

# THE PRECAUTIONARY PRINCIPLE AND CANADIAN ENVIRONMENTAL LAW: FROM PRINCIPLE TO PRACTICE

by

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## 0 INTRODUCTION

The old adages that "an ounce of prevention is worth a pound of cure," "better safe than sorry," and "err on the side of caution" lie at the heart of the emerging international principle of "precaution" in environmental protection. The failure of existing policies to prevent environmental damage and the emergence of various potentially irreversible ecological problems have forced the international community to take a new approach to scientific uncertainty and environmental protection. In the last decade, a consensus has developed at the international level that where risks of serious or irreversible environmental damage are identified but conclusive evidence is not available, a legal framework demanding certainty before taking action cannot produce adequate responses.<sup>1</sup> The challenge to the evolution and development of the "precautionary principle", as it has come to be known in international circles, lies as much or more in its domestic as well as international implementation. In this context, determining what cases, what point in time, and what particular precautionary measures are warranted have become key issues in the development of the precautionary principle in Canadian environmental law.

Part II of this report examines the evolution of the precautionary principle concept, notes some of its various definitions, and suggests that the parameters of the principle are still very much a work in progress.

Part III of the report summarizes briefly the available information on the development of the precautionary principle in two contexts. First, the principle is examined as a norm or rule of customary international law. Second, the principle is examined as a frequent component in international conventions, declarations, and other documents to which Canada is a signatory. The effect of both customary international law and conventional international law embracing the

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<sup>1</sup> Jutta Brune, Book Review, 91 AM. J. INT'L L. 210 (1997) (reviewing *THE PRECAUTIONARY PRINCIPLE AND INTERNATIONAL LAW: THE CHALLENGE OF IMPLEMENTATION* (David Freestone & Ellen Hay eds., 1996)). The precautionary principle or approach also can be viewed as arising out of a rejection of the traditional "assimilative capacity approach," which assumed that science could accurately predict threats to the environment, provide timely technical solutions to mitigate such threats once they are accurately predicted, and do so in the most efficient manner given scarce financial resources. See, e.g., R. Michael M'Gonigle, et al., *Taking Uncertainty Seriously: From Permissive Regulation to Preventive Design in Environmental Decision-Making*, 32 OSGOODE HALL L. J. 99, 129-138 (1994).

precautionary principle increases the pressure on countries to incorporate the principle in their domestic laws in order to meet international obligations.

Part IV examines key issues in the incorporation of the precautionary principle in domestic law. Implementation issues include (1) the environmental scope of the law's application, (2) the human activities that require a precautionary approach, (3) the types of effects or risks that may trigger precautionary action, and (4) the precautionary measures that may be implemented such as requirements for standards, assessments, procedures, burdens of proof, and public participation. The status and application of the precautionary principle in the domestic law of several countries also is examined. These countries include Australia, the United Kingdom, Switzerland, and the United States. The situation in Canada at the federal and provincial levels is then examined with a view to evaluating the extent to which the precautionary principle has become an effective component of Canadian environmental law.

Part V provides brief findings, conclusions, and recommendations on the state of domestic implementation of the precautionary principle in Canada.

## 1 DEFINING THE PRECAUTIONARY PRINCIPLE

The World Commission on Environment and Development (the "Brundtland Commission") concluded in its historic 1987 report that the risks of irreversible damage to natural systems regionally and globally were becoming significant, and that the future – even a sustainable future – will be marked by increasing risk from new technologies.<sup>2</sup> As part of the Brundtland Commission's recommendations for future action it suggested that there was an urgent need to establish and apply new norms for state and interstate behaviour to achieve sustainable development.<sup>3</sup> It further recommended a series of legal principles to the General Assembly of the United Nations to assist that body in future deliberations on development of environmentally protective measures. One measure proposed would have required states to "take all reasonable precautionary measures to limit the risk when carrying out or permitting certain dangerous but beneficial activities..."<sup>4</sup>

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<sup>2</sup> THE WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT, OUR COMMON FUTURE 323 (1987) [hereinafter BRUNDTLAND COMMISSION]. Regional risks were identified as including acidification and deforestation. Global risks were identified as including ozone layer depletion and climate change. *Id.*

<sup>3</sup> *Id.* at 330. The Commission defined "sustainable development" as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." *Id.* at 43.

<sup>4</sup> *Id.* at 349 (proposed legal principle No. 11 on strict liability).

The concept of taking "precautionary measures" eventually was expanded by the 1992 United Nations Conference on Environment and Development (the "Rio Declaration") as follows: "In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation."<sup>5</sup>

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The Rio Declaration is but one formulation of the precautionary principle. As discussed below, a version of the definition has appeared in numerous international agreements, declarations, and documents since the late 1980s.<sup>6</sup> The principle may be understood as still in a period of definitional evolution. However, in general, the principle also may be understood as ensuring that a substance or activity that poses an ecological threat is prevented from adversely affecting the environment, even where there is scientific uncertainty or no conclusive scientific proof linking the particular substance or activity to environmental harm.<sup>7</sup>

## 2 THE INTERNATIONAL LAW CONTEXT

International law is a system of principles and rules that govern relationships between states and other internationally recognized persons. Although international law is neither created nor enforced like domestic law, it is nonetheless law that governs state behaviour. Though there is no central enforcement authority, breach of international law may result in a variety of sanctions.<sup>8</sup> The sources of international law are set out in the statute creating the International Court of Justice and include customary international law and conventional international law.<sup>9</sup> This part of the report examines briefly the status of the precautionary principle in the context of these two particular sources of

<sup>5</sup> Rio Declaration on Environment and Development, June 14, 1992, *reprinted in* 31 I.L.M. 874, 879 (1992) [hereinafter Rio Declaration] (principle 15).

<sup>6</sup> *See infra* part III.B.

<sup>7</sup> James Cameron & Juli Abouchar, *The Precautionary Principle: A Fundamental Principle of Law and Policy for the Protection of the Global Environment*, 14 B.C. INT'L & COMP. L. REV. 1, 2 (1991) (noting that the precautionary principle is a guiding principle in that its purpose is to encourage, if not oblige, decision-makers to consider the likely harmful effects of activities on the environment before they are approved). *Id.*

<sup>8</sup> Paul Muldoon, *Bilateral and Multilateral Dimensions of International Environmental Law*, in ENVIRONMENTAL LAW AND POLICY 551-552 (E.L. Hughes et al., eds. 1998) (sanctions may include collective sanctions under the United Nations Charter, state action such as recourse to the International Court of Justice, arbitration, economic sanctions, diplomatic protests, and political consequences for a state alleged to be in breach of an international duty).

<sup>9</sup> International Court of Justice Acts, 1977, art. 38(a) (international conventions, whether general or particular, expressly recognized by the contesting states), and art. 38(b) (international custom as evidence of general practice accepted as law).

international law. First, the principle is examined as a norm or rule of customary international law. Second, the principle is examined as a frequent component in international conventions, declarations, and other documents to which Canada is a signatory. The effect of both customary international law and conventional international law embracing the precautionary principle increases the pressure on countries, such as Canada, to incorporate the principle in their domestic laws in order to meet international obligations.

## 0 The Precautionary Principle as a Rule of Customary International Law

Customary international law is law that has been established over time without any formally concluded international instrument. It is established by consistent compliance (state practice) and by acceptance of states that they are practising these rules because they believe they are bound by them.<sup>10</sup>

While several international legal scholars argue that the precautionary principle has attained the status of customary international law,<sup>11</sup> other scholars suggest that opinions remain divided on whether the principle has crystallized into a binding norm of customary international law.<sup>12</sup>

### 1 The Precautionary Principle as Conventional International Law

Conventional international law is created when a state contractually binds itself with obligations and duties with one or more states by way of treaty, convention, or some other instrument that they have ratified.<sup>13</sup>

There are a variety of international conventions that have explicitly adopted formulations of the precautionary principle. The following refers to just a few of these instruments by environmental sector or problem area. Canada is a signatory to many of these documents.

## 0 Environment – General

The Treaty Establishing the European Community declares that “Community policy on the environment shall aim at a high level of protection taking into account the diversity of situations in the various regions of the Community. It

<sup>10</sup> Muldoon, *supra* note 8, at 553.

<sup>11</sup> James Cameron, *Future Directions in International Environmental Law: Precaution, Integration and Non-State Actors*, 19 Dalhousie L. J. 122, 138 (1996) (suggesting that environmental problem solvers no longer feel they have the luxury to wait for conclusive evidence of environmental degradation before designing regulatory programs, and that they are building into their decision making systems an element of precaution, which is gradually emerging as a principle of customary international law).

<sup>12</sup> Owen McIntyre & Thomas Mosedale, *The Precautionary Principle as a Norm of Customary International Law*, 9 J. ENVTL. L. 221, 235 (1997) (noting, however, that the adoption of the principle in a wide variety of recent international instruments, its elaboration in the Rio Declaration, strong support from the international legal academic community, recent state practice, and commentary from the International Court of Justice, all lend weight to the view that the principle has attained the status of a norm of customary international law). *Id.* at 222-223, 231-235, 241.

<sup>13</sup> Muldoon, *supra* note 8, at 552.

shall be based on the precautionary principle and on the principles that preventive action should be taken, that environmental damage should as a priority be rectified at source and that the polluter should pay. Environmental protection requirements must be integrated into the definition and implementation of other Community policies."<sup>14</sup>

## 1 Air Pollution

The Montreal Protocol declares that the parties are "Determined to protect the ozone layer by taking precautionary measures to control equitably total global emissions of substances that deplete it, with the ultimate objective of their elimination on the basis of developments in scientific knowledge, taking into account technical and economic considerations..."<sup>15</sup>

The Framework Convention on Climate Change declares that the "parties should take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing such measures, taking into account that policies and measures to deal with climate change should be cost effective so as to ensure global benefits at the lowest possible cost..."<sup>16</sup>

## 2 Marine Pollution

The London Convention on Ocean Dumping declares that in implementing the Convention, the contracting parties "shall be guided by a precautionary approach to environmental protection whereby appropriate preventive measures are taken when there is reason to believe that substances or energy introduced in the marine environment are likely to cause harm even when there is no conclusive evidence to prove a causal relation between inputs and their effects."<sup>17</sup>

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<sup>14</sup> Treaty Establishing the European Community, Feb. 7, 1992, *reprinted in* 31 I.L.M. 247, art. 130r(2) (1992) [hereinafter Maastricht Treaty].

