (section 17). Section 18 goes further to allow the minister in certain circumstances to require, among other things, toxicological and other tests that the minister may direct.

2.1.8 Disclosure and Confidentiality of Information

The operative is section 19 whereby a person who provides information to the minister or a board of review under Part II may submit a written request that the information be treated as confidential. Once submitted, "no person shall disclose any information in respect of which a request for confidentiality has been under section 19."

There are a few exceptions as to where information can be disclosed when a request for confidentiality has been made. These sections usually deal with general information on the substance, safety measures and summaries of effect data.[5] Another exception pertains to the power of the minister. In this instance, the minister may disclose information where:[6]

> (a) the disclosure is in the interest of public health, public safety or the protection of the environment; and
>
> (b) the public interest in the disclosure clearly outweighs in importance any material financial loss or prejudice to the competitive position of the person who provided the information or on whose behalf it was provided.

Apparently, the minister has yet to exercise the power conferred under this section.

2.1.9 Remedial Measures

There are a number of provisions within the statute to deal with the situation where there are releases of substances on the TSL in contravention of regulations made under the Act. Some of these provisions include:

> (a) there are specific duties for persons who owns or has charge of substances on the TSL to report, prevent, remedy and give notice of release of such substances.[7]
>
> (b) where there is a release and those under duty to prevent and remedy does not take action, the federal government can take such action and be compensated for it.[8]
>
> (c) powers to the minister to make regulations directed to

ensure that the substance does not continue to enter the environment, such as enacting regulations directing a manufacture to replace the substance or product with one that does not pose a danger to the environment or to human life or health.[9]

2.2 Limitations of CEPA's Part II

In light of the above description, the next question, simply put, is the statute working? If not, why?

It is difficult to give any definitive response without a full and complete audit of both the legislative and administrative components examined. However, it can be argued that CEPA's Part II is deserving of a failing grade.

Limited Effect of CEPA

In the tenure of the statute, it took 5 years to complete the assessment of 44 substances. Of those substances, 27 were found to be toxic, while for 12 others such an assessment could not be made owing to "insufficient data."

Of the 27 found to be toxic, only a few substances have been subject to regulation at this point in time. Of the 12 substances where an assessment could not be made, they remain in legal limbo since there is no provision in CEPA to determine the course of events in this instance.

The Definition of Toxicity

CEPA is drafted such that a finding of "toxicity" is a precondition before government action. The problem is that the threshold to meet the CEPA definition of toxicity is so high, that the statute is effectively thwarted in its scope and effectiveness. For a substance to be found toxic, it must be emitted into the environment in a quantity or concentration to cause harm to the environment or human health. In effect, not only must a substance be capable of causing harm, but it must in quantities to actually or potentially cause harm. Hence, a substance that has the capability of causing harm may not held to be toxic, unless it can be demonstrate it is in quantities or concentrations to cause such harm. This approach presumes that (1) there is enough, or it is possible to have, data to what quantities or concentrations are in the environment; and (2) there is come good reason why chemicals that have the potential to cause harm should not be regulated.

CEPA Implies a Pollution Control Approach

Traditional approaches to environmental protection attempts

to find acceptable levels of pollution and then find control technologies to collect and treat effluents and wastes at the "end-of-the-pipe." However, a large body of literature suggests have identified serious problems with the pollution control approach. For example,

> 1) The Problem of Inter-media Transfer: Pollution control, by focussing on end-of-the-pipe solution, often prevent pollutants from getting into one part of the environment by putting them into another. Wastewater treatment systems collect and concentrate pollutants into sludge. This sludge then must be incinerated, buried in a landfill or spread on land. Often, these measures re-introduce the same pollutants into the environment sought to be controlled.
>
> 2) Reductions in Total Discharges are Not Required: Pollution control focuses on assessing each individual source of pollution in isolation rather than determining the combined impacts of pollutants discharged into all parts of the environment from all sources. Hence, total discharges of contaminants into the environment may increase, even though an individual discharge may appear insignificant.

CEPA, while not expressly endorsing the pollution control approach, certainly suggests its legitimacy. Most important, CEPA's "cradle to grave" approach suggests that CEPA intends to deal with substances <u>after they are created</u> in a comprehensive way. The Act does not require measures to avoid their use or generation.

The Burden of Proof

Presently, it is up to the public and government to prove that a substance is toxic before it is regulated. The assumption that chemicals are innocent until proven guilty puts citizens, workers and the environment at risk. It means that chemicals may be in use for many years before their dangerous impacts are known. Massive quantities of toxics may have irretrievably contaminated the environment.

CEPA reinforces the view that all chemicals are "innocent" until proven otherwise. Although the government can require information, it is up to the government still to prove that the substance is toxic. This problem is especially acute where there is a lack of toxicological and other information. Government then must spend significant resources.

Substance-by-Substance Approach to Regulation

Regulations are developed under CEPA on a substance-by-substance basis. Of the ten of thousands of substances that are in use in Canada, CEPA is only triggered by assessing each substance one at

a time. This is the case even though substances could be groups together because of similar characteristics or similar effects.

Federal-Provincial Relations

There are many hoops and hurdles, including equivalency agreements, that must be overcome before any new regulations may be passed under CEPA.[10] This results in a patchwork of inconsistent regulations. These issues are discussed in the position paper submitted by the Canadian Institute for Environmental Law and Policy.[11] The concern is that the federal government should retain its ability to implement comprehensive nationwide toxics regulations.

3. Developing a New Framework for Pollution Prevention in CEPA: Recommendations for Reform

3.1 The Need for a New Direction: CEPA and Pollution Prevention

There are serious problems with CEPA. To overcome these problems, there is a need for a new approach - a pollution prevention approach.[12] This approach mandates that emphasis is placed on the avoidance or prevention in the generation or use of toxic substances. It rejects the after-the-fact pollution control approach that deals with toxic pollutants once generated.

This section reviews the rationale for pollution prevention and then a cursory overview as to the progress of implementing it in Canada and other jurisdictions.

3.1.1 Rationale for Pollution Prevention

There is a basic threefold rationale for pollution prevention. These can be summarized as follows:

Many Toxic Chemicals Still Enter the Environment

In the U.S., the most recent data reveals that 37.3 billion pounds of toxic chemicals entered the U.S. environment.[13] This is thought to be only a fraction of the actual amount. Even though there is a reduction of a total toxic releases of 6.6 percent between 1991 and 1992, there was an increase in the total amount of toxics generated during the same time. Moreover the overall decrease in release from 1988 to 1992 may not necessarily be due in large part to the economic recession of recent years rather than any environmental protection strategy.[14]

Similar data is not yet available in Canada, however, there is every reason to suggest that such levels, on a per capita basis, is about the same. Once the data from the National Pollutant Release Inventory is released, a more direct comparison will be possible.

