GUIDANCE FROM ADAPTIVE ENVIRONMENTAL MANAGEMENT, MONITORING, AND INDEPENDENT OVERSIGHT FOR MANITOBA HYDRO'S UPCOMING DEVELOPMENT PROPOSALS

A report prepared for the Public Interest Law Centre of Legal Aid Manitoba

by

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November 7, 2012

SUMMARY

What are the best practice solutions to manage environmental uncertainties for large-scale transmission development? This is the question considered in the context of the Manitoba Hydro's environmental impact statement for the proposed construction of the Bipole III development.

Uncertainty is a reality when it comes to managing complex ecological and social systems. We are gradually learning more as scientific knowledge grows and as managers and policy makers increasingly recognize the value of local expertise and traditional knowledge, but our understanding remains incomplete. Uncertainty in resource management stems from several sources, such as:

- variability in the natural environmental;
- human impacts on the environment;
- lack of knowledge about most aspects of the ecosystems being managed;
- multiple social and political goals which impact resource management at any given time; and,
- imperfect sampling and modeling techniques.

Despite this uncertainty, planning, decision making, and development must and does proceed. Decisions must be made using the best information available at any specific point in time. Fortunately, there are methods and systems in resource management for dealing with uncertainty. One of these is adaptive environmental management (AEM), considered to be a best practice for minimizing the environmental and social risks of development.

This report:

- describes the basic elements of AEM;
- provides a preliminary assessment of the extent to which the Bipole III proposal reflects AEM best practices;
- explores the critical element of environmental monitoring, including independent oversight; and,
- examines the applicability of independent oversight as a model for Manitoba Hydro projects.

The basic elements of AEM

AEM is a systematic process for continually improving management policies and practices by learning from the outcomes of operational programs. Its most effective form employs management programs that are designed to experimentally compare selected policies or practices, by evaluating alternative hypotheses about the system being managed.

AEM is a continuous learning cycle designed to link policy and implementation on a continuous basis. It is iterative, meaning decisions are reviewed and reassessed on a regular basis, and it emphasizes feedback and learning as a way to minimize "known unknowns" and "unknown unknowns".

AEM relies on system monitoring as a basis for identifying impacts on the ground; and it includes ongoing experimentation, which allows for new management strategies to emerge through developing thoughtful testing related to specific valued ecosystem components.

Bipole III and AEM best practices

Using six general guidelines for AEM best practices, we did an assessment of the Bipole III proposal, and found both positive and negative aspects.

- The first principle, **understanding context is crucial**, reinforces the importance of a broad-based, inclusive, and participatory approach.
  - Positive aspects: regulators, Aboriginal communities and groups, and other interested parties will be involved in follow-up activities; community engagement will extend over the construction and maintenance phases of the project; during monitoring Hydro will attempt to build new relationships with local communities, resource management boards, and government agencies; Hydro is considering the development of construction phase monitoring plans involving local monitors and liaisons from directly affected communities.
  - Negative aspects: plans for broad-based public involvement in follow-up activities are limited; lack of a clear community involvement plan or even a basic framework for a plan; specific targets will not be set for the number of community members involved in the environmental protection plan.

- The second principle, **understanding adaptive approaches**, involves being careful, honest and public about what it means to undertake adaptive management so that safe and rewarding conditions can be created for experimentation and learning for better management.
  - Positive aspects: the Bipole environmental impact statement (EIS) makes a commitment to AEM, and covers, at least in a rudimentary way, each phase of the basic cyclical model of AEM and contains properties of the essential elements of AEM.
  - Negative aspects: lack of explicit and public recognition of uncertainty and the need for AEM, and of the political and organizational challenges to undertaking AEM in a meaningful way.

- The third principle, **purposeful and deliberate**, suggests that good AEM starts with the framing of good questions, which directs subsequent undertakings, guides monitoring and evaluation, and emphasizes the social and political nature of the process.
  - Positive aspects: as noted previously, the Bipole EIS contains properties of our four essential elements of AEM; Hydro intends to use the highly challenging, innovative and ambitious form of AEM (the active form) in several parts of its Environmental Protection Plan (EPP).
  - Negative aspects: lack of detail in the EIS about the experimentation to be used during active AEM; lack of plans for broad-based public involvement; lack of plans or even frameworks for access management and for monitoring socio-economic (including community health variables) and heritage resource impacts.

- The fourth principle, **careful documentation**, calls for documents that are transparent and open to scrutiny, and designed to encourage thoughtful and constructive debate.
  - Positive aspects: plans for an Environmental Protection Information Management System (EPIMS); ongoing communications with contractors, regulators and Aboriginal communities; annual reports for distribution to a wider audience; a project web site will be maintained; the heritage resource plan will be reviewed with interested parties prior to construction.
  - Negative aspects: lack of discussion in the EIS of the need for and challenges to implementing AEM; lack of transparency regarding the proponent's intentions for active experimentation; the proponent has yet to release a report of the September 2011 audit of its environmental management system; no plans to release the access management plan until discussions with regulators and local communities have been concluded.

- The fifth principle, **designed to promote learning that translates into action**, requires acknowledgement that AEM is hard, time-consuming, and requires ongoing investment, all of which necessitates organizational commitment and will to act.
  - Positive aspects: the EPP is grounded in broader corporate policies, management systems and programs that acknowledge the need for continuous improvement and for making policy and management adjustments; the importance of learning and management adjustments are recognized at the operational level; the EPP establishes a process for its own review and renewal, including taking into account monitoring and auditing results; examples of management adjustments based on consultation and audit results can be found.

- The sixth principle, **supporting the "right" people**, highlights how important it is to have suitable AEM participants, and that the participants must have the latitude, organizational support and resources to undertake their work.
  - Positive aspects: organizational commitment and will to act has seemingly translated to Hydro practitioners having sufficient authority and organizational supports for doing basic AEM work; clear feedback loops from inspection and monitoring results to internal decision processes; established lines of responsibility in the event monitoring detects a problem; training will be provided to enhance monitoring capacity among Hydro staff and contractors.
  - Negative aspects: uncertainty about the extent to which operational staff have the latitude and organizational supports for involving an array of stakeholders throughout the full AEM cycle; relative lack of clarity regarding who is responsible for environmental auditing, to whom the results will be reported, and who is responsible for acting on the results; the overall level of resources that will be devoted to AEM is unknown.

In addition to the assessment, we compiled a set of 36 questions for determining the quality of AEM strategies and practices. Engaging with these questions can help Hydro more fully harness the power of AEM for responding to the complexity, uncertainty and conflict inherent in the corporation's upcoming development proposals.

Environmental monitoring

As monitoring forms the bulk of follow-up activity in environmental assessment, and serves as the basis for implementing AEM, the second section of the report explores best practice in monitoring. Monitor can be designed to:

- demonstrate compliance with regulatory requirements;
- provide verification of the accuracy of predictions; and,
- measure change that can be attributed to a development project (effects assessment).

Proponents and government typically carry out monitoring programs. However, there is increased interest in employing independent oversight for large-scale projects. Independent oversight involves the creation of an institution or board that is autonomous, or semi-autonomous, from government and project proponents.

Independent oversight

Independent oversight bodies serve different functions, but at their base, they take on watchdog functions usually performed by government and industry, and these are used to demonstrate accountability for the appropriate, proper and intended use of resources.

Independent oversight is increasingly employed in resource management; this document compares and contrasts the implementation frameworks, mandates, funding arrangements, and compositions for nine existing (and two proposed) independent oversight bodies:

- Sollum Voe, Scotland: SOTEAG. This agency is responsible for developing and implementing monitoring programs associated with oil and liquefied gas terminals in the Shetland Islands.
- Alaska, USA: PWSRCAC and CIRCAC. These two Regional Citizens' Advisory Councils were given authority, in law, following the Exxon Valdez Spill in 1989.
- Gulf of Mexico, USA: This is a proposed agency stemming from the Deepwater Horizon spill.
- Inuvik, NT: This was a proposed agency for the Mackenzie Gas Project.
- Sydney, NS: RMOB and CLC. These are oversight bodies for the Sydney Tar Ponds Remediation Project.
- Montana, USA: SEB-GNA. This oversight agency is for the Stillwater Mine in Montana.
- Yellowknife, NT: IEMA, EMAB, SLEMA. Independent environmental oversight boards were created for each of the three diamond mines opened in the Northwest Territories.
- Happy-Valley-Goose Bay, NL: IEMR. This institute oversees the environmental effects of low-level flight training based at the Canadian Forces Base at Goose Bay and conducted over large areas of Labrador and northeastern Quebec.

Based on the literature, and drawing from semi-structured interviews with stakeholders involved in five oversight boards, we identified seven elements of an effective oversight program:

- Strong legal foundation. An organization with a legislated or contractual framework governing activities has a greater ability to undertake tasks associated with its mandate, and to challenge the proponent in cases where monitoring or financial obligations are not being met.

- Clear mandate. Since independent oversight can serve various purposes, the framework must specify the roles and responsibilities of the agency and its stakeholders.
- Effective communication and outreach. Regardless of the specific mandate, to be successful, an oversight body must communicate its mandate to the local stakeholders.
- Independent authority. Once the mandate is struck, the oversight body must be free to meet its mandate, independent of review by the government or the proponent, and not be tied to annual funding. True independent authority includes a mechanism for the oversight body to pursue its own interests, including in matters of conflict resolution, outside of the approval of a signatory to the agreement.
- Independent composition. Although some oversight agencies include representatives from the federal and territorial governments and the proponent, more successful bodies comprise representatives from local non-governmental organizations, and local and Aboriginal governments.
- Adequate, long-term funding. Adequate funding to fulfill tasks in the mandate is a struggle for most oversight agencies. Funding ranges from nothing, up to $3.3 million annually, in the case of the Prince William Sound Citizens' Advisory Group. Beyond sufficient funding, best practice calls for multi-year funding arrangements, so that long-term programs can be established.
- Experience. Organizational learning and experience are important. Assessments during the first decade of operation focus on aspects for improvement, while literature reviews of agencies in existence for 20 years or more (e.g., SOTEAG, PWSRCAC) focus on organizational strengths or achievements.

Independent oversight and Manitoba Hydro

From this discussion, several reasons emerge as to why independent oversight should be considered for Manitoba Hydro's proposed development agenda:

- Bi-Pole III will have a sizable footprint in the hinterland;
- questions regarding federal administrative and monitoring capacity;
- questions of trust between the proponent and the public;
- lack of clarity regarding implementation of monitoring programs; and,
- the overlapping mandate of the Crown in acting as both proponent and regulator for the Bipole III and other proposed Manitoba Hydro projects; this is the most compelling reason why independent oversight should be explored.

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We were retained to analyze the Bipole III environmental impact statement with respect to its incorporation of adaptive environmental management principles and the related practices of environment monitoring and independent oversight.

INTRODUCTION

> There are known knowns. These are things we know that we know. There are known unknowns. That is to say, there are things that we now know we don't know. But there are also unknown unknowns. There are things we don't know we don't know…That's basically what we see as the situation.

Although these comments by former United States Secretary of Defense Donald Rumsfeld[1] were ridiculed by political pundits and satirized in the popular press, they offer a pithy summary of a critical concept in resource management: **uncertainty**. Developers, planners and government agencies make decisions with the best information available at a specific point in time even though they might face some uncertainty in what they know at that time.

Recognizing uncertainty is not fatal to decision making; there are methods and systems in resource management for dealing with uncertainty. One of these is adaptive environmental management (AEM), considered to be a best practice for minimizing the environmental and social risks of development.

AEM is a structured and powerful approach to learning through doing. It involves making explicit predictions of the expected outcomes of management actions, comparing actual outcomes to the predictions, and adjusting both actions and the models that were used to make the predictions. It is based on the premise that humans do not know enough to control complex ecosystems, and thus by turning management actions into experiments, one can learn something about ecosystem processes and structures, and thus design better policies and craft better experiments. Part of the power of AEM is that it is highly scientific but also highly pluralistic, recognizing the value of all good sources of knowledge, including local expertise and traditional knowledge.

The purpose of this report is, therefore, to discuss the opportunities for AEM (and the related practices of monitoring and independent oversight) in the development agenda set by Manitoba Hydro. This agenda includes not only Bipole III, but also the Keeyask and Conawapa dams and proceedings pertaining to Lake Winnipeg regulation. Bipole III is furthest along in the approval process; it is in the midst of a provincial environmental assessment, with public hearings beginning in October 2012.

Given the magnitude and complexity of the projects being considered, their potential social-ecological impacts, and the potential controversy they could engender, it is essential for development to proceed in an adaptive manner. Using AEM best practices can help ensure certainty for the proponent and the public and inspire confidence in the approval and development processes.

The first part of the report outlines four basic elements of AEM: 1) ongoing experimentation; 2) system monitoring; 3) feedback and learning; and, 4) institutional capacity and support. It also

[1] The comments were made at a February 12, 2002 Department of Defense news briefing. For more information, see The Poetry of D.H. Rumsfeld by Hart Seely on Slate.com, posted Wednesday, April 2, 2003 <http://www.slate.com/articles/news_and_politics/low_concept/2003/04/the_poetry_of_dh_rumsfeld.html>.

explains a cross-cutting theme, active and ongoing participation, which affects each of the four elements. The report also offers an assessment of the extent to which the Bipole III proposal reflects adaptive management best practices, drawing from documents filed in the environmental assessment proceedings and an interview with two Manitoba Hydro staff members. Part one concludes with a comprehensive set of criteria, drawn from the literature, for determining the quality of AEM strategies and practices. These are offered to help guide Manitoba Hydro's future AEM efforts.

Part two of the report focuses on the second basic element of AEM, system monitoring, and especially the importance and potential of independent oversight of monitoring activities. This part includes an exploration of the applicability of independent oversight to Manitoba Hydro projects.

PART 1: ADAPTIVE ENVIRONMENTAL MANAGEMENT

1.1 ORIGINS, TERMINOLOGY, ENDURING THEMES

AEM has developed because of insights from complex systems thinking and a realization that the environment constitutes a set of linked social-ecological systems (Capra, 1996; Berkes & Folke, 1998; Levin, 1999). It is believed that such systems are so complex that their overall behaviour is unpredictable, cause and effect is not easily determined, and surprise is inevitable (Ludwig, 2001; Gunderson & Holling, 2002; Jentoft & Chuenpagdee, 2009). As Walters (1986) and Gunderson et al. (1995) argue, complex ecosystems are "moving targets", with multiple futures that are hard to foresee.

The uncertainty inherent in resource management can emerge from a number of factors, including: 1) variability in the natural environment; 2) human impacts on the environment; 3) lack of knowledge about many aspects of the ecosystems being managed; 4) different social and political goals which impact resource management at any given time; and, 5) the potential for imperfect sampling techniques (Hilborn, 1987). Moreover, these factors are typically exacerbated in cases involving multiple jurisdictions and management objectives, long time frames, large projects, several types of ecosystems, and lack of knowledge of baseline conditions (Lee, 1993; Stankey & Allan, 2009).

These lessons and emerging concepts and methods have profound implications for environmental management. As many of the above cited authors have noted, conventional management tends to be characterised by a single target and policy, a single scale of focus (typically short-term and at the local level), and a search for more certainty and more control. Reality, however, serves to undermine such an approach and creates the potential for making incorrect decisions because managers are not able to accurately predict the outcome of any particular management initiative (Lee, 1993).

Given these realities, AEM has been put forward as a way to acknowledge that managed resources will always change as a result of human intervention, that surprises are inevitable, and that new uncertainties will emerge (Gunderson, 1999). As a means of **linking learning with policy and implementation**, the idea of AEM can be traced to a number of seminal works. Holling (1978) was the major early contributor with his 1978 edited book, which focused on how "to plan in the face of the unknown" and how to develop more resilient management policies. Subsequent works by Walters (1986), Lee (1993) and Gunderson et al. (1995) elaborated on the concept of AEM and its potential.

