

Adaptive Management in Environmental Assessment and Environmental Management: A Legal and Policy Analysis

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PART I INTRODUCTION

The notion of “adaptive management” was introduced into the *Canadian Environmental Assessment Act*¹ (“CEAA”) through 2003 amendments.² Subsection 38(5) of the amended Act states:

The results of follow-up programs may be used for implementing adaptive management measures or for improving the quality of future environmental assessments.

The Act defines a “follow-up program” to mean a program for verifying the accuracy of an environmental assessment of a project, and determining the effectiveness of measures taken to mitigate the adverse environmental effects of a project.³

Since added to the Act, the notion of adaptive management has featured in CEAA reviews and court decisions. Unfortunately, the term has not been consistently used or characterized. This paper adopts the Canadian Environmental Assessment Agency’s (the “Agency’s”) definition of “adaptive management” set out in its draft Operational Policy Statement on Adaptive Management Measures.⁴ The Agency administers much of the CEAA environmental assessment process, promotes federal and federal/provincial/territorial cooperation in environmental assessment processes, and develops policy relevant to federal environmental assessment.⁵ The Agency’s definition of ‘adaptive management’ is:

Adaptive management is a process for continuously improving environmental management practices by learning about their outcomes. Adaptive management provides flexibility to implement new mitigation measures or to modify existing ones during the life of a project in response to factors such as:

- ♦ imperfect identification of an environmental effect or prediction of its significance during the EA phase;
- ♦ improved knowledge or technology;
- ♦ evidence that a mitigation measure is inadequate; or

¹ S.C. 1992, c. C-37 (CEAA).

² *Canadian Environmental Assessment Amendment Act*, S.C. 2003, c. 9.

³ CEAA, *supra* note 1, s. 2(1).

⁴ The Consultation Draft was released for stakeholder comment on October 23, 2008, and the comment period closed in November, 2008 (“Consultation Draft”).

⁵ CEAA, *supra* note 1, s. 61.

- ♦ evidence that a mitigation measure has been successful and is no longer required.⁶

This definition is consistent with adaptive management as envisioned by its early proponents, notably, as set out in C.S. Holling's (editor) 1978 publication *Adaptive Environmental Assessment and Management*,⁷ discussed in Part II of this paper.

This paper argues that although adaptive management can play a positive role in environmental assessment and subsequent environmental management, the concept must be correctly applied. In particular, it must not be used as a “substitute for committing to specific mitigation measures.”⁸ So it cannot be used to cover a situation where a proponent is not sure how to mitigate a negative environmental impact, but commits to finding the technology or science in the future, if a problem arises. As well, it must not be used to attempt to reduce uncertainty with respect to likely significant environmental impacts. So if it is uncertain whether a significant environmental impact from a project will occur, adaptive management cannot be asserted to, in effect, say, if there is a significant impact, we will adapt to deal with it. As well, it cannot be used to attempt to reduce uncertainty regarding proposed mitigation measures.⁹ Finally it should not be used as a “set off” to the precautionary principle, which requires that when faced with uncertainty regulators should act in precautionary manner. Adaptive management and the precautionary principle play distinct roles in federal environmental assessment.

The purpose of this paper is to set forth an analysis of how the concept is correctly applied, and to assist readers in recognizing when it is miss-applied. The purpose also is to identify issues relevant to adaptive management that could be raised and addressed during CEAA Review.¹⁰ This paper assumes that in order to rationally consider whether the role of adaptive management in the CEAA is appropriate, or whether it should be amended in CEAA review, the current role must be understood. This paper contends that notwithstanding CEAA's clear language and implications the notion of adaptive management has been misapplied and that this misapplication could lead to diminished environmental protection. Accordingly, in CEAA review the role of adaptive management should be clarified.

⁶ Consultation Draft, *ibid.*, p. 1.

⁷ C. S. Holling, (ed.) *Adaptive Environmental Management and Assessment*, (Chichester: John Wiley & Sons, 1978).

⁸ Consultation Draft, *supra* note 4, p. 3.

⁹ All three examples are *ibid.*

¹⁰ The 2003 CEAA states that within seven years (which would be October 30, 2010) a Parliamentary review by Committee commence to comprehensively review the provisions and operation of the CEAA. See *An Act to Amend the Canadian Environmental Assessment Act*, S.C.2003, c. 9, s. 32(1) (Bill C-9). However, it appears that this Parliamentary review may not take place. In late 2008, it became known that the Minister planned to commence a review of the Act prior to the seven year review. For more information see A. Kwasniak, *Reviewing the Canadian Environmental Assessment Act: A Citizen's Backgrounder*, to be made available on the CEN Planning and Environmental Assessment website, <http://www.cen-rce.org/eng/caucuses/assessment/docs>. Government has stated that it plans to table legislation in spring, 2009.

Part II of this paper provides a short history of adaptive management and its role in environmental assessment and environmental management. Part III focuses on the legislated role of adaptive management in the federal environmental assessment process. Part IV discusses comments made by the Court in *Pembina Institute for Appropriate Development, et al v. Attorney General of Canada and Imperial Oil Resources Ventures Limited*¹¹ decision (the “Kearl Mines case”). The paper argues that some of the Court’s comments on the role of adaptive management in federal environmental assessment processes are incorrect. Part V discusses the role of the precautionary principle in the CEEA as this concept sometimes is confused with adaptive management. Part VI sums up and comments on adaptive management and CEEA review.