The Economic Rationale for Pollution Prevention

The traditional pollution control approach is expensive. According to the U.S. Environmental Protection Agency, in 1990 the cost of all pollution control activities was estimated to be $115 billion annually by the year 2000. Additional environmental cleanup expenses are borne by states, cities, countries, automobile manufacturers, and ultimately consumers.[15]

Not only are pollution control measures expensive, there are many other costs arising from attempts to deal with wastes. These include potential liability costs, on-site and off-site

waste site disposal, transportation costs, among others.

Maintaining Competitiveness

Pollution prevention strategies had a direct relationship with international trade. Not only is the world market for pollution prevention products increasing but foreign markets will demand that Canadian products and processes comply with minimum pollution prevention content to maintain a level playing field. This offers an opportunity for Canadian industries to promote pollution prevention through the export of new technologies and expertise.

Pollution prevention promotes more innovative and more efficient processes which, in addition to the avoidance in the generation of toxics, also reduces resource and energy use.

Costs of Clean-Up and Remediation

There are few reliable or actual costs of the clean-up of toxic chemicals in Canada. The estimates that do exist elsewhere are quite dramatic. Scientists from Canada Centre for Inland Waters estimate a cost of $6 billion over next 30 years and $19 billion over next 100 years to contain, maintain, monitor and clean-up four of largest leaking dumps on the U.S. side of the Niagara River. The Northeast-Midwest Institute estimated will cost from 2.9 billion to 4.3 billion for a partial cleanup of only 10 of the 43 areas designated by as toxic hot spots by the International Joint Commission.[16]

3.1.2 Pollution Prevention in Canada

(a) Federal

There is no federal law or policy that adopts pollution prevention as a national goal or national approach in Canada. Nevertheless, in recent years, it has furthered a number of program or initiatives pertaining to pollution prevention. These include:

Voluntary Pollution Prevention Agreements: The federal government (along with Ontario) has signed a number of voluntary pollution prevention agreements with various industrial sectors, including automotive manufacturing, metal finishing, and automobile parts manufacturing. Although these programs are aimed at reducing toxic chemicals, it is the industries concerned that sets the goals and defines the term pollution prevention. Moreover, there is little, if any, accountability as to progress under these agreements.

Accelerated Reduction/Elimination of Toxics (ARET): ARET is a voluntary program where participating industries will reduce or

eliminate the emissions of designated substances. The novelty of the program prevents the ability to analyze its effectiveness. However, the non-governmental organizations withdrew their participation in it for a variety of reasons, including the fact that it was voluntary and the focus was on emissions rather than use of substances.

Offices of Pollution Prevention: There are national and regional pollution prevention offices which assist in coordinating pollution prevention activities. The national office has consulted on a "Pollution Prevention Framework," although its status remains unclear. The regional office located in Sarnia provides technical assistance and information to industries on pollution prevention.

Demonstration Projects: There are a number of existing or proposed demonstration projects, such as the multiprocess wet cleaning demonstration called "The Green Clean Project."

(b) Provincial

A number of provinces have, or expressed intention, to move to adopt a pollution prevention approach. Ontario, for example, has committed to pollution prevention in the development of its effluent limits under the Municipal-Industrial Strategy for Abatement (MISA). Most of these initiatives, however, are non-regulatory in nature.[17] For example, Ontario has a Pollution Prevention Pledge Program where facilities commit to certain actions in accordance with the criteria set out in the program. Ontario is also signatory to the voluntary agreements mentioned above.

3.1.3 Pollution Prevention in Other Jurisdictions

(a) United States

There is a relative long history of the pollution prevention effort in the U.S. The Hazardous and Solid Waste Amendments of 1984 asked the Environmental Protection Agency (EPA) to report to Congress regarding the feasibility and desirability of incorporating the requirements of a pollution prevention strategy. As a result, the EPA's 1986 Report to Congress provided a definition for both pollution control and source reduction and clearly outlined the differences in the two approaches.

In 1990, Congress passed the Pollution Prevention Act that has furthered federal policy in the nation. The Act improves the Hazardous and Solid Waste Amendments by outlining the pollution prevention policy and establishing a grant program for states. It also defines pollution prevention as source reduction. Through an Executive Order, signed in August of 1993, President

Clinton directed federal compliance with pollution prevention principles and, in particular, a definition of pollution prevention that focuses on the measures to avoid the creation of pollutants.

Apart from the federal level, there are approximately 105 state pollution prevention programs in the U.S.. that includes both regulatory and non-regulatory activities. Over half the U.S. states now have specific legislation in place with a number states that remain the model in the field.[18] Table I outlines the nature and kind of programs available. The programs range from technical assistance and information clearinghouses, loans or grants provided to waste generators, establishment of state offices of pollution prevention, requirements to integrate pollution prevention into regulatory and enforcement activities, prohibition of sale or manufacturing of specific items and the mandating of product substitution. A recent General Accounting Office report concluded:

> Nearly all states have what are termed "pollution prevention" programs, but the types and mandates of these programs tend to vary significantly. As a result, the source reduction approach is not becoming institutionalized as it should be within the state programs. Given that a majority of the programs emphasize waste recycling, treatment, and disposal, we conclude that the source reduction emphasis of the Pollution Prevention Act of 1990 in inconsistently supported on a nation-wide basis.[19]

In 1993, a report found that only 11 percent of the TRI forms from 1991 contained information indicating that companies were making efforts to prevent pollution.[20]

(b) Other Jurisdictions

The European Union (EU) which has fourteen member states was formed for the purposes of developing an economic alliance. In the Single European Act of 1986, the issue of environment was incorporated into EU policies. The EU have two very important Articles which highlight the concept of pollution prevention.[21] It is important to note that these policies have to be incorporated into the member states legislative framework on environmental protection.

Scandinavian countries such as Sweden have developed a sunset regime for the worst toxic chemicals. Action plans on these candidate chemicals have been developed by the National Swedish Environmental Agency. These plans may include phase-out, bans or reduction in use or the use of other measures such as the imposition of taxes on products or substances. In 1988, a Swedish delegate to the Organization of Economic Cooperation and Development proposed a sunset regime to address all toxic

chemicals in commercial use. This proposal was rejected.