<sup>15</sup> Convention for the Protection of the Ozone Layer, *reprinted in* 26 I.L.M. 1529 (preamble, para. 6) (1987) [hereinafter Montreal Protocol].

<sup>16</sup> United Nations Framework Convention on Climate Change, May 9, 1992, *reprinted in* 31 I.L.M. 849, art. 3(3) (1992) [hereinafter Framework Climate Change Convention].

<sup>17</sup> 1972 London Ocean Dumping Convention, *reprinted in* \_\_\_ (1991) [hereinafter Amending Resolution on Ocean Dumping]. This convention also sets out the agreement of the parties to ensure effective implementation of the "precautionary approach" through such measures as preventing pollution at source, evaluation of alternative waste management, reduction of risk and scientific uncertainty of disposal operations, and adequate monitoring. *Id.*

The Convention on Protection of the Baltic Sea Area Marine Environment commits the parties to applying "the precautionary principle, i.e., to take preventive measures when there is reason to assume that substances or energy introduced, directly or indirectly, into the marine environment may create hazards to human health, harm living resources and marine ecosystems, damage amenities or interfere with other legitimate uses of the sea even when there is no conclusive evidence of a causal relationship between inputs and their alleged effects."<sup>18</sup>

### 3 Conservation of Nature

The Preamble to the Convention on Biological Diversity refers to the precautionary principle in the following terms: "Aware of the general lack of information and knowledge regarding biological diversity and of the urgent need to develop scientific, technical and institutional capacities to provide the basic understanding upon which to plan and implement appropriate measures; Noting that it is vital to anticipate, prevent and attack the causes of significant reduction or loss of biological diversity at source; Noting also that where there is a threat of significant reduction or loss of biological diversity, lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimize such a threat..."<sup>19</sup>

### 4 Hazardous Waste

The Bamako Convention on hazardous wastes in Africa declares that the parties should adopt and implement: "...the preventive, precautionary approach to pollution which entails...preventing the release into the environment of substances which may cause harm to humans or the environment without waiting for scientific proof regarding such harm. The parties shall cooperate with each other in taking the appropriate measures to implement the precautionary principle to pollution prevention through the application of clean production methods, rather than the pursuit of a permissible emissions approach based on assimilative capacity assumptions."<sup>20</sup>

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<sup>18</sup> Helsinki Convention on the Protection of the Marine Environment of the Baltic Sea Area, *reprinted in* 8 INT'L J. MARINE & COASTAL L. 191, 215-243, art. 3(2) (1992) [hereinafter Baltic Sea Area Convention].

<sup>19</sup> United Nations Convention on Biological Diversity, June 5, 1992, *reprinted in* 31 I.L.M. 818, preamble (1992) [hereinafter Biodiversity Convention].

<sup>20</sup> Convention on the Ban of Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa, *reprinted in* 30 I.L.M. 775, art. 4(3)(f) (1991) [hereinafter Bamako Convention].



## 5 Summary

From the above brief review of primarily international conventions that have focused on the precautionary principle, the following conclusions may be drawn. First, the precautionary principle has become a key component of many international environmental instruments. Second, many of the documents affirm the view that pollution prevention is preferable to abatement of harm after it has occurred. Third, where full scientific certainty about environmental consequences is lacking, preventive measures may still be required where the environmental threat is potentially significant. Fourth, certain formulations of the precautionary principle, such as the Framework Convention on Climate Change, the Montreal Protocol, (and the Rio Declaration) are explicit in allowing only cost-effective measures where full scientific proof is lacking. Other formulations of the principle are silent on the role economic considerations are to play in such circumstances.

Commentators also have suggested that because in certain conventions, declarations, or other international instruments it is unclear (1) whether the precautionary principle is meant to be a duty or a recommendation (2) what level of environmental risk would trigger precautionary measures, and (3) which sciences, factors (e.g. economic), or scientific determinations are relevant, the principle may become unenforceably vague depending on how it is drafted in a particular instrument.<sup>21</sup> While this concern was expressed in the context of international instruments, the potential exists for the same problems to occur in domestic law treatments of the precautionary principle.

## 3 THE PRECAUTIONARY PRINCIPLE AND NATIONAL LAW

This part of the report examines key issues in the incorporation of the precautionary principle in domestic law. There are a number of implementation issues to consider in the domestic law context. First, the environmental scope of the law's application. Second, the human activities that require a precautionary approach. Third, the types of effects or risks that may trigger precautionary action. Fourth, the precautionary measures that may be implemented such as requirements for standards, assessments, procedures, burdens of proof, and public participation. The status and application of the precautionary principle in the domestic law of several countries also is examined. These countries include Australia, the United Kingdom, Switzerland, and the United States. The situation in Canada at the federal and provincial levels is then examined with a view to evaluating the extent to which the precautionary principle has become an effective component of Canadian environmental law.

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<sup>21</sup> James E. Hickey, Jr. & Vern R. Walker, *Refining the Precautionary Principle in International Environmental Law*, 14 VA. ENVTL. L.J. 423, 437-438 (1995).

## 2 Incorporating the Precautionary Principle in Domestic Law: Key Issues of Concern

Incorporating the precautionary principle into domestic law requires consideration of a number of implementation issues. These are reviewed briefly below.

### 6 Environmental Scope of Law's Application

At the international level, the precautionary principle has been invoked by reference to geographic area,<sup>22</sup> particular aspect of ecosystem or environmental media,<sup>23</sup> or general environmental policy framework.<sup>24</sup> Domestic law has the potential to apply the precautionary principle in a similar manner. As will be discussed below, Canada has incorporated the precautionary principle into national legislation respecting, for example, protection of oceans,<sup>25</sup> while Nova Scotia has invoked the principle under general environmental protection legislation.<sup>26</sup>

### 7 Human Activities Requiring Precaution

International conventions that have adopted the precautionary principle have focused on particular as well as general human activities of concern. Conventions that have focused on particular human activities requiring precautionary measures have focused on such matters as dumping of substances into marine environments,<sup>27</sup> emissions of substances into the atmosphere,<sup>28</sup> and activities respecting the movement and management of hazardous wastes.<sup>29</sup> International conventions and declarations also have been highly general in terms of the human activities that should be the subject of precautionary measures.<sup>30</sup> The incorporation of the precautionary principle into domestic law should be specific enough to ensure that particular activities of concern trigger the obligation to consider and apply precautionary measures.

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<sup>22</sup> See, e.g., Bamako Convention, *supra* note 20, at 776 (Africa).

<sup>23</sup> See, e.g., Montreal Protocol, *supra* note 15, at 1541 (ozone layer).

<sup>24</sup> See, e.g., Maastricht Treaty, *supra* note 14, at \_\_\_ (all European Union environmental policies).

<sup>25</sup> See *infra* part IV.C.1.

<sup>26</sup> See *infra* part IV.C.2.a.

<sup>27</sup> See, e.g., London Ocean Dumping Convention, *supra* note 17, at \_\_\_.

<sup>28</sup> See, e.g., Framework Climate Change Convention, *supra* note 16, at \_\_\_.

<sup>29</sup> See, e.g., Bamako Convention, *supra* note 20, at \_\_\_.

<sup>30</sup> See, e.g., Rio Declaration, *supra* note 5, at \_\_\_ (precautionary approach shall be widely applied by States).

## 8 Types of Effects Triggering Precaution

Where there may be uncertainty about whether a particular activity should be subject to a precautionary approach, reference to the type of effect or level of risk that may be caused can clarify the obligation in particular circumstances. International conventions, declarations, and other documents have provided a wide variety of characterizations of adverse effects that may trigger the obligation to consider and apply precautionary measures. The London Ocean Dumping Convention refers simply to substances or energy introduced in the marine environment that are "likely to cause harm."<sup>31</sup> The Bamako Convention refers to an even lower threshold test; substances released to the environment that "may cause harm."<sup>32</sup> At the other end of the spectrum, the Framework Climate Change Convention requires that a more onerous threshold be met; "threats of serious or irreversible damage."<sup>33</sup>

Commentators have suggested that regardless of the trigger that is employed decision makers proposing to incorporate the precautionary principle into domestic law will have to do at least two things: (1) craft an operationally meaningful standard, and (2) address the role of economic considerations in the process.<sup>34</sup>

## 9 Making Precautionary Measures Operational

There are a number of precautionary measures that may be implemented in domestic law such as requirements for standards, assessments, procedures, burdens of proof, and public participation. These are considered briefly below.

### 0 Standards

To ensure that lack of scientific certainty is not used as a reason for deferring environmentally protective action, commentators have suggested that the precautionary principle requires the use of clean production methods, best available technology ("BAT"), and best environmental management practices.<sup>35</sup> Process standards, such as BAT, are relevant when dealing with removal of industrial emissions and discharges from the environment. Management type standards will be more relevant where the human interference is direct or indirect

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<sup>31</sup> London Ocean Dumping Convention, *supra* note 17, at \_\_\_.

<sup>32</sup> Bamako Convention, *supra* note 20, at \_\_\_.

<sup>33</sup> Framework Climate Change Convention, *supra* note 16, at \_\_\_.

<sup>34</sup> John Moffet, *Legislative Options for Implementing the Precautionary Principle*, 7 J. ENVTL. L. & PRAC. 157 (1997).