PART II ABOUT ADAPTIVE MANAGEMENT

Hollings, Adaptive Management, and Uncertainty

As noted in Part I, C.S. Holling, in the 1979 *Adaptive Environmental Assessment and Management*, was an early proponent of adaptive management.¹² Holling and his colleagues promoted adaptive management as an environmental management approach to address uncertainties inherent in environmental assessment and consequent policy decision making in relation to projects, such as the setting of conditions on permits, including monitoring and follow-up. “Uncertainty” in this context does not mean, for example, that it is uncertain whether a given mitigation technique will actually mitigate adverse environmental impacts. “Uncertainty” rather relates to the acknowledgement that no matter how much scientific evidence and other information to conclude, for example, that a mitigation technique will successfully mitigate adverse effects, there are unknowns owing to the complexities of ecosystems and our inability to completely predict future events. These unknowns could prove that our predictions about mitigation success were incorrect. A publication by the Ministry of Forest Research Programs (British Columbia) summarizes the uncertainties that drive adaptive management as follows:¹³

There would be little need to develop new policies or methods if managers were dealing with stable, predictable ecological and social systems. The outcomes of management programs could be reliably predicted, and standard practices could be taught to each generation of young professionals. Adaptive management and other approaches for dealing with uncertainty would be of little value. Resource managers, however, do not live in such a world¹⁴ ... Uncertainties are pervasive in their work. The major categories of uncertainty that trouble managers when they consider the future are:

¹¹ *Pembina Institute for Appropriate Development v. Canada (Attorney General)*, 2008 FC 302 (the Kearl Mines case).

¹² C.S. Holling (ed.), *supra* note 7.

¹³ From J. B. Nyberg, “Statistics and the Practice of Adaptive Management” in British Columbia, Ministry of Forest Research Program, V. Sit and B. Taylor (Eds) *Statistical Methods for Adaptive Management Studies*, (1998) at 3. Available online at << <http://www.for.gov.bc.ca/hfd/pubs/Docs/Lmh/Lmh42.htm>>>

¹⁴ The author here refers to R. Hilborn, R. 1987. “Living with uncertainty in resource Management” (1987) *N. Am. J. Fish. Manage.* 7:1-5.

- ♦ natural environmental variability (e.g., weather, fire, earthquakes, avalanches, volcanoes, stream flows, genetic composition of species, animal movements);
- ♦ human impacts on the environment through global climate change, new technology, and the growing population;
- ♦ lack of knowledge about most aspects of the ecosystems being managed; and
- ♦ variations in social and political goals expressed as varying budgets, shifting policy directions, and changing demands for commodities, services, and aesthetic values

These uncertainties result from future undetermined events and processes. They may occur despite our highest degree of certainty regarding the predicted impacts of a proposed project and our best efforts to anticipate future scenarios. It is the recognition that we are not seers and cannot predict everything, that unanticipated social changes and development, may cause unknown cumulative effects, that ecological systems are extremely complex, and that any one or a combination of these factor may result in surprises. This paper sometimes calls such uncertainties “highly unpredictable uncertainties.”

Highly unpredictable uncertainties are what remains after we rely on our best science and other relevant information to ascertain certainty. For example, at Time T (a given time) on the basis of our best science and other relevant information we reasonably may predict as certain that if a specific amount of a chemical X at a particular dilution is discharged into a given water body, it will not cause any significant environmental impact, even taking into account actual and likely cumulative effects from other discharges into and activities relating to the water body. Although there may be certainty, it still is possible that something could happen in the future (Time T + 1) that will render this finding of no significant impact of chemical X to be in error. For example, assume that in the future, at Time T+1, a new chemical Y is developed that interacts with X such that together X and Y cause a significant environmental impact to the water body. Further assume that at Time T there is no way of knowing that chemical Y will be developed. Adaptive management imposed at the time of approval of the discharge of chemical X into the water body could make it possible for the regulator to require the proponent to alter environmental management plans to avoid or redress the significant environmental impact.

Treat decisions as experimental hypotheses

Adaptive management provides approaches for environmental managers and policy makers to plan for, reduce, and respond to highly unpredictable uncertainties. One approach is to treat decisions made in relation to proposed projects as experimental hypotheses.¹⁵ Highly unpredictable uncertainties are reduced by, during the planning

¹⁵ J. Benidickson, N. Chalifour & Y. Prévost, J.Chandler, A. Dabrowski, C. Scott Findlay & A. Déziel, H. McLeod-Kilmurray and D. Lane *Practicing Precaution and Adaptive Management: Legal, Institutional, and Procedural Dimensions of Scientific Uncertainty*, a 2005 Report to the SHHRC and Law Commission of Canada at 7.

stage of a project, stakeholders developing scenarios that posit a variety of potential though unlikely future impacts, and developing alternate environmental management actions in the event that a scenario would transpire. Such hypotheses are to be “tested and reevaluated as additional information becomes available.”¹⁶ Thus monitoring and follow-up are key components of the adaptive management approach.

Modifying regulatory responses

Implementing adaptive management may reveal that our predictions regarding the environmental impacts of a project, or the anticipated success of a mitigation procedure were inaccurate. What can be done such a circumstance? Ideally, the environmental management regarding the project will be modified to avoid continued adverse environmental impacts and to remedy the situation. However, this cannot be legally required unless the government has legal authority to require the proponent to make the necessary changes. This may be difficult unless one or the other or both of two situations exist. One is that the applicable legislation authorizes the regulator to require changes in environmental management. The other is that the authorizations that government issued to enable the project to proceed are flexible enough to require the proponent to amend approval conditions in such circumstances.

Contributing to future decisions

Holling states that the heart of adaptive management is that it is “an interactive process using techniques that not only reduce uncertainty but benefit from it. The goal is to develop more resilient policies.”¹⁷ The idea is that knowledge acquired from testing hypotheses, monitoring environmental impacts, and acknowledging and addressing inaccurate predictions, will feed back into the policy making process and will lead to better, and more accurate, decision making in the future.