In the Netherlands, government have set up centres to explore innovative technology especially in the area of energy and environmental protection.

3.2 A Legislated Pollution Prevention Regime for Canada

3.2.1 Overview - How the Regime Would Work

What would CEPA look like if it did incorporate pollution prevention? This section describes a "pollution prevention" CEPA. Although there are components taken from the former regime in CEPA, it would lead to substantial revisions. This new regime can be best described as follows:

(a) Declaration of Pollution Prevention Policy: The stated purpose of CEPA would be to eliminate the use and generation of toxic substances through pollution prevention. The toxics substances regime of CEPA would be divided into two parts: a sunset chemical protocol and a toxic substances part. The universe of substances to be addressed are those on the Domestic Substances List.

(b) Track 1 - Sunset Chemical Protocol: All substances on the Domestic Substances List would undergo a <u>hazard</u> assessment, that is, would be identified if they have certain characteristics. These characteristics are: persistence, bioaccumulation and toxicity. If a substance does have these characteristics, that substance would be placed on a sunset chemical list and scheduled to be phased out.

(c) Track 2 - Toxic Use Reduction: All substances not on the Sunset Chemical list would then potentially be subject to this component. Under this component, there would be an assessment of toxicity according to a new definition. This definition would focus on the intrinsic characteristics of a substance. If a substance is toxic, all facilities using, generating or releasing these substances would be subject to certain federal requirements, including: reporting, pollution prevention planning and performance standards. Further, technical assistance and other programs would be available to facilities.

(d) Track 3 - Additional Regulatory Options: To a large measure, the two tracks described above are <u>in addition</u> to many provisions now within CEPA. The federal government still should retain the powers under section 34 and other necessary powers under Part II of CEPA to regulate substances in ways necessary to protect the environment and human health.

(e) Implementing the Regime: The new pollution prevention regime would have a number of implications. One of the protections in the regime should be that the impacts on workers and communities are addressed in the implementation of this regime. Further, in this transition to cleaner technologies and practices, workers should be given an explicit role in the decision-making process.

Table 2

Overview to a Proposed CEPA Pollution Prevention Regime

Existing Substances on Domestic Substances List

Track 1	Track 2	Track 3
Sunset Chemical Protocol	Toxic Use Reduction	Additional Regulatory Options
(Hazard Assessment)	(Hazard and Toxicological Assessment)	(Hazard and Toxicological Assessment)
Phase-out Timetables	Pollution Planning Requirements Technical/ Financial Programs Integration in Permits/ Enforcement	Specific Substance Regulation under Revised Section 34

3.2.2 A Legislated Pollution Policy

One of the most notable weaknesses of CEPA is that it lacks a clear legislative direction with respect to toxic substances. It also lacks any clear set of goals and benchmarks to determine whether progress is being made.

CEPA should include a statement of purpose expressly adopting pollution prevention as a national goal and thus committing the federal government to its furtherance.

The national pollution prevention policy for Canada is not only an environmental policy, but an industrial policy. As such, it should be the intention of the federal government to commit all departments to this approach and the goals set under it, and then conduct their activities accordingly.

It is therefore recommended that Part II of CEPA be amended by adding the following:

Statement of Purpose/ Declaration

> **The government of Canada hereby declares it to be the national policy of Canada that the use, generation and release of pollutants should be prevented in order to protect the health and well-being of Canada and the environment. The government of Canada shall develop policies, undertake programs and cooperate with other jurisdictions to effect this declaration.**
>
> **In order to further this purpose, the government of Canada commits itself to virtually eliminate the use, generation and discharge of persistent toxic substances no later than 2004 and to reduce the use, generation and release of other toxic substance by 50% by the year 1999. More specific goals and benchmarks should be established by regulation in consultation with interested constituencies.**

3.2.3 Definition of Pollution Prevention

Pollution prevention is distinct from end-of-pipe pollution control practices. The goal of pollution prevention is to protect human health and the environment by preventing or eliminating the use, generation and release of toxic substances. Reducing hazards to workers and consumers, as well as accidental releases and safety hazards, must also be considered.

One of the issues within the context of pollution prevention, however, relates to its definition. There are a number of definitions that have very different implications. Appendix 1 presents a range of definitions of pollution prevention in the United States and Canada. In sum, there is no

formal definition adopted by the Canadian government, while there is a wide range of definitions within the U.S.

Apart from the definition of pollution prevention, there are other terms used to express similar concepts, including: toxic use reduction, hazardous waste minimization and hazardous waste reduction.

The most important decision to be made with respect to pollution prevention pertains to its definition. Its effectiveness rests squarely on how the term is defined. The definition of pollution prevention will drive the planning, implementation and ultimately the effectiveness of government actions in this regard. Equally, the definition will influence, in fundamental ways, the response by those impacted by government actions.

What then are the elements of an appropriate definition for pollution prevention? It is suggested that there are five such elements.

Scope of Measures Within Scope of Pollution Prevention

One of the most important issues with respect to pollution prevention is whether a "pure" approach is taken to include in the definition only those measures that avoid the creation of pollution; or any measure, including pollution control measures, that seek to reduce pollution entering the environment. It is submitted that the former approach is the appropriate one; the latter simply reinforces and legitimizes the status quo.

Focus Must be on Use and Generation, Not Emissions

The focus of some definitions of pollution prevention is on the "release to the natural environment" of substances. This focus excludes the option of examining the use of chemicals and implies that industrial process change, product reformulation and substitution measures are not part of the definition. The most effective way of dealing with discharges to the environment is by moving up the pipe to examine ways to rethink the industrial process. Sometimes this requires an examination of feedstock chemicals and raw products. A definition that focuses on "release to natural environment" pre-empts such examinations.

Focus is on Use and Generation Whether in Workplace or Environment

The fact that some definitions focus on emissions to the "natural environment" are meant to exclude workplace issues. Pollution prevention is fundamentally important to worker safety and in-house pollution issues and as such, must be broad enough to encompass such issues.

Out-of-Process Recycling Process is not Part of Pollution Prevention

Some definitions allows one facilities' waste to be used as a feedstock by another facility. Similarly, these definitions allow for facilities' waste to be used for out-of-process recycling. However, this definition, by implication, would also include measures such as: incineration, on-site disposal, among other measures. A appropriate definition of pollution prevention should not include out-of-process recycling of substances. This issue is fully discussed in the report by the Pollution Prevention Legislative Task Force.[22]

Apart from the definition of pollution prevention, there is the issue of the relationship of pollution prevention to other terms such as source reduction. For example, many US states pollution prevention laws employ the term "toxic use reduction" (TUR).