AEM has been defined in various ways since its development in the early 1970s.[2] While definitions vary by source, several key characteristics of the concept are universal and fundamental. In the most concise terms, AEM:

[2] See for example, Nyberg & Taylor (1995) who, writing in a Canadian context, proposed the following working definition of AEM: A systematic process for continually improving management policies and practices by learning from the outcomes of operational programs. Its most effective form employs management programs that are

- is **iterative,** meaning decisions are reviewed and assessed on a regular basis;
- includes **ongoing experimentation**, which involves treating human interventions in natural systems as "experimental probes";
- focuses on **system monitoring**, involving observing and evaluating changes in the environment caused by the ongoing experimentation; and,
- emphasizes **feedback and learning** as a way to minimize "known unknowns" and "unknown unknowns".

The 'adaptive' bit of the concept is the linking of results from management 'experiments' to policy and decision-making processes. (See **Figure 1.1** for an AEM model from Australia.)

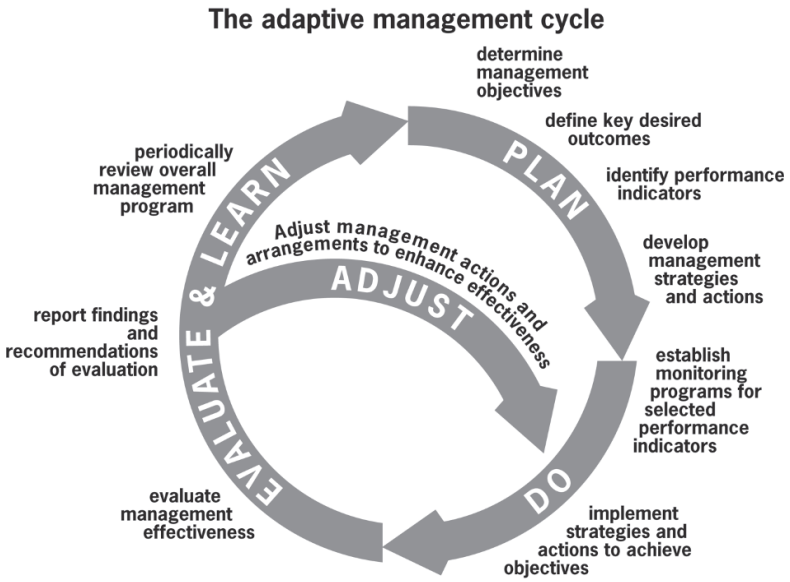

Figure 1.1: The adaptive management cycle for the Tasmanian Wilderness World Heritage Area (Jones, 2009, p.237)

While people will often learn and adapt simply because of their experiences, what distinguishes AEM from such reactive learning is its **purposefulness**, which explicitly replaces learning through *ad hoc*, trial-and-error with learning by careful tests. This form of **"learning by doing"** (Walters & Holling, 1990) is the essence of AEM, and the means by which uncertainty is winnowed (Gunderson, 1999), with environmental management policies treated as hypotheses, or questions rather than answers. With policies as questions, management actions become treatments, in an experimental sense, with AEM structured to make learning both deliberate and more efficient.

designed to experimentally compare selected policies or practices, by evaluating alternative hypotheses about the system being managed.

1.2 ONGOING EXPERIMENTATION

Experimentation is at the core of AEM, with managers treating human intervention in natural systems as experimental probes (Lee 1993). That is, management actions are designed (from the outset) to test hypotheses about the behaviour of an ecosystem being changed through human use. Beyond trial-and-error approaches, two main categories of AEM have been identified – **passive** and **active** – distinguished by the degree to which management actions are treated as experiments (Walters & Holling, 1990).

Passive AEM (a form of sequential learning) is where historical data are used to frame a single best approach, to be taken along a path that is assumed to be correct. Faced with uncertainty, managers implement the alternative they think is 'best' (with respect to meeting management objectives), and then monitor to see if they were right, making adjustments if desired objectives are not met (**Figure 1.2**).

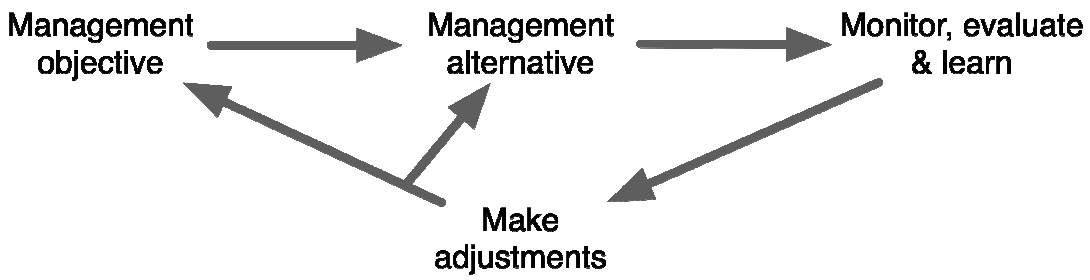

Figure 1.2: A basic model of passive AEM.

While this can be an informative strategy, as shown by Walters & Holling's (1990) seminal work in the Florida Everglades (**Box 1.1**), there are two fundamental limitations to passive AEM. First, it is often unclear whether observed changes are due to the way in which the environment was treated, or whether they are due to other variables affecting the system. Second, it can fail to detect all the opportunities for improving the performance of the management intervention.

Active AEM is the second model, and is explicitly designed to provide data and feedback on the relative efficacy of alternative management or policy options. Faced with uncertainty, managers implement more than one strategy as concurrent experiments to see which will best meet management objectives (**Figure 1.3**).

While both passive and active AEM are characterized by iterative decision making, feedback between monitoring and decisions made (learning), embracing risk and uncertainty as a way of building understanding, **only active AEM deliberately probes** the system to test competing hypotheses. When a policy is successful under active AEM, the hypothesis is validated. When the policy fails the adaptive approach is designed so that learning occurs, adjustments are made and future initiatives are based on the new understanding.

Box 1.1: Successful passive AEM in the Florida Everglades

During the late 1980s, a small technical group suggested that an integration of scientific understanding was needed to help resolve chronic resource issues in the Florida Everglades: declines in wading bird nesting populations, changes in vegetation patterns due to eutrophication and poor water management, changes in aquatic communities, declines in fisheries, and increases in populations of exotic organisms. The Everglades Adaptive Environmental Assessment model was consequently developed to simulate spatial and temporal dynamics of key ecosystem components, with sub-models developed for hydrologic dynamics and sets of ecological interactions. The credibility and generalizability of the hydrology model led to its use in screening policies to identify those that required more evaluation in terms of feasibility and effectiveness, using other models and other analyses. The major conclusion of this informal, collaborative effort was that enough was known about the Everglades ecosystem to begin restoration. The assessment phase of AEM was deemed highly successful, with uncertainty over chronic resource issues (water level and distribution) replaced by more certainty in planning and the formalization of interactions between management agencies and stakeholders.

Source: Walters and Holling (1990)

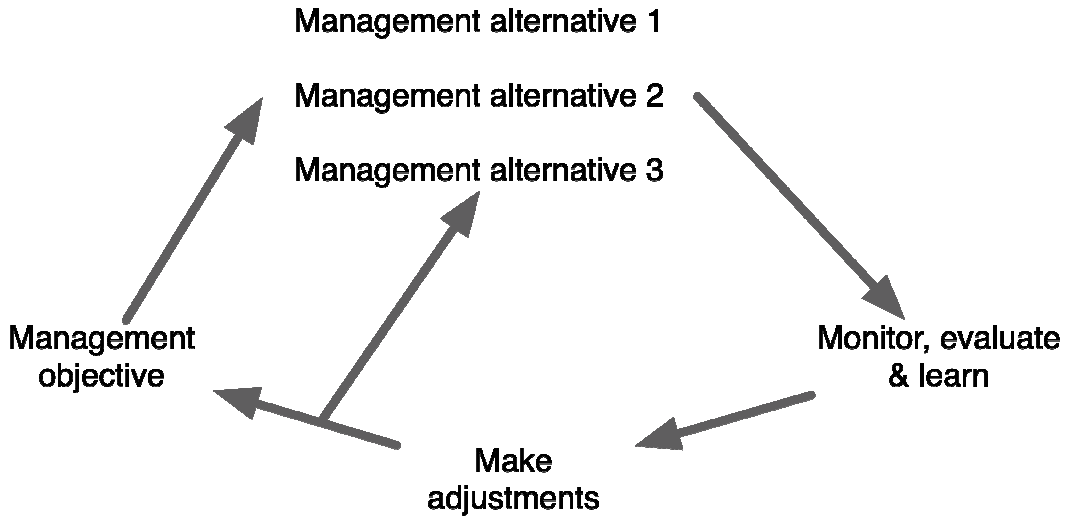

Figure 1.3: A basic model of active AEM.

Of course, scientific experimentation not only includes a clear hypothesis and a way of controlling factors that are (thought to be) extraneous to the hypothesis, but normally offers opportunities to **replicate the experiment to check its reliability**. There are thus complex technical questions about how adaptive management strategies are undertaken in terms of sampling and analysis.

The most important first step is **problem framing**, or "getting the question(s) right" (Walters, 1986, p.9). The aim is for AEM to be "experimental at scales compatible with the scales of critical ecosystem functions", with the spatial focus eco-systemic rather than jurisdictional, and a time frame based on biological parameters rather than business or administrative cycle (Stankey & Allan, 2009).

The next step is to define the target system and determine the units available for experimentation. If the target is a unique ecosystem managed as a single unit (e.g., a particular area of old growth forest) then replication is not applicable. However, when groups of units are sufficiently similar that they can be managed according to a common strategy, replication is desirable to determine the range of possible responses.

For reasons of scale and expense, active AEM may not include controls, replication, multiple treatments, randomization, or other features commonly seen in laboratory-based experiments. For example, it is near to impossible to use classical experimental models that employ controls and replicated treatments to determine the effects of development on wildlife that use huge areas. Rather, in designing AEM experiments, managers must strive to balance practicality with rigor to provide reliable information.

Quasi-experimental field studies are often important in active AEM. Additionally, models are important tools for evaluating alternatives in an adaptive management framework. Models permit managers to incorporate uncertainties into planning by assessing the degree to which model behaviour is altered by changes in parameter values (sensitivity analysis) and external disturbances (Peterson et al., 1997).

Various analytical methods have been developed for use with modelling (Walters, 1986), based on the theory of stochastic processes, Bayesian statistics (Dorazio & Johnson, 2003; Prato, 2005) and decision theory (Peterman & Peters 1998). These methods allow managers to rank their management decisions and thus help decide which experimental design is the most appropriate. **Box 1.2** provides an example from Australia.

1.3 SYSTEM MONITORING

The **monitoring** of key response indicators as well as evaluation of those data, form another component critical to the success of AEM (Nyberg & Taylor, 1995). Monitoring is the basis for determining whether management assumptions hold true and from which learning can then inform subsequent action.

As Jones (2009) explains, monitoring programs may reveal that a management strategy is delivering the anticipated changes and so provide endorsement for continuing the strategy. Alternatively, monitoring may reveal that the management strategy is not delivering expected outcomes and so needs to be reviewed and changed. Monitoring may also be used to differentiate between different hypothesized trajectories of outcomes from a particular management strategy, and thus contribute to learning about how the managed system works.

Box 1.2: Adaptive fisheries management, Australia

This AEM strategy looked to resolve key uncertainties about resource dynamics and sustainable resource use. The resource problem in question was a change in the composition of the fish community on Australia's north-west shelf, namely a decrease in high-valued species and an increase in low-valued species. The key management questions were: Could this be reversed? Was it worth trying to reverse? And, if so, what is the best strategy to use?

Four different hypotheses were identified to explain the observed change, and these had quite different implications for the best long-term management strategy. The hypotheses involved: no inter-specific interaction; two variations of competitive interaction among species; and, trawl-induced alteration of seabed habitats. These alternatives were incorporated in an operating model. The model also included two fishing methods (trap and trawl), which differed in their selectivity on fish species and their impact on seabed habitats.

Non-adaptive, passively adaptive, and actively adaptive strategies were evaluated. The non-adaptive strategy specified the catch and capture method based on existing data and did not include further monitoring or decisions. The passively adaptive strategy involved monitoring the resource while a fixed catch and capture method was applied during a "learning period". At the end of this period the monitoring data were used to update the probability initially placed on each resource dynamics model and a decision rule was used to select catch and capture methods for the future. The actively adaptive strategy had the same structure as the former except that different experimental management regimes were applied in different areas during the learning period. The experimental management regimes were combinations of catch and capture methods applied in an area, and included closing areas to all fishing or to fishing with some type of gear. In both adaptive strategies, the type and intensity of monitoring were varied, and the possibility of failed management implementation was included.

Performance was measured by the expected net present value of the catch (i.e., the sum of the discounted annual net revenue from the fishery). Some actively adaptive strategies performed better than the non-adaptive and passively adaptive strategies, but only for a (roughly) 5–15-year learning period duration. Shorter experiments did not provide enough discrimination among alternative hypotheses to improve selection of the appropriate management regime. Longer experiments gave very good hypothesis discrimination, but the cost of achieving that discrimination was greater than the future value derived from improved decision making.

An adaptive strategy involving sequential closure of areas to trawl fishing was adopted in 1985. By 1991, the experiment had successfully discriminated among the competing hypotheses and provided a greater than expected economic return. The fishery managers of the region now use a complex of areas that are open and closed to trawl fishing.

Source: Sainsbury et al. (1997, pp.107-112), Sainsbury et al. (2000, pp.731-741)

Monitoring, however, is one of the main sources of process failure (Elzinga et al., 2001; Alana & Michael, 2009) in AEM, either because monitoring is never completed or because monitoring data are not properly analyzed. It is thus important for managers to clearly identify the need for monitoring. Doing so helps ensure that well-targeted programs for AEM are established and implemented.

Well-targeted programs will likely be focused on the:

- effectiveness of key management projects, strategies and programs;
- condition of valued resources (including restoration of degraded resources);
- nature, extent and severity of environmental threats, risks and impacts (including new and emerging threats);
- level and nature of human use, its environmental sensitivity and sustainability;
- views of the general public and affected communities; and,
- trends and changes in all of the above (Jones, 2009, pp.251-252).

Additionally, a range of questions should be considered to understand precisely how monitoring results are interpreted, learned from and lessons implemented in a complex social, institutional and political environment. Some of these questions are outlined in **Box 1.3**, and monitoring is examined in more depth in part two of the report.

Box 1.3: **Initial monitoring questions for planners and managers (Jones 2009, p.239-241)**

1. 'What would we expect to see if management was working well?' And the converse question: 'What would we expect to see if management was NOT working well?' The answers to these questions assist in developing clear statements of management intent (key desired outcomes) and also assist in identifying appropriate performance indicators.
2. 'What could we monitor or measure (or photograph, or map, or survey) to reveal the outcomes that are being delivered?' The answers to this question help to identify a range of potential performance indicators that could be used to monitor management effectiveness. If it is important to detect and/or demonstrate change over time (e.g. as a result of the management strategy or program), it is necessary to document the baseline.
3. 'Where would we realistically expect to see improvements or changes if management was working well?' And the converse question: 'Where would we realistically expect to see things getting worse or changing if management was not working well?' The answers to these questions assist in identifying indicators of change', which can suggest high priorities for monitoring programs.
4. How will the findings of monitoring and evaluation be reported and/or used? The answers to this question help to ensure that the findings of monitoring and evaluation are useful and used.
5. Who will be responsible for doing the monitoring, evaluation and reporting (including design of the monitoring program, data collection, data analysis and management, overall coordination and quality control)? The answers to this question assist in identifying the roles, responsibilities and resources required for monitoring, evaluation and reporting.

1.4 FEEDBACK AND LEARNING

Learning from feedback is central to AEM and may involve not only individuals but groups, organizations and societies in general (Diduck, 2010b). Learning derives from action and, in turn, informs subsequent actions to be taken. If there is no learning taking place, then management cannot be "adaptive" because information gained is not used to feed into decision-making processes.

Bunnell & Dunsworth (2004) present a nice Canadian example of management adjustments made in response to feedback and learning. They detailed a forest monitoring program in British Columbia, and identified several ways the program was modified, including redefining old growth forest zones based on new observations and public feedback, and creating an ecological restoration pilot program then evaluating it for its applicability in other jurisdictions.