PART III ADAPTIVE MANAGEMENT AND THE CEAA

About the federal environmental assessment process

CEAA applies when a "federal authority" who is a "responsible authority" exercises certain powers or duties or performs certain functions in respect of a "project" or proposed "project." A "federal authority" means a Minister of the Crown, and certain government agencies, departments or bodies.¹⁸ A "responsible authority" is the federal authority that oversees or administers an environmental assessment under the CEAA and assures that the statutory requirements are met.¹⁹ "Project" means, in relation to a physical work, any "proposed construction, operation, modification, decommissioning,

¹⁶ *Ibid.*

¹⁷ Holling (ed.) *supra* note 7 at 9.

¹⁸ CEAA, *supra* note 1, s. 2. The Act excludes some bodies from the definition.

¹⁹ *Ibid.*

abandonment or other undertaking in relation to that physical work."²⁰ Section 5 of the CEAA sets out the main circumstances that will trigger the Act.²¹

5. (1) An environmental assessment of a project is required before a federal authority exercises one of the following powers or performs one of the following duties or functions in respect of a project, namely, where a federal authority
 - (a) is the proponent of the project and does any act or thing that commits the federal authority to carrying out the project in whole or in part;
 - (b) makes or authorizes payments or provides a guarantee for a loan or any other form of financial assistance to the proponent for the purpose of enabling the project to be carried out in whole or in part, except where the financial assistance is in the form of any reduction, avoidance, deferral, removal, refund, remission or other form of relief from the payment of any tax, duty or impost imposed under any Act of Parliament, unless that financial assistance is provided for the purpose of enabling an individual project specifically named in the Act, regulation or order that provides the relief to be carried out;
 - (c) has the administration of federal lands and sells, leases or otherwise disposes of those lands or any interests in those lands, or transfers the administration and control of those lands or interests to Her Majesty in right of a province, for the purpose of enabling the project to be carried out in whole or in part; or
 - (d) under a provision prescribed pursuant to paragraph 59 (f), issues a permit or license, grants an approval or takes any other action for the purpose of enabling the project to be carried out in whole or in part [under the *Law List Regulations* made pursuant to subsections 59(f) & (g) of the CEAA].

The *Law List Regulations*²² referred to in paragraph (d) of section 5 set out provisions of federal acts or regulations that confer powers, duties or functions on federal authorities, the exercise or performance of which will require a prior environmental assessment. The *Exclusion List Regulation* excludes certain projects from the need for federal

²⁰ *Ibid.*, s. 2; "Project" also means any physical activities set out in the *Inclusion List Regulations*, SOR/1994-637. These regulations set out undertakings that do not necessarily relate to a physical work yet but are subject to the Act. Examples include dumping specified substances, certain aviation activities and killing of migratory birds.

²¹ *Ibid.*, s.5. The CEAA may also apply in circumstances in which there is no s. 5 trigger. For example, the federal Environment Minister may order an environmental assessment in certain circumstances where a project may have significant adverse effects on another province, or where the project is carried out on federal lands or elsewhere in Canada and may have significant adverse environmental effects outside of federal lands or outside of Canada (s. 48) or where public concerns warrants an environmental assessment requirement (s. 28).

²² *Law List Regulations*, S.O.R./1994-636.

environmental assessment under the CEAA.²³ These are projects that the federal government has deemed to have minimal or insignificant environmental effects.

There are four types of federal assessment: screenings, comprehensive studies, mediations, and panel reviews. Depending on type, an environmental assessment may vary in intensity in respect of such matters as public participation, depth of study, and whether there will be a formal hearing. Projects requiring a comprehensive study assessment are listed in the *Comprehensive Study Regulation*.²⁴ These projects are likely to result in significant environmental effects. The Agency's examples are large oil and natural gas developments, some projects in national parks, and larger projects that can cause harm in migratory bird sanctuaries.²⁵ Of the thousands of assessments conducted annually under the CEAA more than 99% are screenings.²⁶ The Responsible Authority may refer a screening of a project to the Minister of the Environment to “bump up” a review to a panel review or a mediation where there is uncertainty regarding whether the project as mitigated will result in a significant adverse environmental effect, where the project as mitigated will likely result in a significant adverse environmental effect, or where public concerns warrant a bump-up.²⁷

Where a project is described on the *Comprehensive Study List Regulation* the responsible authority must consult with the public regarding the scope of project and any concerns that the public may have. After the consultation the responsible authority must decide whether to continue the assessment as a comprehensive study, or to refer it to the Minister for assessment as a panel review or mediation.²⁸

The CEAA environmental assessment decision and the subsequent regulatory decision

Whether an environmental assessment proceeds by way of screening, comprehensive study, mediation, or panel review, at the end of the assessment process, CEAA requires that the responsible authority make a decision. This paper calls it the “environmental assessment decision.” That decision is whether, the project, as mitigated, is likely to cause significant environmental effects.²⁹ If the responsible authority determines that the project as mitigated will not cause a significant environmental effect, then the responsible authority may, in the responsible authority’s discretion, exercise authority to let the project proceed, by, for example, granting a federal authorization, making a federal loan, or granting an interest in federal land. This paper calls the exercise of discretion to do any these things the “regulatory decision.” If the responsible authority determines that the project, as mitigated, is likely to result in a significant environmental effect the CEAA requires the responsible authority to not exercise the regulatory decision in a manner that

²³ *Exclusion List Regulation*, S.O.R. 1994-639.

²⁴ *Comprehensive Study List Regulation* S.O.R./1994-638.

²⁵ See http://www.ceaa.gc.ca/010/basics_e.htm.

²⁶ See *Review of the Canadian Environmental Assessment Act*, Cat. No. EN 194-211-1999E, (Ottawa: 1999) at 25.

²⁷ CEAA, *supra* note 1, s. 20(1)(c).

²⁸ *Ibid.*, s. 21.