One way of clarifying these terms is as follows:

* Pollution prevention is an umbrella concept that incorporates both source reduction and toxics use reduction;

* Source reduction focuses on reducing or eliminating pollution before it is created, that is, it attempts to avoid the generation of pollutants by process change or some other measure;

* Toxic use reduction goes beyond source reduction by encouraging practices that reduce the use of toxic chemicals in the first place. Hence, toxic use reduction requires an examination of feedstock chemicals, the kinds of processes and chemicals throughout the production process and the fact of a substance in products (which will eventually have to be dealt with at the disposal stage).[23]

While at the state level in the U.S., there is no consensus as to the definition of pollution prevention, the U.S. federal government, through the Pollution Prevention Act and the 1993 Executive Order mentioned above, does lend support for a strict definition of pollution prevention.

It is therefore recommended that:

Pollution prevention means those measures that only seek to avoid or prevent the use, generation and release of pollutants; all other measures pertain to pollution control approach.

Pollution prevention measures would include:

* input substitution which would replace a toxic substance with one that is not toxic;
* product reformulation which would replace an end product with one that is non-toxic in terms of use, release and disposal;
* production unit redesign which would change the process of production to a cleaner one;
* improved operation and maintenance of production unit equipment and methods.

3.2.4 Goals and Targets for Pollution Prevention

As mentioned above, it is important for a pollution prevention regime to have goals and targets to send the appropriate signals and to promote accountability of all interests by assessing whether progress is being made.

There are a number of types of goals and targets. These can be described as follows:

* National Goals: There should be national goals with respect to toxic substances. These national goals were described above.

* Sectoral Goals: These goals pertain to the targets and benchmarks to meet the national goal on an industrial sector basis.

* Facility-Based Goals: These goals are fashioned for specific facilities. These goals would be undertaken in the context of pollution prevention plans discussed below.

U.S. state pollution prevention laws often have goals and targets. For example, the Massachusetts law is intended to achieve, by 1997, through pollution prevention, a 50% reduction from 1987 quantities of toxic wastes generated by industry. The New Jersey Pollution Prevention Act of 1991 sets its goal to reduce the generation of hazardous substances at their source by 50% over 5 years following the preparation of pollution prevention plans.

It is recommended that, as part of the pollution prevention regime, there are requirements for the setting of sectoral and facility based goals and targets to meet the national goals and to adjudge progress generally.

3.2.5 Measuring Progress - Information Mechanisms

When setting targets, there must be a means in place to

monitor progress. For this reason, consideration should be given to using a reformed National Pollutant Release Inventory to be of assistance in this regard. New reporting requirements under the Inventory should include: detailing how reductions were achieved (that is, through pollution prevention versus pollution control); quantities of toxic substances used as feedstocks; among other. Further discussion of the Inventory can be found in the position paper submitted by the West Coast Environmental Law Association.[24]

It is therefore recommended that, in the reform of the National Pollutant Release Inventory, reporting requirements be included that would enable the federal government to measure progress in achieving pollution prevention goals and targets.

3.2.6 Track 1 - Sunset Chemical Protocol

(a) General Regime

With the general legislative framework in place, the pollution prevention approach would be is now divided into two tracks: Track 1 is the Sunset Chemical Protocol; and Track 2 is the Toxic Use Reduction approach. Track 1 is an effort to focus on those substances that are so much of a concern that they should be phased-out.

The notion that the worst and most dangerous toxic chemicals should be phased-out over time has quickly gained popularity in Canada, although its origins are elsewhere.[25] The basic idea of this approach is that those substances that have certain characteristics (such as being able to persist in the environment for a long period of time and accumulate in fish, wildlife and humans) should be phased-out or "sunsetted" over time.

The International Joint Commission (IJC) endorsed the sunset chemical approach in its Sixth Biennial Report on Great Lakes Water Quality, and confirmed its view in the Seventh Biennial Report.[26] The IJC, a U.S.-Canada agency, is vested with the responsibility to review the progress made by the governments to achieve the objectives of the Great Lakes Water Quality Agreement. The IJC defines sunsetting as:

> a comprehensive process to restrict, phase out and eventually ban the manufacture, generation, use transport, storage, discharge and disposal of a persistent toxic substance. Sunsetting may require consideration of the manufacturing processes and products associated with a chemical's production and use, as well as of the chemical itself, and realistic yet finite timeframes to achieve the virtual elimination of the persistent toxic substance.[27]

The concept of sunset chemicals has been endorsed by the New Directions Group, a body comprised of industry and environmental representatives.[28] In the past two years, sunsetting chemicals has been discussed, and sought to be implemented, in various consultations such as the Canadian federal consultations Accelerated/Reduction and Elimination of Toxics and the Pollution Prevention Legislative Task Force. Further, the province of Ontario has developed a candidate list of substances for phase-out.[29]

This sunset protocol differs from CEPA at the present time in that it focuses on hazard assessment in the sense that seeks to phase-out substances based on their characteristics rather than the vague and complex notion of risk. As such, the implication of this approach is that the government of Canada has decided, as a matter of public policy, to eliminate the use and generation of persistent, bioaccumulative and toxic substances.

There may be a provision that allows those producing or using a substance on the sunset chemical list to establish that the substance should not be phased-out immediately. In this context, the substance is still on the list, but its timeframe is adjusted.

It is therefore recommended that:

As part of the CEPA's pollution prevention strategy, a sunset chemical protocol be incorporated. This protocol would seek to phase-out all persistent, bio-accumulative and toxic substances. The process would:

(1) identify all persistent, bioaccumulative and toxic substances;
(2) identify the loading and sources of those substances;
(3) consult with all stakeholders relative to those sources to set timetables and deal with other transition issues relative to the phase-out;
(4) monitor the phase-out schedules.

(b) Toward a Class-by-Class Assessment

The Sunset Chemical Protocol and the Toxic Use Reduction program, described below, is still based on a substance-by-substance approach to the regulation of toxic substance. The fact that both programs are based on understanding the inherent toxic characteristics of the substance does provide a route to move to assessing classes of substances. More effort, however, must be on developing a methodology for a class-by-class assessment. The Virtual Elimination Task Force of the International Joint Commission did make a contribution in this

reviewed in Part II of CEPA. Emphasis should be placed on understanding the inherent characteristics or properties of toxic chemicals.