As described in previous sections, AEM techniques look to deal with uncertainty through a form of **closed-loop experimental learning** whereby experiments are used to test hypotheses on system responses to management interventions, monitored, and then continued/expanded if the hypothesis is not rejected or revised if it is rejected. This involves a **continuous process of feedback**, leading to a reformulation of problems, tactics and strategies (Stankey & Allan 2009), rather than a simple depiction of AEM as "plan-act-monitor-evaluate".

Learning in AEM is often described in terms of depth, or levels, of learning outcomes. An example is **"single-loop"** learning in which the outcomes are directed at modifying management strategies without challenging the assumptions upon which those strategies are based. This type of learning is often driven by certainty about how the world works and a firm commitment to personal or organizational presuppositions.

However, because the environment functions as a complex adaptive system, where new problems emerge or existing problems are reconfigured, it is often necessary to rethink the purposes, rules and assumptions by which people, organizations and communities operate. Such critical self-examination or **"double-loop learning"** (Arygis & Schon, 1978) is essential if managers and management agencies hope to:

- address why a problem may have occurred and determine how to proceed;
- use mistakes as "negative feedback", which have the potential to be powerful sources of insight;
- promote change in the face of uncertainty (learning almost always involves change to the organizational system so that future behaviour reflects new information);
- reframe, or to see problems in a new or different way; and,
- commit to value different knowledge systems and epistemologies (Stankey & Allan, 2009).

1.5 INSTITUTIONAL CAPACITY AND SUPPORT

Learning and related management adjustments of the kind required by AEM are no easy task, and will only occur if several important social and institutional factors are in place (Lee 1993). First, they require that organizations have the capacity to accept information that may be contrary to existing beliefs, values and policies. This capacity includes the ability to recognize that AEM experiments bring with them the risk of failure and that failure is acceptable and rewarding if it contributes to meaningful learning outcomes.

Since human agency drives the cycle of learning and management change, a number of scholars see the successful implementation of AEM as dependent on a change of mindset among managers and policy makers, and the emergence of a new generation of "learning organizations" (Senge, 1994; Fazey & Schultz, 2009). Additionally, in carrying out an extensive review of AEM success stories, Schultz and Fazey (2009) found that in nearly all cases (at least in the beginning), the presence of a key individual (invariably described as a champion, a change agent, organizational entrepreneur, local steward, facilitator or broker) "was instrumental in making something happen".

Other best practices that encourage more adaptive forms of management include the setting aside of time and place for learning from and reflection upon management experiments (Rushmer et al., 2004), and the empowerment of co-workers to become adaptive learners, building capacity and confidence in the AEM process (Fazey & Schultz, 2009).

1.6 CROSS-CUTTING THEME: ACTIVE AND ONGOING PARTICIPATION

Successful AEM is dependent on the involvement of a broader set of participants than has traditionally been the norm in resource management. Rather than **participation-limited AEM** (typically restricted to scientists and managers, and consistent with an expert-driven, command and control approach) most proponents promote **integrated AEM**, with the public engaging as peers and partners with managers and scientists (Holling, 1978; Walters, 1986; Lee, 1993).

Active and ongoing participation from "those most likely to be affected by the policies being implemented" (Gunderson, 1999) is what Lee (1993) was referring to in his call for **civic science** to underpin the AEM process. As Jentoft et al. (2010) found for fisheries and coastal areas, systems being governed are often too complex and diverse for a top-down approach, and problems too unique for management solutions to be standardized. Local knowledge is thus essential, and management must therefore be "exercised in proximity to the problem, by involving 'those who know'".

Indeed, among the most important lessons to emerge from empirical research has been the need for collaboration and participation with groups that lie outside the traditional management arena (Olsson et al., 2006) (**see Box 1.4**). This fits Kooiman's (2003) argument that management and governance must necessarily involve all manner of social-political actors since it is the interactions among such actors that best reflect and best respond to societal diversity, dynamics and complexity. See **Figure 1.4** for an example from fisheries governance.

Box 1.4: **Kristianstads Vattenrike Biosphere Reserve, southern Sweden**

Through the promotion of *civic science*, as well as institutionalizing AEM so it becomes less dependent on the existence of dedicated, energetic individuals, the Biosphere Reserve is now managed and monitored by a network of official managers and local stewards (farmers, bird watchers, hunting associations, school children, angler societies, scientists), with key institutional support from a municipal organization called the Biosphere office.

More details in Olsson et al. (2004), Olsson et al. (2006) and Olsson et al. (2007)

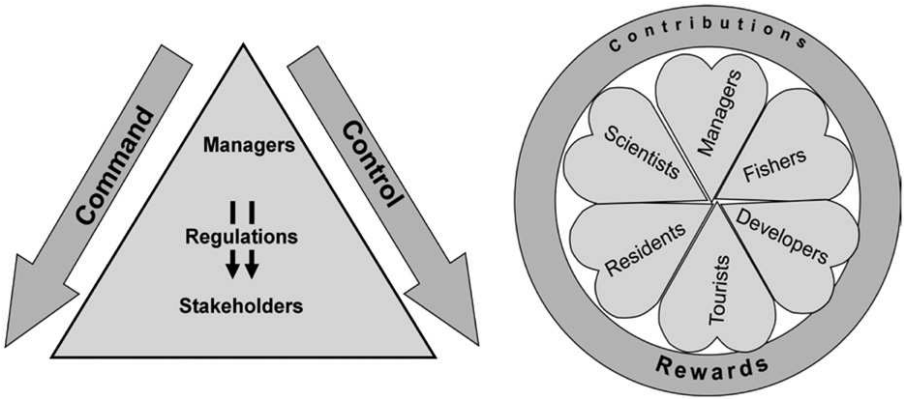

Figure 1.4: **Conventional (pyramid) and alternative (rose) images of the governing system (Jentoft et al., 2010, p.1118)**

The need for active and ongoing participation from a wide array of interested parties has added support to the idea of adaptive co-management (Armitage et al., 2007), with empirical case studies making a powerful argument for state-centred approaches to be replaced by a process of collaborative management, by which rights and responsibilities are jointly shared by multiple stakeholders (Olsson et al., 2004). Such arrangements would also allow for environmental resources to be managed at multiple scales (Berkes, 2007), where each scale has a different set of institutions, actors and requirements. In addition, adaptive co-management allows for new forms of knowledge sharing, utilisation and co-production.

Given the inability of formal, scientific knowledge to respond adequately to the complex issues that confront human society, adaptive co-management incorporates both explicit knowledge (facts, data etc.) and tacit knowledge (intuition, beliefs, values created through experience) (Folke et al., 2005), with tacit knowledge forming a "mental grid" within which explicit knowledge is filtered and interpreted (Saint-Onge, 1996).

1.7 SUMMARY

AEM is a structured and powerful approach to learning through doing. It involves making explicit predictions of the expected outcomes of management actions, comparing actual

outcomes to the predictions, and adjusting both actions and the models used for making the predictions. AEM is based on the premise that humans do not know enough to manage ecosystems, and thus by turning management actions into experiments, one can learn something about ecosystem processes and structures, and thus design better policies and contrive better experiments.

As Walters (1986) notes, **AEM is likely the best way** to root out superstitious learning where erroneous connections are made between cause and effect. In particular, it can generate more reliable answers to questions about the effects of resource use or disturbance over large geographic areas (Nyberg & Taylor, 1995).

AEM has steadily gained wider acceptance in North America in recent decades, but there are important challenges to its implementation, including:

- ensuring managers have adequate training in applying experimental design, modelling and statistics to the problems they want to address;
- difficulties in developing acceptable predictive models;
- lack of resources for active experimentation;
- resolving conflicts between ecological values and management goals;
- integrating stakeholders into decision making;
- giving inadequate attention to "non-scientific" information;
- unwillingness by implementing agencies to promote long-term policies seen as too risky or costly;
- adopting organizational policies and institutional rules that are amenable to AEM; and,
- overcoming opposition to experimental policies by those protecting self-interests (Lee, 1993; Walters, 1997; Nyberg, 1998; Johnson, 1999; Allen & Curtis, 2005; Stankey & Allan, 2009; Diduck 2010a).

To help overcome these challenges several authors have identified AEM best practices and criteria for success. The following section sets out six general guidelines for analyzing the extent to which a management strategy is consistent with AEM best practices. It also presents an analysis of the degree to which Manitoba Hydro's Bipole III proposal reflects such guidelines. The section ends with a comprehensive set of 36 criteria for determining the quality of AEM strategies and practices.

1.8 MANITOBA HYDRO AND AEM BEST PRACTICES

One can find considerable guidance for the design and implementation of AEM strategies and practices, much of which is based on empirical evidence from case studies. Allan and Stankey (2009) offer a concise and elegant set of principles for best practices (**see Box 1.5**). An assessment of the extent to which the Bipole III proposal is consistent with these general guidelines reveals both positive and negative aspects. The various strengths and weaknesses are outlined below, using Allan and Stankey's principles for best practices as a guiding framework.

Box 1.5: Principles for AEM best practices (Allan and Stankey 2009, pp.341-346):

1. **Understanding context is crucial** – which reinforces the importance of having a broad-based, inclusive, and participatory structure to AEM.
2. **Understanding adaptive approaches** – to be careful, honest and public about what it means to undertake adaptive management, and to explain that "it is a significant departure from past practice and will require new and specific policies, skills and resources to succeed".
3. **Purposeful and deliberate** – good AEM starts with the framing of good questions, which directs subsequent undertakings, guides monitoring and evaluation, and emphasises the social and political nature of the process.
4. **Careful documentation** – good documentation is transparent and open to scrutiny, and designed to encourage thoughtful and constructive debate.
5. **Designed to promote learning that translates into action** – acknowledge that the process is hard, time-consuming, and expensive and requires ongoing investment, all of which necessitates organisational commitment and will to act.
6. **Supporting the "right" people** – the choice of suitable participants is critical, with organisational leaders ensuring that practitioners have the latitude, organisational support and resources to undertake their work.

The assessment relied primarily on documents filed in the Bipole III environmental assessment proceedings, and in particular Chapter 5 (Environmental Assessment Consultation Program), Chapter 7 (Identification And Evaluation of Alternative Routes and Sites), selected sections of Chapter 8 (Effects Assessment and Mitigation),[3] Chapter 11 (Environmental Protection, Follow-up and Monitoring), Attachment 11-1 (Environmental Protection Plan) of the environmental impact statement (EIS), various responses to Information Requests (IRs),[4] and Hydro's October 29th mitigation commitment table. In addition, we obtained supplemental information in an interview with two Manitoba Hydro managers.[5]

1.8.1 UNDERSTANDING CONTEXT IS CRUCIAL

Allan and Stankey's (2009) first principle, understanding context is crucial, reinforces the importance of a broad-based, inclusive, and participatory approach to AEM. Such an approach is necessary for developing a deep and nuanced understanding of ecological, social, economic, and cultural contexts. A strong feature of the Bipole III EIS indicates that regulators, Aboriginal communities and groups, and other interested parties will be involved in follow-up activities.[6]

[3] We focused on subsections of Chapter 8 presenting summaries of the residual environmental effects and significance, and summaries of follow-up plans and issues.

[4] We reviewed the following responses to information requests: IR response package 2, questions CEC/MH-II-002a, CEC/MH-II-002c, CEC/MH-II-002d, CEC/MH-II-002e, CEC/MH-II-002f, CEC/MH-II-002h, CEC/MH-II-002i, CEC/MH-II-002jk, CEC/MH-IV-145; IR response package 3, questions CEC/MH-II-001a, CEC/MH-II-002b, CEC/MH-II-002g; IR response package 4, questions CEC/MH-II-002l, CEC/MH-II-002m; IR response package 5, questions CEC/MH-VI-207, CEC/MH-VI-208, CEC/MH-VI-214; CEC/MH-VI-230; IR response package 6, questions CEC/MH-VI-311, CEC/MH-VI-349, CEC/MH-VI-350, CEC/MH-VI-351, CEC/MH-VI-352a, CEC/MH-VI-352b, CEC/MH-VI-355, CEC/MH-VI-358a, CEC/MH-VI-358b; IR response package 7, questions CEC/MH-VII-363, CEC/MH-VII-364, CEC/MH-VII-462, CEC/MH-VII-499, CEC/MH-VII-505.

[5] We interviewed Shannon Johnson and James Matthewson on October 9, 2012.

[6] Chapter 11, section 11.3.4.2; Attachment 11-1, section 6; Attachment 11-1, Appendix H, section 4.

Moreover, the IRs and the interview revealed that community engagement will extend over the construction and maintenance phases of the project,[7] including in the development of access management plans.[8] The IRs also reveal that for monitoring purposes Hydro will attempt to build new relationships with local communities, resource management boards, and government agencies.[9] Moreover, although the IRs state that Hydro does not intend to create partnerships for community-based monitoring,[10] in the interview we established that Hydro is considering the development of construction phase monitoring plans involving local monitors and liaisons from directly affected communities.

An aspect of the EIS that could be improved is that the plans for broad-based public involvement in follow-up are rather limited. The EIS lacks a clear community involvement plan or even a basic framework for a plan. Further, the IRs indicate that specific targets will not be set for the number of community members involved in the Environmental Protection Plan (EPP).[11]

1.8.2 UNDERSTANDING ADAPTIVE APPROACHES

The second guiding principle, understanding adaptive approaches, involves being careful, honest and public about what it means to undertake adaptive management. The principle requires recognizing and discussing openly the uncertain implications of human interventions in complex social-ecological systems. Recognition and acceptance of this uncertainty is necessary for creating conditions in which it is safe and rewarding to experiment carefully and to make occasional errors as long as the errors result in learning that leads to better management.

Positive features of the Bipole III EIS are that it makes a commitment to AEM, and it covers, at least in a rudimentary way, each phase of the basic cyclical model of AEM (plan, do, evaluate and learn, and adjust – see Figure 1). Similarly, it contains properties of each of what we have called the four essential elements of AEM (ongoing experimentation, system monitoring, feedback and learning, and institutional capacity and support), as well as features of the cross-cutting theme of active and ongoing participation.[12]

On the negative side, there is a lack of explicit and public recognition of uncertainty and the need for AEM, and of the political and organizational challenges to undertaking AEM in a meaningful way. The EPP could have been improved by elaborating on these matters and thereby underscoring that AEM "is a significant departure from past practice and will require new and specific policies, skills and resources to succeed".

1.8.3 PURPOSEFUL AND DELIBERATE

Allan and Stankey's (2009) third guiding principle, purposeful and deliberate, suggests that good AEM starts with the framing of good questions, which directs subsequent undertakings, guides monitoring and evaluation, and emphasises the social and political nature of the process.

[7] CEC/MH-VI-351, CEC/MH-VII-363.
[8] For example, CEC/MH-VII-505.
[9] CEC/MH-II-002g, CEC/MH-II-002jk, CEC/MH-VI-351, CEC/MH-VII-363.
[10] CEC/MH-VII-363.
[11] CEC/MH-VI-355.
[12] Chapter 11; Attachment 11-1; and, for example, CEC/MH-VI-311.

As noted above, a positive aspect of the Bipole III EIS is that it contains properties of our four essential elements of AEM: ongoing experimentation, system monitoring, feedback and learning, and institutional capacity and support. On the other hand, a weakness of the document is that it is unclear about the extent to which Hydro's approach follows the highly challenging, innovative and ambitious form of AEM, that is, the active form. As discussed earlier, only active AEM deliberately probes a system in order to test competing hypotheses and experimentally compare selected policies or practices.

The EPP[13] and IR's[14] indicate quite clearly that monitoring will lead to evaluation and learning and, if necessary, adjustments to policy or management, but there was no direct documentary evidence regarding whether these processes would be part of a passive or an active approach. [15] In this respect, the Bipole III proposal is not fully consistent with "the framing of good questions" part of principle three, which implies a need for questions and hypotheses that are testable, quantifiable and replicable. That being said, our interview with Hydro staff revealed that the proponent intends to use active AEM in several parts of the EPP, such as designing caribou corridors and preventing the migration of invasive species. If these intentions and the details of the various experiments had been explicitly noted in the EPP, the EIS would have been improved.

The Bipole III proposal is also not fully congruent with the last part of principle three, which suggests that AEM needs to emphasize the social and political nature of the process. Manitoba Hydro, in many respects, is a provincial leader when to comes to community engagement and building partnerships in environmental governance,[16] but as already noted the corporation's plans for broad-based public involvement in monitoring are rather limited.