<sup>35</sup> Ellen Hey, *The Precautionary Concept in Environmental Policy and Law: Institutionalizing Caution*, 4 GEO. INT'L ENVTL. L. REV. 303, 311 (1992).

removal of biological species and their habitat from the environment. Thus, for example, timber harvesting techniques and locations may have to be chosen that have minimal effects on particularly vulnerable species and their habitat.

### **1 Study or Assessment Requirements**

To ensure that lack of scientific certainty is not used as a reason for deferring precautionary action, commentators have suggested that the precautionary principle also requires the use of comprehensive methods of environmental and economic assessment to decide upon appropriate protective measures.<sup>36</sup> Thus, whenever scientific uncertainty about actual effects exists, activities should only be allowed if the proponent of the activity is obligated to reduce that uncertainty through appropriate study. Environmental assessment, emissions inventories, audits, and monitoring are examples referred to in a variety of international instruments,<sup>37</sup> that also are very familiar measures found in domestic legislation. A key component of an environmental assessment must include examination of alternatives to ensure the least harmful alternative is chosen.<sup>38</sup>

### **2 Procedural Requirements**

Conventions as well as domestic legislation may require prior notice before activities are undertaken, as well as the issuance of permits or licences, or compliance with reporting requirements.<sup>39</sup> These procedural requirements, though rudimentary in nature, may provide the opportunity where they are not observed to prevent potentially damaging activities from proceeding until appropriate precautionary measures are invoked.

### **3 Burden of Proof**

Commentators have suggested that the principle of precautionary action requires that the burden of proof rest with persons responsible for potentially harmful activity to demonstrate that their actions are not or will not cause environmental harm.<sup>40</sup> Many statutes in Canada and the United States place the

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<sup>36</sup> *Id.*

<sup>37</sup> Hickey & Walker, *supra* note 21, at 451.

<sup>38</sup> Chris W. Backes & Jonathan M. Verschuuren, *The Precautionary Principle in International, European, and Dutch Wildlife Law*, 9 *COLO. J. INT'L ENVTL. L. & POL'Y* 43, 56, 58 (1998).

<sup>39</sup> *Id.*

<sup>40</sup> Cameron & Abouchar, *supra* note 7, at 22. See also Backes & Verschuuren, *supra* note 38, at 56, 58; and Bernard A. Weintraub, *Science, International Environmental Regulation, and the Precautionary Principle: Setting Standards and Defining Terms*, 1 *N.Y.U. ENVTL. L.J.* 173, 178,

burden on the proponent of risky activity to demonstrate that their conduct will not lead to harm. However, where the trigger for shifting the burden to responsible persons is set very high, such as "serious and irreversible harm" as set out, for example, in the Framework Convention on Climate Change<sup>41</sup> the adoption of that test in domestic legislation can result in a very significant evidentiary burden being left on government before the burden may be shifted.<sup>42</sup>

#### 4 Public Participation

Public participation also has been seen as an integral part of implementing the precautionary principle because of the need to balance value judgments before decision-makers when health and environmental risks of activities are being evaluated.<sup>43</sup> The role of the public may include involvement in administrative hearings, citizen suits, and access to information.<sup>44</sup>

### 3 The Approach of Other Countries

This part of the report examines the status and application of the precautionary principle in the domestic law of several countries. These countries include Australia, the United Kingdom, Switzerland, and the United States.

#### 10 Australia

The precautionary principle has been applied in three ways in Australia. First, through the adoption of legislation. Second, through policy development. Third, through the courts.

The precautionary principle is entrenched in several pieces of federal environmental legislation in Australia usually in the context of statutes implementing international conventions.<sup>45</sup> The principle is explicitly referred to in the Great Barrier Reef Marine Park Act, which provides that in preparing

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204-207 (1992) (noting that a regime premised on the precautionary principle places the burden of proving harmlessness of particular activities on the persons proposing to engage in those activities before they are undertaken).

<sup>41</sup> Framework Climate Change Convention, *supra* note 16, at \_\_\_.

<sup>42</sup> Moffet, *supra* note 34, at 166.

<sup>43</sup> *Id.* at 168-169.

<sup>44</sup> Cameron & Abouchar, *supra* note 7, at 25.

<sup>45</sup> Charmian Barton, *The Status of the Precautionary Principle in Australia: Its Emergence in Legislation and as a Common Law Doctrine*, 22 HARV. ENVTL. L. REV. 509, 531, 533 (1998). See, e.g. Ozone Protection Act, 1989, (Austl.). This law gives effect in Australia to the Montreal Protocol by annexing the convention in a schedule to the statute.

management plans the regulatory agency established under the statute must have regard to both the protection of world heritage values and the precautionary principle.<sup>46</sup> Other federal statutes address the precautionary principle directly, such as with respect to fisheries management,<sup>47</sup> or indirectly, such as with respect to environmental impact assessment.<sup>48</sup>

A further way in which the precautionary principle has been adopted is in federal environmental protection policies in Australia. An example is the 1992 Intergovernmental Agreement on the Environment ("IGAE").<sup>49</sup> The IGAE sets out a number of principles that the federal, state, territorial, and local government parties agree will inform their environmental decision-making, including application of the precautionary principle expressed as follows:

"Where there are threats of serious irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by: (i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment; and (ii) an assessment of the risk-weighted consequences of the various options."<sup>50</sup>

Although the precautionary principle is to be used to guide environmental decision-making at all levels of government in Australia, commentators note that the IGAE fails to explore the meaning of the principle and gives little assistance as to how the principle is to be applied in practice.<sup>51</sup>

The courts of Australia also have considered the precautionary principle. The most extensive discussion of the precautionary principle in Australian law is *Leatch v. National Parks & Wildlife Service*.<sup>52</sup> Due to a population increase, the local city council proposed to construct a road to relieve traffic congestion on

<sup>46</sup> Great Barrier Reef Marine Park Act, 1975, s. 39Z(1), (Austl.).

<sup>47</sup> Fisheries Management Act, 1991, ss. 3(1)(b), 4(1), (Austl.) (objectives of the law include that the exploitation of fisheries resources and the carrying out of any related activities are conducted in a manner consistent with the principles of ecological sustainable development and the exercise of the precautionary principle).

<sup>48</sup> Environmental Protection (Impact of Proposals) Act, 1974, s. 5 (Austl.) (projects effecting the environment to a "significant extent" require environmental impact assessments). This law has been characterized as indirectly incorporating the precautionary principle because it requires decision-makers to consider potential environmental effects of an activity priority to the activity being permitted to proceed. Barton, *supra* note 45, at 531-532.

<sup>49</sup> The IGAE is annexed in the schedule to the National Environment Protection Council Act, 1994, (Austl.). See also Barton, *supra* note 45, at 523.

<sup>50</sup> IGAE, *supra* note 49, at s. 3.5.1.

<sup>51</sup> Barton, *supra* note 45, at 524.

<sup>52</sup> *Leatch v. Nat'l Parks & Wildlife Serv. and Shoalhaven City Council* (1993), 81 L.G.E.R.A. 270.

existing transportation routes. Before commencing construction of the road, the council obtained a licence, as required by the National Parks and Wildlife Act, from the national wildlife agency permitting the city to "take or kill" wildlife. The applicant Leatch appealed the decision of the agency to grant the licence on the basis of the effect the proposed road would have on certain endangered species in the area. The court noted that pursuant to federal and state laws it was required to take into account various matters including the circumstances of the case and the public interest.

A key issue in the case was whether the precautionary principle was a relevant consideration in the appeal. The court described the precautionary principle as a "statement of common sense. It is directed towards the prevention of serious irreversible harm to the environment in situations of scientific uncertainty. Its premise is that where uncertainty exists concerning the nature or scope of environmental harm (whether this follows from policies, decisions or activities), decision makers should be cautious."<sup>53</sup> The court then considered the purpose of the statute and concluded that it was aimed at the preservation and protection of endangered wildlife. Moreover, although the precautionary principle was not expressly mentioned in the statute, the court was of the view that the cautious approach suggests it is clearly consistent with the subject matter, scope and purpose of the statute. The court noted that there was very little information on the endangered species that were threatened by the road, and what little information that was available was inadequate to assess the impact of the road on the survival of the species. Consequently, the court concluded that:

"Application of the precautionary principle appears to [the court] to be most apt in a situation of a scarcity of scientific knowledge of species population, habitat, and impacts. Indeed, one permissible approach is to conclude that the state of knowledge is such that one should not grant a licence to 'take or kill' the species until much more is known."<sup>54</sup>

Because all parties agreed that the proposed road would likely have an adverse impact on the other endangered species, the court in weighing all the issues, including possible alternative routes and the operation of the precautionary principle, concluded that the decision of the agency to grant the licence to the city should be overturned.<sup>55</sup>

The precautionary principle has been considered by the Australian courts in several other cases. In *Greenpeace Australia Ltd. v. Redbank Power Co.*<sup>56</sup> an

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<sup>53</sup> *Id.* at 282.

<sup>54</sup> *Id.* at 283.

<sup>55</sup> *Id.* at 286-287.