²⁹ *Ibid.*, ss. 20 and 37.

would allow the proponent to carry out the project in whole or in part, unless the responsible authority finds that the significant environmental effect can be justified in the circumstances.³⁰

Type of assessment and a follow-up program

The type of assessment undertaken with respect to a project is important when considering the role of follow-up program, and consequently the use of adaptive management. The CEAA requires that a follow-up program be designed and its implementation ensured when a project has undergone a comprehensive study, mediation or panel review.³¹ The Act requires that a need for follow-up program be considered with respect to screenings, and if needed, that a follow-up program is designed and its implementation ensured.³²

As noted in Part I, a follow-up program is meant to verify the accuracy of the environmental assessment and determine the effectiveness of mitigation measures intended to mitigate any adverse environmental effects of a project.³³ Follow-up is a critical step in environmental assessment. A well designed follow-up program will help us – meaning Canadian society – determine whether an environmental assessment process carried out in respect of a project was accurate. An environmental assessment, after all, partly involves *predictions* regarding likely environmental effects, and monitoring effects through a follow-up program can provide information on whether predictions were correct. Mitigation measures also involve *predictions*; they are predictions that the measures will in fact lessen or even negate environment impacts if the measures are carried out. The success of an environmental assessment process under the CEAA, and consequently the environmental protection afforded by a good environmental assessment process, depend on whether the predictions regarding significant environmental effects and mitigation measures are correct.

The Agency’s Operational Policy Statement, *Follow-up Programs under the Canadian Environmental Assessment Act*,³⁴ reflects the CEAA provision that a responsible authority is not limited by its own legislative mandate in designing a follow-up program.³⁵ The CEAA allows the responsible authority to consider any mitigation measures that are within the legislative authority of the federal government, and any other measures “whose implementation the responsible authority can ensure” or that the responsible authority is satisfied will be “implemented by another person or body.”³⁶ So, for example, a responsible authority may include mitigation measures in his or her calculation of whether there are significant adverse environmental effects that would be enforced under a provincial authorization, or by some other non-federal authority, such as a municipality. However the responsible authority must have good reason to believe that such mitigation measures will be implemented and enforced.

³⁰ *Ibid.*

³¹ *Ibid.*, s. 37(1)(a) and 38(2).

³² *Ibid.*, s. 38(1).

³³ *Ibid.*, s. 2(1).

³⁴ Available online at <<www/ceaa.gc.ca/013/002/followup_e.htm>>.

³⁵ *Ibid.* at 2, and CEAA, *supra* note 1, s. 20(1.1).

³⁶ *Ibid.*

Two aspects of adaptive management in follow up

As noted in Part I, subsection 38(5) of the CEAA enables the results of a follow-up program to be used for implementing adaptive management measures or for improving the quality of future environmental assessments. There are two distinct aspects to subsection 38(5). The first is that follow up may be used for *implementing adaptive management measures*. These would be measures, presumably pursuant to federal or provincial authorizations, that require a project proponent to invoke alternative environmental management measures if it turns out that predictions regarding environmental effects, or predictions regarding the effectiveness of mitigation measures, were wrong. If this provision is to be used, it is critical that either authorizations be flexible enough to require alternative environmental management strategies, or the applicable legislation authorizes the regulator to revisit authorizations in this manner.

The second aspect of subsection 38(2) is that adaptive management be used to improve the quality of future environmental assessments. Thus it is critical that information gleaned in follow-up programs be available for use in future environmental assessments. This monitoring, reporting, storing, and dissemination of information are vital.

Certainty of mitigation measures notwithstanding adaptive management

Notwithstanding the potential that predictions regarding mitigation measures might in the future prove to be in error, the CEAA still requires that the RA have a high level of certainty that mitigation measures will in fact work. Numerous CEAA provisions require this interpretation.

First, under CEAA “mitigation” means:

the elimination, reduction or control of the adverse environmental effects of the project, and includes restitution for any damage to the environment caused by such effects through replacement, restoration, compensation or any other means.³⁷

Note that the definition does not say the “potential elimination, reduction, or control ... etc.” of adverse environmental effects. Nor does it say “measures that likely will be developed in the future that will eliminate, reduce, or control ... etc.” environmental effects. On the contrary, the definition of ‘mitigation’ makes it clear that to be a mitigation measure for the purposes of the CEAA a measure must be known to actually eliminate, reduce or control adverse environmental effects. This does not necessarily mean that the measure has been tried and was proven successful in past projects. But it does mean that there must be sufficient scientific evidence or other information for the CEAA administrator to reasonably conclude that a mitigation measure is certain and will effectively mitigate adverse environmental effects of a proposed project.

Second, this interpretation is confirmed by subsections 20(2) and 37(2.1) of the Act which states that the responsible authority must ensure that mitigation measures are

³⁷ *Ibid.*, s. 2, def. of “mitigation.”

implemented or be satisfied that another person or body will implement mitigation measures. Obviously there cannot be uncertainty as to the nature or identity of mitigation measures if the responsible authority must be satisfied that mitigation measures will be implemented.

Third, this interpretation is confirmed by clause 16(1) (d) of the CEEA that requires that the relevant CEEA administrator consider “measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the project” [emphasis added]. Obviously, if mitigation measure must be technically and economically feasible, and known to actually mitigate an otherwise significant adverse environmental impact, all relevant particulars regarding the measure must be known at the time of the consideration of the measure.