Additionally, the Bipole EPP is notably weaker on the social and political side of things than it is on the biophysical side. The document lacks plans or even frameworks for access management and for monitoring socio-economic (including community health variables) and heritage resource impacts.[17] Further, the IRs indicate that these plans are still under development, although the fundamental components of the socio-economic plan have been identified.[18]

AEM is inherently social and political, but this is particularly true when it is applied to social, economic and cultural parts of the environment. Fully complying with Allan and Stankey's (2009) third principle, would, therefore, have dictated a more robust and ambitious approach to these matters in the EPP.

1.8.4 CAREFUL DOCUMENTATION

Allan and Stankey's (2009) fourth principle is "careful documentation", requiring documents that are transparent and open to scrutiny, and designed to encourage thoughtful and constructive

[13] Chapter 11, section 11.3.4.2; Attachment 11-1, Appendices B and C.
[14] CEC/MH-II-002b, CEC/MH-VI-207, CEC/MH-VI-208, CEC/MH-VI-214, CEC/MH-VI-358a.
[15] The report by Aura Environmental Research and Consulting (section 4.5) notes that the EIS contemplates a passive (or reactive) approach to mitigating cumulative.
[16] See, for example, the extensive consultations described in Chapter 5 of the EIS.
[17] Chapter 11, sections 11.3.4.3-11.3.4.5; Attachment 11-1, Appendix H.
[18] CEC/MH-VI-230, CEC/MH-VI-349, CEC/MH-VII-462, CEC/MH-VII-499.

debate. With regards to this principle, a strong feature of the Bipole III proposal is how the EPP deals with information management and communications. The program includes plans for an Environmental Protection Information Management System (EPIMS),[19] which will include project and regulatory information, inspection and incident reports, and monitoring field data and reports. The program also includes plans for ongoing communications with contractors, regulators and Aboriginal communities, and for annual reports for distribution to a wider audience.[20] A project web site, containing information from the EPIMS, will also be maintained.[21] Further, the IRs state that the heritage resource plan will be reviewed with interested parties prior to construction.[22]

On the negative side, as already noted, shortcomings in the EIS include lack of discussion of the need for and challenges to implementing AEM, and lack of transparency regarding the proponent's intentions for active experimentation. Additionally, the IRs indicate that Hydro is not in a position to release third-party audits and it has yet to release a report of the September 2011 audit of its environmental management system.[23]

The IRs[24] and the interview with Hydro staff clarify that the EPIMS will not be open to the public because of the nature and purpose of the database: timely gathering and sharing of technical, confidential and proprietary information. The decision to keep the EPIMS closed is understandable but an implication is that the project web site will need to be robust, informative, current and highly accessible for Hydro to fully satisfy the fourth principle's prescription for transparency, openness, and thoughtful and constructive debate. The site could also be used to distribute, and collect feedback on, EPP documents that are still under development, although the IRs state that Hydro is not prepared to release the access management plan until discussions with regulators and local communities have been concluded.[25]

1.8.5 DESIGNED TO PROMOTE LEARNING THAT TRANSLATES INTO ACTION

A positive aspect of the Bipole III proposal is the extent to which the EIS is consistent with Allan and Stankey's (2009) fifth principle (designed to promote learning that translates into action), or at least the second part of it, which underlines the importance of organizational commitment and will to act in promoting learning leading to action.

The EPP is grounded in broader corporate policies, management systems and programs that acknowledge the need for continuous improvement and for making policy and management adjustments.[26] A result of having this foundation is that the importance of learning and management adjustments are recognized at the operational level.[27] Additionally, the EPP establishes a process for its own review and renewal,[28] including taking into account monitoring

[19] Chapter 11, section 11.2.11.
[20] Chapter 11, section 11.2.12, CEC/MH-II-002a.
[21] Chapter 11, section 11.2.12.
[22] CEC/MH-VII-499.
[23] CEC/MH-VII-364.
[24] CEC/MH-II-002c.
[25] CEC/MH-VII-462.
[26] Chapter 11, section 11.1.
[27] Chapter 11, section 11.3; Attachment 11-1, section 6.
[28] Chapter 11, section 11.3; Attachment 11-1, section 6; CEC/MH-II-002b, CEC/MH-II-002e, CEC/MH-II-002f.

and auditing results.[29] Moreover, chapter 7 of the EIS provides, and the interview with Hydro staff confirmed, numerous examples of adjustments based on consultation results,[30] and the IRs provide an example of a change based on audit results.[31]

1.8.6 SUPPORTING THE "RIGHT" PEOPLE

The sixth principle, supporting the "right" people, highlights how important it is to have suitable AEM participants, and how important it is that the participants have the latitude, organizational support and resources to undertake their work. A positive aspect of the EIS is that the organizational commitment and will to act discussed above has seemingly translated to Hydro practitioners having sufficient authority and organizational supports for doing basic AEM work.[32] At the operational level, organizational support for AEM is manifest in various parts of the environmental protection program and the project EPP. For example, the EIS[33] and the IRs[34] set out clear feedback loops from inspection and monitoring results to internal decision processes, and they establish lines of responsibility in the event monitoring detects a problem.

On the negative sided, there is uncertainty about the extent to which operational staff have the latitude and organizational supports for involving an array of stakeholders throughout the full AEM cycle. Further, there is a relative lack of clarity in the EPP[35] regarding who is responsible for environmental auditing, to whom the results will be reported, and who is responsible for acting on the results (although as noted earlier the IRs did provide an example of when an audit resulted in an adjustment to the EPIMS[36]).

Additionally, although the EPP[37] and IRs[38] have indicated that training will be provided to enhance monitoring capacity among Hydro staff and contractors, and the IRs have given an estimate of the number of Environmental Inspectors that will be assigned to the project during construction, the overall level of resources that will be devoted to AEM is unknown. Given the apparent lack of attention to community involvement and the relative under development of the social, economic and cultural parts of the EPP, one is left to wonder if sufficient resources will be assigned to AEM and in particular to the monitoring and ongoing assessment of economic, cultural and social environments (including community health). More information on resource allocations for the EPP and especially AEM would have inspired more confidence that the Bipole proposal was fully congruent with the sixth principle.

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[29] CEC/MH-VI-352a, CEC/MH-VI-352b, CEC/MH-VI-358a, CEC/MH-VII-364.
[30] Examples of adjustments based on consultation results include changing from guide-steel lattice transmission towers to self-supported towers and changing the placement of towers to ensure field access for large farm equipment.
[31] Development of the EPIMS in the Bipole III assessment was based on results from a September 2011 audit of Hydro's environmental management system.
[32] CEC/MH-II-002d provided job descriptions for the positions of Senior Environmental Assessment Officer, Environmental Inspector, Environmental Monitor, and Environmental Officer, position that would be integral to AEM activities such as inspection, monitoring, ongoing assessment, and evaluation.
[33] Chapter 11, section 11.2 and 11.3; Attachment 11-1, section 2.3.
[34] CEC/MH-II-002a, CEC/MH-II-002b, CEC/MH-II-002e, CEC/MH-II-002f.
[35] Attachment 11-1, section 5.5.
[36] CEC/MH-VII-364.
[37] e.g., Chapter 11, section 11.2.7.
[38] CEC/MH-VI-358b.

1.8.7 QUESTIONS FOR DETERMINING THE QUALITY OF AEM STRATEGIES AND PRACTICES

Finally, while Allan and Stankey (2009) offer general guidelines for best practices, others, such as Gregory et al. (2006), have proposed more specific criteria. In Table 1 we have brought together guidelines and criteria from these two sources as well as the other literature reviewed above into a comprehensive set of 36 questions for determining the quality of AEM strategies and practices. The questions, which are organized according to the four basic elements of AEM and the cross-cutting theme of interactive governance, are offered to help guide Manitoba Hydro's future AEM efforts. Engaging with these questions can help Hydro more fully harness the power of AEM for responding to the complexity, uncertainty and conflict inherent in the corporation's upcoming development proposals.

Table 1: Questions for planning and assessing AEM strategies and practices.

Experimentation 1. Does the AEM strategy take a long-term, multi-scale and integrative view of the environment? 2. Is the AEM strategy set at scales compatible with those of critical ecosystem functions and appropriate jurisdictional functions? 3. Are proposed management objectives and actions designed to test hypotheses? 4. Is there more than one management alternative? 5. Is the target system well defined? 6. What units have been determined for AEM experiments? 7. What opportunities exist to replicate management actions to check their reliability? 8. If spatial extent or complexity is large, are there opportunities to apply AEM on a subset of the problem and scale up? 9. Has the AEM design been pared down to focus on only those uncertainties most likely to influence management decisions? 10. Have potential issues related to background trends and cumulative effects of management actions been addressed in the AEM design? 11. Will AEM use models to evaluate management alternatives?
Monitoring 12. Is the planned timeline to obtain verified results compatible with management decision-making requirements? 13. How will indicators determine whether management assumptions hold true or reveal that the management strategy is not delivering expected outcomes? 14. How will it be known that observed changes are due to the way in which the environment was treated and not due to other variables affecting the system? 15. Will monitoring differentiate among different hypothesized outcomes from a particular management strategy, and thus contribute to learning about how the managed system works? 16. How is monitoring focused on each of the: • effectiveness of key management projects, strategies and programs; • condition of resource values (including restoration of degraded values); • nature, extent and severity of environmental threats, risks and impacts (including new and emerging threats); • level and nature of human use, its environmental sensitivity and sustainability; and, • views of the general public and/or on-site visitors. 17. Will the information collected through monitoring have sufficient predictive ability to make a difference to managers?
Feedback and learning 18. Does the plan allow managers to receive a continuous process of feedback, leading to a reformulation of problems, tactics and strategies? 19. How will adjustments be made if desired objectives are not met? 20. Is there evidence that Manitoba Hydro is open to rethinking the purposes, rules and assumptions upon which its management strategies are based and by which it operates? 21. Is Manitoba Hydro committed to valuing different knowledge systems and epistemologies?
Institutional capacity and support 22. Does Manitoba Hydro acknowledge that it operates in increasingly complex environments that exist under conditions of rapid change and considerable uncertainty? 23. Does Manitoba Hydro show explicit policy guidance and leadership support for AEM and continual improvement? 24. Is Manitoba Hydro willing to accept and act upon information that may be contrary to existing beliefs, values and policies? 25. Does Manitoba Hydro set aside a specific time and place for learning from and reflection upon the successes and failures of its management decisions? 26. Is there sufficient management flexibility (and continuity) to incorporate new information in revised experimental designs? 27. Are sufficient analytical skills available (staff or contractors) to design, monitor, and evaluate, AEM plans and results? 28. Does Manitoba Hydro acknowledge that AEM is hard, time-consuming, and expensive and requires ongoing investment and organisational commitment and will to act?
Active and ongoing participation 29. Can all the costs and benefits (and risks) of the proposed project be documented and communicated in a manner understandable to all stakeholders? 30. Do the design and assessment of AEM explicitly address the multiple goals of stakeholders? 31. Does AEM elicit active and ongoing participation from those most likely to be affected by the policies being implemented? 32. Does the governance framework for AEM involve the shared, collective effort of Manitoba Hydro, provincial and federal government, private business, civic organizations, local communities and the general public? 33. Will management make use of both explicit and tacit knowledge? 34. Are management plans and other documentation open to scrutiny by all stakeholders and the wider public, and are they designed to encourage thoughtful and constructive debate? 35. Do stakeholders see AEM as an effective way to deal with uncertainty? 36. Does the proposed AEM design involve any trade-offs that might be considered taboo by some stakeholders?

1.9 REFERENCES

Allan, C., & G. Stankey. (2009). Synthesis of lessons. In: C. Allan and G.H. Stankey (eds.), *Adaptive Environmental Management: A Practitioner's Guide*. New York: Springer Verlag.

Allen, C, & A. Curtis. (2005). Nipped in the bud: Why regional scale adaptive management is not blooming. *Environmental Management* 36(3), 414-425.

Argyris C, & D.A. Schon. (1978). *Organizational Learning: A Theory of Action Perspective*. Reading, MA: Addison-Wesley

Armitage, D., & R. Plummer. (2010). Adapting and transforming: Governance for navigating change. In: Armitage, D. and R. Plummer (eds), *Adaptive Capacity and Environmental Governance*. New York, Springer Books.

Armitage, D., F. Berkes, & N. Doubleday (eds). (2007). *Adaptive Co-Management: Collaboration, Learning, and Multi-Level Governance*. Vancouver: University of British Columbia Press.

Armitage, D., F. Berkes, & N. Doubleday. (2007). Introduction: moving beyond co-management. Armitage, D., F. Berkes and N. Doubleday (eds), *Adaptive Co-Management: Collaboration, Learning, and Multi-Level Governance*. Vancouver: University of British Columbia Press.

Berkes, F. (2007). Community-based conservation in a globalized world. *Proceedings of the National Academy of Sciences* 104, 15188-15193.

Berkes, F., & C. Folke (eds). (1998). Linking Social and Ecological Systems: Management Practices and Social Mechanisms for Building Resilience. Cambridge, UK: Cambridge University Press.

Bunnell, F.L, & B.G. Dunsworth. (2004) Making adaptive management for biodiversity work – the examples of Weyerhaeuser in coastal British Columbia. *The Forestry Chronicle* 80(1), 37-43.

Capra, F. (1997). The Web of Life: A New Scientific Understanding of Living Systems. New York: Anchor Books.

Diduck, A. (2010a). Incorporating Participatory Approaches and Social learning. In: B. Mitchell (ed), *Resource and Environmental Management in Canada: Addressing Conflict and Uncertainty*. Toronto: Oxford University Press.

Diduck, A. (2010b). The Learning Dimension of Adaptive Capacity: Untangling the Multi-level Connections. In: Armitage, D. and R. Plummer (eds), *Adaptive Capacity and Environmental Governance*. New York: Springer Books.

Dorazio. R.M., & F.A. Johnson. (2003). Bayesian inference and decision theory: a framework for decision-making in NRM. *Ecological Applications* 13, 556-563.

Elzinga, C.L., D.W. Salzer, J.W. Willoughby, & J.P. Gibbs. (2001). *Monitoring Plant and Animal Populations*. Wiley-Blackwell Books.

Fabricus, C., C. Folke, G. Cundill, & L. Schultz. (2007). Powerless spectators, coping actors, and adaptive co-managers: A synthesis of the role of communities in ecosystem management. *Ecology and Society* [online] 12(1), 29.

Fazey, I., & L. Schultz. (2009). Adaptive people for adaptive management. In: C. Allan and G.H. Stankey (eds.), *Adaptive Environmental Management: A Practitioner's Guide*. New York: Springer Verlag.