<sup>56</sup> *Greenpeace Australia Ltd. v. Redbank Power Co.* (1995), 86 L.G.E.R.A. 143.

appeal of the issuance of a power station construction licence on the grounds that the project would contribute to increased carbon dioxide levels and consequently the greenhouse effect was dismissed by the courts. The court agreed that the project's carbon dioxide levels would contribute to the greenhouse effect, but there was uncertainty about the effect the emissions would have on global warming. The court concluded that "the application of the precautionary principle dictates that a cautious approach should be adopted in evaluating various relevant factors...[but] it does not require that the greenhouse issue should outweigh all other issues."<sup>57</sup> The case has been viewed as suggesting the need for legislation in Australia to implement greenhouse gas controls, as it may be difficult to apply the precautionary principle to any one proposal that has the potential to contribute to the greenhouse effect.<sup>58</sup>

One of the most recent cases in Australia to consider the application of the precautionary principle is *Friends of Hinchinbrook Society Inc. v. Minister for Environment*.<sup>59</sup> In *Hinchinbrook* the applicant challenged a decision of the federal environment minister who had approved the construction of a tourist resort near the Great Barrier Reef, a world heritage area protected under the World Heritage Properties Conservation Act. The applicant argued that the Minister's decision failed to take into account the precautionary principle as formulated under the IGAE. The court dismissed this argument suggesting that the precautionary principle as formulated under the IGAE, is not a relevant consideration that the Minister is required to take into account when making a decision under the World Heritage Properties Conservation Act.

The *Hinchinbrook* court further noted that it would be difficult for the Minister to have regard to the conservation and protection of listed heritage sites, if he did not consider "the prospect of serious or irreversible harm to the property in circumstances where scientific opinion is uncertain or in conflict." While the Minister did not refer to the principle in his reasons for decision, he did have scientific reports before him. According to the court, the Minister was aware that he should act cautiously in making his decisions. Consequently, the court concluded that the Minister "took into account the common sense principle that caution should be exercised where scientific opinion is divided or scientific information is incomplete."<sup>60</sup>

The Australian cases suggest the need for the precautionary principle to be entrenched directly in legislation through objects clauses and operational strategies if governments are to be required to take full account of the principle

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<sup>57</sup> *Id.* at 153-154.

<sup>58</sup> Barton, *supra* note 45, at 542.

<sup>59</sup> *Friends of Hinchinbrook Society Inc. v. Minister for Environment* (1997), 142 A.L.R. 632 (F.C.A.G.D.).

<sup>60</sup> *Id.*



and apply it consistently to matters arising under statute. Australian commentators suggest that for the courts to more fully develop the principle as common law doctrine, a standard of proof such as lack of reasonable medical or ecological concern must be imposed on those with the burden of proof; that is, parties responsible for creating risk of environmental harm.<sup>61</sup>

## 11 United Kingdom

The precautionary principle has been considered in the United Kingdom in both policy pronouncements and by the courts. In 1990, the British Government presented to Parliament a white paper setting out the environmental strategy for several government departments.<sup>62</sup> The white paper characterized the government's responsibility as one of prudent and conscientious stewardship of the planet. In order to fulfill its stewardship responsibilities, the white paper indicated that the government has an obligation to preserve and enhance the environment for future generations. Among the policies and principles proposed in the white paper to achieve these objectives was the precautionary principle: "...given the environmental risks, we must act responsibly and be prepared to take precautionary action where it is justified..."<sup>63</sup> The report expanded on the government's views on the appropriate type of precautionary action to be taken in the following terms:

"We must act on the facts and on the most accurate interpretation of them, using the best scientific and economic information. That does not mean we must sit back and wait until we have 100% evidence about everything. Where the state of our planet is at stake, the risks can be so high and the costs of corrective action so great, that prevention is better and cheaper than cure. We must analyze the possible benefits and costs both of action and inaction. Where there are significant risks of damage to the environment, the government will be prepared to limit the use of potentially dangerous materials or the spread of potentially dangerous pollutants, even where scientific knowledge is not conclusive, if the balance of likely costs and benefits justifies it. This precautionary principle applies particularly where there are good grounds for judging either that action taken promptly at comparatively low cost

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<sup>61</sup> Barton, *supra* note 45, at 557-558.

<sup>62</sup> GOVERNMENT OF THE UNITED KINGDOM, THIS COMMON INHERITANCE: A WHITE PAPER (1990) [hereinafter UK WHITE PAPER] (departments covered by the strategy included environment, health, trade and industry).

<sup>63</sup> *Id.*, para. 1.15.

may avoid more costly damage later, or that irreversible effects may follow if action is delayed."<sup>64</sup>

The applicability of the precautionary principle expressed in the white paper was judicially considered by the English courts in the recent case of *R. v. Secretary of State for Trade and Industry ex parte Duddridge*.<sup>65</sup> In *Duddridge*, an application for judicial review was brought against a decision of the Secretary of State for Trade and Industry when he refused to issue regulations under a national electricity statute to restrict the electromagnetic fields from electric cables that were being laid as part of the national grid system. The applicants alleged that the non-ionizing radiation ("NIR") that would be emitted from the new cables would enter their homes and schools, and would be of such a level as might expose them to the risk of developing leukemia. Consequently, the applicants wanted the Secretary of State to promulgate regulations to remove any such risk.

As part of their argument, the applicants in *Duddridge* referred to the white paper policy for the view that the Secretary of State was obliged to apply the precautionary principle when considering whether he should take action under the electricity law to protect human health from the possibility of risk of serious harm. However, the applicants also argued that the white paper misunderstood the precautionary principle. They suggested that the white paper seeks to set the threshold for action where a significant risk of damage arises, whereas, the applicants were of the view that the precautionary principle requires action as soon as any possible risk is demonstrated.<sup>66</sup>

The court rejected the applicants' argument on this point for the following reasons. First, the court noted that there is no single authoritative definition of the precautionary principle. Second, the court noted that: "If the Government announces a policy which it intends to adopt without being under any obligation to do so, it must be entitled to define the limits of that policy in any way it wishes. If the Government says it will apply a precautionary policy when it perceives a significant risk of harm, it must, in my view, be entitled to apply that threshold for action."<sup>67</sup> Consequently, the court was not prepared to hold that the Secretary of State's decision was "wholly unreasonable or perverse" in the circumstances.<sup>68</sup>

The applicants in *Duddridge* also relied upon the *Leatch* decision in Australia for the proposition that the precautionary principle should be applied as a matter of common sense and reasonableness. The *Duddridge* court rejected

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<sup>64</sup> *Id.*

<sup>65</sup> *R. v. Secretary of State for Trade and Industry ex parte Duddridge*, 7 J. ENVTL. L. 224 (1995) (Q.B.D. Oct. 4, 1994), *aff'd* 7 J. ENVTL. L. 244 (ENG. C.A. Oct. 6, 1995).

<sup>66</sup> *Id.* at 224, 226-227, 230.

<sup>67</sup> *Id.* at 230-231.

<sup>68</sup> *Id.* at 231.

this argument as arising from the particular statute under consideration in *Leatch*, which permitted the *Leatch* court to take into consideration any matter the court considered relevant.<sup>69</sup>

The applicants' third major argument in *Duddridge* was that as a matter of European Community law the Secretary of State was required to apply the precautionary principle because of Article 130r(2) of the Maastricht Treaty. The court rejected this argument on the ground that it is settled law in the European Community that Article 130r(2) does not impose immediate obligations on member states to act in a particular way.<sup>70</sup>

In summary, and as set out in the white paper, the threshold for taking precautionary action in circumstances of uncertainty in the United Kingdom is reached where there are "significant risks of damage." The *Duddridge* case makes this limited or restricted formulation of the precautionary principle a relevant consideration in the law of the United Kingdom.<sup>71</sup>

## 12 Switzerland

The Swiss government also recently has had occasion to apply precautionary principles in the context of potential biological effects from non-ionizing radiation ("NIR"). Current international guidelines assume that low-level exposures to NIR are safe for living things if no heating is caused. However, evidence appears to be growing that current NIR safety standards based on thermal effects, allow exposures that can cause biological effects. Because the current state of scientific consensus remains inadequate to develop reliable exposure standards or limits, and confronted with how to protect public health under conditions of uncertainty, Swiss public health and environmental authorities have decided to turn to the alternative of "prudent avoidance." What this will mean in practice is that the government will establish exclusion zones around new sources of NIR. This application of the precautionary principle will give the Swiss government the "toughest safety guidelines in the world" for NIR.<sup>72</sup>

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<sup>69</sup> *Id.*

<sup>70</sup> *Id.* at 233-237. The case law referred to was the *Peralta* case C-379/92 (Eur. Ct. J., July 14, 1994). The European chemical industry has endorsed the *Duddridge* and *Peralta* interpretations of Article 130r(2) of the Maastricht Treaty; that is, that the precautionary principle is not capable of having direct effect on the laws of member states. The European chemical industry supports the view that the precautionary principle is a source of guidance. See EUROPEAN CHEMICAL INDUSTRY COUNCIL, *THE PRECAUTIONARY PRINCIPLE, INDUSTRY AND LAW-MAKING* 1-3 (1995).

<sup>71</sup> David Hughes, *The Status of the 'Precautionary Principle' in Law*, 7 J. ENVTL. L. 224, 241, 244 (1995).

<sup>72</sup> MICROWAVE NEWS, *TRANSLATING THE PRECAUTIONARY PRINCIPLE INTO ACTION* (1999).

### 13 United States

In the early 1990s, the position of the United States, during the Bush Administration, on the application of the precautionary principle was best known in the context of the issue of climate change. Quite simply, the United States objected to the application of the precautionary principle to the climate change problem.<sup>73</sup> The United States developed an alternative policy proposal, known as "no regrets." The "no regrets" policy was based on taking actions "fully justified in their own right" that have the "added advantage of coping with greenhouse gases." The United States regarded such actions as "making economic and environmental sense regardless of the outcome of scientific disputes over causes and effects."<sup>74</sup> The "no regrets" policy emphasized the tension between economic development and environmental protection, and was seen as a *laissez faire* or business as usual approach to environmental decision-making. In contrast, the precautionary approach, as a companion principle of sustainable development, attempts to treat economic development and environmental protection as interdependent.<sup>75</sup>

The Clinton Administration has been regarded as more sympathetic to the adoption of a precautionary approach to climate change issues. In mid-1998, the Clinton Administration set out the rationale for taking action on climate change in the following terms:

"The great weight of scientific authority suggests that climate change is a serious problem and that prudent steps to mitigate it are in order...As long ago as 1992, the National Academy of Sciences...concluded that '...even given the considerable uncertainties in our knowledge of the relevant phenomena, greenhouse warming poses a potential threat to merit prompt responses...Investment in mitigation measures acts as insurance protection against the great uncertainties and the possibility of dramatic surprises...'