PART IV

THE KEARL MINES CASE – MISTINTERPRETING THE ROLE OF ADAPTIVE MANAGEMENT IN THE CEEA

About the *Kearl Mines* case

The *Pembina Institute for Appropriate Development, et al v. Attorney General of Canada and Imperial Oil Resources Ventures Limited*³⁸ decision (the “Kearl Mines case”) concerned the February 5, 2007 decision of an environmental assessment conducted by Joint Panel Review (Alberta and the Department of Fisheries and Oceans). The Joint Panel found that there would be no significant adverse impacts resulting from the Kearl Project, a proposed oil sands mine north of Fort McMurray including open pit truck and shovel mines, and associated facilities such as for bitumen extraction and tailings management. A number of environmental organizations (“ENGOS”) appealed the Panel’s decision to the court on the basis that it was unreasonable on several grounds. They were successful on one.

The ENGOS were successful with respect to their claim that the Panel erred in determining that the project would have no significant adverse impacts relating to climate change because the Panel did give sufficient reasons for the determination. The facts of the case related that the Project would result in significant greenhouse gas (“GHG”) emissions, approximately the equivalent to 800,000 cars per year. The Panel rationalized that these emissions would not result in a significant adverse impact since the proponent would have to comply with the Alberta *Climate Change and Emissions Management Act*³⁹ requirements for intensity based emission reductions. The ENGOS argued, and the Court agreed, that intensity based reductions would not reduce the Project’s GHG emissions since, given the Project’s anticipated production increases, intensity based targets would not result in a net reduction of GHG emissions. Because the Panel’s rationale for its finding of no significant adverse impacts related to climate change failed, there was a legal error in the Joint Panel Review’s decision with respect to significance of

³⁸ *Supra* note 11.

³⁹ S.A. 2003, c. C-16.7.

environmental impacts. Until the legal error was cured (by the Panel giving supportable reasons) in effect there was no decision of the Panel.

After the close of the proceedings, the Department of Fisheries and Oceans (“DFO”) withdrew its *Fisheries Act* authorization to harmfully alter, destroy, destruct, or disturb fish habitat.⁴⁰ The DFO did this because the CEAA requires that where an environmental assessment is triggered in respect of a project, the assessment must be completed prior to a responsible authority taking action that enables the project to proceed (such as issuing a *Fisheries Act* approval). Because of the Panel’s error the EA was not complete. Subsequent litigation confirmed the correctness of DFO’s withdrawing its authorization. However, in the end the Panel provided reasons for its finding of no significant adverse impacts, and the federal government fast-tracked the issuance of the *Fisheries Act* approval to enable the project to go ahead.

The *Kearl Mines* case and adaptive management

Although the ENGOs won the case on the climate change issue, the Court made some provocative comments about the role of adaptive management in the environmental assessment process. This paper argues that some of these comments were incorrect and misrepresent the role of adaptive management in the federal EA process. The Court made its comments in the context of explaining its understanding of how CEAA operates and in the determination of the adequacy of mitigation measures.

The first comment concerns the nature of permissible findings of environmental effects. In paragraph 32 the Court asserts:

Adaptive management permits projects with uncertain, yet potentially adverse environmental impacts to proceed based on flexible management strategies capable of adjusting to new information regarding adverse environmental impacts where sufficient information regarding those impacts and potential mitigation measures already exist.

In other words, the Court asserts that CEAA permits findings of uncertain yet potentially adverse environmental effects where adaptive management may be used to adjust to new information (the “uncertain environmental effects comment”).

The second comment deals with adaptive management and mitigation. As mentioned earlier, the CEAA requires that mitigation measures must be technically and economically feasible. The ENGO applicants argued that the fact that the panel recommended further testing of predictions relating to end pit lakes, this proposed mitigation measure was not technologically or economically feasible. The Court did not agree stating that “this approach is broadly consistent with the principles of adaptive management.”⁴¹ The Court quoted the *Canadian Parks and Wilderness Society*⁴² as stating:

⁴⁰ *Fisheries Act*, R.S.C. 1985 c. F-14, s. 35(2).

⁴¹ *Kearl Mines*, *supra* note 11, ¶ 56.

[t]he concept of “adaptive management” responds to the difficulty, or impossibility, of predicting all of the environmental consequences of a project on the basis of existing knowledge.

The Kearsley Court then stated:

The same holds true for the assessment of mitigation measures. While there does exist some uncertainty with respect to end pit lake technology, the existing level of uncertainty is not such that it should paralyze the entire project.⁴³

In other words, the Court is saying that CEAA permits some uncertainty with respect to mitigation measures provided that adaptive management is used (the “uncertainty with respect to mitigation comment”).

The third comment concerned the relation between the precautionary principle and adaptive management. The Kearsley Court, referring again to *Canadian Parks and Wilderness Society v. Canada (Minister of Canadian Heritage)*⁴⁴ stated:

“... adaptive management counters the potentially paralyzing effects of the precautionary principle.”

In other words, the Court states, in effect, that under the CEAA what the precautionary principle giveth to environmental protection, the principle of adaptive management may taketh away (the “adaptive management set off to the precautionary principle comment”).

In the writer’s view, the uncertain environmental effects comments [Comment #1], the uncertainty with respect to mitigation finding [Comment #2], and the adaptive management set off to the precautionary principle finding [Comment #3] are not supported, and run contrary to the CEAA for numerous reasons. The following 8 paragraphs set out reasons why with respect to Comment #1 and Comment #2. Part V of the paper addresses Comment #3.

The reasons why CEAA does not permit Comments #1 and #2 are:

1. Adaptive management in the CEAA is expressly authorized only in relation to *follow up*. Nothing in the Act suggests that adaptive management works so that projects with uncertain, yet potentially adverse environmental impacts may proceed [Comment #1]. Nor does anything in the Act suggest that adaptive management may be used to let projects be considered to be mitigated even through there is uncertainty regarding mitigation [Comment #2]. By the application of the legal principle *expressio unius est exclusio alterius*, the express

⁴² *Canadian Parks and Wilderness Society v. Canada (Minister of Canadian Heritage)*, 2003 FCA 197, at ¶ 24.