Folke, C., T. Hahn, P. Olsson, & J. Norberg. (2005). Adaptive governance of social-ecological systems. *Annual Review of Environment and Resources* 30, 441-473.
Gregory, R., D. Ohlson, & J. Arval. (2006). Deconstructing adaptive management: Criteria for applications to environmental management. *Ecological Applications*, 16(6), 2411–2425.
Gunderson, L.H., C.S. Holling, & S.S. Light (eds). (1995). *Barriers and Bridges to the Renewal of Ecosystems and Institutions*. New York, USA: Colombia University Press.
Gunderson, L.H. (1999). Resilience, flexibility and adaptive management: Antitodes for spurious certitude? *Conservation Ecology* [online] 3(1), 7.
Hilborn, R. (1987. Living with uncertainty in resource management. *North American Journal of Fisheries Management* 7, 1-5.
Holling, C.S. 1978). *Adaptive Environmental Assessment and Management*. Chichester, UK: John Wiley & Sons.
Jentoft, S., R. Chuenpagdee, A. Bundy, & R. Mahon. (2010). Pyramids and roses: Alternative images for the governance of fisheries systems. *Marine Policy* 34, 1315-1321.
Jentoft, S., & R. Chuenpagdee. (2009). Fisheries and coastal governance as a wicked problem. *Marine Policy* 33, 553-560.
Jones, G. (2009). The adaptive management system for the Tasmanian Wilderness World Heritage Area: Linking management planning with effectiveness evaluation. In: C. Allan and G.H. Stankey (eds.), *Adaptive Environmental Management: A Practitioner's Guide*. New York: Springer Verlag.
Johnson, B.L. (1999). Introduction to the special feature: Adaptive management - scientifically sound, socially challenged? *Conservation Ecology* [online] 3(1), 10.
Kooiman, J. (2003). *Governing as Governance*. London, UK: Thousand Oaks.
Lee, K.N. (1993). Compass and Gyroscope: Integrating Science And Politics For The Environment. Washington, D.C: Island Press.
Levin, S. (1999). *Fragile Dominion: Complexity and the Commons*. Reading, MA: Persius Books.
Ludwig, D. (2001). The era of management is over. *Ecosystems*, 4(8), 758-764.
Moore, A.L. and M.A. McCarthy. (2009). On valuing information in adaptive management models. *Conservation Biology* 24(4), 984-993.
Nyberg, J.B, & B. Taylor. (1995). Applying adaptive management in British Columbia's forests. In: Proceedings of the FAO/ECE/ILO International Forestry Seminar, Prince George, BC, September 9-15, 1995, pp. 239-245.
Nyberg, J.B. (1998). Statistics and the practice of adaptive management. In: Sit, V. and B. Taylor (eds), *Statistical Methods for Adaptive Management Studies*. Victoria, BC: BC Ministry of Forests.
Olsson, P., C. Folke, & T. Hahn. (2004). Social-ecological transformation for ecosystem management: The development of adaptive co-management of a wetland landscape in southern Sweden. *Ecology and Society* [online] 9(4), 2.
Olsson, P., L.H. Gunderson, S.R. Carpenter, P. Ryan, L. Lebel, C. Folke, & C.S. Holling. (2006). Shooting the rapids: Navigating transitions to adaptive governance of social-ecological systems. *Ecology and Society* [online] 11(1), 18.
Olsson, P., C. Folke, V. Galaz, T. Hahn, & L. Schultz. (2007). Enhancing the Fit through Adaptive Co-management: Creating and Maintaining Bridging Functions for Matching Scales in the Kristianstads Vattenrike Biosphere Reserve, Sweden. *Ecology and Society* [online] 12(1), 28.

Peterman, R.M., & C.N. Peters. (1998). Decision analysis: Taking uncertainties into account in n forest resource management. In: Sit, V. and B. Taylor (eds), *Statistical Methods for Adaptive Management Studies*. Victoria, BC: BC Ministry of Forests.

Peterson, G., G.A. De Leo, J.J. Hellmann, M.A. Janssen, A. Kinzig, J.R. Malcolm, K.L. O'Brien, S.E. Pope, D.S. Rothman, E. Shevliakova, & R.R.T. Tinch. (1997). Uncertainty, climate change, and adaptive management. *Conservation Ecology* [online] 1(2), 4.

Prato, T. (2005). Bayesian adaptive management of ecosystems. *Ecological Modelling* 183, 147-156.

Rushmer, R.K., D. Kelly, M. Lough, J.E. Wilkinson, & H.T.O. Davies. (2004). Introducing the learning practice: The characteristics of learning organisations in primary care. *J Eval Clin Pract* (10)3, 375-386.

Sainsbury K.J., R.A. Campbell, R. Lindholm, & A.W. Whitelaw. (1997). Experimental management of an Australian multispecies fishery: examining the possibility of trawl-induced habitat modification. In: Pikitch E.K., D.D. Huppert and M.P. Sissenwine (eds), *Global Trends: Fisheries Management*. *American Fisheries Society Symposium* 20, 107-112.

Sainsbury, K.J., A.E. Punt, & A.D.M. Smith. (2000). Design of operational management strategies for achieving fishery ecosystem objectives. *ICES Journal of Marine Science* 57, 731–741.

Saint-Onge, H. (1996). Tacit knowledge the key to the strategic alignment of intellectual capital. *Strategy and Leadership* 24(2), 10-16.

Schultz, L., & I. Fazey. (2009). Effective leadership for adaptive management. In: C. Allan and G.H. Stankey (eds.), *Adaptive Environmental Management: A Practitioner's Guide*. New York: Springer Verlag.

Senge, P. (1994). The Fifth Disciple Field-book: Strategies and Tools for Building a Learning Organization. New York: Doubleday/Currency.

Sit, V., & B. Taylor (eds). (1995). *Statistical Methods for Adaptive Management Studies*. Victoria, BC: BC Ministry of Forests.

Stankey, G., & C. Allan. (2009). Introduction. In: C. Allan and G.H. Stankey (eds.), *Adaptive Environmental Management: A Practitioner's Guide*. New York: Springer Verlag.

Uhl-Bien, M., R. Marion, & B. McKelvey. (2007). Complexity leadership theory: Shifting leadership from the industrial age to the knowledge era. *The Leadership Quarterly* 18(4), 298-318.

Walters, C.J. (1986). *Adaptive Management of Renewable Resources.* McMillan, New York, New York, USA.

Walters, C.J., & C.S. Holling. (1990). Large-scale management experiments and learning by doing. *Ecology* 71(6), 2060-68.

Walters, C.J. (1997). Challenges in adaptive management of riparian and coastal ecosystems. *Conservation Ecology* [online] 1(2), 1.

PART 2: LINKING ADAPTIVE ENVIRONMENT MANAGEMENT AND INDEPENDENT OVERSIGHT

This section examines in greater detail the critical importance of environmental monitoring and the different elements that form part of a monitoring program (Section 2.1). The discussion then turns to the role of independent oversight as a governance mechanism for monitoring primary resource developments, including the different reasons why independent oversight bodies have been created for different projects (Section 2.2). It addresses different models of independent oversight and provides a critique of the case examples, based on interviews[39] and peer-reviewed literature. Section 2.3 sets out seven "best practices" principles for independent oversight, while the concluding section (2.4) explores the case for independent oversight of Manitoba Hydro projects, and briefly outlines the factors that support this scenario.

2.1 MONITORING

As noted above, the AEM cycle follows through four stages: plan; do; evaluate and learn; and adjust. Monitoring is a critical component of the third stage, and, in general, serves "as the basis for determining whether management assumptions hold true and from which learning can inform subsequent actions" (Section 1.3).

But beyond its role in AEM, monitoring is standard practice in large-scale resource development in Canada. (See Noble and Story (2005) for a brief explanation of the terms "follow-up", "feedback", "monitoring" and "auditing", and supporting references demonstrating the critical importance of this component of project approval.) Monitoring commitments generally span three categories:

[39] Detailed information about each case was compiled through a review of academic literature, government documents, and private contracts related to each organization, as well as examining organizational websites.

Five cases were selected for further review: the three diamond mining independent environmental oversight agencies in Yellowknife (IEMA, EMAB, SLEMA), the Prince William Sound RCAC (Alaska) and the RMOB developed for the Sydney Tar Ponds Remediation. Data collection for these cases included a site visit (to the oversight agency, not necessarily the project for which the agency was formed), which simultaneously allowed for (i) a more in-depth literature review, and (ii) semi-structured interviews with key stakeholders involved in the agencies. Interviews were conducted in the summer and fall of 2010. Lasting between 30 minutes and two hours, questions explored the strengths and weaknesses of each oversight agency, and the role of independent oversight in resource management (including the circumstances under which independent oversight should be canvassed).

These findings are referenced throughout this section of the report. To protect the confidentiality of participants, codes have been assigned for each participant. The first part of the code specifies the cases: DM represents participants with information on the three agencies created for *diamond mines* in the Northwest Territories; PWS represents participants with information on the Prince William Sound RCAC; and, STP represents participants with information on the agencies created for the Sydney Tar Ponds Remediation. The second part of the code specifies the interest group: P represents a member of non-governmental organizations, academia and the public; IO represents a member of the Oversight Agency (both Board Member and Staff); and G represents members of government (local, state/provincial, and federal). Finally, the number is assigned for each interview, ranging from one to eight at each site. Thus PWS I0-1 is a representative of the Prince William Sound RCAC, interview 1.

Funding for this element of the research was provided through the Social Science and Humanities Research Council of Canada.

- **compliance**: ensures that regulatory requirements, and in some cases, company commitments are fulfilled;
- **verification**: establishes the accuracy of predictions, thereby opening up the opportunity to make revisions as necessary; and,
- **effects assessment**: to "measure the environmental changes that can be attributed to Project construction and/or operation and check the effectiveness of mitigation measures" (Manitoba Hydro, 2011, pp. 4-40).

However, monitoring programs are somewhat more nuanced than this list would suggest, specifically when addressing "effects". Monitoring programs can serve seven different functions, depending on the design and implementation of the program. In addition to compliance and verification, monitoring programs can be designed to:[40]

- establish a **baseline** against which to measure and mitigate change (Indian and Northern Affairs Canada, 2007; McDonald, 2002; Mitchell, 2002; Morrison-Saunders & Arts, 2005);
- **engage** the public in environmental management activities, resulting in increased community capacity and access to information (Mitchell, 2002; Morrison-Saunders & Arts, 2005);
- **identify unforeseen changes** by ensuring adequate surveillance of complex systems, thereby allowing for adaptive management (Indian and Northern Affairs Canada, 2007; Mitchell, 2002);
- **identify areas where insufficient data are available** (McDonald, 2002; Noble, 2005), and in doing so gather data for future decision making (Mitchell, 2002); and,
- **evaluate progress towards sustainable development**, among other legitimate societal goals (Ecological Monitoring and Assessment Network Coordinating Office & Canadian Nature Federation, 2003; Noble & Storey, 2005).

Proponents and government typically carry out monitoring programs. In general, the proponent develops the protocols for monitoring programs, collects and analyzes monitoring data, and provides information to the government, as required. The government reviews and edits the monitoring protocols to ensure compliance with specific legislation and policies; reviews monitoring reports; and, in certain situations, completes spot checks to ensure compliance. In circumstances where results exceed specific targets the government will sometimes employ enforcement measures (generally through fines).

If monitoring is a standard element of project approval, and there is a general process through which monitoring is completed, why are there calls for independent oversight? First, there is recognition that the government is responsible for many broad social imperatives, some of which conflict. There is a general belief that the economic imperative trumps the environmental case; this notion of conflicting mandates becomes more complicated when specific departments have dual responsibilities, or **overlapping mandates**. In addition to overlapping mandates, the Crown may serve several roles, including proponent, assessor and regulator.

[40] Summarized by Moyer, Fitzpatrick, Diduck and Froese (2008).

Second, when resource development is undertaken in sparsely-populated areas, far away from the regulators, some proponents prove to be "difficult to discipline by the state" (Brown & Luttrell, 2004, p. 1). In such **hinterland development**, the project is **"**out of sight and out of mind". Third, the past twenty years have seen **reduced administrative capacity** within federal and provincial departments. Periods of economic recession result in layoffs and hiring freezes in the civil service, which tax the ability of many departments to meet basic mandates.

Fourth, the recent past is witness to several catastrophic **failures to protect the environment**, which decrease faith in the government to fulfill its role in protecting public goods. These elements contribute to a **lack of trust among stakeholders** – in particular between local stakeholders, and the government and/or the proponent.

Finally, as noted by Noble & Story (2005, p. 165), there is considerable evidence of **implementation failures**, that is, follow-up, including monitoring is rarely done, or where done, completed rather poorly. As summarized by a representative of Aboriginal Affairs and Northern Development during the hearings for the Mackenzie Gas project, interest in Independent Oversight stems from the concern that the existing monitoring framework may not address:

> …the concern[s] that northerners have about ensuring that development proceeds in a responsible fashion, that it provides the benefits, that it results in minimum harm and, frankly, their skepticism that that can be entrusted to government and industry alone to ensure it happens. That's part of the issue that we need to deal with. The transparency of the process, the ensuring that information is readily available so that people can confirm for themselves that things are going well is a big part of it (Joint Panel Review, 2007, p. 9135).

As such, there is increasing interest in employing independent oversight bodies.

2.2 INDEPENDENT OVERSIGHT

Independent oversight involves the creation of an institution or board that is autonomous, or semi-autonomous from government and project proponents. Independent oversight bodies serve different functions, but at their base, they take on watch dog functions usually performed by government and industry, and these are used to "**demonstrate .. accountability for the appropriate, proper and intended use of resources**" (Gibson, Lacy, & Dougherty, 2005, p.1).

Independent oversight reflects a growing movement to strengthen mechanisms of accountability in government.[41] Current models of governance usually rely on two forms of accountability: vertical and horizontal (Goetz & Jenkins, 2001). Non-state actors perform **vertical accountability**. Examples include voting in free and fair elections, engaging non-governmental organizations in policy development and implementation, etc. The most significant limitation of this type of accountability is that it is difficult to affect change, particularly in a timely manner. For example, if the citizenry opposes a decision made by a majority government, it may have to

[41] Accountability addresses a range of imperatives directed at ensuring an agency meets the expectations of its constituency. It includes "asking what has been done or will be done ... giving reasons and forming judgment..[and] rewarding good and punishing bad behaviour…" (Schedler, 1999, 15).

wait up to five years to elect a different government. Other forms of vertical accountability are done on an ad-hoc basis, making recourse challenging.

Horizontal accountability is oversight carried out across one level of the system; in other words, one department or agency reviews the actions of another. Common examples of horizontal accountability include appointing ombudspersons, creating corruption control agencies, and appointing investigatory commissions to oversee activities. This type of accountability also has significant limitations, including:

- there may be too many activities to monitor;
- it may be too difficult to monitor the activities in question;
- the responsible department may have insufficient funding to complete the monitoring;
- the responsible department may have inadequate enforcement mechanisms;
- the responsible department may lack of legal power to implement sanctions;[42] and,
- challenges in terms of public perception, particularly if the public has limited trust in one branch of government as a substitute.

Independent oversight reflects a new approach to accountability, termed **diagonal" or "hybrid" accountability** (Ackerman, 2003, p.450). This system is seen to be *complementary to* (not replacing) mechanisms of vertical and horizontal accountability. Each oversight agency has a unique implementation framework, mandate, funding arrangement, and composition, specific to the task at hand. In this way, independent oversight does not suffer the limitations of timing, mandate or public perception suffered by other mechanisms of accountability.

The most commonly known form of independent oversight is that created for the police; for example *Police Service Boards* are typically civilian oversight bodies charged with reviewing citizen complaints, police-involved shootings, etc. However, independent oversight bodies are increasingly being employed in resource management (e.g. Brown & Luttrell, 2004; O'Faircheallaigh, 2007). Table 2 identifies resource-based oversight bodies considered in this study.

[42] Sanctions being the final tool for ensuring enforcement.

Table 2: Resource projects with independent oversight of environmental monitoring.

Location	Resource	Stage	Year[1]	Board	Acronym
Sollum Voe, SCT	Energy (Oil and Gas)	Operations	1977	Shetland Oil Terminal Environmental Advisory Group	SOTEAG
Valdez and Anchorage, AL, USA	Energy (Oil and Gas)	Operations	1990	Prince William Sound Regional Citizens' Advisory Committee for oversight of shipments of oil from Alaska after the Exxon Valdez spill	PWSRCAC
Kenai, AL, USA	Energy (Oil and Gas)	Operations	1990	Cook Inlet Regional Citizens Advisory Committee for oversight of shipments of oil from Alaska after the Exxon Valdez spill	CIRCAC
Gulf of Mexico, USA	Energy (Oil)	Operations	2011[(2)]	Proposed, stemming from the Deepwater Horizon oil spill of 2010	N/A
Mackenzie Valley, NT, CA	Energy (Natural Gas)	Operations	2009[(2)]	Proposed as part of the Joint Panel Review Report	N/A
Sydney, NS, CA	Infrastructure (Steel Smelter)	Remediation	2007	Remediation Monitoring Oversight Board for the Sydney Tar Ponds and Coke Ovens Remediation Project, and the Citizen Oversight Committee Citizen's Liaison Committee	RMOB CLC
Billings, MT, USA	Mining	Operations	2000	Stillwater and East Boulder Oversight Committees under the "Good Neighbor Agreement" for the Stillwater Mining palladium/gold/platinum mine	SEB-GNA
Yellowknife, NT, CA	Mining	Operations	1997	Independent Environmental Monitoring Agency for the BHP Billiton Ekati diamond mine	IEMA
Yellowknife, NT, CA	Mining	Operations	2000	Environmental Monitoring Advisory Board for the Diavik diamond mine	EMAB
Yellowknife, NT, CA	Mining	Operations	2004	Snap Lake Environmental Monitoring Agency for the De Beers Snap lake diamond mine	SLEMA
Happy Valley-Goose Bay, NL, CA	Transportation	Operations	1995	Institute for Environmental Monitoring and Research for the low-level military flying operations in Labrador	IEMR

(1) It is surprisingly difficult to narrow down a specific year of origin for each body. Data for this column, then, rely on the date when the legal framework was released (discussed below).
(2) To date, no independent oversight bodies have been created for these projects. Thus the date refers to the most recent report that considers this option.