What the science tells us is that greenhouse gases are rapidly building up in the atmosphere as a result of the burning of fossil fuels and deforestation; that the concentration of these gases is 30 percent higher than it was at the beginning of the industrial

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<sup>73</sup> Weintraub, *supra* note 40, at 187-188 (noting that the United States had objected to the adoption of precautionary language concerning climate change resolutions proposed at the Second World Climate Conference held in Geneva, Switzerland in 1990).

<sup>74</sup> *Id.* at 188 (noting the comments of then United States Secretary of State James Baker in an address before the National Governors' Association).

<sup>75</sup> *Id.* at 188-189.

revolution; and that this concentration is expected to reach almost twice current levels by 2100 – a level not seen in 50 million years...

Scientific opinion is not unanimous on these points, but most independent climate scientists believe that global climate change poses real risks...The prevailing view is that the risks of climate change warrant prudent and prompt action. Prompt because to wait for greater scientific certainty could have very large costs...Consequently, there is a substantial rationale for acting now. Our task is to act in a manner that responds appropriately to the scope of the risk while at the same time being economically sensible."<sup>76</sup>

In late 1997, the United States announced a domestic program designed to reduce greenhouse gases because: "Global climate change is the premier environmental challenge and opportunity of the 21<sup>st</sup> century, and the risks it poses justify sensible preventive steps."<sup>77</sup>

The Clean Air Act Amendments of 1990 ("CAAA"), the primary federal law in the United States addressing air pollution, has been characterized as applying a precautionary approach. For example, CAAA section 109(b)(1) requires that national primary ambient air quality standards must allow an "adequate margin of safety" sufficient to protect "public health."<sup>78</sup> The United States Court of Appeals has held that this language requires consideration of the uncertainties associated with inconclusive scientific and technical information and is intended to provide a reasonable degree of protection against hazards not yet identified.<sup>79</sup> Moreover, with respect to establishment of primary standards, cost is not to be considered.<sup>80</sup> A further example of a precautionary type approach under the CAAA is section 112(d)(4) regarding hazardous air pollutants ("HAPs"). Where a health threshold has been established for a HAP, this threshold may be

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<sup>76</sup> GOVERNMENT OF THE UNITED STATES, THE KYOTO PROTOCOL AND THE PRESIDENT'S POLICIES TO ADDRESS CLIMATE CHANGE i-ii (1998).

<sup>77</sup> GOVERNMENT OF THE UNITED STATES, PRESIDENT CLINTON'S CLIMATE CHANGE PROPOSAL 1 (1997) (binding targets to reach 1990 emissions levels by 2008-2012, industry consultations, broad-based domestic and international emissions trading system, multi-billion dollar program of tax cuts and research and development for new technologies).

<sup>78</sup> 42 U.S.C.A. § 7409(b)(1) (West 1999). The national primary ambient air quality standards cover six substances: particulate matter, sulphur dioxide, carbon monoxide, nitrogen dioxide, ozone, and lead.

<sup>79</sup> *Lead Indus. Ass'n v. EPA*, 647 F.2d 1130, 1154 (D.C. Cir.), *cert. denied* 449 U.S. 1042 (1980); *American Petr. Inst. v. Costle*, 665 F.2d 1176, 1177 (D.C. Cir. 1981), *cert. denied*, 455 U.S. 1034 (1982).

<sup>80</sup> *Lead Indus. Ass'n* 647 F.2d at 1148.

considered "with an ample margin of safety" when emissions standards are being established.<sup>81</sup>

Under legislative provisions of this type, proof of harm is intended to be relaxed in the face of scientific uncertainty in order to meet public concerns about avoiding environmental health risks. However, laws of this type have been criticized in the United States for leading to few regulations of substances of concern. The cause of this failure to regulate appears to be underestimation of the degree to which uncertainty about environmental or health effects of a substance or activity can constitute a formidable obstacle to regulatory action. Consequently, it has been suggested that it is somewhat problematic to rely on such legislation as a basis for applying precautionary principles without ensuring that the process or regime in place can respond to different levels of certainty and severity of harm.<sup>82</sup>

A further approach to uncertainty in the United States can be found at the state level where a number of state laws require toxics use reduction as a preventive means of addressing environmental problems. Such preventive approaches have been described as providing a foundation for development of the precautionary principle.<sup>83</sup>

#### 4 The Situation in Canada

In this part of the review, the situation in Canada at the federal and provincial levels is examined with a view to evaluating the extent to which the precautionary principle has become an effective component of Canadian environmental law.

#### 14 Federal Law

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<sup>81</sup> 42 U.S.C.A. § 7412(d)(4) (West 1999). HAPs are defined by reference to whether they are listed in the CAAA. 42 U.S.C.A. § 7412(b)(1) (West 1999) (178 substances or classes of substances).

<sup>82</sup> Alyson C. Flournoy, *Legislating Inaction: Asking the Wrong Questions in Protective Environmental Decision-making*, 15 HARV. ENVTL. L. REV. 327, 330-332, 386-389 (1991) (noting that statutes could provide a broad array of responses, accounting for situations in which the threatened harm is extreme, serious, substantial, or slight). The type of regulation could vary according to the severity of the potential harm, the cost in time and resources of obtaining additional relevant information, and the incremental certainty that additional information could provide. *Id.* at 388.

<sup>83</sup> M'Gonigle, *supra* note 1, at 169 (referring to Massachusetts Toxics Use Reduction Act). Toxics use reduction refers to changes in production processes, products or raw materials that reduce, avoid or eliminate the use of toxic or hazardous substances and the generation of hazardous byproducts, so as to reduce overall environmental and human health risks). *Id.* at 150.

Two federal laws that have recently been subject to Parliamentary scrutiny and reform are examined here to determine the extent to which the precautionary principle has been incorporated. These federal laws are (1) the Canadian Environmental Protection Act ("CEPA"),<sup>84</sup> and (2) the Oceans Act.<sup>85</sup>

## 5 *Canadian Environmental Protection Act*

CEPA is the federal government's primary piece of legislation for controlling a number of environmental problems such as toxic substances, ocean dumping, and related matters. First enacted in 1988, Parliament required that the law undergo a five-year comprehensive review thereafter.<sup>86</sup> This review was a prelude to major amendments to the statute that have just recently been passed by Parliament.<sup>87</sup> The following brief examination of CEPA reviews (1) how the issue of precautionary action was considered during the five-year review, (2) how the subsequent government bill, C-32, treated the precautionary principle, and (3) how the final version of what is now known as CEPA, 1999 addresses the principle.

### 0 CEPA Five Year Review

As enacted in 1988 CEPA did not contain reference to the precautionary principle, though a number of initiatives taken under the auspices of the Act had precautionary characteristics.<sup>88</sup> However, in preparing for the five-year review, the federal government did examine how the principle could be incorporated into the law. A study commissioned for the federal government examined three options for addressing the precautionary principle in future amendments to CEPA. The three options were (1) no specific reference to the precautionary principle in the Act,<sup>89</sup> (2) reference to the principle in the preamble to CEPA,<sup>90</sup> and (3) incorporation of the principle into substantive parts of the Act.<sup>91</sup>

<sup>84</sup> Canadian Environmental Protection Act ("CEPA"), R.S.C. 1985 (4<sup>th</sup> Supp.), c. 16.

<sup>85</sup> Oceans Act, S.C. 1996, c. 31.

<sup>86</sup> R.S.C. 1985 (4<sup>th</sup> Supp.), c. 16, s. 139.

<sup>87</sup> Canadian Environmental Protection Act, 1999 (CEPA 1999), S.C. 1999, c. 33 (Assented to Sept 14, 1999). The new Act will come into force in 2000.

<sup>88</sup> David VanderZwaag, *CEPA and the Precautionary Principle/Approach*, in ENVIRONMENT CANADA-REVIEWING CEPA: THE ISSUES - # 18 (1994) (noting, for example, that the Montreal Protocol's precautionary approach to phasing out the production and consumption of ozone depleting substances has been implemented through regulatory schedules under CEPA 1988; the phasing out of the use of PCBs has been implemented pursuant to regulations promulgated under CEPA 1988; and the requirement to describe 3Rs initiatives in waste audits has been imposed on applicants for ocean dumping permits pursuant to ocean dumping regulations under CEPA 1988). *Id.* at 15.

<sup>89</sup> *Id.* at 15-16 (noting that on the one hand the precautionary principle is still vague and elusive and, therefore, legislative incorporation should await fuller understanding of the practical

At parliamentary standing committee hearings during the five-year review process, support was expressed by various witnesses for including the precautionary principle only in the preamble to the statute,<sup>92</sup> and in both the preamble and in the operational parts of the legislation.<sup>93</sup> The standing

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implications of the principle at the domestic and international levels; while on the other hand the principle is already considered to be a fundamental approach at the international level and, consequently, Canada would simply be legally endorsing previous commitments to the principle already made in several international conventions and declarations).

<sup>90</sup> *Id.* at 16 (noting that inclusion of a reference to the principle in the preamble offered the government flexibility by providing guidance to decision-making without the necessity for detailing regulatory obligations, and also allowed for interpretations and application to evolve over time; however, mere inclusion in a preamble runs the risk of having a general principle, lacking in particulars, ignored, downplayed, or its application in a particular case challenged in future litigation on grounds that it improperly fetters decision-making contrary to more substantive provisions of the Act).