⁴³ *Ibid.*

⁴⁴ *Ibid.*

- mention that adaptive management may be used in follow up implies that it may not be used in other processes or determinations in the CEAA. If Parliament meant that adaptive management could be used in determining significance of environmental effects, or effectiveness of mitigation, Parliament would have stated so.
2. Following on point #1, the specific adaptive management provisions in the CEAA were added by amendment to the Act October 30, 2003.⁴⁵ Accordingly, case law that precedes this date that suggests that adaptive management may apply to determinations under the CEAA other than relating to follow-up may not be applicable. All of the cases referred to in the *Kearl* decision in relation to adaptive management concerned legislation prior to the 2003 CEAA amendments.
 3. Following on point #2, the Kearl Court's use of *Canadian Parks and Wilderness Society v. Canada (Minister of Canadian Heritage)* for authority regarding when it is appropriate to use adaptive management in the CEAA with respect to Comments #1 and 2 are misguided because in that case adaptive management was used in relation to the Minister of the Environment's responsibilities under the *Canada National Parks Act*⁴⁶ and not under the CEAA. The provisions of the *Canadian National Parks Act* considered in the case are totally dissimilar to CEAA provisions regarding significance, mitigation, or adaptive management.
 4. There is a specific place for *uncertain environmental effects* in the CEAA and it does not have anything to do with Comment #1 or Comment #2. The CEAA requires, when an assessment proceeds by way of a screening, and "it is uncertain whether the project, taking into account the implementation of any mitigation measures ... is likely to cause significant adverse environmental effects ... the project shall be referred to a mediator or a panel review."⁴⁷ Since the CEAA requires, at least when a project proceeds by way of screening, that if it is uncertain whether a project, as mitigated, will have significant adverse environmental impacts, then the project must go to mediation or a panel, it would be contrary to the CEAA for an RA, in the face of uncertainty, to use adaptive management in an attempt to deal with uncertain impacts.
 5. Following on point 4, although the CEAA does not give specific guidance to a responsible authority regarding uncertainty regarding adverse environmental impacts when a project proceeds by way of comprehensive study, panel review, or mediation, nothing in the CEAA suggests that adaptive management is a proper way to attempt to address any uncertainty. As noted in reason #1 above, the CEAA authorizes the use of adaptive management only in respect to *follow up*.

⁴⁵ *Supra* note 9.

⁴⁶ *Canadian Parks and Wilderness Society v. Canada (Minister of Canadian Heritage)*, *supra* note 43, ¶ 22. The Applicants were not challenging the CEAA environmental assessment process (*ibid.*, ¶ 22) . They only were challenging whether the Heritage Minister properly exercised his authority under the *Canada National Parks Act*, in approving a winter road through Wood Buffalo National Park. The main issue was whether, in approving the road, had properly exercised the Minister's duty under subsection 8(1) of the Act to make "ecological integrity" a "first priority." The Court of Appeal found that the Minister's decision was rational and did not run contrary to the subsection 8(1) duty, especially considering proposed mitigation and the use of adaptive management.

⁴⁷ CEAA , *supra* note 1, s. 20(1)(c)(i).

6. Again, following on point 4, the fact that CEAA mentions uncertain adverse environmental impacts only in relation to screenings suggests that the administrators of the Act are meant to resolve any remnant uncertainty when a screening is bumped up to a mediation or panel review. These assessment streams generally are more comprehensive and intensive than are screenings. The logic of the Act suggests that any uncertainty likely would be resolved through the bump up.
7. As well, following on point 4, if, notwithstanding a bump up to a mediation or panel review there still is uncertainty with respect to adverse environmental impacts of a project, as mitigated, applying the precautionary principle would require a finding of significant adverse environmental impacts.⁴⁸ As further set out in Part V of this paper, the precautionary principle applies to all duties and responsibilities in the Act.
8. Finally, with respect to Comment #2 the CEAA requires that:

16. (1) Every screening or comprehensive study of a project and every mediation or assessment by a review panel shall include a consideration of the following factors:

... (d) measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the project [*emphasis added*].

The plain meaning of this requirement is that the assessor must consider only those mitigation measure that would *in fact* mitigate any significant adverse environmental impacts. In other words, given the current state of science and other relevant information, the administrator must be certain that mitigation measures will work.

PART V PRECAUTIONARY PRINCIPLE AND ADAPTIVE MANAGEMENT

The Whites Point Quarry Report and confusing the two concepts

As noted in the Agency's draft guidance document, the Joint Review Panel Report regarding the White Point Quarry and Marine Terminal Project called on the Agency to produce guidelines for participants in the environmental assessment process regarding the role of adaptive management in the federal environmental assessment process.⁴⁹ This Report concerned Bilcon of Nova Scotia Corporation's (the Proponent's) proposal to

⁴⁸ This is consistent with how the White Points Quarry Panel decision characterized the precautionary principle. At ¶ 3.2.5. the decision states "The precautionary principle instructs the decision-maker to take a cautious approach, or to err on the side of caution, especially where there is a large degree of uncertainty or high risk." See Environmental Assessment of the Whites Point Quarry and Marine Terminal Project, Joint Review Panel Report, October 2007.

⁴⁹ *Whites Point Quarry Joint Panel Review Report*, *ibid*, at p. 5.

“construct, operate and decommission a large basalt quarry, processing facility, ship loading facility and marine terminal at Whites Point, Digby County, Nova Scotia, for the export of aggregate to New Jersey.”⁵⁰ In a number of places the Panel notes how the proponent confuses adaptive management with the precautionary principle. For example, the Panel notes:

The Panel found little evidence from the EIS, information requests or the hearings to indicate that the Proponent appreciates the difference between the precautionary principle and adaptive management, how each should be implemented or how Environmental Assessment of the Whites Point Quarry and Marine Terminal Project fundamental the role of science is in the proper implementation of each. The Panel believes that given the Proponent’s flawed understanding, the eventual application of these tools would potentially negate any positive intention to offset potential environmental impacts.⁵¹

This Part of the paper aims to distinguish the precautionary principle from adaptive management. In doing so it argues that the notions do not, in the CEAA, set off the other, as indicated in Comment #3.