Nine existing and two proposed independent oversight agencies were considered in this analysis:

- Sollum Voe, Scotland: SOTEAG. This agency is responsible for developing and implementing monitoring programs associated with oil and liquefied gas terminals in the Shetland Islands. It served as the model for the Citizens' Advisory Councils created in Alaska following the Exxon Valdez Spill (Ritchie, 2004).
- Alaska, USA: PWSRCAC and CIRCAC. These two Regional Citizens' Advisory Councils were established in law following the Exxon Valdez Spill in 1989 (**see Box 2.1**).
- Gulf of Mexico, USA: This is a proposed agency stemming from the Deepwater Horizon spill. The National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling recommended that an independent oversight body be established "similar to the Regional Citizens' Advisory Councils mandated by the Oil Pollution Act of 1990", to ensure spill planning and management, and local involvement (National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, 2011, p.268-269).

- Inuvik, NT: This was a proposed agency for the Mackenzie Gas Project.[43]
- Sydney, NS: RMOB and CLC. The federal review panel for the remediation of the Sydney Tar Ponds recommended that the government strike an independent monitoring board to ensure that the government "proceed(s) within its approved guidelines" (Public Works and Government Services Canada, 2010, Recommendation 53). Furthermore, it recommended the Crown Corporation overseeing the remediation continue to support a Community Liaison Committee (recommendation 55) to report back to the community about progress (**see Box 2.2**).
- Montana, USA: SEB-GNA. This oversight agency was formed through a private contract among the Northern Plains Resource Council, Cottonwood Resources Council, Stillwater Protective Association, and the Stillwater Mining Company to address issues of concern associated with the development, including those identified specifically in the agreement (Kenney, Stohs, Chavez, Fitzgerald, & Erickson, 2004).
- Yellowknife, NT: IEMA, EMAB, SLEMA. Independent environmental oversight boards were created for each of the three diamond mines opened in the Northwest Territories. With each successive development, the logical organization of its respective oversight body was modified to reflect lessons learned from earlier experiences (**see Box 2.3** regarding the IEMA).
- Happy-Valley-Goose Bay, NL: IEMR. The Institute oversees the environmental effects of low-level flight training based at the Canadian Forces Base at Goose Bay and conducted over large areas of Labrador and northeastern Quebec. Creating the institute was a recommendation by the Independent Review Panel struck for the environmental assessment process (Institute for Environmental Monitoring and Research, 2012).

As described above, each independent oversight board is unique. The design of the body impacts the ability of each oversight agency to meet its obligations, as well as to serve broader public expectations. Table 3 outlines the unique implementation framework, mandate, funding arrangement, and composition for each board or agency.

[43] The Joint Panel Review recommended that the Commissioner of the Environment and Sustainable Development report annually on the implementation of the Panel's recommendations (Joint Review Panel, 2009 recommendation 19.1). In the absence of this report the panel recommended an independent oversight agency be created (recommendation 19.2). However, in its response to the panel, the Governments of Canada and Northwest Territories declined to implement either recommendation.

It is important to consider the government's reasoning underlying its rejection of the Joint Panel's recommendation, particularly since it is inconsistent with earlier positions in other cases, which resulted in independent oversight bodies being established. The government suggested it could not implement recommendation 19.1 because to do so would interfere with the independence of the environmental commissioner. Further, it said recommendation 19.2 was "outside the scope of the Joint Review Panel's mandate. [and] The recommendation is beyond a reasonable recommendation that would flow from considerations of the Joint Review Panel with respect to the environmental impacts of the Mackenzie Gas Project" (*Government of Canada & Government of the Northwest Territories, 2010, 126*). To address the issue of monitoring, the Government response observed the Government of the Northwest Territories has a tracking system in place to address both Territorial and proponent commitments.

Box 2.1: Alyeska Marine Facility and Transfer Station: Prince William Sound Citizens' Advisory Committee

> *The Regional Citizens' Advisory Council was born out of chaos, anger, outrage, and alienation: the chaos of the spill, anger at industry's arrogant and ultimately empty assurances, and outrage at the flimsiness of the spill response and government's flaccid and inept oversight (Stanley, 1994, p.312)*

The discovery of oil in the North Slope of Alaska triggered the construction of the 800 mile Trans-Alaska Pipeline, owned and operated by Alyeska Pipeline Services Company (2011). The oil is shipped to a marine terminal in Valdez, Alaska, where it is transferred onto ships for transport. On March 29, 1989, 10.8 million gallons of oil spilled when the Exxon Valdez tanker ran aground the Bligh Reef (Hunt, 2009). Restitution and clean-up costs for the disaster were significant (National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, 2011, p.232).

Today, there are three organizations involved at the site: two independent oversight bodies (the Prince William Sound Regional Citizens' Advisory Committee, and the Cook Inlet Regional Citizens Advisory Committee), separated by geographic location, and the Exxon Valdez Oil Spill Trustee Council (Trustee Council), created to mitigate the negative effects of the spill. The focus of this box is the **Prince William Sound Regional Citizens' Advisory Committee (PWSRCAC)**.

Although citizens of Prince William Sound sought a voice in pipeline, terminal and marine activities prior to the oil spill, the incident quickly gave traction to local demands. PWSRCAC was created through a contract (and funding) with Alyseka Pipeline Services, and later given a mandate in s. 5002 of the Oil Pollution Act of 1990 (OPA 90) (Capt Max Miller & Lt Dave Haynes, 1994).

The contract between the PWSRCAC and the Alyeska Pipeline Service Company was signed on February 8 (1990). PWSRCAC "had insisted on, and won, four key provisions: absolute independence from Alyeska, generous access to Alyeska facilities, a guaranteed source of annual funding, and assurances that the contract would last as long as oil flows through the pipeline" (Stanley, 1994, p. 313).

The agreement gives the PWSRCAC monitoring and advisory functions respecting the terminal, oil spill prevention, safety and emergency response and, where appropriate, the vessel traffic system (Clause 2, and article II clause 2.1). The PWSRCAC had base funding of $2 million per year, adjusted for inflation, and renegotiated every third year (Clause 3.3). Today, PWSRCAC has funding of over $3.3 million per year (PWS Interviews IO-1, IO-3, IO-4). Article 4 obligates the company to give PWSRCAC reasonable access to facilities and information. Dispute resolution is subject to arbitration (Article 7), unless sufficient notice is provided that PWSRCAC will pursue litigation. The PWSRCAC includes representatives of 18 member organizations, located in the area affected by the spill; it employs a staff of fifteen people, including technical experts who serve as project managers.

The literature suggests there were some growing pains in the early days of the PWSRCAC. As noted by Capt Max Miller & Lt Dave Haynes, "...the early development stages were rocky, even to the point of dissolution" (1994, p. 324). One example involved the question of representation. As the PWSRCAC is comprised of local representatives, there were questions about representation: were board members responsible to their member organizations, or to the Board itself (Stanley, 1994, p.317)? A second issue surrounded mandate: was PWSRCAC a "whistle-blowing watchdog or simply an advisory group?" (Capt Max Miller & Lt Dave Haynes, 1994); was it designed to create trust between the proponent and the community, or to ensure that monitoring was done in a way that met the needs of the local stakeholders (Stanley, 1994)?

Fifteen years later, these questions appear to be resolved. PWSRCAC was held as a model of excellence with respect to both monitoring and community relations in recent hearings into the BP Deepwater Horizon Oil Spill (2011), and in international venues exploring the opportunity for Independent Oversight (Interview PWS Interviews P-2). A point of pride for PWSRCAC staff is that, as of 2010, there has been no spill at the transfer station or in the port area (though the same cannot be said for the pipeline, which is outside the mandate of PWSRCAC) (PWS Interviews IO-1, P-2, IO-3, IO-4, P-5).

Box 2.2: Remediation Monitoring Oversight Board for the Sydney Tar Ponds and Coke Ovens Remediation Project (Tar Ponds)

The Sydney Tar Ponds and Coke Ovens site is, arguably, the most infamous contaminated site in Canada. Located in the Muggah Creek watershed, in the community of Sydney, Nova Scotia, the industrial site was once home to a flourishing steel industry. Production was fuelled by locally mined coal, and processed on-site using coke ovens. The facility was established in 1899. Although it produced close to half of Canada's steel in 1921, by mid-twentieth century the economics of production had become precarious (Rainham, 2002). Nonetheless, the coke ovens were not closed until 1988, followed twelve years later by the steel plant (Palen et al., 2004).

Concerns about contaminants and impacts to human health from this urban-industrial site trace back to the early 1980s (Rainham, 2002). "The first official studies of environmental contamination were conducted in the early 1980s by the federal department of fisheries and indicated levels of PAHs [polycyclic aromatic hydrocarbons] in lobsters to be 200 times higher than anywhere else on Cape Breton Island...[and] led to the closure of fisheries operations in the area," (Haalboom, Elliott, Eyles, & Muggah, 2006, 229).

Responsibility for remediation fell to the federal and provincial governments. The *Sydney Tar Ponds Clean-up Agreement*, 1986, outlined the terms of remediation. Clean up is overseen by the Sydney Tar Ponds Agency (STPA). The STPA is a single purpose entity created by the government of Nova Scotia, funded through a $400 million dollar cost-sharing agreement with the federal government. As the proponent, the STPA manages project design, implementation and public communications (Sydney Tar Ponds Agency, 2010).

The remediation design was created under the espoused value of community engagement. A Joint Action Group (JAG) was struck to finalize a remediation strategy (see Barlow & May, 2000; Palen, et al., 2004, among others). Once that was determined, the STPA employed a Citizens Liaison Committee (CLC) for the purpose of community outreach.

The Joint Panel Review, which reviewed the environmental assessment for the project (Public Works and Government Services Canada, 2010, 18-19) recommended that the CLC continue through project implementation, albeit with a more transparent appointment process and formalized terms of reference (recommendation 55). In addition, the Panel recommended the government strike an independent oversight board that "would act in a formal technical review capacity and to ensure the general public that the Project is proceeding within its approved guidelines" (recommendation 53). Although the federal government agreed, in principle, to the recommendations, it suggested that oversight be conducted not independently, but by government agencies. It also provided support for the province to continue the CLC.

The provincial government was more responsive to the specific recommendations. It agreed, and indeed established the Remediation Monitoring and Oversight Board (RMOB) (recommendation 53) and made the creation of the CLC (recommendation 55) a condition of project approval. The RMOB operates under the terms set out by the Province in its response to the Joint Review Panel (i.e., there is no memorandum of understanding or agreement).

The interview participants expressed significant concerns with the model for independent oversight employed for the Sydney Tar Ponds Project. In particular, they noted:

- a lack of information for the public; (Public Works and Government Services Canada, 2010, 19);
- insufficient trust in government, who serves as both the proponent and regulator (STP-P1, STP- P2, STP IO-5)
- inadequate funding STP-P1, STP- P2, STP IO-5; and,
- lack of independence STP-P1, STP- P2.

Box 2.3: Independent oversight for monitoring of diamond mines in the Northwest Territories, Canada: BHP and the IEMA

The discovery of indicator metals in the Slave Geological province led to the development of three operational diamond mines in the Northwest Territories (see Affolder, 2010; Fitzpatrick, 2007; O'Faircheallaigh, 2006, 2007). The first to open was the Ekati Mine (BHP), quickly followed by the Diavik Diamond Mine (Rio Tinto), and the Snap Lake Diamond Mine (DeBeers).

Ekati was the first diamond mine in Canada, and as such, it faced a number of concerns during its environmental assessment, including:

- issues regarding abandoned mines in the Northwest Territories;
- a legacy of poor company and government relationships with Aboriginal communities;
- concerns about exploitative international business practices of global mining companies; and,
- questions about the adequacy of the regulatory approvals process to ensure companies honoured commitments made during the regulatory process.

Because of these and other concerns, a number of contractual agreements were struck for each diamond project:

- **impact and benefit agreements**, negotiated between the proponents and affected Aboriginal communities. These bilateral agreements, which address the specific impacts of development on Aboriginal peoples, are not addressed in this brief;
- **a socio-economic agreement**, which addresses a range of issues including training commitments, health and social services programs and monitoring, and local business development initiatives. The independent oversight bodies created through these agreements focus on socio-economic conditions, and thus are not addressed in this report; and,
- **an environment agreement**, which addresses a range of issues, including the development of environmental management programs, reporting requirements, closure and reclamation plans, the provision of security deposits to act as remedies for potential infringements on the arguments, and the establishment of independent oversight (Canadian Institute of Resources Law, 1997).

With each successive development, the logical organization of its respective independent oversight body was modified to reflect lessons learned.

The longest standing agency is the Independent Environmental Monitoring Agency (IEMA), created for BHP's Ekati Mine. It consists of a seven-member board of directors, four of whom are appointed by Aboriginal organizations, with the three others being appointed jointly by BHP and the federal and territorial governments, in consultation with Aboriginal organizations. Non-governmental organizations are not represented on IEMA. Although the name of the Agency might imply that monitoring is directly carried out, the IEMA reports on company monitoring and the compliance by the company to commitments related to the environment. The Agency does not have decision-making authority; IEMA reviews documentation, and makes recommendations to the appropriate responsible authority (see also Ross, 2004).

The agreements regarding the Ekati project are relatively well documented in the resource management literature (Affolder, 2010; Fidler & Hitch, 2007; Galbraith, Bradshaw, & Rutherford, 2007; O'Faircheallaigh, 2006, 2007; Ross, 2004), independent reports (Canadian Institute of Resources Law, 1997; SENES Consultants Limited, 2009; Terra Firma Consultants, 2003) and testimony at environmental hearings (Indian and Northern Affairs Canada, 2007; O'Reilly, 1998; Ross, 2007).

After a rough start, wherein Aboriginal organizations expressed concerns that their issues were not adequately addressed by the IEMA (and resulting in a different structure for the EMAB and then again for SLEMA), reviews of this agency are generally favourable. As summarized by O'Faircheallaigh (2006, p. 16), "there appears to be a widespread perception the agency has operated effectively as a mechanism for technical review and independent monitoring of environmental management." Furthermore, activities and recommendations by the IEMA resulted in changes to monitoring programs and operational protocol (O'Faircheallaigh, 2006; Ross, 2007).

Nonetheless, there remain areas for improvement. As noted by O'Fairchealaigh (2006), and Interviews DM IO-1, DM IO-2, DM IO-4, DM IO-5, DM IO-1 G-7, DM P-7, there is limited funding, which translated into limited research, or verification of the results provided by the proponent. Furthermore, funding is negotiated on an annual basis, which leaves the potential for the company to leverage its support for a more favourable assessment. Additionally, although not yet required in practice, the framework agreement only grants remedies in the case of disputes to signatories to the agreement (the proponent, government and Aboriginal organizations); there is no provision for alternative dispute resolution with IEMA as a party.

Table 3: Organizational and governance characteristics of each of the oversight bodies.