<sup>91</sup> *Id.* at 16-19 (noting that the principle could be directly incorporated into the parts of CEPA addressing environmental quality objectives, toxic substances, and ocean dumping). The study noted with respect to toxic substances that CEPA 1988 does not follow a strict precautionary approach for substances on the Domestic Substances List ("DSL") – approximately 21,000 – as the Act appears to place the onus on the government to assess such substances for toxicity. Government identified substances for initial assessment appear on a Priority Substances List ("PSL"). A more reverse onus type obligation is provided for substances new to Canada – non-domestic substances list ("NDSL") – in terms of requiring the giving of notice and the conducting of risk assessments, though no explicit legislative criteria are contained in CEPA 1988 for reaching regulatory decisions for substances on the list under conditions of scientific uncertainty. The study recommended three possible approaches for applying the precautionary principle to control of toxic substances (1) requiring pollution prevention measures, (2) implementing a reverse onus requirement leading to virtual elimination for just persistent and bioaccumulative substances – "narrow reverse onus", an approach already identified by the government as part of its toxic substances management strategy, or (3) implementing a reverse onus requirement on both DSL and NDSL substances with respect to demonstrating particular levels of safety, such as "lack of likely harm," "lack of reasonable medical or ecological concern," or "absence of a threat of serious or irreversible damage to the environment or human health" – "wider reverse onus." *Id.* at 17-18. The study noted with respect to ocean dumping that CEPA 1988 could follow two precautionary approaches (1) simply adopt initiatives coming out of the London Convention on Ocean Dumping, to which Canada is a signatory, by incorporation of these changes into schedules already set up for this purpose under the Act, or (2) pursue a more proactive course by adopting a reverse listing approach by prohibiting all ocean disposal except for listed allowances. *Id.* at 18-19.

<sup>92</sup> HOUSE OF COMMONS STANDING COMMITTEE ON ENVIRONMENT AND SUSTAINABLE DEVELOPMENT, IT'S ABOUT OUR HEALTH! TOWARDS POLLUTION PREVENTION: CEPA REVISITED 54-55 (1995) [hereinafter HOUSE OF COMMONS CEPA REVISITED] (noting caution expressed by mining and chemical industry associations to ensure that precautionary approach not used as a cloak for inadequate science, but supporting Rio Declaration definition of principle).

<sup>93</sup> *Id.* at 55 (noting recommendations of Canadian Bar Association for incorporation of precautionary principle in both preamble and operational parts of CEPA, particularly with respect to toxic substances, because the current CEPA approach based on ensuring scientific certainty on a chemical by chemical basis at each step of the regulatory process is too slow and inconsistent with notion of sustainable development). Other witnesses recommended that the principle incorporate the weight of evidence approach to assessing the toxicity of substances,



committee itself acknowledged that the precautionary principle is an evolving concept requiring further elaboration, but a principle that has received wide endorsement in a growing number of international environmental instruments. In the view of the committee, the principle is a guide that should be both (1) included in the preamble to CEPA, and (2) included in an interpretive provision in the Act that would state that all parts of CEPA should be interpreted in accordance with the principle as defined by the committee. The committee's recommended definition of the precautionary principle for incorporation into CEPA read as follows:

"...in respect of all substances suspected of posing a serious threat to the environment or to human health on the basis of weight of evidence, lack of full scientific certainty shall not be sufficient reason for postponing preventive or remedial measures."<sup>94</sup>

The federal government responded to the standing committee recommendations by noting that the committee was recommending a shift in orientation towards making decisions to control existing substances on the basis of less information. The government viewed this approach as a practical application of the precautionary principle as stated in the Rio Declaration. The government noted that with respect to new substances, it would continue to control the entry of any new dangerous substances into Canadian commerce by requiring users and producers to submit notifications on new substances in advance of manufacture or import. The government response further noted that, as was current practice, this information would be assessed by the government prior to commercial activity and, "in a precautionary way," control measures would be applied "on the basis of a suspicion that danger could occur." The government response further noted that proposals would be made to manage some existing substances based on faster track assessments than those conducted currently under CEPA for priority substances. This would be achieved by applying predetermined criteria that appear in regulations, using scientific judgment, and by making use of the risk assessment efforts of other jurisdictions.<sup>95</sup>

The government response raises a number of issues that become more prominent in the discussions that follow arising from proposed amendments to CEPA introduced by the government in 1998. In particular, the government equated the committee definition of the precautionary principle with that contained in the Rio Declaration. However, the Rio Declaration makes explicit

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rather than waiting for irrefutable, direct proof of damage. *Id.* (noting testimony of Claude Lanthier, Chairman, Canadian Section, International Joint Commission).

<sup>94</sup> *Id.* at 56.

<sup>95</sup> GOVERNMENT OF CANADA, CEPA REVIEW: THE GOVERNMENT RESPONSE TO THE RECOMMENDATIONS OF THE STANDING COMMITTEE ON ENVIRONMENT AND SUSTAINABLE DEVELOPMENT 67-68 (1995) [hereinafter CANADA RESPONSE].

reference to economic considerations, whereas the committee recommendation did not refer to such considerations. Moreover, the committee recommended direct incorporation of the principle in the Act so that it could serve an interpretive function in all parts of the law consistent with the committee's definition of the precautionary principle. From the government response, it is not clear what intention the government had in this regard. These and related issues are considered below in the context of the government bill tabled in Parliament.

## 1 Bill C-32

In March 1998, the government introduced Bill C-32, a major series of amendments to CEPA.<sup>96</sup> Bill C-32 contained many provisions based in whole or in part on recommendations from the standing committee that, taken together, gave the bill a more precautionary flavour. A partial list of these improvements included requirements for pollution prevention, virtual elimination of certain substances, reporting of significant new activities under certain conditions, greater emphasis on an ecosystem approach, and a reverse listing approach for ocean dumping of substances. However, Bill C-32 also approached a number of matters particularly, but not exclusively, relating to toxic substances that militated against a precautionary approach.

In a preamble to Bill C-32, reference was made to the precautionary principle in the following terms:

"...the Government of Canada is committed to implementing the precautionary principle that, where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures designed to prevent environmental degradation."<sup>97</sup>

The Bill C-32 reference to the precautionary principle largely adopts the Rio Declaration. However, the remainder of Bill C-32 was largely silent on the principle. A number of concerns were raised during subsequent standing committee hearings on the extent to which Bill C-32 did not embrace the precautionary principle.<sup>98</sup> First, despite the inclusion of the principle in the preamble, as had been recommended by the standing committee in its 1995

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<sup>96</sup> Bill C-32, *Canadian Environmental Protection Act, 1998*, 36<sup>th</sup> Parl., 1<sup>st</sup> Sess., 46-47 Eliz. II (first reading Mar. 12, 1998, House of Commons).

<sup>97</sup> *Id.* (preamble, para. 6).

<sup>98</sup> See, e.g., *Canadian Environmental Protection Act, 1998: Hearings Before the Standing Committee on Environment and Sustainable Development of the House of Commons*, 36<sup>th</sup> Parl., 1<sup>st</sup> Sess., 46-47 Eliz. II (testimony of John Moffet, principal, Resource Futures International and consultant to the committee, May 28, 1998) [hereinafter *CEPA 1998 Hearings*]. The following points in the text are based on the testimony of Mr. Moffet.

report to Parliament, there was a concern that due to the large number of other preamble statements in Bill C-32, approximately fourteen in total, the cumulative effect could be to provide insufficient guidance to decision-makers implementing the law.

Second, the preamble was the only place the precautionary principle was referred to in C-32. Consequently, there was concern that if there were a conflict between the preamble and a substantive provision of Bill C-32, the latter would take precedence. Moreover, if a substantive provision was ambiguous, the generality of the precautionary principle as expressed in the preamble did not necessarily provide decision-makers with sufficient guidance to be of assistance in a particular circumstance.

Third, despite a lengthy list of administrative duties imposed on the government that were set out in a substantive section of Bill C-32, many of which complemented the preamble provisions respecting taking into account economic factors, applying science, and encouraging federal-provincial cooperation, there was no reference in the section on administrative duties to the precautionary principle. The absence of such an obligation in the administrative duties section of Bill C-32, heightened concern that a precautionary approach would be "watered down" in practice under the bill.

Fourth, concern was expressed that Bill C-32 did not reflect a precautionary approach recommended by the committee with respect to existing and new toxic substances. For example, the view was expressed that with one exception relating to existing substances in Canada that are persistent or bio-accumulative, Bill C-32 largely retained the CEPA 1988 risk assessment approach for determining toxicity of substances (i.e. inherent toxicity and exposure), as opposed to adopting the hazard assessment approach recommended by the committee (i.e. inherent toxicity without regard to exposure potential).

Fifth, even with respect to those substances that are persistent and bio-accumulative, Bill C-32 did not define those terms but left them to be defined in regulations, as is typical in complex legislation of this type. However, to ensure that more than a handful of substances would be subjected to hazard assessment, vigilance would be necessary to ensure that the criteria on which the government would rely to define those terms would be precautionary.

Sixth, concern also was expressed that for those substances that are declared by the government to be toxic, persistent, or bio-accumulative, and therefore slated for virtual elimination, Bill C-32 defined virtual elimination as meaning a reduction in the release of those substances. However, the committee had recommended that virtual elimination should mean a reduction in the release and use of those substances. The failure of Bill C-32 to define virtual elimination

in terms of both reduction of releases and uses went to the core of the concept of pollution prevention and its adequacy under the bill.

Seventh, concern also was expressed that Bill C-32 did not provide for a reverse onus approach for new substances as had been recommended by the committee (i.e. that if a person wanted to introduce a substance into commerce that was new to Canada, the person must first demonstrate to the government that it will not pose an unacceptable risk to human health or the environment). Bill C-32 instead retained the CEPA 1988 approach, which placed the onus on the government to assess the substance before it may be used. Under Bill C-32 the government could require greater information from persons to assist in performing the government review, but such a process still placed intensive resource pressures on the government, in a period of increasing resource constraints within government.