One of the problems with developing a definition for toxicity is that, regardless of what definition is used, there will often be the lack of a full information base necessary to undertake an assessment. One example in this regard is with respect to the assessment of the 44 substances on the Priority Substances List. There were 12 substances where a determination of toxicity could not be made owing to gaps in information.

It is submitted that there must be reform in overcoming this problem. The two mechanisms that should be considered is reversing the onus in certain circumstances such that when there is an information gap, those using or importing the substance should have the onus of providing all information necessary to make a determination. The second mechanism is the standard of evidence may have to be changed from requiring absolute certainty to making decisions based on the weight-of-evidence. Both the reverse onus and weight-of-evidence approach have been recommended by the International Joint Commission in their Fifth and Sixth Biennial Reports in 1990 and 1992 .

It is therefore recommended that serious consideration be given to:

*** imposing a reverse onus provision such that where there is an information gap, the interest using or importing the substance must ensure all information necessary to make an assessment is available; and**

*** changing the standard of proof such that actions can be taken even without absolute scientific certainty so long as the weight-of-evidence suggests that action would prudent in the circumstances.**

(b) Pollution Prevention Planning

Pollution prevention planning is a relatively new concept and is evolving quickly. It is an essential component of an overall pollution prevention framework. Pollution prevention planning encompasses the comprehensive examination of operations at a facility as well as the examination of successive stages in the lifecycle of products with the goal of avoiding, eliminating or reducing pollution. Mandatory pollution prevention planning is required to overcome informational, attitudinal and corporate organizational barriers.

In essence, pollution prevention planning requires a facility to review its production processes, to plan how to avoid or prevent the use and generation of designated toxic substances.

There is usually not an automatic requirement to implement the plan. The fact that a facility has done the "homework" in understanding how to eliminate or reduce the use of toxic chemicals is often enough to provide the evidence to the facility that there is serious benefit in implementing the plan. There could be provisions for implementing the plans, however, in certain circumstances. Further, it is appropriate to have an auditing of the plan by experts knowledgeable in pollution prevention. These experts are trained through special institutions to this end. (See below for a discussion of this notion.) In other words, there would not be a large bureaucracy created under this regime; instead, it would use existing personnel although some retraining of that personnel will be necessary.

Further, there should be some provision to have summary of these pollution prevention plans available to the public for review and comment.

By mid-1993, 21 US states enacted facility pollution planning legislation. The requirements vary by state. New Jersey has the most rigorous law, compelling hazardous waste generators to develop and implement a pollution prevention plan featuring a process-by-process breakdown of how substances are used and generated within a facility. In contrast, Iowa has an advisory law which lays down a framework for plans that hazardous waste generators are encouraged to complete.

Although the diversity of industrial process precludes the dictation of the exact content of pollution prevention plans, the common elements considered appropriate for a comprehensive facility wide pollution prevention plans are described in Table 3.

What happens when facilities fail to implement their plans? In these circumstances, the federal government should have the authority to make performance standards that would ensure all facilities within a sector are governed by a "level playing field." A performance standard would not direct exactly how a facility should meet a goal, but what the goal is and when it must be achieved. These goals would be based on what facilities could do using pollution prevention.

It is therefore recommended that CEPA require Pollution Prevention Plans for facilities and activities using or generating designated substances.

The pollution prevention plans should be comprehensive in nature and include:[31]

*** a definition of their own production units and processes;**

* the development of process flow diagrams and material balances that described the operations (a material balance requires that raw materials be tracked from process input to process input);
* the calculation of the cost of using substances by production unit;
* the development of options to avoid the use and generation of the substances; and
* the development of timeliness to implement those options.

These plans must be approved by certified pollution prevention planners who have been specifically trained for the task. Further, there should be some provision to have summary of these pollution prevention plans available to the public for review and comment.

Provisions should also be in place that, in appropriate circumstances, where the plans are not carried through with, the federal government can require the implementation of the plan on a timely basis.

TABLE 3

Suggested Elements in a Pollution Prevention Plan
Under CEPA

* a policy statement of management support for pollution prevention
* a statement of reduction goals, the reasoning behind them and a schedule for meeting those goals
* a description of efforts initiated in the past that qualify as pollution prevention and an assessment of those efforts' successes and failures
* a quantitative description of current processes in which toxic chemicals are used, generated or released
* a multimedia framework, addressing air, water and waste and worker and consumer safety and health issues and both accidental and routine exposure
* a flowchart of toxic chemical use for each major production process
* estimates of cost associated with the current and projected use of toxic chemicals or pollutants, including the cost of chemical purchasing, reporting, record keeping, pollution control, waste management, employee protection, explosion protection and insurance
* a comprehensive summary of the plan, which does not disclose trade secrets
* publicly announced goals for reducing toxic chemical use and waste
* a process for identifying pollution prevention options in specified areas and assessing their technical and economic feasibility, including (at a minimum)
* changes in operating and maintenance procedures
    * process changes
    * equipment modifications or modernization
    * changes in a product or its formulation
    * substitution of non-toxic or less toxic

* financial and technical analysis of identified options in light of current operating conditions
* criteria or rationale for choosing or discarding identified options for implementation
* schedule for implementing selected options and a procedure for measuring and monitoring progress in achieving reductions
* description of opportunities for employee involvement and training
* certification by responsible corporate officers or facility managers.

3.2.8 Technical/Financial Programs

One of the common elements of a pollution prevention regime pertains to financial and technical assistance programs to industries subject to it. These programs are described elsewhere and are only identified here.

A Federal Pollution Prevention Financial Assistance Program: One of the prohibitive aspects of pollution prevention is that it may require capital investment to undertake a change in the process or research into how to change the progress. Owing to the proposed national policy on pollution prevention, it would be entirely appropriate for the federal government to facilitate change through a capital loan and grant program. This program would only support pollution prevention initiatives and would be carefully monitored as such.

Changes to Financial Barriers to Pollution Prevention: There is a strong argument to be made that there are a number of disincentives to pollution prevention at the federal level. As such, the federal government should undertake a study examining all such barriers, including a study of the Income Tax Act to ensure that provisions like Capital Cost Allowances encourage pollution prevention as opposed to pollution prevention measures.