CEAA and the precautionary principle

Subsection 4(2) of the CEAA states:

Duties of the Government of Canada

In the administration of this Act, the Government of Canada, the Minister, the Agency and all bodies subject to the provisions of this Act, including federal authorities and responsible authorities, shall exercise their powers in a manner that protects the environment and human health and applies the precautionary principle.⁵²

The CEAA does not define “precautionary principle.” However the term has been defined in other federal statutes and in international agreements to which Canada is a signatory. For example, the *Canadian Environmental Protection Act, 1999*⁵³ characterizes the precautionary principle as follows:

2. (1) In the administration of this Act, the Government of Canada shall, having regard to the Constitution and laws of Canada and subject to subsection (1.1),
 - (a) exercise its powers in a manner that protects the environment and human health, applies 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

⁵⁰ *Ibid*, at 1.

⁵¹ *Ibid*. at 92.

⁵² CEAA, *supra* note 1.

⁵³ *Canadian Environmental Protection Act, 1999*, S.C. 1999, c. 33.

environmental degradation, and promotes and reinforces enforceable pollution prevention approaches ...

The preamble to the 2002 *Canada National Marine Conservation Areas Act*⁵⁴ sets out a similar characterization of the principle, minus the “cost effective measures” limitation. As well, under the Act the principle applies when there are merely “threats of environmental damage” and not “serious or irreversible damage” as set out in the *Canadian Environmental Protection Act*. The 2002 Act states:

Whereas the Government of Canada is committed to adopting the precautionary principle in the conservation and management of the marine environment so that, where there are threats of environmental damage, lack of scientific certainty is not used as a reason for postponing preventive measures

The preamble to the 1996 *Oceans Act*⁵⁵ 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” and later characterizes a precautionary approach as one that is “erring on the side of caution.”⁵⁶

The precautionary principle has been recognized as a principle of international law. A well known version of the principle is from the *Rio Declaration*⁵⁷ which is the same as the one in the *Canadian Environmental Protection Act* which states:

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.

However, other versions contain neither the “cost effective” limitation” nor the requirement that environmental threats be “serious” or would have “irreversible damage.” For example, the *Cartegena Protocol on Biosafety*, while affirming the precautionary principle in the Rio Declaration, formulates a stronger version:

Lack of scientific certainty due to insufficient relevant scientific information and knowledge regarding the extent of the potential adverse effects of a living modified organism on the conservation and sustainable use of biological diversity in the Party of import, taking also into account risks to human health, shall not prevent that Party from taking a decision, as appropriate, with regard to the import

⁵⁴ *Canada National Marine Conservation Areas Act*, S.C. 2002, c. 18.

⁵⁵ *Oceans Act*, S.C. 1996, c. 31.

⁵⁶ *Ibid.*, s. 30(c).

⁵⁷ *United Nations Conference on Environment and Development: Rio Declaration on Environment and Development*, 14 June 1992, 31 I.L.M. 874.

of the living modified organism in question ... in order to avoid or minimize such potential adverse effects.⁵⁸

Academic articles discuss what might be called “weak” and “strong” versions of the precautionary principle.⁵⁹ Given that there is no case law that determines, for the purpose of the CEAA, which definition of the precautionary principle applies for the purpose of the Act, this article assumes a moderate/general interpretation. This is the one adopted by Jamie Benidickson *et al.* in their *Practicing Precaution and Adaptive Management: Legal, Institutional and Procedural Dimensions of Scientific Uncertainty*,⁶⁰ namely that, “when scientific uncertainty is high, and the potential for substantial negative (but possibly unexpected) effects exists, administrative decision-making should err on the side of caution.”⁶¹

The precautionary principle in the context of the CEAA

Applying the adopted characterization of the precautionary principle, the CEAA requires the government, in administering the CEAA, exercise powers in a manner so that when there is significant uncertainty and a potential for substantial adverse environmental impacts, the government should err on the side of caution. How would this duty operationalize in the context of a CEAA environmental assessment? One way to determine this would be to identify CEAA administrative duties and consider how applying the precautionary principle might be carried out.

Here is a non-comprehensive list of administrative duties under the CEAA:

- A. section 15 duties relating to determining scope of project,
- B. section 16 duties relating to determining scope of assessment,
- C. subsection 18(3), making a determination regarding the appropriateness of public participation in a screening,
- D. making a determination under clause 16(1)(d) as to whether proposed mitigation measures are “technically and economically feasible” and that they “would mitigate any significant adverse environmental effects of the project,”
- E. making a determination of what constitutes a “significant adverse environmental effect of the project,”
- F. making a determination of the “need for, and the requirements of, any follow-up program in respect of the project” under clause 16(2)(c),

⁵⁸ *Cartagena Protocol on Biosafety to the Convention on Biological Diversity*, 29 January 2000, 39 I.L.M. 1027.

⁵⁹ E.g.: “Canada and the Precautionary Principle/Approach in Ocean and Coastal Management: Wading and Wandering in Tricky Currents” (2002 - 2003) 34 *Ottawa L. Rev.* 117, and S. Lafranchi, “Surveying the Precautionary Principles Ongoing Global Development: The Evolution of an Emergent Environmental Management Tool” (2005) 32 *B.C. Env'tl. Aff. L. Rev.* 679.