Eighth, concern further was expressed that Bill C-32 did not obligate persons using a substance (regulated or not) to report all significant new uses of that substance as recommended by the committee. Bill C-32 authorized the Minister to require reporting of significant new activities for substances on the DSL. However, the Minister must explicitly require reporting of a significant new activity and designate the kinds of activities that must be reported. Consequently, concern existed that a substance on the DSL still might have no significant new use reporting requirements attached to it.

These and related concerns took up the attention of the government, parliament, and a variety of stakeholders over the next year during which time the committee produced its own version of the bill, before the final version of the bill was assented to in mid-September 1999. The extent to which the new law adopts a more precautionary approach than Bill C-32 is reviewed briefly below.

## **2 CEPA 1999**

Apart from the preamble, which remained the same, in enacting CEPA 1999 the government made a number of changes in Bill C-32 to make the law more precautionary in nature with respect to control of toxic substances, though other concerns raised during the committee stage remained unaddressed.

First, the administrative duties under the Act were expanded to include an obligation on the government to (1) apply the precautionary principle that, where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation, and (2) promote and reinforce enforceable pollution prevention approaches.<sup>99</sup>

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<sup>99</sup> CEPA 1999, S.C. 1999, c. 33, s. 2(1)(a).

Second, the Act was amended to require the national advisory committee, established under CEPA 1999 to provide the Minister with advice with respect to the regulation of toxic substances, to use the precautionary principle in providing such advice and recommendations.<sup>100</sup>

Third, the Act was amended to require the Ministers of Environment and Health to apply a weight of evidence approach and the precautionary principle in conducting and interpreting the results of (1) screening level risk assessments, (2) decisions of other jurisdictions to prohibit or restrict substances, or (3) assessments of whether a PSL substance is toxic or capable of becoming so.<sup>101</sup>

However, other concerns identified during the committee stage about the extent to which additional provisions of the Act could have been made more precautionary, remained unaddressed. Unchanged matters in CEPA 1999 included, for example, (1) the definition of virtual elimination continued to focus on reduction of toxic releases but not uses,<sup>102</sup> (2) the approach to addressing significant new activities remained the same,<sup>103</sup> and (3) risk assessment, not hazard assessment, continued to be the preferred methodology for determining the toxicity of most substances under the Act,<sup>104</sup> though the Ministers are now authorized to apply a weight of evidence approach and the precautionary principle in screening level risk assessments.<sup>105</sup>

## 6 Oceans Act

The recently enacted Oceans Act is another federal statute that adverts to the precautionary principle. The purpose of the Act is to manage and protect marine resources.

### 3 Parliamentary Hearings

During parliamentary hearings on the Oceans Act, the Minister of Fisheries and Oceans committed the government to incorporating a precautionary approach to the management of marine resources. The Minister justified implementing such an approach in the following terms:

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<sup>100</sup> *Id.*, s. 6(1), (1.1).

<sup>101</sup> *Id.*, s. 76.1.

<sup>102</sup> *Id.*, s. 65(1).

<sup>103</sup> *Id.*, s. 80.

<sup>104</sup> *Id.*, s. 74.

<sup>105</sup> *Id.*, s. 76.1.

"Too often in the past, governments have erred on the side of social or economic need in managing...ocean resources...But the reality is that in trying to reflect those needs [government] often paid not enough attention to the needs of the resource. We must now err on the side of conservation. This is a prerequisite if we are to keep our commitment to a holistic and collaborative approach to the management of this vast and diverse coastal resource base."<sup>106</sup>

In particular, the Minister committed the government to amending the preamble and a substantive provision of the Act to incorporate explicitly the commitment of the government to the precautionary principle in the management of marine resources.<sup>107</sup>

#### **4 Ocean Management Strategy: Erring on the Side of Caution**

The preamble to the Oceans Act states that "Canada promotes the wide application of the precautionary approach to the conservation, management and exploitation of marine resources in order to protect these resources and preserve the marine environment."<sup>108</sup> Part II of the Act requires the Minister to lead and facilitate the development and implementation of a national strategy for the management of estuarine, coastal and marine ecosystems in waters that form part of Canada or in which Canada has sovereign rights under international law.<sup>109</sup> The Act requires that the national strategy be based on three principles. First, sustainable development. Second, integrated management of estuaries, coastal and marine waters. Third, the precautionary approach, which is further described as "erring on the side of caution."<sup>110</sup> No further elaboration of this formulation of the precautionary principle is provided in the Act. Commentators have suggested that the justiciability of this statutory version of the precautionary principle will prove "challenging."<sup>111</sup>

#### **15 Provincial Law**

Provincial statute law, provincial superior courts, and provincial administrative tribunals also have begun to incorporate or interpret the precautionary principle. These statutory and case law interpretations indicate that there still is comparatively limited formal recognition of the precautionary

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<sup>106</sup> See *Oceans Act: Hearings Before the Standing Committee on Fisheries and Oceans of the House of Commons*, 35<sup>th</sup> Parl., 1<sup>st</sup> Sess., 44 Eliz. II (testimony of the Hon. Brian Tobin, Minister of Fisheries and Oceans, Nov. 20, 1995).

<sup>107</sup> *Id.*

<sup>108</sup> S.C. 1996, c. 31 (preamble, para. 6).

<sup>109</sup> *Id.*, s. 29.

<sup>110</sup> *Id.*, s. 30(a)-(c).

<sup>111</sup> JAMIE BENIDICKSON, ENVIRONMENTAL LAW 272 (1997).

principle at the provincial level in Canada. Experience with the principle in two provinces – Nova Scotia and Ontario – is examined briefly below.

## 7 Nova Scotia

The use of the precautionary principle in decision-making is a goal associated with sustainable development in the environmental legislation of Nova Scotia in that “where there are threats of serious or irreversible damage, the lack of full scientific certainty shall not be used as a reason for postponing measures to prevent environmental degradation.”<sup>112</sup> There are several points of interest with respect to the Nova Scotia law. First, the precautionary principle is a goal enunciated as part of the purpose section of the Act. Inclusion of the principle in the purpose section, rather than in the preamble to the law, will permit the courts to give the principle greater force when interpreting other provisions of the statute.

Second, the principle is identified in the purpose section of the law as associated with sustainable development, and other complementary principles such as pollution prevention.<sup>113</sup> This can provide further interpretive strength to the development of both the precautionary principle and sustainable development in the province.

Third, the formulation of the principle in the Nova Scotia law is based in part on the Rio Declaration. Consequently, a fairly high threshold test must be met before the principle may be applied – threats of serious or irreversible damage. However, the Nova Scotia formulation of the principle leaves out the reference to “cost-effective” contained in the Rio Declaration. Some commentators have suggested that the Rio Declaration formulation of the principle limits the application of the principle as a “cost-effectiveness” test must be met as well.<sup>114</sup> By focusing on the environmental goal behind the need for precaution, Nova Scotia may avoid this problem in future depending upon how the principle is applied in practice by the government and interpreted by the courts.

A comprehensive review of the Act and its regulations, to be initiated five years after its enactment, is required under the Act.<sup>115</sup> This review may contribute to providing some of the answers to how the principle has been applied in practice.

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<sup>112</sup> Environment Act, S.N.S. 1994-95, c. 1, s. 2(b)(ii).

<sup>113</sup> *Id.*, s. 2(b)(iii).

<sup>114</sup> McIntyre & Mosedale, *supra* note 12, at 230.

<sup>115</sup> S.N.S. 1994-95, c. 1, s. \_.

## 8 Ontario

Although Ontario legislation has not been amended to advert to the precautionary principle both the courts and administrative tribunals in the province recently have considered the principle in the context of particular development proposals.

In *611428 Ontario Limited v. Metropolitan Toronto & Region Conservation Authority*,<sup>116</sup> the Divisional Court dismissed an appeal from a developer of decisions of various provincial natural resource agencies, including the respondent MTRCA and the Ontario Mining and Lands Commissioner ("Commissioner"), to refuse to permit the placement of fill on the appellant's lands. The appellant developer's land included a ravine valley containing a minor tributary of a larger creek. The effect of the proposed filling would destroy the valley and permit the creation of four industrial lots. The proposed fill area was subject to the MTRCA's jurisdiction under the Conservation Authorities Act<sup>117</sup> because it was located between flood and fill lines prescribed by the agency under regulations to that Act.

The decision of the Commissioner to dismiss the developer's appeal of the MTRCA refusal to grant the company's application was based in part on the failure of the company to meet the onus of addressing uncertainties in the evidence about the impact placement of the fill would have on the "conservation of land."<sup>118</sup> The Commissioner's reasons for decision addressed the matter in the following terms:

"No model was presented at the hearing to indicate a threshold for intrusion into the watershed beyond which development should not be allowed. In the absence of such a model, the tribunal finds that it is appropriate to apply a precautionary principle to development involving first order and intermittent streams within the headwaters of a watercourse, so that, in the absence of calculation of a threshold or demonstration of no net impact, development within such land should not proceed. This precautionary principle is applied in recognition of the integral role of water in environmental and human health."<sup>119</sup>

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<sup>116</sup> (1996), 20 C.E.L.R. (N.S.) 1 (Ont. Div. Ct.).

<sup>117</sup> R.S.O. 1990, c. C.27.

<sup>118</sup> The test under the Act for whether fill may be placed in an area under the jurisdiction of a conservation authority is whether "the conservation of land may be affected." *Id.*, s. 28(1)(f).