3.2.9 Institutional Proposals

Information Clearinghouse: It is imperative that facilities and others subject to the proposed pollution prevention regime have available the information necessary to fulfil their requirements. The clearinghouse, which could in an electronic format, could be housed in the offices of pollution prevention already in existence.

Offices of Pollution Prevention: There are already two federal offices of pollution prevention. These offices should be made inter-departmental in nature and should be given a statutory base.

Pollution Prevention Institutes: As mentioned above, the pollution prevention plans submitted by industry should be certified by experts in the field. These experts should have to undergo training at Pollution Prevention Institutes established at universities throughout Canada. Pollution prevention does entail new thinking and a new approach. As such, there is need to retrain some experts in the field as well as ensure those entering the field understand both the theory and practice of pollution prevention. Many U.S. state

laws require the establishment of such institutions.

3.2.10 Other Programs

Above are programs and activities that seek to encourage pollution prevention. However, there are also measures that should be incorporated that are more regulatory in nature. The following are proposed:

Pollution Prevention and Federal Approvals: The federal government gives a number of environmental approvals. These approvals should be undertaken in light of the pollution prevention regime proposed above. For example, an approval with respect to a pulp and paper mill should be issued in light of the requirements of pollution prevention plan and the contents of that plan.

Pollution Prevention and Enforcement: Another position paper addressed the issue of enforcement under CEPA.[32] the important issue at this point, however, is that enforcement proceedings should be incorporated into the implementation of the proposed pollution prevention regime. For example, one consequence of an enforcement action may be the implementation of the pollution prevention plan be required as a penalty in accordance to the one of the provisions noted above.

Other Powers for CEPA - Reforming section 34: There are many other programs and activities that would assist in the furtherance of the pollution prevention regime. Hence, it is important that CEPA be amended to ensure that the minister has broad powers to undertake such measures. These measures might include:

* amendments to section 8 that would direct the minister to formulate environmental objectives, codes of practice and guidelines to further pollution prevention goals;[33]

* amendments to section 34 to provide for the requirement of pollution prevention plans along with other measures, including:

    * the power to prohibit the sale and manufacture of specific products;

    * the power to require product substitution.

3.2.11 Track 3 - Additional Regulatory Options

Tracks 1 and 2 will be influential in attempting to come to grips with the toxic pollution problem in Canada. To a large

measure, the two tracks are in addition to many provisions now within CEPA. As such, it is submitted that the federal government still should retain the powers under section 34 and other necessary powers under Part II of CEPA to regulate substances in ways necessary to protect the environment and human health.

4. Issues in Implementing a Pollution Prevention Regime

The proposed pollution prevention regime has a number of implications for its implementation. Three such implications will be discussed: whether there should be a new statute or whether the regime can be incorporated in Part II of CEPA; the constitutional dimensions of the regime; and the implications for other departments.

4.1 Should there be a New Act or a Reformed CEPA?

It is imperative that the proposed pollution prevention have a statutory base. As stated by the General Accounting Office in the U.S. noted, "the lack of a specific statutory base could undermine the efficacy of some of the programs.."[34] It has been argued that a new pollution prevention statute at the federal level would be the most appropriate.[35] However, this debate should not pre-empt a full discussion as to how pollution prevention should be incorporated into CEPA.

4.2 Constitutional Issues

Perhaps one of the complex questions is whether the federal government has the constitutional authority to implement the proposed regime. It is submitted that the federal government does have such powers. This issue will not be discussed in depth here, since it has been dealt with elsewhere.[36]

However, there are a number of comments worthy of note. First, the federal government has taken a narrow interpretation as to what its constitutional powers are to regulate toxic chemicals. One commentator put it this way:

> "The federal government is still plagued by what I would call conservative legal advice in relation to its constitutional authority to act in environmental matters. We submit that the constitutional constraints invoked by Environment Canada are more perceived than real, and we suggest that a number of heads of federal power can be used to support and justify a strong national toxics program."[37]

Second, the proposed pollution prevention regime is not a large intrusion on provincial jurisdiction, if at all. Indeed, a significant aspect of this regime is federal government leadership through technical assistance, institutional reform and an extension of existing regulatory powers. One exception may be the requirement for pollution prevention plans. However, there are opportunities at this point to cooperate with the provinces to ensure there is a coherent national regime in this regard. Federal-provincial cooperation could be facilitated through inter-governmental agreements. However, these inter-government

agreements should be undertaken according to the reforms suggested in a paper submitted by the Canadian Institute for Environmental Law and Policy.[38]

4.3 Transition Planning Considerations

The imposition of a pollution prevention regime will assist in cleaner production processes in Canada to the long term benefit of the environment and the Canadian public. However, it should also be noted that in the implementation of the regime, it must be made clear that workers and communities should not be made to disproportionately suffer the detriment of such changes.[39] As such, efforts must be made to plan the transition from dirty to clean technologies in a fair and equitable way. There has been considerable discussion on this, however, one of the most important voices in this regard are the workers and communities where the facilities are located.

It is therefore recommended that provisions are developed to ensure there are mechanisms in place to protect workers and communities in the transition to cleaner production processes. These mechanisms should be developed in close consultation with the labour interests and community leaders. Finally, workers should be given a legitimate role in all decisions pertaining to the planning for transition.

APPENDIX 1

Definitions in the United States

(a) International Definitions

The Virtual Elimination Task Force of the International Joint Commission stated:

> prevention attempts to avoid use or generation in the first place, through process change, product reformulation, and raw material substitution... The goal is clean production processes, closed loop recycling and elimination of the use and generation of persistent toxic substances.[40]

The report of the Task Force was endorsed by the International Joint Commission in the Commission's Seventh Biennial Report.

(b) U.S. Federal Legislation

The US Pollution Prevention Act of 1990 defines pollution prevention as source reduction.[41] The Act states that it is "to be the National policy of the United States that pollution should be prevented or reduced at source..." Source reduction is defined in the Act[42] any practice which --

> (5) (A)(i) reduces the amount of any hazardous substance, pollutant, or contaminant entering any waste stream or otherwise released into the environment (including fugitive emissions) prior to recycling, treatment, or disposal; and (ii) reduces the hazards to public health and the environment associated with the release of such substances, pollutants, or contaminants.
>
> The term includes equipment or technology modifications, process or procedure modifications, reformulation or redesign of products, substitution of raw materials, and improvements in housekeeping, maintenance, training, or inventory control.
>
> (B) The term "source reduction" does not include any practice which alters the physical, chemical, or biological characteristics or the volume of a hazardous substance, pollutant, or contaminant through a process or activity which itself is not integral to and necessary for the production of a product or the providing of a service.