Resource	Funding	Purpose	Implementation	Composition
SOTEAG Sollum Voe, SCT	Funding amount not available Funded by a limited company created in partnership by the local council and the proponent Funding period not available.	Conduct monitoring Review monitoring reports Provide advice and guidance	Legislation & Private contract	Seven Executive Members (*), Eight Associate Members and Seven Observers (*) three from Universities, two elected councilors from Shetland Island, two from industry
PWRCAC, Valdez and Anchorage, AL, USA	3.3 million per year Proponent Support Negotiated every third year	Conduct monitoring Review monitoring reports Provide advice and guidance Carry out inspections Act as public liaison	Legislation & Private contract	18 member board, (representatives organizations within the affected region)
CIRCAC, Kenai, AL, USA	Approx. $300,000 per year Proponent Support Negotiated every third year	Conduct monitoring Provide advice and guidance;	Legislation & Private contract	22 Directors, with six from interest groups, seven from municipalities, and nine from government agencies (*) (*) non-voting
RMOB, Sydney, NS, CA	Not available Provincial Government Not available	Review monitoring reports (annually)	Requirement for approval	Three representatives with expertise and academic qualifications
CLC, Sydney, NS, CA	Not available, but non-paid participation Proponent (Crown Corporation Not available	Act as public liaison	Requirement for project approval	Three representatives with expertise and academic qualifications
GNA Billings, MT, USA	Funding allocated by activity, with an additional operating budget up to $135,000 per year The proponent Annual	Conduct monitoring Carry out inspections Act as a public liaison	Private contract	Eight members, two appointed by each of the East Boulder and Stillwater Oversight Committee, and two appointed by each group in consultation with the Northern Plains Resource Council (note all organizations are non-profit corporations)
IEMA, Yellowknife, NT, CA	$450,000 per year The Proponent, with support from the government for the first two years Annual	Review monitoring reports Provide advice and guidance; Act as public liaison	Requirement for project approval Private contract	Seven-member board of directors, four of whom are appointed by Aboriginal organizations, and three appointed jointly by BHP, the federal and territorial governments, in consultation with Aboriginal organizations.
EMAB, Yellowknife, NT, CA	$800,000 per year The Proponent, with support from the government for the	Review monitoring reports Provide advice and guidance;	Requirement for project approval Private contract	Eight to eleven member board, with one appointment by each Aboriginal organization, the proponent, and both levels of government.

Resource	Funding	Purpose	Implementation	Composition
	first two years Annual	Act as public liaison		
SLEMA, Yellowknife, NT, CA	$450,000 per year (higher in the first two years) The Proponent, with support from the government for the first two years Annual	Provide advice and guidance; Act as public liaison	Requirement for project approval Private contract	A core group with representatives of each Aboriginal Part; a Science and Technical Panel; two Traditional Knowledge Working Groups
IEMR, Happy Valley-Goose Bay, NL, CA	$1.25 million dollars Federal government Annual, but commitment made on a five year basis	Conduct monitoring Provide advice and guidance, including the power to recommend closure Carry out inspections; Act as public liaison	Requirement for project approval	Nine voting members: five appointed by Aboriginal Organizations; four appointed by local municipalities Four non-voting, ex-officio members, appointed by government

2.2.1 IMPLEMENTATION FRAMEWORK

It is difficult to overstate the importance of the implementation framework through which an oversight agency is created. In addition to setting out an agency's mandate, funding and composition, as discussed below, the framework specifies the authority vested in the oversight body, including opportunities for recourse in the event of non-compliance with monitoring requirements. As illustrated in Table 3, independent oversight is facilitated through three types of arrangements:

- legislation, which was used for the SOTEAG, PWSRCAC and CIRCAC in Alaska and has been proposed for the Gulf of Mexico spill. The pertinent legislation in these cases is the federal Oil Pollution Act 1990. "Section 5002 of OPA 90 establishes a demonstration project in which local citizens have direct involvement in operations, practices and regulatory issues related to terminal facilities and crude oil tankers" (Stanley, 1994, 311).
- private contracts between the proponent and community stakeholders, such as the Good Neighbour Agreement used in the Stillwater and East Boulder Case and the supplementary contract for the RCACs in Alaska. These contracts, "take a variety of forms, but typically are documents promising company concessions and behavioural changes designed to reduce (and more fully disclose) negative community impacts" (Kenney, et al., 2004, p.1).
- conditions of approval. In Canada, independent oversight is primarily a condition of government approval. In two cases (RMOB/ CLC; IEMR[44]) the oversight bodies stem from a recommendation from the environmental assessment. However, in three cases (IEMA; EMAB; SLEMA), following the assessment recommendation, the government negotiated a formal, separate agreement with the proponent, outlining supplemental (or super-added) environmental commitments, including independent oversight.

There is significant debate surrounding best practice for creating an independent oversight agency. Unfortunately, most analysis compares agencies created through similar means, and thus there is not, as of yet, a standard practice or rule for implementation frameworks. Nonetheless, the individual commentaries provide insight into the potential pitfalls that should be considered.

The legislative approach likely holds the most promise for highly rigorous frameworks because it can be used to establish various regulatory as well as civil remedies (Interviews PWS I0-1; PWS P-2; DM IO-1; DM I0-8; STP P-1; STP P-2). However, there are several challenges associated with this mechanism:

- legislation is slow to develop, and slower to change. As such, the authority for independent oversight may come after the damage has been done, as it did for the PWSRCAC.
- direction set by the legislation may be nebulous, or unwieldy, thus making implementation challenging in the short-term (**see Box 2.1**)

[44] IEMR does not have a negotiated, separate agreement. However, unlike the RMOB and CLC, it has a constitution that canvases many key components.

- in the case of the Alaskan RCACs, implementation included the negotiation of a private contract. While OPA 90 likely improved the negotiating position of the local citizens, there are successful examples of private contracts outside of legislative frameworks.

Private contracts, like those created through Good Neighbour Agreements, emerged in the US in the 1970s, and are used in other jurisdictions such as the United Kingdom. As noted by the Friends of the Earth Scotland (2004, p.5), "GNAs can be a useful supplement to effective and stringent environmental regulation in helping deliver environmental justice." GNAs provide an opportunity for the community to ensure environmentally responsible behavior by a company, and provide a means through which local community groups can seek action (Lewis & Henkel, 1997 as cited in Friends of the Earth Scotland 2004). Legally enforceable, these types of agreements often provide for recourse through the courts, provide detailed requirements for verification and ensure the company pays for external monitoring. Furthermore, they may create a positive relationship between the community and the company (Shaw, 2001, as discussed in Friends of the Earth Scotland, 2004).

On the flip side, monitoring agreements, as with other voluntary corporate initiatives, are not substitutes for regulation (Friends of the Earth Scotland, 2004, p.5; Webb, 1999). The agreements often need to be framed in law and supplemented with supporting regulations. At the very least, having the monitoring regime being framed in law must be viewed as a real possibility to provide sufficient incentive for companies to participate in an effective and enforceable agreement. Another challenge is ensuring that all signatories have similar capacity in negotiation and similar levels of resources to enforce compliance with the agreement. Civil actions for breach of contract can be expensive and time consuming. Finally, depending on the specific terms and conditions, some aspects of monitoring agreements may not be legally enforceable.

The last type of framework, founded on conditions for project approval, is widely used in Canada. Lengthy, detailed and sophisticated approval conditions are becoming the norm in Canada – whether for environmental protection or environmental assessment purposes (Muldoon, Lucas, Gibson, & Pickfield, 2009). With regards to monitoring, the approval conditions are often supplemented by super-added agreements for implementation, which are the focus of the ensuing analysis. The literature on such agreements ascribes lofty goals to this type of mechanism, which is seen as a way for communities "to fulfill their desire and responsibility to be involved in minimizing the adverse environmental impacts of large scale resource" developments (Klein, Donihee, & Stewart, 2004; O'Faircheallaigh & Corbett, 2005; as cited in Noble & Birk, 2011, p.18). The most pressing problem with this aspiration is that communities are not always included in negotiation, or as signatories to the agreement!

Super-added agreements provide an opportunity to ensure monitoring occurs beyond specific regulatory requirements (Affolder, 2010; Fitzpatrick, 2007). An agreement can also address site-specific, or time-specific requirements. However, the agreements have been critiqued on the basis that they may "impair the regulatory system by reducing discretion, undermining public accountability and encouraging greater interdepartmental conflict" (Affolder, 2010, pp. 160-161).

A more long-term problem with super-added agreements is that they are project-specific; few provide for independent oversight on a regional level, and once a company has approval, it has little incentive to work outside of the agreement as struck (Affolder, 2010; Fitzpatrick, 2007). But perhaps the most scathing critique is made by Noble & Birk (2011, p. 23). They examined negotiated agreements for uranium mining in the Athabaska Region; ultimately they conclude the super-added agreements have little influence on effects monitoring outcomes. While this is an interesting assessment, it is important to remember (i) the authors have a similarly dire view of monitoring and follow-up programs throughout Canada (regardless of the framework); and (ii) they rely on one specific mandate of monitoring. Furthermore, this conclusion is contradicted by a variety of other studies (Affolder, 2010; BHP Independent Environmental Monitoring Agency, 2007; O'Faircheallaigh, 2007; O'Faircheallaigh & Corbett, 2005; SENES Consultants Limited, 2009, among others).

In our view, the least effective implementation framework is that based solely on conditions for project approval, without a supplemental (or super-added) agreement. One paragraph in an assessment report does not provide clear information on the workings of a monitoring agency, such as mandate, composition and funding. In addition, there is a dearth of information about board composition, the appointment process, conflict of interest and avenues for dispute resolution, which are typically canvassed in supplemental agreements. Without a super-added agreement, independent oversight agencies risk losing sight of local and party-specific nuances important for developing a clear, transparent independent oversight agency (Interviews STP P-1; STP P-2; STP IO-5). This situation can result in significant confusion, and in some cases, mistrust by the public.

To summarize – there is no standard legal framework for implementing independent oversight. However, those bodies created through negotiated agreements (either fully or in part) have greater authority and legal recourse than those whose implementation is limited to either regulation or approval conditions (with no supplemental documentation).

2.2.2 MANDATE

As noted in Section 2.1, monitoring programs are developed for a variety of reasons. Likewise, independent oversight bodies have different mandates. In general, they carry out some or all of five types of activities:

- monitoring (independent of government);
- reviewing monitoring reports (from proponents and government);
- providing advice and guidance;
- carrying out inspections; and,
- acting as a public liaison.

An agency's mandate is of critical importance. It establishes, or in some cases, binds the activities of an organization. From the public's perspective, an effective oversight body should, in addition to acting as a community liaison, be mandated to "deliver higher site-specific environmental and social standards and greater corporate accountability to local communities" (Friends of the Earth Scotland, 2004, p. 44). However, given the range of activities listed above,

this is not always the case. An unclear mandate can result in tensions that arise among the proponent, the oversight agencies and the public.[45]

2.2.3 FUNDING

Funding is also critically important as it necessarily limits the ability of the Board to achieve its mandate. Funding levels, where publically available, differ wildly between each oversight body (**see Table 2**). But is it telling that concerns about funding were most predominant when the oversight agencies had less than a million dollars per year. Nonetheless, adequate funding is a critical issue in almost all cases (e.g., Busenberg, 1997; O'Faircheallaigh, 2006 and Interviews DM IO-1, DM IO-2, DM IO-4, DM IO-5, DM IO-1 G-7, DM P-7, STP P1, STP P2, STP IO 4, PWS IO-1, PWS P-2).

Project proponents typically provide funding for oversight bodies, and funding is usually provided annually. While such a source may be appropriate, there is a fear that should an oversight body be too critical, future funding will be limited. This is particularly relevant when budgets are negotiated on an annual basis. Annual budgeting is likewise problematic because it makes long-term planning all but impossible, and potentially jeopardizes the independent nature of the oversight body (Interviews DM IO-1, DM IO-2, DM IO-4, DM IO-5, DM P-8, DM P-9, PWS IO-1, PWS P-2). Data suggests that agencies with three-year funding cycles were more satisfied than those with annual negotiations.

Movement is afoot to experiment with funding trusts, whereby proponents pay a lump sum, and the oversight body is funded through the accrued interest (PWS P-2).[46] This would eliminate the need for the agency to negotiate with proponents on a regular basis, which is important given that the proponent could easily be the object of the agency's criticism. However, the trust would necessarily need to be sufficiently large such that it could weather global economic conditions. As such, this may only be a solution for oversight bodies created on a regional, rather than a project-by-project basis.

2.2.4 COMPOSITION

As illustrated in Table 2, board size varies, depending on the number of organizations impacted by the development. For the most part, organizations appoint members. What is less evident in the table is the optimal skill set of the appointees. Board members are either appointed as community representatives (PWSCAC, CIRCAC, CLC, GNA, EMAB, SLEMA) or technical experts (RMOB, IEMA, IEMR).

The representation does always match the overall mandate of the oversight body. For example, those agencies with responsibility for public communication need community representatives;

[45] These tensions have resulted in evolving mandates for the diamond mines in the NT. In short, the critique of IEMA shortly after formation was that it did not adequately act as a public liaison. Thus when EMAB was formed, the guidelines over emphasized local participation, and this led to a critique that the Board had insufficient technical expertise. SLEMA was designed to balance Aboriginal engagement with scientific analysis. It is too early to comment on the success of SLEMA's approach; however some have commented it is more successful at engaging the holders of traditional knowledge, whereas IEMA is more successful at providing scientific analysis of monitoring reports.

[46] The trust model is currently being explored for a proposed oversight agency in the Gulf of Mexico.

likewise, those with technical mandates require appropriate expertise. In the absence of technical expertise, where a mandate extends beyond public liaison, sufficient funding must be provided to hire experts as necessary (as is the case with PWSCAC and GNA).

One oversight board has the proponent as a voting member, which has caused significant issues with respect to the independence of that board (DM IO-1, DM IO-2, DM IO-4, DM IO-5, DM P-8, DM P-9). Keeping board composition independent of government and the proponent is this critically important.[47]

2.3 SEVEN ELEMENTS OF AN EFFECTIVE OVERSIGHT PROGRAM

Based on the literature, and drawing from the semi-structured interviews with stakeholders involved in five oversight boards, it is possible to identify seven elements of an effective oversight program (modified from Fitzpatrick, 2012).

1. Strong legal foundation. An organization with a legislated or contractual framework governing activities has a greater ability to undertake tasks associated with its mandate, and to challenge the proponent in cases where monitoring or financial obligations are not being met.
2. Clear mandate. Since independent oversight can serve various purposes, the framework must specify the roles and responsibilities of the agency and its stakeholders.
3. Effective communication and outreach. Regardless of the specific mandate, to be successful, an oversight body must communicate its mandate to the local stakeholders.
4. Independent authority. Once the mandate is struck, the oversight body must be free to meet its mandate, independent of review by the government or the proponent, and not be tied to annual funding (see point 5). True independent authority includes a mechanism for the oversight body to pursue its own interests, including in matters of conflict resolution, outside of the approval of a signatory to the agreement.
5. Independent composition. Although some oversight agencies include representatives from the federal and territorial governments and the proponent, more successful bodies comprise representatives from local non-governmental organizations, and local and Aboriginal governments.
6. Adequate, long-term funding. Adequate funding to fulfill tasks in the mandate is a struggle for most oversight agencies. Funding ranges from nothing, up to funding of $3.3 million annually, in the case of the Prince William Sound Citizens' Advisory Group. Beyond sufficient funding, best practice calls for multi-year funding arrangements, so that long-term programs can be established.
7. Experience. Organizational learning and experience are important. Assessments during the first decade of operation focus on aspects for improvement, while literature reviewing agencies in existence for 20 years or more (e.g., SOTEAG, PWSRCAC) focus on organizational strengths or achievements. More research is needed. Specifically, to what degree do different contractual arrangements influence the long-term success of an oversight agency? Are positive, long-term reviews more favourable because, in fact, the

[47] This supports the direction of the Friends of the Earth Scotland (2004, p.15; Kenney, et al., 2004) to "keep government agencies out of the process".

structure and function of the agency are more effective and efficient than those set up for younger agencies? Or, alternatively, are experience and learning necessary aspects for success?

2.4 MANITOBA HYDRO AND THE CASE FOR INDEPENDENT OVERSIGHT

During the Wuskwatim Hearings, the CAC/PILC proposed the Clean Environment Commission investigate the potential role of independent oversight for proposed projects in northern Manitoba. In responding to this recommendation, the Clean Environment Commission did "not *(make)* a recommendation on this point, *(but)* it *(urged)* Manitoba Conservation to consider such an initiative" (Clean Environment Commission, 2004, pp. 85-86). To our knowledge, there is no information on the public record as to whether or not Manitoba Conservation followed up on this suggestion.