<sup>119</sup> *611428 Ont. Ltd.* 20 C.E.L.R. (N.S.) at \_



In upholding the Commissioner's dismissal of the appeal, the Divisional Court held that it was not an error for the Commissioner to place the onus of proof on the appellant in the circumstances:

"The proposition that the Humber River system will be degraded by the placing of fill in any of its first order streams...is reasonably inferred from the evidence [accepted by the Commissioner]. That being so, why should the appellant not be required to show that the placing of fill in the [valley] would be an exception to that proposition. We construe the words of the Commissioner in context to mean that in view of the reasonable establishment of the evidence of the foregoing proposition, the evidential burden had shifted to the appellant; if the appellant did not adduce evidence to undermine that proposition, then the appellant ran the risk of failure."<sup>120</sup>

The case suggests that it is not an error of law for administrative bodies to place an onus on advocates of development in circumstances of uncertainty to adduce evidence demonstrating a lack of adverse environmental effects from their proposals. Moreover, reliance on the precautionary principle as a basis for this approach did not provide grounds for successfully alleging reviewable error on appeal.

The issue of the application of the precautionary principle also arose in *Re Notre Development Corporation*,<sup>121</sup> a case involving a proposal for the disposal of 20 million tonnes of solid waste, over 20 years, in a 200 metre pit at a former mine site. The application was heard under new amendments to the province's Environmental Assessment Act, that allow the Minister of the Environment to identify the issues to be dealt with at hearings before the province's Environmental Assessment Board.<sup>122</sup> In this case, the Minister directed a hearing primarily on the issue of whether the proposed hydraulic containment system design for the facility was an effective solution for the management of leachate generated by the disposal of waste at the mine site for approximately 1000 years.

During argument counsel for the coalition of environmental groups opposing the application argued that the extraordinary nature of the proposal required an extraordinary standard of proof: "clear and convincing proof based upon cogent evidence." A majority of the Board, while rejecting this argument

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<sup>120</sup> *Id.* at \_\_.

<sup>121</sup> *Re Notre Development Corporation (Adams Mine Site)*, EA-97-01 (E.A.B., June 19, 1998). Application for judicial review of the Board decision was dismissed with brief reasons by the Divisional Court on July 20, 1999.

<sup>122</sup> Environmental Assessment Act, R.S.O. 1990, c. E.18, s. 9.2, as am (partial referral).

and conditionally approving the project, proposed further testing to reduce uncertainties with respect to protection of groundwater:

"The Board...felt constrained to apply the precautionary principle. The doubt arising from the alignment of opposing views leads the Board to a prudent conclusion – to be sure that the undertaking is safe, a way must be found through the [Act] ...to test the findings on groundwater....When everything depends on engineering design and works, it better be right."<sup>123</sup>

A dissenting member of the Board also relied on the precautionary principle, but as a basis for rejecting the application outright:

"When I weigh the totality of the evidence presented on all the above concerns (uncertainty and risk of a 1000 year contaminating lifespan, possible failure of the drainage layer, inadequate monitoring, lack of design detail on contingency plans and the resulting lack of financial assurance information, and uncertain groundwater levels beneath the pit) I come to the conclusion that enough concerns have been raised that a proper exercise of the precautionary principle would lead us to say no to this project."<sup>124</sup>

Consequently, it is clear from both the *611428 Ont. Limited* case and the majority and dissenting opinions in *Re Notre Development* that the precautionary principle is now a consideration in environmental hearings in Ontario even in the absence of statutory direction on the principle. The cases also suggest, however, that how the principle will be applied is highly unpredictable as administrative bodies have no statutory guidance from the legislature about the content of the principle, or how to resolve issues of risk in the face of scientific uncertainty.

#### 4 CONCLUSIONS

This report has examined the evolution of the precautionary principle concept, noted some of its various definitions, and suggested that the parameters of the principle are still very much a work in progress.

Part III of the report summarized briefly the available information on the development of the precautionary principle in two contexts. First, the principle was examined as a norm or rule of customary international law. The prevailing opinion of legal scholars appears to be that the principle has crystallized into a binding norm of customary international law.

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<sup>123</sup> *Id.* at 37.

<sup>124</sup> *Id.* at 63-64.

Second, the principle was examined as a frequent component in international conventions, declarations, and other documents to which Canada is a signatory. From this part of the review of primarily international conventions that have focused on the precautionary principle, the following conclusions were drawn. First, the precautionary principle has become a key component of many international environmental instruments. Second, many of the documents affirm the view that pollution prevention is preferable to abatement of harm after it has occurred. Third, where full scientific certainty about environmental consequences is lacking, preventive measures may still be required where the environmental threat is potentially significant. Fourth, certain formulations of the precautionary principle, such as the Framework Convention on Climate Change, the Montreal Protocol, (and the Rio Declaration) are explicit in allowing only cost-effective measures where full scientific proof is lacking. Other formulations of the principle are silent on the role economic considerations are to play in such circumstances.

This part of the review also noted that commentators have suggested that certain conventions, declarations, or other international instruments are unclear (1) whether the precautionary principle is meant to be a duty or a recommendation (2) what level of environmental risk would trigger precautionary measures, and (3) which sciences, factors (e.g. economic), or scientific determinations are relevant. Consequently, they have suggested that the principle may become unenforceably vague depending on how it is drafted in a particular instrument. While this concern was expressed in the context of international instruments, this review noted that the potential exists for the same problems to occur in domestic law treatments of the precautionary principle.

Overall, however, it was noted that the effect of both customary international law and conventional international law embracing the precautionary principle increases the pressure on countries, such as Canada, to incorporate the principle in their domestic laws in order to meet international obligations.

Part IV examined key issues in the incorporation of the precautionary principle in domestic law. Implementation issues examined included (1) the environmental scope of the law's application, (2) the human activities that require a precautionary approach, (3) the types of effects or risks that may trigger precautionary action, and (4) the precautionary measures that may be implemented such as requirements for standards, assessments, procedures, burdens of proof, and public participation.

Part IV also examined the status and application of the precautionary principle in the domestic law of several countries. These countries included Australia, the United Kingdom, Switzerland, and the United States.

In Australia, the principle has been applied in three ways (1) through the adoption of legislation, (2) through policy development, and (3) through the courts. A review of the Australian case law suggested the need for the precautionary principle to be entrenched directly in legislation through objects clauses and operational strategies if governments are to be required to take full account of the principle and apply it consistently to matters arising under statute. The review also noted that Australian commentators have suggested that for the courts to more fully develop the principle as common law doctrine, a standard of proof such as lack of reasonable medical or ecological concern must be imposed on those with the burden of proof; that is, parties responsible for creating risk of environmental harm.

In the United Kingdom, the review noted that the precautionary principle has been considered in both policy pronouncements and by the courts. The review noted that according to a United Kingdom white paper, the threshold for taking precautionary action in circumstances of uncertainty in the United Kingdom is reached where there are "significant risks of damage." The review noted that recent case law has made this limited or restricted formulation of the precautionary principle a relevant consideration in the law of the United Kingdom.

The review noted that in Switzerland, the national government recently has had occasion to apply precautionary principles in the context of potential biological effects from non-ionizing radiation. The approach of Swiss public health and environmental authorities has been to apply the notion of prudent avoidance by establishing exclusion zones around new sources of such radiation because of continuing uncertainties about potential adverse effects.

In the United States, the Clinton Administration appears to be more sympathetic to the adoption of a precautionary approach to climate change than previous administrations. The review summarizes recent federal initiatives in that regard. Federal environmental laws on air pollution controls and case law also were examined for examples of precautionary approaches. Problems with legislative of this type also were noted.

The situation in Canada at the federal and provincial levels also was examined with a view to evaluating the extent to which the precautionary principle has become an effective component of Canadian environmental law. Two recently amended federal laws were examined to determine the extent to which the precautionary approach has been incorporated, (1) CEPA, and (2) the Oceans Act.

The review of CEPA examined (1) how the issue of precautionary action was considered during the five-year review mandated by the statute, (2) how the subsequent government bill, C-32, treated the precautionary principle, and (3)

how the final version of what is now known as CEPA 1999 addresses the principle. The review noted that, in addition to adoption of the Rio Declaration in a preamble to the law, in enacting CEPA 1999 the government made a number of changes in Bill C-32 to incorporate the precautionary principle into operational parts of the Act with respect to control of toxic substances and ocean dumping. However, the review noted that other concerns raised during the committee stage respecting incorporation of precautionary approaches remained unaddressed.

The review of the Oceans Act noted that a precautionary approach is identified in both the preamble to the Act and with respect to the development of a national oceans management strategy. However, the principle is described as "erring on the side of caution." The review noted that this formulation of the precautionary principle may make the justiciability of the principle in the courts challenging.

At the provincial level legislative, judicial, and administrative developments with respect to the precautionary principle were examined in Nova Scotia and Ontario. In Nova Scotia, a version of the Rio Declaration without reference to "cost-effectiveness" has been adopted in the purpose section of the province's new Environment Act. The review notes the potential advantages and disadvantages of this approach, though there is still comparatively little experience with the principle in practice.

With respect to Ontario, the review noted that although Ontario legislation has not been amended to advert to the precautionary principle both the courts and administrative tribunals in the province recently have considered the principle in the context of particular development proposals. The review noted that recent case law suggests that it is not an error of law for administrative bodies to place an onus on advocates of development in circumstances of uncertainty to adduce evidence demonstrating a lack of adverse environmental effects from their proposals. Moreover, reliance on the precautionary principle as a basis for this approach did not provide grounds for successfully alleging reviewable error on appeal. In addition, the recent Ontario case law made it clear that the precautionary principle is now a consideration in environmental hearings in Ontario even in the absence of statutory direction on the principle. The cases also suggest, however, that how the principle will be applied is highly unpredictable as administrative bodies have no statutory guidance from the legislature about the content of the principle, or how to resolve issues of risk in the face of scientific uncertainty.

Overall, it can be stated that domestic implementation of the precautionary principle in Canada is still in its infancy. It is clear that much work needs to be done before the principle can be considered to be an effective, as