The U.S. Environmental Protection Agency defines "pollution prevention" as

out-of-production waste recycling or other methods of end of pipe treatment of toxics as waste.

Pollution Prevention Definitions in Canada

By and large, the Canadian perspective on pollution prevention seems to be based on the concept of source reduction rather than toxics use reduction.

The Ontario Ministry of Environment and Energy has defined pollution prevention as:

> any action which reduces or eliminates the creation of pollutants or wastes at the source, achieved through activities which promote, encourage or require changes in the basic behavioral patterns of industrial, commercial and institutional generators or individuals. It can be achieved through: process changes, raw material substitution or use reduction; product redesign; in-process recycling; and improved maintenance or operating procedures.

The British Columbia proposed Environmental Protection Act[44] defines pollution prevention as follows:

> measures taken to reduce or eliminate pollution by means of a hierarchy of measures in the following order of implementation:
>
> > (a) the elimination of the use of polluting substance;
> > (b) the substitution of polluting substance with less polluting substances;
> > (c) the reduction in the introduction and use of resources and pollution substances;
> > (d) the elimination and reduction in the generation of polluting substances;
> > (e) the reuse and recycling of polluting substances;
> > (f) the recovery of energy and other resources, and as a last resort; and
> > (g) the recovery, treatment and disposal of residual polluting substance.

Industry Science and technology Canada defines pollution prevention as:

> a practice that reduces or prevents pollution at the source through cost effective changes in the design and operation of production facilities or transportation systems, or the design and use of products.

New Jersey: Pollution Prevention Act

Pollution prevention means:

> changes in production technologies, raw materials or products, that result in the reduction of the demand for hazardous substances per unit of production manufactured and the creation of hazardous products, non-product outputs or destructive results, or changes in the use of raw materials, products or production technologies that result in the reduction of the input use of hazardous substances and the creation of hazardous by-products or destructive results; or on site facility changes in production processes, products or the use of substitute raw materials that result in the reduction of the amount of hazardous waste generated and disposed of on the land or hazardous substances discharged into the air or water per unit of product manufactured prior to treatment, or that reduce or eliminate, without shifting the risks of the use of hazardous substances at an industrial facility pose to employees, consumers and the environment.
>
> Pollution prevention shall include, but need not be limited to, raw material substitution, product reformulation, production process redesign or modification, in process recycling and improved operation and maintenance of production process equipment.
>
> Pollution prevention shall not include any action or charge entailing a substitution of one hazardous substance, product or non-product output for another that results in the creation of substantial new risk, and shall not include treatment, increased pollution control, out of process recycling...

ENDNOTES

1. Citizens Guide to the Canadian Environmental Protection Act. (Environment Canada, May 1988).

2. The summary of the environmental impacts of toxic substances is derived from the following sources: Statement from the Work Session on Chemically Induced Alterations in Sexual Development: The Wildlife/Human Connection, Wingspread Consensus Statement, Wingspread Retreat, Wisconsin, USA, July 26-28, 1991; Glen A. Fox, "What Have Biomarkers Told Us About the Effects of Contaminants on the Health of Fish-Eating Birds in the Great Lakes?" Journal of Great Lakes Research 19:4 (1993), pp. 722-736; Theor Colborn, "Epidemiology of Great Lakes Bald Eagles" Journal of Toxicology and Environmental Health 33:4(1991), pp. 395-453; Theo Colborn, et al. Great Lakes Great Legacy? (Ottawa-Washington: Conservation Foundation and the Institute for Research on Public Policy, 1990); T. Colborn, F.S. vom Sall and A.M Soto, "Developmental Effects of Endocrine-Disrupting Chemicals in Wildlife and Humans" Environmental Health Perspectives: Journal of the National Institute of Environmental Health Sciences 101:5 (October, 1993), pp. 378-384.

3. See: Mark Winfield, Reforming the New Sustances Provisions of CEPA (Canadian Institute for Environmental Law and Policy, 1994); John Jackson, Reforming the Export\Import Provisions of CEPA, 1994.

4. The Canadian Environmental Law Association filed a notice of objection on March 31, 1994 alleging the Minister of the Environment did not complete the assessments as required pursuant to sections 14 and 89 of CEPA.

5. CEPA, ss. 20(3); Also see: s. 20(4).

6. CEPA, s. 20(6).

7. CEPA, s. 36.

8. CEPA, s. 36(5); 39.

9. CEPA, s. 40.

10. CEPA, ss. 34(5) and (6).

11. Karen Clark and Barbara Rutherford, The Constitution, Federal-Provincial Relations, Harmonization and CEPA (Canadian Institute for Environmental Law and Policy, 1994).

12. See for in-depth discussion: Paul Muldoon, "Toward a National Pollution Prevention Strategy: Principles for Reform to Address the Problem of Toxic Contamination in the Canadian Environment" in Canadian Bar Association Committee on Sustainable Development in Canada Sustainable Development in Canada: Options for Law Reform, Ottawa, 1990.

13. U.S. Environmental Protection Agency, 1992 Toxics Release Inventory, Public Data Release.

14. "USA's strides in war on toxic emissions", USA Today, April 20, 1994. page 6A

15. See EPA, Environemntal Investments: The Cost of A Clean Environment (Washington, D.C.: Island Press, 1991).

16. See: National Wildlife Federation and the Canadian Institute for Environmental Law and Policy, Prescription for Healthy Great Lakes, 1991, p. 7.

17. The Ontario Ministry of the Environment and Energy and B.C. Ministry of the Environment have incorporated pollution prevention components in recent regulations regarding pulp and paper. In 1992, the B.C. government announced a draft regulation asking pulp and paper mills to reach virtual elimination of AOX discharges, while the recent regulation passed by the Ontario government asked that pulp and paper mills have a phase out plan for AOX developed by the year 2002. While the B.C. government announced an aggressive pollution prevention regulation that will focus on development of safe alternatives, Ontario does not enforce a comprehensive strategy. Ontario pulp and paper mills are not obliged to implement these AOX phase out plans by the year 2002.

18. Refer to New Jersey Pollution Prevention Act, 1991; Massachusetts Toxics Use Reduction Act; Oregon Toxics Use Reduction and Hazardous Waste Reduction Act; New York: Indiana; Minnesota; Illinois; California; Georgia, Maine, Tennessee, Washington: Florida: Iowa; Kentucky; Ohio; Vermont; Wisconsin.