There are several factors that support the case for independent oversight for Manitoba Hydro Projects. It is clear that Bipole III will have a sizable footprint in the **hinterland**, and numerous stakeholders identified in the impact statement represent Aboriginal organizations. There are also outstanding questions regarding **administrative capacity**. For example, do recent lay-offs at the federal level impinge on the ability of key departments (such as Environment Canada, Fisheries and Oceans Canada, and Natural Resources Canada) to complete their monitoring responsibilities? Third, Manitoba Hydro continues to face questions about its legacy and past hydroelectric development. Although these are frequently deemed out side the scope of any one specific environmental assessment, they contribute to questions of **trust** between the proponent and the public.

Fourth, there are significant outstanding questions regarding **implementation**. For example, there is a dearth of information about follow-up related to the Wuskwatim project on the public record, despite several IRs. Furthermore, Manitoba Hydro has clearly stated that the EPP and the Sustainability Assessment Monitoring Program proposed for this project are preliminary, to be finalized following the report of the Clean Environment Commission. Requests for more detailed information or specific thresholds were met with the response that the data "are currently being developed" (see for example responses to CEC/MH-VI-229; CEC/MH-VI-230; and CEC/MH-VII-498). While Manitoba Hydro has committed to meet with stakeholders prior to the finalization of some components (see CEC/MH-VII-462), the details of these discussions are vague. What is also unclear is how the proponent plans to consult the public about the detailed plans prior to implementation,[48] and include that information in the final plans? What assurances are available that the plans will be subject to an external technical review? Furthermore, it appears as though discussions will not be on going, unless a specific request is made to Manitoba Hydro (CEC/MH-VII-363).[49]

Perhaps the most significant argument in favour of independent oversight focuses on **overlapping mandate**. Manitoba Hydro is a Crown Corporation, with a mandate "to supply

[48] CEC/MH-VI.

[49] The EIS does commit Manitoba Hydro to releasing the monitoring results annually, but there does not appear to be a communication or discussion strategy associated with this release.

power adequate for the needs of the Province of Manitoba and to promote economy and efficiency in the development, generation, transmission, distribution, supply and end-use of power" (Manitoba Hydro, 2011, pp. 1-4).[50] Hydro is responsible to the Minister of Innovation, Energy and Mines, who has responsibilities as regulator and proponent. The Minister of Innovation, Energy and Mines is charged by the Lieutenant Governor in Council with the administration of *The Mines and Minerals Act*, and has obligations under *The Climate Change and Emissions Reductions Act*, both of which are listed as applicable legislation in Appendix 1-3 of the EIS.[51] And respectfully, he, and his colleagues (who are responsible for administering 22 provincial statutes and regulations for the project), all report to the Manitoba Legislative Assembly.[52] These overlapping responsibilities add significant potential for conflict. That the Crown is ultimately acting as both proponent and regulator for this project is the most compelling reason why independent oversight should be explored.

Manitoba Hydro developed, and is continuing to develop, a series of hydroelectric generating stations and transmissions lines throughout the province. This hearing provides an opportunity for Hydro to exercise leadership in the province by implementing a monitoring program that not only espouses best practice, but also sets a high standard for environmental monitoring for both the province and the country. Developing a robust system for independent oversight would make a strong contribution in this respect. In the short term, this could be accomplished through the creation of an independent oversight body charged with reviewing the draft environmental protection plan prior to finalization; reviewing monitoring reports by both the proponent and government departments;[53] carrying out periodic inspections, and acting as a public liaison for monitoring programs. In the medium-term, such an agency would be given additional responsibilities to conduct independent monitoring.[54]

In the medium- to long-term, project-by-project independent oversight should be replaced by regional independent oversight bodies.[55] These bodies would assume the responsibilities for project-by-project independent monitoring (for all future large-scale developments, including those proposed by Manitoba Hydro) within a set geographic area, but also be charged with implementing a monitoring program that considers cumulative impacts.

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[50] This puts citizens of Manitoba in an interesting position. The citizens are directly impacted by the proposal, but are also the proponent's consumers, and some would argue, ultimate shareholders.

[51] A more detailed analysis is not possible at this time, as Manitoba Hydro has not yet responded to our information request for a more detailed summary of applicable legislation, regulation, statutes and permits.

[52] Although the lawyer for Manitoba Hydro suggested, during the Wuskwatim hearings, that independent oversight was provided by the "civil servants employed by our Provincial Government" (*Wuskwatim Generation and Transmission Project Hearing Transcript*, 2004, p. 7623), these civil servants are also ultimately accountable to the Manitoba Legislature; this type of oversight would more aptly be considered **horizontal oversight**. Thus should this line of inquiry be pursued in future hearings, Manitoba Hydro's interpretation should be corrected.

[53] And have on-going access to the Environmental Protection Information Management System.

[54] Although we have not examined the *Northern Flood Agreement*, and the four subsequent *Implementation Agreements* in depth, there may be an opportunity to include representation from (and data collected by) the different Environmental Monitoring Agencies and/or Resource Management Committees struck to undertake monitoring and investigation for each community (see section 6 of the York Factory and Split Lake Implementation Agreements, and Section 7 of the Norway House and Nelson House Implementation Agreement).

[55] Regional oversight has been considered in the Northwest Territories. As summarized by Terra Firma Consultants (2003), this is seen as a natural step in independent monitoring, which would minimize the potential for having a "fragmented approach to monitoring and management", and create an opportunity for a more detailed, nuanced understanding of cumulative effects.

In all of these suggested monitoring and oversight initiatives, we recommend that Hydro take an adaptive approach and view the initiatives themselves as policy experiments that should be monitored, evaluated, and periodically adjusted to reflect lessons learned. By doing so, the corporation can be at the forefront of advancing state of the art environmental management practices in Canada.

2.5 REFERENCES

Ackerman, J. (2003). Co-governance for accountability: Beyond ‘‘exit’’ and ‘‘voice’’. *World Development, 32*(3), 447-463.

Affolder, N. (2010). Rethinking Environmental Contracting. *Journal of Environmental Law and Practice, 21*, 155.

Alyeska Pipeline Service Company. (2011). Welcome. Retrieved January 1, 2011, from http://www.alyeska-pipe.com/Default.asp

Barlow, M., & May, E. (2000). *Frederick Street: Life and death on Canada's Love Canal*. Toronto: Harper Collins Canada.

BHP Independent Environmental Monitoring Agency. (2007, June 7). BHP Independent Environmental Monitoring Agency. from www.monitoringagency.net

Brown, D., & Luttrell, C. (2004). *Review of independent forest monitoring*. London: Forest Policy & Environment Group, Overseas Development Institute.

Busenberg, G. J. (1997). *Citizen Advisory Councils and Environmental Management in the Marine Oil Trade: Technical Report based on Doctoral Dissertation.* University of North Carolina at Chapel Hill, Chapel Hill.

Canadian Institute of Resources Law. (1997). *Independent review of the BHP diamond mine process*. Hull, PQ.: Mineral Resources Directorate, Department of Indian Affairs and Northern Development.

Capt Max Miller, & Lt Dave Haynes. (1994, March 23-25). *Oversight of the marine industry in Western Alaska.* Paper presented at the Prevention, Response, Oversight Five years after the *Exxon Valdez* Oil Spill, Fairbanks, AK.

Clean Environment Commission. (2004). *Report on public hearings: Wuskwatim generation and transmission line projects*. Winnipeg, MB, Canada: Clean Environment Commission.

Ecological Monitoring and Assessment Network Coordinating Office, & Canadian Nature Federation. (2003). *Improving local decision-making through community based monitoring: Toward a Canadian community monitoring network*. Ottawa.

Fidler, C., & Hitch, M. (2007). Impact and benefit agreements: A contentious issue for environmental and Aboriginal justice. *Environments, 35*(2), 49-69.

Fitzpatrick, P. (2007). A new staples industry? Complexity, governance and Canada's diamond mines. *Policy and Society, 26*(1), 87-103.

Fitzpatrick, P. (2012). Guest Statement: Accountability in resource management: Independent oversight of proponents and governments. In P. Dearden & B. Mitchell (Eds.), *Environmental Change and Challenge: A Canadian Perspective* (4th ed., pp. 430-431).

Friends of the Earth Scotland. (2004). *Love thy neighbour? The potential for neighbour agreements in Scotland*. Edinburgh: Friends of the Earth Scotland.

Galbraith, L., Bradshaw, B., & Rutherford, M. B. (2007). Towards a new supraregulatory approach to environmental assessment in Northern Canada. *Impact Assessment and Project Appraisal, 25*(1), 27-41.

Gibson, P. D., Lacy, D. P., & Dougherty, M. J. (2005). Improving performance and accountability in local government with citizen participation. *The Innovative Journal, 10*(1), 12 pp.

Goetz, A. M., & Jenkins, R. (2001). Hybrid Forms Of Accountability: Citizen engagement in institutions of public-sector oversight in India. *Public Management Review, 3*(3), 363 - 383.

Government of Canada, & Government of the Northwest Territories. (2010). *Final response to the Joint Review Panel report for the proposed Mackenzie Gas Project*. Ottawa, ON: Canadian Environmental Assessment Agency.

Haalboom, B., Elliott, S. J., Eyles, J., & Muggah, H. (2006). The risk society at work in the Sydney 'Tar Ponds'. *Canadian Geographer, 50*(2), 227-241.

Hunt, J. (2009). *Mission without a map: The politics and policies of restoration following the Exxon Valdez oil spill: 1989-2002*. Anchorage, AK: The Exxon Valdez Oil Spill Trust Council.

Indian and Northern Affairs Canada. (2007, May 3). *Environmental (biophysical) management plans, monitoring and follow-up programs: Government overview.* Paper presented at the Mackenzie Gas Project Joint Panel Review, Yellowknife, NT.

Institute for Environmental Monitoring and Research. (2012). About IEMR. Retrieved August 12, 2012, from http://www.iemr.org/home.html

Joint Panel Review. (2007). *Mackenzie Gas Project Joint Panel Review Hearing Transcripts* (No. 91). Yellowknife: Northern Gas Project Secretariat.

Joint Review Panel. (2009). *Foundation for a sustainable northern future: Report of the joint review panel for the Mackenzie gas project.* Yellowknife, NT.

Kenney, D. S., Stohs, M., Chavez, J., Fitzgerald, A., & Erickson, T. (2004). *Evaluating the use of good neighbor agreements for environmental and community protection*. Bolder, CO: Natural Resources Law Centre, University of Colorado School of Law.

Klein, H., Donihee, J., & Stewart, G. (2004). *Environmental impact assessment and impact and benefit agreements: creative tension or conflict?* . Paper presented at the International Association for Impact Assessment annual meeting.

Lewis, S., & Henkel, D. (1997). Good neighbor agreements: A tool for environmental and social justice. *Social Justice, 23*(4), 134-151.

Manitoba Hydro. (2011). *Bi-Pole III: Environmental impact statement*. Winnipeg, MB, Canada: Manitoba Hydro

McDonald, A. (2002). Monitoring and evaluating environmental conditions. In B. Mitchell (Ed.), *Resource and environmental management* (2nd ed., pp. 320-321). Essex, England: Longman, Pearson Education Limited.

Mitchell, B. (2002). *Resource and environmental management* (2nd ed.). Essex, England: Longman, Pearson Education Limited.

Morrison-Saunders, A., & Arts, J. (2005). Learning from experience: Emerging trends in environmental impact assessment follow-up. *Impact Assessment and Project Appraisal, 23*(3), 170-174.

Moyer, J., Fitzpatrick, P., Diduck, A. P., & Froese, B. (2008). Towards community-based monitoring in the hog industry in Manitoba: A paper submitted to the Manitoba clean environment commission. *Canadian Public Administration Journal, 51*(4), 637-658.

Muldoon, P., Lucas, A., Gibson, B., & Pickfield, P. (2009). *Environmental Law and Policy in Canada* Toronto: : Emond Montgomery.

National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling. (2011). *Deep Water The Gulf Oil Disaster and the Future of Offshore Drilling: Report to the*

President. Washington, DC.: National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling.
Noble, B. (2005). *Introduction to environmental impact assessment: A guide to principles and practices*. Toronto, ON, Canada: Oxford University Press.
Noble, B., & Birk, J. (2011). Comfort monitoring? Environmental assessment follow-up under community-industry negotiated environmental agreements. *Environmental Impact Assessment Review, 31*(1), 17-24.
Noble, B., & Storey, K. (2005). Towards increasing the utility of follow-up in Canadian EIA. *Environmental Assessment Policy and Management, 25*, 163-180.
O'Faircheallaigh, C. (2006). *Environmental agreements in Canada: Aboriginal participation, EIA follow-up and environmental management of major projects*. Calgary, AB: Canadian Institute of Resources Law.
O'Faircheallaigh, C. (2007). Environmental agreements, EIA follow-up and aboriginal participation in environmental management: The Canadian experience. *Environmental Impact Assessment Review, 27*(4), 319-342.
O'Faircheallaigh, C., & Corbett, T. (2005). Indigenous participation in environmental management of mining projects: the role of negotiated agreements. *Environmental Politics, 14*(5), 629-647.
O'Reilly, K. (1998). *The BHP Independent Environmental Monitoring Agency as a management tool*. Yellowknife, NWT: Canadian Arctic Resources Committee.
Palen, H. R. J., Duinker, P. N., Bruce C. Gilbert, Levy, J. D., MacLeod, M. D., & Wilgenburg, H. V. (2004). *Community-Based Processes in the Context of Contaminated Sites: Lessons from the Joint Action Group for Environmental Clean-Up of the Muggah Creek*. Halifax, NS: Dalhousie University.
Public Works and Government Services Canada. (2010). *Sydney Tar Ponds and Coke Ovens remediation Project: Joint Review Panel recommendations and IMplementation Synopsis* Ottawa, ON: Canadian Environmental Assessment Agency.
PWSRCAC. (1990). Contract Between the Regional Citizens Advisory Commitee and Alyeska Pipeline Service Company (pp. 61).
Rainham, D. (2002). Risk Communication and Public Response to Industrial Chemical Contamination in Sydney, Nova Scotia: A case study. *Journal of Environmental Health, 65*(5), 26-32.
Ritchie, W. (2004). Monitoring long-term environmental change: some lessons from Sullom Voe Shetland Islands. *Journal of Maritime Affairs, 3*(2), 193-204.
Ross, W. (2004). The independent environmental watchdog: A Canadian experiment in EIA follow-up. In A. Morrison-Saunders & J. Arts (Eds.), *Assessing impact: Handbook of EIA and SEA follow-up* (pp. 178-196). Sterling, VA: Earthscan.
Ross, W. (2007, May 8). *The independent environmental monitoring agency.* Paper presented at the Mackenzie Gas Project Joint Panel Review, Yellowknife.
Schedler, A. (1999). Conceptualizing accountability. In A. Schedler, L. Diamond & M. F. Plattner (Eds.), *The self-restraining state: Power and accountability in new democracies* (pp. 13-28). Boulder, CO: Lynne Rienner.
SENES Consultants Limited. (2009). *External Review of the Independent Environmental Monitoring Agency*. Yellowknife, NT: Independent Environmental Monitoring Agency.
Shaw, B. (2001). *Signed, sealed and delivered? The role of negotiated agreements in the UK London*. London: Green Alliance.

Stanley, H. E. (1994, March 23-25). *Citizen oversight under OPA 90: Report card from Prince WIlliam Sound.* Paper presented at the Prevention, Response, Oversight Five years after the *Exxon Valdez* Oil Spill, Fairbanks, AK.

Sydney Tar Ponds Agency. (2010). Together. Making history. Retrieved October 11, 2010, from http://www.tarpondscleanup.ca/

Terra Firma Consultants. (2003). *"An Open Door Exists and... We Need to Change and Improve from what we've learned" Aboriginal Caucus Workshop on Environmental Monitoring of Diamond Mines*. Yellowknife, NT: Independent Environmental Monitoring Agency.

Webb, K. (1999). Voluntary initiatives and the law. In B. Gibson (Ed.), *Voluntary Initiatives and the New Politics of Corporate Greening* (pp. 32-50). Peterborough, Ont.: : Broadview Press.

Wuskwatim Generation and Transmission Project Hearing Transcript, Clean Environment Commission (2004).