⁶⁰ SSHRC Report (2005) available online at <<
http://www.ie.uottawa.ca/English/Reports/JBPP_Final_Report.pdf>>.

⁶¹ *Ibid.*, at A-2 and B-5.

- G. making a determination of the “capacity of renewable resources that are likely to be significantly affected by the project to meet the needs of the present and those of the future” under clause 16(2)(d),
- H. making a determination of whether to consider “Community knowledge and aboriginal traditional knowledge” in conducting an environmental assessment under section 16.1,
- I. making a determination as to whether a screening should be bumped up to a panel review under clause 20(1)(c) or section 25,
- J. making a determination as to whether a comprehensive study should be bumped up to a panel review under section 21.1,
- K. considering whether a project can be justified in the circumstances where there is a determination that the project, as mitigated, will have significant adverse environmental effects, under section 20 or 37,
- L. considering the need for a follow-up program under section 38, determining what will be included in a follow-up program, and implementing a follow-up program.

It is easy to imagine circumstances in which the precautionary principle could come into play when an administrator is carrying out any of the above duties. This paper only will consider three. For example, regarding A, if a project as described by the proponent would likely to have significant adverse environmental effects, and there is scientific uncertainty as to the magnitude or impact of the effects, or whether the effects can be mitigated, the RA would be operationalizing the precautionary principle if the RA determines not to scope the project down to a point to where there would no longer be significant adverse effects to the project as scoped. Regarding I or J, if a project would likely have significant adverse environmental effects, and there is uncertainty as to as to the magnitude or impact of the effects, or whether the effects can be mitigated, the administrator would be operationalizing the precautionary principle if he or she ‘bumps up’ an assessment to a panel review to better ensure that potential impacts are more fully explored and the public has opportunities to participate in the assessment process. Regarding H, if a project as described by the proponent would likely to have significant adverse environmental effects, and there is scientific uncertainty as to the magnitude or impact of the effects, or whether the effects can be mitigated, in applying the precautionary principle, the RA would be operationalizing the precautionary principle if the RA decides to consider community knowledge and aboriginal traditional knowledge in an attempt to reduce uncertainty, one way or the other.

The precautionary principle in contrast to adaptive management

An important distinction between the precautionary principle and adaptive management is that the CEAA requires that the precautionary principle be exercised in all circumstances in administering the Act. The role of adaptive management is much more circumscribed. The CEAA only mentions adaptive management once and it is in subsection 38(5) which states “The results of follow-up programs may be used for implementing adaptive management measures.” Accordingly the two notions do not set each other off as asserted in Comment #3. On the contrary, the precautionary principle tempers the application of adaptive management, since the precautionary principle is to

be applied in respect of all responsibilities under the CEAA including section 38, follow-up. Hence, if there is any question about whether a follow-up program should be imposed, applying the precautionary principle a responsible authority should impose a program and insure that appropriate adaptive management techniques will be implemented to insure that the proponent will be required to adjust environmental management of the project if necessary.

PART VI

Summary – the role of adaptive management in CEAA processes

In summary, the legislated role of adaptive management in CEAA processes really is quite narrow. First, the term ‘adaptive management’ only is mentioned with respect to follow-up programs. Accordingly it should only come into play when a follow-up program is in place and the program either reveals (a) that predictions regarding significance of adverse environmental effects or the success of mitigation measures were wrong, or (b) information that is relevant to future environmental assessments. In the case of (a) the regulator may require alternative environmental management strategies for mitigation or addressing environmental impacts, but presumably, only if the original approval of the project anticipated such flexibility. Notwithstanding the ability of follow up programs to provide for adaptive management, predictions of significant environmental impacts and success of mitigation measures must be certain, on the basis of good and reliable science and other relevant information available at the time when the responsible CEAA administrator answers the question as to whether a project, as mitigated, likely will result in significant environmental impacts. Adaptive management gives regulators a means to avoid or respond to future environmental impacts when, notwithstanding these reasonable and defensible predictions, adverse environmental impacts nevertheless result.

Adaptive management and CEAA review

BETTER ENSURING THE POTENTIAL OF ADAPTIVE MANAGEMENT IMPLEMENTATION

As mentioned earlier, adaptive management may only be successfully implemented to require a project manager to change environmental management if one or the other or both of two situations exist. One is that the applicable legislation authorizes the regulator to require changes in environmental management. The other is that the authorizations that government issued to enable the project to proceed are flexible enough to require the proponent to amend approval conditions in such circumstances.

Regarding the first situation, the CEAA could be amended following review to authorize federal regulators to require changes in environmental management if adaptive management demonstrates that predictions about significance of environmental effects or the success of mitigation were wrong. The limitation on such amendment is that it would only apply to federal authorizations and the CEAA enables the responsible authority to

consider mitigation measures that are enforced by a non-federal entity, such as a province.⁶²

With respect to the second situation, the CEAA could be amended to require that federal authorizations that enable a project to proceed contain adaptive management provisions, where appropriate. Further amendment might be considered to deal with adaptive management implementation with respect to mitigation measures under provincial control.

CONFUSING THE PRECAUTIONARY PRINCIPLE WITH ADAPTIVE MANAGEMENT

The CEAA could be amended to clarify the relationship between the precautionary principle and adaptive management. It could be made clear that adaptive management does not set off the precautionary principle and that adaptive management only applies to follow up programs.

OVERCOMING CASE COMMENTARY THAT MISTINTERPRETS THE ROLE OF ADAPTIVE MANAGEMENT IN ENVIRONMENTAL ASSESSMENT

Finally, the CEAA could be amended to clarify the role of adaptive management in the environmental assessment process to better ensure that it is not used to lend 'certainty' to uncertain mitigation measures, or to 'lessen' the significance of otherwise significant adverse environmental impacts.

⁶² *Supra* note 1, s. 20(1.1).