    See Survey and Summaries: State Legislation Relating to Pollution Prevention, by Waste Reduction Institute for Training and Applications Research, Inc. April 1991.

19. General Accounting Office, Report to the Chairman, Subcommittee on the Environment, Energy, and Natural Resources, Committee on Government Operations, House of Representatives, Pollution Prevention: EPA Should Re-examine the Objectives and Sustainability of State Programs, January, 1994, p. 53.

20. Citizen Action, 1993, Poisoning The Great Lakes, page 2.

21. Article 130R state that the policy on environment must contribute "to the pursuit of: the preservation, protection and improvement of the quality of the environment; the protection of human health; the prudent and rationalization of natural resource". Two other articles further supported that "action by the Community relating to the environment shall be based on the principles that preventative action should be taken, that environmental damage should as a priority be rectified at the source, and the polluter should pay. Environmental protection requirements shall be a component of the Community's other policies" See: Frans Van Kraay, 1993, in Law Teacher, page 80-85, volume 28, n1 and Andrew Jackson, 1993, "Environmental Law in the European Community: Greek Tragedy or Epic Tale?, Natural Resource and Environment, Fall 1993, page 19-22.

22. Pollution Prevention Legislative Task Force, Final Report, September, 1993, p. 21.

23. By way of illustration, a company may use 100 tonnes of a toxic substance, of which 90 tonnes are put into products and 10 are wasted. Eliminating or reducing the 100 tonnes of the toxic substance is fundamentally different from that of eliminating or reducing the 10 tonnes of waste prior to release (source reduction). Once the useful life of the product is spent, the toxic substance will eventually find its back into the environment, through landfill or incineration.

24. C. Rolfe, Ensuring Meaningful Public and Worker Involvement in Environmental Protection (West Coast Environmental Law Association, 1994).

25. In 1989, Bo Wahlstrom, a Swedish delegate to the OECD, proposed that the UN adopt a sunsetting regime to address the most hazardous chemicals in commercial use. See generally: Bo Wahlstrom, "Sunsetting for Dangerous Chemicals" Nature 341 (1989), p. 276; J. Foran, "The Sunset Chemical Proposal" International Environmental Affairs 3:4(1991), pp. 303-308; Paul Muldoon, "Sunset Chemicals: The Dawning of a Less Toxic Canada" Probe Post, 14:1 (1991), pp. 12-14.

    In 1991, the Canadian Institute for Environmental Law and Policy and the National Wildlife Federation outlined a detailed proposal for sunsetting chemicals in the report A Prescription for Healthy Great Lakes: Report of the Program for Zero Discharge.

    Swedish progress is being made on sunsetting some hazardous

chemicals. An action plan is developed for each target chemical having phase-out as its ultimate goal. Regulatory measures are taken to implement these action plans.

In the U.S., the Proposed Great Lakes Initiative will undertake to look at sunsetting persistent toxic chemicals from the Great Lakes.

26. IJC. 1994. Seventh Biennial Report on Great Lakes Water Quality. Further, the IJC established the Virtual Elimination Task Force to discuss the feasibility of sunsetting the worst persistent toxic chemicals and its findings can be found in A Strategy for Virtual Elimination of persistent Toxic Substances (Volume 1 and 2).

27. International Joint Commission, Sixth Biennial Report on Great Lakes Water Quality (Washington, Ottawa), p. 25.

28. New Directions Group, Reducing and Eliminating Toxic Substances Emissions: An Action Plan for Canada (unpublished, September of 1991).

29. Ministry of the Environment and Energy, Candidate Substances List for Bans, Phase-outs or Reduction: Multimedia Revision (Toronto: 1993).

30. T. Muir et al. "Application of a Virtual Elimination Strategy to an Industrial Feedstock Chemical - Chlorine" in Volume 2 of the Report of the Virtual Elimination Task Force to the International Joint Commission A Strategy for Virtual Elimination of Persistent Toxic Substances (1993).

31. See: General Accounting Office, Pollution Prevention: EPA Should Reexamine the Objectives and Sustainability of State Programs (January, 1994), p. 19.

32. See: Karen Clark and Barbara Rutherford, CEPA and Environmental Law Enforcement. The Canadian Institute for Environmental Law and Policy, (September 1994).

33. See: Hajo Versteeg, Examining the Current and Proposed Potential of the Canadian Environmental Protection Act to Incorporate Pollution Prevention Principles and Strategies (A Report Submitted to Environment), March 23, 1993.

34. General Accounting Office, Pollution Prevention: Should EPA Reexamine the Objectives and Sustainability of State Programs (January, 1994), p. 24.

35. For example, see: Canadian Labour Congress, A National Pollution Prevention Strategy Endorsed by the CLC National Environment Committee, February, 1992.

36. Paul Emond, "The Case for a Greater Role in the Environmental Protection Field: An Examination of the Pollution Problem and the Constitution" (1972), 10 Osgoode Hall Law Journal 647; Rodney Northey, "Federalism and Comprehensive Environmental Reform: Seeing Beyond the Murky Medium" (1989) 29 Osgoode Hall Law Journal 127; Hajo Versteeg, Examining the Current and Proposed Potential of the Canadian Environmental Protection Act to Incorporate Pollution Prevention Principles and Strategies. A report submitted to Environment Canada, March 23, 1993; Richard Lindgren, "Toxic Substances in Canada: The Regulatory Role of the Federal Government" (1993).

37. Lindgren, ibid., at p. 41.

38. See: Karen Clark and Barbara Rutherford, "The Constitution, Federal-Provincial Relations, Harmonization and CEPA" (Canadian Institute for Environmental Law and Policy, 1994).

39. See: Citizens for Zero Discharge, The Debate is Over It is Time To Act, Citizens' Presentation to the International Joint Commission, 1993 Biennial Meeting, October 23, 1993.

40. Report of the Virtual Elimination Task Force to the International Joint Commission: A Strategy for the Virtual Elimination of Persistent Toxic Substances (Windsor, International Joint Commission, 1993), p. 14.

41. The Pollution Prevention Act of 1990, section 6602(b). 42 U.S.C. 1310(b).

42. Pollution Prevention Act, s. 13102.

43. U.S. EPA, Pollution Prevention 1991: Progress on Reducing Industrial Pollutants (Washington: D.C.: October 1991), p.4.

44. The proposed B.C. Environmental Protection Act (1994), p. 4.